# Oracle® Database Appliance X10 Deployment and User's Guide





Oracle Database Appliance X10 Deployment and User's Guide, Release 19.27 for Linux x86-64

G29501-02

Copyright © 2022, 2025, Oracle and/or its affiliates.

Primary Author: Aparna Kamath

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software, software documentation, data (as defined in the Federal Acquisition Regulation), or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software," "commercial computer software documentation," or "limited rights data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle®, Java, MySQL, and NetSuite are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

## Contents

I	<b>&gt;</b>	re	21	a	C	e
Ī						

ence	xix
ımentation Accessibility	xix
ted Documents	XİX
ventions	XX
icle Database Appliance Checklists	
cklist for System Requirements	1-1
oyment Checklist for Oracle Database Appliance Bare Metal Systems	1-6
cklist for Custom Network Address Configuration	1-8
oduction to Oracle Database Appliance	
ıt Oracle Database Appliance	2-1
le Database Appliance Software Terminology	2-3
It the Browser User Interface	2-4
adying Oracle Database Appliance for Deployment	2-4
	3-1
adying Oracle Database Appliance for Deployment	
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA	3-1
adying Oracle Database Appliance for Deployment ching Storage Cables to Oracle Database Appliance X10-HA ching Network Cables to Oracle Database Appliance X10-HA	3-1 3-4
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L	3-1 3-2 3-6
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L Ching Power Cords and Initializing Components	3-1 3-4 3-6 3-9
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L Ching Power Cords and Initializing Components Ciguring Oracle Integrated Lights Out Manager	3-1 3-2 3-6 3-9 3-11
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L Ching Power Cords and Initializing Components iguring Oracle Integrated Lights Out Manager Cering On Oracle Database Appliance the First Time	3-1 3-2 3-6 3-9 3-1
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L Ching Power Cords and Initializing Components Ciguring Oracle Integrated Lights Out Manager Cering On Oracle Database Appliance the First Time  Visioning Oracle Database Appliance Bare Metal S	3-1 3-6 3-9 3-9 3-11 ystem
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L Ching Power Cords and Initializing Components Ciguring Oracle Integrated Lights Out Manager Cering On Oracle Database Appliance the First Time  Visioning Oracle Database Appliance Bare Metal S  Gying Cabling and Network Connections	3-1 3-2 3-6 3-9 3-11 ystem
adying Oracle Database Appliance for Deployment Ching Storage Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-HA Ching Network Cables to Oracle Database Appliance X10-S or X10-L Ching Power Cords and Initializing Components Ciguring Oracle Integrated Lights Out Manager Cering On Oracle Database Appliance the First Time  Visioning Oracle Database Appliance Bare Metal S Cying Cabling and Network Connections Cabling the Network	3-1 3-6 3-9 3-9 3-11 ystem 4-1



## 5 Implementing Multi-User Access on Oracle Database Appliance

About Multi-User Access on Oracle Database Appliance	5-2
About Users, Roles, Entitlements, and Operations on a Multi-User Access Enabled Oracle Database Appliance System	5-4
About Granting and Revoking Resource Access	5-5
Using Passwordless Multi-User Access on Oracle Database Appliance	5-6
About Passwordless Multi-User Access on Oracle Database Appliance	5-7
Provisioning Oracle Database Appliance with Passwordless Multi-User Access	5-9
Creating, Viewing, and Deleting Users on Oracle Database Appliance with Passwordless Multi-User Access	5-10
Changing the Password for a User Account on Oracle Database Appliance with Passwordless Multi-User Access	5-11
Example JSON Files to Create a Single-Node Passwordless Multi-User Enabled Appliance	5-12
Example JSON File to Create a High-Availability Passwordless Multi-User Enabled Appliance	5-17
Example JSON Files to Create a Single-Node Passwordless Multi-User Enabled DB System	5-21
Example JSON File to Create a High-Availability Passwordless Multi-User Enabled DB System	5-25
Provisioning Oracle Database Appliance with Multi-User Access	5-29
Creating, Viewing, and Deleting Users on Oracle Database Appliance with Multi-User Access	5-32
Activating a New User on Oracle Database Appliance with Multi-User Access	5-33
Granting and Revoking Resource Access on Oracle Database Appliance with Multi-User Access	5-34
Viewing Roles, Operations, and Entitlements on Oracle Database Appliance with Multi-User Access	5-35
Managing Databases and Database Homes on Oracle Database Appliance with Multi-User Access	5-36
Changing the Password for a User Account on Oracle Database Appliance with Multi-User Access	5-38
Resetting the Password for a Locked User Account on Oracle Database Appliance with Multi-User Access	5-38
Oracle Database Appliance Postinstallation Tasks	
About Password Requirements on Oracle Database Appliance	6-1
Configuring CPU Core Count	6-3
Modifying Oracle ASM Listener Port After Deployment	6-3
Securing Oracle ILOM Service Processors	6-4
Changing Oracle Database Appliance Passwords	6-5



Changing the DNS Server Address on Oracle Database Appliance	6-6
Re-imaging Oracle Database Appliance	
Uninstalling Oracle Database Appliance Components	7-1
Reimaging an Oracle Database Appliance Baremetal System	7-4
Performing Secure Erase of Data on Storage Disks	7-6
Redeployment of Oracle Database Appliance	7-7
Patching Oracle Database Appliance	
About Patching Oracle Database Appliance	8-2
About Patching Prechecks	8-4
About Enabling NUMA on Oracle Database Appliance	8-6
Minimizing Downtime When Patching Oracle Database Appliance	8-7
About Updating Databases and Database Homes	8-8
Updating ESTES-EXT Firmware Before Patching Oracle Database Appliance Server	8-9
Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line	8-18
Patching Oracle Database Appliance DB Systems Using the Command-Line	8-33
Patching Oracle Database Appliance Bare Metal Systems Using the Browser User Interface	8-40
Patching Oracle Database Appliance DB Systems Using the Browser User Interface	8-41
Updating Oracle Database Appliance Repository with Database Clone Files For Bare Metal Systems	8-43
Patching Databases Using ODACLI Commands or the BUI	8-44
Patching Existing Database Homes Using ODACLI or the BUI	8-45
Patching Non-Provisioned Oracle Database Appliance Systems	8-46
Applying Additional Patches and Updates on Bare Metal Systems	8-47
Enabling Kernel Updates	8-47
Applying Out-of-Cycle Database Patches	8-48
Cleaning Up the Patch Repository	8-50
About Upgrading to a Different Database Home	8-51
Setting Dynamic Default Parameters	8-51
Managing Oracle Databases	
About Administrative Groups and Users on Oracle Database Appliance	9-2
About Data Migration Options for Oracle Database Appliance	9-3
About Creating Database Homes on Oracle ACFS Storage	9-3
About Standard Edition High Availability for Oracle Database Appliance	9-5
About Enterprise Edition High Availability for Oracle Database Appliance	9-6
Working with Databases	9-7
Viewing Databases	9-8
Creating a Database Using the Browser User Interface	9-9



One atting a Database Hair of ODAOH On garage and	
Creating a Database Using ODACLI Commands	9-12
Cloning a Database from Backup	9-14
Cloning an Oracle ACFS Database	9-15
Modifying a Database	9-17
Moving a Database from One Oracle Home to Another	9-19
Upgrading a Database	9-20
Upgrading a Database Manually Using AutoUpgrade	9-20
Deleting a Database	9-28
Working with Database Homes	9-28
About Managing Multiple Oracle Homes on Oracle Database Appliance	9-28
Viewing Database Homes	9-29
Creating a Database Home	9-29
Deleting a Database Home	9-30
Migrating Databases	9-30
About Migrating Databases	9-30
Configuring a Static Listener	9-31
Migrating a Database	9-32
Registering a Database	9-34
About Managing Multiple Database Instances Using Instance Caging	9-35
Oracle EM Express and DR Console	9-36
	9-30
Oracle EM Express and DB Console  Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance	10-2
Managing TDE-Enabled Oracle Databases	
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance	10-2
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault	10-2 10-3
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault	10-2 10-3 10-5
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands	10-2 10-3 10-5 10-10
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault	10-2 10-3 10-5 10-10
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on	10-2 10-3 10-5 10-10
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on Oracle Key Vault	10-2 10-3 10-5 10-10 10-16
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on Oracle Key Vault  Changing the Password for TDE-enabled Databases	10-2 10-3 10-5 10-16 10-16 10-18
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on  Oracle Key Vault  Changing the Password for TDE-enabled Databases  Re-keying TDE Master Encryption Key for TDE-Enabled Databases	10-2 10-3 10-5 10-16 10-16 10-18 10-21
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on  Oracle Key Vault  Changing the Password for TDE-enabled Databases  Re-keying TDE Master Encryption Key for TDE-Enabled Databases  Performing Backup and Recovery of TDE-enabled Databases	10-2 10-3 10-5 10-16 10-18 10-18 10-2 10-2
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on Oracle Key Vault  Changing the Password for TDE-enabled Databases  Re-keying TDE Master Encryption Key for TDE-Enabled Databases  Performing Backup and Recovery of TDE-enabled Databases  Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials  Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in	10-2 10-3 10-5 10-16 10-18 10-21 10-22 10-26
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on  Oracle Key Vault  Changing the Password for TDE-enabled Databases  Re-keying TDE Master Encryption Key for TDE-Enabled Databases  Performing Backup and Recovery of TDE-enabled Databases  Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials  Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in  Oracle Key Vault	10-2 10-3 10-5 10-16 10-18 10-18 10-21 10-22 10-26
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance About Oracle Key Vault Creating TDE-Enabled Databases With User Credentials Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands Managing Database Operations on TDE-enabled Databases with TDE keys stored on Oracle Key Vault  Changing the Password for TDE-enabled Databases Re-keying TDE Master Encryption Key for TDE-Enabled Databases Performing Backup and Recovery of TDE-enabled Databases Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in Oracle Key Vault Deleting TDE-enabled Databases	10-2 10-3 10-5 10-16 10-18 10-2 10-2 10-2 10-3 10-4
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on  Oracle Key Vault  Changing the Password for TDE-enabled Databases  Re-keying TDE Master Encryption Key for TDE-Enabled Databases  Performing Backup and Recovery of TDE-enabled Databases  Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials  Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in Oracle Key Vault  Deleting TDE-enabled Databases  Creating a User in Oracle Key Vault Using BUI	10-2 10-16 10-16 10-18 10-18 10-2 10-2 10-2 10-2 10-3 10-4 10-4
Managing TDE-Enabled Oracle Databases  About Transparent Database Encryption (TDE) in Oracle Database Appliance  About Oracle Key Vault  Creating TDE-Enabled Databases With User Credentials  Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault  Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands  Managing Database Operations on TDE-enabled Databases with TDE keys stored on  Oracle Key Vault  Changing the Password for TDE-enabled Databases  Re-keying TDE Master Encryption Key for TDE-Enabled Databases  Performing Backup and Recovery of TDE-enabled Databases  Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials  Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in Oracle Key Vault  Deleting TDE-enabled Databases  Creating a User in Oracle Key Vault Using BUI  Updating Oracle Key Vault Endpoints for Databases	10-1 10-1 10-1 10-1 10-1 10-2 10-2 10-3 10-4 10-4 10-4



Restoring a Software Keystore TDE database using RMAN and Registering the Database	10-62
Creating Oracle Key Vault Server Configuration Object Using the BUI	10-65
Granting and Revoking Access on Oracle Key Vault Server Configuration Using BUI	10-65
Managing Oracle Key Vault Server Configuration Operations Using BUI	10-66
Migrating Tablespaces from a TDE-enabled Oracle Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore	10-67
Migrating Tablespaces from a TDE-enabled Oracle ACFS Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore	10-67
Migrating Tablespaces from a TDE-enabled Oracle ASM Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore	10-75
Migrating Tablespaces from TDE-enabled Oracle ACFS Database with Software Keystore to another TDE-enabled Multitenant Database with Oracle Key Vault Keystore	10-83
Migrating Tablespaces from TDE-enabled Oracle ASM Database with Software Keystore to another TDE-enabled Multitenant Database with Oracle Key Vault Keystore	10-93
Manually Migrating from Software Keystore to Oracle Key Vault Keystore on Oracle Database Appliance	10-102
Manual Migration and Encryption of Data into TDE-Enabled Database	10-111
Migrating Tablespaces from Non-TDE Oracle ACFS Database to Oracle ACFS Database on Oracle Database Appliance	10-112
Migrating Tablespaces from Non-TDE Oracle ASM Database to Oracle ASM Database on Oracle Database Appliance	10-117
Migrating Tablespaces from Non-TDE Oracle ACFS Database to Oracle ACFS CDB Database on Oracle Database Appliance	10-123
Migrating Tablespaces from Non-TDE Oracle ASM Database to Oracle ASM CDB Database on Oracle Database Appliance	10-130
Managing Storage	
About Managing Storage	11-1
About Managing Oracle ASM Disks	11-1
Managing Storage on Single-Node Systems	11-2
About Storage on Oracle Database Appliance X10-S and X10-L	11-2
Adding Small Form Factor (SFF) NVMe Storage Disks	11-3
Adding Add-in-Card (AIC) NVMe Storage Disks	11-8
Replacing Small Form Factor (SFF) NVMe Storage Disks	11-22
Managing Storage on High-Availability Systems	11-23
About Storage Options for Oracle Database Appliance X10-HA	11-23
Adding Solid-State Drives (SSDs) for Data Storage	11-25
Adding the Storage Expansion Shelf	11-31
Managing Networks	
About Network Infrastructure and VLANs on Oracle Database Appliance	12-1
About Oracle Database Appliance X10 Network Interfaces	12-2
Viewing Configured Networks and Network Interfaces	12-4



Creating a Network	12-4
Creating a Physical Network	12-5
Updating a Network	12-5
Adding a Network Interface	12-6
Deleting a Network Interface	12-6
Deleting a Network Interface Using Browser User Interface	12-6
Deleting a Network Using the Browser User Interface  Backup, Restore and Recover Databases	12-7
About Database Backup and Recovery Options	13-1
Configuring NFS Backup and Restore on Oracle Database Appliance	13-9
Configuring an NFS Backup Location	13-9
Backing Up the Database to NFS Location	13-12
Restoring the Database from NFS Backup	13-15
Configuring Agent Proxy Settings for Object Store Access	13-17
Creating a Database Backup Policy	13-18
Updating a Database with a Backup Policy	13-19
Updating a Backup Policy	13-19
Backing Up a Database Using the Browser User Interface	13-19
Viewing Backup Reports	13-20
Recovering a Database Using the Browser User Interface	13-20
Deleting a Backup Using the Browser User Interface	13-21
Deleting a Backup Policy	13-21
Using the CLI to Backup, Restore, and Recover	13-21
Preparing for Database Backup to Disk	13-22
Preparing for Database Backup to NFS Location	13-23
Preparing for Database Backup to Oracle Cloud	13-24
Backing Up a Database with the CLI	13-25
Recovering a Database with the CLI	13-26
Restoring a Database with the CLI	13-28
Restoring Archivelog with the CLI	13-31
Deleting Backups with the CLI	13-31
Using Oracle Data Guard for Disaster Management and Recove Oracle Database Appliance	ry on
About Oracle Data Guard on Oracle Database Appliance	14-2
Deploying Multiple Standby Databases with Oracle Data Guard on Oracle Database	1 / 0
Appliance Configuring Oracle Data Guard on Oracle Database Appliance	14-3 14-3
Configuring Oracle Data Guard on Oracle Database Appliance	14-3 14-26
Configuring Oracle Data Guard on Oracle Database Appliance Using BUI	14-20



	Viewing Oracle Data Guard Status on Oracle Database Appliance	14-28			
	Viewing Oracle Data Guard Status on Oracle Database Appliance Using BUI	14-29			
	Performing Oracle Data Guard Operations	14-29			
	Performing Oracle Data Guard Operations Using BUI	14-30			
	Creating an Oracle Data Guard Network				
	Migrating an Oracle Database from One System to Another Using Integrated Oracle Data				
	Guard	14-32			
	Patching Oracle Data Guard Databases on Oracle Database Appliance	14-38			
	Enabling Oracle Active Data Guard on Existing Configurations	14-40			
	Registering Oracle Data Guard on Oracle Database Appliance Using ODACLI Commands	14-40			
	Registering Oracle Data Guard on Oracle Database Appliance Using BUI	14-61			
	Deconfiguring Oracle Data Guard on Oracle Database Appliance	14-63			
	Deconfiguring Oracle Data Guard on Oracle Database Appliance Using BUI	14-67			
15	Managing CPU Pools on Oracle Database Appliance Bare Metal and KVM Deployments				
	About CPU Pools	15-1			
	Creating a CPU Pool in a Bare Metal or KVM Deployment	15-3			
	Remapping CPU Pools in a Bare Metal or KVM Deployment	15-4			
	Viewing CPU Pools in a Bare Metal or KVM Deployment	15-5			
	Modifying a CPU Pool in a Bare Metal or KVM Deployment	15-6			
	Deleting a CPU Pool in a Bare Metal or KVM Deployment	15-6			
	Viewing CPU Pool Audit Records in a Bare Metal or KVM Deployment	15-7			
	About Over-Subscribed CPU Pools	15-7			
16	Managing an Oracle Database Appliance KVM Deployment				
	About Oracle Database Appliance KVM Deployment	16-2			
	About Oracle Database Appliance KVM Virtualization Architecture	16-3			
	About Virtual Machines and Oracle Database Appliance KVM Deployments	16-4			
	About KVM DB Systems on Oracle Database Appliance	16-7			
	Deploying Multiple Databases on DB Systems on Oracle Database Appliance	16-10			
	Managing DB Systems in KVM Deployment	16-16			
	Creating a DB System in a KVM Deployment	16-17			
	Listing DB Systems in a KVM Deployment	16-23			
	Describing a DB System in a KVM Deployment	16-24			
	Modifying a DB System in a KVM Deployment	16-24			
	Attaching and Detaching a Network for a DB System in a KVM Deployment	16-26			
	Starting a DB System in a KVM Deployment	16-27			
	Stopping a DB System in a KVM Deployment	16-28			
	Deleting a DB System in a KVM Deployment	16-29			



Managing Backup, Restore, and Recovery on a DB System in a KVM Deployment	16-30
Managing Shared CPU Pool with DB System in a KVM Deployment	16-30
Managing Oracle Data Guard on a DB System in a KVM Deployment	16-33
Setting Up and Configuring a KVM Deployment for Applications	16-33
Managing VM Storage in KVM Deployment	16-34
Creating a VM Storage in a KVM Deployment	16-34
Viewing VM Storage in a KVM Deployment	16-35
Modifying VM Storage in a KVM Deployment	16-36
Deleting a VM Storage in a KVM Deployment	16-36
Managing Virtual Networks in KVM Deployment	16-37
Creating a Virtual Network in a KVM Deployment	16-37
Viewing Virtual Networks in a KVM Deployment	16-39
Starting and Stopping Virtual Networks in a KVM Deployment	16-39
Modifying a Virtual Network in a KVM Deployment	16-40
Deleting a Virtual Network in a KVM Deployment	16-40
Managing Virtual Disks in KVM Deployment	16-41
Creating a Virtual Disk in a KVM Deployment	16-41
Viewing Virtual Disks in a KVM Deployment	16-42
Cloning a Virtual Disk in a KVM Deployment	16-43
Modifying a Virtual Disk in a KVM Deployment	16-44
Deleting a Virtual Disk in a KVM Deployment	16-44
Managing Virtual Machines in KVM Deployment	16-45
Creating a Virtual Machine with ODACLI or BUI in a KVM Deployment	16-45
Creating a Virtual Machine with a Kickstart Configuration File	16-49
Cloning a Virtual Machine in a KVM Deployment	16-52
Modifying a Virtual Machine in a KVM Deployment	16-53
Viewing Virtual Machines in a KVM Deployment	16-54
Starting and Stopping Virtual Machines in a KVM Deployment	16-55
Deleting a Virtual Machine in a KVM Deployment	16-55
About Overcommitting Memory or CPUs in an Oracle Database Appliance KVM System	16-56
Example JSON File to Create a Single-Node DB System	16-56
Example JSON File to Create a High-Availability DB System	16-65
Oracle Database Appliance Command-Line Interface	
About Oracle Database Appliance Command-Line Interface	17-2
Managing ODACLI Privileges and Security with SUDO	17-4
ODACLI Command Changes with Multi-User Access on Oracle Database Appliance	17-6
odacli Network Commands	17-13
odacli configure-firstnet	17-13
odacli create-network	17-16
odacli delete-network	17-18



odacii delete-networkinterface	17-19
odacli describe-network	17-20
odacli describe-networkinterface	17-22
odacli list-networks	17-23
odacli list-networkinterfaces	17-23
odacli modify-network	17-24
odacli Multi-User Access Commands	17-26
odacli list-domains	17-27
odacli describe-domain	17-28
odacli list-tenants	17-29
odacli describe-tenant	17-29
odacli create-user	17-30
odacli activate-user	17-31
odacli list-users	17-32
odacli describe-user	17-33
odacli authorize-user	17-34
odacli delete-user	17-35
odacli list-user-roles	17-36
odacli describe-user-role	17-37
odacli list-user-entitlements	17-38
odacli describe-user-entitlement	17-39
odacli list-user-operations	17-40
odacli describe-user-operation	17-40
odacli list-resources-access	17-41
odacli describe-resource-access	17-42
odacli grant-resource-access	17-43
odacli revoke-resource-access	17-44
odacli reset-password	17-45
odacli change-password	17-46
odacli Apply Patch and Update Commands	17-46
odacli cleanup-patchrepo	17-48
odacli create-prepatchreport	17-49
odacli describe-prepatchreport	17-52
odacli list-prepatchreports	17-62
odacli delete-prepatchreport	17-62
odacli list-availablepatches	17-63
odacli describe-component	17-64
odacli describe-latestpatch	17-71
odacli list-agentconfig-parameters	17-72
odacli modify-agentconfig-parameters	17-73
odacli delete-agentconfig-parameters	17-76
odacli update-database	17-77



odacli update-dbhome	17-79
odacli update-dcsadmin	17-80
odacli update-dcsagent	17-81
odacli update-dcscomponents	17-82
odacli update-registry	17-83
odacli update-repository	17-90
odacli update-server	17-92
odacli update-storage	17-93
odaadmcli orachk	17-94
odacli Appliance Commands	17-95
odaconfigcli collectconfig	17-96
odacli extend-localvolume	17-97
odacli list-localvolumes	17-99
odacli modify-asmport	17-101
odacli set-credential	17-103
odacli create-appliance	17-104
odacli describe-system	17-104
odacli ping-agent	17-107
odacli list-nodes	17-107
odacli list-featuretracking	17-108
odacli Backup and Recovery Commands	17-110
odacli create-backup	17-112
odacli create-backupconfig	17-114
odacli create-objectstoreswift	17-115
odacli describe-backupconfig	17-116
odacli delete-backup	17-117
odacli delete-backupconfig	17-118
odacli describe-backupreport	17-118
odacli describe-objectstoreswift	17-121
odacli delete-objectstoreswift	17-121
odacli describe-schedule	17-122
odacli irestore-database	17-122
odacli list-backupconfigs	17-129
odacli list-backupreports	17-129
odacli list-objectstoreswifts	17-130
odacli list-schedules	17-130
odacli list-tdebackupreports	17-132
odacli recover-database	17-132
odacli restore-archivelog	17-135
odacli restore-tdewallet	17-135
odacli modify-backupconfig	17-136
odacli modify-objectstoreswift	17-138



odacli modify-schedule	17-139
odacli Oracle Data Guard Commands	17-140
odacli configure-dataguard	17-140
odacli deconfigure-dataguard	17-152
odacli describe-dataguardstatus	17-154
odacli failover-dataguard	17-156
odacli list-dataguardstatus	17-157
odacli reinstate-dataguard	17-158
odacli register-dataguard	17-159
odacli switchover-dataguard	17-159
odacli CPU Core Commands	17-160
odacli list-cpucores	17-160
odacli describe-cpucore	17-161
odacli modify-cpucore	17-161
odacli CPU Pool Commands for Bare Metal and KVM	17-162
odacli create-cpupool	17-163
odacli remap-cpupools	17-165
odacli list-cpupools	17-166
odacli describe-cpupool	17-166
odacli modify-cpupool	17-166
odacli delete-cpupool	17-167
odacli list-auditrecords	17-168
odacli describe-auditrecord	17-169
odacli Database Commands	17-169
odacli clone-database	17-170
odacli create-database	17-180
odacli delete-database	17-186
odacli describe-database	17-188
odacli list-databases	17-189
odacli modify-database	17-190
odacli move-database	17-193
odacli register-database	17-194
odacli upgrade-database	17-201
odacli DBHome Commands	17-202
odacli configure-dbhome-storage	17-203
odacli list-dbhome-storages	17-204
odacli describe-dbhome-storage	17-205
odacli modify-dbhome-storage	17-206
odacli create-dbhome	17-207
odacli delete-dbhome	17-208
odacli describe-dbhome	17-209
odacli list-dbhomes	17-209



odacli Database Storage Commands	17-210
odacli create-dbstorage	17-211
odacli delete-dbstorage	17-212
odacli describe-dbstorage	17-213
odacli describe-dgstorage	17-214
odacli list-dbstorages	17-216
odacli list-dgstorages	17-217
odacli modify-dbstorage	17-218
odacli modify-dgstorage	17-219
odacli Diagnostics Collection Commands	17-220
odacli create-diagcollection	17-221
odacli describe-diagcollection	17-222
odacli list-diagcollections	17-222
odacli delete-diagcollection	17-223
odacli Job Commands	17-224
odacli create-jobdata-retention-policy	17-224
odacli create-purge-jobdata-job	17-226
odacli delete-jobdata-retention-policy	17-229
odacli describe-job	17-231
odacli list-jobs	17-233
odacli list-pendingjobs	17-237
odacli list-jobdata-retention-policy	17-237
odacli list-purge-jobdata-jobs	17-238
odacli list-scheduled-executions	17-239
odacli Oracle Key Vault Server Configuration Commands	17-240
odacli create-okvserverconfig	17-241
odacli copy-okvtdewallet	17-241
odacli delete-okvserverconfig	17-244
odacli describe-okvserverconfig	17-245
odacli list-okvserverconfigs	17-246
odacli update-okvendpoints	17-247
Log Commands	17-251
odaadmcli manage diagcollect	17-251
odacli create-auto-logclean-policy	17-253
odacli delete-auto-logclean-policy	17-254
odacli create-logcleanjob	17-254
odacli describe-logcleanjob	17-256
odacli list-auto-logclean-policy	17-256
odacli list-logcleanjobs	17-257
odacli list-logspaceusage	17-258
odacli Oracle Auto Service Request Commands	17-259
odacli configure-asr	17-259



odacli DB System Commands for KVM	18-5
About Command-Line Interface for Kernel-Based Virtual Machine (KVM) About ODACLI Commands Supported on Oracle KVM Database System	18-1 18-3
Oracle Database Appliance Command-Line Interface for KVI	M
odaadmcli stordiag	17-287
odaadmcli show storage	17-286
odaadmcli show raidsyncstatus	17-285
odaadmcli show diskgroup	17-284
odaadmcli show disk	17-282
odaadmcli show controller	17-282
odaadmcli power disk	17-281
odacli validate-storagetopology	17-280
odacli list-dgdisks	17-279
odaadmcli expand storage	17-278
odaadmcli asmops diskgroup	17-277
Storage Commands	17-277
odaadmcli show server	17-276
odaadmcli show processor	17-275
odaadmcli show power	17-275
odaadmcli show network	17-274
odaadmcli show memory	17-273
odaadmcli show fs	17-272
odaadmcli show env_hw	17-272
odaadmcli show cooling	17-271
odaadmcli show localdisk	17-271
odaadmcli Hardware Monitoring Commands	17-270
odacli modify-osconfigurations	17-269
odacli list-osconfigurations	17-268
odacli OS Commands	17-268
odacli disable-acr	17-268
odacli list-acr	17-267
odacli redact-acr	17-267
odacli enable-acr	17-266
odacli describe-acr	17-266
Adaptive Classification and Redaction (ACR) Commands	17-265
odacli test-asr	17-265
odacli modify-asr	17-263
odacli export-asrconfig	17-263
odacli delete-asr	17-262
odacli describe-asr	17-261



odacli create-dbsystem	18-6
odacli modify-dbsystem	18-7
odacli modify-dbfileattributes	18-10
odacli list-dbsystems	18-11
odacli describe-dbsystem	18-12
odacli describe-dbsystem-image	18-18
odacli start-dbsystem	18-19
odacli stop-dbsystem	18-20
odacli delete-dbsystem	18-21
odacli VM Storage Commands for KVM	18-23
odacli create-vmstorage	18-23
odacli list-vmstorages	18-24
odacli describe-vmstorage	18-24
odacli modify-vmstorage	18-25
odacli delete-vmstorage	18-25
odacli Virtual Disk Commands for Oracle KVM	18-26
odacli create-vdisk	18-26
odacli list-vdisks	18-27
odacli describe-vdisk	18-27
odacli modify-vdisk	18-28
odacli clone-vdisk	18-28
odacli delete-vdisk	18-29
odacli CPU Pool Commands for Bare Metal and KVM	18-29
odacli create-cpupool	18-30
odacli remap-cpupools	18-31
odacli list-cpupools	18-32
odacli describe-cpupool	18-33
odacli modify-cpupool	18-33
odacli delete-cpupool	18-34
odacli list-auditrecords	18-34
odacli describe-auditrecord	18-35
odacli VM Network Commands for KVM	18-36
odacli create-vnetwork	18-37
odacli list-vnetworks	18-37
odacli describe-vnetwork	18-38
odacli start-vnetwork	18-38
odacli stop-vnetwork	18-39
odacli modify-vnetwork	18-39
odacli delete-vnetwork	18-40
odacli Virtual Machine Commands for Oracle KVM	18-40
odacli create-vm	18-41
odacli list-vms	18-42



	odacli describe-vm	18-43
	odacli modify-vm	18-43
	odacli start-vm	18-46
	odacli stop-vm	18-46
	odacli migrate-vm	18-47
	odacli clone-vm	18-47
	odacli delete-vm	18-48
19	Configuring and Using Oracle Auto Service Request (Oracle ASR)	
	About Configuring Oracle ASR	19-1
	Configuring Internal Oracle ASR	19-3
	Registering with External Oracle ASR Manager	19-5
	Configuring External Oracle ASR When Oracle ASR Manager Does Not Run on an Oracle Database Appliance	19-7
	Testing Oracle ASR	19-11
	Managing an Oracle ASR Configuration	19-12
	Additional Resources for Oracle ASR	19-13
20	Troubleshooting Oracle Database Appliance	
	About Oracle Database Appliance Configuration Collection Utility	20-2
	About Setting Up and Removing SSH Configuration	20-5
	Viewing Oracle Database Appliance Error Correlation Reports	20-5
	Viewing Details About DCS Error Messages	20-7
	Collecting Diagnostics Data Using the BUI	20-7
	Resolving Errors When Updating DCS Components During Patching	20-8
	Viewing Component Information on the Appliance	20-16
	Errors When Logging into the Browser User Interface	20-19
	Errors when re-imaging Oracle Database Appliance	20-20
	Using Oracle Autonomous Health Framework for Running Diagnostics	20-20
	About Installing Oracle Autonomous Health Framework	20-21
	Using the Oracle ORAchk Health Check Tool	20-22
	Generating and Viewing Oracle ORAchk Health Check Tool Reports in the Browser User Interface	20-23
	Generating and Viewing Database Security Assessment Reports in the Browser User Interface	20-23
	Running Oracle Trace File Analyzer (TFA) Collector Commands	20-24
	Sanitizing Sensitive Information in Diagnostic Collections	20-26
	Enabling Adaptive Classification and Redaction (ACR)	20-28
	Sanitizing Sensitive Information in Oracle Trace File Analyzer Collections	20-29
	Redacting and Sanitizing Entities in the BUI	20-29
	Sanitizing Sensitive Information in Oracle ORAchk Output	20-30



	Running the Disk Diagnostic Tool	20-32
	Running the Oracle Database Appliance Hardware Monitoring Tool	20-32
	Disabling the Browser User Interface	20-33
	Preparing Log Files for Oracle Support Services	20-33
Α	Oracle Database Appliance Software Configuration Defaults	
	Directory Paths for Oracle Database Appliance	A-1
	Port Numbers and Protocols of Oracle Database Appliance Components	A-2
	Location of Log Files	A-4
	Oracle Groups and User Configurations for Oracle Database Appliance	A-5
В	Oracle Database Appliance Storage Defaults	
	About Database File Storage	B-1
	Oracle ACFS Mount Points and Storage Space	B-2
	Displaying Mounted Disk Details	B-3
	Usable Space on Oracle Database Appliance X10-S and X10-L	B-4
	Usable Space on Oracle Database Appliance X10-HA	B-5
	Usable Free Space with Oracle ASM	B-6
С	Creating an Appliance Using JSON File	
	Loading and Saving Appliance Configurations	C-1
	Readme for the Command odacli create-appliance	C-1
	Example JSON Files to Create a Single Node Appliance with the CLI	C-2
	Example JSON File to Create a High-Availability Appliance with the CLI	C-7
D	Database Shapes for Oracle Database Appliance	
	About Database Shapes and Classes	D-1
	Database Shapes for the OLTP Class	D-2
	Database Shapes for the In-Memory Class	D-4
	Database Shapes for the DSS Class	D-6
	Index	



## **Preface**

Oracle Database Appliance is an optimized, prebuilt database system that is easy to deploy, operate, and manage. By integrating hardware and software, Oracle Database Appliance eliminates the complexities of nonintegrated, manually assembled solutions. Oracle Database Appliance reduces the installation and software deployment times from weeks or months to just a few hours while preventing configuration and setup errors that often result in suboptimal, hard-to-manage database environments.

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

### **Audience**

This guide is intended for anyone who configures, maintains, or uses Oracle Database Appliance:

- System administrators
- Network administrators
- Database administrators
- Application administrators and users

This book does not include information about Oracle Database architecture, tools, management, or application development that is covered in the main body of Oracle Documentation, unless the information provided is specific to Oracle Database Appliance. Users of Oracle Database Appliance software are expected to have the same skills as users of any other Linux-based Oracle Database installations.

## **Documentation Accessibility**

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

#### **Access to Oracle Support**

Oracle customer access to and use of Oracle support services will be pursuant to the terms and conditions specified in their Oracle order for the applicable services.

## **Related Documents**

For more information about Oracle Database Appliance, go to http://www.oracle.com/goto/oda/docs and click the appropriate release.



For more information about using Oracle Database, go to http://docs.oracle.com/database/ and select the database release from the menu.

For more information about Oracle Integrated Lights Out Manager 3.2, see https://docs.oracle.com/cd/E37444\_01/.

For more details about other Oracle products that are mentioned in Oracle Database Appliance documentation, see the Oracle Documentation home page at http://docs.oracle.com.

## Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action or terms defined in the text.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.
# prompt	The pound (#) prompt indicates a command that is run as the root user.



## Oracle Database Appliance Checklists

Use these checklists to ensure you have completed the tasks required for setting up, deploying, and patching Oracle Database Appliance.

- Checklist for System Requirements
   Before you begin the deployment, ensure that you have the system information described in this checklist ready. This checklist applies to bare metal and KVM deployments.
- Deployment Checklist for Oracle Database Appliance Bare Metal Systems
   This checklist provides an overview of the tasks to setup and deploy Oracle Database
   Appliance bare metal systems for the first time.
- Checklist for Custom Network Address Configuration
   Use the checklist to identify the IP addresses required for Oracle Database Appliance.

## **Checklist for System Requirements**

Before you begin the deployment, ensure that you have the system information described in this checklist ready. This checklist applies to bare metal and KVM deployments.

Table 1-1 Checklist for System Configuration Information for Oracle Database Appliance

Component	Information Required	Comments
Host Name	The name for the Oracle Database Appliance System. The name must conform with the RFC 952 standard, which allows alphanumeric characters and hyphens ( - ), but does not allow underscores ( _ ). The name should not begin with a numeral or hyphen and should not end in a hyphen. Oracle recommends that you use all lowercase characters for the host name.	Use this space to note the values for your appliance. Host Name:
Domain Name	Your domain name. For example: example.com	Domain Name:
Region	The region where you plan to operate the Oracle Database Appliance system.	Region:
Timezone	The time zone where you plan to operate the Oracle Database Appliance system.	Timezone:

Table 1-1 (Cont.) Checklist for System Configuration Information for Oracle Database Appliance

Component	Information Required	Comments
Diskgroup Redundancy	Determine the redundancy level for DATA, RECO, and FLASH:	Use this space to note the values for your appliance.
	If there are up to two disks, then you can select the disk group redundancy as Normal or Flex. If there are more than two disk drives, then you can select the redundancy as Normal (two way mirror), High (three way mirror), or Flex. If you select High redundancy, then DATA, RECO, and FLASH are all High Redundancy.	
Number of Enabled CPU Cores	Based on your capacity-on- demand (CoD) license, this value specifies the number of enabled CPU cores	Use this space to note the values for your appliance.
Backup	Determine the backup location. For external backup, you need an NFS device.	Backup location:
Percentage of Storage Reserved for Data	Determine the amount of reserves for DATA storage. The percentage must be a whole number between 40 and 90, and determines how the disks are partitioned between DATA and RECO. For example, if you specify 80, then 80% of storage is reserved for DATA and the remaining 20% is for RECO.	Use this space to note the values for your appliance.
System Password	The password set for the root user of the system, operating system users, database users, and pdbadmin. The password is also used to set the database SYS and SYSTEM passwords. Ensure that the password you provide is in compliance with common security practices.	You must provide a system password when you deploy your appliance.
DNS Server	(Optional) DNS server details. If configuring DNS, a minimum of one DNS Server IP is required.	DNS Server details:
NTP Server	(Optional) Network Time Protocol (NTP) server details.	NTP Server details:



Table 1-1 (Cont.) Checklist for System Configuration Information for Oracle Database Appliance

Component	Information Required	Comments
Network Information for the client access network	Obtain the following network information:  Node 0 Name: such as example0  Node 1 Name (For HA Models): such as example1  Node 1 Public IP Address (For HA Models): such as example1  Node 1 Public IP Address (For HA Models)  Node 0 Virtual IP Name (For HA Models): for example, example0-vip  Node 0 Public Virtual IP Name (For HA Models): for example, example1-vip  Node 1 Virtual IP Name (For HA Models)  SCAN Name (For HA Models)  SCAN Name (For HA Models)  SCAN IP Addresses: Two SCAN IP addresses are required  Netmask  Gateway IP  The Public and private network must not be in same subnet, they	Use this space to note the values for your appliance.
Network Information for the Oracle Integrated Lights Out Manager (ILOM) network	must be in non-related separate subnet.  Obtain the following ILOM network information:  ILOM host name  ILOM IP address  Subnet mask  Gateway IP  ILOM Password: default is changeme.  For HA systems, ensure that you have the information to configure two ILOM networks.	Use this space to note the values for your appliance.



Table 1-1 (Cont.) Checklist for System Configuration Information for Oracle Database Appliance

Component	Information Required	Comments
User and group information	Determine how you want to configure your users and groups and whether or not you want to allow operating system role separation. The default is two users with six groups.  Operating System Role Separation: Yes/No	Use this space to note the values for your appliance.
	Customization of Users and Groups: Yes/No	
	<ul> <li>Groups and IDs:</li> <li>Grid Infrastructure User</li> <li>Grid Infrastructure User ID</li> <li>Database User</li> <li>Database User ID</li> <li>Install Group</li> <li>Install Group ID</li> <li>DBA Operating System Group</li> <li>DBA Operating System Group ID</li> <li>ASM Admin Group ID</li> <li>ASM Operating System Group ID</li> <li>ASM Operating System Group</li> <li>ASM Operating System Group</li> <li>ASM Operating System Group</li> <li>ASM Operating System Group ID</li> <li>ASM Operating System Group ID</li> <li>ASM Operating System Group ID</li> </ul>	



Table 1-1 (Cont.) Checklist for System Configuration Information for Oracle Database Appliance

_		_
Component	Information Required	Comments
Component  Initial Database Details (if you want to create one during deployment)	<ul> <li>Information Required</li> <li>(Optional) If you choose to create an initial database during deployment, determine the following configuration details:</li> <li>Database name</li> <li>Database unique name</li> <li>Database version (based on the database clones that are registered with the Oracle Database Appliance)</li> <li>Determine the Oracle Database edition licensing that you have, either</li> </ul>	Use this space to note the values for your appliance.
	<ul><li>Enterprise Edition or Standard Edition. You cannot mix editions.</li><li>Database deployment,</li></ul>	
	whether Oracle RAC or single-instance database  • CDB (Container Database):	
	Yes or No	
	PDB name     Chara (for example, adlp4)	
	<ul> <li>Shape (for example, odb1, odb2, and so on)</li> </ul>	
	<ul> <li>Database Class: Enterprise Edition, OLTP, DSS, or IMDB. Standard Edition OLTP only.</li> </ul>	
	<ul> <li>Data files on Flash storage: Yes/No</li> </ul>	
	<ul> <li>Database file size</li> </ul>	
	<ul> <li>Database characterset</li> </ul>	
	National characterset	
	<ul> <li>Database language</li> <li>Storage (Oracle ASM or Oracle ACFS).</li> </ul>	
	<ul> <li>Database redundancy</li> </ul>	
	<ul> <li>Configure Oracle Enterprise         Manager console. If you are         using Enterprise Manager         Cloud Control with this         appliance, do not choose this         option.</li> </ul>	
	<ul> <li>Password for the database</li> </ul>	
	The DB Name and DB Unique	
	name can contain alphanumeric characters and must start with an alphabet. It can contain	
	underscores ( _ ), but cannot	
	contain characters such as "! $@\%^{*}()+=\ ^{-[\{j]\};:'\ ^{*}}.$	



Table 1-1 (Cont.) Checklist for System Configuration Information for Oracle Database Appliance

Component	Information Required	Comments
Oracle Auto Service Request (Oracle ASR) information	(Optional) Do you want to configure and enable Oracle ASR at deployment or later? If required, then ensure that you have the following information.  ASR Type  ASR User Name  ASR Password  SNMP Version  Proxy Server Name  Proxy Port  Proxy User Name  Proxy Password	Oracle Auto Service Request (Oracle ASR) information for your appliance

## Deployment Checklist for Oracle Database Appliance Bare Metal Systems

This checklist provides an overview of the tasks to setup and deploy Oracle Database Appliance bare metal systems for the first time.

Table 1-2 Deployment Checklist for Bare Metal Systems

Component	Tasks
Register your hardware Support Identifier (SI)	Add your hardware Support Identifier (SI) to your My Oracle Support account profile. Your hardware SI is supplied when you purchase Oracle Database Appliance. If you acquire new software licenses, then you must also register your new software SIs. The SI registration process can take up to 24 hours to complete.
Plug in the Appliance	<ul> <li>Plug in all the cables including the power cords, and then wait for the SP OK light to become solid green. Do not power up yet.</li> <li>If there is no video port available on your Oracle Database Appliance hardware model, then use the Server Management Serial Port to connect to a laptop, or determine the DHCP address assigned to it. Note: Serial port must be set to 115200, so make sure the baud rate speed matches.</li> </ul>
Configure Oracle Integrated Lights Out Manager (Oracle ILOM) on Node0 and Node1	<ul> <li>Before you configure Oracle ILOM:</li> <li>Connect an Ethernet cable from the NET MGT port to your site's management network. The NET MGT port is a 1 GbE port for Oracle ILOM and by default, is configured for DHCP.</li> <li>Obtain the Oracle ILOM host name and IP address, the netmask, and the gateway addresses from the DHCP server.</li> <li>Have a new password ready to replace the default Oracle ILOM password</li> <li>Log into the Oracle ILOM console and follow the procedure in the topic Configuring Oracle Integrated Lights Out Manager.</li> </ul>



Table 1-2 (Cont.) Deployment Checklist for Bare Metal Systems

Component	Tasks
Power ON	<ul> <li>Power on each node and log in as root user with welcome1 password.</li> <li>Verify cabling: # /opt/oracle/dcs/bin/odacli validate-storagetopology</li> <li>Verify interconnect networking. Run the commands # ethtool p1p1 and # ethtool p1p2.</li> <li>Follow the steps described in the topic Verifying Cabling and Network Connections.</li> </ul>
Plumb the network	Ensure that you have recorded the IP address and netmask address.  Set up a temporary network connection to Oracle Database Appliance.  Use the command odacli configure-firstnet on NodeO, for both single- and multi-node systems.
	Log into the Oracle ILOM console and follow the procedure in the topic <i>Plumbing the Network</i> .
Download Oracle Database Appliance Software	Log into My Oracle Support and download the software files for deployment. Refer to the <i>Oracle Database Appliance Release Notes</i> for the latest software.
Install Oracle Database Appliance	Upload the zip files to a temporary location on Oracle Database Appliance and then update the repository and install the software. Follow the steps and run the commands described in the topic <i>Installing Oracle Database Appliance Software</i> .
Create Appliance	<ul> <li>Set the Browser User Interface password for the oda-admin user.</li> <li>Log into the Browser User Interface and configure system, network, and users and groups.</li> <li>Ensure that you have the information mentioned in <i>Checklist for System Requirements</i> available to you.</li> <li>Follow the steps described in the topic <i>Creating an Appliance</i>.</li> </ul>
Perform postinstallation tasks	Configure CPU core count.
	Change the passwords for Browser User Interface, Oracle users and groups, and Oracle ILOM.  Follow the steps described in the chapter <i>Oracle Database Appliance Postinstallation Tasks</i> .
Cleanup Deployments	If your deployment failed for some reason, then run the cleanup script and redeploy the appliance.  For steps to run the cleanup script, see the topic <i>Uninstalling Oracle Database Appliance Components</i> .

#### **Related Topics**

- Verifying Cabling and Network Connections
  - After powering on Oracle Database Appliance, verify that the network connections are set up correctly.
- Configuring Oracle Integrated Lights Out Manager
   Configure Oracle Integrated Lights Out Manager (Oracle ILOM) to manage Oracle
   Database Appliance independent of the operating system.
- Installing Oracle Database Appliance Software
  Install Oracle Database Appliance software, before creating the appliance.



- Creating the Appliance
  - Create the appliance using the Browser User Interface or ODACLI commands.
- Oracle Database Appliance Postinstallation Tasks
   Complete these administrative tasks after you have deployed software, but before the system is operational.
- Uninstalling Oracle Database Appliance Components
   Use the Oracle Database Appliance cleanup deploy utility, /opt/oracle/oak/onecmd/
   cleanup.pl to uninstall Oracle Database Appliance components.

## Checklist for Custom Network Address Configuration

Use the checklist to identify the IP addresses required for Oracle Database Appliance.

Note:

Oracle does not recommend changing the default Host Private Address. You cannot change the private network after deploying the appliance.

Table 1-3 Default IP Address Requirements for Oracle Database Appliance

Type of IP	IP Address Default Values	Your Values As Applicable
Client Access Network	No default	No default
Additional Network	No default	No default
Oracle Integrated Lights Out Manager (ILOM)	No default	No default
Host Private Addresses	InfiniBand has bonded interface ibbond0. The system configures icbond0 on non-InfiniBand High-Availability systems. The subnets 192.168.16.0/24 and 192.168.17.0/24 are configured.	Not applicable: the private addresses are defined before deployment and should not be changed



## Introduction to Oracle Database Appliance

Oracle Database Appliance saves time and money by simplifying deployment, maintenance, and support of database solutions for organizations of every size. Oracle Database Appliance hardware models are optimized to run Oracle Database Standard Edition and Enterprise Edition.

- About Oracle Database Appliance
   Understand Oracle Database Appliance hardware models, deployment plans, and database options.
- Oracle Database Appliance Software Terminology
   Understand the software patches available for Oracle Database Appliance.
- About the Browser User Interface
   Use the Oracle Appliance Manager Browser User Interface to deploy and manage the appliance, databases, networks, jobs, CPU pools, compute instances, and database systems.

## **About Oracle Database Appliance**

Understand Oracle Database Appliance hardware models, deployment plans, and database options.

#### **About Oracle Database Appliance Hardware Models**

Choose the Oracle Database Appliance hardware model that suits your business needs.

Oracle Database Appliance Hardware Model	Deployment Use Case
Oracle Database Appliance X11-S, X11-L, X11-HA	<ul> <li>Oracle Database Appliance X11-S is a small configuration designed for smaller or entry- level deployments.</li> </ul>
	<ul> <li>Oracle Database Appliance X11-L is a large configuration designed for larger databases.</li> </ul>
	<ul> <li>Oracle Database Appliance X11-HA is a large configuration designed for larger databases and high-availability.</li> </ul>
Oracle Database Appliance X10-S, X10-L, X10-HA	<ul> <li>Oracle Database Appliance X10-S is a small configuration designed for smaller or entry- level deployments.</li> </ul>
	<ul> <li>Oracle Database Appliance X10-L is a large configuration designed for larger databases.</li> </ul>
	<ul> <li>Oracle Database Appliance X10-HA is a large configuration designed for larger databases and high-availability.</li> </ul>

Oracle Database Appliance Hardware Model	Deployment Use Case
Oracle Database Appliance X9-2S, X9-2L, X9-2-HA	<ul> <li>Oracle Database Appliance X9-2S is a small configuration designed for smaller or entry- level deployments.</li> </ul>
	<ul> <li>Oracle Database Appliance X9-2L is a large configuration designed for larger databases.</li> </ul>
	<ul> <li>Oracle Database Appliance X9-2-HA is a large configuration designed for larger databases and high-availability.</li> </ul>
Oracle Database Appliance X8-2S, X8-2M, X8-2-HA	<ul> <li>Oracle Database Appliance X8-2S is a small configuration designed for smaller or entry- level deployments.</li> </ul>
	<ul> <li>Oracle Database Appliance X8-2M is a medium-sized configuration designed for performance.</li> </ul>
	<ul> <li>Oracle Database Appliance X8-2-HA is a large configuration designed for larger databases and high-availability.</li> </ul>
Oracle Database Appliance X7-2S, X7-2M, X7-2-HA	<ul> <li>Oracle Database Appliance X7-2S is a small configuration designed for smaller or entry- level deployments.</li> </ul>
	<ul> <li>Oracle Database Appliance X7-2M is a medium-sized configuration designed for performance.</li> </ul>
	<ul> <li>Oracle Database Appliance X7-2-HA is a large configuration designed for larger databases and high-availability.</li> </ul>
Oracle Database Appliance X6-2S, X6-2M, X6-2L	<ul> <li>Oracle Database Appliance X6-2S is a small configuration designed for smaller or entry- level deployments.</li> </ul>
	<ul> <li>Oracle Database Appliance X6-2M is a medium-sized configuration designed for performance.</li> </ul>
	<ul> <li>Oracle Database Appliance X6-2L is a large configuration designed for larger databases.</li> </ul>
Oracle Database Appliance X6-2-HA	Highly-available two-node Oracle RAC clusters that can support both Oracle RAC and single-instance databases.
Oracle Database Appliance X5-2	Highly-available two-node Oracle RAC clusters that can support both Oracle RAC and single-instance databases.

You cannot expand or reconfigure Oracle Database Appliance to a different configuration. For example, you cannot expand Oracle Database Appliance X7-S to Oracle Database Appliance X7-2M. For Oracle Database Appliance hardware configuration details, see the *Oracle Database Appliance Owner's Guide*.

#### **About Oracle Database Appliance Deployment Plans**

Oracle Database Appliance X8-2S and X8-2M are single node systems that you deploy as a bare metal platform.

Oracle Database Appliance X8-2-HA is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.



Oracle Database Appliance X7-2S and X7-2M are single node systems that you deploy as a bare metal platform.

Oracle Database Appliance X7-2-HA is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

Oracle Database Appliance X6-2S, X6-2M, X6-2L are single node systems that you deploy as a bare metal platform.

Oracle Database Appliance X6-2-HA is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

Oracle Database Appliance X5-2 is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

#### **About Database Deployment Options for Oracle Database Appliance**

The following Oracle Database editions are available:

Database Edition	Supported Releases
Oracle Database Enterprise Edition	Oracle Database release 19c, 18c, 12.2.0.1, and 12.1.0.2
Oracle Database Standard Edition 2	Oracle Database release 19c, 18c, 12.2.0.1, and 12.1.0.2



It is important to understand your Oracle Database licensing before you create databases. You cannot provision Oracle Database Enterprise Edition and Standard Edition databases in the same bare metal platform, or the same ODA\_BASE virtualized deployment, subject to Oracle Database licensing requirements. Review the *Oracle Database Licensing Information User Manual* for the Oracle Database release to review supported options and products.

## Oracle Database Appliance Software Terminology

Understand the software patches available for Oracle Database Appliance.

The table describes the Oracle Database Appliance patches that are available for download and the purpose of the patch.



Some hardware models may not use the patches listed in the table.

Table 2-1 Software for Oracle Database Appliance

Patch	Description
Oracle Database Appliance patch bundle (quarterly patch release)	Use the patch bundle to update to the latest release after Oracle Database Appliance is deployed. The patch updates the Oracle Database Appliance server, storage, and database components.



Table 2-1 (Cont.) Software for Oracle Database Appliance

Patch	Description
Oracle Database Appliance Grid Infrastructure/Database Clone	Use to perform an initial deployment of Oracle Database Appliance and also to patch your deployment to the latest release.
	The bundle contains the latest Grid Infrastructure and Database components, Oracle Database Appliance Manager software, Oracle Linux and hardware drivers for deployment on an Oracle Database Appliance that is shipped from factory state.
	If you reimage Oracle Database Appliance with the Bare Metal ISO Image, download the Grid Infrastructure/Database Clone patch to deploy Oracle Database Appliance.
Oracle Database Clone	Use the Database Software Clone files to get the latest Database clone binaries for Oracle Database releases 19c, 12.2.0.1, and 12.1.0.2. The RDBMS clone files are needed to create Oracle databases and database homes.
Bare Metal ISO Image	Use to reimage the appliance and reset the system back to the factory configuration.



See the *Oracle Database Appliance Release Notes* for the patch numbers and download locations and the component versions available in the patch bundle.

#### Note:

Starting with Oracle Database 18c, Oracle provides quarterly updates in the form of Release Updates (Updates) and Release Update Revisions (Revisions). Oracle no longer releases patch sets. For more information, see My Oracle Support Note 2285040.1.

Oracle Database releases are of type <code>version</code> and <code>version\_full</code> releases. The <code>version</code> release is designated in the form major release version.0.0.0.0. The major release version is based on the last two digits of the year in which an Oracle Database version is released for the first time. The <code>version\_full</code> release is an update of a version release and is designated based on the major release version, the quarterly release update version (Update), and the quarterly release update revision version (Revision).

Prior to Oracle Database release 18c, changing the first or second digit in the release number was an upgrade, and changing the fourth digit indicated an update. With 18c and later releases, changing the first digit is an upgrade, and changing the second indicates an update.

### About the Browser User Interface

Use the Oracle Appliance Manager Browser User Interface to deploy and manage the appliance, databases, networks, jobs, CPU pools, compute instances, and database systems.

The Browser User Interface provides a user-friendly interface to quickly view and perform many of the tasks needed to deploy, patch, and manage your bare metal system. The *Oracle Database Appliance Deployment and User's Guide* for your hardware model describes how to

use the Browser User Interface to perform many of the tasks related to deployment, patching, and management of your appliance.

Use the links in the side navigation to view and manage the following:

#### Appliance

- Appliance information
- System information
- Disk group information including storage utilization such as free and used space
- Information about all databases that use a storage disk group
- All the patches and hardware and software components installed on the appliance
- List of RPMs and RPM Drift information
- Oracle ASM port

#### Network

- View network details
- Create, update, and delete networks
- View interface details

#### Oracle ASR

- View Oracle Auto Service Request (Oracle ASR) configuration details
- Configure, modify, test, and delete Oracle ASR

#### Repository Manager

- Update the patch repository with Oracle Database Appliance patches
- View component details of the patch and versions that are installed on the appliance
- View component details of the patch and versions that are available, but not yet installed, on the appliance
- Run patch prechecks before applying the patch
- Update the server and storage components

#### Compute Instances

- Create KVM deployment on Oracle Database Appliance
- Create view, modify, and, delete virtual storage, virtul network, and virtual disks
- Create view, modify, and, delete, start, and stop virtual machines

#### DB Systems

- Create DB System
- List and describe DB System
- Modify, delete, start, and stop DB System

#### CPU Pools

Create view, modify, and, delete CPU pool for bare metal and KVM deployments
 Use the links in the top navigation to view and manage the following:

#### Database

Create a database



- View database details
- Apply a backup policy for the database
- Create a manual backup
- Recover a database from a backup
- View and update the database backup schedule and update the archive log backup schedule for the database
- Modify associated networks, database shape and class, and the associated backup policy for a database
- Create, update, and delete backup policies
- Create, update, and delete database homes
- Create and delete database backup
- Clone a database from a database backup or an Oracle ACFS database snapshot
- Patch database homes
- Move databases from one Oracle home to another

#### Credential Store

- Create Object Store Credentials for backup and recovery
- View the details for Object Store Credentials, including the endpoint URL, user name, and tenant
- Update and delete Object Store Credentials
- Configure Oracle Key Vault Server

#### Monitoring

- View the status of hardware, storage, memory, cooling, networking, and power
- View monitoring information for each node, in the case of High-Availability deployments
- View system health status and drilldown to details of incidents
- Click the hardware image to view details

#### Security

View audit records and create and view database security assessment reports

#### Activity

- View a list of jobs, details, and status
- Click a job description to view job details

Expand **Resources** in the upper right corner of the Browser User Interface to perform the following tasks:

- There are links to access the Oracle Database Appliance blogs, FAQs, and Documentation.
- Click About to view the Oracle Database Appliance release that is installed on the appliance.

Expand **Account** in the upper right corner of the Browser User Interface to perform the following tasks:



- Click ILOM Setting to change the root password. To enable first-time login and access to Oracle ILOM, a default Administrator (root) account and its password are provided with the system.
- Click Change Password to change the oda-admin password.
- Click Sign Out to sign out of the Browser User Interface. If you do not sign out, the system
  automatically signs you out after a period of inactivity. A warning will appear 2 minutes
  before the session expires.

#### **Doc Search**

You can access the Oracle Database Appliance documentation set from the Browser User Interface. There is a search box at the top right hand corner on the BUI. Search results are links to documentation pages shown as a new window in the BUI. When you click the **Help** button, links from the documentation relevant to the context of the tab are displayed.

Along with the search results from the Oracle Database Appliance documentation pages, BUI also provides relevant Frequently Asked Questions (FAQs) for the search query. Additionally, you can also search on DCS error codes such as DCS-10001, DCS-10032, and so on in the search box and get the links to documentation pages contains these error codes. When you specify the search query, relevant documentation links, FAQs and DCS error codes links are displayed under separate sections in a new window in the BUI.

For the latest updates to the documentation for a release, see the online Oracle Database Appliance documentation library at https://docs.oracle.com/en/engineered-systems/oracle-database-appliance/index.html.



## Readying Oracle Database Appliance for Deployment

Before deploying Oracle Database Appliance, perform these setup tasks.

- Attaching Storage Cables to Oracle Database Appliance X10-HA
   Connect the storage cables for Oracle Database Appliance X10-HA.
- Attaching Network Cables to Oracle Database Appliance X10-HA
   Connect Oracle Database Appliance X10-HA to either a 10GBase-T (copper) or 25GbE SFP28 (fiber) network.
- Attaching Network Cables to Oracle Database Appliance X10-S or X10-L
   Connect Oracle Database Appliance X10-S or X10-L to either a 10GBase-T (copper) or
   25GbE SFP28 (fiber) network.
- Attaching Power Cords and Initializing Components
   Attach power cords for Oracle Database Appliance.
- Configuring Oracle Integrated Lights Out Manager
   Configure Oracle Integrated Lights Out Manager (Oracle ILOM) to manage Oracle
   Database Appliance independent of the operating system.
- Powering On Oracle Database Appliance the First Time
   Use this procedure the first time you power on Oracle Database Appliance.

## Attaching Storage Cables to Oracle Database Appliance X10-HA

Connect the storage cables for Oracle Database Appliance X10-HA.

Cabling the Storage for Oracle Database Appliance X10-HA

Connect the storage cables for Oracle Database Appliance 10-HA.



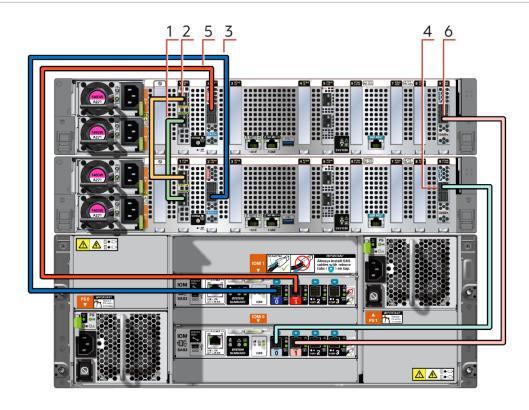
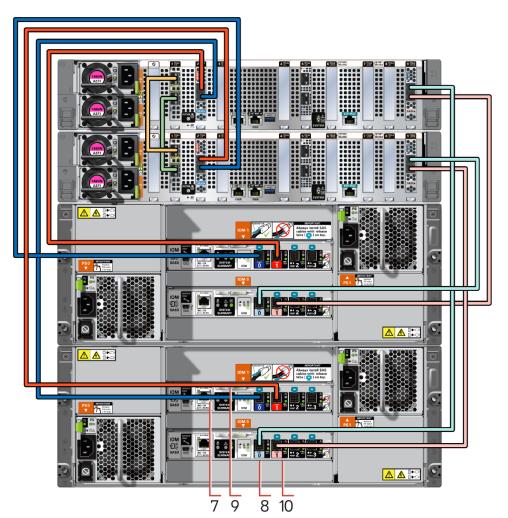


Table 3-1 Storage Cabling for Oracle Database Appliance X10-HA

Callout Numbe r	Purpose	Start - Compute Node0	End - Compute Node1
1	Connect green SFP28 cable (Interconnect Port 25GbE)	Connect into green port (PORT 2) in PCIe slot 1	Connect into green port (PORT 2) in PCIe slot 1
2	Connect yellow SFP28 cable (Interconnect Port 25GbE)	Connect into yellow port (PORT 1) in PCle slot 1	Connect into yellow port (PORT 1) in PCle slot 1
3	Connect dark blue SAS cable	Connect into dark blue port (SAS0) in PCle slot 2 in Node0	Connect into dark blue port in top IO Module (PORT 0)
4	Connect light blue SAS cable	Connect into light blue port (SAS1) in PCIe slot 9 in Node0	Connect into light blue port in bottom IO Module (PORT 0)
5	Connect dark red SAS cable	Connect into dark red port (SAS1) in PCIe slot 2 in Node1	Connect into dark red port in top IO Module (PORT 1)
6	Connect light red SAS cable	Connect into light red port (SAS0) in PCIe slot 9 in Node1	Connect into light red port in bottom IO Module (PORT 1)



#### **Cabling the Storage Expansion Shelf**

Table 3-2 Cabling the Storage Expansion Shelf for Oracle Database Appliance X10-HA

Callout Number	Purpose	Start - Compute Nodes	End - Expansion Shelf
7	Connect dark blue SAS cable	Connect into dark blue port (SAS0) in PCIe slot 2 in Node1	Connect into dark blue port in top IO Module (PORT 0)
8	Connect light blue SAS cable	Connect into light blue port (SAS1) in PCIe slot 9 in Node1	Connect into light blue port in bottom IO Module (PORT 0)
9	Connect dark red SAS cable	Connect into dark red port (SAS1) in PCIe slot 2 in Node0	Connect into dark red port in top IO Module (PORT 1)
10	Connect light red SAS cable	Connect into light red port (SAS0) in PCIe slot 9 in Node0	Connect into light red port in bottom IO Module (PORT 1)

## Attaching Network Cables to Oracle Database Appliance X10-HA

Connect Oracle Database Appliance X10-HA to either a 10GBase-T (copper) or 25GbE SFP28 (fiber) network.

The SFP28 ports support 10Gb and 25Gb fibre and twinaxial cable (twinax), depending on the SFP modules used in these ports. For 10GBase-T public networking, use the Cat-6 network cables. To use the SFP28 ports, use the correct transceivers and cables to meet your switch bandwidth. The following sections show the cabling options for 10GBase and 25GbE SFP28 (fiber) network ports.

Connecting the Fiber and Copper Network Cables for Oracle Database Appliance X10-HA

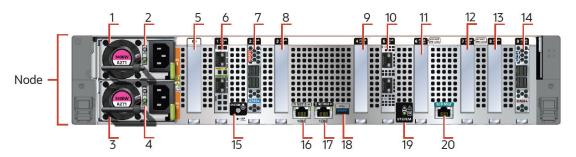


Table 3-3 Network Ports and Power Cabling

Callout	Description
1	Power Supply (PS) 1 with fan module
2	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green
3	Power Supply (PS) 0 with fan module
4	Power Supply (PS) 0 status indicators: Service Required LED: amber, AC OK LED: green
5	Not used
6	PCIe card slot 1: Oracle Dual Port 25Gb Ethernet Adapter which provides two ports for a private cluster interconnect between server nodes
7	PCIe card slot 2: provides two SAS3 connectors used to connect the servers to the storage shelf and the storage expansion shelf
8	PCle card slot 3: filler panel
9	PCIe card slot 4: filler panel, or 2nd optional Oracle Dual Port 25Gb Ethernet Adapter or Oracle Quad Port 10GBase-T Adapter
10	PCIe card slot 5: 1st Oracle Dual Port 25Gb Ethernet Adapter or Oracle Quad Port 10GBase-T Adapter
11	PCIe card slot 6: filler panel
12	PCle card slot 7: filler panel
13	PCIe card slot 8: filler panel, or 3rd optional Oracle Dual Port 25Gb Ethernet Adapter or Oracle Quad Port 10GBase-T Adapter



Table 3-3 (Cont.) Network Ports and Power Cabling

Callout	Description
14	PCIe card slot 9: provides two SAS3 connectors used to connect the servers to the storage shelf and the storage expansion shelf
15	Locate LED (white)
16	100/1000Base-T network interface port with RJ-45 connector: NET 0
17	NET MGT port: 10/100/1000Base-T network interface port with RJ-45 connector used to connect to the Oracle ILOM service processor
18	USB 3.1 connector
19	System status indicators: Service Required LED (amber), Power/OK LED (green)
20	SER MGT port: RJ-45 serial port used to connect to the Oracle ILOM service processor

#### **Fiber Cables**

For optical cables, you must purchase either Short Range (SR) or Long Range (LR) SFP transceivers for each of the network ports, and then plug in the appropriate optical cable. Currently, Oracle sells both the SR and LR SFP transceivers. In addition to these transceivers, you must purchase the appropriate LC-LC terminated fiber optic cables from a third-party vendor.

Table 3-4 Transceivers for the SFP Ports - 10Gb/1Gb

Name	ATO Part Number	x-option Part Number
SFP+ 10GBase-SR (Short Range Transceiver)	2129a	X2129A-N
SFP+ 10GBase-LR (Long Range Transceiver)	5562a-z	X5562A-Z

Table 3-5 Transceivers for the SFP Ports - 25Gb

Name	ATO Part Number	x-option Part Number
Oracle 10/25 GbE Dual Rate SFP28 Short Range (SR) Transceiver	7604269	7604270
SFP28 25GBase-LR (Short Range Transceiver)	7118017	7118019
SFP28 25GBase-LR (Long Range Transceiver)	7118020	7118021

#### **Copper Cables**

You can purchase the following copper cables from Oracle. These cables have built-in SFP connectors.



Table 3-6 Networking Cables for the SFP Ports - 10Gb/1Gb

Name	Length	ATO Part Number	x-option Part Number
TwinAx passive copper cable: 1 meter	1m	7105137	X2130A-1M-N
TwinAx passive copper cable: 2 meter	2m	7105139	7105148
TwinAx passive copper cable: 3 meter	3m	7105140	X2130A-3M-N
TwinAx passive copper cable: 5 meter	5m	7105141	X2130A-5M-N

Table 3-7 Networking Cables for the SFP Ports - 25Gb

Name	Length	ATO Part Number	x-option Part Number
TwinAx passive copper cable: 1 meter	1m	7118359	7118367
TwinAx passive copper cable: 2 meter	2m	7118360	7118368
TwinAx passive copper cable: 3 meter	3m	7118361	7118369
TwinAx passive copper cable: 5 meter	5m	7118362	7118370

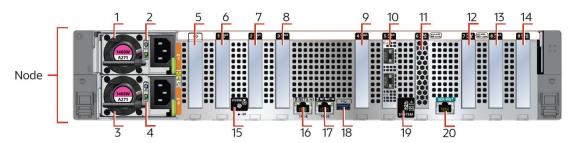
## Attaching Network Cables to Oracle Database Appliance X10-S or X10-L

Connect Oracle Database Appliance X10-S or X10-L to either a 10GBase-T (copper) or 25GbE SFP28 (fiber) network.

The SFP28 ports support 10Gb and 25Gb fibre and twinaxial cable (twinax), depending on the SFP modules used in these ports. For 10GBase-T public networking ports that have RJ-45 connectors, use Cat-6 network cables. To use the SFP28 ports, use the correct transceivers and cables to meet your switch bandwidth. The following sections show the cabling options for 10GBase and 25GbE SFP28 (fiber) network ports.

#### Connecting Network Cables for Oracle Database Appliance X10-S or X10-L

Connect the Fiber and Copper Network Cables for Oracle Database Appliance X10-S or X10-L



**Table 3-8 Network Ports and Power Cabling** 

Callout	Description	
1	Power Supply (PS) 1 with fan module	
2	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green	
3	Power Supply (PS) 0 with fan module	
4	Power Supply (PS) 0 status indicators: Service Required LED: amber, AC OK LED: green	
5	Not used	
6	PCIe card slot 1:     Oracle Database Appliance X10-S: filler panel     Oracle Database Appliance X10-L: filler panel, or 4th optional Oracle Flash Accelerator 680 PCIe Card	
7	PCIe card slot 2:     Oracle Database Appliance X10-S: filler panel     Oracle Database Appliance X10-L: filler panel, or 1st optional Oracle Flash Accelerator 680 PCIe Card	
8	<ul> <li>PCIe card slot 3:</li> <li>Oracle Database Appliance X10-S: filler panel</li> <li>Oracle Database Appliance X10-L: filler panel, or 2nd optional Oracle Flash Accelerator 680 PCIe Card</li> </ul>	
9	PCIe card slot 4:     Oracle Database Appliance X10-S: filler panel     Oracle Database Appliance X10-L: filler panel, or 2nd optional Oracle Flash Accelerator 680 PCIe Card	
10	PCIe card slot 5: 1st Oracle Dual Port 25Gb Ethernet Adapter or Oracle Quad Port 10GBase-T Adapter	
11	PCIe card slot 6: Oracle Retimer PCIe Card	
12	PCIe card slot 7: filler panel	
13	PCIe card slot 8: filler panel, or 3rd optional Oracle Dual Port 25Gb Ethernet Adapter or Oracle Quad Port 10GBase-T Adapter	
14	PCIe card slot 9:  Oracle Database Appliance X10-S: filler panel, or 2nd optional Oracle Dual Port 25Gb Ethernet Adapter or Oracle Quad Port 10GBase-T Adapter  Oracle Database Appliance X10-L: filler panel, or 3rd optional Oracle Flash Accelerator 680 PCIe Card	
15	Locate LED (white)	
16	100/1000Base-T network interface port with RJ-45 connector: NET 0	
17	NET MGT port: 10/100/1000Base-T network interface port with RJ-45 connector used to connect to the Oracle ILOM service processor	
18	USB 3.1 connector	



Table 3-8 (Cont.) Network Ports and Power Cabling

Callout	Description
19	System status indicators: Service Required LED (amber), Power/OK LED (green)
20	SER MGT port: RJ-45 serial port used to connect to the Oracle ILOM service processor

#### **Fiber Cables**

For optical cables, you must purchase either Short Range (SR) or Long Range (LR) SFP transceivers for each of the network ports, and then plug in the appropriate optical cable. Currently, Oracle sells both the SR and LR SFP transceivers. In addition to these transceivers, you must purchase the appropriate LC-LC terminated fiber optic cables from a third-party vendor.

Table 3-9 Transceivers for the SFP Ports - 10Gb/1Gb

Name	ATO Part Number	x-option Part Number
SFP+ 10GBase-SR (Short Range Transceiver)	2129a	X2129A-N
SFP+ 10GBase-LR (Long Range Transceiver)	5562a-z	X5562A-Z

Table 3-10 Transceivers for the SFP Ports - 25Gb

Name	ATO Part Number	x-option Part Number
Oracle 10/25 GbE Dual Rate SFP28 Short Range (SR) Transceiver	7604269	7604270
SFP28 25GBase-LR (Short Range Transceiver)	7118017	7118019
SFP28 25GBase-LR (Long Range Transceiver)	7118020	7118021

#### **Copper Cables**

You can purchase the following copper cables from Oracle. These cables have built-in SFP connectors:

Table 3-11 Networking Cables for the SFP Ports - 10Gb/1Gb

Name	Length	ATO Part Number	x-option Part Number
TwinAx passive copper cable: 1 meter	1m	7105137	X2130A-1M-N
TwinAx passive copper cable: 2 meter	2m	7105139	7105148
TwinAx passive copper cable: 3 meter	3m	7105140	X2130A-3M-N



Table 3-11 (Cont.) Networking Cables for the SFP Ports - 10Gb/1Gb

Name	Length	ATO Part Number	x-option Part Number
TwinAx passive copper cable: 5 meter	5m	7105141	X2130A-5M-N

Table 3-12 Networking Cables for the SFP Ports - 25Gb

Name	Length	ATO Part Number	x-option Part Number
TwinAx passive copper cable: 1 meter	1m	7118359	7118367
TwinAx passive copper cable: 2 meter	2m	7118360	7118368
TwinAx passive copper cable: 3 meter	3m	7118361	7118369
TwinAx passive copper cable: 5 meter	5m	7118362	7118370

## Attaching Power Cords and Initializing Components

Attach power cords for Oracle Database Appliance.



#### **Caution:**

Before plugging in the power cords, ensure that the electrical outlets providing the power are grounded.

If you use only a single AC circuit, then connect both power cords for each component to that circuit. If you want to maintain N+1 power supply redundancy, then use two separate AC circuits. Connect one power cord from each AC circuit into each component.

For more information about cabling with the supplied Cable Management Arm, refer to *Oracle Database Appliance Owner's Guide*.

## Configuring Oracle Integrated Lights Out Manager

Configure Oracle Integrated Lights Out Manager (Oracle ILOM) to manage Oracle Database Appliance independent of the operating system.

Deploying a new Oracle Database Appliance requires a direct connection to the system to configure the Oracle Integrated Lights Out Manager (ILOM) and the first network. If you use the serial port, ensure that the baud rate speeds match. After the first public network interface is configured, you can perform the remaining deployment steps on the Oracle Database Appliance system or from a remote system.

#### Configuring Oracle ILOM Using IP Address Assigned by DHCP

Ensure that the ILOM NIC is enabled and that ipv4 is enabled.



- Using a client system's browser, enter the IP address or host name assigned by DHCP into the browser address field and press Enter. For example, https://129.xxx.xx.xx.
- At the login page, enter the default user name, root and the default password, changeme.
   The Oracle ILOM web interface is displayed.

#### **Configuring Oracle ILOM Using Static IP Address**

1. Using a client system, establish a secure shell (SSH) connection by entering the following on the command line:

```
ssh -l root sp_ip_address
```

where  $sp\_ip\_address$  is the IP address assigned by DHCP.

2. Enter the default user name, root, and the default password, changeme.

The Oracle ILOM CLI prompt appears. Change the default password to a secure password of your choice.

3. Set the working directory.

```
cd /SP/network
```

4. Specify a static Ethernet configuration as follows:

```
set pendingipaddress=xxx.xxx.xx.xx
set pendingipnetmask=yyy.yyy.yyy.y
set pendingipgateway=zzz.zzz.zzz
set commitpending=true
set state=enabled
```

xxx.xxx.xx, yyy.yyy.yy and zzz.zzz.zz are the IP address, netmask, and gateway (respectively) for your ILOM and network configuration.

5. Verify changes and then exit:

```
show /SP/network
exit
```

#### **Configuring Oracle ILOM Using the IPMI tool**

To assign IP addresses to Oracle ILOM manually, follow these steps:

Open the IPMI tool.

```
# ipmitool -I open sunoem cli
```

2. Go to SP/network and verify that the port is enabled:

```
show /SP/network
```

3. If the port is not enabled, then enable the port.

```
# ipmitool -I open sunoem cli "set /SP/network state=enabled"
```

4. In SP/network, verify that ipv4 is enabled.

5. If ipv6 is enabled, then disable ipv6 and enable ipv4.

```
# ipmitool -I open sunoem cli "set /SP/network/ipv6 state=disabled"
# ipmitool -I open sunoem cli "set /SP/network/ipv4 state=enabled"
```

#### **Related Topics**

Deployment Checklist for Oracle Database Appliance Bare Metal Systems
 This checklist provides an overview of the tasks to setup and deploy Oracle Database
 Appliance bare metal systems for the first time.



My Oracle Support Note 1395445.1: "ODA (Oracle Database Appliance) : ILOM configuration via Serial port" at https://support.oracle.com/rs?type=doc&id=1395445.1

## Powering On Oracle Database Appliance the First Time

Use this procedure the first time you power on Oracle Database Appliance.

When you power on Oracle Database Appliance for the first time, the system automatically defines your public network interface based on which of the public interface ports are connected. For Oracle Database Appliance X10-2-HA, the dual-port 10/25 GbE SFP28 PCIe adapter is used for the cluster interconnect.



After you connect power cords, the green SP OK light-emitting diode (LED) lights blink for a few minutes, and then turn to steady ON. The cooling fans also may turn on. However, these events do not indicate that the system is started. You must complete all of the steps in this section to turn on the appliance properly. Read through the entire section to understand the sequence required for initial system startup.

- 1. (For Oracle Database Appliance X10-2-HA) Power on the attached storage shelf, or shelves, by plugging in their AC power cords. Do this before powering on the server nodes as it takes a few minutes for a storage shelf to come online.
- 2. Push the recessed power button to turn on the appliance.

#### Note:

The fully-initialized state is indicated by the green SP OK LEDs staying steadily lit. If any of the green LED lights on the server are still blinking, then wait for them to complete their initialization steps.

Refer to the figures and to the following callout table to identify the power button and the system initialization status indicator lights.

Figure 3-1 Front of Oracle Database Appliance Power Panel

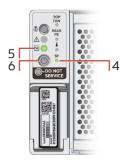


Table 3-13 Description of Callouts for Powering On Oracle Database Appliance

Callout	Function
5	Green Power/OK LED, located on the front panel. The light must be in the steady ON position (Green light does not blink) before you log on to the system.
6	Recessed ON/OFF power button, which is located on the front panel of the appliance. Push this button only once. Do not repeatedly push the power button.
4	SP OK LED light, located on the front panel of the appliance.

Oracle Database Appliance does not use the DO NOT SERVICE indicator.

3. Wait for Oracle Database Appliance to complete startup.



Do not repeatedly push the power buttons. Startup can take several minutes to complete.

Oracle Database Appliance is ready for use when the green Power/OK LED (callout 1) on the front of the system remains steadily on.

4

# Provisioning Oracle Database Appliance Bare Metal System

Understand the process to configure Oracle Database Appliance bare metal system.

The Browser User Interface is the preferred method of deploying your bare metal platform configuration. The Browser User Interface provides all of the fields necessary to provision Oracle Database Appliance, including configuring the system, network, database, and Oracle Auto Service Request (Oracle ASR). If you prefer to use the command-line interface, you must create a JSON file to configure the deployment options.

- Verifying Cabling and Network Connections
   After powering on Oracle Database Appliance, verify that the network connections are set up correctly.
- Plumbing the Network
   Plumb the Oracle Database Appliance network with the public internet protocol (IP) information assigned to a node, to enable provisioning of the Oracle Database Appliance software.
- Downloading Oracle Database Appliance Software
   Download Oracle Database Appliance software and copy to a temporary location before applying updates to your appliance.
- Installing Oracle Database Appliance Software
   Install Oracle Database Appliance software, before creating the appliance.
- Creating the Appliance
   Create the appliance using the Browser User Interface or ODACLI commands.
- Managing Local Volumes
  Understand how you can modify the size of logical volumes LOGVOLOPT and LOGVOLU01.

## Verifying Cabling and Network Connections

After powering on Oracle Database Appliance, verify that the network connections are set up correctly.

Run the validation scripts only on Oracle Database Appliance HA models.

- Log into the Oracle Database Appliance console and access the server node with user name as root and password welcome1.
- 2. Run validation scripts on both nodes, to verify cabling. For example:

#### # /opt/oracle/dcs/bin/odacli validate-storagetopology

```
INFO: ODA Topology Verification
INFO: Running on Node0
INFO: Check hardware type
SUCCESS: Type of hardware found: X9-2
INFO: Check for Environment
SUCCESS: Type of environment found: Bare Metal
INFO: Check number of Controllers
```

```
SUCCESS: Number of ahci controller found: 1
SUCCESS: Number of External SCSI controllers found: 2
INFO: Check for Controllers correct PCIe slot address
SUCCESS: Internal RAID controller:
SUCCESS: External LSI SAS controller 0: 31:00.0
SUCCESS: External LSI SAS controller 1: 9d:00.0
INFO: Check if JBOD powered on
SUCCESS: 2JBOD: Powered-on
INFO: Check for correct number of EBODS(2 or 4)
SUCCESS: EBOD found: 4
INFO: Check for External Controller 0
SUCCESS: Cable check for port 0 on controller 0
SUCCESS: Cable check for port 1 on controller 0
SUCCESS: Overall Cable check for controller 0
INFO: Check for External Controller 1
SUCCESS: Cable check for port 0 on controller 1
SUCCESS: Cable check for port 1 on controller 1
SUCCESS: Overall Cable check for controller 1
INFO: Check for overall status of cable validation on NodeO
SUCCESS: Overall Cable Validation on NodeO
SUCCESS: JBODO Nickname set correctly
SUCCESS: JBOD1 Nickname set correctly
```

3. If there is a storage expansion shelf connected to the appliance, then power it on. Run the storagetopology command on both nodes to make sure the cabling is correct. For example:

#### # /opt/oracle/dcs/bin/odacli validate-storagetopology

```
INFO: ODA Topology Verification
INFO: Running on NodeO
INFO: Check hardware type
SUCCESS: Type of hardware found: X9-2
INFO: Check for Environment
SUCCESS: Type of environment found: Bare Metal
INFO: Check number of Controllers
SUCCESS: Number of ahci controller found: 1
SUCCESS: Number of External SCSI controllers found: 2
INFO: Check for Controllers correct PCIe slot address
SUCCESS: Internal RAID controller:
SUCCESS: External LSI SAS controller 0: 31:00.0
SUCCESS: External LSI SAS controller 1: 9d:00.0
INFO: Check if JBOD powered on
SUCCESS: 2JBOD: Powered-on
INFO: Check for correct number of EBODS(2 or 4)
SUCCESS: EBOD found: 4
INFO: Check for External Controller 0
SUCCESS: Cable check for port 0 on controller 0
SUCCESS: Cable check for port 1 on controller 0
SUCCESS: Overall Cable check for controller 0
INFO: Check for External Controller 1
SUCCESS: Cable check for port 0 on controller 1
SUCCESS: Cable check for port 1 on controller 1
SUCCESS: Overall Cable check for controller 1
INFO: Check for overall status of cable validation on NodeO
SUCCESS: Overall Cable Validation on NodeO
```

```
SUCCESS: JBODO Nickname set correctly SUCCESS: JBODO Nickname set correctly
```

#### **4.** Verify the interconnect network:

```
# ethtool plp1
Settings for plp1:
Supported ports: [ FIBRE ]
Supported link modes: 1000baseT/Full
Supported pause frame use: Symmetric Receive-only
Supports auto-negotiation: Yes
Advertised link modes: 1000baseT/Full
10000baseT/Full
Advertised pause frame use: No
Advertised auto-negotiation: Yes
Speed: 25000Mb/s <<<<<< < << < check speed
Duplex: Full
Port: Direct Attach Copper
PHYAD: 1
Transceiver: internal
Auto-negotiation: on
Current message level: 0x00000000 (0)
Link detected: yes
# ethtool p1p2
Settings for p1p2:
Supported ports: [ FIBRE ]
Supported link modes: 1000baseT/Full
Supported pause frame use: Symmetric Receive-only
Supports auto-negotiation: Yes
Advertised link modes: 1000baseT/Full
10000baseT/Full
Advertised pause frame use: No
Advertised auto-negotiation: Yes
Speed: 25000Mb/s <<<<<<< < << check speed
Duplex: Full
Port: Direct Attach Copper
PHYAD: 1
Transceiver: internal
Auto-negotiation: on
Current message level: 0x00000000 (0)
Link detected: yes
```

#### **Related Topics**

Deployment Checklist for Oracle Database Appliance Bare Metal Systems
 This checklist provides an overview of the tasks to setup and deploy Oracle Database
 Appliance bare metal systems for the first time.

## Plumbing the Network

Plumb the Oracle Database Appliance network with the public internet protocol (IP) information assigned to a node, to enable provisioning of the Oracle Database Appliance software.



On Oracle Database Appliance X9-2, X10, and X11, the <code>odacli configure-firstnet</code> command supports bonding of ports across two supported network PCI cards of the same type.

#### **NOT\_SUPPORTED:**

To change the network bonding after the system is deployed, run the cleanup.pl - cleanDefNet command to ensure that no network setup exists in the bonding interface, and then run the odacli configure-firstnet command to configure the new bonding.

#### Note:

If you enable Link Aggregation Control Protocol (LACP) on the bonding interface when you run the <code>odacli configure-firstnet</code> command, then <code>lacp\_rate</code> is set to 1 (fast). You must adjust the switch setting so that it can support this <code>lacp\_rate</code>.

- Connect to Oracle ILOM remote console, then log into Oracle Database Appliance as root.
- 2. Run the command configure-firstnet on **both** nodes. You can choose to enable Link Aggregation Control Protocol (LACP) on the bonding interface when you run odacli configure-firstnet.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Use bonding on different network interfaces:
    bonding between ports on the same network card [0]
    bonding between Network Card 1 in slot 6 and Network Card 2 in slot 4
[1]
    bonding between Network Card 1 in slot 6 and Network Card 3 in slot 8
[2]
    bonding between Network Card 2 in slot 4 and Network Card 3 in slot 8
[3]
Please input your selection (0 - 3) [0]:
Select the Interface to configure the network on (btbond1 btbond3 btbond5)
[btbond1]:
Use LACP bonding on btbond1 (yes/no) [no]:
Configure DHCP on btbond1 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond1 (yes/no) [no]:
```



Complete the network configuration as prompted and configure the public network interface. Also provide the netmask and gateway IP address.

You use this network connection to transfer the software to the server node.

#### Example 4-1 Example of a Bonded Configuration

For a bonded configuration, answer yes to using a bonding public interface and configure the first network to use a btbond3 interface without configuring DHCP.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Select the Interface to configure the network on (btbond1 btbond3 btbond4)
[btbond1]:btbond3
Use LCAP bonding on btbond3 (yes/no) [no]:yes
INFO: network interface [btbond3] in LACP mode
Configure DHCP on btbond3 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond3 (yes/no) [no]:yes
Configure VLAN on btbond3, input VLAN ID [2 - 4094] 119
INFO: using network interface btbond3.119
Enter the IP address to configure: 10.31.129.36
Enter the Netmask address to configure: 255.255.255.240
Enter the Gateway address to configure [10.31.129.33] :
INFO: Restarting the network
Shutting down interface btbond1: [ OK ]
Shutting down interface btbond2: [ OK ]
Shutting down interface p3p1: [ OK ]
Shutting down interface p3p2: [ OK ]
Shutting down interface sfpbond1: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface btbond1: Determining if ip address 10.209.13.109 is
already in use for device btbond1...
[ OK ]
Bringing up interface btbond2: [ OK ]
Bringing up interface sfpbond1: [ OK ]
```

#### **Example 4-2 Example of Configuring VLAN**

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Select the Interface to configure the network on (btbond1 btbond3 btbond4)
[btbond1]:btbond3
Use LCAP bonding on btbond3 (yes/no) [no]:yes
INFO: network interface [btbond3] in LACP mode
Configure DHCP on btbond3 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond3 (yes/no) [no]:yes
Configure VLAN on btbond3, input VLAN ID [2 - 4094] 119
INFO: using network interface btbond3.119
Enter the IP address to configure : 10.31.129.36
Enter the Netmask address to configure: 255.255.255.240
Enter the Gateway address to configure [10.31.129.33] :
INFO: Restarting the network
Shutting down interface btbond1:
                                                           [ OK ]
Shutting down interface em1:
                                                           [ OK ]
Shutting down interface plp1:
                                                           [ OK ]
Shutting down interface p1p2:
                                                           [ OK ]
```



```
Shutting down loopback interface:
                                                           [ OK ]
Bringing up loopback interface:
                                                           [ OK ]
Bringing up interface btbond1:
Determining if ip address 192.0.2.24 is already in use for device btbond1...
                                                           [ OK ]
Bringing up interface em1:
                                                           [ OK ]
Bringing up interface plp1:
Determining if ip address 192.0.2.24 is already in use for device
p1p1...
                                                                    OK 1
Bringing up interface p1p2:
Determining if ip address 192.0.2.24 is already in use for device p1p2...
                                                           [ OK ]
Bringing up interface btbond1.122:
Determining if ip address 192.0.2.24 is already in use for device
btbond1.122...
                                                           [ OK
INFO: Restarting the DCS agent
initdcsagent stop/waiting
initdcsagent start/running, process 32104
```

#### **Configuring LACP after Deployment**

Use the -o option with the odacli configure-firstnet command to enable or disable LACP on a bonding interface.

#### Enabling LACP on a bonding interface after deployment:

```
# odacli configure-firstnet -o
INFO: Configure network option
Select the Interface to configure the network on (btbond1 btbond3 btbond5)
[btbond1]:btbond3
Use LACP bonding on btbond3 (yes/no) [no]: yes
INFO: network interface [btbond3] setup in LACP mode
```

#### Disabling LACP on a bonding interface after deployment:

```
# odacli configure-firstnet -o
INFO: Configure network option
Select the Interface to configure the network on (btbond1 btbond3 btbond5)
[btbond1]:btbond3
Use LACP bonding on btbond3 (yes/no) [yes]: no
INFO: network interface [btbond3] setup in active-backup mode
```

### Downloading Oracle Database Appliance Software

Download Oracle Database Appliance software and copy to a temporary location before applying updates to your appliance.

 Download the software files from My Oracle Support to a temporary location on an external client. Refer to the release notes for details about the software for the latest release.



For example, download the Oracle Database Appliance GI Clone for ODACLI/DCS stack (patch 30403673) and Oracle Database Appliance RDBMS Clone for ODACLI/DCS stack (patch 30403662) for 19.27:

```
p30403673_1927000_Linux-x86-64.zip
p30403662 1927000 Linux-x86-64.zip
```

2. Unzip the software — it contains README.html and one or more zip files for the patch.

```
unzip p30403673_1927000_Linux-x86-64.zip unzip p30403662_1927000_Linux-x86-64.zip
```

The GI and RDBMS Clone files for release 19.27 are extracted.

```
odacli-dcs-19.27.0.0.0-date-GI-19.27.0.0.zip
odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip
```

3. Copy the software files from the external client to Oracle Database Appliance. Use the scp or sftp protocol to copy the bundle.

Example using scp command:

```
scp software file root@oda host:/tmp
```

Example using sftp command:

```
sftp root@oda_host
```

Enter the root password, and then copy the file.

```
put software file
```

For example, for release 19.27:

```
put odacli-dcs-19.27.0.0.0-date-GI-19.27.0.0.zip
put odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip
```

The GI and RDBMS Clone files are copied to the temporary location on the appliance. You can update the repository, and create the appliance, as explained in the next topic.

#### **Related Topics**

•

## Installing Oracle Database Appliance Software

Install Oracle Database Appliance software, before creating the appliance.

Ensure that the Oracle Database Appliance patches are downloaded and available for updating the repository, as described in the topic *Downloading Oracle Database Appliance Software*.

Starting with Oracle Database Appliance release 19.12, the sizes of volumes /u01 and /opt are smaller than the corresponding sizes in earlier releases. The size of /u01 is now 40GB and

the size of /opt is now 30GB. A new ACFS file system, mounted at /opt/oracle/oak/pkgrepos/orapkgs/clones, is created during provisioning. The DATA disk group provides space of 150 GB for the file system. The Oracle Grid Infrastructure and Oracle Database clone files are stored on this file system.

#### Important:

If you want to install third-party software on your Oracle Database Appliance, then ensure that the software does not impact the Oracle Database Appliance software. The version lock on Oracle Database Appliance RPMs displays a warning if the third-party software tries to override Oracle Database Appliance RPMs. You must restore the affected RPMs before patching Oracle Database Appliance so that patching completes successfully.

#### Important:

To ensure that your deployment has the latest Oracle Database Appliance firmware, download the latest server patch and update the repository. Then, run the <code>odacli</code> <code>describe-component</code> command to check whether the firmware is current or out-of-date. If the firmware is not current, then run the <code>odacli</code> <code>update-server</code> and <code>odacli</code> <code>update-storage</code> commands before you deploy the Oracle Database Appliance software. If the firmware is current, then you can deploy the Oracle Database Appliance software as described in this topic, without updating the server and storage. Before updating the server or storage, ensure that you run the <code>odacli</code> <code>create-prepatchreport</code> command to generate the prechecks report, otherwise an error is displayed.

#### Note:

Public network gateway must be responsive to ping requests. Oracle Clusterware uses the public network gateway as ping target to facilitate the VIP failover in Oracle Database Appliance high-availability environment.

#### Note:

Starting with Oracle Database Appliance release 19.27, Oracle ASM Filter Driver (ASMFD) is not automatically configured during provisioning of the appliance. Do not specify the <code>enableAFD</code> parameter in the provisioning JSON file.

1. Verify the current system version by running the following command on **both** nodes:

[root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-component -v

On a single-node Oracle Database Appliance system, run the command odacli describe-component without the -v option.

[root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-component

2. Update the repository with Oracle Grid Infrastructure and Database software only. To prevent space issues in /opt, it is recommended that you add other repositories after the bare metal instance is provisioned.

```
[root@odal opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
GI clone file,/tmp/DB clone file
```

#### For example, for release 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip,/tmp/odacli-dcs-19.27.0.0.0-
date-GI-19.27.0.0.zip
```

**3.** Confirm that the repository update is successful:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
```

**4.** Delete the software zip files from the temporary location on the appliance to save space:

```
[root@oda1 opt]# rm software_file
rm: remove regular file software file? y
```

You have now updated the repository with the Oracle Database Appliance software, and can create your appliance, as described in the next topic.

#### **Related Topics**

Deployment Checklist for Oracle Database Appliance Bare Metal Systems
 This checklist provides an overview of the tasks to setup and deploy Oracle Database
 Appliance bare metal systems for the first time.

### Creating the Appliance

Create the appliance using the Browser User Interface or ODACLI commands.



If you plan to enable multi-user access, then refer to the chapter *Implementing Multi-User Access on Oracle Database Appliance* before you create your appliance.

#### Creating the Appliance using ODACLI Commands

You can use the command odacli create-appliance and a JSON file that includes your appliance configuration settings to deploy the appliance instead of using the Browser User Interface. Review the readme in the /opt/oracle/dcs/sample directory carefully along with the provided JSON example files. Create a JSON file with the necessary changes based on your environment and requirements.



#### See Also:

Creating an Appliance Using a JSON File in this guide for example JSON files and the procedure to create a JSON file.

#### Note:

It is important to review the readme and the examples carefully before creating your JSON file. If you do not enter your network and Oracle ILOM information correctly based on your setup, you will lose network access to both the host and Oracle ILOM.

#### Creating the Appliance using the Browser User Interface (BUI)

Follow these steps to create the appliance using the BUI:

Ensure that ports 7070 and 7093 on the network between Oracle Database Appliance and the client machine, are open.

 Navigate to the Browser User Interface. You are prompted to set the password for the odaadmin user.

https://ODA-host-ip-address:7093/mgmt/index.html

2. Log into the Browser User Interface with the new password.

When you launch the Browser User Interface on an unconfigured appliance, the Appliance page notifies you that the appliance is not configured and provides a link to the pages needed to configure and create the appliance.

#### Note:

If you face any issues when logging into the Oracle Database Appliance Browser User Interface, then see the topic *Errors When Logging into the Browser User Interface* in the chapter *Troubleshooting Oracle Database Appliance*.

- 3. Click Create Appliance.
- 4. In the Create Appliance page, if you want to create the appliance from a saved configuration, click **Browse**, and select the JSON file. The information from the saved configuration file is loaded. You can retain or edit the fields. Otherwise, manually, provide the values to create the appliance.
- 5. In the System Information tab, specify the values as follows.
  - a. System Name: Enter the host name.

The host name can contain alphanumeric characters and dashes (-), but cannot start with a number or dash (-) or end with dash (-). Do not exceed 30 characters.

- **b. Domain Name**: Enter the domain name.
- c. Region: Select the region of the world where the Oracle Database Appliance is located.
- d. **Time Zone**: Select the time zone where the Oracle Database Appliance is located.
- e. (Optional) **DNS Servers**: Enter addresses for one or more DNS servers.



- (Optional) NTP Servers: Enter addresses for one or more NTP servers.
- g. Diskgroup Redundancy: If there are two disks, then you can select the disk group redundancy as Normal or Flex. To select the the redundancy as High, there must exist more than four disks, and a quorum disk. If five or more disks are configured, then the quorum disk is not required. Select Normal, High, or Flex, as per your deployment requirement.

The Flex parameter defines the disk group redundancy. Flex redundancy requires at least 3 storage devices, including a quorum. For a database to be placed on Oracle ASM, you can set the database redundancy during its creation. For a database to be placed on Oracle ACFS, the database inherits the redundancy of the ACFS file system. You can specify an ACFS file system redundancy during its creation. You can set the disk group redundancy only during appliance creation. The database redundancy can be set anytime you create the database.

The redundancy level for DATA, RECO, and FLASH can be set to Normal, Flex, or High based on whether there are two, four, or more disks.

**Note:** For Oracle Database Appliance hardware models other than X8-2, the redundancy level for REDO is always High.

- h. Data Storage Percentage: Enter a whole number between 40 and 90 to define the percentage of storage reserved for DATA, the remainder is reserved for RECO. For example, if you enter 80, then 80% of the storage for DATA and 20% for RECO.
- i. Disk Group for Database Home Storage: Select the disk group, whether DATA or RECO depending on your hardware model, and specify the size to be allocated. This chooses the disk group from which the ACFS storage required for database homes is allocated.
- j. System Password and Confirm Password: Enter the system password in both fields.

The system password is the password set for UNIX and root users. The password must begin with an alpha character and cannot contain quotation marks. Do not exceed 30 characters.

k. Specify the DNS Servers and NTP Servers details.

Starting with Oracle Database Appliance release 19.16, if you specify DNS servers, then ensure that all host names (except SCAN) are resolvable to one and only one IP address through the given domain name and DNS servers. These include Client Access Network Host Name, VIP Name, and ILOM Host Name. This does not apply to SCAN names as they can resolve to multiple IP addresses. If any of the above host names does not resolve to an IP address or resolves to multiple IP addresses, then the following error is displayed:

DCS-10045: Validation error encountered: Hostname 'hostname1' does not resolve to a unique IP address.

6. In the Network Information tab, configure the primary client access network, virtual networks, and an Oracle Integrated Lights Out Manager (Oracle ILOM) network. You are only required to configure the client access network. The ILOM configuration is optional if you already configured the ILOM for the appliance and you do not need to make changes.

Specify the following, depending on whether it is a single-node or two-node Oracle Database Appliance deployment:

a. Client Access Network Host Name: For Node0, enter the host name for the primary client access network.



- b. Client Access Network IP Address: For Node0, enter the IP address for the primary client access network.
- c. VIP Name for Node0: Enter the name of the virtual IP network for Node0.
- d. VIP IP Address for Node0: Enter the virtual IP address that resides on Node0 and is shared between the nodes.
- e. VIP Name for Node1: Enter the name of the virtual IP network for Node0.
- f. VIP IP Address for Node1: Enter the virtual IP address that resides on Node1 and is shared between the nodes.
- g. (Optional) ILOM Host Name: Enter the name of the Oracle ILOM host for Node0 and Node1.
- h. (Optional) ILOM Network IP Address: Enter the IP address for the ILOM for Node0 and Node1.
- i. (Optional) ILOM Network Subnet Mask: Enter the subnet mask address for the ILOM.
- j. (Optional) ILOM Network Gateway: Enter the gateway address for the ILOM.
- k. Client Access Network Subnet Mask: Enter the subnet mask address for the primary client access network.
- Client Access Network Gateway: Enter the gateway address for the primary client access network.
- m. Client Access Network Interface: Enter the interface for the primary client access network.
- n. SCAN Name: Specify the Single Client Access Name (SCAN).
- SCAN IP Address: Specify the SCAN IP address. You can specify up to three SCAN IP addresses.

Specify the VIP address and SCAN only for high-availability deployments.

- 7. Determine how you want to configure your users and groups and whether or not you want to allow operating system role separation:
  - Two users with six groups: Customize Users and Groups, select No. Allow OS Role Separation, select Yes. This is the default configuration.
  - Two customized users with six customized groups: Customize Users and Groups, select Yes. Allow OS Role Separation, select Yes.
  - Single user with two groups: Customize Users and Groups, select No. Allow OS Role Separation, select No
  - Single user with six groups: Customize Users and Groups, select Yes. Allow OS Role Separation, select No. SAP deployments use this configuration.
- Do you want to create an initial database? Select Yes and go to Step 9 or select No and go to Step 10.
- Enter the following information to configure an initial database:
  - a. **DB Name**: Enter a name for the database.

The name must contain alphanumeric characters and cannot exceed 8 characters.

b. (Optional) DB Unique Name: Enter a globally unique name for the database.

Databases with the same DB Name within the same domain (for example, copies of a database created for reporting or a physical standby) must have a different DB Unique Name that is unique within the enterprise. The name must contain alphanumeric, underscore ( ), dollar (\$), and pound (#) characters, but must begin with an alphabetic



character. No other special characters are permitted in a database name. The unique name cannot exceed 30 characters.

- c. **DB Version**: Select a database bundle patch number.
- d. CDB: Select Yes or No to specify whether or not you want a Container Database (CDB).
- e. PDB Name: Enter a name for the pluggable database (PDB).

The name must begin with an alphanumeric character. The following characters are valid: alphanumeric characters, and underscore ( ).

- f. PDB Admin User: Enter an Admin user name for the pluggable database (PDB).
- g. Database Edition: Select the Oracle Database edition, either Standard Edition and Enterprise Edition. Your license determines which database edition you are eligible to create in the appliance.

For Oracle Database 19c Standard Edition, you can only create single-instance Oracle Database, with or without high-availability.

- h. SYS and PDB Admin User Password: Provide a password for the database.
- i. Deployment: Select a deployment type from the list. The options are RAC, RAC-One, or SI (single-instance database). If you select a single instance database, then select the node for the SI database deployment.

For Standard Edition Oracle Database 19c or later, you can choose to enable high availability for single-instance databases. For Standard Edition Oracle Database 19.6 or later, if you choose to create a single-instance database, then the high availability feature is available by default. To disable high-availability, set the value in the **Enable High Availability** field to **No**.

For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to enable high availability for single-instance databases. For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, if you choose to create a single-instance database, then the high availability feature is disabled by default. To enable high-availability, set the value in the **Enable High Availability** field to **Yes**.

If you select a single instance database, then you have the option to create the database on either Node0 or Node1. The default is Node0.

- j. Shape: Select a database shape from the list.
- k. In the Database Class field, select a database class from the drop-down list. If an option is not available in the list, it is not supported for the database edition on the Oracle Database Appliance or the version that you selected. The default is OLTP.
- In the Storage field, select ACFS or ASM from the drop-down list. The default is Oracle ASM.
- m. If you specified the disk group redundancy as Flex, then you can select the Database Redundancy value as Mirror or High.
- Data Files on Flash Storage: Select Yes or No.

This option is only available if the HA system has HDD storage drives.

o. Configure EM Express: Select Yes or No.

Select **Yes** to configure the Oracle Enterprise Manager Database Express (EM Express) console for Oracle Database 12.2.1.0 or 12.1.0.2. Selecting Yes enables you to use the console to manage the database.

character set: Select a character set.



- q. National Characterset: Select a national characterset.
- r. Language: Select the database language.
- Territory: Select a territory or location from the list.
- t. For Oracle Database Enterprise Edition 19c or later, you can choose to enable Transparent Database Encryption (TDE). Select Yes or No in the Enable TDE option. Specify and confirm the TDE Password. By default, the TDE option is disabled.
- In the Diagnostics Information tab, configure and enable Oracle ASR or choose to enable trace file redaction.

**Enable Trace File Redaction**: Select **Yes** if you want to redact sensitive information in diagnostics collections.

You can configure and enable Oracle Auto Service Request (Oracle ASR) now or later:

- To not enable Oracle ASR during deployment, select No and click Submit. After deployment, you can configure an internal Oracle ASR or register with an external Oracle ASR Manager from either the Browser User Interface or command-line interface.
  - Internal Oracle ASR: choose to configure Oracle ASR Manager on Oracle
     Database Appliance or use Oracle ASR Manager configured on another server in
     the same network as your appliance.
  - External Oracle ASR: If you already have Oracle ASR Manager configured elsewhere, you can register Oracle Database Appliance with your existing Oracle ASR Manager.
- To enable Oracle ASR, select Yes and complete the fields:
- a. Select Internal or External in the ASR Type field.
- **b. ASR User Name**: Enter the e-mail address associated with the My Oracle Support account under which the server is registered.
- **c. Password**: Enter the password associated with the My Oracle Support account under which the server is registered.
- d. (Optional) Specify the HTTPS Port Number for the ASR manager. The default port number is 16162.
- e. HTTP Proxy used for Upload to ASR: Select Yes or No.
- f. Proxy Server Name: If you are using a proxy for upload, enter the proxy server name.
- **g. Proxy Port**: If you are using a proxy for upload, enter the proxy port.
- h. (Optional) HTTP Proxy Requires Authentication: If you are using a proxy for upload, select Yes if you require authentication. If you do not require authentication, select No.
- i. **Proxy User Name**: If you are using a proxy for upload, enter the proxy user name.
- j. (Optional) Proxy Password: If you are using a proxy for upload and require authentication, enter the proxy password.
- 11. Click **Submit**. When prompted, click **Yes** to confirm that you want to start the job to deploy the appliance.
- **12.** Verify that the appliance is deployed. Run the odacli describe-system command. For high-availability deployments, run the command on both nodes.

The job to create the appliance takes time to complete. To monitor the job progress, click the **Activity** tab. Click the job number to view the tasks.



After deployment, the root and database users SYS, SYSTEM, and PDBADMIN are set to the system password. The oracle and grid passwords are set to the default password. Change these passwords to comply with your user security protocols.

#### **Related Topics**

Errors When Logging into the Browser User Interface
 If you have problems logging into the Browser User Interface, then it may be due to your browser or credentials.

#### **Related Topics**

Deployment Checklist for Oracle Database Appliance Bare Metal Systems
 This checklist provides an overview of the tasks to setup and deploy Oracle Database
 Appliance bare metal systems for the first time.

#### **Related Topics**

Reimaging an Oracle Database Appliance Baremetal System
 Reimage Oracle Database Appliance to perform a bare metal restore of Oracle Database
 Appliance.

#### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented on Oracle Database Appliance, its
   advantages and restrictions and the associated life cycle management changes for your
   appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

## **Managing Local Volumes**

Understand how you can modify the size of logical volumes LOGVOLOPT and LOGVOLU01.

#### **About Local Volumes**

During imaging, Oracle Database Appliance creates a RAID1 volume between the two operating system disk. On all systems with Oracle Linux 8 and later, two small partitions are created on this RAID1 volume to support Unified Extensible Firmware Interface (UEFI). The rest of the disk space is assigned to a third partition. A physical volume is initialized on this third partition which is fully assigned to a volume group VolGroupSys. Several logical volumes namely LogVolRoot, LogVolU01, LogVolOPT, and LogVolSwap are created in VolGroupSys. On single-node Oracle Database Appliance systems, two more logical volumes, LogVolRECO and LogVolDATA, each of 1 GB in size are also created. Oracle Database Appliance formats LogVolRoot, LogVolU01, and LogVolOPT as ext4 (fourth extended file system), and mounts them at /, /u01, and /opt respectively. These logical volumes use only a part of the available storage, approximately 125 GB.



The term Local Volume refers to the logical volume and the physical volumes initialized on the operating system disk.



The local volumes LOGVOLOPT and LOGVOLU01 may not have sufficient space for creating Oracle Grid Infrastructure homes, installing additional software, creating Oracle Grid Infrastructure log files, and others. In such cases, extending the size of these local volumes is useful.



After extension, the size of local volumes cannot be reduced through Oracle Database Appliance tooling. Ensure that you carefully plan local volume extensions.

#### Viewing and Extending the Local Volume Size Using ODACLI Commands

Run the following command to view all the local volumes:

```
odacli list-localvolumes
```

The command displays the total size of the physical volume, the free space available in the volume group, and the space required to support ODABR backup during patching. It also displays the space available for extending the local volumes in a safe manner such that sufficient buffer is reserved for ODABR backup. In addition, it shows the details of all the local volumes in the system.

To modify the local volume size, run the following command:

```
odacli extend-localvolume --name volume_name --size increment_size_in_GB --force
```

The command enables extension of LogVolU01 and LogVolOPT only. It allows extension up to the size showed by the Space for extension field in the odacli list-localvolumes output.

#### Viewing and Extending the Local Volume Size Using BUI

Follow these steps:

 Navigate to the Browser User Interface. You are prompted to set the password for the odaadmin user.

```
https://ODA-host-ip-address:7093/mgmt/index.html
```

- 2. In the Appliance home page, click the **Local Volumes** link on the left-hand pane.
- 3. In the Local Volumes Details page, you can view the physical volume and logical volume details. For high-availability system, you can view these details for both nodes.
- 4. To increase the local volumes LOGVOLOPT and LOGVOLU01 sizes, click Extend. Confirm your action in the popup window.
- 5. In the Extend Local Volume page, select the **Volume Name**, and specify the **Increment Size** in GB. Click **Force Run** to override the ODABR backup space requirement. You can extend both LOGVOLOPT and LOGVOLU01 volumes.
- 6. Confirm the operation and submit the job. Track the status of the job completion and verify that it completes successfully.



## Implementing Multi-User Access on Oracle Database Appliance

Understand how multi-user access can be implemented on Oracle Database Appliance, its advantages and restrictions and the associated life cycle management changes for your appliance.



#### **Caution:**

You can enable multi-user access **only** at the time of provisioning Oracle Database Appliance on bare metal systems and **cannot** rollback multi-user access after you provision and deploy your appliance. The Oracle Database Appliance administration model changes when you deploy the Multi-User Access feature. Evaluate your role separation requirements before using this feature. Deploying on a test system first can help with the evaluation and assessment of the new administration model.



#### Note:

You can enable multi-user access on Oracle Database Appliance DB systems when you create the DB system either using ODACLI commands or Browser User Interface (BUI).

- About Multi-User Access on Oracle Database Appliance
   Before provisioning your appliance, understand how multi-user access can enhance the security of the system and provide an efficient mechanism for role separation.
- About Users, Roles, Entitlements, and Operations on a Multi-User Access Enabled Oracle Database Appliance System Understand the users, roles, entitlements, and operations when you provision your appliance with multi-user access enabled.
- About Granting and Revoking Resource Access
   Muti-user access allows exclusive or shared access to resources. Review this example
   about shared resource access.
- Using Passwordless Multi-User Access on Oracle Database Appliance
   Understand how you can implement passwordless multi-user access on Oracle Database
   Appliance, its advantages and restrictions, and the associated life cycle management
   changes for your appliance.
- Provisioning Oracle Database Appliance with Multi-User Access
   You can enable multi-user access only when you provision Oracle Database Appliance, using CLI commands or the Browser User Interface.
- Creating, Viewing, and Deleting Users on Oracle Database Appliance with Multi-User Access

After provisioning the appliance with multi-user access enabled, you can create users with specific entitlements.

- Activating a New User on Oracle Database Appliance with Multi-User Access
   Understand how to activate a new user on multi-user access enabled Oracle Database
   Appliance.
- Granting and Revoking Resource Access on Oracle Database Appliance with Multi-User Access
  - You can grant and revoke resource access on the appliance.
- Viewing Roles, Operations, and Entitlements on Oracle Database Appliance with Multi-User Access
  - You can view roles and entitlements on the appliance.
- Managing Databases and Database Homes on Oracle Database Appliance with Multi-User Access
  - The custom user created on multi-user access Oracle Database Appliance can deploy and manage databases and database homes.
- Changing the Password for a User Account on Oracle Database Appliance with Multi-User Access
  - Understand how to manage passwords on multi-user access Oracle Database Appliance.
- Resetting the Password for a Locked User Account on Oracle Database Appliance with Multi-User Access
  - Understand how to reset the password on multi-user access Oracle Database Appliance.

## About Multi-User Access on Oracle Database Appliance

Before provisioning your appliance, understand how multi-user access can enhance the security of the system and provide an efficient mechanism for role separation.

Currently, a single Oracle Database Appliance account with user name and password is used to securely connect to the appliance, run ODACLI commands, or log into BUI. The root user performs all administration on an Oracle Database Appliance. With multi-user access, you have the option of providing separate access to database administrators to manage databases. Display of resources within the Browser User Interface are also filtered as per user role. The root access is restricted to the Oracle Database Appliance system administrator to access system logs or debug issues that require root access.

When you enable multi-user access, you create multiple users with different roles that restrict them from accessing resources created by other users and also restrict the set of operations they can perform using ODACLI commands or Browser User Interface (BUI). The same user credentials that you set up, can be used for logging into the BUI and running ODACLI commands. The BUI also displays resources and information based on access to the set of resources. A separate **Multi-User Access Management** tab is available only to the odaadmin user to administer the users and resources in the system.

#### Note:

When you enable multi-user access, the Oracle Database Appliance administrator is odaadmin. This user has access to all the resources on the appliance and can run any operations using ODACLI or the BUI using the same set of credentials. When you do not enable multi-user access, the user name you use to log into BUI is odaadmin.



#### Note:

The authentication token support for ODACLI session management is linked to a multi-user access user account. Since root is an operating system administrative user and not a multi-user access user, auth token based session management system is not supported when a user logs in as root. Therefore, you must provide an Oracle Database Appliance account user name and password to run any ODACLI command.

#### Benefits of enabling multi-user access

- Multi-user access feature supports user lifecycle management such as creation, activation, updation, deactivation, deletion, and credential management.
- By using multi-user access, multiple departments such as finance and human resources
  within the same organization can use Oracle Database Appliance as a consolidation
  platform for hosting their databases in a secure manner as only the authorized users in the
  respective departments can access their departmental databases and perform lifecycle
  management operations on the databases.
- Organizations that have root access policy restrictions can use multi-user access and create separate users with restricted roles.
- Without multi-user access, all databases were created as the default database user chosen during provisioning. Hence, even in a sudo-based multi-user environment, the ODA administrator could not track usage of resources. Now such reporting is possible at the database level.
- Multi-user access feature supports token-based session management. A user enters the
  password only when they run the first odacli command. Subsequently, a token is
  generated and till it expires, the user is not required to enter the password again. Each
  time an odacli command is run, the existing token is refreshed with a new token that has
  the expiry of 120 mins or the value configured by the odacdmin user. This means if the
  odacli session is not idle for the expiry duration, the user does not need to enter the
  password again.
- Both Basic Auth and mTLS modes of authentication are supported. ODACLI and BUI uses
  Basic Auth. Users such as oracle and grid can also run certain operations on the DCS
  agent using mTLS-based authentication. Basic Auth is a password-based authentication
  scheme. mTLS is a certificate-based authentication scheme where both the client (user)
  and the server (DCS agent) mutually present and authenticate each other's certificate
  before the authentication is deemed complete.
- Multi-user access provides for user account locking on multiple failed login attempts and password expiration. You can also unlock and reset the account in case the password is forgotten.

#### Note:

You can enable multi-user access **only** at the time of provisioning Oracle Database Appliance and **cannot** rollback multi-user access after you provision and deploy your appliance. Provision the feature on your test system first, and then deploy this feature on your production system.



#### **Related Topics**

- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.
- ODACLI Command Changes with Multi-User Access on Oracle Database Appliance Understand the ODACLI command changes when you enable multi-user access.

## About Users, Roles, Entitlements, and Operations on a Multi-User Access Enabled Oracle Database Appliance System

Understand the users, roles, entitlements, and operations when you provision your appliance with multi-user access enabled.



Note that in a multi-user access enabled deployment, the <code>oda-admin</code> user is not present. The ODA admin user name is <code>odaadmin</code>. The first user with administrative privileges is called <code>odaadmin</code>. This user can log into the BUI and run ODACLI commands. This user can also create other user accounts with roles and entitlements as required.

#### About Roles, Entitlements, and Operations

Each user can be assigned one or more roles in a multi-user enabled Oracle Database Appliance system. Each role encompasses a set of entitlements that authorizes a user to perform only a specific set of operations using ODACLI or BUI. Each entitlement in turn, is a group of a similar set of operations. For example, PROVISIONDB-MGMT is an entitlement that encompasses provisioning-related operations such as create-database, clone-database, delete-database, register-database. Similarly, BACKUPDB-MGMT encompasses backup related operations such as create-backup, delete-backup, irestore-database, recover-database, and so on. The ODA-DB role has access to a collection of entitlements such as PROVISIONDB-MGMT, BACKUPDB-MGMT, and PATCHDB-MGMT. A user with the ODA-DB role can perform all the database lifecycle management operations on the databases that they own. Additionally, if a user with the role of ODA-DB is granted the ODA-GRID role as well, this user can now perform Oracle Grid Infrastructure-related operations.

Roles can be internal or external. Internal roles are assigned to system users and are used internally for the purpose of administration of the Oracle Database Appliance system. For example, the <code>ODA-ADMINISTRATOR</code> role is assigned to the Oracle Database Appliance system administrator to manage the appliance or associated entities. Another example is a DB system communicating with the bare metal using a system user with the role of <code>ODA-DBVMINFRA</code>.

External roles can be granted to the new users created by <code>odaadmin</code>, the Oracle Database Appliance system administrator. For example, the <code>odaadmin</code> creates a new user <code>odadb1</code> with the role of <code>ODA-DB</code>. Now this user <code>odadb1</code> is entitled to create databases and perform lifecycle management operations because of the role granted to them. A user can have one or more roles.

The topic *ODACLI Command Changes with Multi-User Access on Oracle Database Appliance* describes the ODACLI commands that have changes for multi-user access and the entitlements required to run the commands.



#### Multi-User Access User Roles

When you enable multi-user access on Oracle Database Appliance, the following user roles are available:

- ODA-ADMINISTRATOR: This is an internal role assigned to the first user (odaadmin) created during the provisioning of an Oracle Database Appliance. This role entitles odaadmin to run all ODACLI commands or perform all Browser User Interface (BUI) operations. This role cannot be assigned to the new users that odaadmin creates. The odaadmin account is an administrator role that can run any operation (command) on any resource. For example, user oda1 creates a database db1 and user oda2 creates a database db2. Each user can now perform lifecycle management operations on their respective database only. But, odaadmin can patch both databases by running odacli commands. This allows both DBAs (oda1 and oda2) and an overall administrator (odaadmin) to perform functions specific to their role.
- ODA-DB: This is an external role available to odaadmin to assign to newly-created users.
   This role entitles the user to perform database management operations such as create, modify, restore, recover, backup, patch, clone, move, register, and delete.
- ODA-OAKDROOT: This is an internal role that is assigned to system user oakdroot created during provisioning and is used by OAKD to run certain operations such as get-disks and release-disks on the DCS agent. OAKD communicates with DCS through mTLS certificates-based authentication. Hence, this user does not have any password associated with it. Do not use this role to connect by SSH to the appliance or log into the Browser User Intercae to run ODACLI commands. None of the password management commands such as change-password apply to this user.
- **ODA-GRID:** This is an internal role assigned to the grid user. This role entitles the user to run Oracle Grid Infrastructure-related operations.
- **ODA-DBVMINFRA:** This is an internal role assigned to the DBVM user created on the bare metal system when the DB system is provisioned. This role entitles the user to synchronize metadata between the DB system and the bare metal system.

#### **Related Topics**

- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.
- ODACLI Command Changes with Multi-User Access on Oracle Database Appliance Understand the ODACLI command changes when you enable multi-user access.

## **About Granting and Revoking Resource Access**

Muti-user access allows exclusive or shared access to resources. Review this example about shared resource access.

Muti-user access allows exclusive or shared access to resources. It is recommended that each user creates their own database home and then creates databases in the home. This provides for an efficient method of separation of duties where each user has exclusive access to their databases. However, in certain exceptional situations, such as lack of disk space, a user can request the administrator odaadmin to grant them shared access to a resource owned by another user.

For example, if user odal wants to create a database of version 19c and there is already a database home DBH2 of the same version created by another user odal. With the consent of user odal, user odal can now request the odaldmin user to grant them shared access to



database home DBH2. Once the shared access is granted, user oda1 can now create a database db1 on the shared database home DBH2 and manage it. Note that user oda1 can connect to the database db1 only through the SYS user password and not as a password-less connection based on operating system authentication, as the database home DBH2 is still owned by user oda2. Oracle Database Appliance resources such as database home, database storage, and databases can be shared accross users in a similar fashion on an on-demand basis. However, there are restrictions to the secondary owner managing the shared resource.

## Using Passwordless Multi-User Access on Oracle Database Appliance

Understand how you can implement passwordless multi-user access on Oracle Database Appliance, its advantages and restrictions, and the associated life cycle management changes for your appliance.



#### **Caution:**

You can enable passwordless multi-user access **only** at the time of provisioning Oracle Database Appliance on bare metal and DB systems and **cannot** rollback multi-user access after you provision and deploy your appliance. The Oracle Database Appliance administration model changes when you deploy the passwordless multi-user access feature. Evaluate your role separation requirements before using this feature. Deploying on a test system first can help with the evaluation and assessment of the new administration model.

Existing bare metal and DB system deployments that do not have multi-user access enabled or have the earlier multi-user access feature which requires a password when you first run an odacli command, cannot be converted to a passwordless multi-user access deployment.

#### Note:

Starting with Oracle Database Appliance release 19.23, a passwordless flavor of the multi-user access feature is also available. You can provision a DB system with either flavor of multi-user access on a bare metal system that does not have multi-user access enabled. On such a bare metal system, you can still use role separation and resource ownership capabilities that multi-user access or multi-user access passwordless provides.

- About Passwordless Multi-User Access on Oracle Database Appliance
   Before provisioning your appliance, understand how passwordless multi-user access can enhance the security of the system and provide an efficient mechanism for role separation.
- Provisioning Oracle Database Appliance with Passwordless Multi-User Access
  You can enable passwordless multi-user access only when you provision Oracle Database
  Appliance using CLI commands. Passwordless multi-user access feature provisioning and
  management is not supported through the Browser User Interface (BUI).



- Creating, Viewing, and Deleting Users on Oracle Database Appliance with Passwordless Multi-User Access
  - After provisioning the appliance with passwordless multi-user access enabled, you can create users with specific entitlements.
- Changing the Password for a User Account on Oracle Database Appliance with Passwordless Multi-User Access
  - Understand how to manage passwords on multi-user access Oracle Database Appliance.
- Example JSON Files to Create a Single-Node Passwordless Multi-User Enabled Appliance
   Follow these JSON file examples to create a JSON file to deploy a single node appliance
   with the command odacli create-appliance.
- Example JSON File to Create a High-Availability Passwordless Multi-User Enabled Appliance
  - Follow the JSON file example to create a JSON file to deploy a high-availability appliance with the command odacli create-appliance.
- Example JSON Files to Create a Single-Node Passwordless Multi-User Enabled DB System
  - Follow the JSON file example to create a JSON file to deploy a single-node DB System, with role separation, with the command odacli create-dbsystem.
- Example JSON File to Create a High-Availability Passwordless Multi-User Enabled DB System
  - Follow the JSON file example to create a JSON file to deploy a two-node DB System, with role separation, with the command odacli create-dbsystem.

### About Passwordless Multi-User Access on Oracle Database Appliance

Before provisioning your appliance, understand how passwordless multi-user access can enhance the security of the system and provide an efficient mechanism for role separation.

Oracle Database Appliance supports enabling of passwordless multi-user access at the time of provisioning of Oracle Database Appliance, on bare metal systems and DB systems. You must specify the "isMultiUserAccessPLEnabled": true option in the JSON file used for provisioning bare metal systems and DB systems. For more information, see the example JSON file with this option in this chapter.

When you enable passwordless multi-user access, you create multiple users with different roles that restrict them from accessing resources created by other users and also restrict the set of operations they can perform using ODACLI commands.



You can enable passwordless multi-user access on Oracle Database Appliance bare metal and DB systems at the time of provisioning using ODACLI commands. You cannot use the Browser User Interface (BUI) to enable passwordless multi-user access on Oracle Database Appliance bare metal systems. However, you can use the BUI on the Oracle Database Appliance bare metal system to enable multi-user access on Oracle Database Appliance DB systems at the time of provisoning.

#### Benefits of enabling passwordless multi-user access

If your corporate policies prevent direct usage of Oracle Database Appliance user account
passwords by employing tools or software that allow access to Oracle Database Appliance
through your corporate credentials, then you can configure passwordless multi-user

access and run commands on your appliance without the need for specifying your Oracle Database Appliance account password when you first run an ODACLI command or when your authentication token expires. This does not compromise the security of the system as all communication to the Oracle Database Appliance server is through a strong and secure system generated password, unique for every user.

- Passwordless multi-user access feature provides role separation and supports user lifecycle management such as creation, deletion, and credential management.
- By using passwordless multi-user access, multiple departments such as finance and human resources within the same organization can use Oracle Database Appliance as a consolidation platform for hosting their databases in a secure manner as only the authorized users in the respective departments can access their departmental databases and perform lifecycle management operations on the databases.
- Organizations that have root access policy restrictions can use passwordless multi-user access and create separate users with restricted roles.
- Without multi-user access, all databases were created as the default database user chosen during provisioning. Hence, even in a sudo-based multi-user environment, the ODA administrator could not track usage of resources. Now such reporting is possible at the database level.
- For passwordless multi-user access, you do not have to specify the Oracle Database
  Appliance account password when you first run an ODACLI command or when the
  authentication token expires. The Oracle Database Appliance system generates a strong
  and secure password for every user. This password is internally stored by the system and
  used when you run odacli commands.
- Both Basic Auth and mTLS modes of authentication are supported. ODACLI uses Basic
  Auth. Users such as oracle and grid can also run certain operations on the DCS agent
  using mTLS-based authentication. Basic Auth is a password-based authentication scheme.
  mTLS is a certificate-based authentication scheme where both the client (user) and the
  server (DCS agent) mutually present and authenticate each other's certificate before the
  authentication is deemed complete.



You can enable passwordless multi-user access **only** at the time of provisioning Oracle Database Appliance and **cannot** rollback passwordless multi-user access after you provision and deploy your appliance. Provision the feature on your test system first, and then deploy this feature on your production system.

#### **Related Topics**

- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.
- ODACLI Command Changes with Multi-User Access on Oracle Database Appliance Understand the ODACLI command changes when you enable multi-user access.



## Provisioning Oracle Database Appliance with Passwordless Multi-User Access

You can enable passwordless multi-user access **only** when you provision Oracle Database Appliance using CLI commands. Passwordless multi-user access feature provisioning and management is not supported through the Browser User Interface (BUI).

Provision your appliance as described in the chapter *Provisioning Oracle Database Appliance Bare Metal System*.



#### Caution:

You can enable passwordless multi-user access **only** at the time of provisioning Oracle Database Appliance on bare metal systems and **cannot** rollback multi-user access after you provision and deploy your appliance. The Oracle Database Appliance administration model changes when you deploy the passwordless multi-user access feature. Evaluate your role separation requirements before using this feature. Deploying on a test system first can help with the evaluation and assessment of the new administration model.

## Overall Steps in Provisioning Oracle Database Appliance with Passwordless Multi-User Access Enabled

- 1. Enable passwordless multi-user access.
  - To provision your appliance using a JSON file, add the attribute "isMultiUserAccessPLEnabled": true in the prov\_req.json file. If the attribute is set to false or does not exist in the prov\_req.json file, then passwordless multi-user access is not enabled during provisioning of the appliance. Note that you can set either multi-user access or passwordless multi-user access in the JSON file, not both.

- 2. Connect to the Oracle Database Appliance network and run the odacli configure-firstnet command using the Oracle ILOM console.
- 3. Log into Oracle Database Appliance as the root user and run the odacli create-appliance -r prov.json command with "isMultiUserAccessPLEnabled": true in the prov.json file.
- 4. After the provisoning job is submitted, log out as root and log in as the odaadmin user using a PAM utility or passwordless SSH and check the status of the provisioning job and ensure that it is successful.

- 5. The system creates Oracle Database Appliance accounts for odaadmin, oracle, and grid users. These are Oracle Database Appliance system users and their accounts are activated during created. The user odaadmin is created with the role of ODA-ADMINISTRATOR while the oracle and grid users are created with the role of ODA\_DB and ODA\_GRID respectively.
- The system configures the multi-user access repository with a list of roles and entitlements, used for assigning to the users in the system.
- 7. You can now log into the appliance using the PAM utility that is integrated with the appliance. The PAM utility prompts you for your corporate credentials and on successful authentication, logs you into the appliance as an Oracle Database Appliance user as per the mapping defined by the PAM utility administrator. Alternatively, you can set up passwordless SSH to log into the appliance.
- 8. After the bare metal system is provisioned, log in as the odaadmin user and run the odacli create-dbsystem -p prov.json command with "isMultiUserAccessPLEnabled": true in the prov.json file.
- After the DB system is provisioned, log in as the odaadmin user through the PAM utility or passwordless SSH and create additional users, if required.
- 10. Log into the DB system as the oracle user through the PAM utility or passwordless SSH and create databases for the oracle user.
- 11. Log into DB system as a custom user through the PAM utility or passwordless SSH and create databases for the custom user.

#### **Related Topics**

- Provisioning Oracle Database Appliance Bare Metal System
   Understand the process to configure Oracle Database Appliance bare metal system.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

## Creating, Viewing, and Deleting Users on Oracle Database Appliance with Passwordless Multi-User Access

After provisioning the appliance with passwordless multi-user access enabled, you can create users with specific entitlements.

After you provision your appliance with multi-user access enabled, do the following:

#### Creating, Viewing, and Deleting Users with ODACLI Commands

1. Connect to the appliance as the odaadmin user.

```
ssh odaadmin@oda-box hostname/IP
```

- 2. Run any ODACLI command and provide the odaadmin password when prompted.
- 3. On successful authentication, create a user with the following command:

```
odacli create-user -u username -r comma-separated role names
```



For example, create a user dbuser1 with lifecycle management privileges for dabatases:

```
odacli create-user -u dbuser1 -r ODA-DB
```

The odaadmin user creates dbuser1 and assigns a temporary password.

- 4. After the user is created successfully, the dbuser1 can log into the appliance with the temporary password.
- 5. The dbuser1 is in the Inactive state. Activate the user with the following command:

```
odacli activate-user
```

You are prompted to change the password. Enter the temporary password, the new password, and confirm the new password.

- Use the new password to connect by SSH into the appliance and run ODACLI commands or connect to the Browser User Interface.
- 7. The odaadmin user can view all the users in the system:

```
# odacli list-users
```

8. The odaadmin user can view details for a user in the system:

```
# odacli describe-user -u user id
```

Delete a user in the system. Note that only the odaadmin user can delete a user in the system.

```
# odacli delete-user -u user id
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Changing the Password for a User Account on Oracle Database Appliance with Passwordless Multi-User Access

Understand how to manage passwords on multi-user access Oracle Database Appliance.



If your appliance is configured as passwordless multi-user enabled, then all user accounts are preactivated during creation and never get locked because the system internally generates the password for each user and provides it to the DCS agent for authentication when required for running ODACLI commands. For passwordless multi-user enabled systems, do **not** run any scripts for unlocking the <code>odaadmin</code> account or the <code>odacli reset-password</code> command to reset the password. Run the <code>odacli change-password</code> command to change the system generated password for your Oracle Database Appliance account.



## Changing the Password on Passwordless Multi-User Access Enabled System Using ODACLI Commands

 You can change password for an Oracle Database Appliance user, whose account is active. This command resets the password of this user account to a new randomly generated password.

odacli change-password

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

### Example JSON Files to Create a Single-Node Passwordless Multi-User Enabled Appliance

Follow these JSON file examples to create a JSON file to deploy a single node appliance with the command odacli create-appliance.



If you do not enter your network and Oracle ILOM information correctly based on your setup, then network access is lost to both the host and Oracle ILOM.

When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

**Note:** To configure Oracle ASR during provisioning, always specify the asrType parameter in the JSON file.

## Example 5-1 JSON File to Create a Single Node Oracle Database Appliance with Role Separation and Passwordless Multi-User Access

The following is an example of a JSON file that creates a single node appliance on Oracle Database Appliance. The example uses role separation and enables passwordless multi-user access.

```
"instance" : {
   "name" : "odambox",
   "instanceBaseName" : "odambox-c",
   "dbEdition" : "EE",
   "timeZone" : "UTC",
   "ntpServers" : ["xx.x.x.x"],
   "dnsServers" : ["x.x.x.xx","xx.x.xxx","xx.x.xxx"],
   "domainName" : "example.com",
   "isRoleSeparated" : true,
   "isMultiUserAccessPLEnabled" : true,
   "osUserGroup" : {
        "groups" : [ {
            "groupId" : 1001,
```



```
"groupName" : "oinstall",
      "groupRole" : "oinstall"
    }, {
      "groupId" : 1002,
      "groupName" : "dbaoper",
      "groupRole" : "dbaoper"
    }, {
      "groupId" : 1003,
      "groupName" : "dba",
      "groupRole" : "dba"
      "groupId" : 1004,
      "groupName" : "asmadmin",
      "groupRole" : "asmadmin"
    }, {
      "groupId" : 1005,
      "groupName" : "asmoper",
      "groupRole" : "asmoper"
    }, {
      "groupId" : 1006,
      "groupName" : "asmdba",
      "groupRole" : "asmdba"
    } ],
    "users" : [ {
      "userId" : 1000,
      "userName" : "oracle",
      "userRole" : "oracleUser"
    }, {
      "userId" : 1001,
      "userName" : "grid",
      "userRole" : "gridUser"
    } ]
  }
},
 "users": [
                  "id": 1000,
                  "name": "ugrid",
                  "role": "gridUser"
              },
                  "id": 1001,
                  "name": "uoracle",
                  "role": "oracleUser"
          ]
      },
      "multiUserAccess": {
          "isMultiUserAccessPLEnabled": true
  },
"sysOraHomeStorage": {
      "volumeSize": "160",
      "diskgroup": "DATA"
"nodes" : [ {
```

```
"nodeNumber" : "0",
  "nodeName" : "odambox",
  "network" : [ {
     "nicName" : "btbond1",
     "ipAddress" : "xx.x.xx",
     "subNetMask" : "xxx.xxx.xxx.x",
     "gateway" : "xx.x.x.x",
     "networkType" : [ "Public" ],
     "isDefaultNetwork" : true
   },
  ],
  "ilom" : {
   "ilomName": "odambox-c",
   "ipAddress":"xx.x.x.xx",
   "subNetMask": "xxx.xxx.xx.x",
   "gateway":"xx.x.x.x"
} ],
"grid" : {
  "diskGroup" : [ {
   "diskGroupName" : "DATA",
   "redundancy" : "NORMAL",
   "diskPercentage" :80
  }, {
    "diskGroupName" : "RECO",
   "redundancy" : "NORMAL",
    "diskPercentage" :20
 } ],
"scan" : null,
"vip": null,
 "language" : "en"
"database" : {
  "dbName" : "myTestDb",
  "databaseUniqueName": "myTestDb sealkj",
  "dbEdition" : "EE",
  "dbVersion": "19.26.0.0",
 "dbHomeId":null,
  "instanceOnly" : false,
  "isCdb" : true,
  "pdBName" : "pdb1",
  "pdbAdminuserName" : "pdbuser",
  "enableTDE":true,
  "adminPassword" : "password",
  "dbType" : "SI",
  "dbTargetNodeNumber" : null,
  "dbClass" : "OLTP",
  "dbShape" : "odb1",
  "dbStorage" : "ACFS",
  "dbCharacterSet" : {
   "characterSet": "AL32UTF8",
   "nlsCharacterset" : "AL16UTF16",
    "dbTerritory" : "AMERICA",
   "dbLanguage" : "AMERICAN"
  },
  "dbConsoleEnable" : false,
```

```
"backupConfigId":null,
    "rmanBkupPassword": null
},
"asr" :{
    "asrType": "INTERNAL",
    "userName":"john.smith@example.com",
    "password":"password",
    "proxyServerName":"www-proxy.example.com",
    "proxyPort":"80",
    "proxyPort":"80",
    "proxyUserName":"proxy-user",
    "proxyPassword":"proxy-password",
    "httpsPortNumber":"16163"
}
```

## Example 5-2 JSON File to Create a Single Node Oracle Database Appliance without Role Separation and with Passwordless Multi-User Access

The following is an example of a JSON file that creates an Oracle Database Appliance without using role separation and with passwordless multi-user access. This example creates two groups (oinstall and dba) and one user (oracle).

```
"instance" : {
  "name" : "odambox",
  "instanceBaseName" : "odambox-c",
  "dbEdition" : "EE",
  "timeZone" : "UTC",
  "ntpServers" : ["xx.x.x.xx"],
  "dnsServers" : ["xx.x.xx","xx.x.xx","xx.x.xx"],
  "domainName" : "example.com",
  "isRoleSeparated" : false,
  "isMultiUserAccessPLEnabled" : true,
  "osUserGroup" : {
    "groups" : [ {
      "groupId" : 1001,
      "groupName" : "oinstall",
      "groupRole" : "oinstall"
      "groupId" : 1002,
      "groupName" : "dba",
      "groupRole" : "dba"
    } ],
      "multiUserAccess": {
          "isMultiUserAccessPLEnabled": true
  },
"nodes" : [ {
  "nodeNumber" : "0",
  "nodeName" : "odambox",
  "network" : [ {
     "nicName" : "btbond1",
     "ipAddress" : "xx.x.x.xx",
     "subNetMask" : "xxx.xxx.xxx.x",
     "gateway" : "xx.x.x.x",
     "networkType" : [ "Public" ],
```

```
"isDefaultNetwork" : true
   },
  ],
  "ilom" : {
    "ilomName": "odambox-c",
    "ipAddress": "xx.x.x.xx",
    "subNetMask": "xxx.xxx.xxx.x",
    "gateway":"xx.x.x."
} ],
"grid" : {
  "diskGroup" : [ {
    "diskGroupName" : "DATA",
    "redundancy" : "NORMAL",
    "diskPercentage" :80
  }, {
    "diskGroupName" : "RECO",
    "redundancy" : "NORMAL",
    "diskPercentage" :20
  } ],
"scan" : null,
"vip": null,
 "language" : "en"
},
"database" : {
  "dbName" : "myTestDb",
  "databaseUniqueName": "myTestDb sea1kj",
  "dbEdition" : "EE",
  "dbVersion": "19.26.0.0",
  "dbHomeId":null,
  "instanceOnly" : false,
  "isCdb" : true,
  "pdBName" : "pdb1",
  "pdbAdminuserName" : "pdbuser",
  "enableTDE":true,
  "adminPassword" : "password",
  "dbType" : "SI",
  "dbTargetNodeNumber" : null,
  "dbClass" : "OLTP",
  "dbShape" : "odb1",
  "dbStorage" : "ACFS",
  "dbCharacterSet" : {
    "characterSet" : "AL32UTF8",
    "nlsCharacterset" : "AL16UTF16",
    "dbTerritory" : "AMERICA",
    "dbLanguage" : "AMERICAN"
  },
  "dbConsoleEnable" : false,
  "backupConfigId":null,
  "rmanBkupPassword": null
},
"asr" :{
  "asrType": "INTERNAL",
  "userName": "john.smith@example.com",
  "password": "password",
  "proxyServerName": "www-proxy.example.com",
```

```
"proxyPort":"80",
    "proxyUserName":"proxy-user",
    "proxyPassword":"proxy-password",
    "httpsPortNumber":"16163"
}
```

## Example JSON File to Create a High-Availability Passwordless Multi-User Enabled Appliance

Follow the JSON file example to create a JSON file to deploy a high-availability appliance with the command odacli create-appliance.



It is important to review the readme and the examples carefully before creating your JSON file. If you do not enter your network and Oracle ILOM information correctly based on your setup, then network access is lost to both the host and Oracle ILOM.

## Example 5-3 JSON File to Create a High-Availability Oracle Database Appliance with Role Separation and with Passwordless Multi-User Access

The following is an example of a JSON file that creates a high-availability appliance on Oracle Database Appliance bare metal platform. The example uses role separation and with passwordless multi-user access. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"instance":{
   "name": "odahabox",
   "instanceBaseName": "odahabox",
   "dbEdition": "EE",
   "timeZone": "UTC",
   "ntpServers" : ["10.0.3.14"],
   "dnsServers": ["10.0.4.10","10.0.4.11","10.0.4.12"],
   "domainName": "example.com",
   "isRoleSeparated":true,
   "isMultiUserAccessPLEnabled" : true,
   "osUserGroup":{
      "groups":[
            "groupId":1001,
            "groupName": "oinstall",
            "groupRole": "oinstall"
         },
            "groupId":1002,
            "groupName": "dbaoper",
            "groupRole": "dbaoper"
         },
            "groupId":1003,
```

```
"groupName":"dba",
            "groupRole": "dba"
         },
            "groupId":1004,
            "groupName": "asmadmin",
            "groupRole":"asmadmin"
         },
            "groupId":1005,
            "groupName": "asmoper",
            "groupRole":"asmoper"
         },
            "groupId":1006,
            "groupName": "asmdba",
            "groupRole": "asmdba"
      ],
      "users":[
         {
            "userId":101,
            "userName": "grid",
            "userRole":"gridUser"
         },
            "userId":102,
            "userName": "oracle",
            "userRole": "oracleUser"
      ]
   },
   "users": [
                  "id": 1000,
                  "name": "ugrid",
                  "role": "gridUser"
             },
                  "id": 1001,
                  "name": "uoracle",
                  "role": "oracleUser"
         ]
     "multiUserAccess": {
         "isMultiUserAccessPLEnabled": true
},
   "objectStoreCredentials":null
},
"sysOraHomeStorage": {
     "volumeSize": "160",
     "diskgroup": "DATA"
"nodes":[
```

```
"nodeNumber": "0",
      "nodeName": "odahaboxc1n2",
      "network":[
         {
             "nicName": "btbond1",
            "ipAddress":"10.31.98.133",
            "subNetMask": "255.255.240.0",
             "gateway":"10.31.96.1",
            "networkType":[
                "Public"
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox2-c",
         "ipAddress":"10.31.16.140",
         "subNetMask": "255.255.240.0",
         "gateway":"10.31.16.1"
   },
      "nodeNumber": "1",
      "nodeName": "odahaboxc1n1",
      "network":[
             "nicName": "btbond1",
            "ipAddress":"10.31.98.132",
            "subNetMask": "255.255.240.0",
             "gateway":"10.31.96.1",
            "networkType":[
                "Public"
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox1-c",
         "ipAddress":"10.31.16.139",
         "subNetMask": "255.255.240.0",
         "gateway":"10.31.16.1"
   }
],
"grid":{
   "diskGroup":[
         "diskGroupName": "DATA",
         "redundancy": "HIGH",
         "diskPercentage":80
      },
         "diskGroupName": "RECO",
         "redundancy": "HIGH",
         "diskPercentage":20
```

```
},
   ],
   "scan":{
      "scanName": "odahaboxc1-scan",
      "ipAddresses":[
         "10.31.98.182",
         "10.31.98.183"
      ]
   },
   "vip":[
      {
         "nodeNumber":"0",
         "vipName": "odahaboxc1n2-vip",
         "ipAddress":"10.31.98.159"
      },
      {
         "nodeNumber":"1",
         "vipName": "odahaboxc1n1-vip",
         "ipAddress":"10.31.98.158"
   ],
   "language": "en"
},
"database":{
   "dbName": "myTestDb",
   "databaseUniqueName": "myTestDb sea1kj",
   "dbVersion":"19.26.0.0",
   "dbHomeId":null,
   "instanceOnly":false,
   "isCdb":true,
   "pdBName": "pdb1",
   "pdbAdminuserName": "pdbuser",
   "enableTDE":true,
   "adminPassword": "password",
   "dbType": "RAC",
   "dbTargetNodeNumber":null,
   "dbClass": "OLTP",
   "dbShape": "odb1",
   "dbStorage": "ACFS",
   "dbCharacterSet":{
      "characterSet": "AL32UTF8",
      "nlsCharacterset": "AL16UTF16",
      "dbTerritory": "AMERICA",
      "dbLanguage": "AMERICAN"
   },
   "dbConsoleEnable":false,
   "backupConfigId":null
},
"asr":null
```



### Example JSON Files to Create a Single-Node Passwordless Multi-User Enabled DB System

Follow the JSON file example to create a JSON file to deploy a single-node DB System, with role separation, with the command odacli create-dbsystem.

Use the example JSON file to create a file for your environment.



It is important to review the readme and the examples carefully before creating your JSON file.

## Example 5-4 JSON File to Create a Single-Node Oracle KVM Database System with Role Separation and Passwordless Multi-User Access

The following is an example of a JSON file that creates a single-node Oracle KVM Database System on Oracle Database Appliance bare metal platform. The example uses role separation and passwordless multi-user access. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
    "name": "test example",
    "shape": "odb2",
    "customMemorySize": "24G",
    "timeZone": "America/Los Angeles",
    "diskGroup": "DATA",
    "cpuPoolName": "shared dbsystem cpupool",
    "enableRoleSeparation": true,
    "customRoleSeparation": {
        "groups": [
                "name": "oinstall",
                "id": 1001,
                "role": "oinstall"
            },
                "name": "dbaoper",
                "id": 1002,
                "role": "dbaoper"
            },
                "name": "dba",
                "id": 1003,
                "role": "dba"
            },
                "name": "asmadmin",
                "id": 1004,
                "role": "asmadmin"
```



```
},
            {
                "name": "asmoper",
                "id": 1005,
                "role": "asmoper"
            },
                "name": "asmdba",
                "id": 1006,
                "role": "asmdba"
        ],
        "users": [
                "name": "grid",
                "id": 1000,
                "role": "gridUser"
            },
                "name": "oracle",
                "id": 1001,
                "role": "oracleUser"
    "users": [
            {
                "id": 1000,
                "name": "ugrid",
                "role": "gridUser"
            },
                "id": 1001,
                "name": "uoracle",
                "role": "oracleUser"
        ]
    },
    "multiUserAccess": {
        "isMultiUserAccessPLEnabled": true
"database": {
    "name": "db19",
    "uniqueName": "db19",
    "domainName": "example.com",
    "version": "19.27.0.0.250415",
    "edition": "EE",
    "type": "SI",
    "dbClass": "OLTP",
    "shape": "odb2",
    "role": "PRIMARY",
    "targetNodeNumber": null,
    "enableDbConsole": false,
    "enableFlashStorage": false,
```

},

},

```
"enableFlashCache": false,
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "enableSEHA": false,
        "redundancy": null, <<< if diskgroup redundancy is FLEX, then database
redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "ENGLISH"
        },
        "enableTDE": false,
         "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
    "network": {
        "domainName": "test domain",
        "ntpServers": [
            "xx.xxx.xx."
        ],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
            {
                "name": "node1",
                "ipAddress": "xx.xx.xx.xxx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xx.x",
                "number": 0
        ],
  "publicVNetwork": "vnet1"
    } ,
    "grid": {
        "language": "en"
}
```

## Example 5-5 JSON File to Create a Single-Node Oracle KVM Database System without Role Separation and with Passwordless Multi-User Access

The following is an example of a JSON file that creates a single-node Oracle KVM Database System on Oracle Database Appliance bare metal platform, without role separation and with passwordless multi-user access. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
    "name": "test_example",
    "shape": "odb2",
    "customMemorySize": "24G",
    "timeZone": "America/Los_Angeles",
    "diskGroup": "DATA",
```

```
"cpuPoolName": "shared dbsystem cpupool",
    "database": {
        "name": "db19",
        "uniqueName": "db19",
        "domainName": "example.com",
        "version": "19.27.0.0.250415",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb4",
        "role": "PRIMARY",
        "targetNodeNumber": null,
        "enableDbConsole": false,
        "enableUnifiedAuditing": true,
        "redundancy": "HIGH", <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "ENGLISH"
        },
        "enableTDE": false,
        "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
     "users": [
                    "id": 1000,
                    "name": "ugrid",
                    "role": "gridUser"
                },
                    "id": 1001,
                    "name": "uoracle",
                    "role": "oracleUser"
            ]
        },
        "multiUserAccess": {
            "isMultiUserAccessPLEnabled": true
    },
    "network": {
        "domainName": "test domain",
        "ntpServers": [],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
                "name": "node1",
                "ipAddress": "xx.xx.xx.xxx",
                "netmask": "xxx.xxx.xxx.x",
```

## Example JSON File to Create a High-Availability Passwordless Multi-User Enabled DB System

Follow the JSON file example to create a JSON file to deploy a two-node DB System, with role separation, with the command odacli create-dbsystem.

Use the example JSON file to create a file for your environment.

## Example 5-6 JSON File to Create Two-Node Oracle KVM Database System without Role Separation and with Passwordless Multi-User Access

The following is an example of a JSON file that creates two-node Oracle KVM Database System on Oracle Database Appliance bare metal platform, without role separation and with passwordless multi-user access. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
        "name": "test system",
        "shape": "odb2",
        "customMemorySize": "24G",
        "timeZone": "America/Los Angeles",
        "diskGroup": "DATA",
        "cpuPoolName": "shared dbsystem cpupool",
        },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "test domain",
        "version": "19.27.0.0.250415",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false, version
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "redundancy": "MIRROR", <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
```

```
"nlsCharacterset": "AL16UTF16",
        "dbTerritory": "AMERICA",
        "dbLanguage": "AMERICAN"
     "enableTDE": false,
     "isCdb": true,
        "pdbName": "pdb1",
        "pdbAdminUser": "pdbadmin"
 "users": [
                "id": 1000,
                "name": "ugrid",
                "role": "gridUser"
            },
                "id": 1001,
                "name": "uoracle",
                "role": "oracleUser"
        ]
   },
    "multiUserAccess": {
        "isMultiUserAccessPLEnabled": true
},
"network": {
    "domainName": "test domain",
    "ntpServers": [],
    "dnsServers": [
        "xx.xxx.xx"
   ],
    "nodes": [
        {
            "name": "node1",
            "ipAddress": "xx.xx.xxx.xx",
            "netmask": "xxx.xxx.xxx.x",
            "gateway": "xx.xx.xxx.x",
            "number": 0,
            "vipName": "node1-vip",
            "vipAddress": "xx.xx.xxx.xx"
        },
            "name": "node2",
            "ipAddress": "xx.xx.xxx.xx",
            "netmask": "xxx.xxx.xxx.x",
            "gateway": "xx.xx.xxx.x",
            "number": 1,
            "vipName": "node2-vip",
            "vipAddress": "xx.xx.xxx.xx"
   ],
    "publicVNetwork": "vnet1",
    "scanName": "test-scan",
    "scanIps": [
        "xx.xx.xxx.xx",
```

```
"xx.xx.xxx.xx"

},

"grid": {

"language": "en"
}
```

## Example 5-7 JSON File to Create Two-Node Oracle KVM Database System with Role Separation and with Passwordless Multi-User Access

The following is an example of a JSON file that creates two-node Oracle KVM Database System on Oracle Database Appliance bare metal platform. The example uses role separation and with passwordless multi-user access. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
    "system": {
        "name": "test system",
        "shape": "odb2",
        "customMemorySize": "24G",
        "timeZone": "America/Los Angeles",
        "diskGroup": "DATA",
        "cpuPoolName": "shared dbsystem cpupool",
        "enableRoleSeparation": true,
        "customRoleSeparation": {
            "groups": [
                 {
                     "name": "oinstall",
                     "id": 1001,
                     "role": "oinstall"
                },
                     "name": "dbaoper",
                     "id": 1002,
                     "role": "dbaoper"
                },
                     "name": "dba",
                     "id": 1003,
                     "role": "dba"
                 },
                     "name": "asmadmin",
                     "id": 1004,
                     "role": "asmadmin"
                },
                     "name": "asmoper",
                     "id": 1005,
                     "role": "asmoper"
                },
                     "name": "asmdba",
                     "id": 1006,
```



```
"role": "asmdba"
                }
            ],
            "users": [
                {
                    "name": "grid",
                    "id": 1000,
                    "role": "gridUser"
                },
                    "name": "oracle",
                    "id": 1001,
                    "role": "oracleUser"
            ]
        }
    },
     "users": [
                    "id": 1000,
                    "name": "ugrid",
                    "role": "gridUser"
                },
                    "id": 1001,
                    "name": "uoracle",
                    "role": "oracleUser"
            1
        },
        "multiUserAccess": {
            "isMultiUserAccessPLEnabled": true
    },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "test domain",
        "version": "19.27.0.0.250415",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false,
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "redundancy": null, <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "AMERICAN"
```

```
"enableTDE": false,
    "isCdb": true,
        "pdbName": "pdb1",
        "pdbAdminUser": "pdbadmin"
},
"network": {
    "domainName": "test domain",
    "ntpServers": [],
    "dnsServers": [
        "xx.xxx.xx."
    ],
    "nodes": [
        {
            "name": "node1",
            "ipAddress": "xx.xx.xxx.xx",
            "netmask": "xxx.xxx.xxx.x",
            "gateway": "xx.xx.xxx.x",
            "number": 0,
            "vipName": "node1-vip",
            "vipAddress": "xx.xx.xxx.xx"
        },
            "name": "node2",
            "ipAddress": "xx.xx.xxx.xx",
            "netmask": "xxx.xxx.xxx.x",
            "gateway": "xx.xx.xxx.x",
            "number": 1,
            "vipName": "node2-vip",
            "vipAddress": "xx.xx.xxx.xx"
    ],
    "publicVNetwork": "vnet1",
    "scanName": "test-scan",
    "scanIps": [
        "xx.xx.xxx",
        "xx.xx.xxx.xx"
},
"grid": {
    "language": "en"
```

## Provisioning Oracle Database Appliance with Multi-User Access

You can enable multi-user access **only** when you provision Oracle Database Appliance, using CLI commands or the Browser User Interface.

Provision your appliance as described in the chapter *Provisioning Oracle Database Appliance Bare Metal System*.

#### A

#### **Caution:**

You can enable multi-user access **only** at the time of provisioning Oracle Database Appliance on bare metal systems and **cannot** rollback multi-user access after you provision and deploy your appliance. The Oracle Database Appliance administration model changes when you deploy the Multi-User Access feature. Evaluate your role separation requirements before using this feature. Deploying on a test system first can help with the evaluation and assessment of the new administration model.

#### Note:

You can specify the token expiration duration, password expiration duration, maximum failed login attempts, and other details when you provision multi-user access enabled Oracle Database Appliance with JSON file. You can also specify these values as a one-time activity from the Browser User Interface when you configure multi-user access and provision Oracle Database Appliance using the Browser User Interface.

#### Overall Steps in Provisioning Oracle Database Appliance with Multi-User Access Enabled

- Enable multi-user access.
  - If you provision your appliance using a JSON file, then add the attribute "isMultiUserAccessEnabled": true in the prov\_req.json file. If the attribute is set to false or does not exist in the prov\_req.json file, then multi-user access is not enabled during provisioning of the appliance.

You can also set the multi-user access attributes by adding the following in the JSON file:

```
},
   "asr": null,
   "multiUserAccess": {
     "dcsUserPasswdExpDurationInDays": 90,
        "tokenExpirationInMins": 120,
        "maxNumFailedLoginAttempts": 3
   }
}
```

The values for these attributes are as follows:

- Token expiration duration in minutes: The minimum value you can specify is 10 minutes, the maximum value is 600 minutes, and the default is 120 minutes.
- Password expiration duration in days: The minimum value you can specify is 30 days, the maximum value is 180 days, and the default is 90 days.
- Maximum failed login attempts allowed: The minimum value you can specify is
   2, the maximum value is 5, and the default is 3.
- If you create the appliance using the Browser User Interface (BUI), then select the **Enable Multi-User Access (N/A for DB System)** checkbox in the BUI login page.
- 2. Provide passwords for odaadmin, oracle, and grid users. These are Oracle Database Appliance system users and their accounts are activated during created. The user odaadmin is created with the role of ODA-ADMINISTRATOR while the oracle and grid users are created with the role of ODA DB and ODA GRID respectively.
- 3. The system configures the multi-user access repository with a list of roles and entitlements, used for assigning to the users in the system.
- You can now log into the appliance with the newly-created user credentials and deploy databases.

#### Provisioning Oracle Database Appliance Using the Browser User Interface with Multi-User Access Enabled

Access the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- 2. For the first login, since the odaadmin role is not configured, you are prompted to provide the ODA password and enable multi-user access.
- 3. Select Enable Multi-User Access (N/A for DB System) and provide a strong password for the ODA user.
- 4. Click Configure Multi-User Settings and then set the User Password Expiry Duration (In Days), Session Expiration for CLI (minutes), and Maximum Failed Login Attempts. Click Save to save these settings and return to the Login page on the BUI.
- 5. Click Submit. A confirmation message is displayed on successful creation of the user.
- **6.** Click **OK**. You are redirected to the Login page.
- 7. Specify the **User Name** and **ODA Password** and click **Login**. Note that the ODA admin user name is odaadmin if multi-user access is enabled. If multi-user access is not enabled, then the ODA admin user name is oda-admin.
- 8. In the Create Appliance page, specify the details for creating the appliance. See the topic *Creating the Appliance* for detailed information about the information you need to provide.
- Select Assign same password for admin, oracle, grid users if you want to specify the same password for all users. Otherwise, specify different passwords for the system admin, oracle, and grid users.
- 10. Click **Submit** to create the appliance with multi-user access enabled.
- 11. The job is submitted and a confirmation page appears with a link to the job. Click the link to view the job progress, tasks, and status. After you close the Job confirmation page, you can click the Activity tab to monitor the job progress. Click the job number to view the tasks and status details. Click Refresh to refresh the page.



#### **Related Topics**

- Provisioning Oracle Database Appliance Bare Metal System
   Understand the process to configure Oracle Database Appliance bare metal system.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

# Creating, Viewing, and Deleting Users on Oracle Database Appliance with Multi-User Access

After provisioning the appliance with multi-user access enabled, you can create users with specific entitlements.

After you provision your appliance with multi-user access enabled, do the following:

#### Creating, Viewing, and Deleting Users with ODACLI Commands

1. Connect to the appliance as the odaadmin user.

```
ssh odaadmin@oda-box hostname/IP
```

- 2. Run any ODACLI command and provide the odaadmin password when prompted.
- 3. On successful authentication, create a user with the following command:

```
odacli create-user -u username -r comma-separated role names
```

For example, create a user dbuser1 with lifecycle management privileges for dabatases:

```
odacli create-user -u dbuser1 -r ODA-DB
```

The odaadmin user creates dbuser1 and assigns a temporary password.

- 4. After the user is created successfully, the dbuser1 can log into the appliance with the temporary password.
- 5. The dbuser1 is in the Inactive state. Activate the user with the following command:

```
odacli activate-user
```

You are prompted to change the password. Enter the temporary password, the new password, and confirm the new password.

- Use the new password to connect by SSH into the appliance and run ODACLI commands or connect to the Browser User Interface.
- 7. The odaadmin user can view all the users in the system:

```
# odacli list-users
```

8. The odaadmin user can view details for a user in the system:

```
# odacli describe-user -u user id
```



Delete a user in the system. Note that only the odaadmin user can delete a user in the system.

```
# odacli delete-user -u user id
```

#### Creating, Viewing, and Deleting Users with Browser User Interface

1. Log into the Browser User Interface as the odaadmin user:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Multi-User Access tab.
- 3. Click the Users link on the left-hand pane.
- 4. Click Create User.
- In the Create User page, provide the User ID, specify the Role, and provide the ODA
   Password for this user. Note that the same user credentials work for login for BUI and
   ODACLI commands.
- 6. Optionally, click **Generate mTLS Certificate** to enable mTLS-based authentication.
- Click Create.
- 8. The job is submitted and a confirmation page appears with a link to the job. Click the link to view the job progress, tasks, and status. After you close the Job confirmation page, you can click the **Activity** tab to monitor the job progress. Click the job number to view the tasks and status details. Click **Refresh** to refresh the page.
- In the Multi-User Access tab, on the Users page, click on the link for the user whose details you want to view.
- 10. To delete a user, log in as the the odaadmin user. In the Actions drop-down list, select **Delete**. Note that only a user of type **Custom** can be deleted.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Activating a New User on Oracle Database Appliance with Multi-User Access

Understand how to activate a new user on multi-user access enabled Oracle Database Appliance.

## Activating the New User on Multi-User Access Enabled System Using ODACLI Commands

- 1. After a new user is created by odaadmin successfully, the new user, for example, dbuser1 can log into the appliance with the temporary password.
- 2. Activate the user with the following command:

```
odacli activate-user
```



You are prompted to change the password. Enter the temporary password, the new password, and confirm the new password.

## Activating the New User on Multi-User Access Enabled System Using Browser User Interface

 After a new user is created by odaadmin, log into the Browser User Interface as the new user:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Specify the User Name and the temporary password in the ODA Password field.
- Since this is a new account, the Account Status is Inactive. You are prompted to specify and confirm a new password.
- Specify and confirm the Password and click Submit.
- 5. On successful password change, log into the Browser User Interface with the new password.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Granting and Revoking Resource Access on Oracle Database Appliance with Multi-User Access

You can grant and revoke resource access on the appliance.

#### **Granting and Revoking Resource Access with ODACLI Commands**

Grant or revoke access to a resource in a multi-user access enabled system:

```
# odacli grant-resource-access -ri resource_ID -u user_name
# odacli revoke-resource-access -ri resource ID -u user name
```

View access to a DCS resource in a multi-user access system:

```
# odacli describe-resource-access -ri resource ID
```

View access to all DCS resources defined in a multi-user access system:

```
# odacli list-resources-access -ao -rn resource name -rt resource type
```

#### Granting and Revoking Resource Access with Browser User Interface

1. Log into the Browser User Interface as odaadmin:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the Multi-User Access tab.
- Click the Resources link on the left-hand pane.
- 4. Click on a Resource to view more details.



- 5. For a Resource, in the Actions drop down list, select Grant Resource Access to grant the user shared access to a resource. Select the User Name from the drop-down list and click Grant. Click Yes to confirm and submit the job.
- Select Revoke Resource Access to revoke access to a resource from a user. Select the User Name from the drop-down list and click Revoke. Click Yes to confirm and submit the job.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Viewing Roles, Operations, and Entitlements on Oracle Database Appliance with Multi-User Access

You can view roles and entitlements on the appliance.

Viewing Roles, Operations, and Entitlements with ODACLI Commands



For Oracle Database Appliance release 19.13, the multi-user access feature is available for standalone Oracle Database Appliance systems. During provisioning, a single domain and tenancy is created by default and all users are created within the default domain and tenancy.

- View all the roles defined in the system:
  - # odacli list-user-roles
- View details for a user role in the system:
  - # odacli describe-user-role -n role name
- View all the entitlements defined in the system:
  - # odacli list-user-entitlements
- View details for an entitlement in the system:
  - # odacli describe-user-entitlement -n entitlement name
- View all the operations defined in the system:
  - # odacli list-user-operations
- View details for an operation in the system:
  - # odacli describe-user-operation -n operation name



View the domains defined in the system. In this release, this is the default domain.

```
# odacli list-domains
```

View details for a domain in the system:

```
# odacli describe-domain -dn domain name
```

 View the tenants in a multi-user access enabled domain. In this release, this is the default tenancy.

```
# odacli list-tenants
```

View details for a tenant in a multi-user access enabled domain:

```
# odacli describe-tenant -tn tenant_name
```

#### Viewing Roles, Operations, and Entitlements with Browser User Interface

1. Log into the Browser User Interface as odaadmin:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Multi-User Access tab.
- 3. Click the Roles link on the left-hand pane. The roles defined in the system are displayed. These roles cannot be edited or updated.
- Click on a Role to view more details.
- 5. Click the Entitlements link on the left-hand pane. The entitlements defined in the system are displayed. These entitlements cannot be edited or updated.
- 6. Click on an Entitlement to view more details.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Managing Databases and Database Homes on Oracle Database Appliance with Multi-User Access

The custom user created on multi-user access Oracle Database Appliance can deploy and manage databases and database homes.

After you create a custom <code>dbuser1</code> on an Oracle Database Appliance with multi-user access enabled, manage databases as follows:

#### Creating and Listing Databases and Database Homes Using ODACLI Commands

Connect to the appliance as dbuser1.

```
ssh dbuser1@oda-box hostname/IP
```



Create a database:

odacli create-database -n dbName -v dbVersion

3. Run the odacli list-databases to view the databases owned by dbuser1:

odacli list-databases

Another user with the <code>ODA-DB</code> role cannot use the resource owned by <code>dbuser1</code> to create a database home, thus ensuring role separation.

4. Use the -all option on the appliance when multi-user access is enabled to view all the databases in the system.

odacli list-databases -all

5. Use the -all option on the appliance when multi-user access is enabled to view all the database homes in the system.

odacli list-dbhomes -all

#### Creating and Listing Databases and Database Homes Using Browser User Interface

1. Log into the Browser User Interface as dbuser1:

https://host-ip-address:7093/mgmt/index.html

- 2. Click the **Database** tab.
- 3. Click **Show All Databases**. A list of all databases in the system is displayed.
  - View Details: View the details of the database.
  - Modify: Modify the database
  - Move: Move the database
  - Upgrade: Upgrade the database
  - Delete: Delete the database.
  - Grant Access: Grant access privilege to the database to a user.
  - Revoke Access: Revoke access privilege to the database from a user.
  - View Pre-patch reports: View prechecks report for patching.
- 4. Click the Database Home link on the left hand pane. A list of all database homes in the system is displayed.
- **5.** For a database home, you can click the **Actions** dropdown list, and select from the following options:
  - **View Database:** View the details of the database home.
  - Delete: Delete the database.
  - Grant Access: Grant access privilege to the database home to a user.
  - Revoke Access: Revoke access privilege to the database home from a user.
  - View Pre-patch reports: View prechecks report for patching.



#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Changing the Password for a User Account on Oracle Database Appliance with Multi-User Access

Understand how to manage passwords on multi-user access Oracle Database Appliance.

## Changing the Password on Multi-User Access Enabled System Using ODACLI Commands

 You can change password for an Oracle Database Appliance user, whose account is active:

odacli change-password

## Changing the Password on Multi-User Access Enabled System Using Browser User Interface

1. Log into the Browser User Interface as the user whose password you want to change:

https://host-ip-address:7093/mgmt/index.html

- To change the Account password at any time: Click on the Account drop down list in the top right-hand side of Browser User Interface and select Change Password.
- Specify the Old Password and also specify and confirm the new Password and click Submit.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Resetting the Password for a Locked User Account on Oracle Database Appliance with Multi-User Access

Understand how to reset the password on multi-user access Oracle Database Appliance.



## Resetting Password for a Locked User Account on Multi-User Access Enabled System Using ODACLI Commands

#### Note:

If your appliance is configured as passwordless multi-user enabled, then all user accounts are preactivated during creation and never get locked because the system internally generates the password for each user and provides it to the DCS agent for authentication when required for running ODACLI commands. For passwordless multi-user enabled systems, do **not** run any scripts for unlocking the <code>odaadmin</code> account or the <code>odacli reset-password</code> command to reset the password. Run the <code>odacli change-password</code> command to change the system generated password for your Oracle Database Appliance account.

- Unlock the odaadmin user account that is locked due to multiple failed login attempts or password expiry.
  - 1. Log in as root.
  - 2. Run the following:

```
/opt/oracle/dcs/bin/resetCredsForOdaAdmin.sh
```

A temporary password is assigned to the odaadmin user.

- 3. Log in as the odaadmin user with the temporary password.
- 4. Run the following command:

```
odacli reset-password
```

You are prompted to provide the temporary password and specify and confirm the new password. After the command runs successfully, the user account is unlocked.

- Unlock any non-admin user account that is locked due to multiple failed login attempts or password expiry.
  - Log in as odaadmin.
  - 2. Run the following command:

```
odacli authorize-user
```

After you provide a temporary password, the account is unlocked.

- 3. Log in as the user whose account was locked, with the temporary password.
- 4. Run the following command:

```
odacli reset-password
```

You are prompted to provide the old password, the temporary password and specify and confirm the new password. After the command runs successfully, the user account is unlocked and reactivated.



## Resetting Password for a Locked User Account on Multi-User Access Enabled System Using Browser User Interface

- Unlock the non-admin user account that is locked due to multiple failed login attempts or password expiry as follows:
  - 1. Log into the Browser User Interface as the odaadmin user:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. In the **Multi-User Access** tab, on the Users page, click on the link for the user whose password you want to reset. Note that you can reset the password for users of type **Custom** only. The Account Status for the user is LockedFailedLogin.
- 3. In the Actions drop down list, select Authorize Password Reset.
- 4. In the Authorize Password Reset page, specify the **Old Password**, specify and confirm the **Temporary ODA Password**, and click **Authorize**.
- 5. Now, log into the Browser User Interface as the user whose account is being unlocked. Specify the **User Name** and the temporary password in the **ODA Password** field.
- **6.** Since the account was locked, the Account Status is CredentialReset. You are prompted to specify and confirm a new password.
- 7. Specify and confirm the **Password** and click **Submit**.
- 8. On successful password change, log into the Browser User Interface with the new password.

#### **Related Topics**

odacli Multi-User Access Commands

Use odacli commands to enable multi-user access for the appliance.



6

## Oracle Database Appliance Postinstallation Tasks

Complete these administrative tasks after you have deployed software, but before the system is operational.

- About Password Requirements on Oracle Database Appliance
   Understand password requirements for multi-user access and non-multi-user access
   enabled systems.
- Configuring CPU Core Count
   Oracle Database Appliance is delivered with all cores on each server enabled. Follow this procedure to reduce the number of cores, if required.
- Modifying Oracle ASM Listener Port After Deployment
   Understand how you can modify Oracle ASM listener port on Oracle Database Appliance after deployment.
- Securing Oracle ILOM Service Processors
   Change the Oracle ILOM default password after completing Oracle Database Appliance deployment.
- Changing Oracle Database Appliance Passwords
   After deploying your appliance, ensure that you change the following passwords for securing your system.
- Changing the DNS Server Address on Oracle Database Appliance
   If the DNS server in the data center changes, understand how you can update the DNS entries on on Oracle Database Appliance server so that the network functions correctly.

#### **Related Topics**

### About Password Requirements on Oracle Database Appliance

Understand password requirements for multi-user access and non-multi-user access enabled systems.

Following are the password requirements on Oracle Database Appliance for various deployments.

Table 6-1 Password Requirements on Oracle Database Appliance

Component	Multi-user access enabled and passwordless multi-user access-enabled system	Non-multi-user access enabled system
Password Length	Minimum password length is 9 characters. Maximum password length is 30 characters.	Minimum password length is 9 characters. Maximum password length is 30 characters.
Password History	Yes. New password cannot be the same as any previous password.	Yes. New password cannot be the same as any previous password.
Password Complexity	The password must contain at least two characters each from: uppercase letters, lowercase letters, numbers (0-9), and allowed special characters #, - or The password must have a minimum of 9 characters and a maximum of 30 characters.	The password must contain at least two characters each from: uppercase letters, lowercase letters, numbers (0-9), and allowed special characters #, - or The password must have a minimum of 9 characters and a maximum of 30 characters.
Maximum Password Age	The default is 90 days. The permitted range is 30 to 180 days, which can be configured by the user.	The default is 90 days. This value is not configurable.
Account Lockout Threshold	default retry attempts 3 times , Allowed Range 2 times – 5 times, user configurable	None
Reset Account Lockout Counter	Account is locked out when you run an ODACLI command after password has expired or after maximum retrial attempts are exceeded in the case of wrong password. You must obtain authorization from the system administrator to unlock the account. You can then change the temporary password provided by the administrator as part of authorizing an unlock of their account. Till the account is reactivated, you cannot run any ODACLI command.	None
Reset Bad Attempts Counter	If you have not exceeded the maximum retrial attempts and enter correct password, then the counter is reset to 0. If the maximum retrial attempts are exceeded, then the account is immediately locked and you must request for unlocking the account. Till the account is reactivated, you cannot run any ODACLI command.	None



Table 6-1 (Cont.) Password Requirements on Oracle Database Appliance

Component	Multi-user access enabled and passwordless multi-user access-enabled system	Non-multi-user access enabled system
Change on first use	Yes. The user account is created initially as Inactive. You must change the password on first login to make it active. Till the account is activated, you cannot run any ODACLI command.	Can be set by a single oda- admin user on the first login to the BUI.

#### **Related Topics**

- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.
- ODACLI Command Changes with Multi-User Access on Oracle Database Appliance Understand the ODACLI command changes when you enable multi-user access.

## Configuring CPU Core Count

Oracle Database Appliance is delivered with all cores on each server enabled. Follow this procedure to reduce the number of cores, if required.

To reduce the number of cores, run the following command on Node 0 only:
 Set the cores in multiples of 2, for example, 12:

```
[root@oakl opt]# /opt/oracle/dcs/bin/odacli modify-cpucore --cores 12
```

When you run the command, the nodes are restarted to apply the changes.

2. Check if the job completed successfully:

```
[root@oak1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job ID
```

**3.** Verify that the core count is updated on both nodes:

[root@oak1 opt]# /opt/oracle/dcs/bin/odacli describe-cpucore

## Modifying Oracle ASM Listener Port After Deployment

Understand how you can modify Oracle ASM listener port on Oracle Database Appliance after deployment.

#### Modifying Oracle ASM listener port using ODACLI commands

In earlier Oracle Database Appliance releases, you provisioned your bare metal system with Oracle ASM listener port 1525 as the default and as the Oracle ASM discovery address port from DB systems. Starting with Oracle Database Appliance release 19.24, you can customize Oracle ASM listener port number as a postinstallation task. All DB systems that you provision after changing the Oracle ASM listener port number use the new Oracle ASM port number.

#### Use the following command to modify the Oracle ASM listener port number:

odacli modify-asmport -p any unused port between 1024 and 65536

#### For example:

# odacli modify-asmport -p 1528



You can run the <code>odacli modify-asmport</code> command only on deployments where the bare metal system is on Oracle Database Appliance release 19.24 and the DB system is on release 19.24 and you use the DB 23ai clones available with Oracle Database Appliance release 19.24.

#### Modifying Oracle ASM listener port using BUI

#### Follow these steps:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- Click Appliance.
- In the Basic Information page, Click Modify ASM Port to change the Oracle ASM listener port.
- In the Modify ASM Port dialog box, specify the ASM Port and click Modify.
- Click Refresh ASM Port to view the update.

#### **Related Topics**

Modifying Oracle ASM Listener Port After Deployment
 Understand how you can modify Oracle ASM listener port on Oracle Database Appliance after deployment.

## Securing Oracle ILOM Service Processors

Change the Oracle ILOM default password after completing Oracle Database Appliance deployment.

Do not change the default password until after you have completed software deployment on the Oracle Database Appliance.

#### **Changing Oracle ILOM Password from the Console**

- 1. In the Oracle ILOM console, from the **Administration** menu, select **User Management**, and then navigate to the **User Accounts** subtab.
- 2. Select root user and click Edit.
- Change the root user password.



#### **Changing Oracle ILOM Password Using CLI Commands**

1. Connect to the Oracle ILOM service processor (SP) through SSH:

```
# ssh -l root SP-ipaddr
```

2. Set the new password:

```
-> set /SP/users/root password=new_password
Changing password for user /SP/users/root/password...
Enter new password again: *******
New password was successfully set for user /SP/users/root
```

## Changing Oracle Database Appliance Passwords

After deploying your appliance, ensure that you change the following passwords for securing your system.

#### **Changing the Oracle Installation Owner Passwords**

During deployment, the root and database users SYS, SYSTEM and PDBADMIN are set to the system password. After deployment, the oracle and grid passwords are also set to the system password. Change the passwords to comply with your enterprise user security protocols. Refer to the *Oracle Database Appliance Security Guide* and *Oracle Database Security Guide* for information about the required configuration and best practices to secure database systems.

#### Changing the oda-admin User Password through the Command-Line

- **1.** Log in to the appliance as root.
- Run the odacli set-credential command to reset the password. Enter the new password when prompted.

```
# odacli set-credential --username oda-admin
Enter 'user' password:
Retype 'user' password:
```

#### Changing the the oda-admin User Password through the Browser User Interface

- Log into the Browser User Interface using the user name oda-admin.
- 2. Click **About**, then **User Settings** in the upper right corner of the Browser User Interface.
- Enter the password in the Password field and the Password Confirmation field, then click Submit.

A confirmation message is displayed.

- Click About, then click Sign Out.
- 5. Log back into the Browser User Interface with the new password.



The oda-admin password expiration period is 90 days.



# Changing the DNS Server Address on Oracle Database Appliance

If the DNS server in the data center changes, understand how you can update the DNS entries on on Oracle Database Appliance server so that the network functions correctly.

Follow these steps to change the DNS server address on Oracle Database Appliance:

- 1. Log in as the root user.
- 2. Open the /etc/resolv.conf file in a text editor.
- 3. Locate the name server setting for the DNS server and change it to the new value. For example:

search example.com nameserver 10.7.7.3

Save the file and close the editor.



# Re-imaging Oracle Database Appliance

Bare metal operating system re-imaging installs Oracle Database Appliance operating system software on the local (boot) drive.

Bare Metal is a non-virtualized Oracle Database Appliance configuration. Oracle Database Appliance ships from the factory with a bare metal configuration, default ISO image and Appliance Manager installed. Use the OS ISO Image to restore the OS to the "shipped from factory" state. Use only when necessary. Reimaging does not patch the firmware or update the component versions; it only re-images the local system disk from an operating system perspective. After imaging is completed, provision the bare metal system.

- Uninstalling Oracle Database Appliance Components
   Use the Oracle Database Appliance cleanup deploy utility, /opt/oracle/oak/onecmd/
   cleanup.pl to uninstall Oracle Database Appliance components.
- Reimaging an Oracle Database Appliance Baremetal System
   Reimage Oracle Database Appliance to perform a bare metal restore of Oracle Database
   Appliance.
- Performing Secure Erase of Data on Storage Disks
   With this release, you can securely erase data from storage devices. Running the secure erase tool deletes the data on the storage disk permanently.
- Redeployment of Oracle Database Appliance
   Understand the process to redeploy Oracle Database Appliance.

#### **Related Topics**

Errors when re-imaging Oracle Database Appliance
 Understand how to troubleshoot errors that occur when re-imaging Oracle Database
 Appliance.

# Uninstalling Oracle Database Appliance Components

Use the Oracle Database Appliance cleanup deploy utility, /opt/oracle/oak/onecmd/cleanup.pl to uninstall Oracle Database Appliance components.

#### **About the Cleanup Utility**

Use the cleanup deploy utility to do the following:

- Uninstall Oracle Auto Service Request (Oracle ASR)
- Uninstall Oracle Trace File Analyzer (TFA)
- Uninstall Oracle ORAchk Health Check Tool
- Uninstall Oracle Grid Infrastructure and the Oracle stack
- Reset or delete the Oracle Linux udev rules
- Delete users and groups that were created when the appliance was created.

The script removes the firstnet config and the client access VLAN UNIX\_DB, but does not delete any other VLANs. The script also resets any disabled CPU cores and enables all of the cores.

The cleanup utility runs in two modes: default and force mode. In the default mode, the commands used as part of cleanup do not use the force option. The Oracle ASM disk status is changed from MEMBER to FORMER, but ASM header on the disk is not erased. The default mode can be used only for cleaning up or re-provisioning of the same system.



For High-Availability systems, run the cleanup utility on both nodes sequentially. Ensure that the cleanup utility has completed on the first node, and then start the process on the second node.

#### Running the Cleanup Utility for a Baremetal Deployment

# perl /opt/oracle/oak/onecmd/cleanup.pl [-griduser grid\_user] [-dbuser
db\_user] [-groups comma separated list of groups] [-omausers
dbuser1,dbuser2,dbuser3][-erasedata][-nodpr] [-nossh] [f]

When the *grid\_user* and *db\_user* are the same (roleSeparation=false), you must run the script for each user (-gridUser and -dbUser).

#### For example:

cleanup.pl -griduser grid -dbuser oracle -omausers dbuser1,dbuser2,dbuser3

Table 7-1 Command Options for Cleanup Utility

Option	Description
grid_user	Describes the Oracle Grid Infrastructure user name. The default user is grid.
db_user	Describes the database user name. The default user is oracle  Example with grid and oracle users:
	cleanup.pl -griduser grid -dbuser oracle
groups	Describes the comma-separated list of groups. The default groups are oinstall, dba, dbaoper, asmadmin, asmoper, a smdba.
omausers	Describes the comma-separated list of custom users created on a multi-user access enabled Oracle Database Appliance environment. All custom users created after provisioning a multi-user access enabled environment must be removed completely before you reprovision the appliance.



Table 7-1 (Cont.) Command Options for Cleanup Utility

Option	Description
erasedata	Completely erases all disks on the Oracle Database system. It is mandatory to run this option if intention of cleanup is to reuse or move these disks on other systems. This option needs to be run on the first node when running on high- availability systems.
	Example of secure erase:
	cleanup.pl -erasedata
cleanDefNet	Cleans up the default public network.
checkHeader	Checks for OAK/ASM header on disks after successfully running the cleanup script. Use this to validate if the OAK/ASM header was erased by the cleanup script or not.  Example of checking disk header:
	cleanup.pl -checkHeader
nodpr	Forces regular cleanup even if Data Preserving Reprovisioning environment is detected. Wipes out all data on Oracle ASM disks. You cannot run the command odacli restore-node -g after this operation.  On Data Preserving Reprovisioning environments, the default cleanup mode is Data Preserving Reprovisioning mode which cleans the appliance without erasing Oracle SM disks to allow the command odacli restore-node -g to be reattempted. Using the -nodpr option allows you to override this behaviour and force regular cleanup.  Example:
nossh	Does not attempt to set up SSH on high-availability deployments. Use this option in cases such as when the scripts using <b>cleanup.pl</b> are not updated to handle stopping DCS agent, or if you have forgotten the SSH password, or if SSH is not set up on the system.  Example:
	cleanup.pl -nossh



Table 7-1 (Cont.) Command Options for Cleanup Utility

Option	Description
f	In the force mode, all commands use the force option. The ASM disk header is erased. The oakd header on the disk is erased in both default and force modes.
	Example of default mode:
	cleanup.pl
	Example of force mode:
	cleanup.pl -f



The cleanup utility for bare metal deployments produces a log file. The utility tries to create the log file at /opt/oracle/oak/log/hostname/cleanup/cleanup\_timestamp.log. If the log cannot be created in that location, then the log is created at /tmp/cleanup timestamp.log.

#### **Related Topics**

Deployment Checklist for Oracle Database Appliance Bare Metal Systems
 This checklist provides an overview of the tasks to setup and deploy Oracle Database
 Appliance bare metal systems for the first time.

## Reimaging an Oracle Database Appliance Baremetal System

Reimage Oracle Database Appliance to perform a bare metal restore of Oracle Database Appliance.

Bare metal restore uses Oracle Integrated Lights Out Manager (Oracle ILOM) to reimage the Oracle Database Appliance node. The ILOM must be configured before performing a bare metal restore or reimage. Generally, the ILOM is configured as part of readying for deploying Oracle Database Appliance.

Download the Oracle Database Appliance Bare Metal ISO image to your local machine before you launch the Oracle ILOM console.

Follow these steps to reimage your appliance. For Oracle Database Appliance High-Availability deployment, follow these steps on **both** nodes.

 Open a browser and connect to Oracle Integrated Lights Out Manager (ILOM) on Node 0 as root.

https://ilom-ip-address

- Launch the Remote Console.
  - Expand Remote Control in the left navigation.



- Click the Redirection tab.
- c. Click Launch for the Remote Console in the Actions menu.

The state of the system determines what appears on the Console page.

- Add the image.
  - a. Click the KVMS tab, then select Storage.
  - b. Click Add.
  - c. Browse to the Oracle Database Appliance Bare Metal ISO Image, highlight the image, then click Select.
  - d. Click Connect.

The mounting of the ISO image is successful when the **Connect** button changes to a **Disconnect** button.

e. Click OK

The CD-ROM icon in the top right corner is highlighted.

- 4. Configure the CD-ROM as the next boot device.
  - a. Expand **Host Management** in the left menu of the ILOM Remote Console tab.
  - b. Click Host Control.
  - c. Select CDROM from the Next Boot Device menu, then click Save.
- 5. Power cycle the node.
  - a. Click Power Control in the Host Management menu.
  - b. Select Power Cycle, then click Save.

When the node comes back after the power cycle, re-imaging starts automatically. The Oracle Linux page appears, followed by the Running Post-Install scripts page.

The Running Post-Install scripts page is a static page and might give the impression that the reimaging process is not progressing. The post-install process during re-imaging will wait until the synchronization between the partitions of the two mirrored local hard disks is complete, which can take 15 to 20 minutes to complete.

To check the progress of re-synchronization, press the ALT-F2 key combination to open a second console and enter the following command:

# cat /proc/mdstat

When the re-synchronization is complete, re-imaging is completed and the machine restarts.

After the machine restarts, the system is ready for you to deploy the Oracle software on the appliance to create an Oracle Database Appliance bare metal platform.

#### **Related Topics**

Creating the Appliance
 Create the appliance using the Browser User Interface or ODACLI commands.

#### **Related Topics**

Plumbing the Network

Plumb the Oracle Database Appliance network with the public internet protocol (IP) information assigned to a node, to enable provisioning of the Oracle Database Appliance software.

Installing Oracle Database Appliance Software
 Install Oracle Database Appliance software, before creating the appliance.

## Performing Secure Erase of Data on Storage Disks

With this release, you can securely erase data from storage devices. Running the secure erase tool deletes the data on the storage disk permanently.

You may want to consolidate storage disks between appliances. For example, you can use X7-2 disks on X6-2 models, and may want to consolidate all X6-2 disks on one system, and use all new X7-2 storage disks on another system. In such cases, use secure erase to erase headers from disks before re-imaging the disks, since the storage disks across the appliances may have different partition ratios.



The secure erase tool conforms to the NIST 800-88 standard, also called NIST Special Publication 800-88 (NIST SP 800-88), Guidelines for Media Sanitization. Running the secure erase tool removes data from storage disks permanently. If you have any data on the disk, then take a backup of your storage disk before running the secure erase tool.

Follow the steps to run the secure erase tool:

 Stop oakd and the database and Oracle Grid Infrastructure before running the secure erase tool.

On bare metal systems, run the command:

```
# odaadmcli stop oak
```

On Virtualized Platforms:

```
# oakcli stop oak
```

To stop Oracle Clusterware resources:

```
# crsctl stop crs -f
```

2. Run the secure erase tool:

```
# /opt/oracle/oak/bin/odaeraser.py
```

3. You can also run the secure erase tool when running the cleanup tool:

```
# /opt/oracle/oak/onecmd/cleanup.pl -erasedata
```



Example 7-1 Options for the Secure Erase Tool

Option	Description
-a,all	Erases all disks. For example:
	# /opt/oracle/oak/bin/odaeraser.pyall
disk disk1,disk2	Erases specified disks. For example:
	<pre># /opt/oracle/oak/bin/odaeraser.pydisk e0_pd_00,e0_pd_01</pre>
dryrun	Runs the tool in the test mode
type HDD SSD NVMe	Erases the type of disk specified
-v,verbose	Displays verbose output
-h,help	Displays all CLI options for the tool

## Redeployment of Oracle Database Appliance

Understand the process to redeploy Oracle Database Appliance.

After cleaning up the system and erasing the header, you can continue deployment of Oracle Database Appliance as follows:

- 1. Download Oracle Database Appliance software.
- 2. Install Oracle Database Appliance software.
- Create the appliance.

For the above steps, run the procedures as described in this guide.

#### Reprovisioning Oracle Database Appliance without reimaging

You can re-provision Oracle Database Appliance without re-imaging the appliance.

1. Run the following command from the Oracle ILOM console:

/opt/oracle/oak/onecmd/cleanup.pl -erasedata

Or, run the following command to clean up Oracle ASM header on the storage:

/opt/oracle/oak/onecmd/cleanup.pl -f

To re-provision the appliance, confirm that the Oracle ASM header is UNKNOWN:

/opt/oracle/oak/onecmd/cleanup.pl -checkHeader

Continue with the provisioning steps such as configuring firstnet from the Oracle ILOM
console as described in the topic Provisioning Oracle Database Appliance Bare Metal
System.



### **Related Topics**

- Plumbing the Network
  - Plumb the Oracle Database Appliance network with the public internet protocol (IP) information assigned to a node, to enable provisioning of the Oracle Database Appliance software.
- Installing Oracle Database Appliance Software
  Install Oracle Database Appliance software, before creating the appliance.



# Patching Oracle Database Appliance

To keep Oracle Database Appliance running with the latest software, check for and apply Oracle Database Appliance patch bundles when they are released.

- About Patching Oracle Database Appliance
   Use the Oracle Database Appliance Patch Bundle to patch your appliance.
- About Patching Prechecks
   Patching prechecks are designed to detect and flag problems that might be encountered during patching.
- About Enabling NUMA on Oracle Database Appliance
   Understand how you can enable NUMA on bare metal, KVM, and DB Systems on Oracle Database Appliance.
- Minimizing Downtime When Patching Oracle Database Appliance
   Understand best practices to minimize downtime when you apply patches to your Oracle Database Appliance deployment.
- About Updating Databases and Database Homes
   Understand how to update a database and database home using either the Browser User Interface or odacli commands.
- Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.
- Patching Oracle Database Appliance DB Systems Using the Command-Line
   Follow these steps to apply patches to your Oracle Database Appliance DB system deployment and existing Oracle Database home in the DB system, using CLI commands.
- Patching Oracle Database Appliance Bare Metal Systems Using the Browser User Interface
   Upload the Oracle Database Appliance Server Patch to the patch repository, deploy the
  - patch bundle using the Browser User Interface, and then update the DCS admin, DCS components, and DCS agent using CLI commands.
- Patching Oracle Database Appliance DB Systems Using the Browser User Interface
   Upload the Oracle Database Appliance Server Patch to the patch repository, deploy the
   patch bundle using the Browser User Interface, and then update the DCS agent and
   components using CLI commands.
- Updating Oracle Database Appliance Repository with Database Clone Files For Bare Metal Systems
  - Follow these steps to update the Oracle Database Appliance repository with Oracle Database clone files for the latest release using CLI commands.
- Patching Databases Using ODACLI Commands or the BUI
   Use ODACLI commands or the Browser User Interface to patch databases to the latest release in your deployment.

- Patching Existing Database Homes Using ODACLI or the BUI
   Use ODACLI or BUI to patch database homes in your deployment to the latest release.
- Patching Non-Provisioned Oracle Database Appliance Systems
   Oracle Database Appliance supports patching of non-provisioned single-node or high
   availablity systems by running odacli update-server command.
- Applying Additional Patches and Updates on Bare Metal Systems
   Configure additional patch repositories and patch your operating system and databases to ensure that your deployment has the latest updates and security fixes.
- Cleaning Up the Patch Repository
   Use the Browser User Interface or Command Line Interface to delete obsolete or old patches from the repository.
- About Upgrading to a Different Database Home
   Understand how to upgrade to a different database home using either the Browser User Interface or odacli commands.
- Setting Dynamic Default Parameters
   You can set dynamic default parameters using the BUI.

# About Patching Oracle Database Appliance

Use the Oracle Database Appliance Patch Bundle to patch your appliance.

Patches offer new features and may improve the functionality of existing features.

#### **About Out of Place Patching**

Starting with Oracle Database Appliance release 19.11, Oracle Database Appliance uses the out-of-place patching model. This means that a new software Oracle home is created when patching an Oracle Grid Infrastructure or Oracle Database home. Starting with Oracle Database Appliance release 19.11, the patches for Oracle Grid Infrastructure and Oracle Database are available as images. All procedures remain the same.

#### About MySQL Server and DCS Agent

Starting with Oracle Database Appliance release 19.10, DCS Agent uses MySQL server as its metadata store. MySQL server is automatically installed and configured, during provisioning, when creating the appliance. Similarly, during patching, the odacli update-descomponents command automatically installs and configures MySQL server. MySQL server processes do not run with root operating system user account. Instead, MySQL server processes run with a new operating system user account called odamysql. Note that the odamysql operating system user is created only for ownership purposes and the odamysql user account owns only the MySQL directories. The odamysql operating system user cannot log into the appliance. The odamysql operating system user account for MySQL ensures role separation between the user owning Oracle databases on the appliance and the metadata used for DCS operations.

#### **About Oracle Database Appliance Patch Bundles**

The Oracle Database Appliance Patch Bundle contains the latest patches for DCS Admin, DCS Components, OAK, Oracle ILOM, firmware, enhancements, and fixes.

The Oracle Database Appliance Release Notes include information about the latest Oracle Database Appliance patch bundle and a list of component versions in the patch bundle. Oracle recommends updating the appliance with the latest Oracle Database Appliance software version to take advantage of new features, fixes, and the latest supported component versions. See the Oracle Database Appliance Release Notes for the upgrade paths.



#### Caution:

Do not patch Oracle Database Appliance using generic patches for Oracle Grid Infrastructure or Oracle Linux. Also do not use individual infrastructure patches, such as firmware patches. You must only use Oracle Database Appliance patches. If you use patches that are not intended for Oracle Database Appliance, or if you use OPatch, or a similar patching tool, then the metadata maintained by Oracle Database Appliance is not updated, and you cannot complete future patch updates. If you apply out-of-cycle Oracle Database Release Update (RU), then ensure that you also follow the recommendations described in the Readme for the RU.

The patch bundle provides all relevant patches for the entire system, including the following:

- Oracle Database Appliance server
- **BIOS**
- Hardware drivers
- Hardware Management Pack (HMP) and firmware drivers for various components
- Oracle Appliance Manager
- Oracle Linux
- Java Runtime Environment (JRE)
- Oracle Integrated Lights Out Manager (Oracle ILOM)
- Oracle Auto Service Request (Oracle ASR)
- Oracle Intelligent Platform Management Interface (Oracle IPMI)
- Network Card Patches for relevant hardware models

#### **About Updating Oracle Linux RPMs**

While not recommended, you can update some Oracle Linux RPMs for Oracle Database Appliance. Do not update or customize Oracle Linux kernel, Oracle Optimal Flexible Architecture, Oracle InfiniBand, or related software. Other software may be installed, updated, or customized. However, the Oracle Database Appliance update may not carry newer version dependencies of customized components. Therefore, you might be required to remove and subsequently reapply site-specific changes to successfully update Oracle Database Appliance in the future.



#### Caution:

For Oracle Database Appliance, do not update the following:

- Oracle Linux Kernel (kernel)
- Oracle Optimal Flexible Architecture (ofa)
- Oracle RDMA packages (oracle-rdma-release)

For storage, do not apply any RPM updates.



# **About Patching Prechecks**

Patching prechecks are designed to detect and flag problems that might be encountered during patching.

The prechecks view the state of the appliance, including the version and hardware specific upgrades, verify that the necessary conditions and checks are complete before attempting an upgrade, and identify conditions that might cause an upgrade to fail. You can avoid potential patching problems by correcting the conditions and resolving the issues before applying the patch.

The prechecks commands are available on Oracle Database Appliance release 12.2.1.2.0 or later. Update the DCS Agent to ensure that the latest updated prechecks are available when you run these commands.

#### **Components Verified by Patching Prechecks**

Check	Component Verified		
System patching prechecks	Checks that the DCS Agent is online on all nodes		
	Checks that there is sufficient space for the update		
	Validates the minimum agent version and validates the patching tag		
Validate Nexus Reset Estes-Ext Failed	This server patching precheck is displayed for ORCL-EXT-SAS3 controller with model number 0x0097. This precheck verifies that controllers NVDATA is updated to 0e.01.00.0d version. If Estes-Ext is not updated to I_T Nexus Reset, then an error is displayed.		
	SAS3 controller requires Nexus		
	DCS-10293: Current System has ORCL-		
	EXT-SAS3 controller		
	which requires the firmware update		
	to enable NEXUS RESET.		
	To perform the firmware update, run /opt/oracle/oak/pkgrepos/		
	firmwarecontroller/lsilogic/0x0097/ 16.00.08.00/it_nexus_reset.sh on both nodes.		



#### Check Component Verified

#### Server patching prechecks

#### For operating system:

- Validates supported versions
- Validates minimum supported versions
- Validates patching tag
- · Validates whether patch location is available
- Verifies OS patch
- Validates command execution

#### For Oracle ILOM:

- Validates supported versions
- Validates minimum supported versions
- Validates patching tag
- Validates whether patch location is available
- Checks for Oracle ILOM patch version
- Validates Patch location
- Validates command execution
- Validates connectivity to Oracle ILOM

#### For Oracle Grid Infrastructure:

- Validates supported Oracle Grid Infrastructure versions
- Validates available space
- Validates whether Oracle Clusterware is running
- Validates patching tag
- Validates whether system is provisioned
- Validates whether Oracle ASM is online
- Validates the minimum agent version
- Validates the central inventory
- Validates patching locks
- Validates whether clones location exists
- Validates DB start dependencies
- Validates DB stop dependencies
- Validates command execution

#### For Oracle ORAchk:

- Runs the ORAchk tool that performs operating system level prechecks.
- Validates command execution

#### For server:

- Validates whether server patching can be performed in local mode or not
- Validates command execution

Confirms that the bare metal system is upgraded, in the case of DB systems.

Verifies and confirms that the database start/stop dependencies are correct.

Confirms that patching locks are not present.

Verifies that the central inventory is accurate.



Check	Component Verified	
Database home patching prechecks	Confirms that Oracle Grid Infrastructure is instal	
	Confirms that the DCS Agent is at the required version	
	Confirms that Oracle Clusterware is running on all nodes	
	Confirms that Oracle Grid Infrastructure is upgraded	
	Validates that there is sufficient disk space available	
	Checks if the disk group for database homes on Oracle ACFS is configured	
	Checks whether the clone file is present in the repository	
	Checks whether the $/u01/app/odaorabase$ directory exists. If the directory exists, then the check confirms that there is a valid symbolic link.	
Database home patching with out-of-place patching prechecks	The check creates a database home and verifies that all databases can be moved from the source home to new home.	
	This check validates that thelocal option can be used for the database home.	
Storage prechecks	Validates storage patch location and tag	
	Validates patching location and tag	
	Validates command execution	
	Validates Oracle ASM disk groups status	
	Validates rolling patch (for high-availability deployment)	

# About Enabling NUMA on Oracle Database Appliance

Understand how you can enable NUMA on bare metal, KVM, and DB Systems on Oracle Database Appliance.

NUMA (Non-Uniform Memory Access) can help facilitate efficient use of the underlying NUMA hardware. On Oracle Database Appliance, you can enable NUMA for databases on bare metal and DB systems, CPU pools, and for KVM applications.

#### About Enabling NUMA During Provisioning of Oracle Database Appliance

When you provision Oracle Database Appliance with release 19.27, NUMA is automatically enabled on the database, DB system and CPU pools. Hence, when you create a database, DB system, or CPU pool on an Oracle Database Appliance release 19.27 deployment, NUMA is automatically enabled and no additional configuration is required. NUMA is not enabled by default for application VMs.

#### About Enabling NUMA After Patching Oracle Database Appliance

NUMA is enabled by default starting with Oracle Database Appliance release 19.12. When you patch to Oracle Database Appliance release 19.27 from 19.11 or earlier, the odacli update-server command sets NUMA at the system level. New databases created after patching are NUMA-enabled. For existing databases, enable NUMA by running the command alter system set "enable numa support"=true on the database.



After patching the bare metal system to release 19.27 from 19.11 or earlier, as a one-time activity, you must run the command odacli remap-cpupools to enable NUMA on all existing CPU pools (BM, VM, dbsystem).

For existing DB systems, run the command odacli modify-dbsystem --enable-numa to enable NUMA for the dbsystem and the database of the DB system.

NUMA is not enabled by default for application VMs. For new and existing application VMs, run the command <code>odacli modify-vm --enable-numa</code> to enable NUMA for the VM configuration. You must also enable NUMA for the components inside the VM such as operating system and application running inside the VM. The command <code>odacli modify-dbsystem --enable-numa</code> is only supported on application VMs with even number of CPU cores so that CPU cores can be evenly distributed to NUMA nodes. In Oracle Database Appliance, one CPUcore is equal to 2 vCPU.

See the topic *Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line* for more details about the steps to patch your deployment and enable NUMA.

#### **Related Topics**

- Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.
- Patching Oracle Database Appliance DB Systems Using the Command-Line
   Follow these steps to apply patches to your Oracle Database Appliance DB system deployment and existing Oracle Database home in the DB system, using CLI commands.
- Remapping CPU Pools in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to remap CPU pools in a bare
   metal or KVM deployment.
- odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

• odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

- · odacli modify-dbsystem
  - Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

# Minimizing Downtime When Patching Oracle Database Appliance

Understand best practices to minimize downtime when you apply patches to your Oracle Database Appliance deployment.

#### **Recommendations for Minimizing Downtime During Patching**

To minimize database patching downtime, it is recommended that you use Oracle RAC or Oracle RAC One Node on an Oracle Database Appliance high-availability system.



- If available, use Oracle Data Guard and patch the standby system first. After you patch the standby system, switch the workload to the standby system, patch the primary system, and then switch the workload back to the primary system. For more information, see *Patching Oracle Data Guard Databases on Oracle Database Appliance* in this guide.
- Always use Oracle Database Appliance Backup and Recovery (ODABR) to back up the system disks to ensure easy restore, if the patching operation fails. ODABR restores the system disk to pre-patching state.
- The odacli update-storage command has a --rolling option for storage devices (SSD and HDD) to minimize patching downtime. There could be other shared storage component firmware that require a system restart and do not support rolling. Oracle Database Appliance storage patching can be deferred, but it is not recommended. Note that the --rolling option cannot be used with the odacli update-storage command on single-node Oracle Database Appliance systems.

#### Minimizing Downtime using the --local Option During Patching

To minimize downtime, use the --local option with the odacli update-server and odacli update-dbhome commands. Update the DCS components and then run the odacli create-prepatchreport command. There is no downtime during the prepatch process. After analyzing the prepatch report, use the --local option to continue patching Oracle Database Appliance.



Before patching databases, ensure that the server patching operation on both nodes has completed successfully. Do not run the <code>odacli</code> update-dbhome and <code>odacli</code> update-database commands before the <code>odacli</code> update-server operation completes successfully on both nodes.

### See Also:

Oracle Database High Availability Overview and Best Practices Guide in the Oracle Database 19c Documentation Library

# **About Updating Databases and Database Homes**

Understand how to update a database and database home using either the Browser User Interface or odacli commands.

#### **About Updating Databases and Database Homes**

Oracle Database Appliance provides the following options to patch or update databases and database homes:

• Patch or update each database home. The database home is patched out-of-place. When patching database home, Oracle Database Appliance automatically provisions a destination database home if needed, records the source database home, target version, and destination database home mapping in the metadata repository, and then moves all databases running in the source database home to the destination database home. Use the odacli update-dbhome command or the BUI to patch all databases from a single source database home to a single destination database home. Use this option if there are no constraints on your system for space usage or for provisioning a new database home.



• Patch or update selected databases in a database home to a specific database home. You must specify the target database and destination database home when patching. You can use the <code>odacli update-database</code> command or the BUI to patch a specific database to a specific database home or to control when and how many database homes are provisioned. Using the update-database workflow also provides an option to run the operation again, if the patching operation failed. The abort and revert options available with the update-database workflow are not supported when the target database is a single-instance database.

Before patching the database or database home, upload the Oracle Database clone files for the database version, to the repository, and then create the database home. See *Patching Oracle Database Appliance Using the CLI* for the procedure to update the repository with the latest Oracle Database clone files.

## Important:

The odacli update-database command that enabled association of a backup configuration with database was deprecated in Oracle Database Appliance release 19.6. Starting with Oracle Database Appliance release 19.17, the odacli update-database command enables database patching and is similar to the patching functionality that the odacli update-dbhome command provides, with a few differences as described in the Oracle Database Appliance Deployment Guide for your hardware model.

Before you run the <code>odacli</code> update-dbhome command, you must create the prepatch report for the database home by running the command <code>odacli</code> create-prepatchreport -d. Similarly, before you run the <code>odacli</code> update-database command, you must create the prepatch report either for the source database home or target database by running the command <code>odacli</code> create-prepatchreport -db respectively. The source and destination database homes must be consistent in the prepatch report and when specifying them in the <code>odacli</code> update-database command. If you do not create the prepatch report before the patch operation, then the <code>odacli</code> update-database and <code>odacli</code> update-dbhome commands fail with an error message prompting you to run the patching pre-checks.

For more information about the options for the update-dbhome and odacli update-database commands, see the chapter *Oracle Database Appliance Command-Line Interface*.

# Updating ESTES-EXT Firmware Before Patching Oracle Database Appliance Server

Update TMT (Task Management Reset Type) for Estes-Ext before you patch the Oracle Database Appliance server.

Before you patch your Oracle Database Appliance deployment and your existing database homes to the current release, you must update  $I_T$  Target Reset of Estes-Ext to  $I_T$  Nexus Reset. This update is not included in the regular firmware update. Run the <code>/opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/it\_nexus\_reset.sh</code> script to complete this update before you perform server patching. The patching precheck verifies that controllers NVDATA is updated to 0e.01.00.0d version. If <code>Estes-Ext</code> is not updated to  $I_T$  Nexus Reset, then an error is displayed.

Follow these steps:



- 1. Ensure that you update the repository with the server zip file for Oracle Database Appliance release 19.26.
- 2. Shut down Oracle Grid Infrastructure, Oracle Database, and all applications before you run the update. Ensure that Oracle Clusterware is not running.
- 3. Before you patch the Oracle Database Appliance server, run the following command:

```
# /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/
sas3flash -listall
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
```

Adapter Selected is a Avago SAS: SAS3008(C0)

Nu	m Ctlr	FW Ver	NVDATA	x86-BIOS	PCI Addr
_					
0	SAS3008(C0)	16.00.08.00	0e.01.00.0c	08.37.00.00	00:3b:00:00
1	SAS3008(C0)	16.00.08.00	0e.01.00.0c	08.37.00.00	00:e3:00:00

Finished Processing Commands Successfully. Exiting SAS3Flash.

- 4. If the system is already up-to-date, then the following message is displayed:
  - # /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
    0x0097/16.00.08.00/it\_nexus\_reset.sh
    The I\_T Nexus Reset is enabled for the SAS3 controller(s) in this system.
    No action required.
- 5. Run the script.

```
# /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/
it nexus reset.sh
```

Use the -force option to run the script without being prompted for answers.

- **6.** If Oracle Clusterware is running, then the following error is displayed:
  - # /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/ it\_nexus\_reset.sh CRS status found as up and running in this node, please SHUTDOWN the CRS and retry running this script
- 7. Shut down Oracle Clusterware and run the script again:

```
# /u01/app/19.26.0.0/grid/bin/crsctl check crs
CRS-4638: Oracle High Availability Services is online
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
# /u01/app/19.26.0.0/grid/bin/crsctl stop crs
```



```
. . .
# /u01/app/19.26.0.0/grid/bin/crsctl check crs
CRS-4639: Could not contact Oracle High Availability Services
# /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/
it nexus reset.sh
************************
Running it nexus reset.sh script is going to perform nexus reset
  and does DEEP POWER CYCLE of iLOM
Please enter 'yes' to confirm the Nexus Reset operation,
  enter 'no' to cancel.
Do you wish to continue and rest nexus adapter? (yes/no): yes
Trying perform I T Nexus Reset
Updating Adapter with index: 0
running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
0x0097/16.00.08.00/sas3flash -c 0 -f /opt/oracle/oak/pkgrepos/
firmwarecontroller/lsilogic/0x0097/16.00.08.00/
Oracle SAS9300-8e it p 000D ph16.04 nexus.bin
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
       Adapter Selected is a Avago SAS: SAS3008(C0)
       Executing Operation: Flash Firmware Image
               Firmware Image has a Valid Checksum.
               Firmware Version 16.00.08.00
               Firmware Image compatible with Controller.
               Valid NVDATA Image found.
               NVDATA Major Version 0e.01
               Checking for a compatible NVData image...
               NVDATA Device ID and Chip Revision match verified.
               NVDATA SubSystem Vendor and SubSystem Device ID match
verified.
               NVDATA Versions Compatible.
               Valid Initialization Image verified.
               Valid BootLoader Image verified.
               Beginning Firmware Download ...
               Firmware Download Successful.
               Verifying Download...
               Firmware Flash Successful.
               Resetting Adapter...
               Adapter Successfully Reset.
               NVDATA Version 0e.01.00.0d
```



Finished Processing Commands Successfully. Exiting SAS3Flash.

running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/ 0x0097/16.00.08.00/sas3flash -c 0 -o -e 3 Avago Technologies SAS3 Flash Utility Version 17.00.00.00 (2018.04.02) Copyright 2008-2018 Avago Technologies. All rights reserved.

Advanced Mode Set

Adapter Selected is a Avago SAS: SAS3008(C0)

Executing Operation: Erase Flash

Erasing Persistent Configuration Pages Region...

Erase Flash Operation Successful!

Finished Processing Commands Successfully. Exiting SAS3Flash.

running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/ 0x0097/16.00.08.00/sas3flash -c 0 -b /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/mpt3x64.rom Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.

Adapter Selected is a Avago SAS: SAS3008(C0)

Executing Operation: Flash BIOS Image

Validating BIOS Image...

BIOS Header Signature is Valid

BIOS Image has a Valid Checksum.

BIOS PCI Structure Signature Valid.

BIOS Image Compatible with the SAS Controller.

Attempting to Flash BIOS Image...

Verifying Download...

Flash BIOS Image Successful.

Finished Processing Commands Successfully. Exiting SAS3Flash.

running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/ 0x0097/16.00.08.00/sas3flash -c 0 -b /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/mptsas3.rom Avago Technologies SAS3 Flash Utility Version 17.00.00.00 (2018.04.02) Copyright 2008-2018 Avago Technologies. All rights reserved.



```
Adapter Selected is a Avago SAS: SAS3008(C0)
        Executing Operation: Flash BIOS Image
                Validating BIOS Image...
                BIOS Header Signature is Valid
                BIOS Image has a Valid Checksum.
                BIOS PCI Structure Signature Valid.
                BIOS Image Compatible with the SAS Controller.
                Attempting to Flash BIOS Image...
                Verifying Download...
                Flash BIOS Image Successful.
        Finished Processing Commands Successfully.
        Exiting SAS3Flash.
running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
0x0097/16.00.08.00/sas3flash -c 0 -b /opt/oracle/oak/pkgrepos/
firmwarecontroller/lsilogic/0x0097/16.00.08.00/lsisas3f.rom
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
        Adapter Selected is a Avago SAS: SAS3008(C0)
        Executing Operation: Flash BIOS Image
                Validating BIOS Image...
                BIOS Header Signature is Valid
                BIOS Image has a Valid Checksum.
                BIOS PCI Structure Signature Valid.
                BIOS Image Compatible with the SAS Controller.
                Attempting to Flash BIOS Image...
                Verifying Download...
                Flash BIOS Image Successful.
        Finished Processing Commands Successfully.
        Exiting SAS3Flash.
Updating Adapter with index: 1
running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
0x0097/16.00.08.00/sas3flash -c 1 -f /opt/oracle/oak/pkgrepos/
firmwarecontroller/lsilogic/0x0097/16.00.08.00/
Oracle SAS9300-8e it p 000D ph16.04 nexus.bin
```

```
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
        Adapter Selected is a Avago SAS: SAS3008(C0)
        Executing Operation: Flash Firmware Image
                Firmware Image has a Valid Checksum.
                Firmware Version 16.00.08.00
                Firmware Image compatible with Controller.
                Valid NVDATA Image found.
                NVDATA Major Version 0e.01
                Checking for a compatible NVData image...
                NVDATA Device ID and Chip Revision match verified.
                NVDATA SubSystem Vendor and SubSystem Device ID match
verified.
                NVDATA Versions Compatible.
                Valid Initialization Image verified.
                Valid BootLoader Image verified.
                Beginning Firmware Download...
                Firmware Download Successful.
                Verifying Download...
                Firmware Flash Successful.
                Resetting Adapter...
                Adapter Successfully Reset.
                NVDATA Version 0e.01.00.0d
        Finished Processing Commands Successfully.
        Exiting SAS3Flash.
running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
0x0097/16.00.08.00/sas3flash -c 1 -o -e 3
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
        Advanced Mode Set
        Adapter Selected is a Avago SAS: SAS3008(C0)
        Executing Operation: Erase Flash
        Erasing Persistent Configuration Pages Region...
        Erase Flash Operation Successful!
        Finished Processing Commands Successfully.
        Exiting SAS3Flash.
running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
```

0x0097/16.00.08.00/sas3flash -c 1 -b /opt/oracle/oak/pkgrepos/



```
firmwarecontroller/lsilogic/0x0097/16.00.08.00/mpt3x64.rom
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
```

Adapter Selected is a Avago SAS: SAS3008(C0)

Executing Operation: Flash BIOS Image

Validating BIOS Image...

BIOS Header Signature is Valid

BIOS Image has a Valid Checksum.

BIOS PCI Structure Signature Valid.

BIOS Image Compatible with the SAS Controller.

Attempting to Flash BIOS Image...

Verifying Download...

Flash BIOS Image Successful.

Finished Processing Commands Successfully. Exiting SAS3Flash.

running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/ 0x0097/16.00.08.00/sas3flash -c 1 -b /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/mptsas3.rom Avago Technologies SAS3 Flash Utility Version 17.00.00.00 (2018.04.02) Copyright 2008-2018 Avago Technologies. All rights reserved.

Adapter Selected is a Avago SAS: SAS3008(C0)

Executing Operation: Flash BIOS Image

Validating BIOS Image...

BIOS Header Signature is Valid

BIOS Image has a Valid Checksum.

BIOS PCI Structure Signature Valid.

BIOS Image Compatible with the SAS Controller.

Attempting to Flash BIOS Image...

Verifying Download...

Flash BIOS Image Successful.

Finished Processing Commands Successfully. Exiting SAS3Flash.



```
running /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/
0x0097/16.00.08.00/sas3flash -c 1 -b /opt/oracle/oak/pkgrepos/
firmwarecontroller/lsilogic/0x0097/16.00.08.00/lsisas3f.rom
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
        Adapter Selected is a Avago SAS: SAS3008(C0)
        Executing Operation: Flash BIOS Image
                Validating BIOS Image...
                BIOS Header Signature is Valid
                BIOS Image has a Valid Checksum.
                BIOS PCI Structure Signature Valid.
                BIOS Image Compatible with the SAS Controller.
                Attempting to Flash BIOS Image...
                Verifying Download...
                Flash BIOS Image Successful.
        Finished Processing Commands Successfully.
        Exiting SAS3Flash.
create script for ILOM deep recycle
chmod 777 /tmp/dcsfiles/
chmod 700 /tmp/dcsfiles//rebootIlom.sh
prepare system for ILOM recyle
Enabling HOST AUTO_POWER_ON on ILOM
Connected. Use ^D to exit.
-> set /SP/policy HOST AUTO POWER ON=enabled
Set 'HOST_AUTO_POWER_ON' to 'enabled'
-> Session closed
Disconnected
Setting set /System/ deep power cycle=true
Connected. Use 'D to exit.
-> set /System/ deep_power_cycle=true
Set 'deep power cycle' to 'true'
-> Session closed
Disconnected
Trigger recycle script in background
```

8. Continue patching your server and databases as described in the topic *Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line*.

Verify that the updates ran successfully. When the system comes up, verify the NVDATA versions and firmware version.

```
# /opt/oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/
sas3flash -listall
Avago Technologies SAS3 Flash Utility
Version 17.00.00.00 (2018.04.02)
Copyright 2008-2018 Avago Technologies. All rights reserved.
```

Adapter Selected is a Avago SAS: SAS3008(C0)

Nu	m Ctlr	FW Ver	NVDATA	x86-BIOS	PCI Addr
0	SAS3008(C0)	16.00.08.00	0e.01.00.0d	08.37.00.00	00:3b:00:00
1	SAS3008(C0)	16.00.08.00	0e.01.00.0d	08.37.00.00	00:e3:00:00

Finished Processing Commands Successfully. Exiting SAS3Flash.

#### **Related Topics**

- About Enabling NUMA on Oracle Database Appliance
   Understand how you can enable NUMA on bare metal, KVM, and DB Systems on Oracle Database Appliance.
- Patching Oracle Database Appliance DB Systems Using the Command-Line
   Follow these steps to apply patches to your Oracle Database Appliance DB system deployment and existing Oracle Database home in the DB system, using CLI commands.
- Managing Database Homes on Oracle ACFS Storage
   Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to
   manage database home storage in Oracle Database Appliance.
- About Creating Database Homes on Oracle ACFS Storage
   When you create new Oracle Database homes, they are created on Oracle ACFS file
   system which are stored on Oracle Database Appliance storage disks. You can create new
   Oracle Database homes using the odacli create-database or odacli create-dbhome
   commands, or when you patch an existing database home.
- odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.



# Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line

Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.

To patch your Oracle Database Appliance deployment and your existing database homes to the current release, you must download the Oracle Database Appliance Server patch, Oracle Grid Infrastructure clone files, and Oracle Database clone files and update the repository on the bare metal system.

#### NOT\_SUPPORTED:

When you patch your Oracle Database Appliance deployment to the current release, for ORCL-EXT-SAS3 controller with model number 0x0097, the patching precheck verifies that controllers NVDATA is updated to 0e.01.00.0d version. You must update I\_T Target Reset of Estes-Ext to I\_T Nexus Reset by running the /opt/ oracle/oak/pkgrepos/firmwarecontroller/lsilogic/0x0097/16.00.08.00/ it\_nexus\_reset.sh script. For more information, see the topic Updating ESTES-EXT Firmware Before Patching Oracle Database Appliance Server.

## Important:

Oracle recommends always patching from within the previous four Oracle Database Appliance releases because these patching paths are tested. If you patch from any earlier Oracle Database Appliance release, then you may encounter errors.

## Note:

Run the steps in this procedure in the same order as documented. Run the <code>odacli</code> update-dcsadmin and odacli update-dcscomponents commands before running the odacli update-server command.

## Important:

Ensure that there is sufficient space on your appliance to download the patches.



## Important:

If you want to install third-party software on your Oracle Database Appliance, then ensure that the software does not impact the Oracle Database Appliance software. The version lock on Oracle Database Appliance RPMs displays a warning if the third-party software tries to override Oracle Database Appliance RPMs. You must restore the affected RPMs before patching Oracle Database Appliance so that patching completes successfully.

## Important:

If you have configured Oracle ASR and are patching your appliance to Oracle Database Appliance release 19.27, then after updating the DCS agent, delete the existing Oracle ASR configuration and reconfigure it, before you run the odacli update-server command to patch your appliance.

### Note:

Public network gateway must be responsive to ping requests. Oracle Clusterware uses the public network gateway as ping target to facilitate the VIP failover in Oracle Database Appliance high-availability environment.

## See Also:

Enabling Custom SSH Key Management on Oracle Database Appliance in this guide for information on how to manage SSH keys on bare metal systems and DB systems

The Oracle Database Appliance Backup Recovery (ODABR) tool helps recover a system to the pre-patch state, should any potential errors occur during the patching process that may render the system unusable. Download and install the latest version of the Oracle Database Appliance Backup Recovery (ODABR) tool to enable creation of snapshots before patching. See My Oracle Support Note 2466177.1 for the procedure to install ODABR. https://support.oracle.com/rs?type=doc&id=2466177.1

Follow these steps to apply patches to your Oracle Database Appliance and update existing database homes.

 Download the Oracle Database Appliance Server Patch for the ODACLI/DCS stack (patch 37817290), Oracle Grid Infrastructure clone files (patch 30403673), and Oracle Database clone files (patch 30403662) from My Oracle Support to a temporary location on an external client. Refer to the release notes for details about the patch numbers and software for the latest release.

For example, download the server patch for 19.27:

p37817290\_1927000\_Linux-x86-64.zip



2. Unzip the software — it contains README.html and one or more zip files for the patch.

```
unzip p37817290 1927000 Linux-x86-64.zip
```

The zip file contains the following software file:

```
oda-sm-19.27.0.0.0-date-server.zip
```

3. Copy all the software files from the external client to Oracle Database Appliance. For High-Availability deployments, copy the software files to only one node. The software files are copied to the other node during the patching process. Use the scp or sftp protocol to copy the bundle.

Example using scp command:

```
# scp software file root@oda host:/tmp
```

Example using sftp command:

```
# sftp root@oda host
```

Enter the root password, and copy the files.

```
put software file
```

4. Update the repository with the server software file:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
software file
```

For example, for 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/oda-
sm-19.27.0.0.0-date-server.zip
```

5. Confirm that the repository update is successful:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
```

6. Update DCS admin:

```
[root@odal opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v 19.27.0.0.0
```

7. Update the DCS components:

```
 [root@oda1 \ opt] \# \ /opt/oracle/dcs/bin/odacli \ update-dcscomponents \ -v \ 19.27.0.0.0
```

The <code>odacli update-dcscomponents</code> command updates Oracle HAMI, MySQL, and updates other DCS components such as the DCS agent, DCS CLI, and DCS controller on Oracle Database Appliance.



If the DCS components are updated, then the message "status": "Success" is displayed on the command line. For failed updates, fix the error and then proceed with the update by re-running the odacli update-dcscomponents command. See the topic Resolving Errors When Updating DCS Components During Patching about more information about DCS components checks errors.



Note that for DCS agent update to be complete, the <code>odacli update-dcscomponents</code> command must be run. Ensure that both commands are run in the order specified in this procedure.

8. Update the repository with the Oracle Grid Infrastructure clone file and the Oracle Database clone file:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
software file
```

#### For example, for 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-19.27.0.0.0-date-GI-19.27.0.0.zip
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip
```

9. Run patching pre-checks. You must run the odacli create-prepatchreport command before you patch your server; otherwise, the odacli update-server command fails with an error message prompting you to run the patching pre-checks. Note that odacli create-prepatchreport supports the -l option, which runs the prechecks on the local node only. However, to be able to patch the system by running the command odacli update-server, the command odacli create-prepatchreport must be run without the -l option, so that the prechecks can be performed on both nodes before patching is started on any of the two nodes.

Note that there is no downtime when the patching prechecks run.

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -s -v
version
```

#### For example, for 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -s -v
19.27.0.0.0
```

Note that running the odacli create-prepatchreport command creates the target Oracle Grid Infrastructure home, which the server patching operation uses.

10. Verify that the patching pre-checks ran successfully:

[root@odal opt]# /opt/oracle/dcs/bin/odacli describe-prepatchreport



#### For example:

```
[root@oda1 opt]# odacli describe-prepatchreport -i 677d73d2-5eed-46e5-a06f-
d5ca2649d36e
Patch pre-check report
______
                Job ID: 677d73d2-5eed-46e5-a06f-d5ca2649d36e
           Description: Patch pre-checks for [OS, ILOM, GI, ORACHKSERVER,
SERVER]
                Status: SUCCESS
               Created: March 8, 2025 3:37:19 PM CST
                Result: All pre-checks succeeded
Node Name
_____
Pre-Check Status Comments
_____
 OS
Validate supported versions Success Validated minimum supported versions.
Validate patching tag Success Validated patching tag: 19.27.0.0.0
Is patch location available Success Patch location is available.
Verify OS patch Success Verified OS patch
Validate command execution Success Validated command execution
 ILOM
Validate ILOM server reachable Success Successfully connected with ILOM
                                        server using public IP and USB
                                        interconnect
Validate supported versions Success Validated minimum supported versions.
Validate patching tag Success Validated patching tag: 19.27.0.0.0.
Is patch location available Success Patch location is available.
Checking Ilom patch Version Success Successfully verified the versions
Patch location validation Success Successfully validated location
Validate command execution Success Validated command execution
Validate GI metadata Success Successfully validated GI metadata
Validate supported GI versions Success Validated minimum supported
Validate available space Success Validated free space under /u01
Is clusterware running Success Clusterware is running
Validate patching tag Success Validated patching tag: 19.27.0.0.0.
Is system provisioned Success Verified system is provisioned
Validate ASM in online Success ASM is online
Validate kernel log level Success Successfully validated the OS log
                                        level
Validate minimum agent version Success GI patching enabled in current
                                       DCSAGENT version
Validate Central Inventory Success oraInventory validation passed
Validate patching locks Success Validated patching locks
Validate clones location exist Success Validated clones location
Validate DB start dependencies Success DBs START dependency check passed
Validate DB stop dependencies Success DBs STOP dependency check passed
Validate space for clones Success Clones volume is already created
```



```
volume
Evaluate GI patching Success Successfully validated GI patching
Validate command execution Success Validated command execution
Running orachk Success Successfully ran Orachk
Validate command execution Success Validated command execution
Validate local patching Success Successfully validated server local
                                         patching
Validate command execution Success Validated command execution
Node Name
n2
Pre-Check Status Comments
_____
 OS
Validate supported versions Success Validated minimum supported versions.
Validate patching tag Success Validated patching tag: 19.27.0.0.0.
Is patch location available Success Patch location is available.
Verify OS patch Success Verified OS patch
Validate command execution Success Validated command execution
 ILOM
Validate ILOM server reachable Success Successfully connected with ILOM
                                         server using public IP and USB
                                         interconnect
Validate supported versions Success Validated minimum supported versions.
Validate patching tag Success Validated patching tag: 19.27.0.0.0.
Is patch location available Success Patch location is available.
Checking Ilom patch Version Success Successfully verified the versions
Patch location validation Success Successfully validated location
Validate command execution Success Validated command execution
Validate GI metadata Success Successfully validated GI metadata
Validate supported GI versions Success Validated minimum supported
versions.
Validate available space Success Validated free space under /u01
Is clusterware running Success Clusterware is running
Validate patching tag Success Validated patching tag: 19.27.0.0.0.
Is system provisioned Success Verified system is provisioned
Validate ASM in online Success ASM is online
Validate kernel log level Success Successfully validated the OS log
                                         level
Validate minimum agent version Success GI patching enabled in current
                                         DCSAGENT version
Validate Central Inventory Success oraInventory validation passed
Validate patching locks Success Validated patching locks
Validate clones location exist Success Validated clones location
Validate DB start dependencies Success DBs START dependency check passed
Validate DB stop dependencies Success DBs STOP dependency check passed
Validate space for clones Success Clones volume is already created
```

Evaluate GI patching Success Successfully validated GI patching



```
Validate command execution Success Validated command execution

__ORACHK___
Running orachk Success Successfully ran Orachk
Validate command execution Success Validated command execution

__SERVER___
Validate local patching Success Successfully validated server local patching
Validate command execution Success Validated command execution
```

Use the command <code>odacli describe-prepatchreport</code> to view details of the pre-patch report. Fix the warnings and errors mentioned in the report and proceed with the server patching.

**11.** Apply the server update. Note that you can use the --local option with the odacli update-server command to update the local node.

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-server -v version
```

#### For example, for 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-server -v 19.27.0.0.0
```

**12.** Confirm that the server update is successful:

```
[root@odal opt]# /opt/oracle/dcs/bin/odacli describe-job -i job ID
```

#### Note:

After successful server update, it is recommended that you delete any ODABR snapshot you created before starting the server update. If you want to retain any ODABR snapshot when you update the storage and other components, then consider that the presence of active ODABR snapshots may affect system performance. See My Oracle Support Note 2466177.1 for the procedure to create and delete ODABR snapshots: https://support.oracle.com/rs?type=doc&id=2466177.1

**13.** Before you update the storage components, run the odacli create-prepatchreport command with the -st option.

 $[{\tt root@oda1~opt}] \# / {\tt opt/oracle/dcs/bin/odacli~create-prepatchreport~-st~-v} \\ version$ 

#### For example, for 19.27:

 $[root@oda1 \ opt] \# \ /opt/oracle/dcs/bin/odacli \ create-prepatchreport \ -st \ -v \ 19.27.0.0.0 \\$ 

**14.** Verify that the patching pre-checks ran successfully:

[root@odal opt]# /opt/oracle/dcs/bin/odacli describe-prepatchreport

#### For example:

[root@oda1 opt]# odacli describe-prepatchreport -i 95887f92-7be7-4865a311-54318ab385f2

Patch pre-check report

-----

Job ID: 95887f92-7be7-4865-a311-54318ab385f2

Description: Patch pre-checks for [STORAGE]

Status: SUCCESS

Created: March 8, 2025 12:52:37 PM HKT Result: All pre-checks succeeded

Node Name

-----

node1

Pre-Check Status

Comments

-----

-----

\_\_STORAGE\_

Validate patching tag Success Validated patching tag:

19.27.0.0.0.

Patch location validation Success Verified patch

location

Patch tag validation Success Verified patch

tag

Storage patch tag validation Success Verified storage patch

location

Verify ASM disks status Success ASM disks are

online

Validate rolling patch Success Rolling mode patching allowed

as

there is no expander

upgrade.

Validate command execution Success Validated command

execution

Node Name

\_\_\_\_\_

node2

Pre-Check Status

Comments

-----

-----

STORAGE

Validate patching tag Success Validated patching tag:

19.27.0.0.0.

Patch location validation Success Verified patch

location

Patch tag validation Success Verified patch

taq

Storage patch tag validation Success Verified storage patch

location



Verify ASM disks status Success ASM disks are online

Validate rolling patch Success Rolling mode patching allowed as there is no expander upgrade.

Validate command execution Success Validated command

Use the command odacli describe-prepatchreport to view details of the pre-patch report. The pre-patch report also indicates whether storage patching can be rolling or not, based on whether an expander update is also required.

Fix the warnings and errors mentioned in the report and proceed with the storage components patching.

**15.** Update the storage components.

execution

Specify the --rolling option to patch shared disks in a rolling fashion. Note that if you patch from an Oracle Database Appliance release that requires the expander to be patched, then you cannot use the --rolling option during storage patching.

[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-storage -v version -rolling

For example, for 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-storage -v 19.27.0.0.0
--rolling
```

**16.** Starting with Oracle Database Appliance release 19.11, Oracle Database homes are not created on the local disk. Oracle Database homes are created on an Oracle ACFS-managed file system. For a database user oracle, the new database homes are created under /u01/app/odaorahome/oracle/.

If the database home is not already configured on Oracle ACFS, then before patching the database home, configure the database home storage with the <code>odacli configure-dbhome-storage</code> command. For example:

```
[root@oda1 opt]# odacli configure-dbhome-storage -dg DATA
```

The command does not cause storage allocation or creation of volumes or file systems. The command only sets the disk group location in the metadata.

For information about managing database homes on Oracle ACFS, see the topic *Managing Database Home Storage*.

17. To patch existing Oracle Database Homes to release 19.27, ensure that the repository is updated with the Oracle Database clone files. If you have not updated the repository with



the Oracle Database clone files, then update the repository. Note that you must update the DCS agent before you update the repository with the Oracle Database clone files.

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
DB_software_file
```

[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip

## Note:

You have the option to patch each database home using the <code>odacli update-dbhome</code> command or patch selected databases in a database home to a specific database home using the <code>odacli update-database</code> command.

#### 18. To patch all databases in a specified database home:

a. If you want to patch each database home by running the odacli update-dbhome command, then create the prepatch report first. Run the patching pre-checks and review the prepatch report. You must run the odacli create-prepatchreport command before you patch your Oracle Database homes; otherwise, the odacli update-dbhome command fails with an error message prompting you to run the patching pre-checks.

```
[root@odal opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport --
dbhome --dbhomeid DB Home ID -v release number
[root@oda1 opt]# odacli describe-prepatchreport -i Job ID
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport --
dbhome --dbhomeid d03d5187-1c20-470a-9d51-49a0d6f60772 -v 19.27.0.0.0
[root@oda1 opt]# odacli describe-prepatchreport -i 6f040374-d271-4711-
a7db-e6c04597ad69
Patch pre-check report
                Job ID: 6f040374-d271-4711-a7db-e6c04597ad69
           Description: Patch pre-checks for [DB, ORACHKDB]: DbHome
is OraDB19000 home1
                Status: SUCCESS
               Created: March 8, 2025 8:59:48 AM HKT
                Result: All pre-checks succeeded
Node Name
node1
Pre-Check
                              Status
Comments
Validate DB Home ID Success
                                         Validated DB Home
```



ID:

d03d5187-1c20-470a-9d51-49a0d6f60772 Validate patching tag Success Validated patching tag: 19.27.0.0.0. Is system provisioned Success Verified system is provisioned Validate minimum agent version Success Validated minimum agent Is GI upgraded Validated GI is Success upgraded Validate available space for Success Validated free space required under db /u01/app/ odaorahome Validate dbHomesOnACFS Success User has configured diskgroup for Database homes on configured ACFS Validate Oracle base Success Successfully validated Oracle Base Is DB clone available Success Successfully validated clone file exists Successfully validated Evaluate DBHome patching with Success updating RHP dbhome with RHP. and local patching is possible Validate command execution Validated command Success execution ORACHK Successfully ran Running orachk Success Orachk Validate command execution Success Validated command execution Node Name \_\_\_\_\_ node2 Pre-Check Status Comments \_\_\_\_\_\_ \_\_\_\_\_ Validate DB Home ID Success Validated DB Home ID: d03d5187-1c20-470a-9d51-49a0d6f60772 Validate patching tag Success Validated patching tag:



19.27.0.0.0.

Is system provisioned Success

Verified system is

provisioned				
Validate minimum agent version	Success	Validated minimum agent		
version				
Is GI upgraded	Success	Validated GI is		
upgraded	~			
Validate available space for	Success	Validated free space required		
under db		/u01/app/		
odaorahome		/ u01/ app/		
Validate dbHomesOnACFS	Success	User has configured diskgroup		
for	baccess	ober hab configured dibhgroup		
configured		Database homes on		
ACFS				
Validate Oracle base	Success	Successfully validated Oracle		
Base				
Is DB clone available	Success	Successfully validated clone		
file				
exists	_			
Evaluate DBHome patching with	Success	Successfully validated		
updating RHP		dbhome with		
RHP.		abnoile with		
Validate command execution	Success	Validated command		
execution	baccess	variated Communa		
01100001011				
ORACHK				
Running orachk	Success	Successfully ran		
Orachk				
Validate command execution	Success	Validated command		
execution				

If the disk group for database homes on Oracle ACFS is not set up as described in step 17, then the prepatch report lists the error The system is not set up to create database homes on ACFS. Run the odacli configure-dbhome-storage command to configure the disk group for database homes on Oracle ACFS.

Note that running the odacli create-prepatchreport command creates the target Oracle Grid Infrastructure home, which the database patching operation uses.

b. If the pre-patch report does not show any errors, then update the database home to the latest release. You need not use the -f option with the odacli update-dbhome command. Note that you can use the --local option with the odacli update-dbhome command to update the local node.

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dbhome --id
DB_Home_ID -v release_number
```

#### For example, for 19.27:

 $[root@oda1 \ opt] \# \ /opt/oracle/dcs/bin/odacli \ update-dbhome \ --id \ 7c67c5b4-f585-4ba9-865f-c719c63c0a6e \ -v \ 19.27.0.0.0$ 

19. To patch a specific database to a specific database home:

a. If you want patch selected databases in a database home to a specific database home using the odacli update-database command, then create the prepatch report first. Run the patching pre-checks and review the prepatch report. You must run the odacli create-prepatchreport command before you patch your Oracle database; otherwise, the odacli update-database command fails with an error message prompting you to run the patching pre-checks.

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -db - dbid \it DATABASE\ ID -to a68f9947-DB HOME ID
```

```
For example, for 19.27:
[root@oda1 ~]# odacli describe-prepatchreport -i efa93519-
a365-4e9a-9f25-ad3c653cccef
Patch pre-check report
               Job ID: efa93519-a365-4e9a-9f25-ad3c653cccef
           Description: Patch pre-checks for [SINGLEDB,
ORACHKSINGLEDB]: Target DB is db10181, Destination DbHome is
OraDB19000 home8
               Status: SUCCESS
               Created: March 8, 2025 11:19:03 AM PDT
               Result: All pre-checks succeeded
Node Name
-----
node1
Pre-Check Status Comments
______
_____
Is system provisioned Success Verified system is provisioned
Validate dbHomesOnACFS Success User has configured disk group for
configured Database homes on ACFS
Validate Oracle base Success Successfully validated Oracle Base
Evaluate DB clone availability Success Successfully validated clone file
                                       exists
Evaluate DB patching with RHP Success Successfully validated patching DB
                                       with RHP.
Validate command execution Success Validated command execution
```



Is system provisioned Success Verified system is provisioned Validate dbHomesOnACFS Success User has configured disk group for configured Database homes on ACFS

Validate Oracle base Successfully validated Oracle Base
Evaluate DB clone availability Success Successfully validated clone file
exists

Evaluate DB patching with RHP Success Successfully validated patching DB with RHP.

Validate command execution Success Validated command execution

ORACHK

Running orachk Success Successfully ran Orachk
Validate command execution Success Validated command execution

## b. If the pre-patch report does not show any errors, then update the databases to the latest release.

[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-database -i
database ID/-n database name -to destination dbhome ID

#### For example, for 19.27:

[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-database -i
c05458c7-0f1d-4260-8e62-003b3ec26d74/-n db10181 -to dc98eaa9-289c-4710a898-ca6287a07a9c

[root@oda1 ~]# odacli describe-job -i
d442a7d4-594f-48e2-8b02-9124811bb7b4

Job details

\_\_\_\_\_

ID: d442a7d4-594f-48e2-8b02-9124811bb7b4

Description: DB Patching: database ID is

c05458c7-0f1d-4260-8e62-003b3ec26d74

Status: Success

Created: March 8, 2025 3:23:43 PM PDT

Message:

Task Name Node Name Start Time End Time Status

-----

-----

Creating wallet for DB Client nodel March 8, 2025 3:24:42 PM PDT March 8, 2025 3:24:42 PM PDT Success

Patch databases by RHP nodel March 8, 2025 3:24:42 PM PDT March 8, 2025 3:29:34 PM PDT Success

Updating database metadata node2 March 8, 2025 3:29:34 PM PDT March 8, 2025 3:29:34 PM PDT Success

Set log\_archive\_dest for Database nodel March 8, 2025 3:29:34 PM PDT March 8, 2025 3:29:37 PM PDT Success

Generating and saving BOM nodel March 8, 2025 3:29:37 PM PDT March 8, 2025 3:31:44 PM PDT Success

Generating and saving BOM node2 March 8, 2025 3:29:37 PM PDT March 8, 2025 3:31:44 PM PDT Success

TDE parameter update node2 March 8, 2025 3:32:25 PM PDT March 8, 2025 3:32:25 PM PDT Success

20. Confirm that the patch jobs are successful:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli list-jobs
```

- 21. If you are patching your appliance from Oracle Database Appliance release 19.11 or earlier, then run the following steps. You must also run these steps if your appliance was previously patched to Oracle Database Appliance release 19.12 or later, but you did not run these steps when patching to release 19.12.
  - a. After patching the bare metal systems and database homes, enable NUMA (Non-Uniform Memory Access) on existing databases of release 19.12 or earlier, by running the following SQL\*Plus command:

```
SQL> alter system set " enable numa support"=true scope=spfile sid='*';
```

Restart the database after running the command to ensure that the changes take effect.

For more information about enabling NUMA, see the topic *About Enabling NUMA on Oracle Database Appliance*.

- b. If you have deployed DB systems, VMs, or CPU pools, perform the following steps:
  - i. Run the odacli remap-cpupools command:

```
[root@odal opt]# /opt/oracle/dcs/bin/odacli remap-cpupools
```

If the odacli remap-cpupools command fails with the error DCS-10001:Internal error encountered: Not enough physical CPUs available for CPU Pool 'cpupool\_name' on node 'node\_name', run the odacli remap-cpupools command again with the --use\_reserved-cores option. For information about the command options, see the chapter Oracle Database Appliance Command-Line Interface for KVM.

ii. If you have DB systems in your deployment, then run the odacli modifydbsystem command. If you have VMs in your KVM deployment and you want to enable NUMA for the VMs, then run the odacli modify-vm --enable-numa command for VMs. That is: For DB systems:

```
odacli modify-dbsystem --enable-numa
```

#### For VMs:

odacli modify-vm --enable-numa

#### Note:

For bare metal systems and DB systems on Oracle Database Appliance X7-2S and X8-2S, the database init.ora parameter \_enable\_numa\_support is set to FALSE even when NUMA is enabled. This is expected because these hardware models are single socket systems.



#### **Related Topics**

Patching Existing Database Homes Using ODACLI or the BUI
Use ODACLI or BUI to patch database homes in your deployment to the latest release.

#### **Related Topics**

Oracle Database Appliance Release Notes

#### **Related Topics**

Resolving Errors When Updating DCS Components During Patching
 Understand how to troubleshoot errors when updating DCS components during patching.

#### **Related Topics**

- About Enabling NUMA on Oracle Database Appliance
   Understand how you can enable NUMA on bare metal, KVM, and DB Systems on Oracle Database Appliance.
- Patching Oracle Database Appliance DB Systems Using the Command-Line
   Follow these steps to apply patches to your Oracle Database Appliance DB system
   deployment and existing Oracle Database home in the DB system, using CLI commands.
- Managing Database Homes on Oracle ACFS Storage
   Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to manage database home storage in Oracle Database Appliance.
- About Creating Database Homes on Oracle ACFS Storage
   When you create new Oracle Database homes, they are created on Oracle ACFS file
   system which are stored on Oracle Database Appliance storage disks. You can create new
   Oracle Database homes using the odacli create-database or odacli create-dbhome
   commands, or when you patch an existing database home.
- odacli modify-vm
   Use the odacli modify-vm command to modify a virtual machine on Oracle Database
   Appliance Kernel-based Virtual Machine (KVM).
- odacli remap-cpupools
   Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on
   Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli modify-dbsystem
   Use the odacli modify-dbsystem command to modify a DB system on Oracle Database
   Appliance Kernel-based Virtual Machine (KVM).
- odacli create-cpupool
   Use the odacli create-cpupool command to create a new CPU pool on Oracle Database
   Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

# Patching Oracle Database Appliance DB Systems Using the Command-Line

Follow these steps to apply patches to your Oracle Database Appliance DB system deployment and existing Oracle Database home in the DB system, using CLI commands.

To patch your Oracle Database Appliance DB systems deployment and your existing database homes to the current release, you must download the Oracle Database Appliance Server Patch and update the bare metal system repository.



#### Note:

Run the commands in this topic in the same order as documented. Run the odacli update-dcsadmin and odacli update-dcscomponents commands before running the odacli update-server command.

#### Note:

Public network gateway must be responsive to ping requests. Oracle Clusterware uses the public network gateway as ping target to facilitate the VIP failover in Oracle Database Appliance high-availability environment.

Ensure that you have patched your Oracle Database Appliance bare metal deployment to release 19.27 before you patch your DB system.

Follow these steps to apply patches to your Oracle Database Appliance DB system deployment and update the existing database home in the DB system.

1. Ensure that the Oracle Database Appliance Server Patch for the ODACLI/DCS stack, Oracle Grid Infrastructure clone files, and Oracle Database clone files are available in the repository. Run the odacli list-availablepatches command in the bare metal system to view whether the clone files are available in the system.

[root@odal opt]# odacli list-availablepatches

- Connect to the DB system.
- 3. Update DCS admin:

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v
19.27.0.0.0
```

4. Update the DCS components:

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli update-dcscomponents -v
19.27.0.0.0
```

If the DCS components are updated, then the message "status": "Success" is displayed on the command line. For failed updates, fix the error and then proceed with the update by re-running the odacli update-dcscomponents command. See the topic Resolving Errors When Updating DCS Components During Patching about more information about DCS components checks errors.

#### Note:

Note that for DCS agent update to be complete, the <code>odacli update-dcscomponents</code> command must also be run. Ensure that both commands are run in the order specified.



5. Run patching pre-checks. You must run the odacli create-prepatchreport command before you patch your server; otherwise, the odacli update-server command fails with an error message prompting you to run the patching pre-checks.

[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -s v version

#### For example, for 19.27:

[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -s - v 19.27.0.0.0

6. Verify that the patching pre-checks ran successfully:

[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli describe-prepatchreport

#### For example:

```
[root@dbsystem1 ~]# odacli describe-prepatchreport -i
f7e6fb22-1fc0-4aa1-937c-9669dbbb8ae6
```

Patch pre-check report

\_\_\_\_\_\_

Job ID: f7e6fb22-1fc0-4aa1-937c-9669dbb8ae6

Description: Patch pre-checks for [OS, GI, ORACHKSERVER,

SERVER]

Status: SUCCESS

Created: March 8, 2025 3:38:03 PM CET Result: All pre-checks succeeded

Node Name

node1

Pre-Check Status Comments

-----

\_\_\_\_\_

\_os\_

Validate supported versions Success Validated minimum supported

versions.

Validate patching tag Success Validated patching tag:

19.27.0.0.0.

Is patch location available Success Patch location is

available.

Verify OS patch Success Verified OS

patch

Validate command execution Success Validated command

execution

GI

Validate GI metadata Success Successfully validated GI

metadata

Validate supported GI versions Success Validated minimum supported

versions. Validate available space under /u01	Success	Validated free space	
Is clusterware running running	Success	Clusterware is	
Validate patching tag 19.27.0.0.0.	Success	Validated patching tag:	
Is system provisioned provisioned	Success	Verified system is	
Validate BM versions components	Success	Validated BM server	
versions Validate kernel log level log	Success	Successfully validated the OS	
level Validate minimum agent version current	Success	GI patching enabled in	
version		DCSAGENT	
Validate Central Inventory passed	Success	oraInventory validation	
Validate patching locks	Success	Validated patching	
Validate clones location exist location	Success	Validated clones	
Evaluate GI patching patching	Success	Successfully validated GI	
Validate command execution execution	Success	Validated command	
ORACHK Running orachk Orachk	Success	Successfully ran	
Validate command execution execution	Success	Validated command	
SERVER Validate local patching local	Success	Successfully validated server	
patching Validate command execution execution	Success	Validated command	
Node Namenode2			
Pre-Check Comments	Status		
OS Validate supported versions		Validated minimum supported	



versions. Validate patching tag 19.27.0.0.0.	Success	Validated patching tag:	
Is patch location available available.	Success	Patch location is	
Verify OS patch patch	Success	Verified OS	
Validate command execution execution	Success	Validated command	
CT.			
GI Validate GI metadata metadata	Success	Successfully validated GI	
Validate supported GI versions versions.	Success	Validated minimum supported	
Validate available space under /u01	Success	Validated free space	
Is clusterware running running	Success	Clusterware is	
Validate patching tag 19.27.0.0.0.	Success	Validated patching tag:	
Is system provisioned provisioned	Success	Verified system is	
Validate BM versions components	Success	Validated BM server	
versions Validate kernel log level log	Success	Successfully validated the OS	
level Validate minimum agent version	Success	GI patching enabled in	
current		DCSAGENT	
version Validate Central Inventory	Success	oraInventory validation	
passed Validate patching locks locks	Success	Validated patching	
Validate clones location exist location	Success	Validated clones	
Evaluate GI patching patching	Success	Successfully validated GI	
Validate command execution execution	Success	Validated command	
ORACHK	Curana	Cusassafullu van	
Running orachk Orachk	Success	Successfully ran	
Validate command execution execution	Success	Validated command	
SERVER			
Validate local patching local	Success	Successfully validated server	



```
patching
Validate command execution Success Validated command
execution
```

Use the command <code>odacli</code> <code>describe-prepatchreport</code> to view details of the pre-patch report. Fix the warnings and errors mentioned in the report and proceed with the server patching.

7. Apply the server update. Note that you can use the --local option with the odacli update-server command to update the local node.

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli update-server -v version
```

For example, for 19.27:

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli update-server -v
19.27.0.0.0
```

You can use the -f option to override precheck failures and complete the server patching.

8. Confirm that the server update is successful:

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job ID
```

- 9. To patch existing Oracle Database Homes to release 19.27:
  - a. On the bare metal system, run the command odacli describe-dbsystem-image to check that the repository is updated with the required Oracle Database clone files. If the database clone file is not displayed in the command output, then run the command odacli update-repository on the bare metal system to update the repository with the database clone files:

```
[root@odal opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
DB_software_file

[root@odal opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip
```

b. Run the patching pre-checks and review the prepatch report. You must run the odacli create-prepatchreport command before you patch your Oracle Database homes; otherwise, the odacli update-dbhome command fails with the error message prompting you to run the patching pre-checks.

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport
--dbhome --dbhomeid DB_Home_ID -v release_number
[root@dbsystem1 opt]# odacli describe-prepatchreport -i Job_ID
```

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport
--dbhome --dbhomeid 7c67c5b4-f585-4ba9-865f-c719c63c0a6e -v 19.27.0.0.0
[root@dbsystem1 opt]# odacli describe-prepatchreport -i
39ef1eeb-70d3-47ad-b3f5-48960ca0607b
```



Alternatively, you can use the odacli update-database to update the databases in your deployment:

```
[root@dbsystem1 opt]# odacli create-prepatchreport --database --
database_id database_ID --to-home dest_dbhome_ID
[root@dbsystem1 opt]# odacli update-database --id database_ID --to-home
dest_dbhome_ID
```

c. If there are no errors, then update the database home to the latest release. You need not use the -f option with the odacli update-dbhome command. Note that you can use the --local option with the odacli update-dbhome command to update the local node. You can also use the --node option to specify the node containing the database to update.

```
[root@dbsystem1\ opt] \#\ /opt/oracle/dcs/bin/odacli\ update-dbhome\ --id\ {\it DB\ Home\ ID\ -v\ release\ number}
```

For example, for 19.27:

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli update-dbhome --id
7c67c5b4-f585-4ba9-865f-c719c63c0a6e -v 19.27.0.0.0
```

10. Confirm that the patch jobs are successful:

```
[root@dbsystem1 opt]# /opt/oracle/dcs/bin/odacli list-jobs
```

#### **Related Topics**

- About Enabling NUMA on Oracle Database Appliance
   Understand how you can enable NUMA on bare metal, KVM, and DB Systems on Oracle Database Appliance.
- odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli describe-dbsystem-image

Use the odacli describe-dbsystem-image command to view the supported Oracle Grid Infrastructure and Oracle Database versions and the availability of the clone files and Database System KVM image in the Oracle Database Appliance system.



# Patching Oracle Database Appliance Bare Metal Systems Using the Browser User Interface

Upload the Oracle Database Appliance Server Patch to the patch repository, deploy the patch bundle using the Browser User Interface, and then update the DCS admin, DCS components, and DCS agent using CLI commands.

#### Updating the Patch Repository Using the Browser User Interface

- 1. Download the Oracle Database Appliance patches from My Oracle Support and save them in a directory on the appliance. See the *Oracle Database Appliance Release Notes* for a list of available patches and links to download the patches.
- 2. Log into the Browser User Interface.

```
https://Node0-host-ip-address:7093/mgmt/index.html
```

- 3. Click Repository Manager.
- 4. In the Update Patch Repository page, enter the absolute file path and patch name, then click Update Repository to start the update repository job. You can list more than one file to update to the repository with a comma separated list, without spaces, or you can update each file, one at a time.
- 5. Click **Activity** to monitor the progress. When the job completes successfully, the Patch Repository is updated.

## Updating the DCS Admin, DCS Components, and DCS Agent After Updating the Repository and Before Patching

Before patching your appliance using the Browser User Interface, you must update the DCS admin, DCS agent, and DCS components manually through CLI commands.

#### Follow these steps:

- 1. In the BUI, click Appliance and then click Infrastructure Patching on the lefthand pane.
- Using ODACLI commands, update the DCS admin, DCS components, and DCS agent:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v 19.27.0.0.0
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcscomponents -v
19.27.0.0.0
```

If the DCS components are updated, then the message "status": "Success" is displayed on the command line. For failed updates, fix the error and then proceed with the update.



You must log into the Browser User Interface again after running the odacli update-dcscomponents command.



## Running Patching Prechecks and Patching Server, and Storage Using the Browser User Interface

- 1. Do not have any jobs running or pending during the update window.
- In the BUI, click the Appliance tab, and then click Infrastructure Patching on the lefthand pane.
- 3. In the SERVER section, view the Component Details. If you just updated the Patch Repository, click **Refresh**.
  - After the patch is uploaded to the Patch Repository, the Component Details on the page are updated with the Installed Version and Available Version for each component.
- 4. Click Precheck to run patching prechecks. You must run the patching prechecks before updating the server and other components. Click View Pre-check Reports to view the patching prechecks report. If there are no errors in the report, then click Apply Patch to begin the job to patch the server components. For high-availability systems, when updating the server on the bare metal system, you can select the Node to Update. You can choose the node that you want to update or you can choose to update both nodes.
  - When the job finishes, go to the next step. Click **View Jobs** for the job status.
- 5. In the STORAGE section, click Refresh to refresh the Component Details. Click Precheck to run patching prechecks. You must run the patching prechecks before updating the storage components. Click View Pre-check Reports to view the patching prechecks report. If there are no errors in the report, then click Apply Patch to begin the job to patch the storage components. Click View Jobs for the job status.
  - For high-availability environment, you can select the **Rolling** check box to perform rolling patching of storage components.

All patching-related information is logged in the dcs-agent log file at /opt/oracle/dcs/log/dcs-agent.log.

# Patching Oracle Database Appliance DB Systems Using the Browser User Interface

Upload the Oracle Database Appliance Server Patch to the patch repository, deploy the patch bundle using the Browser User Interface, and then update the DCS agent and components using CLI commands.

#### Updating the Patch Repository Using the Browser User Interface

- Download the Oracle Database Appliance patches from My Oracle Support and save them
  in a directory on the appliance. See the Oracle Database Appliance Release Notes for a
  list of available patches and links to download the patches.
- Log into the Browser User Interface within the bare metal system, with the oda-admin user name and password.
  - https://NodeO-host-ip-address:7093/mgmt/index.html
- 3. Click the **Appliance** tab, and then click **Infrastructure Patching** on the lefthand pane.
- 4. In the Update Repository tab, on the Update Patch Repository page, enter the absolute file path and patch name, then click Update Repository to start the update repository job. You can list more than one file to update to the repository with a comma separated list, without spaces, or you can update each file, one at a time.



5. Click **Activity** to monitor the progress. When the job completes successfully, the Patch Repository is updated.

## Updating the DCS Admin, DCS Components, and DCS Agent After Updating the Repository and Before Patching

Before patching your DB system using the Browser User Interface, you must update the DCS admin, DCS agent, and DCS components manually, through CLI commands.

#### Follow these steps:

- 1. In the BUI, click Appliance and then click Infrastructure Patching on the lefthand pane.
- 2. Using ODACLI, update the DCS admin, DCS components, and DCS agent:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v 19.27.0.0.0
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcscomponents -v
19.27.0.0.0
```

If the DCS components are updated, then the message "status": "Success" is displayed on the command line. For failed updates, fix the error and then proceed with the update.



You must log into the Browser User Interface again after running the odacli update-dcscomponents command.

## Running Patching Prechecks and Patching Server and Storage Components Using the Browser User Interface

- 1. Do not have any jobs running or pending during the update window.
- Log into the Browser User Interface within the DB system with the oda-admin user name and password.

```
https://NodeO-host-ip-address:7093/mgmt/index.html
```

- 3. Click the Appliance tab, and then click Infrastructure Patching on the lefthand pane.
- **4.** In the SERVER section, view the Component Details. If you just updated the Patch Repository, click **Refresh**.
  - After the patch is uploaded to the Patch Repository, the Component Details on the page are updated with the Installed Version and Available Version for each component.
- 5. Click Precheck to run patching prechecks. You must run the patching prechecks before updating the server and other components. Click View Pre-check Reports to view the patching prechecks report. If there are no errors in the report, then click Apply Patch to begin the job to patch the server components. For high-availability systems, when updating the server on the bare metal system, you can select the Node to Update. You can choose the node that you want to update or you can choose to update both nodes.
  - When the job finishes, go to the next step. Click **View Jobs** for the job status.
- 6. In the STORAGE section, click **Refresh** to refresh the Component Details. Click **Precheck** to run patching prechecks. You must run the patching prechecks before updating the storage components. Click **View Pre-check Reports** to view the patching prechecks



report. If there are no errors in the report, then click **Apply Patch** to begin the job to patch the storage components. Click **View Jobs** for the job status.

For high-availability environment, you can select the **Rolling** check box to perform rolling patching of storage components.

Click Activity to monitor the progress, and verify that the job completes successfully.

# Updating Oracle Database Appliance Repository with Database Clone Files For Bare Metal Systems

Follow these steps to update the Oracle Database Appliance repository with Oracle Database clone files for the latest release using CLI commands.

To create new databases of a specific release version, you must update the Oracle Database Appliance repository with the Oracle Database clone files for a release. Follow these steps to update the repository with Oracle Database clone files for the latest release.

1. Download the Oracle Database clone software file for a release, for example, p30403662 1927000 Linux-x86-64.zip, and extract the Oracle Database clone software:

For example, download the Oracle Database clone software patch for 19.27:

```
unzip /tmp/p30403662_1927000_Linux-x86-64.zip odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip
```

 Copy all the software files from the external client to Oracle Database Appliance. For High-Availability deployments, copy the software files to only one node. The software files are copied to the other node during the patching process. Use the scp or sftp protocol to copy the bundle.

Example using scp command:

```
# scp software file root@oda host:/tmp
```

Example using sftp command:

```
# sftp root@oda_host
```

Enter the root password, and copy the files.

```
put software file
```

Update the repository with latest release database software:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-db-clone-file.zip/
```

For example, for 19.27:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
odacli-dcs-19.27.0.0.0-date-DB-19.27.0.0.zip
```



Follow the same steps to update the repository with the database clone software for other supported database versions.

4. Confirm that the repository update is successful:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli list-jobs
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job ID
```

5. Delete the software zip files from the temporary location on the appliance to save space:

```
[root@odal opt]# rm software_file
rm: remove regular file software file? y
```

## Patching Databases Using ODACLI Commands or the BUI

Use ODACLI commands or the Browser User Interface to patch databases to the latest release in your deployment.

Before patching the database home, upload the Oracle Database clone files for the database version, to the repository. See *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI* for the procedure to update the repository with the latest Oracle Database clone files.

### Important:

You must run the <code>odacli create-prepatchreport</code> command before you patch the Oracle databases; otherwise, the <code>odacli update-database</code> command fails with an error message prompting you to run the patching pre-checks.

#### Patching Databases on Oracle Database Appliance using ODACLI Commands

Run the following command to patch a database using the CLI:

```
odacli update-database [-a] [-dp] [-f] [-i db_id] [-imp] [-l] [-n db_name] [-ni node] [-r] [-to db home id] [-j] [-h]
```

For more information about the options for the update-database command, see the chapter *Oracle Database Appliance Command-Line Interface*.

#### Patching Databases on Oracle Database Appliance using BUI

Log into the Browser User Interface with the oda-admin user name and password.

```
https://Node0-host-ip-address:7093/mgmt/index.html
```

- 2. Navigate to the **Database** tab.
- 3. Select the database you want to patch.
- 4. Click Update.
- 5. If you select **Apply Data Patch**, then the Data Patch for the specified database is applied and you cannot select any other options.

- On a high-availability system, you can also select the node in the Select Node to Update list.
- 7. Select **Ignore Missing Patches** to ignore missing patches.
- 8. Select **Force Run** to force the operation to run.
- Select the destination database home.
- 10. In the Patching Options
  - Abort: To abort previously unfinished or failed patching operation.
  - Revert: To revert previously unfinished or failed patching operation.
  - None: To patch the database.
- 11. Click Update.
- 12. If you have not run the pre-checks earlier, then an error is displayed when you submit the job to update the database.
- 13. In the Database page, select the Database and then click Precheck to run pre-checks for patching the database.
  - Click Activity for job status.
- 14. In the Database page, for the database to be patched, click Actions and select View Prepatch reports to view the pre-check report. Fix any errors, and then select Action as Apply to patch the database.
- 15. Verify that the patching job completes successfully.

## Patching Existing Database Homes Using ODACLI or the BUI

Use ODACLI or BUI to patch database homes in your deployment to the latest release.

Before patching the database, upload the Oracle Database clone files for the database version, to the repository. See *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI* for the procedure to update the repository with the latest Oracle Database clone files.

#### Patching Database Homes on Oracle Database Appliance using ODACLI Commands

Run the following command to patch a database home using the CLI:

```
odacli update-dbhome -i dbhome_id -v version [-f] [-imp] [-p] [-l] [-u node number] [-j] [-h]
```

For more information about the options for the update-dbhome command, see the chapter *Oracle Database Appliance Command-Line Interface*.

#### Patching Database Homes on Oracle Database Appliance using BUI

1. Log into the Browser User Interface with the oda-admin user name and password.

```
https://Node0-host-ip-address:7093/mgmt/index.html
```

- 2. Navigate to the **Database Home** tab.
- 3. Select the database home you want to patch.
- 4. Select the **Patch Version** for the database home.



- 5. To patch multiple database homes, select each database home to be patched and the patch version for each database home.
- 6. Select the **Node to Update**. You can choose the node that you want to update or you can choose to update all nodes.
- Click Patch. Select Precheck to run pre-checks before patching the database.Click Activity for job status.
- 8. On the Patch page, for the database to be patched, click Actions and select View Prepatch reports to view the pre-check report. Fix any errors, and then select Action as Apply to patch the database.
- Select Ignore Precheck Failures to ignore failures reported in the prechecks reported. It is recommended that you fix errors reported in the precheck results.
- 10. Select Ignore Missing Patches to ignore missing patches.
- 11. Verify that the patching job completes successfully.

#### **Related Topics**

 Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.

#### **Related Topics**

Oracle Database Appliance Release Notes

## Patching Non-Provisioned Oracle Database Appliance Systems

Oracle Database Appliance supports patching of non-provisioned single-node or high availablity systems by running odacli update-server command.

A non-provisioned Oracle Database Appliance system does not have Oracle Grid Infrastructure or Oracle Database installed or running on it. You can upgrade Oracle ILOM and storage firmware on an unprovisioned system without running the <code>odacli create-appliance</code> command by reimaging the system using the bare metal ISO image of Oracle Database release 19.23 or later. Then patch the system with the server patches of the same release as the bare metal ISO image by running the <code>odacli update-server</code> command. When you reimage your system, the DCS infrastructure is updated automatically.

Follow these steps to update the firmware:

- Reimage the Oracle Database Appliance using the bare metal ISO image for Oracle Database Appliance release 19.23 or later.
- 2. Update the repository with the server patch for the Oracle Database Appliance release you want to patch to, for example 19.23 or later.
- For running odacli update-server on Oracle Database Appliance imaged with ISO of release 19.23:

```
odacli update-server -v 19.23.0.0.0 -sko -f
```

For Oracle Database Appliance release 19.23, you can use the -sko option to skip ORAchk failures and proceed with the server patching, and the -f option to override precheck failures and complete the server patching.



- 4. For running odacli update-server on Oracle Database Appliance imaged with ISO of release 19.11 or later, follow these steps:
  - a. Create the pre-patch report for the odacli update-server command by specifying the
     -s option.

```
odacli create-prepatchreport -v 19.11.0.0.0 -s
```

Fix the warnings and errors mentioned in the report and proceed with the server patching.

**b.** Update the server:

```
odacli update-server -v 19.11.0.0.0 -f
```

For Oracle Database Appliance release 19.11 or later, you can use the -f option to override precheck failures and complete the server patching.

# Applying Additional Patches and Updates on Bare Metal Systems

Configure additional patch repositories and patch your operating system and databases to ensure that your deployment has the latest updates and security fixes.

- Enabling Kernel Updates
  - Oracle Ksplice enables you to update your systems with the latest kernel security and bug fix updates.
- Applying Out-of-Cycle Database Patches

The out-of-cycle patching feature enables administrators to patch databases in the Oracle Database Appliance deployment with the latest Oracle Database Release Update, outside of the Oracle Database Appliance releases.

### **Enabling Kernel Updates**

Oracle Ksplice enables you to update your systems with the latest kernel security and bug fix updates.

You can download and install the latest Oracle Ksplice updates (uptrack-updates) with either the local ULN repository or ULN channel.

Follow these steps to install Oracle KSplice:

- Register your server with Unbreakable Linux Network (ULN). By default, you are registered
  for the Oracle Linux Latest channel for your operating system and hardware.
- Log in to Unbreakable Linux Network:

https://www.oracle.com/in/linux/

3. Ensure that you have access to the Internet on the server where you want to use Ksplice. For example, if you are using a proxy server, then set the proxy server and port values in the shell with commands similar to the following:

```
# export http_proxy=http://proxy.company.com:port
# export https proxy=http://proxy.company.com:port
```



Register the server:

```
# uln register
```

- 5. Set up the local repository as described in the Oracle Ksplice user documentation. This enables you to download the latest Ksplice update packages at regular intervals without requiring a direct connection to the Oracle Uptrack server or to ULN.
- 6. To update a system to a specific effective kernel version, install the uptrack-updates package for the current kernel.

```
yum -y install uptrack-updates-'uname -r'
```

You can also download the uptrack-updates RPM from the Ksplice channel and install the RPM manually. For example:

```
# rpm -Uvh uptrack-
updates-4.14.35-1902.11.3.1.el7uek.x86 64-20200325-0.noarch.rpm
```

#### See Also:

Oracle Linux Ksplice User's Guide for information about configuring Oracle Ksplice at:

https://docs.oracle.com/en/operating-systems/oracle-linux/

### Applying Out-of-Cycle Database Patches

The out-of-cycle patching feature enables administrators to patch databases in the Oracle Database Appliance deployment with the latest Oracle Database Release Update, outside of the Oracle Database Appliance releases.

You can apply Oracle Database Release Update (RU) patches manually using OPatch. Refer to the relevant section in this topic to run the OPatch for your database version.

### Note:

The OPatch commands and procedures described in this topic are examples, and may need modifications based on a specific Oracle Database Release Update (RU). Always refer to the Readme of the Oracle Database Release Update (RU) for additional commands and steps.

#### Note:

It is strongly recommended that you patch your deployment through the Oracle Database Appliance releases, whenever possible.





You can apply out-of-cycle patches to baremetal and DB system deployments using this procedure.

#### Using OPatchauto to Manually Patch Oracle Database Release 12c and Later

1. Confirm that the dcs-agent and other components are updated to the latest release.

```
# odacli describe-component
# odacli list-dbhomes
```

- **2.** Update OPatch to the latest version, if available:
  - a. Download the latest OPatch version from My Oracle Support.
  - b. Copy the files to the local host and extract them to the <code>ORACLE HOME/OPatch</code> directory.
  - c. Update the OPatch tool as oracle user.

```
/bin/rm -rf $ORACLE_HOME/OPatch/
su - oracle -c /usr/bin/unzip -q -o OPatch_zip_location/
p6880880 122010 Linux-x86-64.zip -d $ORACLE HOME
```

3. Download the latest database patches from My Oracle Support and copy the files to the local host.

```
scp patchfilename root@hostname:directory
```

4. Unzip patches to an empty directory, for example, /tmp/patchesDir as oracle user. This creates sub directories under /tmp/patchesDir with bug numbers. If the patch you are applying is a Release Update (RU), then the patch directory has multiple subdirectories.

```
/usr/bin/unzip -o location_of_patches/p29301631_180000_Linux-x86-64.zip -d /tmp/patchesDir
```

- 5. For Oracle Database Appliance High-Availability deployments, set up SSH Keys for secure connection.
- 6. Analyze the patches.

```
\label{local_control_opatch} $$ ORACLE\_HOME/OPatch/opatchauto apply $$ directory\_with\_patches\_extracted - analyze - oh $$ ORALCE\_HOME - log / tmp/opatchAutoAnalyzePatch.log
```

7. As root user, apply the patches.

```
\verb§ORACLE_HOME/OPatch/opatchauto apply $directory\_to\_extract\_patches - oh \\ \verb§ORACLE\_HOME - inplace
```

8. When patching is completed on both nodes, run utlrp.sql and catcon.pl scripts to recompile invalid objects in the database.



Update the registry to ensure that system component values are registered.

```
# odacli update-registry -n dbhome -f
```

## Cleaning Up the Patch Repository

Use the Browser User Interface or Command Line Interface to delete obsolete or old patches from the repository.

#### **About Cleaning Up the Patch Repository**

After patching Oracle Database Appliance with the latest patches, old unused clone files may remain and consume space in the repository. Cleanup repository deletes the unused clone/patch files to reclaim space. You can clean up the repository using the Browser User Interface or ODACLI commands.

#### Cleaning Up the Patch Repository Using ODACLI command

```
# odacli cleanup-patchrepo [-cl clones] | [-v version [-comp component]]| [-l
local|-n NodeID]
```

Specify the clone file names and the node from which you want to delete the old patches.

For details about the command options, see the chapter *Oracle Database Appliance Command-Line Interface*.

#### Cleaning Up the Patch Repository Using the Browser User Interface

Follow these steps to clean up the patch repository:

- 1. In the Browser User Interface, click Patch Manager.
- 2. Click the **Cleanup Repository** tab, and then click **Refresh** to list the available patches in the repository.
- 3. Select the Components, such as old Oracle Grid Infrastructure or Oracle Database clone files that you want to clean up from the repository, and the Patch Version, for example, an older release of Oracle Database Appliance.
- 4. Click Cleanup Clone Files to clean up clone files for selected components from the repository at /opt/oracle/oak/pkgrepos/orapkgs/clones/.
- 5. Click **Cleanup Repository** to submit the cleanup repository job.
- Click Activity to monitor the progress. When the job completes successfully, the Patch Repository is updated.

#### **Related Topics**

odacli cleanup-patchrepo

Use the odacli cleanup-patchrepo command to delete obsolete or old patches from the repository.



## About Upgrading to a Different Database Home

Understand how to upgrade to a different database home using either the Browser User Interface or odacli commands.

#### **Prerequisites for Upgrading Database Homes**

You can upgrade database homes of the following releases:

- Oracle Database 12.2 to 19c
- Oracle Database 12.1 to 19c

Before upgrading to a different database home, upload the Oracle Database clone files for the database version, to the repository, and then create the database home. See *Patching Oracle Database Appliance Using the CLI* for the procedure to update the repository with the latest Oracle Database clone files.

#### About Upgrading Database Homes Using the Browser User Interface

Follow these steps to upgrade to a different database home using the Browser User Interface.

Log into the Browser User Interface with the oda-admin user name and password.

```
https://NodeO-host-ip-address:7093/mgmt/index.html
```

- Click the **Database** tab, and then select a database, click **Actions**, and then click **Upgrade**.
- 3. Verify that the database upgrade job completes successfully.

#### About Upgrading Database Homes Using the Command-Line Interface

Run the following command to upgrade to a different database home using the CLI:

```
odacli upgrade-database -i Comma separated list of database ids -from source dbhome id -to destination dbhome id [-j] [-h]
```

For more information about the options for the upgrade-database command, see the chapter Oracle Database Appliance Command-Line Interface.

## Setting Dynamic Default Parameters

You can set dynamic default parameters using the BUI.

#### Setting Dynamic Default Parameters Using the Browser User Interface

Follow these steps:

- 1. From the Appliance page, click **Parameter Repository**.
- 2. The Parameter Repository page lists all the parameters in the repository. Currently, parameters of type RDBMS are supported.
- Select Update Parameter to create a new configuration property.
- 4. In the Update Parameter page, specify the Parameter Name and Value, and provide an optional Description. Specify whether you want to create the parameter for the Bare



**Metal** or **DB System**. You can also specify the whether the parameter applies to **All DB Systems** or you can select the DB system for which you want to create the parameter.

- Click OK.
- **6.** Confirm the action to submit the job. Monitor the job progress and check that it completes successfully.
- 7. To update a parameter, select the **Update** option from the **Actions** menu.
- 8. You can edit the Value, Description, and select whether the parameter applies to **Bare**Metal or DB System. You can also select the DB system for which you want to update the parameter or choose to apply the parameter to All DB Systems.
- 9. Click Update.
- 10. To delete a parameter, select the Delete option from the Actions menu. You can delete the parameter from the Bare Metal or DB System. You can also select the DB system for which you want to delete the parameter or choose to delete the parameter from All DB Systems.
- 11. Click Delete.



9

## **Managing Oracle Databases**

Manage the Oracle Databases on your Oracle Database Appliance.



A bigfile tablespace in Oracle database is a tablespace with a single, but very large, up to 4 GB blocks, datafile. Bigfile is the default file size when creating a new tablespace for Oracle Database. All Oracle database tablespaces are bigfile tablespaces.

- About Administrative Groups and Users on Oracle Database Appliance
  Oracle Database Appliance Browser User Interface deployment creates operating system
  groups and users whose members are granted system administration privileges on the
  appliance.
- About Data Migration Options for Oracle Database Appliance
   Oracle Database Appliance supports the use of standard Oracle Database loading and
   migration tools.
- About Creating Database Homes on Oracle ACFS Storage
   When you create new Oracle Database homes, they are created on Oracle ACFS file
   system which are stored on Oracle Database Appliance storage disks. You can create new
   Oracle Database homes using the odacli create-database or odacli create-dbhome
   commands, or when you patch an existing database home.
- About Standard Edition High Availability for Oracle Database Appliance
   Oracle Database Appliance supports Standard Edition High Availability solution with
   Oracle Grid Infrastructure that provides cluster-based failover for Oracle Database 19c
   Standard Edition.
- About Enterprise Edition High Availability for Oracle Database Appliance
   Oracle Database Appliance supports Enterprise Edition High Availability solution with
   Oracle Grid Infrastructure that provides cluster-based failover for Oracle Database
   Enterprise Edition.
- Working with Databases

Use the Browser User Interface to display a list of databases, database details, and create and delete databases. You can use CLI commands to manage your databases.

- Working with Database Homes
  - Use the Browser User Interface to display a list of database homes, details, and create and delete database homes.
- Migrating Databases
   Review these topics to learn how to prepare for and migrate an entire database to your Oracle Database Appliance.
- About Managing Multiple Database Instances Using Instance Caging
  Use instance caging to manage your system resources on Oracle Database Appliance.

#### Oracle EM Express and DB Console

You can use Oracle Enterprise Manager Database Express (EM Express), or the Database Control Console (DB Console) to manage your database.

# About Administrative Groups and Users on Oracle Database Appliance

Oracle Database Appliance Browser User Interface deployment creates operating system groups and users whose members are granted system administration privileges on the appliance.

During configuration, two administrative accounts are created for Oracle Database Appliance: the user <code>grid</code>, with a user ID (UID) of 1001, and the user <code>oracle</code>, with a UID of 1000. The user <code>grid</code> is the Oracle Grid Infrastructure installation owner. The user <code>oracle</code> is the Oracle Database installation owner, and the owner of all Oracle Database homes (Oracle homes). By default, these users are members of operating system groups whose members are granted privileges to start up and administer Oracle Database and Oracle Automatic Storage Management.

The following table describes the Oracle system privileges groups, and information about the operating system authentication groups:

Table 9-1 Operating System Groups and Users on Oracle Database Appliance

Oracle System Privileges	Group Name	Group ID (GID)	<i>grid</i> is a member	<i>oracle</i> is a member
Oracle Inventory group (OINSTALL)	oinstall	1001	yes (primary group)	yes (primary group)
OSOPER for dbaoper group	dbaoper	1002	yes	yes
OSDBA group	dba	1003	no	yes
OSASM group for Oracle ASM	asmadmin	1004	yes	no
OSOPER for ASM group	asmoper	1005	yes	no
OSDBA for ASM group	asmdba	1006	yes	yes

To change the Group Name and GID from the default values on Oracle Database Appliance bare metal platforms, change the default values from the Browser User Interface during the deployment. If you create an initial database during deployment, then the password for the SYS and SYSTEM users is the password that you set in the Browser User Interface.

To change the Group Name and GID from the default values on the Oracle Database Appliance Virtualized Platform, use the <code>-advance</code> parameter with the command <code>oakclideploy</code>. If you create an initial database during deployment, then the password for the SYS and SYSTEM users is the ROOT password from the Configurator.



Change the password for both users as soon as possible after configuration to prevent unauthorized access to your database using these privileged accounts.



## About Data Migration Options for Oracle Database Appliance

Oracle Database Appliance supports the use of standard Oracle Database loading and migration tools.

If you are loading data or migrating data from an existing database to Oracle Database Appliance, then you can use the standard Oracle Database loading and migration tools. These tools include the following:

- Oracle GoldenGate
- SQL\*Loader
- Oracle Data Pump
- transportable tablespaces
- RMAN

You can also use the RMAN utility to back up and recover databases on Oracle Database Appliance.

## **About Creating Database Homes on Oracle ACFS Storage**

When you create new Oracle Database homes, they are created on Oracle ACFS file system which are stored on Oracle Database Appliance storage disks. You can create new Oracle Database homes using the odacli create-database or odacli create-dbhome commands, or when you patch an existing database home.

Oracle Database homes are created on an Oracle ACFS-managed file system. For a database user oracle, the new database homes are created under /u01/app/odaorahome/oracle/.

The mount /u01/app/odaorahome is a shared file system for a high-availability system. On a high-availability system, /u01/app/odaorahome/ is a shared ORACLE\_HOME between the nodes. Existing database homes continue to remain on the local disks.

The ORACLE\_BASE location has also changed to an Oracle ACFS-based file system. On high-availability system, the ORACLE\_BASE is not shared between the nodes. Each node has its own Oracle ACFS file system for ORACLE\_BASE. The new ORACLE\_BASE for the database homes are created under the mount /u01/app/odaorabase/.

The disk space for the Oracle ACFS file system is located in the DATA or RECO disk group. You must specify the disk group for the Oracle ACFS file system. For Oracle Database Appliance X8-2 hardware model and single-node systems, the Oracle ACFS file system must be located in the DATA disk group. You can specify the initial size of the ORACLE\_HOME volume. The default value is 80 GB. You can set a value from 25 GB to 1024 GB. The initial volume size for ORACLE\_BASE is fixed at 10GB. Note that for these volumes, AUTOEXTEND is off. You can extend the volume size with the odacli modify-dbhome-storage command.

#### Changes When Provisioning Oracle Database Appliance Release 19.27

As part of the provisioning request, you must specify the disk group and size of the volume in the json file in the sysOraHomeStorage section.

```
"sysOraHomeStorage" : {
   "diskgroup" : "DATA",
```



```
"volumeSize" : "80" },
```

If you do not specify the values in the json file, then the following error is displayed during provisioning:

```
DCS-10045: Validation error encountered: Missing argument : sysOraHomeStorage
```

If the values are invalid, then the following errors may be displayed during provisioning:

```
DCS-10024:Input parameter 'Disk Group' contains unacceptable value 'DATAL'. Allowed values are '[DATA, RECO]'. (case insensitive)
DCS-10045:Validation error encountered: Required volumeSize value in sysOraHomeStorage should be in the range of 25GB to 1024GB.
```

#### Changes When Patching to Oracle Database Appliance Release 19.27

If you have patched your appliance from Oracle Database Appliance release 19.6 or later to 19.27, then run the odacli configure-dbhome-storage command **before** creating a new database home. Otherwise, the following error is displayed when creating a new database home:

```
\# odacli create-dbhome -v 19.8.0.0.200714 DCS-10601:The system is not set up to create database homes on ACFS.
```

Once the disk group for the volumes are setup, new database homes are created on the Oracle ACFS file system.

#### **Related Topics**

odacli configure-dbhome-storage

Use the  ${\tt odacli}$  configure-dbhome-storage command to configure the database home storage.

odacli list-dbhome-storages

Use the <code>odacli list-dbhome-storages</code> command to view the database home storage resources after the volumes for <code>ORACLE\_HOME</code> and <code>ORACLE\_BASE</code> are created.

odacli describe-dbhome-storage

Use the odacli describe-dbhome-storage command to view information such as how much space is available (at a volume or diskgroup level).

odacli modify-dbhome-storage

Use the odacli modify-dbhome-storage command to modify database home storage and add additional disk space.

Managing Database Homes on Oracle ACFS Storage

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to manage database home storage in Oracle Database Appliance.



# About Standard Edition High Availability for Oracle Database Appliance

Oracle Database Appliance supports Standard Edition High Availability solution with Oracle Grid Infrastructure that provides cluster-based failover for Oracle Database 19c Standard Edition.

#### About Standard Edition High Availability for Oracle Database 19c

With Standard Edition High Availability, when there is an instance or a node failure, the database automatically fails over to the other node, after attempting to restart on the local node. The database is restarted on the surviving node, thereby providing high availability for Oracle Standard Edition databases.

If your Oracle Database deployment contains Standard Edition 2 Oracle Real Application Cluster (Oracle RAC) databases of releases earlier than 19c, then they must be converted to a Standard Edition High Availability configuration as part of the upgrade to Oracle Database 19c.

For more details about this feature, refer to the Oracle Database Documentation Library at <a href="https://docs.oracle.com/en/database/oracle/oracle-database/index.html">https://docs.oracle.com/en/database/oracle/oracle-database/index.html</a>.

#### About Standard Edition High Availability for Oracle Database Appliance Release 19.27

Standard Edition High Availability for Oracle Database 19c is supported on Oracle Database Appliance for high availability deployments, that is, deployments that have two server nodes, shared storage, and server interconnects.

Oracle Database Appliance enables automatic configuration for failover at deployment time for Oracle Database 19c Standard Edition single-instance databases. Both nodes have Oracle Homes for Standard Edition single-instance databases.

Single-instance Oracle Database 19c Standard Edition databases created using the ODACLI commands or the Browser User Interface (BUI) have Standard Edition High Availability enabled by default. You can also choose to disable the High Availability option. To enable Standard Edition High Availability for existing Standard Edition Oracle RAC databases of releases earlier than 19c, you must convert these Oracle RAC or Oracle One Node databases to single-instance databases, and then upgrade to single-instance Oracle Database 19c Standard Edition database with Standard Edition High Availability enabled by default.

## About Provisioning, Upgrading, and Relocating Standard Edition High Availability Oracle Database

To create a single-instance Oracle Database 19c with Standard Edition High Availability, use the following command:

```
odacli create-database -u db_unique_name -n db_name -dh db_home -y SI -g target_node
```

To upgrade a Standard Edition Oracle RAC Database to Oracle Database 19c Standard Edition, convert the Oracle RAC Database to a single-instance Oracle Database:

odacli modify-database -in db name -y single-instance



Then, upgrade the single-instance database to Oracle Database 19c with Standard Edition High Availability as follows:

```
odacli upgrade-database -i db id -to destination dbhome -ha
```

To relocate a Standard Edition High Availability Oracle Database from one node to another outside of a failover, use the following command, specifying either the target node or the target host in the command:

```
odacli modify-database -in db_name -g target_node
or:
odacli modify-database -in db name -th target host
```

For detailed information about these ODACLI command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

#### **Related Topics**

Oracle Database Appliance Command-Line Interface
 The command-line interface has different classes of tools to manage Oracle Database Appliance.

# About Enterprise Edition High Availability for Oracle Database Appliance

Oracle Database Appliance supports Enterprise Edition High Availability solution with Oracle Grid Infrastructure that provides cluster-based failover for Oracle Database Enterprise Edition.

#### **About Enterprise Edition High Availability for Oracle Database**

With Enterprise Edition High Availability, when there is an instance or a node failure, the database automatically fails over to the other node, after attempting to restart on the local node. The database is restarted on the surviving node, thereby providing high availability for Oracle Enterprise Edition databases.

For more details about this feature, refer to the Oracle Database Documentation Library at https://docs.oracle.com/en/database/oracle/oracle-database/index.html.

#### About Enterprise Edition High Availability for Oracle Database Appliance Release 19.27

Enterprise Edition High Availability for Oracle Database 19.27 is supported on Oracle Database Appliance for high availability deployments, that is, deployments that have two server nodes, shared storage, and server interconnects.

Oracle Database Appliance enables automatic configuration for failover at deployment time for Oracle Database 19.27 Enterprise Edition single-instance databases. Both nodes have Oracle Homes for Enterprise Edition single-instance databases.

To enable Enterprise Edition High Availability for existing Enterprise Edition Oracle RAC databases of release 19.27, you must convert these Oracle RAC databases to single-instance databases, and then upgrade to single-instance Oracle Database 19.27 Enterprise Edition database with Enterprise Edition High Availability enabled by default.



## About Provisioning, Upgrading, and Relocating Enterprise Edition High Availability Oracle Database

To create a single-instance Oracle Database 19.27 with Enterprise Edition High Availability, use the following command:

```
odacli create-database -u db_unique_name -n db_name -dh db_home -y SI -g target node -ha
```

To upgrade an Enterprise Edition Oracle RAC Database to Oracle Database 19.27 Enterprise Edition, convert the Oracle RAC Database to a single-instance Oracle Database:

```
odacli modify-database -in db name -y single-instance
```

Then, upgrade the single-instance database to Oracle Database 19.27 with Enterprise Edition High Availability as follows:

```
odacli upgrade-database -i db_id -to destination_dbhome -ha
```

To relocate an Enterprise Edition High Availability Oracle Database from one node to another outside of a failover, use the following command, specifying either the target node or the target host in the command:

```
odacli modify-database -in db_name -g target_node
or:
odacli modify-database -in db name -th target host
```

For detailed information about these ODACLI command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

#### **Related Topics**

Oracle Database Appliance Command-Line Interface
 The command-line interface has different classes of tools to manage Oracle Database Appliance.

### Working with Databases

Use the Browser User Interface to display a list of databases, database details, and create and delete databases. You can use CLI commands to manage your databases.



#### Note:

Oracle Database Appliance enables unified auditing for databases created in new database homes. Unified audit trail captures audit information and places them in one location and in one format. This consolidated view enables auditors to co-relate audit information from different components. Having a single audit trail also improves management and security of the audit trail. For more information about unified audit trail for Oracle Database, see *Oracle Database Security Guide*.

#### Viewing Databases

Use the Oracle Appliance Manager Browser User Interface to display a list of Oracle databases and database details, create, upgrade, and delete a database in Oracle Database Appliance.

- Creating a Database Using the Browser User Interface
   Use the Oracle Appliance Manager Browser User Interface to create a database in Oracle Database Appliance.
- Managing Database Homes on Oracle ACFS Storage
   Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to
   manage database home storage in Oracle Database Appliance.
- Creating a Database Using ODACLI Commands
   Create a database from the command-line interface.
- Cloning a Database from Backup
  Use the Browser User Interface to clone a database from a backup.
- Cloning an Oracle ACFS Database
   Create a database from an existing Oracle ACFS database using ODACLI commands or BUI.
- Modifying a Database

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to modify a database in Oracle Database Appliance.

Moving a Database from One Oracle Home to Another
 Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to move a database from one Oracle home to another of the same database version.

Upgrading a Database

Use the Oracle Appliance Manager Browser User Interface to upgrade an Oracle database to a different database home version.

- Upgrading a Database Manually Using AutoUpgrade
   Use AutoUpgrade to manually upgrade an earlier release of Oracle database on Oracle Database Appliance.
- Deleting a Database
   Use the Oracle Appliance Manager Browser User Interface to delete an Oracle database.

### **Viewing Databases**

Use the Oracle Appliance Manager Browser User Interface to display a list of Oracle databases and database details, create, upgrade, and delete a database in Oracle Database Appliance.

Log into the Browser User Interface:

https://host name or ip-address:7093/mgmt/index.html

- 2. Click the **Database** tab.
- 3. (Optional) Click the database name, in blue font, to display more details about the database.
- (Optional) Click Actions next to a database entry to view more details, upgrade or delete the database.

### Creating a Database Using the Browser User Interface

Use the Oracle Appliance Manager Browser User Interface to create a database in Oracle Database Appliance.

Ensure that the repository is updated with Oracle RDBMS Clone files for a database version, before creating the database as described in *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI*.



For Standard Edition Oracle Database 19c or later, you cannot create Oracle RAC Or Oracle RAC One Node Database. You can only create single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high availability for single-instance database. For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to enable high availability for single-instance databases.

The Browser User Interface provides a quick and easy method of creating new databases. The Create New Database page in the Browser User Interface is populated with default options for most of the configuration options. Drop-down lists enable you to quickly view and select from a list of available options. You can use the drop-down list to create a new database Oracle Database Home (ORACLE\_HOME) for the database or select an existing ORACLE\_HOME that you created earlier.

Oracle Database 19.27 is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (Oracle ACFS). When databases are created in Oracle ACFS, each database is configured with its own Oracle ACFS file system for the datafiles and uses the following naming convention: /u02/app/db user/oradata/db unique name. The default size of this mount point is 100 GB.

The fields in the Browser User Interface adjust, depending on the database version you select. Follow these steps to create a database:

1. Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- 2. Click the **Database** tab.
- 3. Click **Create Database** to display the Create Database page.
- 4. Select **Create Database** on the Create Database page.
- Enter the following information on the Database Information page to configure the database:



- a. In the **DB Name** field, enter a name for the database. The name *db1* appears in the field as an example of a database name, but the field is not populated. You must enter a name.
  - The name must contain lowercase alphanumeric characters and cannot exceed 8 characters. The Oracle system identifier (SID) is always set to the database name.
- b. (Optional) In the **DB Unique Name** field, enter a name to define a unique name for the database.
- c. In the Use Existing DB Home field, select Yes or No.
- In the **DB Version** field, select a database bundle patch number from the drop-down list.
  - Available database versions with available clones appear in the list in descending order. Supported versions that are not available in the repository appear in light gray font at the bottom of the list. Search is available for the list. To add a supported version to the repository, download the RDBMS clone file and update the repository.
- e. For the CDB option on Oracle Database releases later than 12.1, select Yes or No, depending on whether or not you want the database to be a container database (CDB). The default is Yes.
- f. In the PDB Name field, enter a name for the pluggable database (PDB).
  - Alphanumeric characters and underscore (\_) are valid. The name must begin with an alphanumeric character and cannot exceed 30 characters. The name <code>pdb1</code> appears in the field in italic text as an example, but it is not populated. You must enter a name.
- g. In the PDB Admin User field, enter a name.
  - The field shows pdbadmin as an example, you must enter a name. Alphanumeric characters and underscore (\_) are valid.
- In the Database Edition field, enter the edition for which you have a license, either Enterprise Edition or Standard Edition.
  - For Standard Edition Oracle Database 19c or later, you can only create single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high availability for single-instance database. For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to enable high availability for single-instance databases.
- For single-instance Oracle Database deployment, specify the Node, either Node0 or Node1. The default is Node0. Specify whether you want to Enable High Availability.
- j. In the Shape field, select a database shape from the drop-down list. The shape determines the number of cores and total memory allocated to the database. The default is odb1.
- k. In the Database Class field, select a database class from the drop-down list. If an option is not available in the list, it is not supported for the database edition on the Oracle Database Appliance or the version that you selected. The default is OLTP.
- In the Storage field, select ACFS or ASM from the drop-down list. The default is Oracle ASM.
- m. If the disk group redundancy was set to Flex during the appliance creation, then you can select the Database Redundancy value as Mirror or High.
- Select the Networks you want to associate with the database.
- Select the CPU Pool Name to associate with the database.



p. For the Configure EM Express or Configure EM Console option, select Yes or No. The default is No.

Select **Yes** to configure the Oracle Enterprise Manager Database Express (EM Express) console for Oracle Database 19.27. Selecting **Yes** enables you to use the console to manage the database.

q. In the SYS and PDB Admin User Password field, enter the password for the SYS, SYSTEM, and PDB Admin.

The password must begin with an alpha character and cannot exceed 30 characters. Ouotation marks are not allowed.

- r. In the **Confirm Password** field, enter the password again to confirm.
- s. In the Characterset field, select an option from the drop-down list. The default is AL32UTF8.
- In the National Characterset field, select an option from the drop-down list. The default is AL16UTF16.
- In the Language field, select a database language from the drop-down list. The default is American.
- In the Territory field, select a territory or location for the database from the drop-down list. The default is America.
- Click Next.
- 7. In the TDE Information page, for Oracle Database Enterprise Edition 19c or later, you can choose to enable Transparent Database Encryption (TDE). Select Yes or No in the Enable TDE option. Specify and confirm the TDE Password. By default, the TDE option is disabled.
- 8. Click **Create**. When prompted, click **Yes** to confirm that you want to start the job to create the database.

The job is submitted and a confirmation page appears with a link to the job. Click the link to view the job progress, tasks, and status.

After you close the Job confirmation page, you can click the **Activity** tab to monitor the job progress. Click the job number to view the tasks and status details. Click **Refresh** to refresh the page.

### Managing Database Homes on Oracle ACFS Storage

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to manage database home storage in Oracle Database Appliance.

#### Managing Database Home Storage Using the Browser User Interface

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- 2. Click the **Database** tab.
- 3. Click Database Home Storage on the left pane.
- If Database Home Storage is not configured, then click on the Configure Database Home Storage button.
- Select the Disk Group Name and specify the Size in GB.
- Click Create. When prompted, click Yes to confirm that you want to start the job to configure the database home storage.



- You can also view a list of all Database Home storages from the Database tab and view details for each database.
- 8. To modify Database Home Storage, select **Modify** in the **Actions** drop down list.

## **Managing Database Home Storage Using ODACLI Commands**

- 1. Use the odacli configure-dbhome-storage command to configure the database home storage:
  - # odacli configure-dbhome-storage -dg DATA
- 2. Use the odacli list-dbhome-storages command to list the database home storages:
  - # odacli list-dbhome-storages
- 3. Use the odacli describe-dbhome-storages command to describe a database home storage:

```
odacli describe-dbhome-storage -i 67622ce6-0a00-4fec-b948-7a0ba7922311
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

#### **Related Topics**

· odacli configure-dbhome-storage

Use the odacli configure-dbhome-storage command to configure the database home storage.

· odacli list-dbhome-storages

Use the <code>odacli list-dbhome-storages</code> command to view the database home storage resources after the volumes for <code>ORACLE\_HOME</code> and <code>ORACLE\_BASE</code> are created.

odacli describe-dbhome-storage

Use the odacli describe-dbhome-storage command to view information such as how much space is available (at a volume or diskgroup level).

· odacli modify-dbhome-storage

Use the odacli modify-dbhome-storage command to modify database home storage and add additional disk space.

## Creating a Database Using ODACLI Commands

Create a database from the command-line interface.



If you provisioned the appliance without creating an initial database, then you must create a Oracle home. If the version of the database home is different from the migrated database, create a database home for the migrated database. You might want to create a database home specifically for the migrated database.



### Caution:

When you enable Transparent Data Encryption (TDE) on databases, with software keystore or Oracle Key Vault keystore with endpoints in Oracle Key Vault, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Enter this password carefully when setting it for the first time, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

This example creates a new database named PRODDB with database version 19.27, and a new database home, if a database home does not exist.

1. Use the odacli list-dbhomes command to display a list of database homes and verify that a database home exists for the database version.

Note the ID if you want to use an existing database home or if you want to get more details. Use the odacli describe-dbhomes command to get more details about a specific database home.

```
# odacli list-dbhomes
b727bf80-c99e-4846-ac1f-28a81a725df6 OraDB199 home1 19.27.0.0.0
(continued)
Home Location
/u01/app/orauser/product/19.0.0.0/dbhome 1
```

2. Create a database home if a database home does not exist for the database version.

If you want to create a database home for specifically for the migrated database, you can use the odacli create-dbhome command, or you can create the database home when you create the database. The example creates a database home for database version 19.27.0.0.0.

```
# odacli create-dbhome -v 19.27.0.0.0
```

3. Create a database. You can use an existing database home ID or you can create a database home when creating the database.

To create a database named PRODDB that uses an existing database home with ID b727bf80-c99e-4846-ac1f-28a81a725df6:

```
# odacli create-database -n PRODDB -io -dh b727bf80-c99e-4846-
ac1f-28a81a725df6
```

To create a database named PRODDB with database version 19.27.0.0.0 and a database home:

```
# odacli create-database -n PRODDB -v 19.27.0.0.0 -io
```



#### To create a TDE-enabled database named PRODDB:

# odacli create-database -n PRODDB -t

## Cloning a Database from Backup

Use the Browser User Interface to clone a database from a backup.

When you backup a database in Oracle Database Appliance, a backup report is created. Save the backup report as a JSON file and you can use the file to create a database on the same appliance, or a different appliance.

The following are the prerequisites to cloning a database from a backup:

- The source database backup location must be Object Store or External FRA (Network File System).
- 2. If you use Object Store backup location, then obtain Object Store Credentials for the host.
- 3. If you use an External FRA (Network File System) backup location, then obtain the Network File System (NFS) mount point location.
- **4.** Create a backup policy using the object store credentials or NFS mount point as the backup destination.
- 5. Attach the backup policy to the database that you want to backup. If the source database does not have TDE enabled, then providing the Backup Encryption password is mandatory when attaching Objectstore backup policy. However, the Backup Encryption password is optional when attaching the NFS backup policy. If the source database has TDE enabled, then you need not specify the Backup Encryption password, irrespective of backup destination.
- 6. Create a manual backup of the database and save the backup report generated when the backup completes.

Follow these steps to create a database from backup:

1. Log into the Browser User Interface:

```
\verb|https://host-ip-address:7093/mgmt/index.html||
```

- 2. Click the **Database** tab.
- 3. Click **Create Database** to display the Create Database page.
- **4.** Click **Clone Database from Backup**, then click **Next** to display the Clone Database from Backup page.
- 5. Select the Backup Destination from which you want to create the database. If your backup destination is Object Store:
  - a. Select Backup Destination as **ObjectStore**.
  - b. Select your Object Store Credential Name.
  - Enter the password in the Backup Encryption Passwords field and the Confirm Backup Encryption Passwords field.

If your backup destination is Network File System (NFS):

- a. Select Backup Destination as External FRA.
- Enter the password in the Backup Encryption Passwords field and the Confirm Backup Encryption Passwords field.
- Click Browse and select the backup report from which you want to create the database.



When the backup report is loaded, Database Information and TDE Information steps are displayed on different pages and populated based on the backup report. You can edit some of the fields.

For Standard Edition Oracle Database 19c or later, you cannot clone Oracle RAC or Oracle RAC One Node Database. You can only clone a single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high-availability for single-instance database. For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to enable high availability for single-instance databases.

In the DB Name field, enter a name for the database.

The name must contain lowercase alphanumeric characters and cannot exceed 8 characters. The Oracle system identifier (SID) is always set to the database name.

- Enter the password in the SYS and PDB Admin User Password field and the Confirm Password field.
- Specify the Networks.
- 10. If your source database has Transparent Database Encryption (TDE) enabled, then you can enable TDE on the cloned database. If the source database has TDE enabled, then the backup report has the TDE wallet backup location and the TDE Wallet Backup Location field in the BUI displays this value. Specify and confirm the TDE Password.
- You can choose an Oracle Key Vault server configuration from the Select OKV Server Config drop-down list, and specify the OKV Wallet Location.
- 12. Click Create.
- 13. Click **Yes** to confirm that you want to clone a database from the selected Object Store or External FRA.

When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.

14. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

# odacli describe-job -i jobId

## Cloning an Oracle ACFS Database

Create a database from an existing Oracle ACFS database using ODACLI commands or BUI.

- Cloning enables to:
- Create a database from another database without bringing down the source database
- Create multiple databases from a gold image, thus ensuring standardized mass deployments
- Optimize space utilization, by use of Oracle ACFS snapshots in cloning
- Create different types of databases, from a single source database type. For example, you
  can create single-instance databases, Oracle RAC databases, or Oracle RAC One Node
  databases from any type of source database
- Depending on the available memory and CPU cores, specify a supported database shape such as odb1s, odb2, and so on, to create any class of database from any source database.



- Create clone databases on a standby system. Since standby systems are not production systems, they are a better choice for seeding test or development environments.
- Run clone database from a database home that is different from that of the source database.
- Create clone database from a read-only source database.
- Create read-only clone database from any source database.

Following are the prerequisites to clone a database:

- Ensure that Oracle Clusterware is running on all nodes, and the source database is up and running.
- The source database must use Oracle ACFS storage.
- The source database must not be a multitenant container database (CDB).
- The source database must be opened in either read-write mode, or read-only mode if it is a primary database. A standby database can be in mounted or read-only open mode.
- The source database must not be in backup mode.
- The source database must be in archive mode.
- All data files of the source database must be in the same Oracle ACFS directory.

## Note:

For Standard Edition Oracle Database 19c or later, you cannot clone Oracle RAC or Oracle RAC One Node Database. You can only clone a single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high-availability for single-instance database.

### Cloning an Oracle ACFS Database Using Command Line Interface

1. Run the odacli clone-database command.

```
odacli clone-database --databaseUniqueName --dbname --dbshape --dbtype --sourcedbname --associated-networks --cpupool --dbhomeid --disable-ha --enable-ha --newhome --read-only --tdepassword--json
```

For cloning, you can create a new database home or select an existing database home. To create a new database home, specify the --newhome option. To use an existing database home, specify the --dbhomeid. Specify the unique name of the database, the name for the new database, the database shape, the type of database, and the source database name. For TDE-enabled database, also specify the --tdepassword option. The TDE password of the new database must be the same as the TDE password of the source database.

For information about all the command options, see the *ODACLI Command Reference* chapter.

#### Cloning an Oracle ACFS Database Using the Browser User Interface

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

Click the **Database** tab.



- 3. Click **Create Database** to display the Create Database page.
- 4. Click Clone a Database, then click Next to display the Clone Database page.
- In the Clone Database page, you can create a new database home or select an existing database home.
- To create a new database home, select the Create New DB Home and then provide the values as described in this procedure.
- To specify an existing database home, select the Source Database Name from which you want to create the database and the DB Home Name.
  - For Oracle Database 19c Standard Edition, you can only create single-instance Oracle Database, with or without high-availability. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high-availability for single-instance database. For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to enable high availability for single-instance databases.
- 8. Select the **Database Shape** (template) for your new database. The database shape you select determines the total memory allocated to the database.
- In the DB Name field, enter a name for the database.
  - The name must contain lowercase alphanumeric characters and cannot exceed 8 characters. The Oracle system identifier (SID) is always set to the database name.
- 10. Specify the DB Unique Name for the database. If the database unique name is not provided, then the name of the database is set to the database name.
- 11. Specify the Networks.
- 12. Enter the password in the SYS and PDB Admin User Password field and the Confirm Password field. For Transparent Database Encryption (TDE) enabled database, specify the TDE wallet password. The TDE password is the same as the TDE password of the source database.
- 13. Click Create.
- 14. Click Yes to confirm that you want to clone a database from the selected source database.
  - When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 15. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.
  - # odacli describe-job -i jobId

#### **Related Topics**

· odacli clone-database

Use the odacli clone-database command to clone a new database from a source database.

## Modifying a Database

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to modify a database in Oracle Database Appliance.

#### Modifying a Database Using the Browser User Interface

1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html



- Click the Database tab.
- 3. For the database that you want to modify, select **Modify** in the Actions drop down list.
- 4. In the Modify Database page, you can attach or detach associated networks and backup policy, and modify database shape and class. You can also change TDE wallet management from EXTERNAL to ODA for Oracle Database 19c and later databases.
- To modify the Database Class or Database Shape, select the new value in the drop down list.
- To attach or detach networks, modify the values in the Attach Networks and Detach Networks fields.
- To remove the associated backup policy from the database, do not select any value in the Select Back up Policy drop down list.
- 8. If you configured Oracle Flex disk group when you created the database, you can also modify the database redundancy. If the database you are modifying is an Oracle ACFS Database, then the database redundancy for all cloned Oracle ACFS databases is modified.
- You can choose to change the Backup Encryption Password. If the database has TDE enabled, then the RMAN Backup Encryption password is not used.
- Note that if the database uses Oracle Key Vault server configuration, then you cannot modify any TDE options.
- **11.** Select the **Specify TDE Option** to perform these operations:
  - Select Re-key TDE Master Encryption Key to re-key the TDE master encryption key
    of the database. Specify the Current TDE Wallet password.
  - Select Change Password for TDE Wallet and specify the Current TDE Password and the New TDE Password.
  - If the TDE wallet management is set to EXTERNAL, then you can view and select the Change TDE Wallet Management option, and set it to ODA.
- 12. For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to **Enable High Availability** for single-instance databases.
- For Standard Edition Oracle Database 19.6 or later, you can choose to Enable High Availability for single-instance databases.
- 14. Click Modify. When prompted, click Yes to confirm that you want to start the job to modify the database.

### **Modifying a Database Using ODACLI Commands**

 Use the odacli modify-database command to modify the configuration of a database, such as backup configuration, database class, database type, TDE key, or to change the TDE wallet management from EXTERNAL to ODA.

```
# odacli modify-database -s database shape -cl database class -i dbid
```

#### For example:

# odacli modify-database -i 1941d594-c777-4eca-9fce-18b778d5c153 -s odb2 -cl DSS



For example, the following command re-keys the TDE master encryption key of the database after accepting the current TDE Wallet password.

```
# odacli modify-database -n testdb -rkt
Enter TDE wallet password:
```

For more information about the odacli modify-database command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

## **Related Topics**

odacli modify-database

Use the <code>odacli modify-database</code> command to modify the configuration of a database, such as backup configuration, database class, and database type, and to change TDE wallet management from <code>EXTERNAL</code> to <code>ODA</code>.

## Moving a Database from One Oracle Home to Another

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to move a database from one Oracle home to another of the same database version.

#### Moving a Database Using the Browser User Interface

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- 2. Click the **Database** tab.
- 3. For the database that you want to modify, select **Move** in the Actions drop down list.
- 4. Select the **Destination Database Home** where you want to move the database. The destination database home must be of the same base version. Select **Ignore Missing Patches** to ignore missing patches. For high-availability environment, you can select the **Non-Rolling** check box to perform non-rolling move of the database home.
- Click Move. When prompted, click Yes to confirm that you want to start the job to move the database.

## Moving a Database Using ODACLI Commands

1. Use the odacli move-database command to move a database from one Oracle home to another home of the same database version.

```
# odacli move-database -i database ID -dh destination database home ID
```

For more information about the odacli move-database command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

### **Related Topics**

odacli move-database

Use the command odacli move-database to move a database from one Oracle home to another home of the same database version.



## **Upgrading a Database**

Use the Oracle Appliance Manager Browser User Interface to upgrade an Oracle database to a different database home version.

Before upgrading to a different database home, you must upload the Oracle RDBMS clone files to the repository and create the database home.



You cannot upgrade Oracle RAC or Oracle RAC One Node Database to a destination database home of Standard Edition Oracle Database 19c or later. You must first convert Oracle RAC Or Oracle RAC One Node Database to single-instance Oracle Database using the <code>odacli modify-database</code> command and then upgrade the single-instance Oracle Database to a destination database home of Standard Edition 19c or later.

1. Log into the Browser User Interface:

https://host name or ip-address:7093/mgmt/index.html

- Click the Database tab.
- 3. Click **Actions** next to the database that you want, then select **Upgrade**.
- **4.** Select the destination database home version from the list of available versions for the upgrade.

When upgrading single-instance Standard Edition Oracle Database 18.9 or later to Standard Edition Oracle Database 19c or later, you can also choose to enable or disable High Availability.

- When upgrading single-instance Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can also choose to enable or disable High Availability.
- You can also change the TDE wallet management option if TDE is enabled for the source database and the TDE Wallet Management is set to External. Select Change TDE Wallet Management to set the TDE Wallet Management to ODA.
- 6. Click Upgrade.

## Upgrading a Database Manually Using AutoUpgrade

Use AutoUpgrade to manually upgrade an earlier release of Oracle database on Oracle Database Appliance.

Starting with Oracle Database Appliance release 19.17, you cannot manage releases of Oracle Database earlier than 19c using ODACLI or BUI. To upgrade Oracle databases of release 12.1, 12.2, and 18c on Oracle Database Appliance, use OPatch to patch the databases or use Oracle Database Upgrade Assistant (DBUA) or AutoUpgrade to upgrade these databases manually with Oracle Database Appliance 19.17 or later.

Ensure the following:

 The Oracle Database Appliance server must be on Oracle Database Appliance release 19.19 or later.



- The repository must be updated with the target database clone version on the source and target Oracle Database Appliance systems.
- 1. Create the destination DB home for the database:

```
#odacli create-dbhome -v 19.18.0.0.230117
[root@oda1 ~]# odacli list-dbhomes
ID
                           Name
                                         DB
                 DB Edition Home
Version
Location
                                 Status
product/19.0.0.0/dbhome 1 CONFIGURED
562a7428-9ea7-4878-9005-62c9d732a12b OraDB12102 home1
12.1.0.2.220719
                          /u01/app/odaorahome/oracle/
                   EE
product/12.1.0.2/dbhome 1 CONFIGURED
```

2. Disable SSHCleanerJob and configure SSH user equivalence between both nodes in case of Oracle Database Appliance High-Availability systems.

```
[root@oda1 ~] # odacli list-schedules|grep "Name\|SSH"
ΤD
                                     Name
Description
CronExpression
                           Disabled
44ad4fe2-4893-4c7d-a61c-15845cb74aa5 SSHCleanerJob
                                                            SSH
cleaner job to clean up stale SSH keys 0 0/30 * 1/1 * ?
            false
[root@oda1 ~] # odacli modify-schedule -i 44ad4fe2-4893-4c7d-
a61c-15845cb74aa5 -d
Modify job schedule success
[root@oda1 ~]# odacli list-schedules|grep "Name\|SSH"
                                    Name
Description
CronExpression
                           Disabled
SSH
cleaner job to clean up stale SSH keys 0.0/30 * 1/1 * ?
            true
[oracle@oda1 ~]$ /u01/app/odaorahome/oracle/product/19.0.0.0/dbhome 1/
deinstall/sshUserSetup.sh -user oracle -hosts "oda1 oda2" -
noPromptPassphrase
```

3. Create the AutoUpgrade configuration file as the oracle operating system user on the first node.

```
[oracle@oda1 ~]$ cat autoupgrade.conf global.autoupg_log_dir=/u01/app/odaorabase/oracle/autoupgrade upg1.dbname=italy upg1.start_time=NOW upg1.source home=/u01/app/odaorahome/oracle/product/12.1.0.2/dbhome 1
```

```
upg1.target_home=/u01/app/odaorahome/oracle/product/19.0.0.0/dbhome_1
upg1.sid=italy11
upg1.log_dir=/u01/app/odaorabase/oracle/autoupgrade/italy
upg1.upgrade_node=localhost
upg1.target_version=19
upg1.run_utlrp=yes
upg1.timezone upg=no
```

- Change the Fast Recovery Area to Oracle ACFS if the database was created on Oracle ASM.
  - a. Verify whether the dbstorage of the database is ACFS or ASM.

```
# odacli list-databases
                               DB Name DB Type DB
       CDB Class Shape Storage Status
Version
DbHomeID
_____
5c183783-a198-413e-b96e-2c941fe1a895 italy
12.1.0.2.220719 true OLTP odb2
CONFIGURED 562a7428-9ea7-4878-9005-62c9d732a12b
8f90d26d-c17a-45e3-abbc-67c981c24a3f hun RAC
                            EE
                                  odb1 ASM
19.18.0.0.230117 true OLTP
CONFIGURED f90adcc1-f64a-41ce-b72d-154db155b1fa
[root@oda1 ~]# odacli list-dbhomes
ID
                                               DB
                              Name
Version
                 DB Edition Home
Location
_____
f90adcc1-f64a-41ce-b72d-154db155b1fa OraDB19000_home1
19.18.0.0.230117 EE /u01/app/odaorahome/oracle/
product/19.0.0.0/dbhome 1 CONFIGURED
/u01/app/odaorahome/oracle/
12.1.0.2.220719
                     EE
product/12.1.0.2/dbhome 1 CONFIGURED
[oracle@oda1 ~]$ export ORACLE HOME=/u01/app/odaorahome/oracle/product/
12.1.0.2/dbhome 1
[oracle@oda1 ~]$ export PATH=$ORACLE HOME/bin:$PATH
[oracle@oda1 ~]$ export ORACLE SID=italy1
[oracle@oda1 ~]$ sqlplus / as sysdba
SQL> show parameter db recovery file dest
ACFS:
                  TYPE VALUE
NAME
db_recovery_file_dest string /u03/app/oracle/
```

```
fast_recovery_area/
db_recovery_file_dest_size big integer 53862M

ASM:

NAME TYPE VALUE

_______
db_recovery_file_dest string
+RECO(FG$FILEGROUP_TEMPLATE_MIRROR)
db recovery file dest size big integer 200G
```

b. If the dbstorage is ASM, then create a vmstorage temporarily or use an existing one and create with a slightly larger size than db recovery file dest size.

```
[root@oda1 ~] # odacli create-vmstorage -n tempfra -r mirror -s 250G
[root@oda1 ~]# odacli list-vmstorages
                      Volume name Volume
             Disk group
                     Used Used %
device
               Size
Available Mount Point
Created
               Updated
-----
______
_____
_____
       DATA TEMPFRA /dev/asm/
250.00 GB 1.09 GB 0.44% 248.91
tempfra
tempfra-18
GB /u05/app/sharedrepo/tempfra 2023-04-18 19:05:55 CEST
2023-04-18 19:05:55 CEST
```

c. Create a folder on the vmstorage and change ownership of the folder to oracle: dba.

```
[root@odal ~]# mkdir /u05/app/sharedrepo/tempfra/italy
[root@odal ~]# chown oracle:dba /u05/app/sharedrepo/tempfra/italy
```

d. Change db recovery file dest to ACFS.

```
SQL> alter system set db_recovery_file_dest='/u05/app/sharedrepo/tempfra/italy/' scope=both;
```

**5.** Run prechecks and review the findings.

```
Number of databases [ 1 ]

Jobs finished [1]

Jobs failed [0]

Please check the summary report at:
/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/
status.html
/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/
status.log
```

## Run AutoUpgrade in fixup mode to fix issues that could prevent a successful upgrade (if any).

```
[oracle@oda1 ~]$ /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome 1/jdk/bin/java -jar /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome 1/rdbms/admin/autoupgrade.jar -config ~/autoupgrade.conf -mode
fixups
AutoUpgrade 22.4.220712 launched with default internal options
Processing config file ...
+----+
| Starting AutoUpgrade execution |
+----+
1 CDB(s) plus 2 PDB(s) will be processed
Type 'help' to list console commands
upg> Job 101 completed
----- Final Summary -----
Number of databases
                           [1]
Jobs finished
                            [1]
Jobs failed
                            [0]
Please check the summary report at:
/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/
status.html
/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/
status.log
```

#### 7. Re-run prechecks and review the findings.

```
[oracle@oda1 ~]$ /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome 1/jdk/bin/java -jar /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome 1/rdbms/admin/autoupgrade.jar -config ~/autoupgrade.conf -mode
analyze
AutoUpgrade 22.4.220712 launched with default internal options
Processing config file ...
+----+
| Starting AutoUpgrade execution |
+----+
1 CDB(s) plus 2 PDB(s) will be analyzed
Type 'help' to list console commands
upg> Job 102 completed
----- Final Summary -----
Number of databases
                           [1]
Jobs finished
                           [1]
```

Jobs failed [0]

Please check the summary report at:

/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/status.html

/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/status.log

#### 8. Upgrade the database.

[oracle@oda1 ~]\$ /u01/app/odaorahome/oracle/product/19.0.0.0/dbhome\_1/jdk/bin/java -jar /u01/app/odaorahome/oracle/product/19.0.0.0/dbhome\_1/rdbms/admin/autoupgrade.jar -config ~/autoupgrade.conf -mode deploy

AutoUpgrade 22.4.220712 launched with default internal options Processing config file ...

+----+

| Starting AutoUpgrade execution |

1 CDB(s) plus 2 PDB(s) will be processed

Type 'help' to list console commands

upg> Job 103 completed

----- Final Summary -----

Number of databases [ 1 ]

Jobs finished [1]
Jobs failed [0]
Jobs restored [0]
Jobs pending [0]

---- Drop GRP at your convenience once you consider it is no longer needed

----

Drop GRP from italy1: drop restore point AUTOUPGRADE\_9212\_ROME121020

Please check the summary report at:

/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/status.html

/u01/app/odaorabase/oracle/autoupgrade/cfgtoollogs/upgrade/auto/status/status.log

Note: once you confirmed that database was running as expected from all perspective and downgrade surely would not be needed, drop the restore point which was created by AutoUpgrade tool as the output also instructed

---- Drop GRP at your convenience once you consider it is no longer needed ----

Drop GRP from italy1: drop restore point AUTOUPGRADE 9212 ROME121020

# **9.** Enable SSHCleaner job and remove SSH user equivalence in case of Oracle Database Appliance high-availability system.

```
CronExpression
                              Disabled
   44ad4fe2-4893-4c7d-a61c-15845cb74aa5 SSHCleanerJob
                                                              SSH
  cleaner job to clean up stale SSH keys 0 0/30 * 1/1 * ?
               true
   [root@oda1 ~] # odacli modify-schedule -i 44ad4fe2-4893-4c7d-
  a61c-15845cb74aa5 -e
  Modify job schedule success
   [root@oda1 ~]# odacli list-schedules|grep "Name\|SSH"
  Description
  CronExpression
                              Disabled
   SSH
  cleaner job to clean up stale SSH keys
                                        0 0/30 * 1/1 * ?
               false
  Remove local and remote node from /home/oracle/.ssh/authorized keys files
  on both nodes as oracle OS user using "vi" command
   [oracle@oda1 ~]$ vi /home/oracle/.ssh/authorized keys
   [oracle@oda2 ~]$ vi /home/oracle/.ssh/authorized keys
  Remove all id* files under /home/oracle/.ssh as oracle OS user on both
  nodes
   [oracle@oda1 ~]$ rm /home/oracle/.ssh/id*
   [oracle@oda2 ~]$ rm /home/oracle/.ssh/id*
10. Sync up the DCS metadata of the database.
   [root@oda1 ~]# odacli list-dbhomes
  ΤD
                                                        DB
                                       Name
                          DB Edition Home
  Version
  Location
                                               Status
   _____
  f90adcc1-f64a-41ce-b72d-154db155b1fa OraDB19000_home1
19.18.0.0.230117 EE /u01/app/odaorahome/oracle/
  product/19.0.0.0/dbhome 1 CONFIGURED
```

[root@oda1 ~]# odacli list-databases

product/12.1.0.2/dbhome 1 CONFIGURED

12.1.0.2.220719

ID DB Name DB Type DB Version CDB Class Edition Shape Storage Status DB Home ID

/u01/app/odaorahome/oracle/

EE

222a1d47-24ea-4a00-82f0-20d7fe17f59e italy RAC 12.1.0.2.220719 true OLTP EE odb2 ACFS CONFIGURED 562a7428-9ea7-4878-9005-62c9d732a12b

```
[root@oda1 ~] # odacli describe-dbstorage -n italy|grep DBUnique
            DBUnique Name: rome
   [root@oda1 ~] # odacli update-registry -n db -u rome
   Job details
                     ID: fc54b821-c407-4174-8a1a-c90ba66e6cd2
             Description: Discover Components : db
                  Status: Created
                 Created: April 18, 2023 12:04:55 PM CEST
                 Message:
   [root@oda1 ~]# odacli describe-job -i fc54b821-c407-4174-8a1a-c90ba66e6cd2
   Job details
                     ID: fc54b821-c407-4174-8a1a-c90ba66e6cd2
             Description: Discover Components : db
                  Status: Success
                 Created: April 18, 2023 12:04:55 PM CEST
                 Message:
  Task Name
                                       Node Name
                                                               Start
                             End Time
  Discover DBHome
                                        oda1
                                                         April 18,
  2023 12:05:01 PM CEST April 18, 2023 12:05:04 PM CEST
                                                          Success
  Discover DBHome
                                        oda1
                                                         April 18,
  2023 12:05:04 PM CEST April 18, 2023 12:05:07 PM CEST Success
                                                       April 18, 2023
  Discover DB: rome
                                       oda1
  12:05:09 PM CEST April 18, 2023 12:05:20 PM CEST Success
  [root@oda1 ~]# odacli list-databases
  ID
                                       DB Name DB Type DB
              CDB Class Edition Shape Storage Status
  Version
  DB Home ID
   ______ _______
   222a1d47-24ea-4a00-82f0-20d7fe17f59e italy RAC
   19.18.0.0.230117 true OLTP EE odb2 ACFS
   CONFIGURED f90adcc1-f64a-41ce-b72d-154db155b1fa
11. If you edited db_recovery_file_dest in step 4, then revert the change.
   [oracle@oda1 ~]$ export ORACLE HOME=/u01/app/odaorahome/oracle/product/
   19.0.0.0/dbhome 1
   [oracle@oda1 ~] $ export PATH=$ORACLE HOME/bin:$PATH
   [oracle@oda1 ~]$ export ORACLE SID=italy1
   [oracle@oda1 ~]$ sqlplus / as sysdba
```

```
SQL> alter system set db recovery file dest='+RECO(FG$FILEGROUP TEMPLATE MIRROR)' scope=both;
```

12. Take a full backup.

```
[oracle@oda1 ~] # odacli create-backup -n italy -bt Regular-L0
```

13. Remove the temporary vmstorage.

```
[oracle@oda1 ~] # odacli delete-vmstorage -n tempfra
```

## Deleting a Database

Use the Oracle Appliance Manager Browser User Interface to delete an Oracle database.

1. Log into the Browser User Interface:

```
https://host name or ip-address:7093/mgmt/index.html
```

- 2. Click the Database tab.
- 3. Click Actions next to the database that you want, then select Delete.
- In the Confirmation dialog, select Force Delete to force the deletion and then click OK to confirm the action.

## Working with Database Homes

Use the Browser User Interface to display a list of database homes, details, and create and delete database homes.

- About Managing Multiple Oracle Homes on Oracle Database Appliance
   Create and manage one or more Oracle home directories and Oracle databases on Oracle Database Appliance.
- Viewing Database Homes

Use the Browser User Interface to display a list of database homes and database home details, including databases associated with a DB home.

Creating a Database Home

Use the Browser User Interface to create database homes in Oracle Database Appliance.

Deleting a Database Home

Use the Browser User Interface to delete an Oracle database home.

## About Managing Multiple Oracle Homes on Oracle Database Appliance

Create and manage one or more Oracle home directories and Oracle databases on Oracle Database Appliance.

Oracle home is the directory in which you install Oracle Database binaries, and from which Oracle Database runs. Oracle Database Appliance supports multiple Oracle homes, including support of different release Oracle Database homes. You can create multiple Oracle databases on a given Oracle home. Use Oracle Appliance Manager Browser User Interface to create and manage multiple Oracle homes and databases on Oracle Database Appliance. Oracle Database Appliance Manager automatically creates an Oracle Database Oracle home that is compliant with Oracle's Optimal Flexible Architecture (OFA) standards.

Check the Oracle Database Appliance Release Notes to obtain information about the specific Oracle software releases supported for your Oracle Database Appliance platform.

When you use ODACLI commands to create multiple homes on Oracle Database Appliance, the commands start the Oracle Home cloning process. In Oracle Database Appliance deployments, the user oracle is the default software installation owner.

You can use the Browser User Interface or the command-line interface to create and manage databases.

Use ODACLI commands to create, list, describe, and delete databases on Oracle Database Appliance. The odacli create-database command enables you to create a database with minimal user input. When you run this command without any additional options, the command creates a new database home (ORACLE HOME). You can create a database in an existing home by using the --dbhomeid option. To find the dbhomeid, use the odacli listdbhomes command.

Alternatively, you can use the Browser User Interface to create list, describe and delete databases and database homes. You can display a list of all Database Homes that includes the database home name. ID. version, the date and time that the database home was created and the location on the same page. You can also create and delete database homes on the Browser User Interface.



#### Caution:

Do not apply Oracle Database patches directly to Oracle Databases on Oracle Database Appliance. Only use Oracle Database Appliance patch bundles, which are tested to work across the whole software stack. If a one-off database patch is required, it may be applied to the Oracle Home. When you apply the Oracle Database Appliance patch bundle, it may cause a conflict during future patching events and you might need to roll back and then re-apply the patch.

## Viewing Database Homes

Use the Browser User Interface to display a list of database homes and database home details, including databases associated with a DB home.

Log in to the Browser User Interface:

https://ip-address:7093/mgmt/index.html

- 2. Click the **Database** tab.
- 3. Click **Database Home** on the left menu to view all database homes. The name, ID, version, location and date and time stamp of when the database home was created appears on the page.
- (Optional) Click **Actions** next to a database home entry, then **View Databases** to see the databases that are associated with the database home.

## Creating a Database Home

Use the Browser User Interface to create database homes in Oracle Database Appliance.

Before you can create a database home, the Oracle Database Appliance RDBMS Clone file image must be in the repository. Follow these steps to create a database home:

1. Log in to the Browser User Interface:

https://ip-address:7093/mgmt/index.html

- 2. Click the **Database** tab, then click **Database Home**.
- 3. Click Create Database Home.
- Select a database version from the list of available versions, then select the database edition, either Enterprise Edition or Standard Edition, per your licensing agreement.
- 5. Click **Create**. When prompted, click **Yes** to confirm that you want to start the job.

## Deleting a Database Home

Use the Browser User Interface to delete an Oracle database home.

You can delete a database home (DB Home) if it is not associated with any databases.

**1.** Log into the Browser User Interface:

https://host name or ip-address:7093/mgmt/index.html

- Click the Database tab.
- 3. Click **Database Home** on the left menu to view all database homes. The name, ID, version, location and date and time stamp of when the database home was created appears on the page.
- Click Actions next to a database home entry, then Delete, and then confirm the action to delete a database home.

# Migrating Databases

Review these topics to learn how to prepare for and migrate an entire database to your Oracle Database Appliance.

About Migrating Databases

You can migrate an entire active container database (CDB) or non-CDB database to an Oracle Database Appliance machine by using the RMAN duplicate command.

Configuring a Static Listener

Configure a static listener before you duplicate a database.

Migrating a Database

Use the RMAN Duplicate command to migrate the entire database to the appliance.

Registering a Database

Use the odacli register-database command to register the migrated database with the appliance.

## **About Migrating Databases**

You can migrate an entire active container database (CDB) or non-CDB database to an Oracle Database Appliance machine by using the RMAN duplicate command.

When using RMAN Duplicate, ensure to have network connectivity from source and target databases:

- Source database: The existing database to be migrated.
- Target database: The new database created on an Oracle Database Appliance environment.



If you do not have network connectivity between the source and the target environments, you can use the offline migration method. Offline migration uses RMAN backup sets for duplication, which does not require connectivity to the primary database.

At a high level, the procedure involves the following steps:

1. Deploy or update Oracle Database Appliance to the latest version.

Confirm that the provisioning completed successfully. On bare metal systems, use the command odacli list-jobs and the command odacli describe-job to verify the status.

- Create an instance only database from the command-line interface.
  - On bare metal systems, use the command odacli create-database with the instanceonly flag on an Oracle Database Appliance machine. The new database is the target database.

Creating an instance only database also creates the following:

- ACFS Filesystem used to store the database files
- Directory structures that are required by the database instance/rman duplicate command
- Password file for the SYS user
- 3. Configure a static listener.
- Migrate the existing database to the target database using the backup and restore operations.
- 5. Register the migrated database with the appliance.



You can only migrate and register a database of the same storage type. For example, to migrate and register an Oracle ACFS database, you must create an Oracle ACFS database and then migrate and register it. Similarly, to to migrate an Oracle ASM database, you must create an Oracle ASM database and then migrate it.

## Configuring a Static Listener

Configure a static listener before you duplicate a database.

The static listener is only required when using RMAN Duplicate command.

Perform the following steps to manually configure the listener.ora file:

- Log in as a grid user.
- 2. Navigate to /u01/app/19.0.0.0/grid/network/admin/ directory.
- 3. Edit the default listener.ora file and append the static database entry.



```
(ENVS="TNS_ADMIN=database home/network/admin"))
```

For example, the following file is edited for an 19.27.0.0.0 database named PRODDB in the example.com domain:

- 4. Save the file.
- 5. Restart the listener.

```
srvctl stop listener -l listener
srvctl start listener -l listener
```

## Migrating a Database

Use the RMAN Duplicate command to migrate the entire database to the appliance.

Before migrating the database, verify that a network connection exists between the source and destination databases.

1. Verify that the sysdba connection to the auxiliary database is working. Use the password that you defined when you created the database with the --instanceonly flag.

```
sqlplus sys/password@hostname:PORT/GLOBAL_DBNAME as sysdba << EOF
select 1 from dual;
exit;
EOF</pre>
```

The following example uses the Welcome\_12 password for myhost on port 1521 for PRODDB.example.com.

```
sqlplus sys/Welcome_12@myhost:1521/PRODDB.example.com as sysdba << EOF
select 1 from dual;
exit;
EOF</pre>
```

2. As oracle user, set the ORACLE\_HOME and ORACLE\_SID environment variables.

```
\begin{tabular}{ll} {\tt ORACLE\_HOME=path\ of\ Oracle\ Home\ against\ which\ the\ AUX\ DB\ is\ created} \\ {\tt ORACLE\ SID=} database\ unique\ name \\ \end{tabular}
```

Display a list of all database storage configured on the appliance and database storage identifiers (ID). Use the <code>odacli list-dbstorages</code> to display the storage IDs for all configured filesystems.

Display the database storage details, including the DATA, RECO and REDO locations, for each database storage ID.

For example, use the odacli describe-dbstorage command to display information about the ACFS storage for ID 9fe39332-cc1a-4b4b-8393-165524a6ef6b.

5. Duplicate the database.

Use the RMAN duplicate database command to duplicate the database.

```
rman target sys/Welcome__12@source database hostname: PORT
(Continued)
/Service Name auxiliary sys/Welcome_12@Hostname of the target
database:1521/service name
RUN {
SET NEWNAME FOR DATABASE TO NEW;
duplicate target database to PRODDB from active database
SPFILE
SET cluster_database 'false'
SET audit_file_dest '/u01/app/oracle/admin/PRODDB/adump'
SET db_create_file_dest '/u02/app/oracle/oradata/PRODDB'
SET db_create_online_log_dest_1 '/u03/app/oracle/redo'
SET db_recovery_file_dest '/u03/app/oracle/fast_recovery_area'
SET control_files '/tmp/control_PRODDB.ctl' nofilenamecheck;
}
```

## Registering a Database

Use the <code>odacli register-database</code> command to register the migrated database with the appliance.

The dbclass, dbshape, servicename and password are mandatory for registering the database. The dbclass and dbshape determine the sga\_target and pga\_target settings. The database init.ora parameters are reset as part of the odacli register-database command. Review the init.ora parameters after registration and ensure that the parameters set correctly.

Follow these steps to register a database:

1. Ensure that the sqlpatches are in the Oracle Database Appliance environment. If the patches are not in the environment, copy the \$OH/sqlpatch directories from the source database home to the \$OH in Oracle Database Appliance before executing the odacli register-database command

The odacli register-database command invokes the datapatch utility for applying the post patch SQLs. If the source database has any sqlpatches applied that are not present in the Oracle Database Appliance environment, then the datapatch will fail.

2. Register the database with Oracle Database Appliance.

```
# odacli register-database -c OLTP -s odb1 -sn example service
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
  "jobId": "317b430f-ad5f-42ae-bb07-13f053d266e2",
  "status" : "Created",
  "message" : null,
  "reports" : [],
  "createTimestamp" : "August 08, 2021 05:55:49 AM EDT",
  "description" : "Database service registration with
                   db service name: example service",
  "updatedTime" : "August 08, 2018 05:55:49 AM EDT"
# odacli describe-job -i "317b430f-ad5f-42ae-bb07-13f053d266e2"
Job details
            ID: 317b430f-ad5f-42ae-bb07-13f053d266e2
   Description: Database service registration with
             db service name: example service
        Status: Success
       Created: August 08, 2018 5:55:49 AM EDT
       Message:
Task Name
                               Start Time
restore control file
                              August 08, 2018 5:55:49 AM EDT
move spfile to right location August 08, 2018 5:56:08 AM EDT
register DB with clusterware August 08, 2018 5:56:13 AM EDT
reset db parameters August 08, 2018 5:57:05 AM EDT Running DataPatch August 08, 2018 5:57:36 AM EDT
```



(Continued)								
End Time						Status		
August	08,	2018	5:56:08	AM	EDT	Success		
August	08,	2018	5:56:13	${\tt AM}$	EDT	Success		
August	08,	2018	5:57:05	${\tt AM}$	EDT	Success		
August	08,	2018	5:57:36	${\tt AM}$	EDT	Success		
August	08,	2018	5:57:49	AM	EDT	Success		

3. Use the odacli list-databases command to view the registered database.

# About Managing Multiple Database Instances Using Instance Caging

Use instance caging to manage your system resources on Oracle Database Appliance.

Oracle Database provides a method for managing CPU allocations on a multi-CPU server that runs multiple database instances. This method is called instance caging. Instance caging uses an initialization parameter to limit the number of CPUs that an instance can use simultaneously.

Instance caging and Oracle Database Resource Manager (the Resource Manager) work together to support your desired service levels across multiple instances. Consolidation can minimize idle resources, maximize efficiency, and lower costs.

Oracle Database Appliance templates are already tuned for the size of each database instance workload. They are designed to run on a specific number of cores. Instance caging ensures that each database workload is restricted to the set of cores allocated by the template, enabling multiple databases to run concurrently with no performance degradation, up to the capacity of Oracle Database Appliance. You can select database template sizes larger than your current needs to provide for planned growth.



Oracle strongly recommends that you use the Oracle Database Appliance templates, because they implement best practices and are configured specifically for Oracle Database Appliance.

The Oracle Database Appliance Manager interface refers to the database sizing templates as database classes.

By default, instance caging is not enabled on Oracle Database Appliance. To enable instance caging, set the initialization parameter, RESOURCE\_MANAGER\_PLAN, for each database on Oracle Database Appliance. The parameter specifies the plan to be used by the Resource Manager for the current instance. Setting this parameter directs the Resource Manager to allocate core resources among databases. If a plan is not specified with this parameter, then the Resource Manager and instance caging are not enabled.

Instance caging allocation of core resources is enabled in accordance with the Oracle Database Appliance database template size that you select for each database. The <code>CPU\_COUNT</code> initialization parameter is set in the template. Use the <code>CPU\_COUNT</code> setting that matches the size of each database to consolidate, and follow the standard instructions for configuring instance caging.



# Oracle EM Express and DB Console

You can use Oracle Enterprise Manager Database Express (EM Express), or the Database Control Console (DB Console) to manage your database.

The EM Express console is available for supported releases of Oracle Database. The consoles are web-based tools for managing Oracle Databases.

The EM Express console provides the following features:

- Support for basic administrative tasks, such as storage and user management
- Comprehensive solutions for performance diagnostics and tuning
- Performance advisors in a graphic user interface
- Oracle Database utilities in a graphic user interface, such as SQL\*Loader and Oracle Recovery Manager (RMAN)

EM Express is built inside the database server and cannot perform actions outside the database.



# Managing TDE-Enabled Oracle Databases

Manage TDE-enabled Oracle databases on your Oracle Database Appliance.

- About Transparent Database Encryption (TDE) in Oracle Database Appliance
   Transparent Data Encryption (TDE) enables you to encrypt sensitive data that you store in
   tables and tablespaces.
- About Oracle Key Vault
   Oracle Key Vault is a fault-tolerant, highly available, and scalable, secure and standards compliant key and secrets management appliance, where you can store, manage, and
   share your security objects.
- Creating TDE-Enabled Databases With User Credentials
   Understand how you can create TDE-enabled databases on Oracle Database Appliance using the credentials of a user in Oracle Key Vault. This method supports creation of TDE-enabled databases on bare metal and DB systems.
- Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault Understand how you can create TDE-enabled databases on Oracle Database Appliance using endpoints and wallets already in Oracle Key Vault. This method supports creation of TDE-enabled databases on bare metal and DB systems.
- Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands
   Understand how you can manage Oracle Key Vault server configuration operations on
   Oracle Database Appliance on bare metal and DB systems.
- Managing Database Operations on TDE-enabled Databases with TDE keys stored on Oracle Key Vault
   Understand how you can manage TDE-enabled databases with TDE keys stored on Oracle Key Vault on Oracle Database Appliance on bare metal and DB systems.
- Creating a User in Oracle Key Vault Using BUI
   Create a user with Oracle Key Vault server configuration entitlement on a multi-user access enabled Oracle Database Appliance.
- Updating Oracle Key Vault Endpoints for Databases
   Understand how you can update the Oracle Key Vault client on Oracle Database Appliance
   when the Oracle Key Vault server is updated to the latest release or when certificates are
   regenerated on the Oracle Key Vault server.
- Registering TDE-enabled Databases Configured with Oracle Key Vault
   You can now register TDE-enabled databases that use Oracle Key Vault keystore but were
   not created using Oracle Database Appliance tooling. After registering these databases
   with Oracle Database Appliance, you can use Oracle Database Appliance commands for
   managing the databases.
- Restoring an Oracle Key Vault TDE Database using RMAN and Registering the Database Understand how you can register a TDE-enabled database that uses Oracle Key Vault to store TDE keys.
- Restoring a Software Keystore TDE database using RMAN and Registering the Database Understand how you can register a TDE-enabled database that uses software wallet to store TDE keys.

- Creating Oracle Key Vault Server Configuration Object Using the BUI
   Understand how you can create TDE-enabled database on Oracle Database Appliance
   with TDE keys stored in Oracle Key Vault on bare metal and DB systems using the BUI.
- Granting and Revoking Access on Oracle Key Vault Server Configuration Using BUI
   Understand how you can grant and revoke access to Oracle Key Vault server configuration
   on Oracle Database Appliance on bare metal and DB systems using BUI.
- Managing Oracle Key Vault Server Configuration Operations Using BUI
   Understand how you can manage Oracle Key Vault server configuration operations on
   Oracle Database Appliance on bare metal and DB systems.
- Migrating Tablespaces from a TDE-enabled Oracle Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore Understand how you can migrate tablespaces with the expdp/impdp transportable tablespaces feature from TDE-enabled database using software keystore to use Oracle Key Vault as keystore.
- Manually Migrating from Software Keystore to Oracle Key Vault Keystore on Oracle
   Database Appliance
   Understand how you can migrate tablespaces from software keystore to Oracle Key Vault keystore for databases created on Oracle Database Appliance
- Manual Migration and Encryption of Data into TDE-Enabled Database
   Understand how you can migrate transportable tablespaces to TDE-enabled database on Oracle Database Appliance.

# About Transparent Database Encryption (TDE) in Oracle Database Appliance

Transparent Data Encryption (TDE) enables you to encrypt sensitive data that you store in tables and tablespaces.

After the data is encrypted, this data is transparently decrypted for authorized users or applications when they access this data. TDE helps protect data stored on media (also called data at rest) in the event that the storage media or data file is stolen.

Oracle Database uses authentication, authorization, and auditing mechanisms to secure data in the database, but not in the operating system data files where data is stored. To protect these data files, Oracle Database provides Transparent Data Encryption (TDE).

TDE encrypts sensitive data stored in data files. To prevent unauthorized decryption, TDE stores the encryption keys in a security module external to the database, called a keystore.

Oracle Database Appliance enables creation and lifecycle management of TDE-enabled databases with ODACLI commands or through the BUI. You can create TDE-enabled single-instance, Oracle RAC or Oracle RAC One Node databases with ODACLI commands or BUI. You can also change TDE passwords and re-key the database using ODACLI commands or BUI. When you use software keystore, you can also backup the TDE wallets along with the database. You can also recover the TDE software wallet and restore the database as a new copy with the odacli irestore-database command.

Based on the keystore used, TDE on Oracle Database Appliance can be configured as any of the following types:

 TDE keys stored in software keystore: In this type of TDE method, the TDE keys are stored in a wallet on Oracle Database Appliance.



- TDE keys stored in a wallet on Oracle Key Vault: In this type of TDE method, the TDE keys are stored in a wallet on Oracle Key Vault. Note that if you do not want to provide the credentials of users in Oracle Key Vault, you can use endpoints already created on Oracle Key Vault, and directly specify the endpoints when you create or restore the database on Oracle Database Appliance. Otherwise, you can create Oracle Key Vault server configuration on Oracle Database Appliance with the Oracle Key Vault user details and use these user credentials to create and restore the database on Oracle Database Appliance. You can configure TDE keys with Oracle Key Vault keystore in one of the following ways:
  - Using credentials of a user in Oracle Key Vault: In this configuration, the TDE keys are stored in a wallet on Oracle Key Vault and accessed through Oracle Key Vault user credentials.
  - Using endpoints and wallet already created on Oracle Key Vault: In this
    configuration, the TDE keys are stored in a wallet on Oracle Key Vault and accessed
    through Oracle Key Vault end points.

## Note:

To enable Transparent Data Encryption (TDE), you must deploy Oracle Database Enterprise Edition with Oracle Database 19c or later. Transparent Data Encryption (TDE) is an Advanced Security Option (ASO) available with Oracle Database Enterprise Edition.

## See Also:

Using Transparent Data Encryption in the Oracle Database Advanced Security Guide

#### Caution:

When you enable TDE on databases, either with software keystore or with Oracle Key Vault keystore using endpoints and wallet already created on Oracle Key Vault, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, results in not being able to access the database tables.

# About Oracle Key Vault

Oracle Key Vault is a fault-tolerant, highly available, and scalable, secure and standards-compliant key and secrets management appliance, where you can store, manage, and share your security objects.

For detailed information about Oracle Key Vault, see the Oracle Key Vault documentation at https://docs.oracle.com/en/database/oracle/key-vault/21.10/okvag/okv\_intro.html#GUID-1C565FBE-BC21-4E76-B2A6-88A17F6649D7.



# Terminology used when storing TDE keys on Oracle Key Vault for TDE-enabled databases on Oracle Database Appliance

Understand these concepts about using Oracle Key Vault server with databases on Oracle Database Appliance:

- Role separation: Oracle recommends that you assign different users for database administration and TDE key operations. You must not provide the user who has the database administration role with the credentials of the Oracle Key Vault server. This ensures the database user with data file access cannot open the database without knowing TDE wallet passwords. You can set up this role separation by enabling multi-user access feature on Oracle Database Appliance. For more information about configuring multi-user access, see the topic *Implementing Multi-User Access on Oracle Database Appliance*. On Oracle Database Appliance, the credentials of Oracle Key Vault user need not be shared with the ODA-DB user. The ODA-Adminstrator grants the resource, that is, the Oracle Key Vault server configuration, access to the intended DB user and the DB user can use the Oracle Key Vault server configuration when creating the TDE-enabled database to store the TDE keys on the Oracle Key Vault server.
- Oracle Key Vault server configuration: The term refers to an Oracle Database Appliance resource that stores the metadata of the Oracle Key Vault. The Oracle Key Vault server configuration has details such as the name of the user created to manage the TDE keys on the Oracle Key Vault server and the IP address or host name of the Oracle Key Vault server. The Oracle Key Vault server configuration on Oracle Database Appliance is identified by a name, to differentiate Oracle Key Vault server configurations. This name is unique within the Oracle Database Appliance system and the value is case-sensitive. When creating the Oracle Key Vault server configuration, you must provide the credentials of the user on Oracle Key Vault server. It is recommended that this user is a least privileged user with only Create Endpoint privilege. The user name and password you specify when you create the Oracle Key vault server configuration correspond to the user on the Oracle Key vault server. The password you provide during creation of this object is not stored on Oracle Database Appliance. The Oracle Key Vault client auto-login wallet is created using these credentials and all requests to the Oracle Key Vault server use this client auto-login wallet. The database automatically reads the auto-login wallet for the required ADMINISTER KEY MANAGEMENT SQL commands.
- A user with ODA-DB role: A user with ODA-DB role in a multi-user access-enabled or multi-user access-enabled passwordless environment can create and maintain the database. This user, is granted the ODA-DB role and is entitled to perform all database related operations such as creation, patching, modification, deletion, backup, and recovery. These operations are restricted to the database that belongs to the user. For more details, see the chapter Implementing Multi-User Access on Oracle Database Appliance in this guide.
- Oracle Key Vault user: The Oracle Key Vault user name and password that you provide
  when you create the Oracle Key Vault server configuration must correspond to an existing
  user and the password on the Oracle Key Vault server. Otherwise, there can be failures in
  accessing Oracle Key Vault. This user can also perform create, delete, describe, and list
  operations on the Oracle Key Vault server configuration objects that they create.
- Virtual Wallet: A virtual wallet, created on Oracle Key Vault, is a container for objects that
  must be stored securely. For TDE-enabled databases on Oracle Database Appliance that
  use Oracle Key Vault as the keystore, the TDE keys of the database are stored inside this
  virtual wallet.



# Requirements for configuring TDE-enabled databases with keys stored in Oracle Key Vault

- The Oracle Key Vault server version must be 21.10.0 or later.
- It is recommended that you set up Network Time Protocol on Oracle Database Appliance.
  The database operations interacting with Oracle Key Vault fails if the clock on Oracle
  Database Appliance and Oracle Key Vault server are not synchronized. You must ensure
  that the time is consistent across the servers or use Network Time Protocol on Oracle
  Database Appliance.
- You cannot create a starter database with TDE configured using Oracle Key Vault when you provision Oracle Database Appliance on bare metal systems and select to create a starter database. This is because creation of TDE database that uses Oracle Key Vault to store TDE keys requires Oracle Key Vault server configuration to already exist. To create a database with TDE configured using Oracle Key Vault on DB system, first create a DB system without a starter database and then create the database with TDE configured using Oracle Key Vault as described in the topic Creating TDE-Enabled Database on Oracle Database Appliance Using Oracle Key Vault.
- For configuring TDE-enabled databases with keys stored in Oracle Key Vault with the credentials of a user in Oracle Key Vault, on multi-user access-enabled systems, you must create a new user with the <code>ODA-OKVCONFIGADMIN</code> role which has the entitlements <code>ODA-OKVCONFIGVIEWMGMT</code> and <code>ODA-OKVCONFIGMODIFYMGMT</code>. The <code>ODA-OKVCONFIGVIEWMGMT</code> entitlement enables you to perform operations such as Describe and List on the Oracle Key Vault server configuration object. The <code>ODA-OKVCONFIGMODIFYMGMT</code> entitlement enables you to perform operations such as Create and Delete on the Oracle Key Vault server configuration object. The <code>ODA-OKVCONFIGVIEWMGMT</code> entitlement is included in the <code>ODA-DB</code> role, and any DB user with the <code>ODA-DB</code> role can list and describe the Oracle Key Vault server configuration object and select the required Oracle Key Vault server configuration object to create the database. For non-multi user access-enabled systems, there is no need to create a new user.

## **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented on Oracle Database Appliance, its
   advantages and restrictions and the associated life cycle management changes for your
   appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.
- ODACLI Command Changes with Multi-User Access on Oracle Database Appliance Understand the ODACLI command changes when you enable multi-user access.

# Creating TDE-Enabled Databases With User Credentials

Understand how you can create TDE-enabled databases on Oracle Database Appliance using the credentials of a user in Oracle Key Vault. This method supports creation of TDE-enabled databases on bare metal and DB systems.

Follow these steps to create a TDE-enabled database with TDE keys stored on Oracle Key Vault on Oracle Database Appliance bare metal and DB systems:



# Step 1: Create the user on Oracle Database Appliance corresponding to the user on Oracle Key Vault. This step applies to multi-user access-enabled systems only.

If the user with the <code>ODA-OKVCONFIGADMIN</code> role does not exist, or if you want to assign a different user for the database you are creating, then create the user.

**1.** Create a new user with the ODA-OKVCONFIGADMIN role. For example:

```
odacli create-user -u okvuser1 -r ODA-OKVCONFIGADMIN
```

The user is created and assigned a temporary password.

- 2. After the user is created successfully, the okvuser1 can log into the appliance with the temporary password.
- 3. The okvuser1 is in the Inactive state. If the appliance is configured with multi-user access enabled, then activate the user with the following command. Note that if the appliance is configured with passwordless multi-user access, then you do not need to activate the user. For more information about configuring multi-user access, the topic Implementing Multi-User Access on Oracle Database Appliance.

```
odacli activate-user
```

You are prompted to change the password. Enter the temporary password, the new password, and confirm the new password.

4. Use the new password to connect by SSH into the appliance and run ODACLI commands or connect to the Browser User Interface.

#### Step 2: Create an Oracle Key Vault server configuration

- 1. The Oracle Key Vault user that creates the Oracle Key Vault server configuration must be a user with the least privilege of Create Endpoint on the Oracle Key Vault server.
- 2. For multi-user access-enabled systems, log in as the user with the <code>ODA-OKVCONFIGADMIN</code> role, for example, the <code>okvuser1</code>. For non-multi user access enabled systems, log in as the root user.
- 3. The Oracle Key Vault password prompt displays twice, to accept and confirm the Oracle Key Vault password. Specify the password of the Oracle Key Vault user on the Oracle Key Vault server, which enables the user to log into the Oracle Key Vault server. Specify the user name with the -u option in the odacli create-okvserverconfig command. The name of the Oracle Key Vault server configuration is case-sensitive and no two Oracle Key Vault server configurations can have same name on Oracle Database Appliance. The length of the Oracle Key Vault server configuration cannot exceed 128 characters.

```
odacli create-okvserverconfig -n okvobj1 -u epokvusr1 -ip xxx.xx.xxx.xxx

Enter OKV user password:

Retype OKV user password:

Job details

ID: 730d2469-6efa-4ed1-8386-513e97c866ea

Description: Create OKV Server Config: okvobj1

Status: Created

Created: October 20, 2024 11:28:39 AM PDT

Message: Create OKV Server Config.
```



Task Name Start Time End Time Status odacli describe-job -i 730d2469-6efa-4ed1-8386-513e97c866ea Job details ID: 730d2469-6efa-4ed1-8386-513e97c866ea Description: Create OKV Server Config: okvobj1 Status: Success Created: October 20, 2024 11:28:39 AM PDT Message: Create OKV Server Config. Task Name Node Name Start Time End Time Status ----- -----OKV Password Store creation n1 October 20, 2024 11:28:39 AM PDT October 20, 2024 11:29:04 AM PDT Success October Success

The command creates an Oracle Key Vault server configuration okvobj1 for the Oracle Key Vault server user <code>epokvusr1</code> on the specified server.

n1

n1

October 20, 2024 11:28:45 AM PDT

# Step 3: Share Oracle Key Vault server configuration for multi user access-enabled systems only

20, 2024 11:28:45 AM PDT October 20, 2024 11:28:47 AM PDT

1. For multi-user access-enabled systems, the DB user who creates the database using the Oracle Key Vault server configuration must have shared access to the Oracle Key Vault server configuration created by the Oracle Key Vault user. The odaadmin user must share the Oracle Key Vault server configuration with the DB user using the odacli grant-resource-access command. The DB user can then create the database with the Oracle Key Vault server configuration. An example where the odaadmin user shares the okvobj1 resource with DB user dbusr1 is as follows:

su odaadmin

Edit of OKV REST package

Success

Success

20, 2024 11:28:44 AM PDT

Generate OKV client wallets

odacli grant-resource-access -ri d017d35a-0757-460a-98f0-9f8d0944c872 -u



October

October

dbusr1

Shared access of resource granted to user successfully...

To get the resource ID of the Oracle Key Vault server configuration, run the odacli listokvserverconfigs command. For example:

```
odacli list-okvserverconfigs
```

ID		Name	User
Name	IP address	Host Name	Description
d017d35a-07	57-460a-98f0-9f8d09	944c872 okvobj1	
epadmin	XXX.XX.XX.XX	xx Null	OKV Server for
sales datab	ases		

#### Step 4: Create the database

For multi-user access-enabled systems, log in as the DB user and use the odacli createdatabase command with the options -t, -osc and -kt to create a database with TDE configured using Oracle Key Vault server. For non-multi user access-enabled systems, you can run the same command as root user.

Determine the Oracle Key Vault server you want to store the TDE keys on and provide the value with the -osc option in the odacli create-database command. The DB user can select the required Oracle Key Vault server configuration from the list of Oracle Key Vault server configurations displayed with the odacli list-okvserverconfigs command. For non-multi user access enabled systems, run the odacli list-okvserverconfigs command as root user.

- The option -t indicates that the database must be configured with TDE, using the Oracle Key Vault credentials represented by the Oracle Key Vault server configuration specified using the -osc option.
- The option -kt specifies the the type of kesytore used in TDE configuration. The value of the keystore can be either software or okv. The default is software. The values are caseinsensitive. The OKVServerConfigName attribute of the database is set to the name of the Oracle Key Vault server configuration specified in the create database request.
- The password for TDE wallet is randomly generated by the system, and you do not need to specify it.



#### WARNING:

The password is stored in a wallet on Oracle Key Vault. Loss of that wallet results in not being able to access the database tables. So, do not delete the wallet on Oracle Key Vault.

An example to create a database kokvdb2 which uses Oracle Key Vault credentials represented by Oracle Key Vault server configuration kovobj1 is as follows:

```
odacli create-database -n kokvdb2 -t -kt OKV -osc kovobj1
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
```



```
Job details
                   ID: 94a51f1a-2d4c-4eac-b0c2-7871d88c0df8
           Description: Database service creation with DB name: kokvdb2
               Status: Created
               Created: July 15, 2024 3:00:53 PM CST
               Message:
Task Name
                                      Start
Time
                                End Time
Status
 odacli describe-job -i 94a51f1a-2d4c-4eac-b0c2-7871d88c0df8
Job details
                   ID: 94a51f1a-2d4c-4eac-b0c2-7871d88c0df8
           Description: Database service creation with DB name: kokvdb2
               Status: Success
               Created: July 15, 2024 3:00:53 PM CST
               Message:
Task Name
                                      Start
Time
                                End Time
Validating dbHome available space July 15, 2024 3:01:19 PM
CST
              July 15, 2024 3:01:19 PM CST
TDE configuration using OKV
                                     July 15, 2024 3:17:37 PM
              July 15, 2024 3:20:36 PM CST
CST
TDE Wallet directory creation July 15, 2024 3:17:38 PM
              July 15, 2024 3:17:46 PM CST
Setting Database parameter for OKV July 15, 2024 3:17:46 PM
CST
              July 15, 2024 3:19:07 PM CST
Auto login TDE Wallet creation
                               July 15, 2024 3:19:07 PM
              July 15, 2024 3:19:09 PM CST
OKV TDE Wallet creation
                                     July 15, 2024 3:19:09 PM
              July 15, 2024 3:19:12 PM CST
OKV Endpoint configuration
                                      July 15, 2024 3:19:12 PM
              July 15, 2024 3:19:43 PM CST
CST
Setting TDE Master Encryption Key July 15, 2024 3:19:43 PM
              July 15, 2024 3:20:13 PM CST
Create Users tablespace
                                     July 15, 2024 3:20:36 PM
              July 15, 2024 3:20:39 PM CST
Clear all listeners from Database July 15, 2024 3:20:39 PM
```

July 15, 2024 3:20:40 PM CST

Copy Pwfile to Shared Storage July 15, 2024 3:20:43 PM CST July 15, 2024 3:20:47 PM CST Success

On successful database creation, the Oracle Key Vault client software is installed in the  $/\text{etc/OKV}/db\_unique\_name/okv$  directory. The ownership of all the files is set to  $db\_user$ :oinstall and the permission is set to 750. The autologin TDE wallets are created in the  $/\text{etc/OKV}/db\_unique\_name/tde$  and  $/\text{etc/OKV}/db\_unique\_name/tde$ . The ownership of these directories is recursively set to  $db\_user$ :oinstall and the permission to 750.

### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented on Oracle Database Appliance, its
   advantages and restrictions and the associated life cycle management changes for your
   appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

# Creating TDE-Enabled Databases Using Oracle Key Vault With Endpoints in Oracle Key Vault

Understand how you can create TDE-enabled databases on Oracle Database Appliance using endpoints and wallets already in Oracle Key Vault. This method supports creation of TDE-enabled databases on bare metal and DB systems.

Note:

In this Oracle Database Appliance release, this feature is supported on Oracle RAC and Oracle single-instance databases only. This feature is not available with Oracle RAC One Node databases and Oracle single-instance database with high-availability enabled.

To create a TDE-enabled database using Oracle Key Vault with endpoints in Oracle Key Vault, you must complete the following tasks:

- 1. Log into Oracle Key Vault and create virtual TDE wallet corresponding to a database.
- 2. Create endpoints corresponding to each instance. For a single instance database, you must create one endpoint and for Oracle RAC database, create two endpoints.
- 3. Set the default wallet for the created endpoint.
- 4. Download the <code>okvclient.jar</code> file corresponding to each endpoint. For single instance database, download one file, and for Oracle RAC database, there are two files available for download, one per instance..

### Step 1: Obtain the okvolient.jar file using Oracle Key Vault REST commands

You can create the <code>okvclient.jar</code> file either through Oracle Key Vault REST commands or Oracle Key Vault server user interface.

To obtain the <code>okvclient.jar</code> file using Oracle Key Vault REST commands, log in as the <code>oracle</code> user, and then follow these steps:

1. Create working directories, such as /tmp/work and /tmp/work/client\_wallet. Navigate to the /tmp/work directory and download and unzip the RESTful Service utility from the Oracle Key Vault server. When you unzip the utility, you can observer three directories bin, lib, and conf.

2. Unzip okvrestclipackage.zip. Edit conf/okvrestcli.ini and add the Oracle Key Vault server IP address, user name, and path to the directory where the client autologin wallets are created. In the following example, /tmp/work/client\_wallet is the directory path where client autologin wallets are created.

```
#Provide absolute path for log_property, okv_client_config properties
        [Default]
        log_property=./conf/okvrestcli_logging.properties
        server=okv_server_ip
        okv_client_config=./conf/okvclient.ora
        user=okv_user
        client_wallet=/tmp/work/client_wallet
```

3. Edit the bin/okv file and uncomment the line export OKV\_RESTCLI\_CONFIG=\$OKV\_RESTCLI\_DIR/conf/okvrestcli.ini and also set the JAVA HOME variable:

```
#!/bin/bash
   export OKV_RESTCLI_DIR=$(dirname "${0}")/..
   export OKV_RESTCLI_CONFIG=$OKV_RESTCLI_DIR/conf/okvrestcli.ini
   export JAVA_HOME=/opt/oracle/dcs/java/1.8.0_xxx
   if [ -z "$JAVA_HOME" ]
   then
      echo "JAVA_HOME environment variable is not set."
      exit 1
   fi

if [ -z "$OKV_RESTCLI_CONFIG" ]
   then
      echo "OKV_RESTCLI_CONFIG environment variable is not set."
      exit 1
   fi

export OKV_RESTCLI_JAR=$OKV_RESTCLI_DIR/lib/okvrestcli.jar
   $JAVA_HOME/bin/java -jar $OKV_RESTCLI_JAR "$@"
```

Generate client auto login wallets. You are prompted to provide the Oracle Key Vault user password.

```
/tmp/work/bin/okv admin client-wallet add --client-wallet /tmp/work/
client_wallet --wallet-user okv_user
Password:
```

5. Create the TDE wallet corresponding to the database, if the TDE wallet is not already created using the Oracle Key Vault user interface.

```
/tmp/work/bin/okv manage-access wallet create --wallet wallet_name --
unique FALSE
```

Create the endpoint corresponding to the wallet. For Oracle RAC database, create two endpoints. Create the endpoint only if it is not already created using the Oracle Key Vault user interface.

```
/tmp/work/bin/okv admin endpoint create --endpoint endpoint_name --type ORACLE DB --platform LINUX64 --strict-ip-check TRUE
```

7. Set the default wallet for the endpoint. For Oracle RAC database, the default wallet for both endpoints must be the same TDE wallet. Set the default wallet only if it is not already set using the Oracle Key Vault user interface.

```
/tmp/work/bin/okv manage-access wallet set-default --wallet wallet_name --
endpoint endpoint name
```

8. Download the <code>okvclient.jar</code> command. For Oracle RAC database, you must download the <code>okvclient.jar</code> corresponding to both the endpoints. After the download is complete, copy the <code>okvclient.jar</code> corresponding to the remote instance to the remote node.

```
/tmp/work/bin/okv admin endpoint download --endpoint <endpoint_name> --
location <location>
```

9. While downloading the endpoint, if the Endpoint token is already consumed message is observed as below, then re-enroll the endpoint.

```
/tmp/work/bin/okv admin endpoint download --endpoint endpoint_name --
location location
/tmp/work/log/okv0.log.0 (Permission denied)
{
    "result" : "Failure",
    "message" : "Endpoint token is already consumed"
}
/tmp/work/bin/okv admin endpoint re-enroll --endpoint <endpoint_name>
/tmp/work/log/okv0.log.0 (Permission denied)
{
    "result" : "Success"
}
```

#### Step 2: Create the database

1. For multi user access-enabled and multi user access passwordless systems, log in as the DB user and run the odacli create-database command. For non-multi user access-enabled systems, log in as the root user and run the odacli create-database command. The option --enable-tde/-t indicates that the database must be configured with TDE. The option --keystore-type/-kt specifies the the type of keystore to use in TDE configuration. The option --okvclient-path/-ocp specifies the absolute path to the okvclient.jar file corresponding to the endpoint.

For single-instance database, the option <code>--okvclient-path/-ocp</code> takes only one value. For Oracle RAC database, the option <code>--okvclient-path/-ocp</code> takes two values corresponding to each instance. The values must be comma-separated. The first path corresponds to the local instance whereas the second path corresponds to the remote instance. You are prompted to provide the TDE password.

On successful database creation, the Oracle Key Vault client software is installed in the  $/\text{etc/OKV}/db\_unique\_name/okv$  directory. The local auto login TDE wallets are created in the  $/\text{etc/OKV}/db\_unique\_name/tde$  directory. The okvclient.jar file in the source location is deleted.

An example to create a single-instance database named <code>okvdb</code> without using the Oracle Key Vault server configuration object, is as follows:

```
odacli create-database -n okvdb -y SI -t -kt OKV -ocp /tmp/okvclient.jar
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
Retype TDE wallet password:
Job details
                   ID: 94a51f1a-2d4c-4eac-b0c2-7871d88c0df8
           Description: Database service creation with DB name: okvdb
               Status: Created
              Created: July 15, 2024 3:00:53 PM CST
              Message:
Task Name
                                     Start
Time
                                End
odacli describe-job -i 94a51f1a-2d4c-4eac-b0c2-7871d88c0df8
Job details
______
                   ID: 94a51f1a-2d4c-4eac-b0c2-7871d88c0df8
           Description: Database service creation with DB name: okvdb
               Status: Success
              Created: July 15, 2024 3:00:53 PM CST
              Message:
```

```
Task Name
                                 Start
Time
                             End
Time
                              Status
Validating dbHome available space
                                July 15, 2024 3:01:19 PM
     July 15, 2024 3:01:19 PM CST
TDE configuration using OKV
                                July 15, 2024 3:17:37 PM
            July 15, 2024 3:20:36 PM CST
CST
TDE Wallet directory creation July 15, 2024 3:17:38 PM
CST
            July 15, 2024 3:17:46 PM CST
Setting Database parameter for OKV July 15, 2024 3:17:46 PM
            July 15, 2024 3:19:07 PM CST
Auto login TDE Wallet creation July 15, 2024 3:19:07 PM
            July 15, 2024 3:19:09 PM CST
Installing the OKV client software July 15, 2024 3:19:09 PM
            July 15, 2024 3:19:42 PM CST
                            July 15, 2024 3:19:43 PM
Setting TDE Master Encryption Key
            July 15, 2024 3:20:13 PM CST
Create Users tablespace
                                July 15, 2024 3:20:36 PM
            July 15, 2024 3:20:39 PM CST
                                              Success
Clear all listeners from Database July 15, 2024 3:20:39 PM
            July 15, 2024 3:20:40 PM CST Success
Copy Pwfile to Shared Storage
                         July 15, 2024 3:20:43 PM
CST
             July 15, 2024 3:20:47 PM CST
                                              Success
```

An example to create an Oracle RAC database named <code>okvdbrac</code> without using the Oracle Key Vault server configuration object, is as follows. Specify the path to the <code>okvclient.jar</code> file for the local database instance first, followed by the path to the <code>okvclient.jar</code> file for the remote database instance in the request.

```
odacli create-database -n okvdb -y RAC -t -kt OKV -ocp /tmp/dir1/
okvclient.jar,/tmp/dir2/okvclient.jar
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
Retype TDE wallet password:
Job details
                     ID: cb611ec2-ff87-44f9-a79b-3ab1a290644f
            Description: Database service creation with DB name: okvdbrac
                 Status: Created
                Created: October 20, 2024 6:13:28 AM PDT
                Message:
Task Name
                                         Start
Time
                                   End
                                     Status
```

odacli describe-job -i cb611ec2-ff87-44f9-a79b-3ab1a290644f

Job details

\_\_\_\_\_

ID: cb611ec2-ff87-44f9-a79b-3ab1a290644f

Description: Database service creation with DB name: okvdbrac

Status: Success

Created: October 20, 2024 6:13:28 AM PDT

Message:	21 0.10.20 111 151	
Task Name Time End Time Sta		Start
Validating dbHome available space 20, 2024 6:13:49 AM PDT October Success	n1	October
Validating dbHome available space 20, 2024 6:13:49 AM PDT October Success		October
Setting up SSH equivalence	n1 20, 2024 6:13:54 AM PDT	October
Setting up SSH equivalence 20, 2024 6:13:54 AM PDT October	n1 20, 2024 6:13:57 AM PDT	October
Success Creating ACFS database home 20, 2024 6:13:58 AM PDT October	n1 20, 2024 6:13:58 AM PDT	October
Success Validating dbHome available space 20, 2024 6:13:59 AM PDT October Success		October
. Setting TDE Master Encryption Key 20, 2024 6:34:15 AM PDT October Success		October
Create Users tablespace 20, 2024 6:34:57 AM PDT October Success	n1 20, 2024 6:34:59 AM PDT	October
Clear all listeners from Database 20, 2024 6:35:00 AM PDT October Success		October
Deleting OKV Client Software Jar 20, 2024 6:35:03 AM PDT October Success	n1 20, 2024 6:35:04 AM PDT	October
Deleting OKV Client Software Jar	n2 20, 2024 6:35:04 AM PDT	October
Encrypt all Tablespaces	n1	October



20, 2024 6:35:04 AM PDT Success

October 20, 2024 6:36:15 AM PDT

#### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented on Oracle Database Appliance, its
   advantages and restrictions and the associated life cycle management changes for your
   appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

# Managing Oracle Key Vault Server Configuration Operations Using ODACLI Commands

Understand how you can manage Oracle Key Vault server configuration operations on Oracle Database Appliance on bare metal and DB systems.

You can create, list, delete, and describe Oracle Key Vault server configuration on Oracle Database Appliance bare metal and DB systems. Note that you run these operations only when you create TDE-enabled databases that allow Oracle Database Appliance to store the user credentials of the Oracle Key Vault user, described in the *Creating TDE-Enabled Databases With User Credentials* topic.

#### **Listing Oracle Key Vault server configurations:**

Use the odacli list-okvserverconfigs command to view all the Oracle Key Vault server configurations.

odacli list-okvserverconfigs

ID			Name	Us	er	
Name	IP address	Host N	ame	Description	L	
d017d25a_075	57-460a-98f0-9f8d0	1011077	okvobj1			
	7-460a-9610-91600		2			
epadmin	XXX.XX.XX.X	XXX N	ull	OKV s	erver	for
Sales databa	ise					
b6336173-666	5b-4d81-88bd-5ae38	34419114	okvobj2			
epadmin2	XXX.XX.XX.X	XXX N	ull	OKV s	erver	for
Sales databa	150					

#### Describing an Oracle Key Vault server configuration:

Use the odacli describe-okvserverconfig command to view a Oracle Key Vault server configuration.

#### For example:

```
odacli describe-okvserverconfig -n dokvobj1

OKV Server Config details

ID: c196bd0a-4a42-43a6-8578-9929ceb28525

Name: dokvobj1
```



UserName: user1

IP Address: xxx.xxx.xx.xx

Host Name:

Description: OKV server config for Sales CreatedTime: October 4, 2024 9:41:43 AM HKT UpdatedTime: October 4, 2024 9:42:10 AM HKT

State: CONFIGURED

### **Deleting Oracle Key Vault server configuration:**

Use the <code>odacli delete-okvserverconfig</code> command to delete Oracle Key Vault server configuration. You can delete the Oracle Key Vault server configuration only if all databases that used the Oracle Key Vault server configuration are already deleted.

odacli delete-okvserverconfig -n okvobj1 Job details ID: 7446c9b4-a927-431f-8e0b-099eec8116e7 Description: Delete OKV Server Config: dokvobj1 Status: Running Created: October 4, 2024 9:44:29 AM HKT Message: Delete OKV Server Config Task Name Start Time End Time Status \_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_ OKV Password Store deletion October 4, 2024 9:44:29 AM НКТ Running odacli describe-job -i 7446c9b4-a927-431f-8e0b-099eec8116e7 Job details ID: 7446c9b4-a927-431f-8e0b-099eec8116e7 Description: Delete OKV Server Config: dokvobj1 Status: Success Created: October 4, 2024 9:44:29 AM HKT Message: Delete OKV Server Config Task Name Node Name Start Time End Time Status \_\_\_\_\_\_\_\_\_\_\_\_ OKV Password Store deletion October 4, oda1 2024 9:44:29 AM HKT October 4, 2024 9:44:45 AM HKT Success OKV Server Config directory deletion odal October 4, 2024 9:44:45 AM HKT October 4, 2024 9:44:45 AM HKT Success



OKV Server Config deletion

oda1 2024 9:44:45 AM HKT October 4, 2024 9:44:46 AM HKT October 4, Success

### **Related Topics**

odacli Multi-User Access Commands Use odacli commands to enable multi-user access for the appliance.

## Managing Database Operations on TDE-enabled Databases with TDE keys stored on Oracle Key Vault

Understand how you can manage TDE-enabled databases with TDE keys stored on Oracle Key Vault on Oracle Database Appliance on bare metal and DB systems.

You can re-key TDE master encryption key or restore, delete, perform database backup and recovery, and configure Oracle Data Guard on TDE-enabled database on Oracle Key Vault on Oracle Database Appliance bare metal and DB systems.

- Changing the Password for TDE-enabled Databases Understand how you can change the password of TDE-enabled database on Oracle Database Appliance on bare metal and DB systems, that uses Oracle Key Vault to store TDE keys.
- Re-keying TDE Master Encryption Key for TDE-Enabled Databases Understand how you can re-key TDE master encryption key of TDE-enabled database on Oracle Database Appliance on bare metal and DB systems, that uses Oracle Key Vault to store TDE keys.
- Performing Backup and Recovery of TDE-enabled Databases Understand how you can back up and recover TDE-enabled database with TDE keys stored on Oracle Key Vault on Oracle Database Appliance on bare metal and DB systems.
- Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials Understand how you can restore TDE-enabled databases using database backups, on Oracle Database Appliance bare metal and DB systems, with credentials of a user on Oracle Key Vault.
- Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in Oracle **Key Vault** 
  - Understand how you can restore TDE-enabled databases on Oracle Database Appliance using the endpoints and wallets created manually on Oracle Key Vault. This method supports creation of TDE-enabled databases on bare metal and DB systems.
- **Deleting TDE-enabled Databases** Understand how you can delete a TDE-enabled database on Oracle Database Appliance on bare metal and DB systems, that uses Oracle Key Vault to store TDE keys.

### Changing the Password for TDE-enabled Databases

Understand how you can change the password of TDE-enabled database on Oracle Database Appliance on bare metal and DB systems, that uses Oracle Key Vault to store TDE keys.

Changing the password of TDE-enabled databases on Oracle Database Appliance that use the credentials of a user in Oracle Key Vault

Use the odacli modify-database command with the option --change-tde-password, -ctp for TDE-enabled databases on Oracle Database Appliance that use the credentials of a user in



Oracle Key Vault. The new password is randomly generated and stored securely on the Oracle Key Vault server replacing the old TDE password. For example:

odacli modify-database -n db3 -ctp Job details

-----

ID: b6d0f4c2-976a-42b3-a32d-6cfc7848375d

Description: Modify database: db3

Status: Success

Created: February 24, 2025 08:50:08 UTC

Message: Modify database

Task Name Node Name Start Time End Time Status \_\_\_\_\_\_ \_\_\_\_\_ Re-enroll and Provision of Endpoint n1 February 24, 2025 February 24, 2025 08:50:30 UTC 08:50:14 UTC Success Save the new TDE password using a February 24, 2025 n1 08:50:30 UTC February 24, 2025 08:50:35 UTC Success temporary custom attribute on OKV TDE Wallet closure February 24, 2025 08:50:35 UTC February 24, 2025 08:50:43 UTC Success TDE Wallet closure February 24, 2025 n2 08:50:43 UTC February 24, 2025 08:50:45 UTC Success Change the TDE password in local wallet n1 February 24, 2025 08:50:45 UTC February 24, 2025 08:51:06 UTC Auto login TDE Wallet creation n1 February 24, 2025 08:51:06 UTC February 24, 2025 08:51:12 UTC Re-enroll and Provision of Endpoint n2 February 24, 2025 08:51:12 UTC February 24, 2025 08:51:29 UTC Success Change the TDE password in local wallet n2 February 24, 2025 08:51:29 UTC February 24, 2025 08:51:49 UTC Success Auto login TDE Wallet creation n1 February 24, 2025 08:51:49 UTC February 24, 2025 08:51:54 UTC Save new TDE password on OKV February 24, 2025 n2 08:51:54 UTC February 24, 2025 08:52:04 UTC Success Delete the temporary custom attribute n2 February 24, 2025 08:52:04 UTC February 24, 2025 08:52:07 UTC Success



on OKV

```
Deleting OKV Client Software Jar
                                  n2
                                               February 24, 2025
08:52:08 UTC February 24, 2025 08:52:08 UTC
Success
Database stop (Srvctl)
                                                February 24, 2025
                                   n1
08:52:08 UTC February 24, 2025 08:52:48 UTC
Database start (Srvctl)
                                                February 24, 2025
08:52:48 UTC February 24, 2025 08:53:56 UTC
                             n1
Checking the TDE wallet status
                                                February 24, 2025
08:53:56 UTC
                   February 24, 2025 08:53:59 UTC
                                                       Success
```

## Changing the password of TDE-enabled databases on Oracle Database Appliance that use endpoints and wallets already in Oracle Key Vault

Use the odacli modify-database command with the option --change-tde-password,-ctp. For TDE-enabled databases on Oracle Database Appliance that use endpoints and wallets already in Oracle Key Vault, you are prompted to specify the password during the password change operation. For example, for Oracle RAC database:

```
odacli modify-database -n db14 -ctp
Enter the current TDE password:
Enter the new TDE password:
Re-enter the new TDE password:
Job details
                 ID: aa2a90db-ab9d-4b10-b9cb-4e23fb38844a
          Description: Modify database: okvdb22
              Status: Success
             Created: May 15, 2025 17:29:24 UTC
             Message: Modify database
Task Name
                                   Node Name
                                                        Start
Time
                              End Time
___________
                                  n1
                                            May 15, 2025 17:29:28
TDE Wallet closure
UTC May 15, 2025 17:29:30 UTC
                                            Success
                                            May 15, 2025 17:29:30
Change the TDE password in local wallet n1
                                           Success
May 15, 2025 17:29:30
Success
May 15, 2025 17:29:31
UTC May 15, 2025 17:29:31 UTC
TDE Wallet closure
                                 n2
                May 15, 2025 17:29:30 UTC
UTC
Auto login TDE Wallet creation
                           n1
              May 15, 2025 17:29:31 UTC
                                             Success
Change the TDE password in local wallet n2
                                            May 15, 2025 17:29:31
               May 15, 2025 17:29:32 UTC
                                                   Success
Auto login TDE Wallet creation n1
                                            May 15, 2025 17:29:32
               May 15, 2025 17:29:32 UTC
                                                  Success
Database stop (Srvctl)
                          n1
                                            May 15, 2025 17:29:32
                May 15, 2025 17:30:15 UTC
                                                  Success
                                             May 15, 2025 17:30:15
Database start (Srvctl)
               May 15, 2025 17:30:48 UTC
                                                  Success
```



### **Related Topics**

odacli modify-database

Use the odacli modify-database command to modify the configuration of a database, such as backup configuration, database class, and database type, and to change TDE wallet management from EXTERNAL to ODA.

### Re-keying TDE Master Encryption Key for TDE-Enabled Databases

Understand how you can re-key TDE master encryption key of TDE-enabled database on Oracle Database Appliance on bare metal and DB systems, that uses Oracle Key Vault to store TDE keys.

Use the odacli modify-database command to perform re-key of TDE master encryption key with the option -rkt. For TDE configured using Oracle Key Vault, you are prompted to specify the password during the re-key operation. For example:

```
odacli modify-database -n kokvdb2 -rkt
  "jobId": "dbedf89d-b60f-4209-bbcf-0db61e4eb350",
  "status" : "Created",
  "message" : "Modify database",
  "reports" : [ ],
  "createTimestamp": "July 15, 2024 15:56:01 PM CST",
  "resourceList" : [ {
    "resourceId": "7a1c996b-ee8d-49bc-8759-cbbfcee3bcce",
    "resourceType" : null,
    "resourceNewType" : "Db",
    "jobId": "dbedf89d-b60f-4209-bbcf-0db61e4eb350",
    "updatedTime" : null
  } ],
  "description" : "Modify database: kokvdb2",
  "updatedTime" : "July 15, 2024 15:56:01 PM CST",
  "jobType" : null
odacli describe-job -i dbedf89d-b60f-4209-bbcf-0db61e4eb350
Job details
                    ID: dbedf89d-b60f-4209-bbcf-0db61e4eb350
            Description: Modify database: kokvdb2
                Status: Success
                Created: July 15, 2024 3:56:01 PM CST
                Message: Modify database
Task Name
                                         Start
Time
                                   End Time
Status
```



```
TDE Wallet Re-Key July 15, 2024 3:56:04 PM CST July 15, 2024 3:56:12 PM CST Success
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

### Performing Backup and Recovery of TDE-enabled Databases

Understand how you can back up and recover TDE-enabled database with TDE keys stored on Oracle Key Vault on Oracle Database Appliance on bare metal and DB systems.

#### Performing backup of TDE-enabled database with TDE keys stored on Oracle Key Vault

Use the odacli create-backup command to back up TDE-enabled database with TDE keys stored on Oracle Key Vault. The TDE wallet is not present on Oracle Database Appliance, but resides in Oracle Key Vault server, and hence it is not backed up with the database backup. As a result, the value of TDE wallet backup location attribute of the database backup report is set to null.

```
[odaadmin@oda1 bin]$ odacli describe-job -i be94d1f7-ad6e-48a5-94a3-
f0a52578048b
Job details
______
                  ID: be94d1f7-ad6e-48a5-94a3-f0a52578048b
          Description: Create Regular-LO Backup [TAG:auto] [Db:db15] [NFS:/
nfs backup/orabackups/dbsfb225975e/database/1851419729/db15]
               Status: Success
              Created: March 26, 2024 4:14:19 AM PDT
              Message:
Task Name
                                    Node Name
                                                           Start
                                                      Status
Time
                              End Time
_____
Validate backup config
                                                March 26, 2024 4:14:21
                                    oda1
AM PDT
              March 26, 2024 4:14:21 AM PDT
                                                   Success
NFS location existence validation odal
                                               March 26, 2024 4:14:21
              March 26, 2024 4:14:22 AM PDT
                                                   Success
                                                March 26, 2024 4:14:22
Recovery Window validation
                              oda1
               March 26, 2024 4:14:24 AM PDT
                                                   Success
Archivelog deletion policy configuration oda1
                                               March 26, 2024 4:14:24
              March 26, 2024 4:14:26 AM PDT
AM PDT
                                                   Success
Database backup
                                    oda1
                                                March 26, 2024 4:14:26
AM PDT
              March 26, 2024 4:15:21 AM PDT
                                                   Success
[odaadmin@oda1 bin]$ odacli describe-backupreport -i d2326683-9766-4933-bee1-
a2b59c9d7e9e
  "id": "d2326683-9766-4933-bee1-a2b59c9d7e9e",
  "dbResId": "96a98156-b657-403e-a87c-357c2069c285",
  "tag" : "auto",
```

```
"dbId": "1851419729",
  "dbName" : "db15",
  "dbUniqueName" : "db15",
  "backupType" : "Regular-L0",
  "keepDays" : null,
  "backupLocation": "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/db",
  "cfBackupHandle" : "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/db/c-1851419729-20240326-03",
  "spfBackupHandle" : "/nfs backup/orabackups/dbsfb225975e/database/
1851419729/db15/db/c-1851419729-20240326-03",
  "pitrTimeStamp" : "March 26, 2024 04:15:06 AM PDT",
  "pitrSCN" : "1675444",
  "resetLogsTimeStamp": "March 26, 2024 03:01:39 AM PDT",
  "resetLogsSCN" : "1575481",
  "oraHomeVersion" : "19.23.0.0.240116",
  "sqlPatches": "35926646,34774667,35943157",
  "backupLogLoc": "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/rmanlog/2024-03-26/rman backup auto 2024-03-26 04-14-29.0478.log",
  "tdeWalletLoc" : null,
  "dbConfigLoc": "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/dbconfig/2024-03-26/DBCONFIG auto 2024-03-26 04-15-19.0472.tar.gz",
  "name" : "Backup Report db15",
  "createTime": "March 26, 2024 04:14:26 AM PDT",
  "state" : {
    "status" : "CONFIGURED"
  "updatedTime" : "March 26, 2024 04:14:26 AM PDT",
  "backupReportLogDetail": "/nfs backup/orabackups/dbsfb225975e/database/
1851419729/db15/rmandetaillogreport/2024-03-26/
rman list backup detail auto 2024-03-26_04-15-16.0129.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "RAC",
    "dbShape" : "odb2"
    "dbEdition" : "EE",
    "dbStorage" : "ASM",
    "dbRedundancy" : null,
    "pdbName" : null,
    "isCdb" : false
  "dbDataSize" : "2441M",
  "dbRedoSize" : "16403M",
  "rmanBackupPieces": "/nfs backup/orabackups/dbsfb225975e/database/
1851419729/db15/backuppieces/2024-03-26/backupPieces auto 96a98156-b657-403e-
a87c-357c2069c285 20240326041518.json",
  "compressionAlgo": "BASIC",
  "cpuPool" : null,
  "numberOfCores" : null,
  "keystoreType" : "OKV",
```

Note that since TDE wallet backup is not supported, if the keystore type is <code>OKV</code>, if you specify the component as <code>tdewallet</code> in the <code>odacli</code> <code>create-backup</code> command, an error is encountered.

```
[odaadmin@oda1 bin]\$ odacli create-backup -n db15 -c tdewallet DCS-10144:TDE wallet backup operation is not supported for TDE databases with OKV keystore type.
```

### Performing recovery of database with TDE configured using Oracle Key Vault with credentials of Oracle Key Vault user

Use the <code>odacli recover-database</code> command to recover a database with TDE configured using Oracle Key Vault. For example, to recover a database <code>kokvdb2</code>, run the following command:

odacli recover-database -n kokvdb2 -t latest

```
"jobId": "8a50d65f-2269-41ff-b030-51fe4ecc82b5",
 "status" : "Created",
 "message" : null,
 "reports" : [ ],
  "createTimestamp" : "July 15, 2024 18:26:26 PM CST",
 "resourceList" : [ ],
 "description" : "Create recovery-latest for DB : kokvdb2",
 "updatedTime" : "July 15, 2024 18:26:26 PM CST",
 "jobType" : null
odacli describe-job -i 8a50d65f-2269-41ff-b030-51fe4ecc82b5
Job details
                  ID: 8a50d65f-2269-41ff-b030-51fe4ecc82b5
          Description: Create recovery-latest for DB : kokvdb2
               Status: Success
              Created: July 15, 2024 6:26:26 PM CST
              Message:
Task Name
                                     Start
Time
                               End Time
Status
______ ____
Database recovery validation
                                    July 15, 2024 6:26:30 PM
    July 15, 2024 6:27:50 PM CST
                                    July 15, 2024 6:27:50 PM
Database recovery
             July 15, 2024 6:30:07 PM CST
                                                   Success
                            July 15, 2024 6:30:07 PM
Enable block change tracking
             July 15, 2024 6:30:12 PM CST
Database opening
                                     July 15, 2024 6:30:12 PM
CST
             July 15, 2024 6:30:15 PM CST
                                                  Success
                                    July 15, 2024 6:30:15 PM
Database restart
              July 15, 2024 6:31:31 PM CST
                           July 15, 2024 6:31:31 PM
Recovery metadata persistence
            July 15, 2024 6:31:31 PM CST
                                                  Success
```



The TDE wallets are stored on the Oracle Key Vault server and not on Oracle Database Appliance, and so, ODACLI commands cannot be used for restore and recovery operations. If the keystore type is <code>OKV</code>, and you specify the component as <code>tdewallet</code> in the <code>odacli recoverdatabase</code> command, an error is encountered.

```
[odaadmin@oda1 bin]$ odacli recover-database -n db15 -tl /nfs_backup/ewallet.p12 -t latest

DCS-10045:Validation error encountered: Usage of TDE wallet related parameters is not allowed for a TDE database with OKV keystore type.

[odaadmin@oda1 bin]$ odacli restore-tdewallet -n db15

Enter TDE wallet password:

DCS-10144:Restore TDE wallet operation is not supported for TDE databases with OKV keystore type.
```

### Performing recovery of database with TDE configured using Oracle Key Vault with endpoints in Oracle Key Vault

The odacli recover-database command prompts for the TDE password. Before database recovery, the local auto-login wallet is regenerated using the Administer Key Management command. You must specify the TDE password for database recovery.

```
odacli recover-database -n kokvdb2 -t latest
Enter the TDE password:
odacli describe-job -i 8a50d65f-2269-41ff-b030-51fe4ecc82b5
Job details
                   ID: 8a50d65f-2269-41ff-b030-51fe4ecc82b5
           Description: Create recovery-latest for DB : kokvdb2
               Status: Success
              Created: July 15, 2024 6:26:26 PM CST
              Message:
Task Name
                                      Start
Time
                                End Time
Status
Auto login TDE Wallet creation July 15, 2024 6:26:30 PM
              July 15, 2024 6:27:50 PM CST
Database recovery validation July 15, 2024 6:26:30 PM
    July 15, 2024 6:27:50 PM CST
                                                   Success
                                     July 15, 2024 6:27:50 PM
Database recovery
             July 15, 2024 6:30:07 PM CST
                                                    Success
                                     July 15, 2024 6:30:07 PM
Enable block change tracking
              July 15, 2024 6:30:12 PM CST
Database opening
                                      July 15, 2024 6:30:12 PM
              July 15, 2024 6:30:15 PM CST
CST
                                                   Success
Database restart
                                      July 15, 2024 6:30:15 PM
              July 15, 2024 6:31:31 PM CST
                                                    Success
```



```
Recovery metadata persistance July 15, 2024 6:31:31 PM CST July 15, 2024 6:31:31 PM CST Success
```

### Errors during database recovery

The TDE wallets are stored on the Oracle Key Vault server and not on Oracle Database Appliance, and so, ODACLI commands cannot be used for restore and recovery operations. If the keystore type is <code>OKV</code>, and you specify the component as <code>tdewallet</code> in the <code>odacli recoverdatabase</code> command, an error is encountered.

```
[odaadmin@oda1 bin]$ odacli recover-database -n db15 -tl /nfs_backup/ewallet.p12 -t latest

DCS-10045:Validation error encountered: Usage of TDE wallet related parameters is not allowed for a TDE database with OKV keystore type.

[odaadmin@oda1 bin]$ odacli restore-tdewallet -n db15

Enter TDE wallet password:

DCS-10144:Restore TDE wallet operation is not supported for TDE databases with OKV keystore type.
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Restoring TDE-Enabled Databases Using Oracle Key Vault User Credentials

Understand how you can restore TDE-enabled databases using database backups, on Oracle Database Appliance bare metal and DB systems, with credentials of a user on Oracle Key Vault.

### **Prerequisites**

- To restore a database with primary role in an Oracle Data Guard configuration, TDE wallet for the target database must be created on the Oracle Key Vault server before you run the restore command. This TDE wallet is a copy of the wallet of the source database.
- To restore a database with a standby role in an Oracle Data Guard configuration, the TDE
  wallet copy must **not** be created. The TDE wallet of the primary database must be used for
  the standby database.

# Step 1: Create the Oracle Key Vault user. This step applies to multi-user access-enabled systems only.

If the user with the <code>ODA-OKVCONFIGADMIN</code> role does not exist, or if you want to assign a different user for the database you are restoring, then create the user.

Create a new user with the ODA-OKVCONFIGADMIN role. For example:

```
odacli create-user -u okvuser1 -r ODA-OKVCONFIGADMIN
```

The user is created and assigned a temporary password.



- 2. After the user is created successfully, the <code>okvuser1</code> can log into the appliance with the temporary password.
- 3. The okvuser1 is in the Inactive state. If the appliance is configured with multi-user access enabled, then activate the user with the following command. Note that if the appliance is configured with passwordless multi-user access, then you do not need to activate the user. For more information about configuring multi-user access, the topic *Implementing Multi-User Access on Oracle Database Appliance*.

```
odacli activate-user
```

You are prompted to change the password. Enter the temporary password, the new password, and confirm the new password.

**4.** Use the new password to connect by SSH into the appliance and run ODACLI commands or connect to the Browser User Interface.

#### Step 2: Create an Oracle Key Vault server configuration

Create an Oracle Key Vault server configuration for the target database. Create a new Oracle Key Vault server configuration only if an Oracle Key Vault server configuration for the same Oracle Key Vault server does not already exist. If a configuration already exists, then use the existing configuration.

- 1. The Oracle Key Vault user that creates the Oracle Key Vault server configuration must be a user with atleast the privilege of Create Endpoint on the Oracle Key Vault server.
- 2. For multi-user access-enabled systems, log in as the user with the <code>ODA-OKVCONFIGADMIN</code> role, for example, the <code>okvuser1</code>. For non-multi user access enabled systems, log in as the root user.
- 3. Oracle Key Vault password prompt displays twice, to accept and confirm the Oracle Key Vault password. This is the password of the Oracle Key Vault user on the Oracle Key Vault server, which enables the user to log into the Oracle Key Vault server. Specify the user name with the -u option in the odacli create-okvserverconfig command. The name of the Oracle Key Vault server configuration is case-sensitive and no two Oracle Key Vault server configurations can have same name on Oracle Database Appliance. The length of the Oracle Key Vault server configuration cannot exceed 128 characters.

```
odacli create-okvserverconfig -n okvobj1 -u epokvusr1 -ip xxx.xxx.xxx
Enter OKV user password:
Retype OKV user password :
Job details
                    ID: 8878fc02-3d64-4519-bf52-fcb50839f89f
            Description: Create OKV Server Config: okvcfg5
                 Status: Success
                Created: October 14, 2024 14:04:29 UTC
               Message: Create OKV Server Config.
Task Name
                                        Node Name
                                                                   Start
Time
                                   End
                                     Status
                                                    oda1
OKV Password Store creation
                                                                  October
```



14, 2024 14:04:29 UTC	October 14,	2024 14:04:56 UTC	
Success			
Download of OKV REST package		oda1	October
14, 2024 14:04:31 UTC	October 14,	2024 14:04:32 UTC	
Success			
Edit of OKV REST package		oda1	October
14, 2024 14:04:32 UTC	October 14,	2024 14:04:32 UTC	
Success			
Generate OKV client wallets		oda1	October
14, 2024 14:04:32 UTC	October 14,	2024 14:04:35 UTC	
Success			

The command creates an Oracle Key Vault server configuration <code>okvobj1</code> for the Oracle Key Vault server user <code>epokvusr1</code> on the specified server.

### Step 3: Copy TDE keys from source wallet to target wallet on Oracle Key Vault server using ODACLI commands

Use the odacli copy-okvtdewallet command to copy the TDE wallet to the Oracle Key Vault server. Specify the source wallet name (--source-wallet-name | -swn), target wallet Oracle Key Vault server configuration object name (--target-okvserverconfig | -tosc), and the target wallet name (--target-wallet-name | -twn) in the command. A new wallet with the name specified for the target wallet name (--target-wallet-name | -twn) parameter is created in the target Oracle Key Vault server. This wallet contains the TDE keys copied from the source wallet.

If the source wallet is on a different Oracle Key Vault server than the target wallet, then specify the source wallet Oracle Key Vault server details such as the host name (--source-hostname | -shn) or the IP address (--source-ip | -sip) of the server and the name of the user that owns the wallet on the Oracle Key Vault server (--source-username | -su). You must provide a password when prompted in this case. This is the password of the Oracle Key Vault user that owns the source wallet on the Oracle Key Vault server. For multi-user access enabled systems, run this command as the Oracle Key Vault user on Oracle Database Appliance.

There are three scenarios when you copy the TDE wallet:

## Scenario 1: Copy the TDE wallet on the same Oracle Key Vault server with the same Oracle Key Vault user

In this case, the source TDE wallet and the target TDE wallet are on the same Oracle Key Vault server, and both are owned by the same user on the OKV server. For example:



```
Creating a TDE wallet copy in the OKV June 20, 2024 2:56:03 AM CST June 20, 2024 2:57:17 AM CST Success server
```

### Scenario 2: Copy the TDE wallet on the same Oracle Key Vault server but using a different Oracle Key Vault user

In this case, the source and the target wallet are on the same Oracle Key Vault server but are owned by different users on the Oracle Key Vault server. The owner of the source wallet in the Oracle Key Vault must provide read and manage access permissions on the wallet to the owner of the target wallet on Oracle Key Vault before running the ODACLI command to copy the wallet.

Follow these steps to provide read and manage wallet permissions to the target wallet Oracle Key Vault user:

- 1. Log into the Oracle Key Vault server as the source wallet Oracle Key Vault user.
- Navigate to the Keys and Wallets tab. Select the source wallet checkbox and click the Edit icon.
- Navigate to the Wallet Access Settings section and click Add.
- 4. In the dropdown list for **Type**, select **Users**, and then select the checkbox for the target wallet Oracle Key Vault user.
- 5. In the Access Level section, select Read Only and Manage Wallet.
- Click Save.

After you provide the required permissions to the target wallet user, run the odacli copy-okvtdewallet command.

```
odacli copy-okvtdewallet -swn tdeokv on oda8m013-c -tosc okvobj2 -twn tdeokvdu
Job details
                 ID: 50df7dcc-8e17-48db-9206-879c44e57c20
          Description: Copy wallet in OKV server
              Status: Success
             Created: June 20, 2024 2:56:02 AM CST
             Message:
Task Name
                                  Start
Time
                             End Time
Status
______
Creating a TDE wallet copy in the OKV June 20, 2024 2:56:03 AM
    June 20, 2024 2:57:17 AM CST
                                               Success
server
```

### Scenario 3: Copy the TDE wallet to a different Oracle Key Vault server

In this case, the source wallet and the target wallet are on different Oracle Key Vault servers. Specify the source wallet Oracle Key Vault server details in the <code>odacli copy-okvtdewallet</code>

### command. Specify the password of the source wallet Oracle Key Vault user when prompted. For example:

```
odacli copy-okvtdewallet -swn tdeokv on oda8m013-c -sip xxx.xx.xx.xxx -su
epokvusr1 -tosc okvobj3 -twn tdeokvds
Enter OKV user password:
Retype OKV user password:
Job details
                  ID: 50df7dcc-8e17-48db-9206-879c44e57c20
          Description: Copy wallet in OKV server
              Status: Success
              Created: June 20, 2024 2:56:02 AM CST
              Message:
Task Name
                                    Start
Time
                              End Time
Status
______
Creating a TDE wallet copy in the OKV June 20, 2024 2:56:03 AM
CST
             June 20, 2024 2:57:17 AM CST
server
```

### Alternate method for Step 3: Copying the TDE keys from the source database wallet to the target database wallet using the Oracle Key Vault user interface

Instead of using ODACLI commands, you can create a new wallet for the target database in the Oracle Key Vault server and copy the TDE keys of the source database to the wallet using the Oracle Key Vault user interface as follows:

- Log into the Oracle Key Vault server.
- 2. Navigate to the **Keys & Wallets** tab.
- 3. The Oracle Key Vault user must be provided read, write, and manage wallet permissions from the **Access Settings** section of the source database wallet.
- To create a new wallet, click Create.
- **5.** Specify the new name for the wallet of the target database.
- 6. Copy the TDE keys of the source database when creating the new wallet. Search for the name of the source database in the **Add Wallet Contents** section. When the keys are displayed, select all **TDE Master Encryption Key** checkboxes for the database.
- 7. To save the wallet, click **Save**.
- 8. Run this step only if the Oracle Key Vault administrator has created the wallet for the Oracle Key Vault user. Ensure that the administrator provides read-write and managewallet access for the wallet to the user after creation.
  - **a.** Log into the Oracle Key Vault server as the Oracle Key Vault administrator.
  - b. In the Keys & Wallets tab, select the checkbox for the newly-created wallet and click on the Edit option for the wallet.
  - c. In the Wallet Access Settings, click Add.
  - d. In the Select Endpoint/User Group section, select Users from the dropdown list.



- e. Select the checkbox for the Oracle Key Vault user to be provided access to the wallet.
- f. In the Access Level section, select Read and Modify and Manage Wallet options.
- g. To save the access settings for the wallet, click Save.

### Step 4: Restoring TDE-enabled databases with TDE keys stored on Oracle Key Vault

Use the odacli irestore-database command to restore a TDE-enabled database with TDE keys stored on Oracle Key Vault. Specify the options --enable-tde, --okv-server-config, --okv-wallet-name, and keystore-type in the command.

The option --enable-tde, -t indicates that the restored database must be configured with TDE, using the Oracle Key Vault server configuration specified in the --okv-server-config option. The keystore of such irestored database is set to OKV. The okvServerConfigName attribute of the restored database object is set to the name of the Oracle Key Vault server configuration specified in the irestore request. Specify the wallet name for the target database with the --okv-wallet-name parameter. This wallet must be present in the Oracle Key Vault server and the TDE keys must be copied to the wallet before running the irestore operation.

Since the wallet is already created in the Oracle Key Vault server, specify the name of the wallet, the Oracle Key Vault server configuration where the wallet is created, and the keystore type as <code>OKV</code> in this case in the <code>odacli irestore-database</code> command:

```
odacli irestore-database -r /tmp/db1Backupreport.json -t -osc okvobj1 -kt OKV
-own db2 wallet -n okvdb15
Enter SYS and SYSTEM user password:
Enter SYS and SYSTEM user password:
Job details
                   ID: dc44f3f0-5af3-4402-ad23-e923e1446371
          Description: Database service recovery with DB name: okvdb15
               Status: Success
              Created: July 5, 2024 6:54:00 AM EDT
              Message:
Task Name
                                    Node Name
                                                            Start
Time
Status
_____
Check if cluster ware is running
                                                           July 5,
2024 6:54:23 AM EDT July 5, 2024 6:54:23 AM EDT
Check if cluster ware is running
                                    oda2
                                                          July 5, 2024
6:54:23 AM EDT
                        July 5, 2024 6:54:24 AM EDT
Success
Creating DbStorage for DbRestore
                                                          July 5, 2024
                                    oda1
6:54:25 AM EDT July 5, 2024 6:54:42 AM EDT
Success
Validating DiskSpace for DATA
                                     oda1
                                                           July 5,
2024 6:54:25 AM EDT
                             July 5, 2024 6:54:27 AM EDT
Setting up SSH equivalence
                                                           July 5,
                                     oda1
                           July 5, 2024 6:54:34 AM EDT
2024 6:54:27 AM EDT
```



Success Configuring user access to ACFS 2024 6:54:38 AM EDT Success filesystems for okvdb15		oda1 2024 6:54:39 AM EDT	July 5,
6:54:40 AM EDT July		oda1 6:54:40 AM EDT	July 5, 2024
Success Audit directory creation 6:54:41 AM EDT July	7 5, 2024	oda2 6:54:41 AM EDT	July 5, 2024
Success Configure TDE for RestoreDb Task 6:54:46 AM EDT July		oda1 6:56:07 AM EDT	July 5, 2024
Success Auxiliary Instance Creation 6:54:50 AM EDT July			July 5, 2024
Success TDE Wallet directory creation 6:55:30 AM EDT July			July 5, 2024
Success OKV Endpoint configuration 6:55:31 AM EDT July		oda1 6:56:02 AM EDT	July 5, 2024
Success Auto login TDE Wallet creation 6:56:02 AM EDT July			July 5, 2024
Success Password based TDE Wallet open 2024 6:56:04 AM EDT			July 5,
Success Create pfile for Auxiliary Insta 2024 6:56:07 AM EDT		oda1 2024 6:56:08 AM EDT	July 5,
Success Rman duplicate 2024 6:56:08 AM EDT	July 5,	oda1 2024 7:01:22 AM EDT	July 5,
Success Creating pfile from spfile 2024 7:01:23 AM EDT	July 5,	oda1 2024 7:01:24 AM EDT	July 5,
Success Set PFile Ownership 2024 7:01:24 AM EDT	July 5,	oda1 2024 7:01:24 AM EDT	July 5,
Success Customize Db Parameters 2024 7:01:25 AM EDT	July 5,	oda1 2024 7:01:36 AM EDT	July 5,
Success Shutdown And Start database 2024 7:01:36 AM EDT	July 5,	oda1 2024 7:06:51 AM EDT	July 5,
Success Create spfile for restore db 2024 7:06:51 AM EDT	July 5,	oda1 2024 7:06:53 AM EDT	July 5,
Success Set PFile Ownership 2024 7:06:53 AM EDT	July 5,	oda1 2024 7:06:53 AM EDT	July 5,
Success Shutdown And Mount database		oda1	July 5,

2024 7:06:54 AM EDT	July	5,	2024 7:08:22	AM	EDT		
Success Re-Create control file			oda1			T., ]., E	
2024 7:08:23 AM EDT	.T11 ] 57	5	2024 7:09:21	ΔM	FDT.	July 5	,
Success	oury	٠,	2024 7.03.21	VIII	וטנו		
Removing Disabled Redo Threads			oda1			July 5	
2024 7:09:21 AM EDT	Julv		2024 7:09:23	AM	EDT	0421 0	′
Success	1	-,					
Updating DB attributes			oda1			July 5	,
2024 7:09:23 AM EDT	July	5,	2024 7:09:25	AM	EDT	-	
Success	_						
Register Database taskflow			oda1			July 5	,
2024 7:09:30 AM EDT	July	5,	2024 7:14:51	AM	EDT		
Success							
Create SPFile in shared loc			oda1			July 5	,
2024 7:09:30 AM EDT	July	5,	2024 7:09:40	AM	EDT		
Success							
Delete Local Spfile			oda1			July 5	,
2024 7:09:40 AM EDT	July	5,	2024 7:09:41	AM	EDT		
Success							
Register DB with clusterware	- 1	_	oda1			July 5	,
2024 7:09:41 AM EDT	July	5,	2024 7:11:19	AM	EDT		
Success	DDDG		- d - 1			T1 E	
Add Startup Trigger to Open all 2024 7:11:20 AM EDT			2024 7:11:20	7.1./	E DIII	July 5	,
Success	July	٥,	2024 /:11:20	Alvi	EDI		
Set SysPassword and Create PwFi	1 🗅		oda1			July 5	
2024 7:11:21 AM EDT			2024 7:11:24	ΔМ	EDT	oury o	′
Success	oury	٠,	2021 /.11.21				
Enable block change tracking			oda1			July 5	,
2024 7:11:25 AM EDT	July	5,	2024 7:11:37	AM	EDT	1 1	•
Success	2	•					
Creating pfile			oda1			July 5	,
2024 7:11:37 AM EDT	July	5,	2024 7:11:39	AM	EDT		
Success							
Updating db env			oda1			July 5	,
2024 7:11:39 AM EDT	July	5,	2024 7:11:40	AM	EDT		
Success							
Enable DbSizing Template			oda1			July 5	,
2024 7:11:40 AM EDT	July	5,	2024 7:13:14	AM	EDT		
Success			1 1			- 1 -	
Update Database Global Name	<del>-</del> 1	_	oda1	7.16		July 5	,
2024 7:13:14 AM EDT	July	5,	2024 7:13:17	AM	EDT		
Success			oda1			T., ]., E	
Create tns entry 2024 7:13:18 AM EDT	T11 ] 17	5	2024 7:13:19	7\ M	ייח יים	July 5	,
Success	oury	٠,	2024 7.13.19	MI	וטנו		
Create tns entry			oda2			July 5	
2024 7:13:19 AM EDT	Julv	5.	2024 7:13:21	ΑМ	EDT	oury o	′
Success	0 42 1	٠,	2021 7,120,21				
Running datapatch			oda1			July 5	,
2024 7:13:21 AM EDT	July	5,	2024 7:13:52	AM	EDT	4 -	
Success	-						
Set CPU pool			oda1			July 5	,
2024 7:13:52 AM EDT	July	5,	2024 7:13:52	AM	EDT		
Success							



Reset Associated Networks for Da 2024 7:14:54 AM EDT Success				7:15:00	AM	EDT	July	5,
Reset Associated Networks							July	5,
2024 7:15:00 AM EDT Success	July	٥,	2024	7:15:01	AM	EDT		
Set log archive dest for Databas	е		oda1	L			July	5,
2024 7:15:01 AM EDT							_	•
Success								
Setting Database parameter for O							July	5,
2024 7:15:07 AM EDT	July	5,	2024	7:16:43	AM	EDT		
Success								
Enable New Tablespace Encryption							July	5,
2024 7:16:45 AM EDT	July	5,	2024	7:16:47	AM	EDT		
Success								
Copy Pwfile to Shared Storage			oda1	L			July	5,
2024 7:16:47 AM EDT	July .	5,	2024	7:16:58	AM	EDT		
Success								
Configure All Candidate Nodes			oda1	L			July	5,
2024 7:16:58 AM EDT	July	5,	2024	7:17:01	AM	EDT		
Success								

Restore the database by copying the wallet using ODACLI commands and providing the wallet name to the command. After copying the TDE keys of the wallet of the source database with the odacli copy-okvtdewallet command, specify the target Oracle Key Vault wallet name in the odacli irestore-database command.

```
odacli irestore-database -r /tmp/db1Backupreport.json -t -osc okvobj1 -kt OKV -own db2_wallet
Enter SYS and SYSTEM user password:
Enter SYS and SYSTEM user password:
```

### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Restoring TDE-Enabled Databases With Endpoints and Wallet Manually Created in Oracle Key Vault

Understand how you can restore TDE-enabled databases on Oracle Database Appliance using the endpoints and wallets created manually on Oracle Key Vault. This method supports creation of TDE-enabled databases on bare metal and DB systems.

#### **Prerequisites**

- To restore a database with primary role in an Oracle Data Guard configuration, TDE wallet for the target database must be created on the Oracle Key Vault server before you run the restore command. This TDE wallet is a copy of the wallet of the source database.
- To restore a database with a standby role in an Oracle Data Guard configuration, the TDE
  wallet copy must **not** be created. The TDE wallet of the primary database must be used for
  the standby database.
- The TDE wallet created must be set as the default wallet for the endpoints created.

 The okvclient.jar file corresponding to each endpoint must be downloaded and copied to the Oracle Database Appliance node on which you submit the database restore request.

## Step 1: Copying the TDE keys from the source database wallet to the target database wallet using the Oracle Key Vault user interface

Create a new wallet for the target database in the Oracle Key Vault server and copy the TDE keys of the source database to the wallet as follows:

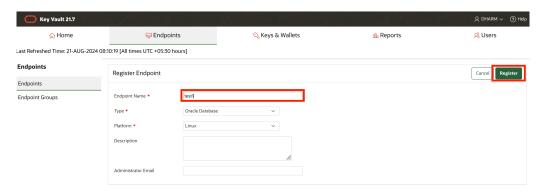
- 1. Log into the Oracle Key Vault server.
- Navigate to the Keys & Wallets tab.
- The Oracle Key Vault user must be provided read, write, and manage wallet permissions from the Access Settings section of the source database wallet.
- 4. To create a new wallet, click **Create**.
- **5.** Specify the new name for the wallet of the target database.
- 6. Copy the TDE keys of the source database when creating the new wallet. Search for the name of the source database in the Add Wallet Contents section. When the keys are displayed, select all TDE Master Encryption Key checkboxes for the database.
- 7. To save the wallet, click **Save**.
- 8. Run this step only if the Oracle Key Vault administrator has created the wallet for the Oracle Key Vault user. Ensure that the administrator provides read-write and manage-wallet access for the wallet to the user after creation.
  - a. Log into the Oracle Key Vault server as the Oracle Key Vault administrator.
  - b. In the Keys & Wallets tab, select the checkbox for the newly-created wallet and click on the Edit option for the wallet.
  - c. In the Wallet Access Settings, click Add.
  - d. In the Select Endpoint/User Group section, select Users from the dropdown list.
  - Select the checkbox for the Oracle Key Vault user to be provided access to the wallet.
  - f. In the Access Level section, select Read and Modify and Manage Wallet options.
  - g. To save the access settings for the wallet, click Save.

#### Step 2: Creating endpoints and setting the default wallet

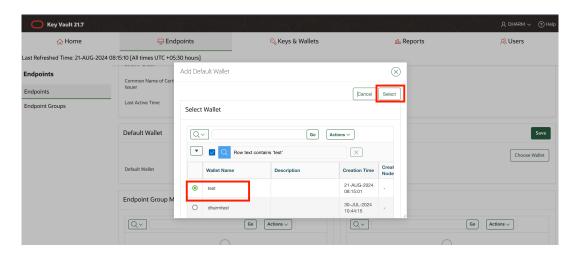
### Follow these steps:

- Create endpoints corresponding to each instance. For Oracle RAC database, create two
  endpoints corresponding to two instances. For single-instance database, create one
  endpoint corresponding to one instance.
  - In the Oracle Key Vault home page, navigate to the Endpoints tab and click Add.
  - b. Specify the Endpoint Name. Select the Type as Oracle Database, Platform as Linux, and click Register.





2. In the Default Wallet page, click **Choose Wallet** and set the default wallet for the created endpoints.



Step 3: Downloading the TDE wallet to Oracle Key Vault server using Oracle Key Vault commands

For multi user access-enabled and multi user access passwordless systems, log in as the Oracle Key Vault server user. For non-multi user access-enabled systems, log in as the oracle user and then follow these steps:

1. Create working directories such as /tmp/work and /tmp/work/client\_wallet. Navigate to the /tmp/work directory. Download and extract the RESTful Service Utility from Oracle Key Vault server. You can view three directories bin, lib, and conf.

2. Extract the contents of okvrestclipackage.zip file. Edit the conf/okvrestcli.ini file and add the Oracle Key Vault server IP address, user name, and path to the directory where the client auto login wallets are created. In the following example, the client auto login wallets are created in the /tmp/work/client wallet directory.

```
log_property=./conf/okvrestcli_logging.properties
server=<okv_server_ip>
okv_client_config=./conf/okvclient.ora
user=<okv_user>
client_wallet=/tmp/work/client_wallet
```

3. Edit the bin/okv file and uncomment the line export OKV\_RESTCLI\_CONFIG=\$OKV\_RESTCLI\_DIR/conf/okvrestcli.ini file. Set JAVA\_HOME as follows:

```
#!/bin/bash
   export OKV_RESTCLI_DIR=$(dirname "${0}")/..
   export OKV_RESTCLI_CONFIG=$OKV_RESTCLI_DIR/conf/okvrestcli.ini
   export JAVA_HOME=/opt/oracle/dcs/java/1.8.0_xxx
   if [ -z "$JAVA_HOME" ]
   then
      echo "JAVA_HOME environment variable is not set."
      exit 1
   fi

   if [ -z "$OKV_RESTCLI_CONFIG" ]
   then
      echo "OKV_RESTCLI_CONFIG environment variable is not set."
      exit 1
   fi

export OKV_RESTCLI_JAR=$OKV_RESTCLI_DIR/lib/okvrestcli.jar
   $JAVA_HOME/bin/java -jar $OKV_RESTCLI_JAR "$@"
```

**4.** Generate the client auto login wallets. Specify the Oracle Key Vault password when prompted.

```
/tmp/work/bin/okv admin client-wallet add --client-wallet /tmp/work/
client_wallet --wallet-user okv_user
    Password:
```

5. Create the endpoint corresponding to the wallet. For Oracle RAC database, you must create two endpoints specific to each database instance. Run this step only if the endpoints are not already created using the Oracle Key Vault Server user interface.

```
/tmp/work/bin/okv admin endpoint create --endpoint endpoint_name --type ORACLE_DB --platform LINUX64 --strict-ip-check TRUE
```

6. Set the wallet created in Step 1 as the default wallet for the endpoints. For Oracle RAC database, the default wallet for both the endpoints must be same TDE wallet. Run this step only if the TDE wallet is not already set as the default wallet for the endpoints using the Oracle Key Vault Server user interface.

```
/tmp/work/bin/okv manage-access wallet set-default --wallet <wallet_name>
--endpoint <endpoint name>
```

7. Download the okvclient.jar file. For Oracle RAC database, download the okvclient.jar file corresponding to both endpoints. After downloading the files, copy the okvclient.jar corresponding to the remote instance to the remote node.

```
/tmp/work/bin/okv admin endpoint download --endpoint <endpoint_name> --
location <location>
```

When you download the endpoints, if you encounter a message such as Endpoint token is already consumed, then you must enroll the endpoint again as follows:

```
/tmp/work/bin/okv admin endpoint download --endpoint endpoint_name --
location location
/tmp/work/log/okv0.log.0 (Permission denied)
{
    "result" : "Failure",
    "message" : "Endpoint token is already consumed"
}
/tmp/work/bin/okv admin endpoint re-enroll --endpoint <endpoint_name>
/tmp/work/log/okv0.log.0 (Permission denied)
{
    "result" : "Success"
}
}
```

#### Step 4: Restoring TDE-enabled databases with TDE keys stored on Oracle Key Vault

For multi-user access-enabled systems, log in as database user. For non-multi user access enabled systems, log in as the root user. Use the odacli irestore-database command to restore a TDE-enabled database with TDE keys stored on Oracle Key Vault. Specify the options --enable-tde, --okvclient-path, and keystore-type in the command.

The option --enable-tde, -t indicates that the restored database must be configured with TDE. Use the option --keystore-type, -kt to specify the type of keystore for the TDE configuration. Use the option --okvclient-path, -ocp to specify the absolute path to the okvclient.jar file corresponding to the database endpoint. For single-instance database, you can specify one value in the --okvclient-path, -ocp option, whereas for Oracle RAC database, you can specify two values. Provide the TDE password when you are prompted. After the restore operation of the database is successful, the Oracle Key Vault endpoint software is installed in the /etc/OKV/db\_unique\_name/okv location. The local auto login TDE wallets are created in the /etc/OKV/db\_unique\_name/tde location.

To restore a single-instance database okvdb without using the Oracle Key Vault server configuration object, run the odacli irestore-database command as follows:



Status: Success

Created: August 28, 2024 2:50:46 PM CST

Message:

Task Name Time Status	End		Start
		_	
Restore Database 2024 2:51:09 PM CST Failure			August 28
Restore Database 2024 2:51:10 PM CST Failure	August 28	scaoda10ha13c2n1 , 2024 2:58:10 PM CST	August 28
Check if cluster ware is run 2024 2:51:14 PM CST Success	_		August 28
Check if cluster ware is run 2024 2:51:14 PM CST Success	-		August 28
Creating DbStorage for DbRes 2024 2:51:14 PM CST Success			August 28
Validating DiskSpace for DAT 2024 2:51:14 PM CST Success			August 28
Setting up SSH equivalence 2024 2:51:15 PM CST Success			August 28
Configuring user access to A 2024 2:51:20 PM CST Success filesystems for okvdb8st			August 28
Audit directory creation 2024 2:51:20 PM CST			August 28
Audit directory creation 2024 2:51:21 PM CST Success	August 28	scaoda10ha13c2n2 , 2024 2:51:21 PM CST	August 28
Configure TDE for RestoreDb 2024 2:51:22 PM CST Success			August 28
Auxiliary Instance Creation 2024 2:51:24 PM CST Success		scaoda10ha13c2n2 , 2024 2:51:36 PM CST	August 28
TDE Wallet directory creatic 2024 2:51:36 PM CST Success			August 28
Installing OKV Client Softwa 2024 2:51:36 PM CST Success			August 28
Auto login TDE Wallet creati	.on	scaoda10ha13c2n1	August 28

2024 2:51:37 PM CST	August	28,	2024 2:51:38 PM CST		
Success					
Password based TDE Wallet open				August	28,
2024 2:51:38 PM CST	August	28,	2024 2:51:39 PM CST		
Success					
Install Object Store Swift mod	dule		scaoda10ha13c2n2	August	28,
2024 2:51:58 PM CST	August	28,	2024 2:52:16 PM CST		
Success	2				
Restoring Spfile From Casper			scaoda10ha13c2n2	August	28.
			2024 2:52:38 PM CST	1149400	_0,
Success	nagasc	20,	2024 2.32.30 IN CDI		
			1 - 1 0 1 2 0 0	7	2.0
Customize Db Parameters				August	Z8,
	August	28,	2024 2:52:47 PM CST		
Success					
Create spfile for restore db				August	28,
2024 2:52:47 PM CST	August	28,	2024 2:52:48 PM CST		
Success					
Restoring control file			scaoda10ha13c2n2	August	28,
	August	28,	2024 2:53:11 PM CST	-	
Success	- 2	- /			
Mounting db			scaoda10ha13c2n2	August	28
	7110110+		2024 2:53:35 PM CST	August	20,
	August	20,	2024 2.33.33 PM CS1		
Success					0.0
Validating backup for Restore				August	28,
2024 2:53:35 PM CST	August	28,	2024 2:53:41 PM CST		
Success					
Restoring DB for migration				August	28,
2024 2:53:41 PM CST	August	28,	2024 2:54:26 PM CST		
Success					
Change DBID and/or DBName			scaoda10ha13c2n2	August	28,
2024 2:54:27 PM CST	August.	28.	2024 2:54:28 PM CST	2	
Success		,			
Register Database taskflow			scaoda10ha13c2n1	August	28
2024 2:54:31 PM CST	7110110±		2024 2:57:08 PM CST	August	20,
	August	20,	2024 2.37.00 PM CS1		
Success			1 101 10 0 0		0.0
Create SPFile in shared loc			scaoda10ha13c2n2	August	28,
2024 2:54:31 PM CST	August	28,	2024 2:54:37 PM CST		
Success					
Delete Local Spfile				August	28,
2024 2:54:37 PM CST	August	28,	2024 2:54:37 PM CST		
Success					
Register DB with clusterware			scaoda10ha13c2n2	August	28,
			2024 2:55:23 PM CST	- 5	- /
Success	magabe	20,	2021 2:00:20 111 001		
Set SysPassword and Create Pwl	E:10		aaaada10ha12a2n1	August	20
				August	20,
	August	Z0,	2024 2:55:25 PM CST		
Success					
Enable block change tracking				August	28,
2024 2:55:26 PM CST	August	28,	2024 2:55:28 PM CST		
Success					
Creating pfile			scaoda10ha13c2n2	August	28,
2024 2:55:28 PM CST	August	28.		-	
Success	,	- ,			
Updating db env			scaoda10ha13c2n2	August	28
	λ11α11α±	20	2024 2:55:30 PM CST	11ugust	20,
	August	20,	2027 2.00.00 FM COI		
Success					



Enable DbSizing Template 2024 2:55:30 PM CST Success	August 28,	scaoda10ha13c2n2 2024 2:56:20 PM CST	August 28,
Create tns entry 2024 2:56:20 PM CST Success	August 28,	scaoda10ha13c2n1 2024 2:56:21 PM CST	August 28,
Create tns entry 2024 2:56:21 PM CST Success	August 28,	scaoda10ha13c2n2 2024 2:56:22 PM CST	August 28,
Running datapatch 2024 2:56:22 PM CST Success		scaoda10ha13c2n2 2024 2:56:23 PM CST	August 28,
Set CPU pool 2024 2:56:23 PM CST	August 28,	scaoda10ha13c2n1 2024 2:56:23 PM CST	August 28,
Success Reset Associated Networks for 2024 2:57:10 PM CST			August 28,
Success Reset Associated Networks 2024 2:57:13 PM CST	August 28,	scaoda10ha13c2n1 2024 2:57:14 PM CST	August 28,
Success Set log_archive_dest for Data 2024 2:57:14 PM CST			August 28,
Success Setting Database parameter for 2024 2:57:18 PM CST			August 28,
Success Enable New Tablespace Encrypt 2024 2:58:07 PM CST	ion August 28,	scaoda10ha13c2n2 2024 2:58:08 PM CST	August 28,
Success Deleting OKV Client Software 2024 2:58:09 PM CST			August 28,
Success Copy Pwfile to Shared Storage 2024 2:58:09 PM CST		scaoda10ha13c2n1 2024 2:58:10 PM CST	August 28, Success

To restore an Oracle RAC database, run the <code>odacli irestore-database</code> command as follows. Specify the <code>okvclient.jar</code> file for the local database instance first, followed by the path to the <code>okvclient.jar</code> file for the remote database instance in the request. In the following example, the <code>okvclient.jar</code> file in the <code>/tmp/dir1</code> location belongs to the local node and the <code>okvclient.jar</code> file in the <code>/tmp/dir2</code> location belongs to the remote node.

```
odacli irestore-database -r /tmp/bkpreport.json -n okvdb7 -y RAC -t -kt OKV -ocp /tmp/dir1/okvclient.jar,/tmp/dir2/okvclient.jar
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
```

Job details

-----

ID: 79b2d96c-0156-444b-b965-185b311f5110

Description: Database service recovery with DB name: okvdb7

Status: Success

Created: August 28, 2024 12:58:39 AM CST

Message:



Task Name Time Status		nd Ti			Start	
Check if cluster ware is runn 2024 12:59:07 AM CST Success	ing		scaoda10ha13c2n1		August 28	,
Check if cluster ware is runn 2024 12:59:07 AM CST Success	_				August 28	,
Creating DbStorage for DbRest 2024 12:59:07 AM CST Success					August 28	,
Validating DiskSpace for DATA 2024 12:59:08 AM CST Success					August 28	,
Setting up SSH equivalence 2024 12:59:09 AM CST Success			scaoda10ha13c2n1 2024 12:59:12 AM		August 28	,
Configuring user access to AC 2024 12:59:13 AM CST Success filesystems for okvdb7					August 28	,
Audit directory creation 2024 12:59:14 AM CST Success					August 28	,
Audit directory creation 2024 12:59:14 AM CST		28,	scaoda10ha13c2n2 2024 12:59:14 AM		August 28	,
Success Configure TDE for RestoreDb T 2024 12:59:15 AM CST Success					August 28	,
Auxiliary Instance Creation 2024 12:59:17 AM CST	August	28,	scaoda10ha13c2n1 2024 12:59:28 AM	CST	August 28	,
Success TDE Wallet directory creation 2024 12:59:28 AM CST					August 28	,
Success Installing OKV Client Softwar 2024 12:59:28 AM CST					August 28	,
Success Installing OKV Client Softwar 2024 12:59:30 AM CST					August 28	,
Success Auto login TDE Wallet creatio 2024 12:59:31 AM CST					August 28	,
Success Password based TDE Wallet ope 2024 12:59:32 AM CST					August 28	,
Success Install Object Store Swift mo	dule		scaoda10ha13c2n2		August 28	,



2024 12:59:51 AM CST	August 28,	2024 1:00:09 AM CST	
Success Restoring Spfile From Casper 2024 1:00:09 AM CST Success		scaoda10ha13c2n1 2024 1:00:28 AM CST	August 28,
Customize Db Parameters 2024 1:00:28 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:00:34 AM CST	August 28,
Create spfile for restore db 2024 1:00:34 AM CST Success		scaoda10ha13c2n1 2024 1:00:35 AM CST	August 28,
Restoring control file 2024 1:00:35 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:00:58 AM CST	August 28,
Mounting db 2024 1:00:58 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:01:23 AM CST	August 28,
Validating backup for Restore 2024 1:01:23 AM CST Success			August 28,
Restoring DB for migration 2024 1:01:29 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:10:54 AM CST	August 28,
Re-Create control file 2024 1:10:54 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:11:36 AM CST	August 28,
Change DBID and/or DBName 2024 1:11:36 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:14:34 AM CST	August 28,
Removing Disabled Redo Thread 2024 1:14:34 AM CST Success			August 28,
Updating DB attributes 2024 1:14:36 AM CST Success	August 28,	scaoda10ha13c2n1 2024 1:14:37 AM CST	August 28,
	.,	2024 1:14:37 AM CS1	
Customize DB for Type RAC/Rac 2024 1:14:37 AM CST Success	One	scaoda10ha13c2n1	August 28,
Customize DB for Type RAC/Rac 2024 1:14:37 AM CST	One August 28, acone db	scaodal0hal3c2nl 2024 1:14:44 AM CST scaodal0hal3c2nl	August 28, August 28,
Customize DB for Type RAC/Rac 2024 1:14:37 AM CST Success Enable cluster ware for rac/r 2024 1:14:45 AM CST	One August 28, acone db August 28, Rac and	scaodal0hal3c2nl 2024 1:14:44 AM CST scaodal0hal3c2nl 2024 1:14:45 AM CST scaodal0hal3c2nl	-
Customize DB for Type RAC/Rac 2024 1:14:37 AM CST Success Enable cluster ware for rac/r 2024 1:14:45 AM CST Success Building Cluster DB Views for 2024 1:14:45 AM CST Success	One August 28, acone db August 28, Rac and August 28,	scaodal0hal3c2nl 2024 1:14:44 AM CST scaodal0hal3c2nl 2024 1:14:45 AM CST scaodal0hal3c2nl 2024 1:14:56 AM CST	August 28, August 28,
Customize DB for Type RAC/Rac 2024 1:14:37 AM CST Success Enable cluster ware for rac/r 2024 1:14:45 AM CST Success Building Cluster DB Views for 2024 1:14:45 AM CST Success RacOne  Register Database taskflow 2024 1:14:58 AM CST Success Create SPFile in shared loc	One August 28, acone db August 28, Rac and August 28, August 28,	scaodal0hal3c2nl 2024 1:14:44 AM CST scaodal0hal3c2nl 2024 1:14:45 AM CST scaodal0hal3c2nl 2024 1:14:56 AM CST	August 28, August 28,



Register DB with clusterware 2024 1:15:05 AM CST August 28, Success	scaoda10ha13c2n1 2024 1:16:33 AM CST	August 28,
Add Startup Trigger to Open all PDBS 2024 1:16:33 AM CST August 28, Success		August 28,
Set SysPassword and Create PwFile	scaoda10ha13c2n1 2024 1:16:38 AM CST	August 28,
Enable block change tracking	scaoda10ha13c2n1 2024 1:16:54 AM CST	August 28,
Creating pfile	scaoda10ha13c2n1 2024 1:16:56 AM CST	August 28,
Updating db env	scaoda10ha13c2n1 2024 1:16:56 AM CST	August 28,
Enable DbSizing Template	scaoda10ha13c2n1 2024 1:18:38 AM CST	August 28,
Update Database Global Name	scaoda10ha13c2n1 2024 1:18:40 AM CST	August 28,
Create tns entry 2024 1:18:40 AM CST August 28,	scaoda10ha13c2n1 2024 1:18:42 AM CST	August 28,
	scaoda10ha13c2n2 2024 1:18:43 AM CST	August 28,
	scaoda10ha13c2n1 2024 1:19:19 AM CST	August 28,
	scaoda10ha13c2n1 2024 1:19:19 AM CST	August 28,
<del>-</del>	scaoda10ha13c2n1 2024 1:20:30 AM CST	August 28,
	scaoda10ha13c2n2 2024 1:20:31 AM CST	August 28,
	scaoda10ha13c2n1 2024 1:20:34 AM CST	August 28,
Success Auto login TDE Wallet creation 2024 1:20:34 AM CST August 28,		August 28,
	scaoda10ha13c2n1 2024 1:22:17 AM CST	August 28,
	scaoda10ha13c2n1 2024 1:22:20 AM CST	August 28,
Success Deleting OKV Client Software Jar 2024 1:22:20 AM CST August 28,	scaoda10ha13c2n1 2024 1:22:20 AM CST	August 28,

```
Success

Deleting OKV Client Software Jar scaodalOhal3c2n2 August 28,
2024 1:22:20 AM CST August 28, 2024 1:22:20 AM CST Success
```

### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

### **Deleting TDE-enabled Databases**

Understand how you can delete a TDE-enabled database on Oracle Database Appliance on bare metal and DB systems, that uses Oracle Key Vault to store TDE keys.

Use the <code>odacli delete-database</code> command to delete TDE-enabled database with TDE keys stored on Oracle Key Vault. Use the <code>-n</code> option to specify the name of the database to be deleted.

```
odacli delete-database -n kokvdb1
  "jobId": "6f001840-5002-43ee-9067-e22930e36d58",
  "status" : "Running",
  "message" : null,
  "reports" : [ {
    "taskId": "TaskDcsJsonRpcExt 2259",
    "taskName" : "Validate DB 9aeeeb5f-afc5-4051-8bd1-00c62048ca01 for
deletion",
    "nodeName" : "scaoda6m006",
    "taskResult" : "",
    "startTime" : "July 15, 2024 15:40:50 PM CST",
    "endTime" : "July 15, 2024 15:40:50 PM CST",
    "duration" : "00:00:00.13",
    "status" : "Success",
   "taskDescription" : null,
    "parentTaskId" : "TaskSequential 2257",
    "jobId": "6f001840-5002-43ee-9067-e22930e36d58",
    "tags" : [ ],
    "reportLevel" : "Info",
    "updatedTime" : "July 15, 2024 15:40:50 PM CST"
  "createTimestamp": "July 15, 2024 15:40:49 PM CST",
  "resourceList" : [ ],
  "description" : "Database service deletion with DB name: kokvdb1 with ID :
9aeeeb5f-afc5-4051-8bd1-00c62048ca01",
  "updatedTime" : "July 15, 2024 15:40:50 PM CST",
  "jobType" : null
odacli describe-job -i 6f001840-5002-43ee-9067-e22930e36d58
Job details
                     ID: 6f001840-5002-43ee-9067-e22930e36d58
            Description: Database service deletion with DB name: kokvdb1
with ID: 9aeeeb5f-afc5-4051-8bd1-00c62048ca01
                 Status: Success
```

Created: July 15, 2024 3:40:49 PM CST Message:

Task Name Start Time End Time Status July 15, 2024 3:40:50 PM Validate DB July 15, 2024 3:40:50 PM CST 9aeeeb5fafc5-4051-8bd1-00c62048ca01 deletion Deleting the RMAN logs July 15, 2024 3:40:50 PM July 15, 2024 3:40:51 PM CST Success OKV Endpoint deletion July 15, 2024 3:40:51 PM July 15, 2024 3:40:56 PM CST CST Success OKV Wallet deletion July 15, 2024 3:40:56 PM July 15, 2024 3:41:05 PM CST Success OKV Files deletion July 15, 2024 3:41:05 PM July 15, 2024 3:41:05 PM CST Success July 15, 2024 3:41:05 PM Database Deletion By RHP CST July 15, 2024 3:42:37 PM CST Unregister DB From Cluster July 15, 2024 3:42:37 PM July 15, 2024 3:42:37 PM CST Kill PMON Process July 15, 2024 3:42:37 PM July 15, 2024 3:42:37 PM CST July 15, 2024 3:42:37 PM Database Files Deletion July 15, 2024 3:42:49 PM CST Delete File Groups of Database kokvdb1 July 15, 2024 3:42:49 PM

### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

July 15, 2024 3:42:58 PM CST

### Creating a User in Oracle Key Vault Using BUI

Create a user with Oracle Key Vault server configuration entitlement on a multi-user access enabled Oracle Database Appliance.

### Creating an Oracle Key Vault User with Browser User Interface

Log into the Browser User Interface as the odaadmin user:

https://host-ip-address:7093/mgmt/index.html

- 2. Click the Multi-User Access tab.
- 3. Click the Users link on the left-hand pane.

- Click Create User.
- 5. In the Create User page, provide the User ID, specify the Role as ODA-OKVCONFIGADMIN, and provide the ODA Password for this user. Note that the same user credentials work for login for BUI and ODACLI commands.
- Click Create.
- 7. The job is submitted and a confirmation page appears with a link to the job. Click the link to view the job progress, tasks, and status. After you close the Job confirmation page, you can click the **Activity** tab to monitor the job progress. Click the job number to view the tasks and status details. Click **Refresh** to refresh the page.
- The account is created with Inactive state. Log into the BUI with the user credentials. You are prompted to change the password. Change the password and log into the BUI with the new password.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

### Updating Oracle Key Vault Endpoints for Databases

Understand how you can update the Oracle Key Vault client on Oracle Database Appliance when the Oracle Key Vault server is updated to the latest release or when certificates are regenerated on the Oracle Key Vault server.

When you update the Oracle Key Vault endpoints software, all the features available on the updated Oracle Key Vault server are available to the Oracle Key Vault endpoints.

When you update Oracle Key Vault server to the latest release, you update the following:

- Oracle Key Vault endpoint software corresponding to each Oracle Key Vault TDE database instance, present in the /etc/OKV/db unique name/okv location.
- Oracle Key Vault PKCS library liborapkcs.so, common to all Oracle Key Vault TDE databases, present in the /opt/oracle/extapi/64/hsm/oracle/1.0.0/ location.
- Oracle Key Vault REST client jar okvrestcli.jar, corresponding to each Oracle Key Vault server configuration object, present in the /etc/OKV/okv\_server\_config\_name/lib/ location.

When you update only the certificates corresponding to the endpoints, you update only the Oracle Key Vault endpoint software corresponding to each Oracle Key Vault TDE database instance, present in the /etc/OKV/db unique name/okv location.

### Updating Oracle Key Vault endpoints software with the odacli update-okvendpoints command

Use the odacli update-okvendpoints command to update the Oracle Key Vault endpoint software.

• The --endpoint-software, -es option specifies that the odacli update-okvendpoints command must update the Oracle Key Vault endpoint software of databases that is specified in the Oracle Key Vault client JSON file.
This is a boolean option, to be used with the --okvclient-json, oj option. When specified, the Oracle Key Vault endpoint software corresponding to each database mentioned in the Oracle Key Vault client JSON is updated. You must specify the JSON file that contains the absolute path to the okvclient.jar file in the option. The default value is false.



To update the endpoint software of the database that did not use Oracle Key Vault user credentials, instead, used <code>okvclient.jar</code>, during its creation, the absolute path to <code>okvclient.jar</code> file, corresponding to each database instance of such database must be specified in the Oracle Key Vault client JSON file.

```
[
    "dbName" : "racdb1",
    "node1" : "/tmp/racdb11/okvclient.jar",
    "node2" : "/tmp/racdb12/okvclient.jar"
},
    "dbName" : "sidb1",
    "node1" : "/tmp/sidb1/okvclient.jar",
}
```

To update the endpoint software of the database that used Oracle Key Vault user credentials, that is, used Oracle Key Vault server configuration, during its creation, specifying its name in the Oracle Key Vault client JSON file is sufficient.

In a multi-user access-enabled or multi-user access-enabled passwordless environment, the endpoint software of only the Oracle Key Vault TDE-enabled databases that belong to the DB user running this request are updated. In a non-multi-user access enabled environment, the endpoint software of all Oracle Key Vault TDE-enabled databases can be updated, as there is no separate DB user and all databases are created by a single user.

• Specify the --okvclient-path-json, -oj option with the --endpoint-software, -es option to update TDE-enabled databases using Oracle Key Vault with endpoints in Oracle Key Vault.

This option specifies the absolute path to the JSON file, which contains the database name and the absolute path to the <code>okvclient.jar</code> file corresponding to each instance of the database. The JSON file must be present on the appliance from which you run this command.

For Oracle RAC databases, the absolute path to the <code>okvclient.jar</code> file corresponding to both instances must be specified. For single-instance Oracle databases, the absolute path to the <code>okvclient.jar</code> file corresponding to the instance must be specified and must be present on the node where the instance is running.

• Specify the --library, -lib option to update the Oracle Key Vault PKCS library and Oracle Key Vault REST client jar file corresponding to each Oracle Key Vault server configuration object present in the system. The default value is false. Use this option only after updating the endpoints of all databases that uses Oracle Key Vault to store TDE keys. To update the endpoints, use the option --endpoint-software, -es and --okvclient-path-json, -oj. Then, use the option --library, -lib to update the Oracle Key Vault PKCS library and OKV REST client jar. Since the Oracle Key Vault PKCS library is common to all databases, it requires the endpoints of all database to be updated first.

However, if only certificates are updated on the Oracle Key Vault server, then updating the endpoints of databases is enough and does not require the library to be updated. Do not use this option with the --endpoint-software, -es or --okvclient-path-json, -oj options.

In a multi-user access-enabled or multi-user access-enabled passwordless environment, the odaadmin user must specify this option.

When you update the Oracle Key Vault PKCS library, the database is restarted.

An example to update the endpoint software of databases that used Oracle Key Vault user credentials is as follows. In the following example, racdb1 is an Oracle RAC database and sidb1 is a single-instance database.

```
odacli update-okvendpoints -es -oj /tmp/okvclient.json
Enter TDE password of 'racdb1' database:
Enter TDE password of 'sidb1' database:
Job details
______
                ID: 64ae75d4-6435-4842-b507-8adcd12bd4bd
         Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
             Status: Created
            Created: May 29, 2025 19:24:55 PDT
            Message:
Task Name Start Time End Time Status
_____
odacli describe-job -i 64ae75d4-6435-4842-b507-8adcd12bd4bd
Job details
                ID: 64ae75d4-6435-4842-b507-8adcd12bd4bd
         Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
             Status: Success
            Created: May 29, 2025 19:24:55 PDT
            Message:
Task Name Node Name Start Time End Time Status
____________
_____
______ ____
Endpoint update: racdb1 n1 May 29, 2025 19:24:58 PDT May 29, 2025 19:24:59
PDT Success
Endpoint update: racdb1 scaoda806c1n2 May 29, 2025 19:24:59 PDT May 29, 2025
19:25:01 PDT Success
Endpoint update : sidb1 n1 May 29, 2025 19:25:05 PDT May 29, 2025 19:25:06
PDT Success
```

An example to update endpoint software of databases that had not used Oracle Key Vault user credential is as follows, where mydb is a single-instance database.

```
cat /tmp/okvclient 2.json
Γ
   "dbName" : "mydb"
1
odacli update-okvendpoints -es -oj /tmp/okvclient 2.json
Job details
_____
                 ID: 245a2d23-4a6a-4fe8-943f-9a81e1059fe7
          Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
              Status: Created
             Created: May 29, 2025 19:26:57 PDT
             Message:
Task Name Start Time End Time Status
_____
odacli describe-job -i 245a2d23-4a6a-4fe8-943f-9a81e1059fe7
Job details
                 ID: 245a2d23-4a6a-4fe8-943f-9a81e1059fe7
          Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
              Status: Success
             Created: May 29, 2025 19:26:57 PDT
             Message:
Task Name Node Name Start Time End Time Status
______ ____
Endpoint update: mydb n1 May 29, 2025 19:27:53 PDT May 29, 2025 19:28:47 PDT
Success
```

#### Sample command to update the Oracle Key Vault PKCS library is as follows:



Status: Created

Created: May 29, 2025 19:42:07 PDT

Message:

Task Name Start Time End Time Status

\_\_\_\_\_\_

odacli describe-job -i f5f6a0f4-061b-4ab1-9656-51beaa381438

Job details

\_\_\_\_\_\_

ID: f5f6a0f4-061b-4ab1-9656-51beaa381438

Description: Update all databases endpoints, OKV PKCS library and

all OKV REST clients

Status: Success

Created: May 29, 2025 19:42:07 PDT

Message:

Task Name	Node Name	Start
Time End Time		Status
Okvobj1 : OKV client library update	n1	May 29, 2025 19:42:20
PDT May 29, 2025 19:42:22 PDT	Success	May 29, 2023 19.42.20
dharm: Racdb1:Database stop (Srvctl)	n1	May 29, 2025 19:42:22
PDT May 29, 2025 19:42:55 PDT	Success	riay 25, 2025 15.42.22
Sidb1:Database stop (Srvct1)	n1	May 29, 2025 19:42:55
PDT May 29, 2025 19:43:21 PDT	Success	114, 23, 2020 13.12.00
Mydb:Database stop (Srvctl)	n1	May 29, 2025 19:43:21
PDT May 29, 2025 19:43:44 PDT	Success	- '
Database start (Srvctl)	n1	May 29, 2025 19:43:44
PDT May 29, 2025 19:44:21 PDT	Success	
OKV PKCS library update	n1	May 29, 2025 19:43:44
PDT May 29, 2025 19:43:44 PDT	Success	
Database start (Srvctl)	n1	May 29, 2025 19:44:22
PDT May 29, 2025 19:44:53 PDT	Success	
Database start (Srvctl)	n1	May 29, 2025 19:44:53
PDT May 29, 2025 19:45:28 PDT	Success	

#### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented on Oracle
  - Understand how multi-user access can be implemented on Oracle Database Appliance, its advantages and restrictions and the associated life cycle management changes for your appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

### Registering TDE-enabled Databases Configured with Oracle Key Vault

You can now register TDE-enabled databases that use Oracle Key Vault keystore but were not created using Oracle Database Appliance tooling. After registering these databases with

Oracle Database Appliance, you can use Oracle Database Appliance commands for managing the databases.

When you register TDE-enabled databases with Oracle Database Appliance, you can choose whether Oracle Database Appliance manages the TDE password or not. When you register the database, if Oracle Key Vault server configuration is used, then the current TDE password is set to a new random TDE password that Oracle Database Appliance manages, and is not known to you. When you register the database, if Oracle Key Vault server configuration is not used, then you manage the TDE password, not Oracle Database Appliance. When TDE password is not managed by Oracle Database Appliance tooling, TDE password must be provided explicitly to operations such as database recovery, re-key and change of TDE password.

#### Note:

Oracle Database Appliance release 19.27 does not support enabling of high availability for single-instance databases when registered in a high availability deployment.

#### WARNING:

The password is stored in a wallet on Oracle Key Vault. Loss of that wallet results in not being able to access the database tables. So, do not delete the wallet on Oracle Key Vault.

Following are the prerequisites to register a database that uses Oracle Key Vault to store the TDE master encryption keys:

- The wallet\_root database initialization parameter must be used to configure TDE and must be set to the /etc/OKV/db unique name value.
- The TDE\_CONFIGURATION initialization parameter must be used to configure TDE and must be set to the KEYSTORE CONFIGURATION=OKV|FILE value.
- The endpoint software must be installed in the /etc/OKV/db\_unique\_name/okv location.
  - For Oracle RAC and Oracle RAC One Node databases, the endpoint software corresponding to two instances must be installed on both nodes.
  - For single-instance databases. the endpoint software must be installed on the node where the database is running.
- Autologin TDE wallet cwallet.sso must be created in the /etc/OKV/db\_unique\_name/tde location. For Oracle RAC and Oracle RAC One Node databases, the autologin TDE wallet must be created on both nodes.
- The name of the endpoints on Oracle Key Vault server must be in following format:
  - Single-instance database: db\_name\_db\_running\_node\_num\_on\_cluster\_name. For example: myokvdb3\_0\_on\_scaodaxxx-c
  - Oracle RAC database: Endpoint name corresponding to instance 1: db\_name1\_on\_cluster\_name. For example: myokvdb31 on scaodaxxx-c
  - Oracle RAC database: Endpoint name corresponding to instance 2: db\_name2\_on\_cluster\_name. For example: myokvdb32\_on\_scaodaxxx-c



- Oracle RAC One Node database: Endpoint name corresponding to active instance: db\_name\_1\_on\_cluster\_name. For example: myokvdb3 1 on scaodaxxx-c
- Oracle RAC One Node database: Endpoint name corresponding to inactive instance:
   db\_name\_2\_on\_cluster\_name. For example: myokvdb3\_2\_on\_scaodaxxx-c
- The name of the wallet on Oracle Key Vault server must be in the format db\_unique\_name\_on\_cluster\_name. For example: myokvdb3\_on\_scaodaxx-c

### Registering Oracle Key Vault TDE-enabled databases without using Oracle Key Vault server configuration

After registering the database, the KeystoreType attribute of database is set to OKV. The OKVServerConfigName attribute of the database is set to NONE.

```
odacli register-database -sn example.com --dbclass OLTP --dbshape odb2
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
 "jobId": "f82172e2-c4c1-4a77-ba41-c3d241127325",
 "status" : "Created",
 "message" : "",
 "reports" : [ ],
 "createTimestamp": "May 07, 2025 08:54:50 PDT",
 "resourceList" : [ ],
 "description" : "Database service registration with DB service name:
aokv1.us.oracle.com",
 "updatedTime": "May 07, 2025 08:54:50 PDT",
 "jobType" : null,
 "cpsMetadata" : null
odacli describe-job -i f82172e2-c4c1-4a77-ba41-c3d241127325
Job details
                 ID: f82172e2-c4c1-4a77-ba41-c3d241127325
          Description: Database service registration with DB service name:
aokv1.us.oracle.com
              Status: Success
             Created: May 07, 2025 08:54:50 PDT
             Message:
Task Name
                                   Node Name
                                                         Start
Time
                             End Time
Status
_____
-----
Setting Database parameter for OKV n1
                                              May 07, 2025 08:54:53
              May 07, 2025 08:56:29 PDT
                                               Success
                              n1
                                              May 07, 2025 08:56:29
Validate Hugepages For Register DB
               May 07, 2025 08:56:29 PDT
                                                  Success
                                              May 07, 2025 08:56:33
Enable OMF parameters
                                  n1
               May 07, 2025 08:56:33 PDT
                                               Success
                                               May 07, 2025 08:56:33
Setting DB character set
                            n1
                May 07, 2025 08:56:34 PDT
PDT
                                                  Success
```

```
May 07, 2025 08:56:34
Move Spfile to right location
                                      n1
PDT May 07, 2025 08:56:42 PDT
                                                       Success
                                                    May 07, 2025 08:58:23
Enable DbSizing Template
                 May 07, 2025 09:00:41 PDT
                                                      Success
                                                    May 07, 2025 09:00:42
Add Startup Trigger to Open all PDBS n1
                                                       Success
PDT
                May 07, 2025 09:00:43 PDT
Running DataPatch
                                                    May 07, 2025 09:00:43
                May 07, 2025 09:01:37 PDT
                                                      Success
Reset Associated Networks for Database n1
                                                    May 07, 2025 09:01:38
                May 07, 2025 09:01:41 PDT
                                                      Success
Reset Associated Networks
                                                   May 07, 2025 09:01:41
                              n2
                May 07, 2025 09:01:41 PDT
PDT
                                                       Success
```

### Registering Oracle Key Vault TDE-enabled databases using Oracle Key Vault server configuration

After registering the database, the <code>KeystoreType</code> attribute of database is set to <code>OKV. The OKVServerConfigName</code> attribute of the database is set to <code>okv\_server\_config\_name</code>. In a multiuser access-enabled or multi-user access-enabled passwordless environment, the DB user who is registering the database must have access to the Oracle Key Vault server configuration resource. The current TDE password of the database is changed to a new random password by Oracle Database Appliance tooling. This new random password is stored on a wallet on the Oracle Key Vault server. The name of the wallet which stores the random password will be of the format <code>db\_name\_pass\_on\_cluster\_name</code>. Ensure that this wallet is not deleted on the Oracle Key Vault server if the database exists.

Following is the example of a register-database job which uses Oracle Key Vault server configuration.

```
odacli register-database -sn example.com --dbclass OLTP --dbshape odb2 -osc
okvobj1
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
Enter TDE wallet password:
Retype TDE wallet password:
  "jobId": "37cb49bb-6129-4c49-a44e-6ee4b5c97e98",
  "status" : "Created",
  "message" : "",
  "reports" : [],
  "createTimestamp" : "May 07, 2025 02:16:42 PDT",
  "resourceList" : [ ],
  "description" : "Database service registration with DB service name:
sokv10.us.oracle.com",
  "updatedTime" : "May 07, 2025 02:16:42 PDT",
  "jobType" : null,
  "cpsMetadata" : null
odacli describe-job -i 37cb49bb-6129-4c49-a44e-6ee4b5c97e98
Job details
                     ID: 37cb49bb-6129-4c49-a44e-6ee4b5c97e98
            Description: Database service registration with DB service name:
sokv10.us.oracle.com
```

Status: Success

Created: May 07, 2025 02:16:42 PDT

Message:

Task Name Time	Node Name		Start
Status			
Setting Database parameter for OKV			07, 2025 02:16:5
PDT May 07, 2025 02:17:59		-	Success
External Store Autologin wallet creation	n1	May	07, 2025 02:17:5
PDT May 07, 2025 02:18:09	PDT		Success
Shutdown database	n1	May	07, 2025 02:18:09
PDT May 07, 2025 02:19:19	PDT		Success
Mount database using SQL	n2	May	07, 2025 02:19:19
PDT May 07, 2025 02:19:46	PDT		Success
External Store Autologin wallet creation	n1	May	07, 2025 02:19:46
PDT May 07, 2025 02:19:57	PDT		Success
Shutdown database	n2	May	07, 2025 02:19:5
PDT May 07, 2025 02:20:18	PDT		Success
Startup database using SQL	n1	May	07, 2025 02:20:19
PDT May 07, 2025 02:20:49	PDT		Success
Re-enroll and Provision of Endpoint	n1	May	07, 2025 02:20:50
PDT May 07, 2025 02:21:31		-	Success
Save the new TDE password using a		May	07, 2025 02:21:33
PDT May 07, 2025 02:21:39		-	Success
temporary custom attribute on OKV			
IDE Wallet closure	n1	May	07, 2025 02:21:39
PDT May 07, 2025 02:21:40	PDT		Success
Change the TDE password in local wallet	n1	May	07, 2025 02:21:42
PDT May 07, 2025 02:21:57	PDT		Success
Auto login TDE Wallet creation	n1	May	07, 2025 02:21:5
PDT May 07, 2025 02:22:01	PDT		Success
Shutdown database	n1	May	07, 2025 02:22:03
PDT May 07, 2025 02:22:35	PDT		Success
Mount database using SQL	n2	May	07, 2025 02:22:35
PDT May 07, 2025 02:23:01	PDT		Success
Re-enroll and Provision of Endpoint	n2	May	07, 2025 02:23:03
PDT May 07, 2025 02:23:43	PDT		Success
Change the TDE password in local wallet	n2	May	07, 2025 02:23:43
PDT May 07, 2025 02:23:55	PDT	_	Success
Auto login TDE Wallet creation	n1	May	07, 2025 02:23:50
PDT May 07, 2025 02:24:00	PDT	-	Success
Shutdown database	n2	May	07, 2025 02:24:00
PDT May 07, 2025 02:24:22	PDT	_	Success
Startup database using SQL	n1	Mav	07, 2025 02:24:22
PDT May 07, 2025 02:24:53	PDT	2	Success
Save new TDE password on OKV	n2	Mav	07, 2025 02:24:53
PDT May 07, 2025 02:24:59	PDT	- 1	Success
Delete the temporary custom attribute		Mav	07, 2025 02:24:59
		11	Success
PDT May 07, 2025 02:25:03	LDI		



Database stop (Srvo	ctl)			n1	May	07,	2025	02:25:04
PDT	May 07,	2025	02:26:04	PDT		Succ	ess	
Deleting OKV Client	t Softwar	re Jar	-	n2	May	07,	2025	02:25:04
PDT	May 07,	2025	02:25:04	PDT		Succ	ess	
Database start (Sr	vctl)			n1	May	07,	2025	02:26:04
PDT	May 07,	2025	02:26:36	PDT		Succ	ess	
Checking the TDE wa	allet sta	atus		n1	May	07,	2025	02:26:36
PDT	May 07,	2025	02:26:40	PDT		Succ	ess	
Validate Hugepages	For Regi	ster	DB	n1	May	07,	2025	02:26:41
PDT	May 07,	2025	02:26:42	PDT		Succ	ess	
Enable OMF paramete	ers			n1	May	07,	2025	02:26:45
PDT	May 07,	2025	02:26:46	PDT		Succ	ess	
Move Spfile to righ	ht locati	on		n1	May	07,	2025	02:26:46
PDT	May 07,	2025	02:26:54	PDT		Succ	ess	
Setting DB characte	er set			n1	May	07,	2025	02:26:46
PDT	May 07,	2025	02:26:46	PDT		Succ	ess	
Restart RACOne data	abase			n1	May	07,	2025	02:26:54
PDT	May 07,	2025	02:28:29	PDT		Succ	ess	
Enable DbSizing Ter	mplate			n1	May	07,	2025	02:28:29
PDT	May 07,	2025	02:30:04	PDT		Succ	ess	
Running DataPatch				n1	May	07,	2025	02:30:05
PDT	May 07,	2025	02:30:41	PDT		Succ	ess	
Reset Associated No	etworks f	or Da	atabase	n1	May	07,	2025	02:30:42
PDT	May 07,	2025	02:30:45	PDT		Succ	ess	
Reset Associated Ne	etworks			n2	Мау	07,	2025	02:30:45
PDT	May 07,	2025	02:30:45	PDT		Succ	ess	

#### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented on Oracle Database Appliance, its
   advantages and restrictions and the associated life cycle management changes for your
   appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

## Restoring an Oracle Key Vault TDE Database using RMAN and Registering the Database

Understand how you can register a TDE-enabled database that uses Oracle Key Vault to store TDE keys.

#### Prerequisites:

- A Regular-L0 or Longterm backup of the database to a NFS location must be available.
- The SYS password and TDE password of the source database must be known.
- The okvclient.jar corresponding to each endpoint of the database must be known.
- The name of the endpoints on Oracle Key Vault server must be in following format:
  - Single-instance database: db\_name\_db\_running\_node\_num\_on\_cluster\_name. For example: myokvdb3 0 on scaodaxxx-c



- Oracle RAC database: Endpoint name corresponding to instance 1: db\_name1\_on\_cluster\_name. For example: myokvdb31 on scaodaxxx-c
- Oracle RAC database: Endpoint name corresponding to instance 2: db\_name2\_on\_cluster\_name. For example: myokvdb32 on scaodaxxx-c
- Oracle RAC One Node database: Endpoint name corresponding to active instance: db\_name\_1\_on\_cluster\_name. For example: myokvdb3 1 on scaodaxxx-c
- Oracle RAC One Node database: Endpoint name corresponding to inactive instance:
   db\_name\_2\_on\_cluster\_name. For example: myokvdb3 2 on scaodaxxx-c
- The name of the wallet on Oracle Key Vault server must be in the format db\_unique\_name\_on\_cluster\_name. For example: myokvdb3 on scaodaxx-c

#### **WARNING:**

The password is stored in a wallet on Oracle Key Vault. Loss of that wallet results in not being able to access the database tables. So, do not delete the wallet on Oracle Key Vault.

#### Follow these steps:

 Create required directories as root user. For Oracle RAC and Oracle RAC One Node databases, create the following directories on both the nodes.

```
mkdir /etc/OKV/db_unique_name
mkdir /etc/OKV/db_unique_name/tde
mkdir /etc/OKV/db_unique_name/okv
chmod -R 700 /etc/OKV/db_unique_name/
chown -R db user:group /etc/OKV/db unique name/
```

In a multi-user access-enabled or multi-user access-enabled passwordless environment, db\_user is the primary owner of the database and the group is dcsagent. For non-multi user access-enabled systems, the db\_user is the oracle user and the group is oinstall.

- 2. The endpoints corresponding to the database instance must be re-enrolled with the Oracle Key Vault server. For Oracle RAC and Oracle RAC One Node databases, the endpoints corresponding to both the instances must be re-enrolled. After re-enrollment, download the okvclient.jar corresponding to the instance on the node where the instance is running.
- 3. Install the okvclient.jar in the /etc/OKV/db\_unique\_name/okv location using the TDE password of the source database.

```
switch to db_user
$ORACLE HOME/jdk/jre/bin/java -jar okvclient.jar
```

**4.** Create a database instance and start it in nomount stage. For single-instance database:

```
Switch to db_user

. oraenv
ORACLE_SID = [dbusr1] ? myokvdb3
ORACLE HOME = [/home/oracle] ? /u01/app/odaorahome/oracle/product/19.0.0.0/
```

```
dbhome_1

cat $ORACLE_HOME/dbs/initmyokvdb3.ora
db_name=myokvdb3
db_unique_name=myokvdb3
wallet_root=/etc/OKV/myokvdb3
TDE_CONFIGURATION="KEYSTORE_CONFIGURATION=OKV|FILE"

orapwd file=$ORACLE_HOME/dbs/orapwmyokvdb3
password=<tde_password_used_during_db_create> entries=5

sqlplus / as sysdba
SQL> startup nomount
```

#### For Oracle RAC database, on node 1:

```
. oraenv
ORACLE_SID = [dbusr1] ? myokvdb31
ORACLE_HOME = [/home/oracle] ? /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_1

cat $ORACLE_HOME/dbs/initmyokvdb31.ora
db_name=myokvdb3
db_unique_name=myokvdb3
wallet_root=/etc/OKV/myokvdb3
TDE_CONFIGURATION="KEYSTORE_CONFIGURATION=OKV|FILE"
instance_number=1
instance_name=myokvdb31

sqlplus / as sysdba
SQL> startup nomount
```

Create autologin TDE wallet using the same TDE password as the one used when creating the database.

For single-instance database:

```
SQL> administer key management add secret 'tde_password'for client 'OKV_PASSWORD' to local auto_login keystore '/etc/OKV/myokvdb3/tde';
```

#### For Oracle RAC database:

```
SQL> administer key management add secret 'tde_password'for client 'OKV_PASSWORD' to local auto_login keystore '/etc/OKV/myokvdb3/tde';
```

**6.** Create the database storage corresponding to the database being restored.

```
odacli create-dbstorage -n db name -r asm
```

Restore the database using RMAN duplicate and specify the NFS backup location.

```
Switch to db user
```



#### For single-instance database:

```
. oraenv
ORACLE_SID = [dbusr1] ? myokvdb3
ORACLE_HOME = [/home/oracle] ? /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_1

rman auxiliary /
run {
    allocate auxiliary channel ch1 type disk;
    duplicate target database to myokvdb3
        spfile
        set db_unique_name='myokvdb3'
        set db_name='myokvdb3'
        BACKUP LOCATION 'nfs_backup_location';
}
```

#### For Oracle RAC database:

```
. oraenv
ORACLE_SID = [dbusr1] ? myokvdb31
ORACLE_HOME = [/home/oracle] ? /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_1

rman auxiliary /
run {
   allocate auxiliary channel ch1 type disk;
   duplicate target database to myokvdb3
        spfile
        set db_unique_name='myokvdb3'
        set db_name='myokvdb3'
        set cluster_database='false'
        set instance_number='1'
        set instance_name='myokvdb31'
        BACKUP_LOCATION 'nfs_backup_location';
}
```

8. For Oracle RAC databases, set the cluster\_database parameter and move the spfile to shared location. For single-instance database, this step is not required. On Node 1:

```
SQL> alter system set cluster_database=TRUE scope=spfile;

SQL> create pfile='/u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_1/dbs/pfile_myokvdb3.ora' from spfile;

File created.

SQL> create spfile='+DATA' from pfile='/u01/app/odaorahome/oracle/product/
19.0.0.0/dbhome_1/dbs/pfile_myokvdb3.ora';

File created.
```



```
orapwd file='+DATA' password=<tde_password_used_during_db_create>
entries=5 dbuniquename='myokvdb3'
```

9. Add the database service. For Oracle RAC database, find the spfile name using the SQL>show parameter spfile command and use it as follows: For single-instance database:

```
srvctl add database -db myokvdb3 -oraclehome /u01/app/odaorahome/oracle/product/19.0.0.0/dbhome_1 -dbtype Single -spfile /u01/app/odaorahome/oracle/product/19.0.0.0/dbhome_1/dbs/spfilesdokv3.ora -pwfile /u01/app/odaorahome/oracle/product/19.0.0.0/dbhome_1/dbs/orapwsdokv3 -node node_name
```

#### For Oracle RAC and Oracle RAC One Node databases:

```
srvctl add database -db myokvdb3 -oraclehome /u01/app/odaorahome/oracle/
product/19.0.0.0/dbhome_1 -dbtype RAC -spfile +DATA/myokvdb3/
PARAMETERFILE/spfile.xxxxxxx

srvctl add instance -d myokvdb3 -i myokvdb31 -n node_1_name
srvctl add instance -d myokvdb3 -i myokvdb32 -n node 2 name
```

- 10. Run the shutdown abort command on the database using SQL\*Plus.
- 11. For Oracle RAC database, create Autologin TDE wallet on Node 2.

```
Switch to db_user
. oraenv
ORACLE_SID = [dbusr1] ? myokvdb32
ORACLE_HOME = [/home/oracle] ? /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_1
sqlplus / as sysdba
SQL> startup nomount
SQL> administer key management add secret 'tde_password' for client
'OKV PASSWORD' to local auto login keystore '/etc/OKV/myokvdb3/tde';
```

- 12. Start the database using the srvctl start database -db myokvdb3 command. After the database starts, on Oracle RAC database, verify that the pmon process corresponding to the instance is running on the respective node.
- 13. If the DB name and DB unique name of the source database are in upper case, then this step is not required. If the DB name and DB unique name of the source database are not in upper case, then restoring the database from RMAN backup will change the DB name and DB unique name to upper case. Hence after restoring the database, the case of the DB name and DB unique name must be restored to the same case as the source database.
  - a. Delete the initfile in db home/dbs/initoracle sid.ora, if it already exist.
  - b. Create the pfile from spfile.

```
SQL> create pfile='db home/dbs/initoracle sid.ora' from spfile;
```

- c. Edit the <code>db\_home/dbs/initoracle\_sid.ora</code> file and update the <code>db\_name</code> and <code>db\_unique\_name</code> with the same case as the source database.
- d. Shut down the database.

```
SQL> shutdown immediate
```

e. Start up the database using the edited pfile.

```
SQL> startup pfile='<db home>/dbs/initoracle sid.ora'
```

Delete spfile, if it already exists and create spfile from pfile.

```
SQL> create spfile='db_home/dbs/spfileoracle_sid.ora' from
pfile='db home/dbs/initoracle sid.ora';
```

q. Restart the database.

```
SQL> shutdown immediate SQL> startup
```

h. Confirm whether the DB name and DB unique name is updated with the same case as the source database.

```
SQL> show parameter db name; SQL> show parameter db unique name;
```

**14.** Register the database without using Oracle Key Vault server configuration:

```
odacli register-database -sn myokvdb3.us.oracle.com --dbclass OLTP --dbshape odb2
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
```

To register the database with Oracle Key Vault server configuration:

```
odacli register-database -sn example.com --dbclass OLTP --dbshape odb2 -osc okv_obj_name
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
Enter TDE wallet password:
Retype TDE wallet password:
```

#### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
   Understand how multi-user access can be implemented an Oracle
  - Understand how multi-user access can be implemented on Oracle Database Appliance, its advantages and restrictions and the associated life cycle management changes for your appliance.
- odacli Multi-User Access Commands

Use odacli commands to enable multi-user access for the appliance.



## Restoring a Software Keystore TDE database using RMAN and Registering the Database

Understand how you can register a TDE-enabled database that uses software wallet to store TDE keys.

#### Prerequisites:

- A Regular-L0 or Longterm backup of the database to a NFS location must be available.
- The SYS password and TDE password must be known.
- Backup of the password-protected TDE wallet (ewallet.p12) and autologin TDE wallet (cwallet.sso) must be available.

#### Follow these steps:

 Create the database storage with the same storage type as the source database being restored.

```
odacli create-dbstorage -n db name -r asm|acfs
```

2. Create the init file corresponding to the database in the SORACLE HOME location.

```
cat $ORACLE_HOME/dbs/initoracle_sid.ora
db_name=db_name
db_unique_name=db_unique_name
wallet_root=source_database_location
TDE CONFIGURATION="KEYSTORE CONFIGURATION=FILE"
```

3. Generate the password file corresponding to the database.

```
orapwd file=\$ORACLE\_HOME/dbs/orapworacle\_sid password=sys\_password entries=5
```

- Copy the password-protected TDE wallet (ewallet.p12) to the wallet root/tde path.
- 5. Connect to the database and start the database with the nomount option.

```
export ORACLE_SID=oracle_sid
export ORACLE_UNQNAME=db_unique_name
export ORACLE_HOME=db_home_location
sqlplus / as sysdba
SQL> startup nomount
```

6. Generate the local autologin wallet using the following command:

```
SQL> ADMINISTER KEY MANAGEMENT CREATE AUTO_LOGIN KEYSTORE FROM KEYSTORE 'wallet root/tde' IDENTIFIED BY "tde password";
```

7. Connect to RMAN auxiliary and run the RMAN duplicate command.

#### For single-instance Oracle Database:

```
rman auxiliary /
run {
   allocate auxiliary channel ch1 type disk;
   duplicate target database to db_name
        spfile
        set db_unique_name='db_unique_name'
        set db_name='db_name'
        BACKUP LOCATION 'nfs_location_pointing_to_backup_pieces;
}
```

#### For Oracle RAC and Oracle RAC One Node databases:

```
run {
   allocate auxiliary channel ch1 type disk;
   duplicate target database to db_name
        spfile
        set db_unique_name='db_unique_name'
        set db_name='db_name'
        set cluster_database='false'
        BACKUP LOCATION 'nfs_location_pointing_to_backup_pieces;
}
```

**8.** Add the restored database to the database service. For single-instance Oracle Database:

```
srvctl add database -db db_unique_name -oraclehome $ORACLE_HOME -dbtype
Single -spfile $ORACLE_HOME/dbs/spfileoracle_sid.ora -
pwfile $ORACLE_HOME/dbs/orapworacle_sid -node node_name
```

#### For Oracle RAC databases:

```
srvctl add database -db db_unique_name -oraclehome $ORACLE_HOME -dbtype
RAC -spfile $ORACLE_HOME/dbs/spfileoracle_sid.ora -
pwfile $ORACLE_HOME/dbs/orapworacle_sid
srvctl add instance -d db_unique_name -i oracle_sid1 -n node_1_name
srvctl add instance -d db_unique_name -i oracle_sid2 -n node 2_name
```

#### For Oracle RAC One Node databases:

```
srvctl add database -db <db_unique_name>db_unique_name -
oraclehome $ORACLE_HOME -dbtype RACOne -spfile $ORACLE_HOME/dbs/
spfileoracle_sid.ora -pwfile $ORACLE_HOME/dbs/orapworacle_sid
srvctl add instance -d db_unique_name -i oracle_sid_1 -n node_1_name
srvctl add instance -d db_unique_name -i oracle_sid_2 -n node_2_name
```



9. Shut down tthe database and start the database as follows:

```
SQL> shutdown immediate srvctl start database -db db_unique_name
```

For Oracle RAC database, run the following command:

```
SQL> alter system set cluster database=TRUE scope=spfile ;
```

- 10. If the DB name and DB unique name of the source database are in upper case, then this step can be skipped. If the DB name and DB unique name of the source database are not in upper case, then restoring the database from RMAN backup changes the DB name and DB unique name to upper case. Hence after restoring, the case of the DB name and DB unique name must be restored back same as the source database.
  - a. Delete the initfile in db home/dbs/initoracle sid.ora, if it already exists.
  - b. Create pfile from spfile.

```
SQL> create pfile='db home/dbs/initoracle sid.ora' from spfile;
```

- c. Edit the db\_home/dbs/initoracle\_sid.ora file and update the db\_name and db unique name with the same case as the source database.
- Shut down the database.

```
SQL> shutdown immediate
```

e. Start the database using the edited pfile.

```
SQL> startup pfile='db_home/dbs/initoracle_sid.ora'
```

f. Delete spfile, if it already exists and create spfile from pfile.

```
SQL> create spfile='db_home/dbs/spfileoracle_sid.ora' from
pfile='db_home/dbs/initoracle_sid.ora';
```

g. Restart the database.

```
SQL> shutdown immediate SQL> startup
```

h. Confirm that the DB name and DB unique name are updated with same case as the source database.

```
SQL> show parameter db_name;
SQL> show parameter db_unique_name;
```

11. If the wallet\_root parameter is not set to the <code>DATA\_LOCATION</code> of the restored database, then create the <code>/opt/oracle/dcs/commonstore/wallets/tde/dbunique\_name</code> directory as the <code>db\_user</code>. Copy the password-protected TDE wallet ewallet.p12 to the <code>/opt/oracle/dcs/commonstore/wallets/tde/dbunique\_name</code> location. For DB systems, set the <code>wallet\_root</code> to the <code>DATA\_LOCATION</code>.



Register the password of the database using the same SYS password and TDE password as the source database.

```
odacli register-database -sn service\_name --dbclass db\_class --dbshape db\_shape -tp
```

#### **Related Topics**

- Implementing Multi-User Access on Oracle Database Appliance
  Understand how multi-user access can be implemented on Oracle Database Appliance, its
  advantages and restrictions and the associated life cycle management changes for your
  appliance.
- odacli Multi-User Access Commands
   Use odacli commands to enable multi-user access for the appliance.

### Creating Oracle Key Vault Server Configuration Object Using the BUI

Understand how you can create TDE-enabled database on Oracle Database Appliance with TDE keys stored in Oracle Key Vault on bare metal and DB systems using the BUI.

Follow these steps to create a TDE-enabled database with TDE keys stored on Oracle Key Vault on Oracle Database Appliance bare metal and DB systems:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- 2. Click Credential Store, then click Oracle Key Vault Server Config.
- 3. The existing Oracle Key Vault server configurations are displayed.
- Click Create and create an Oracle Key Vault server configuration.
- In the Create OKV Server Config page, specify the OKV Server Config Name, OKV Server Host, OKV Server IP address, OKV User Name, and Password.
- 6. Click Create.
- 7. Confirm the creation request job and verify that the job completed successfully.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Granting and Revoking Access on Oracle Key Vault Server Configuration Using BUI

Understand how you can grant and revoke access to Oracle Key Vault server configuration on Oracle Database Appliance on bare metal and DB systems using BUI.

Granting and Revoking Access to Oracle Key Vault server configurations

Follow these steps:

1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html



- Click Credential Store, then click Oracle Key Vault Server Config.
- 3. You can view all existing Oracle Key Vault server configurations.
- 4. To grant access to an existing Oracle Key Vault server configuration, select the Oracle Key Vault server configuration, and from the **Actions** drop-down list, select **Grant Access**.
- In the Grant Resource Access page, select the User Name to whom you want to grant access to the resource.
- Click Grant.
- Click Yes to confirm the action.
- To revoke access to an existing Oracle Key Vault server configuration, select the Oracle Key Vault server configuration, and from the **Actions** drop-down list, select **Revoke Access**.
- In the Revoke Resource Access page, select the User Name from whom you want to revoke access to the resource.
- Click Revoke.
- 11. Click Yes to confirm the action.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Managing Oracle Key Vault Server Configuration Operations Using BUI

Understand how you can manage Oracle Key Vault server configuration operations on Oracle Database Appliance on bare metal and DB systems.

You can create, list, delete, and describe Oracle Key Vault server configuration on Oracle Database Appliance bare metal and DB systems using the Browser User Interface (BUI).

#### Listing and Deleting Oracle Key Vault server configurations:

Follow these steps:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- 2. Click Credential Store, then click Oracle Key Vault Tasks.
- You can view all existing Oracle Key Vault server configurations.
- **4.** To delete an existing Oracle Key Vault server configuration, select the Oracle Key Vault server configuration, and from the **Actions** drop-down list, select **Delete**.

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.



# Migrating Tablespaces from a TDE-enabled Oracle Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore

Understand how you can migrate tablespaces with the expdp/impdp transportable tablespaces feature from TDE-enabled database using software keystore to use Oracle Key Vault as keystore.

Following are the use cases for the migration:

- Migrating Tablespaces from a TDE-enabled Oracle ACFS Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore Understand how you can migrate tablespaces from Oracle ACFS database software keystore to Oracle Key Vault on Oracle Database Appliance.
- Migrating Tablespaces from a TDE-enabled Oracle ASM Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore Understand how you can migrate tablespaces from a TDE-enabled Oracle ASM database with software keystore to another TDE-enabled database with Oracle Key Vault keystore.
- Migrating Tablespaces from TDE-enabled Oracle ACFS Database with Software Keystore
  to another TDE-enabled Multitenant Database with Oracle Key Vault Keystore
  Understand how you can migrate tablespaces from TDE-enabled Oracle ACFS database
  with software keystore to another TDE-enabled multitenant database with Oracle Key Vault
  keystore.
- Migrating Tablespaces from TDE-enabled Oracle ASM Database with Software Keystore to another TDE-enabled Multitenant Database with Oracle Key Vault Keystore Understand how you can migrate tablespaces from TDE-enabled Oracle ASM database with software keystore to another TDE-enabled multitenant database with Oracle Key Vault keystore.

# Migrating Tablespaces from a TDE-enabled Oracle ACFS Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore

Understand how you can migrate tablespaces from Oracle ACFS database software keystore to Oracle Key Vault on Oracle Database Appliance.

Ensure that there is a source and destination database. The two databases must be on different Oracle Database Appliance servers. The source database must be a software keystore TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be on Oracle Database Appliance, must be a TDE enabled database using Oracle Key Vault, and must be created with ODACLI commands.

#### Step 1: Export the tablespace from the source database

 Consider that the source database has a tablespace TBS01 to be migrated to the destination database. Provide information about the tablespace.

### ### login as Oracle user



```
### Connect to database using SQLPLUS as sysdba user and run the
following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
Connected.
SQL> select TABLESPACE NAME, ENCRYPTED from dba tablespaces ;
                      ENC
TABLESPACE NAME
-----
SYSTEM
                    YES
SYSAUX
                    YES
UNDOTBS1
                   YES
USERS
                   YES
TEMP ENC
                   YES
TBS01
                    YES
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
         ______
/u02/app/oracle/oradata/dbtde/DBTDE/datafile/o1 mf tbs01 mz3gfyj0 .dbf
### Make sure the set of tablespaces are self-contained. The following
PL/SQL command must execute successfully
###
SQL> EXECUTE DBMS TTS.TRANSPORT SET CHECK('tbs01',true);
PL/SQL procedure successfully completed.
SQL> exit;
```

Create the database directory in the source database DBTDE to be used for the export.

```
###
### login as Oracle user and run the following
###
# su - oracle
$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump'
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps dir'
### Connect to database using SQLPLUS as sysdba user and run the following
```

```
###
$ sqlplus /nolog

SQL> connect / as sysdba
Connected.

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/
ttsps_dir';

Directory created.

SQL> exit;
```

3. Export the TBS01 tablespace from source database DBTDE. First, set the tablespace to be copied in READ ONLY mode. Next, run expdp on the designated tablespace. Note that the warning ORA-39396 is displayed because expdp does not use ENCRYPTION\_PASSWORD and impdp does not use this option as well. You can ignore this warning. Transfer the TDE software wallet to the destination Oracle Key Vault database server and upload to the corresponding Oracle Key Vault wallet before you run impdp on the destination database. Review the log files for expdp stored under the database directory ttsps dir.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the
following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
Connected.
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
SQL> exit;
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttps dbtde.dmp
Export: Release 19.0.0.0.0 - Production on Mon Apr 7 11:08:49 2025
Version 19.27.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
```

```
Production
Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
DUMPFILE=expttps dbtde.dmp
ORA-39396: Warning: exporting encrypted data using transportable option
without password
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/STATISTICS/MARKER
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Master table "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully loaded/
unloaded
*****************
Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
  /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttps dbtde.dmp
Datafiles required for transportable tablespace TBS01:
  /u02/app/oracle/oradata/dbtde/DBTDE/datafile/o1 mf tbs01 mz3gfyj0 .dbf
Job "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" completed with 1 error(s) at
Mon Apr 7 11:09:15 2025 elapsed 0 00:00:20
```

4. Copy datafiles, TDE wallet, expdp dmp files to the destination database server and alter the status of the data file in the source database DBTDE to READ WRITE. Copy the datafile /u02/app/oracle/oradata/dbtde/DBTDE/datafile/o1\_mf\_tbs01\_mz3gfyj0\_.dbf to the location where datafiles are stored in the destination database. In the following example, /u02/app/oracle/oradata/okvdb/OKVDB/datafile/ is the location of the target database OKVDB. Copy the export file from /u01/app/odaorabase0/oracle/dpdump/ ttsps\_dir to the target database server in the /u01/app/odaorabase0/oracle/dpdump/ ttsps\_dir directory. Also, copy the wallet to the temporary /tmp/dbtde/tde directory in the destination.

```
###
### login as Oracle user and run the following
###

# su - oracle

$ scp /u02/app/oracle/oradata/dbtde/DBTDE/datafile/
ol_mf_tbs01_mz3gfyj0_.dbf oracle@target_server:/u02/app/oracle/oradata/
okvdb/OKVDB/datafile/

### Copy the expdp dump file to the destination server location.
$ scp /u01/app/odaorabase0/oracle/dpdump/ttsps_dir/expttps_dbtde.dmp
oracle@target_server:/location

$ cp /u02/app/oracle/oradata/dbtde/tde/ewallet.p12
oracle@target_server:/tmp/dbtde/tde
###
### In source database, set the tablespace back to read write mode
#### Connect to database using SQLPLUS as sysdba user and run the following
```

```
###
$ sqlplus /nolog

SQL> connect / as sysdba
Connected.

SQL> ALTER TABLESPACE TBS01 READ WRITE;

SQL> exit;
```

#### Step 2: Import the tablespaces into an Oracle Key Vault-enabled database

1. Ensure that a TDE-enabled database with Oracle Key Vault, OKVDB as the destination database exists. For example:

```
# odacli create-database -n okvdb -t -kt okv -ocp /tmp/
okvdb on server name/okvclient.jar -dh 265412be-2b21-4cc4-adc7-
c845bf9e3e3a -r ACFS
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
Retype TDE wallet password:
# odacli describe-database -n okvdb
Database details
______
                   ID: b0d137c0-31fa-453b-82e4-d6a364bca4df
           Description: okvdb
              DB Name: okvdb
              DB Type: SI
                  CDB: false
              Storage: ACFS
              Home ID: 265412be-2b21-4cc4-adc7-c845bf9e3e3a
 TDE Wallet Management: ODA
          TDE Enabled: true
         KeystoreType : OKV
  okvServerConfigName : NONE
```

2. Create the database directory in the Oracle Key Vault-enabled destination database for the import operation. The source database expdp dump file and output for impdp is stored in the database directory object. Copy the expdp dump file from the source database server to this server, and use the impdp dump file to add tablespace metadata to destination database.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba

SQL> CREATE DIRECTORY ttsps dir AS '/u01/app/odaorabase0/oracle/dpdump/
```

```
ttsps dir';
 Directory created.
 SQL> exit;
Upload the wallet keys from source database to OKVDB wallet in the destination database.
 ###
 ### login as Oracle user
 ### Upload the software keystore wallet entries to OKV server wallet.
 Notice the directory name /etc/OKV/<db unique name>/okv/bin
 $ cd /etc/OKV/okvdb/okv/bin
 $ ./okvutil list
 Enter Oracle Key Vault endpoint password:
 Unique ID
                                                          Identifier
                                         Type
 3D433A6C-F7B0-433D-91B3-0ADABBDB7509
                                        Template Default template for
 OKVDB ON <SERVER-NAME>
 FC6AA1F6-C816-4771-A9B6-0D4EC3F4B015
                                         Symmetric Key TDE Master
 Encryption Key: TAG okvdb
 $ ./okvutil upload -t WALLET -l /tmp/dbtde/tde -g okvdb on <server name>-
 c -v 4 -o
 okvutil version 21.10.0.0.0
 Endpoint type: Oracle Database
 Configuration file: /etc/OKV/okvdb/okv/conf/okvclient.ora
 Server: 100.70.126.204:5696
 Standby Servers:
 Uploading from /tmp/dbtde/tde
 Enter source wallet password:
No auto-login wallet found, password needed
 Enter Oracle Key Vault endpoint password:
 ORACLE.SECURITY.ID.ENCRYPTION.
 Trying to connect to 100.70.126.204:5696 ...
 Connected to 100.70.126.204:5696.
 ORACLE.SECURITY.KB.ENCRYPTION.
 ORACLE.SECURITY.KT.ENCRYPTION.ASivkc8tqE9mv6RX0F9nYzsAAAAAAAAAAAAAAAAAAAAAAAAAA
 AAAAAA
 ORACLE.SECURITY.KM.ENCRYPTION.ASivkc8tqE9mv6RX0F9nYzsAAAAAAAAAAAAAAAAAAAAAAAAAA
 ORACLE.SECURITY.DB.ENCRYPTION.ASivkc8tqE9mv6RX0F9nYzsAAAAAAAAAAAAAAAAAAAAAAAAAA
 ORACLE.SECURITY.DB.ENCRYPTION.MASTERKEY
 Uploaded 1 TDE keys
 Uploaded 0 SEPS entries
 Uploaded 0 other secrets
 Uploaded 3 opaque objects
 Uploading private key
 Uploading certificate request
```



Uploading trust points

```
Uploaded 1 private keys
   Uploaded 1 certificate requests
   Uploaded 0 user certificates
   Uploaded 0 trust points
   Upload succeeded
   ###
   ### Comparing the output of 'okvutil list' shows that TDE Wallet Keys were
   uploaded to OKV wallet
   ###
   $ ./okvutil list
   Enter Oracle Key Vault endpoint password:
                                                          Identifier
   Unique ID
                                           Type
                                           Opaque Object Certificate Request
   17D6044D-F777-4E6F-9B0A-F08D653354F2
   3D433A6C-F7B0-433D-91B3-0ADABBDB7509
                                           Template Default template for
   OKVDB ON <SERVER-NAME>
   54FA58D4-B429-4A38-911F-8F2245D3B90F
                                           Opaque Object TDE Wallet Metadata
   9D509C97-231E-43E9-98C8-637DECF13ECD
                                           Opaque Object TDE Wallet Metadata
   A7168F0B-2023-5141-B720-EC771F9B23A1
                                           Symmetric Key TDE Master
   Encryption Key: TAG set master key
   E63A4B3D-3B84-4BEF-96BF-18CC844EB041
                                           Opaque Object TDE Wallet Metadata
   E727B9E3-8803-499B-8DAF-20C08ED587EA
                                           Private Key -
   FC6AA1F6-C816-4771-A9B6-0D4EC3F4B015
                                           Symmetric Key TDE Master
   Encryption Key: TAG okvdb
   $ rm -rf /tmp/dbtde
4. Import the TBS01 tablespace to the destination database OKVDB.
```

```
### Run impdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ impdp system TRANSPORT DATAFILES=\'/u02/app/oracle/oradata/okvdb/OKVDB/
datafile/o1 mf tbs01 mz3gfyj0 .dbf' DIRECTORY=ttsps dir
dumpfile=expttps.dmp
Import: Release 19.0.0.0.0 - Production on Mon Nov 6 12:53:37 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Master table "SYSTEM"."SYS IMPORT TRANSPORTABLE 01" successfully loaded/
Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/******
TRANSPORT DATAFILES='/u02/app/oracle/oradata/dbtde/DBTDE/datafile/
o1 mf tbs01 lnlgn65j .dbf' DIRECTORY=ttsps dir dumpfile=expttps.dmp
```

```
Processing object type TRANSPORTABLE_EXPORT/PLUGTS_BLK
Processing object type TRANSPORTABLE_EXPORT/TABLE
Processing object type TRANSPORTABLE_EXPORT/STATISTICS/TABLE_STATISTICS
Processing object type TRANSPORTABLE_EXPORT/POST_INSTANCE/PLUGTS_BLK
Job "SYSTEM"."SYS_IMPORT_TRANSPORTABLE_01" successfully completed at Mon
Nov 6 12:53:46 2023 elapsed 0 00:00:03
```

5. Change tablespace status and test encryption on the destination Oracle Key Vault-enabled database. Set the imported tablespace to READ WRITE.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
                      STATUS ENC
TABLESPACE NAME
ONLINE YES
SYSTEM
SYSAUX
                   ONLINE YES
UNDOTBS1
                   ONLINE YES
USERS
                   ONLINE YES
TEMP_ENC
                  ONLINE YES READ ONLY YES
TBS01
SQL> alter tablespace TBS01 read write;
Tablespace altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME STATUS ENC
SYSTEM
                   ONLINE YES
                   ONLINE YES
SYSAUX
UNDOTBS1
                   ONLINE YES
               ONLINE YES
ONLINE YES
ONLINE YES
USERS
TEMP_ENC
TBS01
### Retrieve the data from TAB1. Consider that TAB1 was created using
tablespace TBS01 and can now be queried.
###
```

```
SQL> select OWNER, table_name from tab1 where rownum < 3;

OWNER

TABLE_NAME

SYS
TS$

SYS
ICOL$
```

#### **Related Topics**

odacli Multi-User Access Commands
Use odacli commands to enable multi-user access for the appliance.

## Migrating Tablespaces from a TDE-enabled Oracle ASM Database with Software Keystore to another TDE-enabled Database with Oracle Key Vault Keystore

Understand how you can migrate tablespaces from a TDE-enabled Oracle ASM database with software keystore to another TDE-enabled database with Oracle Key Vault keystore.

Ensure that there is a source and destination database. The two databases must be on different servers. The source database must be a software keystore TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be on Oracle Database Appliance, must be a TDE enabled database using Oracle Key Vault, and must be created with ODACLI commands.

#### Step 1: Export the tablespace from the source database

 Consider that the source database has a tablespace TBS01 to be migrated to the destination database. Provide information about the tablespace.

```
SYSAUX YES
UNDOTES1 YES
USERS YES
TEMP_ENC YES
TBS01 YES

SQL> select FILE_NAME from dba_data_files where TABLESPACE_NAME='TBS01';
FILE_NAME
-----+DATA/DBASM/DATAFILE/tbs01.268.1197828959

###
### Make sure the set of tablespaces are self-contained. The following
PL/SQL command must execute successfully
###

SQL> EXECUTE DBMS_TTS.TRANSPORT_SET_CHECK('tbs01',true);
PL/SQL procedure successfully completed.

SQL> exit;
```

2. Export the TBS01 tablespace from the source database DBASM. First, set the tablespace to be copied in READ ONLY mode. Next, run expdp for the tablespace that must be migrated. Review the dump files for expdp stored under the database directory ttsps dir.

```
###
### Set the tablespaces that you need to be exported in read-only mode
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
SQL> exit;
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttps dbasm.dmp
Export: Release 19.0.0.0.0 - Production on Mon Apr 7 18:19:28 2025
```

```
Version 19.27.0.0.0
   Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
   Password:
   Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
   Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
   TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
   DUMPFILE=expttps dbasm.dmp
   ORA-39396: Warning: exporting encrypted data using transportable option
   without password
   Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
   Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
   Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
   Processing object type TRANSPORTABLE EXPORT/TABLE
   Master table "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully loaded/
   ********************
   Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
     /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttps dbasm.dmp
   **********************
   Datafiles required for transportable tablespace TBS01:
     +DATA/DBASM/DATAFILE/tbs01.268.1197828959
   Job "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" completed with 1 error(s) at
   Mon Apr 7 18:19:52 2025 elapsed 0 00:00:18
3. Copy the datafile from Oracle ASM to file system, then move the datafile to destination
   database server. Then, move the data file to the destination database server and and copy
   the file to Oracle ASM. Then, alter the status of the tablespace to READ WRITE.
   ###
   ### login to grid user
   ### Copy datafile from ASM to filesystem
   ###
   # su - grid
   $ asmcmd cp +DATA/DBASM/DATAFILE/tbs01.278.1197745689 /home/grid/tbs01.dbf
   copying +DATA/DBASM/DATAFILE/tbs01.278.1197745689 -> /home/grid/tbs01.dbf
```

### In source database, set the tablespace back to read write mode

### Connect to database using SQLPLUS as sysdba user and run the following



###

###

# su - oracle
\$ sqlplus /nolog

### login as Oracle user

SQL> connect / as sysdba

```
SQL> ALTER TABLESPACE TBS01 READ WRITE;
SOL> exit;
```

Copy the software keystore wallet of the source database to the file system on the target server.

```
$ mkdir -pv /tmp/DBASM/tde
mkdir: created directory '/tmp/DBASM'
mkdir: created directory '/tmp/DBASM/tde'

SQL> administer key management create keystore '/tmp/DBASM/tde' identified
by "<password>";

keystore altered.

SQL> administer key management merge keystore '+DATA/DBASM/tde' identified
by "<password>" into existing keystore '/tmp/DBASM/tde' identified by
"<password>" with backup;
keystore altered.
```

5. Copy the expdp dump files from /u01/app/odaorabase0/oracle/dpdump/ttsps\_dir to the destination server, and copy the datafile from /home/grid/tbs01.dbf to the target database server.

The expdp and impdp directory is the same in this case, so, no copy is necessary, for remote copy dumpfile using similar this command \$ scp /u01/app/odaorabase0/oracle/dpdump/ttsps\_dir/expttps\_dbasm.dmp oracle@target server:/location

#### Step 2: Import the tablespaces into an Oracle Key Vault-enabled database

1. Ensure there exists a TDE-enabled database with Oracle Key Vault, OKVASM as the destination database. Copy the datafile and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

```
# odacli create-database -n okvasm -t -kt okv -ocp /tmp/
okvasm on <server name>/okvclient.jar -dh 265412be-2b21-4cc4-adc7-
c845bf9e3e3a -r ASM
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
Retype TDE wallet password:
# odacli describe-database -n okvasm
Database details
                     ID: 19ce57f8-6f10-4e15-a403-4ded6ac0084b
            Description: okvasm
                DB Name: okvasm
                DB Type: SI
                   CDB: false
                Storage: ASM
                Home ID: 265412be-2b21-4cc4-adc7-c845bf9e3e3a
```



Copy the datafiles from file system to the destination Oracle ASM location of OKVASM and change the datafiles permissions.

```
###
### login to grid user
### Copy datafile from from filesystem to ASM
###
# su - grid
$ asmcmd cp /home/grid/tbs01.dbf +DATA/OKVASM//DATAFILE/tbs01 --
dest dbname OKVASM
copying /home/grid/tbs01.dbf -> +DATA/OKVASM//DATAFILE/tbs01
ASMCMD> cd +DATA/OKVASM//DATAFILE
ASMCMD> ls --permission
                                        Group
                                                         Permission Name
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
                                                         rw-----
SYSAUX.290.1197813993
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
SYSTEM.315.1197813987
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
UNDOTBS1.309.1197814001
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
                                                          rw-----
USERS.313.1197813977
 grid@3fe6130d68b04fc6ffab5b96ff256f8e
                                                          rw-----
tbs01 => +DATA/OKVASM/DATAFILE/tbs01.318.1197830121
  grid@3fe6130d68b04fc6ffab5b96ff256f8e
                                                          rw-----
tbs01.318.1197830121
ASMCMD>
ASMCMD> chown oracle@3fe6130d68b04fc6ffab5b96ff256f8e:OKVASM CDB$ROOT tbs01
ASMCMD> ls --permission
                                        Group
User
                                                         Permission Name
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
SYSAUX.290.1197813993
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
SYSTEM.315.1197813987
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
UNDOTBS1.309.1197814001
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
USERS.313.1197813977
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
tbs01 => +DATA/OKVASM/DATAFILE/tbs01.318.1197830121
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASM CDB$ROOT
                                                        rw-----
tbs01.318.1197830121
ASMCMD>
```

3. Create the database directory in the OKVASM database for import.

```
###
### login as Oracle user
```

```
### Connect to database using SQLPLUS as sysdba user and run the following
   # su - oracle
   $ sqlplus /nolog
   SQL> connect / as sysdba
   SQL> CREATE DIRECTORY ttsps dir AS '/u01/app/odaorabase0/oracle/dpdump/
   ttsps dir';
   Directory created.
   SOL> exit;
4. Upload the wallet keys from the source wallet to the OKVASM OKV wallet in the
   destination.
   ###
   ### login as Oracle user
   ### Upload the software keystore wallet entries to OKV server wallet
   ###
   $ cd /etc/OKV/okvasm/okv/bin
   $ ./okvutil list
   Enter Oracle Key Vault endpoint password:
                                                           Identifier
                                           Type
   4E58C724-E704-4245-A131-D357E1A7762A Template Default template for
   OKVASM ON <SERVER-NAME>
   C839BE56-9688-48C6-8C16-F2E34A304847
                                           Symmetric Key TDE Master
   Encryption Key: TAG okvasm
   $ ./okvutil upload -t WALLET -l /tmp/DBASM/tde -g
   okvasm on <server name>-c -v 4 -o
   okvutil version 21.10.0.0.0
   Endpoint type: Oracle Database
   Configuration file: /etc/OKV/okvasm/okv/conf/okvclient.ora
   Server: 100.70.126.204:5696
   Standby Servers:
   Uploading from /tmp/DBASM/tde
   Enter source wallet password:
   No auto-login wallet found, password needed
   Enter Oracle Key Vault endpoint password:
   ORACLE.SECURITY.KB.ENCRYPTION.
   Trying to connect to 100.70.126.204:5696 ...
   Connected to 100.70.126.204:5696.
   ORACLE.SECURITY.ID.ENCRYPTION.
   ORACLE.SECURITY.KT.ENCRYPTION.Aeb4ZXoXJU9/
   v0wdUBJyfMMAAAAAAAAAAAAAAAAAAAAAAAAAAAA
   ORACLE.SECURITY.KM.ENCRYPTION.Aeb4ZXoXJU9/
   v0wdUBJyfMMAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
   ORACLE.SECURITY.DB.ENCRYPTION.Aeb4ZXoXJU9/
   v0wdUBJyfMMAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
   ORACLE.SECURITY.DB.ENCRYPTION.MASTERKEY
```



```
Uploaded 1 TDE keys
Uploaded 0 SEPS entries
Uploaded 0 other secrets
Uploaded 3 opaque objects
Uploading private key
Uploading certificate request
Uploading trust points
Uploaded 1 private keys
Uploaded 1 certificate requests
Uploaded 0 user certificates
Uploaded 0 trust points
Upload succeeded
###
### Comparing the output of 'okvutil list' shows that TDE Wallet Keys were
uploaded to OKV wallet
###
$ ./okvutil list
Enter Oracle Key Vault endpoint password:
                                                       Identifier
Unique ID
                                        Type
                                       Opaque Object TDE Wallet Metadata
2FF42EBA-AB07-456C-BBC1-5AFEC1CCB544
4E58C724-E704-4245-A131-D357E1A7762A
                                       Template Default template for
OKVASM ON <SERVER-NAME>
6403E441-2624-4360-BB55-E0C35709CDA6
                                       Opaque Object Certificate Request
949A121D-B76A-448C-91EF-856BFD54DC1F
                                       Private Key -
A726D77A-09C1-5CD5-9650-3FDCB6BD0738
                                       Symmetric Key TDE Master
Encryption Key: TAG set master key
C81832F9-E5E9-4050-8A52-160705EC71BF
                                       Opaque Object TDE Wallet Metadata
C839BE56-9688-48C6-8C16-F2E34A304847
                                       Symmetric Key TDE Master
Encryption Key: TAG okvasm
E860114F-A374-4534-8717-98DB92499E1A
                                       Opaque Object
                                                       TDE Wallet Metadata
```

```
$ rm -rf /tmp/DBASM/tde
```

Import the TBS01 tablespace to the destination database OKVASM.
 TRANSPORT\_DATAFILES references the location of the data file in the destination database.

```
###
### login as Oracle user
### Run impdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
# su - oracle
$ impdp system TRANSPORT DATAFILES=\'+DATA/OKVASM/DATAFILE/tbs01\'
```

```
DIRECTORY=ttsps dir dumpfile=expttps dbasm.dmp
   Import: Release 19.0.0.0.0 - Production on Mon Apr 7 18:43:53 2025
   Version 19.27.0.0.0
   Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
   reserved.
   Password:
   Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
   Master table "SYSTEM"."SYS IMPORT TRANSPORTABLE 01" successfully loaded/
   unloaded
   Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/******
   TRANSPORT DATAFILES='+DATA/OKVASM/DATAFILE/tbs01' DIRECTORY=ttsps dir
   dumpfile=expttps dbasm.dmp
   Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
   Processing object type TRANSPORTABLE EXPORT/TABLE
   Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
   Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
   Job "SYSTEM". "SYS IMPORT TRANSPORTABLE 01" successfully completed at Mon
   Apr 7 18:44:05 2025 elapsed 0 00:00:04
6. Change the tablespace status and test encryption on the destination OKVASM database.
   ###
   ### login as Oracle user
   ### Connect to database using SQLPLUS as sysdba user and run the following
   ###
   # su - oracle
   $ sqlplus /nolog
   SQL> connect / as sysdba
   SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
   TABLESPACE NAME
                            STATUS ENC
   SYSTEM
                         ONLINE YES
                         ONLINE
                                   YES
   SYSAUX
   UNDOTBS1
                        ONLINE YES
   USERS
                        ONLINE YES
   TEMP ENC
                        ONLINE
                                  YES
   TBS01
                        READ ONLY YES
   6 rows selected.
   SQL> alter tablespace TBS01 read write;
   Tablespace altered.
   SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
   TABLESPACE NAME
                             STATUS ENC
```

SYSTEM	ONLINE	YES			
SYSAUX	ONLINE	YES			
UNDOTBS1	ONLINE	YES			
USERS	ONLINE	YES			
TEMP_ENC	ONLINE	YES			
TBS01	ONLINE	YES			
### ### Retrieve the ###	data from TAB1				
SQL> select OWNE	R, table_name f	rom tab1 wh	ere rownum	< 3;	
OWNER					
TABLE NAME					
  SYS					

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Migrating Tablespaces from TDE-enabled Oracle ACFS Database with Software Keystore to another TDE-enabled Multitenant Database with Oracle Key Vault Keystore

Understand how you can migrate tablespaces from TDE-enabled Oracle ACFS database with software keystore to another TDE-enabled multitenant database with Oracle Key Vault keystore.

Ensure that there is a source and destination database. The two databases can be on one Oracle Database Appliance server or on different servers. The source database must be a software keystore TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be an Oracle Database Appliance Oracle Key Vault enabled-database created with ODACLI commands.

#### Step 1: Export the tablespace from the source database

 Consider that the source database has a tablespace TBS01 to be migrated to the destination database. Provide information about the tablespace.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the
```

```
following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
Connected.
SQL> select TABLESPACE NAME, ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                  ENC
-----
SYSTEM
                    YES
SYSAUX
                    YES
UNDOTBS1
                     YES
USERS
                    YES
TEMP ENC
                    YES
TBS01
                    YES
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
/u02/app/oracle/oradata/dbtdec/DBTDEC/321537BF1BE47143E063E730850AA965/
datafile/o1 mf tbs01 mz69cvrf .dbf
### Make sure the set of tablespaces are self-contained. The following
PL/SQL command must execute successfully
###
SQL> EXECUTE DBMS TTS.TRANSPORT SET CHECK('tbs01',true);
PL/SQL procedure successfully completed.
SOL> exit;
```

2. Create the database directory in the source database DBTDEC to be used for the export. Create a database directory object in the destination database to be used by expdp.

```
###
### login as Oracle user and run the following
###

# su - oracle
$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump'
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'
###
```

```
### Connect to database using SQLPLUS as sysdba user and run the following
###

$ sqlplus /nolog

SQL> connect / as sysdba
Connected.

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/
ttsps_dir';

Directory created.

SQL> exit;
```

3. Export the TBS01 tablespace from source database DBTDEC. First, set the tablespace to be copied in READ ONLY mode. Next, run <code>expdp</code> on the designated tablespace. Note that the warning <code>ORA-39396</code> is displayed because expdp does not use <code>ENCRYPTION\_PASSWORD</code> and <code>impdp</code> does not use this option as well. Transfer the TDE software wallet to the destination Oracle Key Vault database server and upload to the corresponding Oracle Key Vault wallet before you run <code>impdp</code> on the destination database. Review the log files for <code>expdp</code> stored under the database directory <code>ttsps</code> dir.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the
following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
Connected.
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
SQL> exit;
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttps dbtde.dmp
Export: Release 19.0.0.0.0 - Production on Mon Apr 7 11:08:49 2025
Version 19.27.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
```

```
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
   Production
   Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
   TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
   DUMPFILE=expttps dbtde.dmp
   ORA-39396: Warning: exporting encrypted data using transportable option
   without password
   Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
   Processing object type TRANSPORTABLE EXPORT/STATISTICS/MARKER
   Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
   Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
   Processing object type TRANSPORTABLE EXPORT/TABLE
   Master table "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully loaded/
   unloaded
                  *************
   Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
     /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttps dbtde.dmp
   Datafiles required for transportable tablespace TBS01:
     /u02/app/oracle/oradata/dbtdec/DBTDEC/321537BF1BE47143E063E730850AA965/
   datafile/o1 mf tbs01 mz69cvrf .dbf
   Job "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" completed with 1 error(s) at
   Mon Apr 7 11:09:15 2025 elapsed 0 00:00:20
4. Copy datafiles, TDE wallet, and expdp dmp files to the destination database server and edit
   the status of the data file in the source database DBTDE to READ WRITE. Copy the
   datafile /u02/app/oracle/oradata/dbtdec/DBTDEC/321537BF1BE47143E063E730850AA965/
   datafile/o1 mf tbs01 mz69cvrf .dbf to the Oracle Key Vault database server in the
   PDB location /u02/app/oracle/oradata/okvdbc/OKVDBC/
   323B892160327BC5E063E730850A8FEA/datafile/.
   ###
   ### login as Oracle user and run the following
   ###
   # su - oracle
   $ scp /u02/app/oracle/oradata/dbtdec/DBTDEC/
   321537BF1BE47143E063E730850AA965/datafile/o1 mf tbs01 mz69cvrf .dbf
   oracle@target server:/u02/app/oracle/oradata/okvdbc/OKVDBC/
   323B892160327BC5E063E730850A8FEA/datafile/
   ### Copy the expdp dump file to the destination server location.
   $ scp /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttps.dmp
   oracle@<target server>:/<location>
   cp /u02/app/oracle/oradata/dbtdec/tde/ewallet.p12
   oracle@target server:/tmp/dbtdec/tde
   ###
   ### In source database, set the tablespace back to read write mode
```

### Connect to database using SQLPLUS as sysdba user and run the following

```
$ sqlplus /nolog
SQL> connect / as sysdba

SQL> alter session set container=pdb;
Session altered.

SQL> ALTER TABLESPACE TBS01 READ WRITE;
SQL> exit;
```

###

#### Step 2: Import the tablespaces into an Oracle Key Vault-enabled database

1. Ensure there exists a TDE-enabled database with Oracle Key Vault, OKVDBC as the destination database. Copy the data file and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

```
# odacli create-database -n okvdbc -t -kt okv -ocp /tmp/
okvdbc on <server name>/okvclient.jar -dh 265412be-2b21-4cc4-adc7-
c845bf9e3e3a -r ACFS --cdb -d pdbadmin -p pdb
# odacli describe-database -n okvdbc
Database details
______
                  ID: 045c22d6-96ed-47d7-95b9-7c9923d94fd9
          Description: okvdbc
              DB Name: okvdbc
              DB Type: SI
                 CDB: true
             PDB Name: pdb
   PDB Admin User Name: pdbadmin
              Storage: ACFS
              Home ID: 265412be-2b21-4cc4-adc7-c845bf9e3e3a
 TDE Wallet Management: ODA
          TDE Enabled: true
        KeystoreType : OKV
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
### Take a note of PDB GUID which helps to determine the path of PDB
datafile
###
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> col PDB NAME for a20
SQL> select PDB NAME, GUID from dba pdbs ;
PDB NAME
             GUID
_____
    323B892160327BC5E063E730850A8FEA
PDB
PDB$SEED
             323B5ABA63C6340CE063E730850A4161
```

```
SQL> exit;
```

2. Create the service and TNS name for the PDB.

3. Create the database directory in the PDB for the import.

```
###
### login as Oracle user and run the following
###

# su - oracle

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'

###
### Connect to database using SQLPLUS as sysdba user and run the following
###

$ sqlplus /nolog
SQL> connect / as sysdba

SQL> ALTER SESSION SET CONTAINER=PDB;

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/
ttsps_dir';

Directory created.

SQL> exit;
```

4. Upload the wallet keys from the source to the OKVDBC wallet in the destination database. For impdp to recognize the tablespace, upload the software keystore wallet content to the destination database with Oracle Key Vault enabled. Copy the wallet to e destination

server, create a temporary endpoint for the wallet, upload the wallet content, and delete the temporary endpoint and the source database wallet.

```
###
### login as Oracle user
### Upload the software keystore wallet entries to OKV server wallet
###
$ cd /etc/OKV/okvdbc/okv/bin/
$ ./okvutil list
Enter Oracle Key Vault endpoint password:
Unique ID
                                         Type
                                                         Identifier
2299AD61-915F-4568-82EA-2E07FDF8F129
                                        Symmetric Key TDE Master
Encryption Key: TAG okvdbc
51EA3595-433A-4FE8-BCAA-A2FBB768F88A
                                        Symmetric Key
                                                        TDE Master
Encryption Key: TAG okvdbc
A7A80EB2-899F-47B3-8050-3A8C76ED449B
                                        Symmetric Key
                                                       TDE Master
Encryption Key: TAG okvdbc pdb
A7C3463B-B8AD-45A3-A31C-E8BABAB1289F
                                                     Default template for
                                        Template
OKVDBC ON <SERVER-NAME>
$ ./okvutil upload -t WALLET -l /tmp/dbtdec/tde -g
okvdbc on <server name>-c -v 4 -o
okvutil version 21.10.0.0.0
Endpoint type: Oracle Database
Configuration file: /etc/OKV/okvdbc/okv/conf/okvclient.ora
Server: 100.70.126.204:5696
Standby Servers:
Uploading from /tmp/dbtdec/tde
Enter source wallet password:
No auto-login wallet found, password needed
Enter Oracle Key Vault endpoint password:
ORACLE.SECURITY.ID.ENCRYPTION.
Trying to connect to 100.70.126.204:5696 ...
Connected to 100.70.126.204:5696.
ORACLE.SECURITY.KB.ENCRYPTION.
ORACLE.SECURITY.KT.ENCRYPTION.AecOmWLewk8dv1z3KsizxucAAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.KM.ENCRYPTION.AecOmWLewk8dv1z3KsizxucAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.DB.ENCRYPTION.AecomWLewk8dv1z3KsizxucAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAA
ORACLE.SECURITY.KT.ENCRYPTION.AV351c5etE+Av4EsIkDeWjsAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.KM.ENCRYPTION.AV351c5etE+Av4EsikDeWjsAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAA
ORACLE.SECURITY.DB.ENCRYPTION.AV35lc5etE+Av4EsIkDeWjsAAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.DB.ENCRYPTION.MASTERKEY.321537BF1BE47143E063E730850AA965
ORACLE.SECURITY.DB.ENCRYPTION.MASTERKEY
Uploaded 2 TDE keys
Uploaded 0 SEPS entries
```



```
Uploaded 0 other secrets
Uploaded 4 opaque objects
Uploading private key
Uploading certificate request
Uploading trust points
Uploaded 1 private keys
Uploaded 1 certificate requests
Uploaded 0 user certificates
Uploaded 0 trust points
Upload succeeded
### Comparing the output of 'okvutil list' shows that TDE Wallet Keys were
uploaded to OKV wallet
###
$ ./okvutil list
Enter Oracle Key Vault endpoint password:
                                                        Identifier
Unique ID
                                        Type
OCDCC93D-EEEA-4760-848F-2162D0074B20
                                        Opaque Object
                                                        TDE Wallet Metadata
2299AD61-915F-4568-82EA-2E07FDF8F129
                                        Symmetric Key TDE Master
Encryption Key: TAG okvdbc
3616D7C9-1025-4093-BEC4-1DD2BAC8047C
                                        Opaque Object
                                                        TDE Wallet Metadata
3F716086-2740-4688-82C3-428B6DA55720
                                        Private Key -
5130AEF7-AA35-57B1-8EB7-88A297867B7F
                                        Symmetric Key
                                                        TDE Master
Encryption Key: TAG set master key
51EA3595-433A-4FE8-BCAA-A2FBB768F88A
                                        Symmetric Key
                                                        TDE Master
Encryption Key: TAG okvdbc
60769770-17A6-4D77-B5AF-80E870B3E95E
                                        Opaque Object
                                                       TDE Wallet Metadata
                                        Opaque Object TDE Wallet Metadata
75E9B037-2FA4-45DD-A4D1-FA1A07102602
9B72895D-8551-5792-B3E5-90DC76BE1EBA
                                        Symmetric Key
                                                        TDE Master
Encryption Key: TAG set master key
A7A80EB2-899F-47B3-8050-3A8C76ED449B
                                        Symmetric Key
                                                        TDE Master
Encryption Key: TAG okvdbc pdb
A7C3463B-B8AD-45A3-A31C-E8BABAB1289F
                                        Template
                                                    Default template for
OKVDBC ON <SERVER-NAME>
DDF529BA-348A-4FF3-8F31-73C170749956
                                        Opaque Object Certificate Request
```

\$ rm -rf /tmp/dbtdec/tde

5. Import TBS01 tablespace to the destination database PDB container on OKVDBC. impdp uses the dump file that was copied earlier to add tablespace metadata to the destination database. TRANSPORT\_DATAFILES references the location of the datafile in the destination database.

```
###
### login as Oracle user
### Run impdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
```

```
# su - oracle
```

```
$ impdp system@okvdbc pdb TRANSPORT DATAFILES=\'/u02/app/oracle/oradata/
okvdbc/OKVDBC/323B892160327BC5E063E730850A8FEA/datafile/
o1 mf tbs01 mz69cvrf .dbf\' DIRECTORY=ttsps dir dumpfile=expttps dbtdec.dmp
Import: Release 19.0.0.0.0 - Production on Mon Apr 7 20:49:35 2025
Version 19.27.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Master table "SYSTEM". "SYS IMPORT TRANSPORTABLE 01" successfully loaded/
unloaded
Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/
*******@okvdbc pdb TRANSPORT DATAFILES='/u02/app/oracle/oradata/okvdbc/
OKVDBC/323B892160327BC5E063E730850A8FEA/datafile/
o1 mf tbs01 mz69cvrf .dbf' DIRECTORY=ttsps dir dumpfile=expttps dbtdec.dmp
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE_EXPORT/TABLE
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/STATISTICS/MARKER
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Job "SYSTEM". "SYS IMPORT TRANSPORTABLE 01" successfully completed at Mon
Apr 7 20:50:06 2025 elapsed 0 00:00:16
```

#### Change tablespace status and test tablespace encryption on the destination OKVDBC database PDB.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> alter session set container=pdb ;
Session altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                      STATUS ENC
----- ---
                   ONLINE YES
SYSTEM
SYSAUX
                   ONLINE YES
UNDOTBS1
                  ONLINE YES
                   ONLINE
USERS
                            YES
```



```
TEMP ENC
                ONLINE YES
TBS01
                READ ONLY YES
SQL> alter tablespace TBS01 read write;
Tablespace altered.
SQL> select TABLESPACE_NAME, STATUS , ENCRYPTED from dba_tablespaces ;
TABLESPACE NAME
             STATUS ENC
----- ---
SYSTEM
                ONLINE YES
SYSAUX
               ONLINE YES
UNDOTBS1
                ONLINE
                        YES
USERS
               ONLINE YES
TEMP ENC
               ONLINE YES
               ONLINE YES
TBS01
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
______
  _____
/u02/app/oracle/oradata/okvdbc/OKVDBC/323B892160327BC5E063E730850A8FEA/
datafile/o1 mf tbs01 mz69cvrf .dbf
###
### Retrieve the data from TAB1
SQL> select OWNER, table name from tab1 where rownum < 3
OWNER
TABLE NAME
       _____
SYS
TS$
SYS
ICOL$
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Migrating Tablespaces from TDE-enabled Oracle ASM Database with Software Keystore to another TDE-enabled Multitenant Database with Oracle Key Vault Keystore

Understand how you can migrate tablespaces from TDE-enabled Oracle ASM database with software keystore to another TDE-enabled multitenant database with Oracle Key Vault keystore.

Ensure that there is a source and destination database. The two databases can be on one Oracle Database Appliance server or on different servers. The source database must be a software keystore TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be an Oracle Database Appliance Oracle Key Vault enabled-database created with ODACLI commands.

#### Step 1: Export the tablespace from the source database

 Consider that the source database has a tablespace TBS01 to be migrated to the destination database. Provide information about the tablespace.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
Connected.
SQL> select TABLESPACE NAME, ENCRYPTED from dba tablespaces ;
TABLESPACE NAME ENC
SYSTEM YES
SYSAUX YES
UNDOTBS1 YES
USERS YES
TEMP ENC YES
TBS01 YES
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
+DATA/DBASMC/DATAFILE/tbs01.268.1197828959
### Make sure the set of tablespaces are self-contained. The following
PL/SQL command must execute successfully
```

```
SQL> EXECUTE DBMS_TTS.TRANSPORT_SET_CHECK('tbs01',true) ;
PL/SQL procedure successfully completed.
SQL> exit;
```

Export the TBS01 tablespace from the source database DBASMC. First, set the
tablespace to be copied in READ ONLY mode. Next, run expdp on the designated
tablespace. Review the dump files for expdp stored under the database directory
ttsps dir.

```
ttsps dir.
###
### Set the tablespaces that you need to be exported in read-only mode
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
# su - oracle
$ sqlplus /noloq
SQL> connect / as sysdba
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
SQL> exit;
###
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttps dbasm.dmp
Export: Release 19.0.0.0.0 - Production on Mon Apr 7 18:19:28 2025
Version 19.27.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
DUMPFILE=expttps dbasm.dmp
ORA-39396: Warning: exporting encrypted data using transportable option
without password
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
```

3. Copy the datafile from Oracle ASM to the file system on the source server. Then, alter the status of the tablespace to READ WRITE.

```
###
### login to grid user
### Copy datafile from ASM to filesystem
###
# su - grid
$ asmcmd cp DATA/DBASMC/DATAFILE/tbs01.268.1197828959
copying DATA/DBASMC/DATAFILE/tbs01.268.1197828959 -> /home/grid/tbs01.dbf
###
### In source database, set the tablespace back to read write mode
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> ALTER TABLESPACE TBS01 READ WRITE;
SQL> exit;
```

Copy the software keystore wallet of the source database to the file system on the target server.

```
SQL> administer key management create keystore '/tmp/DBASMC/tde' identified by "<password>";
keystore altered.

SQL> administer key management merge keystore '+DATA/DBASMC/tde' identified by "<password>" into existing keystore '/tmp/DBASMC/tde' identified by "<password>" with backup;
keystore altered.
```



5. Copy the expdp dump files to the destination database server. Copy the data file from /u01/app/odaorabase0/oracle/dpdump/ttsps dir to the target database server.

```
The expdp and impdp directory is the same in this case, so, no copy is necessary, for remote copy dumpfile using similar this command $ scp /u01/app/odaorabase0/oracle/dpdump/ttsps_dir/expttps_dbasm.dmp oracle@target_server:/location
```

#### Step 2: Import the tablespaces into an Oracle Key Vault-enabled database

1. Ensure there exists a TDE-enabled database with Oracle Key Vault, OKVASMC as the destination database. Copy the data file and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

```
# odacli create-database -n okvasmc -t -kt okv -ocp /tmp/
okvasmc on <server name>/okvclient.jar -dh 265412be-2b21-4cc4-adc7-
c845bf9e3e3a -r ASM --cdb -d pdbadmin -p pdb
# odacli describe-database -n okvasmc
Database details
                    ID: dc9f9d7b-7e22-4997-bb20-4a3adcc764a4
            Description: okvasmc
               DB Name: okvasmc
               DB Type: SI
                   CDB: true
               PDB Name: pdb
    PDB Admin User Name: pdbadmin
               Storage: ASM
               Home ID: 265412be-2b21-4cc4-adc7-c845bf9e3e3a
  TDE Wallet Management: ODA
            TDE Enabled: true
          KeystoreType : OKV
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
# su - oracle
$ sqlplus /noloq
SQL> connect / as sysdba
SQL> col PDB NAME for a20
SQL> select PDB NAME, GUID from dba pdbs ;
PDB NAME
           3247726469554039E063E730850A5A00
PDB
PDB$SEED
              324743827B457329E063E730850A27E7
SQL> exit ;
```

Copy the data files from file system to the destination Oracle ASM location of OKVASMC and set the permissions correctly after copying the data files.

```
###
### login to grid user
###
# su - grid
$ asmcmd cp /home/grid/tbs01.dbf +DATA/OKVASMC/
3247726469554039E063E730850A5A00/DATAFILE/tbs01 --dest dbname OKVASMC
copying /home/grid/tbs01.dbf -> +DATA/OKVASMC/
3247726469554039E063E730850A5A00/DATAFILE/tbs01
$ asmcmd
ASMCMD> pwd
+DATA/OKVASMC/3247726469554039E063E730850A5A00/DATAFILE
ASMCMD> ls --permission
                                                    Permission Name
User
                                        Group
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
                                                     ~w-----
SYSAUX.337.1197886103
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
SYSTEM.330.1197886099
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
UNDOTBS1.338.1197886107
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
USERS.336.1197886111
  grid@3fe6130d68b04fc6ffab5b96ff256f8e
                                                      rw----- tbs01 =>
+DATA/OKVASMC/DATAFILE/tbs01.339.1197886535
ASMCMD> chown oracle@3fe6130d68b04fc6ffab5b96ff256f8e:OKVASMC PDB tbs01
ASMCMD>
ASMCMD> ls --permission
User
                                        Group
                                                     Permission Name
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
SYSAUX.337.1197886103
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
SYSTEM.330.1197886099
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
UNDOTBS1.338.1197886107
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
                                                      rw-----
USERS.336.1197886111
oracle@3fe6130d68b04fc6ffab5b96ff256f8e OKVASMC PDB
                                                      rw----- tbs01 =>
+DATA/OKVASMC/DATAFILE/tbs01.339.1197886535
```

Create the service and TNS name for the PDB.

```
###
### Create service for PDB database and add TNS alias for PDB
to $ORACLE HOME/network/admin/tnsnames.ora
###
```



4. Create the database directory in the PDB for the import.

```
###
### login as Oracle user and run the following
###

# su - oracle

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'

###
### Connect to database using SQLPLUS as sysdba user and run the following
###

$ sqlplus /nolog
SQL> connect / as sysdba

SQL> ALTER SESSION SET CONTAINER=PDB;
SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/
ttsps_dir';

Directory created.

SQL> exit;
```

5. Upload the wallet keys from the source to the OKVASMC Oracle Key Vault wallet in the destination database. For impdp to recognize the tablespace, upload the software keystore wallet content to the destination database with Oracle Key Vault enabled.

```
Encryption Key: TAG okvasmc pdb
                                        Template
9E0B4E98-2249-4159-9B12-04A60980D25E
                                                    Default template for
OKVASMC ON <SERVER-NAME>
B4569785-465C-4906-8C82-3736A15ED3E7
                                        Symmetric Key TDE Master
Encryption Key: TAG okvasmc
$ ./okvutil upload -t WALLET -l /tmp/DBASMC/tde -g
okvasmc on <server name>-c -v 4 -o
okvutil version 21.10.0.0.0
Endpoint type: Oracle Database
Configuration file: /etc/OKV/okvasmc/okv/conf/okvclient.ora
Server: 100.70.126.204:5696
Standby Servers:
Uploading from /tmp/DBASMC/tde
Enter source wallet password:
No auto-login wallet found, password needed
Enter Oracle Key Vault endpoint password:
ORACLE.SECURITY.KB.ENCRYPTION.
Trying to connect to 100.70.126.204:5696 ...
Connected to 100.70.126.204:5696.
ORACLE.SECURITY.ID.ENCRYPTION.
ORACLE.SECURITY.KT.ENCRYPTION.AYGo9jtJAk+JvwRLClz4E7wAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.KM.ENCRYPTION.AYGo9jtJAk+JvwRLClz4E7wAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.DB.ENCRYPTION.AYGo9jtJAk+JvwRLClz4E7wAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.KT.ENCRYPTION.Afk3edvpTU8yv82U/
FM99CoAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.KM.ENCRYPTION.Afk3edvpTU8yv82U/
FM99CoAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.DB.ENCRYPTION.Afk3edvpTU8yv82U/
FM99CoAAAAAAAAAAAAAAAAAAAAAAAAAAAA
ORACLE.SECURITY.DB.ENCRYPTION.MASTERKEY.3215781D91701754E063E730850A04B1
ORACLE.SECURITY.DB.ENCRYPTION.MASTERKEY
Uploaded 2 TDE keys
Uploaded 0 SEPS entries
Uploaded 0 other secrets
Uploaded 4 opaque objects
Uploading private key
Uploading certificate request
Uploading trust points
Uploaded 1 private keys
Uploaded 1 certificate requests
Uploaded 0 user certificates
Uploaded 0 trust points
Upload succeeded
```

###

```
### Comparing the output of 'okvutil list' shows that TDE Wallet Keys were
uploaded to OKV wallet
###
```

### \$ ./okvutil list Enter Oracle Key Vault endpoint password:

Unique ID	Type	Identifier
1D4F6104-FAFE-42C5-AE3E-F9B46BCA51CA	Opaque Object	Certificate Request
20D37B20-78C2-4679-8B56-B50F184B5D61	Symmetric Key	TDE Master
Encryption Key: TAG okvasmc		
2F4FCE20-A679-415A-B2E9-F4F80A28576A	Opaque Object	TDE Wallet Metadata
40A3C0F2-CED1-497F-8C70-13A6E69AC0F7	Symmetric Key	TDE Master
<pre>Encryption Key: TAG okvasmc_pdb</pre>		
41B0D244-BAC0-5311-A624-3BB0496C8BE9	Symmetric Key	TDE Master
<pre>Encryption Key: TAG set_master_key</pre>		
74A196AC-3C9E-49B5-A10B-19F2DFB3D27B	Opaque Object	TDE Wallet Metadata
87793E99-E79C-4855-8CF1-5C463DCFCE60	Opaque Object	TDE Wallet Metadata
9E0B4E98-2249-4159-9B12-04A60980D25E	Template Def	ault template for
OKVASMC_ON_ <server-name></server-name>		
B4569785-465C-4906-8C82-3736A15ED3E7	Symmetric Key	TDE Master
Encryption Key: TAG okvasmc		
E31121D2-5A43-4D1A-882B-26881FB1D3A2	Private Key -	
E885E79C-AF01-5856-A066-7292198BF650	Symmetric Key	TDE Master
<pre>Encryption Key: TAG set_master_key</pre>		
F0834140-19A5-4E2F-9AB6-CC4026A0FC62	Opaque Object	TDE Wallet Metadata

```
$ rm -rf /tmp/DBASMC/tde
```

6. Import the TBS01 tablespace to the destination database OKVASMC. TRANSPORT\_DATAFILES references the location of the data file in the destination database.

```
Production
Master table "SYSTEM"."SYS_IMPORT_TRANSPORTABLE_01" successfully loaded/
unloaded
Starting "SYSTEM"."SYS_IMPORT_TRANSPORTABLE_01": system/
********@okvasmc_pdb TRANSPORT_DATAFILES='+DATA/OKVASMC/
3247726469554039E063E730850A5A00/DATAFILE/tbs01' DIRECTORY=ttsps_dir
dumpfile=expttps_dbasmc.dmp
Processing object type TRANSPORTABLE_EXPORT/PLUGTS_BLK
Processing object type TRANSPORTABLE_EXPORT/TABLE
Processing object type TRANSPORTABLE_EXPORT/STATISTICS/TABLE_STATISTICS
Processing object type TRANSPORTABLE_EXPORT/STATISTICS/MARKER
Processing object type TRANSPORTABLE_EXPORT/POST_INSTANCE/PLUGTS_BLK
Job "SYSTEM"."SYS_IMPORT_TRANSPORTABLE_01" successfully completed at Tue
Apr 8 10:30:25 2025 elapsed 0 00:00:17
```

Change the tablespace status and test encryption on the destination Oracle Key Vault database.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user and run the following
###
# su - oracle
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> alter session set container=pdb;
Session altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                       STATUS ENC
SYSTEM
                    ONLINE
                              YES
SYSAUX
                    ONLINE YES
UNDOTBS1
                    ONLINE YES
USERS
                   ONLINE YES
                   ONLINE YES
TEMP ENC
TBS01
                    READ ONLY YES
SQL> alter tablespace TBS01 read write;
Tablespace altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                       STATUS ENC
                    ONLINE YES
              ONLINE YES
ONLINE YES
SYSAUX
UNDOTBS1
```



```
USERS
                        ONLINE
                                  YES
TEMP ENC
                        ONLINE
                                  YES
TBS01
                       ONLINE
                                  YES
###
### Retrieve the data from TAB1
SQL> select OWNER, table name from tab1 where rownum < 3;
TABLE NAME
SYS
IND$
SYS
CDEF$
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

## Manually Migrating from Software Keystore to Oracle Key Vault Keystore on Oracle Database Appliance

Understand how you can migrate tablespaces from software keystore to Oracle Key Vault keystore for databases created on Oracle Database Appliance

For the migration, a TDE wallet, set as the default wallet, and endpoints must exist on the Oracle Key Vault server. Ensure that the <code>okvclient.jar</code> file specific to the endpoints is available on Oracle Database Appliance.

- 1. Log into Oracle Key Vault and create the virtual TDE wallet corresponding to a database.
- 2. Create endpoints corresponding to each instance. For a single instance database, you must create one endpoint and for Oracle RAC, Oracle RAC One, and single-instance databases with high-availability enabled, create two endpoints.
- 3. Set the default wallet for the created endpoint.
- 4. Download the okvclient.jar file corresponding to each endpoint. For single instance database, download one file, and for Oracle RAC database, there are two files available for download, one per instance.

Before migration, the TDE keys are present in a file-based wallet on Oracle ASM storage in the database. After migration, all the current TDE keys are migrated to the Oracle Key Vault keystore.

1. As the database owner, for example, oracle, connect to SQL\*Plus and configure the new WALLET ROOT initialization parameter for the database.

```
# su - oracle
$. oraenv
ORACLE_SID = [oracle] ? enter the database SID
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> ALTER SYSTEM SET WALLET_ROOT='/etc/OKV/dbUniqueName' scope=spfile
sid='*';
System altered.
```

Create the wallet root and TDE directories. Run this step on both nodes for Oracle RAC, Oracle RAC One Node, and Oracle Database Enterprise Edition High Availability databases.

```
$ mkdir /etc/OKV/dbUniqueName/
$ mkdir /etc/OKV/dbUniqueName/okv
$ mkdir /etc/OKV/dbUniqueName/tde
```

3. Copy the software keystore (ewallet.p12) file from the +DATA/dbUniqueName/tde location to the /etc/OKV/dbname/tde location.

For Oracle ASM databases, copy the file from the +DATA/dbUniqueName/tde Oracle ASM location.

```
$. oraenv
ORACLE_SID = [oracle] ? enter the database SID
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> ADMINISTER KEY MANAGEMENT CREATE KEYSTORE '/etc/OKV/dbUniqueName/tde'
identified by "current TDE password";

keystore altered.

SQL> ADMINISTER KEY MANAGEMENT MERGE KEYSTORE '+DATA/dbUniqueName/tde'
identified by "current TDE password" INTO EXISTING KEYSTORE '/etc/OKV/
<dbUniqueName>/tde' identified by "current TDE password" WITH BACKUP USING
"delete";

keystore altered.
```

For Oracle ACFS databases, copy the file from the /u02/app/oracle/oradata/dbUniqueName/tde location.

```
cp /u02/app/oracle/oradata/dbUniqueName/tde/ewallet.p12 /etc/OKV/dbUniqueName/tde
```

4. Install the Oracle Key Vault endpoint software. Two endpoints must be created for Oracle RAC, Oracle RAC One Node, and Oracle Database Enterprise Edition High Availability databases specific to each instance and must be installed on each node, so run this step on both nodes for these databases. Use the Java binary from the database home location. On successful installation, the files listed in step 4c must be present in the /etc/OKV/dbUniqueName/okv/location.

a. Find the database home location with the odacli describe-database command and make a note of the Home ID.

**b.** List the database homes present in the environment and save the Home Location corresponding to the ID copied in step a.

c. Install the <code>okvclient.jar</code> specific to the endpoint created for the database instance using the Java binary from the database home location saved from step 4b.

```
$ DatabaseHomeLocation/jdk/bin/java -jar okvclient.jar path -d /etc/OKV/dbUniqueName/okv/
Detected JAVA_HOME: /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_2/jdk/jre
Enter new Key Vault endpoint password (enter for auto-login): current
TDE password

Confirm new Key Vault endpoint password: current TDE password

The endpoint software for Oracle Key Vault installed successfully.
Deleted the file :<okvclient.jar path
```

d. Verify that the <code>okvclient.jar</code> is installed successfully by listing the files from the <code>/etc/OKV/dbUniqueName/okv</code> location.

```
$ ls -ltR /etc/OKV/dbUniqueName/okv/
/etc/OKV/dbUniqueName/okv/:
total 28
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 log
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 conf
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 ssl
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 bin
```

```
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 lib
drwxr-x--- 3 oracle oinstall 4096 Mar 28 12:18 csdk
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 jlib
/etc/OKV/dbUniqueName/okv/log:
total 4
-rw-r---- 1 oracle oinstall 2162 Mar 28 12:18 okvutil.deploy.log
/etc/OKV/dbUniqueName/okv/conf:
total 12
-rw-r---- 1 oracle oinstall 450 Mar 28 12:18 logging.properties
-rw-r---- 1 oracle oinstall 882 Mar 28 12:18 okvclient.ora
-rw-r---- 1 oracle oinstall 0 Mar 28 12:18 okvclient.lck
-rwx----- 1 oracle oinstall 1009 Mar 28 12:09 okvsshendpoint.conf
/etc/OKV/dbUniqueName/okv/ssl:
total 8
-rw----- 1 oracle oinstall 4361 Mar 28 12:18 ewallet.p12
/etc/OKV/dbUniqueName/okv/bin:
total 8548
-rwxr-x--- 1 oracle oinstall 18108 Mar 28 12:09 ep healthcheck.sh
-rwxr-x--- 1 oracle oinstall 8682112 Mar 28 12:09 okveps.x64
-rwxr-x--- 1 oracle oinstall 29651 Mar 28 12:09
okv ssh ep lookup authorized keys
-rwxr-x--- 1 oracle oinstall 7721 Mar 28 12:09 okvutil
-rwxr-x--- 1 oracle oinstall 5030 Mar 28 12:09 root.sh
/etc/OKV/dbUniqueName/okv/lib:
total 8708
-rwxr-x--- 1 oracle oinstall 8913371 Mar 28 12:09 liborapkcs.so
/etc/OKV/dbUniqueName/okv/csdk:
drwxr-x--- 2 oracle oinstall 4096 Mar 28 12:18 lib
/etc/OKV/dbUniqueName/okv/csdk/lib:
total 8748
-rwxr-x--- 1 oracle oinstall 8954149 Mar 28 12:09 liborasdk.so
/etc/OKV/dbUniqueName/okv/jlib:
total 72
-rw-r---- 1 oracle oinstall 71387 Mar 14 2024 okvutil.jar
```

5. As the root user, run the root.sh script to install the PKCS library. For Oracle RAC, Oracle RAC One Node, and Oracle Database Enterprise Edition High Availability databases, run this step on both nodes.

```
# id -a
uid=0(root) gid=0(root) groups=0(root)
# /etc/OKV/dbUniqueName/okv/bin/root.sh
Creating directory: /opt/oracle/extapi/64/hsm/oracle/1.0.0/
Copying PKCS library to /opt/oracle/extapi/64/hsm/oracle/1.0.0/
Setting PKCS library file permissions
Installation successful.
```

After the command runs successfully, verify that the library is installed.

```
# id -a
uid=0(root) gid=0(root) groups=0(root)
# ls -ltr /opt/oracle/extapi/64/hsm/oracle/1.0.0/
total 8708
-rwxr-xr-x 1 root root 8913371 Mar 28 12:33 liborapkcs.so
```

**6.** Run steps 6 to 13 as the database owner, for example, oracle. Upload the software keystore ewallet.p12 to the Oracle Key Vault server.

```
# su - oracle
$ /etc/OKV/dbUniqueName/okv/bin/okvutil upload -l /etc/OKV/
dbUniqueName/tde -t wallet -g wallet name
Enter source wallet password: current TDE password
Enter Oracle Key Vault endpoint password: current TDE password
Upload succeeded
```

Verify that the TDE keys are uploaded to the wallet on the Oracle Key Vault server with the okvutil list command:

```
$ /etc/OKV/dbUniqueName/okv/bin/okvutil list
Enter Oracle Key Vault endpoint password:
                                                Identifier
Unique ID
                                      Type
                                      Opaque Object TDE Wallet Metadata
8D938C3D-8434-45A4-B6F3-A9405C26B0C5
A816E0FB-5CF2-48FF-A29F-5EC7282B4035
                                      Opaque Object TDE Wallet Metadata
121AC7F1-44AC-5537-A705-52BB7DAEDDAA
                                      Symmetric Key TDE Master
Encryption Key: TAG set master key
3977568B-A800-5532-96DB-C196AEA75C2E
                                      Symmetric Key TDE Master
Encryption Key: TAG set master key
3DC733BF-4977-42E0-92E6-D436BBFA206F
                                      Opaque Object TDE Wallet Metadata
                                      Opaque Object TDE Wallet Metadata
0640B156-1D2A-4CE4-9608-CDDA004938E2
                                      Private Key -
051ED678-68D2-4DF5-8CE2-41DBAB000003
2E7D00F6-9AC2-4543-B308-0697D9A401CF
                                      Opaque Object Certificate Request
4585DCAE-EDD1-4BAA-AD8F-E1FC8AD5E763
                                      Template Default template for
TDEDB 707EP1
```

7. Create the local autologin wallet for the database on the local node.

keystore altered.

```
$. oraenv
ORACLE_SID = [oracle] ? enter the SID of the local database instance
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> ADMINISTER KEY MANAGEMENT ADD SECRET 'current TDE password' FOR
CLIENT 'OKV_PASSWORD' TO LOCAL AUTO_LOGIN KEYSTORE '/etc/OKV/dbUniqueName/
tde';
```

For Oracle RAC databases, create the local and external store autologin wallet for the remote instance on the remote node.

```
$. oraenv
ORACLE SID = [oracle] ? enter the SID of the remote database instance
```

```
ORACLE_HOME = [/home/oracle] ? enter the database home path $ sqlplus / as sysdba SQL> ADMINISTER KEY MANAGEMENT ADD SECRET 'current TDE password' FOR CLIENT 'OKV_PASSWORD' TO LOCAL AUTO_LOGIN KEYSTORE '/etc/OKV/dbUniqueName/tde';
```

keystore altered.

For Oracle RAC One Node and single-instance databases with high-availability enabled, follow these steps on the remote node:

a. Shut down the instance on the local node.

```
$. oraenv
ORACLE_SID = [oracle] ? <enter the SID of the local database instance>
ORACLE_HOME = [/home/oracle] ? <enter the database home path>
$ sqlplus / as sysdba
SQL> shutdown immediate;
```

**b.** Mount the instance on the remote node.

```
$. oraenv
ORACLE_SID = [oracle] ? enter the SID of the remote database instance
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> startup nomount;
```

c. Create the local autologin wallet.

```
$. oraenv
ORACLE_SID = [oracle] ? enter the SID of the remote database instance
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> ADMINISTER KEY MANAGEMENT ADD SECRET 'current TDE password' FOR
CLIENT 'OKV_PASSWORD' TO LOCAL AUTO_LOGIN KEYSTORE '/etc/OKV/
dbUniqueName/tde';
```

keystore altered.

d. Shut down the instance on the remote node.

```
$. oraenv
ORACLE_SID = [oracle] ? enter the SID of the remote database instance
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> shutdown;
```

e. Mount the instance on the local node.

```
$. oraenv
ORACLE_SID = [oracle] ? enter the SID of the local database instance
ORACLE_HOME = [/home/oracle] ? enter the database home path
$ sqlplus / as sysdba
SQL> startup;
```

**8.** Connect to SQL\*Plus and set the tde\_configuration initialization parameter for the database.

```
$ sqlplus / as sysdba

SQL> ALTER SYSTEM SET TDE_CONFIGURATION = "KEYSTORE_CONFIGURATION=OKV|
FILE" SCOPE = BOTH sid='*';

System altered.
```

Restart the database to apply the database initialization parameters set in step 8.

```
$ srvctl stop database -d dbUniqueName
$ srvctl start database -d dbUniqueName
```

10. Connect to SQL\*Plus and run the command to migrate the TDE keys to OKV.

```
$ sqlplus / as sysdba
SQL> ADMINISTER KEY MANAGEMENT set key identified by "current TDE password" force keystore migrate using "current TDE password";
keystore altered.
```

11. Delete the file based wallet ewallet.p12 files from the /etc/OKV/dbUniqueName/tde location.

```
$ rm -f /etc/OKV/dbUniqueName/tde/ewallet*
```

12. Restart the database again to apply the keystore migration performed in step 10.

```
$ srvctl stop database -d dbUniqueName
$ srvctl start database -d dbUniqueName
```

13. Connect to SQL\*Plus and run the query to check the status of the wallet. It must be in the Open state. If it is not in the Open state, restart the database to verify that the communication with Oracle Key Vault is fine.

```
WRL TYPE
_____
WRL PARAMETER
______
STATUS
            WALLET_TYPE WALLET_OR KEYSTORE FULLY_BAC
CON_ID
OPEN
            OKV
               PRIMARY NONE UNDEFINED
  1
WRL TYPE
_____
WRL PARAMETER
______
           WALLET_TYPE WALLET_OR KEYSTORE FULLY_BAC
 CON ID
FILE
OPEN_NO_MASTER_KEY LOCAL_AUTOLOGIN SINGLE UNITED
UNDEFINED
  2
WRL TYPE
WRL PARAMETER
STATUS
            WALLET_TYPE WALLET_OR KEYSTORE FULLY_BAC
CON_ID
OKV
OPEN
            OKV
               SINGLE UNITED UNDEFINED
  2
WRL TYPE
______
WRL PARAMETER
        WALLET_TYPE WALLET_OR KEYSTORE FULLY_BAC
```



```
CON ID
FILE
OPEN NO MASTER KEY LOCAL AUTOLOGIN SECONDARY UNITED
UNDEFINED
   3
WRL TYPE
WRL PARAMETER
______
STATUS
              WALLET_TYPE WALLET_OR KEYSTORE FULLY_BAC
 CON ID
_____
OKV
              OKV PRIMARY UNITED UNDEFINED
OPEN
   3
```

**14.** As the grid user, delete the software keystore and the autologin wallet. Connect to ASMCMD and delete the +DATA/dbUniqueName/tde folder.

```
# su - grid
$ asmcmd
ASMCMD> cd +DATA/dbUniqueName
ASMCMD> rm -rf tde/
```

15. Update the KeystoreType parameter in the DCS metadata for the database. For Oracle Database Appliance release 19.27, use the odacli register-database command to update the MySQL metadata for the database.

```
\$ odacli register-database -sn database service name -c database class -s database shape
```

To register the database using Oracle Key Vault server configuration, run the following command:

```
\ odacli register-database -sn database service name -c database class -s database shape -osc <code>OKVServerConfigName</code>
```

16. Verify that the keystoreType parameter for the database is set to OKV. Run the odacli describe-database -n dbName -j command and check the keystoreType parameter in the command output. For the databases registered using Oracle Key Vault server configuration, the okvServerConfigName parameter in the odacli describe-database

command output displays the Oracle Key Vault server configuration name used by the database.

```
$ odacli describe-database -n dbName -j
$ odacli describe-database -n tdedb -j
  "name" : "tdedb",
  "dbName" : "tdedb",
  "databaseUniqueName" : "tdedb",
  "enableTDE" : true,
  "tdePassword" : "*******
  "tdeWalletManagement" : "ODA",
  "dbType" : "RAC",
  "dbRole" : "PRIMARY",
  "dbTargetNodeNumber" : null,
  "dbClass" : "OLTP",
  "dbShape" : "odb1",
  "dbStorage" : "ASM",
  "keystoreType" : "OKV",
  "okvServerConfigName" : "NONE"
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

### Manual Migration and Encryption of Data into TDE-Enabled Database

Understand how you can migrate transportable tablespaces to TDE-enabled database on Oracle Database Appliance.

- Migrating Tablespaces from Non-TDE Oracle ACFS Database to Oracle ACFS Database on Oracle Database Appliance
  - Understand how you can migrate tablespaces from non-TDE Oracle ACFS database to Oracle ACFS database with Oracle Key Vault enabled on Oracle Database Appliance.
- Migrating Tablespaces from Non-TDE Oracle ASM Database to Oracle ASM Database on Oracle Database Appliance
  - Understand how you can migrate tablespaces from non-TDE Oracle ASM database to Oracle ASM database with Oracle Key Vault enabled on Oracle Database Appliance.
- Migrating Tablespaces from Non-TDE Oracle ACFS Database to Oracle ACFS CDB Database on Oracle Database Appliance
  - Understand how you can migrate tablespaces from non-TDE Oracle ACFS database to Oracle ACFS CDB database with Oracle Key Vault enabled on Oracle Database Appliance.

Migrating Tablespaces from Non-TDE Oracle ASM Database to Oracle ASM CDB
 Database on Oracle Database Appliance
 Understand how you can migrate tablespaces from non-TDE Oracle ASM database to
 Oracle ASM CDB database with Oracle Key Vault enabled on Oracle Database Appliance.

### Migrating Tablespaces from Non-TDE Oracle ACFS Database to Oracle ACFS Database on Oracle Database Appliance

Understand how you can migrate tablespaces from non-TDE Oracle ACFS database to Oracle ACFS database with Oracle Key Vault enabled on Oracle Database Appliance.

Ensure that there is a source and destination database. The two databases can be on one Oracle Database Appliance server or on different servers. The source database must be an non TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be an Oracle Database Appliance database created with ODACLI commands.

#### Step 1: Export the tablespace from the source database

 Consider that the source database has a tablespace TBS01 to be migrated to the destination database. Provide information about the tablespace.

```
SQL> select TABLESPACE NAME, ENCRYPTED from dba tablespaces;
TABLESPACE NAME STATUS
                            ENC
SYSTEM
                 ONLINE
SYSAUX
                  ONLINE
                            NO
UNDOTBS1
                  ONLINE
                            NO
TEMP
                  ONLINE
                            NO
USERS
                  ONLINE
TBS01
                   ONLINE
                            NΟ
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
/u02/app/oracle/oradata/dbnotde/DBNOTDE/datafile/o1 mf tbs01 lnlgn65j .dbf
SQL>
###
### Make sure the set of tablespaces are self-contained. The following
PL/SQL command must run successfully
###
SQL> EXECUTE DBMS TTS.TRANSPORT SET CHECk('tbs01',true);
PL/SQL procedure successfully completed.
SQL> exit;
```



2. Create the database directory in the source database DBNOTDE to be used for the export. Create a database directory object in the destination database to be used by expdp.

```
###
### login as oracle user
###

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'

###
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir';

Directory created.

SQL>
```

3. Export the TBS01 tablespace from souce database DBNOTDE. First, set the tablespace to be copied in READ ONLY mode. Next, run expdp on the designated tablespace. Review the log files for expdp stored under the database directory ttsps dir.

```
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttps.dmp
Export: Release 19.0.0.0.0 - Production on Mon Nov 6 12:47:00 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
```

```
TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
DUMPFILE=expttps.dmp
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Master table "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully loaded/
unloaded
*****************
Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
 /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttps.dmp
*****************
Datafiles required for transportable tablespace TBS01:
 /u02/app/oracle/oradata/dbnotde/DBNOTDE/datafile/
o1 mf tbs01 lnlqn65j .dbf
Job "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" successfully completed at Mon
Nov 6 12:47:19 2023 elapsed 0 00:00:14
```

4. Move data files to the destination database server and edit the status of the data file in the source database DBNOTDE to READ WRITE. Move the data file to the TDE-enabled database server in the location /u02/app/oracle/oradata/dbtde/DBTDE/datafile.

```
###
### login as oracle user
###

$ cp /u02/app/oracle/oradata/dbnotde/DBNOTDE/datafile/
o1_mf_tbs01_lnlgn65j_.dbf /u02/app/oracle/oradata/dbtde/DBTDE/datafile/
o1_mf_tbs01_lnlgn65j_.dbf

###
### In source database, set the tablespace back to read write mode
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###
SQL> ALTER TABLESPACE TBS01 READ WRITE;
```

#### Step 2: Import the tablespaces into a TDE-enabled database

1. Create a TDE-enabled database with Oracle Key Vault, DBTDE as the destination database, as described in the earlier procedure. Copy the data file and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

```
# odacli create-database -n dbtde -t -kt okv -osc adminobj1 -dh
e2a65596-6435-4410-9e8d-6b21a6005779 -r ACFS

# odacli describe-database -n dbtde
Database details
```



```
ID: e261b9f8-8212-499b-840e-eb6ea3e09447

Description: dbtde

DB Name: dbtde

DB Type: SI

CDB: false

Storage: ACFS

Home ID: e2a65596-6435-4410-9e8d-6b21a6005779

TDE Wallet Management: ODA

TDE Enabled: true

KeystoreType: OKV
```

2. Create the database directory in the Oracle Key Vault-enabled destination database for the import operation. The source database expdp dump file and output for impdp is stored in the database directory object. Copy the expdp dump file from the source database server to this server, and use the impdp dump file to add tablespace metadata to destination database.

```
###
### login as sysdba user and run the following:
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/
ttsps_dir';
Directory created.
```

3. Import the TBS01 tablespace to the destination database DBTDE. Copy the <code>expdp</code> dump file of the source database to the database directory <code>ttsps\_dir</code>. The <code>impdp</code> uses the dump file to add tablespace metadata to destination database. TRANSPORT\_DATAFILES references the location of the data file in the destination database.

```
### Run impdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ impdp system TRANSPORT DATAFILES=\'/u02/app/oracle/oradata/dbtde/DBTDE/
datafile/o1 mf tbs01 lnlgn65j .dbf\' DIRECTORY=ttsps dir
dumpfile=expttps.dmp
Import: Release 19.0.0.0.0 - Production on Mon Nov 6 12:53:37 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Master table "SYSTEM"."SYS IMPORT TRANSPORTABLE 01" successfully loaded/
Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/******
TRANSPORT DATAFILES='/u02/app/oracle/oradata/dbtde/DBTDE/datafile/
o1 mf tbs01 lnlgn65j .dbf' DIRECTORY=ttsps dir dumpfile=expttps.dmp
```

```
Processing object type TRANSPORTABLE_EXPORT/PLUGTS_BLK
Processing object type TRANSPORTABLE_EXPORT/TABLE
Processing object type TRANSPORTABLE_EXPORT/STATISTICS/TABLE_STATISTICS
Processing object type TRANSPORTABLE_EXPORT/POST_INSTANCE/PLUGTS_BLK
Job "SYSTEM"."SYS_IMPORT_TRANSPORTABLE_01" successfully completed at Mon
Nov 6 12:53:46 2023 elapsed 0 00:00:03
```

4. Enable and test encryption on the destination Oracle Key Vault-enabled database.

```
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                           STATUS ENC
----- ---
                            ONLINE YES
                            ONLINE YES
SYSAUX
UNDOTBS1
                            ONLINE YES
TEMP
                           ONLINE YES
USERS
                           ONLINE YES
TBS01
                           READ ONLY NO
SQL> alter tablespace TBS01 read write;
Tablespace altered.
### encrypt TBS01. In case encrypt operation is interrupted , run 'alter
tablespace TBS01 encryption online finish encrypt;'
SQL> alter tablespace TBS01 encryption online encrypt;
Tablespace altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                             STATUS ENC
SYSTEM
                            ONLINE YES
                            ONLINE YES
SYSAUX
UNDOTBS1
                            ONLINE YES
TEMP
                            ONLINE YES
USERS
                           ONLINE YES
                           ONLINE YES
TBS01
### Retrieve the data from TAB1
###
SQL> select OWNER, table name from tab1 where rownum < 3;
```

```
OWNER
TABLE NAME
          ______
SYS
TS$
SYS
ICOL$
###
### When the wallet is closed or unavailable, same SQL does not retrieve
### To simulate wallet absence rename the cwallet.sso wallet under
<wallet root>/tde to some other name like cwallet.sso.orig
### and close the wallet. To return auto-login wallet , rename file back
to cwallet.sso and run the SQL again.
###
SQL> show parameter wallet root
                     TYPE
NAME.
                               VALUE
wallet root
                     string /etc/OKV/dbtde
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

### Migrating Tablespaces from Non-TDE Oracle ASM Database to Oracle ASM Database on Oracle Database Appliance

Understand how you can migrate tablespaces from non-TDE Oracle ASM database to Oracle ASM database with Oracle Key Vault enabled on Oracle Database Appliance.

Ensure that there is a source and destination database. The two databases can be on one Oracle Database Appliance server or on different servers. The source database must be an non TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be an Oracle Database Appliance database created with ODACLI commands and with Oracle Key Vault enabled on it.

#### Step 1: Export the tablespace from the source database

 Consider that the source database has a tablespace TBS01 to be migrated to the destination database. Provide information about the tablespace.

```
SQL> select TABLESPACE_NAME, STATUS , ENCRYPTED from dba_tablespaces;
TABLESPACE_NAME STATUS ENC

SYSTEM ONLINE NO
SYSAUX ONLINE NO
UNDOTBS1 ONLINE NO
```

```
NO
TEMP
                       ONLINE
USERS
                      ONLINE
TBS01
                       ONLINE
                                 NO
SQL> SQL> select FILE NAME from dba data files where
TABLESPACE NAME='TBS01';
FILE NAME
+DATA/ASMNOTDE/DATAFILE/tbs01.374.1152267015
### Checks if a set of tablespaces (to be transported) is self-contained
###
SQL> EXECUTE DBMS TTS.TRANSPORT SET CHECk('tbs01',true);
PL/SQL procedure successfully completed.
```

Create the database directory in the source database ASMNOTDE to use for the export.Create a database directory object in the destination database for expdp.

```
###
### login as oracle user
###

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'

###
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir';

Directory created.
```

3. Export the TBS01 tablespace from the souce database ASMNOTDE. First, set the tablespace to be copied in READ ONLY mode. Next, run <code>expdp</code> on the designated tablespace. Review the dump files for <code>expdp</code> stored under the database directory <code>ttsps</code> dir.

```
###
### Set the tablespaces that you need to be exported in read-only mode
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following

SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
```

```
SOL>
###
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttpsasm.dmp
Export: Release 19.0.0.0.0 - Production on Tue Nov 7 10:12:19 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
DUMPFILE=expttpsasm.dmp
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Master table "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully loaded/
unloaded
          Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
 /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttpsasm.dmp
* * *
Datafiles required for transportable tablespace TBS01:
 +DATA/ASMNOTDE/DATAFILE/tbs01.374.1152267015
Job "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" successfully completed at Tue
Nov 7 10:12:49 2023 elapsed 0 00:00:20
```

 Move data files to the destination database server and edit the status of the data file in the source database ASMNOTDE to READ WRITE.

```
###
### login to grid user
### Copying datafiles from ASM to filesystem
###
$ asmcmd cp +DATA/ASMNOTDE/DATAFILE/tbs01.295.1165369089 /home/grid/
tbs01.dbf
copying +DATA/ASMNOTDE/DATAFILE/tbs01.295.1165369089 -> /home/grid/
tbs01.dbf
###
### In source database, set the tablespace back to read write mode
```

```
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###

SQL> ALTER TABLESPACE TBS01 READ WRITE;
```

#### Step 2: Import the tablespaces into a TDE-enabled database

 Create a TDE-enabled database with Oracle Key Vault, ASMTDE as the destination database. Copy the data file and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

2. Copy the data file from file system to the destination Oracle ASM location of ASMTDE.

```
###
### login to grid user
###
$ asmcmd cp /home/grid/tbs01.dbf +DATA/ASMTDE/DATAFILE/tbs01 --dest dbname
copying /home/grid/tbs01.dbf -> +DATA/ASMTDE/DATAFILE/tbs01
ASMCMD> ls --permission
User
                                        Group Permission Name
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                              ~w-----
SYSAUX.292.1165368127
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
SYSTEM.279.1165368093
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                               rw-----
UNDOTBS1.290.1165368143
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                               rw-----
USERS.288.1165368875
  grid@66d5786e6a057fd3bfa6ca745d993aef
                                               rw----- tbs01 => +DATA/
ASMTDE/DATAFILE/tbs01.294.1165425531
 grid@66d5786e6a057fd3bfa6ca745d993aef
                                               rw-----
tbs01.294.1165425531
```



```
ASMCMD> chown dbusr1@66d5786e6a057fd3bfa6ca745d993aef tbs01
ASMCMD> ls --permission
User
                                       Group Permission Name
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                              rw-----
SYSAUX.292.1165368127
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                               rw-----
SYSTEM.279.1165368093
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                               rw-----
UNDOTBS1.290.1165368143
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                               rw-----
USERS.288.1165368875
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
                                               rw----- tbs01 => +DATA/
OKVDB2/DATAFILE/tbs012.294.1165425531
                                               rw-----
dbusr1@66d5786e6a057fd3bfa6ca745d993aef
tbs01.294.1165425531
```

3. Create the database directory in the ASMTDE database for the import.

```
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/
ttsps_dir';
Directory created.
```

4. Import the TBS01 tablespace to the destination database ASMTDE. Copy the <code>expdp</code> dump file of the source database to the database directory <code>ttsps\_dir</code>. The <code>impdp</code> uses the dump file to add tablespace metadata to destination database. TRANSPORT\_DATAFILES references the location of the data file in the destination database.

```
### Run impdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ impdp system TRANSPORT DATAFILES=\'/u02/app/oracle/oradata/dbtde/DBTDE/
datafile/o1 mf tbs01 lnlgn65j .dbf\' DIRECTORY=ttsps dir
dumpfile=expttps.dmp
Import: Release 19.0.0.0.0 - Production on Mon Nov 6 12:53:37 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Master table "SYSTEM"."SYS IMPORT TRANSPORTABLE 01" successfully loaded/
unloaded
Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/******
TRANSPORT DATAFILES='/u02/app/oracle/oradata/dbtde/DBTDE/datafile/
```

```
o1_mf_tbs01_lnlgn65j_.dbf' DIRECTORY=ttsps_dir dumpfile=expttps.dmp
Processing object type TRANSPORTABLE_EXPORT/PLUGTS_BLK
Processing object type TRANSPORTABLE_EXPORT/TABLE
Processing object type TRANSPORTABLE_EXPORT/STATISTICS/TABLE_STATISTICS
Processing object type TRANSPORTABLE_EXPORT/POST_INSTANCE/PLUGTS_BLK
Job "SYSTEM"."SYS_IMPORT_TRANSPORTABLE_01" successfully completed
```

5. Enable and test encryption on the destination Oracle Key Vault-enabled database.

```
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                    STATUS ENC
----- ---
SYSTEM
                   ONLINE NO
SYSAUX
                   ONLINE NO
UNDOTBS1
                   ONLINE NO
TEMP
                   ONLINE NO
USERS
                   ONLINE YES
TBS01
                   READ ONLY NO
6 rows selected.
SQL> alter tablespace TBS01 read write;
Tablespace altered.
### encrypt TBS01. In case encrypt operation is interrupted , run 'alter
tablespace TBS01 encryption online finish encrypt;'
       alter tablespace TBS01 encryption online encrypt;
SQL>
Tablespace altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                 STATUS ENC
                   ONLINE NO
SYSTEM
SYSAUX
                   ONLINE NO
UNDOTBS1
                   ONLINE NO
TEMP
                   ONLINE NO
                   ONLINE YES
USERS
TBS01
                   ONLINE YES
6 rows selected.
###
### Retrieve the data from TAB1
###
```

```
SQL> select OWNER, table name from tab1 where rownum < 3
OWNER
TABLE NAME
______
SYS
TS$
SYS
ICOL$
### When the wallet is closed or unavailable, same SQL does not retrieve
### To simulate wallet absence rename the cwallet.sso wallet under
<wallet root>/tde to some other name like cwallet.sso.orig
### and close the wallet. To return auto-login wallet , rename file back
to cwallet.sso and run the SQL again.
###
SQL> show parameter wallet root
NAME
wallet root
                     string /etc/OKV/asmtde
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Migrating Tablespaces from Non-TDE Oracle ACFS Database to Oracle ACFS CDB Database on Oracle Database Appliance

Understand how you can migrate tablespaces from non-TDE Oracle ACFS database to Oracle ACFS CDB database with Oracle Key Vault enabled on Oracle Database Appliance.

Ensure that there is a source and destination database. The two databases can be on one Oracle Database Appliance server or on different servers. The source database must be an non TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be an Oracle Database Appliance database created with ODACLI commands and with Oracle Key Vault enabled on it.

#### Step 1: Export the tablespace from the source database

 Ensure that the source database has a tablespace TBS01 to be migrated to the destination database. Find the information about the tablespace.

```
###
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
```

SQL> select TABLESPACE NAME, ENCRYPTED from dba tablespaces;

```
STATUS ENC
TABLESPACE NAME
SYSTEM
                  ONLINE NO
                  ONLINE NO
SYSAUX
UNDOTBS1
                  ONLINE
                           NO
TEMP
                  ONLINE NO
USERS
                  ONLINE NO
TBS01
                  ONLINE NO
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
        ______
/u02/app/oracle/oradata/dbnotde/DBNOTDE/datafile/o1 mf tbs01 lnlgn65j .dbf
SQL>
###
### Checks if a set of tablespaces (to be transported) is self-contained
SQL> EXECUTE DBMS TTS.TRANSPORT SET CHECk('tbs01',true);
PL/SQL procedure successfully completed.
```

2. Create the database directory in the source database DBNOTDE to be used for the export. Create a database directory object in the destination database to be used by expdp.

```
###
### login as oracle user
###

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'
###
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir';
Directory created.
SQL>
```



3. Export the TBS01 tablespace from souce database DBNOTDE. First, set the tablespace to be copied in READ ONLY mode. Next, run expdp on the designated tablespace. Review the log files for expdp stored under the database directory ttsps dir.

```
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
###
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttps.dmp
Export: Release 19.0.0.0.0 - Production on Mon Nov 6 12:47:00 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
DUMPFILE=expttps.dmp
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Master table "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" successfully loaded/
unloaded
**********************
Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
 /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttps.dmp
***********************
Datafiles required for transportable tablespace TBS01:
 /u02/app/oracle/oradata/dbnotde/DBNOTDE/datafile/
o1 mf tbs01 lnlgn65j .dbf
Job "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully completed at Mon
Nov 6 12:47:19 2023 elapsed 0 00:00:14
```

4. Move data files to the destination database server and edit the status of the data file in the source database DBNOTDE to READ WRITE. Move the data file to the TDE-enabled database server in the PDB2 data files location.

```
###
### login as oracle user
###

$ cp /u02/app/oracle/oradata/dbnotde/DBNOTDE/datafile/
o1_mf_tbs01_lnlgn65j_.dbf /u02/app/oracle/oradata/cdbtde/CDBTDE/
092546916A493FE5E063E730850AF5BE/datafile/

###
### In source database, set the tablespace back to read write mode
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> ALTER TABLESPACE TBS01 READ WRITE;
```

#### Step 2: Import the tablespaces into a TDE-enabled database

 Create a TDE-enabled database with Oracle Key Vault, CDBTDE as the destination database. Copy the data file and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

```
# odacli create-database -n okvdb2 -t -kt okv -osc adminobj1 -dh
e2a65596-6435-4410-9e8d-6b21a6005779 -r ACFS --cdb -d pdbadmin -p pdb2
# odacli describe-database -n cdbtde
Database details
 _____
                   ID: c1ba7c6a-2808-4a20-bf23-e35cb62c3fd0
           Description: cdbtde
              DB Name: cdbtde
               DB Type: SI
                  CDB: true
              PDB Name: PDB2
   PDB Admin User Name: pdbadmin
               Storage: ACFS
              Home ID: e2a65596-6435-4410-9e8d-6b21a6005779
 TDE Wallet Management: ODA
           TDE Enabled: true
         KeystoreType : OKV
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
### Take a note of PDB2 GUID which helps to determine the path of PDB2
datafiles
###
SQL> col PDB NAME for a20
```

2. Create thsnames service for PDB2.

3. Create directory in PDB2 for the import.

```
###
### login as oracle user
###

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'
###
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> ALTER SESSION SET CONTAINER=PDB2;
SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir';
Directory created.
SQL>
```

4. Import the TBS01 tablespace to the destination database PDB2 container on CDBTDE. Copy the <code>expdp</code> dump file of the source database to the database directory <code>ttsps\_dir</code>. The <code>impdp</code> uses the dump file to add tablespace metadata to destination database. TRANSPORT\_DATAFILES references the location of the data file in the destination database.

```
\mbox{\#\#\#} Run impdb as SYSTEM user, password for SYSTEM need to be entered when prompted
```

```
###
```

```
$ impdp system@pdb2 TRANSPORT DATAFILES=\'/u02/app/oracle/oradata/cdbtde/
CDBTDE/092546916A493FE5E063E730850AF5BE/datafile/
o1 mf tbs01 lnlgn65j .dbf\' DIRECTORY=ttsps dir dumpfile=exp1.dmp
Import: Release 19.0.0.0.0 - Production on Thu Nov 9 21:42:25 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Master table "SYSTEM". "SYS IMPORT TRANSPORTABLE 01" successfully loaded/
unloaded
Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/******@pdb2
TRANSPORT DATAFILES='/u02/app/oracle/oradata/cdbtde/CDBTDE/
092546916A493FE5E063E730850AF5BE/datafile/o1_mf_tbs01_lnlgn65j_.dbf'
DIRECTORY=ttsps dir dumpfile=expl.dmp
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/STATISTICS/MARKER
Processing object type TRANSPORTABLE EXPORT/POST_INSTANCE/PLUGTS_BLK
Job "SYSTEM". "SYS IMPORT TRANSPORTABLE 01" successfully completed at Thu
Nov 9 21:42:52 2023 elapsed 0 00:00:19
```

#### Enable and test encryption on the destination Oracle Key Vault-enabled database PDB1.

```
### login as oracle user
\#\#\# Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> alter session set container=pdb2;
Session altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                       STATUS ENC
SYSTEM
                    ONLINE NO
SYSAUX
                    ONLINE NO
UNDOTBS1
                    ONLINE NO
TEMP
                    ONLINE NO
USERS
                   ONLINE NO
TBS01
                    READ ONLY NO
SQL> alter tablespace TBS01 read write;
```

Tablespace altered.

```
### encrypt TBS01. In case encrypt operation is interrupted , run 'alter
tablespace TBS01 encryption online finish encrypt;'
SQL> alter tablespace TBS01 encryption online encrypt;
Tablespace altered.
SQL> select TABLESPACE_NAME, STATUS , ENCRYPTED from dba_tablespaces ;
TABLESPACE NAME
                   STATUS ENC
SYSTEM
                   ONLINE
                            NO
SYSAUX
                   ONLINE
                            NO
UNDOTBS1
                   ONLINE NO
TEMP
                   ONLINE
                            NO
USERS
                    ONLINE
                            NO
TBS01
                    ONLINE YES
SQL> select FILE NAME from dba data files where TABLESPACE NAME='TBS01';
FILE NAME
         ______
/u02/app/oracle/oradata/cdbtde/CDBTDE/092546916A493FE5E063E730850AF5BE/
datafile/
o1 mf tbs01 lnx8h50f .dbf
### Retrieve the data from TAB1
###
SQL> select OWNER, table name from tab1 where rownum < 3
OWNER
TABLE NAME
______
SYS
TS$
SYS
ICOL$
### When the wallet is closed or unavailable, same SQL does not retrieve
### To simulate wallet absence rename the cwallet.sso wallet under
<wallet root>/tde to some other name like cwallet.sso.orig
\#\#\# and close the wallet. To return auto-login wallet , rename file back
to cwallet.sso and run the SQL again.
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.

# Migrating Tablespaces from Non-TDE Oracle ASM Database to Oracle ASM CDB Database on Oracle Database Appliance

Understand how you can migrate tablespaces from non-TDE Oracle ASM database to Oracle ASM CDB database with Oracle Key Vault enabled on Oracle Database Appliance.

Ensure that there is a source and destination database. The two databases can be on one Oracle Database Appliance server or on different servers. The source database must be an non TDE-enabled database, either an Oracle Database Appliance database or any Oracle database with compatible Endian. The destination database must be an Oracle Database Appliance database created with ODACLI commands and with Oracle Key Vault enabled on it.

#### Step 1: Export the tablespace from the source database

 Ensure that the source database has a tablespace TBS01 to be migrated to the destination database. Find the information about the tablespace.

```
SQL> SQL> select TABLESPACE_NAME, ENCRYPTED from dba_tablespaces;

TABLESPACE_NAME STATUS ENC

SYSTEM ONLINE NO
SYSAUX ONLINE NO
UNDOTES1 ONLINE NO
TEMP ONLINE NO
USERS ONLINE NO
USERS ONLINE NO
SQL> select FILE_NAME from dba_data_files where TABLESPACE_NAME='TBS01';

FILE_NAME

----
+DATA/ASMNOTDE/DATAFILE/tbs01.374.1152267015

###

### Checks if a set of tablespaces (to be transported) is self-contained
###

SQL> EXECUTE DBMS_TTS.TRANSPORT_SET_CHECK('tbs01',true);

PL/SQL procedure successfully completed.
```



2. Create the database directory in the source database ASMNOTDE to use for the export. Create a database directory object in the destination database for expdp.

```
###
### login as oracle user
###

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'

###
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir';

Directory created.
```

3. Export the TBS01 tablespace from the souce database ASMNOTDE. First, set the tablespace to be copied in READ ONLY mode. Next, run expdp on the designated tablespace. Review the dump files for expdp stored under the database directory ttsps dir.

```
###
### Set the tablespaces that you need to be exported in read-only mode
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
SQL> ALTER TABLESPACE TBS01 READ ONLY;
Tablespace altered.
SQL>
### Run expdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ expdp system TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES
DIRECTORY=ttsps dir DUMPFILE=expttpsasm.dmp
Export: Release 19.0.0.0.0 - Production on Tue Nov 7 10:12:19 2023
Version 19.25.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
```

```
Starting "SYSTEM"."SYS EXPORT TRANSPORTABLE 01": system/******
TRANSPORT TABLESPACES=TBS01 TRANSPORT FULL CHECK=YES DIRECTORY=ttsps dir
DUMPFILE=expttpsasm.dmp
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Master table "SYSTEM"."SYS EXPORT TRANSPORTABLE 01" successfully loaded/
unloaded
******************
Dump file set for SYSTEM.SYS EXPORT TRANSPORTABLE 01 is:
  /u01/app/odaorabase0/oracle/dpdump/ttsps dir/expttpsasm.dmp
***********************
Datafiles required for transportable tablespace TBS01:
 +DATA/ASMNOTDE/DATAFILE/tbs01.374.1152267015
Job "SYSTEM". "SYS EXPORT TRANSPORTABLE 01" successfully completed at Tue
Nov 7 10:12:49 2023 elapsed 0 00:00:20
```

Move data files to the destination database server and edit the status of the data file in the source database ASMNOTDE to READ WRITE.

```
###
### login to grid user
### Copying datafiles from ASM to filesystem
###
$ asmcmd cp +DATA/ASMNOTDE/DATAFILE/tbs01.374.1152267015 /home/grid/
tbs01.dbf
copying +DATA/ASMNOTDE/DATAFILE/tbs01.374.1152267015 -> /home/grid/
tbs01.dbf

###
### In source database, set the tablespace back to read write mode
### login as Oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###
SQL> ALTER TABLESPACE TBS01 READ WRITE;
```

#### Step 2: Import the tablespaces into a TDE-enabled database

 Create a TDE-enabled database with Oracle Key Vault, ASMTDE as the destination database. Copy the data file and tablespace of the source database to this database using expdp and impdp. Create the database on an Oracle Database Appliance using the Browser User Interface (BUI) or ODACLI commands. For example:

```
# odacli create-database -n asmtde -t -kt okv -osc adminobj1 -dh
e2a65596-6435-4410-9e8d-6b21a6005779 -r ASM --cdb -d pdbadmin -p pdb1
# odacli describe-database -n asmtde
Database details
```

```
ID: 5dfa97d9-d774-4a4a-93a2-d21a36faf283
           Description: asmtde
              DB Name: asmtde
              DB Type: SI
                  CDB: true
             PDB Name: PDB1
   PDB Admin User Name: pdbadmin
              Storage: ASM
              Home ID: e2a65596-6435-4410-9e8d-6b21a6005779
 TDE Wallet Management: ODA
           TDE Enabled: true
         KeystoreType : OKV
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> col PDB NAME for a20
SQL> select PDB NAME, GUID from dba pdbs ;
PDB NAME
              GUID
-----
PDB1
              1599A96E256A8B99E063BE6B1F0AC02B
PDB$SEED
              15998A6665985353E063BE6B1F0A494A
```

2. Copy the data file from file system to the destination Oracle ASM location of ASMTDE. Ensure that you set the relevant permissions after copying the file.

```
###
### login to grid user
###
$ asmcmd cp /home/grid/tbs01.dbf +DATA/ASMTDE/
1599A96E256A8B99E063BE6B1F0AC02B/DATAFILE/tbs01 --dest dbname ASMTDE
copying /home/grid/tbs01.dbf -> +DATA/ASMTDE/
1599A96E256A8B99E063BE6B1F0AC02B/DATAFILE/tbs01
$ asmcmd
ASMCMD> pwd
+DATA/ASMTDE/1599A96E256A8B99E063BE6B1F0AC02B/DATAFILE
ASMCMD> ls --permission
                                       Group Permission Name
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
SYSAUX.332.1165769683
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                              rw-----
SYSTEM.333.1165769683
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                               rw-----
UNDOTBS1.331.1165769683
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                               rw-----
USERS.335.1165769685
```

```
grid@00eea686ffb0ff1bbf28c0b8362cccf6
                                              rw----- tbs01 => +DATA/
ASMTDE/DATAFILE/tbs01.338.1165770781
ASMCMD> chown dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6 tbs01
ASMCMD>
ASMCMD> ls --permission
                                        Group Permission Name
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                               rw-----
SYSAUX.332.1165769683
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                               rw-----
SYSTEM.333.1165769683
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                               rw-----
UNDOTBS1.331.1165769683
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
USERS.335.1165769685
dbusr1@00eea686ffb0ff1bbf28c0b8362cccf6
                                               rw----- tbs01 => +DATA/
ASMTDE/DATAFILE/tbs01.338.1165770781
```

#### Create the there is a contract of the 
#### 4. Create the directory in PDB1 for the import.

```
###
### login as oracle user
###

$ mkdir -pv /u01/app/odaorabase0/oracle/dpdump/ttsps_dir
mkdir: created directory '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir'

###
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as sysdba ) and run the following
###

SQL> ALTER SESSION SET CONTAINER=PDB1;
SQL> CREATE DIRECTORY ttsps_dir AS '/u01/app/odaorabase0/oracle/dpdump/ttsps_dir';
Directory created.
```

SQL>

5. Import the tablespace to PDB1. Copy the <code>expdp</code> dump file of the source database to the database directory <code>ttsps\_dir</code>. The <code>impdp</code> uses the dump file to add tablespace metadata to destination database. TRANSPORT\_DATAFILES references the location of the data file in the destination database.

```
###
\#\#\# Run impdb as SYSTEM user, password for SYSTEM need to be entered when
prompted
###
$ impdp system@asmtde pdb1 TRANSPORT DATAFILES=\'+DATA/ASMTDE/
1599A96E256A8B99E063BE6B1F0AC02B/DATAFILE/tbs01\' DIRECTORY=ttsps dir
dumpfile=expttpsasm.dmp
Import: Release 19.0.0.0.0 - Production on Mon Apr 8 17:52:09 2024
Version 19.23.0.0.0
Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights
reserved.
Password:
Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Master table "SYSTEM"."SYS IMPORT TRANSPORTABLE 01" successfully loaded/
Starting "SYSTEM"."SYS IMPORT TRANSPORTABLE 01": system/******@pdb1
TRANSPORT DATAFILES='+DATA/ASMTDE/1599A96E256A8B99E063BE6B1F0AC02B/
DATAFILE/tbs01' DIRECTORY=ttsps dir dumpfile=expttpsasm.dmp
Processing object type TRANSPORTABLE EXPORT/PLUGTS BLK
Processing object type TRANSPORTABLE EXPORT/TABLE
Processing object type TRANSPORTABLE EXPORT/STATISTICS/TABLE STATISTICS
Processing object type TRANSPORTABLE EXPORT/POST INSTANCE/PLUGTS BLK
Job "SYSTEM"."SYS IMPORT TRANSPORTABLE 01" successfully completed at Mon
Apr 8 17:52:18 2024 elapsed 0 00:00:03
```

6. Enable and test encryption on the destination Oracle Key Vault-enabled database PDB1.

```
###
### login as oracle user
### Connect to database using SQLPLUS as sysdba user ( sqlplus / as
sysdba ) and run the following
###
SQL> alter session set container=pdb1;
Session altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
                      STATUS
TABLESPACE NAME
                              ENC
----- ---
SYSTEM
                   ONLINE NO
SYSAUX
                   ONLINE NO
```



```
UNDOTBS1
                      ONLINE
                               NO
TEMP
                      ONLINE
USERS
                      ONLINE NO
                      READ ONLY NO
TBS01
6 rows selected.
SQL> alter tablespace TBS01 read write;
Tablespace altered.
### encrypt TBS01. In case encrypt operation is interrupted , run 'alter
tablespace TBS01 encryption online finish encrypt;'
     alter tablespace TBS01 encryption online encrypt;
Tablespace altered.
SQL> select TABLESPACE NAME, STATUS , ENCRYPTED from dba tablespaces ;
TABLESPACE NAME
                        STATUS ENC
SYSTEM
                     ONLINE NO
                     ONLINE NO
SYSAUX
UNDOTBS1
                     ONLINE NO
TEMP
                     ONLINE NO
USERS
                     ONLINE
                               NO
TBS01
                     ONLINE YES
6 rows selected.
###
### Retrieve the data from TAB1
SQL> select OWNER, table name from tab1 where rownum < 3
 2 ;
OWNER
TABLE NAME
SYS
TS$
SYS
ICOL$
### When the wallet is closed or unavailable, same SQL does not retrieve
data
### To simulate wallet absence rename the cwallet.sso wallet under
<wallet root>/tde to some other name like cwallet.sso.orig
```

#### **Related Topics**

odacli Multi-User Access Commands
 Use odacli commands to enable multi-user access for the appliance.



## **Managing Storage**

Understand the storage options and how to manage storage for your Oracle Database Appliance deployment.

- About Managing Storage
   Understand Oracle Database Appliance storage options.
- About Managing Oracle ASM Disks
   Understand the Oracle ASM disk management features that Oracle Database Appliance supports.
- Managing Storage on Single-Node Systems
   Understand the storage options for your Oracle Database Appliance X10-S and X10-L systems.
- Managing Storage on High-Availability Systems
   Understand the storage for your Oracle Database Appliance X10-HA system.

## **About Managing Storage**

Understand Oracle Database Appliance storage options.

Oracle Database Appliance uses raw storage to protect data in the following ways:

- Fast Recovery Area (FRA) backup. FRA is a storage area (directory on disk or Oracle ASM diskgroup) that contains redo logs, control file, archived logs, backup pieces and copies, and flashback logs.
- Mirroring. Double or triple mirroring provides protection against mechanical issues.

The amount of available storage is determined by the location of the FRA backup (external or internal) and if double or triple mirroring is used. External NFS storage is supported for online backups, data staging, or additional database files.

Oracle Database Appliance X10-L and X10-HA models provide storage expansion options from the base configuration. In addition, on Oracle Database Appliance X10-HA multi-node platforms, you can add an optional storage expansion shelf.

The redundancy level for FLASH is based on the DATA and RECO selection. If you choose High redundancy (triple mirroring), then FLASH is also High redundancy.

## **About Managing Oracle ASM Disks**

Understand the Oracle ASM disk management features that Oracle Database Appliance supports.

Oracle Database Appliance enables you to manage your Oracle ASM disks.

#### **Bringing Oracle ASM Disk Groups Online Automatically**

Oracle Database Appliance periodically checks the status of Oracle ASM disks in disk groups. If any Oracle ASM disk is OFFLINE due to transient disk errors, then Oracle Database Appliance attempts to bring the disk ONLINE.

#### **Optimizing Oracle ASM Disk Group Rebalance Operations**

Oracle Database Appliance ensures rebalancing of Oracle ASM disks to complete as quickly as possible, without overloading the system and the disks at the same time. This ensures that the system is in a steady state running with the appropriate redundancy. There are default thresholds for the values for rebalancing operations, and you can also set the custom threshold values. For example:

```
odacli modify-agentconfig-parameters -n ASMRM_CPU_RQ -v 50 -d "CPU RUN QUEUE THRESHOLD" -u odacli modify-agentconfig-parameters -n ASMRM_MAX_HDD_DISK_RQ -v 2 -d "HDD DISK QUEUE THRESHOLD" -u odacli modify-agentconfig-parameters -n ASMRM_MAX_SSD_DISK_RQ -v 32 -d "SSD DISK QUEUE THRESHOLD" -u odacli modify-agentconfig-parameters -n ASMRM_MAX_NVME_DISK_RQ -v 50 -d "NVME DISK QUEUE THRESHOLD" -u
```

The above command options set custom threshold limits for rebalance monitoring of Oracle ASM disks.

You can monitor rebalance operations using the odacli describe-schedule -i *Schedule ID* and odacli list-scheduled-executions commands.

## Managing Storage on Single-Node Systems

Understand the storage options for your Oracle Database Appliance X10-S and X10-L systems.

- About Storage on Oracle Database Appliance X10-S and X10-L
   Understand the storage for your Oracle Database Appliance single-node system.
- Adding Small Form Factor (SFF) NVMe Storage Disks
   Depending on the available drives, you can expand Oracle Database Appliance X10-L storage to add Small Form Factor (SFF) NVMe disks or replace existing NVMe disks.
- Adding Add-in-Card (AIC) NVMe Storage Disks
   You can expand Oracle Database Appliance X10-L storage with two or four Add-in-Card (AIC) NVMe disks. Oracle Database Appliance X10-L supports a maximum of four AICs.
- Replacing Small Form Factor (SFF) NVMe Storage Disks
   Understand how you can replace existing SFF NVMe disks on Oracle Database Appliance.

## About Storage on Oracle Database Appliance X10-S and X10-L

Understand the storage for your Oracle Database Appliance single-node system.

Oracle Database Appliance X10-S has two 6.8TB NVMe disks that host DATA and RECO disk groups. There are ten partitions that you can divide between DATA and RECO for Oracle ASM storage information. By default, DATA has an eight partition configuration and RECO has a two partition configuration. The storage capacity is fixed and cannot be expanded.

Oracle Database Appliance X10-L has two form factor-based NVMe disks namely Small Form Factor (SFF) and AIC (Add-in-Card). Both form factor NVMe disks are of 6.8TB storage capacity. SFF is a single disk of 6.8TB capacity whereas AIC has two NVMe disks each of 3.4TB capacity, with a combined storage capacity of 6.8TB. The default configuration for

Oracle Database Appliance X10-L is two 6.8TB NVMe disks that host DATA and RECO disk groups.

When you first deploy and configure X10-L in this release, you can set the storage on X10-L in multiple of 2 packs of NVMe and AIC drives, such as 2, 4, and 6 disks, up to a maximum of 8 disks.

Oracle Database Appliance X10-L supports four SFF NVMe disks and four AIC NVMe disks. You must populate all four SFF NVMe disks before you add AIC NVMe disks to the system.

The table describes the NVMe storage configurations with expansion memory and storage options for single-node systems.

Table 11-1 Storage Options for Oracle Database Appliance X10-S and X10-L

Configuration	Oracle Database Appliance X10-S	Oracle Database Appliance X10-L
Base Configuration	2 x 6.8 TB NVMe = 13.6 TB NVMe	2 x 6.8 TB NVMe = 13.6 TB NVMe
Storage addition options	None	6x6.8TB NVMe storage drives for total storage of 54.4TB NVMe.
		You must populate all four SFF NVMe disks before you add AIC NVMe disks to the system.
		For the additional two SFF NVMe, order the following:
		Qty:1 - 7606150 (Two 6.8TB 2.5- inch NVMe PCIe SFF SSD with marlin bracket for Oracle Database Appliance X10-L)
		For the additional four NVMe AIC SSDs (these are PCIe NVMe Flash Cards that require cover removal to install), order the following:
		Qty:1 for two, Qty:2 for four:
		Qty:1 - 7605325 (Two 6.8 TB NVMe PCIe Cards for Oracle Database Appliance X10-L)

### Adding Small Form Factor (SFF) NVMe Storage Disks

Depending on the available drives, you can expand Oracle Database Appliance X10-L storage to add Small Form Factor (SFF) NVMe disks or replace existing NVMe disks.

Use the ODAADMCLI commands to perform appliance storage maintenance tasks, including perform storage diagnostics and collect diagnostic logs for storage components.

#### Preparing for a Storage Upgrade

Review and perform these best practices before adding storage.

- Check the disk health of the existing storage disks.
  - # odaadmcli show disk



- 2. Run the the odaadmcli show disk and asmcmd lsdsk -p commands to view and review the storage disk information in OAKD and Oracle Automatic Storage Management (Oracle ASM).
  - # odaadmcli show disk
  - # asmcmd lsdsk -p
- 3. Use ORAchk to confirm Oracle ASM and Oracle Clusterware health.

#### Adding Small Form Factor (SFF) NVMe Storage Disks

The default configuration for Oracle Database Appliance X10-S or X10-L includes two NVMe disks. You cannot expand storage for Oracle Database Appliance X10-S.

For Oracle Database Appliance X10-L, you can expand storage by adding two SFF NVMe disks followed by two or four Add-in-Cards (AIC).

Important:

You must populate all four SFF slots before adding AIC.

#### WARNING:

Pulling a drive before powering it off will crash the kernel, which can lead to data corruption. Do not pull the drive when the LED is an amber or green color. When you need to replace an NVMe drive, use the software to power off the drive before pulling the drive from the slot. If you have more than one disk to replace, complete the replacement of one disk before starting replacement of the next disk.

Follow all these steps to add SFF NVMe disks:

- Before adding the NVMe disks, ensure that the current disks are online in oakd and Oracle ASM. Otherwise, the prechecks fail. For example, for 2-disks expansion to slots 2 and 3, the disks in slots 0 and 1 must be online in Oracle ASM and oakd.
- 2. Insert each disk one at a time in the appropriate slot and wait for the disk to power ON.
- 3. The disk automatically powers on when you insert the disk in the slot. Wait for one minute and then check disk status. If the disk is in the ON state, then you need not power on the disk manually. If the disk state is OFF as per the disk status, and then power on the disk manually, and then check the status again.
  - # odaadmcli power disk status slot number
  - # odaadmcli power disk on slot number



For example, to add two (2) NVMe disks, insert the disks in slots 2 and 3.

```
# odaadmcli power disk status pd_02
# odaadmcli power disk on pd_02
# odaadmcli power disk status pd_03
# odaadmcli power disk on pd 03
```

- 4. Repeat steps 2 and 3 for each disk to be added.
- 5. Run the odaadmcli expand storage command to add the new storage disks. Note: You must run this step to add the storage disk. Otherwise, the newly-added disk is not visible to OAKD and hence does not display when you run the odaadmcli show disk or odaadmcli show storage commands. The newly-added disk is recognized by OAKD after the odaadmcli expand storage command completes running successfully.

```
# odaadmcli expand storage -ndisk number of disks
```

For example, to add two (2) NVMe drives:

```
#odaadmcli expand storage -ndisk 2
Running precheck, it may take a few minutes.
Precheck passed.
Check the progress of expansion of storage by executing 'odaadmcli show disk'
Waiting for expansion to finish. It may take several minutes to complete depending upon the number of disks being expanded
```

6. Check the status of the new disk in OAKD with the odaadmcli show disk command. The disk must have the status Online and Good in OAKD.

```
# odaadmcli show disk
NAME PATH TYPE STATE STATE_DETAILS

pd_00 /dev/nvme0n1 NVD ONLINE Good
pd_01 /dev/nvme1n1 NVD ONLINE Good
pd_02 /dev/nvme3n1 NVD ONLINE Good
pd_03 /dev/nvme14n2 NVD ONLINE Good
#
```

- 7. Verify that the disks in slots 2 and 3 are added to Oracle Automatic Storage Management (Oracle ASM) as follows. The new disk in Oracle ASM must be in CACHED MEMBER ONLINE NORMAL state.
  - a. Run asm\_script to verify that the disks in slots 2 and 3 are added to Oracle ASM. Verify that both disks are successfully added (CACHED and MEMBER). Following is example of default configuration of 80:20 where eight partitions (p1 to p8) are part of the DATA disk group and two partitions (p9 and p10) are part of the RECO disk group.

```
# su gridUser /opt/oracle/oak/bin/stordiag/asm_script.sh 0 6
# su grid /opt/oracle/oak/bin/stordiag/asm_script.sh 0 6

Tue Nov 28 02:46:20 PST 2023

SQL*Plus: Release 19.0.0.0.0 - Production on Tue Nov 28 02:46:20 2023
```

Version 19.21.0.0.0

Copyright (c) 1982, 2022, Oracle. All rights reserved.

#### Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production Version 19.21.0.0.0

SQL> SQL> SQL> SQL>

PATH

NAME GROUP\_NUMBER STATE MODE\_ST

MOUNT\_S HEADER\_STATU

\_\_\_\_\_

AFD:NVD S02 S6UENA0TC001P1			
NVD S02 S6UENA0TC001P1	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S02 S6UENA0TC001P10			
NVD S02 S6UENAOTC001P10	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S02_S6UENAOTC001P2			
NVD S02 S6UENA0TC001P2	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S02 S6UENAOTC001P3			
NVD S02 S6UENA0TC001P3	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S02 S6UENAOTC001P4			
NVD S02 S6UENAOTC001P4	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S02 S6UENAOTC001P5			
NVD S02 S6UENAOTC001P5	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S02 S6UENA0TC001P6			
NVD S02 S6UENAOTC001P6	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S02 S6UENA0TC001P7			
NVD S02 S6UENAOTC001P7	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S02_S6UENA0TC001P8			
NVD_S02_S6UENAOTC001P8	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S02_S6UENA0TC001P9			
NVD_S02_S6UENAOTC001P9	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S03_S6UENAOTC001P1			
NVD_S03_S6UENAOTC001P1	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S03_S6UENAOTC001P10			
NVD_S03_S6UENA0TC001P10	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S03_S6UENAOTC001P2			
NVD_S03_S6UENAOTC001P2	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S03_S6UENAOTC001P3			



```
1 NORMAL
NVD S03 S6UENA0TC001P3
                                                          ONLINE
CACHED MEMBER
AFD:NVD S03 S6UENA0TC001P4
NVD S03 S6UENA0TC001P4
                                               1 NORMAL
                                                          ONLINE
CACHED MEMBER
AFD:NVD S03 S6UENA0TC001P5
NVD S03 S6UENA0TC001P5
                                               1 NORMAL
                                                          ONLINE
CACHED MEMBER
AFD:NVD S03 S6UENA0TC001P6
NVD S03 S6UENA0TC001P6
                                               1 NORMAL
                                                          ONLINE
CACHED MEMBER
AFD:NVD S03 S6UENA0TC001P7
NVD S03 S6UENA0TC001P7
                                               1 NORMAL
                                                          ONLINE
CACHED MEMBER
AFD:NVD S03 S6UENA0TC001P8
NVD S03 S6UENA0TC001P8
                                               1 NORMAL
                                                          ONLINE
CACHED MEMBER
AFD:NVD S03 S6UENA0TC001P9
NVD S03 S6UENA0TC001P9
                                               2 NORMAL
                                                          ONLINE
CACHED MEMBER
SQL> Disconnected from Oracle Database 19c Enterprise Edition Release
19.0.0.0.0 - Production
Version 19.21.0.0.0
```

b. Use the odaadmcli show validation storage errors command to view hard storage errors. Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

```
# odaadmcli show validation storage errors
```

[root@node1 ~]#

- c. Use the odaadmcli show validation storage failures command to view soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.
  - # odaadmcli show validation storage failures
- d. Confirm that the <code>oak\_storage\_conf.xml</code> file shows the number of disks added. For example, if you added 2 disks to the base configuration, then the <code>oak storage conf.xml</code> file must show <code>numberOfDisks</code> as 4.



## Adding Add-in-Card (AIC) NVMe Storage Disks

You can expand Oracle Database Appliance X10-L storage with two or four Add-in-Card (AIC) NVMe disks. Oracle Database Appliance X10-L supports a maximum of four AICs.

Use the ODAADMCLI commands to perform appliance storage maintenance tasks, including perform storage diagnostics and collect diagnostic logs for storage components.

#### **Preparing for a Storage Upgrade**

Review and perform these best practices before adding storage.

Update Oracle Database Appliance to the latest Patch Bundle before expanding storage.

```
# odacli describe-component
```

2. Check the disk health of the existing storage disks.

```
# odaadmcli show disk
```

- 3. Run the odaadmcli show diskgroup command to display and review Oracle Automatic Storage Management (Oracle ASM) disk group information.
- Use the asmcmd command to verify that all the disks for the four SFF slots are part of Oracle ASM.
- 5. Use Oracle ORAchk to confirm Oracle ASM and Oracle Clusterware health.

#### Adding Add-in-Cards (AIC) NVMe Storage Disks

For Oracle Database Appliance X10-L, you can expand storage by adding two SFF NVMe disks followed by two or four Add-in-Cards (AIC). You can expand storage by first adding 2 AIC NVMe disks or 4 AIC, up to a maximum of 4 AIC disks. When you expand storage, adding odd numbers of AIC drives is **not** supported.



You must populate all four SFF slots before adding AIC.

#### **WARNING:**

Pulling a drive before powering it off will crash the kernel, which can lead to data corruption. Do not pull the drive when the LED is an amber or green color. When you need to replace an NVMe drive, use the software to power off the drive before pulling the drive from the slot. If you have more than one disk to replace, complete the replacement of one disk before starting replacement of the next disk.

#### See Also:

Chapter Installing Oracle Database Appliance Into a Rack in the Oracle Database Appliance X10 Owner's Guide in the Oracle Database Appliance Documentation Library for this release for requirements before adding any optional PCIe add-in card storage

Note that you must install the AIC NVMe disks in the correct slots as described in the *Oracle Database Appliance X10 Owner's Guide* and complete all configuration steps to add the AIC NVMe disks. Following are PCI slot for AIC:

- x16-PCle slot 2:NVMe AIC (first)
- x8-PCle slot 3: NVMe AIC (second)
- x8-PCle slot 9: NVMe AIC (third)
- x16-PCle slot 1: NVMe AIC (fourth)

Follow these steps to add AIC NVMe disks:

 On successful installation of AIC, the system restarts. Check that Oracle Clusterware is up and running.

```
crsctl check crs

CRS-4638: Oracle High Availability Services is online

CRS-4537: Cluster Ready Services is online

CRS-4529: Cluster Synchronization Services is online

CRS-4533: Event Manager is online
```

2. Verify that the oakd process is running.

```
# odaadmcli show disk
```

If the oakd process is not running, then start it:

```
# odaadmcli start oak
```

3. Run the odaadmcli show disk command to check that oakd has discovered all AIC NVMe disks. For 2 AIC disks, there are four (4) NVMe disks of 3.4TB, and for four AIC disks, there are eight (8) 3.4TB NVME disks.
For two AIC:

```
# odaadmcli show storage
```

==== BEGIN STORAGE DUMP =======

Host Description: Oracle Corporation:ORACLE SERVER E5-2L Total number of controllers: 8

Id = 0Pci Slot = 100

Serial Num = S6UENA0TC00191

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3

FwVers = MPPA6R5Q strId = nvme:62:00.00

Pci Address = 62:00.0

Id = 1Pci Slot = 101

Serial Num = S6UENA0TC00163

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3

FwVers = MPPA6R5Q
strId = nvme:63:00.00
Pci Address = 63:00.0

Id = 3Pci Slot = 103

Serial Num = S6UENA0TC00186

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3

FwVers = MPPA6R5Q
strId = nvme:64:00.00
Pci Address = 64:00.0

Id = 2 Pci Slot = 102

Serial Num = S6UENAOTC00198

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3

FwVers = MPPA6R5Q strId = nvme:65:00.00

Pci Address = 65:00.0

Id = 4 Pci Slot = 2

Serial Num = PHAZ2233000R6P4AGN-1

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310 strId = nvme:c1:00.00

Pci Address = c1:00.0

Id = 5Pci Slot = 22

Serial Num = PHAZ2233000R6P4AGN-2

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310 strId = nvme:c2:00.00 Pci Address = c2:00.0

```
= 7
       Id
       Pci Slot = 3
       Serial Num = PHAZ2333000R6P4AGN-1
       Vendor
                   = Intel
       Model
                   = INTEL SSDPFCKE064T1S
       FwVers
                  = 9CV1R310
                  = nvme:e2:00.00
       strId
       Pci Address = e2:00.0
                 = 6
       Ιd
                = 23
       Pci Slot
       Serial Num = PHAZ2333000R6P4AGN-2
       Vendor
                 = Intel
                  = INTEL SSDPFCKE064T1S
       Model
       FwVers
                   = 9CV1R310
       strId
                   = nvme:e3:00.00
       Pci Address = e3:00.0
Total number of expanders: 0
Total number of PDs: 8
       /dev/nvme0n1
                       Samsung
                                        NVD 6801gb slot: 0 pci-addr:
62 SAMSUNG MZWLR7T6HBLA-00AU3
                                    SFF
                                        NVD 6801gb slot: 1 pci-addr:
       /dev/nvme1n1 Samsung
63 SAMSUNG MZWLR7T6HBLA-00AU3
                                    SFF
                                        NVD 6801gb slot: 2 pci-addr:
       /dev/nvme2n1
                       Samsung
65 SAMSUNG MZWLR7T6HBLA-00AU3
                                    SFF
       /dev/nvme3n1
                       Samsung
                                        NVD
                                             6801qb slot: 3 pci-addr:
64 SAMSUNG MZWLR7T6HBLA-00AU3
                                    SFF
       /dev/nvme4n1
                                        NVD
                                             3400gb slot: 4 pci-addr:
                      Intel
  INTEL SSDPFCKE064T1S
                                    AIC
                                             3400gb slot: 5 pci-addr:
       /dev/nvme5n1
                     Intel
                                        NVD
   INTEL SSDPFCKE064T1S
                                    AIC
       /dev/nvme9n1
                                            3400gb slot: 6 pci-addr:
                                        NVD
                       Intel
   INTEL SSDPFCKE064T1S
                                   AIC
       /dev/nvme8n1
                                        NVD 3400gb slot: 7 pci-addr:
                    Intel
e3 INTEL SSDPFCKE064T1S
                                   AIC
==== END STORAGE DUMP =======
# odaadmcli show disk
                                                      STATE
       NAME
                       PATH
                                       TYPE
STATE DETAILS
       pd 00
                       /dev/nvme0n1
                                      NVD
                                                      ONLINE
Good
       pd 01
                       /dev/nvme1n1
                                      NVD
                                                      ONLINE
Good
       pd_02
                       /dev/nvme2n1
                                      NVD
                                                      ONLINE
Good
       pd 03
                       /dev/nvme3n1
                                      NVD
                                                      ONLINE
Good
       pd 04 c1
                       /dev/nvme5n1
                                      NVD
                                                      UNKNOWN
NewDiskInserted
       pd 04 c2
                       /dev/nvme4n1
                                      NVD
                                                      UNKNOWN
NewDiskInserted
       pd 05 c1
                       /dev/nvme9n1
                                                      UNKNOWN
                                      NVD
```

NewDiskInserted

pd 05 c2 /dev/nvme8n1 NVD UNKNOWN

NewDiskInserted

#### For four AIC:

# odaadmcli show storage

==== BEGIN STORAGE DUMP ======

Host Description: Oracle Corporation: ORACLE SERVER E5-2L

Total number of controllers: 12

= 2 Ιd Pci Slot = 9

Serial Num = PHAZ2233001M6P4AGN-1

= Intel Vendor

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310 strId = nvme:41:00.00

Pci Address = 41:00.0

= 1 Id Pci Slot = 29

Serial Num = PHAZ2233001M6P4AGN-2

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310 = nvme:42:00.00 strId

Pci Address = 42:00.0

= 0Id Pci Slot = 100

Serial Num = S6UENA0TC00191

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3 FwVers = MPPA6R5Q strId = nvme:62:00.00

Pci Address = 62:00.0

= 5 Id Pci Slot = 101

Serial Num = S6UENA0TC00163

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3

FwVers = MPPA6R5Q = nvme:63:00.00strId

Pci Address = 63:00.0

= 7 Ιd Pci Slot = 103

Serial Num = S6UENAOTC00186

Vendor = Samsung

= SAMSUNG MZWLR7T6HBLA-00AU3 Model

FwVers = MPPA6R5Q = nvme:64:00.00strId Pci Address = 64:00.0

Id = 6Pci Slot = 102

Serial Num = S6UENA0TC00198

Vendor = Samsung

Model = SAMSUNG MZWLR7T6HBLA-00AU3

FwVers = MPPAGR5Q
strId = nvme:65:00.00
Pci Address = 65:00.0

Id = 3Pci Slot = 1

Serial Num = PHAZ2233001N6P4AGN-1

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310
strId = nvme:a1:00.00
Pci Address = a1:00.0

Id = 4Pci Slot = 21

Serial Num = PHAZ2233001N6P4AGN-2

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310
strId = nvme:a2:00.00
Pci Address = a2:00.0

Id = 8 Pci Slot = 2

Serial Num = PHAZ2233000R6P4AGN-1

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310
strId = nvme:c1:00.00
Pci Address = c1:00.0

Id = 9Pci Slot = 22

Serial Num = PHAZ2233000R6P4AGN-2

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310 strId = nvme:c2:00.00

Pci Address = c2:00.0

Id = 11Pci Slot = 3

Serial Num = PHAZ2333000R6P4AGN-1

Vendor = Intel

Model = INTEL SSDPFCKE064T1S

FwVers = 9CV1R310 strId = nvme:e2:00.00

Pci Address = e2:00.0

Id = 10Pci Slot = 23

```
Model
                    = INTEL SSDPFCKE064T1S
                    = 9CV1R310
        FwVers
        strId
                    = nvme:e3:00.00
        Pci Address = e3:00.0
Total number of expanders: 0
Total number of PDs: 12
        /dev/nvme0n1
                                           NVD 6801gb slot: 0 pci-addr:
                        Samsung
    SAMSUNG MZWLR7T6HBLA-00AU3
                                      SFF
        /dev/nvme1n1
                        Samsung
                                           NVD
                                                6801gb slot: 1 pci-addr:
    SAMSUNG MZWLR7T6HBLA-00AU3
                                      SFF
                                                6801gb slot: 2 pci-addr:
        /dev/nvme2n1
                        Samsung
                                           NVD
    SAMSUNG MZWLR7T6HBLA-00AU3
                                      SFF
        /dev/nvme3n1
                                                6801gb slot: 3 pci-addr:
                        Samsung
                                           NVD
    SAMSUNG MZWLR7T6HBLA-00AU3
                                      SFF
        /dev/nvme4n1
                        Intel
                                           NVD
                                                3400gb slot: 4 pci-addr:
    INTEL SSDPFCKE064T1S
                                      AIC
        /dev/nvme5n1
                        Intel
                                           NVD
                                                3400gb slot: 5 pci-addr:
    INTEL SSDPFCKE064T1S
c2
                                     AIC
        /dev/nvme9n1
                        Intel
                                           NVD
                                                3400gb slot: 6 pci-addr:
   INTEL SSDPFCKE064T1S
                                     AIC
e2
        /dev/nvme8n1
                                                3400gb slot: 7 pci-addr:
                        Intel
                                           NVD
   INTEL SSDPFCKE064T1S
                                     AIC
e3
                                                3400gb slot: 8 pci-addr:
        /dev/nvme11n1
                        Intel
                                           NVD
   INTEL SSDPFCKE064T1S
41
                                      AIC
        /dev/nvme10n1
                        Intel
                                           NVD
                                                3400gb slot: 9 pci-addr:
    INTEL SSDPFCKE064T1S
42
                                      AIC
        /dev/nvme12n1
                                                3400gb slot: 10 pci-addr:
                        Intel
                                           NVD
    INTEL SSDPFCKE064T1S
                                      AIC
                                                3400gb slot: 11 pci-addr:
        /dev/nvme13n1
                        Intel
                                           NVD
   INTEL SSDPFCKE064T1S
                                     AIC
==== END STORAGE DUMP =======
# odaadmcli show disk
                                         TYPE
        NAME
                        PATH
                                                         STATE
STATE DETAILS
        pd 00
                        /dev/nvme0n1
                                         NVD
                                                         ONLINE
Good
        pd_01
                        /dev/nvme1n1
                                         NVD
                                                         ONLINE
Good
                        /dev/nvme2n1
        pd 02
                                         NVD
                                                         ONLINE
Good
        pd 03
                        /dev/nvme13n1
                                         NVD
                                                         ONLINE
Good
        pd 04 c1
                        /dev/nvme4n1
                                                         UNKNOWN
                                         NVD
NewDiskInserted
                        /dev/nvme3n1
        pd 04 c2
                                         NVD
                                                         UNKNOWN
NewDiskInserted
        pd 05 c1
                        /dev/nvme9n1
                                         NVD
                                                         UNKNOWN
NewDiskInserted
        pd 05 c2
                        /dev/nvme10n1
                                         NVD
                                                         UNKNOWN
NewDiskInserted
```

Serial Num = PHAZ2333000R6P4AGN-2

= Intel

Vendor

pd_06_c1	/dev/nvme5n1	NVD	UNKNOWN
NewDiskInserted			
pd_06_c2	/dev/nvme8n1	NVD	UNKNOWN
NewDiskInserted			
pd_07_c1	/dev/nvme12n1	NVD	UNKNOWN
NewDiskInserted			
pd_07_c2	/dev/nvme11n1	NVD	UNKNOWN
NewDiskInserted			

For example, to add two (2) AIC disks, you must specify ndisk values as 4 because AIC has two NVMe disks, so the total value of two AIC disks is four NVMe disks.

```
#odaadmcli expand storage -ndisk 4
Running precheck, it may take a few minutes.
Precheck passed.
Check the progress of expansion of storage by executing 'odaadmcli show disk'
Waiting for expansion to finish. It may take several minutes to complete depending upon the number of disks being expanded
```

4. Run the odaadmcli show disk command to ensure that all disks are listed, are online, and are in a good state.

```
# odaadmcli show disk

NAME PATH TYPE STATE STATE_DETAILS

pd_00 /dev/nvme0n1 NVD ONLINE Good
pd_01 /dev/nvme1n1 NVD ONLINE Good
pd_02 /dev/nvme3n1 NVD ONLINE Good
pd_03 /dev/nvme14n2 NVD ONLINE Good
pd_04_c1 /dev/nvme10n1 NVD ONLINE Good
pd_04_c2 /dev/nvme11n1 NVD ONLINE Good
pd_05_c1 /dev/nvme8n1 NVD ONLINE Good
pd_05_c2 /dev/nvme9n1 NVD ONLINE Good
```

- 5. Verify that the two AIC disks are added to Oracle Automatic Storage Management (Oracle ASM) as follows:
  - a. Run asm\_script to verify that the disks in slots 3 and 4 are added to Oracle ASM. Verify that both disks are successfully added (CACHED and MEMBER). Following is an example of default configuration of 80:20 where eight partitions (p1 to p8) are part of the DATA disk group and two partitions (p9 and p10) are part of the RECO diskgroup.

```
# su gridUser /opt/oracle/oak/bin/stordiag/asm_script.sh 0 6
# su grid /opt/oracle/oak/bin/stordiag/asm_script.sh 0 6

Tue Nov 28 02:46:20 PST 2023

SQL*Plus: Release 19.0.0.0.0 - Production on Tue Nov 28 02:46:20 2023
Version 19.21.0.0.0

Copyright (c) 1982, 2022, Oracle. All rights reserved.
```

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production Version 19.21.0.0.0

SQL> SQL> SQL> SQL> SQL> PATH NAME GROUP NUMBER STATE MODE ST MOUNT\_S HEADER\_STATU AFD:NVD\_S04 C1 PHAZ22330P1 NVD S04\_C1\_PHAZ22330P1 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C1 PHAZ22330P2 NVD S04 C1 PHAZ22330P2 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C1 PHAZ22330P3 NVD S04 C1 PHAZ22330P3 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C1 PHAZ22330P4 NVD\_S04\_C1 PHAZ22330P4 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C1 PHAZ22330P5 NVD S04 C1 PHAZ22330P5 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C2 PHAZ22330P10 NVD S04 C2 PHAZ22330P10 2 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C2 PHAZ22330P6 NVD S04 C2 PHAZ22330P6 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C2 PHAZ22330P7 NVD\_S04\_C2\_PHAZ22330P7 2 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C2 PHAZ22330P8 NVD S04 C2 PHAZ22330P8 2 NORMAL ONLINE CACHED MEMBER AFD:NVD S04 C2 PHAZ22330P9 NVD S04 C2 PHAZ22330P9 2 NORMAL ONLINE CACHED MEMBER AFD:NVD S05 C1 PHAZ23330P1 NVD S05 C1 PHAZ23330P1 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S05 C1 PHAZ23330P2 NVD S05 C1 PHAZ23330P2 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S05 C1 PHAZ23330P3 NVD S05 C1 PHAZ23330P3 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S05 C1 PHAZ23330P4 NVD S05 C1 PHAZ23330P4 1 NORMAL ONLINE CACHED MEMBER AFD:NVD S05 C1 PHAZ23330P5 NVD S05 C1 PHAZ23330P5 1 NORMAL ONLINE



```
CACHED MEMBER
AFD: NVD S05 C2 PHAZ23330P10
NVD S05 C2 PHAZ23330P10
                                              2 NORMAL
                                                         ONLINE
CACHED MEMBER
AFD:NVD S05 C2 PHAZ23330P6
NVD S05 C2 PHAZ23330P6
                                              1 NORMAL
                                                         ONLINE
CACHED MEMBER
AFD:NVD S05 C2 PHAZ23330P7
NVD S05 C2 PHAZ23330P7
                                              2 NORMAL
                                                         ONLINE
CACHED MEMBER
AFD:NVD S05 C2 PHAZ23330P8
NVD S05 C2 PHAZ23330P8
                                              2 NORMAL
                                                         ONLINE
CACHED MEMBER
AFD:NVD S05 C2 PHAZ23330P9
NVD S05 C2 PHAZ23330P9
                                              2 NORMAL
                                                         ONLINE
CACHED MEMBER
AFD:SSD QRMDSK P2
               O NORMAL ONLINE CLOSED FORMER
AFD:SSD QRMDSK P1
               O NORMAL ONLINE CLOSED FORMER
SQL> Disconnected from Oracle Database 19c Enterprise Edition Release
19.0.0.0.0 - Production
Version 19.21.0.0.0
```

b. Use the odaadmcli show validation storage errors command to view hard storage errors. Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

```
# odaadmcli show validation storage errors
```

- c. Use the odaadmcli show validation storage failures command to view soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.
  - # odaadmcli show validation storage failures
- d. Confirm that the <code>oak\_storage\_conf.xml</code> file shows the number of disks added. For example, if you added two AIC to four SFF, then the <code>oak\_storage\_conf.xml</code> file must show <code>numberOfDisks</code> as 8.

```
multiple partition scheme -->
        <!-- are derived from number of partitions per disk which are
part of ASM DATA diskgroup -->
        <numOfDataDiskPartitionInAsm>8</numOfDataDiskPartitionInAsm>
        </OakStorageConfigInfo>
        </CometConfiguration>
#
```

For example, to add four (4) AIC disks, you must specify ndisk values as 8 because AIC has two NVMe disks, so the total value of four AIC disks is eight NVMe disks.

```
#odaadmcli expand storage -ndisk 8
Running precheck, it may take a few minutes.
Precheck passed.
Check the progress of expansion of storage by executing 'odaadmcli show disk'
Waiting for expansion to finish. It may take several minutes to complete depending upon the number of disks being expanded
```

e. Run the odaadmcli show disk command to ensure that all disks are listed, are online, and are in a good state.

```
# odaadmcli show disk
pd_00 /dev/nvme0n1 NVD ONLINE Good
pd_01 /dev/nvme1n1 NVD ONLINE Good
pd_02 /dev/nvme2n1 NVD ONLINE Good
pd_03 /dev/nvme3n1 NVD ONLINE Good
pd_04_c1 /dev/nvme4n1 NVD ONLINE Good
pd_04_c2 /dev/nvme5n1 NVD ONLINE Good
pd_05_c1 /dev/nvme9n1 NVD ONLINE Good
pd_05_c2 /dev/nvme8n1 NVD ONLINE Good
pd_06_c2 /dev/nvme11n1 NVD ONLINE Good
pd_06_c2 /dev/nvme10n1 NVD ONLINE Good
pd_07_c1 /dev/nvme12n1 NVD ONLINE Good
pd_07_c2 /dev/nvme13n1 NVD ONLINE Good
```

- f. Verify that the disks are added to Oracle Automatic Storage Management (Oracle ASM) as follows:
  - i. Run asm\_script to verify that the AIC disks are added to Oracle ASM. Verify that both disks are successfully added (CACHED and MEMBER). Following is example of default configuration of 80:20 where eight partitions (p1 to p8) are part of the DATA disk group and two partitions (p9 and p10) are part of the RECO diskgroup.

```
# su gridUser /opt/oracle/oak/bin/stordiag/asm_script.sh 0 6
# su grid /opt/oracle/oak/bin/stordiag/asm_script.sh 0 6

Tue Nov 28 02:46:20 PST 2023

SQL*Plus: Release 19.0.0.0.0 - Production on Tue Nov 28 02:46:20
2023
Version 19.21.0.0.0

Copyright (c) 1982, 2022, Oracle. All rights reserved.
```



Connected to: Oracle Database 19c Enterprise Edition Release Production Version 19.21.0.0.0	19.0.0.0.0	-
SQL> SQL> SQL> SQL>		
AFD:NVD S04 C1 PHAZ22330P1		
NVD S04 C1 PHAZ22330P1	1 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD S04 C1 PHAZ22330P2		
NVD S04 C1 PHAZ22330P2	1 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C1_PHAZ22330P3		
NVD_S04_C1_PHAZ22330P3	1 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C1_PHAZ22330P4		
NVD_S04_C1_PHAZ22330P4	1 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C1_PHAZ22330P5		
NVD_S04_C1_PHAZ22330P5	1 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C2_PHAZ22330P10		
NVD_S04_C2_PHAZ22330P10	2 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C2_PHAZ22330P6		
NVD_S04_C2_PHAZ22330P6	2 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C2_PHAZ22330P7		
NVD_S04_C2_PHAZ22330P7	2 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C2_PHAZ22330P8		
NVD_S04_C2_PHAZ22330P8	2 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S04_C2_PHAZ22330P9	0 1705175	
NVD_S04_C2_PHAZ22330P9	2 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S05_C1_PHAZ23330P1	1 NODWAT	ONIT TAID
NVD_S05_C1_PHAZ23330P1	1 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD_S05_C1_PHAZ23330P2 NVD S05_C1_PHAZ23330P2	1 NORMAL	ONLINE
CACHED MEMBER	I NORMAL	ONTINE
AFD:NVD S05 C1 PHAZ23330P3		
NVD S05 C1 PHAZ23330P3	1 NORMAL	ONLINE
CACHED MEMBER	I NORMAL	ONTINE
AFD:NVD S05 C1 PHAZ23330P4		
NVD S05 C1 PHAZ23330P4	1 NORMAL	ONLINE
CACHED MEMBER	7 110141111	V1111111
AFD:NVD S05 C1 PHAZ23330P5		
NVD S05 C1 PHAZ23330P5	1 NORMAL	ONLINE
CACHED MEMBER	_ 1.0141111	2
AFD:NVD S05 C2 PHAZ23330P10		
NVD S05 C2 PHAZ23330P10	2 NORMAL	ONLINE
CACHED MEMBER		
AFD:NVD S05 C2 PHAZ23330P6		
— — — —		



NVD S05 C2 PHAZ23330P6	2	NORMAL	ONLINE
CACHED MEMBER	_	110141111	ONLINE
AFD:NVD S05 C2 PHAZ23330P7			
NVD_S05_C2_PHAZ23330P7	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S05 C2 PHAZ23330P8			
NVD_S05_C2_PHAZ23330P8	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S05 C2 PHAZ23330P9			
NVD S05 C2 PHAZ23330P9	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD S06 C1 PHAZ22330P1			
NVD S06 C1 PHAZ22330P1	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C1_PHAZ22330P2			
NVD_S06_C1_PHAZ22330P2	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C1_PHAZ22330P3			
NVD_S06_C1_PHAZ22330P3	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C1_PHAZ22330P4			
NVD_S06_C1_PHAZ22330P4	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C1_PHAZ22330P5			
NVD_S06_C1_PHAZ22330P5	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C2_PHAZ22330P10			
NVD_S06_C2_PHAZ22330P10	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C2_PHAZ22330P6			
NVD_S06_C2_PHAZ22330P6	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C2_PHAZ22330P7			
NVD_S06_C2_PHAZ22330P7	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C2_PHAZ22330P8			
NVD_S06_C2_PHAZ22330P8	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S06_C2_PHAZ22330P9			
NVD_S06_C2_PHAZ22330P9	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S07_C1_PHAZ22330P1			
NVD_S07_C1_PHAZ22330P1	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S07_C1_PHAZ22330P2			
NVD_S07_C1_PHAZ22330P2	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S07_C1_PHAZ22330P3	1	11001171	0111 1110
NVD_S07_C1_PHAZ22330P3	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD:NVD_S07_C1_PHAZ22330P4	1	NODAT	ONIT TATE
NVD_S07_C1_PHAZ22330P4	1	NORMAL	ONLINE
CACHED MEMBER			
AFD: NVD_S07_C1_PHAZ22330P5	4	MODMA	ONIT TATE
NVD_S07_C1_PHAZ22330P5	Τ	NORMAL	ONTINE
CACHED MEMBER			

AFD:NVD_S07_C2_PHAZ223 NVD_S07_C2_PHAZ22330P1 CACHED MEMBER				2 NORMAL	ONLINE
AFD:NVD_S07_C2_PHAZ223	30P6				
NVD_S07_C2_PHAZ22330P6	· )			2 NORMAL	ONLINE
CACHED MEMBER					
AFD:NVD_S07_C2_PHAZ223	30P7				
NVD_S07_C2_PHAZ22330P7				2 NORMAL	ONLINE
CACHED MEMBER					
AFD:NVD_S07_C2_PHAZ223	30P8				
NVD_S07_C2_PHAZ22330P8	}			2 NORMAL	ONLINE
CACHED MEMBER					
AFD:NVD_S07_C2_PHAZ223	30P9				
NVD_S07_C2_PHAZ22330P9	)			2 NORMAL	ONLINE
CACHED MEMBER					
AFD:SSD_QRMDSK_P2					
0	NORMAL	ONLINE	CLOSED	FORMER	
AFD:SSD_QRMDSK_P1					
0	NORMAL	ONLINE	CLOSED	FORMER	

ii. Use the odaadmcli show validation storage errors command to view hard storage errors. Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

```
# odaadmcli show validation storage errors
```

iii. Use the odaadmcli show validation storage failures command to view soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.

```
# odaadmcli show validation storage failures
```

iv. Confirm that the oak\_storage\_conf.xml file shows the number of disks added. For example, if you added four AIC to four SFF, then the oak\_storage\_conf.xml file must show numberOfDisks as 12, that is, four SFF NVME disks and eight NVMe disks for four AIC.

```
#cat /opt/oracle/oak/conf/oak_storage_conf.xml
<!--
This file is created by the ODA software as part of system
provisioning
based on system provisioning requests. Values of element nodes can
changed by OAK in response to storage configuration change
operation.
DO NOT EDIT THIS FILE.
<CometConfiguration>
  <OakStorageConfigInfo type="string" dimension="vector"</pre>
readonly="true" required="true" default="">
    <!-- Number of disks part of OAK -->
    <numberOfDisks>12</numberOfDisks>
    <!-- Number of partitions per disk part of DATA diskgroup in
multiple partition scheme
                           -->
    <!-- Number of partitions per disk part of RECO diskgroup in
```

```
multiple partition scheme
    <!-- are derived from number of partitions per disk which are
part of ASM DATA diskgroup -->
    <numOfDataDiskPartitionInAsm>12/numOfDataDiskPartitionInAsm>
  </OakStorageConfigInfo>
</CometConfiguration>
```

# Replacing Small Form Factor (SFF) NVMe Storage Disks

Understand how you can replace existing SFF NVMe disks on Oracle Database Appliance.

#### Preparing for a Storage Upgrade

Check the disk health of the existing storage disks.

```
# odaadmcli show disk
```

Run the the odaadmcli show disk and asmcmd lsdsk -p commands to view and review the storage disk information in OAKD and Oracle Automatic Storage Management (Oracle ASM).

```
# odaadmcli show disk
# asmcmd lsdsk -p
```

Use ORAchk to confirm Oracle ASM and Oracle Clusterware health.

#### Replacing NVMe Storage Disks

Follow all these steps to replace NVMe storage disks:

#### • WARNING:

Pulling a drive before powering it off will crash the kernel, which can lead to data corruption. Do not pull the drive when the LED is an amber or green color. When you need to replace an NVMe drive, use the software to power off the drive before pulling the drive from the slot. If you have more than one disk to replace, complete the replacement of one disk before starting replacement of the next disk.

- Power OFF the NVMe disk before removing it from the slot.
- Wait for one minute for OAKD to complete the operation for disk removal. 2.
- Insert the new disk in the slot.
- Wait for at least 2-3 minutes between inserting each disk for OAKD to complete the operation to add the disk to Oracle ASM and OAK.
- Check the status of the new disk in OAKD with the odaadmcli show disk command. The disk must have the status Online and Good in OAKD. Check the status of the new disk in

Oracle ASM with the asmcmd lsdsk -p command. The disk must be in CACHED MEMBER ONLINE NORMAL state.

- # odaadmcli show disk
- # asmcmd lsdsk -p

# Managing Storage on High-Availability Systems

Understand the storage for your Oracle Database Appliance X10-HA system.

- About Storage Options for Oracle Database Appliance X10-HA
   Oracle Database Appliance High-Availability systems have options for high performance and high capacity storage configurations.
- Adding Solid-State Drives (SSDs) for Data Storage
   Add a pack of solid-state drives (SSDs) for data storage into the existing Oracle Database
   Appliance X10-HA base configuration to fully populate the base storage shelf.
- Adding the Storage Expansion Shelf
   After the base storage shelf is fully populated, you can add the storage expansion shelf to expand your data storage on your high-availability platform.

# About Storage Options for Oracle Database Appliance X10-HA

Oracle Database Appliance High-Availability systems have options for high performance and high capacity storage configurations.

The base configuration of Oracle Database Appliance X10-HA hardware model has six slots (slots 0-5) with 7.68 TB drives of SSD raw storage. If you choose to order and deploy the full storage capacity, then you can fill the remaining 18 slots (slots 6-23) with either SSD or HDD drives. For even more storage, you can add a storage expansion shelf to double the storage capacity of your appliance.

In all configurations, the base storage and the storage expansion shelf each have six SSDs for DATA/RECO in the SSD option or FLASH in the HDD option.

Oracle Database Appliance X10-HA does not allocate dedicated SSD drives for REDO disk groups. Instead, the space for REDO logs is allocated on SSD drives as required.

For Oracle ASM storage, the REDO logs are stored in the available disk group space during database creation, based on the database shape selected. For Oracle ACFS storage, the space for REDO logs is allocated during the database storage creation assuming the minimum db shape (odb1s). If you create the database storage without database, then the space allocated for REDO logs is 4 GB, assuming the minimum db shape (odb1s). Subsequently, when you create a database with your required database shape on the existing database storage, the REDO logs space is extended based on shape of the database.

On Oracle Database Appliance X10-HA High Performance configurations, with only SSD drives, the DATA and RECO disk groups use all the SSD drives whether 6, 12, 18, 24, or 48 with storage expansion shelf. REDO logs are stored in the RECO disk group.

On Oracle Database Appliance X10-HA High Capacity configurations, with both HDD and SSD drives, the DATA and RECO disk groups use the HDD drives, and the SSD drives store the FLASH disk group. REDO logs are stored in the FLASH disk group.

On both High Performance and High Capacity configurations, REDO logs are always created on SSD drives, similar to earlier Oracle Database Appliance hardware models. REDO logs are always created with high redundancy irrespective of the redundancy level of the disk group, whether RECO or FLASH.

### **High Performance**

A high performance configuration uses solid state drives (SSDs) for DATA and RECO storage. The base configuration has six disks, each with 7.68 TB SSD raw storage for DATA and RECO.

You can add up to three (3) 6-Pack SSDs on the base configuration, for a total of 184.32 TB SSD raw storage. If you need more storage, you can double the capacity by adding an expansion shelf of SSD drives. The expansion shelf provides an additional 24 SSDs, each with 7.68TB raw storage for DATA and RECO, for a total of another 184.32 TB SSD raw storage.

Adding an expansion shelf requires that the base storage shelf and expansion shelf are fully populated with SSD drives. When you expand the storage, there is no downtime.

A system fully configured for high performance has 368.64 TB SSD raw storage for DATA and RECO.

#### **High Capacity**

A high capacity configuration uses a combination of SSD and HDD drives.

The base configuration has six disks, each with 7.68 TB SSD raw storage for FLASH.

The following expansion options are available:

- Base shelf: additional 396 TB HDD raw storage for DATA and RECO (18 HDDs, each with 22 TB storage)
- Expansion Storage shelf: additional shelf storage configuration must be identical to the storage configuration of the base shelf.

A system fully configured for high capacity has a total of 884.16 TB raw storage for DATA, RECO, and FLASH, with 92.16 TB SSD and 792 TB HDD.

Table 11-2 Storage Options for Oracle Database Appliance X10-HA

Configuration	Oracle Database Appliance X10-HA SSD-Only Configuration for High Performance	Oracle Database Appliance X10-HA SSD and HDD Configuration for High Capacity
Base configuration	Base storage shelf contains 6 SSDs of 7.68 TB.  • 6 x 7.68 TB SSD = 46 TB SSD	Base storage shelf is fully populated with 6-pack SSDs of 7.68 TB and 18-drives of HDDs with 22 TB.
		<ul> <li>6 x 7.68 TB SSD = 46 TB SSD</li> <li>18 x 22TB HDD = 396 TB HDD</li> </ul>
		<ul> <li>Total storage on the first JBOD = 442 TB, with 46 TB SSD and 396 TB HDD</li> </ul>



Table 11-2 (Cont.) Storage Options for Oracle Database Appliance X10-HA

Configuration	Oracle Database Appliance X10-HA SSD-Only Configuration for High Performance	Oracle Database Appliance X10-HA SSD and HDD Configuration for High Capacity
Storage addition options	Base shelf contains 6 SSDs. Additional 18 SSDs must be added in packs of 6.  Base system: 6 x 7.68 TB SSD = 46 TB SSD  Adding 6 SSDs: 12x 7.68 TB SSD = 92 TB SSD  Adding 12 SSDs: 18 x 7.68 TB SSD = 138 TB SSD  Adding 18 SSDs: 24 x 7.68 TB SSD = 184 TB SSD (full shelf)	Not applicable. Base storage shelf is fully populated.
Storage shelf expansion options	<ul> <li>The optional expansion storage shelf can only be installed after the base storage shelf is fully populated, and it must have the same configuration as the base storage shelf.</li> <li>Total storage on the base storage shelf = 184 TB SSD</li> <li>Storage on the expansion shelf = 24 x 7.68 TB SSD = 184 TB SSD</li> <li>Total storage including both JBODs = 368.6 TB SSD</li> </ul>	<ul> <li>The optional expansion storage shelf can only be installed after the base storage shelf is fully populated, and it must have the same configuration as the base storage shelf.</li> <li>Total storage on the base storage shelf = 442 TB, with 46 TB SSD and 396 TB HDD</li> <li>Total storage including both JBODs = 884 TB, with 92 TB SSD and 792 TB HDD</li> </ul>

### **Converting High Performance to High Capacity system**

You can order a fully populated base storage shelf of 6 SSD + 18 HDD for high capacity configuration. If you initially ordered only the default 6 SSD base storage shelf and deployed high performance system, then you can later convert this to high capacity system configuration. Order 18 HDD and populate the base storage shelf as follows:

- 1. Takea backup of your database on the default storage of 6 SSD configuration on the provisioned system.
- 2. Run the cleanup utility with the --erasedata option on both nodes to erase all SSD disks of OAK and Oracle ASM headers. The --erasedata option completely erases the SSD disk so any data on the disks is lost and becomes unrecoverable.
- After cleanup of both nodes, add 18 HDD disks to the base storage shelf. These 18 HDDs must be brand new disks from Oracle without any OAK and Oracle ASM header.
- Reimage both nodes with the required OAK version.
- 5. Reprovision the system again.

# Adding Solid-State Drives (SSDs) for Data Storage

Add a pack of solid-state drives (SSDs) for data storage into the existing Oracle Database Appliance X10-HA base configuration to fully populate the base storage shelf.

If you need to add storage to the base configuration, you can order one, two, or three 6-pack of SSDs to complete the base configuration on Oracle Database Appliance X10-HA.

You must fully populate the base configuration before you can add an expansion shelf to Oracle Database Appliance X10-HA. If you add an expansion shelf, the shelf must have the same disk storage configuration as the base configuration.



For a high-performance configuration, you can add SSDs to the base storage shelf or add a storage expansion shelf. For high-capacity base configuration with 6-SSDs, if you want to expand storage to use HDDs, then you must reimage and deploy the appliance.

Before adding the disks to the system, ensure that Oracle Database Appliance is on the latest release.

1. Insert disks one at a time in the slots.

To add one 6-pack of SSDs, insert the disks in slots 6 to 11. To add two 6-pack of SSDs, insert the disks in slots 6 to 17. To add three 6-pack of SSDs, insert the disks in slots 6 to 23.



Allow at least one minute between inserting each disk.

After all disks are added, go to Step 2.

2. Run the odaadmcli expand storage command on any node.

```
# odaadmcli expand storage -ndisk number_of_disks_to_be_added -enclosure
enclosure number of the disks to be added
```

The enclosure number is 0 when you add storage disks to the first storage enclosure or JBOD (just a bunch of disks).

## For example:

# odaadmcli expand storage -ndisk 6 -enclosure 0
Running precheck, it may take a few minutes.
Precheck passed.

Check the progress of expansion of storage by executing 'odaadmcli show disk'

Waiting for expansion to finish. It may take several minutes to complete depending upon the number of disks being expanded

odaadmcli expand storage command completed.

Check the status of the newly-expanded disk in OAK by running the odaadmcli show disk command.

All disks must be in the ONLINE status. Check the status of the newly-expanded disk in Oracle ASM by running the asmcmd lsdsk -p.

The mount status must be CACHED and the header status must be MEMBER for all the newly-added disks.

If the status of the newly-added disks in OAK and Oracle ASM are different, then the odaadmcli expand storage command failed.

It takes 10 to 12 minutes to add all of the disks to the configuration.

- 3. Run the odaadmcli show disk command to ensure that all disks are listed, are online, and are in a good state.
  - # odaadmcli show disk
- Verify that the disks in slots 6 to 11 are added to Oracle Automatic Storage Management (Oracle ASM).
  - a. Run the asm\_script to verify that the disks in slots 6 to 11 are added to Oracle Automatic Storage Management (Oracle ASM). If the 6 disks are successfully added (CACHED and MEMBER), then go to Step 7. Following is example of default configuration of 80:20 where eight partitions (p1 to p8) are part of the DATA disk group and two partitions (p9 and p10) are part of the RECO diskgroup.
    - # su gridUser /opt/oracle/oak/bin/stordiag/asm script.sh 1 6

#### For example:

```
# su gridUser /opt/oracle/oak/bin/stordiag/asm script.sh 1 6
# su grid /opt/oracle/oak/bin/stordiag/asm script.sh 1 6
SQL*Plus: Release 19.0.0.0.0 - Production on Thu Nov 30 04:57:57 2023
Version 19.21.0.0.0
Copyright (c) 1982, 2022, Oracle. All rights reserved.
Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0 - Production
Version 19.21.0.0.0
SQL> SQL> SQL> SQL> SQL>
PATH
NAME
                               GROUP NUMBER STATE MODE ST
MOUNT S HEADER STATU
_____
______ ___________
_____
AFD:SSD E0 S06 46724304P1
SSD E0 S06 46724304P1
                                         1 NORMAL ONLINE
CACHED MEMBER
AFD:SSD E0 S06 46724304P10
SSD E0 S06 46724304P10
                                        2 NORMAL ONLINE
CACHED MEMBER
AFD:SSD E0 S06 46724304P2
SSD E0 S06 46724304P2
                                        1 NORMAL
                                                   ONLINE
CACHED MEMBER
AFD:SSD E0 S06 46724304P3
SSD E0 S06 46724304P3
                                        1 NORMAL ONLINE
CACHED MEMBER
AFD:SSD E0 S06 46724304P4
```



SSD_E0_S06_46724304P4 CACHED MEMBER	1 NORMAL	ONLINE
AFD:SSD_E0_S06_46724304P5 SSD_E0_S06_46724304P5 CACHED MEMBER	1 NORMAL	ONLINE
AFD:SSD_E0_S06_46724304P6 SSD_E0_S06_46724304P6	1 NORMAL	ONLINE
CACHED MEMBER AFD:SSD_E0_S06_46724304P7 SSD_E0_S06_46724304P7	1 NORMAL	ONLINE
CACHED MEMBER AFD:SSD_E0_S06_46724304P8 SSD_E0_S06_46724304P8	1 NORMAL	ONLINE
CACHED MEMBER  AFD:SSD_E0_S06_46724304P9  SSD_E0_S06_46724304P9	2 NORMAL	ONLINE
CACHED MEMBER AFD:SSD_E0_S07_47182256P1 SSD_E0_S07_47182256P1	1 NORMAL	ONLINE
CACHED MEMBER AFD:SSD_E0_S07_47182256P10 SSD_E0_S07_47182256P10	2 NORMAL	
CACHED MEMBER AFD:SSD_E0_S07_47182256P2		
SSD_E0_S07_47182256P2 CACHED MEMBER AFD:SSD_E0_S07_47182256P3	1 NORMAL	
SSD_E0_S07_47182256P3 CACHED MEMBER AFD:SSD E0 S07 47182256P4	1 NORMAL	ONLINE
SSD_E0_S07_47182256P4 CACHED MEMBER AFD:SSD_E0_S07_47182256P5	1 NORMAL	ONLINE
SSD_E0_S07_47182256P5 CACHED MEMBER AFD:SSD E0 S07 47182256P6	1 NORMAL	ONLINE
SSD_E0_S07_47182256P6 CACHED MEMBER	1 NORMAL	ONLINE
AFD:SSD_E0_S07_47182256P7 SSD_E0_S07_47182256P7 CACHED MEMBER	1 NORMAL	ONLINE
AFD:SSD_E0_S07_47182256P8 SSD_E0_S07_47182256P8 CACHED MEMBER	1 NORMAL	ONLINE
AFD:SSD_E0_S07_47182256P9 SSD_E0_S07_47182256P9 CACHED_MEMBER	2 NORMAL	ONLINE
AFD:SSD_E0_S08_46724288P1 SSD_E0_S08_46724288P1 CACHED MEMBER	1 NORMAL	ONLINE
AFD:SSD_E0_S08_46724288P10 SSD_E0_S08_46724288P10 CACHED MEMBER	2 NORMAL	ONLINE
AFD:SSD_E0_S08_46724288P2 SSD_E0_S08_46724288P2 CACHED_MEMBER	1 NORMAL	ONLINE



AFD:SSD_E0_S08_46724288P3			
SSD_E0_S08_46724288P3	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S08_46724288P4			
SSD_E0_S08_46724288P4	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S08_46724288P5			
SSD E0 S08 46724288P5	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD E0 S08 46724288P6			
SSD E0 S08 46724288P6	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD E0 S08 46724288P7			
SSD E0 S08 46724288P7	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD E0 S08 46724288P8			
SSD E0 S08 46724288P8	1	NORMAL	ONT.TNE
CACHED MEMBER	_	NOTURE	ONLINE
AFD:SSD E0 S08 46724288P9			
SSD E0 S08 46724288P9	2	NORMAL	ONI THE
	۷	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S09_47180592P1	1	MODMAT	ONT THE
SSD_E0_S09_47180592P1	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S09_47180592P10			
SSD_E0_S09_47180592P10	2	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S09_47180592P2			
SSD_E0_S09_47180592P2	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S09_47180592P3			
SSD_E0_S09_47180592P3	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S09_47180592P4			
SSD E0 S09 47180592P4	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD E0 S09 47180592P5			
SSD E0 S09 47180592P5	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD E0 S09 47180592P6			
SSD E0 S09 47180592P6	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD E0 S09 47180592P7			
SSD E0 S09 47180592P7	1	NORMAL	ONLINE
CACHED MEMBER	_	NOIGHIL	OMETME
AFD:SSD E0 S09 47180592P8			
SSD E0 S09 47180592P8	1	NORMAL	ONI THE
	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S09_47180592P9	^	NODMAT	ONT THE
SSD_E0_S09_47180592P9	2	NORMAL	ONTINE
CACHED MEMBER			
AFD:SSD_E0_S10_47182288P1	_		
SSD_E0_S10_47182288P1	1	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S10_47182288P10			
SSD_E0_S10_47182288P10	2	NORMAL	ONLINE

CACHED MEMBER			
AFD:SSD_E0_S10_47182288P2	1	MODMAT	ONIT TAID
SSD_E0_S10_47182288P2	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S10_47182288P3	1	MODMAT	ONIT THE
SSD_E0_S10_47182288P3	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S10_47182288P4	1	NORMAL	ONT THE
SSD_E0_S10_47182288P4	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S10_47182288P5	1	MODMAT	ONI TME
SSD_E0_S10_47182288P5	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S10_47182288P6	1	MODMAT	ONT THE
SSD_E0_S10_47182288P6	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S10_47182288P7	1	MODMAT	ONIT THE
SSD_E0_S10_47182288P7	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S10_47182288P8	1	MODMAT	ONIT THE
SSD_E0_S10_47182288P8	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S10_47182288P9	2	MODMAT	ONIT THE
SSD_E0_S10_47182288P9	۷	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S11_46722912P1	1	MODMAT	ONIT THE
SSD_E0_S11_46722912P1	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD: SSD_E0_S11_46722912P10	2	MODMAT	ONT THE
SSD_E0_S11_46722912P10	۷	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S11_46722912P2 SSD E0 S11 46722912P2	1	NODMAT	ONI THE
	Τ	NORMAL	ONLINE
CACHED MEMBER			
AFD:SSD_E0_S11_46722912P3 SSD E0 S11 46722912P3	1	MODMAT	ONI TME
CACHED MEMBER	Τ	NORMAL	ONLINE
AFD:SSD_E0_S11_46722912P4 SSD E0 S11 46722912P4	1	NORMAL	ONI THE
CACHED MEMBER	Τ	NORMAL	ONLINE
AFD:SSD E0 S11 46722912P5			
SSD E0 S11 46722912P5	1	NORMAL	ONT THE
CACHED MEMBER		NORMAL	OMPTME
AFD:SSD E0 S11 46722912P6			
SSD E0 S11 46722912P6	1	NORMAL	ONT THE
CACHED MEMBER		NORMAL	OMPTME
AFD:SSD E0 S11 46722912P7			
SSD E0 S11 46722912P7	1	NORMAL	ONLINE
CACHED MEMBER	1	MOMINI	ONLINE
AFD:SSD E0 S11 46722912P8			
SSD E0 S11 46722912P8	1	NORMAL	ONLINE
CACHED MEMBER	Τ.	TAOT/IVIT	OINTTINE.
AFD:SSD E0 S11 46722912P9			
SSD E0 S11 46722912P9	2	NORMAL	ONLINE
CACHED MEMBER	۷	TAOT/IVIT	OINTTINE.
OUCHED LIEUDER			

```
SQL> Disconnected from Oracle Database 19c Enterprise Edition Release
19.0.0.0.0 - Production
Version 19.21.0.0.0
#
```

b. Use the odaadmcli show validation storage errors command to view hard storage errors. Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

```
# odaadmcli show validation storage errors
```

c. Use the odaadmcli show validation storage failures command to view soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.

```
# odaadmcli show validation storage failures
```

d. Confirm that the <code>oak\_storage\_conf.xml</code> file shows the number of disks added. For example, if you added 6 disks to the base configuration, then the <code>oak\_storage\_conf.xml</code> file must show <code>numberOfDisks</code> as 12. If you added 12 disks to the base configuration, then the <code>oak storage conf.xml</code> file must show 18.

```
#cat /opt/oracle/oak/conf/oak storage conf.xml
<!--
This file is created by the ODA software as part of system provisioning
based on system provisioning requests. Values of element nodes can be
changed by OAK in response to storage configuration change operation.
DO NOT EDIT THIS FILE.
-->
<CometConfiguration>
  <OakStorageConfigInfo type="string" dimension="vector"</pre>
readonly="true" required="true" default="">
    <!-- Number of disks part of OAK -->
    <numberOfDisks>12</numberOfDisks>
    <!-- Number of partitions per disk part of DATA diskgroup in
multiple partition scheme
                            -->
    <!-- Number of partitions per disk part of RECO diskgroup in
multiple partition scheme
                           -->
    <!-- are derived from number of partitions per disk which are
part of ASM DATA diskgroup -->
    <numOfDataDiskPartitionInAsm>8</numOfDataDiskPartitionInAsm>
  </OakStorageConfigInfo>
</CometConfiguration>
```

# Adding the Storage Expansion Shelf

After the base storage shelf is fully populated, you can add the storage expansion shelf to expand your data storage on your high-availability platform.

The expansion shelf is available on Oracle Database Appliance high-availability platforms, such as Oracle Database Appliance X10-HA. The addition of the storage expansion shelf includes checks across both nodes. It is important to confirm that SSH does work across the nodes and all users can connect as expected using their shared password.

You must fully populate the base configuration before you can add an expansion shelf. If you add an expansion shelf, the shelf must have the same disk storage configuration as the base storage shelf.



Oracle recommends that you add a storage expansion shelf when you have relatively little activity on your databases. When the system discovers the new storage, Oracle Automatic Storage Management (Oracle ASM) automatically rebalances the disk groups. The rebalance operation may degrade database performance until the operation completes.

1. Install and cable the storage expansion shelf, but do **not** power on the expansion shelf.



#### **Caution:**

Review cabling instructions carefully to ensure that you have carried out cabling correctly. Incorrect connections can cause data loss when adding a storage expansion shelf to Oracle Database Appliance with existing databases.

 Verify that both nodes plus the base storage shelf are up and running. Log into each server node and run the odacli validate-storagetopology command to confirm that the base configuration cabling is correct.

```
# odacli validate-storagetopology
...
    INFO : Check if JBOD powered on
SUCCESS : JBOD : Powered-on
    INFO : Check for correct number of EBODS(2 or 4)
SUCCESS : EBOD found :
2
    INFO : Check for overall status of cable validation
on Node0
SUCCESS : Overall Cable Validation on Node0
SUCCESS : JBOD Nickname set correctly : Oracle Database Appliance - E0
```

Run the command to confirm that the two server nodes are properly cabled to the base storage shelf and all disks are online, with a good status, and added to the existing disk groups on both nodes. If there any failures, then fix the cabling before proceeding to the next step.



If the output shows that EBOD found is 2, then you only have the base storage shelf. If EBOD found is 4, then you have a base storage shelf and an expansion shelf.

### Note:

If you add a new JBOD fresh from the factory, then the output of the odacli validate-storagetopology command is:

```
# odacli validate-storagetopology
...
WARNING : JBOD Nickname is incorrectly set to :
```

- Power on the storage expansion shelf and wait for 20 minutes before issuing the CLI command for storage expansion.
- 4. Log in to each server node and run the odacli validate-storagetopology command to validate the storage cabling and confirm that the new storage shelf is recognized.

```
# odacli validate-storagetopology
  INFO
        : Check if JBOD powered on
  SUCCESS: 2JBOD: Powered-
on
        : Check for correct number of EBODS(2 or 4)
  INFO
  SUCCESS : EBOD found :
   . . .
   . . .
           : Check for overall status of cable validation on NodeO
   INFO
   SUCCESS: Overall Cable Validation on NodeO
   SUCCESS: JBODO Nickname set correctly: Oracle Database Appliance - E0
   SUCCESS: JBOD1 Nickname set correctly: Oracle Database Appliance -
E1
```

If you add a new JBOD fresh from the factory, then the output of the <code>odacli validate-storagetopology</code> command is:

```
# odacli validate-storagetopology
...
WARNING : JBOD Nickname is incorrectly set to :
```

Look for the following indicators that both storage shelves are recognized:

When there are two shelves, the JBOD is numbered. For example:

```
SUCCESS: 2JBOD: Powered-on
```

When both shelves are recognized, the EBOD found value is 4.

```
SUCCESS: EBOD found: 4
```



When the expansion shelf is cabled properly, the nickname is E1. For example:

```
SUCCESS: JBODO Nickname set correctly: Oracle Database Appliance - E0
SUCCESS: JBODO Nickname set correctly: Oracle Database Appliance - E1
```

Fix any errors before proceeding.

5. Run the odaadmcli show disk command to ensure that all disks in the expansion shelf are listed, are online, and are in a good state.

```
# odaadmcli show disk
```

When all disks are online and in a good state, proceed to the next step.

6. Run the odaadmcli show enclosure command to check the health of components in expansion shelf.

```
# odaadmcli show enclosure
```

7. Run the odaadmcli expand storage command.

```
# odaadmcli expand storage -ndisk 24 -enclosure 1
Running precheck, it may take a few minutes.
Precheck passed.
Check the progress of expansion of storage by executing 'odaadmcli show disk'
Waiting for expansion to finish. It may take several minutes to complete depending upon the number of disks being expanded
odaadmcli expand storage command completed.
```

It takes approximately 30 to 40 minutes to add all of the disks to the configuration.

8. Check the status of the newly-expanded disk in OAK by running the <code>odaadmcli show disk</code> command. All disks must have status ONLINE. Check the status of the newly-expanded disk in Oracle ASM by running the <code>asmcmd lsdsk -p</code> command. The mount status must be CACHED and header status must be MEMBER for all the newly-added disks. If the status of the newly-added disks in OAK and Oracle ASM is different, then the <code>odaadmcli expand storage</code> command failed.

Example of an Oracle Database Appliance X10-HA High Capacity System:

	dmcli show disk NAME DETAILS	PATH	TYPE	STATE
Good	e0_pd_00	/dev/sda	SSD	ONLINE
Good	e0_pd_01	/dev/sdb	SSD	ONLINE
Good	e0_pd_02	/dev/sdc	SSD	ONLINE
Good	e0_pd_03	/dev/sdab	SSD	ONLINE



Good	e0_pd_04	/dev/sdad	SSD	ONLINE
Good	e0_pd_05	/dev/sdac	SSD	ONLINE
	e0_pd_06	/dev/sdae	HDD	ONLINE
Good	e0_pd_07	/dev/sdaf	HDD	ONLINE
Good	e0_pd_08	/dev/sdag	HDD	ONLINE
Good	e0_pd_09	/dev/sdai	HDD	ONLINE
Good	e0_pd_10	/dev/sdah	HDD	ONLINE
Good	e0_pd_11	/dev/sdaj	HDD	ONLINE
Good	e0_pd_12	/dev/sdak	HDD	ONLINE
Good	e0 pd 13	/dev/sdam	HDD	ONLINE
Good	e0 pd 14	/dev/sdal	HDD	ONLINE
Good	e0 pd 15	/dev/sdan	HDD	ONLINE
Good				
Good	e0_pd_16	/dev/sdap	HDD	ONLINE
Good	e0_pd_17	/dev/sdar	HDD	ONLINE
Good	e0_pd_18	/dev/sdaq	HDD	ONLINE
Good	e0_pd_19	/dev/sdao	HDD	ONLINE
Good	e0_pd_20	/dev/sdat	HDD	ONLINE
Good	e0_pd_21	/dev/sdas	HDD	ONLINE
Good	e0_pd_22	/dev/sdau	HDD	ONLINE
	e0_pd_23	/dev/sdav	HDD	ONLINE
Good	e1_pd_00	/dev/sdaw	SSD	ONLINE
Good	e1_pd_01	/dev/sdax	SSD	ONLINE
Good	e1_pd_02	/dev/sday	SSD	ONLINE
Good	e1_pd_03	/dev/sdaz	SSD	ONLINE
Good	e1 pd 04	/dev/sdba	SSD	ONLINE
Good	 e1 pd 05	/dev/sdbb	SSD	ONLINE
Good	e1 pd 06	/dev/sdbc	HDD	ONLINE
Good	e1 pd 07	/dev/sdbd	HDD	ONLINE
Good	e1_ba_0/	/ ue v / subu	מחוו	ONTINE

G 1	e1_pd_08	/dev/sdbe	HDD	ONLINE
Good	e1_pd_09	/dev/sdbf	HDD	ONLINE
Good	e1_pd_10	/dev/sdbg	HDD	ONLINE
Good	e1_pd_11	/dev/sdbh	HDD	ONLINE
Good	e1_pd_12	/dev/sdbi	HDD	ONLINE
Good	e1 pd 13	/dev/sdbj	HDD	ONLINE
Good	 e1 pd 14	/dev/sdbk	HDD	ONLINE
Good	e1 pd 15	/dev/sdbl	HDD	ONLINE
Good	e1 pd 16	/dev/sdbm	HDD	ONLINE
Good		/dev/sdbm		
Good	e1_pd_17		HDD	ONLINE
Good	e1_pd_18	/dev/sdbo	HDD	ONLINE
Good	e1_pd_19	/dev/sdbp	HDD	ONLINE
Good	e1_pd_20	/dev/sdbq	HDD	ONLINE
Good	e1_pd_21	/dev/sdbr	HDD	ONLINE
Good	e1_pd_22	/dev/sdbs	HDD	ONLINE
Good	e1_pd_23	/dev/sdbt	HDD	ONLINE
#				
# su g	rid /opt/oracle	/oak/bin/stordia	ag/asm_scrip	t.sh 1 6
	us: Release 19. n 19.23.0.0.0	0.0.0.0 - Produc	ction on Tue	Apr 2 21:05:51 2024
Copyri	ght (c) 1982, 2	023, Oracle. A	ll rights re	served.
Oracle Versio	n 19.23.0.0.0		on Release 1	9.0.0.0.0 - Production
PATH	QL> SQL> SQL> S			
NAME HEADER	_STATU		GROUP_NUMBER	STATE MODE_ST MOUNT_S
AFD:HD	 D_E0_S06_134748	696P1		
HDD_E0 MEMBER	_S06_134748696P	1	1	NORMAL ONLINE CACHED

AFD:HDD_E0_S06_134748696P10				
HDD_E0_S06_134748696P10	2	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S06_134748696P2				
HDD_E0_S06_134748696P2	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S06_134748696P3				
HDD_E0_S06_134748696P3	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S06_134748696P4				
HDD_E0_S06_134748696P4	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD E0 S06 134748696P5				
HDD E0 S06 134748696P5	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD E0 S06 134748696P6				
HDD E0 S06 134748696P6	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD E0 S06 134748696P7				
HDD E0 S06 134748696P7	1	NORMAL	ONLINE	CACHED
MEMBER	_	1.014111	01122112	01101122
AFD:HDD E0 S06 134748696P8				
HDD E0 S06 134748696P8	1	NORMAL	ONLINE	CACHED
MEMBER	_	WOIGHIE	ONDIND	CHOHED
AFD:HDD E0 S06 134748696P9				
HDD E0 S06 134748696P9	2	NORMAL	ONIT THE	CACHED
MEMBER	2	NORMAL	ONLINE	CACHED
AFD:HDD E0 S07 134749392P1				
HDD E0 S07 134749392P1	1	NORMAL	ONLINE	CACHED
	Т	NORMAL	ONLINE	CACHED
MEMBER AED-UDD E0 007 124740202D10				
AFD: HDD_E0_S07_134749392P10	2	MODMAT	ONIT THE	CACHED
HDD_E0_S07_134749392P10	2	NORMAL	ONLINE	CACHED
MEMBER				
AFD: HDD_E0_S07_134749392P2	1		0111 1115	03 011ED
HDD_E0_S07_134749392P2	Τ	NORMAL	ONLINE	CACHED
MEMBER				
AFD: HDD_E0_S07_134749392P3	-			~ - ~
HDD_E0_S07_134749392P3	Τ	NORMAL	ONLINE	CACHED
MEMBER				
AFD: HDD_E0_S07_134749392P4				
HDD_E0_S07_134749392P4	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD: HDD_E0_S07_134749392P5				
HDD_E0_S07_134749392P5	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S07_134749392P6				
HDD_E0_S07_134749392P6	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S07_134749392P7				
HDD_E0_S07_134749392P7	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S07_134749392P8				
HDD_E0_S07_134749392P8	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:HDD_E0_S07_134749392P9				
HDD_E0_S07_134749392P9	2	NORMAL	ONLINE	CACHED

MEMBER
''
''
''
SQL> Disconnected from Oracle Database 19c Enterprise Edition Release
19.0.0.0.0 - Production
Version 19.23.0.0.0
#

# Example of an Oracle Database Appliance X10-HA High Performance System:

# odaad	mcli show disk NAME ETAILS	РАТН	TYPE	STATE
_	e0_pd_00	/dev/sda	SSD	ONLINE
Good	e0_pd_01	/dev/sdc	SSD	ONLINE
Good	e0_pd_02	/dev/sdaa	SSD	ONLINE
Good	e0_pd_03	/dev/sdab	SSD	ONLINE
Good	e0_pd_04	/dev/sdac	SSD	ONLINE
Good	e0_pd_05	/dev/sdad	SSD	ONLINE
Good	e0_pd_06	/dev/sdag	SSD	ONLINE
Good	e0_pd_07	/dev/sdae	SSD	ONLINE
Good	e0_pd_08	/dev/sdah /dev/sdaf	SSD	ONLINE
Good	e0_pd_09 e0_pd_10	/dev/sdai	SSD	ONLINE
Good	e0_pd_11	/dev/sdaj	SSD	ONLINE
Good	e0_pd_12	/dev/sdak	SSD	ONLINE
Good	e0_pd_13	/dev/sdam	SSD	ONLINE
Good	e0_pd_14	/dev/sdal	SSD	ONLINE
Good	e0_pd_15	/dev/sdan	SSD	ONLINE
Good	e0_pd_16	/dev/sdap	SSD	ONLINE
Good	e0_pd_17	/dev/sdao	SSD	ONLINE
Good	e0_pd_18	/dev/sdaq	SSD	ONLINE
Good	e0_pd_19	/dev/sdar	SSD	ONLINE

Caad	e0_pd_20	/dev/sdas	SSD	ONLINE
Good	e0_pd_21	/dev/sdau	SSD	ONLINE
Good	e0_pd_22	/dev/sdat	SSD	ONLINE
Good	e0_pd_23	/dev/sdav	SSD	ONLINE
Good	e1_pd_00	/dev/sdaw	SSD	ONLINE
Good	e1_pd_01	/dev/sdax	SSD	ONLINE
Good	e1_pd_02	/dev/sday	SSD	ONLINE
Good	e1_pd_03	/dev/sdaz	SSD	ONLINE
Good	e1_pd_04	/dev/sdba	SSD	ONLINE
Good	e1_pd_05	/dev/sdbb	SSD	ONLINE
Good	e1_pd_06	/dev/sdbc	SSD	ONLINE
Good	e1_pd_07	/dev/sdbd	SSD	ONLINE
Good	e1_pd_08	/dev/sdbe	SSD	ONLINE
Good	e1_pd_09	/dev/sdbf	SSD	ONLINE
Good	e1_pd_10	/dev/sdbg	SSD	ONLINE
Good	e1_pd_11	/dev/sdbh	SSD	ONLINE
Good	e1_pd_12	/dev/sdbi	SSD	ONLINE
Good	e1_pd_13	/dev/sdbj	SSD	ONLINE
Good	e1_pd_14	/dev/sdbk	SSD	ONLINE
Good	e1_pd_15	/dev/sdbl	SSD	ONLINE
Good	e1_pd_16	/dev/sdbm	SSD	ONLINE
Good	e1_pd_17	/dev/sdbn	SSD	ONLINE
Good	e1_pd_18	/dev/sdbo	SSD	ONLINE
Good	e1_pd_19	/dev/sdbp	SSD	ONLINE
Good	e1_pd_20	/dev/sdbq	SSD	ONLINE
Good	e1_pd_21	/dev/sdbr	SSD	ONLINE
Good	e1_pd_22	/dev/sdbs	SSD	ONLINE
Good	e1_pd_23	/dev/sdbt	SSD	ONLINE
Good				

#su grid /opt/oracle/oak/bin/stordiag/asm script.sh 1 6 SQL\*Plus: Release 19.0.0.0.0 - Production on Sat Mar 30 03:09:45 2024 Version 19.23.0.0.0 Copyright (c) 1982, 2023, Oracle. All rights reserved. Connected to: Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production Version 19.23.0.0.0 SQL> SQL> SQL> SQL> SQL> PATH NAME GROUP NUMBER STATE MODE ST MOUNT S HEADER STATU \_\_\_\_\_ AFD:SSD E0 S00 51829200P1 SSD E0 S00 51829200P1 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P10 SSD E0 S00 51829200P10 2 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P2 SSD E0 S00 51829200P2 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P3 SSD E0 S00 51829200P3 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P4 SSD E0 S00 51829200P4 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P5 SSD\_E0\_S00\_51829200P5 1 NORMAL ONLINE CACHED MEMBER AFD:SSD\_E0 S00 51829200P6 SSD E0 S00 51829200P6 1 NORMAL ONLINE CACHED MEMBER AFD:SSD\_E0 S00 51829200P7 SSD\_E0\_S00\_51829200P7 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P8 SSD E0 S00 51829200P8 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S00 51829200P9 SSD E0 S00 51829200P9 2 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S01 51829664P1 SSD E0 S01 51829664P1 1 NORMAL ONLINE CACHED MEMBER AFD:SSD E0 S01 51829664P10 SSD E0 S01 51829664P10 2 NORMAL ONLINE CACHED MEMBER



AFD:SSD_E0_S01_51829664P2				
SSD_E0_S01_51829664P2	Ι	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S01_51829664P3 SSD E0 S01 51829664P3	1	NORMAL	ONITNE	CACHED
MEMBER	Τ	INOMIALI	OMPTIME	CACILLD
AFD:SSD E0 S01 51829664P4				
SSD E0 S01 51829664P4	1	NORMAL	ONI.THE	CACHED
MEMBER	_	потапть	ONLIND	CITCIIDD
AFD:SSD E0 S01 51829664P5				
SSD E0 S01 51829664P5	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD E0 S01 51829664P6				
SSD_E0_S01_51829664P6	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S01_51829664P7				
SSD_E0_S01_51829664P7	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S01_51829664P8				
SSD_E0_S01_51829664P8	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S01_51829664P9	2	MODMAT	ONIT TAIL	ON OLLED
SSD_E0_S01_51829664P9 MEMBER	2	NORMAL	ONLINE	CACHED
AFD:SSD E0 S02 51849168P1				
SSD E0 S02 51849168P1	1	NORMAL	ONLINE	CACHED
MEMBER	_	иотили	ONLIND	CHCHED
AFD:SSD E0 S02 51849168P10				
SSD E0 S02 51849168P10	2	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S02_51849168P2				
SSD_E0_S02_51849168P2	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S02_51849168P3				
SSD_E0_S02_51849168P3	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S02_51849168P4	4			~~ ~~~~
SSD_E0_S02_51849168P4	Τ	NORMAL	ONLINE	CACHED
MEMBER AFD:SSD E0 S02 51849168P5				
SSD E0 S02 51849168P5	1	NORMAL	ONLINE	CVCHED
MEMBER		MOIMINI	OMPINE	CACILED
AFD:SSD E0 S02 51849168P6				
SSD E0 S02 51849168P6	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD E0 S02 51849168P7				
SSD_E0_S02_51849168P7	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S02_51849168P8				
SSD_E0_S02_51849168P8	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S02_51849168P9	_	NOP: 22 =	0117 7:	03 0···==
SSD_E0_S02_51849168P9	2	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S03_51828144P1 SSD E0 S03 51828144P1	1	NORMAL	ONTINE	СУСПЕЛ
000_00_0102014411	Т	MOINIMI	OINTINE	CACILED



MEMDED				
MEMBER AFD:SSD E0 S03 51828144P10				
SSD E0 S03 51828144P10	2	NORMAL	ONLINE	CACHED
MEMBER	_	MOLUMIL	ONLIND	СИСППП
AFD:SSD E0 S03 51828144P2				
SSD E0 S03 51828144P2	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD E0 S03 51828144P3				
SSD E0 S03 51828144P3	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD E0 S03 51828144P4				
SSD E0 S03 51828144P4	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S03_51828144P5				
SSD_E0_S03_51828144P5	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S03_51828144P6				
SSD_E0_S03_51828144P6	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S03_51828144P7				
SSD_E0_S03_51828144P7	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD: SSD_E0_S03_51828144P8	1			~~ ~~~~
SSD_E0_S03_51828144P8	Τ	NORMAL	ONLINE	CACHED
MEMBER				
AFD: SSD_E0_S03_51828144P9	2	MODMAT	ONIT TAID	CACHED
SSD_E0_S03_51828144P9	2	NORMAL	ONLINE	CACHED
MEMBER AFD:SSD E0 S04 51829536P1				
SSD E0 S04 51829536P1	1	NORMAL	ONLINE	CACHED
MEMBER	Τ	NORMAL	ONLINE	CACIIED
AFD:SSD E0 S04 51829536P10				
SSD E0 S04 51829536P10	2	NORMAL	ONLINE	CACHED
MEMBER	_	.,014111	01122112	01101122
AFD:SSD E0 S04 51829536P2				
SSD E0 S04 51829536P2	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD E0 S04 51829536P3				
SSD E0 S04 51829536P3	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S04_51829536P4				
SSD_E0_S04_51829536P4	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S04_51829536P5				
SSD_E0_S04_51829536P5	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD:SSD_E0_S04_51829536P6	_			
SSD_E0_S04_51829536P6	1	NORMAL	ONLINE	CACHED
MEMBER				
AFD: SSD_E0_S04_51829536P7	1	NODMAT	ONIT THE	ON OLLED
SSD_E0_S04_51829536P7	Τ	NORMAL	ONTINE	CACHED
MEMBER				
AFD:SSD_E0_S04_51829536P8 SSD E0 S04 51829536P8	1	NORMAL	ONTINE	CVCDED
SSD_E0_S04_S1029SS0F0 MEMBER	Τ	MAMA	OMPTINE	CACUED
AFD:SSD E0 S04 51829536P9				
1112.002_10_001_0102900019				

```
2 NORMAL
SSD E0 S04 51829536P9
                                                           ONLINE CACHED
MEMBER
AFD:SSD E0 S05 51841136P1
SSD_E0_S05_51841136P1
                                                1 NORMAL
                                                           ONLINE CACHED
MEMBER
AFD:SSD E0 S05 51841136P10
SSD E0 S05 51841136P10
                                                2 NORMAL
                                                           ONLINE CACHED
MEMBER
AFD:SSD E0 S05 51841136P2
SSD E0 S05 51841136P2
                                                1 NORMAL
                                                           ONLINE CACHED
MEMBER
AFD:SSD E1 S23 51847424P9
SSD E1 S23 51847424P9
                                                2 NORMAL
                                                           ONLINE CACHED
MEMBER
, ,
. .
SQL> Disconnected from Oracle Database 19c Enterprise Edition Release
19.0.0.0.0 - Production
Version 19.23.0.0.0
```

Use the odaadmcli show validation storage errors command to show hard storage errors.

Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

- # odaadmcli show validation storage errors
- 10. Use the odaadmcli show validation storage failures command to show soft validation errors.

A typical soft disk error would be an invalid version of the disk firmware.

- # odaadmcli show validation storage failures
- 11. Run the odacli describe-component command to verify that all firmware components in the storage expansion are current.
  - # odacli describe-component
- 12. If needed, update the storage shelf and then run the odacli describe-component command to confirm that the firmware is current.

```
# odacli update
# odacli describe-component
```

# Managing Networks

View the public and private networks that are configured on your Oracle Database Appliance.

- About Network Infrastructure and VLANs on Oracle Database Appliance
   Learn about networks and virtual local area networks (VLANs) on the appliance.
- About Oracle Database Appliance X10 Network Interfaces
   Learn about onboard network interfaces for Oracle Database Appliance.
- Viewing Configured Networks and Network Interfaces
   Use the Browser User Interface to display a list of configured networks, network details, and interfaces.
- Creating a Network
   Understand how you can use the Browser User Interface to create a network for the appliance.
- Creating a Physical Network
   Understand how you can use the Browser User Interface to create a physical network on the unused network interface.
- Updating a Network
   Understand how you can use the Browser User Interface to update a network and revise the IP address, subnet mask, gateway, or type of network.
- Adding a Network Interface
   Understand how you can add a configured network interface.
- Deleting a Network Interface
   Understand how you can delete a configured network interface.
- Deleting a Network Interface Using Browser User Interface
   Understand how you can delete a configured network interface using the Browser User Interface.
- Deleting a Network Using the Browser User Interface
   Understand how you can delete a configured network using the Browser User Interface.

# About Network Infrastructure and VLANs on Oracle Database Appliance

Learn about networks and virtual local area networks (VLANs) on the appliance.

Oracle Database Appliance has two dual-port public network interfaces (either copper or fiber), which are bonded. For dual-port networks cards, the bonded network interface used for primary public network is always btbond1. You can, optionally, configure upto six bonded interfaces, btbond1 to btbond6. If you use network cards with four ports, then you can select either btbond1 or btbond2 as the public network interface.

You can use the Browser User Interface to display all physical and virtual networks. You can use ODACLI commands or the Browser User Interface to create, update, and deleted networks.

#### Virtual Local Area Networks (VLANs)

Oracle Database Appliance supports multiple virtual local area networks (VLANs) on the same network port or bond. VLANs are multiple logical networks that are created from a single physical network switch port, providing network security isolation for multiple workloads that share a common network. For example, application, backup, and management networks. Each VLAN acts as an independent logical network operating with other VLANs over the same physical connection. The VLAN tag associated with the data packet and network define the network. You can create a collection of isolated networks to enhance network security and bandwidth and keep data packets separated.

The network interfaces differ, depending on your Oracle Database Appliance hardware. The VLAN is created on btbond0 in single-node and high-availability platforms. In all cases, connections to user domains are through the selected interfaces. A switch that supports tagged VLANs uses VLAN IDs to identify the packet, including to which network the packet belongs.



To use VLANs with Oracle Database Appliance, you must configure the VLANs before you deploy the appliance.

The Browser User Interface enables you to create, list, and delete VLANs on the appliance. For high-availability systems, you can use the Browser User Interface to create a VLAN on both nodes of the appliance. To create a VLAN on a specific node, use the command-line interface.

For a bare metal deployment, use the Browser User Interface or odacli commands to manage the following types of VLANs:

- Data Guard: For Oracle Data Guard.
- Database: For Oracle Database.
- Backup: For backup operations.
- Management: For management traffic.
- Other: For usage defined by the customer. For example, for applications.

The public VLAN is setup when you configure the first network using the command odacli configure-firstnet. You can set up only one public VLAN. Use the command-line interface to create other VLANs. For high-availability systems, the IP addresses for Node 0 and Node 1 cannot be the same. Oracle Database Appliance does not support Dynamic Host Configuration Protocol (DHCP) to provide IP addresses, subnet mask and default gateway.

# About Oracle Database Appliance X10 Network Interfaces

Learn about onboard network interfaces for Oracle Database Appliance.

The network interfaces differ, depending on your Oracle Database Appliance hardware. In all cases, connections to user domains are through the selected interfaces. Two ports inside a network card are used to create an active-backup mode bonding interface.

The following table lists the default network interfaces for Oracle Database Appliance bare metal systems on Oracle Database Appliance X10-HA.

Table 12-1 Network Interfaces for Oracle Database Appliance X10-HA Bare Metal Deployment

PCIe Network Card Slot	PCle Network Port	Network Interfaces	Network Bonds	IP Addresses
PCIe Slot 1 (Interconnect)	2 x 10/25GbE SFP28 ports	p1p1, p1p2	icbond0	Node 0: 192.168.16.24
				Node 1: 192.168.16.25
PCIe Slot 5 (required - first NIC)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28 ports	p5p1, p5p2 (p5p3, p5p4)	btbond1 (btbond2)	Can be assigned during provisioning or post deployment.
PCIe Slot 4 (optional - second NIC)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28 ports	p4p1, p4p2 (p4p3, p4p4)	btbond3 (btbond4)	Can be assigned during provisioning or post deployment.
PCIe Slot 8 (optional - third NIC)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28 ports	p8p1, p8p2 (p8p3, p8p4)	btbond5 (btbond6)	Can be assigned during provisioning or post deployment.
On-board	1GBase-T	em1	Not applicable	Assigned post deployment

The following table lists the default network interfaces for Oracle Database Appliance bare metal systems on Oracle Database Appliance X10-S and X10-L.

Table 12-2 Network Interfaces for Oracle Database Appliance X10-S and X10-L Bare Metal Deployment

PCIe Network Card Slot	PCIe Network Port	Network Interfaces	Network Bonds	IP Addresses
PCIe Slot 5 (required - first NIC)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28 ports	p5p1, p5p2 (p5p3, p5p4)	btbond1 (btbond2)	btbond1 and btbond2 can be assigned during deployment.
PCIe Slot 4 (optional - second NIC for Oracle Database Appliance X10-L)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28 ports	p4p1, p4p2 (p4p3, p4p4)	btbond3 (btbond4)	Can be assigned during deployment. If not assigned during deployment, then it can be assigned post deployment.
PCIe Slot 9 (optional - second NIC for Oracle Database Appliance X10-S)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28 ports	p9p1, p9p2 (p9p3, p9p4)	btbond3 (btbond4)	Can be assigned during deployment. If not assigned during deployment, then it can be assigned post deployment.



during deployment, then it can be assigned post deployment.

Assigned post

deployment

Not applicable

PCIe Network Card Slot	PCIe Network Port	Network Interfaces	Network Bonds	IP Addresses
PCIe Slot 8 (optional - third NIC)	4 x 10GBase-T ports or 2 x 10/25GbE SFP28	p8p1, p8p2 (p8p3, p8p4)	btbond5 (btbond6)	Can be assigned during deployment. If not assigned

Table 12-2 (Cont.) Network Interfaces for Oracle Database Appliance X10-S and X10-L Bare Metal Deployment

# Viewing Configured Networks and Network Interfaces

ports

1GBase-T

Use the Browser User Interface to display a list of configured networks, network details, and interfaces.

em1

- 1. Click the **Appliance** tab in the Browser User Interface.
- 2. Click the **Network** tab in the left navigation to display a list of configured networks and configured databases.
  - When the appliance is a high-availability system, the network details for **Node0** and **Node1** display on the page.
- Click Show Interfaces in the upper left corner of the Network page to display a list of network interfaces.
  - If the appliance is a high-availability system, then the network interface details for **Node0** and **Node1** display on the page.
- 4. Click **Show Networks** to go back to the network view.

# Creating a Network

On-board

Understand how you can use the Browser User Interface to create a network for the appliance.

When naming a network, you can use alphanumeric characters, dashes (-) and underscores (\_). The network name cannot exceed 40 characters and must begin with an alpha character.

- 1. Click the **Appliance** tab in the Browser User Interface.
- Click the Network tab in the left navigation to display a list of configured networks.
- 3. If the appliance is a high-availability system, then the Browser User Interface helps you create the network for both nodes at the same time.
- Click Create Network in the upper right corner.
- 5. Enter the network information in the required fields. The Interface field has a drop-down menu with available choices. The Subnet Mask field has a drop-down menu with available choices and a search box. Optionally, enter a Gateway IP address and select an option from the Network Type list. The network type helps to identify if the network is for backup, database, dataguard, management, private, or other.



If the appliance is a high-availability system, then you must also specify the SCAN (Oracle Single Client Access Name) details such as name and IP address, and VIP (Virtual IP) name and address.

6. Click Create.

# Creating a Physical Network

Understand how you can use the Browser User Interface to create a physical network on the unused network interface.

- 1. Click the **Appliance** tab in the Browser User Interface.
- Click the Network tab in the left navigation to display a list of configured networks.
- 3. If the appliance is a single-node system, then click **Create Network** in the upper right corner. If the appliance is a high-availability system, then go to Step 4.
  - a. Enter the network information in the required fields. The Interface field has a drop-down menu with available choices. The Subnet Mask field has a drop-down menu with available choices and a search box. Optionally, enter a Gateway IP address and select an option from the Network Type list. The network type helps to identify if the network is for backup, database, dataguard, management, private, or other.
  - b. Click Create.
- 4. If the appliance is a high-availability system, then the Browser User Interface helps you create the network for both nodes at the same time. Click **Create Network** in the upper right corner.
  - a. Enter the network information in the required fields. The Interface field has a drop-down menu with available choices. The Subnet Mask field has a drop-down menu with available choices and a search box. Optionally, enter a Gateway IP address and select an option from the Network Type list. The network type helps to identify if the network is for backup, database, dataguard, management, private, or other.
  - b. Click Create.

# **Updating a Network**

Understand how you can use the Browser User Interface to update a network and revise the IP address, subnet mask, gateway, or type of network.

- 1. Click the **Appliance** tab in the Browser User Interface.
- Click the Network tab in the left navigation to display a list of configured networks.
  - When the appliance is a high-availability system, tabs named **Node0** and **Node1** display in the right corner, below the **Refresh** button. Click a tab to display network details for each node.
- 3. If the appliance is a high-availability system, click **Node0** or **Node1** to display the node where the network that you want to edit resides.
- 4. Expand the Actions menu, then click **Update** for the network that you want to edit.
- 5. Update the information in the IP Address, Subnet Mask, and Gateway fields and select a network type from the list, as needed, then click **Update**. For High-Availability deployments, you can also update the Virtual IP Address and Oracle Single Client Access Name (SCAN).



# Adding a Network Interface

Understand how you can add a configured network interface.

This procedure explains how to add a network interface card on Oracle Database Appliance.

- 1. Power off the appliance.
- 2. Add the network interface card.
- Power on the appliance.
- The network configuration files are automatically updated for network bonding and configuration changes.

# Deleting a Network Interface

Understand how you can delete a configured network interface.

This procedure explains how to delete a network interface card on Oracle Database Appliance X8-2. You cannot delete the network interface card in slot 7. You also cannot delete the btbond1 and btbond2 networks.

- Disconnect all networks for the network interface card from all applications on the appliance.
- 2. Power off the appliance.
- 3. Remove the network interface card.
- 4. Power on the appliance.
- 5. Run the command odacli delete networkinterface to clean up the network configuration files.

```
odacli delete networkinterface network_interface_name
[root@oak ~]# odacli delete-networkinterface btbond3
Network btbond3 has been deleted successfully
[root@oak ~]# odacli delete-networkinterface btbond4
Network btbond4 has been deleted successfully
```

# Deleting a Network Interface Using Browser User Interface

Understand how you can delete a configured network interface using the Browser User Interface.

- Click the Appliance tab in the Browser User Interface.
- 2. Click the **Network** tab in the left navigation to display a list of configured networks.
- 3. Click the **Show Interfaces** tab in the right navigation to display a list of configured network interfaces.
- Expand the Actions menu, then click Delete for the network interface that you want to delete.



5. Confirm the action when prompted.

# Deleting a Network Using the Browser User Interface

Understand how you can delete a configured network using the Browser User Interface.

- Click the Appliance tab in the Browser User Interface.
- 2. Click the **Network** tab in the left navigation to display a list of configured networks.

When the appliance is a high-availability system, tabs named **Node0** and **Node1** display in the right corner, below the **Refresh** button. Click a tab to display network details for each node.

- 3. If the appliance is a high-availability system, then click **Node0** or **Node1** to display the node where the network that you want to delete resides.
- 4. Expand the **Actions** menu, then click **Delete** for the network that you want to delete.
- 5. Confirm the action when prompted.



# Backup, Restore and Recover Databases

Review backup, restore, and recovery operations for your databases.

- About Database Backup and Recovery Options
   Backup your databases in Oracle Database Appliance and use the restore and recover features to restore a database to the same or another system or to recover database files.
- Configuring NFS Backup and Restore on Oracle Database Appliance
   To backup databases to Network File System (NFS) location or to restore the database
   from NFS location, you must configure the NFS backup location to ensure that Oracle
   Database Appliance can perform read and write operations.
- Configuring Agent Proxy Settings for Object Store Access
   If the Object Store IP address is accessible only through proxy setup by the Oracle
   Database Appliance server, then define the proxy setting for the agent, so that the agent
   can access the Object Store.
- Creating a Database Backup Policy
   Understand how to create a policy to backup a database to an internal or external Oracle
   Fast Recovery Area (FRA) location or to the Object Store using the Browser User
   Interface.
- Updating a Database with a Backup Policy
   Attach a backup policy to a database to define the database backup attributes and destination.
- Backing Up a Database Using the Browser User Interface
   Apply a backup policy to a database, create a manual backup, update a database backup schedule, or update an archive log backup scheduler.
- Viewing Backup Reports
   Understand how you can use the Browser User Interface to view backup reports.
- Recovering a Database Using the Browser User Interface Understand the recovery options available for recovering a database.
- Deleting a Backup Using the Browser User Interface
   Use the Browser User Interface to delete database backups.
- Deleting a Backup Policy
   Use the Browser User Interface to delete a database backup policy.
- Using the CLI to Backup, Restore, and Recover
  Use the command-line interface to backup, restore, and recover databases.

# About Database Backup and Recovery Options

Backup your databases in Oracle Database Appliance and use the restore and recover features to restore a database to the same or another system or to recover database files.

It is important to create a backup recovery strategy to protect the databases in Oracle Database Appliance from data loss. A user error or a physical problem with a disk can cause a failure of a read or write operation on a disk file required to run the database. You can create a backup policy in the Browser User Interface or from the command-line interface.

The following backup options are available:

- Backup to an Oracle Fast Recovery Area (FRA) disk (Internal FRA)
- Backup to Oracle Cloud Infrastructure Object Storage (Oracle Object Storage)
- Backup to a Network File System (NFS) location (External FRA)

You can use the backup, restore, and recovery features with databases that have backup policy attached to them in the system. You can choose to manage your backups, and set up your backup, restore, and recovery options.

The backup feature enables you to create a backup policy with your backup parameters, such as backup location, recovery window, enable and disable crosscheck, and ObjectStoreSwift Object details. For new and existing databases, you can create and attach a backup policy to a database to perform backup. After a backup policy is attached to a database, the DCS agent automatically schedules the database backup and archive logs backup, for the database. By default, the frequency of the database backup schedule is once a day and the frequency of archivelog backup schedule is 30 minutes. The database backup scheduler performs level 0 backup every Sunday and a level 1 backup Monday through Saturday. However the level 0 backup day can be changed from the default Sunday to any day of the week. The database backup scheduler and archive logs backup schedulers can be disabled or have their frequencies changed.

The DCS agent generates and saves a backup report for each backup. The backup report contains the metadata required to recover or restore a database.

Oracle Database Appliance uses the Oracle Recovery Manager (RMAN) to recover the database. You can recover from a backup report, a point-in-time (PITR), a System Change Number (SCN), or from the latest backup. When a backup report is used for recovery, it performs an SCN recovery, by reading the SCN value from the backup report. For recovery of data block, tablespaces, data files, PDBs, see the *Oracle Database Backup and Recovery Reference Guide*.

#### **Backup Policy**

The backup policy defines the backup details. When you create a backup policy, you define the destination for the database backups, either Internal FRA (Disk) or External FRA (NFS location), or Oracle Object Storage, and you define the recovery window.

If you use the Oracle Object Storage for backup and recovery, you must have an ObjectStore Resource ID or Name.

You can assign the backup policy to the database when you create the database. You can also attach a backup policy to an existing database or update a backup policy.

You can specify compression algorithm while creating the backup policy. The supported compression algorithms are BASIC, LOW, MEDIUM, and HIGH. For Objectstore backup policy, you can specify any compression algorithm. By default, if you do not specify the compression algorithm while creating the Objectstore backup policy, then MEDIUM compression algorithm is used. By default, if you do not specify the compression algorithm while creating the Disk or NFS backup policy, then BASIC compression algorithm is used. Refer to the *Oracle Database Licensing Information User Manual* for license considerations when you use LOW, MEDIUM, or HIGH compression algorithms for Disk or NFS backup policy.



#### **Backup Levels**

Specify the backup level when you take a backup. The supported back levels are:

- Level 0: This backup captures all blocks in the datafile. By default, level 0 backups occur
  every Sunday. You can customize your backup settings through the Browser User Interface
  or the command-line. A level 0 backup is a full backup and is used as the parent for a level
  1 backup.
- Level 1: This backup is an incremental backup that captures only those blocks that change between backups in each datafile. By default, a level 1 backup occurs daily, Monday through Saturday, and captures images of each block in a datafile that changed. Level 1 backups are differential backups. The Level 1 backup includes blocks that were changed from the most recent level 1 or level 0 backup.
- LongTerm: This backup is a long-term, or archival backup. Use LongTerm to create a
  backup that is all-inclusive and exempt from the backup retention policy. The backup is allinclusive because every file needed to restore and recover the database is backed up to a
  single location. The backup is exempt from the retention policy that is defined in the
  recovery window. For long term backups, you must use External FRA (NFS location) or
  Objectstore backup policy.
- Archivelog: This is a backup of all archive logs not yet backed up to the backup destination, such as Internal FRA, External FRA (NFS location), or Object Store.

When a database is modified with a backup configuration, database backup schedule and archive logs backup schedules are created automatically. Automatic database backup schedule creates a level 0 backup on Level 0 Backup Day, by default, on Sunday, and level 1 on the remaining days of the week. Also, automatic archive logs backup schedules creates archive logs backup for the database with a default frequency of 30 minutes. These backup schedules can be edited to enable or disable or change the frequency using cron expression.

## **Backup to Disk**

When you backup to disk, you are using the Oracle Fast Recovery Area (FRA) of the disk. FRA is a storage directory that allows backup and recovery operations on Oracle databases. The directory contains archived redo logs, backup pieces and copies, and the control file.

Advantages to backing up to disk are as follows:

- Quick recovery from backups stored on disk
- Automate management of recovery related files (like archived logs)

#### Note:

- When you backup to disk, the data for non-TDE database is not encrypted and RMAN backup encryption are not allowed. In addition, backup to disk requires a lot of disk space (up to two to three times the size of the database).
- If the database is TDE-enabled, then the RMAN backup encryption password is not required, irrespective of the backup destination.

The following is a high-level overview of the workflow for backup and recovery when using a disk:



- Create a backup policy to define the backup destination (disk) and recovery window for the disk destination.
- Create a database and attach the backup policy to the database. When the backup policy is associated with a database, archive logs backups and database backups are automatically created.
- Manage obsolete backups.
- 4. Recover the database from a backup on the disk.

#### **Backup to External FRA (Network File System)**

Specifying a Network File System (NFS) location for backups, enables you to safely and securely store or retrieve a database backup at any time.

The advantages of using NFS backup location are:

- With NFS, you can access remote files, locally, by mounting local file systems on a network.
- Provides a centralized backup location, without requiring manual refresh.
- Supports enhanced security options using firewalls and Kerberos.
- Support for encrypted backups using passwords. You optionally, set the backup password, and provide the same during restore operation.
- The RMAN Backup Encryption password is applicable for databases that do not have TDE enabled. If the database has TDE enabled, then the RMAN backup password is not required, irrespective of the backup destination.

The following is a high-level overview of the workflow for backup and recovery when using an NFS location:

- 1. Create a mount point for the NFS location.
  - The mount point must be accessible from both nodes. The oracle user must have read/ write permissions to the NFS location. If the request is being made to a remote server, ensure that it is running. See *Creating a Mount Point for NFS Backup Location* for the procedure to create a mount point.
- Create a backup policy specifying the NFS location, and the recovery window for NFS destination.
- 3. Associate the database with this backup policy, either during database creation, or by updating the backup policy for the database.
- 4. Backups are automatically scheduled, and you can also run manual backups. You can specify manual backup options in the Browser User Interface or using ODACLI commands.
- Manage obsolete backups.
- **6.** Restore from backup. When you save your backups to NFS, you can restore the database to the same system or to a different system.
- 7. Recover the database from a backup on NFS.

#### **Backup to Oracle Object Storage**

Oracle Object Storage is a highly secure, scalable storage platform that enables you to safely and securely store or retrieve a database backup at any time. Data and the associated metadata are stored as an object in a logical container (bucket). Oracle Database Appliance creates a Backup Report and a unique ID to identify each backup.



Oracle Object Storage is tightly integrated with Oracle Cloud Infrastructure Identity and Access Management. The data, user-defined metadata associated with the data, and encryption keys are automatically encrypted using 256-bit Advanced Encryption Standard (AES- 256). The encryption keys are rotated frequently and cannot be disabled. By default, only authenticated users that have explicitly been granted access to specific resources can access data stored in Oracle Object Storage. Data is uploaded and downloaded over SSL endpoints using the HTTPS protocol.

When you backup to Oracle Object Storage, you are using your backup policy and your Oracle ObjectStoreSwift credentials. The credentials are stored in an encrypted Oracle wallet. You can attach the credentials to one or more backup policies.



Credentials are validated when you create the backup policy that uses Oracle Object Storage. The credentials are not validated against the URL and tenancy.

Advantages to using Oracle Object Storage are as follows:

 Backups are encrypted using the password for non-TDE databases. For TDE-enabled databases, backups are encrypted by default and do not require the RMAN backup encryption password to be specified separately.



#### Caution:

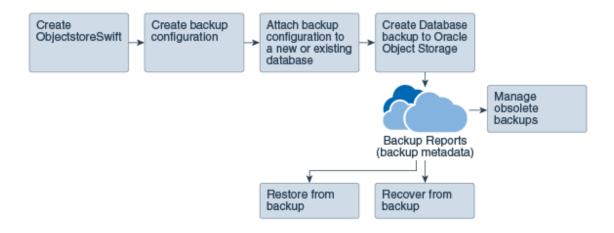
Save the password that you use during backups in a safe location, you must provide the password during recovery operations.

- Quick recovery from backups. With the Oracle Object Storage, you can safely and securely
  use the Browser User Interface to store or retrieve data directly from within the cloud
  platform, at any time.
- Automate management of recovery related files (like archived logs)
- Oracle Object Storage is not directly accessed by the operating system, instead it uses APIs to access the storage at the application level.

The following is a high-level overview of the workflow for backup and recovery when using Oracle Object Storage:

- 1. Create an Object Store object with your credentials.
- Create a backup policy to define the backup location (Object Store), Object Store Credentials Name, the container (bucket) name where you want to store backups, and the recovery window.
- 3. Create a database and attach the backup policy either as a part of creating the database, or update the database with backup policy after creating the database. When the backup policy is associated with a database, backups are automatically created.
- 4. Manage obsolete backups.
- 5. Restore from backup. When you save your backups to Oracle Object Storage, you can restore the database to the same system or to a different system.
- Recover the database from a backup on Oracle Object Storage.





## Note:

Before you can use this backup option, you must create an Oracle Cloud Infrastructure Object Storage account. When you create the account, you define the account credentials, end point URL, and bucket. Go to the Oracle Store and sign up for Oracle Cloud Infrastructure Object Storage.

#### **Backup Reports**

A backup report is generated for each backup and is similar to, but does not replace, a recovery catalog. The report contains the Oracle Database Appliance information and metadata needed to restore or recover a database. The Backup Report is designed to keep track of all of the information required to restore or recover a database.

The following is an example of a level 1 backup report:

```
"id" : "2d82460c-d648-4e75-8c7d-72cc90bc442a",
   "dbResId": "b5fc646e-01a6-4c8b-8286-7633346c4329",
   "tag" : null,
"dbId" : "2717054291",
"dbName" : "HRDbO",
   "dbUniqueName": "HRDbOu",
"backupType": "REGULAR-L1",
"keepDays": null,
  "keepDays": null,
"backupDocation": "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket",
"cfBackupHandle": "c-2717054291-20171108-04",
"spfBackupHandle": "c-2717054291-20171108-04",
"pitrTimeStamp": "November 08, 2017 12:43:14 PM UTC",
"pitrSCN": "1175058",
"resetLogsTimeStamp": "November 08, 2017 09:55:34 AM UTC",
   resetLogsTimeStamp . November 00, 2017 03:33:34 Am 01c 
"resetLogsSCN" : "1112268", 
"oraHomeVersion" : "12.2.0.1.170814 (26723265, 26609817)",
   "sqlPatches": "25811364,26609817",
"backupLogLoc": "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket/scaoda702c1n1/rmanlog/
HRDbOu/2717054291/2017-11-08/rman_backup_2017-11-08_12-42-41.0545.log",
"tdeWalletLoc": null,

"dbConfigLoc": "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket/scaoda702c1n1/dbconfig/
HRDbOu/2717054291/2017-11-08/DBCONFIG_TAG20171108T124407_2017-11-08_12-44-07.0533.tar.gz",
   "name" : "Backup Report HRDbO",
   "createTime": "November 08, 2017 12:42:08 PM UTC",
   "state" : {
    "status" : "CONFIGURED"
   "updatedTime": "November 08, 2017 12:44:12 PM UTC",
"backupReportLogDetail": "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket/scaoda702c1n1/
rmandetaillogreport/HRDbOu/2717054291/2017-11-08/rman list backup detail 2017-11-08 12-44-04.0362.log",
   "dbInfo" : {
    "dbClass" : "OLTP",
      "dbType" : "RAC",
      "dbShape" : "odb1",
      "dbEdition" : "EE",
      "dbStorage" : "ASM'
    "dbDataSize" : "1542M",
```

"dbRedoSize" : "16403M"

#### **About Backup of TDE Wallet**

When the database backup is performed, the TDE wallet backup is also taken. The database backup can be of any type like regular-L0, regular-L1, longterm and archivelog. Use the odacli list-tdebackupreports command to view the latest TDE wallet backup in a backup destination. For example, if a TDE-enabled database named tdedb1 was attached with Disk, and then NFS, and later Oracle Object Storage backup configuration, and the database was backed up to each of these backup destination eventually, then the odacli list-tdebackupreports command lists three entries of TDE wallet backup corresponding to Disk, NFS and Oracle Object Storage backup destination, respectively, for the database tdedb1. The reason for selecting the latest copy is that the TDE wallet is a cumulative wallet, that is, all previous changes, such as re-key operation is available in the latest TDE wallet itself.

#### **About Recovery Options**

The recovery in Oracle Database Appliance always performs a full database restore or recover. The recovery options are LATEST, PITR, SCN, and BackupReport.

The following types of recovery are available:

- LATEST: Performs a complete recovery (valid backups and all required archived logs and online redo logs must be available)
- PITR: Point-in-Time Recovery that performs a recovery to a specified timestamp within the current incarnation of database
- SCN: SCN-based recovery that performs a recovery is an incomplete recovery to a specified SCN within the current incarnation of database.
- BackupReport: Performs a recovery based on the Backup Report SCN. The BackupReport
  option is similar to SCN, except that the recovery uses the Backup Report SCN instead of
  a specified SCN.

#### Point-in-Time Database Recovery

Point-in-Time Recovery (PITR) recovers the database to a specific point-in-time. You must specify the timestamp for this type of recovery.

A point-in-time recovery is often used for the following situations:

- You want to recover the database to an SCN before a user or administrative error.
- Complete database recovery failed because all necessary archived redo logs were not available.
- A database upgrade fails.
- You are creating a test database or a reporting database from production database backups.

#### **System Change Number Recovery**

A system change number (SCN) is a stamp that defines a committed version of a database at a point in time. Oracle assigns every committed transaction a unique SCN. You can recover a database to the latest time or to an SCN.

The database is restored from backups created before the target time, and then applies incremental backups and logs to re-create all changes between the time of the data file backups and the end point of recovery. When the end point is specified as an SCN, the



database applies the redo logs and stops after each redo thread or the specified SCN, whichever occurs first. When the end point is specified as a time, the database internally determines a suitable SCN for the specified time and then recovers to this SCN.

SCN is a primary mechanism to maintain data consistency in Oracle database. With each execution, there is an increase in the count of the SCN. The following are some examples of areas that use SCN:

- Redo records. Every redo record has an SCN version of the redo record in the redo header (redo records can have non-unique SCN). Given redo records from two threads (as in the case of RAC), recovery will order them in SCN order, essentially maintaining a strict sequential order.
- 2. Data block. Every data block has block SCN (block version). In addition to that, a change vector in a redo record also has expected block SCN. This means that a change vector can be applied to one and only version of the block. Code checks if the target SCN in a change vector is matching with the block SCN before applying the redo record. If there is a mismatch, corruption errors are thrown.
- 3. Read consistency. Every query has query environment which includes an SCN at the start of the query. A session can see the transactional changes only if that transaction commit SCN is lower then the query environment SCN.
- **4.** Commit. Every commit generates an SCN (commit SCN) that marks a transaction boundary. Group commits are possible too.

#### **Restoring Archive Logs**

The database auto backup policies - Regular-L0, and Regular-L1 delete archivelog, which could be essential in later process, such as in configuration or reinstate operations for Oracle Data Guard. Oracle Database Appliance supports restore of archive logs for a database. You can choose to restore archive logs from one SCN to another SCN, or from one timestamp to another timestamp.

Run the command odacli restore-archivelog specifying the SCN or timestamp period.

#### **Obsolete Database Backups**

It is important to remove older backups once they become obsolete. The type of backup and the recovery window that you define in the database backup policy determines when database backups become obsolete.

For level 0, level 1, and archivelog backups, run the command odacli delete-backup for a given Database Resource Identifier to delete obsolete backups and backup reports based on the defined recovery window.

For Longterm backups, provide the corresponding backup report as an input and use the command odacli delete-backup to delete the backups from Oracle Object Storage or NFS backup location and the back report you specify in the command.

Typically, older level 0 and level 1 database backups are considered obsolete based on the defined recovery window and those obsolete backups are deleted when you run the odaclidelete-backup command. The defined recovery window is as follows:

Disk: 1-14 days

Object Storage: 1-30 days

Starting with Oracle Database Appliance release 19.15, on attaching a backup policy to a database, the DCS agent creates a scheduler for deleting the database backup. It deletes the obsolete backups and backup reports for the database. By default, the frequency of this delete



backup scheduler is once a week. It runs on every Monday to delete obsolete backups and backup reports of the database. The delete backup scheduler can be edited to disable it or to change its frequency.

#### **Related Topics**

Configuring an NFS Backup Location
 Configure Network File System (NFS) backup location, to set up the NFS backup and mount the NFS client location on Oracle Database Appliance.

## Configuring NFS Backup and Restore on Oracle Database Appliance

To backup databases to Network File System (NFS) location or to restore the database from NFS location, you must configure the NFS backup location to ensure that Oracle Database Appliance can perform read and write operations.

Following are the steps to configure the NFS location, backup database to NFS location, and restore database as a standby database from the NFS backup location.

- Configuring an NFS Backup Location
   Configure Network File System (NFS) backup location, to set up the NFS backup and mount the NFS client location on Oracle Database Appliance.
- Backing Up the Database to NFS Location
   To backup a database to NFS location on Oracle Database Appliance, you must create an NFS backup configuration object and then attach the same to the database.
- Restoring the Database from NFS Backup Understand the steps to restore a database from NFS location.

## Configuring an NFS Backup Location

Configure Network File System (NFS) backup location, to set up the NFS backup and mount the NFS client location on Oracle Database Appliance.

An NFS setup involves an NFS server location and an NFS client location. While performing database backup operation, it is recommended that you configure the NFS server location on a different system, than the system where the source database, that is, the database to be backed up, is running. This ensures the database backups are not lost, even if the system where the source database is running, is corrupted or lost. However, the NFS client location must be configured on the same machine where the database is running, to perform database backup operation. Also, while performing database restore operation, the NFS client location must be configured on the same system where the database must be restored.



- An NFS backup configuration object must be created and attached to the database. This NFS backup location is a mandatory parameter to create a NFS backup configuration object.
- For TDE-enabled database, Oracle Database Appliance requires the backup path to be
  different for database and TDE wallet, as per security guidelines. If the source database is
  TDE-enabled, then configure another NFS client location following the steps in this topic.



Run the following steps on the NFS server:

 Create an Oracle ADVM volume and format the volume as Oracle ACFS, on any node, for example, node0, of a different Oracle Database Appliance system, as the grid operating system user.

```
[root@**** ~] # su - grid
[grid@**** ~] # asmcmd
ASMCMD> volcreate -G data -s 100G backup
ASMCMD> volinfo -G data backup
Diskgroup Name: DATA
Volume Name: BACKUP
Volume Device: /dev/asm/backup-322
State: ENABLED
Size (MB): 102400
Resize Unit (MB): 64
Redundancy: HIGH
Stripe Columns: 8
Stripe Width (K): 4096
Usage:
Mountpath:
ASMCMD> exit
[grid@***** ~]$ mkfs -t acfs /dev/asm/backup-322
mkfs.acfs: version = 19.0.0.0.0
mkfs.acfs: on-disk version = 46.0
mkfs.acfs: volume = /dev/asm/backup-322
mkfs.acfs: volume size = 107374182400 ( 100.00 GB )
mkfs.acfs: Format complete.
[grid@**** ~]$ exit
```

2. Create an operating system directory as the root user to export Oracle ACFS volume created in the previous step.

```
[root@***** ~]# mkdir /nfs_backup_server
```

3. Register the file system with Oracle Clusterware and start the file system as the root user.

```
[root@***** ~]# /u01/app/19.13.0.0/grid/bin/srvctl add filesystem -
d /dev/asm/backup-322 -path /nfs_backup_server -mountowner oracle -
mountgroup asmadmin
[root@***** ~]#/u01/app/19.13.0.0/grid/bin/srvctl start filesystem -
d /dev/asm/backup-322
```

4. Identify the owner and group of the <code>DBHOME/bin/oracle</code> binary of the source database and set the directory ownership to the same owner and group. In the following example, the owner and group of the <code>DBHOME/bin/oracle</code> binary are <code>oracle</code> and <code>asmadmin</code> respectively. Hence, the ownership of NFS server location is set to the same. The permissions of the directory must be set to 750.

```
[root@***** ~]# ls -ltr /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome_1/bin/oracle
    -rwsr-s--x 1 oracle asmadmin 449234896 Sep 21 11:39 /u01/app/
```

```
odaorahome/oracle/product/19.0.0.0/dbhome_1/bin/oracle

[root@***** ~]# chown oracle:asmadmin /nfs_backup_server
[root@***** ~]# chmod 750 /nfs_backup_server
[root@***** ~]# ls -ld /nfs_backup_server
    drwxr-x--- 2 oracle asmadmin 4096 Sep 21 12:25 /nfs backup server
```

5. When NFS server location and NFS client location are on different systems, then there may be cases where the IDs of the oracle user and the asmadmin group may be different. If the IDs of the oracle user and the asmadmin group are the same, then do not run step 6. In the following example, the ID of oracle user is 1001 on the NFS server system and 1000 on the NFS client system.

```
Output of the system where the NFS server location is configured:

[root@***** ~] # id oracle
uid=1001(oracle) gid=1001(oinstall)
groups=1001(oinstall),1006(asmdba),1003(dba),1002(dbaoper)

Output of the system where the NFS client location is configured:

[root@***** ~] # id oracle
uid=1000(oracle) gid=1001(oinstall)
groups=1001(oinstall),1006(asmdba),1003(dba),1002(dbaoper)
```

In such a case, the ownership of the NFS server location must be set to the same ID as the oracle useron the system where the NFS client location is configured. The ownership of the /nfs backup server location must be set to 1000 as follows:

```
[root@***** ~]# chown 1000:asmadmin /nfs backup server/
```

Export the NFS server location to the systems where the NFS client location is created.

```
[root@***** ~] # cat /etc/exports
    /nfs_backup_server Node0_NFS_Client_Location_IP(rw,sync,no_root_squash)
    /nfs_backup_server Node1_NFS_Client_Location_IP(rw,sync,no_root_squash)
```

Note that the NFS mount option must be (rw, sync, no\_root\_squash). Starting with Oracle Database Appliance release 19.17, there is no dependency on NFS mount option no\_root\_squash, It can then be (rw, sync).

Restart the NFS server.

```
Command on Oracle Linux 7 systems:
    [root@***** ~]# /bin/systemctl restart nfs.service
Command on Oracle Linux 8 systems:
    [root@***** ~]# /bin/systemctl restart nfs-server
```

**8.** Verify the mount point using the showmount -e command.

```
[root@***** ~]# showmount -e
    Export list for ****:
```



```
/nfs_backup_server
Node0_NFS_Client_Location_IP,Node1_NFS_Client_Location_IP
```

Follow these steps to mount the NFS location on Oracle Database Appliance. If the source database is on an Oracle Database Appliance high-availability system, then run the following steps on both nodes.

Create a NFS client location as the root user.

```
[root@***** ~]# mkdir /nfs backup client
```

2. Mount the NFS client location on to the NFS server location, using the IP address of the system where the NFS server location is configured.

```
[root@***** ~] # mount -t nfs NFS_Server_Location_IP:/nfs_backup_server /
nfs backup client
```

#### **Related Topics**

About Database Backup and Recovery Options
 Backup your databases in Oracle Database Appliance and use the restore and recover features to restore a database to the same or another system or to recover database files.

#### **Related Topics**

Preparing for Database Backup to NFS Location
 Use the command-line interface to create a policy to backup a database to an External FRA (NFS Location).

## Backing Up the Database to NFS Location

To backup a database to NFS location on Oracle Database Appliance, you must create an NFS backup configuration object and then attach the same to the database.

The relationship between NFS backup configuration object and database is one-to-many, that is, you can attach one NFS backup configuration object to multiple databases. Use the NFS backup location that you configured in the *Configuring an NFS Backup Location* topic to create an NFS backup configuration object.

Follow these steps to backup a database to an NFS location:

1. Create the NFS backup configuration with the NFS backup location using the odacli create-backupconfig command. In the following sample output, the NFS backup location, specified using the -c option, is /nfs\_backup\_client/, the name of the NFS backup configuration object, specified using the -n option is nfsbcfg, the destination, specified using the -d option is nfs and the retention period, specified using the -w option is 1 day.

If the source database is TDE-enabled, then along with database backup location, specified using the -c option, the TDE wallet location must also be specified using the -f option. The TDE backup path must be different from the database backup path and can be configured in the same way as the database backup path.

```
# odacli create-backupconfig -n nfsbcfg -d nfs -c /nfs_backup_client/ -w 1
{
    "jobId" : "0a86bd50-7ac7-4d6d-af4b-1ee2c4d451d5",
    "status" : "Created",
    "message" : "backup config creation",
    "reports" : [],
```



```
"createTimestamp": "September 21, 2022 17:02:21 PM UTC",
      "resourceList" : [ {
        "resourceId": "023eb9ac-a4d0-4071-a358-c904791d15d7",
        "resourceType" : null,
        "resourceNewType" : "BackupConfig",
        "jobId": "0a86bd50-7ac7-4d6d-af4b-1ee2c4d451d5",
       "updatedTime" : null
      "description" : "create backup config:nfsbcfg",
      "updatedTime" : "September 21, 2022 17:02:21 PM UTC"
 # odacli describe-job -i 0a86bd50-7ac7-4d6d-af4b-1ee2c4d451d5
    Job details
                        ID: 0a86bd50-7ac7-4d6d-af4b-1ee2c4d451d5
               Description: create backup config:nfsbcfg
                    Status: Success
                   Created: September 21, 2022 5:02:21 PM UTC
                   Message: backup config creation
   Task Name
                                           Start
Time
                             End Time
                                                                Status
   Backup config metadata persist September 21, 2022 5:02:21 PM
UTC September 21, 2022 5:02:21 PM UTC Success
```

Attach the NFS backup configuration object to the database using the odacli modifydatabase command.

```
# odacli modify-database -n mydb -bin nfsbcfg
     "jobId": "4cd995f1-feb4-413e-a863-71e87cc97cff",
     "status" : "Created",
     "message": "Modify database",
     "reports" : [ ],
     "createTimestamp" : "September 21, 2022 17:37:13 PM UTC",
     "resourceList" : [ {
       "resourceId": "09b476c2-8f09-4636-9233-d8789c320b25",
       "resourceType" : "DB",
       "resourceNewType" : null,
       "jobId": "4cd995f1-feb4-413e-a863-71e87cc97cff",
       "updatedTime" : "September 21, 2022 17:37:13 PM UTC"
     } ],
     "description" : "Modify database : mydb",
     "updatedTime" : "September 21, 2022 17:37:13 PM UTC"
   }
 # odacli describe-job -i 4cd995f1-feb4-413e-a863-71e87cc97cff
   Job details
                        ID: 4cd995f1-feb4-413e-a863-71e87cc97cff
```

```
Description: Modify database : mydb
                  Status: Success
                 Created: September 21, 2022 5:37:13 PM UTC
                 Message: Modify database
   Task Name
                                       Start
Time
                          End Time
                                                          Status
______
   Validate OMF parameter values
                                      September 21, 2022 5:37:18 PM
UTC September 21, 2022 5:37:19 PM UTC Success
   update db with backupconfig attributes September 21, 2022 5:37:34 PM
   September 21, 2022 5:37:39 PM UTC Success
   Enable Database Autobackup
                                     September 21, 2022 5:37:39 PM
    September 21, 2022 5:37:39 PM UTC Success
UTC
   Enable Archivelog Autobackup
                                    September 21, 2022 5:37:39 PM
    September 21, 2022 5:37:39 PM UTC Success
   Configure Control file Auto Backup Format September 21, 2022 5:37:39
PM UTC September 21, 2022 5:37:42 PM UTC Success
   Backup Current Control file
                                       September 21, 2022 5:37:42 PM
    September 21, 2022 5:37:50 PM UTC Success
   Update metadata for database:mydb September 21, 2022 5:37:50 PM
UTC September 21, 2022 5:37:50 PM UTC Success
```

3. Back up the database using the odacli create-backup command. For example, you can take a backup type called Regular-L0 with archivelog using the -ka option.

Note that you must take the backup with the -ka option, if you want to restore the backup as a standby database only for Oracle Database Appliance releases earlier than 19.12. From Oracle Database Appliance release 19.12 and later, the -ka option is not mandatory for restoring the database as standby.

```
# odacli create-backup -n mydb -bt regular-10 -ka
      "jobId": "6dc7ae65-93e3-4dc2-b4a7-563c8f98b01a",
      "status" : "Created",
     "message" : null,
      "reports" : [ ],
      "createTimestamp" : "September 21, 2022 17:39:03 PM UTC",
      "resourceList" : [],
      "description" : "Create regular-10 Backup[TAG:auto][Db:mydb][NFS:/
nfs backup client/orabackups/scaoda823-c/database/3031000803/mydb]",
      "updatedTime" : "September 21, 2022 17:39:03 PM UTC"
 # odacli describe-job -i 6dc7ae65-93e3-4dc2-b4a7-563c8f98b01a
    Job details
                         ID: 6dc7ae65-93e3-4dc2-b4a7-563c8f98b01a
               Description: Create regular-10 Backup[TAG:auto][Db:mydb]
[NFS:/nfs backup client/orabackups/scaoda823-c/database/3031000803/mydb]
                    Status: Success
                   Created: September 21, 2022 5:39:03 PM UTC
                   Message:
```

```
Task Name
                                           Start
Time
                            End Time
                                                               Status
   Validate backup config
                                           September 21, 2022 5:39:05 PM
UTC September 21, 2022 5:39:05 PM UTC Success
   NFS location existence validation
                                        September 21, 2022 5:39:05 PM
UTC September 21, 2022 5:39:05 PM UTC Success
   Backup Validations
                                         September 21, 2022 5:39:05 PM
UTC September 21, 2022 5:39:11 PM UTC Success
   Recovery Window validation
                                           September 21, 2022 5:39:11 PM
UTC September 21, 2022 5:39:13 PM UTC Success
   Archivelog deletion policy configuration September 21, 2022 5:39:13 PM
    September 21, 2022 5:39:16 PM UTC Success
   Database backup
                                           September 21, 2022 5:39:16 PM
UTC September 21, 2022 5:40:27 PM UTC Success
```

4. Oracle Database Appliance creates a backup report corresponding to each backup. Identify the backup report of the above database backup job using the odacli list-backupreports command. Describe the backup using the odacli describe-backupreport - backupreport\_id command and save its output to a JSON file, as shown in the following example. After the JSON file for the backup report is ready, copy the file to the target system where you want to restore the database backup.

## Restoring the Database from NFS Backup

Understand the steps to restore a database from NFS location.

Follow these steps to restore a database from an NFS location:

1. The NFS client location must be created on both the nodes of the Oracle Database Appliance system as the root user.

```
[root@***** ~]# mkdir /nfs backup client
```

2. At the server system, export the NFS server location to the Oracle Database Appliance system using the IP address of the Oracle Database Appliance system.

```
[root@***** ~]# cat /etc/exports
   /nfs_backup_server <Node0_target_machine_IP>(rw,sync,no_root_squash)
   /nfs backup server <Node1 target machine IP>(rw,sync,no root squash)
```

For Oracle Database Appliance release 19.16 and earlier, you must specify the no\_root\_squash parameter. Starting with Oracle Database Appliance release 19.17, you need not specify the no\_root\_squash parameter.

#### 3. Restart the NFS server on the system with the NFS server location.

```
Command on Oracle Linux 7 systems:
     [root@***** ~]# /bin/systemctl restart nfs.service
 Command on Oracle Linux 8 systems:
      [root@***** ~]# /bin/systemctl restart nfs-server
Restore the database.
 # odacli irestore-database -r mydb.json
    Enter SYS user password:
    Retype SYS user password:
      "jobId": "85a8792a-ca9b-4a50-8202-11d63949d3f2",
      "status" : "Created",
      "message" : null,
      "reports" : [ ],
      "createTimestamp": "September 21, 2022 17:43:06",
      "resourceList" : [ ],
      "description" : "Database service recovery with db name: mydb",
      "updatedTime" : "September 21, 2022 17:43:06"
 # odacli describe-job -i 85a8792a-ca9b-4a50-8202-11d63949d3f2
    Job details
    _____
                      ID: 85a8792a-ca9b-4a50-8202-11d63949d3f2
               Description: Database service recovery with db name: mydb
                   Status: Success
                  Created: September 21, 2022 5:43:06 PM UTC
                  Message:
    Task Name
                                        Start
Time
                           End Time
                                                           Status
    _____
 _____
    Check if cluster ware is running
                                        September 21, 2022 5:43:30 PM
UTC September 21, 2022 5:43:30 PM UTC Success
   Check if cluster ware is running
                                       September 21, 2022 5:43:30 PM
UTC September 21, 2022 5:43:30 PM UTC Success
    Creating DbStorage for DbRestore
                                       September 21, 2022 5:43:30 PM
UTC September 21, 2022 5:48:36 PM UTC Success
    Validating dbHome available space
                                         September 21, 2022 5:43:30 PM
    September 21, 2022 5:43:30 PM UTC
                                      Success
    Validating dbHome available space
                                         September 21, 2022 5:43:30 PM
     September 21, 2022 5:43:30 PM UTC Success
                                       September 21, 2022 5:43:30 PM
    Validating DiskSpace for DATA
UTC September 21, 2022 5:43:31 PM UTC Success
    Generating SSH key
                                       September 21, 2022 5:43:31 PM
 UTC September 21, 2022 5:43:31 PM UTC Success
```

.

```
Reset Associated Networks
UTC September 21, 2022 6:30:04 AM UTC Success
Set log_archive_dest for Database
UTC September 21, 2022 6:30:11 AM UTC Success
September 21, 2022 6:30:04 AM UTC Success
```

## Configuring Agent Proxy Settings for Object Store Access

If the Object Store IP address is accessible only through proxy setup by the Oracle Database Appliance server, then define the proxy setting for the agent, so that the agent can access the Object Store.

To create a backup policy that uses Object Store location, the agent must be able to access the Object Store URL.

1. Define the HttpProxyHost and HttpProxyPort settings in the modify-agentconfig-parameters command.

For more information about the modify-agentconfig-parameters command usage, see the Oracle Database Appliance Command-Line Interface.

2. Verify that the update succeeded:

3. Run the list-agentconfigParameters command to view the changes in the proxy settings:

```
# odacli list-agentConfigParameters
```

```
Name Value Description Updated

HttpProxyHost www-proxy.test.com October 23, 2023 4:56:53 PM IST

HttpProxyPort 80 October 23, 2018 4:56:53 PM IST

HttpsProxyHost Https proxy server host October 23, 2023 12:23:21 AM IST

HttpsProxyPort Https proxy server port October 23, 2023 12:23:21 AM IST

OSPatchRepos Repo list for OS patching October 23, 2023 12:23:21 AM IST
```

You can now use the Browser User Interface or the command-line interface to create a backup policy to use the ObjectStore location for backup.

#### **Related Topics**

odacli list-agentconfig-parameters
 Use the odacli list-agentconfig-parameters command to list configuration
 variables used by the appliance.

## Creating a Database Backup Policy

Understand how to create a policy to backup a database to an internal or external Oracle Fast Recovery Area (FRA) location or to the Object Store using the Browser User Interface.

The backup policy defines the backup, including the location where you want to store the backups and the recovery window. Backup to disk requires a lot of disk space (up to two to three times the size of the database).

Follow these steps to create a backup policy from the Browser User Interface:

- Click the **Database** tab in the Browser User Interface.
- 2. Click **Backup Policy** in the left navigation to display a list of backup policies.
- Click Create Backup Policy.
- 4. Enter a name for the backup policy and select the number of days for the recovery window. Select Enable Crosscheck to determine if the files on the disk or in the media management catalog correspond to data in the RMAN repository. The Enable Compression checkbox is selected by default. Selecting this option ensures backups are compressed. Select one of the following as the backup destination:
  - To backup to disk, select Internal FRA as the backup destination.
  - To backup to the cloud, select ObjectStore as the backup destination. If you have more than one Object Store, then select the Object Store Credential Name from the list. Enter a name in the Container Name field.
  - To backup to an NFS location, select External FRA as the backup destination, and specify the NFS mount point location.
  - To not define a destination, select None.

The Backup Policy name must begin with an alpha character and contain only alphanumeric characters.

- You must specify the TDE Wallet Backup Location to associate the backup configuration to a TDE-enabled database.
- 6. Click **Create**. Click **Yes** to confirm that you want to create the backup policy.

A link to the job appears. When the job completes successfully, the backup configuration is ready.

Update an existing database to attach the backup configuration to the database using the ID or Name. When you attach the backup configuration to a database, the DCS agent schedules

daily automatic backups for the database and automatic backups for archivelog of the database.

## Updating a Database with a Backup Policy

Attach a backup policy to a database to define the database backup attributes and destination.

- 1. In the Browser User Interface, click the **Database** tab.
- 2. For the database that you want to modify, select **Modify** in the Actions drop down list.
- In the Modify Database page, select a backup policy from the Select Backup Policy drop down list.
- 4. Specify and confirm the **Backup Encryption Password**.
- 5. Click **Modify** to submit the job.
- Click the Activity tab to check the job status.When the job completes successfully, the backup policy is associated with the database.

## **Updating a Backup Policy**

Use the Browser User Interface to update the recovery window, change the ObjectStore Credential, or change the crosscheck option for a backup policy.

Crosscheck determines if the files on the disk on in the media management catalog correspond to data in the RMAN repository.

- 1. Click the **Database** tab in the Browser User Interface.
- 2. Click **Backup Policy** in the left navigation to display a list of backup policies.
- Expand the Actions menu for a backup policy, then click Update.
- 4. To change the recovery window, use the up or down arrow to change the number of days.
- 5. To enable or disable the crosscheck, select or deselect **Enable Crosscheck**.
- Click Update. Click Yes to confirm that you want to update the backup policy.
   A link to the job appears. When the job completes successfully, the backup configuration is ready.

## Backing Up a Database Using the Browser User Interface

Apply a backup policy to a database, create a manual backup, update a database backup schedule, or update an archive log backup scheduler.

You can use the Browser User Interface or the command-line interface to create a database backup. In the command-line interface, use the command odacli create-backup for a specified Database.

Before creating a database backup, you must have a backup policy. The backup policy defines the recovery window and the backup destination. You must associate a backup policy with the database, otherwise you cannot create backups.

Follow these steps to backup a database from the Browser User Interface:

- 1. In the Browser User Interface, click the **Database** tab.
- Click a database name to select a database from the list.



- 3. Review the database information, including the backup policy name and destination details. To select a backup policy for the database, click Apply Backup Policy. Select a policy and specify the Backup Encryption Password. For TDE-enabled databases, backups are encrypted by default and do not require the RMAN backup encryption password to be specified separately. For databases that do not have TDE enabled, the Backup Encryption Password is mandatory for Objectstore backup destination, optional for NFS backup destination and not required for Disk backup destination.
- Click Manual Backup, Update Database Backup Schedule or Update Archive Log Backup Schedule.

If the action is disabled, then apply a backup policy.

5. Click **Yes** to confirm the job.

A link to the job appears. When the job completes successfully, the backup is ready. A list of backups appears at the bottom of the page.

## Viewing Backup Reports

Understand how you can use the Browser User Interface to view backup reports.

A report is generated when a database backup is performed. The backup report lists the type, location, and date and timestamp of the backup.

- In the Browser User Interface, click the **Database** tab, then click the database name in the list of databases.
  - Information about the database appears on the Database Information page.
- 2. Scroll to the bottom of the page to view a list of Backups.
- Click the Job ID for a backup to view the Backup Report and more details about the backup.

## Recovering a Database Using the Browser User Interface

Understand the recovery options available for recovering a database.

- 1. In the Browser User Interface, click the **Database** tab, then select a database from the list.
- 2. On the Database Information page, click **Recover**.
- 3. On the Recover Database page, select any of the following recovery options:

**Recover Full Database to the specified Backup:** Select the existing backup from which you want to recover the database

**Recover Full Database to the Latest:** Select this option to recover the database from the last known good state, with the least possible data loss.

**Recover Full Database to the specified Timestamp:** Specify the timestamp to recover the database.

**Recover Full Database to the System Change Number (SCN):** Specify the SCN of the backup from which you want to recover the database.

- Specify and confirm the Backup Encryption Password for databases without Transparent Database Encryption (TDE) enabled.
- If the database has TDE enabled, then the TDE Wallet Backup Location and TDE Password fields are displayed.
- 6. Click the **Activity** tab to check the job status.



When the job completes successfully, the database is recovered as per the specified recovery options.

## Deleting a Backup Using the Browser User Interface

Use the Browser User Interface to delete database backups.

You can delete Level-0, Level-1, and Archive Log backups anytime. To delete long term backups, you must check the Backup Report for the database to determine when the backup is obsolete.

- Click the **Database** tab in the Browser User Interface.
- 2. Click the database name, in blue font, to display more details about the database for which you want to delete the backup.
- Click Delete Backups .
- 4. Select the Backup type you want to delete, whether Level-0, Level-1, and Archive Log backup or long Term backup, then click Start. Click Yes to confirm that you want to delete the backup.

A link to the job appears. When the job completes successfully, the backup is deleted.

## Deleting a Backup Policy

Use the Browser User Interface to delete a database backup policy.

- Click the **Database** tab in the Browser User Interface.
- Click Backup Policy in the left navigation to display a list of backup policies.
- 3. Expand the **Actions** menu for a backup policy, then click **Delete**. Click **Yes** to confirm that you want to delete the backup policy.

A link to the job appears. When the job completes successfully, the backup policy is deleted.

## Using the CLI to Backup, Restore, and Recover

Use the command-line interface to backup, restore, and recover databases.

- Preparing for Database Backup to Disk
  - Use the command-line interface to create a policy to backup a database to the Oracle Fast Recovery Area (FRA) of a disk.
- Preparing for Database Backup to NFS Location
  - Use the command-line interface to create a policy to backup a database to an External FRA (NFS Location).
- Preparing for Database Backup to Oracle Cloud
  - Create a backup configuration to backup a database to Oracle Cloud Infrastructure Object Storage.
- Backing Up a Database with the CLI
  - Create a level 0, level 1, LongTerm database backup, or archivelog backup with the command-line interface.



#### Recovering a Database with the CLI

Recover the database to the system using a Backup Report, point-in-time recovery (PITR), a system change number (SCN), or from the latest backup time.

· Restoring a Database with the CLI

You can restore a database to a system from Oracle Object Storage or NFS backup location using a backup report and the command-line interface.

Restoring Archivelog with the CLI

You can restore archivelog from one SCN to another SCN, or from one timestamp to another timestamp using the command-line interface.

Deleting Backups with the CLI

Delete older, obsolete level 0, level 1, archive log, and long term backups along with obsolete backup reports.

## Preparing for Database Backup to Disk

Use the command-line interface to create a policy to backup a database to the Oracle Fast Recovery Area (FRA) of a disk.

You can create a backup policy using the Browser User Interface or the command-line interface. Most of the backup and recovery commands enable you to provide either a resource name or resource ID to identify the database.

Backup to disk or the **Backup to Internal FRA** option in the Browser User Interface, requires a lot of disk space (up to two to three times the size of the database).

Follow these steps to create a backup policy through the command-line interface:

 Create a BackupConfig object (backup configuration) using the command odacli create-backupconfig.

The backup configuration defines the backup, including the location where you want to store the backups and the recovery window.

The following example creates a backup configuration named mkgldailydisk with a backup to disk and a 1 day recovery window.

```
# odacli create-backupconfig -d Disk -n mkgldailydisk -w 1
```

2. Check the job status.

```
# odacli describe-job -i job id from step1
```

When the job completes successfully, the backup configuration is ready.

3. Update an existing database to attach the backup configuration to the database using the ID or Name.

When you attach the backup configuration to a database, the DCS agent schedules daily automatic backups for the database and automatic backups for the archivelog.

The following example uses the Database Resource ID and Backup Configuration ID:

```
# odacli modify-database -i d3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac90 -bi 9d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
```



The following example uses the Database Resource Name, mydb and the Backup Configuration Name, mydb:

```
# odacli modify-database -n mydb -bin mybcfg
```

## Preparing for Database Backup to NFS Location

Use the command-line interface to create a policy to backup a database to an External FRA (NFS Location).

You can create a backup policy using the Browser User Interface or the command-line interface. Most of the backup and recovery commands enable you to provide either a resource name or resource ID to identify the database.

Backup to NFS location or the **Backup to External FRA** option in the Browser User Interface, requires creation of an NFS mount point.

Follow these steps to create a backup policy through the command-line interface:

 Create a BackupConfig object (backup configuration) using the command odacli create-backupconfig.

The backup configuration defines the backup, including the location where you want to store the backups and the recovery window.

The following example creates a backup configuration named mkgldailynfs with a backup to disk and a 1 day recovery window.

```
\# odacli create-backupconfig -d NFS -n mkgldailynfs -c absolute-path-to-parent-directory-for-NFS-destination -w 1
```

2. Check the job status.

```
# odacli describe-job -i job id from step1
```

When the job completes successfully, the backup configuration is ready.

3. (Optional) Update an existing database to attach the backup configuration to the database using the ID or Name.

When you attach the backup configuration to a database, the DCS agent schedules daily automatic backups for the database and automatic backups for the archivelog.

The following example uses the Database Resource ID and Backup Configuration ID:

```
# odacli modify-database -i d3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac90 -bi
9d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
```

The following example uses the Database Resource Name, mydb and the Backup Configuration Name, mydb:

```
# odacli modify-database -in mydb -bin mybcfg -bp
```

The -bp option to specify the backup password is optional and is not applicable for TDE-enabled databases.

#### **Related Topics**

Configuring an NFS Backup Location
 Configure Network File System (NFS) backup location, to set up the NFS backup and mount the NFS client location on Oracle Database Appliance.

## Preparing for Database Backup to Oracle Cloud

Create a backup configuration to backup a database to Oracle Cloud Infrastructure Object Storage.

Before you can backup to Oracle Object Storage, you must sign up for an Oracle Cloud Infrastructure Object Storage account and know your Oracle Object Storage credentials. When you create an Oracle ObjectStoreSwift object, the command creates and stores the credential details in the system and stores the password in an encrypted Oracle wallet. The Oracle wallet contains the Oracle Object Storage password.

Go to the Oracle Store to sign up for Oracle Cloud Infrastructure Object Storage.

 Create an Oracle ObjectStoreSwift object using the command createobjectstoreswift.

```
# odacli create-objectstoreswift -e swift end point URL -n Object Store
Swift name -t Object Store tenant name -u Object Store user name
```

#### For example:

```
# odacli create-objectstoreswift -e https://
swiftobjectstorage.rl.oracleiaas.com/vl -n ossnl -t mytenant -u
user.name@example.com
```

The output includes an objectstoreswift Resource ID to identify an ObjectStoreSwift credential.

Create a BackupConfig object (backup configuration) using the command odacli create-backupconfig.

The backup configuration defines the backup, including the location (container) where you want to store the backups, the recovery window, and the credentials that are defined in your encrypted Oracle wallet.

The following example creates a backup configuration named  $hr_7d_cloud$  with a backup to the <code>ObjectStore</code>. The following backup parameters are defined: the container is  $hr_bucket$ , crosscheck is not enabled, the recovery window is 7 days, and the ObjectStoreSwift Resource ID is provided, which attaches the ObjectStoreSwiftObject to the backup configuration.

```
# odacli create-backupconfig -n hr_7d_cloud -d ObjectStore -w 7 -o
b974f006-5503-4949-ab6c-6f1a56e4ac37 -c hr bucket -no-cr
```



If the ObjectstoreSwift Object was not created with valid credentials, then creating the backup configuration will fail.

Check the job status.

```
odacli describe-job -i job id from step2
```

When the job completes successfully, the backup configuration is ready.

Update an existing database to attach the backup configuration to the database.

When you attach the backup configuration to a database, the DCS agent schedules daily automatic backups for the database, automatic backups for the archivelog, and weekly deletion of obsolete backups and backup reports for the database.

```
# odacli modify-database -i e3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac10 -bi 7d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
```



When you create a new database, you have the option to associate the database with any type of backup configuration.

## Backing Up a Database with the CLI

Create a level 0, level 1, LongTerm database backup, or archivelog backup with the command-line interface.

You can create a database backup in the Browser User Interface or with the command-line interface. When you attach a backup configuration object to a database, the DCS agent automatically schedules daily backups for the database. The day and time are based on the Oracle Database Appliance time zone. The AutoSchedule triggers a level 0 Backup every Sunday, a level 1 the other 6 days of the week, and an archivelog backup every 30 minutes. Use the command odacli modify-schedule to disable or change the scheduled backup time.

To create a Long Term database backup, or a level 0 or level 1 backup outside of the automatic backups, use the command odacli create-backup.

#### **Note:**

To recover a database, there must be a level 0 backup taken, so that the backup report contains information about the base backup. Restoring a database to the same system with a different DB Name and DB Unique Name or to another system does not always require a long term database backup report. You can use archivelog, or level 0, or level 1 backup reports as well. If you use the archivelog backup report , a prior database backup must exist. To restore a database to another system, you must have a long term database backup in Oracle Object Storage.

- 1. Verify that a backup configuration object is associated with the database.
- 2. Create a single backup, outside of the automatic backups, using the command odacli create-backup.



Use the Database Resource ID or Database Name to identify the database to backup, specify the type of backup, and use a tag to create a name for the backup. You can use up to 30 alphanumeric characters for the backup name tag. For example, create a level 0 backup named 2018Jan02\_HRLevel0 for resource ID 20576eb1-bc32-4e34-bf97-fda0b60ca15b

```
\# odacli create-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -bt Regular-L0 -t 2018Jan02 HRLevel0
```

When the job finishes, a backup report is generated for the backup. The report contains all of the metadata required to recover a database.

3. (Optional) Display a list of backup reports.

```
# odacli list-backupreports
```

## Recovering a Database with the CLI

Recover the database to the system using a Backup Report, point-in-time recovery (PITR), a system change number (SCN), or from the latest backup time.

Recovering a database in Oracle Database Appliance is a full RMAN database recovery.

Recovering from a backup report requires JSON input for the backup report.

When recovering a TDE-enabled database, you need not specify the backup password.

 Display a list of backup reports and locate the latest Backup Report for the database and save the Backup Report ID.

```
# odacli list-backupreports
```

2. Use the Backup Report ID to display the details of the Backup Report. Determine how you want to recover the database: PITR, SCN, or Latest and locate the needed information in the Backup Report.

```
# odacli describe-backupreport -i 7fbb06bf-e3a3-4aed-b617-4d1cd3d33387
  "id": "7fbb06bf-e3a3-4aed-b617-4d1cd3d33387",
  "dbResId": "4903d18a-6c20-4860-9ed0-d2ea7bd3d7b9",
  "tag" : "auto",
  "dbId": "3022438697",
  "dbName" : "tdbasm1",
  "dbUniqueName" : "tdbasm1",
  "backupType" : "regular-10",
  "keepDays" : null,
  "backupLocation": "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups",
  "cfBackupHandle": "c-3022438697-20201022-03",
  "spfBackupHandle" : "c-3022438697-20201022-03",
  "pitrTimeStamp" : "October 22, 2020 07:51:59 AM UTC",
  "pitrSCN" : "2549429",
  "resetLogsTimeStamp" : "October 22, 2020 05:23:56 AM UTC",
  "resetLogsSCN" : "2510142",
  "oraHomeVersion": "19.8.0.0.200714",
  "sqlPatches" : "31281355",
```

```
"backupLogLoc" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/rmanlog/2020-10-22/
rman backup auto 2020-10-22 07-51-06.0546.log",
  "tdeWalletLoc": "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/TestLtBackupFailur/scaoda8s002-
c/database/3022438697/tdbasm1/tdewallet/
ewallet 2020102207525186 tdbasm1.p12",
  "dbConfigLoc" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/dbconfig/2020-10-22/
DBCONFIG auto 2020-10-22 07-52-43.0230.tar.gz",
  "name" : "Backup Report tdbasm1",
  "createTime" : "October 22, 2020 07:51:03 AM UTC",
  "state" : {
    "status" : "CONFIGURED"
  },
  "updatedTime" : "October 22, 2020 07:52:55 AM UTC",
  "backupReportLogDetail" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/rmandetaillogreport/2020-10-22/
rman list backup detail auto 2020-10-22 07-52-33.0919.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "SI",
    "dbShape" : "odb1",
    "dbEdition" : "EE",
    "dbStorage" : "ASM",
    "dbRedundancy" : null,
    "pdbName" : null,
    "isCdb" : false
  },
  "dbDataSize" : "1662M",
  "dbRedoSize" : "12298M",
  "rmanBackupPieces": "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/backuppieces/2020-10-22/
backupPieces auto 4903d18a-6c20-4860-9ed0-
d2ea7bd3d7b9 20201022075238.json",
  "compressionAlgo": "MEDIUM",
  "cpuPool" : null,
  "numberOfCores" : null
```

3. To recover from a backup report, based on SCN, identify the database ID and the backup report for recovery.

In the following example, the JSON input file for the backup report is backupreport.json.

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -br
backupreport.json
```

To recover based on PITR, identify the database ID and the date and time stamp for recovery.

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t PITR -r 01/08/2018 12:57:33
```

5. To recover based on SCN, identify the database ID and the SCN number.

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t SCN -s 392375947
```

6. To recover based on the latest backup, identify the database ID and use the Latest option.

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t Latest
```

7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

```
# odacli describe-job -i jobId
```

When the job completes successfully, the recovery is complete.

## Note:

Use the -p option only if the database backup is encrypted using the RMAN backup password. The -p option is not applicable for TDE-enabled databases.

## Restoring a Database with the CLI

You can restore a database to a system from Oracle Object Storage or NFS backup location using a backup report and the command-line interface.

When you restore a database, environment and validation checks and setup tasks are performed. Restoring a database requires a number of tasks and configuration details, such as creating database storage, Oracle Home, recreating the control file, registering the database, and establishing RMAN restore and recovery. An Oracle Database Appliance backup report is generated for each backup and contains the metadata required to restore a database. The report is designed to help you to quickly and efficiently restore a database.

You can restore a database from one appliance to another appliance, or to the same appliance when the source database is deleted:

- To restore to a different system, copy the backup report generated by the command odacli create-backup to any folder on the other machine and use the command odacli irestore-database with the backup report. You must provide the complete location of the backup report when you run the command odacli irestore-database.
- To restore to the same system, delete the source database and use the backup report generated by the command odacli create-backup.

To restore a database from Object Store backup, the backup report corresponding to that backup must be present in the target system. Also an ObjectStoreSwift object with the credential that can access the Object Store backup must be created and specified while restoring the database.



For Standard Edition Oracle Database 19c or later, you cannot restore Oracle RAC or Oracle RAC One Node Database.

Follow these steps to restore a database using the command-line (CLI):

 Display a list of backup reports and locate the latest Backup Report in Oracle Object Storage or NFS for the database and save the Backup Report ID.

```
# odacli list-backupreports
```

Use the Backup Report ID to display the details of the latest Backup Report.

```
# odacli describe-backupreport -i 7fbb06bf-e3a3-4aed-b617-4d1cd3d33387
  "id": "7fbb06bf-e3a3-4aed-b617-4d1cd3d33387",
  "dbResId": "4903d18a-6c20-4860-9ed0-d2ea7bd3d7b9",
  "tag" : "auto",
  "dbId" : "3022438697",
  "dbName" : "tdbasm1",
  "dbUniqueName" : "tdbasm1",
  "backupType" : "regular-10",
  "keepDays" : null,
  "backupLocation" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups",
  "cfBackupHandle": "c-3022438697-20201022-03",
  "spfBackupHandle": "c-3022438697-20201022-03",
  "pitrTimeStamp" : "October 22, 2020 07:51:59 AM UTC",
  "pitrSCN" : "2549429",
  "resetLogsTimeStamp" : "October 22, 2020 05:23:56 AM UTC",
  "resetLogsSCN" : "2510142",
  "oraHomeVersion": "19.8.0.0.200714",
  "sqlPatches" : "31281355",
  "backupLogLoc" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/rmanlog/2020-10-22/
rman backup auto 2020-10-22 07-51-06.0546.log",
  "tdeWalletLoc" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/TestLtBackupFailur/scaoda8s002-
c/database/3022438697/tdbasm1/tdewallet/
ewallet 2020102207525186 tdbasm1.p12",
  "dbConfigLoc" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/dbconfig/2020-10-22/
DBCONFIG auto 2020-10-22 07-52-43.0230.tar.gz",
  "name": "Backup Report tdbasm1",
  "createTime" : "October 22, 2020 07:51:03 AM UTC",
  "state" : {
    "status" : "CONFIGURED"
  },
  "updatedTime" : "October 22, 2020 07:52:55 AM UTC",
  "backupReportLogDetail" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
```

```
database/3022438697/tdbasm1/rmandetaillogreport/2020-10-22/
rman list backup detail auto 2020-10-22 07-52-33.0919.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "SI",
    "dbShape" : "odb1",
    "dbEdition" : "EE",
    "dbStorage" : "ASM",
    "dbRedundancy" : null,
    "pdbName" : null,
    "isCdb" : false
  },
  "dbDataSize" : "1662M",
  "dbRedoSize" : "12298M",
  "rmanBackupPieces" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha Backups/scaoda8s002-c/
database/3022438697/tdbasm1/backuppieces/2020-10-22/
backupPieces auto 4903d18a-6c20-4860-9ed0-
d2ea7bd3d7b9_20201022075238.json",
  "compressionAlgo": "MEDIUM",
  "cpuPool" : null,
  "numberOfCores" : null
```

3. (Optional) If you need to generate a new backup report, use the command odacli create-backup.

```
# odacli create-backup
```

4. Locate the Swift Object Store credential ID for the database backup.

```
# odacli list-objectstoreswifts
```

- 5. Save the backup report from Step 2, as a JSON file in any directory on the appliance. For example, backupreport.json.
- 6. Restore the database to the system using the JSON file in the command odacli irestore-database. You must specify the abolute path to the JSON file.

Run the command, then enter the SYS user password when prompted.

```
# odacli irestore-database -r backupreport.json -oid Object Store ID
```

To restore a TDE-enabled database, the TDE wallet password must be provided. You must specify the -t option in the command odacli irestore-database. If source database is TDE enabled, then the target database which was restored will also have TDE enabled.

7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

```
# odacli describe-job -i jobId
```



## Restoring Archivelog with the CLI

You can restore archivelog from one SCN to another SCN, or from one timestamp to another timestamp using the command-line interface.

Follow these steps to restore archivelog using the command-line (CLI):

 Restore archivelog from one SCN to another SCN, or from one timestamp to another timestamp:

```
# odacli restore-archivelog -fs from_scn -ts to_scn
# odacli restore-archivelog -ft from timestamp -tt to timestamp
```

## Deleting Backups with the CLI

Delete older, obsolete level 0, level 1, archive log, and long term backups along with obsolete backup reports.

For level 0, level 1, and archive log backups, the recovery window defined in the Backup Configuration determines when the backup is obsolete. The ranges are as follows:

- Backup to disk: between 1 and 14 days
- Backup to the Oracle Object Storage: between 1 and 31 days

For Long Term backups to the Oracle Object Storage or NFS, view the keepDays attribute of the Backup Report for a database to determine when the backup is obsolete. To delete Long Term Backup, the Database Resource ID or Database name and the Backup Report are required.

Follow these steps to delete database backups using odacli commands:

1. Display a list of all backup reports.

```
# odacli list-backupreports
```

2. Obtain the Database ID and type of backup.

```
# odacli describe-backupreport -i Backup Report ID
```

3. To delete obsolete level 0, level 1, and archivelog backups along with obsolete backup reports, use the Database ID or Database Name to delete the backup.

```
# odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b
```

**4.** To delete Long Term backups, use the Backup Report from the JSON file to delete the backup.

In the following example, the JSON input file for the backup report is backupreport.json.

```
# odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -br
backupreport.json
```



# Using Oracle Data Guard for Disaster Management and Recovery on Oracle Database Appliance

Understand how you can use Oracle Data Guard for disaster management and recovery on Oracle Database Appliance.

- About Oracle Data Guard on Oracle Database Appliance
   Oracle Database Appliance provides client interface through ODACLI commands and BUI
   for easy configuration and management of Oracle Data Guard for high availability, data
   protection, and disaster recovery.
- Deploying Multiple Standby Databases with Oracle Data Guard on Oracle Database Appliance
  - In this release, Oracle Database Appliance supports Oracle Data Guard configuration with multiple standby databases.
- Configuring Oracle Data Guard on Oracle Database Appliance
   Oracle Database Appliance enables you to set up Oracle Data Guard using ODACLI
   commands.
- Configuring Oracle Data Guard on Oracle Database Appliance Using BUI
   Oracle Database Appliance enables you to set up Oracle Data Guard using BUI.
- Viewing Oracle Data Guard Status on Oracle Database Appliance
   View Oracle Data Guard status using ODACLI commands.
- Viewing Oracle Data Guard Status on Oracle Database Appliance Using BUI View Oracle Data Guard status using BUI.
- Performing Oracle Data Guard Operations
   Perform failover, switchover, and reinstate operations on Oracle Data Guard using ODACLI commands.
- Performing Oracle Data Guard Operations Using BUI
   Perform failover, switchover, and reinstate operations on Oracle Data Guard using BUI.
- Creating an Oracle Data Guard Network
   Create an Oracle Data Guard network and associate it with a database using ODACLI commands.
- Migrating an Oracle Database from One System to Another Using Integrated Oracle Data Guard
   Understand how you can use Integrated Oracle Data Guard to migrate an Oracle
  - Understand how you can use Integrated Oracle Data Guard to migrate an Oracle Database from one system to another.
- Patching Oracle Data Guard Databases on Oracle Database Appliance
   Understand how you can patch primary and standby databases on Oracle Data Guard using ODACLI commands.
- Enabling Oracle Active Data Guard on Existing Configurations
   Understand how you can enable Oracle Active Data Guard on existing configurations.

- Registering Oracle Data Guard on Oracle Database Appliance Using ODACLI Commands
   Oracle Database Appliance enables you to migrate Oracle Data Guard configuration that
   were manually configured, and register the configuration metadata with Oracle Database
   Appliance using ODACLI commands.
- Registering Oracle Data Guard on Oracle Database Appliance Using BUI
   Oracle Database Appliance enables you to migrate Oracle Data Guard configuration that
   were manually configured, and register the configuration metadata with Oracle Database
   Appliance using BUI.
- Deconfiguring Oracle Data Guard on Oracle Database Appliance Deconfigure Oracle Data Guard status using ODACLI commands.
- Deconfiguring Oracle Data Guard on Oracle Database Appliance Using BUI Deconfigure Oracle Data Guard status using BUI.

## About Oracle Data Guard on Oracle Database Appliance

Oracle Database Appliance provides client interface through ODACLI commands and BUI for easy configuration and management of Oracle Data Guard for high availability, data protection, and disaster recovery.

Oracle Data Guard provides a comprehensive set of services that create, maintain, manage, and monitor one or more standby databases to enable production Oracle databases to survive disasters and data corruptions. Oracle Data Guard maintains these standby databases as copies of the production database. Then, if the production database becomes unavailable because of a planned or an unplanned outage, Oracle Data Guard can switch any standby database to the production role, minimizing the downtime associated with the outage. Oracle Data Guard can be used with traditional backup, restoration, and cluster techniques to provide a high level of data protection and data availability. Oracle Data Guard transport services are also used by other Oracle features such as Oracle Streams and Oracle GoldenGate for efficient and reliable transmission of redo from a source database to one or more remote destinations.

With Oracle Data Guard, administrators can optionally improve production database performance by offloading resource-intensive backup and reporting operations to standby systems.

The ability to create clone databases on a standby system enables you to set up test or development environments based on your standby databases. Since standby systems are not production systems, they are a better choice for seeding test or development environments.



Oracle Database Enterprise Edition includes Oracle Data Guard.



# Deploying Multiple Standby Databases with Oracle Data Guard on Oracle Database Appliance

In this release, Oracle Database Appliance supports Oracle Data Guard configuration with multiple standby databases.

## Prerequisites for deploying multiple standby databases with Oracle Data Guard configuration

- Primary and standby databases must be on different Oracle Database Appliance systems.
- For multiple standby configuration, you must deploy three Oracle Database Appliance DB systems.
- You can deploy multiple standby databases by providing the values in the odacli configure-dataguard command or through JSON file.



In this release, you can configure a maximum of two standby databases with Oracle Data Guard configuration.

## Note:

You can only configure all standby databases at the time of Oracle Data Guard configuration, that is, when you run the <code>odacli configure-dataguard command</code>. You cannot configure additional standby databases later.

## Configuring Oracle Data Guard on Oracle Database Appliance

Oracle Database Appliance enables you to set up Oracle Data Guard using ODACLI commands.

#### **Prerequisites for Oracle Database Guard Configuration**

Before you begin:

- Oracle recommends running the primary and the standby databases on separate Oracle Database Appliance hardware, so ensure that you have at least two separate Oracle Database Appliance machines.
- Oracle recommends that the primary and standby systems have the same Oracle
  Database Appliance configuration. The database must have identical configuration for
  database version and storage, that is, they must have either Oracle ASM or Oracle ACFS
  storage, to avoid any unpredictability with the database switch roles.
- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.23 or later.
- If you have customized the operating system, then ensure that environments on the systems are identical.



- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices. See the Oracle Maximum Availability Architecture (MAA) page on Oracle Technology Network.
- If you decide to use Oracle ObjectStore for backup and recovery, then you must configure access for the primary and standby systems.

#### Setting up Backup and Recovery for Oracle Database Guard Configuration

You can use either Object Store or External FRA (NFS) to set up the backup for primary and standby databases when configuring Oracle Data Guard on Oracle Database Appliance. A backup is necessary to instantiate a standby database.

### To set up Object Store backup (recommended):

Configure the agent proxy settings:

```
# odacli modify-agentconfig-parameters -n HttpProxyHost -v www-proxy.test.com -n HttpProxyPort -v 80 -u
```

For more information, see the topic *Configuring Agent Proxy Settings for Object Store Access* in this guide.

2. Create the Object Store credentials on both primary and standby systems:

```
# odacli create-objectstoreswift -e swift_end_point_URL -n Object
Store Swift name -t Object Store tenant name -u Object Store user name
```

#### For example:

```
# odacli create-objectstoreswift -e https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1 -n aaa -t test user -u testuser
```

3. View the Object Store Swift name:

```
# odacli list-objectstoreswifts
```

Create the backup configuration:

```
# odacli create-backupconfig -d objectstore -c testuser -on aaa -w 7 -cr -
n backupConfig7days
```

5. Associate the backup configuration with the database:

```
# odacli modify-database -n test db -bin backupConfig7days -bp
```

#### To set up NFS backup:

 Create the backup configuration. For high-availability deployments, run the command on one node only.

```
# odacli create-backupconfig -n nfsbkup -w 10 -d NFS -c /u01/nfs_backup
```

2. Associate the backup configuration with the database:

```
# odacli modify-database -n test_db -bin nfsbkup
```



#### **Configuring Oracle Data Guard using ODACLI commands**

Follow these steps:

Take a backup of your primary database to Object Store or External FRA (NFS).

```
# odacli create-backup --backupType Regular-L0 -n primary DB
```

#### For example:

```
# odacli create-backup --backupType Regular-LO -n test db
```

2. Save the backup report:

```
# odacli describe-backupreport -i eba406c7-ae46-4d1d-a1e5-3e985397b171 >
backup report test db 0620.json
```

The backup report ID is the ID of the backup created in step 1 and can be obtained by running the odacli list-backupreports command.

3. Copy the backup report to the standby system and restore the backup to a standby database. Note that to create a database with role as standby in an Oracle Data Guard configuration on Oracle Database Appliance, you do not need to copy the wallet of the primary database when using Oracle Key Vault keystore for TDE-enabled databases. The same wallet can be specified in the odacli irestore-database command.

```
# odacli irestore-database -ro STANDBY
```

If you want to use Object Store, then specify the Object Store location:

```
# odacli irestore-database -r backup_report.json -u dbUniqueName -on
objectStoreName -bp -ro STANDBY
Rman Backup Encryption Password(s). Multiple passwords needs to be comma
separated.:
Password for SYS user:
```

In the above command, specify the dbUniqueName of the standby system.

```
odacli irestore-database -r backup_report.json -u dbUniqueName -ro STANDBY Password for SYS user:
```

4. Configure Oracle Data Guard, by running the odacli configure-dataguard command on the primary system. Provide the values for your configuration through the interactive command line interface.

In the interactive CLI configuration steps, the parameters are as follows:

- Standby site address is IP address or host name of the standby host. Provide the fully
  qualified domain name and hostname if the primary and the standby systems are in
  the same domain and DNS is configured.
- You can specify multiple standby databases.



For multiple standby databases, on non-multi user access enabled systems, retain the
default user name as oda-admin. Specify the BUI password for oda-admin user and
operating system password for the root user when prompted.

```
# odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby site standby. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter
'oda-admin'; otherwise, enter the name of the user who has irestored
the Standby
database (default: oda-admin):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby 2 site address: standby2
BUI username for Standby site standby2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby2, enter
'oda-admin'; otherwise, enter the name of the user who has irestored
the Standby
database (default: oda-admin):
BUI password for Standby site standby2:
Password for root user on Standby site standby2:
```

For multiple standby databases, on multi-user access enabled systems, specify the
user name who has irestored the standby database. Specify the BUI password of the
same user when prompted.

```
# odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Passwordless is not enabled on Standby site standby1, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): u1
BUI password for Standby site standby1. If Multi-user Access
Passwordless is enabled on
Standby site, copy the cwallet.sso file from Standby site
(/opt/oracle/dcs/conf/dcspublickey wallet/) to Primary site (/root/).
Rename the file to 'cwallet.sso.standby1', set the file ownership
(root:root) and file permission (0440) and then press enter:
Standby 2 site address: standby2
BUI username for Standby
 site standby2. If Multi-user Access/Multi-user Access
Passwordless is not enabled on Standby site standby2, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): usr1
BUI password for Standby
 site standby2. If Multi-user Access Passwordless is enabled on
Standby site, copy the cwallet.sso file from Standby site
(/opt/oracle/dcs/conf/dcspublickey wallet/) to Primary site (/root/).
Rename the file to 'cwallet.sso.standby2', set the file ownership
(root:root) and file permission (0440) and then press enter:
```

For multiple standby databases, on multi-user access passwordless systems, specify
the user name who has irestored the standby database. You are prompted to copy the
wallet, follow the instructions in the interactive command flow.

```
# odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby
 site standbyl. If Multi-user Access/Multi-user Access
Passwordless is not enabled on Standby site standby1, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): u1
BUI password for Standby
site standby1. If Multi-user Access Passwordless is enabled on
Standby site, copy the cwallet.sso file from Standby site
(/opt/oracle/dcs/conf/dcspublickey wallet/) to Primary site (/root/).
Rename the file to 'cwallet.sso.standby1', set the file ownership
(root:root) and file permission (0440) and then press enter:
Standby 2 site address: standby2
BUI username for Standby
site standby2. If Multi-user Access/Multi-user Access
Passwordless is not enabled on Standby site standby2, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): usr1
BUI password for Standby
 site standby2. If Multi-user Access Passwordless is enabled on
Standby site, copy the cwallet.sso file from Standby site
(/opt/oracle/dcs/conf/dcspublickey wallet/) to Primary site (/root/).
Rename the file to 'cwallet.sso.standby2', set the file ownership
(root:root) and file permission (0440) and then press enter:
```

 Select Oracle Data Guard protection modes to meet availability, performance and data protection requirements. Oracle Data Guard Protection Modes are Maximum Availability, Maximum Performance, and Maximum Protection. The log transport modes are ASYNC, SYNC, and FASTSYNC.
 You can select the following combinations of protection modes and transport types:

Table 14-1 Oracle Data Guard protection modes and transport modes

Protection Mode \ Transport Type	ASYNC	FASTSYNC**	SYNC
MAXPERFORMANCE	Y*	Υ	Υ
MAXAVAILABILITY***	N	Y*	Υ
MAXPROTECTION	N	N	Y*

<sup>\*</sup> in the table indicates the default supported pair and \*\* FASTSYNC mode is available only in Oracle Database 12.1 or later. \*\*\* MaxAvailability protection mode requires at least one standby having transport type FASTSYNC or SYNC.

Example with one standby configuration:

```
# odacli configure-dataguard
# /opt/oracle/dcs/bin/odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1):
Standby 1 site address: phxdbfzp04.dev3farm3phx.databasede3phx
```



```
BUI username for Standby site host1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site
phxdbfzp04.dev3farm3phx.databasede3phx, enter 'oda-admin'; otherwise,
enter the name of the user who has irestored the Standby database
(default: oda-admin): oda-admin
BUI password for Standby site host2:
Password for root user on Standby site host2:
Data Guard configuration name: tdb dg
Database name for Data Guard configuration: tdb
Primary database SYS password:
Protection mode [MAX PROTECTION, MAX PERFORMANCE, MAX AVAILABILITY]
(default: MAX PERFORMANCE):
Enable Active Data Guard (Y/N, default:N):
******************
Data Guard default settings for standby database - tdbstndby
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N): N
******
Enter Primary database RMAN backup encryption password if any:
Do you want to provide another Primary database RMAN backup encryption
password if any? [y/n] (default 'n'):
Standby database's SYS password will be set to Primary database's after
Data Guard configuration. Ignore warning and proceed with Data Guard
configuration? (Y/N, default:N): Y
  "jobId": "e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "January 23, 2025 03:12:44 AM UTC",
  "resourceList" : [],
  "description" : "DG Config service for DB tdb",
  "updatedTime" : "January 23, 2025 03:12:44 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@host1 work] # /opt/oracle/dcs/bin/odacli describe-job -i e02cc0b3-
bce3-4d6c-a1f5-5b121bb7f66a
Job details
                    ID: e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a
           Description: DG Config service for DB tdb
                Status: Success
               Created: January 23, 2025 03:12:44 UTC
```

#### Message:

```
Task Name
                                   Start
Time
                             End
Time
                               Status
_____
______ ____
Validate configure primary request January 23, 2025 03:13:10
            January 23, 2025 03:13:21 UTC
                                              Success
(Primary site) (Host:
host1/Job
ID:
901389f5-0cad-4ee6-91be-3f77b85652af)
Validate configure standby request January 23, 2025 03:13:21
            January 23, 2025 03:13:29 UTC
                                              Success
(Standby site)
(Host:
host2/Job
ID:
856d86e4-dd51-41a7-9050-
b0c39ae771f9)
Uploading Primary DB Password File January 23, 2025 03:13:29
      January 23, 2025 03:13:52 UTC
                                              Success
(Standby
site)
Configure primary database (Primary January 23, 2025 03:13:52
            January 23, 2025 03:15:29 UTC
                                              Success
site) (Host: host1/Job
ID:
5dd46e86-
e07f-423f-9ebf-2515b4ac17d5)
Configure standby request (Standby January 23, 2025 03:15:29
UTC
            January 23, 2025 03:17:30 UTC
                                              Success
site)
(Host:
host2/Job
ID:
2ab511a2-15c0-4371-
bf30-9b7e27ff5288)
Create archive log restore (Primary January 23, 2025 03:17:30
            January 23, 2025 03:17:52 UTC Success
site) (Host: host1/Job
ID:
```

```
96766874-6537-4972-81a9-971440e2acfb)
Configure and enable Data Guard January 23, 2025 03:17:53
             January 23, 2025 03:19:19 UTC
                                                  Success
(Primary site) (Host:
host1/Job
ID:
7ad65ffa-ea06-479d-bb21-
e0b81fb8c743)
Enable Flashback (Standby site) (Host: January 23, 2025 03:19:19
             January 23, 2025 03:19:38 UTC
host2/Job
ID:
a1768703-4dd4-4f1f-
b9a3-9fe0f99615d5)
Re-enable Data Guard (Primary site) January 23, 2025 03:19:38
UTC January 23, 2025 03:19:44 UTC
(Host: host1/Job
ID:
3f6dd276-63e3-4804-a179-
e10052386206)
Create Data Guard status (Primary January 23, 2025 03:19:44
             January 23, 2025 03:19:49 UTC
site) (Host: host1/Job
ID:
8a3eb946-3501-4618-9d4a-
ad8a6d298cc8)
Create Data Guard status (Standby January 23, 2025 03:19:49
             January 23, 2025 03:19:57 UTC
                                                  Success
site)
(Host:
host2/Job
ID:
d9d65942-6284-40d5-a991-b1d21edae96f)
```

# Example with two standby databases configuration:

```
# odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter
'oda-admin'; otherwise, enter the name of the user who has irestored the
```

```
Standby
database (default: oda-admin):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby 2 site address: standby2
BUI username for Standby site standby2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby2, enter
'oda-admin'; otherwise, enter the name of the user who has irestored the
Standby
database (default: oda-admin):
BUI password for Standby site standby2:
Password for root user on Standby site standby2:
********************
******
Data Guard configuration name: dgbb
Database name for Data Guard configuration: bb
Primary database SYS password:
Protection mode [MAX PROTECTION, MAX PERFORMANCE, MAX AVAILABILITY]
(default:
MAX PERFORMANCE):
Enable Active Data Guard (Y/N, default:N):
******
Data Guard default settings for standby database - bb1
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N):
Data Guard default settings for standby database - bb2
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N):
Warning: in compliance with Oracle MAA best practices. DbType (RAC) of
Primary
database bb is different from DbType (SI) of Standby database. Ignore
and proceed with Data Guard configuration? (Y/N, default:N): y
Warning: in compliance with Oracle MAA best practices. DbType (RAC) of
Primary
database bb is different from DbType (SI) of Standby database. Ignore
and proceed with Data Guard configuration? (Y/N, default:N): y
*************
Enter Primary database RMAN backup encryption password if any:
Do you want to provide another Primary database RMAN backup encryption
if any? [y/n] (default 'n'):
```

```
Standby database's SYS password will be set to Primary database's after
Guard configuration. Ignore warning and proceed with Data Guard
configuration?
(Y/N, default:N): y
  "jobId": "f1df87d7-221c-4dc3-a15f-fa35d91560f5",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "January 17, 2025 22:57:55 PM UTC",
  "resourceList" : [ ],
  "description" : "DG Config service for DB bb",
  "updatedTime" : "January 17, 2025 22:57:55 PM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@host1 ~]# odacli describe-job -i
"fldf87d7-221c-4dc3-a15f-fa35d91560f5"
Job details
                   ID: fldf87d7-221c-4dc3-a15f-fa35d91560f5
           Description: DG Config service for DB bb
               Status: Success
              Created: January 17, 2025 22:57:55 UTC
              Message:
Task Name
                                    Node Name
                                                              Start
Time End Time
                        Status
                                    host1 January 17,2025
Validate configure primary request
             January 17, 2025 22:58:44 UTC
                                                    Success
22:58:38 UTC
(Primary site) (Host:host1/Job
eb8bbb43-159c-48e0-8dda-9e2bbd280669)
Validate configure standby request host1 January 17,2025
22:58:44 UTC January 17, 2025 22:58:52 UTC
                                                     Success
(Standby site) (Host: standby1/Job
ID:
86345f35-500c-4ba8-8ff9-
f97c201ad3c7)
Uploading Primary DB Password File host1 January 17,2025
22:58:52 UTC January 17, 2025 22:59:07 UTC
(Standby
site)
```

Configure primary database (Primary host1 January 17,2025 22:59:07 UTC January 17, 2025 22:59:58 UTC Success site) (Host: host1/Job ID: 23ee7263-a59e-40bd-bbec-4c17a5d4ba99)

Configure standby request (Standby host1 January 17,2025 22:59:58 UTC January 17, 2025 23:02:00 UTC Success

site) (Host: standby1/Job

ID:

af543839-85ba-4e83-89d3-

af161d528256)

Create archive log restore (Primary host1 January 17,2025 23:02:00 UTC January 17, 2025 23:02:37 UTC Success

site) (Host: host1/Job ID: b2940217-cec6-4b22-92d2-f4ec8f26b8b8)

Configure and enable Data Guard host1 January 17,2025 23:02:37 UTC January 17, 2025 23:04:19 UTC Success

(Primary site)

(Host:

host1/Job ID:

7882e1e5-0d71-48df-bd86-

e79ee6b57a21)

Enable Flashback (Standby site) (Host: host1 January 17,2025 23:04:19 UTC January 17, 2025 23:04:37 UTC Success

standby1/Job

ID:

c2ef962c-

f429-4e97-8bc3-1355cd7d0ca8)

Re-enable Data Guard (Primary site) host1 January 17,2025 23:04:37 UTC January 17, 2025 23:04:43 UTC Success

(Host: host1/Job ID: fb4a7055-0049-4d44-a726-0871ed54ca07)

Create Data Guard status (Primary host1 January 17,2025 23:04:43 UTC January 17, 2025 23:04:54 UTC Success

site) (Host: host1/Job ID:

5aca5c16-632f-488b-aade-1c677030c81d)

Create Data Guard status (Standby host1 January 17,2025 23:04:54 UTC January 17, 2025 23:05:07 UTC Success

site) (Host: standby1/Job

ID:

5f0c5460-4c38-4aed-8a5b-

e70c0ca70df8)

Validate configure primary request host1 January 17,2025

23:05:07 UTC January 17, 2025 23:05:13 UTC Success (Primary site) (Host:host1/Job 5ac64b32-5da6-48dfb8cc-020853363695) Validate configure standby request host1 January 17,2025 23:05:13 UTC January 17, 2025 23:05:21 UTC (Standby site) (Host: standby2/Job ID: 81aa6900-4460-408e-9ab2fdcd92c8b7bf) Uploading Primary DB Password File host1 January 17,2025 23:05:21 UTC January 17, 2025 23:05:32 UTC Success (Standby site) Configure primary database (Primary host1 January 17,2025 23:05:32 UTC January 17, 2025 23:06:14 UTC Success site) (Host: host1/Job ID: c78a8072-8023-4278bd94-3dd1ef97e066) Configure standby request (Standby host1 January 17,2025 January 17, 2025 23:07:43 UTC Success 23:06:14 UTC site) (Host: standby2/Job 46274a35-bb06-43a9a8a5-66dc4d163463) Create archive log restore (Primary host1 January 17,2025 23:07:43 UTC January 17, 2025 23:08:15 UTC Success site) (Host: host1/Job ID: 2b20aaa2-fcb7-4bc5b501-27ad9d45f34b) Configure standby TNS entry (New host1 January 17,2025 23:08:15 UTC January 17, 2025 23:08:24 UTC Success standby site) (Host: standby2/Job ID: 7e32db8c-999c-44fa-

bdf5-3aed77c9590c)

Configure standby TNS entry (Existing host1 January 17,2025 23:08:24 UTC January 17, 2025 23:08:28 UTC Success

standby site) (Host: standby1/Job

ID:

6a44539e-d5b9-4c45ad2c-7bff8c871e37)

Add standby database (Primary site) host1 January 17,2025 23:08:28 UTC January 17, 2025 23:09:50 UTC Success

```
(Host: host1/Job ID:
1d7c6c93-bd85-496a-
bb7d-67ae7b224d58)
Enable Flashback (Standby site) (Host: host1 January 17,2025
             January 17, 2025 23:10:03 UTC
23:09:50 UTC
standby2/Job
ID:
4a6b8623-
efc0-4016-80be-305b0ed56363)
Re-enable Data Guard (Primary site) host1 January 17,2025
23:10:03 UTC
             January 17, 2025 23:10:09 UTC
(Host: host1/Job ID:
2afea759-752a-42a4-a077-
bd85d4b687a3)
Update Data Guard status (Primary host1 January 17,2025
23:10:09 UTC January 17, 2025 23:10:35 UTC Success
site) (Host: host1/Job ID:
11d93988-ea4d-4e37-
af30-763c2522693d)
Create Data Guard status (New standby host1 January 17,2025
23:10:35 UTC January 17, 2025 23:10:53 UTC Success
site) (Host: standby2/Job ID:
aa5b286f-30f1-48d1-8c2d-2490d15ce408)
Update Data Guard status (Existing host1 January 17,2025 23:10:53
UTC January 17, 2025 23:11:06 UTC Success
standby site) (Host: standby1/JobID:
7d8ffa16-6785-468a-bff9-baf8e13b38ec)
```

#### Example with Oracle Data Guard custom configuration:

```
# odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby 2 site address: standby2
BUI username for Standby site standby2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby2, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin):
BUI password for Standby site standby2:
Password for root user on Standby site standby2:
Data Guard configuration name: dg6
Database name for Data Guard configuration: db
```

```
Primary database SYS password:
Protection mode [MAX PROTECTION, MAX PERFORMANCE, MAX_AVAILABILITY]
(default: MAX PERFORMANCE): MAX AVAILABILITY
Enable Active Data Guard? (Y/N, default:N): y
*****
Data Guard default settings for standby database kdb
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N): y
******************
Primary site network for Data Guard configuration [Public-network]
(default: Public-network):
Standby site network for Data Guard configuration [Public-network]
(default: Public-network):
Primary database listener port (TCP) (default: 1521):
Standby database listener port (TCP) (default: 1521):
Transport type [ASYNC, FASTSYNC, SYNC] (default: ASYNC): SYNC
*****
Data Guard default settings for standby database ldb
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N): y
******************
*****
Primary site network for Data Guard configuration [Public-network]
(default: Public-network):
Standby site network for Data Guard configuration [Public-network]
(default: Public-network):
Primary database listener port (TCP) (default: 1521):
Standby database listener port (TCP) (default: 1521):
Transport type [ASYNC, FASTSYNC, SYNC] (default: ASYNC): SYNC
Enter Primary database RMAN backup encryption password if any:
Do you want to provide another Primary database RMAN backup encryption
password if any? [y/n] (default 'n'):
Standby database's SYS password will be set to Primary database's after
Data Guard configuration. Ignore warning and proceed with Data Guard
configuration? (Y/N, default:N): y
  "jobId" : "fcf23de7-3ef0-4dae-9a3c-735abf9bda4a",
  "status" : "Created",
  "message" : "",
  "reports" : [],
  "createTimestamp": "December 13, 2024 01:58:53 AM CET",
  "resourceList" : [ ],
  "description" : "DG Config service for DB db",
  "updatedTime": "December 13, 2024 01:58:53 AM CET",
  "jobType" : null,
```

```
"cpsMetadata" : null
[root@test host ~]# odacli describe-job -i
fcf23de7-3ef0-4dae-9a3c-735abf9bda4a
Job details
                 ID: fcf23de7-3ef0-4dae-9a3c-735abf9bda4a
          Description: DG Config service for DB db
              Status: Success
             Created: December 13, 2024 01:58:53 CET
             Message:
Task Name
                                  Start
Time
                             End
Time
                              Status
_____
-----
Validate configure primary request December 13, 2024 02:01:18
           December 13, 2024 02:01:29 CET
(Primary site)
(Host:
test host/Job
ID:
cce1142e-24e4-4bbc-9d46-
f46f96bf3191)
Validate configure standby request December 13, 2024 02:01:29
CET December 13, 2024 02:01:45 CET Success
(Standby site)
(Host:
standby1/Job
ID:
f962f6dc-4eeb-497f-9a0c-
b9387d25318b)
Uploading Primary DB Password File December 13, 2024 02:01:45
          December 13, 2024 02:02:16 CET Success
(Standby
site)
Configure primary database (Primary December 13, 2024 02:02:16
CET December 13, 2024 02:02:43 CET
                                            Success
site) (Host: test host/Job
0d909875-ecec-450a-
a2f9-6c09103d9f26)
Configure standby request (Standby December 13, 2024 02:02:43
```

```
December 13, 2024 02:04:11 CET
                                                Success
site) (Host: standby1/Job
ID:
03ffc6b5-5f45-47af-b96c-
d75b82a09234)
Create archive log restore (Primary December 13, 2024 02:04:11
CET December 13, 2024 02:04:47 CET Success
site) (Host: test host/Job
49808676-bd12-4933-8c28-
eef7dee17503)
Configure and enable Data Guard December 13, 2024 02:04:47
CET December 13, 2024 02:06:32 CET
                                               Success
(Primary site)
(Host:
test host/Job
ID:
7ed03a2d-
bb93-4ff7-9e45-0f825c8fff2f)
Enable Flashback (Standby site) (Host: December 13, 2024 02:06:32
CET December 13, 2024 02:06:53 CET Success
standby1/Job
ID:
dalee6fb-cfb3-4f6d-9eaa-
a6c1c8811d0e)
Re-enable Data Guard (Primary site) December 13, 2024 02:06:53
CET December 13, 2024 02:06:59 CET Success
(Host: test_host/Job
ID:
f1b8f204-
da5b-40f4-886f-3dc2d0f71042)
Enable Active Data Guard (Standby December 13, 2024 02:06:59
CET December 13, 2024 02:07:26 CET Success
site) (Host: standby1/Job
d5982a61-
b48d-4449-8cad-2eb41fc89ff9)
Create Data Guard status (Primary December 13, 2024 02:07:26
CET December 13, 2024 02:07:42 CET Success
site) (Host: test host/Job
ID:
e7b6448b-301d-45e5-9a90-4388ac6f55f6)
```

```
Create Data Guard status (Standby December 13, 2024 02:07:42
          December 13, 2024 02:07:58 CET
                                               Success
site) (Host: standby1/Job
ID:
b046c3ca-dcae-47c4-
b904-8fe8fb7cd166)
Validate configure primary request December 13, 2024 02:07:59
CET December 13, 2024 02:08:10 CET Success
(Primary site)
(Host:
test host/Job
ID:
f2cec30f-74ee-44e3-bbbc-
f6bc47bcc781)
Validate configure standby request December 13, 2024 02:08:10
CET December 13, 2024 02:08:26 CET
(Standby site)
(Host:
standby2/Job
ID:
f170c64f-347b-4606-af31-
dbb4c0abaccf)
Uploading Primary DB Password File December 13, 2024 02:08:26
CET December 13, 2024 02:08:57 CET Success
(Standby
site)
Configure primary database (Primary December 13, 2024 02:08:57
CET December 13, 2024 02:09:23 CET Success
site) (Host: test host/Job
ID:
f680835a-3813-433e-
bcc3-8d49ae235833)
Configure standby request (Standby December 13, 2024 02:09:23
CET December 13, 2024 02:11:02 CET Success
site) (Host: standby2/Job
ID:
d66ef480-0810-4219-
a5e1-633be0d6fe9a)
Create archive log restore (Primary December 13, 2024 02:11:03
CET December 13, 2024 02:11:36 CET Success
site) (Host: test host/Job
ID:
```

```
ae4e5f3d-6792-44c4-8971-
df41ae212a04)
Configure standby TNS entry (New December 13, 2024 02:11:36
            December 13, 2024 02:11:54 CET
standby site)
(Host:
standby2/Job
27bbe14a-6f7d-4a7f-
bded-9d530327090f)
Configure standby TNS entry (Existing December 13, 2024 02:11:54
          December 13, 2024 02:12:13 CET
                                                Success
standby site)
(Host:
standby1/Job
dcf53474-
d649-452f-818a-4fe069e9761e)
Add standby database (Primary site) December 13, 2024 02:12:13
CET December 13, 2024 02:13:38 CET Success
(Host: test host/Job
ID:
2ffb36d8-74a0-4dc4-9f79-
cc74223f1016)
Enable Flashback (Standby site) (Host: December 13, 2024 02:13:38
            December 13, 2024 02:14:00 CET
                                                Success
standby2/Job
ID:
01a23d42-
d49a-4b61-9c28-19e9f7639800)
Re-enable Data Guard (Primary site) December 13, 2024 02:14:00
CET December 13, 2024 02:14:06 CET Success
(Host: test host/Job
f416981a-99c1-4c0a-
ab72-2bbb5a0e3a40)
Enable Active Data Guard (Standby December 13, 2024 02:14:06
CET December 13, 2024 02:14:32 CET Success
site) (Host: standby2/Job
ID:
99618fc7-0500-4275-8ea2-
```

```
f65a8b4e8f77)
Update Data Guard status (Primary December 13, 2024 02:14:32
    December 13, 2024 02:14:48 CET Success
site) (Host: test host/Job
ID:
14b4526c-
eebe-410a-920e-396df5216c93)
Create Data Guard status (Standby December 13, 2024 02:14:48
            December 13, 2024 02:15:15 CET
                                                  Success
site) (Host: standby2/Job
ID:
090f829d-7f80-4481-800c-
c9c6115a4be2)
Update Data Guard status (Old Standby December 13, 2024 02:15:15
            December 13, 2024 02:15:31 CET
site) (Host: standby1/Job
afc0a2b3-18ad-461c-a13d-ec688427c6e6)
```

You can specify a JSON file to configure Oracle Data Guard. Ensure that you specify the databaseName and standbyEndpoints options in the JSON file.

```
{
   "name": "tdb DG",
    "protectionMode": "MAX PERFORMANCE",
    "enableFlashback": true,
    "enableActiveDg": "false",
    "databaseName": "tdb",
                                        ==> newly added mandatory field
    "replicationGroups": [
        {
            "sourceEndPoints": [
                {
                    "endpointType": "PRIMARY",
                    "hostName": "host name",
                    "listenerPort": 1521,
                    "databaseUniqueName": "tdb",
                    "ipAddress": "xx.xx.xx.xx" ==> VIP of the
corresponding network
            ],
            "targetEndPoints": [
                    "endpointType": "STANDBY",
                    "hostName": "host name",
                    "listenerPort": 1521,
                    "databaseUniqueName": "tdbstndby",
                    "ipAddress": "xx.xx.xx.xx"
            ],
```

```
"transportType": "SYNC"

}

],

"standbyEndpoints": [ ==> newly added optional field

{
         "name": "endpoint_test",
         "dcsUserName": "oda-admin"
      }

]
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

# Configuring Oracle Data Guard with one standby database on Oracle Database Appliance using JSON file

```
# /opt/oracle/dcs/bin/odacli configure-dataguard --requestjson /mnt/host1/
nfsbackup/dgcmd.json
Number of standby databases (enter 1 or 2 | default: 1):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Primary database SYS password:
Standby database's SYS password will be set to Primary database's after Data
Guard configuration. Ignore warning and proceed with Data Guard
configuration? (Y/N, default:N): Y
  "jobId" : "73adf616-3b6c-452f-bf93-e95abc675cc5",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "January 23, 2025 05:08:50 AM UTC",
  "resourceList" : [ ],
  "description" : "DG Config service for DB tdb",
  "updatedTime" : "January 23, 2025 05:08:50 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
}
[root@host1 work]# /opt/oracle/dcs/bin/odacli describe-job -i
73adf616-3b6c-452f-bf93-e95abc675cc5
Job details
                     ID: 73adf616-3b6c-452f-bf93-e95abc675cc5
            Description: DG Config service for DB tdb
                 Status: Success
                Created: January 23, 2025 05:08:50 UTC
                Message:
Task Name
                                         Start
Time
                                   End Time
Status
```

```
______
Validate configure primary request January 23, 2025 05:09:19
            January 23, 2025 05:09:30 UTC Success
(Primary site) (Host:
host1/Job
ID:
7bd1a3d5-2f8c-4d9e-
a381-61d04f01b514)
Validate configure standby request January 23, 2025 05:09:30
UTC January 23, 2025 05:09:43 UTC Success
(Standby site)
(Host:
host2/Job
ID:
18731cf2-bf42-4a3a-
b187-17e93cedbb7c)
Uploading Primary DB Password File January 23, 2025 05:09:43
     January 23, 2025 05:10:03 UTC Success
(Standby
site)
Configure primary database (Primary January 23, 2025 05:10:03
UTC January 23, 2025 05:11:35 UTC
site) (Host: host1/Job
ID:
d3030fe0-8885-42d6-a57f-
ae38baef54af)
Configure standby request (Standby January 23, 2025 05:11:35
           January 23, 2025 05:13:35 UTC
UTC
                                              Success
site)
(Host:
host2/Job
ID:
763881f4-ea4d-43bc-8e6a-
c7f78765c0ff)
Create archive log restore (Primary January 23, 2025 05:13:35
UTC January 23, 2025 05:13:54 UTC Success
site) (Host: host1/Job
ID:
5dfbe653-10c8-420f-
bada-4c0c8cb6a9e1)
Configure and enable Data Guard January 23, 2025 05:13:54
```

```
January 23, 2025 05:15:26 UTC
                                                    Success
(Primary site) (Host:
host1/Job
ID:
137d29a2-9d2c-4ddc-85c8-3a729847e188)
Enable Flashback (Standby site) (Host: January 23, 2025 05:15:26
UTC
              January 23, 2025 05:15:44 UTC
                                                    Success
host2/Job
ID:
70306983-40a2-4039-98cb-57ba5e11e9a5)
Re-enable Data Guard (Primary site) January 23, 2025 05:15:44
              January 23, 2025 05:15:50 UTC
                                                    Success
(Host: host1/Job
ID:
4a5fb2aa-1b0b-45c8-
b2f3-95103c9f1f00)
Create Data Guard status (Primary January 23, 2025 05:15:50
             January 23, 2025 05:15:56 UTC
                                                   Success
site) (Host: host1/Job
ID:
6848b9c1-356f-43ff-
b6e0-5e9b1b01fc53)
Create Data Guard status (Standby January 23, 2025 05:15:56
             January 23, 2025 05:16:09 UTC
site)
(Host:
host2/Job
ID:
3109148f-9ef8-4914-ab43-adab4851e126)
```

# Example JSON for configuring Oracle Data Guard with two standby databases on Oracle Database Appliance

To configure two standby databases using JSON file, you must specify two replicationGroups sections, where sourceEndpoints corresponds to the information about the primary database and targetEndPoints in each replicationGroups section corresponds to each standby database. For example:

```
"name": "dgname",
    "protectionMode": "MAX_PERFORMANCE",
    "databaseName": "vmdb1",
    "enableActiveDg": false,
    "databaseName": "tdb", ==> newly added field
    "standbyEndpoints": [ ==> newly added field
```

```
"name": "endpoint test",
          "dcsUserName": "oda-admin"
 ]
"replicationGroups": [
    "sourceEndPoints": [
     {
        "databaseUniqueName": "vmdb1",
        "ipAddress": "xx.xx.xx.xx",
        "hostName": "host name",
        "listenerPort": 1521
   ],
    "targetEndPoints": [
        "databaseUniqueName": "bvmdb1",
        "ipAddress": "xx.xx.xx.xx",
        "hostName": "host name,
        "listenerPort": 1521
     }
   ],
    "transportType": "ASYNC"
  {
    "sourceEndPoints": [
     {
        "databaseUniqueName": "vmdb1",
        "ipAddress": "xx.xx.xx.xx",
        "hostName": "host name",
        "listenerPort": 1521
   ],
    "targetEndPoints": [
        "databaseUniqueName": "avmdb1",
        "ipAddress": "xx.xx.xx.xx",
        "hostName": "host name",
        "listenerPort": 1521
   ],
    "transportType": "ASYNC"
```

# **Related Topics**

- Configuring Agent Proxy Settings for Object Store Access
   If the Object Store IP address is accessible only through proxy setup by the Oracle
   Database Appliance server, then define the proxy setting for the agent, so that the agent
   can access the Object Store.
- https://www.oracle.com/in/database/technologies/high-availability/maa.html

# Configuring Oracle Data Guard on Oracle Database Appliance Using BUI

Oracle Database Appliance enables you to set up Oracle Data Guard using BUI.

### **Prerequisites for Oracle Database Guard Configuration**

## Before you begin:

- Oracle recommends running the primary and the standby databases on separate Oracle Database Appliance hardware, so ensure that you have at least two separate Oracle Database Appliance machines.
- Oracle recommends that the primary and standby systems have the same Oracle
  Database Appliance configuration. The database must have identical configuration for
  database version and storage, that is, they must have either Oracle ASM or Oracle ACFS
  storage, to avoid any unpredictability with the database switch roles.
- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.26 or later.
- If you have customized the operating system, then ensure that environments on the systems are identical.
- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices. See the Oracle Maximum Availability Architecture (MAA) page on Oracle Technology Network.
- If you decide to use Oracle ObjectStore for backup and recovery, then you must configure access for the primary and standby systems.
- Ensure that the backup for for primary and standby databases is set up. You can use either
  Object Store or External FRA (NFS) to set up the backup for primary and standby
  databases when configuring Oracle Data Guard on Oracle Database Appliance. A backup
  is necessary to instantiate a standby database.

## **Configuring Oracle Data Guard using BUI**

#### Follow these steps:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- Click Database.
- 3. In the Database page, click on the database to view the database details.
- **4.** In the Database details page, click the **Dataguard Associations** tab. The Oracle Data Guard configurations associated with the database are displayed.
- 5. To configure an Oracle Data Guard configuration, click **Configure**.
- 6. In the System Information tab, you can use a JSON file to provide the Oracle Data Guard configuration values or specify the values for each field.
- 7. To configure Oracle Data Guard using JSON file, in the System Information tab, click **Browse** and load the configuration.
- 8. Or, specify the **Dataguard Configuration Name** and **Select Protection Mode**. The **Database name** field is already populated.
- 9. Select Enable Active Dataguard, if you want to enable Oracle Active Data Guard.



- 10. In the Primary Information tab, specify the VIP of the Associated Network, Listener Port, Database SYS Password, and Backup Encryption Passwords. For high-availability systems, specify the Node 0 VIP of the Associated Network, Node 1 Primary Host Name, and Node 1 VIP of the Associated Network.
- 11. In the Standby Information tab, specify the Standby Host Name, VIP of the Associated Network, BUI User, BUI Password, System User, Database Unique Name, Database SYS Password, Listener Port, and Select Transport Type. For high-availability systems, specify the Node 0 Standby Host Name, Node 0 VIP of the Associated Network, Node 1 Standby Host Name, and Node 1 VIP of the Associated Network.
- 12. You can add multiple standby Oracle Data Guard configurations. Click Add Standby to add a new standby Oracle Data Guard configuration. A new Standby Information tab is opened for each new standby you add.
- 13. For each new standby, specify the Standby Host Name, VIP of the Associated Network, BUI User, BUI Password, System User, Database Unique Name, Database SYS Password, Listener Port, and Select Transport Type. For high-availability systems, specify the Node 0 Standby Host Name, Node 0 VIP of the Associated Network, Node 1 Standby Host Name, and Node 1 VIP of the Associated Network.
- 14. Click Save Configuration if you want to save the configuration as a JSON file.
- **15.** Click **Configure** and click **Yes** to confirm. Verify that the job is submitted and completes successfully.

Example JSON for configuring Oracle Data Guard on Oracle Database Appliance

```
"name": "test1 test7",
"databaseName": "test",
"protectionMode": "MAX PERFORMANCE",
"enableFlashback": true,
"enableActiveDg": false,
"replicationGroups": [
    "sourceEndPoints": [
        "endpointType": "PRIMARY",
        "hostName": test domain1",
        "listenerPort": 1521,
        "databaseUniqueName": "test1",
        "ipAddress": "test IPaddress"
      },
    "endpointType": "PRIMARY",
    "hostName": "test domain1",
    "listenerPort": 1521,
    "databaseUniqueName": "test1",
    "ipAddress": "test IPaddress2"
    ],
    "targetEndPoints": [
        "endpointType": "STANDBY",
        "hostName": "test domain2",
        "listenerPort": 1521,
        "databaseUniqueName": "test7",
```



```
"ipAddress": "test_IPaddress3"
},

{
    "endpointType": "STANDBY",
    "hostName": "test_domain2",
    "listenerPort": 1521,
    "databaseUniqueName": "test7",
    "ipAddress": "test_IPaddress4"
    }
    ],
    "transportType": "ASYNC"
}
]
```

### **Related Topics**

- Configuring Agent Proxy Settings for Object Store Access
   If the Object Store IP address is accessible only through proxy setup by the Oracle
   Database Appliance server, then define the proxy setting for the agent, so that the agent
   can access the Object Store.
- https://www.oracle.com/in/database/technologies/high-availability/maa.html

# Viewing Oracle Data Guard Status on Oracle Database Appliance

View Oracle Data Guard status using ODACLI commands.

# Viewing Oracle Data Guard Status using ODACLI commands

Follow these steps:

 To view the status of primary and standby databases in your Oracle Data Guard configuration, use the following command:

```
# odacli list-dataguardstatus
```

 To view the status of your specific Oracle Data Guard configuration, use the following command:

```
# odacli describe-dataguardstatus -i 5f0ed48a-366d-454c-a389-fe367772dbb7
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

#### **Related Topics**

odacli Oracle Data Guard Commands
 Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle
 Database Appliance deployment.



# Viewing Oracle Data Guard Status on Oracle Database Appliance Using BUI

View Oracle Data Guard status using BUI.

### Listing and Viewing Oracle Data Guard Status using BUI

### Follow these steps:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- Click Database.
- 3. In the Database page, click on the database to view the database details.
- In the Database details page, click the **Dataguard Associations** tab.
   The Oracle Data Guard configurations associated with the database are displayed.
- To view the status of a specific Oracle Data Guard configuration, from the Actions dropdown list of the Oracle Data Guard configuration, select View.

### **Related Topics**

odacli Oracle Data Guard Commands
 Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle
 Database Appliance deployment.

# Performing Oracle Data Guard Operations

Perform failover, switchover, and reinstate operations on Oracle Data Guard using ODACLI commands.

## Performing Oracle Data Guard operations using ODACLI commands

#### Follow these steps:

• To switch roles between the primary database and standby database in your Oracle Data Guard configuration, run the following command on the **primary** system. Specify the standby database unique name with the -u option.

```
# odacli switchover-dataguard -i dg_ID -u
standby db unique name to switchover
```

# For example:

```
# odacli switchover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u test db2
```

### Confirm that the switchover of roles completed successfully:

# odacli describe-dataguardstatus -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19



 A failover provides for transitioning a standby database in your configuration to take over the primary database role, if all instances of an Oracle RAC primary database fail, or are unreachable.

To failover a standby database to the primary database in your Oracle Data Guard configuration, run the following command on your current **standby** system.

```
# odacli failover-dataguard -i dg_ID -u
standby db unique name to failover to
```

# For example:

```
\# odacli failover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u test db2
```

Confirm that the requested database failover to the new primary database has completed successfully:

```
# odacli describe-dataguardstatus -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19
```

 To reinstate a failed primary database after a failover and convert it to a new standby database in your Oracle Data Guard configuration, run the following command on your new primary system.

```
# odacli reinstate-dataguard -i dg ID -u db unique name to reinstate
```

#### For example:

```
# odacli reinstate-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u
test db2
```

Confirm that the requested database is reinstated as a new standby database:

```
# odacli describe-dataguardstatus -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

# **Related Topics**

odacli Oracle Data Guard Commands
 Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

# Performing Oracle Data Guard Operations Using BUI

Perform failover, switchover, and reinstate operations on Oracle Data Guard using BUI.

Performing switchover, failover, and reinstate Oracle Data Guard operations using BUI Follow these steps:

1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html

- Click Database.
- In the Database page, click on the database to view the database details.
- 4. In the Database details page, click the **Dataguard Associations** tab. The Oracle Data Guard configurations associated with the database are displayed.
- You can perform switchover operation only from the primary Oracle Data Guard Association using the BUI. From the **Actions** drop-down list of the Oracle Data Guard configuration, select **Switchover**.
- In the Confirmation message, verify the DB Unique Name and Target Database Password, and click Yes.
- You can perform failover operation only from the standby Oracle Data Guard Association using the BUI. From the **Actions** drop-down list of the Oracle Data Guard configuration, select **Failover**.
- In the Confirmation message, verify the DB Unique Name and Target Database Password, and click Yes.
- 9. You can perform reinstate operation only from the primary Oracle Data Guard Association using the BUI. To reinstate an Oracle Data Guard configuration, from the Actions dropdown list of the Oracle Data Guard configuration, select Reinstate.
- In the Confirmation message, verify the DB Unique Name and Target Database Password, and click Yes.

## **Related Topics**

odacli Oracle Data Guard Commands
 Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle
 Database Appliance deployment.

# Creating an Oracle Data Guard Network

Create an Oracle Data Guard network and associate it with a database using ODACLI commands.

### Configuring an Oracle Data Guard Network using ODACLI commands

You can configure Oracle Data Guard using a network of type Public, Database, or Dataguard.

#### Follow these steps:

1. Create the network:

```
# odacli create-network -n btbond1 -t VLAN -p 192.209.10.227 -w Dataguard - no-d -s 255.255.255.240 -v 369 -g 192.209.10.225
```

2. View the new network:

# odacli list-networks



```
INTERNAL 255.255.240 [ IP Address on node0: 192.168.16.24 ] la312239-761d-4321-84d2-8da406f21e5c Public-network btbond1.359 VLAN 255.255.255.240 10.209.10.65 359 [ IP Address on node0: 192.209.10.69 ] f279ac96-5a4a-4b73-86af-1afbdb6ae5d4 vlan369 btbond1.369 VLAN 255.255.255.240 10.209.10.225 369 [ IP Address on node0: 192.209.10.227]
```

3. To attach a network of type Dataguard to a database:

```
# odacli modify-database -in test db -an vlan369
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

# **Related Topics**

odacli Oracle Data Guard Commands
 Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle
 Database Appliance deployment.

# Migrating an Oracle Database from One System to Another Using Integrated Oracle Data Guard

Understand how you can use Integrated Oracle Data Guard to migrate an Oracle Database from one system to another.

#### Migrating Oracle Data Guard Database using ODACLI commands

If your database is on an old Oracle Database Appliance hardware model, and you want to move your deployment to a new Oracle Database Appliance hardware, then you can use your Oracle Data Guard configuration on Oracle Database Appliance to migrate from one system to another. The same steps can also be applied to migrate an Oracle Database from an Oracle Database Appliance bare Metal system to a DB system in a KVM deployment, or from one DB system in a KVM deployment to another DB system.

#### Before you begin:

- Oracle recommends running the primary and the standby databases on separate Oracle
  Database Appliance hardware, so ensure that you have at least two separate Oracle
  Database Appliance machines.
- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.8 or later. The instances on the primary and standby databases must have similar configuration for database parameter settings including database version, memory, CPU, networking, and storage (Oracle ASM or Oracle ACFS), thus avoiding any unpredictability when the databases switch roles.
- If you have customized the operating system, then ensure that environments on both machines are identical.
- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices.

#### Follow these steps:



Take a backup of your primary database to Object Store or External FRA (NFS).

```
# odacli create-backup primary DB
```

# For example:

```
# odacli create-backup --backupType Regular-LO -n test db
```

2. Save the backup report:

```
# odacli describe-backupreport -i eba406c7-ae46-4d1d-a1e5-3e985397b171 >
backup report test db 0620.json
```

The backup report ID is the ID of the backup created in step 1 and can be obtained by running the odacli list-backupreports command.

Copy the backup report to the standby system and restore the backup to a standby database.

```
# odacli irestore-database -ro STANDBY
```

If your backup option is Object Store, then specify the Object Store location:

```
# odacli irestore-database -r backup_report.json -u dbUniqueName -on
objectStoreName -bp -ro STANDBY -dh
Password for SYS user:
Rman Backup Encryption Password(s). Multiple passwords needs to be comma
separated.:
```

If your backup option is NFS, then specify the NFS location:

```
odacli irestore-database -r backup_report.json -u dbUniqueName -ro STANDBY Password for SYS user:
```

4. Configure Oracle Data Guard, by running the following command on the primary system:

Data Guard configuration name: tdb\_dg
Database name for Data Guard configuration: tdb
Primary database SYS password:
Protection mode [MAX\_PROTECTION, MAX\_PERFORMANCE, MAX\_AVAILABILITY]
(default: MAX\_PERFORMANCE):

```
Enable Active Data Guard (Y/N, default:N):
****************
Data Guard default settings for standby database - tdbstndby
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N): N
Enter Primary database RMAN backup encryption password if any:
Do you want to provide another Primary database RMAN backup encryption
password if any? [y/n] (default 'n'):
Standby database's SYS password will be set to Primary database's after
Data Guard configuration. Ignore warning and proceed with Data Guard
configuration? (Y/N, default:N): Y
 "jobId" : "e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a",
 "status" : "Created",
 "message" : "",
 "reports" : [ ],
 "createTimestamp": "January 23, 2025 03:12:44 AM UTC",
 "resourceList" : [ ],
 "description" : "DG Config service for DB tdb",
 "updatedTime" : "January 23, 2025 03:12:44 AM UTC",
 "jobType" : null,
 "cpsMetadata" : null
[root@phxdbfzp22 work] # /opt/oracle/dcs/bin/odacli describe-job -i
e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a
Job details
______
                  ID: e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a
          Description: DG Config service for DB tdb
              Status: Success
             Created: January 23, 2025 03:12:44 UTC
             Message:
Task Name
                                   Start
Time
                              End
_____
______
Validate configure primary request January 23, 2025 03:13:10
            January 23, 2025 03:13:21 UTC
(Primary site) (Host:
phxdbfzp22/Job
ID:
```



```
901389f5-0cad-4ee6-91be-3f77b85652af)
Validate configure standby request January 23, 2025 03:13:21
UTC January 23, 2025 03:13:29 UTC Success
(Standby site)
(Host:
                                    host1/Job
ID:
856d86e4-dd51-41a7-9050-
b0c39ae771f9)
Uploading Primary DB Password File January 23, 2025 03:13:29
UTC January 23, 2025 03:13:52 UTC Success
(Standby
site)
Configure primary database (Primary January 23, 2025 03:13:52
UTC January 23, 2025 03:15:29 UTC Success
site) (Host: phxdbfzp22/Job
ID:
5dd46e86-
e07f-423f-9ebf-2515b4ac17d5)
Configure standby request (Standby January 23, 2025 03:15:29
            January 23, 2025 03:17:30 UTC Success
UTC
site)
(Host:
host1/Job
ID:
2ab511a2-15c0-4371-
bf30-9b7e27ff5288)
Create archive log restore (Primary January 23, 2025 03:17:30
UTC January 23, 2025 03:17:52 UTC
site) (Host: phxdbfzp22/Job
ID:
96766874-6537-4972-81a9-971440e2acfb)
Configure and enable Data Guard January 23, 2025 03:17:53
UTC January 23, 2025 03:19:19 UTC Success
(Primary site) (Host:
phxdbfzp22/Job
ID:
7ad65ffa-ea06-479d-bb21-
e0b81fb8c743)
Enable Flashback (Standby site) (Host: January 23, 2025 03:19:19
    January 23, 2025 03:19:38 UTC Success
host1/Job
```

```
ID:
a1768703-4dd4-4f1f-
b9a3-9fe0f99615d5)
Re-enable Data Guard (Primary site) January 23, 2025 03:19:38
             January 23, 2025 03:19:44 UTC
(Host: phxdbfzp22/Job
ID:
3f6dd276-63e3-4804-a179-
e10052386206)
Create Data Guard status (Primary January 23, 2025 03:19:44
             January 23, 2025 03:19:49 UTC
                                                   Success
site) (Host: phxdbfzp22/Job
ID:
8a3eb946-3501-4618-9d4a-
ad8a6d298cc8)
Create Data Guard status (Standby January 23, 2025 03:19:49
          January 23, 2025 03:19:57 UTC
                                                   Success
site)
(Host:
host1/Job
ID:
d9d65942-6284-40d5-a991-b1d21edae96f)
```

5. Check the status of Oracle Data Guard and ensure it is working:

```
# odacli describe-dataguardstatus -i dataguard configuration ID
```

**6.** Switch over to the standby database:

```
\# odacli switchover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u houdg02
```

7. Deconfigure Oracle Data Guard. The process also deletes the standby database on the old Oracle Database Appliance hardware machine.

```
# /opt/oracle/dcs/bin/odacli deconfigure-dataguard --id "ee22f382-
b04e-4658-a6c7-ab00fc7e3270"
Number of standby databases (enter 1 or 2 | default: 1):
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter 'oda-admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): oda-admin
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby database will be deleted after Data Guard configuration is
removed. Ignore warning and proceed with Data Guard deconfiguration?
(Y/N): Y
```

```
"jobId": "0613c649-3da6-463a-8359-2f6d7d17399b",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp" : "January 23, 2025 03:42:41 AM UTC",
  "resourceList" : [ ],
  "description" : "DG Deconfig service",
  "updatedTime" : "January 23, 2025 03:42:41 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@phxdbfzp22 work]# /opt/oracle/dcs/bin/odacli describe-job -i
0613c649-3da6-463a-8359-2f6d7d17399b
Job details
                    ID: 0613c649-3da6-463a-8359-2f6d7d17399b
           Description: DG Deconfig service
                Status: Success
               Created: January 23, 2025 03:42:41 UTC
               Message:
Task Name
                                        Start
Time
                                  End
Time
De-configure Dataguard (Primary site) January 23, 2025 03:42:44
              January 23, 2025 03:44:22 UTC
                                                     Success
(Host: phxdbfzp22/Job
ID:
93758e42-2cf4-4aa1-949e-
b6018c1c35d7)
Delete Dataguard Status(Primary site) January 23, 2025 03:44:22
             January 23, 2025 03:44:28 UTC
                                                    Success
(Host: phxdbfzp22/Job
ID:
e090af71-9c6d-4d14-8e16-3c64c4aa7f14)
Delete Dataguard Status (Standby site) January 23, 2025 03:44:28
UTC
              January 23, 2025 03:44:36 UTC
                                                    Success
(Host:
host1/Job
ID:
a5bf022a-
c1ca-4c1a-8747-4ff6a0e938c0)
Delete Standby Database (Standby site) January 23, 2025 03:44:36
```

```
UTC
               January 23, 2025 03:46:07 UTC
                                                          Success
(Host:
host1/Job
ID:
f93b1f26-69d9-4690-84f9-4c0c9947423a)
```

For more information about these command options, see the Oracle Database Appliance Command Line Reference chapter in this guide.

# **Related Topics**

odacli Oracle Data Guard Commands Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

# Patching Oracle Data Guard Databases on Oracle Database **Appliance**

Understand how you can patch primary and standby databases on Oracle Data Guard using ODACLI commands.

## Prerequisites for patching Oracle Data Guard primary and standby databases using **ODACLI** commands

Before patching the database homes, upload the Oracle Database clone files for the database version, to the repository. See Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI for the procedure to update the repository with the latest Oracle Database clone files. Also ensure that the primary Oracle Database Appliance system and the standby Oracle Database Appliance system are on the same Oracle Database Appliance release. It is recommended that the two systems be on the latest Oracle Database Appliance release. See Patching Oracle Database Appliance Bare Metal Systems Using the Command-*Line* for the procedure to patch your Oracle Database Appliance deployment.



### Important:

Patch the standby database on Oracle Database Appliance first, before patching the primary database to ensure that all functions are updated correctly. Patching the standby first may affect Oracle Active Data Guard OJVM functionality. Hence, ensure that you patch the standby system first, and then patch the primary system immediately after that.

# Patching Oracle Data Guard primary and standby databases using odacli updatedatabase command

You can use the odacli update-database command to update the databases in your Oracle Data Guard configuration. Follow these steps for patching databases in your Oracle Data Guard configuration:

Patching workflow with primary database A and standby database B:



Create prepatch report for database B:

```
# odacli create-prepatchreport -db -dbid databaseId -to dbhomeid
```

2. Update standby database B:

```
# odacli update-database -i databaseId -to dbhomeId
```

3. Switch roles between the primary database and standby database in your Oracle Data Guard configuration, by running the following command on the primary system:

```
# odacli switchover-dataguard -i dgid -u db A
```

4. Create prepatch report for database A:

```
# odacli create-prepatchreport -db -dbid databaseId -to dbhomeid
```

5. Update database A:

```
# odacli update-database -i databaseId -to dbhomeid
```

6. Switch roles again between the primary database and standby database in your Oracle Data Guard configuration, by running the following command on the primary system:

```
# odacli switchover-dataguard -i dgid -u db A
```

7. Create a prepatch report for the datapatch for database A:

```
# odacli create-prepatchreport -dp -dbid databaseId
```

8. Apply datapatch on database A:

```
# odacli update-database -i databaseId -dp
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Patching Oracle Data Guard primary and standby databases using odacli updatedbhome command

Follow these steps to patch the databases in your Oracle Data Guard configuration on Oracle Database Appliance:

1. Run the following command on the standby database:

```
# odacli update-dbhome
```

2. After patching job on the standby database is successful, run the following command on the primary database:

```
# odacli update-dbhome
```



Confirm that the patching jobs are successful:

```
# /opt/oracle/dcs/bin/odacli list-jobs
```

4. Confirm the existing Data Guard configuration is working properly by running the following command on both primary and standby systems:

```
odacli describe-dataguardstatus -i dgid
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

# **Enabling Oracle Active Data Guard on Existing Configurations**

Understand how you can enable Oracle Active Data Guard on existing configurations.

Oracle Active Data Guard is licensed option to the Oracle Database Enterprise Edition and enables advanced capabilities that extend the basic Oracle Data Guard functionality.

Oracle Active Data Guard function requires database to be open as read-only while enabling the *redo log apply* option. Follow these steps to enable Oracle Active Data Guard on existing configurations:

1. Modify database to have read-only start option:

```
srvctl modify database -d standby_db_unique_name -startoption "read only"
srvctl stop database -d standby_db_unique_name
srvctl start database -d standby_db_unique_name
```

To check if Oracle Data Guard has read-only start option set, run the following command:

```
srvctl config database -d standby db unique name | grep "Start options"
```

Enable redo log apply by running the following PL/SQL commands:

```
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL;
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;
```

# Registering Oracle Data Guard on Oracle Database Appliance Using ODACLI Commands

Oracle Database Appliance enables you to migrate Oracle Data Guard configuration that were manually configured, and register the configuration metadata with Oracle Database Appliance using ODACLI commands.

### **Prerequisites for Oracle Database Guard Registration**

Before you begin:

Oracle recommends running the primary and the standby databases on separate Oracle Database Appliance hardware, so ensure that you have at least two separate Oracle Database Appliance machines.

- Oracle recommends that the primary and standby systems have the same Oracle
  Database Appliance configuration. The database must have identical configuration for
  database version and storage, that is, they must have either Oracle ASM or Oracle ACFS
  storage, to avoid any unpredictability with the database switch roles.
- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.23 or later.
- If you have customized the operating system, then ensure that environments on the systems are identical.
- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices. See the Oracle Maximum Availability Architecture (MAA) page on Oracle Technology Network.

### Registering Oracle Data Guard using ODACLI commands

### Follow these steps:

1. Register Oracle Data Guard with Oracle Database Appliance, in one of the following ways: Register Oracle Data Guard using interactive mode:

```
[root@node1 ~]# odacli register-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: host2
BUI username for Standby site host2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site host2, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin):
BUI password for Standby site host2:
Password for root user on Standby site host2:
Standby 2 site address: host3
BUI username for Standby site host3. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site host1, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin):
BUI password for Standby site host3:
Password for root user on Standby site host3:
*******************
*****
Data Guard configuration name: books dgconf
Database name for Data Guard configuration: books
Primary database SYS password:
Protection mode [MAX PROTECTION, MAX PERFORMANCE, MAX AVAILABILITY]
(default: MAX PERFORMANCE):
                         ***********
******
Data Guard default settings for standby database - books ul
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
For standby 'books ul', does the above Data Guard configuration match your
actual configuration? (Y/N, default:N): y
```



```
Data Guard default settings for standby database - books u2
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
For standby 'books u2', does the above Data Guard configuration match your
actual configuration? (Y/N, default:N): y
 "jobId" : "525d4c0d-5d4c-401b-9d7a-add15e1057a5",
 "status" : "Created",
 "message" : "",
 "reports" : [ ],
 "createTimestamp": "December 15, 2024 03:22:40 AM MSK",
 "resourceList" : [ ],
 "description" : "Register Dataguard service for DB a9cca840-
d5f6-4c52-8136-10668ce88c69",
 "updatedTime" : "December 15, 2024 03:22:40 AM MSK",
 "jobType" : null,
 "cpsMetadata" : null
[root@host1 ~]# odacli describe-job -i 525d4c0d-5d4c-401b-9d7a-add15e1057a5
Job details
                  ID: 525d4c0d-5d4c-401b-9d7a-add15e1057a5
          Description: Register Dataguard service for DB a9cca840-
d5f6-4c52-8136-10668ce88c69
               Status: Success
              Created: December 15, 2024 03:22:40 MSK
              Message:
Task Name
                                     Node Name
                                                     Start
Time
                               End
                                 Status
Time
________
_____
Validate register dataguard primary host1 December 15,
2024 03:23:45 MSK December 15, 2024 03:24:20 MSK
Success
request (Primary site)
(Host:
host1/Job
ID:
e11da95d-
e00e-41b3-9894-8dd7a9ffceb9)
Validate register dataguard standby
                                    host1
                                                    December 15,
2024 03:24:20 MSK December 15, 2024 03:25:05 MSK
Success
request (Standby site)
```

```
(Host:
host2/Job
ID:
6e566598-700c-4154-8056-853df67d15b3)
Validate register dataguard standby host1 December 15,
2024 03:25:05 MSK December 15, 2024 03:25:45 MSK
Success
request (Standby site)
(Host:
host1/Job
ID:
11330cdd-ccdf-4e05-
acf8-2885418a9efc)
Create Data Guard status (Primary host1 December 15,
2024 03:25:45 MSK December 15, 2024 03:26:07 MSK
Success
site) (Host: host1/Job
a779a3d6-709a-4a1c-
a649-9fbf373624ed)
Create Data Guard status (Standby host1 December 15,
2024 03:26:07 MSK December 15, 2024 03:26:34 MSK
Success
site) (Host: host2/Job
ID:
9233aea0-021a-4790-
b359-60de42d50526)
Create Data Guard status (Standby host1
                                           December 15,
2024 03:26:34 MSK December 15, 2024 03:27:01 MSK
Success
site) (Host: host1/Job
ID:
79f7ec79-fb43-4f57-8f05-da37afbe275b)
```

# Oracle Data Guard status on the primary system:

```
# odacli list-dataguardstatus
Updated about 2 minute(s) ago
It can take up to several minutes to update Data Guard status. You can re-
run the command to obtain the latest status.
ΙD
                 Role
                            Protection Mode
Database Name
                                                Status
```

```
books dgconf
a3543f5a-63a8-42c3-abcc-a8e180a1dd25
                     PRIMARY MAX PERFORMANCE CONFIGURED
[root@host1 node1 ~]# odacli list-dataguardstatus -j
]
  "id" : "a3543f5a-63a8-42c3-abcc-a8e180a1dd25",
  "name" : "books dgconf",
  "databaseId": "a9cca840-d5f6-4c52-8136-10668ce88c69",
  "protectionMode" : "MAX PERFORMANCE",
  "role" : "PRIMARY",
  "replicationGroups" : [ {
    "sourceEndPoints" : [ {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "books",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "n1",
      "listenerPort" : 1521,
      "serviceName" : "test service",
      "sysPassword" : null,
      "openMode" : "READ WRITE",
      "state" : {
        "status" : "ENABLED"
    }, {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "books",
      "ipAddress" : "xx.xx.xxx.xxx",
      "hostName" : "host2",
      "listenerPort" : 1521,
      "serviceName" : "test service",
      "sysPassword" : null,
      "openMode" : "READ WRITE",
      "state" : {
        "status" : "ENABLED"
    } ],
    "targetEndPoints" : [ {
      "endpointType" : "STANDBY",
      "databaseUniqueName" : "books u1",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "n2",
      "listenerPort" : 1521,
      "serviceName" : "test service",
      "sysPassword" : null,
      "openMode" : null,
      "state" : {
        "status" : "ENABLED"
    }, {
      "endpointType" : "STANDBY",
      "databaseUniqueName" : "books u1",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "host_name",
      "listenerPort" : 1521,
      "serviceName" : "test service",
      "sysPassword" : null,
```

```
"openMode" : null,
  "state" : {
   "status" : "ENABLED"
} ],
"transportType" : "ASYNC",
"applyLag" : "0 seconds",
"transportLag" : "0 seconds",
"approximateRoleTransitionTime" : "30 seconds",
"applyRate" : "12.00 KByte/s"
"sourceEndPoints" : [ {
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "n1",
  "listenerPort" : 1521,
  "serviceName" : "test service",
  "sysPassword" : null,
  "openMode" : "READ WRITE",
  "state" : {
   "status" : "ENABLED"
}, {
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.x.xx.xxx",
  "hostName" : "host2",
  "listenerPort" : 1521,
  "serviceName" : "test service",
  "sysPassword" : null,
  "openMode" : "READ WRITE",
  "state" : {
   "status" : "ENABLED"
} ],
"targetEndPoints" : [ {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u2",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "host1",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
   "status" : "ENABLED"
}, {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u2",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "host1",
  "sysPassword" : null,
```

```
"openMode" : null,
      "state" : {
       "status" : "ENABLED"
   } ],
   "transportType" : "ASYNC",
   "applyLag" : "0 seconds",
   "transportLag" : "0 seconds",
   "approximateRoleTransitionTime" : "30 seconds",
   "applyRate" : "5.00 KByte/s"
 "observers" : [ ],
 "createTime": "December 15, 2024 03:25:48 AM MSK",
 "state" : {
   "status" : "CONFIGURED"
 "updatedTime" : "December 15, 2024 03:26:06 AM MSK"
[root@host1_node2 ~]# odacli list-dataguardstatus -j
]
 "id" : "a3543f5a-63a8-42c3-abcc-a8e180a1dd25",
 "name" : "books dgconf",
 "databaseId": "a9cca840-d5f6-4c52-8136-10668ce88c69",
 "protectionMode" : "MAX PERFORMANCE",
 "role" : "PRIMARY",
 "replicationGroups" : [ {
   "sourceEndPoints" : [ {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "books",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "n1",
      "listenerPort" : 1521,
      "serviceName" : "test service",
      "sysPassword" : null,
      "openMode" : "READ WRITE",
      "state" : {
       "status" : "ENABLED"
   }, {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "books",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "host2",
      "listenerPort" : 1521,
      "serviceName" : "test_service",
      "sysPassword" : null,
      "openMode" : "READ WRITE",
      "state" : {
       "status" : "ENABLED"
   } ],
   "targetEndPoints" : [ {
      "endpointType" : "STANDBY",
      "databaseUniqueName" : "books u1",
      "ipAddress" : "xx.xx.xx.xx",
```

```
"hostName" : "n2",
  "listenerPort" : 1521,
  "serviceName" : "test service",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
    "status" : "ENABLED"
}, {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u1",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "test service",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
    "status" : "ENABLED"
} ],
"transportType" : "ASYNC",
"applyLag" : "0 seconds",
"transportLag" : "0 seconds",
"approximateRoleTransitionTime" : "30 seconds",
"applyRate" : "12.00 KByte/s"
"sourceEndPoints" : [ {
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "n1",
  "listenerPort" : 1521,
  "serviceName" : "test service",
  "sysPassword" : null,
  "openMode" : "READ WRITE",
  "state" : {
    "status" : "ENABLED"
}, {
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host2",
  "listenerPort" : 1521,
  "serviceName" : "test_service",
  "sysPassword" : null,
  "openMode" : "READ WRITE",
  "state" : {
    "status" : "ENABLED"
} ],
"targetEndPoints" : [ {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u2",
  "ipAddress" : "x.xx.xxx.xx",
```

```
"hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "host1",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
 }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "host1",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
 "approximateRoleTransitionTime" : "30 seconds",
  "applyRate" : "5.00 KByte/s"
"observers" : [ ],
"createTime": "December 15, 2024 03:25:48 AM MSK",
"state" : {
 "status" : "CONFIGURED"
},
"updatedTime" : "December 15, 2024 03:26:06 AM MSK"
```

#### Oracle Data Guard status on the first standby system:

```
# odacli list-dataguardstatus
Updated about 3 minute(s) ago
It can take up to several minutes to update Data Guard status. You can re-
run the command to obtain the latest status.
Database Name Role Protection Mode
                                            Status
___________
a3543f5a-63a8-42c3-abcc-a8e180a1dd25 books dgconf
        STANDBY MAX PERFORMANCE CONFIGURED
[root@host2 node1 ~]# odacli list-dataguardstatus -j
 "id" : "a3543f5a-63a8-42c3-abcc-a8e180a1dd25",
 "name" : "books dgconf",
 "databaseId" : "d2ccb22b-3e31-47cb-967c-1f1fdefea54e",
 "protectionMode" : "MAX PERFORMANCE",
 "role" : "STANDBY",
 "replicationGroups" : [ {
```

```
"sourceEndPoints" : [ {
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "targetEndPoints" : [ {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u1",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service_name",
    "sysPassword" : null,
    "openMode" : "MOUNTED",
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u1",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : "MOUNTED",
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
  "applyRate": "11.00 KByte/s"
}, {
```

```
"sourceEndPoints" : [ {
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "targetEndPoints" : [ {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service_name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
  "applyRate" : "5.00 KByte/s"
} ],
```

```
"observers" : [ ],
  "createTime": "December 15, 2024 00:26:21 AM GMT",
  "state" : {
    "status" : "CONFIGURED"
  "updatedTime" : "December 15, 2024 00:26:31 AM GMT"
[root@host2 node2 bin]# odacli list-dataguardstatus
Updated about 5 minute(s) ago
It can take up to several minutes to update Data Guard status. You can re-
run the command to obtain the latest status.
Database Name Role Protection Mode
                                                  Status
a3543f5a-63a8-42c3-abcc-a8e180a1dd25 books dgconf
books STANDBY MAX PERFORMANCE CONFIGURED
[root@scaoda603c4n2 bin]# odacli list-dataguardstatus -j
  "id" : "a3543f5a-63a8-42c3-abcc-a8e180a1dd25",
  "name" : "books dgconf",
  "databaseId": "d2ccb22b-3e31-47cb-967c-1f1fdefea54e",
  "protectionMode" : "MAX PERFORMANCE",
  "role" : "STANDBY",
  "replicationGroups" : [ {
    "sourceEndPoints" : [ {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "books",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "host_name",
      "listenerPort" : 1521,
      "serviceName" : "service name",
      "sysPassword" : null,
      "openMode" : null,
      "state" : {
       "status" : "ENABLED"
    }, {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "books",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "host name",
      "listenerPort" : 1521,
      "serviceName" : "service name",
      "sysPassword" : null,
      "openMode" : null,
      "state" : {
        "status" : "ENABLED"
    } ],
    "targetEndPoints" : [ {
      "endpointType" : "STANDBY",
      "databaseUniqueName" : "books u1",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "host name",
```

```
"listenerPort" : 1521,
    "serviceName" : "service_name",
    "sysPassword" : null,
    "openMode" : "MOUNTED",
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u1",
    "ipAddress": "10.32.202.58",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : "MOUNTED",
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
  "applyRate" : "11.00 KByte/s"
}, {
  "sourceEndPoints" : [ {
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service_name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "targetEndPoints" : [ {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress": "10.32.202.9",
    "hostName" : "host name",
```

```
"listenerPort" : 1521,
    "serviceName" : "service_name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
 "applyRate" : "5.00 KByte/s"
} ],
"observers" : [ ],
"createTime": "December 15, 2024 00:26:21 AM GMT",
"state" : {
 "status" : "CONFIGURED"
"updatedTime" : "December 15, 2024 00:26:31 AM GMT"
```

#### Oracle Data Guard status on the second standby system:

```
# odacli list-dataguardstatus
Updated about 3 minute(s) ago
It can take up to several minutes to update Data Guard status. You can re-
run the command to obtain the latest status.
ΙD
                                   Name
Database Name
              Role Protection Mode
____________
a3543f5a-63a8-42c3-abcc-a8e180a1dd25 books dgconf
books STANDBY MAX PERFORMANCE CONFIGURED
[root@scaoda603c4n1 ~]# odacli list-dataguardstatus -j
[ {
 "id" : "a3543f5a-63a8-42c3-abcc-a8e180a1dd25",
 "name" : "books dgconf",
 "databaseId": "d2ccb22b-3e31-47cb-967c-1f1fdefea54e",
 "protectionMode" : "MAX PERFORMANCE",
 "role" : "STANDBY",
 "replicationGroups" : [ {
   "sourceEndPoints" : [ {
```

```
"endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service name",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
   "status" : "ENABLED"
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service name",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
   "status" : "ENABLED"
} ],
"targetEndPoints" : [ {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u1",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service_name",
  "sysPassword" : null,
  "openMode" : "MOUNTED",
  "state" : {
   "status" : "ENABLED"
}, {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u1",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service_name",
  "sysPassword" : null,
  "openMode" : "MOUNTED",
  "state" : {
   "status" : "ENABLED"
} ],
"transportType" : "ASYNC",
"applyLag" : "0 seconds",
"transportLag" : "0 seconds",
"approximateRoleTransitionTime" : "30 seconds",
"applyRate" : "11.00 KByte/s"
"sourceEndPoints" : [ {
```

```
"endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort": 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
    "endpointType" : "PRIMARY",
    "databaseUniqueName" : "books",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "targetEndPoints" : [ {
   "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service_name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
  "applyRate" : "5.00 KByte/s"
} ],
"observers" : [ ],
```

```
"createTime": "December 15, 2024 00:26:21 AM GMT",
  "state" : {
   "status" : "CONFIGURED"
  },
  "updatedTime" : "December 15, 2024 00:26:31 AM GMT"
[root@host3 node2 bin]# odacli list-dataguardstatus
Updated about 5 minute(s) ago
It can take up to several minutes to update Data Guard status. You can re-
run the command to obtain the latest status.
ΙD
                   Role
                           Protection Mode
Database Name
                                                Status
    a3543f5a-63a8-42c3-abcc-a8e180a1dd25 books dgconf
                  STANDBY MAX PERFORMANCE CONFIGURED
books
[root@scaoda603c4n2 bin]# odacli list-dataguardstatus -j
[ {
  "id" : "a3543f5a-63a8-42c3-abcc-a8e180a1dd25",
  "name" : "books dgconf",
  "databaseId": "d2ccb22b-3e31-47cb-967c-1f1fdefea54e",
  "protectionMode" : "MAX PERFORMANCE",
  "role" : "STANDBY",
  "replicationGroups" : [ {
   "sourceEndPoints" : [ {
     "endpointType" : "PRIMARY",
     "databaseUniqueName" : "books",
     "ipAddress" : "xx.xx.xx.xx",
     "hostName" : "host name",
     "listenerPort" : 1521,
     "serviceName" : "service name",
     "sysPassword" : null,
     "openMode" : null,
     "state" : {
       "status" : "ENABLED"
   }, {
     "endpointType" : "PRIMARY",
     "databaseUniqueName" : "books",
     "ipAddress" : "xx.xx.xx.xx",
     "hostName" : "host name",
     "listenerPort" : 1521,
     "serviceName" : "service name",
     "sysPassword" : null,
     "openMode" : null,
     "state" : {
       "status" : "ENABLED"
    } ],
    "targetEndPoints" : [ {
     "endpointType" : "STANDBY",
     "databaseUniqueName" : "books u1",
     "ipAddress" : "xx.xx.xx.xx",
     "hostName" : "host name",
     "listenerPort" : 1521,
```

```
"serviceName" : "service name",
  "sysPassword" : null,
  "openMode" : "MOUNTED",
  "state" : {
    "status" : "ENABLED"
}, {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u1",
  "ipAddress" : "10.32.202.58",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service name",
  "sysPassword" : null,
  "openMode" : "MOUNTED",
  "state" : {
   "status" : "ENABLED"
} ],
"transportType" : "ASYNC",
"applyLag" : "0 seconds",
"transportLag" : "0 seconds",
"approximateRoleTransitionTime" : "30 seconds",
"applyRate" : "11.00 KByte/s"
"sourceEndPoints" : [ {
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service_name",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
    "status" : "ENABLED"
}, {
  "endpointType" : "PRIMARY",
  "databaseUniqueName" : "books",
  "ipAddress" : "xx.xx.xx.xx",
  "hostName" : "host name",
  "listenerPort" : 1521,
  "serviceName" : "service name",
  "sysPassword" : null,
  "openMode" : null,
  "state" : {
    "status" : "ENABLED"
} ],
"targetEndPoints" : [ {
  "endpointType" : "STANDBY",
  "databaseUniqueName" : "books u2",
  "ipAddress" : "10.32.202.9",
  "hostName" : "host name",
  "listenerPort" : 1521,
```

```
"serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  }, {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "books u2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
    "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
  "applyRate" : "5.00 KByte/s"
"observers" : [ ],
"createTime" : "December 15, 2024 00:26:21 AM GMT",
"state" : {
  "status" : "CONFIGURED"
},
"updatedTime" : "December 15, 2024 00:26:31 AM GMT"
```

#### Register Oracle Data Guard with two standby systems with JSON file:

```
[root@node1 ~]# odacli register-dataguard -r advregdg.json
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: host2
BUI username for Standby site host2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site host2, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): u1
BUI password for Standby site host2. If Multi-user Access Passwordless is
enabled on Standby site, copy the cwallet.sso file from Standby site (/opt/
oracle/dcs/conf/dcspublickey wallet/) to Primary site (/root/). Rename the
file to 'cwallet.sso.host2', set the file ownership (root:root) and file
permission (0440) and then press enter:
Standby 2 site address: host3
BUI username for Standby site host3. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site host3, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): usr1
BUI password for Standby site host3. If Multi-user Access Passwordless is
enabled on Standby site, copy the cwallet.sso file from Standby site (/opt/
oracle/dcs/conf/dcspublickey wallet/) to Primary site (/root/). Rename the
```

```
file to 'cwallet.sso.host3', set the file ownership (root:root) and file
permission (0440) and then press enter:
Primary database SYS password:
  "jobId": "5c4be2a3-5892-4482-9549-e47005f05548",
  "status" : "Created",
  "message" : "",
  "reports" : [],
  "createTimestamp": "December 19, 2024 01:13:42 AM UYT",
  "resourceList" : [ ],
  "description": "Register Dataguard service for DB 0f56f07e-ale5-4c88-
a535-4cfc7858a80a",
  "updatedTime" : "December 19, 2024 01:13:42 AM UYT",
  "jobType" : null,
  "cpsMetadata" : null
[root@host2 ~]# odacli describe-job -i 5c4be2a3-5892-4482-9549-e47005f05548
Job details
                    ID: 5c4be2a3-5892-4482-9549-e47005f05548
           Description: Register Dataguard service for DB 0f56f07e-
a1e5-4c88-a535-4cfc7858a80a
                Status: Success
               Created: December 19, 2024 01:13:42 UYT
               Message:
Task Name
                                       Start
Time
                                 End
Time
                                   Status
_____
Validate register dataquard primary December 19, 2024 01:13:58
             December 19, 2024 01:14:15 UYT
request (Primary site)
(Host:
host2/Job
ID:
6e0cdfbd-69f8-442c-
be4a-73937e67b938)
Validate register dataquard standby December 19, 2024 01:14:15
             December 19, 2024 01:14:35 UYT
request (Standby site)
(Host:
host2/Job
ID:
f505eec8-533d-4a80-9edc-34ec16008167)
Validate register dataquard standby December 19, 2024 01:14:35
             December 19, 2024 01:15:01 UYT
UYT
                                                    Success
```

```
request (Standby site)
(Host:
host2/Job
ID:
3d8e79e9-15ab-4d7d-
ba92-2f3d0e73852b)
Create Data Guard status (Primary December 19, 2024 01:15:01
UYT December 19, 2024 01:15:07 UYT Success
site) (Host: host2/Job
87591524-9ec4-42f6-
ae3a-1b5eddf4945d)
Create Data Guard status (Standby December 19, 2024 01:15:07
            December 19, 2024 01:15:15 UYT
                                                    Success
site) (Host: host2/Job
ID:
4705752a-24b7-41b5-
b2e5-2c64f6eac3c4)
Create Data Guard status (Standby December 19, 2024 01:15:15
             December 19, 2024 01:15:23 UYT
                                                     Success
site) (Host: host2/Job
ID:
0c7553ba-0f53-49f3-9f7f-8128f7d47e30)
  "name" : "dgconf c2",
  "protectionMode" : "MAX AVAILABILITY",
  "replicationGroups" : [ {
    "sourceEndPoints" : [ {
     "endpointType" : "PRIMARY",
      "databaseUniqueName" : "c2",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "host2",
      "listenerPort" : 1521,
      "serviceName" : "c2",
      "sysPassword" : null
    } ],
    "targetEndPoints" : [ {
    "endpointType" : "STANDBY",
      "databaseUniqueName" : "c2t 2",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "c2t 2",
      "listenerPort" : 1521,
      "serviceName" : "c2t 2",
      "sysPassword" : null
    } ],
    "transportType" : "SYNC"
  }, {
```

```
"sourceEndPoints" : [ {
   "endpointType" : "PRIMARY",
    "databaseUniqueName" : "c2",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host2",
    "listenerPort" : 1521,
    "serviceName" : "c2",
    "sysPassword" : null
  "targetEndPoints" : [ {
     "endpointType" : "STANDBY",
    "databaseUniqueName" : "c2t 1",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host2",
    "listenerPort" : 1521,
    "serviceName" : "c2t 1",
    "sysPassword" : null
  "transportType" : "FASTSYNC"
} ]
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

#### **Related Topics**

https://www.oracle.com/in/database/technologies/high-availability/maa.html

# Registering Oracle Data Guard on Oracle Database Appliance Using BUI

Oracle Database Appliance enables you to migrate Oracle Data Guard configuration that were manually configured, and register the configuration metadata with Oracle Database Appliance using BUI.

#### **Prerequisites for Oracle Database Guard Registration**

#### Before you begin:

- Oracle recommends running the primary and the standby databases on separate Oracle Database Appliance hardware, so ensure that you have at least two separate Oracle Database Appliance systems.
- Oracle recommends that the primary and standby systems have the same Oracle
  Database Appliance configuration. The database must have identical configuration for
  database version and storage, that is, they must have either Oracle ASM or Oracle ACFS
  storage, to avoid any unpredictability with the database switch roles.
- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.26 or later.
- If you have customized the operating system, then ensure that environments on the systems are identical.
- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices. See the Oracle Maximum Availability Architecture (MAA) page on Oracle Technology Network.

#### Registering Oracle Data Guard using BUI

#### Follow these steps:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- 2. Click Database.
- 3. In the Database page, click on the database to view the database details.
- 4. In the Database details page, click the Dataguard Associations tab. The Oracle Data Guard configurations associated with the database are displayed.
- To register an Oracle Data Guard configuration, click Register.
- 6. In the System Information tab, you can use a JSON file to provide the Oracle Data Guard configuration values or specify the values for each field.
- To register Oracle Data Guard using JSON file, in the System Information tab, click Browse and load the configuration.
- 8. Or, specify the **Dataguard Configuration Name** and **Select Protection Mode**. The **Database name** field is already populated.
- 9. Select Enable Active Dataguard, if you want to enable Oracle Active Data Guard.
- 10. In the Primary Information tab, specify the VIP of the Associated Network, Listener Port, Database SYS Password, and Backup Encryption Passwords. For high-availability systems, specify the Node 0 VIP of the Associated Network, Node 1 Primary Host Name, and Node 1 VIP of the Associated Network.
- 11. In the Standby Information tab, specify the Standby Host Name, VIP of the Associated Network, BUI User, BUI Password, System User, Database Unique Name, Database SYS Password, Listener Port, and Select Transport Type. For high-availability systems, specify the Node 0 Standby Host Name, Node 0 VIP of the Associated Network, Node 1 Standby Host Name, and Node 1 VIP of the Associated Network.
- 12. You can add multiple standby Oracle Data Guard configurations. Click **Add Standby** to add a new standby Oracle Data Guard configuration. A new **Standby Information** tab is opened for each new standby you add.
- 13. For each new standby, specify the Standby Host Name, VIP of the Associated Network, BUI User, BUI Password, System User, Database Unique Name, Database SYS Password, Listener Port, and Select Transport Type. For high-availability systems, specify the Node 0 Standby Host Name, Node 0 VIP of the Associated Network, Node 1 Standby Host Name, and Node 1 VIP of the Associated Network.
- 14. Click Save Configuration if you want to save the configuration as a JSON file.
- Click Register and click Yes to confirm. Verify that the job is submitted and completes successfully.

#### Example JSON for registering Oracle Data Guard on Oracle Database Appliance

```
[root@node1 ~]# cat dg.json
{
   "name" : "provdb1_sprovdb",
   "protectionMode" : "MAX_PERFORMANCE",
   "replicationGroups" : [ {
        "sourceEndPoints" : [ {
            "endpointType" : "PRIMARY",
            "databaseUniqueName" : "provdb1",
```



```
"ipAddress": "10.32.65.225",
    "hostName" : "host1.domain.com",
    "listenerPort": 1521,
    "serviceName" : "provdb.domain.com",
    "sysPassword" : null
  } ],
  "targetEndPoints" : [ {
    "endpointType" : "STANDBY",
    "databaseUniqueName" : "sprovdb",
    "ipAddress" : "10.32.65.230",
    "hostName" : "host2.domain.com",
    "listenerPort" : 1521,
    "serviceName" : "sprovdb.domain.com",
   "sysPassword" : null
  } ],
  "transportType" : "ASYNC"
} ]
```

#### **Related Topics**

https://www.oracle.com/in/database/technologies/high-availability/maa.html

## Deconfiguring Oracle Data Guard on Oracle Database Appliance

Deconfigure Oracle Data Guard status using ODACLI commands.

#### **Deconfiguring Oracle Data Guard Status using ODACLI commands**

To deconfigure Oracle Data Guard, you must specify the Oracle Data Guard Configuration ID. Run the odacli list-dataguardstatus command to find the Oracle Data Guard Configuration ID.

#### Follow these steps:

 To deconfigure Oracle Data Guard with one standby database, run the following command on the primary system:

```
# /opt/oracle/dcs/bin/odacli deconfigure-dataguard --id "ee22f382-
b04e-4658-a6c7-ab00fc7e3270"
Number of standby databases (enter 1 or 2 | default: 1):
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the
Standby database (default: oda-admin): oda-admin
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby database will be deleted after Data Guard configuration is
removed. Ignore warning and proceed with Data Guard deconfiguration?
(Y/N): Y
  "jobId": "0613c649-3da6-463a-8359-2f6d7d17399b",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
```

```
"createTimestamp": "January 23, 2025 03:42:41 AM UTC",
  "resourceList" : [ ],
  "description" : "DG Deconfig service",
  "updatedTime": "January 23, 2025 03:42:41 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@n1 oda]# /opt/oracle/dcs/bin/odacli describe-job -i
0613c649-3da6-463a-8359-2f6d7d17399b
Job details
                   ID: 0613c649-3da6-463a-8359-2f6d7d17399b
           Description: DG Deconfig service
               Status: Success
               Created: January 23, 2025 03:42:41 UTC
               Message:
Task Name
                                       Start
Time
                                 End
Time
_____
De-configure Dataguard (Primary site) January 23, 2025 03:42:44
              January 23, 2025 03:44:22 UTC
(Host: phxdbfzp22/Job
ID:
93758e42-2cf4-4aa1-949e-
b6018c1c35d7)
Delete Dataguard Status(Primary site) January 23, 2025 03:44:22
             January 23, 2025 03:44:28 UTC
(Host: phxdbfzp22/Job
ID:
e090af71-9c6d-4d14-8e16-3c64c4aa7f14)
Delete Dataguard Status (Standby site) January 23, 2025 03:44:28
UTC
             January 23, 2025 03:44:36 UTC
                                                   Success
(Host:
standby1
/Job
ID:
a5bf022a-
c1ca-4c1a-8747-4ff6a0e938c0)
Delete Standby Database (Standby site) January 23, 2025 03:44:36
UTC
             January 23, 2025 03:46:07 UTC
(Host:
standby1
```

```
/Job
ID:
f93b1f26-69d9-4690-84f9-4c0c9947423a)
```

 To deconfigure Oracle Data Guard with two standby databases, run the following command on the primary system:

```
# odacli deconfigure-dataguard -i
281ed08c-302f-4a94-932f-02fabf95e88e
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter
'oda-admin'; otherwise, enter the name of the user who has irestored the
Standby
database (default: oda-admin):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby 2 site address: standby2
BUI username for Standby site standby2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby2, enter
'oda-admin'; otherwise, enter the name of the user who has irestored the
Standby
database (default: oda-admin):
BUI password for Standby site standby2:
Password for root user on Standby site standby2:
Standby database will be deleted after Data Guard configuration is removed.
Ignore warning and proceed with Data Guard deconfiguration? (Y/N): y
  "jobId": "e0b74b70-da87-4f46-8950-8cf061a8c576",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp" : "January 17, 2025 21:12:57 PM UTC",
  "resourceList" : [ ],
  "description" : "DG Deconfig service",
  "updatedTime" : "January 17, 2025 21:12:57 PM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@n1 ~]# odacli describe-job -i "e0b74b70-da87-4f46-8950-8cf061a8c576"
Job details
                     ID: e0b74b70-da87-4f46-8950-8cf061a8c576
            Description: DG Deconfig service
                 Status: Success
                Created: January 17, 2025 21:12:57 UTC
                Message:
Task Name
                                         Start
Time
 End Time
                                          Status
```

```
De-configure Dataguard (Primary site) January 17, 2025 21:13:02
          January 17, 2025 21:14:14 UTC
                                              Success
(Host: scaoda8m014/Job
ID:
65fbb55a-167d-428b-90ad-72c9e6acd706)
Delete Dataguard Status (Primary site) January 17, 2025 21:14:14
          January 17, 2025 21:14:20 UTC Success
(Host: scaoda8m014/Job
3ade2aa0-6dcf-469a-
a592-61e7111d26c2)
Delete Dataguard Status (Standby site) January 17, 2025 21:14:20
UTC January 17, 2025 21:14:29 UTC Success
(Host: standby1/Job
9948a60f-119f-4a6d-944f-
fe02741be5b9)
Delete Standby Database (Standby site) January 17, 2025 21:14:29
UTC January 17, 2025 21:16:41 UTC Success
(Host: standby1/Job
ID:
714e53db-3dd6-4a22-
b614-5110a4e98004)
Delete Dataguard Status (Standby site) January 17, 2025 21:16:41
         January 17, 2025 21:16:49 UTC Success
(Host: standby2/Job ID:
17958ff9-
c3e3-4ca8-9dc2-975ea2f369cb)
Delete Standby Database (Standby site) January 17, 2025 21:16:49
UTC January 17, 2025 21:19:22 UTC Success
(Host: standby2/Job ID:
c352ea80-6c98-4249-bc7f-2700f1e81fdc)
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

#### **Related Topics**

odacli Oracle Data Guard Commands

Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

## Deconfiguring Oracle Data Guard on Oracle Database Appliance Using BUI

Deconfigure Oracle Data Guard status using BUI.

#### **Deconfiguring Oracle Data Guard Status using BUI**

#### Follow these steps:

- 1. Log into the Browser User Interface: https://host-ip-address:7093/mgmt/index.html
- Click Database.
- 3. In the Database page, click on the database to view the database details.
- 4. In the Database details page, click the **Dataguard Associations** tab. The Oracle Data Guard configurations associated with the database are displayed.
- From the Actions drop-down list of the Oracle Data Guard configuration, select Deconfigure.
- 6. In the Standby Information tab, specify the Standby Host Name, VIP of the Associated Network, BUI User, BUI Password, System User, and Database SYS Password. For high-availability systems, specify the Node 0 Standby Host Name, Node 0 VIP of the Associated Network, Node 1 Standby Host Name, and Node 1 VIP of the Associated Network.
- 7. Select **Force Run** to run the operation.
- 8. Click **Add Standby** to add another standby for deconfiguration.
- After adding details of all the standby systems that you want to deconfigure, click
   Deconfigure and confirm the action. Verify that the job is submitted and completes
   successfully.

#### **Related Topics**

odacli Oracle Data Guard Commands
 Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle
 Database Appliance deployment.



## Managing CPU Pools on Oracle Database Appliance Bare Metal and KVM Deployments

Use CPU pools to manage CPU resources on Oracle Database Appliance bare metal and KVM deployments.

#### About CPU Pools

CPU pools enable management of CPU resources on Oracle Database Appliance on both bare metal and KVM deployments. There are three types of CPU pools, that is, BM, VM, and DB system.

- Creating a CPU Pool in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a CPU pool in a bare
   metal or KVM deployment.
- Remapping CPU Pools in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to remap CPU pools in a bare
   metal or KVM deployment.
- Viewing CPU Pools in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to view all CPU pools or details
   about a CPU pool in a bare metal or KVM deployment.
- Modifying a CPU Pool in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to modify a CPU pool in a bare
   metal or KVM deployment.
- Deleting a CPU Pool in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to delete a CPU pool in a bare
   metal or KVM deployment.
- Viewing CPU Pool Audit Records in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to view CPU pool audit records in a
   bare metal or KVM deployment.
- About Over-Subscribed CPU Pools
   Configure virtual machines so that they do not subscribe to more CPU resources than the resources available in CPU pools.

### **About CPU Pools**

CPU pools enable management of CPU resources on Oracle Database Appliance on both bare metal and KVM deployments. There are three types of CPU pools, that is, BM, VM, and DB system.

Use the BM CPU pool to ensure that the database on a bare metal host runs exclusively on the CPU lists specified in the CPU pool. All Oracle processes are bound to the CPUs in this CPU pool and run only on these CPUs. The bare metal CPU pool is assigned to database by updating the init.ora parameter processor group name.

Use the VM CPU pools to cage and manage CPU resource allocations to workloads for virtual machines. Workloads are isolated by creating CPU pools and assigning or pinning virtual

machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

The DB system CPU pool is similar to the VM CPU pool, but it only applies to a DB system.

Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs. But one CPU pool can be assigned to multiple databases (BM CPU pool), or VMs (VM CPU pools), or DB systems (shared DB system CPU pools).

Oracle Database Appliance provides ODACLI commands to create, update, modify, and delete CPU pools.

By default, the first core of the socket is reserved and cannot be used by the VM and DB system CPU pools for optimal performance. This behavior is available from release 19.12 and later when NUMA is enabled. If you want to use the first core of the socket in your CPU pool, then use the <code>--use-reserved-cores</code> option to enable use of the first core of socket for VM and DB system CPU pools.

#### **About Bare Metal CPU Pools**

For new databases, you can attach the new CPU pool using the create-database command. For existing databases, use the modify-database command to attach the CPU pool to the database. Restart the database manually for changes to take effect. Clone, irestore and recover database operations will also try to use the same CPU pool if the CPU pool is used by the source database. Specify the --cpupool option to use the new CPU pool. The standby database uses the CPU pool configured for the primary database. Specify the --cpupool option in the irestore-database command when restoring the backup to the standby site if you want to use a separate CPU pool on the standby site. For more details about the command syntax, see the *Oracle Database Appliance Command Line Interface* chapter in this guide.

#### **About VM CPU Pools**

For new VMs, you can attach the new CPU pool using the <code>create-vm</code> command. For existing VMs, use the <code>modify-vm</code> command to attach or update the CPU pool. Use the <code>--live</code> option to apply the changes to a running VM, and use the <code>--config</code> parameter to persist the change. For more details about the command syntax, see the <code>Oracle Database Appliance Command Line Interface</code> chapter in this guide.

#### **About DB System CPU Pools**

Creating a DB system automatically creates an internal DB system CPU pool associated with this DB system. The internal DB system CPU pool is created and managed internally. It cannot be created, modified, or deleted manually. Starting with Oracle Database Appliance release 19.11, you can create a new type of shared DB system CPU pool which can be shared among DB systems. For more details, see the topic *Managing Shared CPU Pool with Database System in a KVM Deployment* in this guide.

#### **About Audit Records for CPU Pools**

CPU pool operations history are recorded in audit records metadata and system log for audit purposes. The CPU pool changes include create, modify, delete operations, and attach and detach operations from VMs and databases. The CPU pool audit records can be queried using odacli list-auditrecords and odacli describe-auditrecord commands but they can not be changed or deleted. For more details about the command syntax, see the *Oracle Database Appliance Command Line Interface* chapter in this guide.



#### Understanding the Effect of Changing the CPU Cores on CPU Pool Allocation

You may have changed the CPU core count on Oracle Database Appliance using the <code>odaclimodify-cpucore</code> command. You must assign cores in multiples of two, with a minimum of two cores. If you change the CPU core count, then you can subsequently only increase the CPU core count.

If you change the CPU core count in an Oracle Database Appliance environment which has CPU pools, then the following behavior is seen:

- odacli create-cpupool and odacli modify-cpupool will always select the online CPUs.
   Therefore, on both bare metal and KVM deployments, any CPU pool created after running the odacli modify-cpucore command, will select from the available online CPUs.
- For existing CPU pools on bare metal and KVM deployments, some CPUs can become offline when you run the odacli modify-cpucore command. Check the CPU pools for any offline CPUs using the odacli describe-cpupool command. You can then update the CPU pool to use available ONLINE CPUs by using the odacli modify-cpupool command.
- If the databases use a CPU pool and some CPUs become offline, then use the odacli modify-cpupool command to update the CPU pool. Restart the databases to use the updated CPU pool.

#### **Related Topics**

- Managing Shared CPU Pool with DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to manage shared CPU pool with
   DB system in a KVM deployment.
- Oracle Database Appliance Command-Line Interface
   The command-line interface has different classes of tools to manage Oracle Database Appliance.

## Creating a CPU Pool in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to create a CPU pool in a bare metal or KVM deployment.

#### Using ODACLI to Create a CPU Pool

Use the command odacli create-cpupool to create a CPU pool.

Create a VM CPU pool named cpupool1 with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool1 -c 6 -vm
```

#### Using Browser User Interface to Create a CPU Pool

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- Click CPU Pool to display the CPU Pool page.



- Click Create CPU Pool.
- 5. In the Create CPU Pool page, specify the following:
  - CPU Pool Name: Name of the CPU pool
  - CPU Pool Type: Specify if the CPU pool is for bare metal or virtual system.
  - Number of CPU Cores: Number of CPU cores allocated to the pool
  - Socket to Use: Specify the sockets to use for the CPU pool.
  - Configure on: For high-availability deployments, select the nodes where you want to configure the CPU pool.
  - Use Reserved CPU Cores: Select this option to use reserved CPU cores.
- Click Create.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

#### **Related Topics**

- odacli modify-dbsystem
  - Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli modify-vm
  - Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- Remapping CPU Pools in a Bare Metal or KVM Deployment
   Use ODACLI commands or the Browser User Interface to remap CPU pools in a bare
   metal or KVM deployment.

## Remapping CPU Pools in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to remap CPU pools in a bare metal or KVM deployment.

#### **Using ODACLI to Remap CPU Pools**

When you patch the bare metal system to Oracle Database Appliance release 19.12 and later, NUMA is enabled after patching. Then, use the command odacli remap-cpupools to remap CPU pools.

See the topic About Enabling NUMA on Oracle Database Appliance for more information.

#### Using Browser User Interface to Remap CPU Pools

Follow these steps:

1. Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click CPU Pool to display the CPU Pools page.



- 4. Click Remap CPU Pool on the page. This will remap all CPU pools for NUMA allocation.
- In the confirmation dialog, select Force Run if you want to force the remap operation.
   Select Use Reserved CPU Cores to use reserved CPU cores.
- Click Yes to confirm the action.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

#### **Related Topics**

· odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## Viewing CPU Pools in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to view all CPU pools or details about a CPU pool in a bare metal or KVM deployment.

#### **Using ODACLI to View CPU Pools**

The command odacli describe-cpupool displays details about a CPU pool. Use the command odacli list-cpupools to view all CPU pools in the deployment.

```
# odacli list-cpupools
# odacli describe-cpupool -n cpupool1
```

#### **Using Browser User Interface to View CPU Pools**

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the **Appliance** tab.
- Click CPU Pool to display the CPU Pool page.
- You can view the list of all configured CPU pools.
- To view the details of a CPU pool, click on the CPU pool or click on the Actions drop down and select View Details.



## Modifying a CPU Pool in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a CPU pool in a bare metal or KVM deployment.

#### **Using ODACLI to Modify CPU Pool**

Use the command odacli modify-cpupool to modify a CPU pool.

```
# odacli modify-cpupool -n cpupool1 -c 10
```

Restart the associated databases to use the updated CPU pool.

#### Using Browser User Interface to Modify CPU Pool

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the Appliance tab.
- 3. Click **CPU Pool** to display the CPU Pools page.
- 4. From the Actions drop down list for the CPU pool you want to modify, select Modify.
- In the Modify CPU Pool page, specify any changes in the Number of CPU Cores, and select if you want to apply the changes to running VMs or if you want to force the modify operation. Then click **Modify**.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Deleting a CPU Pool in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a CPU pool in a bare metal or KVM deployment.

#### Using ODACLI to Delete CPU Pool

Use the command odacli delete-cpupool to delete a CPU Pool.

Delete a CPU pool named cpupool1.

```
# odacli delete-cpupool -n cpupool1
```

#### Using Browser User Interface to Delete CPU Pool

Follow these steps:



Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click **CPU Pool** to display the CPU Pool page.
- 4. From the Actions drop down list for the CPU pool you want to delete, select **Delete**.
- 5. Click Yes to confirm your choice.
- 6. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Viewing CPU Pool Audit Records in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to view CPU pool audit records in a bare metal or KVM deployment.

#### Using ODACLI to View Audit Record Details for CPU Pools

Use the odacli list-auditrecords command to list the audit records for a CPU Pool:

# odacli list-auditrecords

Use the odacli describe-auditrecord command to describe the audit record for a CPU Pool.

# odacli describe-auditrecord

#### Using Browser User Interface to View Audit Record Details for CPU Pools

Follow these steps:

Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- 2. Click the **Security** tab.
- Select Show Advanced Search and specify the filters for the CPU audit records details such as the From and To dates, Resource type, Resource name, DCS user name, Operation type, and the number of records to display the CPU Pool details.
- From the list of audit records displayed, click on the audit record ID for which you to drill down for more details.

### **About Over-Subscribed CPU Pools**

Configure virtual machines so that they do not subscribe to more CPU resources than the resources available in CPU pools.



A CPU resource can belong to one, and only one, CPU pool. You can assign multiple virtual machines to a CPU pool. A CPU pool becomes oversubscribed when the virtual machines that are active in the pool require more CPUs than you configured for the pool. For example, if a CPU pool has four CPUs, then you can start two virtual machines that are defined to use four CPUs each. In this case, the CPU pool is oversubscribed, because each of the four CPUs is supporting two virtual machines.

If you stop one of those virtual machines, but start another one that requires two CPUs, then the CPU pool is still oversubscribed. This is because two of the CPUs are supporting both virtual machines. When oversubscribing a CPU pool, assess the performance of the virtual machines in that pool. Reassign one or more virtual machines to a different CPU pool if sharing an oversubscribed pool degrades performance to unacceptable levels.



## Managing an Oracle Database Appliance KVM Deployment

KVM virtualization uses a kernel-based virtual machine (KVM) to create a virtualized environment for your Linux applications.

Understand the Oracle Database Appliance KVM architecture, and procedures to deploy a guest virtual machine, manage high availability, manage CPU pools, and configure network settings for Oracle Database Appliance KVM deployment.

- About Oracle Database Appliance KVM Deployment
  You can use Oracle KVM to optimize your system resource use for databases and
  applications.
- About Oracle Database Appliance KVM Virtualization Architecture
   Review this topic to understand how Oracle Database Appliance KVM deployment works
   with Oracle Database Appliance hardware.
- About Virtual Machines and Oracle Database Appliance KVM Deployments
   Oracle Database Appliance KVM deployment is designed to run and deploy virtual
   machines to manage system resources.
- About KVM DB Systems on Oracle Database Appliance
   Understand how you can deploy KVM-based DB systems on Oracle Database Appliance
   to run your Oracle Database environments.
- Deploying Multiple Databases on DB Systems on Oracle Database Appliance
   Understand the guidelines and procedure to deploy multiple databases on a DB system on
   Oracle Database Appliance.
- Managing DB Systems in KVM Deployment
   Use ODACLI to create, list, describe, start, stop, and delete DB systems in an Oracle
   Database Appliance KVM deployment.
- Setting Up and Configuring a KVM Deployment for Applications
   Understand the steps to set up and configure KVM deployment for applications.
- Managing VM Storage in KVM Deployment
   Use ODACLI to create, view, modify, and delete VM storage in an Oracle Database Appliance KVM deployment.
- Managing Virtual Networks in KVM Deployment
   Use ODACLI to create, view, start, stop, and delete virtual networks in an Oracle Database
   Appliance KVM deployment.
- Managing Virtual Disks in KVM Deployment
   Use ODACLI to create, view, clone, modify, and delete virtual disks on Oracle Database Appliance KVM deployment.
- Managing Virtual Machines in KVM Deployment
   Use ODACLI to create, view, clone, modify, start, stop, and delete virtual machines in an
   Oracle Database Appliance KVM deployment.
- About Overcommitting Memory or CPUs in an Oracle Database Appliance KVM System Understand performance and other considerations before overcommiting CPU and memory for application KVM.

- Example JSON File to Create a Single-Node DB System
   Follow the JSON file example to create a JSON file to deploy a single-node DB System,
   with role separation, with the command odacli create-dbsystem.
- Example JSON File to Create a High-Availability DB System
   Follow the JSON file example to create a JSON file to deploy a High-Availability DB system, with role separation, with the command odacli create-dbsystem.

### About Oracle Database Appliance KVM Deployment

You can use Oracle KVM to optimize your system resource use for databases and applications.

You can deploy a Kernel-based Virtual Machine (KVM) virtual platform on Oracle Database Appliance. With Oracle Database Appliance KVM deployments, you can use the capabilities of Oracle KVM to effectively allocate resources to databases and applications running on the same physical Oracle Database Appliance. Rather than simply disabling unnecessary server cores, you can use the excess capacity to host other workloads. This enables consolidation of both databases and applications, while retaining the ease of deployment and management associated with Oracle Database Appliance.

#### See Also:

For more information about supported operating systems, see the *Oracle Linux KVM User's Guide*: https://docs.oracle.com/en/operating-systems/oracle-linux/kvm-user/index.html

The KVM feature provides a set of modules that enable you to use the Oracle Linux kernel as a hypervisor. KVM supports x86\_64 processor architecture. By default, KVM is built into the Unbreakable Enterprise Kernel (UEK) release. KVM features are actively developed and may vary depending on platform and kernel release. If you are using Unbreakable Enterprise Kernel, you should refer to the release notes for the kernel release of your Oracle Database Appliance to obtain information about features and any known issues or limitations that may apply. KVM is supported on Oracle Linux 7.

#### What are the differences between KVM and Oracle VM Virtualization?

Oracle KVM makes it easy to setup and manage the virtualized environment with little virtualization expertise. With the KVM deployment, you can consolidate entire multi-tier environments within a single Oracle Database Appliance system.

The following are some of the advantages of deploying Oracle Database Appliance with the KVM option:

- Deploy database and applications in a single hardware environment.
- Use your CPU cores (and memory) efficiently.
- Use virtual local area networks (VLANs) to provide separate networks to different virtual machines.
- Use VM storage to grow storage for the virtual machine repository.
- Enables easy resource management per VM and maintainence of quality of service (QoS)
- Provides solution-in-a-box with application, middleware, and databases.



- Improves data center efficiency by increasing space utilization and reducing energy consumption and cooling costs.
- Oracle KVM virtualization is available on bare metal deployments of Oracle Database Appliance, whereas Oracle VM virtualization on Oracle Database Appliance requires Virtualized Platform setup.
- Oracle Database Appliance supports KVM on all hardware models, whereas Virtualized Platform deployments using Oracle VM are supported on only Oracle Database Appliance High-Availability models.
- Oracle Database Appliance KVM deployments use Type 2 host operating system-based hypervisor, whereas Oracle Database Appliance Virtualized Platform deployments use Type 1 bare metal hypervisor.
- KVM is the virtualization technology used in Oracle Cloud Infrastructure (OCI), where as
  Oracle Database Appliance Virtualized Platform is based on Xen technology.

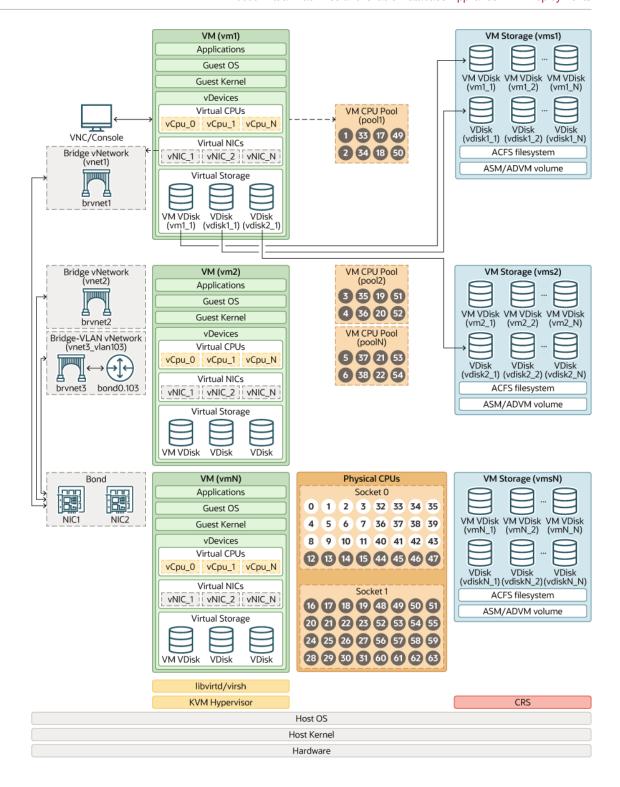
## About Oracle Database Appliance KVM Virtualization Architecture

Review this topic to understand how Oracle Database Appliance KVM deployment works with Oracle Database Appliance hardware.

Oracle Database Appliance KVM deployment provides virtualization technology that enables multiple applications to share the same physical server. The Oracle Database Appliance KVM architecture is engineered specifically to leverage the Oracle Database Appliance hardware capabilities. Oracle Database Appliance KVM stack is integrated with Oracle Clusterware. The KVM resources such as VM storages and Virtual Machines are registered as CRS resources and are automatically managed by CRS for high availability.

The Oracle Database Appliance KVM virtualization architecture uses the virtual machine components shown in the following illustration:





## About Virtual Machines and Oracle Database Appliance KVM Deployments

Oracle Database Appliance KVM deployment is designed to run and deploy virtual machines to manage system resources.

Configure virtual machines on Oracle Database Appliance KVM deployment to manage the use of resources, such as the CPU pool, memory, and other shared resources by your application.

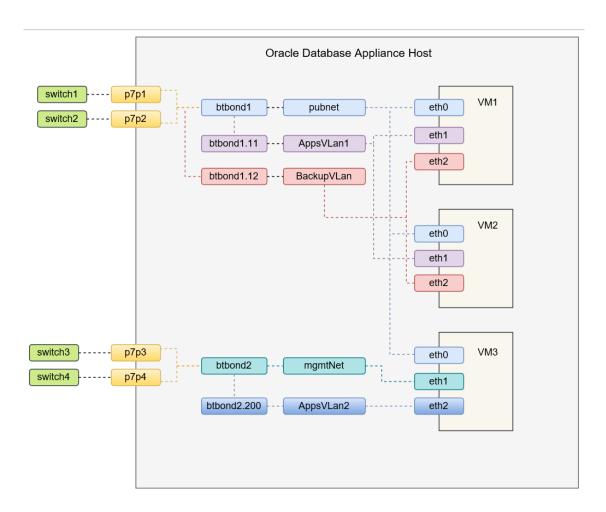
Understand the terminology of the various components you need to set up for an Oracle Database Appliance KVM deployment. The ODACLI tooling handles all the required configuration for your Oracle Database Appliance KVM deployment.

#### **VM Storage**

A VM storage is a central location for storing resources that are essential to creating and managing virtual machines. These resources include ISO files (virtual DVD images), virtual machine configuration files, and virtual disks. The VM storage is configured on an Oracle Automatic Storage Management Cluster File System (Oracle ACFS). Oracle Database Appliance KVM uses VM storage to optimize available disk space usage in the environment, and for easy reallocation of virtual machines if a physical server fails. The virtual machine files can be stored on shared disks, providing shared storage for the virtual machines. You can:

- Create one or more virtual machines on the VM storage.
- Use ODACLI commands to create and manage VM storage, virtual disks, and their virtual machines, and the underlying architecture shown in the illustration.

#### **Virtual Networks**





Oracle Database Appliance KVM virtual network supports two type of networks, bridged and bridged-vlan. The above figure is an example of the KVM virtual network on Oracle Database Appliance X8-2 hardware models.

In a bridged network, a Linux bridge is created and the network interface or bond interface, is attached to the bridge. A default bridge network named pubnet is created on the public network selected during the appliance deployment. Any VM that wants to access this public network can be attached to this pubnet vnetwork. This pubnet vnetwork cannot be modified or deleted. In the above diagram, btbond1 is used for the public network, and default vnetwork pubnet is created with btbond1. eth0 of VMs are attached to this pubnet vnetwork. Except for the default pubnet bridge, no other bridged network is allowed to be created on this public network interface. Additional bridged vnetwork can be created on other interfaces that are not used for the public network. In the above diagram, the mgmtNet bridged network is created with btbond2. eth1 of VM3 is attached to this mgmtNet vnetwork.

#### For example:

```
odacli create-vnetwork --name mgmtNet --bridge mgmtNet --type bridged --interface btbond2 --ip <code>ip_address</code> --gateway <code>gateway</code> --netmask <code>netmask</code>
```

In a bridged-vlan network, VLAN can be created on all available public interfaces, including the interface where public network is already configured. For example, you can create a VLAN on both btbond1 and btbond2. Follow proper procedures to configure the VLAN on the switch before creating the bridged-vlan network. In the figure above, backupVLan and AppsVlan1 are created from btbond1 and attached to eth1 and eth2 of VM1 and VM2 respectively.

#### For example:

```
odacli create-vnetwork --name backupvlan --bridge backupvlan --type bridged-vlan --vlan-id 12 --interface btbondl --ip ip\_address --gateway gateway --netmask netmask
```

vnetwork is not supported on private interfaces and secondary interfaces of the bond interface.

#### Virtual Disks

In addition to virtual machines, you can create virtual disks in VM storage. Virtual disks provide additional storage options for virtual machines by enabling you to attach additional block storage to your virtual machines. Similarly, you can detach the disk if you no longer need the additional space. You can use virtual disks to expand existing file system storage inside the virtual machine by adding the new virtual disk to an existing logical volume, or by creating a new file system on a virtual disk. Virtual disks can optionally be attached to multiple virtual machines.

#### **Virtual Machines**

A *virtual machine* is granted virtual resources, and can be started, stopped, cloned, and restarted independently. By default, virtual machines are created with autostart and failover enabled for high-availability models. During failover, the VM is automatically started, and there will be attempt to restart once before failing over to a different node on high-availability models. You can enable or disable autostart and failover using the <code>odacli modify-vm</code> command options. The option to autostart is also available on single-node Oracle Database Appliance models.



# About KVM DB Systems on Oracle Database Appliance

Understand how you can deploy KVM-based DB systems on Oracle Database Appliance to run your Oracle Database environments.

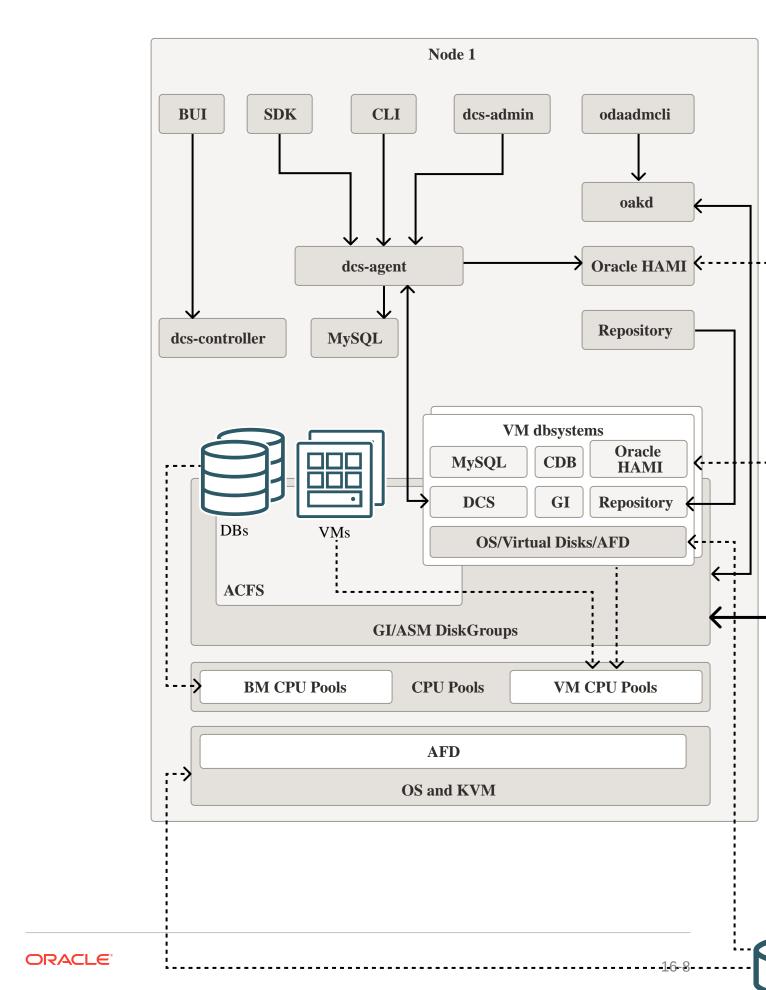
#### **About KVM DB Systems**

KVM DB systems enable hard partitioning for Oracle Database licensing, where each KVM DB system has its own CPU pool that is automatically assigned during KVM DB system creation. Oracle Database Appliance simplifies the management of KVM DB systems with the built-in Browser User Interface (BUI) or ODACLI Command Line Interface (ODACLI).

#### **About KVM DB System Architecture**

You can provision and configure a DB system on an Oracle KVM. The database can be a single-instance Oracle Database or an Oracle RAC Database with two instances. You can create multiple databases in each DB system.



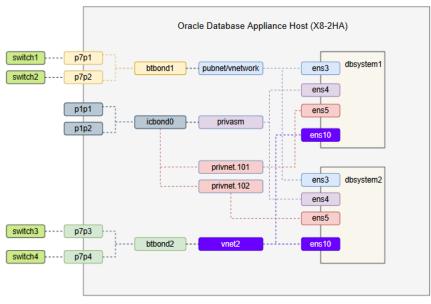


#### About KVM DB System Networks

Each Oracle Database Appliance DB system on KVM has the following networks created by default:

- Public network: The default vnetwork pubnet is created on the bare metal system, based
  on the public interface you select for Oracle Grid Infrastructure provisioning. When you
  create a DB system, the public network of the DB system is attached to the pubnet
  vnetwork created on the bare metal system. The pubnet network is selected by default as
  the public network of the DB system. You can also create a different vnetwork and use it as
  public network for the dbsystem.
- Oracle ASM network: Oracle Database Appliance DB system uses Oracle ASM to manage the database storage. The Oracle ASM instance runs on bare metal systems, but not on the DB system. The database on the DB System uses the Oracle ASM listener running on the bare metal system to communicate with Oracle ASM. The Oracle ASM network for example, privasm in the network diagram below, is created to facilitate this communication between the database on the DB system and the Oracle ASM listener on the bare metal system. This network is also used for communications between the DCS agent on the DB system and DCS agent on the bare metal system, and for enabling sharing of the central repository on bare metal system with the DB systems. Starting with Oracle Database Appliance release 19.26, there are restrictions on the Oracle ASM network so that only authorized communications between DB system and bare metal host are allowed on the Oracle ASM network.
- **DB** system cluster interconnect network: When DB system is created as a two-node cluster on high-availability model, a cluster interconnect network is created automatically and it is deleted when the DB system is deleted. Each cluster owns its cluster interconnect. Different DB system cannots communicate with each other using cluster interconnect network. 192.168.16.0/24 and 192.168.17.0/24 are reserved for the use of these two internal networks. So, ensure that the IP CIDR 192.168.16.0/24 and 192.168.17.0/24 are available for use by Oracle Database Appliance DB system on KVM.
- Starting with Oracle Database Appliance release 19.12, you can create a vnetwork, either
  a bridged or bridged-vlan vnetwork, such as vnet2 in the image below, and then use the
  odacli modify-dbsystem command to attach the vnetwork to the dbsystem.





- · ens3: public network
- · ens4: asm network
- · ens5: cluster interconnect network
- ens10: additional public network

#### **Restrictions When Deploying KVM DB System**

The following restrictions apply when you deploy KVM DB system on Oracle Database Appliance:

- You cannot use Oracle ACFS for storage within the DB system. The database running inside the dbsystem uses Oracle ASM storage. The VM is created on Oracle ACFS based storage.
- On Oracle Database Appliance DB systems, the Oracle Grid Infrastructure software installed is of the same version as the Oracle Database version you install. The version is specified in the DB system JSON payload, with the attribute version for database.
- You cannot configure CPU pools or run VM commands within the DB system.

# Deploying Multiple Databases on DB Systems on Oracle Database Appliance

Understand the guidelines and procedure to deploy multiple databases on a DB system on Oracle Database Appliance.

#### **Supported DB System Shapes**

In earlier releases of Oracle Database Appliance, where the DB system supported creation of only one database, the DB system shape was the same as the database shape. Starting with Oracle Database Appliance release 19.23, you can create multiple databases on the DB system, with a separate DB system shape dbsX, where X is the number of CPU cores on the DB system VM. X is an even number that ranges from 2 to N-2 where N is the maximum number of CPU cores on the bare metal system. You can view the value of N with the odacli list-cpucores command on the bare metal system. The default memory of the DB system is eight times that of the CPU cores of the DB system. You can create the DB system with



custom memory size that is larger than the default memory size by specifying the memory size in the JSON file or BUI when you create the DB system.

#### Restrictions and Guidelines for Deploying Multiple Databases on DB Systems

You can provision and configure a DB system on an Oracle KVM. The database can be a single-instance Oracle Database or an Oracle RAC Database with two instances. Starting with Oracle Database Appliance release 19.23, you can create multiple databases in each DB system. For an existing appliance, after you patch the bare metal system to Oracle Database Appliance release 19.23, you can create new DB systems that support multiple databases. For existing DB systems to support multiple databases, you must patch them to Oracle Database Appliance release 19.23 first. To check whether a DB system supports multiple databases, run the odacli list-dbsystems command and verify that the shape of the DB system is *dbsx*.

- You can create multiple databases on DB systems with Oracle Database release 19c version, but cannot create different major version databases within a DB system. To create a DB system that supports 19c database, specify a 19c starter database during the DB system creation. If no starter database is specified in the DB system creation payload, a DB system that supports 19c database is created.
- You can use the odacli create-database command to create the first database if you did
  not choose to create a starter database, or additional databases in the DB system. The
  Oracle Grid Infrastructure home and database home are configured on the local file
  system /u01 of the DB system.
- When you create a database in DB system with the odacli create-database command, the default database shape is odb1.
- DB system must be sized properly based on the sizing requirement of databases running in the DB system. Taken together, the shapes of databases running in a DB system must be no greater than the shape of the DB system, for example, databases odbA, odbB, ..., odbN running in the DB system shape dbsX, then A+B+...N must be less than or equal to X. You can change the DB system shapes to meet the sizing requirement of the databases in the DB system.
- When you create a DB system, if you specify the starter database, then Oracle Grid
  Infrastructure of the same release as the database is installed. If you do not specify a
  starter database when you create a DB system, then Oracle Grid Infrastructure of the
  same release as the Oracle Database Appliance is installed.
- When you delete a DB system, and you use the --force option with the odacli deletedbsystem command, all database data files in the DB system are deleted.
- You can move databases in the DB system across different database homes using the odacli move-database command.
- You can restore databases with the odacli irestore-database command to a DB system with support for multiple databases. This may result in multiple databases running in the DB system. Make sure the DB system shape supports the additional databases restored. If not, change the DB system shape to accommodate additional databases.
- Starting with Oracle Database Appliance release 19.23, the odacli modify-dbsystem -- shape command only changes the shape of the DB system; it does not change the shapes of the database inside the DB system any more. You must modify database shapes accordingly based on the new shape of the DB system. Ensure that you scale up database shapes after the DB system shape is scaled up. Similarly, scale down database shapes before DB system shape is scaled down, otherwise databases could fail to start because of reduced DB system memory.



#### **Creating Multiple Databases on DB Systems**

You can create databases on the DB system in one of the following ways:

- When you create the DB system using the odacli create-dbsystem command, you can
  optionally choose to create the starter database. The Oracle Grid Infrastructure software is
  installed and the started database is created. You specify the starter database details in
  the JSON file.
- If you do not specify the starter database details in the JSON file when you create the DB system, then only Oracle Grid Infrastructure is installed, but a database is not created.

  After the odacli create-dbsystem command completes successfully, you can then create multiple databases using the odacli create-database command.

#### Example JSON files to create databases on DB systems

Example JSON file to create DB system with starter database:

```
"system": {
     "name": "dbsystem1",
     "diskGroup": "DATA",
     "systemPassword": "password",
      "timeZone": "Pacific/Majuro",
      "enableRoleSeparation": false,
      "shape": "dbs4",
      "customRoleSeparation": {
           "users": [
                 {
                      "name": "oracle",
                      "id": 1618,
                      "role": "oracleUser"
                 }
           ],
           "groups": [
                 {
                      "name": "oinstall",
                      "id": 1018,
                      "role": "oinstall"
                 },
                 {
                      "name": "dbaoper",
                      "id": 1019,
                      "role": "dbaoper"
                 },
                      "name": "dba",
                      "id": 1020,
                      "role": "dba"
                 },
                 {
                      "name": "asmadmin",
                      "id": 1021,
                      "role": "asmadmin"
                 },
                 {
```



```
"name": "asmoper",
                    "id": 1022,
                    "role": "asmoper"
               },
                    "name": "asmdba",
                    "id": 1023,
                    "role": "asmdba"
          ]
     }
},
"network": {
     "domainName": "example.com",
     "ntpServers": [
          "xx.xx.xxx.xx"
     ],
     "dnsServers": [
          "xxx.xxx.xx",
          "xxx.xx.xx"
     ],
     "scanName": "dbsystem1-scan",
     "scanIps": [
          "xx.xx.xxx",
          "xx.xx.xxx"
     ],
     "nodes": [
          {
               "name": "node1",
               "ipAddress": "xx.xx.xx.xxx",
               "netmask": "xxx.xxx.xxx.x",
               "gateway": "xx.xx.xxx.x",
               "number": 0,
               "vipName": "nodel-vip",
               "vipAddress": "xx.xx.xxx.xxx"
          },
               "name": "node2",
               "ipAddress": "xx.xx.xxx.xxx",
               "netmask": "xxx.xxx.xxx.0",
               "gateway": "xx.xx.xxx.x",
               "number": 1,
               "vipName": "node2-vip",
               "vipAddress": "xx.xx.xxx.xxx"
     ]
},
"grid": {
     "language": "en",
},
"database": {
     "name": "rZWuZTw4",
     "uniqueName": "rZWuZTw4U",
     "domainName": "test_domain",
     "adminPassword": "password",
     "version": "19.27.0.0.250415",
```

```
"edition": "EE",
          "type": "RAC",
          "dbClass": "IMDB",
          "shape": "odb2",
          "role": "PRIMARY",
          "targetNodeNumber": null,
          "enableDbConsole": false,
          "enableUnifiedAuditing": true,
          "redundancy": null,
          "characterSet": {
               "characterSet": "AL32UTF8",
               "nlsCharacterset": "AL16UTF16",
               "dbTerritory": "AMERICA",
               "dbLanguage": "AMERICAN"
          },
          "rmanBackupPassword": null,
          "levelOBackupDay": null,
          "enableTDE": false,
          "tdePassword": null,
          "isCdb": true,
          "pdbName": "test pdb",
          "pdbAdminUser": "test_pdb_admin"
}
```

#### Example JSON file to create DB system without starter database:

```
{
    "system": {
         "name": "dbsystem1",
         "diskGroup": "DATA",
         "systemPassword": "password",
          "timeZone": "Pacific/Majuro",
          "enableRoleSeparation": false,
          "shape": "dbs4",
          "customRoleSeparation": {
               "users": [
                          "name": "oracle",
                          "id": 1618,
                          "role": "oracleUser"
               ],
               "groups": [
                     {
                          "name": "oinstall",
                          "id": 1018,
                          "role": "oinstall"
                     },
                     {
                          "name": "dbaoper",
                          "id": 1019,
                          "role": "dbaoper"
                    },
                     {
```

```
"name": "dba",
                    "id": 1020,
                    "role": "dba"
               },
               {
                    "name": "asmadmin",
                    "id": 1021,
                    "role": "asmadmin"
               },
               {
                    "name": "asmoper",
                    "id": 1022,
                    "role": "asmoper"
               },
                    "name": "asmdba",
                    "id": 1023,
                    "role": "asmdba"
               }
     }
},
"network": {
     "domainName": "testdomain",
     "ntpServers": [
          "xx.xx.xxx"
     ],
     "dnsServers": [
          "xxx.xxx.xx.",
          "xx.xx.xx"
     ],
     "scanName": "dbsystem1-scan",
     "scanIps": [
          "xx.xx.xxx",
          "xx.xx.xxx.xxx"
     ],
     "nodes": [
          {
               "name": "node1",
               "ipAddress": "xx.xx.xx.xx",
               "netmask": "xxx.xxx.xxx.x",
               "gateway": "xx.xx.xxx.x",
               "number": 0,
               "vipName": "node1-vip",
               "vipAddress": "xx.xx.xxx.xxx"
          },
               "name": "node2",
               "ipAddress": "xx.xx.xx.xx",
               "netmask": "xxx.xxx.xxx.x",
               "gateway": "xx.xx.xxx.x",
               "number": 1,
               "vipName": "node2-vip",
               "vipAddress": "xx.xx.xxx.xxx"
     ]
```

## Managing DB Systems in KVM Deployment

Use ODACLI to create, list, describe, start, stop, and delete DB systems in an Oracle Database Appliance KVM deployment.

- Creating a DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a DB system in a KVM
   deployment.
- Listing DB Systems in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to list DB systems in a KVM
   deployment.
- Describing a DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to describe a DB system in a KVM
   deployment.
- Modifying a DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to modify a DB system in a KVM
   deployment.
- Attaching and Detaching a Network for a DB System in a KVM Deployment Use ODACLI commands to attach or detach networks for DB system in a KVM deployment.
- Starting a DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to start a DB system in a KVM deployment.
- Stopping a DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to stop a DB system in a KVM deployment.
- Deleting a DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to delete a DB system in a KVM
   deployment.
- Managing Backup, Restore, and Recovery on a DB System in a KVM Deployment Understand the backup, restore, and recovery operations supported on a DB system in a KVM deployment.
- Managing Shared CPU Pool with DB System in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to manage shared CPU pool with
   DB system in a KVM deployment.
- Managing Oracle Data Guard on a DB System in a KVM Deployment Understand the Oracle Data Guard operations supported on a DB system in a KVM deployment.

## Creating a DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a DB system in a KVM deployment.

### Important:

Oracle Grid Infrastructure of the same version as the database version is installed in the DB system. Use the command odacli describe-dbsystem-image to check the supported database versions for the DB system. Oracle Database Appliance release 19.27 supports creation of 23ai DB system that runs Oracle Grid Infrastructure 23ai and and Oracle Database 23ai. To create 23ai DB system, download and update the repository with DBVM 23ai template (patch 36524660), Oracle Grid Infrastructure 23ai clone (patch 36524627), and Oracle Database 23ai clones (patch 36524642). Specify the starter Oracle Database 23ai version in the create-dbsystem JSON file. Use the odacli describe-dbsystem-image command to check the exact Oracle Database 23ai version. The 23ai DB system supports running only Oracle Database 23ai database.

#### NOT\_SUPPORTED:

To create the DB system, access control must be enabled in Oracle ASM running on bare metal system. When the bare metal system is newly provisioned or patched to Oracle Database Appliance release 19.27, access control is already enabled, which is a prerequisite for setting appropriate file ownerships for all the files created in DB systems and on the bare metal system. Before you create the DB system, the files on Oracle ASM disk groups that do not have file ownership must be set up with ownership. If ownership is not set, then creation of DB system fails. Use the odacli modify-dbfileattributes command to set up the file ownerships.

#### Using ODACLI to Create a KVM DB System

Use the command odacli create-dbsystem to create a KVM DB system.

#### Follow these steps:

 Download the Oracle Database Appliance KVM DB System Image from My Oracle Support to a temporary location on an external client. Refer to the release notes for details about the software for the latest release.

For example, to create a 23ai DB system, use patch number 36524660. For 19c DB system, use patch number 32451228.

```
patch number 1927000 Linux-x86-64.zip
```

2. Unzip the software — it contains README.html and one or more zip files for the patch.

```
unzip patch_number_1927000_Linux-x86-64.zip
odacli-dcs-19.27.0.0.0-date-ODAVM-19.27.0.0.zip
```



3. Update the repository with the image.

```
# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/odacli-
dcs-19.27.0.0.0-date-ODAVM-19.27.0.0.zip
```

4. Run the odacli describe-dbsystem-image command to query the supported Oracle Grid Infrastructure and Oracle Database versions for this DB system KVM image. The Oracle Grid Infrastructure version that supports the Oracle Database version is installed.

```
# odacli describe-dbsystem-image
DB System Image details
Component Name Supported Versions Available Versions
DBVM 23.5.0.1.0 23.5.0.1.0
GI 23.5.0.24.07 23.5.0.24.07
   23.5.0.24.07 23.5.0.24.07
DB 23.5.0.24.07 23.5.0.24.07
  23.5.0.24.07 23.5.0.24.07
DBVM 19.24.0.0.0 19.24.0.0.0
 GI 19.24.0.0.240716 19.24.0.0.240716
                      19.23.0.0.240416 not-available
                      19.22.0.0.240116 not-available
                      19.21.0.0.231017 not-available
                      19.20.0.0.230718 not-available
                      19.19.0.0.230418 not-available
                      19.18.0.0.230117 not-available
                      19.17.0.0.221018 not-available
                      19.16.0.0.220719 not-available
                      19.15.0.0.220419 not-available
                      19.14.0.0.220118 not-available
                      19.13.0.0.211019 not-available
                      19.12.0.0.210720 not-available
                      19.11.0.0.210420 not-available
                      21.8.0.0.221018 not-available
                      21.7.0.0.220719 not-available
                      21.6.0.0.220419 not-available
                      21.5.0.0.220118 not-available
                      21.4.0.0.211019 not-available
                      21.3.0.0.210720 not-available
  DB 19.24.0.0.240716 19.24.0.0.240716
                      19.23.0.0.240416 not-available
                      19.22.0.0.240116 not-available
                      19.21.0.0.231017 not-available
                      19.20.0.0.230718 not-available
                      19.19.0.0.230418 not-available
                      19.18.0.0.230117 not-available
                      19.17.0.0.221018 not-available
                      19.16.0.0.220719 not-available
                      19.15.0.0.220419 not-available
                      19.14.0.0.220118 not-available
                      19.13.0.0.211019 not-available
                      19.12.0.0.210720 not-available
                      19.11.0.0.210420 not-available
```

21.8.0.0.221018 not-available

```
21.7.0.0.220719 not-available
21.6.0.0.220419 not-available
21.5.0.0.220118 not-available
21.4.0.0.211019 not-available
21.3.0.0.210720 not-available
```

- 5. If the odacli describe-dbsystem-image command output shows any component as not-available on the system, then download the component with supported versions and run the odacli update-repository to import the component to the repository.

  To deploy Oracle Database release 19.27, deploy Oracle Grid Infrastructure release 19.27. To deploy 23ai DB system, ensure that the DBVM 23.4.x, Oracle Grid Infrastructure 23.4.x, and Oracle Database 23.4.x clones are shown available in the odacli describedbsystem-image command output.
- 6. Create the prov.json file as per examples provided in this chapter.

  Oracle Database 21c and later supports only Container Databases (CDB). Ensure that you set the parameter "isCdb": true, and provide both the pdbName and pdbAdminUser in the JSON file if provisioning an Oracle Database 21c or later DB system.
- 7. Run the odacli create-dbsystem command with the prov.json file on the host.

```
# odacli create-dbsystem -p prov.json
```

- 8. If the odacli create-dbsystem command displays the message ASM ACL setup is not completed, please run 'odacli modify-dbfileattributes' command, then run the odacli modify-dbfileattributes command, and make sure the job finishes successfully before running the odacli create-dbsystem command.
- 9. If the odacli create-dbsystem command displays the message css\_critical configuration should be different on both nodes on a high-availability environment, then follow the instructions below to set css\_critical and ensure that the DB system functions properly when interconnect fails.
  - **a.** Run crsctl set server css\_critical yes on the first bare metal host. You must restart the Oracle Clusterware stack on the node for the values to take effect.
  - b. Run crsctl set server css\_critical no on the second bare metal host. You must restart the Oracle Clusterware stack on the node for the values to take effect.
  - c. Run crsctl get server css\_critical to verify the value. Refer to Oracle Clusterware Administration and Deployment Guide for more details about setting css critical.

#### Using Browser User Interface to Create a KVM DB System

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the **Appliance** tab.
- 3. Click **DB Systems** to display the DB Systems page.
- 4. In the page, click Create DB System.
- 5. In the Create DB System page, provide the DB system values.



- 6. If you want to use an existing configuration file, click **Browse** and select the configuration file. The system information from the file is populated in the relevant fields.
- 7. In the System Information tab, specify the values as follows.
  - **DB System Name**: Enter the DB System name. The name cannot end with a dash (-). Do not exceed 15 characters.
  - Domain Name: Enter the domain name.
  - Region: Select the region of the world where the Oracle Database Appliance is located.
  - Time Zone: Select the time zone where the Oracle Database Appliance is located.
  - Select Specify Multi-User Access Option to enable multi-user access on the DB system. You can choose either the Enable Multi-User Access or Enable
     Passwordless Multi-User Access option. For more information about these features, see the chapter Implementing Multi-User Access on Oracle Database Appliance in this guide.
    - If you choose to enable multi-user access, then specify and confirm the ODA
       Administrator User Password, Oracle User Password, and Grid User
       Password. Click Configure Multi-User Access Settings and set the User
       Password Expiry Duration, Session Expiration for CLI, and Maximum Failed
       Login Attempts.
    - If you choose to enable passwordless multi-user access, then you do not need to specify any of the above passwords.
  - System Password and Confirm Password: Enter the system password in both fields. The system password is the password set for UNIX and root users. The password must contain at least two characters each from: uppercase letters, lowercase letters, numbers (0-9), and allowed special characters #, or \_. The password must have a minimum of 9 characters and a maximum of 30 characters. Select the Assign same password for admin, oracle, and grid users option if you want to keep the same password for all users.
  - Disk Group for VM Storage: Select the disk group that is used for hosting the KVM storage. Note that this is different from the database file storage for the database that runs in the KVM, which is displayed automatically from the correct Oracle ASM disk group based on the database file type.
  - CPU Pool Name: Select the CPU pool to be associated with the DB system.
  - Select Force Run if you want to allow the DB system to use this CPU pool even if selecting the CPU pool leads to oversubscription of the CPU pool. Select Use Reserved CPU Cores to use reserved CPU cores.
  - Memory Size: Specify the memory to be allocated to the DB system. The memory size
    can be in KB, MB, GB, or TB. The default is GB.
  - VM Storage Redundancy: Specify the redundancy for the VM storage, either Mirror or High.
  - (Optional) DNS Servers: Enter addresses for one or more DNS servers.
  - (Optional) NTP Servers: Enter addresses for one or more NTP servers.
  - Public Network: Select from the existing virtual networks.
- 8. In the Network Information tab, specify the client access network details.
  - Node Name: For Node0, enter the host name for the primary client access network.
  - IP Address: Enter the virtual IP address that is shared between the nodes.



- Subnet Mask: Enter the subnet mask address for the primary client access network.
- Gateway: Enter the gateway address for the primary client access network.

For two-node deployments, provide the above values for both nodes. In addition, you must also specify the following:

- VIP Name and VIP Address: Specify the Virtual IP name and address.
- SCAN Name and SCAN IP Address: Specify the Single Client Access Name (SCAN) and SCAN IP address.
- 9. In the User and Group Selection tab, configure your users and groups and specify whether or not you want to allow operating system role separation:
  - Two users with six groups: Customize Users and Groups, select No. Allow OS Role Separation, select Yes. This is the default configuration.
  - Two customized users with six customized groups: Customize Users and Groups, select Yes. Allow OS Role Separation, select Yes.
  - Single user with two groups: Customize Users and Groups, select No. Allow OS Role Separation, select No.
  - Single user with six groups: Customize Users and Groups, select Yes. Allow OS Role Separation, select No.
  - Specify the GI User, DB User, Install Group, DBA Oper Group, DBA Group, ASM Admin Group, ASM Oper Group, ASM DBA Group, and the User and Group IDs.
- 10. In the Database Information tab, specify the following information to configure the database:
  - **DB Name**: Enter a name for the database. The name must contain alphanumeric characters and cannot exceed 8 characters.
  - DB Version: Specify the database version.
  - (Optional) **DB Unique Name**: Enter a globally unique name for the database. Databases with the same DB Name within the same domain (for example, copies of a database created for reporting or a physical standby) must have a different DB Unique Name that is unique within the enterprise. The name must begin with a lowercase or uppercase letter, and contain only alphanumeric characters and underscores(\_). The name must not contain dollar (\$), and pound (#) characters. The name cannot exceed 30 characters.
  - CDB: Select Yes or No to specify whether or not you want a Container Database (CDB).
  - PDB Name: Enter a name for the pluggable database (PDB).
  - **PDB Admin User**: Enter an Admin user name for the pluggable database (PDB). The name must begin with an alphanumeric character. You can specify alphanumeric characters and underscore (\_) in the name.
  - Database Edition: Select the Oracle Database edition, either Standard Edition and Enterprise Edition. Your license determines which database edition you are eligible to create in the DB System.
  - Deployment: Select the type of Deployment, whether RAC, RAC One, or SI. For Standard Edition Oracle Database 19c or later, you can only create single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high availability for single-instance database.

For Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, you can choose to enable high availability for single-instance databases. For

Enterprise Edition Oracle Database 19.15 or later or Oracle Database 21.6 or later, if you choose to create a single-instance database, then the high availability feature is disabled by default. To enable high-availability, set the value in the **Enable High Availability** field to **Yes**.

- Sys and PDB Admin User Password and Confirm Password: Provide a password for the database.
- Shape: Select a database shape from the list.
- Database Redundancy: If disk group redundancy is FLEX, then select HIGH or MIRROR from the drop down list for database redundancy. If the disk group redundancy is not FLEX, then the database redundancy field is not available and is set to the same as the disk group redundancy internally.
- In the Database Class field, select a database class from the drop-down list. If an
  option is not available in the list, it is not supported for the database edition on the
  Oracle Database Appliance or the version that you selected. The default is OLTP.
- Configure EM Express: Select Yes or No. Select Yes to configure the Oracle Enterprise Manager Database Express (EM Express) console.
- Character set: Select a character set.
- National Characterset: Select a national characterset.
- Language: Select the database language.
- Territory: Select a territory or location from the list.
- For Oracle Database Enterprise Edition 19c or later, you can choose to enable Transparent Database Encryption (TDE). Select **Yes** or **No** in the **Enable TDE** option. Specify and confirm the **TDE Password**. By default, the TDE option is disabled.
- Data Files on Flash Storage: Select Yes or No. This option is only available if the high-availability system has HDD storage drives.
- 11. Click Create.
- 12. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 13. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

#### Creating the BUI user oda-admin on a non-multi-user access enabled DB system

To create the BUI user oda-admin on a non-multi-user access enabled DB system, do one of the following:

- When you log into the DB system BUI for the first time after provisioning, you are prompted
  to enter a password and confirm the password to create the oda-admin user. After the odaadmin user is created, you can use the same credentials to log into the BUI.
- Run the odacli set-credential -u oda-admin command. When prompted, enter a password and confirm the password. After the command runs successfully, the oda-admin user is created. Use these credentials to log into the BUI.

#### **Related Topics**

Implementing Multi-User Access on Oracle Database Appliance
 Understand how multi-user access can be implemented on Oracle Database Appliance, its
 advantages and restrictions and the associated life cycle management changes for your
 appliance.



- Example JSON File to Create a High-Availability DB System
   Follow the JSON file example to create a JSON file to deploy a High-Availability DB system, with role separation, with the command odacli create-dbsystem.
- Example JSON File to Create a Single-Node DB System
   Follow the JSON file example to create a JSON file to deploy a single-node DB System,
   with role separation, with the command odacli create-dbsystem.
- odacli describe-dbsystem-image

Use the odacli describe-dbsystem-image command to view the supported Oracle Grid Infrastructure and Oracle Database versions and the availability of the clone files and Database System KVM image in the Oracle Database Appliance system.

odacli modify-dbfileattributes

Use the <code>odacli modify-dbfileattributes</code> command to properly set the file attributes (permissions and ownership) of files on Oracle ASM disk group on a bare metal host to support a dbsystem. Only run this command if prompted by the <code>odacli create-dbsystem</code> command.

## Listing DB Systems in a KVM Deployment

Use ODACLI commands or the Browser User Interface to list DB systems in a KVM deployment.

#### **Using ODACLI to List DB Systems**

Use the command odacli list-dbsystems to list DB systems.

# odacli list-dbsystems

#### Using Browser User Interface to List DB Systems

Follow these steps:

Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- 2. Click the Appliance tab.
- 3. Click **DB Systems** to display the DB Systems page.
- In the page, click on the DB system for which you want to view details.

#### **Related Topics**

odacli list-dbsystems

Use the odacli list-dbsystems command to view the database systems on Oracle Database Appliance Kernel-based Virtual Machine (KVM).



## Describing a DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to describe a DB system in a KVM deployment.

#### Using ODACLI to Describe a DB System

Use the command odacli describe-dbsystem to describe a DB system.

```
# odacli describe-dbsystem -n dbsystem name
```

#### Using Browser User Interface to Describe a DB System

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- Click DB Systems to display the DB Systems page.
- 4. In the page, click on the DB System for which you want to view details or click on the **Actions** drop down and select **View Details** to view the DB System details.
- 5. Click on the System Information tab for the DB System details, associated CPU Pool, Storage details, and associated VMs.
- 6. Click on the Database Information tab to view the associated database details.
- Click on the Network Information tab to view the network details for single node or highavailability deployments.

#### **Related Topics**

odacli describe-dbsystem

Use the odacli describe-dbsystem command to describe a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## Modifying a DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a DB system in a KVM deployment.

#### Using ODACLI to Modify a DB System

Use the command <code>odacli modify-dbsystem --shape</code> to change shape of the DB system. Starting with Oracle Database Appliance release 19.23, the <code>odacli modify-dbsystem --shape</code> command only changes the shape of the DB system; it does not change the shapes of the database inside the DB system any more. You must modify database shapes accordingly based on the new shape of the DB system. Ensure that you scale up database shapes after the DB system shape is scaled up. Similarly, scale down database shapes before DB system shape is scaled down; otherwise databases could fail to start because of reduced DB system memory.

```
# odacli modify-dbsystem -n dbsystem_name -s dbs4 [-dvn v_networks_to_detach]
[-en] [-gw gateway] [-ip ip address] [-nm netmask] [-sip scan ip address] [-
```

```
sn scan_name] [-s shape] [-vips vip_address] [-vt v_network_type] [-m
custom memory size]
```

You can attach a CPU pool to the DB system, or remove the CPU pool from the DB system.

Use the command <code>odacli modify-dbsystem -m</code> to increase the DB system memory. This does not change the database memory configuration. You must manually update the database memory configuration such as SGA, PGA, and others to utilize the increased memory. The command does not support reducing DB system memory. Changing the shape of the DB system after you change the DB system memory resets the memory of the DB system.

You can increase the DB system memory with the <code>odacli modify-dbsystem</code> command using the <code>-m</code> option.

```
# odacli modify-dbsystem -n dbsystem_name -m 24G
```

To reduce the DB system memory, use the --shape option with the command odacli modify-dbsystem. The DB system is automatically restarted for the new shape to take effect.

```
# odacli modify-dbsystem --name dbsystem1 --shape dbs2
```

Use the command <code>odacli modify-dbsystem</code> to attach or detach a new network to the DB system. This new network can be used for database backup, Oracle Data Guard setup or other purposes in the DB system.

You can use <code>odacli modify-dbsystem</code> to attach or detach the shared DB system CPU pool. Attaching a shared DB system CPU pool removes the internal CPU pool that was created at DB system creation time. When detaching shared CPU pool from the DB system, an internal CPU pool is automatically created and attached to the DB system. One shared DB system CPU pool can be attached to multiple DB systems. Oversubscribing to shared DB system CPU pool is allowed, but there could be potential performance impact if shared CPU pool is oversubscribed.

#### Note:

The odacli modify-dbsystem -s shape command only works on Oracle Database Appliance release 19.13 and later DB systems. The CPU pool commands are available on Oracle Database Appliance release 19.11 and later DB systems. In Oracle Database Appliance release 19.23 and later, the odacli modify-dbsystem -s shape command changes the DB system shape only; it does not modify the database shape. Run the odacli modify-database command in the DB system to change the database shape in the DB system.

#### Using Browser User Interface to Modify a KVM DB System

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

Click the Appliance tab.

- Click DB Systems to display the DB Systems page.
- 4. In the page, click on the DB System for which you want to view details or click on the Actions drop down and select Modify to change the following:
  - DB System shape
  - Attach or detach CPU pool for the DB system
  - Attach or detach networks
  - Enable or disable NUMA for the DB system
  - Memory size allocated to the DB system
  - VM storage redundancy (either Mirror or High)
- Select the new shape and CPU pool and click Modify.
- 6. Click Enable NUMA to set NUMA capabilities, and click Modify.
- Click the Detach Networks field to view the networks, select the network you want to detach, and click Modify.
- 8. To attach a network, specify the Name, IP Address, Subnet Mask, Gateway, Network Type, Default Network, and click Modify.
- 9. Confirm your action to submit the job to modify the DB System. You can manually run the odacli modify-database command inside the DB system to change the database shape.

#### **Related Topics**

odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## Attaching and Detaching a Network for a DB System in a KVM Deployment

Use ODACLI commands to attach or detach networks for DB system in a KVM deployment.

#### Using ODACLI to Attach or Detach a Network to a DB System

You can attach a new vnetwork to the DB system and use it for database backup, Oracle Data Guard configuration, and other options. Use the <code>odacli modify-dbsystem</code> to attach or detach network for a DB system in a KVM deployment. The vnetwork must exist before you can attach it to the dbsystem.

Follow these steps to attach a vnetwork to a DB system:

1. Identify the name of vnetwork bridge to attach to the DB system using the odacli list-vnetworks and odacli describe-vnetwork -n vnetwork name commands.



2. Use the odacli modify-dbsystem command to attach vnetwork to DB system:

```
# odacli modify-dbsystem -n dbsystem1 -avn vnet2 -t Dataguard -ip
192.168.10.119,192.168.10.120 -nm 255.255.240.0 -gw 192.168.10.1 -sn scan1
-sip 192.168.10.30,192.168.10.31 -vips
vip1:0:192.168.15.57,vip2:1:192.168.15.58
```

The IP address, netmask (nm) and gateway (gw) values are used to configure the new interface of the DB system. The SCAN name (sn), SCAN IP address (sip) and Virtual IP address (vip) are used when the vnetwork type is database or dataguard.

To detach a vnetwork in the DB system, run the following command:

```
# odacli modify-dbsystem -n name -dvn vnetwork name
```

#### Using Browser User Interface to Modify a DB System

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the Appliance tab.
- 3. Click **DB Systems** to display the DB Systems page.
- 4. In the page, click on the DB System for which you want to view details or click on the **Actions** drop down and select **Modify** to attach or detach vnetworks for the DB system.
- 5. Click the Detach Networks field to view the vnetworks, select the vnetwork you want to detach, and click Modify.
- 6. To attach a network, specify the Name, IP Address, Subnet Mask, Gateway, Network Type, Default Network, and click Modify.
- 7. Confirm your action to submit the job to modify the DB system.

## Starting a DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to start a DB system in a KVM deployment.

#### Using ODACLI to start a DB System

Use the command odacli start-dbsystem to start a DB system.

```
# odacli start-dbsystem -n dbsystem_name
```

#### Using Browser User Interface to Start a DB System

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

2. Click the **Appliance** tab.



- Click DB Systems to display the DB Systems page.
- In the page, click on the DB System which you want to start.
- 5. Click on the System Information tab and then click Start.
- **6.** For high-availability deployments, select the node on which you want to start the DB System. Click **Yes**.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.
- 9. When the DB System starts, the state displays as ONLINE.

#### **Related Topics**

odacli start-dbsystem
 Use the odacli start-dbsystem command to start a database system on Oracle
 Database Appliance Kernel-based Virtual Machine (KVM).

## Stopping a DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to stop a DB system in a KVM deployment.

#### Using ODACLI to Stop a DB System

Use the command odacli stop-dbsystem to stop a DB system.

```
# odacli stop-dbsystem -n dbsystem name
```

#### Using Browser User Interface to Stop a DB System

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the **Appliance** tab.
- 3. Click **DB Systems** to display the DB Systems page.
- 4. In the page, click on the DB System which you want to stop.
- Click on the System Information tab and then click Stop.
- 6. For high-availability deployments, select the node on which you want to stop the DB System. Click **Yes**.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.
- When the DB system stops, the state displays as OFFLINE.



#### **Related Topics**

odacli stop-dbsystem

Use the odacli stop-dbsystem command to stop a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## Deleting a DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a DB system in a KVM deployment.

#### Using ODACLI to Delete a KVM DB System

Use the command odacli delete-dbsystem to delete a KVM DB system.

```
# odacli delete-dbsystem -n dbsystem_name -f
```

If you do not specify the <code>-f</code> option, then the operation deletes the DB system and Oracle Clusterware files, and retains the database files. With the <code>-f</code> option, the operation deletes the DB system, Oracle Clusterware files, and the database files.

#### Using Browser User Interface to Delete a KVM DB System

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **DB Systems** to display the DB Systems page.
- In the page, for DB System which you want to delete, click on the Actions drop down list and select Delete.
- Confirm that you want to delete the DB System. Select Force Delete if you want to delete the DB system, Oracle Clusterware files, and the database files during the delete operation. Click Yes.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

#### **Related Topics**

odacli delete-dbsystem

Use the odacli delete-dbsystem command to delete a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).



# Managing Backup, Restore, and Recovery on a DB System in a KVM Deployment

Understand the backup, restore, and recovery operations supported on a DB system in a KVM deployment.

#### About Backup, Restore, and Recovery on a DB System

Similar to the bare metal systems, you can use ODACLI commands to configure and perform backup, restore, and recovery operations on DB systems. For information about backup, restore, and recovery on Oracle Database Appliance, see the chapter *Backup, Recover and Restore* in this guide.

#### **Related Topics**

Backup, Restore and Recover Databases
 Review backup, restore, and recovery operations for your databases.

## Managing Shared CPU Pool with DB System in a KVM Deployment

Use ODACLI commands or the Browser User Interface to manage shared CPU pool with DB system in a KVM deployment.

#### Using ODACLI to Manage Shared CPU Pool with DB system

Creating a DB system automatically creates an internal DB system CPU pool associated with this DB system. This DB system pool is managed internally and cannot be created, modified, or deleted manually. You can create a new type of shared CPU pool using the <code>odacli create-cpupool --dbsystem/-dbs -n cores</code> command. Similarly to VM and BM types, this CPU pool must not overlap with other CPU pools. In high-availability environments, the DB system CPU pool cannot be local, it must exist on both nodes always.

#### **Associating Shared DB System CPU Pool**

A shared DB system CPU pool can be associated to a new DB system or existing DB system. To create a new DB system with shared DB system CPU pool, add the "cpuPoolName" parameter in the create-dbsystem json file. The associated internal CPU pool is automatically deleted after a shared CPU pool is attached to a DB system. Use the odacli modify-dbsystem command to associate the CPU pool to an existing DB system.

```
# odacli modify-dbsystem -n dbsystem name -cp dbspool1
```

The cores of the DB System (based on its shape) must fit into the shared DB System CPU pool. Associating a shared DB system CPU pool to an existing DB system removes the internal CPU pool associated to the DB system. A single shared DB System CPU pool can be shared by multiple DB Systems. Oversubscription to the DB system CPU pool is allowed, but performance may be impacted if the CPU pool is oversubscribed. The list of associated DB systems can be queried using odacli list-cpupool or odacli describe-cpupool commands.



Use  $odacli\ describe-dbsystem$  to check the details of the CPU pool associated to the DB system:

# odacli describe-dbsystem -n dbs4e912c
CPU Pool

-----

Name: ce3f42bb28

Number of cores: 2

Host: n1

Effective CPU set: 9-10,29-30 Online CPUs: 9, 10, 29, 30

Offline CPUs: NONE

Host: n2

Effective CPU set: 9-10,29-30
Online CPUs: 9, 10, 29, 30

Offline CPUs: NONE

Use odacli list-cpupools to view the DB system CPU pool type and associated DB systems. The internal DB system CPU pool has type "DB\_SYSTEM" and shared DB system CPU pool has type "DB\_SYSTEM\_SHARED".

<pre># odacli list-cpupool Name Associated resources Updated</pre>	Туре	Created	Configured on		Cores
bmpool1 NONE UTC	BM	2021-03-30	n1, 0 17:54:59 UTC	2 2021-03-30	17:55:00
n2					
vmpool1 NONE UTC	VM	2021-03-30	n1, 0 17:54:48 UTC	2 2021-03-30	17:54:49
n2					
dbspool1 NONE UTC	DB_SYSTEM	_SHARED 2021-03-30	n1, 0 17:55:11 UTC		17:55:11
n2					
ce3f42bb28 dbs4e912c UTC	DB_SYSTEM	2021-03-30	n1, 0 17:57:43 UTC	2 2021-03-30	18:01:27
			114		



Use odacli describe-cpupool to find out more details about DB system CPU pool:

```
# odacli describe-cpupool -n ce3f42bb28
CPU Pool
details
                      ID: 8e62933b-b394-4bcf-9c32-6a4cea2e0360
                    Name: ce3f42bb28
                 Created: 2021-03-30 17:57:43 UTC
                 Updated: 2021-03-30 18:01:27 UTC
                    Type: DB SYSTEM
         Number of cores: 2
    Associated resources: dbs4e912c
CPU Allocations
                    Node: n1
       Effective CPU set: 9-10,29-30
             Online CPUs: 9, 10, 29, 30
            Offline CPUs: NONE
                    Node: n2
       Effective CPU set: 9-10,29-30
             Online CPUs: 9, 10, 29, 30
            Offline CPUs: NONE
```

#### **Dissociating Shared DB System CPU Pool**

A DB System with a shared DB System CPU pool could have the shared CPU pool detached from it and an internal DB System CPU Pool is created. If the internal DB system CPU pool cannot be created, then the odacli modify-dbsystem command fails.

Dissociating shared DB System CPU Pool:

```
# odacli modify-dbsystem -n dbs4e912c -no-cp
```

#### Modifying Shared DB System CPU Pool

A shared DB system CPU pool could be resized if all the associated DB systems shapes still fit into the cores of the pool (CPU pool size >= individual DB system size) The change is effective immediately on running DB system VMs.

#### Modifying a DB System Associated with a Shared DB System CPU Pool

If a DB System is associated with a shared DB System CPU Pool and its shape is modified with the odacli modify-dbsystem command, then the new shape of the DB system must fit into the cores of the pool.

#### **Deleting Shared DB System CPU Pool**

A shared DB system CPU Pool can be deleted using the odacli delete-cpupool command only if it has no associated DB systems.

#### **Related Topics**

Oracle Database Appliance KVM Hard Partitioning Compliance

#### odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Remapping CPU Pools in a Bare Metal or KVM Deployment
 Use ODACLI commands or the Browser User Interface to remap CPU pools in a bare metal or KVM deployment.

#### odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## Managing Oracle Data Guard on a DB System in a KVM Deployment

Understand the Oracle Data Guard operations supported on a DB system in a KVM deployment.

#### About Using Oracle Data Guard on a DB System

Similar to the bare metal systems, you can configure and use Oracle Data Guard on DB systems using ODACLI commands. You can set up Oracle Data Guard between the bare metal system and DB system, or between two DB systems. Integrated Oracle Data Guard can also be used for migrating from bare metal system to DB system, or between two DB systems. For information about Oracle Data Guard on Oracle Database Appliance, see the chapter *Using Oracle Data Guard for Disaster Management and Recovery on Oracle Database Appliance* in this guide.

#### **Related Topics**

 Using Oracle Data Guard for Disaster Management and Recovery on Oracle Database Appliance

Understand how you can use Oracle Data Guard for disaster management and recovery on Oracle Database Appliance.

# Setting Up and Configuring a KVM Deployment for Applications

Understand the steps to set up and configure KVM deployment for applications.

Follow these steps to set up a KVM deployment on Oracle Database Appliance

- Create a VM storage.
- 2. Create a virtual network.
- Create virtual disks.
- 4. Create virtual machines.

The following links provide information about performing these steps:



#### **Related Topics**

- Creating a VM Storage in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a VM storage in a KVM
   deployment.
- Creating a Virtual Network in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a virtual network in a
   KVM deployment.
- Creating a Virtual Disk in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a virtual disk in a KVM
   deployment.
- Creating a Virtual Machine with ODACLI or BUI in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a virtual machine in a
   KVM deployment.

## Managing VM Storage in KVM Deployment

Use ODACLI to create, view, modify, and delete VM storage in an Oracle Database Appliance KVM deployment.

- Creating a VM Storage in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a VM storage in a KVM
   deployment.
- Viewing VM Storage in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to view all VM storage or details
   about a VM storage in a KVM deployment.
- Modifying VM Storage in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to modify VM storage in a KVM
   deployment.
- Deleting a VM Storage in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to delete a VM storage in a KVM
   deployment.

## Creating a VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a VM storage in a KVM deployment.

#### **Using ODACLI to Create VM Storage**

Use the command odacli create-vmstorage to create a VM Storage.

Create a VM storage named share1 of 8 GB.

# odacli create-vmstorage -n share1 -s 8G

#### **Using Browser User Interface to Create VM Storage**

Follow these steps:

1. Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html



- Click the Appliance tab.
- 3. Click **Show VM Instances** to display the VM Instances page.
- 4. In the page, select the Create VM Storage option and click Next.
- 5. In the Create VM Storage page, specify the following:
  - Storage Name: Name of the VM storage
  - Storage Size: Size of the storage to be allocated
  - ASM Disk group: Select the Oracle ASM disk group
  - Redundancy: Select the VM storage redundancy, either Mirror or High
- 6. Click Create.
- 7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Viewing VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all VM storage or details about a VM storage in a KVM deployment.

#### Using ODACLI to View VM Storage

The command odacli describe-vmstorage displays details about VM storage. Use the command odacli list-vmstorages to view all VM storages in the deployment.

- # odacli list-vmstorages
- # odacli describe-vmstorage

#### Using Browser User Interface to View VM Storage

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- Click VM Instances to display the VM Details page.
- 4. Click the **Show VM Storage** tab to view the list of all configured VM storages.
- 5. Click on a VM Storage to view the details of the VM storage.



## Modifying VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify VM storage in a KVM deployment.

#### Using ODACLI to Modify VM Storages

Use the command odacli modify-vmstorage to modify VM storage.

Increase the size of a VM storage named share1 by 10 gigabytes.

```
# odacli modify-vmstorage -n share1 -i 10G
```

Decrease the size of a VM storage named share1 by 5 gigabytes.

```
# odacli modify-vmstorage -n share1 -s 5G
```

#### Using Browser User Interface to Modify VM Storage

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- Click the Show VM Storage tab.
- 5. In the page, select a VM Storage, select the **Modify** option and click **Next**.
- In the Modify VM Storage page, specify Increment in size, the VM storage Redundancy as either Mirror or High, and click Modify.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Deleting a VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a VM storage in a KVM deployment.

#### Using ODACLI to Delete VM Storage

Use the command odacli delete-vmstorage to delete a VM storage.

Delete a VM storage named vs1.

```
# odacli delete-vmstorage -n vs1
```



#### Using Browser User Interface to Modify VM Storage

Follow these steps:

Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- 2. Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- Click the Show VM Storage tab.
- 5. In the page, select a VM Storage, select the **Delete** option.
- Click Yes to confirm your choice.
- 7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

# Managing Virtual Networks in KVM Deployment

Use ODACLI to create, view, start, stop, and delete virtual networks in an Oracle Database Appliance KVM deployment.

- Creating a Virtual Network in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a virtual network in a
   KVM deployment.
- Viewing Virtual Networks in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to view all virtual networks or
   details about a virtual network in a KVM deployment.
- Starting and Stopping Virtual Networks in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to start or stop virtual networks in a
   KVM deployment.
- Modifying a Virtual Network in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to modify a virtual network in a
   KVM deployment.
- Deleting a Virtual Network in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to delete a virtual network in a
   KVM deployment.

## Creating a Virtual Network in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a virtual network in a KVM deployment.

#### **Using ODACLI to Create Virtual Network**

Use the command odacli create-vnetwork to create a virtual network.



#### Create a VM network of type bridged using the interface btbond2.

```
# odacli create-vnetwork --name mgmtNet --bridge mgmtNet --type bridged --
interface btbond2 --ip 192.168.120.26 --gateway 192.168.120.1 --netmask
255.255.255.0
```

Create a VM network of type bridged-vlan using the interface btbondl.

```
# odacli create-vnetwork --name backupvlan --bridge backupvlan --type bridged-
vlan --vlan-id 12 --interface btbond1 --ip 192.168.100.10 --gateway
192.168.100.1 --netmask 255.255.255.0
```

#### Using Browser User Interface to Create Virtual Network

#### Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the **Appliance** tab.
- 3. Click **Show VM Instances** to display the VM Instances page.
- In the page, select the Create Virtual Network option and click Next.
- 5. In the Create Virtual Network page, specify the following:
  - Name: Name of the virtual network
  - IP Address: Virtual network IP address
  - Subnet Mask and Gateway: Virtual network subnet mask and gateway
  - Network Type: Virtual network type
  - Interface: Virtual network interface
  - Bridge Name: Name of the network bridge
  - VLAN ID: ID of the VLAN network
- 6. Click Create.
- 7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.



## Viewing Virtual Networks in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all virtual networks or details about a virtual network in a KVM deployment.

#### **Using ODACLI to View Virtual Networks**

The command odacli describe-vnetwork displays details about a virtual network. Use the command odacli list-vnetworks to view all virtual networks in the deployment.

```
# odacli list-vnetworks
```

# odacli describe-vnetwork -n vnet1

#### **Using Browser User Interface to Create Virtual Networks**

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click VM Instances to display the VM Details page.
- 4. Click the **Show Virtual Networks** tab to view the list of all configured virtual networks.
- 5. Click on a Virtual Network to view the details of the virtual network.

## Starting and Stopping Virtual Networks in a KVM Deployment

Use ODACLI commands or the Browser User Interface to start or stop virtual networks in a KVM deployment.

#### Using ODACLI to Start and Stop Virtual Networks

The command odacli start-vnetwork starts a virtual network. Use the command odacli stop-vnetwork to stop a virtual network in the deployment.

```
# odacli start-vnetwork -n vnet1
```

# odacli stop-vnetwork -n vnet1

#### Using Browser User Interface to Start and Stop Virtual Networks

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.



- Click the Show Virtual Networks tab to view the list of all configured virtual networks.
- To start a virtual network, click on a Virtual Network, and then click Start.
- 6. To stop a virtual network, click on a virtual network, and then click **Stop**.

## Modifying a Virtual Network in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual network in a KVM deployment.

#### **Using ODACLI to Modify Virtual Network**

Use the command odacli modify-vnetwork to modify a virtual network.

```
# odacli modify-vnetwork -n vnet1 -g 10.11.44.41
```

#### **Using Browser User Interface to Modify Virtual Network**

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- Click the Show Virtual Networks tab.
- 5. In the page, select a Virtual Network, select the **Modify** option and click **Next**.
- In the Modify Virtual Network page, specify any changes in the Subnet Mask, Gateway, or IP Address, and click Modify.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Deleting a Virtual Network in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a virtual network in a KVM deployment.

#### **Using ODACLI to Delete Virtual Networks**

Use the command odacli delete-vnetwork to delete a virtual network.

Delete a virtual network named vnet1.

# odacli delete-vnetwork -n vnet1

#### Using Browser User Interface to Modify Virtual Networks

Follow these steps:



Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- Click the Show Virtual Networks tab.
- 5. In the page, select a virtual network, select the **Delete** option.
- 6. Click Yes to confirm your choice.
- 7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

# Managing Virtual Disks in KVM Deployment

Use ODACLI to create, view, clone, modify, and delete virtual disks on Oracle Database Appliance KVM deployment.

- Creating a Virtual Disk in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to create a virtual disk in a KVM
   deployment.
- Viewing Virtual Disks in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to view all virtual disks or details about a virtual disk in a KVM deployment.
- Cloning a Virtual Disk in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to clone a virtual disk in a KVM
   deployment.
- Modifying a Virtual Disk in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to modify a virtual disk in a KVM
   deployment.
- Deleting a Virtual Disk in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to delete a virtual disk in a KVM
   deployment.

## Creating a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a virtual disk in a KVM deployment.

Ensure that a VM storage exists before you create a virtual disk.

#### **Using ODACLI to Create Virtual Disks**

Use the command odacli create-vdisk to create a virtual disk.

Specify the name of the virtual disk in the command odacli create-vdisk -n name. Identify the storage in which you create the virtual disk by using the -vms storage option. Use the option -s size to specify the virtual disk size. If you want to configure the virtual disk as a shared disk, then use the option -sh.



The vdisk name must start with a letter followed by underscores, hyphens, or alphanumeric characters and can have a maximum length of 30 characters.

Create a 2 GB non-sparse and shareable virtual disk named vdisk1 inside the VM storage vms1.

```
odacli create-vdisk -n vdisk1 -vms vms1 -s 2G -sh
```

#### Using Browser User Interface to Create Virtual Disks

Follow these steps:

Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click VM Instances to display the Virtual Disk page.
- 4. Click Create Virtual Disk.
- 5. In the page, select the **Create Virtual Disk** option and click **Next**.
- 6. In the Create Virtual Disk page, specify the following:
  - Virtual Disk Name: Name assigned to the virtual disk that is unique within the name repository
  - VM Storage Name: Name of the VM storage where the virtual disk will be created
  - Disk Size: Size of the virtual disk
  - Shared: Specify if you want to share the virtual disk
  - Sparse or Non-Sparse: Specify if the virtual disk is sparse
- Click Create.
- 8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

### Viewing Virtual Disks in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all virtual disks or details about a virtual disk in a KVM deployment.

#### **Using ODACLI to View Virtual Disks**

The command odacli describe-vdisk displays details about a virtual disk. Use the command odacli list-vdisks to view all virtual disks in the deployment.

```
# odacli list-vdisks
```

```
# odacli describe-vdisk -n vdisk name
```



#### Using Browser User Interface to Create Virtual Disks

#### Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- 4. Click the **Show Virtual Disks** tab to view the list of all configured virtual disks.
- Click on a virtual disk to view the details of the virtual disk.

## Cloning a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to clone a virtual disk in a KVM deployment.

#### **Using ODACLI to Clone Virtual Disks**

Use the command odacli clone-vdisk to clone an existing virtual disk.

Specify the source vdisk from which you want to clone with the -n option, and specify the name of the cloned virtual disk with the -cn option.

Create a clone of a virtual disk named <code>vdisk1</code>, with the name <code>vdisk1\_clone</code>. The cloned disk is created on the same storage as <code>vdisk1</code>.

```
# odacli clone-vdisk -n vdisk1 -cn vdisk1 clone
```

#### Using Browser User Interface to Create Virtual Disks

#### Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- 2. Click the Appliance tab.
- 3. Click VM Instances to display the Virtual Disk page.
- 4. Click Create Virtual Disk.
- 5. In the page, select the Clone Virtual Disk option and click Next.
- 6. In the Clone Virtual Disk page, specify the following:
  - Select the source virtual disk you want to clone
  - Specify the name of the cloned virtual disk
- Click Create.
- 8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.



## Modifying a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual disk in a KVM deployment.

#### **Using ODACLI to Modify Virtual Disks**

Use the command odacli modify-vdisk to increase the size of a virtual disk.

Increase the size of a virtual disk named vdisk1 by 4 gigabytes.

```
# odacli modify-vdisk -n vdisk1 -i 4G
```

#### Using Browser User Interface to Modify Virtual Disks

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- 4. Click the Show Virtual Disks tab.
- In the page, select a Virtual Disk, select the Modify Virtual Disk option and click Next.
- In the Modify Virtual Disk page, specify Increment in size and if you want to share the virtual disk.
- Click Modify.
- 8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

### Deleting a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a virtual disk in a KVM deployment.

#### **Using ODACLI to Delete Virtual Disks**

Use the command odacli delete-vdisk to delete a virtual disk.

Delete a virtual disk named vdisk1.

```
# odacli delete-vdisk -n vdisk1
```

#### Using Browser User Interface to Modify Virtual Disks

Follow these steps:



Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- 4. Click the **Show Virtual Disks** tab.
- 5. In the page, select a Virtual Disk, select the **Delete** option.
- Click Yes to confirm your choice.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Managing Virtual Machines in KVM Deployment

Use ODACLI to create, view, clone, modify, start, stop, and delete virtual machines in an Oracle Database Appliance KVM deployment.

- Creating a Virtual Machine with ODACLI or BUI in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual machine in a
  KVM deployment.
- Creating a Virtual Machine with a Kickstart Configuration File
   Use a local kickstart configuration file to create a virtual machine in a KVM deployment.
- Cloning a Virtual Machine in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to clone a virtual machine instance
   in a KVM deployment.
- Modifying a Virtual Machine in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to modify a virtual machine in a
   KVM deployment.
- Viewing Virtual Machines in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to view all virtual machines or
   details about a virtual machine in a KVM deployment.
- Starting and Stopping Virtual Machines in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to start or stop virtual machines in
   a KVM deployment.
- Deleting a Virtual Machine in a KVM Deployment
   Use ODACLI commands or the Browser User Interface to delete a virtual machine in a
   KVM deployment.

## Creating a Virtual Machine with ODACLI or BUI in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a virtual machine in a KVM deployment.

Ensure that a VM storage exists before you create a VM instance.



#### **Using ODACLI to Create Virtual Machine Instance**

Use the command odacli create-vm to create a VM instance. Specify the preferred node on which to start the virtual machine after creation (-pn option).

Following is an example command to create a VM named vm1 with 8 vcpus and 8 GB memory. A VM disk of size 10 GB is created automatically as /dev/vda inside the VM for the operating system installation. The VM disk is stored in the VM storage vms1. The source used for the installation is located on /u01/OL7.iso. If you want to attach an additional virtual disk to the VM, you can specify --vdisks  $vdisk_name$ , where  $vdisk_name$  is an existing virtual disk. This virtual disk when attached, is shown as /dev/vdb inside the VM.

```
# odacli create-vm -n vm1 -vc 8 -m 8G -vms vms1 -src /u01/OL7.iso -size 10G
```

To use a kickstart configuration file to create the VM instance, include the file in the <code>--extra-args</code> parameter. Include the file name in the <code>--extra-args</code> parameter, and use HTTP-based install tree. The <code>--extra-args</code> parameter does not work with ISO directly; it requires an installation tree. Create a kickstart configuration file, including the network configuration for the guest VM. Ensure that you specify the network details in the <code>--extra-args</code> parameter so that the VM bootstrap can use it to access the kickstart configuration file in this format <code>"net.ifnames=0 biosdevname=0 dns=dns ip</code>

ip=ip::gateway:netmask:hostname:interface:none". The IP must belong to the vnetwork to be attached to the VM, and the kickstart configuration must be available over this vnetwork.

#### For example:

```
odacli create-vm --name odaksvm --vnetwork pubnet --memory 4G --source http_based_install_tree --vmstorage myvms --size 10G --vcpus 2 --extra-args "net.ifnames=0 biosdevname=0 dns=dns_IP ip=vm_IP::gateway_IP:netmask:vm_hostname:eth0:none console=tty0 console=ttyS0,115200 ks=http://Webserver_IP:portnumber/ks.txt"
```

The odacli create-vm command also supports local kickstart configuration. Use the -k option to specify the path to the local kickstart file. For example:

```
odacli create-vm -vn pubnet -m 4G -vc 8 -src https://example.com/iso/OracleLinux/OL9/u5/x86_64/OracleLinux-R9-U5-x86_64-dvd/ -vms vms1 -g vnc,listen=0.0.0.0,port=5949 -n vm1 -s 20G --ks-config /u01/kvm/images/ks.txt --extra-args "inst.ks=file:/ks.txt net.ifnames=0 biosdevname=0 nameserver=dns_IP ip=vm_ip::gateway_ip:netmask:vm_hostname:eth0:none"
```

If you do not use a kickstart configuration file to create the VM instance, then complete the VM instance creation as follows:

- 1. Run the odacli create-vm command and check that it completes successfully.
- 2. Use the odacli describe-vm command to check the VNC port.
- 3. Log in to the VM instance using the VNC port: host:vncport. See the section Connecting to the VM instance Using VNC for the steps to connect to the VM instance using VNC.
- 4. Complete the installation process by providing your values for the installation screens.



- Log in again to the VM instance using the VNC port: host:vncport. See the section Connecting to the VM instance Using VNC for the steps to connect to the VM instance using VNC.
- 6. If you specified --vnetwork in the odacli create-vm command, then you can run ifconfig -a to view the network interface in the VM. Configure the network as you would on a Linux system.
- After the network is configured, log into the VM using the network and customize the VM instance.
- 8. If you did not specify --vnetwork in the odacli create-vm command, then the VM network is created using the default Network Address Translation (NAT) based KVM bridge virbr0. eth0 is configured as DHCP inside the VM.

#### Connecting to the VM instance Using VNC: Method 1

1. Find out the VNC display port of the VM from the command odacli describe-vm -n vm name: 127.0.0.1:1

Run vncserver on the Oracle Database Appliance host. Note down the vncserver address odahost:11.

```
# vncserver
New 'odahost:11 (root)' desktop is odahost:11
```

- 3. Launch vncviewer from your desktop, login to the Oracle Database Appliance host using the vncserver address created in step 2: odahost:11. This launches a vncviewer that logs into the Oracle Database Appliance host.
- 4. From vncviewer launched in step 3, run the vncviewer command with the display port from the odacli describe-vm output. For example, in the previous step, the odacli describe-vm command shows the display port is 127.0.0.1:1, so type vncviewer 127.0.0.1:1.

#### Connecting to the VM instance Using VNC: Method 2

 Find out the VNC display port of the VM from the command odacli describe-vm. For example, the Display Port is Display Port: 127.0.0.1:1, and the current node myodahost1.

```
# odacli describe-vm -n vm1
VM details
-----
ID: c280af13-997c-49b1-97ce-0617610535f1
Name: vm1
```



```
Graphics settings: vnc,listen=127.0.0.1
Display Port: 127.0.0.1:1 <<<<
...
Status

Current node: myodahost1 <<<
Current state: ONLINE
Target state: ONLINE
```

2. On Linux or macOS operating systems where you want to launch the vncviewer, use the following command to create the SSH tunnel:

```
ssh -L localport:127.0.0.1:vncport root@odahost
```

where localport is an available port number greater than 1024 on your local machine (for example, 12345) where vnc viewer is launched. vncport is the VNC port displayed in the odacli describe-vm command plus 5900. For example, if odacli describe-vm returns the display port as 127.0.0.1:1, then use 5901 as the VNC port. odahost1 is the host name of the Oracle Database Appliance host where the VM is running. 127.0.0.1 is the address where vnc server is listening at. Do not change the 127.0.0.1 address. For example:

```
ssh -L 12345:127.0.0.1:5901 root@odahost1
```

On Windows, use PuTTY to create the SSH tunnel.

3. Launch vncviewer from your desktop, enter VNC server address as localhost:localport, where localport is one used in the SSH tunnel in step 2 (such as 12345). For example:

```
vncserver: localhost:12345
```

#### How to find VM network interface attached to the vnetwork

If you specified --vnetwork in the odacli create-vm command, then you can run ifconfig -a to view the network interface in the VM. Find out the VM network interface name that is attached to the vnetwork by matching the interface MAC address to the MAC address displayed in the odacli describe-vm command.

#### For example:



```
... vNetworks: pubnet:52:54:00:15:b5:c4 pubnet:52:54:00:15:b5:c4 <<<<
```

Run "ip link show"inside the VM, find the interface name whose MAC address (the link/ether field in the ip command output: link/ether 52:54:00:15:b5:c4) that matches the vnetwork MAC address in the describe-vm output "pubnet:52:54:00:15:b5:c4", in this case it is eth0. So eth0 is the interface attached to the vnetwork "pubnet".

```
# ip link show
...
3: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP
mode DEFAULT group default qlen 1000
    link/ether 52:54:00:15:b5:c4 brd ff:ff:ff:ff:
```

Configure the network interface eth0 as you would on a Linux system.

#### Using Browser User Interface to Create Virtual Machine Instance

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **Show VM Instances** to display the VM Instances page.
- 4. In the page, select the Create VM Instance option and click Next.
- 5. In the Create Virtual VM page, specify the following:
  - VM Name: Name assigned to the VM instance that is unique within the name repository
  - VM Storage Name: Name of the VM storage where the VM instance will be created
  - Source Installation: The source from which you want to create the VM
  - Preferred Node: Node where you want to run the VM instance
  - Memory Size: Size of the memory to be allocated
  - CPU Pool Name: Select the CPU Pool
  - Number of vCPUs to Use: Number of virtual CPUs to be allocated
- Click Create.
- 7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Creating a Virtual Machine with a Kickstart Configuration File

Use a local kickstart configuration file to create a virtual machine in a KVM deployment.

Ensure that a VM storage exists before you create a VM instance.



Use a kickstart configuration file to create the VM instance as follows:

1. Create a kickstart file similar to the following:

```
[root@node1 html]# cat ks.txt
# Environment setup
*************************
# url --url="http://xxx.xxx.xxx.x:xxxx/cent7"
text
auth --enableshadow --passalgo=sha512
keyboard --vckeymap=us --xlayouts='us'
lang en US.UTF-8
eula --agreed
reboot
# network configuration
*************************
network --bootproto=static --ip=xx.xx.xxx.xx --gateway=xx.xx.xx.x
netmask=xxx.xxx.x --noipv6 --device=eth0 --nameserver=10.209.76.198 --
#network --bootproto=dhcp --device=eth0 --ipv6=auto --activate
network --hostname=host1
timezone Africa/Nairobi --isUtc
# partitioning
ignoredisk --only-use=vda
bootloader --location=mbr --boot-drive=vda
zerombr
clearpart --none --initlabel
autopart --type=lvm
# part swap --asprimary --fstype="swap" --size=1024
# part /boot --fstype xfs --size=200
# part pv.01 --size=1 --grow
# volgroup rootvg01 pv.01
# logvol / --fstype xfs --name=lv01 --vgname=rootvg01 --size=1 --grow
```

```
#################
# User Accounts
# Generate encrypted password: python -c 'import crypt;
print(crypt.crypt("My Password"))'
# Or openssl passwd -1 password
#################
rootpw password
# user --groups=wheel --name=josepy --password=password --gecos="Mutai
Josphat"
# SELinux and Firewalld
selinux --enforcing
#selinux --permissive
#selinux --disabled
# firewall --enabled --http --ssh --ftp --port=https:tcp --port=ipp:tcp
# firewall --disabled
# Software Packages
%packages --nobase --ignoremissing
@core
@base
vim
bash-completion
%end
[root@node1 html]# ll /etc/httpd/conf/httpd.conf
-rw-r--r-- 1 root root 11753 Jan 28 01:08 /etc/httpd/conf/httpd.conf
[root@node1 html]# 11
total 8
-rw-r--r-- 1 root root 2257 Feb 23 15:18 ks.txt
-rw-r--r-- 1 root root 15 Feb 23 14:37 test.html
[root@node1 html]#
[root@node1 html]# pwd
/var/www/html
```

2. Run the odacli create-vm command and specify the kickstart configuration file location with the --ks-config /-k option, specifying the full file path, and adding the "ks=file:/name of kickstart file only, no path" parameter.

```
[root@nodel log]# odacli create-vm -m 8G -n test1 -src /mnt/OL77 -vc 4 -
vms vms776904 -osv ol7.7 -ea
"ks=file:/ol_ks4540390061705364312.txt net.ifnames=0 biosdevname=0
dns=xxx.xxx.xx
ip=xx.xx.xx.xx::xx.xx.xx::xx.xxx.xxx.xx:host:eth0:none console=tty0
console=ttyS0, 11520"
-s 9G -k /tmp/ol ks4540390061705364312.txt
```

3. Log in to the VM instance and confirm that the VM is created.

```
[root@node1 network-scripts]# cat ifcfg-eth0
# Generated by parse-kickstart
UUID="3c4bce29-23d0-4dd2-b22b-349476a028a0"
DNS1="xx.xxx.xx.xx"
IPADDR="xx.xxx.xx.xx"
GATEWAY="xx.xxx.xx.xx"
NETMASK="xx.xxx.xx.xx"
BOOTPROTO="static"
DEVICE="eth0"
ONBOOT="yes"
IPV6INIT="no"
[root@node1 network-scripts]#
 ~ % ssh root@node1
Warning: Permanently added 'host1' (ED25519) to the list of known hosts.
root@host1's password:
Last login: Thu Feb 23 18:17:34 2023
(reverse-i-search) `': ^C
[root@node1 ~]#
```

## Cloning a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to clone a virtual machine instance in a KVM deployment.

#### Using ODACLI to Clone Virtual Machine Instance

Use the command odacli clone-vm to clone an existing virtual machine.

The name of the VM you create is defined by the command odacli clone-vm -cn name. Specify the source VM from which you want to clone.

Create a clone of a virtual machine named vm1, with the name  $vm1\_clone$ . The cloned VM is created on the same storage as vm1.

```
# odacli clone-vm -n vm1 -cn vm1 clone
```

#### Using Browser User Interface to Clone Virtual Machine Instance

Follow these steps:

Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Instance page.
- Click Create VM Instance.
- 5. In the page, select the Clone VM Instance option and click Next.
- 6. In the Clone VM Instance page, specify the following:
  - · Select the Source VM you want to clone
  - Specify the name and description of the cloned VM instance
- 7. Click Create.
- 8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Modifying a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual machine in a KVM deployment.

#### **Using ODACLI to Modify Virtual Machines**

Use the command odacli modify-vm to modify a virtual machine.

Update the configuration of a VM named vm1, setting the CPU count to 6 and the maximum memory to 6 gigabytes on both the running VM and subsequent boots.

```
# odacli modify-vm -n vml -c 6 -mm 6G --live --config
```

#### Modify a VM to attach a vnetwork:

```
# odacli modify-vm -n vm name -avn vnetwork name
```

- When an application VM is created, a default network interface is created by default in the VM. This interface is attached to the default kvm bridge (virbr0) at the host. This interface is intended for convenient communication between the host and VM. This interface does not attach to any physical network interface at the host. Do not configure this interface to use for any external communication.
- You must create a vnetwork using the command odacli create-vnetwork and attach the
  vnetwork (odacli modify-vm -avn) to the VM. This creates a second interface in the VM.
  Configure this network interface for your network requirement.
- The network interface name in the VM depends on the operating system.

#### **Using Browser User Interface to Modify Virtual Machines**

Follow these steps:



Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- Click the Show VM Instances tab.
- 5. In the page, select a Virtual Machine, select the **Modify** option and click **Next**.
- 6. In the Modify VM page, specify Increment in size, and if you want to Auto Start, Set Failover, or Enable NUMA.
- 7. You can also modify the CPU Pool, Number of vCPUs to use, Memory Size, and attach and detach virtual disks and virtual networks.
- 8. Select if you want to save the configuration or apply the configuration to the running VM.
- Click Modify.
- 10. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 11. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

## Viewing Virtual Machines in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all virtual machines or details about a virtual machine in a KVM deployment.

#### **Using ODACLI to View Virtual Machines**

The command odacli describe-vm displays details about a virtual machine. Use the command odacli list-vms to view all virtual machines in the deployment.

```
# odacli list-vms
# odacli describe-vm -n vm_name
```

#### **Using Browser User Interface to Create Virtual Machines**

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- 4. Click the **Show VM Instances** tab to view the list of all configured virtual machines.
- 5. Click on a VM Instance to view the details of the virtual machine.



## Starting and Stopping Virtual Machines in a KVM Deployment

Use ODACLI commands or the Browser User Interface to start or stop virtual machines in a KVM deployment.

#### **Using ODACLI to Start and Stop Virtual Machines**

The command odacli start-vm starts a virtual machine. Use the command odacli stop-vm to stop a virtual machine in the deployment.

If pref-node is defined for the VM, then the VM starts on the pref-node. If pref-node is not defined for the VM, then the VM can start on any node, in a high-availability deployment. However, if you specify the node name -n, then the VM starts on the specified node, even if the preferred node is defined.

```
# odacli start-vm -n vm1
# odacli stop-vm -n vm1
```

#### Using Browser User Interface to Start and Stop Virtual Machines

Follow these steps:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- 4. Click the **Show VM Instances** tab to view the list of all configured virtual machines.
- To start a virtual machine, click on a VM Instance, and then click Start and select the node to start the virtual machine.
- 6. To stop a virtual machine, click on a VM Instance, and then click **Stop** to stop the virtual machine. Click **Force Stop** to close all running processes and stop the virtual machine.

### Deleting a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a virtual machine in a KVM deployment.

#### **Using ODACLI to Delete Virtual Machines**

Use the command odacli delete-vm to delete a virtual machine.

Delete a virtual machine named vm1.

```
# odacli delete-vm -n vm1
```

#### **Using Browser User Interface to Modify Virtual Machines**

Follow these steps:



Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Appliance tab.
- 3. Click **VM Instances** to display the VM Details page.
- Click the Show VM Instances tab.
- 5. In the page, select a VM Instance, select the **Delete** option.
- Click Yes to confirm your choice.
- When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
- 8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command odacli describe-job with the job ID.

# About Overcommitting Memory or CPUs in an Oracle Database Appliance KVM System

Understand performance and other considerations before overcommiting CPU and memory for application KVM.

Oracle Database Appliance does not restrict overcommiting of CPU and memory for application KVM. However, it is not recommended to overcommit CPU or memory. Overcommitting CPU can lead to slow performance of the VMs and the host. Overcommitting memory can cause the system to run out of memory (OOM), which may lead to the Linux kernel shutting down important system processes. Before you decide to overcommit CPU or memory, ensure that you test your systems. When sizing the application VMs, it is recommended to reserve at least 24 GB memory and 2 CPU cores for bare metal system KVM host when there is no database running on the bare metal system host.

Oracle Database Appliance validates oversubscription of shared CPU pools for DB systems as well as memory associated with DB systems. Starting with Oracle Database Appliance release 19.15, the commands <code>odacli start-dbsystem</code>, <code>odacli modify-dbsystem</code>, <code>odacli create-dbsystem</code>, and <code>odacli modify-cpupool</code> display errors if the operations result in overcommiting of the CPU pool or memory for the DB system. You can use the <code>--force/-f</code> option to allow overcommit of resources for DB systems. This check applies to DB systems only, not for application VMs.

## Example JSON File to Create a Single-Node DB System

Follow the JSON file example to create a JSON file to deploy a single-node DB System, with role separation, with the command odacli create-dbsystem.

Use the example JSON file to create a file for your environment.



It is important to review the readme and the examples carefully before creating your JSON file.



# Example 16-1 JSON File to Create a Single-Node Oracle KVM Database System with Role Separation

The following is an example of a JSON file that creates a single-node DB 23ai DB system on Oracle Database Appliance bare metal system. To create a DB 23ai DB system, use the example JSON, and update the version in the database section to DB 23ai version. Use the odacli describe-dbsystem-image command to view the supported 23ai version. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
    "name": "test example",
    "shape": "odb2",
    "customMemorySize": "24G",
    "timeZone": "America/Los Angeles",
    "diskGroup": "DATA",
    "cpuPoolName": "shared dbsystem cpupool",
    "clusterName": "cl-test",
    "enableRoleSeparation": true,
    "customRoleSeparation": {
        "groups": [
            {
                "name": "oinstall",
                "id": 1001,
                "role": "oinstall"
            },
                "name": "dbaoper",
                "id": 1002,
                "role": "dbaoper"
            },
                "name": "dba",
                "id": 1003,
                "role": "dba"
            },
                "name": "asmadmin",
                "id": 1004,
                "role": "asmadmin"
            },
                "name": "asmoper",
                "id": 1005,
                "role": "asmoper"
            },
                "name": "asmdba",
                "id": 1006,
                "role": "asmdba"
        "users": [
                "name": "grid",
```

```
"id": 1000,
                    "role": "gridUser"
                },
                    "name": "oracle",
                    "id": 1001,
                    "role": "oracleUser"
            ]
    },
    "database": {
        "name": "db19",
        "uniqueName": "db19",
        "domainName": "example.com",
        "version": "23.5.0.24.07",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": null,
        "enableDbConsole": false,
        "enableFlashStorage": false,
        "enableFlashCache": false,
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "enableSEHA": false,
        "redundancy": null, <<< if diskgroup redundancy is FLEX, then database
redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "ENGLISH"
        "enableTDE": false,
         "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
    "network": {
        "domainName": "test domain",
        "ntpServers": [
            "xx.xxx.xx."
        ],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
            {
                "name": "node1",
                "ipAddress": "xx.xx.xx.xxx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xx.x",
                "number": 0
```

```
}
    ],
    "publicVNetwork": "vnet1"
    },
    "grid": {
        "language": "en"
    }
}
```

## Example 16-2 JSON File to Create a Single-Node Oracle KVM Database System without Role Separation

The following is an example of a JSON file that creates a single-node Oracle KVM Database System on Oracle Database Appliance bare metal platform, without role separation. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
    "system": {
        "name": "test example",
        "shape": "odb2",
        "customMemorySize": "24G",
        "timeZone": "America/Los Angeles",
        "diskGroup": "DATA",
        "cpuPoolName": "shared dbsystem cpupool",
        "clusterName": "cl-test",
        "enableRoleSeparation": true,
        "customRoleSeparation": {
            "groups": [
                     "name": "oinstall",
                     "id": 1001,
                     "role": "oinstall"
                },
                     "name": "dbaoper",
                    "id": 1002,
                     "role": "dbaoper"
                },
                     "name": "dba",
                     "id": 1003,
                     "role": "dba"
                },
                     "name": "asmadmin",
                     "id": 1004,
                     "role": "asmadmin"
                },
                     "name": "asmoper",
                     "id": 1005,
                     "role": "asmoper"
                },
                     "name": "asmdba",
```



```
"id": 1006,
                    "role": "asmdba"
                }
            ],
            "users": [
                {
                    "name": "grid",
                    "id": 1000,
                    "role": "gridUser"
                },
                    "name": "oracle",
                    "id": 1001,
                    "role": "oracleUser"
            ]
    },
    "database": {
        "name": "db19",
        "uniqueName": "db19",
        "domainName": "example.com",
        "version": "19.27.0.0.250415",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb4",
        "role": "PRIMARY",
        "targetNodeNumber": null,
        "enableDbConsole": false,
        "enableUnifiedAuditing": true,
        "redundancy": "HIGH", <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "ENGLISH"
        },
        "enableTDE": false,
        "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
    "network": {
        "domainName": "test domain",
        "ntpServers": [],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
                "name": "node1",
                "ipAddress": "xx.xx.xx.xxx",
                "netmask": "xxx.xxx.xxx.x",
```

# Example 16-3 JSON File to Create a Single-Node Oracle KVM Database System with the --template/-t option

The following is an example of a JSON file template sample that creates a single-node Oracle KVM Database System on Oracle Database Appliance bare metal platform. This template sample is generated when you run the odacli create-dbsystem command with the --template/-t option. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
        "name": "test dbsystem",
        "shape": "dbs2",
        "customMemorySize": "24G",
        "timeZone": "America/Los Angeles",
        "diskGroup": "DATA",
        "cpuPoolName": "shared dbsystem cpupool",
        "enableRoleSeparation": true,
        "clusterName" : "clus-test",
        "customRoleSeparation": {
            "groups": [
                 {
                     "name": "oinstall",
                     "id": 1001,
                     "role": "oinstall"
            ],
            "users": [
                 {
                     "name": "grid",
                     "id": 1000,
                     "role": "gridUser"
                },
                     "name": "oracle",
                     "id": 1001,
                     "role": "oracleUser"
            1
        }
    },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
```

```
"domainName": "example.com",
        "version": "19.16.0.0.220719",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false,
        "enableFlashStorage": false,
        "enableFlashCache": false,
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "enableSEHA": false,
        "redundancy": "MIRROR",
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "ENGLISH"
        },
        "enableTDE": false,
        "isCdb": true,
        "pdbName": "pdb1",
        "pdbAdminUser": "pdbadmin"
    } ,
    "network": {
        "domainName": "example.com",
        "ntpServers": [
            "xxx.xxx.xxx"
        ],
        "dnsServers": [
            "xxx.xxx.xxx"
        "nodes": [
            {
                "name": "node1",
                "ipAddress": "xxx.xxx.xxx.xxx",
                "netmask": "xxx.xxx.xxx.xxx",
                "gateway": "xxx.xxx.xxx.xxx",
                "number": 0
        ],
        "publicVNetwork": "vnet1"
    },
    "arid": {
        "language": "en"
}
```

## Example 16-4 JSON File to Create a Single-Node Oracle KVM Database System with the --template-annotated/-ta option

The following is an example of a JSON file that creates a single-node Oracle KVM Database System on Oracle Database Appliance bare metal platform with the --template-annotated/-

ta option. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system" : {
       "name" : "test_dbsystem",
                                                      ---> The name for the
DB System
        "shape" : "dbs2",
                                                      ---> The shape for the
DB System
        "customMemorySize" : "24G",
                                                      ---> The memory size
for the DB System
       "timeZone" : "America/Los Angeles",
                                                      ---> The timezone for
the DB System
       "diskGroup" : "DATA",
                                                      ---> The ASM disk
group to be used for the DB System volumes. Allowed options: <DATA>, <RECO>,
<REDO>
        "cpuPoolName" : "shared dbsystem cpupool", ---> The CPU Pool for
the DB System
        "enableRoleSeparation" : true,
                                                  ---> Whether or not to
enable Role Separation. If true, need to specify 6 groups and two users.
'groupName' and 'userName' can be customized. If false, need to specify 2
groups and one user. 'groupName' and 'userName' can be customized. Allowed
options: <true>, <false>
        "customRoleSeparation" : {
            "groups" : [
                    "name" : "oinstall",
                                                     ---> Name of the group
to create, must be unique
                   "id" : 1001,
                                                      ---> ID of the group
to create, must be unique
                   "role" : "oinstall",
                                                     ---> Role of the
group
           ],
            "users" : [
                    "name" : "grid",
                                                      ---> Name of the user
to create, must be unique
                   "id" : 1000,
                                                      ---> ID of the user to
create, must be unique
                    "role" : "gridUser",
                                                      ---> Role of the
user
                },
                    "name" : "oracle",
                                                      ---> Name of the user
to create, must be unique
                   "id" : 1001,
                                                      ---> ID of the user to
create, must be unique
                    "role" : "oracleUser",
                                                      ---> Role of the
user
           ]
       }
    },
    "database" : {
                                                      ---> Name for the DB
        "name" : "dbtest",
```

```
System database
       "uniqueName" : "dbtest",
                                                     ---> The unique name
for the DB System database
       "domainName" : "example.com",
                                                    ---> The domain name
that the DB System database will have
       "version": "19.27.0.0.250415",
                                                 ---> The version for the
DB System database. Execute 'odacli describe-dbsystem-image' to get the
supported version
       "edition" : "EE",
                                                     ---> Enter 'EE' for
Enterprise Edition, or 'SE' for Standard Edition
       "type" : "SI",
                                                     ---> Enter a database
deployment type. Allowed options: <RAC>, <RACOne>, <SI> (single instance
database)
       "dbClass" : "OLTP",
                                                     ---> The class for the
DB System database. Standard Edition only supports OLTP. Allowed options:
<OLT>, <DSS>, <IMDB>
       "shape" : "odb2",
                                                     ---> The DB System
database shape, it must be same as the DB System shape
       "role" : "PRIMARY",
                                                     ---> The role for the
DB System database. Allowed options: <PRIMARY>, <STANDBY>
       "targetNodeNumber" : "0",
                                                     ---> Use '0' for Node0
and '1' for Nodel. For RAC or RACOne use null. The default is '0' for
Node0
       "enableDbConsole" : false,
create dbconsole or EM express. By default, dbconsole is disabled. Allowed
options: <true>, <false>
       "enableFlashStorage" : false,
                                                     ---> Whether or not to
enable the flash storage for the DB System database. Allowed options: <true>,
       "enableFlashCache" : false,
                                                     ---> Whether or not to
enable the flash cache for the DB System database. Allowed options: <true>,
       "enableUnifiedAuditing" : true,
                                                    ---> Whether or not to
enable unified auditing for the DB System database. Allowed options: <true>,
<false>
       "enableEEHA" : true,
                                                     ---> Whether or not to
enable HA for EE SI database. enableEEHA is only valid when the edition is
EE. Allowed options: <true>, <false>
       "enableSEHA" : false,
                                                     ---> Whether or not to
enable HA for SE SI database. enable SEHA is only valid when the edition is
SE. Allowed options: <true>, <false>
       "redundancy" : "MIRROR",
                                                     ---> If diskgroup
redundancy is FLEX, then database redundancy must be set to one of 'HIGH' or
'MIRROR', otherwise, can be null
       "characterSet" : {
           "characterSet" : "AL32UTF8",
                                                     ---> The character set
for the DB System database
           set for the DB System database
           "dbTerritory" : "AMERICA",
                                                    ---> The territory for
the DB System database
           "dbLanguage" : "ENGLISH",
                                                     ---> The language for
the DB System database
       },
       "enableTDE" : false,
                                                     ---> Whether or not to
enable TDE. Allowed options: <true>, <false>
```

```
"isCdb" : true,
                                                       ---> Enter 'true' if
this database is container DB. For 21c and above, cdb must be true. Enter
'false' if this is non-cdb. Allowed options: <true>, <false>
        "pdbName" : "pdb1",
                                                       ---> Enter pdbName if
isCdb parameter is 'true', use 'null' if isCdb is 'false'
        "pdbAdminUser" : "pdbadmin",
                                                      ---> Enter PDB admin
user name, use 'null' if isCdb parameter is 'false'
    "network" : {
        "domainName" : "example.com",
                                                      ---> The domain name
for the DB System network
        "ntpServers" : [
            "xxx.xxx.xxx"
        "dnsServers" : [
           "xxx.xxx.xxx"
       ],
        "nodes" : [
                "name" : "node1",
                                                     ---> The name used to
configure the hostname
               "ipAddress" : "xxx.xxx.xxx.xxx",
                                                      ---> The IP address
for this node
               "netmask" : "xxx.xxx.xxx.xxx",
                                                      ---> The mask of the
network for this node
                "gateway" : "xxx.xxx.xxx.xxx",
                                                   ---> The gateway
address for this node
                "number" : 0,
                                                      ---> 0 (Use 0 for the
first node of the DB System instance)
       ],
        "publicVNetwork" : "vnet1",
                                                      ---> The name of the
public virtual network. The ipAddress, vipAddress and scanIps must be on this
publicVNetwork
   },
    "grid" : {
       "language" : "en",
                                                      ---> The language used
for GI (Oracle Grid Infrastructure) installation
}
```

## Example JSON File to Create a High-Availability DB System

Follow the JSON file example to create a JSON file to deploy a High-Availability DB system, with role separation, with the command odacli create-dbsystem.

Use the example JSON file to create a file for your environment.

# Example 16-5 JSON File to Create a High-Availability DB system without Role Separation

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform, without role separation. When using the

example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
    "name": "test example",
    "shape": "odb2",
    "customMemorySize": "24G",
    "timeZone": "America/Los Angeles",
    "diskGroup": "DATA",
    "cpuPoolName": "shared dbsystem cpupool",
    "clusterName": "cl-test",
    "enableRoleSeparation": true,
    "customRoleSeparation": {
        "groups": [
                "name": "oinstall",
                "id": 1001,
                "role": "oinstall"
            },
                "name": "dbaoper",
                "id": 1002,
                "role": "dbaoper"
            },
                "name": "dba",
                "id": 1003,
                "role": "dba"
            },
                "name": "asmadmin",
                "id": 1004,
                "role": "asmadmin"
            },
                "name": "asmoper",
                "id": 1005,
                "role": "asmoper"
            },
                "name": "asmdba",
                "id": 1006,
                "role": "asmdba"
        ],
        "users": [
            {
                "name": "grid",
                "id": 1000,
                "role": "gridUser"
            },
                "name": "oracle",
                "id": 1001,
                 "role": "oracleUser"
```

```
]
    },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "test domain",
        "version": "19.27.0.0.250415",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false, version
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "redundancy": "MIRROR", <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "AMERICAN"
         "enableTDE": false,
         "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
    "network": {
        "domainName": "test domain",
        "ntpServers": [],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
            {
                "name": "node1",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 0,
                "vipName": "node1-vip",
                "vipAddress": "xx.xx.xxx.xx"
            },
                "name": "node2",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 1,
                "vipName": "node2-vip",
                "vipAddress": "xx.xx.xxx.xx"
```

#### Example 16-6 JSON File to Create a High-Availability DB system with Role Separation

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform. The example uses role separation. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
    "system": {
        "name": "test system",
        "shape": "dbs2",
        "customMemorySize": "24G",
        "timeZone": "America/Los Angeles",
        "diskGroup": "DATA",
        "cpuPoolName": "shared dbsystem cpupool",
        "enableRoleSeparation": true,
        "customRoleSeparation": {
            "groups": [
                 {
                     "name": "oinstall",
                     "id": 1001,
                     "role": "oinstall"
                },
                 {
                     "name": "dbaoper",
                     "id": 1002,
                     "role": "dbaoper"
                },
                     "name": "dba",
                     "id": 1003,
                     "role": "dba"
                },
                     "name": "asmadmin",
                     "id": 1004,
                     "role": "asmadmin"
                },
                     "name": "asmoper",
                     "id": 1005,
                     "role": "asmoper"
```

```
},
                {
                    "name": "asmdba",
                    "id": 1006,
                    "role": "asmdba"
            ],
            "users": [
                {
                    "name": "grid",
                    "id": 1000,
                    "role": "gridUser"
                },
                    "name": "oracle",
                    "id": 1001,
                    "role": "oracleUser"
            ]
    },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "test domain",
        "version": "23.5.0.24.07",
        "edition": "EE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false,
        "enableUnifiedAuditing": true,
        "enableEEHA": true,
        "redundancy": null, <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "AMERICAN"
        },
        "enableTDE": false,
        "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
    "network": {
        "domainName": "test domain",
        "ntpServers": [],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
```

```
"name": "node1",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 0,
                "vipName": "node1-vip",
                "vipAddress": "xx.xx.xxx.xx"
            },
                "name": "node2",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 1,
                "vipName": "node2-vip",
                "vipAddress": "xx.xx.xxx.xx"
        ],
        "publicVNetwork": "vnet1",
        "scanName": "test-scan",
        "scanIps": [
            "xx.xx.xxx",
            "xx.xx.xxx.xx"
    },
    "grid": {
        "language": "en"
}
```

# Example 16-7 JSON File to Create a High-Availability DB system with Standard Edition High-Availability Enabled

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"name": "dbaoper",
                    "id": 1002,
                    "role": "dbaoper"
                },
                    "name": "dba",
                    "id": 1003,
                    "role": "dba"
                },
                    "name": "asmadmin",
                    "id": 1004,
                    "role": "asmadmin"
                },
                    "name": "asmoper",
                    "id": 1005,
                    "role": "asmoper"
                },
                    "name": "asmdba",
                    "id": 1006,
                    "role": "asmdba"
            ],
            "users": [
                {
                    "name": "grid",
                    "id": 1000,
                    "role": "gridUser"
                },
                    "name": "oracle",
                    "id": 1001,
                    "role": "oracleUser"
            ]
    },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "test_domain",
        "version": "19.27.0.0.250415",
        "edition": "SE",
        "type": "SI",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false,
        "enableUnifiedAuditing": true,
        "enableSEHA": true,
        "redundancy": "MIRROR", <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
```

```
"characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "AMERICAN"
         "enableTDE": false,
         "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    } ,
    "network": {
        "domainName": "test domain",
        "ntpServers": [],
        "dnsServers": [
            "xx.xxx.xx."
        ],
        "nodes": [
            {
                "name": "node1",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 0,
                "vipName": "node1-vip",
                "vipAddress": "xx.xx.xxx.xx"
            },
                "name": "node2",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 1,
                "vipName": "node2-vip",
                "vipAddress": "xx.xx.xxx.xx"
        ],
        "publicVNetwork": "vnet1",
        "scanName": "test-scan",
        "scanIps": [
            "xx.xx.xxx",
            "xx.xx.xx"
    },
    "grid": {
        "language": "en"
    }
}
```

## Example 16-8 JSON File to Create a High-Availability DB system with Oracle RAC Database

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform. When using the example to create your JSON

file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
    "name": "test example",
    "shape": "odb2",
    "customMemorySize": "24G",
    "timeZone": "America/Los Angeles",
    "diskGroup": "DATA",
    "cpuPoolName": "shared dbsystem cpupool",
    "enableRoleSeparation": true,
    "customRoleSeparation": {
        "groups": [
                "name": "oinstall",
                "id": 1001,
                "role": "oinstall"
            },
                "name": "dbaoper",
                "id": 1002,
                "role": "dbaoper"
            },
                "name": "dba",
                "id": 1003,
                "role": "dba"
            },
                "name": "asmadmin",
                "id": 1004,
                "role": "asmadmin"
            },
                "name": "asmoper",
                "id": 1005,
                "role": "asmoper"
            },
                "name": "asmdba",
                "id": 1006,
                "role": "asmdba"
            }
        ],
        "users": [
            {
                "name": "grid",
                "id": 1000,
                "role": "gridUser"
            },
                "name": "oracle",
                "id": 1001,
                "role": "oracleUser"
```

```
},
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "test domain",
        "version": "19.27.0.0.250415",
        "edition": "EE",
        "type": "RAC",
        "dbClass": "OLTP",
        "shape": "odb2",
        "role": "PRIMARY",
        "targetNodeNumber": "0",
        "enableDbConsole": false,
        "enableUnifiedAuditing": true,
        "redundancy": "MIRROR", <<< if diskgroup redundancy is FLEX, then
database redundancy must be set to one of "HIGH" or "MIRROR", otherwise, can
be null
        "characterSet": {
            "characterSet": "AL32UTF8",
            "nlsCharacterset": "AL16UTF16",
            "dbTerritory": "AMERICA",
            "dbLanguage": "AMERICAN"
         "enableTDE": false,
         "isCdb": true,
            "pdbName": "pdb1",
            "pdbAdminUser": "pdbadmin"
    },
    "network": {
        "domainName": "test_domain",
        "ntpServers": [],
        "dnsServers": [
            "xx.xxx.xx.xx"
        ],
        "nodes": [
            {
                "name": "node1",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 0,
                "vipName": "node1-vip",
                "vipAddress": "xx.xx.xxx.xx"
            },
                "name": "node2",
                "ipAddress": "xx.xx.xxx.xx",
                "netmask": "xxx.xxx.xxx.x",
                "gateway": "xx.xx.xxx.x",
                "number": 1,
                "vipName": "node2-vip",
                "vipAddress": "xx.xx.xxx.xx"
        ],
```

# Example 16-9 JSON File to Create a High-Availability DB system with the --template/-t option

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform. This template sample is generated when you run the odacli create-dbsystem command with the --template/-t option. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
    "system": {
        "name": "test dbsystem",
        "shape": "dbs2",
        "customMemorySize": "24G",
        "timeZone": "America/Los_Angeles",
        "diskGroup": "DATA",
        "cpuPoolName": "shared dbsystem cpupool",
        "enableRoleSeparation": true,
        "customRoleSeparation": {
            "groups": [
                {
                     "name": "oinstall",
                     "id": 1001,
                     "role": "oinstall"
            ],
            "users": [
                 {
                     "name": "grid",
                     "id": 1000,
                     "role": "gridUser"
                },
                     "name": "oracle",
                     "id": 1001,
                     "role": "oracleUser"
            1
        }
    },
    "database": {
        "name": "dbtest",
        "uniqueName": "dbtest",
        "domainName": "example.com",
```

```
"version": "19.27.0.0.250415",
    "edition": "EE",
    "type": "SI",
    "dbClass": "OLTP",
    "shape": "odb2",
    "role": "PRIMARY",
    "targetNodeNumber": "0",
    "enableDbConsole": false,
    "enableFlashStorage": false,
    "enableFlashCache": false,
    "enableUnifiedAuditing": true,
    "enableEEHA": true,
    "enableSEHA": false,
    "redundancy": "MIRROR",
    "characterSet": {
        "characterSet": "AL32UTF8",
        "nlsCharacterset": "AL16UTF16",
        "dbTerritory": "AMERICA",
        "dbLanguage": "AMERICAN"
   },
    "enableTDE": false,
    "isCdb": true,
    "pdbName": "pdb1",
    "pdbAdminUser": "pdbadmin"
} ,
"network": {
    "domainName": "example.com",
    "ntpServers": [
        "xxx.xxx.xxx"
   ],
    "dnsServers": [
        "xxx.xxx.xxx"
   ],
    "nodes": [
        {
            "name": "node1",
            "ipAddress": "xxx.xxx.xxx.xxx",
            "netmask": "xxx.xxx.xxx.xxx",
            "gateway": "xxx.xxx.xxx.xxx",
            "number": 0,
            "vipName": "node1-vip",
            "vipAddress": "xxx.xxx.xxx.xxx"
        },
            "name": "node2",
            "ipAddress": "xxx.xxx.xxx.xxx",
            "netmask": "xxx.xxx.xxx.xxx",
            "gateway": "xxx.xxx.xxx.xxx",
            "number": 1,
            "vipName": "node2-vip",
            "vipAddress": "xxx.xxx.xxx.xxx"
   ],
    "publicVNetwork": "vnet1",
    "scanName": "dbtest-scan",
    "scanIps": [
```

# Example 16-10 JSON File to Create a High-Availability DB system with the --template/-t option

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform. This template sample is generated when you run the odacli create-dbsystem command with the --template/t option. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"system": {
    "name": "test dbsystem",
    "shape": "dbs2",
    "customMemorySize": "24G",
    "timeZone": "America/Los Angeles",
    "diskGroup": "DATA",
    "cpuPoolName": "shared dbsystem cpupool",
    "enableRoleSeparation": true,
    "customRoleSeparation": {
        "groups": [
                "name": "oinstall",
                "id": 1001,
                "role": "oinstall"
        ],
        "users": [
            {
                "name": "grid",
                "id": 1000,
                "role": "gridUser"
            },
                "name": "oracle",
                "id": 1001,
                "role": "oracleUser"
        1
},
"database": {
    "name": "dbtest",
    "uniqueName": "dbtest",
    "domainName": "example.com",
    "version": "19.27.0.0.250415",
    "edition": "EE",
    "type": "SI",
```

```
"dbClass": "OLTP",
    "shape": "odb2",
    "role": "PRIMARY",
    "targetNodeNumber": "0",
    "enableDbConsole": false,
    "enableFlashStorage": false,
    "enableFlashCache": false,
    "enableUnifiedAuditing": true,
    "enableEEHA": true,
    "enableSEHA": false,
    "redundancy": "MIRROR",
    "characterSet": {
        "characterSet": "AL32UTF8",
        "nlsCharacterset": "AL16UTF16",
        "dbTerritory": "AMERICA",
        "dbLanguage": "AMERICAN"
   },
    "enableTDE": false,
    "isCdb": true,
    "pdbName": "pdb1",
    "pdbAdminUser": "pdbadmin"
},
"network": {
    "domainName": "example.com",
    "ntpServers": [
        "xxx.xxx.xxx"
    "dnsServers": [
        "xxx.xxx.xxx"
   ],
    "nodes": [
        {
            "name": "node1",
            "ipAddress": "xxx.xxx.xxx.xxx",
            "netmask": "xxx.xxx.xxx.xxx",
            "gateway": "xxx.xxx.xxx.xxx",
            "number": 0,
            "vipName": "node1-vip",
            "vipAddress": "xxx.xxx.xxx.xxx"
        },
            "name": "node2",
            "ipAddress": "xxx.xxx.xxx.xxx",
            "netmask": "xxx.xxx.xxx.xxx",
            "gateway": "xxx.xxx.xxx.xxx",
            "number": 1,
            "vipName": "node2-vip",
            "vipAddress": "xxx.xxx.xxx.xxx"
   ],
    "publicVNetwork": "vnet1",
    "scanName": "dbtest-scan",
    "scanIps": [
        "xxx.xxx.xxx",
        "xxx.xxx.xxx"
   ]
```

```
},
   "grid": {
        "language": "en"
}
```

# Example 16-11 JSON File to Create a High-Availability DB system with the --template-annotated/-ta option

The following is an example of a JSON file that creates a High-Availability DB system on Oracle Database Appliance bare metal platform. This template sample is generated when you run the odacli create-dbsystem command with the --template-annotated/-ta option. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
    "system" : {
        "name" : "test dbsystem",
                                                       ---> The name for the
DB System
        "shape" : "dbs2",
                                                       ---> The shape for the
DB System
        "customMemorySize": "24G",
                                                       ---> The memory size
for the DB System
       "timeZone" : "America/Los Angeles",
                                                       ---> The timezone for
the DB System
       "diskGroup" : "DATA",
                                                       ---> The ASM disk
group to be used for the DB System volumes. Allowed options: <DATA>, <RECO>,
<REDO>
        "cpuPoolName" : "shared dbsystem cpupool", ---> The CPU Pool for
the DB System
        "useReservedCores" : false,
                                                       ---> Whether or not to
use reserved CPU cores. Allowed options: <true>, <false>
        "enableRoleSeparation" : true,
                                                       ---> Whether or not to
enable Role Separation. If true, need to specify 6 groups and two users.
'groupName' and 'userName' can be customized. If false, need to specify 2
groups and one user. 'groupName' and 'userName' can be customized. Allowed
options: <true>, <false>
        "customRoleSeparation" : {
            "groups" : [
                {
                    "name" : "oinstall",
                                                      ---> Name of the group
to create, must be unique
                    "id" : 1001,
                                                      ---> ID of the group
to create, must be unique
                    "role" : "oinstall",
                                                      ---> Role of the
group
                }
            ],
            "users" : [
                    "name" : "grid",
                                                       ---> Name of the user
to create, must be unique
                    "id" : 1000,
                                                       ---> ID of the user to
create, must be unique
                    "role" : "gridUser",
                                                       ---> Role of the
user
```

```
},
                {
                    "name" : "oracle",
                                                       ---> Name of the user
to create, must be unique
                    "id" : 1001,
                                                       ---> ID of the user to
create, must be unique
                    "role" : "oracleUser",
                                                      ---> Role of the
user
           ]
    },
    "database" : {
       "name" : "dbtest",
                                                      ---> Name for the DB
System database
       "uniqueName" : "dbtest",
                                                       ---> The unique name
for the DB System database
       "domainName" : "example.com",
                                                       ---> The domain name
that the DB System database will have
        "version": "19.27.0.0.250415",
                                                       ---> The version for
the DB System database. Execute 'odacli describe-dbsystem-image' to get the
supported version
       "edition" : "EE",
                                                       ---> Enter 'EE' for
Enterprise Edition, or 'SE' for Standard Edition
       "type" : "SI",
                                                       ---> Enter a database
deployment type. Allowed options: <RAC>, <RACOne>, <SI> (single instance
database)
        "dbClass" : "OLTP",
                                                       ---> The class for the
DB System database. Standard Edition only supports OLTP. Allowed options:
<OLT>, <DSS>, <IMDB>
       "shape" : "odb2",
                                                       ---> The DB System
database shape, it must be same as the DB System shape
       "role" : "PRIMARY",
                                                       ---> The role for the
DB System database. Allowed options: <PRIMARY>, <STANDBY>
       "dbStorage" : "ASM",
                                                       ---> Storage type of
the DB System database. The default value is ASM. Allowed options: <ASM>,
       "levelOBackupDay" : "wednesday",
                                                       ---> Backup day of the
DB System database. Allowed options: <monday>, <tuesday>, <wednesday>,
<thursday>, <friday>, <saturday>, <sunday>
       "targetNodeNumber" : "0",
                                                       ---> Use '0' for Node0
and '1' for Nodel. For RAC or RACOne use null. The default is '0' for
Node0
        "enableDbConsole" : false,
                                                       ---> Whether or not to
create dbconsole or EM express. By default, dbconsole is disabled. Allowed
options: <true>, <false>
                                                      ---> Whether or not to
       "enableFlashStorage" : false,
enable the flash storage for the DB System database. Allowed options: <true>,
<false>
        "enableFlashCache" : false,
                                                       ---> Whether or not to
enable the flash cache for the DB System database. Allowed options: <true>,
        "enableUnifiedAuditing" : true,
                                                       ---> Whether or not to
enable unified auditing for the DB System database. Allowed options: <true>,
       "enableEEHA" : true,
                                                       ---> Whether or not to
```

```
enable HA for EE SI database. enableEEHA is only valid when the edition is
EE. Allowed options: <true>, <false>
       "enableSEHA" : false,
                                                     ---> Whether or not to
enable HA for SE SI database. enableSEHA is only valid when the edition is
SE. Allowed options: <true>, <false>
        "redundancy" : "MIRROR",
                                                     ---> If diskgroup
redundancy is FLEX, then database redundancy must be set to one of 'HIGH' or
'MIRROR', otherwise, can be null
       "characterSet" : {
           "characterSet" : "AL32UTF8",
                                                     ---> The character set
for the DB System database
           "nlsCharacterset" : "AL16UTF16", ---> The NLS character
set for the DB System database
           "dbTerritory" : "AMERICA",
                                                    ---> The territory for
the DB System database
       "dbLanguage" : "AMERICAN",
                                                     ---> The language for
the DB System database
       "enableTDE" : false,
                                                     ---> Whether or not to
enable TDE. Allowed options: <true>, <false>
       "isCdb" : true,
                                                     ---> Enter 'true' if
this database is container DB. For 21c and above, cdb must be true. Enter
'false' if this is non-cdb. Allowed options: <true>, <false>
       "pdbName" : "pdb1",
                                                     ---> Enter pdbName if
isCdb parameter is 'true', use 'null' if isCdb is 'false'
       "pdbAdminUser" : "pdbadmin",
                                                     ---> Enter PDB admin
user name, use 'null' if isCdb parameter is 'false'
   },
   "network" : {
       "domainName" : "example.com",
                                                    ---> The domain name
for the DB System network
       "ntpServers" : [
           "xxx.xxx.xxx"
        "dnsServers" : [
           "xxx.xxx.xxx"
        "nodes" : [
           {
               "name" : "node1",
                                                     ---> The name used to
configure the hostname
               "ipAddress" : "xxx.xxx.xxx.xxx",
                                                 ---> The IP address
for this node
               "netmask" : "xxx.xxx.xxx.xxx",
                                                     ---> The mask of the
network for this node
               "gateway" : "xxx.xxx.xxx.xxx",
                                                     ---> The gateway
address for this node
               "number" : 0,
                                                     ---> 0 (Use 0 for the
first node of the DB System instance)
               "vipName" : "node1-vip",
                                                    ---> The VIP name for
this first node, only for HA case
               "vipAddress" : "xxx.xxx.xxx.xxx",
                                                    ---> The VIP address
for this first node, only for HA case
           },
               "name" : "node2",
                                           ---> The name used to
```

```
configure the hostname
               "ipAddress" : "xxx.xxx.xxx.xxx",
                                                    ---> The IP address
for this node
               "netmask" : "xxx.xxx.xxx.xxx",
                                                    ---> The mask of the
network for this node
               "gateway" : "xxx.xxx.xxx.xxx",
                                                    ---> The gateway
address for this node
               "number" : 1,
                                                     ---> 1 (Use 1 for the
second node of the DB System instance)
               "vipName" : "node2-vip",
                                                     ---> The VIP name for
this second node, only for HA case
               "vipAddress" : "xxx.xxx.xxx", ---> The VIP address
for this second node, only for HA case
          }
       ],
       "publicVNetwork" : "vnet1",
                                                    ---> The name of the
public virtual network. The ipAddress, vipAddress and scanIps must be on this
publicVNetwork
       "scanName" : "dbtest-scan",
                                                     ---> The scan name of
the DB System. It should resolve to the IPs defined in the scanIps. Only for
HA case
       "scanIps" : [
           "xxx.xxx.xxx",
           "xxx.xxx.xxx"
   } ,
   "grid" : {
       "language" : "en",
                                                    ---> The language used
for GI (Oracle Grid Infrastructure) installation
}
```



# Oracle Database Appliance Command-Line Interface

The command-line interface has different classes of tools to manage Oracle Database Appliance.

# About Oracle Database Appliance Command-Line Interface

Three classes of tools are available to perform deployment, lifecycle management, and system administration on Oracle Database Appliance.

## Managing ODACLI Privileges and Security with SUDO

Oracle Appliance Manager command-line utility requires  $\mathtt{root}$  system privileges for most administration actions. You may want to use SUDO as part of your system auditing and security policy.

 ODACLI Command Changes with Multi-User Access on Oracle Database Appliance Understand the ODACLI command changes when you enable multi-user access.

#### odacli Network Commands

Use the odacli network commands to list and describe network interfaces.

#### odacli Multi-User Access Commands

Use odacli commands to enable multi-user access for the appliance.

#### odacli Apply Patch and Update Commands

Use the commands odacli update and apply patch to apply patches and update the appliance.

#### odacli Appliance Commands

Use the odacli appliance commands to perform lifecycle activities for the appliance.

#### odacli Backup and Recovery Commands

Use the odacli backup and recover commands to backup to and restore from Oracle Cloud Infrastructure Object Storage or disk or NFS.

# odacli Oracle Data Guard Commands

Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

# odacli CPU Core Commands

Use the CPU Core commands to enable CPU cores and display current and historical CPU core configurations.

#### odacli CPU Pool Commands for Bare Metal and KVM

Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.

# odacli Database Commands

Use the odacli database commands to perform database lifecycle operations.

#### odacli DBHome Commands

Use the odacli DBHome commands to manage database Home operations.

## odacli Database Storage Commands

Use the Database Storage commands to list, describe, create, and delete Oracle database storage.

- odacli Diagnostics Collection Commands
   Use the diagnostics collection commands to display diagnostics details.
- odacli Job Commands
   Use the odacli list-jobs and odacli describe-job commands to display job details.
- odacli Oracle Key Vault Server Configuration Commands
   Use odacli commands to manage Oracle Key Vault server configuration for databases on Oracle Database Appliance.
- Log Commands
   Use the odacli log commands to specify the options to collect and delete logs.
- odacli Oracle Auto Service Request Commands
   Use the Oracle Auto Service Request (Oracle ASR) commands to configure, update, test, and delete Oracle ASR on the system.
- Adaptive Classification and Redaction (ACR) Commands
   Understand Adaptive Classification and Redaction (ACR) commands.
- odacli OS Commands
   Use the odacli OS commands to list and update operating system (OS) parameters.
- odaadmcli Hardware Monitoring Commands
   Use the hardware monitoring commands to display hardware configurations.
- Storage Commands
   Understand the commands to perform storage operations and diagnostics.

# About Oracle Database Appliance Command-Line Interface

Three classes of tools are available to perform deployment, lifecycle management, and system administration on Oracle Database Appliance.

The command-line interface (CLI) is an alternative to Oracle Database Appliance Browser User Interface for some appliance configuration and patching tasks, database management, and job activity.

Oracle Database Appliance uses a role-based command-line interface. Use the odacli commands to perform lifecycle management tasks and the odadmcli commands to perform storage and hardware monitoring maintenance. Many tasks related to managing Oracle Databases are also required with databases on Oracle Database Appliance. Tasks common to Oracle Database generally are described in the Oracle Database documentation library. However, to simplify tasks, use the Oracle Database Appliance command-line interface. The odacli and odaadmcliutilities combine the capabilities of the SYS database administrator role and the operating system Superuser (root user). Always perform administrative tasks using the Oracle Database Appliance Browser User Interface or CLI utilities.

The following classes of commands are available:

- Deployment and Configuration: Use the deployment and configuration commands as part
  of the initial deployment of the appliance and to configure CPU cores.
- Lifecycle management: Use odacli commands to perform database and system administration tasks for the appliance. The odacli commands are the primary interface to perform life cycle activities for the appliance.
- Administration: Use odaadmcli commands to perform hardware administration tasks for the appliance. The odaadmcli commands are the interface for infrequent administration activities needed to manage appliance hardware components, storage, and VLAN.

You can perform the following deployment and configuration tasks:

- Configure the first network in the appliance
- Unzip and copy the Oracle Database Appliance software to the correct locations
- Set the number of CPU Cores for the system

You can perform the following appliance lifecycle tasks with odacli commands:

- Create and describe the appliance
- Create, list, describe, and delete databases
- Create, list, describe, and delete Oracle Database Homes
- Create, list, and describe the networks
- List and describe the jobs

You can perform the following appliance administration tasks with odaadmcli commands:

- Show storage, disks, disk groups, and controllers
- Display storage diagnostics for disks and NVM Express (NVMes)
- Show server, memory, processor, power, cooling, and network details

Depending on your version of Oracle Appliance Manager and your hardware, some of the odacli commands may not be available to you. To see which commands are supported on your version of Oracle Appliance Manager and your hardware, run the odacli help command: odacli -h.

## **Command-Line Interface Syntax**

The command-line interface commands and parameters are case-sensitive.

An odacli or odaadmclicommand uses the following command syntax:

odacli command [options]

- *command* is an action you want to perform on the appliance. For example: odacli list-networks Or odacli describe-jobs.
- options are optional parts of the odacli command. Options can consist of one or more options that extend the use of the odacli command carried out on an object. Options include additional information about the action that you want to perform on the object. Option names are preceded with a dash. Some options require the name of an object for the command to perform the action that you want to carry out. If an option is preceded with an \* (asterisk), this information is required to submit the command. When appending -j to the odacli command, the output is returned in JSON format. The help option (-h) is an option that is available with almost all commands. When you include the -h option, you can obtain additional information about the command that you want to perform.

#### **Oracle Database Appliance Manager Command-Line Interface Help**

Run the -h command to see the usage information for all commands available for your Oracle Database Appliance. For example:

odacli -h



Run odacli *command* -h to see detailed help about a specific command. For example, to see detailed help for the odacli describe-dbhome command, use the following:

odacli describe-dbhome -h

# Managing ODACLI Privileges and Security with SUDO

Oracle Appliance Manager command-line utility requires root system privileges for most administration actions. You may want to use SUDO as part of your system auditing and security policy.

For most tasks, Oracle recommends that you log in as root to use the Oracle Appliance Manager command-line interface on Oracle Database Appliance. If you are not logged in as root, then you cannot carry out most actions on the appliance. For example, if you are not logged in as root, then you can view storage information, but you cannot modify the storage.

## **Allowing Root User Access Using SUDO**

In environments where system administration is handled by a different group than database administration, or where security is a significant concern, you may want to limit access to the root user account and password. SUDO enables system administrators to grant certain users (or groups of users) the ability to run commands as root, while logging all commands and arguments as part of your security and compliance protocol.

A SUDO security policy is configured by using the file /etc/sudoers. Within the sudoers file, you can configure groups of users and sets of commands to simplify and audit server administration with SUDO commands.



#### Caution:

Configuring SUDO to allow a user to perform any operation is equivalent to giving that user root privileges. Consider carefully if this is appropriate for your security needs.

# Example 17-1 SUDO Example 1: Allow a User to Perform Any ODACLI Operation

This example shows how to configure SUDO to enable a user to perform any ODACLI operation. You do this by adding lines to the commands section in the /etc/sudoers file:

```
## The commands section may have other options added to it.
##
Cmnd_Alias ODACLI_CMDS=/opt/oracle/dcs/bin/odacli *
jdoe ALL = ODACLI_CMDS
```

In this example, the user name is <code>jdoe</code>. The file parameter setting <code>ALL= ODACLI\_CMDS</code> grants the user <code>jdoe</code> permission to run all <code>odacli</code> commands that are defined by the command alias <code>ODACLI\_CMDS</code>. After configuration, you can copy one <code>sudoers</code> file to multiple hosts. You can also create different rules on each host.





Before database creation, you must set up user equivalency with SSH for the root user on each server. If you do not set up user equivalency and configure SSH on each server, then you are prompted to provide the root password for each server during database creation.

After you configure the sudoer file with the user, the user jdoe can run the set of odacli commands configured with the command alias ODACLI CMDS. For example:

```
odacli create-database --dbname newdb
Enter new 'SYS, SYSTEM and PDB Admin user' password:
Confirm 'SYS, SYSTEM and PDB Admin user' password:

Job details

ID: 1bc31577-f910-4d3f-b6ff-8e3fccd30141

Description: Database service creation with db name: newdb
Status: Created
Created: November 30, 2018 9:23:57 AM PST
Message:

Task Name Start Time End Time Status
```

# Example 17-2 SUDO Example 2: Allow a User to Perform Only Selected ODACLI Operations

To configure SUDO to allow a user to perform only selected ODACLI operations, add lines to the commands section in the /etc/sudoers file as follows:

```
## DCS commands for oracle user
Cmnd Alias DCSCMDS = /opt/oracle/dcs/bin/odacli describe-appliance
oracle ALL=
             DCSCMDS
$ sudo /opt/oracle/dcs/bin/odacli describe-appliance
Appliance Information
______
                ID: a977bb04-6cf0-4c07-8e0c-91a8c7e7ebb8
            Platform: OdaliteL
      Data Disk Count: 6
       CPU Core Count: 20
            Created: October 24, 2017 6:51:52 AM HDT
System Information
______
               Name: system1001
         Domain Name: example.com
          Time Zone: America/Adak
          DB Edition: EE
         DNS Servers: 10.200.76.198 10.200.76.199 192.0.2.254
```

NTP Servers: 10.200.0.1 10.200.0.2

Disk Group Information

DG Name	Redundancy	Percentage
Data	Normal	90
Reco	Normal	10

In this example, the user <code>jdoe2</code> tries to run the <code>sudo odacli list-databases</code> command, which is not part of the set of commands that is configured for that user. SUDO prevents <code>jdoe2</code> from running the command.

[jdoe2@servernode1 ~]\$ sudo /opt/oracle/dcs/bin/odacli list-databases

Sorry, user jdoe2 is not allowed to execute '/opt/oracle/dcs/bin/odacli list-databases' as root on servernode1.

# ODACLI Command Changes with Multi-User Access on Oracle Database Appliance

Understand the ODACLI command changes when you enable multi-user access.

#### About the odacli-view command

In a multi-user access-enabled environment, to run automated scripts, that is, to generate a system report based on the output of odacli commands, you may need to provide the user credentials when prompted by the system. In such cases, the automation of scripts may fail. In such cases, use the odacli-view command instead of the odacli command. The odacli-view command allows you to run read-only odacli commands as root user without providing user credentials. Read-only odacli commands include commands to list, describe, get, read, or ping.

However, the security of the system is not compromised because the user credentials of a securely-generated internal user are used for this purpose. The <code>odacli-view</code> command can be used in Oracle Database Appliance deployments with or without multi-user access. In an Oracle Database Appliance environment where multi-user access is not enabled, <code>odacli-view</code> has the same functionality as <code>odacli</code>. In a multi-user access-enabled environment, <code>odacli-view</code> provides the information about all the resources in a system. For example, <code>odacli-view</code> <code>list-databases</code> command lists all the databases in the system.

# Usage:

/opt/oracle/dcs/bin/odacli-view command name

# For example:

/opt/oracle/dcs/bin/odacli-view list-dbhomes
/opt/oracle/dcs/bin/odacli-view list-databases
/opt/oracle/dcs/bin/odacli-view list-users



# ODACLI Command Usage and Entitlement Requirements When Multi-User Access is Enabled

# Note:

If you have enabled multi-user access, then you can run all supported ODACLI commands on KVM and DB systems, after logging in as odaadmin.

# Note:

The authentication token support for ODACLI session management is linked to a multi-user access user account. Since  $\mathtt{root}$  is an operating system administrative user and not a multi-user access user, auth token based session management system is not supported when a user logs in as  $\mathtt{root}$ . Therefore, you must provide an Oracle Database Appliance account user name and password to run any ODACLI command.

The following table describes the ODACLI commands that have changes for multi-user access and the entitlements required to run the commands.

ODACLI Command	Roles Required	Changes in command option
odacli configure-firstnet	ODA-ADMINISTRATOR	No change
odacli create-network	ODA-ADMINISTRATOR	No change
odacli delete-network	ODA-ADMINISTRATOR	No change
odacli delete-networkinterface	ODA-ADMINISTRATOR	No change
odacli describe-network	ODA-ADMINISTRATOR, ODA-DB	No change
odacli describe-networkinterface	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-networks	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-networkinterfaces	ODA-ADMINISTRATOR, ODA-DB	No change
odacli modify-network	ODA-ADMINISTRATOR	No change
odacli cleanup-patchrepo	ODA-ADMINISTRATOR, ODA-DB	No change
odacli create-prepatchreport	ODA-ADMINISTRATOR, ODA-DB	No change
odacli describe-prepatchreport	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-prepatchreports	ODA-ADMINISTRATOR, ODA-DB	No change
odacli delete-prepatchreport	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-availablepatches	ODA-ADMINISTRATOR, ODA-DB	No change
odacli describe-component	ODA-ADMINISTRATOR, ODA-DB	No change
odacli describe-latestpatch	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-agentconfig- parameters	ODA-ADMINISTRATOR	No change
odacli modify-agentconfig- parameters	ODA-ADMINISTRATOR	No change
odacli delete-agentconfig- parameters	ODA-ADMINISTRATOR	No change



ODACLI Command	Roles Required	Changes in command option
odacli update-dbhome	ODA-ADMINISTRATOR, ODA-DB	User odaadmin with the role of ODA-ADMINISTRATOR can update any database home. A custom user with the role of ODA-DB can only update a database home that they have primary access (as the creator) or shared access (as a user who is granted access by odaadmin).
odacli update-dcsadmin	ODA-ADMINISTRATOR	No change
odacli update-dcsagent	ODA-ADMINISTRATOR	No change
odacli update-dcscomponents	ODA-ADMINISTRATOR	No change
odacli update-registry	User with any role	No change
odacli update-repository	ODA-ADMINISTRATOR, ODA-DB	No change
odacli update-server	ODA-ADMINISTRATOR	No change
odacli update-storage	ODA-ADMINISTRATOR	No change
odaadmcli orachk	ODA-ADMINISTRATOR	No change
odacli set-credential	ODA-ADMINISTRATOR, ODA-DB	Not supported when multi-user access is enabled. When multi-user access is enabled, log in as a custom user and use odacli change-password instead.
odacli create-appliance	ODA-ADMINISTRATOR	Add an attribute called "isMultiUserAccessEnabled" :true in the provision.json file. When you run the command, you are prompted to enter and confirm passwords for odaadmin, oracle and grid users and the provisioning job is submitted.
odacli describe-system	User with any role	No change
odacli list-featuretracking	ODA-ADMINISTRATOR	No change
odacli create-backup	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli create-backupconfig	ODA-ADMINISTRATOR, ODA-DB	If creating backupconfig based on ObjectStoreSwift, user must be the creator of the ObjectStoreSwift.
odacli create-objectstoreswift	ODA-ADMINISTRATOR, ODA-DB	No change
odacli delete-backup	ODA-ADMINISTRATOR, ODA-DB	User must have primary (creator of that database) or shared access (granted by odaadmin) on the database whose backup is being deleted.
odacli delete-backupconfig	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli describe-backupreport	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli delete-objectstoreswift	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access



ODACLI Command	Roles Required	Changes in command option
odacli describe-schedule	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli irestore-database	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli list-backupconfigs	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli list-backupreports	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli list-objectstoreswifts	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli list-schedules	ODA-ADMINISTRATOR, ODA-DB	No changes
odacli list-tdebackupreports	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli recover-database	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli restore-archivelog	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli restore-tdewallet	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli modify-backupconfig	ODA-ADMINISTRATOR, ODA-DB	Must have primary or shared access
odacli modify-schedule	ODA-ADMINISTRATOR, ODA-DB	No change
odacli configure-dataguard	ODA-ADMINISTRATOR, ODA-DB	The creator of the primary database and the standby database could be the same or different users. The default is oda-admin.
odacli deconfigure-dataguard	ODA-ADMINISTRATOR, ODA-DB	The creator of the primary database and the standby database could be the same or different users. The default is oda-admin.
odacli describe-dataguardstatus	ODA-ADMINISTRATOR, ODA-DB	No change
odacli failover-dataguard	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-dataguardstatus	ODA-ADMINISTRATOR, ODA-DB	No change
odacli reinstate-dataguard	ODA-ADMINISTRATOR, ODA-DB	No change
odacli switchover-dataguard	ODA-ADMINISTRATOR, ODA-DB	No change
odacli list-cpucores	ODA-ADMINISTRATOR	No change
odacli describe-cpucore	ODA-ADMINISTRATOR	No change
odacli modify-cpucore	ODA-ADMINISTRATOR	No change
odacli create-cpupool	ODA-ADMINISTRATOR	Only odaadmin can create it but a non-admin user with role of ODA-DB can use them.
odacli remap-cpupools	ODA-ADMINISTRATOR	No change
odacli list-cpupools	ODA-ADMINISTRATOR, ODA-DB	A non-admin user with the role of ODA-DB can run the odacli list-cpupools command to view all available CPU pools.



ODACLI Command	Roles Required	Changes in command option
odacli describe-cpupool	ODA-ADMINISTRATOR, ODA-DB	A non-admin user with the role of ODA-DB can run the odacli describe-cpupool command to view details of the CPU pool.
odacli modify-cpupool	ODA-ADMINISTRATOR	No change
odacli delete-cpupool	ODA-ADMINISTRATOR	No change
odacli list-auditrecords	ODA-ADMINISTRATOR	No change
odacli describe-auditrecord	ODA-ADMINISTRATOR	No change
odacli clone-database	ODA-ADMINISTRATOR, ODA-DB	User must have primary or shared access to the database home and the source database being cloned. A user with shared access to source database gets only shared access to the cloned database. Hence, the primary owner of the source database remains the primary owner of the cloned database in this case.
odacli create-database	ODA-ADMINISTRATOR, ODA-DB	For database creation in an existing database home, the user must have primary or shared access to the database home. A user with shared access to the database home gets only shared access to the new database, whose primary owner remains the primary owner of the database home. When using existing database storage for the new database, the user must have primary or shared access to that database storage.
odacli delete-database	ODA-ADMINISTRATOR, ODA-DB	Can access only those databases where the user has primary or shared access
odacli describe-database	ODA-ADMINISTRATOR, ODA-DB	Can access only those databases where the user has primary or shared access
odacli list-databases	ODA-ADMINISTRATOR, ODA-DB	User can only view listing of the databases for which they have primary or shared access. Use the -all option to view all databases and request access.
odacli modify-database	ODA-ADMINISTRATOR, ODA-DB	User should have primary or shared access to the database and the backupconfig being attached. Additionally, the primary owner (creator) of the database and backupconfig should be the same.



ODACLI Command	Roles Required	Changes in command option
odacli move-database	ODA-ADMINISTRATOR, ODA-DB	User must have primary or shared access to the source database that is being moved and the target database home. Additionally, the primary owner of the source and target database home must be the same.
odacli register-database	ODA-ADMINISTRATOR, ODA-DB	User must be the primary owner (creator) of the database home on which this database is to be registered.
odacli upgrade-database	ODA-ADMINISTRATOR, ODA-DB	User must have primary or shared access to the source database (the database being upgraded) and the target database home. Additionally, the owner of the source and target database home must be the same.
odacli update-database	ODA-ADMINISTRATOR, ODA-DB	User must have primary or shared access to the source database (the database being updated) and the target database home. Additionally, the owner of the source and target database home must be the same.
odacli configure-dbhome-storage	ODA-ADMINISTRATOR	No change
odacli list-dbhome-storages	ODA-ADMINISTRATOR	No change
odacli describe-dbhome-storage	ODA-ADMINISTRATOR	No change
odacli modify-dbhome-storage	ODA-ADMINISTRATOR	No change
odacli create-dbhome	ODA-ADMINISTRATOR, ODA-DB	Can access only those database homes where the user has primary or shared access.
odacli delete-dbhome	ODA-ADMINISTRATOR, ODA-DB	Can access only those database homes where the user has primary or shared access.
odacli describe-dbhome	ODA-ADMINISTRATOR, ODA-DB	Can access only those database homes where the user has primary or shared access.
odacli list-dbhomes	ODA-ADMINISTRATOR, ODA-DB	Can access only those database homes where the user has primary or shared access. Use the -all option to view all database homes and request access.
odacli create-dbstorage	ODA-ADMINISTRATOR	Can access only those dbstorages where the user has primary or shared access.
odacli delete-dbstorage	ODA-ADMINISTRATOR	Can access only those dbstorages where the user has primary or shared access.
odacli describe-dbstorage	ODA-ADMINISTRATOR	Can access only those dbstorages where the user has primary or shared access.



ODACLI Command	Roles Required	Changes in command option
odacli list-dbstorages	ODA-ADMINISTRATOR	Can access only those dbstorages where the user has primary or shared access.
odacli modify-dbstorage	ODA-ADMINISTRATOR	Can access only those dbstorages where the user has primary or shared access.
odacli modify-dgstorage	ODA-ADMINISTRATOR	No change
odacli create-jobdata-retention- policy	ODA-ADMINISTRATOR	No change
odacli create-purge-jobdata-job	ODA-ADMINISTRATOR	No change
odacli delete-jobdata-retention- policy	ODA-ADMINISTRATOR	No change
odacli describe-job	User with any role	No change
odacli list-jobs	User with any role	No change
odacli list-jobdata-retention-policy	ODA-ADMINISTRATOR	No change
odacli list-purge-jobdata-job	ODA-ADMINISTRATOR	No change
odacli list-scheduled-executions	ODA-ADMINISTRATOR	No change
odaadmcli manage diagcollect	ODA-ADMINISTRATOR	No change
odacli create-auto-logclean-policy	ODA-ADMINISTRATOR	No change
odacli create-logcleanjob	ODA-ADMINISTRATOR	No change
odacli describe-logcleanjob	ODA-ADMINISTRATOR	No change
odacli list-auto-logclean-policy	ODA-ADMINISTRATOR	No change
odacli list-logcleanjobs	ODA-ADMINISTRATOR	No change
odacli list-logspaceusage	ODA-ADMINISTRATOR	No change
odacli configure-asr	ODA-ADMINISTRATOR	No change
odacli delete-asr	ODA-ADMINISTRATOR	No change
odacli describe-asr	ODA-ADMINISTRATOR	No change
odacli test-asr	ODA-ADMINISTRATOR	No change
odacli modify-asr	ODA-ADMINISTRATOR	No change
odacli list-osconfigurations	ODA-ADMINISTRATOR	No change
odacli modify-osconfigurations	ODA-ADMINISTRATOR	No change
odaadmcli show cooling	root	No change
odaadmcli show env_hw	root	No change
odaadmcli show fs	root	No change
odaadmcli show memory	root	No change
odaadmcli show network	root	No change
odaadmcli show power	root	No change
odaadmcli show processor	root	No change
odaadmcli show server	root	No change
odaadmcli asmops diskgroup	root	No change
odaadmcli expand storage	root	No change
odacli list-dgdisks	ODA-ADMINISTRATOR, ODA-DB	No change
odacli validate-storagetopology	ODA-ADMINISTRATOR	No change
odaadmcli power disk	root	No change



ODACLI Command	Roles Required	Changes in command option
odaadmcli show controller	root	No change
odaadmcli show disk	root	No change
odaadmcli show diskgroup	root	No change
odaadmcli show raidsyncstatus	root	No change
odaadmcli show storage	root	No change
odaadmcli stordiag	root	No change

# odacli Network Commands

Use the odacli network commands to list and describe network interfaces.

#### odacli configure-firstnet

Use the command odacli configure-firstnet to configure the first network in the appliance after racking and connecting the power and network cables.

#### odacli create-network

Use the odacli create-network command to create a network.

#### odacli delete-network

Use the command odacli delete-network to delete a network.

#### odacli delete-networkinterface

Use the command odacli delete-networkinterface to delete a network interface on Oracle Database Appliance X8-2 hardware models.

#### odacli describe-network

Use the <code>odacli describe-network</code> command to display the details of a specific network.

#### odacli describe-networkinterface

Use the odacli describe-networkinterface command to display the details of any network interface.

## odacli list-networks

Use the odacli list-networks command to display networks.

## odacli list-networkinterfaces

Use the odacli list-networkinterfaces command to display network interfaces.

#### odacli modify-network

Use the odacli modify-network command to update an existing network configuration.

# odacli configure-firstnet

Use the command odacli configure-firstnet to configure the first network in the appliance after racking and connecting the power and network cables.

# File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# /opt/oracle/dcs/bin/odacli configure-firstnet

## **Usage Notes**

This command ensures that the system is available in the network, enabling you to manage the deployment through the Oracle Appliance Manager Browser User Interface.

- Bonded network configuration: Bonded dual-ported interface. With the bonded configuration, you can only enable one of the interfaces. The bonded configuration supports VLANs. The bonded network configuration uses btbond1 on Oracle Database Appliance hardware models other than X8-2. On Oracle Database Appliance X8-2, the bonded network configuration uses btbond1 to btbond6. This is the default setting.
- Non-bonded network configuration (on Oracle Database Appliance hardware models other than X8-2): Two separate physical network interfaces, this configuration does not support VLANs. The non-bonded network configuration uses em2 and em3 as public interfaces.
   Note that Oracle Database Appliance X8-2 does not support non-bonded network configuration.
- To change a non-bonded network configuration to a bonded configuration, run the Oracle Database Appliance Cleanup Script and redeploy the appliance.
- You can choose to enable Link Aggregation Control Protocol (LACP) on the bonding interface when you run odacli configure-firstnet.
- You can use the -o option with the odacli configure-firstnet command to configure the network speed for Oracle Dual Port 25 Gb Ethernet Adapter.
- You can also use the -o option with the odacli configure-firstnet command to enable or disable LACP on a bonding interface after deployment.

Enabling LACP on a bonding interface after deployment:

```
# odacli configure-firstnet -o
INFO: Configure network option
Select the Interface to configure the network on (btbond1 btbond3 btbond5)
[btbond1]:btbond3
Use LACP bonding on btbond3 (yes/no) [no]: yes
INFO: network interface [btbond3] setup in LACP mode
```

#### Disabling LACP on a bonding interface after deployment:

```
# odacli configure-firstnet -o
INFO: Configure network option
Select the Interface to configure the network on (btbond1 btbond3 btbond5)
[btbond1]:btbond3
Use LACP bonding on btbond3 (yes/no) [yes]: no
INFO: network interface [btbond3] setup in active-backup mode
```

## Example 17-3 Configuring the First Network as a Bonded Network

Configure the first network to use a btbond1 interface without configuring DHCP. Complete the IP address, netmask address, and gateway address.



Values that you need to provide are shown in *italic font*, with the exception of the net1 gateway address; the program obtains the gateway IP address. The program derives this gateway address using the network information you provided for the other IP addresses. Accept this value, unless your network administrator provides an alternative gateway address that is different from the default that the appliance command-line interface detects.

The following is an example of the command on a single node platform:

## Example 17-4 Configuring the First Network as a Non-Bonded Network

The following is an example of a non-bonded configuration. For a non-bonded configuration, answer no to using a bonding public interface. Note that Oracle Database Appliance X8-2 does not support non-bonded network configuration.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Using bonding public interface (yes/no) [yes]: no
INFO: Breaking the bonding on btbond1
INFO: remove bonding module: rmmod bonding
INFO: remove slave setup in /etc/sysconfig/network-scripts/ifcfg-em2
INFO: remove slave setup in /etc/sysconfig/network-scripts/ifcfg-em3
INFO: Restarting the network
Shutting down interface em1: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface em1: [ OK ]
Bringing up interface em2: [ OK ]
Bringing up interface em3: [ OK ]
INFO: Restarting the DCS agent
initdcsagent stop/waiting
initdcsagent start/running, process 57629
Select the Interface to configure the network on (em2 em3) [em2]:
Configure DHCP on em2 (yes/no) [no]:
INFO: You have chosen Static configuration
Enter the IP address to configure: 10.31.102.101
Enter the Netmask address to configure: 255.255.240.0
Enter the Gateway address to configure[10.31.96.1] :
INFO: Plumbing the IPs now
INFO: Restarting the network
Shutting down interface em1: [ OK ]
```

```
Shutting down interface em2: [ OK ]
Shutting down interface em3: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface em1: [ OK ]
Bringing up interface em2: Determining if ip address 10.31.102.101 is already in use for device em2...
[ OK ]
Bringing up interface em3: [ OK ]
```

# **Example 17-5** Configuring the Speed of the Network Interface

The following is an example of setting the speed of the network card manually.

```
# odacli configure-firstnet -o
INFO: Configure network option
Select the Interface to configure the network on (btbond1 btbond2 btbond3)
[btbond1]:btbond3

Use LACP bonding on btbond3 (yes/no) [no]:
Set the network speed on btbond3 to 1) AUTO, 2) 1G, 3) 10G, 4) 25G [AUTO]: 3
INFO: The speed of the network port is set to '10G'
INFO: Please set the speed for the connected ports in the switch
INFO: stop the network 'btbond3'
INFO: start the network 'btbond3'
INFO: Network interface btbond3 (p2p1, p2p2) has been set to using speed '10G'
```

# odacli create-network

Use the odacli create-network command to create a network.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

```
odacli create-network [-d|-no-d] -n name [-nn nodeName] [-lp listener_ports]
[-sp scan_ports] [-f interface] [ -p ipaddress] [-w {Public|Dataguard|
Database|Management|Backup|Other}] [-s subnetmask] [-g gateway] [-h] [-sip] [-sn] [-vs] [-j]
```

Parameter	Description
defaultnetwork, -d	(Optional) Identifies the default network.
gateway,-g	(Optional) Defines the network gateway. The gateway is required for the default network.
help, -h	(Optional) Displays help for using the command.
interface, -f	(Optional) Defines the name of the network interface.
interfacetype, -t	(Optional) Defines the network interface type {BOND  PHYSICAL VLAN INTERNAL} (non case-sensitive).



Parameter	Description
ipaddress,-p	(Optional) Defines the network IP address. This can be specified in the format IPAddress or nodeNumber0:IPAddress0,nodeNumber1:IPAddress1,
listener-ports,-lp	(Optional) Specifies the comma-separated list of listener ports. The default value is 1521.
scan-ports,-sp	(Optional) Specifies the comma-separated list of SCAN listener ports. The default value is 1521.
json,-j	(Optional) Displays JSON output.
networktype, -w	(Optional) Defines the type of network. Options are: {Public  Dataguard Database Management Backup Other}. The default is Other.
name, -n	(Mandatory) Name of the network.
no-defaultnetwork, no-d	(Optional) Identifies a network as not the default network.  Usedefaultnetwork -d to identify a default network.
subnetmask,-s	(Optional) Defines the Network Subnet Mask.
scanips,-sip	(Optional) Defines the SCAN IP addresses (in the format scanip0,scanip1,)
scanname, -sn	(Optional) Defines the SCAN name.
nodeName, -nn	(Optional) Defines the node name for High-Availability deployments.
vips,-vs	(Optional) List of virtual IP addresses. They can be specified in the format vipname0:nodeNumber0:vip0,vipname1:nodenumber1:vip1,
vlanid, -v	(Optional) Add VLAN as a new network. This option is available for for High-Availability deployments.

# **Usage Notes**

- Network of public type can only be defined when deploying the appliance or when running odacli configure-firstnet during initial provisioning.
- Use this command to create an additional network not done in create-appliance.
- You are only allowed to create a network on the bond interface.
- On Oracle Database Appliance non-High Availability systems, you cannot specify Virtual IP addresses. The Virtual IP address is set to the same value as the IP address.
- Single Client Access Name (SCAN) cannot be set up on Oracle Database Appliance non-High Availability systems.

#### Example 17-6 Creating a Network

The following example creates a new network, sfpbond1, with IP address 192.0.2.15. The network is an additional network that uses subnet mask 255.255.255.0 and is not a default network.

# odacli create-network -n network1 -f sfpbond1 -p 192.0.2.15 -w Backup -s
255.255.255.0 -no-d



## Example 17-7 Creating a VLAN Network

```
odacli create-network -g 10.31.131.129 -f btbond1 -t VLAN -p 0:10.31.131.132,1:10.31.131.133 -nn vlan150 -w Database -no-d -sip 10.31.131.134,10.31.131.135 -sn scaoda702c1-vlan150-scan -s 255.255.255.128 -vs n1-vlan150-vip:0:10.31.131.136,n2-vlan150-vip:1:10.31.131.137 -v 150
```

# odacli delete-network

Use the command odacli delete-network to delete a network.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

To delete a network:

```
odacli delete-network -i id [-n] [-h] [-j]
```

#### **Parameters**

Parameter	Description
id, -i	Defines the network identity.
name, -n	Specifies the network name.
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

You cannot delete the Public-network or Private-network after the system is deployed.

On High-Availability systems, if the node number is not specified in the odacli deletenetwork command, then the network on both nodes is deleted.

# Example 17-8 Deleting a Network

The following example deletes a backup network with a network ID of 55db39db-d95c-42c5-abbd-b88eb99b83ec.

# odacli delete-network -i 55db39db-d95c-42c5-abbd-b88eb99b83ec

```
"jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
"status" : "Running",
"message" : null,
"reports" : [ {
     "taskId" : "TaskSequential_137",
     "taskName" : "deleting network",
     "taskResult" : "Running",
     "startTime" : "March 8, 2025 23:14:32 PM EDT",
     "endTime" : "March 8, 2025 23:14:32 PM EDT",
```



```
"status" : "Running",
  "taskDescription" : null,
  "parentTaskId" : "TaskSequential 135",
  "jobId": "c26d217e-419b-4a91-8680-7b06bcfe9828",
  "tags" : [ ],
  "reportLevel" : "Info",
  "updatedTime" : "March 8, 2025 23:14:32 PM EDT"
} , {
"taskId": "TaskZJsonRpcExt 142",
 "taskName" : "Setting up Network",
  "taskResult" : "Network setup success",
  "startTime": "March 8, 2025 23:14:32 PM EDT",
  "endTime" : "March 8, 2025 23:14:32 PM EDT",
  "status" : "Success",
  "taskDescription" : null,
  "parentTaskId" : "TaskParallel 141",
  "jobId": "c26d217e-419b-4a91-8680-7b06bcfe9828",
  "tags" : [ ],
  "reportLevel" : "Info",
  "updatedTime": "March 8, 2025 23:14:32 PM EDT" } ],
"createTimestamp" : "March 8, 2025 23:14:32 PM EDT",
"description" : "Network service delete",
"updatedTime" : "March 8, 2025 23:14:32 PM EDT"
```

# odacli delete-networkinterface

Use the command odacli delete-networkinterface to delete a network interface on Oracle Database Appliance X8-2 hardware models.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

To delete a network interface:

```
odacli delete-networkinterface [-i id] [-n name] [-h] [-j]
```

#### **Parameters**

Parameter	Description
id, -i	Defines the network interface ID.
name, -n	Defines the network interface name.
help,-h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

You cannot delete the network interface card in slot 7.

## **Example 17-9 Deleting a Network Interface**

```
[root@oak ~]/opt/oracle/dcs/bin/odacli delete-networkinterface -n btbond4
{
"jobId" : "a81066e2-417e-4df6-b810-08df24c646c1",
"status" : "Running",
"message" : null,
"reports" : ,
"createTimestamp" : "March 8, 2025 00:01:09 AM UTC",
"resourceList" : ,
"description" : "Network Interface Deletion with name btbond4",
"updatedTime" : "March 8, 2025 00:01:09 AM UTC"
}
```

# Example 17-10 Deleting btbond1 Network Interface is Not Allowed

[root@oak ~]# /opt/oracle/dcs/bin/odacli delete-networkinterface -n btbond1 DCS-10001:Internal error encountered: Delete operation is not allowed on network interface: btbond1.

## Example 17-11 Deleting Network Interface When Network Exists is Not Allowed

[root@oak  $\sim$ ]# opt/oracle/dcs/bin/odacli delete-networkinterface -n btbond3 DCS-10001:Internal error encountered: Delete operation is not allowed - networks {[Public-network]} found on interface btbond3. Pleae delete the network first.

# odacli describe-network

Use the odacli describe-network command to display the details of a specific network.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

To display the details of a specific network:

```
odacli describe-network [-i id] [-nn node name] [-n name] [-j][-h]
```

Parameter	Description
id, -i	Identifies the network ID. Use the odacli list-networks command to obtain the id.
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
name, -n	Specifies the network name.
node-name, -nn	(Optional) Displays the network interface information for the specified node name.



## **Example 17-12 Displaying Network Details**

Enter the following command to display the details of the public network:

```
# odacli describe-network -n Public-network
Network details
                    ID: a11573f1-cad4-41fc-9dd0-3ba958b605f8
                  Name: Public-network
                   NIC: btbond1
         Interface Type: BOND
            Subnet Mask: 255.255.255.0
               Gateway: 10.31.116.1
               VLAN ID:
                  Type: Public
               Default: true
               Created: March 30, 2020 8:37:00 AM PDT
               Updated: March 30, 2023 10:25:27 AM PDT
                Status: Configured
         Node Networks: [IP Address on node0: 10.31.117.60, IP Address on
node1: 10.31.117.62]
             Scan Name: odal-scan
              Scan Ips: 10.31.117.64 10.31.117.65
                  Vips: [odal-vip on node0: 10.31.116.61, oda2-vip on
node1: 10.31.116.63]
  Associated Databases: odacn db122a db122b db122c db122d
```

# **Example 17-13 Displaying Network Details**

Enter the following command to display the details of network ID 93c07043-3002-494a-8fa0-f3ae932fb4c5:

Created: November 18, 2023 10:54:16 PM PST



# odacli describe-networkinterface

Use the odacli describe-networkinterface command to display the details of any network interface.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

To display the details of a specific network interface:

```
odacli describe-networkinterface -i id -n name [-nn node name] [-j][-h]
```

#### **Parameters**

Parameter	Description
id, -i	Identifies the network interface ID. Use the odacli list-networks command to obtain the id.
name, -n	Specifies the network interface name.
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
node-name, -nn	(Optional) Displays the network interface information for the specified node name.

# **Usage Notes**

By default, this command always displays the network interface description of the local node. To display the description of another node, specify the node name option (-nn).

# **Example 17-14 Displaying Network Details**

Enter the following command to display the details of network interface with ID fe1bf0a7-f56e-44cd-9a84-f374c0aa4b61:

```
# /opt/oracle/dcs/bin/odacli describe-networkinterface
-i felbf0a7-f56e-44cd-9a84-f374c0aa4b61 -nn oda1
```

Network Interface details

-----

ID: fe1bf0a7-f56e-44cd-9a84-f374c0aa4b61

Name: eth2
NIC: eth2
Type: PHYSICAL
Members: eth2
Slave Interface: true

Created: October 16, 2023 1:16:59 PM PDT



# odacli list-networks

Use the odacli list-networks command to display networks.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-networks [-nn node name] [-j] [-h]

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
node-name, -nn	(Optional) Displays the network interface information for the specified node name.

# Example 17-15 Displaying a List of Networks

Use the odacli list-networks command to display a list of networks:

# odacli list-networkinterfaces

Use the odacli list-networkinterfaces command to display network interfaces.

# File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-networkinterfaces [-nn node\_name] [-j] [-h]

Parameter	Description
json,-j	(Optional) Displays JSON output.



Parameter	Description
help, -h	(Optional) Displays help for using the command.
node-name, -nn	(Optional) Displays the network interface information for the specified node name.

# Example 17-16 Displaying a List of Network Interfaces

Use the odacli list-networkinterfaces command to display a list of network interfaces:

<pre># odacli list-networkinterfaces -nn oda1 ID Type</pre>	Name	NIC
d5907a23-1c5d-48c7-8d47-2c188ed43ddd	bond0	bond0
4f7ea558-9a43-42a9-8e08-6bfdf3a33229 BOND	bond1	bond1
743ced8d-bbe5-4987-b316-5fdf95d5e60b PHYSICAL	eth0	eth0
a4121f9e-e694-4852-a521-44efc6ef3fde PHYSICAL	eth1	eth1
c62c5f04-aa93-4783-a3a7-275bf9fab2d9 PHYSICAL	eth2	eth2
bda21dad-5c1c-4073-89e5-798b8fce8533 PHYSICAL	eth3	eth3
0141f1ac-5c34-4393-8b99-76094b6f795c PHYSICAL	ib0	ib0
e8cb138a-087f-4739-bb8d-90b1d903aeb6 PHYSICAL	ib1	ib1
a31cfd63-fb90-4cbb-a2fb-382c5e33983b BOND	ibbond0	ibbond0

# odacli modify-network

Use the odacli modify-network command to update an existing network configuration.

# File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

# To update a network:

odacli modify-network -i id -n name [-p IP address] [-lp listener\_ports] [-sp scan\_ports] [-w {Public|Dataguard|Database|Management|Backup|Other}] [-s network subnet mask] [-g network gateway] [-sip] [-sn] [-vs] [-j] [-h]

#### **Parameters**

Parameter	Description
id, -i	Defines the network identity.
name, -n	Defines the network name.
gateway,-g	(Optional) Defines the network gateway.
ipaddress, -p	(Optional) Defines the network IP address. This can be specified in the format IPAddress or nodeNumber0:IPAddress0,nodeNumber1:IPAddress1,
networktype,-w	(Optional) Defines the type of network. {Public Dataguard  Database Management Backup Other}
scanips, -sip	Defines the SCAN IP addresses (in the format scanip0,scanip1,)
scanname, -sn	Defines the SCAN name.
listener-ports,-lp	(Optional) Specifies the comma-separated list of listener ports. The default value is 1521.
scan-ports, -sp	(Optional) Specifies the comma-separated list of SCAN listener ports. The default value is 1521.
subnetmask, -s	(Optional) Defines the Network Subnet Mask.
vips, -vs	List of virtual IP addresses. They can be specified in the format vipname0:nodeNumber0:vip0,vipname1:nodenumber1:vip1,
help,-h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

- You cannot modify the Public and Private-interfaces after the system is deployed.
- On Oracle Database Appliance non-High Availability systems, you cannot update Virtual IP addresses. The Virtual IP address is set to the same value as the IP address.
- Single Client Access Name (SCAN) cannot be set up on Oracle Database Appliance non-High Availability systems.
- On Oracle Database Appliance High Availability systems, you cannot update network of type Database to other types of network (such as backup, management and so on). You can, however, update IP address, Virtual IP address, Gateway, and Subnet mask for all network types.
- The system has both SFP+ and 10GBaseT bonded pairs, which means that one of them is
  used for the public, and you can configure the other after deployment if you want additional
  connectivity. For example, if you want a backup network.

# Example 17-17 Modifying a Network

The following example updates the network ID 192.0.0.2 and designates the network as a backup network:

# odacli modify-network -i 192.0.0.2 -w Backup



# odacli Multi-User Access Commands

Use odacli commands to enable multi-user access for the appliance.



The multi-user access feature is available for standalone Oracle Database Appliance systems. During provisioning, a single domain and tenancy is created by default and all users are created within the default domain and tenancy.

#### odacli list-domains

Use the odacli list-domains command to list all multi-user access domains.

#### odacli describe-domain

Use the odacli describe-domain command to describes a multi-user access domain.

#### odacli list-tenants

Use the odacli list-tenants command to list all tenants in a multi-user access domain.

#### odacli describe-tenant

Use the odacli describe-tenant command to describe a tenant in a multi-user access domain.

#### odacli create-user

Use the odacli create-user command to create a user in a multi-user access system.

#### odacli activate-user

Use the odacli activate-user command to activate a user in a multi-user access system.

#### odacli list-users

Use the odacli list-users command to list all users in a multi-user access system.

## odacli describe-user

Use the  $odacli\ describe-user$  command to describe a user in a multi-user access system.

# · odacli authorize-user

Use the odacli authorize-user command in a multi-user access system to unlock a user account that is locked due to multiple failed login attempts or where the password has expired, and authorize the user to reset their password to reactivate their account.

#### odacli delete-user

Use the odacli delete-user command in a multi-user access system to delete a user account.

#### odacli list-user-roles

Use the <code>odacli list-user-roles</code> command to list user roles in a multi-user access system.

## odacli describe-user-role

Use the <code>odacli describe-user-role</code> command to describe a user role in a multi-user access system.



#### odacli list-user-entitlements

Use the odacli list-user-entitlements command to list all entitlements in a multi-user access system.

#### odacli describe-user-entitlement

Use the odacli describe-user-entitlement command to describe an entitlement in a multi-user access system.

#### odacli list-user-operations

Use the odacli list-user-operations command to list all operations in a multi-user access system.

# · odacli describe-user-operation

Use the odacli describe-user-operation command to describe an operation in a multi-user access system.

#### odacli list-resources-access

Use the odacli list-resources-access command to list access to DCS resources in a multi-user access system.

# odacli describe-resource-access

Use the odacli describe-resource-access command to describe access to a DCS resource in a multi-user access system.

### odacli grant-resource-access

Use the odacli grant-resource-access command to grant shared access to a DCS resource in a multi-user access system.

#### odacli revoke-resource-access

Use the <code>odacli revoke-resource-access</code> command to revoke access to a DCS resource in a multi-user access system.

# odacli reset-password

Use the odacli reset-password command to reset the password for a user, after it is unlocked, in a multi-user access system.

# odacli change-password

Use the odacli change-password command to change the password for a user in a multi-user access system.

# odacli list-domains

Use the odacli list-domains command to list all multi-user access domains.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-domains [-j] [-h]

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



## **Usage Notes**

The odaadmin user can run this command to view all the multi-user access domains.

# Example 17-18

# odacli describe-domain

Use the odacli describe-domain command to describes a multi-user access domain.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli describe-domain -dn domain\_name [-j] [-h]

#### **Parameters**

Parameter	Description
domain-name, -dn	(Required) Specifies the multi-user access domain.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

The odaadmin user can run this command to view details of the multi-user access domain.

# Example 17-19

Name: odalocal.com Description: Default domain

Is Active: true

Created: November 22, 2021 7:39:50 PM UTC Last Updated: November 22, 2021 7:39:50 PM UTC



# odacli list-tenants

Use the odacli list-tenants command to list all tenants in a multi-user access domain.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-tenants -dn domain name [-j] [-h]

#### **Parameters**

Parameter	Description
domain-name, -dn	(Optional) Specifies the multi-user access domain name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

• The odaadmin user can run this command to view the tenants in a multi-user access domain.

# Example 17-20

# odacli describe-tenant

Use the odacli describe-tenant command to describe a tenant in a multi-user access domain.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli describe-tenant -tn tenant name -dn domain name [-j] [-h]

Parameter	Description
tenant-name, -tn	(Required) Specifies the multi-user access tenant name.



Parameter	Description
domain-name, -dn	(Optional) Specifies the multi-user access domain name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

 The odaadmin user can run this command to view the tenant details in a multi-user access domain.

# Example 17-21

```
[odaadmin@oda1 bin]$ odacli describe-tenant -tn odalocal
Tenant details
```

ID: 1656723b-f614-4539-9634-d9013e611015

Domain Name: odalocal.com Tenant Name: odalocal Tenant Description: Default tenant

Is Active: true

Created: November 22, 2021 7:39:50 PM UTC Last Updated: November 22, 2021 7:39:50 PM UTC

# odacli create-user

Use the odacli create-user command to create a user in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli create-user -u user\_id -r roles [-gc] [-j] [-h]

Parameter	Description
user-id, -u	(Required) Specifies the user whose details are being created.
user-roles, -r	(Required) Specifies the role to be assigned to the user. Use commas to specify multiple roles.
generate-cert,-gc	(Optional) This option generates and registers a pair of certificates, one for the client and the other for the server (DCS agent). After these certificates are mutually exchanged and authenticated, the client and server can communicate with each other using mTLS (mutual Transport Layer Security). This attribute is optional and must be enabled only when you need to connect to the DCS agent with mTLS in addition to Basic Authentication.
help, -h	(Optional) Displays help for using the command.



Parameter	Description
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

Use the command to create a user in a multi-user access system. After odaadmin creates a
user and generates temporary login credentials, the new user must activate their account
by connecting to the appliance with the temporary password. Run the odacli activateuser command and provide the temporary password and then specify the new password.
You can also activate the user from the Browser User Interface.

# Example 17-22

```
[odaadmin@oda1 bin]$ odacli create-user -u dcsdb2 -r ODA-DB
Enter ODA account password for user 'dcsdb2':
Retype ODA account password for user 'dcsdb2':
Job details
                  ID: 856b3d79-8ae1-427c-a77a-8893254a451f
          Description: User creation(dcsdb2)
              Status: Running
             Created: November 29, 2023 7:01:54 AM UTC
             Message:
Task Name Start Time End Time Status
______
[odaadmin@oda1 bin]$ odacli describe-job -i 856b3d79-8ae1-427c-
a77a-8893254a451f
Job details
                  ID: 856b3d79-8ae1-427c-a77a-8893254a451f
          Description: User creation(dcsdb2)
              Status: Success
             Created: November 29, 2023 7:01:54 AM UTC
             Message:
Task Name Start Time End Time Status
_______
```

# odacli activate-user

Use the odacli activate-user command to activate a user in a multi-user access system.

## File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli activate-user [-j] [-h]

#### **Parameters**

Parameter	Description
domain-name, -d	(Optional) Specifies the name of the domain in which the user exists.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

Use the command to activate a user in a multi-user access system. To activate a user, the
user to be activated must connect to the Oracle Database Appliance system through SSH
and then run the command.

# Example 17-23

[dcsdb2@oda1 bin]\$ odacli activate-user Enter your ODA account password: Enter new password for your ODA account: Retype new password for your ODA account: User 'dcsdb2' activated successfully.

# odacli list-users

Use the odacli list-users command to list all users in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-users [-d domain name] [-t tenant name] [-u user id] [-j] [-h]

Parameter	Description
domain-name,-d	(Optional) Specifies the name of the domain in which the user exists.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
user-id, -u	(Optional) Specifies the user for whom the list is being generated.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



ODA-

### **Usage Notes**

• The odaadmin user can run this command to view all the users in a multi-user access system.

# Example 17-24

[odaadmin@oda1 bin]\$ odacli list-users ΙD DCS User Name OS User Name Role(s) Account Status User Type \_\_\_\_\_ 13b64a36-23f8-4ba2-9af3-e0a17a16b376 dcsdb2 dcsdb2 ODA-Active Custom 5006da5b-0fc0-4d6f-9115-17d89ad235e4 oakdroot oakdroot ODA-OAKDROOT Active System 7af066af-55bd-48a9-8db5-c0d3049a1541 ugrid ugrid ODA-Active System 8361ca4b-8747-4687-9459-799c6a17d1b1 uoracle uoracle ODA-Active System

# odacli describe-user

Use the odacli describe-user command to describe a user in a multi-user access system.

a205ce98-2675-49a2-81e2-4e1c7540f023 odaadmin odaadmin

System

## File Path

/opt/oracle/dcs/bin/odacli

ADMINISTRATOR Active

#### **Syntax**

odacli describe-user [-u user\_id] [-d domain\_name] [-rd] [-t tenant\_name] [j] [-h]

# **Parameters**

Parameter	Description
user-id, -u	(Required) Specifies the user whose details are being viewed.
domain-name, -d	(Optional) Specifies the name of the domain in which the user exists.
role-details, -rd	(Optional) Specifies the entitlements and operations associated with the user role.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



### **Usage Notes**

Use the command to view details about a user in a multi-user access system.

## Example 17-25

# odacli authorize-user

Use the odacli authorize-user command in a multi-user access system to unlock a user account that is locked due to multiple failed login attempts or where the password has expired, and authorize the user to reset their password to reactivate their account.

# File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

```
odacli authorize-user -u user_id [-d domain_name] [-t tenant_name] [-j] [-h]
```

#### **Parameters**

Parameter	Description
user-id, -u	(Required) Specifies the user whose account is locked.
domain-name, -d	(Optional) Specifies the name of the domain in which the user exists.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

#### **Usage Notes**

• Use the command to authorize a user in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

## Example 17-26

```
[odaadmin@odal bin]$ odacli authorize-user -u dcsdb2
Enter your ODA account password:
Enter new password for user 'dcsdb2':
Retype new password for user 'dcsdb2':
User 'dcsdb2' authorized successfully.
User can now login with the temporary password assigned to them by the system administrator
and reset their password by executing 'odacli reset-password' command or via
BUI.
```

# odacli delete-user

Use the odacli delete-user command in a multi-user access system to delete a user account.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli delete-user -u user id [-d domain name] [-t tenant name] [-j] [-h]

#### **Parameters**

Parameter	Description
user-id, -u	(Required) Specifies the user account to be deleted.
domain-name, -d	(Optional) Specifies the name of the domain in which the user exists.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

- Use the command to delete a user in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.
- The user can be deleted only if there are no resources currently being held in their name.

# Example 17-27



Task Name Start Time End Time Status dcs

-----

-----

[odaadmin@oda1 bin]\$ odacli describe-job -i a8724a04-3225-43b3-9484-a949bce1c5c0

Job details

\_\_\_\_\_\_

ID: a8724a04-3225-43b3-9484-a949bce1c5c0

Description: User deletion(dcsdb2)

Status: Success

Created: November 19, 2021 11:44:35 AM UTC

Message:

Task Name Start Time End Time Status

\_\_\_\_\_\_

\_\_\_\_\_\_

# odacli list-user-roles

Use the <code>odacli list-user-roles</code> command to list user roles in a multi-user access system.

# File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-user-roles [-n role\_name] [-j] [-h]

## **Parameters**

Parameter	Description	
role-name, -n	(Optional) Displays the list for the specified role.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output.	

# **Usage Notes**

• Use the command to view all the roles in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

# Example 17-28

[odaadmin@oda1 bin]\$ odacli list-user-roles

Role Name Role Description Is Admin Role Is Internal Is Active

\_\_\_\_\_\_

\_\_\_\_\_\_ \_\_\_\_

ODA-DB Role with DB provisioning related entitlements

false false true

ODA-GRID Role with GRID provisioning related entitlements

false true true

ODA-DBVMINFRA Role with DBVM user related entitlements false

true true

ODA-ADMINISTRATOR System Administrator role with all entitlements

true true true

ODA-OAKDROOT Role with OAKD related entitlements

false true true

# odacli describe-user-role

Use the odacli describe-user-role command to describe a user role in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli describe-user-role [-n role name] [-j] [-h]

#### **Parameters**

Parameter	Description	
role-name, -n	(Required) Specifies the user role for which you want to list the details.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output.	

## **Usage Notes**

• Use the command to describe a user role in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

#### **Example 17-29**

[odaadmin@oda1 bin]\$ odacli describe-user-role -n ODA-DB Role details

-----

Name: ODA-DB

Description: Role with DB provisioning related entitlements

Is Admin Role: false
 Is Internal: false
 Is Active: true

Mapped Entitlement(s): PROVISIONDB-MGMT, BACKUPDB-MGMT, PATCHDB-MGMT, DATAGUARD-MGMT, DBSTORAGE-MGMT, OBJSTORESWIFT-MGMT, RMANREPORT-MGMT, SCHEDULE-MGMT, ORACHK-MGMT, ASM-RDBMS-INSTANCE-MGMT, CPUPOOLVIEW-MGMT, COMMON-ALL



# odacli list-user-entitlements

Use the odacli list-user-entitlements command to list all entitlements in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-user-entitlements [-ao] [-n entitlement name] [-j] [-h]

#### **Parameters**

Parameter	Description
active-only, -ao	(Optional) Lists the active entitlements.
entitlement-name, -n	(Optional) Displays the list for the specified entitlement.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

• Use the command to view all entitlements in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

# Example 17-30

[odaadmin@oda1 bin]\$ odacli list-user-entitlements

Entitlement Name Description		Is Active
TOKEN-MGMT	Entitlement	for performing user token management
operations	true	
OSCONFIGS-MGMT	Entitlement	for performing os configurations related
operations true		
FEATURETOGGLE-MGMT	Entitlement	for performing feature enable/diable
management operations	true	
SERVER-MGMT	Entitlement	for performing server related
operations	true	
HAT-MGMT	Entitlement	for performing HAT Administrative
operations	true	
ASM-RDBMS-INSTANCE-MGM	r Entitlement	for performing ASM/RDBMS instance related
operations true		
RMANREPORT-MGMT	Entitlement	for performing RMAN report(s) related
operations t	rue	
DBHOME-MGMT	Entitlement	for performing DBHomes (on ACFS) related
operations true		
DCSCOMPS-MGMT	Entitlement	for performing DCS component related
operations	true	

KVM-MGMT-INTERNAL Entitlement for performing blackbox KVM related internal operations true

# odacli describe-user-entitlement

Use the odacli describe-user-entitlement command to describe an entitlement in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli describe-user-entitlement -n entitlement\_name [-j] [-h]

#### **Parameters**

Parameter	Description	
entitlement-name, -n	(Required) Displays the details for the specified entitlement.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output.	

#### **Usage Notes**

• Use the command to view an entitlement in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

#### Example 17-31

```
[odaadmin@oda1 bin]$ odacli describe-user-entitlement -n PROVISIONDB-MGMT

Entitlement details

Name: PROVISIONDB-MGMT

Description: Entitlement for performing DB provision related operations

Is Active: true

Mapped Operation(s): clone-database, create-database, delete-database, describe-database, list-databases, modify-database, move-database, register-database, update-database, upgrade-database, create-dbhome, delete-dbhome, describe-dbhome, list-dbhomes, describe-netsecurity, update-netsecurity, list-supported-dbversions, get-db-shapes, restore-archivelog, restore-tdewallet, modify-dbfileattributes
```



# odacli list-user-operations

Use the <code>odacli list-user-operations</code> command to list all operations in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-user-operations [-ao] [-n operations name] [-j] [-h]

#### **Parameters**

Parameter	Description	
active-only, -ao	(Optional) Lists the active multi-user access operations.	
operation-name, -n	(Optional) Displays the list for the specified operation.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output.	

#### **Usage Notes**

• Use the command to view operations in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

# Example 17-32

[odaadmin@oda1 bin]\$ odacli list-user-operations

Operation Name	Operation Description	Is Active
list-orachkreports	List orachkreports	true
list-osconfigurations	List os configurations	true
describe-database	Describe database	true
retrieveall-resources	Retrieve all resources	true
modify-dbsystem-vm	Modify DB System VMs	true
list-backupconfigs	List backup configurations	true

# odacli describe-user-operation

Use the odacli describe-user-operation command to describe an operation in a multi-user access system.

## File Path

/opt/oracle/dcs/bin/odacli



# **Syntax**

odacli describe-user-operation [-n operation name] [-j] [-h]

#### **Parameters**

Parameter	Description	
operation-name, -n	(Optional) Displays the details for the specified operation.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output.	

# **Usage Notes**

• Use the command to view an operation in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

# Example 17-33

[odaadmin@oda1 bin]\$ odacli describe-user-operation -n create-database Operation details

\_\_\_\_\_

Name: create-database Description: Create database

Is Active: true

# odacli list-resources-access

Use the odacli list-resources-access command to list access to DCS resources in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-resources-access [-ao] [-rn resource\_name] [-rt resource\_type] [j] [-h]

# **Parameters**

Description	
(Optional) Lists the active resources.	
(Optional) Displays the list by resource name.	
(Optional) Displays the list for the specified resource type, for example, oda_dbhome, oda_db, oda_dbstorage, oda_objstoreswift, and oda_backupconfig.	
(Optional) Displays help for using the command.	
(Optional) Displays JSON output.	



ODA BACKUPCONFIG

ODA DBSTORAGE

## **Usage Notes**

 Use the command to view access to resources in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

[odaadmin@oda1 bin]\$ odacli list-resources-access

abc9a670-493e-4226-b186-6bc91ea48b9a default

2360eebc-8899-471c-828f-c008e56fefea asmtde1

true

true

odaadmin

## Example 17-34

Resource ID Resource Name Resource Location Resource Type Primary Owner Shared Access Is Active \_\_\_\_\_ cfc65e00-5d9e-4c00-a7a0-f7ea37884e06 asmtde1 53f434fe-598e-46a0-bbdca456404da0c9 ODA\_DB odadb1 odaadmin true 1dd795e1-b582-49f1-b1fb-eb3d77eb158b bkpcfg o1 ObjectStore ODA BACKUPCONFIG odaadmin odadb1 true 06682f78-8f5f-4dd2-a918-7935e00bf0c4 o1 https:// swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1 ODA OBJSTORESWIFT odadb1 odaadmin true 53f434fe-598e-46a0-bbdc-a456404da0c9 OraDB19000 home1 /u01/app/odaorahome/ odadb1/product/19.0.0.0/dbhome 1 ODA DBHOME odadb1 odaadmin true

# odacli describe-resource-access

uoracle

DATA, RECO, RECO

odadb1 odaadmin

Disk

Use the odacli describe-resource-access command to describe access to a DCS resource in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli describe-resource-access [-ri resource\_ID] [-j] [-h]

#### **Parameters**

Parameter	Description	
resource-ID, -ri	(Required) Specifies the resource ID.	
help, -h	(Optional) Displays help for using the command.	



Parameter	Description
json,-j	(Optional) Displays JSON output.

### **Usage Notes**

 Use the command to view access to a resource in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

## Example 17-35

```
[odaadmin@oda1 bin]$ odacli describe-resource-access -ri cfc65e00-5d9e-4c00-a7a0-f7ea37884e06
```

Resource Access details

-----

Resource ID: cfc65e00-5d9e-4c00-a7a0-f7ea37884e06

Resource Name: asmtde1

Resource Location: 53f434fe-598e-46a0-bbdc-a456404da0c9

Resource Type: ODA\_DB Primary Owner: odadb1 Shared Access: odaadmin Is Active: true

Created: November 17, 2021 1:31:55 PM UTC Last Updated: November 17, 2021 1:31:55 PM UTC

# odacli grant-resource-access

Use the odacli grant-resource-access command to grant shared access to a DCS resource in a multi-user access system.

## File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli grant-resource-access [-ri resource\_ID] [-u user ID] [-j] [-h]

#### **Parameters**

Parameter	Description
resource-ID, -ri	(Required) Specifies the resource ID.
user-ID, -u	(Required) Specifies the user name to be granted shared access.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

#### **Usage Notes**

Use the command to grant access to a resource in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.



#### Example 17-36

[odaadmin@oda1 bin]\$ odacli grant-resource-access -ri cfc65e00-5d9e-4c00-a7a0-f7ea37884e06 -u odadb2
Shared access of resource granted to user successfully...
[odaadmin@oda1 bin]\$ odacli describe-resource-access -ri cfc65e00-5d9e-4c00-a7a0-f7ea37884e06
Resource Access details

-----

Resource ID: cfc65e00-5d9e-4c00-a7a0-f7ea37884e06

Resource Name: asmtde1

Resource Location: 53f434fe-598e-46a0-bbdc-a456404da0c9

Resource Type: ODA\_DB
Primary Owner: odadb1

Shared Access: odaadmin,odadb2

Is Active: true

Created: November 17, 2021 1:31:55 PM UTC Last Updated: November 19, 2021 12:46:55 PM UTC

# odacli revoke-resource-access

Use the <code>odacli revoke-resource-access</code> command to revoke access to a DCS resource in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli revoke-resource-access [-ri resource ID] [-u user ID] [-j] [-h]

#### **Parameters**

Parameter	Description	
resource-ID, -ri	(Required) Specifies the resource ID.	
user-ID, -u	(Required) Specifies the user name whose shared access is to be revoked.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output.	

#### **Usage Notes**

• Use the command to revoke access to a resource in a multi-user access system. Only the system administrator odaadmin has the necessary privileges to run this command.

# Example 17-37

[odaadmin@oda1 bin]\$ odacli revoke-resource-access -ri cfc65e00-5d9e-4c00-a7a0-f7ea37884e06 -u dcsdb2
Shared access of resource to the user revoked successfully...
[odaadmin@oda1 bin]\$ odacli describe-resource-access -ri cfc65e00-5d9e-4c00-a7a0-f7ea37884e06

# Resource Access details

-----

Resource ID: cfc65e00-5d9e-4c00-a7a0-f7ea37884e06

Resource Name: asmtdel

Resource Location: 53f434fe-598e-46a0-bbdc-a456404da0c9

Resource Type: ODA\_DB
Primary Owner: odadb1
Shared Access: odaadmin
Is Active: true

Created: November 17, 2021 1:31:55 PM UTC Last Updated: November 19, 2021 12:53:43 PM UTC

# odacli reset-password

Use the odacli reset-password command to reset the password for a user, after it is unlocked, in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli reset-password [-d domain name] [-t tenant name] [-j] [-h]

#### **Parameters**

Parameter	Description
domain-name, -d	(Optional) Specifies the name of the domain in which the user exists.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Usage Notes**

• Use the command to reset the password for a user in a multi-user access system. The password of a user must be reset either when the user account is locked due to multiple failed login attempts or if the password has expired. The odaadmin must first unlock the user account by running the odacli authorize-user command. The user can then log in with the temporary password assigned by odaadmin, run the odacli reset-password command, provide the temporary password, and then specify the new password. You can also reset the password from the Browser User Interface.

# Example 17-38

```
[dcsdb2@oda1 bin]$ odacli reset-password
Enter your ODA account password:
Enter new password for your ODA account:
Retype new password for your ODA account:
Password reset for user 'dcsdb2' successful...
```



# odacli change-password

Use the <code>odacli</code> change-password command to change the password for a user in a multi-user access system.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli change-password [-d domain name] [-t tenant name] [-j] [-h]

#### **Parameters**

Parameter	Description
domain-name, -d	(Optional) Specifies the name of the domain in which the user exists.
tenant-name, -t	(Optional) Specifies the tenancy in which the user exists.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

• This command must be run by the active user who wants to change the password. To reset the password of a locked or expired account, use the odacli reset-password command.

#### **Example 17-39**

```
[dcsdb2@oda1 bin]$ odacli reset-password
Enter your ODA account password:
Enter new password for your ODA account:
Retype new password for your ODA account:
Password reset for user 'dcsdb2' successful...
```

# odacli Apply Patch and Update Commands

Use the commands odacli update and apply patch to apply patches and update the appliance.

odacli cleanup-patchrepo

Use the odacli cleanup-patchrepo command to delete obsolete or old patches from the repository.

odacli create-prepatchreport

Use the odacli create-prepatchreport command to run pre-checks for patching.

odacli describe-prepatchreport

Use the odacli describe-prepatchreport command to display the pre-check report, with a list of pre-checks run with status and comments.



#### odacli list-prepatchreports

Use the odacli list-prepatchreports command to display all pre-check reports, with a list of pre-checks run with status and comments.

# odacli delete-prepatchreport

Use the odacli delete-prepatchreport command to delete any pre-check report.

## odacli list-availablepatches

Use the odacli list-available patches command to display all available patches for Oracle Database Appliance.

# odacli describe-component

Use the <code>odacli describe-component</code> command to display the installed version and the latest available version for each component.

# odacli describe-latestpatch

Use the odacli describe-latestpatch command to display a list of the latest supported patch versions for each component.

# · odacli list-agentconfig-parameters

Use the <code>odacli list-agentconfig-parameters</code> command to list configuration variables used by the appliance.

## odacli modify-agentconfig-parameters

Use the odacli modify-agentconfig-parameters command to modify configuration variables used by the appliance.

## odacli delete-agentconfig-parameters

Use the odacli delete-agentconfig-parameters command to delete configuration variables used by the appliance.

#### odacli update-database

Use the odacli update-database command to update a database to a specific database home with later version, and within the same major release.

# odacli update-dbhome

Use the odacli update-dbhome command to update a specific database home to the latest patch bundle version.

#### odacli update-dcsadmin

Use the odacli update-dcsadmin command to update the DCS admin for DCS components upgrade.

#### odacli update-dcsagent

Use the odacli update-dcsagent command to update the agent.

#### odacli update-dcscomponents

Use the odacli update-dcscomponents command to update the DCS components such as the DCS agent, CLI, and controller.

#### odacli update-registry

Use the odacli update-registry command to update the metadata for the components that are already present in the registry. For database home and grid home, this command updates the patch information, when you apply patches manually.

# odacli update-repository

Use the odacli update-repository command to update the repository with the new Oracle Database Appliance software.

# odacli update-server

Use the odacli update-server command to update the operating system, firmware, Oracle Appliance Kit, Oracle Clusterware, and all other infrastructure components.

odacli update-storage

Use the odacli update-storage command to update the storage.

odaadmcli orachk

Use the odaadmcli orachk command to check configuration settings for Oracle Database Appliance components.

# odacli cleanup-patchrepo

Use the odacli cleanup-patchrepo command to delete obsolete or old patches from the repository.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli cleanup-patchrepo [-nn node\_name] [-cl clones] [-v version [-comp component] [-l local]

#### **Parameters**

Parameter	Description
clones, -cl	Specifies the option to clean up clone files (DB and GI) from the repository /opt/oracle/oak/pkgrepos/orapkgs/clones/.
version, -v	Defines the Oracle Database Appliance release you want to delete. You cannot delete the initial or current release files.
	For example, 12.2.1.4.0.
component, -comp	A comma-separated list of components as $\{DB,GI\}$ to cleanup for a specific Oracle Database Appliance patch version. The default is both $\{DB,GI\}$ .
local, -l	(Optional) Cleans up the repository on the local node.
node-name, -nn	(Optional) Cleans up the repository on the specified node names.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

- Use the command to free up space in the patch repository.
- This command does not delete the current patches or latest installed patch repository.

## Example 17-40 Deleting RDBMS and GI components for a specific release

```
# odacli cleanup-patchrepo -cl -comp db,gi -v 12.2.1.4.0
{
"jobId" : "d915ffc0-c7f6-49cf-8ddd-ab5d2ad9072f",
"status" : "Created",
"message" : null,
"reports" : ,
"createTimestamp" : "April 17, 2024 06:44:28 AM UTC",
"resourceList" : ,
```



```
"description" : "Cleanup patchrepos",
"updatedTime" : "April 17, 2024 06:44:28 AM UTC"
```

# **Example 17-41 Deleting Clone Files**

```
# odacli cleanup-patchrepo -cl
{
"jobId" : "5d8549a2-la5e-4b4f-9867-c1f671c659c4",
"status" : "Created",
"message" : null,
"reports" : ,
"createTimestamp" : "April 17, 2024 06:43:45 AM UTC",
"resourceList" : ,
"description" : "Cleanup patchrepos",
"updatedTime" : "April 17, 2024 06:43:45 AM UTC"
}
```

# odacli create-prepatchreport

Use the odacli create-prepatchreport command to run pre-checks for patching.

Patching pre-checks help identify and remedy any problems before patching is attempted, and ensure all components are ready for updates.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

```
odacli create-prepatchreport [-db] [-dbid database_id] [-dp] [-d][-i
dbhome_id] [-f files] [-l] [-nn node_name] [-os] [-r] [-s] [-sko] [-st] [-to
dest db home id] [-v version] [-j] [-h]
```

#### **Parameters**

Parameter	Description
database, -db	(Optional) Specifies the database component for running the prechecks. This option cannot be used with the -dp and -d options.
databaseid, -dbid	(Optional) Specifies the ID of the database to be updated and for which you want to run the pre-checks.
datapatch, -dp	(Optional) Specifies the datapatch component for running the prechecks. This option cannot be used with the -db and -d options.
dbhome, -d	(Optional) Specifies the database home component for running the pre-checks. This option cannot be used with the -dp and -db options.
dbhomeid, -i	(Optional) Specifies the IDs of the database homes to be updated and for which you want to run the pre-checks.
files, -f	(Optional) Specifies files required to update repository, comma- separated if multiple files are required.



Parameter	Description
operating-system, -os	(Optional) Specifies the operating system components. Use this option to run operating system upgrade. If you specify -c, then the only option is os. If you specify -c os, then you can also specify -local (optional).
node-name, -nn	(Optional) Runs patch pre-checks on specified node names.
local, -l	(Optional) Runs patch pre-checks on local node only.
operating-system, -os	(Optional) Specify this option to run the patch pre-checks for the operating system components.
repo, -r	(Optional) Specify this option to run the patch pre-checks for the repository components.
server, -s	(Optional) Specify this option to run the patch pre-checks for the server components.
storage, -st	(Optional) Specify this option to run the patch pre-checks for the storage components.
version, -v	(Optional) Specifies the version for running the pre-checks.
to-home, -to	(Optional) Specifies the destination Oracle Database Home on the target database for the update. Note that you must use this option with the -db option.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

# **Usage Notes**

Use the odacli create-prepatchreport command to generate a pre-check report. Use the --node or --local option to run the patch pre-checks on specific nodes or the local node.

# Example 17-42 Creating Pre-Check Report

# Example 17-43 Creating Pre-Check Report for Updating Database and Applying Datapatch

```
Job ID: efa93519-a365-4e9a-9f25-ad3c653cccef
           Description: Patch pre-checks for [SINGLEDB, ORACHKSINGLEDB]:
Target DB is db10181, Destination DbHome is OraDB19000 home8
                Status: SUCCESS
               Created: October 18, 2023 11:19:03 AM PDT
                Result: All pre-checks succeeded
Node Name
_____
node1
Pre-Check Status Comments
______
  SINGLEDB
Is system provisioned Success Verified system is provisioned
Validate dbHomesOnACFS Success User has configured disk group for
configured Database homes on ACFS
Validate Oracle base Success Successfully validated Oracle Base
Evaluate DB clone availability Success Successfully validated clone file
Evaluate DB patching with RHP Success Successfully validated patching DB
                                        with RHP.
Validate command execution Success Validated command execution
 ORACHK
Running orachk Success Successfully ran Orachk
Validate command execution Success Validated command execution
wandli: Node Name
node2
Pre-Check Status Comments
Is system provisioned Success Verified system is provisioned
Validate dbHomesOnACFS Success User has configured disk group for
configured Database homes on ACFS
Validate Oracle base Success Successfully validated Oracle Base
Evaluate DB clone availability Success Successfully validated clone file
Evaluate DB patching with RHP Success Successfully validated patching DB
Validate command execution Success Validated command execution
 ORACHK
Running orachk Success Successfully ran Orachk
Validate command execution Success Validated command execution
wandli: example for applying datapatch,
[root@oda1 ~]# odacli describe-prepatchreport -i 2cdb0b6e-
ce24-4857-86ab-91480a2ac4e8
Patch pre-check report
                Job ID: 2cdb0b6e-ce24-4857-86ab-91480a2ac4e8
           Description: Patch pre-checks for [SINGLEDB, ORACHKSINGLEDB]:
```

Target DB is season, Destination DbHome is OraDB19000\_home6

Status: SUCCESS

Created: September 16, 2023 10:38:58 PM UTC

Result: All pre-checks succeeded

Node Name

\_\_\_\_\_

oda1

Pre-Check Status Comments

------

SINGLEDB

Is system provisioned Success Verified system is provisioned Validate dbHomesOnACFS Success User has configured disk group for configured Database homes on ACFS

Validate Oracle base Success Successfully validated Oracle Base
Evaluate DB clone availability Success Successfully validated clone file

Evaluate DB patching with RHP Success Successfully validated patching DB with RHP.

Validate command execution Success Validated command execution

ORACHK\_

Running orachk Success Successfully ran Orachk Validate command execution Success Validated command execution

# odacli describe-prepatchreport

Use the odacli describe-prepatchreport command to display the pre-check report, with a list of pre-checks run with status and comments.

Patching pre-checks help identify and remedy any problems before attempting to patch, and ensure all components are ready for updates.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli describe-prepatchreport -i ID [-j] [-h]

# **Parameters**

Parameter	Description	
id, -i	Specifies the Job ID for the pre-check report.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output. The default is false.	

## **Usage Notes**

Use the odacli describe-prepatchreport command to display the pre-check report.

The pre-checks report indicates whether the server patching can be rolling or not.



# Example 17-44 Patch pre-checks report with rolling mode patching supported when expander upgrade is not required

[root@node1 bin]# odacli describe-prepatchreport -i 83e41cc6-bd0e-4c53-a9fec3f6b7ecd47b

Patch pre-check report

-----

Job ID: 83e41cc6-bd0e-4c53-a9fe-c3f6b7ecd47b

Description: Patch pre-checks for [STORAGE]

Status: SUCCESS

Created: September 3, 2024 2:51:29 PM UTC

Result: All pre-checks succeeded

Node Name

-----

node1

Pre-Check Status Comments

\_\_\_\_\_

STORAGE

Validate patching tag Success Validated patching tag:

19.25.0.0.0.

Patch location validation Success Verified patch

location

Patch tag validation Success Verified patch

tag

Storage patch tag validation Success Verified storage patch

location

Verify ASM disks status Success ASM disks are

online

Validate rolling patch Success Rolling mode patching allowed

as

there is no expander

upgrade.

Validate command execution Success Validated command

execution

Node Name

-----

node2

Pre-Check Status Comments

\_\_\_\_\_

STORAGE

Validate patching tag Success Validated patching tag:

19.25.0.0.0.

Patch location validation Success Verified patch

location

Patch tag validation Success Verified patch

tag

Storage patch tag validation Success Verified storage patch

location



Verify ASM disks status Success ASM disks are

online

Validate rolling patch Success Rolling mode patching allowed

as

there is no expander

upgrade.

Validate command execution Success Validated command execution

# Example 17-45 Patch pre-checks report with rolling mode patching not supported when expander upgrade is required

[root@node1 bin]# odacli describe-prepatchreport -i 4a3bef2b-687e-41f2-b3d7-cbda79e63877

Patch pre-check report

-----

Job ID: 4a3bef2b-687e-41f2-b3d7-cbda79e63877

Description: Patch pre-checks for [STORAGE]

Status: SUCCESS

Created: September 7, 2024 12:30:57 PM UTC

Result: All pre-checks succeeded

Node Name

\_\_\_\_\_

node1

Pre-Check Status Comments \_\_\_\_\_\_ \_\_\_\_\_ STORAGE Validate patching tag Success Validated patching tag: 19.25.0.0.0. Patch location validation Success Verified patch location Patch tag validation Success Verified patch Storage patch tag validation Success Verified storage patch location Verify ASM disks status Success ASM disks are online Validate rolling patch Alert Rolling mode patching not allowed as there is expander upgrade. Validate command execution Success Validated command execution Node Name

Pre-Check Status Comments

\_\_\_\_\_

node2

\_\_\_\_\_



STORAGE		
Validate patching tag	Success	Validated patching tag:
19.25.0.0.0.		
Patch location validation	Success	Verified patch
location		
Patch tag validation	Success	Verified patch
tag		
Storage patch tag validation	Success	Verified storage patch
location		
Verify ASM disks status	Success	ASM disks are
online		
Validate rolling patch	Alert	Rolling mode patching not allowed
as		
		there is expander
upgrade.		
Validate command execution	Success	Validated command
execution		

# Example 17-46 Displaying the Patch Pre-Checks Report for Operating System, Oracle Grid Infrastructure, and ORAchk

Node Name -----node1

Pre-Check	Status	Comments
OS		
Validate supported versions versions.	Success	Validated minimum supported
Validate patching tag 19.25.0.0.0.	Success	Validated patching tag:
Is patch location available available.	Success	Patch location is
Verify OS patch patch	Success	Verified OS
Validate command execution execution	Success	Validated command
ILOM Validate ILOM server reachable ILOM	Success	Successfully connected with
		server using public IP and

# USB

interconnect		
Validate supported versions versions.	Success	Validated minimum supported
Validate patching tag	Success	Validated patching tag:
Is patch location available available.	Success	Patch location is
Checking Ilom patch Version versions	Success	Successfully verified the
Patch location validation	Success	Successfully validated
Validate command execution execution	Success	Validated command
GI		
Validate GI metadata metadata	Success	Successfully validated GI
Validate supported GI versions versions.	Success	Validated minimum supported
Validate available space under /u01	Success	Validated free space
Is clusterware running running	Success	Clusterware is
Validate patching tag 19.25.0.0.0.	Success	Validated patching tag:
Is system provisioned provisioned	Success	Verified system is
Validate ASM in online	Success	ASM is
online	Buccess	71011 13
online Validate kernel log level log	Success	Successfully validated the OS
Validate kernel log level log		
Validate kernel log level log level Validate minimum agent version	Success	Successfully validated the OS
Validate kernel log level log level Validate minimum agent version current	Success	Successfully validated the OS
Validate kernel log level log  level Validate minimum agent version current version Validate Central Inventory	Success	Successfully validated the OS  GI patching enabled in
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks	Success	Successfully validated the OS  GI patching enabled in  DCSAGENT
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks locks Validate clones location exist	Success Success	Successfully validated the OS  GI patching enabled in  DCSAGENT  oraInventory validation
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks locks Validate clones location exist location Validate DB start dependencies	Success Success Success	Successfully validated the OS  GI patching enabled in  DCSAGENT  oraInventory validation  Validated patching
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks locks Validate clones location exist location Validate DB start dependencies passed Validate DB stop dependencies	Success Success Success Success	Successfully validated the OS  GI patching enabled in  DCSAGENT  oraInventory validation  Validated patching  Validated clones
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks locks Validate clones location exist location Validate DB start dependencies passed Validate DB stop dependencies passed Evaluate GI patching	Success Success Success Success Success	Successfully validated the OS  GI patching enabled in  DCSAGENT  oraInventory validation  Validated patching  Validated clones  DBs START dependency check
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks locks Validate clones location exist location Validate DB start dependencies passed Validate DB stop dependencies passed	Success Success Success Success Success Success	Successfully validated the OS  GI patching enabled in  DCSAGENT  oraInventory validation  Validated patching  Validated clones  DBs START dependency check  DBs STOP dependency check
Validate kernel log level log  level Validate minimum agent version current  version Validate Central Inventory passed Validate patching locks locks Validate clones location exist location Validate DB start dependencies passed Validate DB stop dependencies passed Evaluate GI patching patching Validate command execution	Success Success Success Success Success Success Success Success	Successfully validated the OS  GI patching enabled in  DCSAGENT  oraInventory validation  Validated patching  Validated clones  DBs START dependency check  DBs STOP dependency check  Successfully validated GI



Orachk Validate command execution execution	Success	Validated command
SERVER Validate local patching in	Alert	Rolling patching is not possible:  IB enabled
environments Validate command execution execution	Success	Validated command
Node Name		
node2		
Pre-Check	Status	Comments
os		Talidakad minimum aummankad
Validate supported versions versions.	Success	Validated minimum supported
Validate patching tag 19.25.0.0.0.	Success	Validated patching tag:
Is patch location available	Success	Patch location is
available. Verify OS patch	Success	Verified OS
<pre>patch Validate command execution execution</pre>	Success	Validated command
ILOM Validate ILOM server reachable ILOM	Success	Successfully connected with server using public IP and
USB		Server doring public in and
interconnect Validate supported versions versions.	Success	Validated minimum supported
Validate patching tag	Success	Validated patching tag:
19.25.0.0.0. Is patch location available	Success	Patch location is
available. Checking Ilom patch Version	Success	Successfully verified the
versions		-
Patch location validation location	Success	Successfully validated
Validate command execution execution	Success	Validated command
GI		
Validate GI metadata	Success	Successfully validated GI
metadata Validate supported GI versions versions.	Success	Validated minimum supported



Validate available space under /u01	Success	Validated free space
Is clusterware running running	Success	Clusterware is
Validate patching tag 19.25.0.0.0.	Success	Validated patching tag:
Is system provisioned provisioned	Success	Verified system is
Validate ASM in online online	Success	ASM is
Validate kernel log level log	Success	Successfully validated the OS
level	0	
Validate minimum agent version current	Success	GI patching enabled in
version		DCSAGENT
Validate Central Inventory passed	Success	oraInventory validation
Validate patching locks	Success	Validated patching
Validate clones location exist location	Success	Validated clones
Validate DB start dependencies passed	Success	DBs START dependency check
Validate DB stop dependencies passed	Success	DBs STOP dependency check
Evaluate GI patching patching	Success	Successfully validated GI
Validate command execution execution	Success	Validated command
ORACHK		
Running orachk Orachk	Success	Successfully ran
Validate command execution execution	Success	Validated command
SERVER		
Validate local patching in	Alert	Rolling patching is not possible:
environments		IB enabled
Validate command execution	Success	Validated command execution

# Example 17-47 Pre-checks report for storage

# odacli describe-prepatchreport -i 95887f92-7be7-4865-a311-54318ab385f2

Patch pre-check report

-----

Job ID: 95887f92-7be7-4865-a311-54318ab385f2

Description: Patch pre-checks for [STORAGE]

Status: SUCCESS

Created: May 13, 2025 12:52:37 PM HKT Result: All pre-checks succeeded

Node Name

-----

node1		
Pre-Check		Comments
STORAGE Validate patching tag 19.25.0.0.0.	Success	Validated patching tag:
Patch location validation location	Success	Verified patch
Patch tag validation tag	Success	Verified patch
Storage patch tag validation location	Success	Verified storage patch
Verify ASM disks status online	Success	ASM disks are
Validate rolling patch as	Success	Rolling mode patching allowed
		there is no expander
upgrade. Validate command execution execution	Success	Validated command
Node Name		
node2		
Pre-Check		Comments
STORAGE Validate patching tag	Success	Validated patching tag:
19.25.0.0.0. Patch location validation	Success	Verified patch
location Patch tag validation	Success	Verified patch
tag Storage patch tag validation	Success	Verified storage patch
location		
<del>-</del>	Success	ASM disks are
Verify ASM disks status online Validate rolling patch as	Success Success	

Validate command execution Success Validated command execution



upgrade.

# Example 17-48 Pre-checks report for updating database home

# odacli describe-prepatchreport -i 6f040374-d271-4711-a7db-e6c04597ad69

Patch pre-check report

\_\_\_\_\_\_

Job ID: 6f040374-d271-4711-a7db-e6c04597ad69

Description: Patch pre-checks for [DB, ORACHKDB]: DbHome is

OraDB19000 home1

Status: SUCCESS

Created: May 13, 2025 8:59:48 AM HKT Result: All pre-checks succeeded

Node Name

\_\_\_\_\_

node1

Pre-Check Status Comments

\_\_\_\_\_

DB

Validate DB Home ID Success Validated DB Home

ID:

d03d5187-1c20-470a-9d51-49a0d6f60772

Validate patching tag Success Validated patching tag:

19.25.0.0.0.

Is system provisioned Success Verified system is

provisioned

Validate minimum agent version Success Validated minimum agent

version

Is GI upgraded Success Validated GI is

upgraded

Validate available space for Success Validated free space required

under

db /u01/app/

odaorahome

Validate dbHomesOnACFS Success User has configured diskgroup

for

configured Database homes on

ACFS

Validate Oracle base Successfully validated Oracle

Base

Is DB clone available Success Successfully validated clone

file

exists

Evaluate DBHome patching with Success Successfully validated

updating

RHP dbhome with RHP. and local

patching

is

possible

Validate command execution Success Validated command

execution

ORACHK\_ Running orachk Success Successfully ran Orachk Validate command execution Success Validated command execution Node Name \_\_\_\_\_ node2 Pre-Check Status Comments \_\_\_\_\_ Validate DB Home ID Success Validated DB Home ID: d03d5187-1c20-470a-9d51-49a0d6f60772 Validate patching tag Success Validated patching tag: 19.25.0.0.0. Is system provisioned Success Verified system is provisioned Validate minimum agent version Success Validated minimum agent version Is GI upgraded Success Validated GI is upgraded Validate available space for Success Validated free space required under db /u01/app/ odaorahome Validate dbHomesOnACFS Success User has configured diskgroup for configured Database homes on ACFS Validate Oracle base Success Successfully validated Oracle Is DB clone available Successfully validated clone Success file Evaluate DBHome patching with Success Successfully validated updating RHP dbhome with RHP. Success Validated command Validate command execution execution ORACHK Running orachk Success Successfully ran Orachk Validate command execution Success Validated command execution



# odacli list-prepatchreports

Use the <code>odacli list-prepatchreports</code> command to display all pre-check reports, with a list of pre-checks run with status and comments.

Patching pre-checks help identify and remedy any problems before attempting to patch, and ensure all components are ready for updates.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli list-prepatchreports [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

Use the odacli list-prepatchreports command to display all pre-check reports.

#### Example 17-49 Displaying All Patch Pre-Checks Reports

# odacli delete-prepatchreport

Use the odacli delete-prepatchreport command to delete any pre-check report.

#### File Path

/opt/oracle/dcs/bin/odacli



## **Syntax**

odacli delete-prepatchreport -i Report ID

#### **Parameters**

Parameter	Description	
id, -i	Describes the ID of the report to be deleted.	
help, -h	(Optional) Displays help for using the command.	

# **Usage Notes**

Use the odacli delete-prepatchreport command to delete pre-check reports.

# Example 17-50 Deleting A Patch Pre-Checks Report

# odacli delete-prepatchreport -i 741f635b-7c75-4832-8813-782367f1e6fd

# odacli list-availablepatches

Use the odacli list-available patches command to display all available patches for Oracle Database Appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli list-availablepatches [-h] [-j]

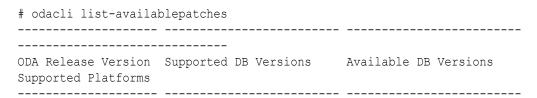
#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

#### **Usage Notes**

Use the odacli list-available patches command to display all available patches for Oracle Database Appliance.

# Example 17-51 Displaying All Available Patches on Bare Metal System





19.14.0.0.0 System	21.5.0.0.220118	21.5.0.0.220118	DB
Metal, DB System	19.14.0.0.220118	19.14.0.0.220118	Bare
	12.2.0.1.220118	12.2.0.1.220118	Bare
Metal	12.1.0.2.220118	12.1.0.2.220118	Bare
Metal			
19.11.0.0.0 Metal, DB System	19.11.0.0.210420	19.11.0.0.210420	Bare
	18.14.0.0.210420	18.14.0.0.210420	Bare
Metal	12.2.0.1.210420	12.2.0.1.210420	Bare
Metal	12.1.0.2.210420	12.1.0.2.210420	Bare
Metal			

# Example 17-52 Displaying All Available Patches on DB System

#	040011	1:0+-200	115h1	enatches
#	odacii	1 1 S 1 - a v a	I I an	lebal ches

Supported Platforms	Supported DB Versions		
19.14.0.0.0 System	21.5.0.0.220118	21.5.0.0.220118	DB
_	19.14.0.0.220118	19.14.0.0.220118	Bare
Metal, DB System	12.2.0.1.220118	12.2.0.1.220118	Bare
Metal	12.1.0.2.220118	12.1.0.2.220118	Bare
Metal			
19.11.0.0.0 Metal, DB System	19.11.0.0.210420	19.11.0.0.210420	Bare
-	18.14.0.0.210420	18.14.0.0.210420	Bare
Metal	12.2.0.1.210420	12.2.0.1.210420	Bare
Metal	12.1.0.2.210420	12.1.0.2.210420	Bare
Metal			0

# odacli describe-component

Use the odacli describe-component command to display the installed version and the latest available version for each component.

If there are multiple DB homes installed on Oracle Database Appliance, then the output displays the version details for each of the installed homes and the databases in each database home. You can use this command to check the component version after applying a patch.

#### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli describe-component [-d][-j][-h][-s][-v][-l][-nn node name]

#### **Parameters**

Parameter	Description
dbhomes, -d	(Optional) Lists the database home versions and available versions.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.
local, -1	(Optional) Describes the components for the local node. Use to display details on the local node of multi-node high availability (HA) systems. This option is not needed to display component details on single-node systems.
node-name, -nn	(Optional) Describes the components for a specific node name on high availability (HA) systems. This option is not needed to display component details on single node systems.
server, -s	(Optional) Lists the server components and versions and the available versions to which you can patch them.
systemversion, -v	(Optional) Displays only the system version. This option is available only on high-availability systems.

# **Usage Notes**

Use the <code>odacli describe-component</code> command to get component details. On a multinode environment, the command provides details across all nodes. Use the <code>--node</code> or <code>--local</code> option to get component details for a specific node.

The odacli describe-component command displays the local and shared storage components and the updates required for them separately.

# Example 17-53 Displaying patch details for components for High-Availability Oracle Database Appliance Systems for a release



```
OAK 23.5.0.0.0 up-to-date
DCSCONTROLLER 23.5.0.0.0 up-to-date
DCSCLI 23.5.0.0.0 up-to-date
DCSAGENT 23.5.0.0.0 up-to-date
DCSADMIN 23.5.0.0.0 up-to-date
OS 8.10 up-to-date
ILOM 5.1.4.20.r157857 up-to-date
BIOS 84060600 up-to-date
LOCAL CONTROLLER FIRMWARE {
     [c0, c1] E2MU200 up-to-date
     [c4, c5, c6] 26.33.1048 26.37.1014
SHARED CONTROLLER FIRMWARE {
     [c2, c3] 23.00.01.00 up-to-date
FIRMWAREEXPANDER {
     [c2x0, c3x0] 0310 up-to-date
SHARED DISK FIRMWARE {
     [c2d0, c2d1, c2d2, RXA0 up-to-date
     c2d3, c2d4, c2d5,
     c3d0, c3d1, c3d2,
     c3d3, c3d4, c3d5]
     [c2d6, c2d7, c2d8, A7B0 up-to-date
     c2d9, c2d10,
     c2d11, c2d12,
     c2d13, c2d14,
     c2d15, c2d16,
     c2d17, c2d18,
     c2d19, c2d20,
     c2d21, c2d22,
     c2d23, c3d6, c3d7,
     c3d8, c3d9, c3d10,
     c3d11, c3d12,
     c3d13, c3d14,
     c3d15, c3d16,
     c3d17, c3d18,
     c3d19, c3d20,
     c3d21, c3d22, c3d23]
HMP 2.4.9.2.600 up-to-date
```

```
System Node Name
_____
oak1
Local System Version
23.5.0.0.0
Component Installed Version Available Version
OAK 23.5.0.0.0 up-to-date
DCSCONTROLLER 23.5.0.0.0 up-to-date
DCSCLI 23.5.0.0.0 up-to-date
DCSAGENT 23.5.0.0.0 up-to-date
DCSADMIN 23.5.0.0.0 up-to-date
OS 8.10 up-to-date
ILOM 5.1.4.20.r157857 up-to-date
BIOS 84060600 up-to-date
LOCAL CONTROLLER FIRMWARE {
     [c0, c1] E2MU200 up-to-date
    [c4, c5, c6] 26.33.1048 26.37.1014
SHARED CONTROLLER FIRMWARE {
     [c2, c3] 23.00.01.00 up-to-date
FIRMWAREEXPANDER {
     [c2x0, c3x0] 0310 up-to-date
SHARED DISK FIRMWARE {
     [c2d0, c2d1, c2d2, RXA0 up-to-date
    c2d3, c2d4, c2d5,
    c3d0, c3d1, c3d2,
    c3d3, c3d4, c3d5]
     [c2d6, c2d7, c2d8, A7B0 up-to-date
    c2d9, c2d10,
    c2d11, c2d12,
    c2d13, c2d14,
    c2d15, c2d16,
    c2d17, c2d18,
    c2d19, c2d20,
    c2d21, c2d22,
    c2d23, c3d6, c3d7,
    c3d8, c3d9, c3d10,
    c3d11, c3d12,
```

```
c3d13, c3d14,
c3d15, c3d16,
c3d17, c3d18,
c3d19, c3d20,
c3d21, c3d22, c3d23]
}
```

# Example 17-54 List DB Home Details

# Example 17-55 List the Server Components and Versions

```
OS 8.10 up-to-date
DCSCLI 23.5.0.0.0 up-to-date
DCSADMIN 23.5.0.0.0 up-to-date
ILOM 5.1.4.20.r157857 up-to-date
BIOS 84060600 up-to-date
LOCAL CONTROLLER FIRMWARE {
     [c0, c1] E2MU200 up-to-date
     [c4, c5, c6] 26.33.1048 26.37.1014
SHARED CONTROLLER FIRMWARE {
     [c2, c3] 23.00.01.00 up-to-date
FIRMWAREEXPANDER {
     [c2x0, c3x0] 0310 up-to-date
SHARED DISK FIRMWARE {
     [c2d0, c2d1, c2d2, RXA0 up-to-date
     c2d3, c2d4, c2d5,
     c3d0, c3d1, c3d2,
     c3d3, c3d4, c3d5]
     [c2d6, c2d7, c2d8, A7B0 up-to-date
     c2d9, c2d10,
     c2d11, c2d12,
     c2d13, c2d14,
     c2d15, c2d16,
     c2d17, c2d18,
     c2d19, c2d20,
     c2d21, c2d22,
     c2d23, c3d6, c3d7,
     c3d8, c3d9, c3d10,
     c3d11, c3d12,
     c3d13, c3d14,
     c3d15, c3d16,
     c3d17, c3d18,
     c3d19, c3d20,
     c3d21, c3d22, c3d23]
System Node Name
oak1
Local System Version
23.5.0.0.0
Component Installed Version Available Version
```

```
OAK 23.5.0.0.0 up-to-date
DCSCONTROLLER 23.5.0.0.0 up-to-date
OS 8.10 up-to-date
DCSCLI 23.5.0.0.0 up-to-date
DCSADMIN 23.5.0.0.0 up-to-date
ILOM 5.1.4.20.r157857 up-to-date
BIOS 84060600 up-to-date
LOCAL CONTROLLER FIRMWARE {
     [c0, c1] E2MU200 up-to-date
     [c4, c5, c6] 26.33.1048 26.37.1014
SHARED CONTROLLER FIRMWARE {
     [c2, c3] 23.00.01.00 up-to-date
FIRMWAREEXPANDER {
     [c2x0, c3x0] 0310 up-to-date
SHARED DISK FIRMWARE {
     [c2d0, c2d1, c2d2, RXA0 up-to-date
     c2d3, c2d4, c2d5,
     c3d0, c3d1, c3d2,
     c3d3, c3d4, c3d5]
     [c2d6, c2d7, c2d8, A7B0 up-to-date
     c2d9, c2d10,
     c2d11, c2d12,
     c2d13, c2d14,
     c2d15, c2d16,
     c2d17, c2d18,
     c2d19, c2d20,
     c2d21, c2d22,
     c2d23, c3d6, c3d7,
     c3d8, c3d9, c3d10,
     c3d11, c3d12,
     c3d13, c3d14,
     c3d15, c3d16,
     c3d17, c3d18,
     c3d19, c3d20,
     c3d21, c3d22, c3d23]
}
```

# odacli describe-latestpatch

Use the <code>odacli describe-latestpatch</code> command to display a list of the latest supported patch versions for each component.

#### File Path

\$ORACLE\_HOME/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli describe-latestpatch [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Example 17-56** Listing the Latest Supported Versions

# odacli describe-latestpatch

ComponentType	availableVersion
gi	18.7.0.0.190716
db	18.7.0.0.190716
db	12.2.0.1.190716
db	12.1.0.2.190716
oak	18.7.0.0.0
asr	18.3.1
ilom	3.0.16.22.f.r100119
ilom	4.0.2.31.r126282
ilom	4.0.4.41.r130359
ilom	4.0.4.37.r130617
ilom	4.0.0.24.r121140
ilom	4.0.4.40.r130348
ilom	4.0.4.38.r130206
OS	6.10
bios	17140300
	30150300
bios	25080100
	41060300
	38130200
	39090000
bios	52010400
firmwareexpande firmwareexpande	
=	
firmwareexpande firmwaredisk	
firmwaredisk	
firmwaredisk	•
firmwarecontrol	
TITHWATECONCLOT	101 11.00.00.00



```
firmwarecontroller qdv1rf30
firmwarecontroller vdv1ry03
firmwarecontroller 20.08.01.14
firmwarecontroller 2.11.1280
firmwarecontroller 13.00.00.00
firmwarecontroller 4.650.00-7176
firmwarecontroller kpyair3q
dcsagent
             18.7.0.0.0
firmwaredisk a7e0
firmwaredisk a4c0
firmwaredisk a72a
firmwaredisk a880
firmwaredisk a122
firmwaredisk a38k
firmwaredisk c122
firmwaredisk 944a
firmwaredisk 9440
firmwaredisk e12b
firmwaredisk 5q08
firmwaredisk a902
firmwaredisk a140
firmwaredisk sa03
firmwaredisk 0b25
firmwaredisk sf04
firmwaredisk c38k
firmwaredisk a3a0
firmwaredisk pd51
firmwaredisk m554
firmwaredisk 0121
firmwaredisk xc311102
```

## odacli list-agentconfig-parameters

Use the odacli list-agentconfig-parameters command to list configuration variables used by the appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-agentconfig-parameters [-h] [-j] [-n] [-t]

## **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.
name, -n	Specifies the name of the parameter.
type, -t	(Optional) Specifies the configuration value for the given type. The default value is PUBLIC.

#### **Usage Notes**

Use the odacli list-agentconfig-parameters command to list configuration variables used by the appliance.

## Example 17-57 Displaying the HttpProxyPort

## ./odacli list-agentconfig-parameters -n HttpProxyPort

## Example 17-58 Displaying the agent configuration

```
# odacli list-agentconfig-parameters
```

Name	Value I	escription	Updated	
HttpProxyHost	Http prox	y server ho	st March 8,	2025 4:14:10 AM UTC
HttpProxyPort	Http prox	y server po	rt March 8	, 2025 4:14:10 AM UTC
HttpsProxyHost	t Https pr	oxy server	host March	8, 2025 4:14:10 AM UTC
HttpsProxyPort	t Https pro	xy server p	ort March 8	, 2025 4:14:10 AM UTC

## Example 17-59 Displaying Oracle ASM configuration

### **Related Topics**

Configuring Agent Proxy Settings for Object Store Access
 If the Object Store IP address is accessible only through proxy setup by the Oracle
 Database Appliance server, then define the proxy setting for the agent, so that the agent
 can access the Object Store.

# odacli modify-agentconfig-parameters

Use the odacli modify-agentconfig-parameters command to modify configuration variables used by the appliance.

### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli modify-agentconfig-parameters -n name\_param [-adbs] [-a] [-bm] [-c
comment\_param] [-dbs dbsys\_param] [-d description\_param] [-r] [-t type\_param]
[-u] [-v value param] [-j] [-h]

#### **Parameters**

Parameter	Description
append, -a	(Optional) Appends the parameter values. For example, -n p1 -v v1 -n p2 -v v2 -a.
all-dbsystems, -adbs	(Optional) Dynamic parameter update for all DB systems.
bm-only, -bm	(Optional) Dynamic parameter update for bare metal systems only.
comment, -c	(Optional) Specifies the comment for the parameter.
dbsystem, -dbs	(Optional) DB system name for dynamic parameter update.
description, -d	(Optional) Specifies the description of the parameter.
name, -n	Specifies the name of the parameter. Provide multiple parameter values in the format -n p1 - v v1 -n p2 -v v2.
reset, -r	Resets the parameter to the default value. For example: -n p1 -n p2 -r.
update, -u	Replaces the parameter with the specified value. For example: -n p1 -v v1 -n p2 -v v2 -u.
value, -v	Specifies the value of the parameter. Provide multiple parameter values in the format -n p1 - v v1 -n p2 -v v2.
type, -t	(Optional) Specifies the type of the parameter.
json,-j	(Optional) Displays JSON output. The default is false.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

Use the <code>odacli modify-agentconfig-parameters</code> command to modify configuration variables used by the appliance. The supported configuration parameters are <code>HttpsProxyHost</code> and <code>HttpsProxyPort</code>.

Multiple values can be specified. For High-Availability models, the command sets the parameter values on both nodes in the cluster.

For a DB system, dynamic parameter value specified using the -dbs flag has more priority than the parameter value specified using the -adbs flag, which in turn has a higher priority than the case where the parameter was updated without using any flag from the bare metal system.



## **Example 17-60 Setting Multiple Parameters**

```
# odacli modify-agentconfig-parameters -n HttpsProxyPort -v 80 -d "Http proxy
port"
-n HttpsProxyPort -v 80 -d "Https proxy port" -u

modify-agentconfig-parameters -n HttpsProxyPort -n HttpProxyPort -r

modify-agentconfig-parameters -n HttpsProxyHost -v 90 -a

modify-agentconfig-parameters -n OSPatchRepos -v
```

## **Example 17-61 Setting Oracle RDBMS Parameters**

```
\# odacli modify-agentconfig-parameters -t RDBMS -n processes -v 300 -u The value of processes will be set to 300 in BM and all the DBVMs.
```

# odacli list-agentconfig-parameters -t RDBMS -n processes

# Example 17-62 Updating the RDBMS Parameter for all DB systems in the Bare Metal System

# odacli modify-agentconfig-parameters -t RDBMS -n processes -v 400 -u -adbs

In the bare metal system, the value of the processes parameter is not changed:

# odacli list-agentconfig-parameters -t RDBMS -n processes

## In all DB systems, the value of processes is changed:



UTC

## You can set the value for a specific DB system:

# odacli modify-agent config-parameters -t RDBMS -n processes -v 700 -u -dbs DBSYSTEM1

## Value is changed on DBSYSTEM1:

# odacli list-agentconfig-parameters -t RDBMS -n processes

Name Updated	Value	Description					
processes	700		March	8,	2025	12:08:15	AM

# odacli delete-agentconfig-parameters

Use the odacli delete-agentconfig-parameters command to delete configuration variables used by the appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli delete-agentconfig-parameters -n name\_param [-adbs] [-bm] [-dbs dbs\_param] [-t type\_param] [-j] [-h]

## **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
name, -n	(Mandatory) Specifies the name of the parameter.
type, -t	(Optional) Deletes the configuration value for the given type.
all-dbsystems, -adbs	(Optional) Deletes the dynamic parameter updated for DB systems, using the -ad option in the odacli modify-agentconfig-parameters command.
bm-only, -bm	(Optional) Deletes the dynamic parameter only from the bare metal systems.
dbsystem, -dbs	(Optional) Deletes the dynamic parameter for a specific DB system.



#### **Usage Notes**

Use the <code>odacli delete-agentconfig-parameters</code> command to delete configuration values. For High-Availability models, the command deletes the parameter values on both nodes in the cluster.

#### Example 17-63 Deleting configuration parameters

```
# odacli delete-agentconfig-parameters -n HttpProxyHost

Job details

ID: c6e123c6-1b76-48f8-973d-63c8dab65545

Description: delete configuration parameter HttpProxyHost
Status: Running
Created: March 8, 2025 9:45:39 AM PDT
Message:

Task Name
Start Time
End Time
Status
```

#### Example 17-64 Deleting processes configuration parameter

```
# odacli delete-agentconfig-parameters -t rdbms -n processes
odacli list-agentconfig-parameters -t RDBMS -n processes
No result found

Note: Parameters updated using -adbs, -dbs flags should be deleted using the same corresponding flags.

# odacli delete-agentconfig-parameters -t rdbms -n processes -dbs DBSYSTEM1
# odacli delete-agentconfig-parameters -t rdbms -n processes -adbs
```

## odacli update-database

Use the odacli update-database command to update a database to a specific database home with later version, and within the same major release.

## File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

```
odacli update-database [-a] [-dp] [-f] [-i db_id] [-imp] [-l] [-n db_name] [-nn node name] [-r] [-to db home id] [-j] [-h]
```

#### **Parameters**

Parameter	Description
to-home, -to	(Optional) Specifies the destination Oracle Database Home ID.
	The -to option is not a mandatory option if you want to apply datapatch using the odacli update-database command. The -to option is only required when you want to use the odacli update-database command to patch a specific database to a specific database home.
abort, -a	(Optional) Aborts the unfinished or failed patching operation.
name, -n	(Optional) Specifies the database name the patch.
ignore-missing-patch, -imp	(Optional) Ignores all missing patches and forces the operation.
force, -f	(Optional) Ignores precheck error and forces the operation.
local, -l	(Optional) Updates the database locally.
node-name, -nn	(Optional) Specifies the node name to be updated.
id, -i	(Optional) Specifies the database ID to be patched.
datapatch, -dp	(Optional) Applies only the datapatch.
revert, -r	(Optional) Reverts the unfinished or failed patching operation.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

#### **Usage Notes**

- You must run the patching pre-checks at least once before running the odacli update-database command. Analyze any failed pre-checks, fix them, and rerun pre-checks. If any of the failed pre-checks can be ignored, only then run the odacli update-database command with the -f option.
- The update-database command patches a database to a specific database home with later version, and within the same major release.
- To patch a database to a specific database home, the database must be running.
- To patch a database, it must have the status <code>Configured</code>. Use the <code>odacli list-database</code> command to see a list of configured databases. Patch requests for target databases in any other status are rejected during patching.
- You can patch only the database homes in the Configured status. Use the odacli list-dbhomes command to see a list of configured database homes. Patch requests for target database homes in any other status are rejected during patching.
- The --datapatch option applies the datapatch to the specific database. This option is helpful for databases that have moved to a destination database home without the datapatch. Examples of using the --datapatch option are as follows:

- When you patch the database as a standby database and then switch the database as the primary database.
- When you must apply additional or one-off data patches after patching your Oracle Database Appliance deployment.

## **Example 17-65 Updating an Oracle Database**

To patch a specific database to a specific database home:

```
# odacli update-database -i e5b60db5-2ee9-4cfc-93ee-179302ee6ebc -todc98eaa9-289c-4710-a898-ca6287a07a9c
```

When the database home version is earlier than the target database version, an error is encountered:

```
# odacli update-database -i c05458c7-0f1d-4260-8e62-003b3ec26d74 -to
7ef2449d-3583-47fd-a57a-6ba3fd224119
DCS-10045:Validation error encountered: Target database's version is higher
than destination dbhome, no need to patch.
```

## odacli update-dbhome

Use the <code>odacli update-dbhome</code> command to update a specific database home to the latest patch bundle version.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
odacli update-dbhome -i dbhome_id -v version [-f] [-imp] [-p] [-l] [-nn node name] [-j] [-h]
```

### **Parameters**

Parameter	Description
id, -i	Defines the Oracle Database Home to update.
help-h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output.
precheck, -p	(Optional) Analyzes the patch.
force, -f	(Optional) Ignores precheck error and forces the operation.
local, -1	(Optional) Updates the Database Home locally.
node-name, -n	(Optional) Specifies the node name to be updated.
version, -v	Defines the Oracle Database Appliance version to update. For example, 19.23.0.0.0.
ignore-missing-patch,-imp	(Optional) Ignores missing patch error and forces the operation.



### **Usage Notes**

- You must run the patching pre-checks at least once before running the odacli update-dbhome command. Analyze any failed pre-checks, fix them, and rerun pre-checks. If any of the pre-checks fail, then run the odacli update-dbhome command with the -f option.
- The update-dbhome command applies the latest release update (RU) for Oracle Database home.
- To be updated with the latest patches, the database must be running.
- Only databases in the Configured status are updated. Use the odacli list-database command to see a list of configured databases. Databases in any other status are skipped during the update.
- When you use the --local option, you can patch in the following way. Note that you can patch the nodes in any order, for example, you can patch the instance on node1 first, and then the instance on node0.
  - Run --local/--node 0 on node0, then --node 1 on node0.
  - Or, run --local/--node 0 on node0, then -local/--node 1 on node1.
  - Or, run --local/--node on either of the nodes, and then update the database home without using the --local/--node on either of the nodes.

### Example 17-66 Updating an Oracle Database Home

To apply the latest patch bundle to update an Oracle Database:

# odacli update-dbhome -i ad6c7326-e460-411e-94df-230dedbef743 -v 19.27.0.0.0

# odacli update-dcsadmin

Use the odacli update-dcsadmin command to update the DCS admin for DCS components upgrade.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli update-dcsadmin -v version [-j] [-h]

## **Parameters**

Parameter	Description
version, -v	Defines the Oracle Database Appliance version after update.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

### **Usage Notes**

The update-dcsadmin command sets up the dcsadmin and other components. Run the update-dcsadmin command only after you update the DCS agent.



#### Example 17-67 Updating DCS Admin

```
# odacli update-dcsadmin -v 19.27.0.0.0
{
   "jobId" : "4c238b93-e641-4f9d-9f86-93d0574dd234",
   "status" : "Created",
   "message" : null,
   "reports" : [],
   "createTimestamp" : "March 8, 2025 03:11:53 AM UTC",
   "resourceList" : [],
   "description" : "DcsAdmin patching",
   "updatedTime" : "March 8, 2025 03:11:53 AM UTC"
}
```

## odacli update-dcsagent

Use the odacli update-dcsagent command to update the agent.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
odacli update-dcsagent -v version [-j] [-h]
```

## **Parameters**

Parameter	Description
version, -v	Defines the Oracle Database Appliance version after update.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**



This command is deprecated in this release and may be desupported in a future release.

The update dcsagent command updates the dcs-agent to the RPM package that is located in the *location* and restarts the dcs-agent. After the update is applied, the agent automatically restarts. It will take a few minutes to reconnect to the dcs-agent. Wait until the agent shuts down and completes restarting before performing any tasks.



Before updating the agent, ensure that you do not have any jobs running or pending during the update window.

## **Example 17-68 Updating the Agent**

To update the dcs-agent to version 19.27:

```
# odacli update-dcsagent -v 19.27
{
   "jobId" : "77e454d3-eb68-4130-a247-7633f8d6192b",
   "status" : "Created",
   "message" : null,
   "reports" : [],
   "createTimestamp" : "March 8, 2025 14:09:24 PM CST",
   "description" : "DcsAgent patching",
   "updatedTime" : "March 8, 2025 14:09:24 PM CST"
}
```

## odacli update-dcscomponents

Use the odacli update-dcscomponents command to update the DCS components such as the DCS agent, CLI, and controller.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
odacli update-dcscomponents -v version [-j] [-h]
```

## **Parameters**

Parameter	Description
version, -v	Defines the Oracle Database Appliance version after update.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

The update-descomponents command sets up the descomponents such as the DCS agent, CLI, and controller.

## **Example 17-69 Updating DCS Components**

```
# odacli update-dcscomponents -v 19.27.0.0.0
{
```

```
"jobId" : "4c238b93-e641-4f9d-9f86-93d0574dd234",
"status" : "Created",
"message" : null,
"reports" : [],
"createTimestamp" : "March 8, 2025 03:11:53 AM UTC",
"resourceList" : [],
"description" : "DcsComponents patching",
"updatedTime" : "March 8, 2025 03:11:53 AM UTC"
```

## odacli update-registry

Use the odacli update-registry command to update the metadata for the components that are already present in the registry. For database home and grid home, this command updates the patch information, when you apply patches manually.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

```
odacli update-registry -n component [-u db unique name] [-f] [-j] [-h]
```

#### **Parameters**

Parameter	Description
component, -n	Defines the Oracle Database Appliance component for the registry update.
	When you specify system, then the components discovered include gihome, dbnode, sysinstance. When you specify all, then the components discovered include dbhome, db, dbstorage, asr. You can also specify the individual component to be refreshed. The individual options include gihome, dbnode, sysinstance, dbhome, DB, dbstorage, ASR.
db-unique-name, -u	(Optional) Specifies the global unique name for the database. This option is only applicable for components DB or dbstorage.
force, -f	This option is deprecated.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

### **Usage Notes**

- Starting with Oracle Database Appliance release 19.18, the odacli update-registry command does not require the -force option for metadata refresh of a component that already exists in the registry metadata. If the metadata for the component to be updated already exists in the appliance registry metadata, then the command rediscovers the attributes from the environment and updates the system registry.
- The following attribute cannot be discovered with the odacli update-registry command:

- **DB component:** rmanBkupPassword, enableEEHA, isBcfgInSync, dbConsoleEnable, cpupool, dbClass, backupConfigId, cloudStorageContainer, isAutoBackupDisabled, registerOnly, entitySource, instanceOnly, dbShape, enableSEHA.
- Use the --db-unique-name, -u option to update the appliance registry metadata for a specific database or dbstorage. The odacli update-registry command then modifies only the registry metadata for the database or dbstorage associated with the database unique name. For example:

```
odacli update-registry -n db -u db_unique_name odacli update-registry -n dbstorage -u db unique name
```

• The odacli update-registry command discovers and updates the metadata in the registry only for databases created using ODACLI commands or the Browser User Interace (BUI). An error is displayed when you run the odacli update-registry command to update the metadata for databases that were not created using ODACLI commands or BUI. Hence, for database migration cases, do not use the odacli update-registry command. Instead, use the odacli register-database command. For example:

```
# odacli update-registry -n db -u provdb
DCS-10131: Database 'provdb' cannot discover because metadata does not exist

# dcserr 10131
10131, Discover_New_Database_Not_Supported, "Database ''{0}'' cannot discover because metadata does not exist."
// *Cause: The database did not support discovery of new entities.
// *Action: Use the 'odacli register-database' command.
```

• Similarly, if you run the odacli update-registry -n dbstorage command to update the metadata for databases or dbstorage that were not created using ODACLI commands or BUI, then an error is displayed. While migrating a database, if the database runs on the appliance and dbstorage also exists, but the corresponding appliance registry metadata does not exist, then you cannot run the odacli update-registry -n dbstorage command to discover the registry metadata. Instead, use the odacli create-dbstorage command.

```
# odacli update-registry -n dbstorage -u newstorage
DCS-10132: Dbstorage 'newstorage' cannot discover because metadata does
not exist

# dcserr 10132
10132, Discover_New_Dbstorage_Not_Supported, "Dbstorage ''{0}'' cannot
discover because metadata does not exist."

// *Cause: The database storage did not support discovery of new entities.
// *Action: Use the 'odacli create-dbstorage' command.
```

- The odacli update-registry command rediscovers only the following DCS components:
  - System resources: Oracle Grid Infrastructure (gihome), Oracle Database node (dbnode), System instance (sysinstance)
  - Database Home (dbhome)
  - Database (db)
  - Database storage (dbstorage)



## Oracle ASR (asr)

The odacli update-registry command does not rediscover any other components not mentioned in the above list.

- If a TDE database is created without using Oracle Database Appliance tooling and the registry is updated for database components, then this database is added to the DCS metadata. If the TDE Wallet Management of the database is ODA, then the TDE password of the database must be updated in the DCS metadata by modifying the database with the same option you use to change the TDE password. You can specify the same password for both the current and new TDE password to ensure that the TDE password is updated in the DCS metadata.
- A report is generated after the odacli update-registry command completes running.
   This report displays the values present before the command was run and the updated values. The report is saved in the location /opt/oracle/dcs/logs/discoveryReport.txt.
   If the command is run again, then the new report is appended to the same file along with the timestamp of the latest run of the command.

## Example 17-70 Update Registry Report

```
# odacli update-registry -n system
-----Begin Discovery at 2023-01-24 12-06-28.0666-----
******
Database Storage Discovery
*******
******
DbStorage Details : Vredf
******
_____
_____
       Parameter Name
                            Old
Value
                                             New
Value
       ===========
_____
_____
       Database Unique Name
Vredf
Vredf
       Name
Vredf
Vredf
       State
CONFIGURED
CONFIGURED
       Entity Source
n1111
null
       Volume Name1
datvredf
datvredf
       Volume Type1
Data
Data
       Volume Disk Group1
```



data data Volume File System1 /u02/app/oracle/oradata/ Vredf /u02/app/oracle/oradata/ Vredf Volume Initial Size1 102400 102400 Volume Name2 orahome\_sh orahome sh Volume Type2 Redo Redo Volume Disk Group2 data data Volume File System2 /u01/app/ /u01/app/ odaorahome odaorahome Volume Initial Size2 204800 204800 Volume Name3 reco reco Volume Type3 Reco Reco Volume Disk Group3 reco reco Volume File System3 /u03/app/ /u03/app/ oracle/ oracle/ Volume Initial Size3 3050496 3050496

\_\_\_\_\_\_

\*\*\*\*\*\*\* DbStorage Location : Vredf \_\_\_\_\_ \_\_\_\_\_

> Parameter Name Old

Value New

Value

\_\_\_\_\_

/u02/app/oracle/oradata/ DATA Destination

/u02/app/oracle/oradata/ Vredf

```
Vredf
         Database Unique Name
Vredf
Vredf
                                    6909f458-9bc4-5d7d-7606-
         Database Id
c765cd20b823
                                6909f458-9bc4-5d7d-7606-
c765cd20b823
         Database Storage Type
Acfs
Acfs
         Flash Cache Destination
null
null
                                    /u03/app/oracle/
         Reco Destination
fast recovery area/
                                      /u03/app/oracle/
fast_recovery_area/
         Redo Destination
                                    /u04/app/oracle/
redo/
                                       /u04/app/oracle/
redo/
         Name
Vredf
Vredf
         State
CONFIGURED
CONFIGURED
-----Begin Discovery at 2023-01-24_12-43-48.0876------
******
Database Home : OraDB19000 home1
*******
      ============
_____
_____
                                 Old
     Parameter Name
                                                 New Value
Value
_____
     Database Edition
EΕ
                                /u01/app/odaorahome/oracle/product/
     Database Home Location
19.0.0.0/dbhome 1 /u01/app/odaorahome/oracle/product/19.0.0.0/
dbhome 1
      Database Version
19.18.0.0.230118
                                                    19.18.0.0.230118
     Entity Source
null
                                                    null
                                 976643xf-6fa9-7466-
      Ιd
```

x7ws-391b6agb4d4c 5bb324e4-361e-4f76a40d-080f24d68faf Name OraDB19000 home1 OraDB19000 home1 State CONFIGURED CONFIGURED 2023-01-24 Updated Time 03:33:31.65 Tue Jan 24 12:43:41 UTC 2023 Unified Auditing TRUE TRUE \_\_\_\_\_\_ \*\*\*\*\*\* Database Home : OraDB19000 home2 \*\*\*\*\*\*\* \_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ Parameter Name Old Value New Value =========== \_\_\_\_\_ \_\_\_\_\_ Database Edition ΕE Database Home Location /u01/app/odaorahome/oracle/product/ 19.0.0.0/dbhome 2 /u01/app/odaorahome/oracle/product/19.0.0.0/ dbhome 2 Database Version 19.18.0.0.230118 19.18.0.0.230118 Entity Source null null 5f3595fa-3509-49a1-8507-36441e12ba46 b790a5f9-9792-421b-931a-fea341384f58 Name OraDB19000 home2 OraDB19000 home2 State CONFIGURED CONFIGURED Updated Time 2023-01-24 08:21:30.65 Tue Jan 24 12:44:10 UTC 2023 Unified Auditing TRUE TRUE \_\_\_\_\_\_ \_\_\_\_\_\_ \*\*\*\*\*\*\* Database : oneDb \*\*\*\*\*\*\* ============= \_\_\_\_\_

Parameter Name Old

Value New Value

===========

\_\_\_\_\_

\_\_\_\_\_

Id 24d62501-0b3e-44e5bd09-0e49f57560c6 e3c522ae-7d89-49cc-

bd3c-291cef8fb606 dbName

oneDb oneDb

State

CONFIGURED CONFIGURED

BackupConfigId

null null

CloudStorageContainer

null

CpuPool

null null

dbUniqueName

oneDb0 oneDb0

Db Character Set

AL32UTF8 AL32UTF8

DbLanguage

AMERICAN AMERICAN

DbTerritory

AMERICA AMERICA

NlsCharacterSet

AL16UTF16 AL16UTF16

DbClass

Oltp

DbConsoleEnable

false

DbDomainName

null us.oracle.com

DbEdition

EE EE

DbHomeId 976643xf-6fa9-7466x7ws-391b6agb4d4c 976643xf-6fa9-7466-

x7ws-391b6agb4d4c

DBId

3409102472 3409102472

isCdb

true true

DbOnFlashStorage

null false

DbRedundancy

null

DbRole

PRIMARY PRIMARY

DbShape

Odb1 Odb1

DbStorage

ACFS ACFS

DbTargetNodeName()

null

DbTargetNodeNumber()

0	11 27	0
PDB1	pdbName	PDB1
null	pdbUserName	PDBADMIN
Si	Database Type	Si
19.18.	DbVersion 0.0.230118	19.18.0.0.230118
false	enableEEHA	false
false	enableSEHA	false
false	enableTDE	false
false	InstanceOnly	false
true	isAutoBackupDisabled IsBcfgInSync	true
null	IsFileConversionComplete	null
null	Level OBackupDay	null
null	RegisterOnly	null
null	RmanBkupPassword	null
null	TdePassword	null
null	TdeWalletManagement	null
null	•	null

# odacli update-repository

Use the <code>odacli update-repository</code> command to update the repository with the new Oracle Database Appliance software.

## **Prerequisites**

Before updating the repository, you must upload the Oracle Database Appliance software to the appliance. If the patch contains more than one zip file, then extract and concatenate the zip files before updating the repository.

## File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To unpack and copy the patch bundle to the correct locations in the file system:

```
odacli update-repository -f filename [-j] [-h]
```

#### **Parameters**

Parameter	Description
filename,-f	Defines the zip filename of patch bundle or RDBMS clones downloaded from My Oracle Support. Provide a comma-separated list of absolute file paths of the end user and patch bundles.
json,-j	(Optional) Displays JSON output. The default is false.
help,-h	(Optional) Displays help for using the command.

### **Usage Notes**

- Before updating the repository, ensure that you do not have any jobs running or pending during the update window.
- Upload the patches to dom0 on Node0. On multi-node systems, the DCS-Agent copies the
  patch to Node1 and updates the patch repository on both nodes.
- Starting with Oracle Database Appliance release 19.12, a new Oracle ACFS file system is created to store the Oracle Database and Oracle Grid Infrastructure clone files. The DATA disk group provides a space of 150 GB for the file system. When provisioning a system with Oracle Database Appliance release 19.12, the file system is created after Oracle Grid Infrastructure software is configured. When patching a system with Oracle Database Appliance release 19.12, the file system is created when you run the odacli update-server command. If you run the command odacli update-repository after this file system is configured during provisioning or patching, then the odacli update-repository command fails if Oracle Clusterware is not running. The following error is displayed:

DCS-10626:Cannot update the repository as the Clusterware is down. Some files need to be stored on an ACFS file system.

## Example 17-71 Updating the Repository

The server patch zip file is located in the /u01/tmpdir directory. The following example updates the repository with the latest server patch and then lists the job to verify that the update is successful:

```
# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/oda-sm-19.27.0.0.0-
date-server.zip,/tmp/oda-sm-19.27.0.0.0-date-server.zip
{
   "jobId" : "d3510276-da05-447b-990e-6d30964f8f79",
   "status" : "Created",
   "message" : "/u01/tmpdir/oda-sm-12.2.1.1.0-171031-server.zip",
   "reports" : [],
   "createTimestamp" : "March 8, 2025 14:13:45 AM CST",
   "description" : "Repository Update",
```



## odacli update-server

Use the odacli update-server command to update the operating system, firmware, Oracle Appliance Kit, Oracle Clusterware, and all other infrastructure components.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

```
odacli update-server [-c] -v version [-f][-ng] [-l] [-n node name] [-j] [-h]
```

#### **Parameters**

Description	
(Mandatory) Defines the version to update.	
(Optional) Component that is to be upgraded. Supported value is OS.	
(Optional) Ignores precheck error and forces the patching operation.	
(Optional) Updates the server on the local node.	
(Optional) Specifies the node name to be updated.	
(Optional) Displays JSON output. The default is false.	
(Optional) Displays help for using the command.	

#### **Usage Notes**

- The update-server command applies the patches to various infrastructure components and Oracle Clusterware.
  - After the update is applied, the agent automatically restarts. It will take a few minutes to reconnect to the server. Wait until the agent shuts down and completes restarting before performing any tasks. Allow at least two (2) minutes before running the next command.
- You must run the patching pre-checks at least once before running the <code>odacli update-server</code> command. Analyze any failed pre-checks, fix them, and rerun pre-checks. If any of the pre-checks fail, then run the <code>odacli update-server</code> command with the <code>-f</code> option.
- When you use the --local option, you can patch in the following way. Note that you can patch the nodes in any order, for example, you can patch the instance on node1 first, and then the instance on node0.

- Run --local/--node 0 on node0, then --node 1 on node0.
- Or, run --local/--node 0 on node0, then -local/--node 1 on node1.
- Or, run --local/--node on either of the nodes, and then update the server without using the --local/--node on either of the nodes.



Before updating the server, ensure that you do not have any jobs running or pending during the update window. You must run the <code>odacli create-prepatchreport</code> command before you patch your server; otherwise, the <code>odacli update-server</code> command fails with an error message prompting you to run the patching pre-checks. You can use the <code>-f</code> option to override precheck failures and complete the server patching.

#### Example 17-72 Updating the Server

Run the odacli update-server command to update the server to 19.27.0.0.0. On a high-availability system, run the command on one node. The patches are applied automatically to both nodes.

```
# odacli update-server -v 19.27.0.0.0
{
   "jobId" : "6f27a29a-959f-44e1-b984-7473e3c918ad",
   "status" : "Created",
   "message" : "Success of Server Update may trigger reboot of node after 4-5
minutes.
Please wait till node restart",
   "reports" : [ ],
   "createTimestamp" : "March 8, 2025 14:13:45 PM CST",
   "resourceList" : [ ],
   "description" : "Server Patching",
   "updatedTime" : "March 8, 2025 14:13:45 PM CST"
}
```

# odacli update-storage

Use the odacli update-storage command to update the storage.

#### File Path

/opt/oracle/dcs/bin/odacli

## Syntax

```
odacli update-storage -v version [-d] [-e] [-h] [-j] [-r]
```

#### **Parameters**

Parameter	Description
version, -v	Defines the version to update.



Parameter	Description
json,-j	(Optional) Displays JSON output. The default is false.
help, -h	(Optional) Displays help for using the command.
rolling,-r	(Optional) Enables to patch shared disks in rolling fashion without stopping Oracle Clusterware. The shared disks must be online.
only-disk,-d	(Optional) Specifies the storage disk firmware to be updated.
only-expander, -e	(Optional) Specifies the storage expander firmware to be updated.

## **Usage Notes**

- If the FIRMWAREEXPANDER Installed Version is earlier than or equal to the Available Version, then you cannot use rolling mode to update the storage.
- Use either the --only-disk, -d option or the --only-expander, -e option independently to target specific components. If neither option is specified, both disk and expander are updated by default.

## Example 17-73 Updating the Storage

# odacli update-storage -v 19.27.0.0.0

## odaadmcli orachk

Use the odaadmcli orachk command to check configuration settings for Oracle Database Appliance components.

## File Path

/opt/oracle/oak/bin/odaadmcli

## **Syntax**

To perform diagnostic checks of components:

odaadmcli orachk [-h]

#### **Parameters**

Description
(Optional) Displays help for using the command.
(Optional) Specifies the comma-separated list of components for which you want to collect data. Specify the component to be checked in the command. For example:
# odaadmcli orachk -a
Displays detailed message.



#### **Usage Notes**

The odaadmcli orachk command invokes orachk from the directory opt/oracle.SupportTools/orachk.

### Example 17-74 Running odaadmcli orachk

```
[root@oak bin] # ./odaadmcli orachk
INFO: 2019-09-04 16:41:26: Running orachk under /opt/oracle.SupportTools/
orachk
```

## Example 17-75 Running odaadmcli orachk for a component

```
[root@oak bin] # ./odaadmcli orachk -a
INFO: 2019-09-19 10:45:16: Running orachk under /usr/bin/orachk
Checking ssh user equivalency settings on all nodes in cluster for root
```

# odacli Appliance Commands

Use the odacli appliance commands to perform lifecycle activities for the appliance.

## odaconfigcli collectconfig

Use the  ${\tt odaconfigcli}$  collectconfig command to collect configuration data from the appliance.

#### · odacli extend-localvolume

Use the odacli extend-localvolume command to extend the sizes of local volumes LOGVOLOPT and LOGVOLU01.

#### odacli list-localvolumes

Use the odacli list-local volumes command to list all the local volumes.

#### odacli modify-asmport

Use the odacli modify-asmport command to modify the Oracle ASM listener port number.

## odacli set-credential

Use the odacli set-credential command to change the oda-admin or oda-cliadmin user credentials on a deployment where multi user access is not enabled.

### odacli create-appliance

Use the odacli create-appliance command in a JSON file format to provision Oracle Database Appliance.

## odacli describe-system

Use the odacli describe-system command to display details about components installed on the system.

#### odacli ping-agent

Use the odacli ping-agent command to ping the DCS agent resource.

#### odacli list-nodes

Use the odacli list-nodes command to list all nodes in the deployment.

#### odacli list-featuretracking

Use the odacli list-featuretracking command to display the latest feature tracking report.

# odaconfigcli collectconfig

Use the odaconfigcli collectconfig command to collect configuration data from the appliance.

#### File Path

/opt/oracle/odaconfig/bin/odaconfigcli

### **Syntax**

To collect Oracle Database Appliance configuration information:

# odaconfigcli collectconfig [-loc] [-dbsystems] [-redact] [-silent]

#### **Parameters**

Parameter	Description
loc	(Optional) Specifies custom results location. The default is /opt/oracle/odaconfig/cnr_data.
redact	(Optional) Redacts sensitive entities in configuration collection. Permitted values are sanitize and mask.
	sanitize: Sensitive entities are replaced with a substitution string
	mask: Sensitive entities are replaced with '*'
-dbsystems	(Optional) Specifies the list of DB systems.  Specify the DB system name as displayed in the odacli list-dbsystems command output. Do not specify the DB system host name or IP address.
silent	(Optional) Suppresses all confirmation prompts.

## Example 17-76 Creating a diagnostics collection

```
# odaconfigcli collectconfig
Oracle Database Appliance system config collection:
-- Performing validations:
-- Collecting configuration from the system test1
The config collection is being created at:
/opt/oracle/odaconfig/cnr_data/odaconfig_test1_23_01_2025_19_38_47
1. Collecting system info
Collecting system details [e.g. version, hardwaretype, etc] ....
Collecting RPM drift info ....
Collecting AFD state ....
Collecting network info ....
```



```
2. Collecting Baremetal database info
Collecting system info ....
Collecting component info ....
Collecting dbstorage info ....
Collecting database info ....
Collecting dbhome info ....
Collecting backupconfig info ....
Collecting cpupool info ....
Collecting network info ....
Collecting objectstoreswift info ....
Collecting backupreport info ....
3. Processing Odaconfig report. Please note ** it will take few minutes ** to
collect all the command outputs
Collecting ODA stack information
Collecting fixed commands information
Generating html ODAConfig report
4. Setting file protection to the files on config collection.
5. Not redacting the collection
Finished config collection and creating jsons. Following is the collection
summary:
Config collect bundle created at: /opt/oracle/odaconfig/cnr data/
```

## odacli extend-localvolume

Use the odacli extend-local volume command to extend the sizes of local volumes LOGVOLOPT and LOGVOLU01.

HTML ODAConfig report can be found at: /opt/oracle/odaconfig/cnr data/

Logs for this run can be found at : /opt/oracle/odaconfig/cnr data/

#### File Path

/opt/oracle/dcs/bin/odacli

odaconfig\_testoda803c1n1\_23\_01\_2025\_19\_38\_47

odaconfig testoda803c1n1 23 01 2025 19 38 47/ odaconfig testoda803c1n1 23 01 2025 19 38 47.html

odaconfig\_testoda803c1n1\_23\_01\_2025\_19\_38\_47/logs

#### **Syntax**

odacli extend-localvolume -is lv\_increment\_size -n local\_volume\_name [-f] [j] [-h]

#### **Parameters**

Parameter	Description
increment-size, -is	(Mandatory) Specifies the size to be extended.
name, -n	(Mandatory) Specifies the name of the local volume: logvolopt or logvolu01. The value is not case-sensitive.
force, -f	(Optional) Specifies to extend size by force.



Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## Example 17-77 Command output details

# odacli extend-localvolume -n LOGVOLOPT -is 10
Extending a local volume is a permanent change. ODA does not support any
option

to revert the change or reduce the volume size as that may induce data loss, corruption etc. Are you sure you want to proceed with this operation? (Y/N):

Job details

------

ID: 4a8a0c4e-62fc-42b9-b4da-96ecd933a72a Description: File system modification: LOGVOLOPT

Status: Created

Created: October 23, 2024 07:32:53 UTC

Message:

Task Name Start Time End Time

Status

\_\_\_\_\_

-----

[root@n1 bin] # odacli describe-job -i 4a8a0c4e-62fc-42b9-b4da-96ecd933a72a

Job details

\_\_\_\_\_

ID: 4a8a0c4e-62fc-42b9-b4da-96ecd933a72a
Description: File system modification: LOGVOLOPT

Status: Success

Created: October 23, 2024 07:32:53 UTC

Message:

Task Name Node Name Start

Time End Time

Status

 Validate inputs
 c1n1
 October 23, 2024

 07:32:54 UTC
 October 23, 2024 07:32:56 UTC
 Success

 Extend file system
 c1n1
 October 23, 2024

 07:32:56 UTC
 October 23, 2024 07:32:56 UTC
 Success

## **Related Topics**

Managing Local Volumes
 Understand how you can modify the size of logical volumes LOGVOLOPT and LOGVOLU01.

## odacli list-localvolumes

Use the odacli list-local volumes command to list all the local volumes.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-localvolumes [-j] [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## Example 17-78 Command output details on Oracle Database Appliance highavailability system

In the following example output, **Volume Size** specifies the total size of the physical volume. **Free Space** describes the total free space on the volume group. **ODABR Requirement** describes the space required to support ODABR backup. **Space for extension** describes the space available for extension as per ODABR requirements.

```
# odacli list-localvolumes
Local Disk and Volume details
Node
_____
cln1
Physical Volume details
         Volume Size: 446.1G
          Free Space: 232.1G
     ODABR requirement: 190.0G
    Space for extension: 20.0G
Logical Volume details
_____
Volume Name Path
                                    FS Type Mounted on
    Used
-----
                                    ext4 /opt
LOGVOLOPT
40.0G 22.2G
LOGVOLROOT
                                          /
                                    ext4
110.0G 9.2G
LOGVOLU01
                                    ext4
                                          /u01
40.0G
    22.2G
```



N/A LOGVOLSWAP N/A 24.0G Node \_\_\_\_\_ c1n2 Physical Volume details \_\_\_\_\_ Volume Size: 446.1G Free Space: 312.1G ODABR requirement: 110.0G Space for extension: 20.0G Logical Volume details \_\_\_\_\_ Volume Name Path FS Type Mounted on Used \_\_\_\_\_ LOGVOLOPT ext4 /opt 40.0G 22.6G ext4 / LOGVOLROOT 30.0G 9.5G LOGVOLU01 ext4 /u01 40.0G 22.6G N/A N/A LOGVOLSWAP 24.0G

# Example 17-79 Command output details on Oracle Database Appliance single-node system

# odacli list-localvolumes Local Disk and Volume details Node \_\_\_\_\_ n1 Physical Volume details Volume Size: 446.1G Free Space: 169.1G ODABR requirement: 231.0G Space for extension: 0.0G Logical Volume details \_\_\_\_\_ Volume Name Path FS Type Mounted on Used \_\_\_\_\_ ext4 /opt LOGVOLOPT 70.0G 18.5G

LOGVOLROOT		ext4	/	
30.0G	10.1G			
LOGVOLU01		ext4	/u01	
131.0G	34.4G			
LOGVOLDATA		N/A	N/A	1.0G
LOGVOLEXTR	A	ext4	/extra	
20.0G	24.0K			
LOGVOLRECO		N/A	N/A	1.0G

## **Related Topics**

Managing Local Volumes
 Understand how you can modify the size of logical volumes LOGVOLOPT and LOGVOLU01.

## odacli modify-asmport

Use the odacli modify-asmport command to modify the Oracle ASM listener port number.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli modify-asmport -p [-j] [-h]

#### **Parameters**

Parameter	Description
p, -p	(Mandatory) Specifies the new port number for the Oracle ASM listener.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output.

#### **Usage Notes**

You can modify the Oracle ASM listener port number on the bare metal system. All DB systems that you provision after changing the Oracle ASM listener port number use the new Oracle ASM port number.

## Example 17-80 Command output details on bare metal system and DB system

Description: Modify ASM listener port

Status: Success

Created: July 18, 2024 4:03:05 PM CST

Message:



Task Name Start
Time End Time

Status

-----

-----

-----

 Stop CRS on DB System(s)
 July 18, 2024 4:14:44 PM CST
 July 18, 2024 4:14:44 PM CST
 Success

 Modify the ASM listener port on BM CST
 July 18, 2024 4:14:48 PM CST
 Success

 Change discovery address for DB Systems
 July 18, 2024 4:34:17 PM CST
 July 18, 2024 5:34:17 PM CST

After running the command on the bare metal system, the DB system job details are as follows:

# Stopping Oracle Clusterware

[root@node1 ~]# odacli describe-job -i 72ed400c-c8ff-4d82-9d8c-b7561d3f3616

Job details

.....

ID: 72ed400c-c8ff-4d82-9d8c-b7561d3f3616

Description: Stop Clusterware

Status: Success

Created: July 18, 2024 10:14:12 AM CEST

Message:

Task Name Start
Time End Time

Status

\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_

Stop crs with force option July 18, 2024 10:14:13 AM CEST July 18, 2024 10:14:23 AM CEST Success

# Updating the port

[root@node1 ~]# odacli describe-job -i b728b936-7426-463f-b6d4-b7ab9ff9f399

Job details

-----

ID: b728b936-7426-463f-b6d4-b7ab9ff9f399

Description: Modify ASM listener port

Status: Success

Created: July 18, 2024 11:32:42 AM CEST

Message:

Task Name Start Time End Time

Status

-----

```
Updating the ASM discovery address in July 18, 2024 11:32:43 AM
             July 18, 2024 11:32:43 AM CEST
                                                    Success
OLR
Starting the clusterware
                                      July 18, 2024 11:32:43 AM
              July 18, 2024 11:33:44 AM CEST
Updating the ASM discovery address in July 18, 2024 11:33:44 AM
             July 18, 2024 11:34:44 AM CEST
CEST
                                                    Success
OCR
Restarting Clusterware
                                      July 18, 2024 11:34:44 AM
             July 18, 2024 11:37:24 AM CEST
                                                     Success
```

## **Related Topics**

odacli modify-asmport
 Use the odacli modify-asmport command to modify the Oracle ASM listener port
 number.

## odacli set-credential

Use the odacli set-credential command to change the oda-admin or oda-cliadmin user credentials on a deployment where multi user access is not enabled.

#### **Syntax**

To reset the oda-admin or oda-cliadmin user credentials in interactive mode:

```
odacli set-credential --username username [-j] [-h]
```

## **Parameters**

Parameter	Description
username, -u	User name credentials that you want to reset. The user name can be oda-admin or oda-cliadmin. The oda-admin user credentials allow access to the BUI and the oda-cliadmin user credentials allow ODACLI to communicate with the DCS agent internally.
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

### **Usage Notes**

Only the root user can reset the oda-admin or oda-cliadmin user credentials.

## Example 17-81 Resetting the oda-admin Password in Interactive Mode

To reset the oda-admin user password to a new password in interactive mode:

```
# odacli set-credential --username oda-admin
Enter 'user' password:
Retype 'user' password:
```

# odacli create-appliance

Use the odacli create-appliance command in a JSON file format to provision Oracle Database Appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To view help for the odacli create-appliance command:

```
odacli create-appliance -r requestjson [-j] [-h]
```



The odacli create-appliance command only supports a JavaScript Object Notation (JSON) file format. An example JSON files and a readme are available in an appendix in this document and in the /opt/oracle/dcs/sample directory.

#### **Parameters**

Parameter	Description
requestjson,-r	JSON input for appliance creation.
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

For example JSON files, see the chapter *Creating an Appliance Using a JSON File* in this publication.

## odacli describe-system

Use the <code>odacli describe-system</code> command to display details about components installed on the system.

#### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

To list jobs and view job details and status:

```
odacli describe-system [-h] [-b] [-d] [-j]
```

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
bom, -b	(Optional) Displays the bill of materials for the installed components on the appliance.
details, -d	(Optional) Display on the command-line, the details of all installed components on the appliance.

## **Usage Notes**

Do not provide both options -b and -d at the same time, in the command.

# Example 17-82 Example Command to View the Bill of Materials from the Command Line for Bare Metal Deployments

```
# odacli describe-system -b
ODA Components Information
-----
Component Name
                             Component
Details
NODE
                             Name : oda1
                             Domain Name :
                             Time Stamp : April 29, 2020 7:00:12 PM UTC
RPMS
                             Installed RPMS : acl-2.2.49-7.el6 9.1.x86 64,
                                              aide-0.14-11.el6.x86 64,
                                              alsa-lib-1.1.0-4.el6.x86 64,
                                              at-3.1.10-49.el6.x86 64,
                                              atk-1.30.0-1.el6.x86 64,
                                              attr-2.4.44-7.el6.x86 64,
                                              audit-2.4.5-6.el6.x86 64,
                                              audit-libs-2.4.5-6.el6.x86 64,
                                              audit-libs-
python-2.4.5-6.el6.x86 64,
                                              augeas-
libs-1.0.0-10.el6.x86 64,
authconfig-6.1.12-23.el6.x86 64,
                                              avahi-
libs-0.6.25-17.el6.x86 64,
                                              b43-openfwwf-5.2-10.el6.noarch,
basesystem-10.0-4.0.1.el6.noarch,
                                              bash-4.1.2-48.el6.x86 64,
                                              bc-1.06.95-1.el6.x86 64,
                                              bind-
```



libs-9.8.2-0.62.rc1.el6_9.5.x86_64,	
utils-9.8.2-0.62.rc1.el6_9.5.x86_64,	bind-
binutils-2.20.51.0.2-5.47.el6_9.1.x86_64,	biosdevname-0.7.2-1.el6.x86_64, bridge-utils-1.2-10.el6.x86_64, busybox-1.15.1-21.el6_6.x86_64, bzip2-1.0.5-7.el6_0.x86_64, bzip2-
libs-1.0.5-7.el6_0.x86_64,	ca-
certificates-2017.2.14-65.0.1.el6_9.noarch,	cairo-1.8.8-6.el6_6.x86_64, celt051-0.5.1.3-0.el6.x86_64,
checkpolicy-2.0.22-1.el6.x86_64,	
chkconfig-1.3.49.5-1.el6.x86_64,	cloog-
ppl-0.15.7-1.2.el6.x86_64,	<pre>compat-libcap1-1.10-1.x86_64, compat-libstdc+</pre>
+-33-3.2.3-69.el6.x86_64,	compat-
readline5-5.2-17.1.el6.x86_64, +-4.8.2-16.el6.x86 64,	compat-sap-c+
libs-0.4.1-6.el6.x86 64,	ConsoleKit-0.4.1-6.el6.x86_64, ConsoleKit-
x11-0.4.1-6.e16.x86_64,	ConsoleKit-
coreutils-8.4-46.0.1.el6.x86_64,	coreutils-
libs-8.4-46.0.1.el6.x86_64,	cpio-2.10-13.el6.x86_64, cpp-4.4.7-18.el6.x86_64, cpupowerutils-1.3-2.el6.x86_64, cpuspeed-1.5-22.0.1.el6.x86_64, cracklib-2.8.16-4.el6.x86_64, cracklib-
dicts-2.8.16-4.el6.x86_64,	crash-7.1.4-1.0.1.el6_7.x86_64,
crda-3.13_2015.10.22-3.el6.x86_64,	
createrepo-0.9.9-27.el6_9.noarch,	cronie-1.4.4-16.el6_8.2.x86_64,
anacron-1.4.4-16.el6_8.2.x86_64,	cronie- crontabs-1.10-33.el6.noarch,
luks-1.2.0-11.el6.x86_64,	cryptsetup- cryptsetup-luks-

```
libs-1.2.0-11.el6.x86_64,

cups-

libs-1.4.2-78.el6_9.x86_64,

....
```

## odacli ping-agent

Use the odacli ping-agent command to ping the DCS agent resource.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli ping-agent [-j] [-h]

## **Parameters**

Parameter	Description	
help, -h	(Optional) Displays help for using the command.	
json, -j	(Optional) Displays JSON output.	

## Example 17-83

# odacli ping-agent

## odacli list-nodes

Use the odacli list-nodes command to list all nodes in the deployment.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-nodes [-j] [-h]

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



## Example 17-84

# odacli list-nodes

## odacli list-featuretracking

Use the odacli list-featuretracking command to display the latest feature tracking report.

## File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

Use the odacli list-featuretracking command to display the latest feature tracking report.

odacli list-featuretracking [-h] [-j]

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

# Example 17-85 Example Command to View the Features Report from the Command Line

# odacli list-featuretracking

DCS Feature Tracking Report

Last collection date: 10/26/18 15:35

Report version: 1.0

\_\_\_\_\_\_

DCS Feature Usage Summary

	Currently	
Detected Total Last Usage Feature Name Samples Time	Used	Usages
Object Store 12	TRUE	
Automatic Service Request (ASR) 0 12	FALSE	
Storage Expansion Shelf 0 12	FALSE	

-----

## DCS High Water Mark Statistics

	d Feature Name Category	High Water
	usage of CPU	8.12
8	DCS Agent	
	usage of Memory	437.12
MB .	DCS Agent	
	number of threads	
150	DCS Agent	
Maximum 257	number of open file descriptors  DCS Agent	
Maximum	number of Databases	
1	Database	
Maximum	number of EE Databases	
1	Database	
Maximum	number of SE Databases	
0	Database	
Maximum	number of CDBs	
1	Database	
Maximum	number of non-CDBs	
0	Database	
Maximum	number of RAC Databases	
1	Database	
Maximum	number of RAC One Databases	
0	Database	
Maximum	number of Single Instance Databases	
0	Database	
Maximum	number of PDBs	
0	Database	
	number of Datafiles	
7	Database	
	number of Database Homes	
1	Database	
	number of Flashback Databases	
0	Database	6 40
	size of a Database	6.40
GB	Database	
18.0.0.0	Database version	
18.0.0.0	Database version 0.0 Database	
12	number of Backups	
	Database number of NFS Backups	
0	Database	
· ·	number of Object Store Backups	
12	Database	
	number of Disk Backups	
0	Database	
•	number of Regular-LO Backups	
0	Database	
•	number of Regular-L1 Backups	
1	Database	
_	number of ArchiveLog Backups	
11021111UIII	named of montyodog backapo	

9 Database	
Maximum number of Longterm Backups	
2 Database	
Maximum interval between Database Backups	0 Day(s),
01:01:06 Database	
Maximum number of Object Store tenants	
1 Object Store	
Maximum number of enabled CPU cores	
12 Server	
Maximum number of disks	
24 Storage	
Maximum number of ASM Disks Groups	
3 Storage	
Maximum size of ASM Disk Groups	11.46
TB Storage	
Maximum usage of ASM Disk Groups	1.70
% Storage	
Maximum number of ASM Disks Groups with redundancy 'NORMAL	'
0 Storage	
Maximum number of ASM Disks Groups with redundancy 'HIGH'	
3 Storage	
Maximum number of ASM Disks Groups with redundancy 'EXTERN	1
0 Storage	
Maximum number of ASM Disks Groups with redundancy 'FLEX'	
0 Storage	
Maximum ASM Disk Groups compatibility	
18.0.0.0.0 Storage	
Minimum ASM Disk Groups compatibility	
18.0.0.0.0 Storage	
Maximum number of non-ACFS file systems	
4 Storage	
Maximum size of non-ACFS file systems	98.31
GB Storage	
Maximum usage of non-ACFS file systems	82.71
% Storage	
Maximum number of ACFS file systems	
1 Storage	
Maximum size of ACFS file systems	5.00
GB Storage	
Maximum usage of ACFS file systems	12.19
% Storage	

# odacli Backup and Recovery Commands

Use the odacli backup and recover commands to backup to and restore from Oracle Cloud Infrastructure Object Storage or disk or NFS.

## odacli create-backup

Use the command odacli create-backup to create a Level O, Level 1, archivelog, or Longterm backup.

## · odacli create-backupconfig

Use the command odacli create-backupconfig to create a backup configuration.

#### odacli create-objectstoreswift

Use the command odacli create-objectstoreswift to create and store the Oracle credential details required to backup to Oracle Object Store.

#### odacli describe-backupconfig

Use the command odacli describe-backupconfig to describe a backup configuration.

#### odacli delete-backup

Use the command odacli delete-backup to delete obsolete backups and backup reports.

### · odacli delete-backupconfig

Use the command odacli delete-backupconfig to delete a backup configuration.

### odacli describe-backupreport

Use the command odacli describe-backupreport to display details of a specific backup report.

## odacli describe-objectstoreswift

Use the command describe-objectstoreswift to describe a Swift ObjectStore.

#### · odacli delete-objectstoreswift

Use the command  ${\tt odacli}$   ${\tt delete-objectstoreswift}$  to delete the credentials for the ObjectStore account.

#### odacli describe-schedule

Use the command odacli describe-schedule to display details for a specific schedule.

#### odacli irestore-database

Use the command <code>odacli irestore-database</code> to restore a database from one system to other system from an external FRA (NFS) or Object Store location based on a backup report.

## odacli list-backupconfigs

Use the command odacli list-backupconfigs to list all backup configurations.

## odacli list-backupreports

Use the command odacli list-backupreports to display a list of all backup reports.

#### odacli list-objectstoreswifts

Use the command  $odacli\ list-objectstoreswifts$  to display a list of credentials for the ObjectStore account.

#### odacli list-schedules

Use the command odacli list-schedules to display all of the schedules in the system, including database backup schedules and some internal maintenance schedules.

#### odacli list-tdebackupreports

Use the odacli list-tdebackupreports command to view TDE Wallet backup reports.

## odacli recover-database

Use the odacli recover-database command to recover or restore a database from backup.

### odacli restore-archivelog

Use the odacli restore-archivelog command to restore archivelog from one SCN to another SCN, or from one timestamp to another timestamp.

#### odacli restore-tdewallet

Use the odacli restore-tdewallet command to restore TDE wallet from the backup location.

## · odacli modify-backupconfig

Use the command odacli modify-backupconfig to update a backup configuration.

#### odacli modify-objectstoreswift

Use the command  ${\tt odacli}\ {\tt modify-objectstoreswift}$  to change the credentials for the ObjectStore account.

## · odacli modify-schedule

Use the command odacli modify-schedule to update the schedule for a database, or to disable the database backup schedule.

## odacli create-backup

Use the command odacli create-backup to create a Level 0, Level 1, archivelog, or Longterm backup.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli create-backup [-i Database Resource ID | -n Database Resource Name] [-h] [-j]

Parameter	Description
backupType, -bt {Regular-L0 Regular-L1  Longterm archivelog}	Defines the type of backup. The options are not case sensitive.
component, -c {Database TDEWallet}	(Optional) Defines the component. The supported options are Database and TDE Wallet. The options are not case-sensitive. The default value is Database. If you specify the value as Database, then a backup of both the database and TDE Wallet is taken.
name, -n	Defines the database name.
id,-i	Defines the Database Resource ID.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.
keep-archivelog,-ka	Keeps archive logs.
keepDays, -k	Defines the Keep Days. For Longterm Backup Type only.
tag, -t	Defines the name of the backup. A tag is alphanumeric, up to 30 characters. Required for Longterm Backup Type. The tag must be wrapped in single quotes when special characters are used.



#### **Usage Notes**

- Use the command odacli create-backup for a specified Database Resource ID and provide a tag for the backup name. Use up to 30 alphanumeric characters for the backup name tag. Three types of backups are available:
  - Level 0: An RMAN incremental backup that backs up all data blocks in the data files being backed up. An incremental backup at level 0 is identical in content to a full backup, but unlike a full backup, the level 0 backup is part of an incremental backup strategy.
  - Level 1: An RMAN incremental backup that includes only those blocks that have been changed since the "parent" backup was taken. A parent backup can be either a level 0 or a level 1 backup.
  - Longterm: Longterm backups are available when backing up to NFS (External FRA) or Oracle Cloud Infrastructure Object Storage (Oracle Object Storage).
  - Archivelog: This option is used to perform backup of all archivelogs not yet backed up to the backup destination, such as Internal FRA, External FRA (NFS location), or Object Store.
- For TDE-enabled databases with TDE keys stored in Oracle Key Vault, the TDE wallet of the database is not backed up because the wallet is stored outside Oracle Database Appliance.
- The Backup Type must be specified in most cases, when you run the odacli create-backup command. If the Backup Component is TDE Wallet, then you need not specify the Backup Type.
- This command creates a Backup Report with a Resource ID. To get the ID, use the command odacli describe-job -i job\_id -j and look for the resourceId attribute in resourceList.

## Example 17-86 Create a Manual Database Backup

Create a long term backup that is kept for 90 days and named g12018HR.

```
\# odacli create-backup -i {\it Database Resource ID} -bt Longterm -c database -k 90 -t q12018HR
```

## Example 17-87 Create a Level 0 Database Backup

Create a Level 0 backup named 2017Dec22ProductionLevel0 for resource ID 20576eb1-bc32-4e34-bf97-fda0b60ca15b

```
# odacli create-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -bt Regular-L0
-t 2017Dec22ProductionLevel0
```

#### Example 17-88 Create a Backup of only the TDE Wallet

```
# odacli create-backup -n testdb -c TDEWallet
```

#### Example 17-89 Create a Backup of the database and TDE Wallet

```
# odacli create-backup -n testdb -bt regular-10
```



## odacli create-backupconfig

Use the command  ${\tt odacli}$   ${\tt create-backupconfig}$  to  ${\tt create}$  a backup configuration.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli create-backupconfig -n backup configuration name -d backup
destination{Disk|ObjectStore|NFS|None} [-c] [-cr] [-h] [-j] [-no-cr] [-o] [-w] [-f] [-ca] [-dc] [-ec] [-on]

Parameter	Description
backupdestination, -d {Disk  ObjectStore NFS None}	Defines the backup destination. The options are not case sensitive.
container,-c	(Optional) Defines the object store container.
crosscheck, -cr	(Optional) Enable crosscheck.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
name, -n	Defines the backup configuration name.
no-crosscheck, -no-cr	(Optional) Disable crosscheck.
objectstoreswiftId,-o	(Optional) Defines the swift object store credential ID.
tde-container,-f	(Optional) Defines the container or backup location to backup the TDE Wallet. Must be the absolute path to the parent directory when the backup target is NFS, and must be the container name when the backup target is Objectstore.
recoverywindow, -wDisk: {1-14}   ObjectStore: {1-31}	(Optional) Defines the Recovery Window in days. {1-14} days for Disk and {1-31} days for Object Storage in the cloud.
compression-algo,-ca	(Optional) Defines the compression algorithm {basic low medium high} that RMAN must use. (default: basic(disk/NFS), medium(ObjectStore))
disable-compression, -dc	(Optional) Disables compression for the backups. Compression is enabled by default.
enable-compression, -ec	(Optional) Enables compression for the backups. Compression is enabled by default.
objectstoreswiftName, -on	(Optional) Defines the Objectstore Swift resource name. Specify the Objectstore Swift resource name or Objectstore Swift ID.



#### **Usage Notes**

- To backup a TDE-enabled database, backup configuration with separate TDE Wallet backup location and Database backup location is mandatory.
- To backup a non-TDE database, backup configuration with either single database backup location or backup configuration with both database backup location and TDE Wallet backup location can be used.
- For Disk backup configuration, TDE Wallet backup location is by default, Fast Recovery Area (FRA), but in a separate path from the Database backup path within FRA. Hence, TDE Wallet backup location need not be specified when creating the Disk backup configuration.
- The recovery window that is defined in the backup configuration determines when backups are considered obsolete. The following are guidelines:
  - Disk: 1-14 days
  - Object Storage: 1-31 days

## Example 17-90 Create a Backup Configuration for disk

Create a backup configuration named production that backs up to disk with a 14 day recovery window.

```
# odacli create-backupconfig -d Disk -n production -w 14
```

### Example 17-91 Create a Backup Configuration for NFS location

Create a backup configuration that backs up to NFS with a 2 day recovery window.

```
# odacli create-backupconfig -d NFS -n NfsPolicy1 -c /tmp/Nfsbackps -w 2
```

# Example 17-92 Create a Backup Configuration with separate backup locations for database backup and TDE Wallet backup

```
# odacli create-backupconfig -n bcfg1 -d Objectstore -w 1 -c location1-on
oss1 -f location2
```

# Example 17-93 Create a Backup Configuration with single backup location for database backup

```
# odacli create-backupconfig -n bcfg2 -d Objectstore -w 1 -c testb2 -on oss2
```

## odacli create-objectstoreswift

Use the command odacli create-objectstoreswift to create and store the Oracle credential details required to backup to Oracle Object Store.

## File Path

/opt/oracle/dcs/bin/odacli



## **Syntax**

# odacli create-objectstoreswift -e swift end point URL [-h] [-j] -n Object Store Swift name -t Object Store tenant name -u Object Store user name

#### **Parameters**

Parameter	Description
endpointurl, -e	Defines the swift end point URL.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
name, -n	Defines the Object Store Swift name.
tenantname, -t	Defines the Object Store Swift tenant name.
username, -u	Defines the Object Store Swift user name.

## **Usage Notes**

The command creates and stores the Oracle Cloud Infrastructure Object Storage credential details in the system and stores the password in an encrypted Oracle wallet. You can attach the credentials to one or more backup configurations.

The credentials are validated during Object Store backup configuration creation against the endpoint URL and tenancy.

## odacli describe-backupconfig

Use the command odacli describe-backupconfig to describe a backup configuration.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli describe-backupconfig [-i backup\_configuration\_id] [-n name] [-h]
[-j]

Parameter	Description
id, -i	Specifies the backup configuration identifier (ID).
name, -n	Specifies the backup configuration name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



## Example 17-94 Describing a Backup Configuration

Describe a backup configuration named production

# odacli describe-backupconfig -n production

## odacli delete-backup

Use the command odacli delete-backup to delete obsolete backups and backup reports.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli delete-backup -i Database Resource ID -n name [-br] [-h] [-j]

#### **Parameters**

Parameter	Description
backupreport, -br	(Optional) Defines the backup report. To delete a Long Term backup, use a JSON input file for the backupreport.
id, -i	Defines the Database Resource Identifier (ID). To delete obsolete level 0, level 1 and archivelog backups and backup reports, use the database resource ID.
name, -n	Defines the Database resource name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

- Delete older, obsolete level 0 and level 1, archive log backups and backup reports with the Database Resource ID. The recovery window that is defined in the backup configuration determines when backups are considered obsolete.
- Delete long term backups and backup report from Oracle Object Storage or NFS backup location using a JSON file with the --backupreport option.
- To locate the database ID, view the databases in the Browser User Interface or use the command odacli list-databases.

## Example 17-95 Delete a Level 0 or Level 1 Backup

# odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b



## Example 17-96 Delete a Long Term Backup Report

Delete a Long Term backup using a JSON input file for the Backup Report. In this example, backupreport.json is the JSON input for the backupreport.

# odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -br backupreport.json

## odacli delete-backupconfig

Use the command odacli delete-backupconfig to delete a backup configuration.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli delete-backupconfig -n name -i backup configuration id [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
id, -i	Defines the Backup Config identifier (ID).
name, -n	Defines the Backup Config name.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

You cannot delete a backup configuration if it is attached to a database.

## Example 17-97 Deleting a Backup Configuration

Delete a backup configuration named production

# odacli delete-backupconfig -n production

## odacli describe-backupreport

Use the command odacli describe-backupreport to display details of a specific backup report.

#### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli describe-backupreport [-h] [-j] [-i]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
id,-i	Defines the backup report ID.

# Example 17-98 Backup report for a TDE-enabled database (contains a keystoreType attribute)

```
odacli describe-backupreport -i d2326683-9766-4933-bee1-a2b59c9d7e9e
  "id": "d2326683-9766-4933-bee1-a2b59c9d7e9e",
  "dbResId": "96a98156-b657-403e-a87c-357c2069c285",
  "tag" : "auto",
  "dbId": "1851419729",
  "dbName" : "db15",
  "dbUniqueName" : "db15",
  "backupType" : "Regular-L0",
  "keepDays" : null,
  "backupLocation" : "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/db",
  "cfBackupHandle": "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/db/c-1851419729-20240326-03",
  "spfBackupHandle": "/nfs backup/orabackups/dbsfb225975e/database/
1851419729/db15/db/c-1851419729-20240326-03",
  "pitrTimeStamp" : "March 26, 2024 04:15:06 AM PDT",
  "pitrSCN" : "1675444",
  "resetLogsTimeStamp": "March 26, 2024 03:01:39 AM PDT",
  "resetLogsSCN" : "1575481",
  "oraHomeVersion": "19.22.0.0.240116",
  "sqlPatches": "35926646,34774667,35943157",
  "backupLogLoc": "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/rmanlog/2024-03-26/rman backup auto 2024-03-26 04-14-29.0478.log",
  "tdeWalletLoc" : null,
  "dbConfigLoc": "/nfs backup/orabackups/dbsfb225975e/database/1851419729/
db15/dbconfig/2024-03-26/DBCONFIG auto 2024-03-26 04-15-19.0472.tar.gz",
  "name": "Backup Report db15",
  "createTime" : "March 26, 2024 04:14:26 AM PDT",
  "state" : {
    "status" : "CONFIGURED"
  "updatedTime" : "March 26, 2024 04:14:26 AM PDT",
  "backupReportLogDetail" : "/nfs backup/orabackups/dbsfb225975e/database/
1851419729/db15/rmandetaillogreport/2024-03-26/
rman list backup detail_auto_2024-03-26_04-15-16.0129.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "RAC",
    "dbShape" : "odb2",
    "dbEdition" : "EE",
    "dbStorage" : "ASM",
    "dbRedundancy" : null,
```

```
"pdbName" : null,
    "isCdb" : false
},
    "dbDataSize" : "2441M",
    "dbRedoSize" : "16403M",
    "rmanBackupPieces" : "/nfs_backup/orabackups/dbsfb225975e/database/
1851419729/db15/backuppieces/2024-03-26/backupPieces_auto_96a98156-b657-403e-a87c-357c2069c285_20240326041518.json",
    "compressionAlgo" : "BASIC",
    "cpuPool" : null,
    "numberOfCores" : null,
    "keystoreType" : "OKV" <<<< HERE
}</pre>
```

## Example 17-99 Display Details of a Specific Backup Report

```
# odacli describe-backupreport -i 2d82460c-d648-4e75-8c7d-72cc90bc442a
  "id": "2d82460c-d648-4e75-8c7d-72cc90bc442a",
  "dbResId": "b5fc646e-01a6-4c8b-8286-7633346c4329",
  "tag" : null,
  "dbId": "2717054291",
  "dbName" : "ExampleDB",
  "dbUniqueName" : "ExampleDBu",
  "backupType" : "REGULAR-L1",
  "keepDays" : null,
  "backupLocation": "https://swiftobjectstorage.example.com/v1/dbaasimage/
backupbucket",
  "cfBackupHandle": "c-2717054291-20180108-04",
  "spfBackupHandle": "c-2717054291-20180108-04",
  "pitrTimeStamp" : "September 08, 2024 12:43:14 PM UTC",
  "pitrSCN" : "1175058",
  "resetLogsTimeStamp": "September 08, 2024 09:55:34 AM UTC",
  "resetLogsSCN" : "1112268",
  "oraHomeVersion": "12.2.0.1.170814 (26723265, 26609817)",
  "sqlPatches": "25811364,26609817",
  "backupLoqLoc": "https://swiftobjectstorage.example.com/v1/dbaasimage/
backupbucket/scaoda702c1n1/rmanlog/ExampleDBu/2717054291/2018-01-08/
rman backup 2018-01-08 12-42-41.0545.log",
  "tdeWalletLoc" : null,
  "dbConfigLoc" : "https://swiftobjectstorage.example.com/v1/dbaasimage/
backupbucket/scaoda702c1n1/dbconfig/ExampleDBu/2717054291/2018-01-08/
DBCONFIG TAG20180108T124407 2018-01-08 12-44-07.0533.tar.gz",
  "name" : "Backup Report ExampleDB",
  "createTime" : "January 08, 2018 12:42:08 PM UTC",
  "state" : {
   "status" : "CONFIGURED"
  "updatedTime" : "January 08, 2018 12:44:12 PM UTC",
  "backupReportLogDetail": "https://swiftobjectstorage.example.com/v1/
dbaasimage/backupbucket/scaoda702c1n1/rmandetaillogreport/ExampleDBu/
2717054291/2018-01-08/rman list backup detail 2018-01-08 12-44-04.0362.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "RAC",
```

```
"dbShape" : "odb1",
  "dbEdition" : "EE",
  "dbStorage" : "ASM"
},
  "dbDataSize" : "1542M",
  "dbRedoSize" : "16403M"
}
```

## odacli describe-objectstoreswift

Use the command describe-objectstoreswift to describe a Swift ObjectStore.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
# odacli describe-objectstoreswift -i Object Store_Swift_id -n Object
Store Swift name [-h] [-j]
```

#### **Parameters**

Parameter	Description
id, -i	Specifies the Object Store Swift identifier (ID).
name, -n	Specifies the Object Store Swift name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## Example 17-100 Describing the Swift Object Store

# odacli describe-objectstoreswift -i Object Store Swift id

## odacli delete-objectstoreswift

Use the command  ${\tt odacli}$   ${\tt delete-objectstoreswift}$  to delete the credentials for the ObjectStore account.

## File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

# odacli delete-objectstoreswift -i Object Store Swift id -n Object Store
Swift name [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
id, -i	Defines the Object Store Swift identifier (ID).
name, -n	Defines the Object Store Swift name.

## **Usage Notes**

You cannot delete the Object Store credentials if they are attached to a backup configuration.

## **Example 17-101** Deleting the Oracle Object Store Credentials

# odacli delete-objectstoreswift -i Object Store Swift id

## odacli describe-schedule

Use the command odacli describe-schedule to display details for a specific schedule.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

# odacli describe-schedule [-h] [-j] [-i]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
id, -i	Defines the schedule with an identifier (ID).

## Example 17-102 Display Schedule Details

# odacli describe-schedule -i scheduleid

## odacli irestore-database

Use the command odacli irestore-database to restore a database from one system to other system from an external FRA (NFS) or Object Store location based on a backup report.

#### File Path

/opt/oracle/dcs/bin/odacli



## **Syntax**

```
odacli irestore-database -r [-tn] [-n] [-bp] [-cl] [-nn] [-co] [-s] [-ro] [-dr] [-y] [-c] [-oid] [-tf] [-bl] [-t] [-kt] [-ocp] [-tl] [-cp] [-dh] [-dn] [-de] [-f] [-rd] [-on] [-ha|-no-ha] [-own] [-osc] [-h] [-j]
```

Parameter	Description
backupPassword(s),-bp	(Optional) Defines the RMAN password for recovery. You can provide more than one password, but the passwords must be separated by a comma(,).
backupReport,-r	JSON input for a backup report.
enable-tde,-t	Specifies whether to enable Transparent Data Encryption (TDE) which uses software keystore.
keystore-type,-kt	Specifies the type of keystore which stores the TDE master encryption key. The value can be software or okv. The default is software.
okvclient-path, -ocp	Specifies the absolute path to the <code>okvclient.jar</code> file.  Multiple values must be comma-separated. Cannot be used with the <code>okv-server-config,-osc</code> option.
dbClass,-cl {EE: OLTP/DSS/IMDB, SE: OLTP}	(Optional) Defines the Database class.
dbConsoleEnable, -co	(Optional) Enables the Database Console.
dbShape, -s {odb1,odb2, and so on}	(Optional) Defines the database shape.
dbStorage, -dr {ACFS ASM}	(Optional) Defines the database storage. Database Storage {ACFS ASM} (non case-sensitive). The default is ASM.
dbType, -y	(Optional) Defines the type of database. For high-availability deployments, the values can be RAC RACOne SI, with the default as RAC. For single-node deployments, the value is SI.
dbEdition, -de	(Optional) Defines the Database Edition (SE or EE).
databaseHome, -dh	(Optional) Defines the database home.
dbName, -n	(Optional) Defines the database name.
dbUniqueName, -u	(Optional) Defines the database unique name.
dbDomainName, -dn	Defines the database domain name.
dbrole, -ro	Defines the database role for Oracle Data Guard operations. The options are PRIMARY   STANDBY.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
node-name, -tn	(Optional) Specifies the target host name (applicable only for Oracle RAC One Node Database and single-instance Oracle Database, where supported). This option is available for Oracle Database Appliance high-availability deployments.
enable-tde,-t	(Optional) Specifies whether you want to enable TDE on the target database.
tde-backup-location, -tl	(Optional) Specifies the backup location for TDE wallet.



Parameter	Description	
keystore-type, -kt	Specifies the type of keystore which stores the TDE master encryption key. The value can be software or okv. The default is software.	
okv-server-config,-osc	Specifies the name of the Oracle Key Vault server configuration object which serves as the metadata of the Oracle Key Vault user credentials used by the target database.	
okv-wallet-name, -own	Specifies the name of the wallet of the target database on the Oracle Key Vault server. Use this option only if the wallet is manually created on the Oracle Key Vault server.	
noOfRmanChannels, -c	(Optional) Defines the number of RMAN channels (parallelism) Default: SE Edition: 1, Other Enterprise Editions: 5	
objectStoreId, -oid	Defines the Swift Object Store credential ID.	
objectStoreName, -on	Defines the Swift Object Store resource name.	
backuplocation, -bl	(Optional) Specifies the NFS or local directory path where backups are available.	
dbRedundancy, -rd	Specifies the database redundancy value, that is, {HIGH  MIRROR}. To specify the dbRedundancy option for an Oracle ASM or ACFS storage-based database, at least one disk group of FLEX redundancy must exist. To specify the dbRedundancy option for an Oracle ASM storage database, the dbVersion or dbHomeVersion must be 12.2 or later.  The precedence logic for setting the dbRedundancy is:	
	<ol> <li>dbRedundancy that is specified in the irestoredatabase command.</li> </ol>	
	2. dbRedundancy in the backup report.	
	3. If the disk group redundancy is FLEX, then the default dbRedundancy value is MIRROR.	
associated-networks, -nn	Specifies the associated network names (in the format networkName1,networkName2,).	
dbOnFlashStorage, -f	(Optional) Specifies whether to enable data on Flash storage.	
no-dbOnFlashStorage, -no-f	(Optional) Specifies whether to disable data on Flash storage.	
disable-ha, -no-ha	(Optional) Disables High Availability for single-instance Oracle Database 19c and later.	
enable-ha, -ha	(Optional) Enables High Availability for single-instance Oracle Database 19c and later.	



#### **Usage Notes**

## A

## **Caution:**

When you create a database with Transparent Data Encryption (TDE) enabled, with TDE keys stored in software keystore, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

- The command odacli irestore-database restores a database to a system using the Backup Report that is in the Oracle Object Store or External FRA (NFS) location. You can restore a database from one appliance to another appliance, or to the same appliance after the source database is deleted.
- An Oracle wallet (ObjectStoreSwift credentials) must be created to access the backups in Oracle Object Store. This command performs the environment checks, validation checks, and tasks needed to restore a database to an Oracle Database Appliance system.
- If -cp parameter is provided as part of the command, the database is associated with the particular CPU pool.
- If -cp parameter is not provided as part of the command, and if the backup report has
  information about the associated CPU pool, then the command validates the CPU pool
  specified in the backup report. If the validation fails, then an error message is displayed.
- If the backup report does not have information about any associated CPU pool, then the database is created without being associated with any CPU pool.
- To restore a TDE-enabled database, the TDE wallet password must be provided.
- If source database is TDE enabled, then the target database which was restored will also have TDE enabled.
- Specify the TDE wallet location if the backup report does not have TDE wallet location or if the backup report is inaccessible or unavailable.
- To create a database with role as standby in an Oracle Data Guard configuration on Oracle
  Database Appliance, you do not need to copy the wallet of the primary database when
  using Oracle Key Vault keystore for TDE-enabled databases. The same wallet can be
  specified in the odacli irestore-database command.

### Example 17-103 Restoring a Database to the Same System

Run the command odacli irestore-database with the backup report. Enter the SYS user password when prompted.

# odacli irestore-database -r backupreport.json -oid Object Store ID



### Example 17-104 Restoring a Database to a Different System

To restore to a different system, copy the backup report to the other machine's \bin folder (or provide the complete path to the backup report), then run the command odacli irestoredatabase with the backup report. Enter the SYS user password when prompted.

```
# odacli irestore-database -r backupreport.json -oid Object Store ID
```

## Example 17-105 Restoring a Database with TDE Wallet backup from a backup report

```
# odacli irestore-database -r backupreport.json -on oss1 -t
Enter SYS user password:
Retype SYS user password:
Enter TDE wallet password:
```

### Example 17-106 Restoring a Database with TDE Wallet backup specified on the CLI

```
# odacli irestore-database -r backupreport.json -tl https://
swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paas_test/tde_Backups/
test2-c/database/91276171/tdbacf2/tdewallet/ewallet_2020021714442745.p12 -on
oss2 -p -m
Enter SYS user password:
Retype SYS user password:
Enter TDE wallet password:
```

# Example 17-107 Restoring to a standby database when Oracle Data Guard is configured

```
# odacli irestore-database -r backup report.json -u dbUniqueName -ro STANDBY
```

#### Example 17-108 Recovering a Database that was associated with a CPU Pool

```
# odacli irestore-database -n irmendb3 -r dbcpupllong.json -on ostore -bp -dh
45156cc5-e768-4817-8b52-2a0a482be18f
Enter SYS user password:
Retype SYS user password:
Enter RMAN backup encryption password:
Do you want to provide another RMAN backup encryption password? [y/n]
(default 'n'): n
{
    "jobId": "31af6cc8-5e04-459b-8017-271c55b8c99b",
    "status": "Created",
    "message": null,
    "reports": [],
    "createTimestamp": "August 10, 2024 11:20:08 AM UTC",
    "resourceList": [],
    "description": "Database service recovery with db name: irmendb3",
    "updatedTime": "August 10, 2024 11:20:08 AM UTC"
}
```

### Example 17-109 Recovering a Database that was associated with a CPU Pool

Restore an Oracle single-instance database okvdb without using the Oracle Key Vault server configuration object as follows:

```
odacli irestore-database -r /tmp/bkpreport.json -n okvdb8 -y SI -t -kt OKV -
ocp /tmp/okvclient.jar
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
Job details
                   ID: dce7bde6-7fc4-48ec-891b-649525f1ce4f
           Description: Database service recovery with DB name: okvdb8
               Status: Success
              Created: August 28, 2024 2:50:46 PM CST
              Message:
Task Name
                                     Node Name
                                                             Start
Time
                                End Time
Status
    ______
                                    n1 August 28, 2024 2:51:09
Restore Database
PM CST August 28, 2024 2:58:11 PM CST Failure
Restore Database n1 August 28, 2024 2:51:10
PM CST August 28, 2024 2:58:10 PM CST Failure
Check if cluster ware is running n1 August 28, 2024 2:51:14
PM CST August 28, 2024 2:51:14 PM CST
                                               Success
                                              August 28, 2024 2:51:14
Check if cluster ware is running
                               n2
PM CST
              August 28, 2024 2:51:14 PM CST
                                                Success
                                              August 28, 2024 2:51:14
Creating DbStorage for DbRestore n1
                                              Success
August 28, 2024 2:51:14
PM CST
              August 28, 2024 2:51:21 PM CST
Validating DiskSpace for DATA n1
PM CST
              August 28, 2024 2:51:15 PM CST
                                                Success
Setting up SSH equivalence
                            n1
                                               August 28, 2024 2:51:15
              August 28, 2024 2:51:19 PM CST
                                                 Success
Configuring user access to ACFS
                              n1
                                               August 28, 2024 2:51:20
PM CST
               August 28, 2024 2:51:20 PM CST
                                                   Success
filesystems for
okvdb8st
Audit directory creation
                                     n1
                                                August 28, 2024 2:51:20
        August 28, 2024 2:51:21 PM CST
                                                 Success
                                                August 28, 2024 2:51:21
Audit directory creation
                                     n2
PM CST
              August 28, 2024 2:51:21 PM CST
                                                    Success
Configure TDE for RestoreDb TaskFlow n1
                                                August 28, 2024 2:51:22
PM CST
              August 28, 2024 2:51:39 PM CST
                                                Success
Auxiliary Instance Creation
                                               August 28, 2024 2:51:24
                              n2
              August 28, 2024 2:51:36 PM CST
                                                Success
TDE Wallet directory creation
                                               August 28, 2024 2:51:36
                              n1
              August 28, 2024 2:51:36 PM CST
                                                Success
                                               August 28, 2024 2:51:36
Installing OKV Client Software
                               n2
PM CST
              August 28, 2024 2:51:37 PM CST
                                               Success
```

Auto login TDE Wallet creation		August 28, 2024 2:51:37
PM CST August 28, 2024 2:51:38		Success
Password based TDE Wallet open		August 28, 2024 2:51:38
PM CST August 28, 2024 2:51:39		Success
Install Object Store Swift module		August 28, 2024 2:51:58
PM CST August 28, 2024 2:52:16	PM CST	Success
Restoring Spfile From Casper	n2	August 28, 2024 2:52:16
PM CST August 28, 2024 2:52:38	PM CST	Success
Customize Db Parameters	n2	August 28, 2024 2:52:38
PM CST August 28, 2024 2:52:47	PM CST	Success
Create spfile for restore db		August 28, 2024 2:52:47
PM CST August 28, 2024 2:52:48		Success
Restoring control file		August 28, 2024 2:52:48
PM CST August 28, 2024 2:53:11	PM CST	Success
Mounting db	n2	August 28, 2024 2:53:11
PM CST August 28, 2024 2:53:35		Success
Validating backup for RestoreDB		August 28, 2024 2:53:35
PM CST August 28, 2024 2:53:41		Success
		August 28, 2024 2:53:41
Restoring DB for migration PM CST August 28, 2024 2:54:26		
		Success
Change DBID and/or DBName		August 28, 2024 2:54:27
PM CST August 28, 2024 2:54:28		Success
Register Database taskflow		August 28, 2024 2:54:31
PM CST August 28, 2024 2:57:08		Success
Create SPFile in shared loc		August 28, 2024 2:54:31
PM CST August 28, 2024 2:54:37		Success
Delete Local Spfile		August 28, 2024 2:54:37
PM CST August 28, 2024 2:54:37		Success
Register DB with clusterware		August 28, 2024 2:54:37
PM CST August 28, 2024 2:55:23	PM CST	Success
Set SysPassword and Create PwFile	n1	August 28, 2024 2:55:23
PM CST August 28, 2024 2:55:25	PM CST	Success
Enable block change tracking	n2	August 28, 2024 2:55:26
PM CST August 28, 2024 2:55:28	PM CST	Success
Creating pfile	n2	August 28, 2024 2:55:28
PM CST August 28, 2024 2:55:29	PM CST	Success
Updating db env	n2	August 28, 2024 2:55:29
PM CST August 28, 2024 2:55:30	PM CST	Success
Enable DbSizing Template	n2	August 28, 2024 2:55:30
PM CST August 28, 2024 2:56:20		Success
Create this entry	n1	August 28, 2024 2:56:20
PM CST August 28, 2024 2:56:21		Success
Create ths entry	n2	August 28, 2024 2:56:21
PM CST August 28, 2024 2:56:22		
	n2	Success
Running datapatch		August 28, 2024 2:56:22
PM CST August 28, 2024 2:56:23		Success
Set CPU pool	n1	August 28, 2024 2:56:23
PM CST August 28, 2024 2:56:23		Success
Reset Associated Networks for Database		August 28, 2024 2:57:10
PM CST August 28, 2024 2:57:13		Success
Reset Associated Networks	n1	August 28, 2024 2:57:13
PM CST August 28, 2024 2:57:14		Success
Set log_archive_dest for Database	n2	August 28, 2024 2:57:14
PM CST August 28, 2024 2:57:18		Success
Setting Database parameter for OKV	n1	August 28, 2024 2:57:18
PM CST August 28, 2024 2:58:05	PM CST	Success

Enable New Tablespace Encryption n2 August 28, 2024 2:58:07

PM CST August 28, 2024 2:58:08 PM CST Success

Deleting OKV Client Software Jar n2 August 28, 2024 2:58:09

PM CST August 28, 2024 2:58:09 PM CST Success

Copy Pwfile to Shared Storage n1 August 28, 2024 2:58:09

PM CST August 28, 2024 2:58:10 PM CST Success

## odacli list-backupconfigs

Use the command odacli list-backupconfigs to list all backup configurations.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli list-backupconfigs [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Example 17-110** Displaying a List of Backup Configuration

Display a list of backup configurations.

# odacli list-backupconfigs

## odacli list-backupreports

Use the command odacli list-backupreports to display a list of all backup reports.

#### File Path

\$ORACLE\_HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

# odacli list-backupreports [-h] [-j]

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.



#### **Usage Notes**

Displays a list of all database backup reports generated from the command odacli create-backup.

## Example 17-111 Display a List of all Backup Reports

# odacli list-backupreports

## odacli list-objectstoreswifts

Use the command odacli list-objectstoreswifts to display a list of credentials for the ObjectStore account.

#### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli list-objectstoreswifts [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Example 17-112** Displaying a List of ObjectStore Swift Credentials

# odacli list-objectstoreswifts

## odacli list-schedules

Use the command odacli list-schedules to display all of the schedules in the system, including database backup schedules and some internal maintenance schedules.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

# odacli list-schedules [-h] [-j]

Parameter	Description
help, -h	(Optional) Displays help for using the command.



Parameter	Description
json, -j	(Optional) Displays JSON output. The default is false.

### **Usage Notes**

The command lists all of the schedules in the system, including database backup schedules and some internal maintenance schedules.

Starting with Oracle Database Appliance release 19.16, DCS software provides a cron job for cleaning up SSH equivalence that was set up by DCS. The SSH cleaner job runs every 30 minutes. If the SSH cleaner job finds that there are currently no DCS jobs which use SSH, then it cleans up SSH keys, and removes passwordless SSH equivalence across the Oracle Database Appliance nodes on high-availability systems. It also deletes any SSH keys (id\_rsa and id\_rsa.pub) present in the /root/.ssh and /home/operating\_system\_user/.ssh directories. The SSH cleaner job ensures that DCS jobs are thread safe because jobs (threads) do not interleave while operating on shared resources, such as SSH. To retain the SSH equivalence, or the SSH keys, you can disable the SSH cleaner job job using the odacli modify-schedule command.

## Example 17-113 Display a List of Scheduled Database Backups

Display a list of all scheduled database backups and details.

```
# odacli list-schedules
ID
                                        Name
Description
CronExpression
                             Disabled
072dceea-9f09-4c1c-a155-6aa4e3d64669
                                        AgentState metastore cleanup
internal agentstateentry metastore maintenance 0 0 0 1/1 * ?
                false
76e530bf-50db-4598-8b9b-6aa89e58b7d7
                                        bom maintenance
                                                                    bom
                                             0 0 1 ? * SUN *
reports generation
7b2a8981-fb88-480f-8280-90d463fcbff8
                                        feature tracking job
                                                                    Feature
tracking job
                                          0 0 20 ? * WED *
false
af5bc954-c867-4ba4-b587-c9d527cbe07b
                                        Log files Cleanup
                                                                    Auto
                                             0 0 3 1/1 * ? *
log file purge bases on policy
false
c4b14c87-e975-43ba-adf3-cb54c72c9cf0
                                        Rebalance Monitoring
Rebalance poll and Power modification
                                                  0 0/5 * 1/1 * ?
              true
d21ccf0d-3341-4030-b204-f3eed892e443
                                        SSHCleanerJob
                                                                    SSH
cleaner job to clean up stale SSH keys
                                        0 0/30 * 1/1 * ? *
false
```



## odacli list-tdebackupreports

Use the odacli list-tdebackupreports command to view TDE Wallet backup reports.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-tdebackupreports [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

The TDE backup report saves the latest TDE Wallet backup location of a TDE-enabled database, when a database backup or a TDE Wallet backup is taken for that database.

## Example 17-114 Viewing the TDE backup report

```
# odacli list-tdebackupreports
DbResID
                                      OraDbId
BackupLocation
 _____
49772c1b-e4e4-401b-a5f0-16c7992d6766
                                     1080131389
                                                          https://
swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paastest/
TestLtBackupFailur/test2-c/database/1080131389/tddb3/tdewallet/
ewallet 2020053120350968.p12
f1043fa4-b1ee-461b-84d6-8541e4f6f053
                                                          /u01/NFS TDE/
                                     1052183392
orabackups/test2-c/database/1052183392/tddb4/tdewallet/
ewallet 2020060102471941.p12
944a5613-2a1f-41fb-b7b1-91d35e3e8530
                                                          /u03/app/oracle/
                                     1002460890
fast recovery area/TDDB5/tdewallet/ewallet 2020060103125231.
```

## odacli recover-database

Use the odacli recover-database command to recover or restore a database from backup.

#### File Path

/opt/oracle/dcs/bin/odacli



### **Syntax**

```
odacli recover-database [-i] [-br] [-h] [-j] [-r] [-t] [-p] [-s] [-n] [-tp] [-tl] [-tz] [-cp]
```

#### **Parameters**

Parameter	Description
backupReport, -br{Regular-L0 Regular-L1 Longterm}	(Optional) JSON input for a backup report.
name, -n	Defines the database name.
id, -i	Defines the Database Resource ID.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
tde-backup-location, -tl	(Optional) Specifies the backup location for TDE wallet. If not specified, the latest known TDE backup location is used.
recoveryTimeStamp, -r	(Optional) Defines the date and time of the backup. The Recovery Timestamp (in format mm/dd/yyyy hh:mm:ss) is required when the recovery is a point in time recovery (PITR).
recoverytype, -t {Latest PITR SCN}	(Optional) Defines the recovery type. Do not provide the recovery type if you define the Backup Report.
rmanrecoverypassword(s),-p	(Optional) Defines the password for recovery. You can provide more than one password, but the passwords must be within single quote separated by comma(,).
scn, -s	(Optional) Defines the SCN recovery type. Required when the RecoveryType is SCN.
cpupool, -cp	(Optional) Specifies the CPU pool name.
timeZone, -tz	(Optional) Specifies the recovery time zone, in a format similar to {area}/{city} such as america/los_angeles. This option is required when the recovery type is a point in time recovery (PITR).

### **Usage Notes**

Recovers a database to the latest, a point in time recovery (PITR), or System Change Number (SCN) as input. You can also recover a database from a Backup Report provided as JSON input file.

This command performs various environment and validation checks in order to attempt to ensure that recovery of database is successful. If non-TDE database backups are in ObjectStore, the RMAN recovery passwords are needed to recover the database. This includes RMAN restore and recovery.

This command always performs a full RMAN database restore and recovery. This command is most useful when there is a complete database loss or when the majority of the database files are lost. If you do not require a full RMAN restore, you can perform a manual recovery. For example, a single data file loss or control file loss.

• If -cp parameter is provided as part of the command, recovered database is associated with the particular CPU pool.

- If -cp parameter is not provided as part of the command, and if the backup report has
  information about the associated CPU pool, then the recovered database is also
  associated with the same CPU pool.
- If the original database does not have any associated CPU pool, then the recovered database is also not associated with any CPU pool.

## Example 17-115 Recovering a Database to a Point-in-Time

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t PITR -r
11/08/2017 12:57:33 -p
```

### Example 17-116 Recovering a Database to the latest

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t Latest -p
```

## Example 17-117 Recovering a Database to an SCN

```
\# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t SCN -s 392375947
```

# Example 17-118 Restoring a TDE wallet when performing database recovery is not supported for TDE-enabled databases with TDE keys stored in Oracle Key Vault

The following error is displayed:

```
# odacli recover-database -n db15 -tl /nfs_backup/ewallet.p12 -t latest
DCS-10045:Validation error encountered: Usage of TDE wallet related
parameters is not allowed for a TDE database with OKV keystore type.
```

## Example 17-119 Restoring the TDE Wallet while performing database recovery, if TDE wallets are lost

```
# odacli recover-database -n db1 -t latest -tp -tl /u01/NFS_TDE/testbackups/
test2-c/database/91276171/tdbacf2/tdewallet/ewallet_2020021714442745.p12
Enter TDE wallet password:
```

#### Example 17-120 Recovering a Database that was associated with a CPU Pool

```
# odacli recover-database -t latest -n irmendb4 -cp testcpupool3
{
   "jobId" : "b09f2d3f-2b01-4dbb-9797-122ba786e0e4",
   "status" : "Created",
   "message" : null,
   "reports" : [],
   "createTimestamp" : "May 10, 2023 14:56:57 PM UTC",
   "resourceList" : [],
   "description" : "Create recovery-latest for db : irmendb4",
   "updatedTime" : "May 10, 2023 14:56:57 PM UTC"
}
```



## odacli restore-archivelog

Use the odacli restore-archivelog command to restore archivelog from one SCN to another SCN, or from one timestamp to another timestamp.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
odacli restore-archivelog -n database_name -i DB_ID -fs from_scn -ts to_scn -ft from_timestamp -tt to_timestamp [-h] [-j]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the Database Name.
id, -i	(Optional) Specifies the Database resource ID.
from-scn,-fs	(Optional) Specifies the start SCN of archivelog restore.
from-timestamp,-ft	(Optional) Specifies the start time of archivelog restore (in the format mm/dd/yyyy hh:mi:ss).
to-scn, -ts	(Optional) Specifies the end SCN of archivelog restore.
to-timestamp,-tt	(Optional) Specifies the end time of archivelog restore (in the format mm/dd/yyyy hh:mi:ss).
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

#### **Usage Notes**

You can restore archivelog for all supported database versions and database types for an Oracle Database Appliance release.

## Example 17-121 Restoring archivelog

```
# odacli restore-archivelog -fs from_scn -ts to_scn
# odacli restore-archivelog -ft from timestamp -tt to timestamp
```

## odacli restore-tdewallet

Use the odacli restore-tdewallet command to restore TDE wallet from the backup location.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

```
odacli restore-tdewallet [-i] [-n] [-tl] [-h] [-j]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the Database Name.
id, -i	Specifies the Database ID.
tde-backup-location, -tl	(Optional) Specifies the backup location for TDE wallet.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**



#### Caution:

When you create a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

- This command prompts for TDE wallet password. When prompted, enter the password of the TDE wallet. This password is the one you created or last updated using the modifydatabase command.
- TDE Wallet backup location is optional. If no TDE Wallet backup location is provided, then
  the latest TDE Wallet backup of the database known to the system is used for restoring the
  TDE Wallet.
- This command is not supported for the TDE-enabled databases with TDE keys stored in Oracle Key Vault. The following error is displayed:

```
# odacli restore-tdewallet -n db15
Enter TDE wallet password:
DCS-10144:Restore TDE wallet operation is not supported for TDE databases
with OKV keystore type.
```

### Example 17-122 Restoring TDE wallet for a database from a backup location

# odacli restore-tdewallet -n testdb -tl /u01/NFS\_TDE/testbackups/test2-c/
database/91276171/tdbacf2/tdewallet/ewallet\_2020021714442745.p12
Enter TDE wallet password:

## odacli modify-backupconfig

Use the command odacli modify-backupconfig to update a backup configuration.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli modify-backupconfig [-i] [-n] [-ca] -d backup destination{Disk|
ObjectStore|None} [-c] [-cr][-no-cr] [-dc] [-ec] [-o][-w] [-h] [-j]

## **Parameters**

Parameter	Description
id,-i	Defines the Backup Config ID.
name, -n	Defines the Backup Config name.
backupdestination, -d{Disk ObjectStore  None}	Defines the backup destination. The options are not case sensitive. Applicable to System type backup config.
compression-algo, -ca{BASIC LOW  MEDIUM HIGH}	Defines the Compression Algorithm that RMAN must use. The default is BASIC for Disk and NFS backup and MEDIUM for ObjectStore backup.
container, -c	(Optional) Defines the object store container or absolute path to the parent directory of NFS destination for backups.
crosscheck, -cr	(Optional) Enable Crosscheck. Applicable to Database type backup config.
name, -n	Defines the backup configuration name.
no-crosscheck, -no-cr	(Optional) Disable crosscheck.
objectstoreswiftid, -o	(Optional) Defines the swift object store credential ID.
recoverywindow, -w Disk: {1-14} ObjectStore: {1-30}	(Optional) Defines the Recovery Window in days. {1-14} days for Disk and {1-30} days for Object store. Applicable to Database type backup config.
disable-compression, -dc	(Optional) Disables compression for the backups.
enable-compression, -ec	(Optional) Enables compression for the backups.
objectstoreswiftname, -on	(Optional) Describes the Swift Object Store credential name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

• The recovery window that is defined in the backup configuration determines when backups are considered obsolete. The following are guidelines:

Disk: 1-14 days

ObjectStore in Casper: 1-30 days



## Example 17-123 Revise a Backup Configuration for Disk

Create a backup configuration named production that backs up to disk with a 14 day recovery window.

# odacli modify-backupconfig -d Disk -n production -w 14

## odacli modify-objectstoreswift

Use the command  ${\tt odacli}\ {\tt modify-objectstoreswift}$  to change the credentials for the ObjectStore account.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

# odacli modify-objectstoreswift [-n name] [-i id] [-p swiftpassword] [-u
Object Store user name] [-h] [-j]

#### **Parameters**

Parameter	Description
id, -i	Defines the Object Store Swift identifier (ID).
name, -n	Defines the Object Store Swift name.
swiftpassword, -p	(Optional) Defines the Object Store Swift password.
username, -u	(Optional) Defines the Object Store Swift user name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

Use this command to update the password when it is changed for an ObjectStore account. The command updates the Oracle ObjectStore credential details in the system and stores the password in an encrypted Oracle wallet.

The credentials are validated during the command odacli modify-backupconfig with objectstore as the destination. The credentials are not validated against endpoint URL and tenancy.

### Example 17-124 Changing the Oracle Casper ObjectStore Password

# odacli modify-objectstoreswift -i Object Store Swift id -p



### Example 17-125 Changing the Oracle ObjectStore User Name

# odacli modify-objectstoreswift -i Object Store Swift id -u Object Store user name

## odacli modify-schedule

Use the command odacli modify-schedule to update the schedule for a database, or to disable the database backup schedule.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

# odacli modify-schedule [-i] [-x cronExpression] [-t description] [-d] [e] [-h] [-j]

#### **Parameters**

Parameter	Description
scheduleid, -i	Defines the schedule with an identifier (ID).
cronExpression, -x	(Optional) Specifies the cron expression. Use 5 fields or 6 fields cron expression only.
description, -t	(Optional) Provides a description for the update schedule.
disable, -d	(Optional) Disables the schedule.
enable, -e	(Optional) Enables a disabled schedule.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

#### **Usage Notes**

Backups incur overhead on the system. When possible, do not schedule backups to run when users are trying to access data.

Starting with Oracle Database Appliance release 19.20, the DCS agent supports only 5 fields cron expressions or 6 fields cron expressions by default, in job schedules. When you patch your deployment from Oracle Database Appliance release 19.19 or earlier, the DCS agent automatically converts all 7 fields cron expression from existing job schedules into an equivalent 6 fields cron expression.

## Example 17-126 Modify the Time the Backup Occurs

Edit the cron expression to change the time of scheduled backups for a given schedule ID.

```
# odacli modify-schedule -i scheduleid -x "0 0 13 1/1 * *" -e
```



### Example 17-127 Disable Scheduled Database Backups

# odacli modify-schedule -i scheduleid -d

## odacli Oracle Data Guard Commands

Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

## odacli configure-dataguard

Use the command odacli configure-dataguard to configure Oracle Data Guard on Oracle Database Appliance.

### odacli deconfigure-dataguard

Use the command odacli deconfigure—dataguard to deconfigure Oracle Data Guard on Oracle Database Appliance.

## odacli describe-dataguardstatus

Use the command odacli describe-dataguardstatus to view Oracle Data Guard status on Oracle Database Appliance.

## odacli failover-dataguard

Use the command odacli failover-dataguard on the standby system to failover the Oracle Data Guard primary database to the standby database. Oracle Data Guard operations such as switchover, failover, and reinstate can be run in parallel for different Oracle Data Guard configurations.

## odacli list-dataguardstatus

Use the command odacli list-dataguardstatus to verify Oracle Data Guard status on both primary and standby databases.

#### odacli reinstate-dataguard

Use the command odacli reinstate-dataguard on the new primary system to reinstate a failed primary database after a failover and convert it to a new standby database. Oracle Data Guard operations such as switchover, failover, and reinstate can be run in parallel for different Oracle Data Guard configurations.

### odacli register-dataguard

Use the command odacli register-dataguard to register Oracle Data Guard with Oracle Database Appliance.

#### odacli switchover-dataguard

Use the command odacli switchover-dataguard on the primary system to reverse the Oracle Data Guard primary and standby database roles on Oracle Database Appliance. Oracle Data Guard operations such as switchover, failover, and reinstate can be run in parallel for different Oracle Data Guard configurations.

## odacli configure-dataguard

Use the command odacli configure-dataguard to configure Oracle Data Guard on Oracle Database Appliance.

#### File Path

/opt/oracle/dcs/bin/odacli



#### **Syntax**

# odacli configure-dataguard [-h] [-j] [-i] [-r] [-s] [-du]

#### **Parameters**

Optional) Displays help for using the command.  (Optional) Displays JSON output. The default is false.  (Optional) Specifies the JSON file for creating the
(Optional) Displays JSON output. The default is false.
false.
(Ontional) Specifies the ISON file for creating the
appliance.
(Optional) Specifies that step to copy the password from primary database to standby database can be skipped.
(Optional) Specifies the database user. The default is SYS.

#### **Usage Notes**

If the database orapwd file is not in the typical location, then an error may occur in the configuration process. In such a case, manually copy the orapwd file from the primary database to the standby database in advance, and configure Oracle Data Guard with the --skip-password-copy option.

## Example 17-128 Configuring Oracle Data Guard interactively on the command line

Example with one standby configuration:

```
# odacli configure-dataguard
# /opt/oracle/dcs/bin/odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1):
Standby 1 site address: phxdbfzp04.dev3farm3phx.databasede3phx
BUI username for Standby site host1. If Multi-user Access/Multi-user Access
Passwordless is not enabled on Standby site
phxdbfzp04.dev3farm3phx.databasede3phx, enter 'oda-admin'; otherwise, enter
the name of the user who has irestored the Standby database (default: oda-
admin): oda-admin
BUI password for Standby site host2:
Password for root user on Standby site host2:
Data Guard configuration name: tdb dg
Database name for Data Guard configuration: tdb
Primary database SYS password:
Protection mode [MAX PROTECTION, MAX PERFORMANCE, MAX AVAILABILITY] (default:
MAX PERFORMANCE):
Enable Active Data Guard (Y/N, default:N):
******
```

Data Guard default settings for standby database - tdbstndby

```
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N): N
********************
Enter Primary database RMAN backup encryption password if any:
Do you want to provide another Primary database RMAN backup encryption
password if any? [y/n] (default 'n'):
Standby database's SYS password will be set to Primary database's after Data
Guard configuration. Ignore warning and proceed with Data Guard
configuration? (Y/N, default:N): Y
  "jobId" : "e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "January 23, 2025 03:12:44 AM UTC",
  "resourceList" : [ ],
  "description" : "DG Config service for DB tdb",
  "updatedTime" : "January 23, 2025 03:12:44 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@host1 work] # /opt/oracle/dcs/bin/odacli describe-job -i e02cc0b3-
bce3-4d6c-a1f5-5b121bb7f66a
Job details
                    ID: e02cc0b3-bce3-4d6c-a1f5-5b121bb7f66a
           Description: DG Config service for DB tdb
                Status: Success
               Created: January 23, 2025 03:12:44 UTC
               Message:
Task Name
                                       Start
Time
                                 End Time
Status
Validate configure primary request January 23, 2025 03:13:10
             January 23, 2025 03:13:21 UTC
(Primary site) (Host:
host1/Job
ID:
901389f5-0cad-4ee6-91be-3f77b85652af)
Validate configure standby request January 23, 2025 03:13:21
              January 23, 2025 03:13:29 UTC
(Standby site)
```

```
(Host:
host2/Job
ID:
856d86e4-dd51-41a7-9050-
b0c39ae771f9)
Uploading Primary DB Password File January 23, 2025 03:13:29
           January 23, 2025 03:13:52 UTC
                                                 Success
(Standby
site)
Configure primary database (Primary January 23, 2025 03:13:52
    January 23, 2025 03:15:29 UTC
site) (Host: host1/Job
ID:
5dd46e86-
e07f-423f-9ebf-2515b4ac17d5)
Configure standby request (Standby January 23, 2025 03:15:29
UTC January 23, 2025 03:17:30 UTC
site)
(Host:
host2/Job
ID:
2ab511a2-15c0-4371-
bf30-9b7e27ff5288)
Create archive log restore (Primary January 23, 2025 03:17:30
            January 23, 2025 03:17:52 UTC
                                                Success
site) (Host: host1/Job
ID:
96766874-6537-4972-81a9-971440e2acfb)
Configure and enable Data Guard January 23, 2025 03:17:53
             January 23, 2025 03:19:19 UTC
                                                 Success
(Primary site) (Host:
host1/Job
ID:
7ad65ffa-ea06-479d-bb21-
e0b81fb8c743)
Enable Flashback (Standby site) (Host: January 23, 2025 03:19:19
UTC January 23, 2025 03:19:38 UTC Success
host2/Job
ID:
a1768703-4dd4-4f1f-
b9a3-9fe0f99615d5)
```

```
Re-enable Data Guard (Primary site) January 23, 2025 03:19:38
              January 23, 2025 03:19:44 UTC
                                                    Success
(Host: host1/Job
TD.
3f6dd276-63e3-4804-a179-
e10052386206)
Create Data Guard status (Primary January 23, 2025 03:19:44
             January 23, 2025 03:19:49 UTC
site) (Host: host1/Job
8a3eb946-3501-4618-9d4a-
ad8a6d298cc8)
Create Data Guard status (Standby January 23, 2025 03:19:49
             January 23, 2025 03:19:57 UTC
UTC
                                                    Success
site)
(Host:
host2/Job
ID:
d9d65942-6284-40d5-a991-b1d21edae96f)
```

#### Example 17-129 Configuring Oracle Data Guard with two standby configurations

## Example with two standby databases configuration:

```
# odacli configure-dataguard
Number of standby databases (enter 1 or 2 | default: 1): 2
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter
'oda-admin'; otherwise, enter the name of the user who has irestored the
Standby
database (default: oda-admin):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby 2 site address: standby2
BUI username for Standby site standby2. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby2, enter
'oda-admin'; otherwise, enter the name of the user who has irestored the
Standby
database (default: oda-admin):
BUI password for Standby site standby2:
Password for root user on Standby site standby2:
*****
Data Guard configuration name: dgbb
Database name for Data Guard configuration: bb
Primary database SYS password:
Protection mode [MAX_PROTECTION, MAX_PERFORMANCE, MAX_AVAILABILITY] (default:
```

```
MAX PERFORMANCE):
Enable Active Data Guard (Y/N, default:N):
Data Guard default settings for standby database - bb1
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N):
Data Guard default settings for standby database - bb2
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port (TCP): 1521
Standby database listener port (TCP): 1521
Transport type: ASYNC
Do you want to edit this Data Guard configuration? (Y/N, default:N):
Warning: in compliance with Oracle MAA best practices. DbType (RAC) of Primary
database bb is different from DbType (SI) of Standby database. Ignore warning
and proceed with Data Guard configuration? (Y/N, default:N): y
Warning: in compliance with Oracle MAA best practices. DbType (RAC) of Primary
database bb is different from DbType (SI) of Standby database. Ignore warning
and proceed with Data Guard configuration? (Y/N, default:N): y
******
Enter Primary database RMAN backup encryption password if any:
Do you want to provide another Primary database RMAN backup encryption
password
if any? [y/n] (default 'n'):
Standby database's SYS password will be set to Primary database's after Data
Guard configuration. Ignore warning and proceed with Data Guard configuration?
(Y/N, default:N): y
  "jobId": "f1df87d7-221c-4dc3-a15f-fa35d91560f5",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "January 17, 2025 22:57:55 PM UTC",
  "resourceList" : [ ],
  "description" : "DG Config service for DB bb",
  "updatedTime" : "January 17, 2025 22:57:55 PM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@host1 ~]# odacli describe-job -i
"f1df87d7-221c-4dc3-a15f-fa35d91560f5"
Job details
                     ID: f1df87d7-221c-4dc3-a15f-fa35d91560f5
            Description: DG Config service for DB bb
                 Status: Success
```

Created: January 17, 2025 22:57:55 UTC

Message:

Task Name Node Name Start

Time End Time Status

\_\_\_\_\_

\_\_\_\_\_

Validate configure primary request host1 January 17,2025 22:58:38 UTC January 17, 2025 22:58:44 UTC Success

(Primary site) (Host:host1/Job

ID:

eb8bbb43-159c-48e0-8dda-9e2bbd280669)

Validate configure standby request host1 January 17,2025 22:58:44 UTC January 17, 2025 22:58:52 UTC Success

(Standby site) (Host: standby1/Job

ID:

86345f35-500c-4ba8-8ff9-

f97c201ad3c7)

Uploading Primary DB Password File host1 January 17,2025 22:58:52 UTC January 17, 2025 22:59:07 UTC Success

(Standby site)

Configure primary database (Primary host1 January 17,2025 22:59:07 UTC January 17, 2025 22:59:58 UTC Success

site) (Host: host1/Job ID:

23ee7263-a59e-40bd-bbec-4c17a5d4ba99)

Configure standby request (Standby host1 January 17,2025 22:59:58 UTC January 17, 2025 23:02:00 UTC Success

site) (Host: standby1/Job ID: af543839-85ba-4e83-89d3-

af161d528256)

Create archive log restore (Primary host1 January 17,2025 23:02:00 UTC January 17, 2025 23:02:37 UTC Success

site) (Host: host1/Job ID: b2940217-cec6-4b22-92d2-

f4ec8f26b8b8)

Configure and enable Data Guard host1 January 17,2025 23:02:37 UTC January 17, 2025 23:04:19 UTC Success

(Primary site)

(Host:

host1/Job ID:

7882e1e5-0d71-48df-bd86-

e79ee6b57a21)

Enable Flashback (Standby site) (Host: host1 January 17,2025 23:04:19 UTC January 17, 2025 23:04:37 UTC Success

standby1/Job ID:

c2ef962c-

f429-4e97-8bc3-1355cd7d0ca8)

Re-enable Data Guard (Primary site) host1 January 17,2025 23:04:37 UTC January 17, 2025 23:04:43 UTC Success

(Host: host1/Job ID: fb4a7055-0049-4d44-a726-0871ed54ca07)

Create Data Guard status (Primary host1 January 17,2025 23:04:43 UTC January 17, 2025 23:04:54 UTC Success

site) (Host: host1/Job ID: 5aca5c16-632f-488b-

aade-1c677030c81d)

Create Data Guard status (Standby host1 January 17,2025 23:04:54 UTC January 17, 2025 23:05:07 UTC Success

site) (Host: standby1/Job ID: 5f0c5460-4c38-4aed-8a5b-e70c0ca70df8)

Validate configure primary request host1 January 17,2025 23:05:07 UTC January 17, 2025 23:05:13 UTC Success

(Primary site) (Host:host1/Job

ID:

5ac64b32-5da6-48dfb8cc-020853363695)

Validate configure standby request host1 January 17,2025 23:05:13 UTC January 17, 2025 23:05:21 UTC Success

(Standby site) (Host: standby2/Job

ID:

81aa6900-4460-408e-9ab2-

fdcd92c8b7bf)

Uploading Primary DB Password File host1 January 17,2025 23:05:21 UTC January 17, 2025 23:05:32 UTC Success (Standby

site)

Configure primary database (Primary host1 January 17,2025 23:05:32 UTC January 17, 2025 23:06:14 UTC Success

site) (Host: host1/Job ID: c78a8072-8023-4278-

c/8a80/2-8023-42/8bd94-3dd1ef97e066)

Configure standby request (Standby host1 January 17,2025 23:06:14 UTC January 17, 2025 23:07:43 UTC Success

site) (Host: standby2/Job ID:

46274a35-bb06-43a9-

a8a5-66dc4d163463)

Create archive log restore (Primary host1 January 17,2025 23:07:43 UTC January 17, 2025 23:08:15 UTC Success

site) (Host: host1/Job ID:

2b20aaa2-fcb7-4bc5b501-27ad9d45f34b)

Configure standby TNS entry (New host1 January 17,2025 23:08:15 UTC January 17, 2025 23:08:24 UTC Success

standby site) (Host: standby2/Job

ID:

7e32db8c-999c-44fa-bdf5-3aed77c9590c)

Configure standby TNS entry (Existing host1 January 17,2025 23:08:24 UTC January 17, 2025 23:08:28 UTC Success

standby site) (Host: standby1/Job

ID:

6a44539e-d5b9-4c45-ad2c-7bff8c871e37)

Add standby database (Primary site) host1 January 17,2025 23:08:28 UTC January 17, 2025 23:09:50 UTC Success

(Host: host1/Job ID: 1d7c6c93-bd85-496a-bb7d-67ae7b224d58)

Enable Flashback (Standby site) (Host: host1 January 17,2025 23:09:50 UTC January 17, 2025 23:10:03 UTC Success

standby2/Job ID:

4a6b8623-

efc0-4016-80be-305b0ed56363)

Re-enable Data Guard (Primary site) host1 January 17,2025 23:10:03 UTC January 17, 2025 23:10:09 UTC Success

(Host: host1/Job ID: 2afea759-752a-42a4-a077-bd85d4b687a3)

Update Data Guard status (Primary host1 January 17,2025 23:10:09 UTC January 17, 2025 23:10:35 UTC Success

site) (Host: host1/Job ID:

11d93988-ea4d-4e37-af30-763c2522693d)

Create Data Guard status (New standby host1 January 17,2025 23:10:35 UTC January 17, 2025 23:10:53 UTC Success

site) (Host: standby2/Job ID:

aa5b286f-30f1-48d1-8c2d-2490d15ce408)

Update Data Guard status (Existing host1 January 17,2025 23:10:53 UTC January 17, 2025 23:11:06 UTC Success

```
standby site) (Host: standby1/JobID: 7d8ffa16-6785-468a-bff9-baf8e13b38ec)
```

## Example 17-130 Configuring Oracle Data Guard using JSON file

```
# /opt/oracle/dcs/bin/odacli configure-dataguard --requestjson /mnt/host1/
nfsbackup/dgcmd.json
Number of standby databases (enter 1 or 2 | default: 1):
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Primary database SYS password:
*******************
Standby database's SYS password will be set to Primary database's after Data
Guard configuration. Ignore warning and proceed with Data Guard
configuration? (Y/N, default:N): Y
  "jobId": "73adf616-3b6c-452f-bf93-e95abc675cc5",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "January 23, 2025 05:08:50 AM UTC",
  "resourceList" : [ ],
  "description" : "DG Config service for DB tdb",
  "updatedTime" : "January 23, 2025 05:08:50 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@host1 work]# /opt/oracle/dcs/bin/odacli describe-job -i
73adf616-3b6c-452f-bf93-e95abc675cc5
Job details
                  ID: 73adf616-3b6c-452f-bf93-e95abc675cc5
           Description: DG Config service for DB tdb
               Status: Success
              Created: January 23, 2025 05:08:50 UTC
              Message:
Task Name
                                    Start
Time
                               End Time
Status
______
-----
Validate configure primary request
                                   January 23, 2025 05:09:19
             January 23, 2025 05:09:30 UTC
                                                 Success
(Primary site) (Host:
host1/Job
ID:
7bd1a3d5-2f8c-4d9e-
a381-61d04f01b514)
```

```
Validate configure standby request January 23, 2025 05:09:30
            January 23, 2025 05:09:43 UTC
                                                Success
(Standby site)
(Host:
host2/Job
ID:
18731cf2-bf42-4a3a-
b187-17e93cedbb7c)
Uploading Primary DB Password File January 23, 2025 05:09:43
    January 23, 2025 05:10:03 UTC Success
(Standby
site)
Configure primary database (Primary January 23, 2025 05:10:03
UTC January 23, 2025 05:11:35 UTC
                                                Success
site) (Host: host1/Job
ID:
d3030fe0-8885-42d6-a57f-
ae38baef54af)
Configure standby request (Standby January 23, 2025 05:11:35
            January 23, 2025 05:13:35 UTC
UTC
                                                Success
site)
(Host:
host2/Job
ID:
763881f4-ea4d-43bc-8e6a-
c7f78765c0ff)
Create archive log restore (Primary January 23, 2025 05:13:35
UTC January 23, 2025 05:13:54 UTC
                                                Success
site) (Host: host1/Job
ID:
5dfbe653-10c8-420f-
bada-4c0c8cb6a9e1)
Configure and enable Data Guard January 23, 2025 05:13:54
    January 23, 2025 05:15:26 UTC
(Primary site) (Host:
host1/Job
ID:
137d29a2-9d2c-4ddc-85c8-3a729847e188)
Enable Flashback (Standby site) (Host: January 23, 2025 05:15:26
UTC
         January 23, 2025 05:15:44 UTC
host2/Job
```

```
ID:
70306983-40a2-4039-98cb-57ba5e11e9a5)
Re-enable Data Guard (Primary site) January 23, 2025 05:15:44
              January 23, 2025 05:15:50 UTC
                                                      Success
(Host: host1/Job
ID:
4a5fb2aa-1b0b-45c8-
b2f3-95103c9f1f00)
Create Data Guard status (Primary January 23, 2025 05:15:50
              January 23, 2025 05:15:56 UTC
                                                       Success
site) (Host: host1/Job
TD.
6848b9c1-356f-43ff-
b6e0-5e9b1b01fc53)
Create Data Guard status (Standby
                                        January 23, 2025 05:15:56
              January 23, 2025 05:16:09 UTC
site)
(Host:
host2/Job
ID:
3109148f-9ef8-4914-ab43-adab4851e126)
```

# **Example 17-131** Sample JSON for configuring Oracle Data Guard with two standby databases

To configure two standby databases using JSON file, you must specify two replicationGroups sections, where sourceEndpoints corresponds to the information about the primary database and targetEndPoints in each replicationGroups section corresponds to each standby database. For example:

```
"hostName": "host name",
      "listenerPort": 1521
 ],
  "targetEndPoints": [
      "databaseUniqueName": "bvmdb1",
      "ipAddress": "xx.xx.xx.xx",
      "hostName": "host_name,
      "listenerPort": 1521
 ],
  "transportType": "ASYNC"
},
  "sourceEndPoints": [
     "databaseUniqueName": "vmdb1",
      "ipAddress": "xx.xx.xx.xx",
      "hostName": "host_name",
      "listenerPort": 1521
 ],
  "targetEndPoints": [
      "databaseUniqueName": "avmdb1",
      "ipAddress": "xx.xx.xx.xx",
      "hostName": "host name",
      "listenerPort": 1521
  "transportType": "ASYNC"
```

## odacli deconfigure-dataguard

Use the command odacli deconfigure—dataguard to deconfigure Oracle Data Guard on Oracle Database Appliance.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli deconfigure-dataguard [-h] [-j] -i [-f]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

Parameter	Description
json, -j	(Optional) Displays JSON output. The default is false.
id,-i	Specifies the Oracle Data Guard Configuration ID.
force, -f	Forces the deconfiguration of Oracle Data Guard.

#### **Usage Notes**

For deconfiguring Oracle Data Guard, you must specify the Oracle Data Guard Configuration ID. Run the odacli list-dataguardstatus command to find the Oracle Data Guard Configuration ID.

#### Example 17-132 Deconfiguring Oracle Data Guard with one standby database

```
# /opt/oracle/dcs/bin/odacli deconfigure-dataguard --id "ee22f382-b04e-4658-
a6c7-ab00fc7e3270"
Number of standby databases (enter 1 or 2 | default: 1):
Standby 1 site address: standby1
BUI username for Standby site standby1. If Multi-user Access/Multi-user
Access Passwordless is not enabled on Standby site standby1, enter 'oda-
admin'; otherwise, enter the name of the user who has irestored the Standby
database (default: oda-admin): oda-admin
BUI password for Standby site standby1:
Password for root user on Standby site standby1:
Standby database will be deleted after Data Guard configuration is removed.
Ignore warning and proceed with Data Guard deconfiguration? (Y/N): Y
  "jobId": "0613c649-3da6-463a-8359-2f6d7d17399b",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp" : "January 23, 2025 03:42:41 AM UTC",
  "resourceList" : [ ],
  "description" : "DG Deconfig service",
  "updatedTime" : "January 23, 2025 03:42:41 AM UTC",
  "jobType" : null,
  "cpsMetadata" : null
[root@n1 oda]# /opt/oracle/dcs/bin/odacli describe-job -i
0613c649-3da6-463a-8359-2f6d7d17399b
Job details
                     ID: 0613c649-3da6-463a-8359-2f6d7d17399b
            Description: DG Deconfig service
                Status: Success
                Created: January 23, 2025 03:42:41 UTC
                Message:
Task Name
                                         Start
Time
                                   End Time
```

```
._____ ___
De-configure Dataguard (Primary site) January 23, 2025 03:42:44
             January 23, 2025 03:44:22 UTC
(Host: phxdbfzp22/Job
ID:
93758e42-2cf4-4aa1-949e-
b6018c1c35d7)
Delete Dataguard Status (Primary site) January 23, 2025 03:44:22
             January 23, 2025 03:44:28 UTC
                                                  Success
(Host: phxdbfzp22/Job
ID:
e090af71-9c6d-4d14-8e16-3c64c4aa7f14)
Delete Dataguard Status(Standby site) January 23, 2025 03:44:28
UTC
             January 23, 2025 03:44:36 UTC
                                                  Success
(Host:
standby1
/Job
ID:
a5bf022a-
c1ca-4c1a-8747-4ff6a0e938c0)
Delete Standby Database (Standby site) January 23, 2025 03:44:36
             January 23, 2025 03:46:07 UTC
(Host:
standby1
/Job
ID:
f93b1f26-69d9-4690-84f9-4c0c9947423a)
```

## odacli describe-dataguardstatus

Use the command odacli describe-dataguardstatus to view Oracle Data Guard status on Oracle Database Appliance.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli describe-dataguardstatus -i [-h] [-j] [-s]

#### **Parameters**

Parameter	Description
id, -i	(Mandatory) Specifies the Oracle Data Guard Status ID.
synchronous, -s	(Optional) Obtains the latest Oracle Data Guard status synchronously.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.

#### **Usage Notes**

### **Example 17-133** Viewing Oracle Data Guard configuration status

```
# odacli describe-dataguardstatus -i 1b13fddf-1648-44e9-b928-7aa6b36b783f -j
  "id": "1b13fddf-1648-44e9-b928-7aa6b36b783f",
  "name" : "dgname",
  "databaseId": "216697dd-c590-4807-8e15-98afc8624fa4",
  "protectionMode" : "MAX PROTECTION",
  "role" : "STANDBY",
  "replicationGroups" : [ {
    "sourceEndPoints" : [ {
      "endpointType" : "PRIMARY",
      "databaseUniqueName" : "ctest",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "n1",
      "listenerPort" : 1521,
      "serviceName" : "serice name",
      "sysPassword" : null,
      "openMode" : null,
      "state" : {
        "status" : "ENABLED"
      }
    } ],
    "targetEndPoints" : [ {
     "endpointType" : "STANDBY",
      "databaseUniqueName" : "ptest",
      "ipAddress" : "xx.xx.xx.xx",
      "hostName" : "n2",
      "listenerPort" : 1521,
      "serviceName" : "pservice name",
      "sysPassword" : null,
      "openMode" : "READ ONLY WITH APPLY",
      "state" : {
        "status" : "ENABLED"
    } ],
    "transportType" : "SYNC",
    "applyLag" : "0 seconds",
    "transportLag" : "0 seconds",
    "approximateRoleTransitionTime" : "30 seconds",
```

```
"applyRate" : "3.00 KByte/s"
}, {
  "sourceEndPoints" : [ {
   "endpointType" : "PRIMARY",
    "databaseUniqueName" : "ctest",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "n1",
    "listenerPort" : 1521,
    "serviceName" : "servic nae",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "targetEndPoints" : [ {
   "endpointType" : "STANDBY",
   "databaseUniqueName" : "dtest",
    "ipAddress" : "xx.xx.xx.xx",
    "hostName" : "host name",
    "listenerPort" : 1521,
   "serviceName" : "service name",
    "sysPassword" : null,
    "openMode" : null,
    "state" : {
      "status" : "ENABLED"
  } ],
  "transportType" : "ASYNC",
  "applyLag" : "0 seconds",
  "transportLag" : "0 seconds",
  "approximateRoleTransitionTime" : "30 seconds",
  "applyRate" : "15.00 KByte/s"
"observers" : [ ],
"createTime" : "November 22, 2024 23:47:13 CET",
"state" : {
  "status" : "CONFIGURED"
"updatedTime" : "November 23, 2024 00:12:24 CET"
```

## odacli failover-dataguard

Use the command odacli failover-dataguard on the standby system to failover the Oracle Data Guard primary database to the standby database. Oracle Data Guard operations such as switchover, failover, and reinstate can be run in parallel for different Oracle Data Guard configurations.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

# odacli failover-dataguard [-h] [-j] [-i] [-u] [-du]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
id, -i	Specifies the Oracle Data Guard Status ID.
databaseUniqueName, -u	Specifies the unique name of the database to failover to.
db-user, -du	(Optional) Specifies the database user. The default is SYS.

## **Usage Notes**

After performing the failover, view the status with the <code>odacli list-dataguardstatus</code> command.

## Example 17-134 Performing Failover Oracle Data Guard

# odacli failover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u houdg02

# odacli list-dataguardstatus

Use the command odacli list-dataguardstatus to verify Oracle Data Guard status on both primary and standby databases.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

# odacli list-dataguardstatus [-s] [-h] [-j]

#### **Parameters**

Parameter	Description
synchronous, -s	(Optional) Obtains the latest Oracle Data Guard status synchronously.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**



#### Example 17-135 Viewing Oracle Data Guard status on primary and standby databases

## odacli reinstate-dataguard

Use the command odacli reinstate-dataguard on the new primary system to reinstate a failed primary database after a failover and convert it to a new standby database. Oracle Data Guard operations such as switchover, failover, and reinstate can be run in parallel for different Oracle Data Guard configurations.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli reinstate-dataguard [-h] [-j] [-i] [-u] [-du]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.
id,-i	Specifies the Oracle Data Guard Status ID.
databaseUniqueName, -u	(Optional) Specifies the unique name of the database to reinstate.
db-user, -du	(Optional) Specifies the database user. The default is SYS.

#### **Usage Notes**

After completing the reinstate operation, view the status with the <code>odacli list-dataguardstatus</code> command.

#### Example 17-136 Performing reinstate operation on Oracle Data Guard

# odacli reinstate-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u houdg02

# odacli register-dataguard

Use the command odacli register-dataguard to register Oracle Data Guard with Oracle Database Appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli register-dataguard [-h] [-j] [-r json input file]

#### **Parameters**

Parameter	Description
requestjson,-r	Specifies the JSON input for creation of Oracle Data Guard configuration in the advanced option.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

# odacli switchover-dataguard

Use the command odacli switchover-dataguard on the primary system to reverse the Oracle Data Guard primary and standby database roles on Oracle Database Appliance. Oracle Data Guard operations such as switchover, failover, and reinstate can be run in parallel for different Oracle Data Guard configurations.

## File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

# odacli switchover-dataguard [-h] [-j] [-i] [-u] [-du]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.
id,-i	Specifies the Oracle Data Guard Status ID.
databaseUniqueName, -u	(Optional) Specifies the unique name of the database to switchover to.
db-user, -du	(Optional) Specifies the database user. The default is SYS.



#### **Usage Notes**

After performing the switchover, view the status with the odacli list-dataguardstatus command.

## Example 17-137 Switching over Oracle Data Guard

# odacli switchover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u houdg02

## odacli CPU Core Commands

Use the CPU Core commands to enable CPU cores and display current and historical CPU core configurations.

## odacli list-cpucores

Use the odacli list-cpucores command lists the history of core configuration changes in the system.

## odacli describe-cpucore

Use the <code>odacli describe-cpucore</code> command to display the current core configuration and the modification date and time.

### odacli modify-cpucore

Use the odacli modify-cpucore command to enable the number of CPU cores in the system.

## odacli list-cpucores

Use the odacli list-cpucores command lists the history of core configuration changes in the system.

#### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli list-cpucores [-h]

## **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

## Example 17-138 Displaying a List of Cores

# odacli list-cpucores

Node	Cores	Modified	Job Status
0	10	July 22, 2016 12:06:08 PM SGT	Configured
0	8	July 25, 2016 9:39:59 AM SGT	Configured



# odacli describe-cpucore

Use the <code>odacli describe-cpucore</code> command to display the current core configuration and the modification date and time.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli describe-cpucore [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

## **Example 17-139 Displaying the Current Core Configuration**

# odacli describe-cpucore

Node	Cores	Modified					Job	Status	
0	8	July 25.	2016	9:39:59	AM	SGT	Conf	figured	

# odacli modify-cpucore

Use the <code>odacli modify-cpucore</code> command to enable the number of CPU cores in the system.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli modify-cpucore -c cores [-j] [-h]

## **Parameters**

Parameter	Description
cores, -c	Defines the number of cores to be enabled in the system.
help,-h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

The number of cores you enable must be a multiple of 2.



- After the initial configuration, you cannot reduce the number of cores. You can only increase the number of cores.
- When you run the command, you are prompted to confirm the operation with the following message:

```
Modifying the enabled number of CPU requires a reboot of all nodes in the ODA system. Are you sure you want to proceed with this operation? (Y/N):
```

 Nodes are restarted after modifying the cores in the BIOS. Note this results in database outage as all the nodes in the cluster are restarted at the same time. Once the system is restarted, the system is updated with the correct number of cores.

#### Example 17-140 Enabling CPU Cores

The following command enables 8 CPU cores.

```
# odacli modify-cpucore -c 32
Modifying the enabled number of CPU requires a reboot of all nodes in the ODA
system. Are you sure you want to proceed with this operation? (Y/N): y
  "jobId": "la59d182-79f0-4847-81e6-ab3ebf779096",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp": "March 8, 2025 10:29:37 AM UTC",
  "resourceList" : [ ],
  "description" : "CPU cores service update",
  "updatedTime": "March 8, 2025 10:29:37 AM UTC"
WARNING: Reducing the number of enabled cores may set offline any of the CPUs
used by a CPU Pool. Thus, please review the status of all the CPU Pools after
this operation using the 'describe-cpupool' command. In case of any CPU from
a CPU Pool was offline please run 'modify-cpupool' to update the list of CPUs
and use only online CPUs.
WARNING: All the nodes in this ODA system will reboot after this operation
```

## odacli CPU Pool Commands for Bare Metal and KVM

Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.

CPU pools enable management of CPU resources in both bare metal and KVM environments. There are two types of CPU pools, that is, BM and VM.

Use the BM CPU pool to ensure that the database on a bare metal host runs exclusively on the CPUs specified in the CPU pool.

Use the VM CPU pools to cage and manage CPU resource allocations to workloads for virtual machines. Workloads are isolated by creating CPU pools and assigning or pinning virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.

#### odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## · odacli list-cpupools

Use the odacli list-cpupools command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

### odacli describe-cpupool

Use the odacli describe-cpupool command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli modify-cpupool

Use the odacli modify-cpupool command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli delete-cpupool

Use the odacli delete-cpupool command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli list-auditrecords

Use the <code>odacli list-auditrecords</code> command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli describe-auditrecord

Use the <code>odacli describe-auditrecord</code> command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## **Syntax**

```
odacli create-cpupool -n name -c number_of_cores {-bm|-vm} [-nn node_name] [-s socket]
[-dbs] [-urc] [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the CPU Pool name.
cores, -c	Specifies the CPU Pool cores.
bm, -bm	(Optional) Specifies the CPU Pool as Bare Metal.
vm, -vm	(Optional) Specifies the CPU Pool as Virtual Machine.
dbsystem, -dbs	(Optional) Specifies the CPU Pool type as DB System.
socket, -s	(Optional) Specifies the socket to use. If not specified, then use all available sockets.



Parameter	Description
use-reserved-cores, -	(Optional) Specifies to use reserved CPU cores.
node-name, -nn	(Optional) Specifies the node where the CPU Pool will be created. On High-Availability deployment, if this option is not specified, then the CPU pool is created on both nodes.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

- Attach the BM CPU pool to databases. Bare metal CPU pools can be assigned to multiple databases.
- Attach VM CPU pool VM to guest machines. VM CPU pools can be assigned to multiple VMs.
- Attach dbsystem CPU pool to DB systems. dbsystem CPU pool can be assigned to
  multiple DB systems. After you create a dbsystem CPU pool, you can create a new DB
  system with this CPU pool by adding the new CPU pool parameter in the create-dbsystem
  json file, or modify-dbsystem to attach CPU pool to an existing DB system.
- Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.
- After you create a BM CPU pool, you can associate this CPU pool to a database using the create-database or modify-database command.
- After you create a VM CPU pool, you can associate this CPU pool to a VM using the create-vm or modify-vm command.
- Number of cores must be an even number between 2 and the total number of available cores on the system.
- By default, a CPU in the CPU pool is allocated across two sockets in release 19.12 and later. Optionally, you can choose to allocate the CPU based on the socket number (0 or 1). This is especially useful to support Standard Edition licensing. It is recommended that you use the default allocation and do not mix two types of allocation.
- By default, the first core of the socket is reserved and cannot be used by the VM and DB system CPU pools for optimal performance. Use the --use-reserved-cores option to enable use of the first core of socket for VM and DB system CPU pools.

#### **Example**

Create a BM CPU pool named cpupool1 with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool1 -c 6 -bm
```

Create a VM CPU pool named cpupool2 with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool2 -c 6 -vm
```

Create a DB System CPU pool named cpupool3 with 6 cores associated to it.

# odacli create-cpupool -n cpupool3 -c 6 -dbs



Create a DB System CPU pool named cpupool4 with 4 cores of CPUs allocated from socket 0.

```
# odacli create-cpupool -n cpupool4 -dbs -s 0 -c 4
```

# odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

```
odacli remap-cpupools -f -urc [-j] [-h]
```

#### **Parameters**

Parameter	Description		
force, -f	(Optional) Specifies to force the operation.		
use-reserved-cores,-j	(Optional) Specifies to use reserved CPU cores.		
json,-j	(Optional) Displays output in JSON format.		
help, -h	(Optional) Displays help for using the command.		

#### **Usage Notes**

If the odacli remap-cpupools command fails with the error DCS-10001:Internal error encountered: Not enough physical CPUs available for CPU Pool 'cpupool\_name' on node 'node\_name', run the odacli remap-cpupools command again with the --use\_reserved-cores option.

Use the --force option to remap CPU pools even if the CPU pool is marked as NUMA-enabled. You must use odacli remap-cpupools command, after updating the bare metal CPU cores with the command odacli modify-cpucores for CPU core number changes.

By default, the first core of the socket is reserved and cannot be used by the VM and DB system CPU pools for optimal performance. Use the --use-reserved-cores option to enable use of the first core of socket for VM and DB system CPU pools.

#### **Example**

# odacli remap-cpupools

## **Related Topics**

odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).



## odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## odacli list-cpupools

Use the odacli list-cpupools command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

### **Syntax**

odacli list-cpupools [-j] [-h]

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays output in JSON format.
help,-h	(Optional) Displays help for using the command.

#### **Example**

# odacli list-cpupools

## odacli describe-cpupool

Use the odacli describe-cpupool command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

### **Syntax**

odacli describe-cpupool -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the name of the CPU Pool.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## Example: Describing a CPU pool named cpupool1

# odacli describe-cpupool -n cpupool1

## odacli modify-cpupool

Use the odacli modify-cpupool command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

odacli modify-cpupool -n name -c cores -f -l [-j] [-h]



#### **Parameters**

Parameter	Description
name, -n	Specifies the CPU Pool name
cores, -c	Specifies the new number of CPU cores
force, -f	(Optional) Forces the operation
live, -l	(Optional) Applies the changes to running VMs
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

For VM CPU pool, if --live is not specified, then the changes are applied to the VM configuration file and will be activated next time the VM is started. If --live is specified, then the changes will be applied to both VM configuration file and to the running VM.

## **Example**

Set the size of a CPU Pool <code>cpupool1</code> to 10. If --live is not specified, the change is applied to the VM configuration file and will be activated next time the VM is started.

# odacli modify-cpupool -n cpupool1 -c 10

## odacli delete-cpupool

Use the odacli delete-cpupool command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli delete-cpupool -n name -f [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the CPU Pool name to be deleted
force, -f	(Optional) Forces deletion.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example**

Delete a CPU pool named cpupool1.

# odacli delete-cpupool -n cpupool1



# odacli list-auditrecords

Use the odacli list-auditrecords command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## **Syntax**

odacli list-auditrecords -du dcs-username -f from\_date-range -l latest -nn node\_name - ot operation\_type -ou OS\_username -rn resource\_name -rt resource\_type -t to\_date-range [-j] [-h]

## **Parameters**

Parameter	Description
dcs-user, -du	(Optional) Specifies the DCS user name.
from, -f	(Optional) Specfies the <i>from</i> date in the date range for the CPU pool audit records.
latest, -l	(Optional) Specifies the latest number of CPU pool audit records.
node-name, -nn	(Optional) Specifies the node name.
op-type, -ot	(Optional) Specifies the type of operation.
os-user, -ou	(Optional) Specifies the operating system user.
rsc-name, -rn	(Optional) Specifies the resource name.
rsc-type, -rt	(Optional) Specifies the resource type.
to, -t	(Optional) Specfies the <i>to</i> date in the date range for the CPU pool audit records.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example**

<pre># odacli list-auditrecords</pre>		
ID	esource type	Resource name
Operation type DCS username OS use	ername Timestam	ρ
41295d99-f263-4284-b6d9-2aff1ae0f850 BM	1_CPU_POOL	testbmpool
CREATE oda-admin root	2020-10-0	08 13:27:05 UTC
0f07a013-5bb4-4cd8-bd49-04dc61fcd454 BM	1_CPU_POOL	pool_9f74a8e9-
DELETE oda-admin root	2020-10-0	08 12:26:30 UTC
d858269b-6c28-4bc2-af71-79004f3561e6 BM	1_CPU_POOL	pool_9f74a8e9-
CREATE oda-admin root	2020-10-0	08 12:24:36 UTC
9d7852c1-93fb-410e-9e0c-8c0a95ed3f0c VM	1_CPU_POOL	pool_d48e81e4-
DELETE oda-admin root	2020-10-0	08 12:06:45 UTC
0235cc84-9345-40bc-ac4f-7de3f63202e2 VM	1_CPU_POOL	pool_4fe0b4f4-
DELETE oda-admin root	2020-10-0	08 12:06:45 UTC
762f7263-7bd9-4b12-b891-48305165bf36 VM	1_CPU_POOL	pool_4fe0b4f4-
MODIFY oda-admin root	2020-10-0	08 12:06:22 UTC
0bd2a25d-2327-4918-bd47-8c00f7406f92 VM	1_CPU_POOL	pool_4fe0b4f4-
MODIFY		_



## odacli describe-auditrecord

Use the odacli describe-auditrecord command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

```
odacli describe-auditrecord -i [-j] [-h]
```

#### **Parameters**

Parameter	Description
id, -i	Describes the ID of the audit record.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

```
# odacli describe-auditrecord -i 41295d99-f263-4284-b6d9-2aff1ae0f850
Audit Record details
Event details
               Record ID: 41295d99-f263-4284-b6d9-2aff1ae0f850
        Record timestamp: 2020-10-08 13:27:05 UTC
            DCS username: oda-admin
             OS username: root
              Cluster ID: test_cluster-c
                 Node ID: test_cluster
Resource/Operation
           Resource type: BM CPU POOL
             Resource ID: b17cb623-bf79-491f-86d8-d8502987e26c
           Resource name: testbmpool
          Operation type: CREATE
   Operation description: Created with '2' cores and allocation
'test cluster:1-2,17-18'
```

## odacli Database Commands

Use the odacli database commands to perform database lifecycle operations.

odacli clone-database

Use the <code>odacli clone-database</code> command to clone a new database from a source database.

odacli create-database

Use the odacli create-database command to create a new database.

odacli delete-database

Use the odacli delete-database command to delete a database.

odacli describe-database

Use the odacli describe-database command to display database details.

#### odacli list-databases

Use the odacli list-databases command to list all databases on the appliance.

## · odacli modify-database

Use the odacli modify-database command to modify the configuration of a database, such as backup configuration, database class, and database type, and to change TDE wallet management from EXTERNAL to ODA.

#### · odacli move-database

Use the command odacli move-database to move a database from one Oracle home to another home of the same database version.

#### odacli register-database

Use the odacli register-database command to register a migrated database with the appliance.

#### odacli upgrade-database

You can use the odacli upgrade-database command to upgrade a database from a supported release.

## odacli clone-database

Use the odacli clone-database command to clone a new database from a source database.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli clone-database [-u] [-n] [-dh] [-nh] [-ro] [-s] [-t] [-j] [-f] [-nn] [-p] [-h] [-ha|-no-ha] [-cp]

## **Parameters**

Parameter	Description
databaseUniqueName, -u	Defines a unique name for the database.
dbname, -n	Defines the name given to the new database (dbname.)
dbhomeid, -dh	Specifies the database home ID of the new database.
newhome, -nh	Specifies that a new database home must be created.
readonly, -ro	(Optional) Specifies to open the database in read-only mode.
dbshape, -s	(Optional) Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is odb1.
dbtype, -t [RAC RACOne SI]	(Optional) Defines the database type. The default database type is the source database type, if the option is not specified. For high-availability deployments, the values can be RAC RACOne SI, with the default as RAC. For single-node deployments, the value is SI.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output.

Parameter	Description
sourcedbname, -f	Specifies the name of the source database
associated-networks,-nn	(Optional) Specifies the associated network names (in the format networkName1,networkName2,).
disable-ha,-no-ha	(Optional) Disables High Availability for single-instance Oracle Database 19c and later.
enable-ha,-ha	(Optional) Enables High Availability for single-instance Oracle Database 19c and later.
cpupool, -cp	(Optional) Specifies the CPU pool name.
tdepassword, -p	(Optional) Specifies the TDE password of the source database.

## **Usage Notes**

- The source database must be up and running.
- The source database must be opened in either read-write mode, or read-only mode if it is a primary database. A standby database can be in mounted or read-only open mode.
- The source database must use Oracle ACFS storage.
- The source database must not be a multitenant container database (CDB)
- If -cp parameter is provided as part of the command, cloned database is associated with the particular CPU pool.
- If -cp parameter is not provided as part of the command, and if the parent database has an associated CPU pool, then the cloned database is also associated with the same CPU pool as that of parent database.
- If -cp parameter is not provided as part of the command, and if the parent database does
  not have any associated CPU pool, then the cloned database is also not associated with
  any CPU pool.
- All data files of the source database must be in the same Oracle ACFS directory.

## Example 17-141 Cloning a Database in a new database home

# odacli list-databases

ID			DB Nai	me DB	Туре	DB
Version	CDB	Class	Shape	Storage	Sta	atus
DbHomeID						
bb06935b-384d-	-482f-b494-45d	l368d2122a	mydb	SI		
19.16.0.0.220	719 true	OLTP	odb1	ACFS		CONFIGURED
542032e5-a76c-	-4d66-92e1-bb2	97ec6192d				
a03b5971-bee5-	-4d9a-b003-009	df6f018f6	prima	ry SI		
19.16.0.0.220	719 false	OLTP	odb1	ACFS		CONFIGURED
618b26d7-a49b-	-452f-a14b-cfc	:2c79d0555				
a5173f68-6b5c-	-491f-b8b4-05b	ce0e7ec20	chome	1 SI		
19.16.0.0.220	719 false	OLTP	odb1	ACFS		CONFIGURED
6339e2fc-7ae7	-4de2-ac3c-9f5	b2eaec131				



# odacli list-dbhomes

ΙD Name DB

Version Home Location Status

542032e5-a76c-4d66-92e1-bb297ec6192d OraDB19000 home1

/u01/app/odaorahome/oracle/product/ 19.16.0.0.220719

19.0.0.0/dbhome 1 CONFIGURED 

19.16.0.0.220719 /u01/app/odaorahome/oracle/product/

19.0.0.0/dbhome 2 CONFIGURED

618b26d7-a49b-452f-a14b-cfc2c79d0555 OraDB19000 home3

19.16.0.0.220719 /u01/app/odaorahome/oracle/product/

19.0.0.0/dbhome 3 CONFIGURED

# odacli clone-database -n chome4 -u chome4 -f primary -nh

Enter SYS user password: Retype SYS user password:

Job details

ID: f3052b47-e9b6-4825-bef3-91635db4f255

Description: Snap Database service creation with db name: chome4

Status: Created

Created: August 4, 2022 12:23:41 PM UTC

Message:

Task Name Start Time

End Time Status

# odacli describe-job -i f3052b47-e9b6-4825-bef3-91635db4f255

Job details

ID: f3052b47-e9b6-4825-bef3-91635db4f255

Description: Snap Database service creation with db name: chome4

Status: Success

Created: August 4, 2022 12:23:41 PM UTC

Message:

Task Name Start Time

End Time Status

August 4, 2022 12:24:00 PM UTC Validate HugeSpaces

August 4, 2022 12:24:00 PM UTC Success

Validate source database August 4, 2022 12:24:00 PM UTC

August 4, 2022 12:24:11 PM UTC Success

Setting up ssh equivalance August 4, 2022 12:24:11 PM UTC

August 4, 2022 12:24:12 PM UTC Success

Creating volume rdochome4 August 4, 2022 12:24:12 PM UTC

August 4, 2022 12:24:28 PM UTC	Succe		4	0000	10 04 00	D14	
Creating ACFS filesystem for RECO August 4, 2022 12:24:46 PM UTC	Cuan	_	4,	2022	12:24:28	PM	UTC
Database home creation	Succe		1	2022	12:24:46	DM	TITC
August 4, 2022 12:28:06 PM UTC	Succe				New task	I M	UIC
Creating ACFS database home	bucce				12:24:46	РM	TITC
August 4, 2022 12:24:46 PM UTC	Succe				New task	111	010
Validating dbHome available space	bucce				12:24:46	PM	UTC
August 4, 2022 12:24:46 PM UTC	Succe				New task		010
Creating DbHome Directory					12:24:46	PM	UTC
August 4, 2022 12:24:46 PM UTC	Succe				New task		
Create required directories		August	4,	2022	12:24:46	PM	UTC
August 4, 2022 12:24:46 PM UTC	Succe	ess <===			New task		
Extract DB clone		August	4,	2022	12:24:46	PM	UTC
August 4, 2022 12:26:14 PM UTC	Succe	ess <===			New task		
ProvDbHome by using RHP		August	4,	2022	12:26:14	PM	UTC
August 4, 2022 12:27:43 PM UTC	Succe	ess <===			New task		
Enable DB options					12:27:43	PM	UTC
August 4, 2022 12:28:02 PM UTC	Succe	ess <===			New task		
Creating wallet for DB Client		August	4,	2022	12:28:06	PM	UTC
August 4, 2022 12:28:06 PM UTC	Succe	ess <===		====	New task		
Audit directory creation		August	4,	2022	12:28:06	PM	UTC
August 4, 2022 12:28:06 PM UTC	Succe				New task		
Creation of snapshot database		August	4,	2022	12:28:06	PM	UTC
August 4, 2022 12:32:46 PM UTC	Succe	ess					
Removing Disabled Redo Threads		August	4,	2022	12:32:46	PM	UTC
August 4, 2022 12:32:47 PM UTC	Succe						
Creation of SPFile for Shared locat:	ion	August	4,	2022	12:32:50	PM	UTC
August 4, 2022 12:32:56 PM UTC	Succe						
Delete SPFile from local location		August	4,	2022	12:32:56	PM	UTC
August 4, 2022 12:32:56 PM UTC	Succe						
Register DB with clusterware		August	4,	2022	12:32:56	PM	UTC
August 4, 2022 12:34:23 PM UTC	Succe						
Set SysPassword and Create PwFile		-	4,	2022	12:34:23	PM	UTC
August 4, 2022 12:34:27 PM UTC	Succe						
Creating pfile		=	4,	2022	12:34:27	PM	UTC
August 4, 2022 12:34:28 PM UTC	Succe						
Disabling external references		=	4,	2022	12:34:28	PM	UTC
August 4, 2022 12:34:29 PM UTC	Succe		4	0000	10 04 00		
Set CPU pool	•	=	4,	2022	12:34:29	PM	UTC
August 4, 2022 12:34:29 PM UTC	Succe		4	0000	10 05 45	D) (	
Enabling supplemental log data	9		4,	2022	12:35:45	PM	UTC
August 4, 2022 12:35:46 PM UTC	Succe		1	2022	10.25.46	DM	TIMO.
Enabling blockchange tracking	0		4,	2022	12:35:46	PM	UTC
August 4, 2022 12:35:47 PM UTC	Succe		1	2022	10.25.47	DM	TIMO.
Enabling flashback	C	-	4,	2022	12:35:47	PM	UTC
August 4, 2022 12:35:48 PM UTC	Succe		1	2022	10.25.40	DM	TTM C
Copy Pwfile to Shared Storage August 4, 2022 12:35:51 PM UTC	Succe		4,	2022	12:35:48	ΡM	UIC
Create this entry	Succe		1	2022	12.35.51	DM	TITC
August 4, 2022 12:35:52 PM UTC	Succe	=	٦,	2022	12:35:51	L IAI	OIC
Reset Associated Networks	Succe		Δ	2022	12:35:52	рм	וןייר∼
August 4, 2022 12:35:55 PM UTC	Succe	=	-1 <i>(</i>	2022	14.00.04	T 1,1	010
Set log archive dest for Database	Ducce		Δ	2022	12:35:55	рм	וןייר
August 4, 2022 12:35:58 PM UTC	Succe	_	· /	2022	12.00.00	T 1.1	010
1149400 1, 2022 12.00.00 1F1 010	Lucce						

## # odacli list-databases

ID Version DbHomeID	CDB	Class	DB Name Shape St	DB T	= =		
bb06935b-384	1d-482f-b494-4 20719 true 5c-4d66-92e1-k	45d368d2122a e OLTP	mydb odb1	SI ACFS	CONFIGURED		
19.16.0.0.22	e5-4d9a-b003-0 20719 fals 9b-452f-a14b-0	se OLTP	primary odb1	SI ACFS	CONFIGURED		
19.16.0.0.22 6339e2fc-7ae	e7-4de2-ac3c-9	se OLTP 9f5b2eaec131	chome1 odb1	SI ACFS	CONFIGURED		
19.16.0.0.22	0f-4acb-bb93-3 20719 fals 55-4932-8ad6-8	se OLTP	chome4 odb1	SI ACFS	CONFIGURED		
# odacli lis	st-dbhomes						
ID Version			Name Home		DB		
Location			Status				
19.16.0.0.22			OraDB190 /u01/app		1 home/oracle/product/		
19.0.0.0/dbhome_1 CONFIGURED 6339e2fc-7ae7-4de2-ac3c-9f5b2eaec131 19.16.0.0.220719			O DD1 00	OraDB19000_home2 /u01/app/odaorahome/oracle/product/			
				_			
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22	nome_2 CONFIGU 0b-452f-a14b-0 20719	JRED cfc2c79d0555	/u01/app OraDB190	o/odaora 000_home	home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22	nome_2 CONFIGU 0b-452f-a14b-0 20719 nome_3 CONFIGU E5-4932-8ad6-8 20719	JRED cfc2c79d0555 JRED Babe8c93ce46	/u01/app OraDB190 /u01/app OraDB190 /u01/app	o/odaora 000_home 0/odaora 000_home	home/oracle/product/ 3 home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22	nome_2 CONFIGU 0b-452f-a14b-0 20719 nome_3 CONFIGU 55-4932-8ad6-8	JRED cfc2c79d0555 JRED Babe8c93ce46	/u01/app OraDB190 /u01/app OraDB190 /u01/app	o/odaora 000_home 0/odaora 000_home	home/oracle/product/  3 home/oracle/product/ 4		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh	nome_2 CONFIGU 0b-452f-a14b-c 0719 nome_3 CONFIGU 05-4932-8ad6-8 0719 nome_4 CONFIGU scribe-databas	JRED cfc2c79d0555 JRED Babe8c93ce46 JRED <=== New	/u01/app OraDB190 /u01/app OraDB190 /u01/app	o/odaora 000_home 0/odaora 000_home	home/oracle/product/  3 home/oracle/product/ 4		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh	nome_2 CONFIGU 20-452f-a14b-c 20719 nome_3 CONFIGU 55-4932-8ad6-8 20719 nome_4 CONFIGU scribe-databas ails	JRED cfc2c79d0555 JRED Babe8c93ce46 JRED <=== New	/u01/app OraDB190 /u01/app OraDB190 /u01/app DB Home	o/odaora 000_home o/odaora 000_home o/odaora	home/oracle/product/  3 home/oracle/product/  4 home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh	nome_2 CONFIGU 20719 nome_3 CONFIGU 25-4932-8ad6-8 20719 nome_4 CONFIGU scribe-databas ails 	JRED cfc2c79d0555  JRED Babe8c93ce46  JRED <=== New se -n chome4  6bf06951-d89 chome4	/u01/app OraDB190 /u01/app OraDB190 /u01/app DB Home	o/odaora 000_home o/odaora 000_home o/odaora	home/oracle/product/  3 home/oracle/product/  4 home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh	nome_2 CONFIGU Db-452f-a14b-c 20719 nome_3 CONFIGU E5-4932-8ad6-8 20719 nome_4 CONFIGU scribe-databas ails 	JRED cfc2c79d0555  JRED Babe8c93ce46  JRED <=== New Se -n chome4  6bf06951-d89 chome4 chome4	/u01/app OraDB190 /u01/app OraDB190 /u01/app DB Home	o/odaora 000_home o/odaora 000_home o/odaora	home/oracle/product/  3 home/oracle/product/  4 home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh	nome_2 CONFIGU Db-452f-a14b-c 20719 nome_3 CONFIGU E5-4932-8ad6-8 20719 nome_4 CONFIGU scribe-databas ails 	JRED cfc2c79d0555  JRED Babe8c93ce46  JRED <=== New se -n chome4  6bf06951-d89 chome4 chome4 19.16.0.0.22	/u01/app OraDB190 /u01/app OraDB190 /u01/app DB Home	o/odaora 000_home o/odaora 000_home o/odaora	home/oracle/product/  3 home/oracle/product/  4 home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh # odacli des Database det	nome_2 CONFIGU Bb-452f-a14b-c 20719 nome_3 CONFIGU 55-4932-8ad6-8 20719 nome_4 CONFIGU scribe-databas ails Description: DB Name: DB Version: DB Type: DB Role:	JRED cfc2c79d0555  JRED Babe8c93ce46  JRED <=== New  se -n chome4  6bf06951-d89 chome4 chome4 19.16.0.0.22 SI PRIMARY	/u01/app OraDB190 /u01/app OraDB190 /u01/app DB Home	o/odaora 000_home o/odaora 000_home o/odaora	home/oracle/product/  3 home/oracle/product/  4 home/oracle/product/		
19.0.0.0/dbh 618b26d7-a49 19.16.0.0.22 19.0.0.0/dbh 31693275-85f 19.16.0.0.22 19.0.0.0/dbh # odacli des Database det	nome_2 CONFIGUED-452f-a14b-c20719 nome_3 CONFIGUED-4932-8ad6-820719 nome_4 CONFIGUED-4 CON	JRED cfc2c79d0555  JRED Babe8c93ce46  JRED <=== New Se -n chome4  6bf06951-d89 chome4 chome4 19.16.0.0.22 SI PRIMARY scaoda8m002	/u01/app OraDB190 /u01/app OraDB190 /u01/app DB Home	o/odaora 000_home o/odaora 000_home o/odaora	home/oracle/product/  3 home/oracle/product/  4 home/oracle/product/		



Instance Only Database: false

CDB: false

PDB Name:

PDB Admin User Name:

High Availability: false

Class: OLTP
 Shape: odb1
Storage: ACFS

DB Redundancy:

CharacterSet: AL32UTF8
National CharacterSet: AL16UTF16
Language: AMERICAN
Territory: AMERICA

Home ID: 31693275-85f5-4932-8ad6-8abe8c93ce46

<====== OraDB19000 home4

Console Enabled: false

TDE Wallet Management:

TDE Enabled: false

Level 0 Backup Day:

AutoBackup Enabled: false

Created: August 4, 2022 12:23:41 PM UTC

DB Domain Name: example.com
Associated Networks: Public-network

CPU Pool Name:

#### Example 17-142 Cloning a Database in an existing database home

# odacli list-dbhomes

ID Name DB Version Home

Location Home Status

------ ------

-----

19.0.0.0/dbhome 1 CONFIGURED

# odacli create-dbhome -v 19.16.0.0.220719

# odacli describe-job -i e2e73a4a-cb54-4bef-90ba-e6d6aeff594a

Job details

-----

ID: e2e73a4a-cb54-4bef-90ba-e6d6aeff594a

Description: Database Home OraDB19000 home2 creation with

version :19.16.0.0.220719

Status: Success

Created: August 4, 2022 11:00:48 AM UTC

Message: Create Database Home

Task Name Start Time

End Time Status

------

-----

August 4, 2022 11:01:04 AM UTC Setting up ssh equivalance August 4, 2022 11:01:05 AM UTC Success Setting up ssh equivalance August 4, 2022 11:01:05 AM UTC August 4, 2022 11:01:06 AM UTC Success Creating ACFS database home August 4, 2022 11:01:06 AM UTC August 4, 2022 11:01:06 AM UTC Success Validating dbHome available space August 4, 2022 11:01:06 AM UTC August 4, 2022 11:01:06 AM UTC Success Creating DbHome Directory August 4, 2022 11:01:06 AM UTC August 4, 2022 11:01:06 AM UTC Success Create required directories August 4, 2022 11:01:06 AM UTC August 4, 2022 11:01:06 AM UTC Success Extract DB clone August 4, 2022 11:01:06 AM UTC August 4, 2022 11:02:35 AM UTC Success August 4, 2022 11:02:35 AM UTC ProvDbHome by using RHP August 4, 2022 11:04:06 AM UTC Success Enable DB options August 4, 2022 11:04:06 AM UTC August 4, 2022 11:04:25 AM UTC Success Creating wallet for DB Client August 4, 2022 11:04:29 AM UTC August 4, 2022 11:04:29 AM UTC Success # odacli list-dbhomes ID Name Version Home Location Status 542032e5-a76c-4d66-92e1-bb297ec6192d OraDB19000 home1 19.16.0.0.220719 /u01/app/odaorahome/oracle/product/ 19.0.0.0/dbhome 1 CONFIGURED 6339e2fc-7ae7-4de2-ac3c-9f5b2eaec131 OraDB19000 home2 19.16.0.0.220719 /u01/app/odaorahome/oracle/product/ 19.0.0.0/dbhome 2 CONFIGURED # odacli clone-database -n chome1 -u chome1 -f primary -dh 6339e2fc-7ae7-4de2ac3c-9f5b2eaec131 <======= New DB Home OraDB19000 home2 [root@scaoda8m002 bin]# odacli describe-job -i ed76ad28-aff6-47c7-9233-6ef2f7c3e8cd Job details ID: ed76ad28-aff6-47c7-9233-6ef2f7c3e8cd Description: Snap Database service creation with db name: chome1 Status: Success Created: August 4, 2022 12:02:54 PM UTC Message: Task Name Start Time End Time Status Validate HugeSpaces August 4, 2022 12:02:59 PM UTC August 4, 2022 12:03:00 PM UTC Success Validate source database August 4, 2022 12:03:00 PM UTC

August 4, 2022			Success					
Setting up ssh	_		August	4,	2022	12:03:11	PM	UTC
August 4, 2022			Success					
Creating volume			August	4,	2022	12:03:11	PM	UTC
August 4, 2022			Success					
Creating ACFS f	-		August	4,	2022	12:03:27	PM	UTC
August 4, 2022			Success					
Audit directory			_	4,	2022	12:03:45	PM	UTC
August 4, 2022			Success					
Creation of sna			August	4,	2022	12:03:45	PM	UTC
August 4, 2022			Success					
Removing Disabl				4,	2022	12:08:25	PM	UTC
August 4, 2022			Success					
Creation of SPF			on August	4,	2022	12:08:28	PM	UTC
August 4, 2022			Success					
Delete SPFile f			August	4,	2022	12:08:35	PM	UTC
August 4, 2022			Success					
Register DB wit			August	4,	2022	12:08:35	PM	UTC
August 4, 2022			Success					
Set SysPassword			-	4,	2022	12:10:00	PM	UTC
August 4, 2022	12:10:03 PM UTC		Success					
Creating pfile			-	4,	2022	12:10:03	PM	UTC
August 4, 2022			Success					
Disabling exter			-	4,	2022	12:10:04	PM	UTC
August 4, 2022	12:10:06 PM UTC		Success	,	0000	10 10 00		
Set CPU pool	10 10 06 51 555		-	4,	2022	12:10:06	PM	UTC
August 4, 2022			Success	4	0000	10 11 10	D1.6	
Enabling supple	-		=	4,	2022	12:11:18	PM	UTC
August 4, 2022			Success	1	2022	10.11.00	DM	TIMO
Enabling blockc August 4, 2022			Success	4,	2022	12:11:20	РМ	UTC
Enabling flashb				1	2022	12:11:21	DM	TITE C
August 4, 2022			Success	4,	2022	12.11.21	FM	UIC
Copy Pwfile to				1	2022	12:11:22	DM	TITE C
August 4, 2022	_		Success	٦,	2022	12.11.22	E IM	UIC
Create ths entr				Λ	2022	12:11:25	DM	TITTC
August 4, 2022	=		Success	4,	2022	12.11.25	FM	UIC
Reset Associate				Λ	2022	12:11:26	DM	TITC
August 4, 2022			Success	٦,	2022	12.11.20	1 11	010
Set log archive			August	Λ	2022	12.11.20	DM	TITTC
August 4, 2022			Success	٦,	2022	12.11.27	1 11	OIC
August 4, 2022	12.11.52 IM OIC		Duccess					
# odacli list-d	atahases							
" oddoll libe d	acababeb							
ID			DB Name	е	DB '	Type DB		
	CDB C	lass						
DbHomeID			1		- 5 -			
bb06935b-384d-4	82f-b494-45d368							
19.16.0.0.22071			odb1	1	ACFS	CON	FIGU	JRED
542032e5-a76c-4								
a03b5971-bee5-4				_				
19.16.0.0.22071				1	ACFS	CON	FIGU	JRED
618b26d7-a49b-4	52f-a14b-cfc2c7	9d0555	j					

```
a5173f68-6b5c-491f-b8b4-05bce0e7ec20
                                       chome1
                                                 SI
19.16.0.0.220719 false OLTP odb1 ACFS CONFIGURED
6339e2fc-7ae7-4de2-ac3c-9f5b2eaec131 <======= CLONE DB CREATED
SUCCESSFULLY
# odacli describe-database -n chome1
Database details
                    ID: a5173f68-6b5c-491f-b8b4-05bce0e7ec20
           Description: chome1
               DB Name: chome1
            DB Version: 19.16.0.0.220719
               DB Type: SI
               DB Role: PRIMARY
   DB Target Node Name: scaoda8m002
           DB Edition: EE
                  DBID: 2639447957
Instance Only Database: false
                   CDB: false
              PDB Name:
   PDB Admin User Name:
     High Availability: false
                 Class: OLTP
                 Shape: odb1
               Storage: ACFS
         DB Redundancy:
          CharacterSet: AL32UTF8
 National CharacterSet: AL16UTF16
              Language: AMERICAN
             Territory: AMERICA
               Home ID: 6339e2fc-7ae7-4de2-ac3c-9f5b2eaec131
       Console Enabled: false
 TDE Wallet Management:
           TDE Enabled: false
    Level 0 Backup Day:
    AutoBackup Enabled: false
               Created: August 4, 2022 12:02:54 PM UTC
        DB Domain Name: example.com
   Associated Networks: Public-network
         CPU Pool Name:
```

# Example 17-143 Cloning a Database and associating it with the same CPU Pool as the parent database

Task Name Start Time
End Time Status

### Example 17-144 Cloning a Database and associating it with a different CPU pool

Status: Created

Created: August 09, 2022 10:36:55 AM UTC

Message:

Task Name Start Time

End Time Status

\_\_\_\_\_\_\_

-----

### Example 17-145 Cloning a TDE-enabled database

# odacli clone-database --sourcedbname tdbacf2 --dbname tdbacf2c -databaseUniqueName tdacf2cu -p
Enter SYS user password:
Retype SYS user password:
Enter TDE wallet password of source database:

#### Example 17-146 Cloning a database and opening the clone in read only mode

# odacli clone-database -n clonedb -u clonedb -f sourcedb -ro
Enter SYS user password:
Retype SYS user password:

The task Open Clone DB in READ ONLY mode is displayed as the last task in the description of the above job.

## **Related Topics**

 Cloning an Oracle ACFS Database
 Create a database from an existing Oracle ACFS database using ODACLI commands or BUI.



## odacli create-database

Use the odacli create-database command to create a new database.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli create-database -n database\_name -cs characterset -cl {OLTP|DSS|IMDB}-1 dblanguage -s dbshape -r {ACFS|ASM} -dt dbterritory -y dbtype -ns nationalscharacterset -d pdbadmin -p pdbname -v version [-u databaseUniqueName] [-dh Database Home ID] [-c|-no-c] [-co|-no-co][-bi backupconfigid] [-io] [-dn] [-j] [-nn] [-tn node\_name] [-h] [-rd] [-ha|-no-ha] [-t] [-cp] [-osc] [-kt] [-ocp]

Parameter	Description
backupconfigid, -bi	(Optional) Defines the backup configuration identifier for future use.
cdb, -c	(Optional) Creates the database as a container database. Use the $-c$ flag to create a container database and use the $-no-c$ flag to create a non-CDB database. The default is $-no-c$ .
characterset, -cs	Defines the character set. The default is AL32UTF8.
databaseUniqueName, -u	(Optional) Defines a unique name for the database.
dbdomainname, -dn	Defines the database domain name.
cpupool, -cp	Defines the CPU pool name. The CPU pool must be of type bare metal (BM).
dbEdition, -de	Defines the Database Edition.
dbclass,-cl {OLTP DSS IMDB}	Defines the database class. The default is OLTP. The options are as follows:  • Enterprise Edition: OLTP, DSS, or IMDB.
	Standard Edition: OLTP
dbconsole, -co	(Optional) Enables the Database Console. Use the -no-co flag to disable the Database Console. If not selected, the default is no database console.
dbhomeid, -dh	(Optional) Identifies the existing Database Home ID.
dblanguage, -l	Defines the database language. The default language is AMERICAN.
dbname, -n	Defines the name given to the new database (dbname.)
dbshape, -s	Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is odb1. You cannot specify the database shape when you create a instance-only database.
dbstorage, -r{ACFS ASM}	Defines the Database Storage, either Oracle ACFS or Oracle ASM. The default value is Oracle ASM.



Parameter	Description
dbterritory, -dt	Defines the database territory. The default territory is AMERICA.
dbtype, -y [RAC RACOne SI]	Defines the database type. For high-availability deployments, the values can be RAC RACOne SI, with the default as RAC. For single-node deployments, the value is SI.
help, -h	(Optional) Displays help for using the command.
instanceonly,-io	(Optional) Creates a database instance, password file and also the underlying Oracle ACFS mount point. You can use the instance as an auxiliary instance for RMAN duplicate.
json,-j	(Optional) Displays JSON output.
nationalscharacterset,-ns	Defines the NLS National Character Set. The default is AL16UTF16.
no-cdb, -no-c	(Optional) Creates a database that is <i>not</i> a container database. Use this flag when you want to create a non-CDB database. Use the -c flag to create a container database.
no-dbconsole, -no-co	(Optional) Disables Database Console. Use the -co flag to enable Database Console.
pdbadmin,-d	Defines the Pluggable Database (PDB) Admin User.
pdbname, -p	Defines the Pluggable Database (PDB) name. The default value is pdb1.
version, -v	Defines the database bundle patch number. To install the latest bundle patch for a release, specify the release version.  To specify a specific supported bundle, use the 5 digit format.
dbRedundancy, -rd	Specifies the database redundancy value, that is, {HIGH  MIRROR}. To specify the dbRedundancy option for an Oracle ASM or ACFS storage-based database, all disk groups must have FLEX redundancy. To specify the dbRedundancy option for an Oracle ASM storage database, the dbVersion or dbHomeVersion must be 12.2 or later.
associated-networks,-nn	Specifies the associated network names (in the format networkName1,networkName2,).
enable-tde,-t	Specifies whether to enable Transparent Data Encryption (TDE) which uses software keystore.
keystore-type,-kt	Specifies the type of keystore which stores the TDE master encryption key. The value can be software or okv. The default is software.
okv-server-config,-osc	Specifies the name of the Oracle Key Vault server configuration which serves as the metadata of the Oracle Key Vault user credentials. This option must be provided only when thekeystore-type,-kt option is specified
okvclient-path,-ocp	Specifies the absolute path to the <code>okvclient.jar</code> file. Multiple values must be comma-separated. Cannot be used with the <code>okv-server-config</code> , <code>-osc</code> option.
target-node, -tn	(Optional) Specifies the target node name (applicable only for Oracle RAC One Node Database and single-instance Oracle Database, where supported).
levelzerobackupday, -lb	(Optional) Specifies the level zero backup day. The values can be Monday Tuesday Wednesday Sunday. The default is Sunday.

Parameter	Description
backupconfigname, -bn	(Optional) Specifies the name of the backup configuration.
bkuppassword, -bp	(Optional) Specifies the RMAN backup encryption password.
enableFlashCache, -fc	(Optional) Specifies whether to enable Flash Cache.
no-enableFlashCache, -no-fc	(Optional) Specifies whether to disable Flash Cache.
dbOnFlashStorage,-f	(Optional) Specifies whether to enable data on Flash storage.
no-dbOnFlashStorage, -no-f	(Optional) Specifies whether to disable data on Flash storage.
disable-ha,-no-ha	(Optional) Disables High Availability for single-instance Oracle Database 19c and later.
enable-ha, -ha	(Optional) Enables High Availability for single-instance Oracle Database 19c and later. Theenable-ha, -ha option is the default for single-instance databases on high availability deployments.

- If the disk group redundancy is FLEX, then the default dbRedundancy value is MIRROR.
- Flash cache is disabled by default.
- You cannot mix Oracle Database Standard Edition and Enterprise Edition databases on the same appliance.
- For Standard Edition Oracle Database 19c or later, you cannot create Oracle RAC Or Oracle RAC One Node Database. For Standard Edition, you can only deploy singleinstance Oracle Database with or without high-availability enabled.
- Transparent Data Encryption (TDE) is an Advanced Security Option (ASO) available with Oracle Database Enterprise Edition.
- TDE is not configured by default during database creation.
- The dbname and databaseUniqueName can contain underscores (-), lowercase and uppercase alphabet (a-zA-Z, and numeric characters (0-9), must start with an alphabet, and must not exceed 8 characters in length. Underscores are not permitted only if the --dbname is set to RACOne, as it is used as a delimiter to identify the database instance. The dbname and databaseUniqueName must not also be an Oracle reserved key word.
- Use the --cdb or --no-cdb flag to indicate whether or not the database is a container database. When neither flag is specified, the default database created is a non-CDB database.
- When --dbhomeid is not provided, the create-database command creates a new Oracle Database Home.
- When --dbhomeid is provided, the create-database command creates the database using the existing Oracle Home. Use the odacli list-dbhomes command to obtain the dbhomeid.
- When you use the command to create an instance-only database, then you cannot specify the database shape (template).
- When you specify both the --version and the--dbhomeid, the version is ignored and the database is created against the existing database home.



- Oracle Database 19c and later is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (ACFS). The default is Oracle ASM.
- When databases are created on Oracle ACFS, each database is configured with its own Oracle ACFS file system for the datafiles and uses the following naming convention: /u02/app/db user/oradata/db unique name. The default size of this mount point is 100 GB.

## Note:

Oracle recommends not sharing the mount point across different databases.

- Online logs are stored in the /u03/app/db user/redo/ directory.
- Oracle Fast Recovery Area (FRA) is located in the /u03/app/db user/ fast\_recovery\_area directory.
- For the version, you can specify the database version, for example, 19.24.0.0, or you can use a 5 digit format to specify a specific patch bundle version. If you use the database version without specifying the bundle patch number, the latest bundle patch is used.
- You must specify either the Oracle Key Vault server configuration or the absolute path of the okvclient.jar file.
- You cannot configure Oracle Key Vault on Oracle RAC One database and single-instance database with high-availability enabled.
- For Oracle Key Vault configuration, you must specify one okvclient.jar file path for single-instance database. For Oracle RAC database, you must specify multiple okvclient.jar file path.
- For TDE-enabled database configuration, if the keystore type is not specified, then, by default, the keystore is software keystore.

## A

## **Caution:**

When you create a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

## Example 17-147 Creating a TDE-Enabled Database with Software Keystore

```
# odacli create-database -n test -t
Enter new 'SYS, SYSTEM and PDB Admin user' password:
Confirm 'SYS, SYSTEM and PDB Admin user' password:
Enter new 'TDE wallet' password:
Confirm 'TDE wallet' password:
```



### **Example 17-148** Creating a Database in Interactive Mode

This example creates a 19.27.0.0.0 OLTP container database named hrdb with shape odb2 and enables you to provide the password interactively.

```
# odacli create-database -n hrdb -c -cl OLTP -s odb2 -p pdb1
Enter new 'SYS, SYSTEM and PDB Admin user' password:
Confirm 'SYS, SYSTEM and PDB Admin user' password:
{
    "jobId" : "f12485f2-dcbe-4ddf-aeel-de24d37037b6",
    "status" : "Created",
    "message" : null,
    "reports" : [],
    "createTimestamp" : "March 8, 2025 03:54:03 AM EDT",
    "description" : "Database service creation with db name: hrdb",
    "updatedTime" : "March 8, 2025 03:54:03 AM EDT"
}
```

## Example 17-149 Creating a Database Against a Different Version

Either of the following statements creates a database against a home with Oracle Database Bundle applied:

```
# odacli create-database -n hrmsdb1 -v 19.27.0.0.0
# odacli create-database -n hrmsdb2 -v 19.27.0.0.250415
```

The following statement creates a new database against a home with a specific Oracle Database Bundle:

```
# odacli create-database -n hrmsdb3 -v 19.27.0.0.250415
```

## Example 17-150 Creating a Database associated with a CPU Pool

The following command creates a new database associated with a CPU pool:

```
# odacli create-database -j -n dbcpupl -r ACFS -cp testdbcpupool
```

# Example 17-151 Creating a TDE-Enabled Database with Credentials of a User on Oracle Key Vault

An example to create a database dbokv1 which uses Oracle Key Vault credentials represented by Oracle Key Vault server configuration okvobj1 is as follows:

```
odacli create-database -n dbokv1 -t -osc okvobj1 -kt OKV Enter SYS and SYSTEM user password:
Enter SYS and SYSTEM user password:
```

# Example 17-152 Creating a TDE-Enabled Database with keys stored in Oracle Key Vault

Create an Oracle RAC database okvdbrac without using the Oracle Key Vault server configuration object. Specify the path to the okvclient.jar file for the local database instance first, followed by the path to okvclient.jar file for the remote database instance in the request.

```
odacli create-database -n okvdbrac -y RAC -t -kt OKV -ocp /tmp/okvracdb1/
okvclient.jar,/tmp/okvracdb2/okvclient.jar
Enter SYS and SYSTEM user password:
Retype SYS and SYSTEM user password:
Enter TDE wallet password:
Retype TDE wallet password:
Job details
_____
                 ID: cb611ec2-ff87-44f9-a79b-3ab1a290644f
          Description: Database service creation with DB name: okvdbrac
              Status: Created
             Created: October 20, 2024 6:13:28 AM PDT
             Message:
Task Name
                                  Start
Time
                            End Time
Status
_____
odacli describe-job -i cb611ec2-ff87-44f9-a79b-3ab1a290644f
Job details
                 ID: cb611ec2-ff87-44f9-a79b-3ab1a290644f
          Description: Database service creation with DB name: okvdbrac
              Status: Success
             Created: October 20, 2024 6:13:28 AM PDT
             Message:
Task Name
                                  Node Name
                                                        Start
Time
                             End Time
Status
__________
-----
Validating dbHome available space n1
                                              October 20, 2024
                  October 20, 2024 6:13:49 AM PDT
6:13:49 AM PDT
Success
Validating dbHome available space
                                 n2
                                               October 20, 2024
6:13:49 AM PDT
              October 20, 2024 6:13:49 AM PDT
Success
Setting up SSH equivalence
                                              October 20, 2024
                                  n1
6:13:51 AM PDT October 20, 2024 6:13:54 AM PDT
Success
                                              October 20, 2024
Setting up SSH equivalence
                                 n1
```



October 20, 2024 6:13:57 AM PDT 6:13:54 AM PDT Success Creating ACFS database home n1 October 20, 2024 October 20, 2024 6:13:58 AM PDT 6:13:58 AM PDT Success n1 October 20, 2024 Validating dbHome available space 6:13:59 AM PDT October 20, 2024 6:13:59 AM PDT Success Setting TDE Master Encryption Key n1 October 20, 2024 6:34:15 AM PDT October 20, 2024 6:34:56 AM PDT Success n1 October 20, 2024 Create Users tablespace 6:34:57 AM PDT October 20, 2024 6:34:59 AM PDT Success October 20, 2024 Clear all listeners from Database n1 6:35:00 AM PDT October 20, 2024 6:35:01 AM PDT Deleting OKV Client Software Jar n1 October 20, 2024 6:35:03 AM PDT October 20, 2024 6:35:04 AM PDT Deleting OKV Client Software Jar n2 October 20, 2024 6:35:04 AM PDT October 20, 2024 6:35:04 AM PDT Success Encrypt all Tablespaces n1 October 20, 2024 6:35:04 AM PDT October 20, 2024 6:36:15 AM PDT Success

## odacli delete-database

Use the odacli delete-database command to delete a database.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

## To delete a database:

odacli delete-database -i dbid -n name [-h] [-j] [-fd]

Parameter	Description
id, -i	Identifies the database home identifier (ID) to display.
	Use the odacli list-databases command to obtain theid.
name, -n	Defines the database name.
force, -fd	(Optional) Forces the delete operation.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



#### Usage

- When you run the odacli delete-database command on a TDE-enabled database that uses software keystore to store TDE keys, the TDE wallet is also deleted.
- When you run the odacli delete-database command on a TDE-enabled database that
  uses Oracle Key Vault to store TDE keys and was created using Oracle Key Vault user
  credentials, the TDE wallet and the corresponding endpoints in the Oracle Key Vault are
  also deleted.
- However, when you run the odacli delete-database command on a TDE-enabled database that uses Oracle Key Vault to store TDE keys and was created using endpoints in Oracle Key Vault server, the TDE wallet and the corresponding endpoints in the Oracle Key Vault are not deleted automatically. You must manually delete the TDE wallet and the corresponding endpoints in the Oracle Key Vault.
- The odacli delete-database command deletes the database, the file system, and the underlying advm volumes assigned to the database. For example, deleting a database named hrdb also deletes the file system /u02/app/oracle/oradata/hrdb. Do not keep any other files on this database file location. If you have manually added static entries for the database you want to delete in your listener.ora file, then remove these entries before running the odacli delete-database command.
- The odacli delete-database command does not delete the database files. This is expected behavior so that you can archive the database files, if required, or manually restore the database with these database files. Use the --force option to delete the database files completely.

## Example 17-153 Deleting a Database Named hrmsdb

In this example we want to delete a database named hrmsdb. Before we can delete the database, we need to know the database home identifier (dbid). This example shows how to run the odacli list-databases command to list the databases and their associated dbid, then how to delete database hrmsdb.

# odacli list-databases

ID	DB Name	DB Version	CDB Cla	ass
a3f4a6c0-a0c9-4c79-bad7-898afcf9de46	hrmsdb	19.22.0.0	true	OLTP
7e28bf52-1a09-49fd-9391-841838d2c42f	crmdb	19.22.0.0.	false	OLTP

#### (continued)

Shape	Storage	Status
odb1	ACFS	Configured
odb1	ACFS	Configured

# odacli delete-database -i a3f4a6c0-a0c9-4c79-bad7-898afcf9de46



## odacli describe-database

Use the odacli describe-database command to display database details.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

To display database details:

```
odacli describe-database -i dbid -n name [-h] [-j]
```

#### **Parameters**

Parameter	Description
id, -i	Identifies the database home identifier (ID) to display.
	Use the odacli list-databases command to obtain theid.
name, -n	Defines the database name.
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

## **Example 17-154**

Display information for a database.

National CharacterSet: AL16UTF16

Language: AMERICAN

```
# odacli describe-database -n odacn
Database details
                    ID: 896238139
            Description: odacn
                DB Name: odacn
            DB Version: 19.6.0.0.200114
                DB Type: Si
                DB Role: PRIMARY
    DB Target Node Name: node1
            DB Edition: EE
                   DBID: 896238139
Instance Only Database: false
                   CDB: false
               PDB Name:
    PDB Admin User Name:
High Availability Enabled: false
                  Class: Oltp
                  Shape: Odb1
                Storage: Asm
          DB Redundancy: MIRROR
          CharacterSet: AL32UTF8
```

Territory: AMERICA

Home ID: bcc3991a-0ffc-4d29-86ae-40f2b8721dc4

Console Enabled: false Level O Backup Day: Sunday AutoBackup Enabled: true

Created: March 30, 2020 9:33:09 AM PDT

DB Domain Name: domain.com
Associated Networks: Public-network

## Example 17-155 Displaying Database Details

Display information for database named ac48e0d2-a7b0-4ffd-a27e-f8e42b028c5f:

# odacli describe-database -i ac48e0d2-a7b0-4ffd-a27e-f8e42b028c5f

Database details

\_\_\_\_\_\_

ID: ac48e0d2-a7b0-4ffd-a27e-f8e42b028c5f

Description: rdb1
DB Name: rdb1

DB Version: 19.27.0.0.0

DBID: 1339792271

CDB: true

PDB Name: r1pdb1

PDB Admin User Name: pdbadmin

Class: OLTP
Shape: odb2
Storage: ASM

CharacterSet: DbCharacterSet(characterSet=AL32UTF8,

nlsCharacterset=AL16UTF16, dbTerritory=AMERICA, dbLanguage=AMERICAN)

Home ID: fe87f30c-b810-45d1-8b96-13996ad7a255

Console Enabled: true

Created: March 8, 2025, 2016 6:21:14 PM

## odacli list-databases

Use the odacli list-databases command to list all databases on the appliance.

## File Path

\$ORACLE\_HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

To display a list of all databases:

odacli list-databases [-h]

Parameter	Description
help, -h	(Optional) Displays help for using the command.



Parameter	Description
-all	(Optional) This option is available only when multi-user access is enabled. Provides a read-only view of all the databases in the system.

## Example 17-156 Displaying a List of Databases

## Display a list of databases:

# odacli list-databases

ID				DB Name	DB Version CI	)B 
ad6c7326-e460-411e-94df-230dedbef743 fb4d02f3-2413-47ca-8584-a768e23ec2e7			rdb121a ee12db	19.27.0.0.0 19.27.0.0.0	true false	
(Continued) Class Shape Storage Status						
OLTP IMDB	odb1 odb1	ACFS ASM	Configured Configured			

# odacli modify-database

Use the <code>odacli modify-database</code> command to modify the configuration of a database, such as backup configuration, database class, and database type, and to change TDE wallet management from <code>EXTERNAL</code> to <code>ODA</code>.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli modify-database [-i] [-dn] [-no-ha] [ha] [-lb] [-no-bkp] [-tn node\_name] [-g] [-cl] [-rd] [-s] [-an] [-ctm] [-bi] [-bin] [-bp] [-id] [-n] [-y] [-cp] [-no-cpupool] [-rkt] [-ctp] [-h] [-j]

Parameter	Description
name, -n	Defines the database name to be updated. Specify eithername orid.
id, -i	Defines the database ID to be updated. Specify either name orid.
dbRedundancy, -rd	(Optional) Specifies the database redundancy value, that is, {HIGH MIRROR}. To specify the dbRedundancy option for an Oracle ASM or ACFS storage-based database, at least one disk group of FLEX redundancy must exist. To specify the dbRedundancy option for an Oracle ASM storage database, the dbVersion or dbHomeVersion must be 12.2 or later.



Parameter	Description
levelzerobackupday,-lb	(Optional) Specifies the Level zero Backup Day. For example, Monday Tuesday Wednesday Sunday
backupconfigid, -bi	(Optional) Defines the backup configuration identifier for future use.
backupconfigname, -bin	(Optional) Specifies the name of the backup configuration.
bkuppassword, -bp	(Optional) Specifies the RMAN backup encryption password.
no-backup, -no-bkp	(Optional) Disables database backups. Specify this option to also remove the database backup and archivelog backup schedulers.
	To enable database backups again, you must update the database with a backupconfig object.
dbclass,-cl	(Optional) Defines the database class. The default is OLTP. The options are OLTP, DSS, or IMDB.
dbshape, -s	(Optional) Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is odb1. You cannot specify the database shape for an instance-only database.
attachnetworks, -an	(Optional) Specifies the name of the networks to be attached. Specify the networks in the format network_name1, network_name1.
detachnetworks, -dn	(Optional) Specifies the name of the networks to be detached. Specify the networks in the format network_name1, network_name1.
dbtype, -y	Defines new database type. The only option is SI. The conversion to single-instance database is available only for Oracle Database Standard Edition.
disable-ha,-no-ha	(Optional) Disables High Availability for single-instance Oracle Database 19c and later.
enable-ha, -ha	(Optional) Enables High Availability for single-instance Oracle Database 19c and later.
target-node, -tn	(Optional) Specifies the target node name (applicable only for Oracle RAC One Node Database and single-instance Oracle Database, where supported).
cpupool,-cp	(Optional) Specifies the CPU pool name. Use this option to associate a CPU pool to a database that does not use any CPU pool or to change the existing association of a CPU pool to a new CPU pool for a database.
no-cpupool	(Optional) Removes the attached CPU pool.
change-tde-password,-ctp	(Optional) When specified, you are prompted for the current and new TDE Wallet password. Note that in this release, you cannot modify the TDE configuration to use Oracle Key Vault.
change-tdewallet-mgmt,-ctm	(Optional) When specified, the TDE wallet is changed from external to ODA.
rekey-tde,-rkt	(Optional) When specified, current TDE Wallet password is prompted to rekey the TDE master encryption key.

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



#### **Caution:**

When you change the TDE wallet password for a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

## Example 17-157 Modifying the Database Shape (Template) and Database Class

```
# odacli modify-database -s database_shape -cl database_class -i dbid
odacli modify-database -i 1941d594-c777-4eca-9fce-18b778d5c153 -s odb2 -cl DSS
{
    "jobId" : "833d43a7-bcc6-48a7-9f98-b42ffdab3fe1",
    "status" : "Created",
    "message" : null,
    "reports" : [ ],
    "createTimestamp" : "May 16, 2023 06:48:58 AM UTC",
    "resourceList" : [ ],
    "description" : "modify-database service with db ids: 1941d594-
c777-4eca-9fce-18b778d5c153",
    "updatedTime" : "May 16, 2023 06:48:58 AM UTC"
}
```

## Example 17-158 Converting Oracle RAC or Oracle RAC One Node Database to Singleinstance Oracle Database

```
# odacli modify-database -n db18 -y SI
For moving a database between homes please use the command 'move-database'.
{
   "jobId" : "4b548365-dac5-4557-a6a8-2f65c2b725e7",
   "status" : "Created",
   "message" : "Modify database",
   "reports" : [ ],
   "createTimestamp" : "May 21, 2023 00:32:55 AM UTC",
   "resourceList" : [ {
        "resourceId" : "de2a7959-e31b-4dee-b600-6b16dfb78c34",
        "resourceType" : "DB",
        "resourceNewType" : null,
        "jobId" : "4b548365-dac5-4557-a6a8-2f65c2b725e7",
        "updatedTime" : "May 21, 2023 00:32:55 AM UTC"
    } ],
    "description" : "Modify database : db18",
```

```
"updatedTime" : "May 21, 2023 00:32:55 AM UTC"
```

## Example 17-159 Specifying the target node when converting database

```
# odacli modify-database -n db18 -y SI -g node_number
# odacli modify-database -n db18 -y SI -th node name
```

## **Example 17-160 Changing the TDE Wallet Password**

```
# odacli modify-database -n testdb -ctp
Enter current 'TDE wallet' password:
Enter new 'TDE wallet' password:
Confirm 'TDE wallet' password:
```

## **Example 17-161** Re-keying the TDE Master Encryption Password

```
# odacli modify-database -n testdb -rkt
Enter current 'TDE wallet' password:
```

## Example 17-162 Removing a CPU pool

```
# odacli modify-database -n dbcpupin -cp testdbcpupool2
DB will be restarted as part of CPU Pool operation. Do you want to continue
[y/n]:y
For moving a database between homes please use the command 'move-database'.
  "jobId": "c1d05fb3-828a-4644-af9a-9d82b4ef5a89",
  "status" : "Created",
  "message" : "Modify database",
  "reports" : [ ],
  "createTimestamp" : "May 09, 2023 16:18:54 PM UTC",
  "resourceList" : [ {
    "resourceId": "ff9c138b-a003-40cf-b1fc-0b33cd955ebf",
    "resourceType" : "DB",
   "resourceNewType" : null,
    "jobId": "c1d05fb3-828a-4644-af9a-9d82b4ef5a89",
    "updatedTime" : "May 09, 2023 16:18:54 PM UTC"
  } ],
  "description" : "Modify database : dbcpupin",
  "updatedTime": "May 09, 2023 16:18:54 PM UTC"
```

## odacli move-database

Use the command odacli move-database to move a database from one Oracle home to another home of the same database version.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli move-database [-i dbid] [-imp] [-nr] [-n dbname] [-dh dest-dbhome-id] [-dhn dest-dbhome-name] [-j] [-h]

#### **Parameters**

Parameter	Description
id, -i	(Optional) Defines the database ID.
name, -n	(Optional) Defines the database name.
non-rolling, -nr	(Optional) Specifies whether you want to move the target database in non-rolling manner. By default, the value is false and the database is moved in a rolling manner.
ignore-missing-patch, -imp	(Optional) Ignores all missing patches and forces the operation.
dest-db-home-id, -dh	(Optional) Defines the destination database home ID.
dest-dbhome-name, -dhn	(Optional) Defines the destination database home name.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

#### **Usage Notes**

Starting with Oracle Database Appliance release 19.19, when you run the <code>odacli move-database</code>, the database is moved in a rolling manner, unless you specify the <code>--non-rolling,-nr</code> option.

## Example 17-163 Moving a Database from one Oracle home to another

# ./odacli move-database -i database ID -dh destination database home ID

## odacli register-database

Use the <code>odacli register-database</code> command to register a migrated database with the appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli register-database -c {OLTP|DSS|IMDB} -osc [-co|-no-co] [-nn
associated\_network\_names] [-bi backup\_config\_id] [-c db\_class] [-s db\_shape]
[-t {RAC|RACOne|SI}] [-no-ha] [-ha] [-o host\_name] [-osc okv\_server\_config] [-sn service name] [-tp] [-j] [-h]



Parameter	Description
backupconfigid, -bi	(Optional) Defines the backup configuration identifier for future use.
dbclass, -c {OLTP DSS IMDB}	Defines the database class. The database class setting determines the database SGA memory and instance PGA memory configuration. The options are as follows:
	<ul><li>Enterprise Edition: OLTP, DSS, or IMDB.</li><li>Standard Edition: OLTP</li></ul>
dbconsole, -co	(Optional) Enables the Database Console. Use the -no-coflag to disable the Database Console. If not selected, the default is no Database Console.
dbshape, -s	Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is odb1.
dbtype, -t [SI RACOne RAC]	Defines the type of database. For high-availability deployments, the values can be RAC RACOne SI, with the default as RAC. For single-node deployments, the value is SI.
help, -h	(Optional) Displays help for using the command.
hostname, -o	Defines the host name. Default: local host name
json, -j	(Optional) Displays JSON output.
no-dbconsole, -no-co	(Optional) Disables Database Console. Use the - coflag to enable Database Console.
servicename, -sn	Defines the Database Service Name. Using this service name, the EZCONNECT String is derived for connecting to the database. For example, hostname:port/servicename.
	The Port number is the port configured for the listener, as part of the deployment.
associated-networks,-nn	Specifies the associated network names (in the format networkName1,networkName2,).
disable-ha, -no-ha	(Optional) Disables High Availability for single-instance Oracle Database 19c and later.
enable-ha, -ha	(Optional) Enables High Availability for single- instance Oracle Database 19c and later.
tde-wallet-passwd, -tp	Specifies the password for the TDE wallet.
okv-server-config,-osc	Specifies the name of the Oracle Key Vault server configuration object which serves as the metadata of the Oracle Key Vault user credentials.



## Note:

It is a good practice to use Easy Connect (EZCONNECT) to test the database connectivity before registering the database.

Log in as the  ${\tt sys}$  user and enter the following command:

sqlplus sys/password@//hostname:1521/service name

- The odacli register-database command is supported on the primary and the standby database. For the standby database, only the database is registered with Oracle Database Appliance. Oracle Data Guard is not registered with Oracle Database Appliance.
- The migrated database is registered with the listener configured during the provisioning of the appliance. The migrated database must be in read-write or read-only mode for the registration to succeed.
- The register-database command validates the datafile and log file locations and moves the controlfile and spfile to the correct locations.
- Some init.ora parameters are set, or reset, as part of the registration. Review the parameter changes before and after registration.

The following are examples of changes implemented as part of registration:

- The memory\_target is reset.
- The sga\_target/pga\_aggregate\_target/log\_buffer/inmemory\_size is configured based on the database class and database shape settings used during registration.
- The registration process sets or resets the recommended appliance-specific parameters. The database is restarted as part of the register database operation.
- The database being registered must use Oracle Managed Files and the file location must match the DATA Location, REDO Location and RECO Location of the odacli describe-dbstorage command.
- As part of the registration process, the database is registered with Oracle Clusterware.
   Only the primary database is registered with Oracle Clusterware.
- TDE-enabled database can also be registered. If TDE is configured using software keystore and the database version is 18c and higher, then TDE wallet management is also supported similar to a TDE database created using the Oracle Database Appliance framework.
- TDE-enabled databases that use Oracle Key vault to store TDE keys can also be registered. If you want Oracle Database Appliance tooling to handle the TDE password, then the database must be registered using Oracle Key Vault server configuration object, by specifying its current TDE password. If you do not want Oracle Database Appliance tooling to handle the TDE password, then the database must be registered without using Oracle Key Vault server configuration.



# Example 17-164 Registering a TDE-enabled Database with TDE keys stored on Oracle Key Vault

Following is the example of a register-database job which does not use Oracle Key Vault server configuration.

```
odacli register-database -sn example.com --dbclass OLTP --dbshape odb2
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
  "jobId": "f82172e2-c4c1-4a77-ba41-c3d241127325",
  "status" : "Created",
  "message" : "",
  "reports" : [ ],
  "createTimestamp": "May 07, 2025 08:54:50 PDT",
  "resourceList" : [],
  "description" : "Database service registration with DB service name:
aokv1.us.oracle.com",
  "updatedTime" : "May 07, 2025 08:54:50 PDT",
  "jobType" : null,
  "cpsMetadata" : null
odacli describe-job -i f82172e2-c4c1-4a77-ba41-c3d241127325
Job details
                     ID: f82172e2-c4c1-4a77-ba41-c3d241127325
            Description: Database service registration with DB service name:
aokv1.us.oracle.com
                 Status: Success
                Created: May 07, 2025 08:54:50 PDT
                Message:
                                         Node Name Start
Task Name
Time
                   End Time
                                             Status
Setting Database parameter for OKV
                                        scaoda806c1n1 May 07, 2025 08:54:53
PDT May 07, 2025 08:56:29 PDT Success
Validate Hugepages For Register DB
                                        scaoda806c1n1 May 07, 2025 08:56:29
PDT May 07, 2025 08:56:29 PDT Success
Enable OMF parameters
                                         scaoda806c1n1 May 07, 2025 08:56:33
PDT May 07, 2025 08:56:33 PDT Success
dharm: Setting DB character set
                                        scaoda806c1n1 May 07, 2025 08:56:33
PDT May 07, 2025 08:56:34 PDT Success
Move Spfile to right location
                                         scaoda806c1n1 May 07, 2025 08:56:34
PDT May 07, 2025 08:56:42 PDT Success
Enable DbSizing Template
                                         scaoda806c1n1 May 07, 2025 08:58:23
PDT May 07, 2025 09:00:41 PDT Success
Add Startup Trigger to Open all PDBS
                                         scaoda806c1n1 May 07, 2025 09:00:42
PDT May 07, 2025 09:00:43 PDT Success
                                         scaoda806c1n1 May 07, 2025 09:00:43
Running DataPatch
PDT May 07, 2025 09:01:37 PDT Success
Reset Associated Networks for Database scaoda806c1n1 May 07, 2025 09:01:38
PDT May 07, 2025 09:01:41 PDT Success
```

```
Reset Associated Networks scaoda806c1n2 May 07, 2025 09:01:41 PDT May 07, 2025 09:01:41 PDT Success
```

# Example 17-165 Registering a TDE-enabled Database with TDE keys stored on Oracle Key Vault

Following is the example of a register-database job which uses Oracle Key Vault server configuration.

```
odacli register-database -sn example.com --dbclass OLTP --dbshape odb2 -osc
okvobj1
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
Enter TDE wallet password:
Retype TDE wallet password:
  "jobId": "37cb49bb-6129-4c49-a44e-6ee4b5c97e98",
  "status" : "Created",
  "message" : "",
  "reports" : [],
  "createTimestamp": "May 07, 2025 02:16:42 PDT",
  "resourceList" : [ ],
  "description" : "Database service registration with DB service name:
sokv10.us.oracle.com",
  "updatedTime": "May 07, 2025 02:16:42 PDT",
  "jobType" : null,
  "cpsMetadata" : null
odacli describe-job -i 37cb49bb-6129-4c49-a44e-6ee4b5c97e98
Job details
                   ID: 37cb49bb-6129-4c49-a44e-6ee4b5c97e98
           Description: Database service registration with DB service name:
sokv10.us.oracle.com
                Status: Success
               Created: May 07, 2025 02:16:42 PDT
               Message:
Task Name
                                      Node Name
                                                               Start
Time
                                End Time
_____
Setting Database parameter for OKV n1
                                                   May 07, 2025 02:16:51
                 May 07, 2025 02:17:59 PDT
                                                   Success
                                                   May 07, 2025 02:17:59
External Store Autologin wallet creation n1
                May 07, 2025 02:18:09 PDT
PDT
                                                    Success
                                                   May 07, 2025 02:18:09
Shutdown database
                                      n1
                May 07, 2025 02:19:19 PDT
                                                   Success
Mount database using SQL
                                     n2
                                                   May 07, 2025 02:19:19
                 May 07, 2025 02:19:46 PDT
                                                    Success
External Store Autologin wallet creation n1
                                                   May 07, 2025 02:19:46
                May 07, 2025 02:19:57 PDT
                                                       Success
```

Shutdown database	n2	May	07, 2025 02:19:57
PDT May 07, 2025 02:20:18	PDT		Success
Startup database using SQL	n1	Mav	07, 2025 02:20:19
PDT May 07, 2025 02:20:49	PDT	_	Success
Re-enroll and Provision of Endpoint		Mav	07, 2025 02:20:50
PDT May 07, 2025 02:21:31		11dy	Success
<u>-</u> · · ·	n1	Мотт	
Save the new TDE password using a		Мау	07, 2025 02:21:31
PDT May 07, 2025 02:21:39	PDT.		Success
temporary custom attribute on			
OKV			
TDE Wallet closure	n1	May	07, 2025 02:21:39
PDT May 07, 2025 02:21:40	PDT		Success
Change the TDE password in local wallet	n1	Мау	07, 2025 02:21:41
PDT May 07, 2025 02:21:57	PDT		Success
Auto login TDE Wallet creation	n1	Mav	07, 2025 02:21:57
PDT May 07, 2025 02:22:01	PDT	_	Success
Shutdown database	n1	Matr	07, 2025 02:22:01
PDT May 07, 2025 02:22:35		ray	Success
<del>-</del>			
Mount database using SQL	n2	мау	07, 2025 02:22:35
PDT May 07, 2025 02:23:01			Success
Re-enroll and Provision of Endpoint	n2	May	07, 2025 02:23:01
PDT May 07, 2025 02:23:43	PDT		Success
Change the TDE password in local wallet	n2	May	07, 2025 02:23:43
PDT May 07, 2025 02:23:55	PDT		Success
Auto login TDE Wallet creation	n1	May	07, 2025 02:23:56
PDT May 07, 2025 02:24:00	PDT	_	Success
Shutdown database	n2	Mav	07, 2025 02:24:00
PDT May 07, 2025 02:24:22		11dy	Success
<u>=</u> · · ·		Marr	
Startup database using SQL	n1	мау	07, 2025 02:24:22
PDT May 07, 2025 02:24:53			Success
Save new TDE password on OKV	n2	May	07, 2025 02:24:53
PDT May 07, 2025 02:24:59	PDT		Success
Delete the temporary custom attribute	n2	May	07, 2025 02:24:59
PDT May 07, 2025 02:25:03	PDT		Success
on			
OKV			
Database stop (Srvctl)			
	n l	Mav	07. 2025 02:25:04
	n1	May	07, 2025 02:25:04
PDT May 07, 2025 02:26:04	PDT	_	Success
Deleting OKV Client Software Jar	PDT n2	_	Success 07, 2025 02:25:04
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04	PDT n2 PDT	May	Success 07, 2025 02:25:04 Success
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04 Database start (Srvctl)	PDT n2 PDT n1	May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04 Database start (Srvctl) PDT May 07, 2025 02:26:36	PDT n2 PDT n1	May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04 Database start (Srvctl) PDT May 07, 2025 02:26:36 Checking the TDE wallet status	PDT n2 PDT n1 PDT n1	May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04 Database start (Srvctl) PDT May 07, 2025 02:26:36	PDT n2 PDT n1 PDT n1	May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04 Database start (Srvctl) PDT May 07, 2025 02:26:36 Checking the TDE wallet status	PDT n2 PDT n1 PDT n1	May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36
Deleting OKV Client Software Jar PDT May 07, 2025 02:25:04 Database start (Srvctl) PDT May 07, 2025 02:26:36 Checking the TDE wallet status PDT May 07, 2025 02:26:40	PDT n2 PDT n1 PDT n1 PDT n1	May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42	PDT n2 PDT n1 PDT n1 PDT n1	May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters	PDT n2 PDT n1 PDT n1 PDT n1 PDT n1 PDT	May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46	PDT n2 PDT n1 PDT n1 PDT n1 PDT n1 PDT n1 PDT	May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location	PDT n2 PDT n1 PDT n1 PDT n1 PDT n1 PDT n1 PDT n1	May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:45
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location  PDT May 07, 2025 02:26:54	PDT n2 PDT n1 PDT n1 PDT n1 PDT n1 PDT n1 PDT n1 PDT	May May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:45 Success
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location  PDT May 07, 2025 02:26:54  Setting DB character set	PDT n2 PDT n1	May May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location  PDT May 07, 2025 02:26:54  Setting DB character set  PDT May 07, 2025 02:26:46	PDT n2 PDT n1 PDT	May May May May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location  PDT May 07, 2025 02:26:54  Setting DB character set  PDT May 07, 2025 02:26:46  Restart RACOne database	PDT n2 PDT n1	May May May May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location  PDT May 07, 2025 02:26:54  Setting DB character set  PDT May 07, 2025 02:26:46	PDT n2 PDT n1	May May May May May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:54 Success
Deleting OKV Client Software Jar  PDT May 07, 2025 02:25:04  Database start (Srvctl)  PDT May 07, 2025 02:26:36  Checking the TDE wallet status  PDT May 07, 2025 02:26:40  Validate Hugepages For Register DB  PDT May 07, 2025 02:26:42  Enable OMF parameters  PDT May 07, 2025 02:26:46  Move Spfile to right location  PDT May 07, 2025 02:26:54  Setting DB character set  PDT May 07, 2025 02:26:46  Restart RACOne database	PDT n2 PDT n1	May May May May May May May May	Success 07, 2025 02:25:04 Success 07, 2025 02:26:04 Success 07, 2025 02:26:36 Success 07, 2025 02:26:41 Success 07, 2025 02:26:45 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46 Success 07, 2025 02:26:46

```
May 07, 2025 02:30:04 PDT
                                                       Success
PDT
Running DataPatch
                                    n1
                                                 May 07, 2025 02:30:05
               May 07, 2025 02:30:41 PDT
                                                 Success
Reset Associated Networks for Database n1
                                                 May 07, 2025 02:30:42
                May 07, 2025 02:30:45 PDT
                                                  Success
                                                 Success
May 07, 2025 02:30:45
Reset Associated Networks
                                n2
PDT
                May 07, 2025 02:30:45 PDT
                                                     Success
```

## **Example 17-166** Registering a Migrated Database

The following is the syntax to register a single instance OLTP database that is using shape odb1.

```
odacli register-database -c OLTP -s odb1 -sn crmdb.example.com
Enter new 'SYS user' password:
Confirm 'SYS user' password:
  "jobId": "317b430f-ad5f-42ae-bb07-13f053d266e2",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp": "March 8, 2025 05:55:49 AM EDT",
  "description" : "Database service registration with db service name:
crmdb.example.com",
  "updatedTime" : "March 8, 2025 05:55:49 AM EDT"
rpandrap: ]# odacli describe-job -i "317b430f-ad5f-42ae-bb07-13f053d266e2"
Job details
                  ID: 317b430f-ad5f-42ae-bb07-13f053d266e2
           Description: Database service registration with db service name:
crmdb.example.com
               Status: Success
              Created: March 8, 2025 5:55:49 AM EDT
              Message:
Task Name
                            Start Time
______
restore control file
                           March 8, 2025 5:55:49 AM EDT
move spfile to right location March 8, 2025 5:56:08 AM EDT
register DB with clusterware March 8, 2025 5:56:13 AM EDT
reset db parameters March 8, 2025 5:57:05 AM EDT
                           March 8, 2025 5:57:36 AM EDT
Running DataPatch
(Continued)
 End Time
                           Status
______
March 8, 2025 5:56:08 AM EDT Success
March 8, 2025 5:56:13 AM EDT Success
March 8, 2025 5:57:05 AM EDT Success
March 8, 2025 5:57:36 AM EDT Success
March 8, 2025 5:57:49 AM EDT Success
```

## odacli upgrade-database

You can use the odacli upgrade-database command to upgrade a database from a supported release.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

## To upgrade an Oracle Database:

odacli upgrade-database -i Comma separated list of database ids -n Comma separated list of database names -from source dbhome id -to destination dbhome id | -fn source dbhome name -tn destination dbhome name [-ctm] [-j] [-h] [-ha|-no-ha]

#### **Parameters**

Parameter	Description
ids, -i	(Optional) Defines the Database IDs to upgrade. You can use a comma separated list of database IDs.
names, -n	(Optional) Defines the names of the databases to upgrade.
dest-dbhome-id, -to	The DB HOME ID of the destination database home.
dest-dbhome-name, -tn	The DB HOME name of the destination database home.
source-dbhome-id, -from	The DB HOME ID of the source database home.
source-dbhome-name, -fn	The DB HOME name of the source database home.
change-tdewallet-mgmt,	(Optional) When specified, the TDE wallet management attribute is changed from External to ODA.
json,-j	(Optional) Displays JSON output. The default is false.
disable-ha, -no-ha	(Optional) Disables High Availability for single-instance Oracle Database 19c and later.
enable-ha, -ha	(Optional) Enables High Availability for single-instance Oracle Database 19c and later.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

You cannot upgrade Oracle RAC or Oracle RAC One Node Database to a destination database home of Standard Edition 19c or later. You must first convert Oracle RAC or Oracle RAC One Node Database to single-instance Oracle Database using the odacli modify-database command and then upgrade the single-instance Oracle Database to a destination database home of Standard Edition 19c or later.

You have the following options for defining the databases to upgrade:

 When you define a single database ID, only the database of the source database home is upgraded.

- When you define more than one database ID, only those databases of the source database home are upgraded.
- When you do not define a database ID, all of the databases under the source database home are upgraded.

You can upgrade databases of the following releases:

- Oracle Database 12.2 to 19c
- Oracle Database 12.1 to 19c
- Oracle Database 12.1 to 12.2

## Example 17-167 Upgrading an Oracle Database

In this example, a single database is upgraded. Use the command odacli list-databases to display the database ID, then use the command odacli upgrade-databases to upgrade the database. After the upgrade is complete, you can run the command odacli list-databases again to verify the upgrade.

```
# odacli list-databases
                                DB Name DB Version CDB
fb4d02f3-2413-47ca-8584-a768e23ec2e7 ee12db 12.1.0.2 false
(Continued)
Class Shape Storage Status
OLTP odb1 ACFS Configured
IMDB odb1 ASM Configured
# odacli upgrade-database -i ad6c7326-e460-411e-94df-230dedbef743 -from fa4321f5-0543-477d-bb54-
a429dcc8ee8d -to d752df28-ecdd-4af4-9454-38085ea17f8b
  "jobId": "1bbe8boe-acb0-4296--9c8b-473b69da0c18",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "October 24, 2017 03:54:03 AM EDT",
  "description": "Database service upgrade with db ids: [ad6c7326-e460-411e-94df-230dedbef743]",
  "updatedTime" : "October 24, 2017 03:54:03 AM EDT"
# odacli list-databases
                                DB Name DB Version CDB
------
ad6c7326-e460-411e-94df-230dedbef743 rdb121a 12.1.0.2 true
fb4d02f3-2413-47ca-8584-a768e23ec2e7 ee12db 12.1.0.2 false
(Continued)
Class Shape Storage Status
_____
OLTP odb1 ACFS Configured IMDB odb1 ASM Configured
```

## odacli DBHome Commands

Use the odacli DBHome commands to manage database Home operations.

#### odacli configure-dbhome-storage

Use the odacli configure-dbhome-storage command to configure the database home storage.

#### odacli list-dbhome-storages

Use the  $odacli\ list$ -dbhome-storages command to view the database home storage resources after the volumes for ORACLE\_HOME and ORACLE\_BASE are created.

## · odacli describe-dbhome-storage

Use the odacli describe-dbhome-storage command to view information such as how much space is available (at a volume or diskgroup level).

## · odacli modify-dbhome-storage

Use the odacli modify-dbhome-storage command to modify database home storage and add additional disk space.

#### odacli create-dbhome

Use the odacli create-dbhome command to create an Oracle Database Home.

#### odacli delete-dbhome

Use the odacli delete-dbhome command to delete database home that is not associated with a database.

#### · odacli describe-dbhome

Use the odacli describe-dbhome command to display Oracle Database Home details.

#### odacli list-dbhomes

Use the odacli list-dbhomes command to display a list of Oracle Home directories.

## odacli configure-dbhome-storage

Use the odacli configure-dbhome-storage command to configure the database home storage.

### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli configure-dbhome-storage -dg disk group [-s volume size] [-j] [-h]

Parameter	Description
diskgroup, -dg	(Mandatory) Defines the name of the disk group.
size, -s	(Optional) Defines the size, in gigabytes (GB), of the ORACLE_HOME volume. The default is: 80 GB. The minimum value that can be specified is 25GB and the maximum value is 1024GB.
json,-j	(Optional) Displays the output in JSON format.
help, -h	(Optional) Displays help for using the command.



- Valid values for the --diskgroup option vary depending on the hardware. For the X5-2, X6-2 and X7-2 HA platforms, you can select between the DATA or RECO diskgroup. For all other platforms such as X8-2, you must select only the DATA diskgroup. With later hardware, you must still run the odacli configure-dbhome-storage command.
- When you run the command to create a new database home, it also creates the volumes
  to hold the database homes. Till the volumes are created, you can run the odacli
  configure-dbhome-storage command to change the diskgroup or the inital size of the
  volume. Once the volumes for this feature are created, running this command results in an
  error:

```
# odacli configure-dbhome-storage -dg RECO
DCS-10606:Database homes storage has already been created, no changes are
allowed.
```

## Example 17-168 Creating Database Home Storage

```
# odacli configure-dbhome-storage -dg DATA
{
   "jobId" : "553bfeb9-0092-4d73-bbd4-43fcb590886f",
   "status" : "Created",
   "message" : null,
   "reports" : [],
   "createTimestamp" : "May 11, 2021 06:48:12 AM GMT",
   "resourceList" : [],
   "description" : "Configure database home storage",
   "updatedTime" : "May 11, 2021 06:48:12 AM GMT"
}
```

## odacli list-dbhome-storages

Use the <code>odacli list-dbhome-storages</code> command to view the database home storage resources after the volumes for <code>ORACLE\_HOME</code> and <code>ORACLE\_BASE</code> are created.

#### File Path

```
/opt/oracle/dcs/bin/odacli
```

## **Syntax**

```
odacli list-dbhome-storages [-j] [-h]
```

Parameter	Description
json, -j	(Optional) Displays the output in JSON format.
help, -h	(Optional) Displays help for using the command.



- Starting with Oracle Database Appliance release 19.27, Oracle Database homes are no longer created on the local disk. New Oracle Database homes are created on an Oracle ACFS-managed file system. To create an Oracle ACFS file system, ADVM volumes are created.
- The command lists the resource ID, the node on which the volume is created, and the diskgroup on which the volume is created.

## Example 17-169 Listing Database Home Storage on a Single-Node System

# odacli list-dbhome-storages

========	=======		=====		
========		======			
ID			Node	Description	Disk Group
Volume	Size(GB)	Status			
6801cabb-4e	45-41d7-9f2	0-c75dc7cf30c2	0	ORACLE_HOME	DATA
orahome_sh	80	CONFIGURED		_	
f5ad1258-a4	a1-4cc1-980	c-e2eeca738d99	0	ORACLE_BASE	DATA
odabase_n0	80	CONFIGURED			
========	=======	==========	=====	=======================================	=========
=======================================					

## Example 17-170 Listing Database Home Storage on a High-Availability System

# odacli list-dbhome-storages

========	=======	============	=====		
		======			
ID			Node	Description	Disk Group
Volume	Size(GB)	Status			
67622ce6-0a	00-4fec-b94	8-7a0ba7922311	0,1	SHARED ORACLE HOME	DATA
orahome sh	200	CONFIGURED		_	
ac813348-293	35-4903-b9a	6-eb4f0d9637b3	0	ORACLE BASE	DATA
odabase n0	80	CONFIGURED		_	
c8153e7b-6al	b7-4a55-90a	d-20d4196d2ac4	1	ORACLE BASE	DATA
odabase n1	80	CONFIGURED		_	
	=======	=========			
		======			

## odacli describe-dbhome-storage

Use the odacli describe-dbhome-storage command to view information such as how much space is available (at a volume or diskgroup level).

## File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli describe-dbhome-storage -i db home id [-j] [-h]

#### **Parameters**

Parameter	Description
id, -i	(Mandatory) Specifies the Oracle home storage ID. This is the ID listed in the odacli list-dbhome-storages command output.
json, -j	(Optional) Displays the output in JSON format.
help, -h	(Optional) Displays help for using the command.

## Example 17-171 Describing Database Home Storage

```
odacli describe-dbhome-storage -i 67622ce6-0a00-4fec-b948-7a0ba7922311 ORACLE HOME storage details:
```

ID: 67622ce6-0a00-4fec-b948-7a0ba7922311

State: CONFIGURED

Created: February 11, 2021 5:30:10 AM UTC Updated: February 18, 2021 4:33:30 PM UTC

Volume Details

Nama

Name: ORAHOME\_SH

Disk Group: DATA

Description: SHARED ORACLE\_HOME

Node Number: 0,1
Allocated Space: 200.0 GB
Used Space: 12.10 GB
Free Space: 187.89 GB

Location: /u01/app/odaorahome

DiskGroup Details

\_\_\_\_\_

Name: DATA

Allocated Space: 15.52 TB
Used Space: 2.69 TB
Free Space: 12.83 TB

-----

## odacli modify-dbhome-storage

Use the odacli modify-dbhome-storage command to modify database home storage and add additional disk space.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
odacli modify-dbhome-storage -i db home id -s size[-j] [-h]
```

#### **Parameters**

Parameter	Description
id, -i	(Mandatory) Specifies the Oracle home storage ID. This is the ID listed in the odacli list-dbhome-storages command output.
size, -s	(Mandatory) Specifies the new size in GB. The minimum value that can be specified is 25GB and the maximum value is 1024GB.
json,-j	(Optional) Displays the output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example 17-172 Modifying Database Home Storage**

```
odacli modify-dbhome-storage -i 9b9c9e0f-db04-4985-be48-3f1e263cd73a -s 30
{
    "jobId" : "badfad81-cfc1-4c82-a181-69ebdfb11c22",
    "status" : "Created",
    "message" : null,
    "reports" : [],
    "createTimestamp" : "May 11, 2021 14:04:09 PM CST",
    "resourceList" : [],
    "description" : "Modify database home storage",
    "updatedTime" : "May 11, 2021 14:04:09 PM CST"
}
```

## odacli create-dbhome

Use the odacli create-dbhome command to create an Oracle Database Home.

### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

To create an Oracle Database Home:

```
odacli create-dbhome -v version [-j] [-h]
```

Parameter	Description
-v version number	Defines the database bundle patch number.
json,-j	(Optional) Displays JSON output.



Parameter	Description
help, -h	(Optional) Displays help for using the command.

For the version number, you can specify the database version, such as 18.7.0.0, 18.5.0.0, 12.2.0.1, or 12.1.0.2, or you can use a 5 digit format to specify a specific patch bundle version. For example, 19.27.0.0.250415. If you use the database version without specifying the bundle patch number, then the latest bundle patch is used.

## Example 17-173 Creating an Oracle Database Home

The following example creates an Oracle Database Home version 19.27.0.0.250415.

# odacli create-dbhome -v 19.27.0.0.250415

## odacli delete-dbhome

Use the <code>odacli delete-dbhome</code> command to delete database home that is not associated with a database.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli delete-dbhome -i db home ID | -n db home name [-h]

#### **Parameters**

Parameter	Description
id, -i	Identifies the database home using a database identifier (ID).
name, -n	Identifies the database home using a database name.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

- Use the odacli list-dbhomes command to locate the identifier.
- To delete, or uninstall, a database home (dbhome), there must not be any associated databases in the dbhome.
- Use the odacli delete-database command to delete an existing database.

## Example 17-174 Deleting an Empty Database Home

# odacli delete-dbhome -i 0ce547ca-3df2-4178-a7e6-eefa613aeab4



## odacli describe-dbhome

Use the odacli describe-dbhome command to display Oracle Database Home details.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

To display details about Oracle Database Home:

```
odacli describe-dbhome -i dbhomeid -n name [-h] [-j] [-v]
```

#### **Parameters**

Parameter	Description
id, -i	Identifies the database home ID. Use the odacli list-dbhomes command to get the id.
name, -n	Identifies the database home name. Use the odacli list-dbhomes command to get the database name.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.
dbversion, -v	(Optional) Identifies the Database Home Version. Use the odacli list-dbhomes —v command to get the dbversion.

## Example 17-175 Displaying Oracle Database Home Details

The following output is an example of using the display Oracle Database Home details command:

```
# odacli describe-dbhome -i b727bf80-c99e-4846-ac1f-28a81a725df6

DB Home details
```

ID: b727bf80-c99e-4846-ac1f-28a81a725df6

Name: OraDB19\_home1 Version: 19.19.0.0.0

## odacli list-dbhomes

Use the odacli list-dbhomes command to display a list of Oracle Home directories.

## File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

## **Syntax**

To display a list of Oracle Home directories:

```
odacli list-dbhomes [-h] [-j]
```

#### **Parameters**

Parameter	Description
help,-h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.
-all	(Optional) This option is available only when multi-user access is enabled. Provides a read-only view of all the database homes in the system.

## **Example 17-176** Displaying a List of Oracle Home Directories

Run the following command to display a list of Oracle Home directories:

```
# odacli list-dbhomes
```

ID	Name	DB Version
b727bf80-c99e-4846-ac1f-28a81a725df6	OraDB12102_home1	12.1.0.2
(continued) Home Location		
/u01/app/orauser/product/12.1.0.2/dbhome_1		

# odacli Database Storage Commands

Use the Database Storage commands to list, describe, create, and delete Oracle database storage.

odacli create-dbstorage

Use the <code>odacli create-dbstorage</code> command to create the file system for database migrations.

odacli delete-dbstorage

Use the <code>odacli</code> <code>delete-dbstorage</code> command to delete database storage that is not associated with a database.

odacli describe-dbstorage

Use the <code>odacli describe-dbstorage</code> command to display storage configuration details.

odacli describe-dgstorage

Use the odacli describe-dgstorages command to display the disk group information.

## odacli list-dbstorages

Use the odacli list-dbstorages command to display a list of all of the database storage configured in the appliance.

## odacli list-dgstorages

Use the odacli list-dgstorages command to display the disk group information.

## · odacli modify-dbstorage

Use the odacli modify-dbstorage command to resize the database storage.

### odacli modify-dgstorage

Use the odacli modify-dgstorage command to release disks.

# odacli create-dbstorage

Use the <code>odacli create-dbstorage</code> command to create the file system for database migrations.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli create-dbstorage -n dbname -s dataSize -u databaseUniqueName -r [ASM| ACFS] -rd [high|mirror] [-h]

Parameter	Description
dbname, -n	Defines the name of the database.
dataSize,-s	(Optional) Defines the size, in gigabytes (GB), of the filesystem for storing database files and temp files. The default is: 100 GB The minimum size is 10 GB. When entering the size, do not include GB. For example, for 50 GB, use 50.
databaseUniqueName, -u	(Optional) Defines a unique name for the database. Specify only if the database unique name is different than the database name. The command creates the following mount point: /u02/app/oracle/oradata/db unique name
dbstorage, -r [ASM ACFS]	(Optional) Defines the type of database storage, either ASM or ACFS. When you select ASM, the command only creates the supporting directory structure for storing non-database files. The default is ASM.
db-redundancy, -rd	(Optional) Defines the database redundancy. The values can be high or mirror.
	The database redundancy is not applicable to database storages of Oracle ASM type, or database storages on normal or high redundancy disk groups. For database storages of Oracle ACFS type, specifying this option creates volumes of the specified redundancy on Oracle ASM disk groups of flex redundancy.

Parameter	Description
help, -h	(Optional) Displays help for using the command.

- The odacli create-dbstorage command registers the storage metadata with the Appliance Manager.
- Oracle Database is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (ACFS). The default is Oracle ASM.
- When you create ACFS database storage, the command creates a separate ACFS file system and creates the directory structure for other database files, such as archives and online logs.
- When you create ASM database storage, the command only creates the corresponding directories for non-database files.

## Example 17-177 Creating Database Storage

The following statement creates 50 GB ACFS database storage for the APPSDB database.

```
# odacli create-dbstorage -n APPSDB -s 50 -r ACFS
{
    "jobId" : "fc6bf8fd-60c2-44f3-b8b7-efd0e9a2149f",
    "status" : "Created",
    "message" : null,
    "reports" : [],
    "createTimestamp" : "August 09, 2016 06:19:35 AM WSST",
    "description" : "Database storage service creation with db name: APPSDB",
    "updatedTime" : "August 09, 2016 06:19:35 AM WSST"
}
```

## odacli delete-dbstorage

Use the odacli delete-dbstorage command to delete database storage that is not associated with a database.

### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

```
odacli delete-dbstorage -i ID -n name [-h] [-j]
```

Parameter	Description
id, -i	Identifies the database storage using a database identifier (ID).
name, -n	Specifies the database storage name.
help, -h	(Optional) Displays help for using the command.



Parameter	Description
json, -j	(Optional) Displays JSON output.

## **Usage Notes**

- You can only use the delete-dbstorage when the storage is not associated with any databases.
- Use the delete-database command to delete an existing database.
- Use the list-dbstorages command to locate the identifier.

## Example 17-178 Deleting Empty Database Storage

# odacli delete-dbstorage -i 9fe39332-cc1a-4b4b-8393-165524a6ef6b

## odacli describe-dbstorage

Use the odacli describe-dbstorage command to display storage configuration details.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli describe-dbstorage -i ID -n name [-j] [-h]

#### **Parameters**

Parameter	Description
id, -i	Specifies the database storage ID.
name, -n	Specifies the database storage name.
json,-j	(Optional) Displays JSON output. The default is false.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

- Use the odacli list-dbstorages command to get the database storage identifier (ID).
- The DATA Location corresponds to the init.ora parameter db create file dest.
- RECO Location corresponds to the init.ora parameter db\_recovery\_file\_dest
- REDO Location corresponds to the init.ora parameter db\_create\_online\_log\_dest\_1



### Example 17-179 Displaying Database Oracle ACFS Storage Details

The following example displays Oracle ASM Cluster file system (ACFS) storage details:

### Example 17-180 Displaying Database Oracle ASM Storage Details

The following example displays Oracle Automatic Storage Management (Oracle ASM) storage details:

## odacli describe-dgstorage

Use the odacli describe-dgstorages command to display the disk group information.

#### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli describe-dgstorage -d diskgroup -h

#### **Parameters**

Parameter	Description
diskgroup, -d	Specifies the disk group for which information is displayed.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

This command displays the storage information for all the databases backed by a disk group, for each disk group present in the system.

## **Example 17-181 Displaying Disk Group Storage**

```
# odacli list-dgstorages -r redundancy
Diskgroup storage details
Diskgroup: DATA
                  Redundancy: extern|normal|high|flex
                  Physical Free Space: wGB
                  Physical Total Space: xGB
                  Database Unique Name: rdbx
                                    Location: /u02/app/test/test1/rdbx
                                    Used Space: dGB (acfsutil.total -
acfsutil.freespace)
                                    Free Space: dGB (acfsutil.freespace)
                 Database Unique Name: rdby
                                    Location: +DATA/rdby
                                    Used Space: zGB (v$asm file.bytes)
                                    Free Space: xGB (PhyFree/redundancy)
                                    Physical Space:
vGB(v$asm_diskgroup.total_mb)
                                    Physical Used : wGB (v$asm_file.space)
```

Physical Free:

```
uGB(v$asm diskgroup.free mb)
                                    Physical Reserved : uGB(Lookup Table)
Diskgroup: RECO
                  Redundancy: normal|high|flex
                  Physical Free Space: wGB
                  Physical Total Space: xGB
                  Database Unique Name: rdbx
                                    Location: /u02/app/test/fast_recovery_area
                                    Used Space: dGB (acfsutil.total -
acfsutil.freespace)
                                    Free Space: dGB (acfsutil.freespace)
                 Database Unique Name: rdby
                                    Location: +DATA/rdby
                                    Used Space: zGB (v$asm file.bytes)
                                    Free Space: xGB
                                                     (PhyFree/redundancy)
                                    Physical Space:
vGB(v$asm diskgroup.total mb)
                                    Physical Used: wGB (v$asm file.space)
                                    Physical Free:
uGB(v$asm diskgroup.free mb)
                                    Physical Reserved : uGB(Lookup Table)
```

## odacli list-dbstorages

Use the <code>odacli list-dbstorages</code> command to display a list of all of the database storage configured in the appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli list-dbstorages [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

This command displays a list of all of the filesystems that are configured with the createdatabase command and the createdbstorage command.

## Example 17-182 Displaying a List of all Database Storage

# odacli list-dbstorages

ID Type	DBUnique	Name	Status
9fe39332-cc1a-4b4b-8393-165524a6ef6b	Acfs	rdb121a	Configured
4f2a1b59-ca66-4d80-951c-425ab7b0acae	Asm	ee12db	Configured
0266edac-c729-4539-861f-3f3d543be9e4	Acfs	db12SE	Configured

## odacli list-dgstorages

Use the odacli list-dgstorages command to display the disk group information.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-dgstorages -r redundancy -h

#### **Parameters**

Parameter	Description
redundancy, -r	Specifies the disk group redundancy for FLEX disk group.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

- The command displays the storage-related information for all the disk groups present in the system.
- The redundancy option is valid only for FLEX disk groups. For all disk groups that are not FLEX, logical free space is calculated using the redundancy obtained from v\$asm\_diskgroup rather than the CLI option.
- Redundancy option can take the values MIRROR | HIGH. Use one of these options to specify the database redundancy for FLEX disk groups.
- In the example below, Physical Total Space is the total space in the disk group.
   (V\$ASM\_DISKGROUP.total\_mb) Physical Reserved Space is the reserved space required

to handle disk failures. Physical Free Space is the free space in the disk group. (V\$ASM\_DISKGROUP.free\_mb) Logical Free Space is the logical free space in the diskgroup. (V\$ASM\_DISKGROUP.free\_mb / redundancy)

This command displays the storage information for all the databases backed by a disk group, for each disk group present in the system.

## Example 17-183 Displaying Disk Group Storage

#### # odacli list-dgstorages -r redundancy

Diskgroup Redundancy Physical Total Space Physical Reserved Space Physical Free Space Logical Free Space DATA FLEX хGВ уGВ zGB uGB REDO HIGH хGВ yGB zGB uGB RECO NORMAL хGВ yGB

## odacli modify-dbstorage

Use the odacli modify-dbstorage command to resize the database storage.

uGB

### File Path

zGB

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli modify-dbstorage [-ds] [-in] [-fs] [-rcs] [-rds] [-h] [-j]

## **Parameters**

Parameter	Description
datasize, -ds	(Optional) Specifies the extendable size in GB for the DATA volume. Specify at least one size from FLASH, RECO, REDO, or DATA volumes.
dbname, -in	Defines the database name on which you want to extend the volumes.
flashsize, -fs	(Optional) Specifies the extendable size in GB for the FLASH volume.
recosize, -rcs	(Optional) Specifies the extendable size in GB for the RECO volume.



Parameter	Description
redosize, -rds	(Optional) Specifies the extendable size in GB for the REDO volume.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Usage Notes**

- The command can resize DATA, RECO, REDO, and FLASH volumes.
- Database name is a mandatory parameter. All other parameters are optional, however, one
  of the volume sizes must be specified. If you only provide the DATA size, then the DCS
  agent calculates the recommended RECO size for the given DATA size is internally
  calculated. The storage is then extended with the recommended values.
- The mounted Oracle ACFS and its underlying Oracle ADVM storage is extended by the specified value.
- The maximum resize value that can be specified in the command at a time is 100 GB. To
  resize with a value greater than 100 GB, run the command multiple times with a maximum
  value of 100 GB each time. For further resize, ensure that the command completes
  successfully before you run it again.
- To check the result of the resize operation, use the odacli list-dbstorages command.
- After database resize operation is completed, use the odacli describe-dbstorage command to display storage configuration details.

## **Example 17-184 Modifying the Database Storage**

```
# odacli modify-dbstorage -ds 10 -rcs 15 -n amdb1
{
  "jobId" : "e6d54155-ed4c-4fd6-a3f6-454120fa5c18",
  "status" : "Created",
  "message" : null,
  "reports" : [],
  "createTimestamp" : "June 03, 2019 06:06:42 AM UTC",
  "resourceList" : [],
  "description" : "Database storage modify operation",
  "updatedTime" : "June 03, 2019 06:06:42 AM UTC"
}
```

## odacli modify-dgstorage

Use the odacli modify-dgstorage command to release disks.

## File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

To release disks:

```
odacli modify-dgstorage [-f] [-rd list] [-j] [-h]
```

#### **Parameters**

Parameter	Description
force, -f	(Optional) Forces release of specified disks. When this option is specified, the check to verify that all disk groups are mounted on the current node is skipped.
release-disk, -rd	Specifies the disks to release. Generally, this specifies a single storage device with partitions on different disk groups. You can also specify a comma-separated list of disks to release.
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

- Run the odacli list-dgdisks to view details of the disk, before running the odacli modify-dgstorage command.
- The odacli modify-dgstorage command runs a precheck to ensure all disk groups are mounted on the node. You can use the -f option to override the precheck.

# Example 17-185 Releasing a physical disk HDD\_E0\_S10\_577135552 which has two logical partitions on two different disk groups

```
# odacli modify-dgstorage -rd HDD_E0_S10_577135552

Job details

ID: 46bc736c-417b-4ac2-826e-aa857db50e29

Description: Release disks: [HDD_E0_S10_577135552]

Status: Running

Created: March 8, 2025 6:24:27 PM PDT

Message: Release ASM disks

Verifying the result of the Release Disks operation:

# odacli describe-job -i 46bc736c-417b-4ac2-826e-aa857db50e29

Job details

ID: 46bc736c-417b-4ac2-826e-aa857db50e29

Description: Release disks: [HDD_E0_S10_577135552]

Status: Success

Created: March 8, 2025 6:24:27 PM PDT
```

## odacli Diagnostics Collection Commands

Use the diagnostics collection commands to display diagnostics details.

Message: Release ASM disks

odacli create-diagcollection
Use the odacli create-diagcollection command to create diagnostics collection
data from the appliance.

### odacli describe-diagcollection

Use the odacli describe-diagnoslics collection data from the appliance.

### odacli list-diagcollections

Use the odacli list-diagcollections command to list the diagnostics collections.

### odacli delete-diagcollection

Use the <code>odacli</code> <code>delete-diagcollection</code> command to delete diagnostics collection data from the appliance.

## odacli create-diagcollection

Use the odacli create-diagnostics collection command to create diagnostics collection data from the appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To create diagnostics collection:

```
odacli create-diagcollection -i id [-d] [-t] [-j] [-h]
```

#### **Parameters**

Parameter	Description
id, -i	(Mandatory) Specifies the DCS job ID for the collection.
description, -d	(Optional) Description of the diagnostic collection.
tag, -t	(Optional) Specifies tag name to identify the collection.
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

## Example 17-186 Creating a diagnostics collection

# odacli create-diagcollection -i ID

Job details

-----

ID: f840feb8-7712-49a1-a525-1ee911176c50

Description: Diagnostic collection creation

Status: Created

Created: April 11, 2023 7:15:30 PM UTC

Message:



## odacli describe-diagcollection

Use the odacli describe-diagnollection command to describe diagnostics collection data from the appliance.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To describe diagnostics collection:

```
odacli describe-diagcollection -i id [-j] [-h]
```

### **Parameters**

Parameter	Description
id, -i	(Mandatory) Specifies the diagnostics collection ID.
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

### Example 17-187 Describing a diagnostics collection

```
# odacli describe-diagcollection -i ID

Diagnostic collection
details

--

ID: f5c07af8-2635-466d-b487-0f04d15fba79
Requested job ID: 016e74cb-01e0-4812-96ef-94602b5ea2c5
Description: Diagnostic collection for job 'Agent State Update

Job'

Collection file path: /opt/oracle/dcs/commonstore/diag/2023/04/
f5c07af8-2635-466d-b487-0f04d15fba79.tar.gz
Collection size: 91.88 KB

Start time: February 27, 2023 7:58:41 PM UTC
End time: February 27, 2023 7:59:39 PM UTC
```

## odacli list-diagcollections

Use the odacli list-diagcollections command to list the diagnostics collections.

## File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To list all diagnostics collections:

```
odacli list-diagcollections [-j] [-h]
```

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

## Example 17-188 Listing all diagnostics collections

```
Description Collection size Start time End time

3c65bcd3-cd30-4332-88b7-fc25b256db75 Diagnostic collection for job

'DcsAdmin patching' 8.37 MB 2023-03-08 15:37:02

UTC 2023-03-08 15:38:01 UTC

7dd1d951-056c-47b2-ad78-8614d0b3bbd0 Diagnostic collection for job 'VM winvm1 start' 6.59 MB 2023-03-08 15:37:02

UTC 2023-03-08 15:38:01 UTC
```

## odacli delete-diagcollection

Use the odacli delete-diagcollection command to delete diagnostics collection data from the appliance.

## File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

To delete diagnostics collection:

```
odacli delete-diagcollection -i id [-j] [-h]
```

#### **Parameters**

Parameter	Description
id, -i	(Mandatory) Specifies the diagnostics collection ID to be deleted.
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.



### Example 17-189 Deleting a diagnostics collection

# odacli delete-diagcollection -i ID

## odacli Job Commands

Use the odacli list-jobs and odacli describe-job commands to display job details.

### odacli create-jobdata-retention-policy

Use the odacli create-jobdata-retention-policy command to create job data retention policy for default DCS jobs and specific auto scheduled jobs.

## odacli create-purge-jobdata-job

Use the odacli create-purge-jobdata-job command to create a job to delete data for default DCS jobs and specific auto scheduled jobs.

## odacli delete-jobdata-retention-policy

Use the odacli delete-jobdata-retention-policy command to delete job data retention for default DCS jobs and specific auto scheduled jobs.

### odacli describe-job

Use the odacli describe-job command to display details about a specific job, including the job ID, status, tasks, and the job created date and time stamp.

#### odacli list-jobs

Use the odacli list-jobs command to display a list of jobs, including the job IDs, status, and the job created date and time stamp. The default number of jobs listed is 50 from the earliest to the latest.

## odacli list-pendingjobs

Use the odacli list-pendingjobs command to list all pending jobs.

## odacli list-jobdata-retention-policy

Use the odacli list-jobdata-retention-policy command to list job data retention policy for default DCS jobs and specific auto scheduled jobs.

#### odacli list-purge-jobdata-jobs

Use the <code>odacli list-purge-jobdata-jobs</code> command to list purge job data for default DCS jobs and specific auto scheduled jobs.

odacli list-scheduled-executions

## odacli create-jobdata-retention-policy

Use the odacli create-jobdata-retention-policy command to create job data retention policy for default DCS jobs and specific auto scheduled jobs.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

To create job data retention policy:

odacli create-jobdata-retention-policy [-j] [-h] [-w] [-s]



#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
retentionWindow, -w	(Optional) Describes the time interval to retain the job data. Default is 30 days if not specified.
retentionWindowUnit, -u	(Optional) Describes the unit for the retentionWindow. Possible values are Day   Hour   Minute. Default is Day if no value is specified.
scheduleIds, -s	(Optional) Specifies the IDs, delimited by commas, of the scheduled jobs similar to the odacli list-schedules result. Use Default for all DCS jobs.

## **Usage Notes**

• Once a policy is created, an auto scheduled job is created to start purging DCS job records regularly, for example, every day at 4 AM, based on the retention policies you define.

# Example 17-190 Creating a default policy to purge all the jobs and scheduled executions older than 30 days

```
# odacli create-jobdata-retention-policy
Job details
ID: 36d00489-39b1-425f-81bf-6d6e3bfede8b
Description: set job data retention policy
Status: Created
Created: April 23, 2020 3:32:09 PM PDT
Message:
Task Name Start Time End Time Status
______
[root@oda1]# ./odacli describe-job -i c40c17f0-4185-40fe-a126-30fe1f0e5cdd
Job details
______
ID: c40c17f0-4185-40fe-a126-30fe1f0e5cdd
Description: set job data retention policy
Status: Success
Created: April 23, 2020 5:42:28 PM PDT
Message:
Task Name Start Time End Time Status
set job data retention policy April 23, 2020 5:42:28 PM PDT April 23,
2020 5:42:28 PM PDT Success
```



create auto job data schedule April 23, 2020 5:42:28 PM PDT April 23, 2020 5:42:28 PM PDT Success

# Example 17-191 Set up a retention policy of 10 days for the schedule 'archive\_log\_backup'

# odacli create-jobdata-retention-policy -s 284a22b5-41e6-4be1a916-048eac74e076 -w 10 -u Day

Job details

-----

ID: ea68a90e-a8e2-4fc4-a4f1-75461e12c387
Description: set job data retention policy

Status: Created

Created: April 23, 2020 6:22:14 PM PDT

Message:

Task Name Start Time End Time Status

-----

[root@oda1]# ./odacli list-jobdata-retention-policy

Schedule Id Retention Window Unit Modified

-----

Default 20 Day April 23, 2020 6:16:59 PM PDT 284a22b5-41e6-4bel-a916-048eac74e076 10 Day April 23, 2020 6:22:14 PM PDT

## odacli create-purge-jobdata-job

Use the odacli create-purge-jobdata-job command to create a job to delete data for default DCS jobs and specific auto scheduled jobs.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

To create job data purge:

odacli create-purge-jobdata-job [-j] [-h] [-i] [-o] [-u] [-s]

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
jobIds,-i	(Optional) Purges data for given DCS job IDs, delimited by commas.



Parameter	Description
olderThan, -o	(Optional) Purges job data older than the specified time. If not specified, use the existing retentionWindow value.
olderThanUnit, -u	(Optional) Describes the unit for the OlderThan option. Possible values are Day   Hour   Minute. If not specified, use the existing retentionWindow value.
scheduleIds, -s	(Optional) Specifies the IDs, delimited by commas, of the scheduled jobs similar to the odacli list-schedules result.

## Example 17-192 Creating a job to purge job data

# odacli create-purge-jobdata-job

Job details

ID: e43dbd56-dc7c-4812-b653-0fc3208e0929

Description: purge job data

Status: Created

Created: April 23, 2020 6:27:40 PM PDT

Message:

Task Name Start Time End Time Status

\_\_\_\_\_\_

[root@oda1]# odacli describe-job -i e43dbd56-dc7c-4812-b653-0fc3208e0929

Job details

ID: e43dbd56-dc7c-4812-b653-0fc3208e0929

Description: purge job data

Status: Success

Created: April 23, 2020 6:27:40 PM PDT

Message: Purged 21 metadata records and 10 files. Purge policies are:

Purge all jobs and scheduled executions older than 30 Days

Purge scheduled executions for ID:284a22b5-41e6-4be1-a916-048eac74e076 older

than 10 Day

Task Name Start Time End Time Status

\_\_\_\_\_\_

purge job data April 23, 2020 6:27:40 PM PDT April 23, 2020 6:27:40 PM

PDT Success

## Example 17-193 Purging job data older than 5 hours, including all jobs and scheduled executions related records

# odacli create-purge-jobdata-job -o 5 -u Hour Job details

ID: 4d065c96-a8eb-4974-a446-573b5ad3cb95

Description: purge job data

Status: Created

Created: April 23, 2020 1:55:59 PM PDT

Message:

Task Name Start Time End Time Status

\_\_\_\_\_\_

-----

[root@oda1]# odacli describe-job -i 4d065c96-a8eb-4974-a446-573b5ad3cb95

Job details

.\_\_\_\_\_

ID: 4d065c96-a8eb-4974-a446-573b5ad3cb95

Description: purge job data

Status: Success

Created: April 23, 2020 1:55:59 PM PDT

Message: Purged 242 metadata records and 0 files. Purge policies are:

Purge all jobs and scheduled executions older than 5 Hour

Task Name Start Time End Time Status

purge job data April 23, 2020 1:55:59 PM PDT 1:55:59 PM PDT Success April 23, 2020

## Example 17-194 Purging job data for multiple jobs

# odacli create-purge-jobdata-job -i 87a926cd-a243-49e0ba02-9d8968e1de1e,0e2a38c0-041a-41d8-91ad-7f9f7c646f12

Job details

ID: 217cbdbf-15a5-47d3-9582-3f26d6b5eebf

Description: purge job data

Status: Created

Created: April 23, 2020 2:01:25 PM PDT

Message: Task Name Start Time End Time Status

[root@oda1]# odacli describe-job -i 217cbdbf-15a5-47d3-9582-3f26d6b5eebf

ID: 217cbdbf-15a5-47d3-9582-3f26d6b5eebf

Description: purge job data

Status: Success

Created: April 23, 2020 2:01:25 PM PDT

Message: Purged 11 metadata records and 0 files. Purge policies are:

Purge job with ID:87a926cd-a243-49e0-ba02-9d8968e1de1e Purge job with ID:0e2a38c0-041a-41d8-91ad-7f9f7c646f12

Task Name Start Time End Time Status

\_\_\_\_\_\_

purge job data 2:01:25 PM PDT April 23, 2020 2:01:25 PM PDT Success

April 23, 2020

## Example 17-195 Purging job data for specific job data schedules older than 5 days

```
# odacli create-purge-jobdata-job -s 39cc86d6-30c2-4744-bfbc-
e62535e2aa67,31b3a83b-76ca-44d3-9268-b4dac948e217 -o 5 -u Day
Job details
 ______
ID: be839a81-a79b-43ce-bf70-c8aba1a9cc91
Description: purge job data
Status: Created
Created: April 23, 2020 2:44:54 PM PDT
Message:
Task Name Start Time End Time Status
______
[root@oda1]# ./odacli describe-job -i be839a81-a79b-43ce-bf70-c8aba1a9cc91
Job details
ID: be839a81-a79b-43ce-bf70-c8aba1a9cc91
Description: purge job data
Status: Success
Created: April 23, 2020 2:44:54 PM PDT
Message: Purged 0 metadata records and 0 files. Purge policies are:
Purge scheduled executions for ID:39cc86d6-30c2-4744-bfbc-e62535e2aa67 older
than 5 Day
Purge scheduled executions for ID:31b3a83b-76ca-44d3-9268-b4dac948e217 older
than 5 Day
Task Name Start Time End Time Status
______
purge job data April 23, 2020 2:44:54 PM PDT April 23, 2020 2:44:54 PM PDT
```

## odacli delete-jobdata-retention-policy

Use the <code>odacli delete-jobdata-retention-policy</code> command to delete job data retention for default DCS jobs and specific auto scheduled jobs.

#### File Path

Success

/opt/oracle/dcs/bin/odacli

### **Syntax**

To delete job data retention:

odacli delete-jobdata-retention-policy [-j] [-h][-s]



#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.
scheduleIds, -s	(Optional) Specifies the IDs applied by the job data retention policy. If not supplied, delete all the existing policies.

## Example 17-196 Deleting the job data retention policies

# odacli delete-jobdata-retention-policy

Job details

\_\_\_\_\_\_

ID: ab819d57-9e35-4f55-bd5e-d26fc6372448
Description: delete job data retention policy

Status: Running

Created: April 23, 2020 7:34:05 PM PDT

Message:

Task Name Start Time End Time Status

------

-----

remove job data retention policy entries April 23, 2020 7:34:05 PM PDT April 23, 2020 7:34:05 PM PDT Running

[root@oda1]# odacli describe-job -i ab819d57-9e35-4f55-bd5e-d26fc6372448

Job details

-----

ID: ab819d57-9e35-4f55-bd5e-d26fc6372448
Description: delete job data retention policy

Status: Success

Created: April 23, 2020 7:34:05 PM PDT

Message:

Task Name Start Time End Time Status

-----

-----

remove job data retention policy entries

April 23, 2020 7:34:05 PM

PDT April 23, 2020 7:34:05 PM PDT Success

remove auto job data schedule

April 23, 2020 7:34:05 PM

PDT April 23, 2020 7:34:05 PM PDT Success

[root@oda1]# odacli list-jobdata-retention-policy

DCS-10032:Resource JobDataRetentionPolicy is not found.

## odacli describe-job

Use the odacli describe-job command to display details about a specific job, including the job ID, status, tasks, and the job created date and time stamp.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To view a specific job, status, and tasks:

```
odacli describe-job -i id [-e] [-n parent_task] [-sd sorted_by_duration] [-s status] [-j] [-h]
```

#### **Parameters**

Parameter	Description
id, -i	(Mandatory) Identifies the job. To get the job identifier (jobid), run the list-jobs command.
ecr, -e	(Optional) Specifies to display the error correlation report.
number, -n	(Optional) Specifies the number of parent tasks.
sort-duration, -sd	(Optional) Sorts tasks by duration, either ascending (asc) or descending (desc).
status, -s	(Optional) Specifies the status of the task, such as running, failure, success.
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

#### Example 17-197 Displaying Details for a Job

To display details of a specific job with job ID 02df22c8-c21f-4162-8265-97f7826c243a:

```
# odacli describe-job -i 02df22c8-c21f-4162-8265-97f7826c243a
```

## Example 17-198 Viewing Error Correlation Report

To view error correlation report using ODACLI command:



```
Failed Task Messages
______
[Database service deletion with DB name: zdjGIEn with id: 4ab1da3e-3918-4acf-
bb7f-5529e750849f] - DCS-10001:Internal error encountered: Failed to delete:
RECO/ZDJGIENU for the database: zdjGIEn.
odal Log Messages
 DCS Agent
  ~~~~~~~
   Error Logs
    [Kill Pmon Process] - No process running for database : zdjGIEnU
    [Database Files Deletion] - Failed to delete directory RECO/ZDJGIENU due
to error: ORA-29261: bad argument
    [Database Files Deletion] - ORA-15178: directory 'ZDJGIENU' is not empty;
cannot drop this directory
    [Database Files Deletion] - ORA-15028: ASM file '+RECO.431.1134101713'
not dropped; currently being accessed
    [Database Files Deletion] - ORA-06512: at "SYS.X$DBMS DISKGROUP", line
666
    [Database Files Deletion] - ORA-06512: at line 2 (DBD ERROR:
OCIStmtExecute)
    [Database Files Deletion] - Failed to delete: RECO/ZDJGIENU for the
database: zdjGIEn
    [Database Service deletion for 4ab1da3e-3918-4acf-bb7f-5529e750849f] -
DCS-10001:Internal error encountered: Failed to delete: RECO/ZDJGIENU for the
database: zdjGIEn.
     Error code - DCS-10001
     Cause: An internal error occurred.
     Action: Contact Oracle Support for assistance.
RHP Error Logs
    ========
    [jobid-cb6faa85-d2b4-441a-864a-17a8532cf78d] -
[BatchMoveOpImpl.getMoveDBStateInfo:9195] attempt to fetch metadata from
repos failed with EntityNotExistsException: PRGR-110: Repository object
"dbsa03b123e2;;;/u01/app/oracle/product/19.0.0.0/dbhome 1" of type "MOVE"
does not exist.
     Error code - PRGR-110
     Cause: The specified repository object does not exist in the repository
database.
     Action: Specify the correct repository object name.
    [jobid-cb6faa85-d2b4-441a-864a-17a8532cf78d] -
[GridHomeFactoryImpl.getTempLocation:1437] Exception node: PRCR-1001:
Resource ora.rhpserver does not exist
     Error code - PRCR-1001
     Cause: An attempt was made to operate on a resource that does not
     Action: Check the resource using the command 'srvctl config <object>'
and if the resource does not exist, then create it using the command 'srvctl
add <object>'.
Release Notes
```

No matching results were found.

#### Documentation

-----

1. Deleting a Database

 $\tt Abstract$  - Use the Oracle Appliance Manager Browser User Interface to delete an Oracle database.

Link -

https://domainname:7093/docs/cmtxn/managing-databases-oda.html#GUID-D85D987A-1D9E-4615-B9DB-65B4B393B1D1

## odacli list-jobs

Use the odacli list-jobs command to display a list of jobs, including the job IDs, status, and the job created date and time stamp. The default number of jobs listed is 50 from the earliest to the latest.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

To list jobs and view job details and status:

```
odacli list-jobs [-all] [-d] [-desc description_pattern] [-ec] [-o day]
    [-f from] [-hd head] [-l last] [-msg message_pattern]
    [-ndesc not_match_description_pattern]
    [-nmsg not_match_message_pattern] [-sd sorted_by_duration]
    [-s status] [-tl tail] [-t to] [-j] [-h]
```

#### **Parameters**

Parameter	Description
all-jobs, -all	(Optional) Displays jobs created by both DCS and error correlation framework.
ec-jobs, -ec	(Optional) Displays jobs created by the error correlation framework.
for, -o	(Optional) Describes a job created on a specific date. In the format YYYY-MM-DD, such as 2018-01-01.
	Example:
	# odacli list-jobs -o 2018-08-09



Parameter	Description
from, -f	(Optional) Describes a job created since a specific date. In the format YYYY-MM-DD or YYYY-MM-DD HH:mm:ss, such as 2018-01-01 or 2018-01-01 01:00:00.
	Examples:
	<pre># odacli list-jobs -f 2018-08-27 # odacli list-jobs -f "2018-08-27 03:00:00"</pre>
head, -hd	(Optional) Describes the maximum number of older jobs to be displayed, values can be 1 to 200. Example:
	odacli list-jobs -hd 10
to, -t	(Optional) Describes a job created ahead of a specific date. In the format YYYY-MM-DD or YYYY-MM-DD HH:mm:ss, such as 2018-01-01 or 2018-01-01 01:00:00.
	Example:
	# odacli list-jobs -t 2018-08-07
last, -l	(Optional) Describes jobs created from last 'n' time unit - where n can be any integer and time unit can be d for days, h for hours or m for minutes.
tail,-tl	(Optional) Describes the maximum number of latest jobs to be displayed, values can be 1 to 200.
	Example:
	# odacli list-jobs -tl 10
description, -desc	(Optional) Specifies the pattern to filter jobs based on their description. For example, .*a, b.*, .*a b.*
no-desc, -ndesc	(Optional) Specifies the pattern to filter jobs that do not match their description. For example, .*a, b.*, .*a b.*
message, -msg	(Optional) Specifies the pattern to filter jobs based on their message. For example, .*a, b.*, .*a b.*
no-message, -nmsg	(Optional) Specifies the pattern to filter jobs that do not match their message. For example, .*a, b.*, .*a b.*



Parameter	Description
sort-duration, -sd	(Optional) Specifies to sort jobs by duration, either asc or desc.
status, -s	(Optional) Specifies the status of the job, such as created, scheduled, running, failure, success, internalerror.
	Example:
	# odacli list-jobs -s success
describe-job, -d	(Optional) Specifies the description of the filtered job, if the filter returns a single job.
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

## Example 17-199 Displaying a List of Jobs

## To display a list of jobs:

## Example 17-200 Displaying Specified Number of Older Jobs

To display a specified number of older jobs:

```
# odacli list-jobs -hd 5
ID Description Created Status
--- ---
643c6186-a667-43d7-847f-d756a96fa072 Create detailed Backup Report
August 5, 2018 12:36:26 AM UTC Success
f29cb82c-6150-487d-aaff-52d65f6ab972 Create recovery-pitr : time '08/05/2018
07:16:12'
for db : igIyoz August 5, 2018 1:01:39 AM UTC Success
cfe19337-ab2f-4ef3-85b5-24601ba31be2 Create detailed Backup Report
August 5, 2018 1:17:46 AM UTC Success
3749b5e2-240e-4df5-b3c1-32d345243b25 Create detailed Backup Report
August 5, 2018 2:01:07 AM UTC Success
64828852-bb16-4f06-aca9-4bdf9fe7b6f2 Create regular-5 Backup with TAG-iD5UNjBZ8HN2FYL
for Db:igIyoz August 5, 2018 2:14:19 AM UTC Success
```



### Example 17-201 Displaying Jobs in a Date Range

To display jobs created within a time frame:

```
# ./odacli list-jobs -f 2018-08-07 -t 2018-08-08
ID Description Created Status
1fc5ef97-a9db-49b2-9664-7c551bd005f4 Authentication key update for test user
August 7, 2018 12:56:58 AM UTC Success
e24f86cf-bb2e-4ebe-84e0-da5cedb27ad4 Provisioning service creation August 7,
2018 1:00:54 AM UTC Success
7f67efd6-cce5-47b4-8dc4-fdb732491f99 CPU cores service update August 7, 2018
1:41:05 AM UTC Success
Oae9a312-bac8-43be-8a64-5a12c24c2a02 SSH keys update August 7, 2018 1:42:59
AM UTC Success
af41fdc1-87ff-46cd-bc41-26615e115ae7 SSH key delete August 7, 2018 1:44:56 AM
79e4cbb0-b474-48ab-9e04-d3d602bc0ed2 DcsCli patching August 7, 2018 1:50:18
AM UTC Success
edd55e7d-f81f-4a10-942d-1121aef0bff3 DcsCli patching August 7, 2018 1:50:32
AM UTC Success
acc22c60-3476-4566-8faa-4d36b116eded create backup
config:aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa August 7, 2018 2:01:46 AM UTC Success
d89efedf-9110-429a-a3b2-ccd6a53f8564 Database Home OraDB12201 home2 creation
with version :12.2.0.1 August 7, 2018 2:36:05 AM UTC Success
2a5532ae-41fa-47c2-bc90-010a5f26d6b2 Database service creation with db name:
my122 August 7, 2018 3:52:38 AM UTC Success
c4e533e9-c596-478f-92db-2f11f1384075 Discover Components : all August 7, 2018
4:07:09 AM UTC Success
149e89b5-27d3-4c7c-9c03-f029ca3dd495 Discover Components : all August 7, 2018
4:08:45 AM UTC Success
21d4c37b-49ad-48dd-a1db-1f25d9288312 Database Home OraDB11204 home1 creation
with version :11.2.0.4 August 7, 2018 4:19:32 AM UTC Success
b61dbbca-edc1-4a4a-9db2-82b0bdcb64e6 Database service deletion with db name:
myTestDb with id: 6400c81d-5837-480c-b4a1-7c01591ee144 August 7, 2018
4:24:50 AM UTC Success
d4a104df-5796-4e37-9173-82f0e263d642 create backup config:bkfqd August 7,
2018 4:28:54 AM UTC Success
a121d40b-f33b-47a4-8fc6-4e3b84173f44 Database service creation with db name:
my112 August 7, 2018 6:51:13 PM UTC Success
42dd661f-9ba0-4877-ace9-39d3f212c071 Discover Components : all August 7, 2018
7:12:56 PM UTC Success
2f648f5a-c9c5-42ec-adb0-98cf6497c89e Discover System Components : system
August 8, 2018 3:28:12 AM UTC Success
a5755f43-509d-4d4c-b7ef-9f99660c4de7 DB Home Patching: Home Id is
97df26b3-42f2-4189-805b-82d1b38737d0 August 8, 2018 3:52:08 AM UTC Success
79b0e697-065f-4630-a524-8d072a4e139a Database Home OraDB12102 home1 creation
with version :12.1.0.2 August 8, 2018 4:34:30 AM UTC Success
112b75bc-3512-4c28-a479-3e0317eb0dc4 Database service creation with db name:
mynew121 August 8, 2018 8:02:51 AM UTC Failure
09f56fb0-le91-4b02-a9b8-5add11a8da32 Database service creation with db name:
my121a August 8, 2018 9:13:01 AM UTC Success
5633ded9-07ea-4bf9-9533-31eb65789fe7 Database service deletion with db name:
mynew121 with id: 24be4362-16c8-476f-903a-f6f2ef59f5e4 August 8, 2018
9:24:31 AM UTC Success
458d1c45-02dc-456c-ae88-5da613faaa66 Database service creation with db name:
```

```
mynew121 August 8, 2018 9:27:31 AM UTC Success f178f378-a9d7-4d5c-b6f5-6f62ea4e05bb Database service deletion with db name: myTestDb with id: ef50387b-0c62-4446-b210-f8d070e2a043 August 8, 2018 9:40:43 AM UTC Success 7fab740f-a711-466a-ba6d-dd5643374c28 Database service deletion with db name: myTestDb with id: 6632a083-558a-4eb4-8c2b-af0710179980 August 8, 2018 9:41:04 AM UTC Success 3121529d-2b9d-4bbe-bf58-996c2cf46996 Database service creation with db name: mydss August 8, 2018 9:42:06 AM UTC Success 3d0a9261-19d7-42bb-8b92-00fcc4f8c41e Discover Components: db August 8, 2018 10:17:22 AM UTC Success
```

## odacli list-pendingjobs

Use the odacli list-pendingjobs command to list all pending jobs.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

odacli list-pendingjobs [-j] [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Example 17-202**

# odacli list-pendingjobs

## odacli list-jobdata-retention-policy

Use the odacli list-jobdata-retention-policy command to list job data retention policy for default DCS jobs and specific auto scheduled jobs.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

To list jobs and view job details and status:

odacli list-jobdata-retention-policy [-j] [-h]



#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

## Example 17-203 Listing all job retention policies

## odacli list-purge-jobdata-jobs

Use the odacli list-purge-jobdata-jobs command to list purge job data for default DCS jobs and specific auto scheduled jobs.

#### File Path

/opt/oracle/dcs/bin/odacli

# odacli list-purge-jobdata-jobs

#### **Syntax**

To list job data purge policy:

```
odacli list-purge-jobdata-jobs [-j] [-h]
```

#### **Parameters**

Parameter	Description
json, -j	(Optional) Displays JSON output.
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

The command describes the files that are purged, the purged count, the purged file size, and the time of purge.

## Example 17-204 Listing history, statistics, and rules for job data purge jobs

Purge By Job Purged Object Count Size Type Purged Time



```
4d065c96-a8eb-4974-a446-573b5ad3cb95TaskReport102MetadataApril23, 2020 1:55:59 PM PDT4d065c96-a8eb-4974-a446-573b5ad3cb95ServiceJobReport24MetadataApril23, 2020 1:55:59 PM PDT4d065c96-a8eb-4974-a446-573b5ad3cb95LogCleanupSummary2MetadataApril23, 2020 1:55:59 PM PDT4d065c96-a8eb-4974-a446-573b5ad3cb95JobExecutionResource93MetadataApril23, 2020 1:55:59 PM PDT4d065c96-a8eb-4974-a446-573b5ad3cb95JobDataPurgeResult21MetadataApril23, 2020 1:55:59 PM PDT
```

## odacli list-scheduled-executions

Use the command odacli list-scheduled-executions to display a list of jobs that were executed.

#### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

### **Syntax**

```
odacli list-scheduled-executions [-e] [-1] [-j] [-h]
```

#### **Parameters**

Parameter	Description
executionid, -e	(Optional) Displays the execution ID.
scheduleid, -i	(Optional) Displays the Schedule ID.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.

#### Example 17-205 Displaying a List of Scheduled and Executed Jobs

Display a list of scheduled tasks, the status, and the date and time that the task was executed. In the following example, three (3) scheduled tasks were executed. One task, Schedule ID 04b5750c-0d13-42cf-aba3-85416e8edafb, was executed twice.



To learn more about a scheduled backup, run the command odacli list-schedules. The output displays the ID, name, description, and schedule for each task.

```
# odacli list-schedules
                                        Name
Description
d136cc72-4a80-4ab8-9f1e-120b995b2794 metastore maintenance
internal metastore maintenance
04b5750c-0d13-42cf-aba3-85416e8edafb AgentState metastore cleanup
internal agentstateentry metastore maintenance
7ee1e2aa-80a8-4297-97f7-365b84bcce4d backupreport maintenance backup
reports deletion
(Continued)
CronExpression
                             Disabled
0 0 0 1/1 * ? *
0 0 0 1/1 * ? *
                             false
0 0 0 1/3 * ? *
                              false
```

## odacli Oracle Key Vault Server Configuration Commands

Use odacli commands to manage Oracle Key Vault server configuration for databases on Oracle Database Appliance.

- odacli create-okvserverconfig
  - Use the command odacli create-okvserverconfig to create an Oracle Key Vault server configuration.
- odacli copy-okvtdewallet
  - Use the command odacli copy-okvtdewallet to copy an Oracle Key Vault TDE wallet.
- odacli delete-okvserverconfig
  - Use the command odacli delete-okvserverconfig to delete an Oracle Key Vault server configuration.
- odacli describe-okvserverconfig
  - Use the command odacli describe-okvserverconfig to view the Oracle Key Vault server configuration details.
- odacli list-okvserverconfigs
  - Use the command odacli list-okvserverconfigs to view all Oracle Key Vault server configurations.
- · odacli update-okvendpoints
  - Use the command  ${\tt odacli}$  update-okvendpoints to update Oracle Key Vault endpoints software.



## odacli create-okvserverconfig

Use the command odacli create-okvserverconfig to create an Oracle Key Vault server configuration.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli create-okvserverconfig -n name -u okv\_user\_name [-d okv\_description]
[-host okv host name] [-ip okv ip address] [-h] [-j]

#### **Parameters**

Parameter	Description	
name, -n	(Mandatory) Specifies the name of the Oracle Key Vault server configuration object.	
user-name, -u	(Mandatory) Specifies the name of the Oracle Key Vault user on the Oracle Key Vault server.	
description, -d	(Optional) Describes the Oracle Key Vault server configuration object.	
hostname, -host	(Optional) Specifies the name of the Oracle Key Vault server where the Oracle Key Vault user has an account.	
server-ip, -ip	(Optional) Specifies the IP address of the Oracle Key Vault server where the Oracle Key Vault user has an account.	
help, -h	(Optional) Displays help for using the command.	
json,-j	(Optional) Displays JSON output. The default is false.	

#### **Usage Notes**

To create an Oracle Key Vault server configuration okvobj1 for the Oracle Key Vault server user epokvusr1 on the specified server:

## Example 17-206 Creating an Oracle Key Vault server configuration

odacli create-okvserverconfig -n okvobj1 -u epokvusr1 -ip xxx.xxx.xxx
Enter OKV user password :
Retype OKV user password :

## odacli copy-okvtdewallet

Use the command odacli copy-okvtdewallet to copy an Oracle Key Vault TDE wallet.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

```
# odacli copy-okvtdewallet -swn source_wallet_name -tosc
target_okv_server_config -twn target_okv_wallet_name [-shn hostname] [-sip
ip address] [-su user name] [-j] [-h]
```

#### **Parameters**

Parameter	Description
source-wallet-name, -swn	(Mandatory) Specifies the name of the wallet from which TDE keys must be copied to the target wallet in the Oracle Key Vault server.
target-okvserverconfig,-tosc	(Mandatory) Specifies the name of the Oracle Key Vault server configuration object where the target wallet must be created.
target-wallet-name, -twn	(Mandatory) Specifies the name of the wallet to which the TDE keys must be copied from the source wallet in the Oracle Key Vault server.
source-hostname, -shn	(Optional) Specifies the fully-qualified domain name (FQDN) of the Oracle Key Vault server where the source wallet is created. Specify this value only if the source wallet and the target wallet use different Oracle Key Vault servers.
source-ip, -sip	(Optional) Specifies the IP address of the Oracle Key Vault server where the source wallet is created. Specify this value only if the source wallet and the target wallet use different Oracle Key Vault servers.
source-username, -su	(Optional) Specifies the name of the Oracle Key Vault user who owns the source wallet on the Oracle Key Vault server. Specify this value only if the source wallet and the target wallet use different Oracle Key Vault servers.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

# Example 17-207 Copying the TDE wallet in the same Oracle Key Vault server and owned by the same Oracle Key Vault user

The source TDE wallet and the target TDE wallet are on the same Oracle Key Vault server, and both are owned by the same user on the Oracle Key Vault server.

```
odacli copy-okvtdewallet -swn tdeokv_on_scaoda8m013-c -tosc okvobj1 -twn tdeokvss  
   Job details
```

ID: 50df7dcc-8e17-48db-9206-879c44e57c20

Description: Copy wallet in OKV server

Status: Success

Created: June 20, 2024 2:56:02 AM CST

Message:



# Example 17-208 Copying the TDE wallet on the same Oracle Key Vault server but using a different Oracle Key Vault user

The source and the target wallet are on the same Oracle Key Vault server but are owned by different users on the Oracle Key Vault server. In this scenario, the target wallet user must copy the source wallet with the following command. Before running the ODACLI command to copy the wallet, the source wallet Oracle Key Vault user must provide read and manage access permissions on the wallet, to the target wallet Oracle Key Vault user. For more details, see the Restoring TDE-Enabled Database with TDE Keys Stored on Oracle Key Vaulttopic.

```
odacli copy-okvtdewallet -swn tdeokv on scaoda8m013-c -tosc okvobj2 -twn
tdeokvdu
Job details
               ID: 50df7dcc-8e17-48db-9206-879c44e57c20
        Description: Copy wallet in OKV server
            Status: Success
           Created: June 20, 2024 2:56:02 AM CST
           Message:
Task Name
                              Start
Time
                         End Time
Status
_____
_____
______
Creating a TDE wallet copy in the OKV June 20, 2024 2:56:03 AM
CST
          June 20, 2024 2:57:17 AM CST
server
```

## Example 17-209 Copying the TDE wallet to a different Oracle Key Vault server

The source wallet and the target wallet are on different Oracle Key Vault servers. Specify the source wallet Oracle Key Vault server details also must be provided in the ODACLI command. Specify the source wallet Oracle Key Vault user password, when prompted.



Status: Success

Created: June 20, 2024 2:56:02 AM CST

Message:

 $\begin{array}{ccc} {\tt Task \ Name} & {\tt Start} \\ {\tt Time} & {\tt End \ Time} \\ \end{array}$ 

Status

\_\_\_\_\_

\_\_\_\_\_

Creating a TDE wallet copy in the OKV June 20, 2024 2:56:03 AM CST June 20, 2024 2:57:17 AM CST Success server

## odacli delete-okvserverconfig

Use the command odacli delete-okvserverconfig to delete an Oracle Key Vault server configuration.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli delete-okvserverconfig [-n name] [-h] [-j]

### **Parameters**

Parameter	Description
name, -n	(Mandatory) Specifies the Oracle Key Vault server configuration to delete.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

### **Usage Notes**

Use the <code>odacli delete-okvserverconfig</code> command to delete Oracle Key Vault server configuration. You can delete the Oracle Key Vault server configuration only if the databases that used the Oracle Key Vault server configuration are already deleted.

#### Example 17-210 Deleting Oracle Key Vault server configuration

odacli delete-okvserverconfig -n okvobj1

## odacli describe-okvserverconfig

Use the command odacli describe-okvserverconfig to view the Oracle Key Vault server configuration details.

#### File Path

/opt/oracle/dcs/bin/odacli

#### **Syntax**

# odacli describe-okvserverconfig [-n name] [-h] [-j]

#### **Parameters**

Parameter	Description
name, -n	(Mandatory) Specifies the Oracle Key Vault server configuration.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

For example, the odacli describe-okvserverconfig command in a multi-user access enabled system displays the following:

# Example 17-211 Viewing Oracle Key Vault server configuration details in a multi-user access enabled system

```
odacli describe-okvserverconfig -n okvobj1
OKV Server Config details
                        _____
                   ID: 441fb120-35f8-4c9a-9a5c-76aebaba1c36
                 Name: okvobj1
         OKV User Name: epadmin
         OKV Server IP: xxx.xx.xx.xxx
         Primary owner: okvusr1
      Secondary owners: [odaadmin,dbusr1, dbusr2]
odacli describe-okvserverconfig -n okvobj1 -j
   "ID": "441fb120-35f8-4c9a-9a5c-76aebaba1c36",
   "Name" : "okvobj1"
   "Primary owner" : "okvusr1"
   "Secondary Owners : [ "odaadmin", "dbusr1", "dbusr2" ]
   "createTime" : "January 04, 2024 11:25:04 AM UTC",
   "updatedTime" : "January 04, 2024 11:37:48 AM UTC"
```

# Example 17-212 Viewing Oracle Key Vault server configuration details in a non-multi user access enabled system

In a non-multi user access enabled system, the primary and secondary owner details are not displayed:

# Example 17-213 Viewing Oracle Key Vault server configuration details with the -j option

```
odacli describe-okvserverconfig -n dokvobj1 -j
{
    "id" : "2348516e-37f4-41a6-b482-c70ce0e53bc8",
    "name" : "dokvobj1",
    "userName" : "user1",
    "hostname" : null,
    "ipAddress" : "xxx.xxx.xxx.xxx",
    "description" : null,
    "createTime" : "October 20, 2024 05:49:22 AM PDT",
    "updatedTime" : "October 20, 2024 05:49:47 AM PDT",
    "state" : {
        "status" : "CONFIGURED"
    }
}
```

## odacli list-okvserverconfigs

Use the command odacli list-okvserverconfigs to view all Oracle Key Vault server configurations.

### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli list-okvserverconfigs [-h] [-j]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

## Example 17-214 Viewing all Oracle Key Vault server configurations

odacli list-okvserverconfigs

ID			Name	User
Name	IP address	Host	Name	Description
d017d35a-075	7-460a-98f0-9f8d0944	c872	okvobj1	
epadmin	XXX.XX.XX		Null	Brief
description				
b6336173-666k	o-4d81-88bd-5ae38441	9114	okvobj2	
epadmin2	XXX.XX.XX		Null	Brief description

## odacli update-okvendpoints

Use the command odacli update-okvendpoints to update Oracle Key Vault endpoints software.

#### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

# odacli update-okvendpoints [-es] [-lib] [-oj okv\_client\_json] [-j] [-h]

## **Parameters**

Parameter	Description
endpoint-software, -es	When specified, updates the endpoint software of databases that use Oracle Key Vault.
library, -lib	When specified, updates Oracle Key Vault PKCS library and restarts all databases. Also updates Oracle Key Vault REST client of all Oracle Key Vault server configuration object available in the system.



Parameter	Description
okvclient-json,-oj	Specifies the absolute path to JSON file which contains database name and absolute path to okvclient.jar file, corresponding to each database instance.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.

### **Usage Notes**

Sample command to update endpoint software of Oracle Key Vault TDE databases that were created without using Oracle Key Vault user credentials is as follows:

```
cat /tmp/okvclient.json
    "dbName" : "racdb1",
    "node1" : "/tmp/racdb11/okvclient.jar",
    "node2" : "/tmp/racdb12/okvclient.jar"
    "dbName" : "sidb1",
   "node1" : "/tmp/sidb1/okvclient.jar"
  }
odacli update-okvendpoints -es -oj /tmp/okvclient.json
Enter TDE password of 'racdb1' database:
Enter TDE password of 'sidb1' database:
Job details
                     ID: 64ae75d4-6435-4842-b507-8adcd12bd4bd
           Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
                 Status: Created
                Created: May 29, 2025 19:24:55 PDT
                Message:
Task Name Start Time End Time Status
odacli describe-job -i 64ae75d4-6435-4842-b507-8adcd12bd4bd
Job details
                     ID: 64ae75d4-6435-4842-b507-8adcd12bd4bd
           Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
                 Status: Success
                Created: May 29, 2025 19:24:55 PDT
```

#### Message:

```
Task Name Node Name Start Time End Time Status
Endpoint update: racdb1 scaoda806c1n1 May 29, 2025 19:24:58 PDT May 29, 2025
19:24:59 PDT Success
Endpoint update: racdb1 scaoda806c1n2 May 29, 2025 19:24:59 PDT May 29, 2025
19:25:01 PDT Success
Endpoint update: sidb1 scaoda806c1n1 May 29, 2025 19:25:05 PDT May 29, 2025
19:25:06 PDT Success
dharm: Sample command to update endpoint software of Oracle Keyvault TDE
databases that were created using okv user credentials.
cat /tmp/okvclient 2.json
   "dbName" : "mydb"
]
odacli update-okvendpoints -es -oj /tmp/okvclient 2.json
Job details
                   ID: 245a2d23-4a6a-4fe8-943f-9a81e1059fe7
           Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
               Status: Created
              Created: May 29, 2025 19:26:57 PDT
              Message:
Task Name Start Time End Time Status
_____
odacli describe-job -i 245a2d23-4a6a-4fe8-943f-9a81e1059fe7
Job details
._____
                   ID: 245a2d23-4a6a-4fe8-943f-9a81e1059fe7
           Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
               Status: Success
              Created: May 29, 2025 19:26:57 PDT
              Message:
Task Name Node Name Start Time End Time Status
__________
Endpoint update: mydb scaoda806c1n1 May 29, 2025 19:27:53 PDT May 29, 2025
19:28:47 PDT Success
```

An example to update the Oracle Key Vault PKCS library is as follows. Confirm your action when prompted in the command output flow.

```
odacli update-okvendpoints -lib
Databases [racdb1, sidb1, mydb] will be restarted during library update. Want
to proceed? (Y/N): y
Job details
                   ID: f5f6a0f4-061b-4ab1-9656-51beaa381438
           Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
               Status: Created
               Created: May 29, 2025 19:42:07 PDT
               Message:
Task Name Start Time End Time Status
odacli describe-job -i f5f6a0f4-061b-4ab1-9656-51beaa381438
Job details
                   ID: f5f6a0f4-061b-4ab1-9656-51beaa381438
           Description: Update all databases endpoints, OKV PKCS library and
all OKV REST clients
               Status: Success
               Created: May 29, 2025 19:42:07 PDT
               Message:
Task Name
                                 Node Name Start Time
                        Status
___________
_____
Okvobj1 : OKV client library update scaoda806c1n1 May 29, 2025 19:42:20 PDT
May 29, 2025 19:42:22 PDT Success
                                 scaoda806c1n1 May 29, 2025 19:42:22 PDT
Racdb1:Database stop (Srvctl)
May 29, 2025 19:42:55 PDT Success
Sidb1:Database stop (Srvctl)
                                 scaoda806c1n1 May 29, 2025 19:42:55 PDT
May 29, 2025 19:43:21 PDT Success
Mydb:Database stop (Srvctl)
                                 scaoda806c1n1 May 29, 2025 19:43:21 PDT
May 29, 2025 19:43:44 PDT Success
dharm: Database start (Srvctl)
                                 scaoda806c1n1 May 29, 2025 19:43:44 PDT
May 29, 2025 19:44:21 PDT Success
OKV PKCS library update
                                 scaoda806c1n1 May 29, 2025 19:43:44 PDT
May 29, 2025 19:43:44 PDT Success
Database start (Srvctl)
                                 scaoda806c1n1 May 29, 2025 19:44:22 PDT
May 29, 2025 19:44:53 PDT Success
Database start (Srvctl)
                                 scaoda806c1n1 May 29, 2025 19:44:53 PDT
May 29, 2025 19:45:28 PDT Success
```



### **Related Topics**

Updating Oracle Key Vault Endpoints for Databases

Understand how you can update the Oracle Key Vault client on Oracle Database Appliance when the Oracle Key Vault server is updated to the latest release or when certificates are regenerated on the Oracle Key Vault server.

# Log Commands

Use the odacli log commands to specify the options to collect and delete logs.

# odaadmcli manage diagcollect

Use the odaadmcli manage diagcollect command to collect diagnostic logs for Oracle Database Appliance components.

odacli create-auto-logclean-policy

Use the odacli create-auto-logclean-policy command to create a policy for a job to automatically purge log files for a specified time period when certain criteria are met.

odacli delete-auto-logclean-policy

Use the odacli delete-auto-logclean-policy command to delete a policy for a job to automatically purge log files for a specified time period when certain criteria are met.

odacli create-logcleanjob

Use the odacli create-logcleanjob command to create a job to purge log files for a specified time period.

odacli describe-logcleanjob

Use the odacli describe-logcleanjobcommandto describe a log cleanup job.

odacli list-auto-logclean-policy

Use the odacli list-auto-logclean-policy command to list the jobs to purge log files.

odacli list-logcleanjobs

Use the odacli list-logclean jobs command to list the jobs to purge log files.

odacli list-logspaceusage

Use the odacli list-logspaceusage command to display the log file usage.

# odaadmcli manage diagcollect

Use the odaadmcli manage diagcollect command to collect diagnostic logs for Oracle Database Appliance components.

#### File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

To collect diagnostic logs for components:

```
odaadmcli manage diagcollect [-h] [--dataMask] [--dataSanitize] [--
fromTime] [--toTime] [--Components]
```



Parameter	Description
help, -h	(Optional) Displays help for using the command.
dataMask	(Optional) Masks sensitive data. The default is No.
dataSanitize	(Optional) Sanitizes (redacts) sensitive data. The default is No.
fromTime	(Optional) Specifies the time from when you want to collect data. The timestamp formats can be of the type: mon/dd/yyyy hh:mm:ss, or yyyy-mm-dd hh:mm:ss, or yyyy-mm-dd.
toTime	(Optional) Specifies the time till when you want to collect data. The timestamp formats can be of the type:  mon/dd/yyyy hh:mm:ss, or yyyy-mm-dd hh:mm:ss, or yyyy-mm-ddThh:mm:ss, or yyyy-mm-dd.
Components	(Optional) Specifies the comma-separated list of components for which you want to collect data. The supported values are:
	all, ips, oda, odalite, dcs, odabackup, odapatching, odadataguard, odaprovisioning, odaconfg, odasystem, odastorage, database, asm, crsclient, dbclient, dbwlm, tns, rhp, procinfo, afd, crs, cha, wls, emagent, oms, ocm, emplugins, em, acfs, install, cfgtools, os, ashhtml, ashtext, awrhtml, awrtext
verbose	Displays detailed message.

# **Usage Notes**

The following types of sensitive information can be redacted using the --dataMask or the --dataSanitize option:

- Host names
- IP addresses
- Database names
- Tablespace names
- Service names
- Ports
- Operating System user names

For example, when the --dataMask option is used, all instances of a sensitive name such as a database name called "payrolldb" are replaced with "\*\*\*\*\*\*\*\*" in the TFA collection.

For example, when the --dataSanitize option is used, all instances of a sensitive name such as a database name called "payrolldb" are replaced with another string, such as "oCjlN7F8P", in the TFA collection.



### Example 17-215 Masking Sensitive Data in Log Collection

# /opt/oracle/oak/bin/odaadmcli manage diagcollect --dataMask
DataMask is set as true
TFACTL command is: /opt/oracle/tfa/tfa\_home/bin/tfactl
Data mask is set.
Collect data within last 12 hours as default
Please wait for several minutes for the collection to complete.

# odacli create-auto-logclean-policy

Use the odacli create-auto-logclean-policy command to create a policy for a job to automatically purge log files for a specified time period when certain criteria are met.

### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli create-auto-logclean-policy [-h] [-c] [-o] [-u] [-uMB] [-f] [-uPer]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
components, -c	(Optional) Specifies the list of components, separated by comma. The values are gi  database dcs For example, gi dcs.
olderthan, -o	(Optional) Cleans logs older than specified time interval. Default is 30 if it is not specified.
olderThanUnit, -u	(Optional) Unit for theolderthan parameter.  Default is Day if it is not specified.
freeSpaceBelowPercentage, -f	Starts purge when free disk space is below the specified number of percentage of the total partition size. Valid range is 20-50. Default is 20.
usageOverMB, -uMB	Starts purge when log usage is over the specified number of MB. Valid range is 10%-50% of partition size.
usageOverPercentage, -uPer	Starts purge when log usage is over the specified number of percentage of total partition space. Valid range is 10-50.

# **Example 17-216 Creating Automatic Jobs to Purge Logs**

To create a policy for automatic jobs to purge logs:

# odacli create-auto-logclean-policy -c 'dcs' -o 30 -uPer 30
Component UsageOverPercentage freeSpaceBelowPercentage UsageOverMB
OlderThan OlderThanUnit



dcs	30	20	0		
30	Day				

# odacli delete-auto-logclean-policy

Use the odacli delete-auto-logclean-policy command to delete a policy for a job to automatically purge log files for a specified time period when certain criteria are met.

## File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli odacli delete-auto-logclean-policy [-c] [-h] [-j]

### **Parameters**

Parameter	Description
components, -c	(Optional) Specifies the list of components, separated by comma. The values are gi   database   dcs For example, gi   dcs.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output. The default is false.

# odacli create-logcleanjob

Use the odacli create-logcleanjob command to create a job to purge log files for a specified time period.

## File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

## **Syntax**

To list jobs and view job details and status:

odacli create-logcleanjob [-h] [-c] [-o] [-u]

Parameter	Description
help, -h	(Optional) Displays help for using the command.
components, -c	(Optional) Specifies the list of components, separated by comma. The values are gi   database   dcs For example, gi, dcs.
olderthan, -o	(Optional) Cleans logs older than specified time interval. Default is 30 if it is not specified.



Parameter	Description
unit, -u	(Optional) Unit for theolderthan parameter.  Default is Day if it is not specified.

# **Example 17-217 Creating Jobs to Purge Logs**

To create jobs to purge logs:

# odacli create-logcleanjob
Job details

-----

ID: e03d90b5-41dd-45e0-8b7a-1480d6d7f86f

Description: log file cleanup

Status: Created

Created: July 25, 2018 8:06:56 PM UTC

Message:

Task Name Start Time End Time Status

\_\_\_\_\_\_

-----

# ./odacli describe-job -i e03d90b5-41dd-45e0-8b7a-1480d6d7f86f

Job details

-----

ID: e03d90b5-41dd-45e0-8b7a-1480d6d7f86f

Description: log file cleanup

Status: Success

Created: July 25, 2018 8:06:56 PM UTC

Message:

Task Name Start Time End Time Status

Clean TFA logs July 25, 2018 8:06:56 PM UTC July 25, 2018 8:06:59 PM UTC

Success

Clean DCS logs July 25, 2018 8:06:56 PM UTC July 25, 2018 8:06:56 PM

UTC Success



# odacli describe-logcleanjob

Use the odacli describe-logcleanjobcommandto describe a log cleanup job.

### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

# **Syntax**

To list jobs and view job details and status:

odacli describe-logcleanjob -i [-h] [-j]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output.
id, -i	Displays the summary of the log cleanup with the specified job ID.

## **Example 17-218 Displaying Log Cleanup Jobs**

To display log cleanup jobs:

e03d90b5-41dd-45e0-8b7a-1480d6d7f86f 0 0 bytes gi /u01/app/12.2.0.1/grid July 25, 2018 8:06:59 PM UTC

# odacli list-auto-logclean-policy

Use the odacli list-auto-logclean-policy command to list the jobs to purge log files.

### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

### **Syntax**

To list jobs and view job details and status:

odacli list-auto-logclean-policy [-h] [-c]



Parameter	Description
help,-h	(Optional) Displays help for using the command.
components, -c	(Optional) Specifies the list of components, separated by comma. The values are gi  database dcs For example, gi, dcs.

## **Example 17-219 Listing Jobs to Purge Logs**

To list jobs to purge logs:

# odacli list-auto-logclean-policy
Component UsageOverPercentage freeSpaceBelowPercentage UsageOverMB
OlderThan OlderThanUnit

gi	40		20
0	60	Day	
database	40		20
0	60	Day	
dcs	30		20
0	30	Day	

# odacli list-logcleanjobs

Use the odacli list-logcleanjobs command to list the jobs to purge log files.

# File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

# **Syntax**

To list jobs and view job details and status:

odacli list-logcleanjobs [-h]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

# Example 17-220 Listing Jobs to Purge Logs

To list jobs to purge logs:

# odacli list-logcleanjobs
JobId Files Deleted Size Freed Component Top Path TimeStamp



# odacli list-logspaceusage

Use the odacli list-logspaceusage command to display the log file usage.

#### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

To list jobs and view job details and status:

odacli list-logspaceusage [-c] [-h]

# **Parameters**

Parameter	Description
components, -c	Describes the list of components delimited by comma. The values can be gi database dcs. For example,gi,dcs.
help, -h	(Optional) Displays help for using the command.

# Example 17-221 Displaying a List of Logs

To display log file space usage for a list of components:

root@node1 ~]# odacli list-logspaceusage

Timestamp: January 13, 2022 8:38:32 AM UTC

Node : node1

Component Size (MB) Partition LogUsagePercentage

PartitionFreePercentage

-----

dcs	685.00	/dev/mapper/VolGroupSys-LogVolOpt	0.76	84.00
gi	2293.76	/dev/mapper/VolGroupSys-LogVolU01	1.63	79.00
database	744.14	/dev/asm/odabase n0-159	7.27	83.00

Node : no	de2			
Component Partition		Partition ntage	LogUsagePercentage	
dcs gi database	174.00 1863.68 299.36	/dev/mapper/VolGroupSys-LogVolOpt /dev/mapper/VolGroupSys-LogVolU01 /dev/asm/odabase n1-159		85.00 79.00 90.00

# odacli Oracle Auto Service Request Commands

Use the Oracle Auto Service Request (Oracle ASR) commands to configure, update, test, and delete Oracle ASR on the system.

- odacli configure-asr
   Use the odacli configure-asr command to configure Oracle Auto Service Request (Oracle ASR) after deploying the appliance.
- · odacli describe-asr
- odacli delete-asr
- · odacli export-asrconfig
- · odacli modify-asr
- odacli test-asr

# odacli configure-asr

Use the odacli configure—asr command to configure Oracle Auto Service Request (Oracle ASR) after deploying the appliance.

### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

```
odacli configure-asr -u asr_usr [-e asr_type] [-t proxy_port] [-r proxy server] [-y proxy usr] [-hp HTTPS port] [-j] [-h]
```

Specifies the Oracle ASR user name. The user name is the My Oracle Support user name under which the server is registered.
Specifies the Oracle ASR Configuration Type. The default is internal.
(Optional) Specifies the HTTPS port for Oracle ASR Manager. The default port is 16162.



Parameter	Description
proxyport, -t	(Optional) Specifies the port on which Oracle ASR must be configured.
proxyserver, -r	(Optional) Specifies the proxy server address that can enable connect to My Oracle Support.
proxyuser, -y	(Optional) Specifies the proxy user name needed to authenticate the proxy server.
help, -h	(Optional) Displays help for using the command.
json, -j	(Optional) Displays JSON output.

### **Usage Notes**

- All log files for Oracle ASR are located in the /var/opt/asrmanager/log/ directory.
- To configure an external Oracle ASR Manager, you must define the Oracle ASR
   Configuration Type as external (-e external). For example, odacli configure-asr -e
   external.

## Example 17-222 Configuring Oracle ASR with a Proxy Server

This example configures Oracle ASR for user name user@example.com. An HTTPS port 16165 is defined.

```
# odacli configure-asr -u user@example.com -hp 16165
Enter ASR user's password:
Retype ASR user's password:
```

Job details

truststore

-----

ID: 2e6244e5-41e3-46cf-bd7a-43098dd071d8

Description: Configure ASR

Status: Success

Created: September 5, 2023 2:08:56 PM CST

Message:

Task Name Start Time

End Time Status

-----

\_\_\_\_\_ \_\_\_\_ Modify JavaExec Path September 5, 2023 2:08:57 PM CST September 5, 2023 2:08:57 PM CST Success Install ASR September 5, 2023 2:08:57 PM CST September 5, 2023 2:10:13 PM CST Success Registering ASR Manager September 5, 2023 2:10:14 PM CST September 5, 2023 2:10:22 PM CST Success Creating ASR configuration folders September 5, 2023 2:10:22 PM CST September 5, 2023 2:10:22 PM CST Success Enable HTTPS for ASR September 5, 2023 2:10:22 PM CST September 5, 2023 2:10:46 PM CST Success Importing ASR certificate into DCS September 5, 2023 2:10:46 PM CST September 5, 2023 2:10:48 PM CST Success



Registering Asset: ODA Host September 5, 2023 2:10:48 PM CST
September 5, 2023 2:10:48 PM CST

ASR assets activation September 5, 2023 2:10:48 PM CST
September 5, 2023 2:10:49 PM CST

Remove AsrConfBackup File September 5, 2023 2:10:55 PM CST
September 5, 2023 2:10:55 PM CST
Success

### Example 17-223 Configuring an External Oracle ASR

This example configures Oracle Database Appliance to use an external Oracle ASR instance.

```
# odacli configure-asr -e External
Enter ASR user's password:
Retype ASR user's password:
Job details
                    ID: cdd8445f-aefb-4f43-881a-145eaa1a1181
           Description: Configure ASR
                Status: Success
               Created: September 5, 2023 1:41:33 PM CST
               Message:
Task Name
                                         Start Time
End Time
                                   Status
Creating ASR configuration folders September 5, 2023 1:41:37 PM CST
September 5, 2023 1:41:38 PM CST Success
Importing ASR certificate into DCS September 5, 2023 1:41:38 PM CST
September 5, 2023 1:41:39 PM CST Success
truststore
Registering Asset: ODA Host
                                        September 5, 2023 1:41:39 PM CST
September 5, 2023 1:41:39 PM CST Success
ASR assets activation
                                        September 5, 2023 1:41:39 PM CST
September 5, 2023 1:41:40 PM CST Success
```

# odacli describe-asr

Use the odacli describe-asr command to display Oracle Auto Service Request (Oracle ASR) configuration details.

### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

describe-asr [-h]

Parameter	Description
help, -h	(Optional) Displays help for using the command.

## Example 17-224 Displaying Oracle ASR Details for ASR Type Internal

```
# odacli describe-asr

ASR details

ID: e0e31043-c312-4371-8301-e62642ef8a4a
Name: ASR
ASR Type: Internal
ASR Manager IP: 10.32.202.13

ASR Manager username: username@example.com
HTTPS port number: 16164
State: CONFIGURED
Created: September 3, 2023 4:02:38 AM UTC
Updated: September 3, 2023 4:03:32 AM UTC
```

# odacli delete-asr

Use the odacli delete-asr command to remove the Oracle Auto Service Request (Oracle ASR) configuration from the system.

## File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli

### **Syntax**

```
# odacli delete-asr [-h]
```

## **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

# Example 17-225 Deleting Oracle ASR From the System

```
# odacli delete-asr
{
"jobId" : "5d70bd17-ec4a-48da-8196-1364105db99d",
"status" : "Running",
"message" : null,
"reports" : [],
"createTimestamp" : 1469409622451,
"description" : "Delete ASR",
"updatedTime" : 1469409622458
}
```

# odacli export-asrconfig

Use the odacli export-asrconfig command to export the internal Oracle ASR Manager configuration files into a zip. The generated zip file can be used to configure the external Oracle ASR Manager on another Oracle Database Appliance.

### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli export-asrconfig [-j] [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

## **Example 17-226** Exporting the Internal Oracle ASR Configuration

```
# odacli export-asrconfig
Job details
```

ID: 7adb6cdc-31b8-42a4-83ac-a866307329fc

Description: Export ASR Config

Status: Created

Created: September 4, 2023 6:11:14 PM UTC

Message: Run Update repository with the zip /opt/oracle/asr/

asrConfiguration/ASRConfiguration.zip in the External ASR host once the current job is successful

Task Name Node Name Start Time End Time Status

# odacli modify-asr

Use the odacli modify-asr command to make changes to Oracle Auto Service Request (Oracle ASR) configuration details after deploying the appliance.

### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli modify-asr -u username [-r proxyserver] [-t proxyport] [-y proxyuser] e [internal|external][-hp HTTPS port] [-j] [-h]



Parameter	Description
username, -u	Defines the Oracle ASR user name. The user name is the My Oracle Support user name under which the server is registered.
asrtype, -e [internal   external]	Defines the Oracle ASR configuration type. The default is internal.
https-port, -hp	(Optional) Specifies the HTTPS port for Oracle ASR Manager. The default port is 16162.
proxyport, -t	(Optional) Defines the proxy server port.
proxyserver, -r	(Optional) Defines the proxy server address.
proxyuser, -y	(Optional) Defines the proxy user name needed to authenticate the proxy server.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

### **Usage Notes**

- Enter the ASR user password during Oracle ASR configuration.
- All log files for Oracle ASR are located in the /var/opt/asrmanager/log/ directory.
- You cannot use the modify-asr command to change the Oracle ASR type. For example, from internal to external. To change the Oracle ASR type, delete the existing configuration using the odacli delete-asr and then re-configure Oracle ASR using the odacli configure-asr command.
- You cannot modify an external Oracle ASR Manager using the odacli modify-asr command. To modify external ASR, you must delete the existing Oracle ASR configuration and reconfigure Oracle ASR using the odacli configure-asr command. Before running the odacli configure-asr command, you must update the repository with the modified Oracle ASR Manager configuration zip file.

## Example 17-227 Modifying Oracle ASR to use a New Proxy Server

This example updates Oracle ASR for user name scott.tiger@example.com. The password is not defined in the command-line. You are prompted to enter the password during configuration. The proxy server is updated to www-proxy2.example.com.

```
# odacli modify-asr -u scott.tiger@example.com --proxyserver www-
proxy2.example.com --proxyport 80
Enter ASR user's password:
Retype ASR user's password:
```

Job details

.....

ID: 79cb2baa-1644-45c5-a004-a303e3111807

Description: Update ASR

Status: Created

Updated: March 8, 2025 9:53:54 AM PST

Message:



Task Name Start Time End Time Status

# odacli test-asr

Use the odacli test-asr command to test the Oracle Auto Service Request (Oracle ASR) configuration. When the command is run, an email alert is sent to each host and Oracle ILOM registered with Oracle ASR Manager.

### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

# odacli test-asr [-h]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

### Example 17-228 Testing the Oracle ASR Configuration

```
# odacli test-asr

Job details

ID: 51522c07-1b32-4874-9bc7-bbee5885f1e5

Description: Test ASR
Status: Success
Created: October 20, 2022 1:02:49 PM UTC
Message:

Task Name Start Time End Time
Status

Test ASR October 20, 2022 1:02:50 PM UTC October 20, 2022 1:02:50 PM UTC Success
```

# Adaptive Classification and Redaction (ACR) Commands

Understand Adaptive Classification and Redaction (ACR) commands.

- odacli describe-acr
  - Use the odacli describe-acr command to check the status of ACR.
- odacli enable-acr

Use the odacli enable-acr command to enable ACR across all nodes, causing redaction of files during Oracle Trace File Analyzer diagnostic collections to occur.

### odacli redact-acr

Use the odacli redact-acr command to enable ACR across all nodes, causing redaction of files during Oracle Trace File Analyzer diagnostic collections to occur.

odacli list-acr

Use the odacli list-acr command to print reverse map of sanitized entities.

odacli disable-acr

Use the <code>odacli disable-acr</code> command to disable ACR across all nodes. Redaction of files during Oracle Trace File Analyzer diagnostic collections, then, does not occur.

# odacli describe-acr

Use the odacli describe-acr command to check the status of ACR.

### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli describe-acr [-j] [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Example 17-229**

# odacli describe-acr

# odacli enable-acr

Use the odacli enable-acr command to enable ACR across all nodes, causing redaction of files during Oracle Trace File Analyzer diagnostic collections to occur.

# File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli enable-acr [-j] [-h]

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



# **Example 17-230**

# odacli enable-acr

# odacli redact-acr

Use the odacli redact-acr command to enable ACR across all nodes, causing redaction of files during Oracle Trace File Analyzer diagnostic collections to occur.

## File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli redact-acr -i path name -m mode [-j] [-h]

## **Parameters**

Parameter	Description
inpath, -i	(Required) Specifies the path of input file to be redacted.
mode, -m	(Required) Specifies the redaction mode. The values can be mask or sanitize.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

# **Example 17-231**

# odacli redact-acr -i path\_name -m sanitize

# odacli list-acr

Use the odacli list-acr command to print reverse map of sanitized entities.

### File Path

/opt/oracle/dcs/bin/odacli

## **Syntax**

odacli list-acr -l list [-j] [-h]

Parameter	Description
list,-l	(Required) Specifies the list of sanitized entities.
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.



## **Example 17-232**

# odacli list-acr -l list

# odacli disable-acr

Use the odacli disable-acr command to disable ACR across all nodes. Redaction of files during Oracle Trace File Analyzer diagnostic collections, then, does not occur.

### File Path

/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli disable-acr [-j] [-h]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output.

### **Example 17-233**

# odacli disable-acr

# odacli OS Commands

Use the odacli OS commands to list and update operating system (OS) parameters.

- odacli list-osconfigurations
  - Use the command odacli list-osconfigurations to display the current HugePage and memlock values and view suggested values based on the total available space.
- odacli modify-osconfigurations

Use the command odacli modify-osconfigurations to update the HugePage and memlock values.

# odacli list-osconfigurations

Use the command odacli list-osconfigurations to display the current HugePage and memlock values and view suggested values based on the total available space.

### File Path

\$ORACLE\_HOME/opt/oracle/dcs/bin/odacli

### **Syntax**

odacli list-osconfigurations [-h] [-j]



Parameter	Description
help, -h	(Optional) Displays help for using the command.
json,-j	(Optional) Displays JSON output. The default is false.

## **Usage Notes**

The command displays the configured values for HugePage and memlock from the <code>/etc/sysctl.conf</code> and <code>/etc/security/limits.conf</code> files. Based on the total available space, suggested values are calculated for the parameters.

# **Example 17-234** Displaying a List of Configured and Suggested Memlock and HugePage Configurations

# odacli list-osconfigurations

Parameter	User	ConfiguredValue	SuggestedValue
Memlock	grid	295971180KB	289034355KB
Memlock	oracle	295971180KB	289034355KB
HugeSpace	default	101430MB	101161MB

# odacli modify-osconfigurations

Use the command odacli modify-osconfigurations to update the HugePage and memlock values.

### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

odacli modify-osconfigurations [-hs hugepage] [-m memlock] [-nhp  $number\ of\ hugepages$ ] [-j] [-h]

Parameter	Description
memlock, -m	(Optional) Updates only the memlock value.
hugepage, -hs	(Optional) Updates only the HugePage value.
number-hugepages, -nhp	(Optional) Updates HugePages value.
json,-j	(Optional) Displays JSON output. The default is false.
help, -h	(Optional) Displays help for using the command.



### **Usage Notes**

The command updates memlock in the /etc/security/limits.conffile and HugePage in the/etc/sysctl.conf file with the suggested values.

You can modify memlock or hugepage. If no option is provided, then both parameters are updated to the suggested values.

# Example 17-235 Updating the HugePage and Memlock Parameters to the Suggested Values

```
odacli modify-osconfigurations
"jobId": "954cf7a5-9cad-451c-8820-3140a716af26",
"status" : "Created",
"message" : "Successfully submitted a request to configure OS
parameters.",
reports" : [],
"createTimestamp" : "March 8, 2025 00:03:51 AM MST",
"resourceList" : [ ],
"description" : "Configuring OS Parameter",
"updatedTime" : "March 8, 2025 00:03:51 AM MST"
[root@rwsoda6s002 ~]# odacli describe-job -i
"954cf7a5-9cad-451c-8820-3140a716af26"
Job details
ID: 954cf7a5-9cad-451c-8820-3140a716af26
Description: Configuring OS Parameter
Status: Success
Created: March 8, 2025 12:03:51 AM MST
                    Start Time
                                                      End Time
Setting up memlock. March 8, 2025 12:03:51 AM MST March 8, 2025 12:03:51 AM MST Success Setting up HugeSpace March 8, 2025 12:03:51 AM MST March 8, 2025 12:03:51 AM MST Success
```

# odaadmcli Hardware Monitoring Commands

Use the hardware monitoring commands to display hardware configurations.

#### odaadmcli show localdisk

Use the odaadmcli show localdisk command to show the status and details of the local operating system disks.

### odaadmcli show cooling

Use the odaadmcli show cooling command to show cooling details.

### · odaadmcli show env hw

Use the odaadmcli show env\_hw command to display information about the environment and hardware.

### odaadmcli show fs

Use the odaadmcli show fs command to display filesystem details.

### odaadmcli show memory

Use the odaadmcli show memory command to display memory details.

### odaadmcli show network

Use the odaadmcli show network command to show network details.

### odaadmcli show power

Use the odaadmcli show power command to display power supply details.

odaadmcli show processor

Use the odaadmcli show processor command to display processor details.

· odaadmcli show server

Use the odaadmcli show server command to display server details.

# odaadmcli show localdisk

Use the <code>odaadmcli</code> show <code>localdisk</code> command to show the status and details of the local operating system disks.

### File Path

/opt/oracle/oak/bin/odaadmcli

## **Syntax**

To show the status and details of the local operating system disks:

odaadmcli show localdisk [-h]

### **Parameters**

Parameter	Description	
help, -h	(Optional) Displays help for using the command.	

# **Example**

# odaadmcli show localdisk NAME PATH TYPE STATUS STATE\_IN\_ILOM /dev/sda lpd 0 SSD PredictiveFailure OK /dev/sdb lpd 1 SSD OK OK

# odaadmcli show cooling

Use the odaadmcli show cooling command to show cooling details.

## File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

To show cooling details:

odaadmcli show cooling [-h]

Parameter	Description	
help, -h	(Optional) Displays help for using the command.	

# odaadmcli show env\_hw

Use the odaadmcli show env\_hw command to display information about the environment and hardware.

## File Path

/opt/oracle/oak/bin/odaadmcli

## **Syntax**

To display environment and hardware details:

odaadmcli show env\_hw [-h]

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

# **Example 17-236 Displaying Environment and Hardware Details**

To display the hardware details, enter the command odaadmcli show env\_hw. The results show a bare metal Oracle Database Appliance system.

```
# odaadmcli show env_hw
BM X7-2 Medium
```

# odaadmcli show fs

Use the odaadmcli show fs command to display filesystem details.

## File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

To display filesystem details:

odaadmcli show fs [-h]

Parameter	Description	
help, -h	(Optional) Displays help for using the command.	

# Example 17-237 Displaying Filesystem Details

```
# odaadmcli show fs
```

Type	Total Space	Free Space	Total DG Space	Free DG Space
ext3	30237M	7763M	-	-
ext3	484M	416M	-	-
ext3	60475M	38149M	-	-
ext3	100793M	22060M	-	-
acfs	102400M	102158M	4894016M	2418668M
acfs	102400M	100501M	4894016M	2418668M
acfs	102400M	100601M	4894016M	2418668M
(Contin	1104)			

```
(Continued)
```

```
Diskgroup Mount Point
/
/boot
/opt
/u01

DATA /u02/app/oracle/oradata/ACFSDB1

DATA /u02/app/oracle/oradata/ACFSDB2
```

/u02/app/oracle/oradata/EE12NCDB

# odaadmcli show memory

DATA

Use the odaadmcli show memory command to display memory details.

### File Path

/opt/oracle/oak/bin/odaadmcli

## **Syntax**

To show memory details:

```
odaadmcli show memory [-h]
```

Parameter	Description	
help, -h	(Optional) Displays help for using the command.	



### Example 17-238 Display Memory Details

# odaadmcli show memory

NAME DIMM_0 DIMM_11 DIMM_3 DIMM_8	HEALTH OK OK OK	HEALTE - - - -	_DETAILS	PART_NO. 3A4K40BB1-CRC 3A4K40BB1-CRC 3A4K40BB1-CRC 3A4K40BB1-CRC	SERIAL_NO. 00CE01154602EADA96 00CE01154602EADADA 00CE01154602EADBC7 00CE01154602EADBA0
(Continu	ed)				
LOCATION	MANUFAC	TURER	MEMORY_SIZ	E CURR_CLK_SPEED	ECC_Errors
P0/D0	Samsung		32 GB	2400 MHz	0
PO/D1	Samsung		32 GB	2400 MHz	0
P0/D3	Samsung		32 GB	2400 MHz	0
P0/D8	Samsung		32 GB	2400 MHz	0

# odaadmcli show network

Use the odaadmcli show network command to show network details.

### File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

To show network details:

odaadmcli show network [-h]

# **Parameters**

Parameter	Description	
help, -h	(Optional) Displays help for using the command.	

# Example 17-239 Showing Network Details

# odaadmcli show network HEALTH HEALTH DETAILS LOCATION PART NO MANUFACTURER MAC\_ADDRESS LINK\_DETECTED DIE\_TEMP Ethernet NIC 0 i210 OK NET0 INTEL 00:10:E0:DD:9D:14 no (em1) N/A X710/X557-AT Intel Ethernet NIC 1 OK NET1 3C:FD:FE:78:93:92 no (p2p3) N/A Ethernet NIC 2 X710/X557-AT Intel NET2 OK 3C:FD:FE:78:93:91 yes (p2p2) N/A Ethernet NIC 3 X710/X557-AT Intel OK NET3 3C:FD:FE:78:93:90 yes (p2p1) N/A Ethernet NIC 4 OK NET4 BCM57414 Broadcom B0:26:28:3F:D8:B8 yes (p7p2) N/AEthernet NIC 5 OK NET5 X710/X557-AT Intel 3C:FD:FE:78:93:93 no (p2p4) N/A

Ethernet\_NIC\_6 OK - NET6 BCM57414 Broadcom B0:26:28:3F:D8:B0 yes (p7p1) N/A

# odaadmcli show power

Use the odaadmcli show power command to display power supply details.

### File Path

/opt/oracle/oak/bin/odaadmcli

# **Syntax**

Run this command on the first node, to display power supply details on Oracle Database Appliance High-Availability (HA) models:

odaadmcli show power [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

# **Example 17-240 Displaying Power Supply Details**

# odaadmcli show power

NAME HEALTH HEALTH DETAILS PART\_NO. SERIAL\_NO.
Power\_Supply\_0 OK - 7079395 476856Z+1514CE056G

(Continued)
LOCATION INPUT\_POWER OUTPUT\_POWER INLET\_TEMP
PS0 Present 112 watts 28.000 degree C 34.938 degree C

# odaadmcli show processor

Use the odaadmcli show processor command to display processor details.

### File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

To show processor details:

odaadmcli show processor [-h]

Parameter	Description
help, -h	(Optional) Displays help for using the command.



## Example 17-241 Displaying Processor Details

# odaadmcli show server

Use the odaadmcli show server command to display server details.

### File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

### To show server details:

```
odaadmcli show server [-h]
```

### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

### Example 17-242 Displaying Server Details

```
# odaadmcli show server

Power State : On
Open Problems : 0
Model : ORACLE SERVER X7-2
Type : Rack Mount
Part Number : 7320190
Serial Number : 1605NM10JJ
Primary OS : Not Available
ILOM Address : 10.209.8.215
ILOM MAC Address : 00:10:E0:95:98:F0
Description : Oracle Database Appliance X7-2 Small 1606NM1s02
Locator Light : Off
Actual Power Consumption : 135 watts
Ambient Temperature : 24.250 degree C
Open Problems Report : System is healthy
```



# **Storage Commands**

Understand the commands to perform storage operations and diagnostics.

### odaadmcli asmops diskgroup

Use the odaadmcli asmops diskgroup command to manage Oracle ASM disk group.

### odaadmcli expand storage

Use the odaadmcli expand storage command to expand storage.

## odacli list-dgdisks

Use the odacli list-dgdisks command to display details about the available disks.

# odacli validate-storagetopology

Use the <code>odacli validate-storagetopology</code> command to check the cable connections between the system controllers and the storage shelf, as well as the cable connection to the storage expansion shelf (if one is installed).

### odaadmcli power disk

Use the odaadmcli power disk command to power a disk on or off for NVMe drives only.

### odaadmcli show controller

Use the odaadmcli show controller command to display details of the controller.

### odaadmcli show disk

Use the odaadmcli show disk command to display the status of a single disk or of all disks on the system.

### odaadmcli show diskgroup

Use the odaadmcli show diskgroup command to list configured diskgroups or display a specific diskgroup configuration.

### odaadmcli show raidsyncstatus

Use the odaadmcli show raidsyncstatus command to display the RAID SYNC status.

### odaadmcli show storage

Use the odaadmcli show storage command to show the storage controllers, expanders, and disks.

# odaadmcli stordiag

Use the odaadmcli stordiag command to collect detailed information for each disk or NVMe.

# odaadmcli asmops diskgroup

Use the odaadmcli asmops diskgroup command to manage Oracle ASM disk group.

### File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

odaadmcli asmops diskgroup -G diskgroup\_name -o {add|remove|offline|
online} -p path -D disk name -f -w -t timeout [-h]

Parameter	Description
-G	(Mandatory) Specifies the disk group name.
-0	(Mandatory) Specifies the operation to be performed on Oracle ASM disk. Add disk to disk group, remove from disk group, offline the disk or online the disk.
-р	(Mandatory for addition of disks) Specify the disk path during addition of disk to Oracle disk group.
-D	(Mandatory) Specify Oracle ASM disk name or alias.
help, -h	(Optional) Displays help for using the command.
-f	(Optional) Specifies if you want to force the operation.
-M	(Optional) Specifies if you want to wait for the operation to complete. This option is valid for the disk online operation.
-t	(Optional) Specifies the duration after which the disks are dropped by Oracle ASM after a disk offline operation. The time out values can be specified in the format 35m, 2h, and so on. This option is valid for the disk offline operation.

# **Usage Notes**

Run the command on the Oracle Database Appliance system to manage Oracle ASM disk group.

# odaadmcli expand storage

Use the odaadmcli expand storage command to expand storage.

### File Path

/opt/oracle/oak/bin/odaadmcli

# **Syntax**

odaadmcli expand storage -ndisk number of disks to be added -enclosure  $\{0 \mid 1\}$  [-h]

Parameter	Description
enclosure {0 1}	Defines the JBOD or shelf number. The base storage shelf is 0. The storage expansion shelf is 1.
	This option is only available for multi-node platforms. It is not supported on Oracle Database Appliance single node platforms.
help, -h	(Optional) Displays help for using the command.



Parameter	Description
-ndisk	Defines the number of disks to be added in the enclosure.

## **Usage Notes**

On high-availability (HA) Oracle Database Appliance hardware models, run the command only on the first node.

Various storage options are available. On multi-node platforms, the base storage is SSD and you can choose to add either SSD or HDD disks. When adding a storage expansion shelf, all disks must be the same type (you cannot combine SSD and HDD disks).



In addition to reviewing the expand storage command, it is important to follow the procedures for adding storage. Cabling validation and disk placement is important. In some cases, you must move disks to different slots to successfully expand storage.

# odacli list-dgdisks

Use the odacli list-dgdisks command to display details about the available disks.

### File Path

/opt/oracle/dcs/bin/odacli

# **Syntax**

To list available disk details:

```
odacli list-dgdisks [-h] [-dg] [-dp] [-j]
```

Parameter	Description
json,-j	(Optional) Displays JSON output.
help,-h	(Optional) Displays help for using the command.
diskgroup, -dg	(Optional) Displays all disks in the specified disk group. The possible values are: ALL, DATA, RECO, REDO, FLASH. If no value is specified, then ALL disks are displayed.
diskpath,-dp	(Optional) Displays all disks that contains the specified value in the path. If no value is specified, then all disks are displayed.



### **Usage Notes**

# Example 17-243 Listing All Available Disks on the System

### # odacli list-dgdisks -dg ALL

Name		Group Moun	t St Group 1	Num Mode St	State		
Redundancy	Fail Grp		Path			Health	Inc
HDD_E0_S19_	_576667504P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S19_5766	667504P1	AFD:HDD_E0	_S19_576667	504P1	0	0
HDD_E0_S08_	_577087696P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S08_5770	087696P1	AFD:HDD_E0	_S08_577087	696P1	0	0
HDD_E0_S11_	_576021940P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S11_5760	021940P1	AFD:HDD_E0	_S11_576021	940P1	0	0
HDD_E0_S13_	_576660012P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S13_5766	660012P1	AFD:HDD_E0	_S13_576660	012P1	0	0
HDD_E0_S15_	_577131668P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S15_5771	131668P1	AFD:HDD_E0	_S15_577131	668P1	0	0
HDD_E0_S09_	576662448P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S09_5766	662448P1	AFD:HDD_E0	_S09_576662	448P1	0	0
HDD_E0_S18_	577136300P1	DATA CACH	ED 1	ONLINE	NORMAL		
UNKNOWN	HDD_E0_S18_5771	136300P1	AFD:HDD_E0	_S18_577136	300P1	0	0

# Example 17-244 Listing Disks with the Specified Disk Path on the System

### # odacli list-dgdisks -dp HDD E0 S10 577135552

Name	Group Mount St	Group Num Mode St	State	Redundancy
Fail Grp	Path	Heal	th Inc	
HDD_E0_S10_577135552P1	DATA CACHED	1 ONLINE	NORMAL	UNKNOWN
HDD_E0_S10_577135552P1	AFD:HDD_E0_S10	_577135552P1 0	0	
HDD_E0_S10_577135552P2	RECO CACHED	2 ONLINE	NORMAL	UNKNOWN
HDD_E0_S10_577135552P2	AFD:HDD_E0_S10	_577135552P2 0	0	

# odacli validate-storagetopology

Use the <code>odacli validate-storagetopology</code> command to check the cable connections between the system controllers and the storage shelf, as well as the cable connection to the storage expansion shelf (if one is installed).

Oracle recommends that you run the <code>odacli validate-storagetopology</code> command before deploying the system to ensure that the cabling is correct. This will avoid and prevent problems during deployment due to incorrect or missing cable connections. If the cabling is not correct, you will see errors in your output.

### File Path

\$ORACLE HOME/opt/oracle/dcs/bin/odacli



### **Syntax**

odacli validate-storagetopology [-h]

#### **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

# odaadmcli power disk

Use the odaadmcli power disk command to power a disk on or off for NVMe drives only.

### File Path

/opt/oracle/oak/bin/odaadmcli

### **Syntax**

To power an NVMe disk on or off:

```
odaadmcli power disk {on|off|status} disk_name [-h]
```

### **Parameters**

Parameter	Description
disk_name	Defines the disk resource name. The resource name format is pd_[03].
{on off status}	Power on a disk, power off a disk, display status.
help, -h	(Optional) Displays help for using the command.

# Example 17-245 Powering a Disk Off

This example shows how to power off a disk.

```
# odaadmcli power disk off pd_00
Disk 'pd_00' is already part of ASM
Are you sure you want to power OFF the disk?: 'pd_00'?
[yes/no]:
yes
Powered OFF pd 00
```

## Example 17-246 Checking the Disk Status

This example shows how to get the status of disk pd\_00.

```
# odaadmcli power disk status pd_00
The disk is powered ON
```



# odaadmcli show controller

Use the odaadmcli show controller command to display details of the controller.

### File Path

/opt/oracle/oak/bin/odaadmcli

# **Syntax**

To display details of the controller:

```
odaadmcli show controller id [-h]
```

### **Parameters**

Parameter	Description
controller_id, id	Defines the controller.
help, -h	(Optional) Displays help for using the command.

# **Example 17-247 Showing Controller Details**

```
# odaadmcli show controller 1
Controller [1] information:
        sun-controller-id = nvme:1b:00.00
        sun-id = nvme:1b:00.00
        sun-controller-manufacturer = Samsung
        pci-vendor-id = 0x0000144d
        sun-controller-model = 0xa821
        pci-device-id = 0x0000a821
        sun-controller-type = NVMe
        sun-card-manufacturer = Sun Microsystems
        pci-subvendor-id = 0x0000108e
        sun-card-model = 0xa803
        pci-subdevice-id = 0x0000a803
        pci-address = 1b:00.0
        sun-version-firmware = KPYA7R3Q
        sun-serial-number = S2LHNAAH101008
        sun-product-name = MS1PC2DD3ORA3.2T
        pci-slot-number = 11
        nvme-power-control = 1
        sun-nac-name = /SYS/DBP/NVME1
```

# odaadmcli show disk

Use the <code>odaadmcli</code> show <code>disk</code> command to display the status of a single disk or of all disks on the system.

### File Path

/opt/oracle/oak/bin/odaadmcli



### **Syntax**

To display the status of all disks on the system:

```
odaadmcli show disk [-h]
```

To display the status of a single disk:

```
odaadmcli show disk disk name [-h]
```

#### **Parameters**

Parameter	Description
disk_name	(Optional) Define the disk resource name. The resource name format is $pd_{0}3$ .
help, -h	(Optional) Displays help for using the command.

# Example 17-248 Displaying the Status of All Disks

To display the status of all the disks on the system:

# Example 17-249 Displaying the Status of a Single Disk

To display the status of a disk named pd 00:

```
# odaadmcli show disk pd 00
The Resource is : pd 00
ActionTimeout: 1500
ActivePath : /dev/nvmeOn1
AsmDiskList : |data 00||reco 00|
AutoDiscovery: 1
AutoDiscoveryHi : |data:80:NVD||reco:20:NVD|
CheckInterval: 300
ColNum : 0
CriticalWarning: 0
DependListOpr : add
Dependency: |0|
DiskId : 360025380144d5332
DiskType : NVD
Enabled: 1
ExpNum: 19
HbaPortNum : 10
IState : 0
Initialized: 0
IsConfigDepende : false
 ModelNum: MS1PC2DD3ORA3.2T
```



MonitorFlag : 1

MultiPathList : |/dev/nvme0n1|

Name : pd\_00
NewPartAddr : 0

OSUserType : |userType:Multiuser|

 ${\tt PlatformName} \; : \; {\tt X7\_1\_LITE\_S}$ 

PrevState : Invalid
PrevUsrDevName :
SectorSize : 512

SerialNum : S2LHNAAH000001 Size : 3200631791616

SlotNum : 0

SmartDiskWarnin : 0
SmartTemperatur : 37

State : Online

StateChangeTs : 1465263789

StateDetails : Good

TotalSectors: 6251233968

TypeName : 0

UsrDevName : NVD\_S00\_S2LHNAAH101026

VendorName : Samsung

gid: 0 mode: 660 uid: 0

# odaadmcli show diskgroup

Use the odaadmcli show diskgroup command to list configured diskgroups or display a specific diskgroup configuration.

### File Path

/opt/oracle/oak/bin/odaadmcli

# **Syntax**

### To list configured diskgroups:

```
odaadmcli show diskgroup [-h]
```

### To display DATA configurations:

```
odaadmcli show diskgroup [DATA] [-h]
```

## To display RECO configurations:

```
odaadmcli show diskgroup [RECO] [-h]
```

Parameter	Description
DATA	(Optional) Displays the DATA diskgroup configurations.



Parameter	Description
RECO	(Optional) Displays the RECO diskgroup configurations.
help, -h	(Optional) Displays help for using the command.

# Example 17-250 Listing All Diskgroups

```
# odaadmcli show diskgroup
DiskGroups
_____
DATA
RECO
```

# **Example 17-251 Displaying DATA Configurations**

```
# odaadmcli show diskgroup DATA
```

ASM_DISK	PATH	DISK	STATE	STATE_DETAILS
data_00	/dev/NVD_S00_S2LHNAAH101026p1	pd_00	ONLINE	Good
data 01	/dev/NVD S01 S2LHNAAH101008p1	pd 01	ONLINE	Good

# odaadmcli show raidsyncstatus

Use the odaadmcli show raidsyncstatus command to display the RAID SYNC status.

#### File Path

/opt/oracle/oak/bin/odaadmcli

#### **Syntax**

To display the status of RAID SYNC:

```
odaadmcli show raidsyncstatus [-h]
```

## **Parameters**

Parameter	Description
help, -h	(Optional) Displays help for using the command.

# Example 17-252 Displaying the RAID SYNC Status

To display the RAID SYNC details and status:

```
# odaadmcli show raidsyncstatus

Raid Type Raid Device Raid Status maintainPdFailHistory Rebuildrate
H/W Raid /dev/sda Optimal ON 30%
```



# odaadmcli show storage

Use the odaadmcli show storage command to show the storage controllers, expanders, and disks.

#### File Path

/opt/oracle/oak/bin/odaadmcli

#### **Syntax**

To display the storage controllers, expanders, and disks:

```
odaadmcli show storage [-h]
```

### To show storage errors:

```
odaadmcli show storage -errors [-h]
```

#### **Parameters**

Parameter	Description	
errors	(Optional) Shows storage errors.	
help, -h	(Optional) Displays help for using the command.	

## **Example 17-253 Displaying Storage Devices**

The following example displays details about the storage devices on an appliance.

```
# odaadmcli show storage
==== BEGIN STORAGE DUMP ======
Host Description: Oracle Corporation: ORACLE SERVER X6-2
Total number of controllers: 2
   Id = 0
   Pci Slot = 10
   Serial Num = S2LHNAAH101026
    Vendor = Samsung
  Model = MS1PC2DD3ORA3.2T
  FwVers = KPYA7R3Q
  strId = nvme:19:00.00
     Pci Address = 19:00.0
     Id = 1
     Pci Slot = 11
     Serial Num = S2LHNAAH101008
     Vendor = Samsung
   Model = MS1PC2DD3ORA3.2T
   FwVers = KPYA7R3Q
    strId = nvme:1b:00.00
  Pci Address = 1b:00.0
```



```
Total number of expanders: 0

Total number of PDs: 2

/dev/nvme0n1 Samsung NVD 3200gb slot: 0 pci : 19
/dev/nvme1n1 Samsung NVD 3200gb slot: 1 pci : 1

==== END STORAGE DUMP =========
```

# odaadmcli stordiag

Use the odaadmcli stordiag command to collect detailed information for each disk or NVMe.

#### File Path

/opt/oracle/oak/bin/odaadmcli

# **Syntax**

To collect storage diagnostics for disks and NVM Express (NVMe):

```
odaadmcli stordiag [-n] [-h]
```

#### **Parameters**

Parameter	Description
-n <i>disk_name</i>	Defines the disk resource name. The resource name format is $pd_{0.3}$ .
help, -h	(Optional) Displays help for using the command.

# Example 17-254 Displaying NVMe Details

To display detailed information for NVMe pd 00:

```
# odaadmcli stordiag pd 00
```

# Oracle Database Appliance Command-Line Interface for KVM

Use odacli commands to manage Oracle Linux Kernel-based Virtual Machine (KVM) on Oracle Database Appliance.



If you have enabled multi-user access, then you can run all supported ODACLI commands on KVM and DB systems, after logging in as odaadmin.

- About Command-Line Interface for Kernel-Based Virtual Machine (KVM)
   The odacli commands are the primary method for performing database and system administration on Oracle Database Appliance Kernel-Based Virtual Machine (KVM).
- About ODACLI Commands Supported on Oracle KVM Database System
   Understand the odacli commands supported on Oracle Database Appliance Kernel-Based Virtual Machine (KVM) Database System in this release.
- odacli DB System Commands for KVM
   Use the odacli DB system commands to manage databases on Oracle Database
   Appliance for Oracle KVM.
- odacli VM Storage Commands for KVM
   Use the odacli virtual machine storage commands to manage storage on Oracle Database Appliance for Oracle KVM.
- odacli Virtual Disk Commands for Oracle KVM
   Use the odacli virtual disk commands to manage virtual disks on Oracle Database Appliance for Oracle KVM.
- odacli CPU Pool Commands for Bare Metal and KVM
   Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.
- odacli VM Network Commands for KVM
   Use the odacli virtual machine network commands to manage network on Oracle Database Appliance for Oracle KVM.
- odacli Virtual Machine Commands for Oracle KVM
   Use the odacli virtual machine commands to manage virtual machines on Oracle Database Appliance for Oracle KVM.

# About Command-Line Interface for Kernel-Based Virtual Machine (KVM)

The odacli commands are the primary method for performing database and system administration on Oracle Database Appliance Kernel-Based Virtual Machine (KVM).

You can perform the following tasks with ODACLI commands on Kernel-Based Virtual Machine (KVM):

- Manage VM instances
- Manage VM storage
- Manage virtual disks
- Manage virtual network
- Manage CPU pools

#### **ODACLI Command Location and Path Configuration**

The odacli command-line interface is in the following directory:

```
/opt/oracle/dcs/bin/odacli
```

Configure the root user account on your Oracle Database Appliance servers to have the PATH variable defined to search for odacli commands in the path /opt/oracle/dcs/bin/odacli.

## **ODACLI Syntax**

Oracle Appliance Manager command-line interface commands and parameters are casesensitive.

An odacli command uses the following command syntax:

```
odacli command object [options]
```

- command is an action you want to perform on the appliance. For example: show, locate, apply.
- *object* is the target or object on which the odacli command performs the operation. For example, you issue a command to create or configure a virtual disk, or a network, or perform other system or software administration. You can also use object abbreviations.
- options are optional parts of the odacli command. Options can consist of one or more options that extend the use of the odacli command carried out on an object. Options include additional information about the action that you want to perform on the object. Option names are preceded with a dash. Many options require the name of an object for the command to perform the action that you want to carry out. The help option (-h) is an option that is available with every command. When you include the -h option, you can obtain additional information about the command that you want to perform.

#### **Oracle Appliance Manager Command-Line Interface Help**

Run the following command to see the usage information for all odacli commands available for your Oracle Database Appliance:

```
odacli -h
```

Run the following command to see detailed help about a specific odacli command:

```
odacli command -h
```



Run the following command to see detailed help about a specific odacli command carried out on an object, and the options that are available for you to use with that object.

odacli command object -h

# About ODACLI Commands Supported on Oracle KVM Database System

Understand the odacli commands supported on Oracle Database Appliance Kernel-Based Virtual Machine (KVM) Database System in this release.

This release of Oracle Database Appliance supports the provisioning of Oracle KVM database system through odacli create-dbsystem or the Browser User Interface. The following ODACLI commands are supported on Oracle KVM Database System on Oracle Database Appliance:

- odacli ping-agent
- odacli delete-agentconfig-parameters
- odacli list-agentconfig-parameters
- odacli modify-agentconfig-parameters
- odacli restore-archivelog
- odacli create-auto-logclean-policy
- odacli delete-auto-logclean-policy
- odacli list-auto-logclean-policy
- odacli list-availablepatches
- odacli create-backup
- odacli delete-backup
- odacli create-backupconfig
- odacli delete-backupconfig
- odacli describe-backupconfig
- odacli list-backupconfigs
- odacli modify-backupconfig
- odacli describe-backupreport
- odacli describe-component
- odacli set-credential
- odacli create-database
- odacli delete-database
- odacli describe-database
- odacli irestore-database
- odacli list-databases
- odacli modify-database



- odacli recover-database
- odacli register-database
- odacli configure-dataguard
- odacli deconfigure-dataguard
- odacli failover-dataguard
- odacli reinstate-dataguard
- odacli register-dataguard
- odacli switchover-dataguard
- odacli describe-dataguardstatus
- odacli list-dataguardstatus
- odacli create-dbhome
- odacli delete-dbhome
- odacli describe-dbhome
- odacli list-dbhomes
- odacli create-dbstorage
- odacli delete-dbstorage
- odacli describe-dbstorage
- odacli list-dbstorages
- odacli describe-job
- odacli list-jobs
- odacli create-jobdata-retention-policy
- odacli delete-jobdata-retention-policy
- odacli list-jobdata-retention-policy
- odacli describe-latestpatch
- odacli create-logcleanjob
- odacli describe-logcleanjob
- odacli list-logcleanjobs
- odacli list-logspaceusage
- odacli describe-network
- odacli list-networks
- odacli describe-networkinterface
- odacli list-networkinterfaces
- odacli list-nodes
- odacli create-objectstoreswift
- odacli delete-objectstoreswift
- odacli describe-objectstoreswift



- odacli list-objectstoreswifts
- odacli modify-objectstoreswift
- odacli list-osconfigurations
- odacli modify-osconfigurations
- odacli list-pendingjobs
- odacli create-prepatchreport
- odacli delete-prepatchreport
- odacli describe-prepatchreport
- odacli list-prepatchreports
- odacli create-purge-jobdata-job
- odacli list-purge-jobdata-jobs
- odacli describe-schedule
- odacli list-schedules
- odacli modify-schedule
- odacli list-scheduled-executions
- odacli describe-systemcomponent
- odacli list-tdebackupreports
- odacli restore-tdewallet

# Note:

No other ODACLI commands than the ones above are supported on Oracle Database Appliance KVM Database System, in this release.

# odacli DB System Commands for KVM

Use the odacli DB system commands to manage databases on Oracle Database Appliance for Oracle KVM.

#### odacli create-dbsystem

Use the odacli create-dbsystem command to create a new database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli modify-dbfileattributes

Use the <code>odacli modify-dbfileattributes</code> command to properly set the file attributes (permissions and ownership) of files on Oracle ASM disk group on a bare metal host to support a dbsystem. Only run this command if prompted by the <code>odacli create-dbsystem</code> command.



#### odacli list-dbsystems

Use the odacli list-dbsystems command to view the database systems on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli describe-dbsystem

Use the odacli describe-dbsystem command to describe a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## · odacli describe-dbsystem-image

Use the odacli describe-dbsystem-image command to view the supported Oracle Grid Infrastructure and Oracle Database versions and the availability of the clone files and Database System KVM image in the Oracle Database Appliance system.

## odacli start-dbsystem

Use the odacli start-dbsystem command to start a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli stop-dbsystem

Use the odacli stop-dbsystem command to stop a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli delete-dbsystem

Use the odacli delete-dbsystem command to delete a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

# odacli create-dbsystem

Use the odacli create-dbsystem command to create a new database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli create-dbsystem [-f] [-p json payload path] [-t template] [-ta] [-j] [-h]

#### **Parameters**

Parameter	Description
params, -p	(Optional) Specifies the input parameters file path for DB system creation.
force, -f	(Optional) Forces the operation with the specified parameters.
template, -t	(Optional) Specifies the path where the template with sample values will be created.
template-annotated, -ta	(Optional) Displays the DB system template with field descriptions.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

# **Usage Notes**

For example JSON files that you can use to create the DB system, see the Example JSON File to Create a High-Availability DB System and Example JSON File to Create a Single-Node DB System topics in this guide.



### **Example**

Create a KVM database system using a JSON file for input parameters.

```
# odacli create-dbsystem -p example_system.json

Job details

ID: fcfe305c-3e75-4af4-8702-992aa15619d0

Description: DB System example_system creation

Status: Created

Created: March 8, 2025 9:28:03 AM CST

Message:

Task Name

Start Time

End Time

Status
```

## **Related Topics**

- Example JSON File to Create a High-Availability DB System
   Follow the JSON file example to create a JSON file to deploy a High-Availability DB
   system, with role separation, with the command odacli create-dbsystem.
- Example JSON File to Create a Single-Node DB System
   Follow the JSON file example to create a JSON file to deploy a single-node DB System,
   with role separation, with the command odacli create-dbsystem.
- odacli describe-dbsystem-image
   Use the odacli describe-dbsystem-image command to view the supported Oracle Grid
   Infrastructure and Oracle Database versions and the availability of the clone files and
   Database System KVM image in the Oracle Database Appliance system.

# odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli modify-dbsystem -n name [-cp cpu_pool_name] [-no-cp] [-r]
[-avd v_disk_to_attach] [-avn v_network]
[-dvd v_disk_to_detach] [-dvn v_networks_to_detach] [-en] [-gw gateway]
[-ip ip_address] [-nm netmask] [-tvm vm_name]
[-sip scan_ip_address] [-sn scan_name] [-s shape]
[-vips vip address] [-vt v network type] [-m] [-j] [-h]
```

Parameter	Description
name, -n	(Mandatory) Describes the name of the DB system.



Parameter	Description
redundancy, -r	(Optional) Specifies the VM storage redundancy for a DB system. The value can be HIGH or MIRROR. This option is not supported for DB systems on non-FLEX disk group. The options can be MIRROR or HIGH. The default option is MIRROR.
attach-vdisk,-avd	(Optional) Specifies the vdisk to attach.
attach-vnetwork, -avn	(Optional) Specifies the name of the vnetwork to attach.
cpupool, -cp	(Optional) Specifies the shared DB System CPU Pool name.
detach-vdisk,-dvd	(Optional) Specifies the vdisk to detach.
detach-vnetwork, -dvn	(Optional) Specifies the name of the vnetworks to detach.
enable-numa, -en	(Optional) Enables NUMA configuration for the DB System.
gateway,-gw	(Optional) Specifies the network gateway. If the gateway is specified, it is added as the default gateway. If you do not want to configure a default gateway, then do not specify thegateway option.
ip,-ip	(Optional) Specifies the network IP address.
netmask,-nm	(Optional) Specifies the netmask of the network.
no-cpupool, -no-cp	(Optional) Specifies to dissociate the current DB System CPU Pool name.
target-vm,-tvm	(Optional) Specifies the DB system host name to attach or detach a vdisk.
scan-ips, -sip	(Optional) Specifies the SCAN IP of the network.
scan-name, -sn	(Optional) Specifies the SCAN of the network.
shape, -s	(Optional) Specifies the new shape. You can specify a higher or lower value than the current shape. This option only changes the shape of the DB system. It does not change the shape of databases in the DB system.
vips, -vips	(Optional) Specifies the virtual IP of the network in the format vip_name_0:0:vip_ip_0, vip_name_1:1:vip_ip_1.
vnetwork-type, -vt	(Optional) Specifies the vnetwork type to attach.
memory, -m	(Optional) Defines the memory size. The format is M G.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

# **Usage Notes**

- The odacli modify-dbsystem command supports the following use cases:
  - attach or detach the shared DB system cpupools.
     Attaching a CPU pool:

odacli modify-dbsystem --name dbsystem\_name -cp cpupool

# Detaching a CPU pool:

odacli modify-dbsystem --name dbsystem\_name --no-cp



Change DB system shape, that is, scale up (increase) or scale down (decrease):

```
odacli modify-dbsystem -n dbsystem name -s new shape
```

Enable NUMA for the existing DB system. NUMA is enabled on Oracle Database
 Appliance release 19.12 and later. For existing DB sytems created before release
 19.12, use the odacli modify-dbsystem --enable\_numa command to enable the
 NUMA for the DB system. This command includes enabling the NUMA for the VM
 configuration, operation system, and the database inside the DB system.

```
odacli modify-dbsystem --name dbsystem name --enable numa
```

Attach or detach new network to the DB system. Before attaching a vnetwork, ensure
that the vnetwork exists. You must specify the IP address and netmask to configure the
new network interface inside the DB system. If the network type is database or
dataguard, specify the VIPs, SCAN name, and SCAN IPs.

```
odacli modify-dbsystem -n dbsystem1 -avn vnet2 -t Dataguard -ip 192.168.10.119,192.168.10.120 -nm 255.255.240.0 -gw 192.168.10.1 -sn scan1 -sip 192.168.10.30,192.168.10.31 -vips vip1:0:192.168.15.57,vip2:1:192.168.15.58
```

To detach a network from DB system:

```
odacli modify-dbsystem -n dbsystem1 -dvn vnet2
```

- Starting with Oracle Database Appliance release 19.23, the odacli modify-dbsystem -- shape command only changes the shape of the DB system; it does not change the shapes of the database inside the DB system any more. You must modify database shapes accordingly based on the new shape of the DB system. Ensure that you scale up database shapes after the DB system shape is scaled up. Similarly, scale down database shapes before DB system shape is scaled down, otherwise databases could fail to start because of reduced DB system memory.
- To attach a vdisk to a DB system, note the following:
  - The vdisk must already exist.
  - When you attach a vdisk, the vdisk attaches to the DB system and displays in the DBVM operating system as a block device, for example, /dev/vdc. You must format and create a file system with the block device and maintain the device in the DB system.
  - For high-availability systems, you must specify the DB system to attach the vdisk, using the --target-vm option. Specify the VM host name without the domain name in the --target-vm option. You can view the VM host name with the odacli describedbsystem command.
  - On high-availability systems, the vdisk attached to the two nodes on the DB system is local to the DBVM it is attached to. The vdisk is not shared and cannot be shared between two DBVMs in the DB system.
- To detach a vdisk from a DB system, note the following:
  - Detaching a vdisk from the DB system removes the vdisk from the DBVM. The block device, for example, /dev/vdc is removed from the DBVM operating system level. You must ensure that sufficient care is exercised at the operating system level, for example, properly back up the content of the file system, remove the block device from



logical volume manager, or remove the block device from /etc/fstab, before you detach the vdisk. Without proper handling, the DBVM could fail to restart after running the detach vdisk operation.

- For high-availability systems, you must specify the DB system from which to detach the vdisk, using the --target-vm option. Specify the VM host name without the domain name in the --target-vm option. You can view the VM host name with the odacli describe-dbsystem command.
- If the detach vdisk operation fails, then you can retry the detach operation with the -force, -f parameter to ensure that the vdisk is detached from the device block list
  and the metadata as well.
- The attach and detach vdisk operations restart the DB system.

## **Example: Modify a KVM DB system**

# odacli modify-dbsystem -n example system1 -cp example pool -s new shape

#### Example: Increase the DB System memory to 24 GB

The command supports increasing the DB system memory. To reduce the DB system memory, use the --shape option with the command odacli modify-dbsystem.

# odacli modify-dbsystem -n dbsystem name -m 24G

## **Related Topics**

odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

# odacli modify-dbfileattributes

Use the <code>odacli modify-dbfileattributes</code> command to properly set the file attributes (permissions and ownership) of files on Oracle ASM disk group on a bare metal host to support a dbsystem. Only run this command if prompted by the <code>odacli create-dbsystem</code> command.

#### **Syntax**

odacli modify-dbfileattributes [-in db name] [-j] [-h]

Parameter	Description
dbname, -in	(Optional) Describes the name of the database for which you want to modify the file attributes.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.



### **Usage Notes**

- To create the database system, access control must be enabled in Oracle ASM running on bare metal system. When the bare metal system is newly provisioned or patched to Oracle Database Appliance release 19.27, access control is already enabled. This helps you set appropriate file ownerships for all the files created in DB systems and on bare metal.
- Before you create the database system, the files on Oracle ASM disk groups that do not have file ownership must be set up with ownership. The creation of dbsystem fails, and you are prompted to run the odacli modify-dbfileattributes command to set up the file ownership and permission. Since there can be many files on Oracle ASM disk group, the user can run this step at their own convenience. Use the odacli modify-dbfileattributes command to set up the file ownerships.
- This command sets the file attributes (permissions and ownership) of all files on Oracle
  ASM disk group. The files include database files and also Oracle Clusterware files such as
  OCR (Oracle Clusterware Registry). Before creating the first DB system, set up attributes
  for files owned by both Oracle Grid Infrastructure and Oracle Database by running the
  odacli modify-dbfileattributes command with no arguments.
- If the overall operation was successful for many files, but failed for some files, then you can run the command again by specifying the database names.

#### **Example**

Modify the file attributes of the databases.

```
# odacli modify-dbfileattributes -in example_db_name
```

# odacli list-dbsystems

Use the odacli list-dbsystems command to view the database systems on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

```
odacli list-dbsystems [-j] [-h]
```

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays output in JSON format.
help,-h	(Optional) Displays help for using the command.

#### **Example**

List the KVM database systems.



```
dbsystem2 odb2 2 16.00 GB CREATING 2020-12-16 09:28:03 CST 2020-12-16 09:28:03 CST
```

# odacli describe-dbsystem

Use the odacli describe-dbsystem command to describe a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

```
odacli describe-dbsystem -n db system name [-p payload] [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	(Mandatory) Describes the name of the DB system.
payload, -p	(Optional) Displays the payload describing the specified DB system. The option that can be specified is COPY.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

Image version is the version which the DB System was created from. Current version is the current version of the DB system. For instance, if the DB System was created on 19.26 and it was patched to 19.27, the output is as follows:

```
Image version: 19.26.0.0.0
Current version: 19.27.0.0.0
```

#### **Example**

View details of a KVM database system on a single-node system.

```
# odacli describe-dbsystem -n example_system1

DB System details

ID: 04f718f8-ddc9-4b45-8e8e-07d14165eb9c

Name: example_system2

Image version: 19.27.0.0.0

Current version: 19.27.0.0.0

Shape: odb2

Cluster name: dbsa4b75be52

Grid version: 19.27.0.0.250415

Memory: 16.00 GB

NUMA enabled: YES

Status: CONFIGURED

Created: 2023-04-19 10:00:08 UTC
```

Updated: 2023-04-19 10:04:02 UTC

CPU Pool

```
Name: c4bfa26faa
         Number of cores: 2
                   Host: n1
       Effective CPU set: 0-1,20-21
             Online CPUs: 0, 1, 20, 21
            Offline CPUs: NONE
                   Host: n2
       Effective CPU set: 0-1,20-21
             Online CPUs: 0, 1, 20, 21
            Offline CPUs: NONE
 VM Storage
-----
             Disk group: DATA
            Volume name: S4BFA26FAA
           Volume device: /dev/asm/s4bfa26faa-497
                    Size: 400.00 GB
             Mount Point: /u05/app/sharedrepo/example system
 VMs
-----
                   Host: host1
                VM Name: x4bfa26faa
            VM Host Name: example domain1
           VM image path: /vm image path1
            Target State: ONLINE
           Current State: ONLINE
                   Host: host2
                 VM Name: y4bfa26faa
            VM Host Name: example domain2
           VM image path: /vm image path2
            Target State: ONLINE
           Current State: ONLINE
VNetworks
                   Host: example domain1
                 VM Name: x4bfa26faa
                 Public: xxx.xxx.xxx / xxx.xxx.xxx / ens3 /
BRIDGE (pubnet)
                    ASM: xxx.xxx.xxx / xxx.xxx.xxx / ens4 /
BRIDGE(privasm) VLAN(icbond0.100)
            Interconnect: xxx.xxx.xxx / xxx.xxx.xxx / ens5 /
                   Host: example domain2
                 VM Name: y4bfa26faa
                  Public: xxx.xxx.xxx / xxx.xxx.xxx / ens3 /
BRIDGE (pubnet)
                    ASM: xxx.xxx.xxx / xxx.xxx.xxx / ens4 /
BRIDGE(privasm) VLAN(icbond0.100)
```

```
Interconnect: xxx.xxx.xxx / xxx.xxx.xxx / ens5 /
Databases
_____
                    Name: flashvm
             Resource ID: 350b72f7-2351-49e7-ada3-4051af9594f0
             Unique name: flashvmU
             Database ID:
             Domain name: domain name
              DB Home ID: 617664f6-0a16-4922-8346-9eeb3d7256ee
                   Shape: odb2
                 Version: 19.0.0.0
                 Edition: EE
                    Type: SI
                    Role: PRIMARY
                   Class: OLTP
                 Storage: ASM
              Redundancy:
        Target node name:
           Character set: AL32UTF8
       NLS character set:
                Language: AMERICAN
               Territory: AMERICA
         Console enabled: false
            SEHA enabled: false
     Associated networks: NONE
        Backup config ID:
      Level 0 Backup Day: sunday
      Autobackup enabled: true
             TDE enabled: true
                CDB type: false
                PDB name:
          PDB admin user:
```

# View details of a KVM database system on a High Availability system, with InfiniBand.

```
# odacli describe-dbsystem -n example system3
DB System details
                      ID: 0c5280a1-3ee1-438e-ad11-1cee23de17fd
                    Name: example system3
           Image version: 19.16.0.0.0
         Current version: 19.16.0.0.0
                   Shape: odb2
            Cluster name: dbsa4b75be52
            Grid version: 19.27.0.0.250415
                 Memory: 16.00 GB
            NUMA enabled: YES
                 Status: CONFIGURED
                Created: 2020-12-10 02:11:11 UTC
                 Updated: 2020-12-10 02:11:11 UTC
CPU Pool
 _____
```

```
Name: ce2ab55255
         Number of cores: 2
                  Host: node1
       Effective CPU set: 4-5,24-25
            Online CPUs: 4, 5, 24, 25
            Offline CPUs: NONE
                   Host: node2
       Effective CPU set: 4-5,24-25
            Online CPUs: 4, 5, 24, 25
            Offline CPUs: NONE
VM Storage
_____
             Disk group: DATA
            Volume name: SE2AB55255
           Volume device: /dev/asm/se2ab55255-187
                   Size: 400.00 GB
            Mount Point: /u05/app/sharedrepo/example system
                   Host: host1
                VM Name: xe2ab55255
           VM Host Name: host_name1
           VM image path: /vm image path1
            Target State: ONLINE
           Current State: ONLINE
                   Host: host2
                VM Name: ye2ab55255
           VM Host Name: host name2
           VM image path: /vm_image_path2
            Target State: ONLINE
           Current State: ONLINE
VNetworks
_____
                   Host: node1
                VM Name: xe2ab55255
                 Public: xxx.xxx.xxx /xxx.xxx.xxx / ens3 /
BRIDGE (pubnet)
                    ASM: xxx.xxx.xxx / xxx.xxx.xxx / ibbond0 /
VF(90:03.5)
            Interconnect: xxx.xxx.xxx / xxx.xxx.xxx / ibbond1 /
VF(90:01.7)
                   Host: node2
                VM Name: ye2ab55255
                 Public: xxx.xxx.xxx / xxx.xxx.xxx / ens3 /
BRIDGE (pubnet)
                    ASM: xxx.xxx.xxx / xxx.xxx.xxx / ibbond0 /
VF(90:01.0)
            Interconnect: xxx.xxx.xxx / xxx.xxx.xxx / ibbond1 /
```

```
VF(90:01.6)
```

#### Databases

```
Name: datavm
        Resource ID: 6aac341a-3c73-46eb-af2a-1eada9b57661
        Unique name: datavmU
        Database ID: 3806144946
        Domain name: domain name
         DB Home ID: dcc928f1-5eb3-477b-875d-050640b7f68c
              Shape: odb2
            Version: 19.27.0.0.250415
            Edition: EE
               Type: RAC
               Role: PRIMARY
              Class: OLTP
            Storage: ASM
         Redundancy:
   Target node name:
      Character set: AL32UTF8
  NLS character set:
           Language: AMERICAN
          Territory: AMERICA
    Console enabled: false
       SEHA enabled: false
Associated networks: NONE
   Backup config ID:
 Level 0 Backup Day: sunday
 Autobackup enabled: true
        TDE enabled: true
           CDB type: false
           PDB name:
     PDB admin user:
```

## View details of a DB system in the JSON file format

```
# odacli describe-dbsystem -n scaoda815c2 -p
  "forced" : null,
  "system" : {
    "name" : "scaoda815c2",
    "shape" : "odb4",
    "customMemorySize" : "32.00 GB",
    "cpuPoolName" : "c519cd5314",
    "useReservedCores" : false,
    "diskGroup" : "DATA",
    "systemPassword" : null,
    "timeZone" : "UTC",
    "enableRoleSeparation" : true,
    "singleNode" : null,
    "failOver" : false,
    "customRoleSeparation" : {
      "groups" : [ {
        "id" : 1001,
        "name" : "oinstall",
```

```
"role" : "oinstall"
   }, {
     "id" : 1002,
      "name" : "dbaoper",
      "role" : "dbaoper"
    }, {
      "id" : 1003,
     "name" : "dba",
     "role" : "dba"
    }, {
     "id" : 1004,
      "name" : "asmadmin",
      "role" : "asmadmin"
   }, {
      "id" : 1005,
     "name" : "asmoper",
      "role" : "asmoper"
      "id" : 1006,
      "name" : "asmdba",
     "role" : "asmdba"
    } ],
    "users" : [ {
     "id" : 1000,
     "name" : "grid",
     "role" : "gridUser"
   }, {
      "id" : 1001,
     "name" : "oracle",
     "role" : "oracleUser"
   } ]
  },
  "redundancy" : "MIRROR"
"network" : {
  "domainName" : "testdomain.com",
  "ntpServers" : [ ],
  "dnsServers" : [ "xxx.xxx.xxx.xxx" ],
  "scanName" : "scaoda815c2-scan",
  "scanIps" : [ "xxx.xxx.xxx", "xxx.xxx.xxx"],
  "nodes" : [ {
    "number" : 1,
    "name" : "scaoda815c2n2",
   "ipAddress" : "xxx.xxx.xxx.xxx",
    "netmask" : "xxx.xxx.xxx.xxx",
    "gateway" : "xxx.xxx.xxx.xxx",
    "vipName" : "scaoda815c2n2-vip",
    "vipAddress" : "xxx.xxx.xxx"
  }, {
    "number" : 0,
   "name" : "n1",
    "ipAddress" : "xxx.xxx.xxx.xxx",
    "netmask" : "xxx.xxx.xxx.xxx",
    "gateway" : "xxx.xxx.xxx.xxx",
    "vipName" : "n1-vip",
    "vipAddress" : "xxx.xxx.xxx"
```

```
"publicVNetwork" : null,
    "clusterInterconnect" : null
  "grid" : {
    "language" : "en",
  "database" : {
    "name" : "mydb2",
    "uniqueName" : "mydb2u",
    "domainName" : "domainname",
    "adminPassword" : null,
    "version": "19.27.0.0.250415",
    "edition" : "EE",
    "type" : "RAC",
    "dbClass" : "OLTP",
    "shape" : "odb4",
    "role" : "PRIMARY",
    "redundancy" : "MIRROR",
    "characterSet" : {
      "characterSet" : "AL32UTF8",
      "nlsCharacterset" : "AL16UTF16",
      "dbTerritory" : "AMERICA",
      "dbLanguage" : "AMERICAN"
    "enableDbConsole" : false,
    "enableSEHA" : false,
    "enableEEHA" : false,
    "enableFlashStorage" : false,
    "rmanBackupPassword" : null,
    "levelOBackupDay" : "sunday",
    "enableTDE" : false,
    "tdePassword" : null,
    "enableUnifiedAuditing" : false,
    "isCdb" : true,
    "pdbName" : "pdb1",
    "pdbAdminUser" : "pdbadmin",
    "targetNodeNumber" : 0,
    "dbStorage" : "ASM"
}
```

# odacli describe-dbsystem-image

Use the odacli describe-dbsystem-image command to view the supported Oracle Grid Infrastructure and Oracle Database versions and the availability of the clone files and Database System KVM image in the Oracle Database Appliance system.

#### **Syntax**

```
odacli describe-dbsystem-image [-j] [-h]
```

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

#### View details of a KVM database system image

# View details of a system where KVM database system image is not available

The output shows that the KVM Database System image is not yet available on the system. Download the image and run the <code>odacli update-repository</code> to import the image to the repository. The output shows that the Oracle Grid Infrastructure and Oracle Database clones are already available on the system.

# odacli start-dbsystem

Use the odacli start-dbsystem command to start a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli start-dbsystem -n dbsystem name [-nn node name] [-j] [-h]
```

Parameter	Description
name, -n	(Mandatory) Describes the name of the DB system.



Parameter	Description
node-name, -nn	(Optional) Specifies the bare metal system node name on which to start the DB system VM.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example**

Start a KVM database system.

```
# odacli start-dbsystem -n example_system
```

Job details

\_\_\_\_\_

ID: 68044afa-d3cc-4024-9dc8-50fcf847642c

Description: DB System scaoda8s008c4 start

Status: Success

Created: December 16, 2020 9:12:51 AM UTC

Message:

Task Name Start Time

End Time Status

-----

-----

Start DB System December 16, 2020 9:12:51 AM UTC

December 16, 2020 9:12:52 AM UTC Success

# odacli stop-dbsystem

Use the odacli stop-dbsystem command to stop a database system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

# **Syntax**

odacli stop-dbsystem -n dbsystem name [-nn node name] [-f] [-j] [-h]

Parameter	Description	
name, -n	(Mandatory) Describes the name of the DB system.	
force, -f	(Optional) Forces the operation to stop the DB system.	
node-name, -nn	(Optional) Specifies the bare metal system node name on which to stop the DB system VM.	
json,-j	(Optional) Displays output in JSON format.	
help, -h	(Optional) Displays help for using the command.	



### **Example**

## Stop a KVM database system.

```
# odacli stop-dbsystem -n example system
```

Job details

ID: 68044afa-d3cc-4024-9dc8-50fcf847642c

Description: DB System scaoda8s008c4 start

Status: Success

Created: December 16, 2020 9:12:51 AM UTC

\_\_\_\_\_

Message:

Task Name Start Time

End Time Status

December 16, 2020 9:12:51 AM UTC Stop DB System

December 16, 2020 9:12:52 AM UTC Success

# odacli delete-dbsystem

Use the odacli delete-dbsystem command to delete a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli delete-dbsystem -n dbsystem name [-f] [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	(Mandatory) Describes the name of the DB system.
force, -f	(Optional) If specified, then the operation deletes the database system, Oracle Clusterware files, and the database files.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

If you do not specify the -f option, then the delete DB system operation validates that the DB system does not contain any database. If there are any databases within the DB system, then the following error message is displayed:

DB System 'name' must not have any database in order to be deleted, found following databases: list of databases

- Specify the -f option to delete the DB system, the Oracle Clusterware files, and the database files.
- The odacli delete-dbsystem command does not delete the database files. This is expected behavior so that you can archive the database files, if required, or manually

restore the database with these database files. Use the --force option to delete the database files completely.

# **Example**

#### Delete a DB system.

[root@nodelha17c1n1 log]# odacli delete-dbsystem -n dbsfe0bd8 WARNING: Use --force option to delete the database and datafiles. Do you confirm delete DB System 'dbsfe0bd8'? (Options: y/n, default: n): y DCS-10045:Validation error encountered: DB System 'dbsfe0bd8' must not have any database in order to be deleted, found following databases: dbb34f97.

[root@nodelha17c1n1 log]# odacli describe-job -i 41de9e46-e1d4-44c0-b0abc6049579e9f8

Job details

-----

ID: 41de9e46-e1d4-44c0-b0ab-c6049579e9f8

Description: DB System dbs7283a3 deletion [Forced]

Status: Success

Created: June 13, 2024 8:14:08 PM UTC

Message:

	Node Name l Time	Start
		June 13, 2024
Delete database 8:14:08 PM UTC June 13, 20 Success	024 8:14:09 PM UTC	
Remove DB System from Clusterware	nodelha17c1n1	June 13, 2024
8:14:09 PM UTC June 13, 20 Success		
Delete ASM client cluster config	node1ha17c1n1	June 13, 2024
8:14:09 PM UTC June 13, 20 Success		
Deprovision DB System VM(s)	node1ha17c1n1	June 13, 2024
8:14:09 PM UTC June 13, 20		
Success		
Delete DB System ACFS filesystem	node1ha17c1n1	June 13, 2024
8:14:10 PM UTC June 13, 20 Success	024 8:14:11 PM UTC	
Delete DB System ACFS mount point	node1ha17c1n1	June 13, 2024
8:14:11 PM UTC June 13, 20 Success	024 8:14:11 PM UTC	
Delete DB System ASM volume	node1ha17c1n1	June 13, 2024
8:14:11 PM UTC June 13, 20		
Success		
Delete DB System Networks		June 13, 2024
8:14:12 PM UTC June 13, 20 Success	24 8:14:12 PM UTC	
Remove unused network interfaces	nodelha17c1n1	June 13, 2024



8:14:12 PM UTC	June	13,	2024	8:14:12 PM UTC		
Success						
Delete imported certificate	es			node1ha17c1n1	June 13,	2024
8:14:12 PM UTC	June	13,	2024	8:14:13 PM UTC		
Success						
Delete DB System metadata				node1ha17c1n1	June 13,	2024
8:14:13 PM UTC	June	13,	2024	8:14:13 PM UTC	Succ	ess

# odacli VM Storage Commands for KVM

Use the odacli virtual machine storage commands to manage storage on Oracle Database Appliance for Oracle KVM.

## odacli create-vmstorage

Use the odacli create-vmstorage command to create a new VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli list-vmstorages

Use the odacli list-vmstorages command to list all VM storages on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## odacli describe-vmstorage

Use the odacli describe-vmstorage command to describe VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli modify-vmstorage

Use the odacli modify-vmstorage command to modify VM storage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

# odacli delete-vmstorage

Use the odacli delete-vmstorage command to delete a vmstorage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

# odacli create-vmstorage

Use the odacli create-vmstorage command to create a new VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli create-vmstorage -n name -s size -dg disk\_group [-r {MIRROR|HIGH}] [-j] [-h]

Parameter	Description
name, -n	Name assigned to the VM storage.
size,-s	Specifies the storage size. Format is $K M G T$ . Minimum Size is 1024M (1G)
diskgroup,-dg	(Optional) Defines the ASM disk group of the VM storage (Default: DATA).
redundancy, -r	(Optional) Specifies the VM storage redundancy for a DB system. The value can be HIGH or MIRROR. This option is not supported for DB systems on non-FLEX disk group. The options can be MIRROR or HIGH. The default option is MIRROR.
json,-j	(Optional) Displays output in JSON format.



Parameter	Description
help, -h	(Optional) Displays help for using the command.

## **Example**

Create a VM storage named share1 of 8 GB.

# odacli create-vmstorage -n share1 -s 8G

# odacli list-vmstorages

Use the odacli list-vmstorages command to list all VM storages on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli list-vmstorages [-j] [-h]

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example**

# odacli list-vmstorages

# odacli describe-vmstorage

Use the odacli describe-vmstorage command to describe VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli describe-vmstorage -n name [-j] [-h]

## **Parameters**

Parameter	Description
name, -n	Specifies the name of the VM storage.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### Example: Describing a VM Storage named share1

# odacli describe-vmstorage -n share1



# odacli modify-vmstorage

Use the <code>odacli modify-vmstorage</code> command to modify VM storage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli modify-vmstorage -n name -i increment [-r {MIRROR|HIGH}] [-s decrement] [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the VM storage name
increment, -i	(Optional) Defines the size to grow the VM storage. Format is $K M G T$
shrink,-s	(Optional) Defines the size to shrink the VM storage. Format is $K M G T$
redundancy, -r	(Optional) Specifies the VM storage redundancy for a DB system. The value can be HIGH or MIRROR. This option is not supported for DB systems on non-FLEX disk group. The options can be MIRROR or HIGH. The default option is MIRROR.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

### **Example**

Increase the size of a VM storage named share1 by 10 gigabytes.

# odacli modify-vmstorage -n share1 -i 10G

# odacli delete-vmstorage

Use the odacli delete-vmstorage command to delete a vmstorage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli delete-vmstorage -n name [-f] [-j] [-h]

## **Parameters**

Parameter	Description
name, -n	Specifies the vmstorage name to be deleted
force, -f	(Optional) Specifies the force option
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

# Example

Delete a VM storage named share1.

odacli delete-vmstorage -n share1



# odacli Virtual Disk Commands for Oracle KVM

Use the odacli virtual disk commands to manage virtual disks on Oracle Database Appliance for Oracle KVM.

#### odacli create-vdisk

Use the odacli create-vdisk command to create a new virtual disk in a VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli list-vdisks

Use the odacli list-vdisks command to list all virtual disks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli describe-vdisk

Use the <code>odacli describe-vdisk</code> command to describe a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## odacli modify-vdisk

Use the odacli modify-vdisk command to modify a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli clone-vdisk

Use the odacli clone-vdisk command to clone a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli delete-vdisk

Use the <code>odacli delete-vdisk</code> command to delete a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

# odacli create-vdisk

Use the odacli create-vdisk command to create a new virtual disk in a VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli create-vdisk -n name -vms vmstorage name -s size -sh -sp [-j] [-h]

Parameter	Description
name, -n	Name assigned to the virtual disk that is unique within the name repository
vmstorage, -vms	Name of the VM storage where the virtual disk will be created
size, -s	Amount of storage to be assigned from the shared repository to the shared disk. The default unit is G (for gigabytes) and the minimum size is 500 M (for megabytes). Format is $K[M]GT$
shareable, -sh	(Optional) Sets the option of allowing the virtual disk to be shared by more than one virtual machine (shared)
sparse, -sp	(Optional) Creates a sparse vdisk. Use the default option, non-sparse, to pre-allocate the full vdisk size in the vdisk image. Specify sparse vdisk with thesparse, -sp option when you do not need to pre-allocate the vdisk size in the vdisk image. The image size can increase till it reaches the total current vdisk size.



Parameter	Description
json, -j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example**

Create a 2 GB non-sparse and shareable Virtual Disk named vdisk1 inside the VM storage vms1.

odacli create-vdisk -n vdisk1 -vms vms1 -s 2G -sh

# odacli list-vdisks

Use the odacli list-vdisks command to list all virtual disks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

# **Syntax**

odacli list-vdisks [-j] [-h]

#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Example**

odacli list-vdisks

# odacli describe-vdisk

Use the odacli describe-vdisk command to describe a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

## **Syntax**

odacli describe-vdisk -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the name of the virtual disk.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### Example: Describing a Virtual Disk named vdisk1

odacli describe-vdisk -n vdisk1



# odacli modify-vdisk

Use the odacli modify-vdisk command to modify a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli modify-vdisk -n name -i [-no-s|-s] [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual disk name
increment, -i	Defines the size to increase the virtual disk. Format is $\textit{value units}$ , units are $K M G T$
-no-shareable,no-s	(Optional) Set the Virtual Disk as non-shareable
shareable,-s	(Optional) Set the Virtual Disk as shareable
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Increase the size of a virtual disk named vdisk1 by 4 gigabytes.

```
# odacli modify-vdisk -n vdisk1 -i 4G
```

# odacli clone-vdisk

Use the odacli clone-vdisk command to clone a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli clone-vdisk -n name -cn clone_name [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual disk name to be cloned
clone-name, -cn	Specifies the name of the cloned virtual disk
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Create a clone of a virtual disk named <code>vdisk1</code>, with the name <code>vdisk1\_clone</code>. The cloned disk is created on the same storage as <code>vdisk1</code>.

```
# odacli clone-vdisk -n vdisk1 -cn vdisk1_clone
```



# odacli delete-vdisk

Use the odacli delete-vdisk command to delete a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli delete-vdisk -n name [-f] [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual disk name to be deleted
force, -f	(Optional) Specifies the force option
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Delete a virtual disk named vdisk1.

# odacli delete-vdisk -n vdisk1

# odacli CPU Pool Commands for Bare Metal and KVM

Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.

CPU pools enable management of CPU resources in both bare metal and KVM environments. There are two types of CPU pools, that is, BM and VM.

Use the BM CPU pool to ensure that the database on a bare metal host runs exclusively on the CPUs specified in the CPU pool.

Use the VM CPU pools to cage and manage CPU resource allocations to workloads for virtual machines. Workloads are isolated by creating CPU pools and assigning or pinning virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.

## odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

## · odacli list-cpupools

Use the odacli list-cpupools command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli describe-cpupool

Use the odacli describe-cpupool command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### · odacli modify-cpupool

Use the odacli modify-cpupool command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli delete-cpupool

Use the odacli delete-cpupool command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### · odacli list-auditrecords

Use the <code>odacli list-auditrecords</code> command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### odacli describe-auditrecord

Use the odacli describe-auditrecord command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

# odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

```
odacli create-cpupool -n name -c number_of_cores {-bm|-vm} [-nn node_name] [-s socket]
[-dbs] [-urc] [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the CPU Pool name.
cores, -c	Specifies the CPU Pool cores.
bm, -bm	(Optional) Specifies the CPU Pool as Bare Metal.
vm, -vm	(Optional) Specifies the CPU Pool as Virtual Machine.
dbsystem, -dbs	(Optional) Specifies the CPU Pool type as DB System.
socket, -s	(Optional) Specifies the socket to use. If not specified, then use all available sockets.
use-reserved-cores, - urc	(Optional) Specifies to use reserved CPU cores.
node-name, -nn	(Optional) Specifies the node where the CPU Pool will be created. On High-Availability deployment, if this option is not specified, then the CPU pool is created on both nodes.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

## **Usage Notes**

 Attach the BM CPU pool to databases. Bare metal CPU pools can be assigned to multiple databases.

- Attach VM CPU pool VM to guest machines. VM CPU pools can be assigned to multiple VMs.
- Attach dbsystem CPU pool to DB systems. dbsystem CPU pool can be assigned to
  multiple DB systems. After you create a dbsystem CPU pool, you can create a new DB
  system with this CPU pool by adding the new CPU pool parameter in the create-dbsystem
  json file, or modify-dbsystem to attach CPU pool to an existing DB system.
- Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.
- After you create a BM CPU pool, you can associate this CPU pool to a database using the create-database or modify-database command.
- After you create a VM CPU pool, you can associate this CPU pool to a VM using the create-vm or modify-vm command.
- Number of cores must be an even number between 2 and the total number of available cores on the system.
- By default, a CPU in the CPU pool is allocated across two sockets in release 19.12 and later. Optionally, you can choose to allocate the CPU based on the socket number (0 or 1). This is especially useful to support Standard Edition licensing. It is recommended that you use the default allocation and do not mix two types of allocation.
- By default, the first core of the socket is reserved and cannot be used by the VM and DB system CPU pools for optimal performance. Use the --use-reserved-cores option to enable use of the first core of socket for VM and DB system CPU pools.

### **Example**

Create a BM CPU pool named cpupool1 with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool1 -c 6 -bm
```

Create a VM CPU pool named cpupool2 with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool2 -c 6 -vm
```

Create a DB System CPU pool named cpupool3 with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool3 -c 6 -dbs
```

Create a DB System CPU pool named cpupool4 with 4 cores of CPUs allocated from socket 0.

```
# odacli create-cpupool -n cpupool4 -dbs -s 0 -c 4
```

# odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

```
odacli remap-cpupools -f -urc [-j] [-h]
```



#### **Parameters**

Parameter	Description
force, -f	(Optional) Specifies to force the operation.
use-reserved-cores, -j	(Optional) Specifies to use reserved CPU cores.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

If the odacli remap-cpupools command fails with the error DCS-10001:Internal error encountered: Not enough physical CPUs available for CPU Pool 'cpupool\_name' on node 'node\_name', run the odacli remap-cpupools command again with the --use\_reserved-cores option.

Use the --force option to remap CPU pools even if the CPU pool is marked as NUMA-enabled. You must use odacli remap-cpupools command, after updating the bare metal CPU cores with the command odacli modify-cpucores for CPU core number changes.

By default, the first core of the socket is reserved and cannot be used by the VM and DB system CPU pools for optimal performance. Use the --use-reserved-cores option to enable use of the first core of socket for VM and DB system CPU pools.

#### **Example**

# odacli remap-cpupools

## **Related Topics**

odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli remap-cpupools

Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

# odacli list-cpupools

Use the odacli list-cpupools command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

odacli list-cpupools [-j] [-h]

#### **Parameters**

Parameter	Description
json, -j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

# odacli list-cpupools

# odacli describe-cpupool

Use the odacli describe-cpupool command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

odacli describe-cpupool -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the name of the CPU Pool.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

# Example: Describing a CPU pool named cpupool1

# odacli describe-cpupool -n cpupool1

# odacli modify-cpupool

Use the odacli modify-cpupool command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

# **Syntax**

odacli modify-cpupool -n name -c cores -f -l [-j] [-h]

Parameter	Description
name, -n	Specifies the CPU Pool name
cores, -c	Specifies the new number of CPU cores
force, -f	(Optional) Forces the operation
live, -l	(Optional) Applies the changes to running VMs
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.



#### **Usage Notes**

For VM CPU pool, if --live is not specified, then the changes are applied to the VM configuration file and will be activated next time the VM is started. If --live is specified, then the changes will be applied to both VM configuration file and to the running VM.

#### **Example**

Set the size of a CPU Pool cpupool1 to 10. If --live is not specified, the change is applied to the VM configuration file and will be activated next time the VM is started.

```
# odacli modify-cpupool -n cpupool1 -c 10
```

## odacli delete-cpupool

Use the odacli delete-cpupool command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli delete-cpupool -n name -f [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the CPU Pool name to be deleted
force, -f	(Optional) Forces deletion.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Delete a CPU pool named cpupool1.

```
# odacli delete-cpupool -n cpupool1
```

### odacli list-auditrecords

Use the odacli list-auditrecords command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

```
odacli list-auditrecords -du dcs-username -f from_date-range -l latest -nn node_name - ot operation_type -ou OS_username -rn resource_name -rt resource_type -t to_date-range [-j] [-h]
```

#### **Parameters**

Parameter	Description
dcs-user, -du	(Optional) Specifies the DCS user name.
from, -f	(Optional) Specfies the <i>from</i> date in the date range for the CPU pool audit records.



Parameter	Description
latest, -l	(Optional) Specifies the latest number of CPU pool audit records.
node-name, -nn	(Optional) Specifies the node name.
op-type, -ot	(Optional) Specifies the type of operation.
os-user, -ou	(Optional) Specifies the operating system user.
rsc-name, -rn	(Optional) Specifies the resource name.
rsc-type, -rt	(Optional) Specifies the resource type.
to, -t	(Optional) Specfies the <i>to</i> date in the date range for the CPU pool audit records.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### Example

# odacli list-auditrecords	
ID Re	esource type Resource name
Operation type DCS username OS use	ername Timestamp
41295d99-f263-4284-b6d9-2aff1ae0f850 BM	M_CPU_POOL testbmpool
CREATE oda-admin root	2020-10-08 13:27:05 UTC
0f07a013-5bb4-4cd8-bd49-04dc61fcd454 BM	4_CPU_POOL pool_9f74a8e9-
DELETE oda-admin root	2020-10-08 12:26:30 UTC
d858269b-6c28-4bc2-af71-79004f3561e6 BM	4_CPU_POOL pool_9f74a8e9-
CREATE oda-admin root	2020-10-08 12:24:36 UTC
9d7852c1-93fb-410e-9e0c-8c0a95ed3f0c VI	4_CPU_POOL pool_d48e81e4-
DELETE oda-admin root	2020-10-08 12:06:45 UTC
0235cc84-9345-40bc-ac4f-7de3f63202e2 VI	
DELETE oda-admin root	2020-10-08 12:06:45 UTC
762f7263-7bd9-4b12-b891-48305165bf36 VI	4_CPU_POOL pool_4fe0b4f4-
MODIFY oda-admin root	2020-10-08 12:06:22 UTC
0bd2a25d-2327-4918-bd47-8c00f7406f92 V	4_CPU_POOL pool_4fe0b4f4-
MODIFY	<b>_</b>

## odacli describe-auditrecord

Use the odacli describe-auditrecord command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

#### **Syntax**

odacli describe-auditrecord -i [-j] [-h]

#### **Parameters**

Parameter	Description
id, -i	Describes the ID of the audit record.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.



#### **Example**

```
# odacli describe-auditrecord -i 41295d99-f263-4284-b6d9-2aff1ae0f850
Audit Record details
Event details
               Record ID: 41295d99-f263-4284-b6d9-2aff1ae0f850
        Record timestamp: 2020-10-08 13:27:05 UTC
            DCS username: oda-admin
             OS username: root
              Cluster ID: test_cluster-c
                 Node ID: test cluster
Resource/Operation
           Resource type: BM_CPU_POOL
             Resource ID: b17cb623-bf79-491f-86d8-d8502987e26c
           Resource name: testbmpool
          Operation type: CREATE
   Operation description: Created with '2' cores and allocation
'test cluster:1-2,17-18'
```

### odacli VM Network Commands for KVM

Use the odacli virtual machine network commands to manage network on Oracle Database Appliance for Oracle KVM.

#### odacli create-vnetwork

Use the odacli create-vnetwork command to create a new network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli list-vnetworks

Use the <code>odacli list-vnetworks</code> command to list all virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli describe-vnetwork

Use the odacli describe-vnetwork command to describe virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli start-vnetwork

Use the <code>odacli start-vnetwork</code> command to start a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli stop-vnetwork

Use the odacli stop-vnetwork command to stop a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli modify-vnetwork

Use the odacli modify-vnetwork command to modify a network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli delete-vnetwork

Use the odacli delete-vnetwork command to delete a virtual network configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

### odacli create-vnetwork

Use the odacli create-vnetwork command to create a new network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli create-vnetwork -n name -if interface-name -t type -br bridge -g gateway -ip IP-address -nm netmask -u uniform -vlan VLAN-network ID [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual network name.
interface-name,-if	Specifies the the network interface on the host. This can be physical interface or bonded interface.
type, -t	Specifies the virtual network type. Values are bridged or bridged-vlan.
bridge, -br	(Optional) Specifies the name of the bridge.
gateway, -gw	(Optional) Specifies the virtual network gateway
ip, -ip	(Optional) Specifies the virtual network addresses. For more than one address, use the format "node0_ip,node1_ip,"
netmask, -nm	(Optional) Specifies the virtual network netmask
uniform, -u	(Optional) Specifies whether the virtual network is created on both nodes in a high-availability deployment
vlan-id, -vlan	(Optional) Specifies the VLAN network ID
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

If you did not specify the IP address, or netmask, or gateway during vnetwork creation, then you can add them later using the odacli modify-vnetwork command.

#### **Example**

Create a VM network of type bridged using the interface btbond2.

# odacli create-vnetwork -n vnet1 -if btbond2 -type bridged

### odacli list-vnetworks

Use the <code>odacli list-vnetworks</code> command to list all virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli list-vnetworks [-j] [-h]



#### **Parameters**

Parameter	Description
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

# odacli list-vnetworks

## odacli describe-vnetwork

Use the odacli describe-vnetwork command to describe virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli describe-vnetwork -n [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the name of the virtual network.
json,-j	(Optional) Displays output in JSON format.
help,-h	(Optional) Displays help for using the command.

#### Example: Describing a VM Network named vnet1

# odacli describe-vnetwork -n vnet1

### odacli start-vnetwork

Use the <code>odacli start-vnetwork</code> command to start a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli start-vnetwork -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual machine name to be stopped
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Start a virtual network named vnet1.

# odacli start-vnetwork -n vnet1



# odacli stop-vnetwork

Use the odacli stop-vnetwork command to stop a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli stop-vnetwork -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual network to be stopped
json,-j	(Optional) Displays output in JSON format.
help,-h	(Optional) Displays help for using the command.

#### **Example**

Stop a virtual network named vnet1.

# odacli stop-vnetwork -n vnet1

## odacli modify-vnetwork

Use the odacli modify-vnetwork command to modify a network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli modify-vnetwork -n name -if -t -br -gw -ip -nm -u -vlan [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual network name.
gateway, -gw	(Optional) Specifies the virtual network gateway
ip, -ip	(Optional) Specifies the virtual network addresses. For more than one address, use the format "node0_ip,node1_ip,". Specify the value as none to remove the IP address.
netmask, -nm	(Optional) Specifies the virtual network netmask
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Modify a VM network to specify the gateway.

# odacli modify-vnetwork -n vnet1 -g 10.11.44.41



### odacli delete-vnetwork

Use the odacli delete-vnetwork command to delete a virtual network configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli delete-vnetwork -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the vnetwork name to be deleted
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Delete a VM network named vnet1.

# odacli delete-vnetwork -n vnet1

### odacli Virtual Machine Commands for Oracle KVM

Use the odacli virtual machine commands to manage virtual machines on Oracle Database Appliance for Oracle KVM.

#### odacli create-vm

Use the odacli create-vm command to create a new virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli list-vms

Use the odacli list-vms command to list all virtual machines on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli describe-vm

Use the odacli describe-vm command to describe a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli start-vm

Use the  $odacli\ start-vm$  command to start a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli stop-vm

Use the odacli stop-vm command to stop a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### · odacli migrate-vm

Use the odacli migrate-vm command to migrate a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### odacli clone-vm

Use the odacli clone-vm command to clone a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### · odacli delete-vm

Use the odacli delete-vm command to delete a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

### odacli create-vm

Use the odacli create-vm command to create a new virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli create-vm -n name -m memory -bo boot_options -src source -vc vcpus -vms vmstorage -cp cpupool -d description -g graphics -mm max-mem-size -mvc max-vcpu-count -osv os_variant -pn preferred_node -s disk_size -vd vdisks -vn virtual network names -ea extra args -esrc extra srcs [-j] [-h]
```

#### **Parameters**

Danier at an	December 1
Parameter	Description
name, -n	Specifies the VM name
memory, -st	Specifies the size of the VM memory. The format is "value_unit". Unit is $\mbox{M} \mbox{G}.$
source, -src	Specifies the source installation. If local, it can be an ISO or a bootable disk image. If remote, it can be an URI pointing to an install tree hosted remotely over HTTP, HTTPS, or FTP.
vcpus, -vc	Specifies the number of vCPUs to use.
vmstorage, -vms	Specifies the VM storage name.
boot-options, -bo	Specifies the VM boot options.
cpupool, -cp	(Optional) Specifies the CPU pool name
extra-srcs, -esrc	(Optional) Specifies the extra sources for the guest VM that are mounted as CDROM devices
description, -d	(Optional) Specifies the VM description
extra-args, -ea	(Optional) Specifies the extra arguments for the VM installer.
graphics, -g	(Optional) Specifies the graphics settings for the VM
max-memory, -mm	(Optional) Specifies the maximum size of the VM memory. The format is "value_unit". Unit is $M \vert G. \>$
max-vcpus, -mvc	(Optional) Specifies the maximum number of VCPUs
os-variant,-osv	(Optional) Specifies the operating system variant. Use the command osinfo-query os to get the list of the accepted OS variants.
pref-node, -pn	(Optional) Specifies the preferred node to run the VM
size, -s	(Optional) Specifies the size of the VM. The format is "value_unit". Unit is $K[M]G\c T.$
vdisks, -vd	(Optional) Specifies the names of the vdisks to use
vnetworks, -vn	(Optional) Specifies the names of the virtual networks to use
json,-j	(Optional) Displays output in JSON format.



Parameter	Description
help, -h	(Optional) Displays help for using the command.

#### **Usage Notes**

 Use the --extra-args parameter to add kickstart configuration file, kernel parameters for example, serial console. For example: --extra-args "console=tty0 console=ttyS0,115200 ks=http://192.168.122.100:80/ks.txt"

#### **Example**

Create a VM named vm1 with 8 vcpus and 8 GB memory. The VM is stored in the VM Storage vms1. The source used for the installation is located on /u01/OL7.iso.

```
# odacli create-vm -n vm1 -vc 8 -m 8G -vms vs1 -src /u01/OL7.iso
```

#### **Example**

If the installation source is located through network, the network configuration of the VM must be provided by --extra-args so that the network can be setup at the bootstrap of the VM, to reach the installation source over the network. For example, to create a VM from source https://example.com/iso/OracleLinux/OL7/u9/x86\_64/OracleLinux-R7-U9-Server-x86\_64-dvd/:

```
# odacli create-vm -vn pubnet -m 4G -vc 8 -src https://example.com/iso/
OracleLinux/OL7/u9/x86_64/OracleLinux-R7-U9-Server-x86_64-dvd/ -vd vmstorage_vdisk2 -vms
vmstore -g vnc,listen=0.0.0.0,port=5949 -n vm1 -s 20G --extra-args
"dns=<dns_server_ip_addr>
ip=<vm1_ip_addr>::<gateway_ip>:<netmask>:<vm1_hostname>:ens3:none"
```

### odacli list-vms

Use the odacli list-vms command to list all virtual machines on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli list-vms [-j] [-h]
```

#### **Parameters**

Parameter	Description	
json,-j	(Optional) Displays output in JSON format.	
help, -h	(Optional) Displays help for using the command.	

#### **Example**

# odacli list-vms



### odacli describe-vm

Use the odacli describe-vm command to describe a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli describe-vm -n name [-j] [-h]

#### **Parameters**

Parameter	Description
name, -n	Specifies the name of the virtual machine.
json,-j	(Optional) Displays output in JSON format.
help,-h	(Optional) Displays help for using the command.

#### Example: Describing a Virtual Machine named vm1

# odacli describe-vm -n vm1

# odacli modify-vm

Use the odacli modify-vm command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

odacli modify-vm -n name -as -en -bo boot\_options -cfg -avd attach\_vdisks -avn attach\_vnetworks -dev device -d description -dn -dvd detach-vdisk -dvn detach-vnetworks -mm max-memory -mvc max-vcpuc -m memory -no-cp -pn preferred-node -vc vcpu\_count -di disk-increment -en -fo -g graphics -l -no-as [-f] [-g] [-j] [-h]

#### **Parameters**

Parameter	Description	
name, -n	Specifies the VM name	
autostart, -as	(Optional) Specifies if the auto-start option must be set for the VM	
no-autostart, -no-as	(Optional) Disables the auto-start option for the VM	
boot-options, -bo	(Optional) Specifies the the boot options to use	
config, -cfg	(Optional) Specifies whether the changes persist.	
live, -l	(Optional) Indicates whether the specified changes take place live (true) or after the next boot (false). Default is false	
enable-numa, -en	(Optional) Enables NUMA configuration for the VM.	
disable-numa, -dn	(Optional) Disables NUMA configuration for the VM.	
cpu-pool, -cp	(Optional) Specifies the CPU pool name	
description, -d	(Optional) Specifies the VM description	
failover, -fo	(Optional) Specifies the configuration for the failover	
no-failover, -no-fo	(Optional) Specifies the configuration for the failover	



Parameter	Description	
vcpus, -vc	(Optional) Specifies the number of vCPUs.	
memory, -m	(Optional) Specifies the memory size of the VM. The format is "value_unit". Unit is M G.	
max-memory, -mm	(Optional) Specifies the maximum memory size of the VM. The format is "value_unit". Unit is $M\mid G$ .	
max-vcpus, -mvc	(Optional) Specifies the maximum number of vCPUs.	
no-cpupool, -no-cp	(Optional) Dissasociates the associated CPU Pool	
detach-vdisk, -dvd	(Optional) Specifies the names of the virtual disks to detach	
detach-vnetworks,-dvn	(Optional) Specifies the names of the virtual networks to detach	
pref-node, -pn	(Optional) Specifies the preferred node to run the VM	
disk-increment, -di	Specifies the change in size of the VM. The format is "value_unit". Unit is K M G T.	
attach-vdisks,-avd	(Optional) Specifies the names of the vdisks to attach	
attach-vnetworks, -avn	(Optional) Specifies the names of the virtual networks to attach	
device, -dev	(Optional) Modifies the device as specified in the expression:  Where device_expression = [vdisk=vdisk_name,] [bus=bus type,][target=target device]	
	vdisk_name: If specified, must refer to an attached vDisk name.  Otherwise it refers to the VM image.	
	bus_type: The value can be ide, virtio, scsci, fdc, xen, usb, sata or sd.	
	target_device: Must be a device name compatible with the bus_type. For example: vda, hda, sda.	
force, -f	(Optional) Specifies to force the operation.	
graphics,-g	(Optional) Defines the graphics settings for the VM. The supported graphics setting is VNC. For example, vnc, listen=127.0.0.1, port=5901.	
json,-j	(Optional) Displays output in JSON format.	
help, -h	(Optional) Displays help for using the command.	

#### **Usage Tips**

- --live: The change is applied to the running VM instance, but does not persist after the VM stops.
- --enable-numa: Use this option to enable NUMA for an existing VM.
- --config: The change persists in the configuration of VM instance and takes effect on subsequent reboots.
- If neither --live or --config is specified, then the default behavior is --config.
- You can specify both the --live or --config options if you want the modification to take effect immediately and on subsequent boots.
- When an application VM is created, a default network interface is created by default in the VM. This interface is attached to the default kvm bridge (virbr0) at the host. This interface is intended for convenient communication between the host and VM. This interface does not attach to any physical network interface at the host. Do not configure this interface to use for any external communication.

- You must create a vnetwork using the command odacli create-vnetwork and attach the vnetwork (odacli modify-vm -avn) to the VM. This creates a second interface in the VM. Configure this network interface for your network requirement.
- The network interface name in the VM depends on the operating system.

#### Modifying CPU Count and Memory for a VM

Update the configuration of a VM named vm1, setting the CPU count to 6 and the maximum memory to 6 gigabytes on both the running VM and subsequent boots.

```
# odacli modify-vm -n vm1 -vc 6 -mm 6G --live --config
```

#### **Enabling NUMA**

Use --enable-numa to enable NUMA for the VM configuration. The command odacli modify-dbsystem --enable-numa is only supported on application VMs with even number of CPU cores so that CPU cores can be evenly distributed to NUMA nodes. In Oracle Database Appliance, one CPUcore is equal to 2 vCPU. For more information, see *About Enabling NUMA on Oracle Database Appliance*.

```
# odacli modify-vm --name name --enable-numa
```

#### Modifying a VM to attach a vnetwork

Modify a VM to attach a vnetwork:

```
# odacli modify-vm -n vm name -avn vnetwork name
```

#### Modifying a VM to change the bus type for the VM image

Modify the bus type for the VM image from virtio to sata. This is useful when the VM image does not support the virtio driver, for example, a Windows VM without virtio driver installed:

```
# odacli modify-vm -dev "bus=sata" -n winvm
```

#### Modifying a VM to change the bus type for a specific vdisk attached to the VM

To modify the bus type for a specific vdisk attached to the VM, run the following command:

```
# odacli modify-vm -dev "vdisk=vdisk_name, bus=sata" -n winvm
```

The command changes the winvm bus type of  $vdisk\_name$  to sata. If you do not specify the vdisk parameter, the command changes the bus type to the vdisk that holds the VM image.

#### **Related Topics**

- · odacli remap-cpupools
  - Use the odacli remap-cpupools command to remap CPU pools to NUMA allocation on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli modify-dbsystem

Use the odacli modify-dbsystem command to modify a DB system on Oracle Database Appliance Kernel-based Virtual Machine (KVM).



#### odacli create-cpupool

Use the odacli create-cpupool command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

### odacli start-vm

Use the odacli start-vm command to start a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli start-vm -n name -nn [-j] [-h]
```

#### **Parameters**

Parameter	Description	
name, -n	Specifies the virtual machine name to be stopped	
node-name, -nn	(Optional) Specifies the node name where the virtual machine will be started	
json,-j	(Optional) Displays output in JSON format.	
help, -h	(Optional) Displays help for using the command.	

#### **Usage Notes**

- If pref-node is defined for the VM, then the VM starts on the pref-node. If pref-node is
  not defined for the VM, then the VM can start on any node, in a high-availability
  deployment.
- If you specify the node name -n, then the VM starts on the specified node, even if the preferred node is defined.

#### **Example**

Start a virtual machine named vm1.

```
# odacli start-vm -n vm1
```

## odacli stop-vm

Use the <code>odacli stop-vm</code> command to stop a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli stop-vm -n name [-f] [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual machine name to be stopped
force, -f	(Optional) Specifies the force option
json, -j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.



#### **Example**

Stop a virtual machine named vm1.

```
# odacli stop-vm -n vm1
```

### odacli migrate-vm

Use the odacli migrate-vm command to migrate a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli migrate-vm -n name -th node_name [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual machine name to be migrated.
target-node, -th	Specifies the destination node name.
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Migrate a virtual machine named vm1 to node named oda1.

```
odacli migrate-vm -n vm1 -th oda1
```

### odacli clone-vm

Use the odacli clone-vm command to clone a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
# odacli clone-vm -n name_of_vm_to_clone_from -cn clone_name [-j] [-h]
```

#### **Parameters**

Parameter	Description	
name, -n	Specifies the virtual machine name to be cloned	
clone-name, -cn	Specifies the name of the cloned virtual machine	
description, -d	(Optional) Specifies the description of the virtual machine	
json,-j	(Optional) Displays output in JSON format.	
help, -h	(Optional) Displays help for using the command.	

#### **Example**

Create a clone of a virtual machine named vm1, with the name  $vm1\_clone$ . The cloned VM is created on the same storage as vm1.

# odacli clone-vm -n vm1 -cn vm1\_clone

### odacli delete-vm

Use the odacli delete-vm command to delete a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

#### **Syntax**

```
odacli delete-vm -n name [-f] [-j] [-h]
```

#### **Parameters**

Parameter	Description
name, -n	Specifies the virtual machine name to be deleted
force, -f	(Optional) Specifies the force option
json,-j	(Optional) Displays output in JSON format.
help, -h	(Optional) Displays help for using the command.

#### **Example**

Delete a virtual machine named vm1.

odacli delete-vm -n vm1

# Configuring and Using Oracle Auto Service Request (Oracle ASR)

Configure and use Oracle ASR to automatically generate a service request for specific hardware faults.

#### About Configuring Oracle ASR

Configure Oracle Auto Service Request (Oracle ASR) to automatically generate service requests for specific hardware faults.

#### Configuring Internal Oracle ASR

Use ODACLI commands or the Browser User Interface (BUI) to configure Oracle Auto Service Request (Oracle ASR) in Oracle Database Appliance.

#### Registering with External Oracle ASR Manager

Use ODACLI commands or the Browser User Interface to register Oracle Database Appliance with an external Oracle Auto Service Request (Oracle ASR) Manager.

 Configuring External Oracle ASR When Oracle ASR Manager Does Not Run on an Oracle Database Appliance

Understand how you can configure Oracle Database Appliance with an external Oracle Auto Service Request (Oracle ASR) Manager.

#### Testing Oracle ASR

Use the odacli test-asr command to confirm that your Oracle ASR configuration is working.

#### Managing an Oracle ASR Configuration

Use the command-line to review an existing configuration, make changes to a configuration, or delete a configuration.

#### Additional Resources for Oracle ASR

Refer to these sections for more information about Oracle ASR.

# **About Configuring Oracle ASR**

Configure Oracle Auto Service Request (Oracle ASR) to automatically generate service requests for specific hardware faults.

Oracle ASR is a secure support feature that can improve system availability through expedited diagnostics and priority service request handling. You can configure Oracle ASR on Oracle Database Appliance to use its own Oracle ASR Manager (internal Oracle ASR) or use Oracle ASR Manager configured on another server in the same network as your appliance (external Oracle ASR).

Oracle Database Appliance supports two types of Oracle ASR configurations - Internal and External. You can use the <code>odacli configure-asr</code> command to configure both types of Oracle ASR.

• Internal Oracle ASR: For this type of configuration, Oracle ASR Manager is installed on the Oracle Database Appliance, where assets need to be monitored. For this type of configuration, Oracle ASR Manager is installed on the Oracle Database Appliance, where

assets need to be monitored. The assets Oracle ILOM and the host are registered with Oracle ASR using an XML payload that is sent to the HTTPS endpoint of Oracle ASR Manager. After successful registration, the alerts are also sent from the assets to the Oracle ASR Manager by composing an XML payload. Once the XML file is sent, an SR is generated based on the alert information present in the XML file.

• External Oracle ASR: For this type of configuration, Oracle ASR Manager is not installed on one Oracle Database Appliance. For example, if Oracle ASR manager is not installed on oda1, but Oracle ASR Manager is installed on another Oracle Database Appliance, oda2, then the assets that belong to oda2 assets are registered with Oracle ASR Manager installed on oda1. To register Oracle Database Appliance assets with an external Oracle ASR Manager, you must first update the repository with Oracle ASR Manager configuration files. After that, configure Oracle ASR as external to register the assets with Oracle ASR Manager.

#### Note:

With an internal Oracle ASR Manager, an alert is not sent when the server is not running because the Oracle ASR Manager runs on the same server. However, if a critical event occurs on Oracle Database Appliance with an external Oracle ASR Manager, then an alert can still be generated since the Oracle ASR Manager is not running on the same host.

You can configure Oracle ASR as part of deploying the appliance, or you can use the Browser User Interface (BUI) or command-line interface to configure or edit an Oracle ASR after deployment.

Starting with Oracle Database Appliance release 19.21, when you configure Oracle ASR, you specify HTTPS settings and not the SNMP settings. Following are the requirements to configure Oracle ASR:

- Oracle Database Appliance hardware must be associated with a Support Identifier (SI) in My Oracle Support.
- If a proxy server is required for Internet access to Oracle, then you must also provide the name of the proxy server.
- To configure an internal Oracle ASR Manager, you need a My Oracle Support account user name (e-mail address) and password associated with the My Oracle Support account under which the server is registered.
- To register with an external Oracle ASR Manager, use zip file generated by the odacli
  export-asrconfig command when it is run on the appliance where Oracle ASR Manager
  runs.

#### **Related Topics**

- Configuring Internal Oracle ASR
   Use ODACLI commands or the Browser User Interface (BUI) to configure Oracle Auto Service Request (Oracle ASR) in Oracle Database Appliance.
- Configuring External Oracle ASR
   Use ODACLI commands or the Browser User Interface to register Oracle Database
   Appliance with an external Oracle Auto Service Request (Oracle ASR) Manager.
- odacli configure-asr
   Use the odacli configure-asr command to configure Oracle Auto Service Request (Oracle ASR) after deploying the appliance.

# Configuring Internal Oracle ASR

Use ODACLI commands or the Browser User Interface (BUI) to configure Oracle Auto Service Request (Oracle ASR) in Oracle Database Appliance.

You can register with an internal Oracle ASR Manager at any time, or modify an existing registration. Before configuring, verify that the Oracle Database Appliance hardware is associated with a Support Identifier (SI) in My Oracle Support.

You need the following information to configure Oracle ASR:

- The e-mail address associated with the My Oracle Support account under which the server is registered
- The password associated with the My Oracle Support account under which the server is registered
- If a proxy server is required for Internet access to Oracle, then you must also provide the name of the proxy server

#### **Configuring Internal ASR Using ODACLI Commands**

Use the odacli configure—asr command to configure Oracle ASR after deploying the appliance.

```
# odacli configure-asr -u user@example.com -hp 16165
Enter ASR user's password:
Retype ASR user's password:
Job details
                 ID: 1c9f126e-f5d2-4178-9d59-1343314b86ee
          Description: Configure ASR
              Status: Success
              Created: November 29, 2023 4:42:07 PM UTC
              Message:
Task Name
                                   Start
Time
                              End Time
Status
___________
Setting up SSH equivalence
                                 November 29, 2023 4:42:07 PM
UTC November 29, 2023 4:42:07 PM UTC Success
Modify JavaExec Path
                                  November 29, 2023 4:42:08 PM
UTC November 29, 2023 4:42:08 PM UTC Success
Install ASR
                                   November 29, 2023 4:42:08 PM
        November 29, 2023 4:44:53 PM UTC Success
Registering ASR Manager
                      November 29, 2023 4:45:01 PM
          November 29, 2023 4:45:09 PM UTC Success
                                  November 29, 2023 4:45:09 PM
Configure ILOM
          November 29, 2023 4:45:13 PM UTC Success
Creating ASR configuration folders November 29, 2023 4:45:13 PM
          November 29, 2023 4:45:13 PM UTC Success
Setup ASR XML templates
                                 November 29, 2023 4:45:13 PM
```

```
November 29, 2023 4:45:13 PM UTC
UTC
                                            Success
Enable HTTPS for ASR
                    November 29, 2023 4:45:13 PM
UTC November 29, 2023 4:45:36 PM UTC Success
Importing ASR certificate into DCS November 29, 2023 4:45:36 PM
   November 29, 2023 4:45:38 PM UTC
UTC
                                      Success
truststore
                                 November 29, 2023 4:45:38 PM
Registering Asset: ODA Host
         November 29, 2023 4:45:38 PM UTC Success
                             November 29, 2023 4:45:39 PM
ASR assets activation
        November 29, 2023 4:45:40 PM UTC Success
Remove AsrConfBackup File
                                 November 29, 2023 4:45:41 PM
         November 29, 2023 4:45:41 PM UTC Success
```

After configuring Oracle ASR, check the the asset status for both the host and the Oracle ILOM asset as follows:

#### Configuirng Internal ASR Using the BUI

1. Open a browser and enter the following URL to access BUI:

```
https://ip-address:7093/mgmt/index.html
```

- 2. Login as oda-admin.
- Click the Appliance tab.
- Click the Oracle ASR menu.
- If Oracle ASR is already configured, then in the Configure ASR page, provide the Oracle ASR configuration values.
- **6.** Select **Internal** in the **ASR Type** field.
- 7. In the **ASR User Name** field, enter e-mail address associated with the My Oracle Support account under which the server is registered.
- 8. In the **ASR Password** field, enter the password associated with the My Oracle Support account under which the server is registered.
- (Optional) Specify the HTTPS port for the Oracle ASR Manager. The default HTTPS port is 16162.
- 10. (Optional) If you are using an HTTP Proxy for upload to Oracle ASR, complete the following:
  - a. HTTP Proxy used for Upload to ASR: Select Yes.

- b. Proxy User Name: If you are using a proxy for upload, enter the proxy user name.
- c. **Proxy Port**: If you are using a proxy for upload, enter the proxy port.
- d. (Optional) HTTP Proxy Requires Authentication: If you are using a proxy for upload, select Yes if you require authentication. If you do not require authentication, select No.
- e. (Optional) Proxy Password: If you are using a proxy for upload and require authentication, enter the proxy password.
- 11. Click Create.

# Registering with External Oracle ASR Manager

Use ODACLI commands or the Browser User Interface to register Oracle Database Appliance with an external Oracle Auto Service Request (Oracle ASR) Manager.

You can register with an external Oracle ASR Manager at any time.

Before configuring, verify that the Oracle Database Appliance hardware is associated with a Support Identifier (SI) in My Oracle Support.

Before configuring external Oracle ASR on an appliance, ensure that Oracle ASR Manager is configured on another appliance.

#### **Configuring External ASR Using ODACLI Commands**

Run these steps on the appliance where Oracle ASR Manager is configured:

Export the internal Oracle ASR Manager configuration files into a zip file:

```
[root@node1 bin]# odacli export-asrconfig
Job details
                   ID: 9c9e74d4-d3d8-4f77-9394-42c8eb7bfe1e
           Description: Export ASR Config
               Status: Success
               Created: November 30, 2023 7:02:51 AM UTC
              Message: Run update repository with the zip /opt/
oracle/asr/asrConfiguration/ASRConfiguration.zip in the External ASR host
once the current job is successful
Task Name
                                     Start Time
End Time
                              Status
_____
Creating a zip of ASR config files November 30, 2023 7:02:52 AM UTC
November 30, 2023 7:02:52 AM UTC Success
```

Copy the zip file from the Oracle ASR Manager appliance to the system where the external Oracle ASR Manager must be configured. The zip file path is displayed in the job description in step 1.

```
$ scp zipFilePath user@system name/IP:destination path for the zip
```

After copying the Oracle ASR Manager configuration zip file to the external Oracle ASR appliance, run the following steps on the external Oracle ASR appliance:

# 1. Run the odacli update-repository command to extract the zip file on the external Oracle ASR Manager system.

```
[root@node1 bin]# odacli update-repository -f zip file path
   Job details
                     ID: c659b6ee-9f02-4cb4-aba4-4ed8de883e3a
             Description: Repository Update
                  Status: Success
                 Created: November 30, 2023 3:44:28 PM CST
                 Message: /opt/oracle/dcs/bin/ASRConfiguration.zip
  Task Name Start Time End Time Status
   _____
   _____
  Unzip bundle November 30, 2023 3:44:28 PM CST November 30, 2023 3:44:28 PM
  CST Success
Configure Oracle ASR Manager as External.
   [root@node1 bin]# odacli configure-asr -e External
  Enter ASR user's password:
  Retype ASR user's password:
   [root@node1 bin]# odacli describe-job -i cdd8445f-
  aefb-4f43-881a-145eaa1a1181
  root@scaoda6f001 ~]# odacli describe-job -i 1099eac8-2879-4341-b391-
  d56237696395
   Job details
                     ID: 1099eac8-2879-4341-b391-d56237696395
             Description: Configure ASR
                  Status: Success
                 Created: November 30, 2023 3:46:50 PM CST
                 Message:
  Task Name
                                        Start Time
  End Time
                                Status
   ______
  Setting up SSH equivalence
                                      November 30, 2023 3:46:52 PM CST
  November 30, 2023 3:46:54 PM CST Success
                                   November 30, 2023 3:46:54 PM CST
  Creating ASR configuration folders
  November 30, 2023 3:46:54 PM CST Success
                                       November 30, 2023 3:46:54 PM CST
  Setup ASR XML templates
  November 30, 2023 3:46:54 PM CST Success
   Importing ASR certificate into DCS
                                      November 30, 2023 3:46:54 PM CST
  November 30, 2023 3:46:56 PM CST Success
   truststore
  Registering Asset: ODA Host
                                        November 30, 2023 3:46:56 PM CST
  November 30, 2023 3:46:57 PM CST Success
```

ASR assets activation

November 30, 2023 3:46:57 PM CST

3. To verify the successful activation of the assets with the external Oracle ASR Manager, run the command to list assets in the Oracle ASR Manager host as follows:

```
[root@node1 bin]# /opt/asrmanager/bin/asr list asset
IP ADDRESS HOST NAME SERIAL NUMBER PARENT SERIAL ASR ASR STATUS
PROTOCOL SOURCE LAST HEARTBEAT PRODUCT NAME
______ _____
IP address 1 odal 1642NM10D1
                                    Y Active
HTTP ESSW XML NA ORACLE SERVER X7-2
IP address 2 oda2 1921XLAOAN
                                    Y Active
HTTP ILOM XML NA ORACLE SERVER X8-2L
IP address 3 oda3 1921XLAOAN Y Active
HTTP ESSW XML NA ORACLE SERVER X8-2L x86/x64 System
IP_address_4 oda4 1921XLAOAW Y Active
HTTP ILOM XML NA ORACLE SERVER X8-2L
IP address 5 oda5 1921XLAOAW Y Active
HTTP ESSW XML NA ORACLE SERVER X8-2L x86/x64 System
```

Use My Oracle Support to view the activation status. To view the latest available asset status in Oracle ASR Manager, run the send asset status command.

#### **Configuring External Oracle ASR Using the BUI**

Ensure that the zip file of Oracle ASR configured externally is imported to the repository using the odacli update-repository command, and then run the following steps:

Open a browser and enter the following URL to access BUI:

```
https://ip-address:7093/mgmt/index.html
```

- Login as oda-admin.
- 3. Click the **Appliance** tab.
- 4. Click the Oracle ASR menu.
- 5. Select **External** from the ASR Type menu.
- 6. Click Create.

# Configuring External Oracle ASR When Oracle ASR Manager Does Not Run on an Oracle Database Appliance

Understand how you can configure Oracle Database Appliance with an external Oracle Auto Service Request (Oracle ASR) Manager.

#### Prerequisites:

1. Ensure that the ASR manager is installed with version 23.2.0 or above. Run the /opt/asrmanager/bin/asr show version command to view the Oracle ASR version:

```
/opt/asrmanager/bin/asr show_version
```



```
ASR Manager version: 23.2.0
Rules definitions version: 23.2.0.0
Auto Update Statistics
Last Run Time: 2024-02-08 12:19:27.777
Last Run Status: Oracle Automated Service Manager not yet registered.
Next Run Time: 2024-02-09 12:19:27.777
Skipping ASR connectivity tests as ASR Auto Update isn't enabled
Auto Update Status
Auto Update functionality is disabled.
Please refer to the My Oracle Support Doc Id: 1503107.1 for instructions
on Auto Update of ASR Manager software.
ASR Manager Services
_____
ASR Notification Trap is enabled.
Remote Request feature is enabled.
```

2. Ensure that Oracle ASR is enabled to run with HTTPS by running the following commands:

```
/opt/asrmanager/bin/asr https_config
/opt/asrmanager/bin/asr https enable
```

Ensure that the required setting is present by running the <code>/opt/asrmanager/bin/asr</code> show http receiver command as follows:

```
/opt/asrmanager/bin/asr show_http_receiver
HTTP Receiver configuration:

HTTP Receiver Status: Enabled
Host Name: xx.xxx.x.xxx
SFB forward: true
HTTP Port: 16161
HTTPS/SSL Port: 16162
HTTPS/SSL: Enabled
Jetty HTTP Compliance: Medium - RFC2616
Enable Jetty Older Ciphers: true
```

The output of the command must display HTTPS/SSL as Enabled.

Note that when you run the <code>/opt/asrmanager/bin/asr</code> <code>https\_config</code> command, and the "What is your first and last name?" question is prompted for the certificate, you must enter the ASR manager IP address and keep the rest of the answers default.

#### **Configuring External ASR Using ODACLI Commands**

Run these steps on the appliance where Oracle ASR Manager is configured:

Create a directory called asr under /tmp.

```
mkdir /tmp/asr
```

2. Go to the directory created in step 1.

```
cd /tmp/asr
```

3. Generate the public key with the name asrHTTPSCertificate.crt under the directory created in step 1 for Oracle ASR Manager, using its keystore present at /var/opt/asrmanager/configuration/asrmKeyStore.jks. The following command creates a certificate /tmp/asr/asrHTTPSCertificate.crt for the keystore:

```
jdkbinpath/keytool -exportcert -alias alias set for the keystore -
keystore /var/opt/asrmanager/configuration/asrmKeyStore.jks -file /tmp/asr/
asrHTTPSCertificate.crt -rfc
Enter keystore password: Enter the certificate password provided in "asr
https config" command
```

- 4. Create a new JSON file with the name asrdetails.json with the following details under /tmp/asr and set the values for the following:
  - asrManagerIp: The IP address of the host where Oracle ASR Manager runs.
  - userName: The email ID with which Oracle ASR Manager is registered.
  - httpsPortNumber: The HTTPS port number set for Oracle ASR Manager in the asr https\_config command.
  - httpsCertAlias: The certificate ALIAS set when prompted by the asr https\_config command.

**Example of** /tmp/asr/asrdetails.json:

```
"asrManagerIp" : "xx.xxx.x.xxx",
"userName" : "test",
"httpsPortNumber" : 16162,
"httpsCertAlias" : "oda-asr-client2024-01-31t10:15:52"
```

5. Generate a zip file with the files created in step 3 and step 4 asrHTTPSCertificate.crt and asrdetails.json from the asr directory present under /tmp directory.

```
cd /tmp
zip ASRConfiguration.zip asr/asrHTTPSCertificate.crt asr/asrdetails.json
```

6. Copy the zip file created in step 5 to the Oracle Database Appliance machine whose assets must be registered with the external Oracle ASR.

```
$ scp /tmp/ASRConfiguration.zip user@machine name/IP:destination path for the zip
```

After copying the external Oracle ASR Manager configuration zip file to Oracle Database Appliance, run the following steps on the Oracle Database Appliance:

1. Run the odacli update-repository command to unzip the zip file created on the external Oracle ASR machine and copied to the appliance.

```
$odacli update-repository -f <zip file path>
odacli describe-job -i c659b6ee-9f02-4cb4-aba4-4ed8de883e3a
Job details
                  ID: c659b6ee-9f02-4cb4-aba4-4ed8de883e3a
          Description: Repository Update
               Status: Success
              Created: November 30, 2023 3:44:28 PM CST
              Message: /opt/oracle/dcs/bin/ASRConfiguration.zip
Task Name
                                    Start
Time
                               End
Time
_____
                                   November 30, 2023 3:44:28 PM
Unzip bundle
CST November 30, 2023 3:44:28 PM CST Success
```

Configure Oracle ASR Manager as External.

```
$odacli configure-asr -e External
Enter ASR user's password: <SSO password>
Retype ASR user's password:
odacli describe-job -i 1099eac8-2879-4341-b391-d56237696395
Job details
                  ID: 1099eac8-2879-4341-b391-d56237696395
          Description: Configure ASR
               Status: Success
              Created: November 30, 2023 3:46:50 PM CST
              Message:
Task Name
                                    Start
Time
                               End
Time
Setting up SSH equivalence
                                   November 30, 2023 3:46:52 PM
     November 30, 2023 3:46:54 PM CST Success
Creating ASR configuration folders November 30, 2023 3:46:54 PM
          November 30, 2023 3:46:54 PM CST Success
                      November 30, 2023 3:46:54 PM
Setup ASR XML templates
          November 30, 2023 3:46:54 PM CST Success
Importing ASR certificate into DCS November 30, 2023 3:46:54 PM
     November 30, 2023 3:46:56 PM CST Success
CST
truststore
```

```
      Registering Asset: ODA Host
      November 30, 2023 3:46:56 PM

      CST
      November 30, 2023 3:46:57 PM
      CST
      Success

      ASR assets activation
      November 30, 2023 3:46:57 PM
      Success

      CST
      November 30, 2023 3:46:58 PM
      CST
      Success

      Configure ILOM
      November 30, 2023 3:46:58 PM
      CST
      Success

      November 30, 2023 3:47:07 PM
      CST
      Success
```

#### Configuring External ASR Using Browser User Interface (BUI)

After copying the external Oracle ASR Manager configuration zip file to Oracle Database Appliance, follow these steps:

1. Open a browser and enter the following URL to access BUI:

```
https://ip-address:7093/mgmt/index.html
```

- 2. Login as oda-admin.
- Click the Appliance tab.
- 4. Click the Oracle ASR menu, and then click Export on the ASR Information page. Note: You must run the export operation from the Oracle Database Appliance on which internal Oracle ASR Manager is configured.
- 5. After the job completes successfully, a zip file is generated in the location /opt/oracle/asr/asrConfiguration.
- **6.** Manually copy the zip file from the appliance with the internal Oracle ASR Manager to the system where the external Oracle ASR Manager must be configured.
- 7. In the Configure ASR page, select ASR Type as External.
- 8. Specify the **Zip File Location** copied in step 6.
- 9. Click Update Repository.
- **10.** After the repository is updated with the zip file, click **Next**.
- 11. Specify and confirm the ASR Password.
- 12. Click Configure ASR.
- **13.** After the job completes sccessfully, verify the Oracle ASR configuration on the ASR Information page.

# **Testing Oracle ASR**

Use the odacli test-asr command to confirm that your Oracle ASR configuration is working.

When you run the command, a test alert is sent to Oracle ASR manager from both Oracle ILOM and the host registered with Oracle ASR. The registered email ID receives an email about the test alert for the registered Oracle ILOM and host.

Attempting to test the configuration outside of the <code>odacli test-asr</code> command might not provide the expected test result.

1. Log in as root user.



Run the odacli test-asr command.

# Managing an Oracle ASR Configuration

Use the command-line to review an existing configuration, make changes to a configuration, or delete a configuration.

You can view and edit the configuration details, but you cannot change the Oracle ASR type. For example, from internal to external. To change the Oracle ASR type, delete the existing configuration and then re-configure Oracle ASR.

All log files for Oracle ASR are located in the /var/opt/asrmanager/log/ directory.

 To display Oracle Auto Service Request (Oracle ASR) configuration details, use the odacli describe-asr command.

```
# odacli describe-asr

ASR details

ID: e0e31043-c312-4371-8301-e62642ef8a4a
Name: ASR
ASR Type: Internal
ASR Manager IP: 10.32.202.13

ASR Manager username: scott.tiger@example.com
HTTPS port number: 16164
State: CONFIGURED
Created: September 3, 2023 4:02:38 AM UTC
Updated: September 3, 2023 4:03:32 AM UTC
```

- (Optional) To make changes to Oracle ASR configuration details after deploying the appliance, use the odacli modify-asr command.
- 3. (Optional) To remove the Oracle ASR configuration from the system, use the odacli delete-asrcommand.

```
# odacli delete-asr
{
```

```
"jobId" : "5d70bd17-ec4a-48da-8196-1364105db99d",
"status" : "Running",
"message" : null,
"reports" : [],
"createTimestamp" : 1469409622451,
"description" : "Delete ASR",
"updatedTime" : 1469409622458
}
```

#### **Related Topics**

odacli Oracle Auto Service Request Commands
Use the Oracle Auto Service Request (Oracle ASR) commands to configure, update, test, and delete Oracle ASR on the system.

### Additional Resources for Oracle ASR

Refer to these sections for more information about Oracle ASR.

Oracle ASR product page:

http://www.oracle.com/asr

- Oracle Database Appliance products qualified for Oracle ASR:
  - Oracle ASR Qualified Oracle Database Appliance Products
  - IMPORTANT: Oracle ASR Qualifed Product and Fault Rule Coverage Supplement (Doc ID 2142295.1)
- Oracle ASR user documentation:

http://docs.oracle.com/cd/E37710\_01/index.htm

# Troubleshooting Oracle Database Appliance

Understand tools you can use to validate changes and troubleshoot Oracle Database Appliance problems.

- About Oracle Database Appliance Configuration Collection Utility
   Oracle Database Appliance configuration collection collects configuration information for all components in the appliance.
- About Setting Up and Removing SSH Configuration
   Understand how you can set up and remove SSH configuration.
- Viewing Oracle Database Appliance Error Correlation Reports
   Understand how to view Error Correlation Report and how to interpret the report to troubleshoot your appliance.
- Viewing Details About DCS Error Messages
   Understand how to view details about DCS errors for troubleshooting them.
- Collecting Diagnostics Data Using the BUI Understand how to collect diagnostics data to troubleshoot errors.
- Resolving Errors When Updating DCS Components During Patching
   Understand how to troubleshoot errors when updating DCS components during patching.
- Viewing Component Information on the Appliance
   View details of all the components installed on the appliance, and the RPM drift information.
- Errors When Logging into the Browser User Interface
   If you have problems logging into the Browser User Interface, then it may be due to your browser or credentials.
- Errors when re-imaging Oracle Database Appliance
   Understand how to troubleshoot errors that occur when re-imaging Oracle Database Appliance.
- Using Oracle Autonomous Health Framework for Running Diagnostics
   Oracle Autonomous Health Framework collects and analyzes diagnostic data collected, and proactively identifies issues before they affect the health of your system.
- Running the Disk Diagnostic Tool
   Use the Disk Diagnostic Tool to help identify the cause of disk problems.
- Running the Oracle Database Appliance Hardware Monitoring Tool
   The Oracle Database Appliance Hardware Monitoring Tool displays the status of different hardware components in Oracle Database Appliance server.
- Disabling the Browser User Interface
   You can also disable the Browser User Interface. Disabling the Browser User Interface
   means you can only manage your appliance through the command-line interface.
- Preparing Log Files for Oracle Support Services
   If you have a system fault that requires help from Oracle Support Services, then you may need to provide log records to help Oracle support diagnose your issue.

# About Oracle Database Appliance Configuration Collection Utility

Oracle Database Appliance configuration collection collects configuration information for all components in the appliance.

The utility generates a configuration collection with a specific timestamp that can be utilized by other utilities. The collection contains configuration details for all Oracle Database Appliance components in the form of JSON files and a unified HTML configuration report. Creating a snapshot of the appliance configuration assists in debugging issues on the appliance and provides a comprehensive record of all object versions and configuration details at a specific date and time. Additionally, it serves as a valuable reference for tracking configuration changes over time.

The configuration collection tool obtains and stores details about the following components:

- DCS framework such as DCS controller, DCS agent, DCS admin, etc CPU pools, Oracle Grid Infrastructure, Oracle Database, operating system, Oracle ILOM, BIOS, Oracle ASR, the firmware, Oracle HMP, and so on.
- Operating system, storage, Oracle Clusterware, Oracle KVM, and others.

The utility, by default, collects DB system list and describe information available on the bare metal system. To collect detailed information from DB systems, use the <code>-dbsystems</code> option. You must set passwordless SSH connection from the bare metal system to the DB system. The utility does not store any credentials or perform authentication of the connection. You can restore connectivity to the previous state after configuration is collected.

Use the odaconfigcli collectconfig [-loc] [-dbsystems] [-redact] [-silent] command to run the configuration collection.

```
# odaconfigcli collectconfig
Oracle Database Appliance system config collection:
-- Performing validations:
-- Collecting configuration from the system test1
The config collection is being created at:
/opt/oracle/odaconfig/cnr data/odaconfig test1 23 01 2025 19 38 47
1. Collecting system info
Collecting system details [e.g. version, hardwaretype, etc] ....
Collecting storage details ....
Collecting RPM drift info ....
Collecting network info ....
2. Collecting Baremetal database info
Collecting system info ....
Collecting component info ....
Collecting dbstorage info ....
Collecting database info ....
Collecting dbhome info ....
Collecting backupconfig info ....
Collecting cpupool info ....
Collecting network info ....
Collecting objectstoreswift info ....
```



Collecting backupreport info ....

- 3. Processing Odaconfig report. Please note \*\* it will take few minutes \*\* to collect all the command outputs
  Collecting ODA stack information
  Collecting fixed commands information
  Generating html ODAConfig report
- 4. Setting file protection to the files on config collection.
- 5. Not redacting the collection

```
Finished config collection and creating jsons. Following is the collection summary:

Config collect bundle created at: /opt/oracle/odaconfig/cnr_data/
odaconfig_testoda803cln1_23_01_2025_19_38_47

HTML ODAConfig report can be found at: /opt/oracle/odaconfig/cnr_data/
odaconfig_testoda803cln1_23_01_2025_19_38_47/
odaconfig_testoda803cln1_23_01_2025_19_38_47.html

Logs for this run can be found at: /opt/oracle/odaconfig/cnr_data/
odaconfig_testoda803cln1_23_01_2025_19_38_47/logs
```

When you run the utility from the bare metal system, the output includes the list of DB systems and their configurations, as this information is available in the bare metal DCS metadata. The collected configuration data is provided in the form of JSON files and a unified HTML report. The CLI offers a redaction option for configuration collection, with two modes: sanitize and mask. In the sanitize mode, sensitive entities such as host name and database name are replaced with alternative strings, while in the mask mode, they are replaced with \*.

#### Prerequisites to run the utility

- You must run the utility from the bare metal system as the root user.
- You can also run the utility on multi-user access enabled systems and multi-user access enabled passwordless systems. Since the utility uses odacli-view, no password prompts are required in these environments. If you want to redact the output in a multi-user access enabled environment, ensure that passwordless login for odacli from the odaadmin user is enabled, eliminating the need for password input.
- The oakd service must be running, as the utility uses odaadmcli to gather hardware information.
- The system must be provisioned, as there is typically minimal DCS configuration to collect on a new system.

#### Command and parameters

odaconfigcli collectconfig [-loc] [-dbsystems] [-redact] [-silent]

Parameter	Description
-loc	(Optional) Customizes results location. The default is /opt/oracle/odaconfig/cnr_data.



Parameter	Description
-dbsystems	(Optional) Specifies the list of DB systems. Specify the DB system name as displayed in the odacli list-dbsystems command output. Do not specify the DB system host name or IP address.
-redact	(Optional) Redacts sensitive entities in configuration collection. Permitted values are sanitize and mask.
	sanitize: Sensitive entities are replaced with a substitution string
	mask: Sensitive entities are replaced with '*'
-silent	(Optional) Suppresses all confirmations.

You can specify custom commands for the tool in a JSON file. For example:

```
# /opt/oracle/odaconfig/customize/commands output.json:
     "name" : "DCS Extra",
      "commands":
                "command": "rpm -qa | grep -e dcs -e oda-hw-mgmt -e hami -e
mysql",
                 "filename": "dcsextra rpmqadcs.out"
                "command": "/opt/oracle/dcs/bin/odacli list-featuretracking",
                 "filename": "dcsextra listfeaturetracking.out"
              },
                "command": "/opt/oracle/dcs/bin/odacli list-dataguardstatus",
                 "filename": "dcsextra listdataguardstatus.out"
                "command": "/opt/oracle/dcs/bin/odacli list-schedules",
                 "filename": "dcsextra listschedules.out"
. . . . . . . . . . . .
    "os":
      "name" : "Operating System",
      "commands":
            [
                 "command": "lscpu",
                 "filename": "os_lscpu.out"
               },
```



```
"command": "free",
  "filename": "os_free.out"
},
{
  "command": "top -bn1 | head -n 50",
  "filename": "os_top50.out"
},
```

#### **Related Topics**

odaconfigcli collectconfig
 Use the odaconfigcli collectconfig command to collect configuration data from the appliance.

# About Setting Up and Removing SSH Configuration

Understand how you can set up and remove SSH configuration.

In earlier Oracle Database Appliance releases, the DCS agent used a scheduled SSH cleaner job that ran every 30 minutes, to clean up SSH connections configured in the system. Starting with Oracle Database Appliance release 19.24, the DCS agent does not remove SSH configurations.

The DCS agent has a new <code>agentconfig</code> parameter called <code>ODA\_MANAGED\_SSH</code> that you can use to deactivate the <code>Setup\_SSH</code> job on Oracle Database Appliance. You must set up SSH before you run any job that requires SSH configuration between nodes. If you run a job that requires SSH configuration, then the job uses the pre-configured SSH setup. If the SSH keys are present, but not functioning, or SSH configuration does not exist, then the job displays an error. You must set up a working SSH equivalence between nodes before you rerun the job.

The DCS agent does not configure SSH between nodes when the <code>ODA\_MANAGED\_SSH</code> parameter is set to <code>false</code>. For example:

```
odacli modify-agentconfig-parameters -n ODA MANAGED SSH -u -v false
```

You can view the current value of the <code>ODA\_MANAGED\_SSH</code> parameter using the <code>odacli list-agentconfig-parameters</code> command. For example:

```
odacli list-agentconfig-parameters -n ODA MANAGED SSH
```

# Viewing Oracle Database Appliance Error Correlation Reports

Understand how to view Error Correlation Report and how to interpret the report to troubleshoot your appliance.

#### **About Error Correlation Reports**

If a DCS job fails, an Error Correlation job is created automatically to generate an Error Correlation report. You can access and review the generated Error Correlation report from the BUI to explore possible ways of error resolution.

The Error Correlation Report contains the following:

Log Messages: Errors, exceptions and warnings from various log files.

- Failed Task Messages: Error message displayed when the DCS job failed.
- Release Notes: Relevant Known Issues from *Oracle Database Appliance Release Notes* to help resolve the issue.
- **Documentation:** Relevant topics from the Oracle Database Appliance Documentation Library to help resolve the error.

The Error Correlation Report is generated for every failed DCS job and can be accessed from the BUI. On Oracle Database Appliance high-availability deployments, the Error Correlation report contains the error information derived from log files of both the nodes.

#### Viewing Error Correlation Reports using ODACLI Commands

You can view the Error Correlation report of a failed DCS job by running the odacli describe-job -i failed\_dcs\_job\_id --ecr command. For an example output, see the topic odacli describe-job in this guide.

#### **Viewing Error Correlation Reports from the BUI**

To view the Error Correlation Report from the Activities page in the BUI:

Log into the Browser User Interface:

https://host-ip-address:7093/mgmt/index.html

- Click the Activity tab.
- 3. In the Activities page, click the Failure or InternalError link in the failed DCS job for which you want to view the Error Correlation report. Note that only failed DCS jobs have associated Error Correlation Reports.
- You can also view the Error Correlation Report for the failed DCS job when you click the Actions menu, and select View Error Correlation Report.
- 5. The Error Correlation Report contains the following tabs:
  - Log Messages: Displays the logs for DCS agent, DCS admin, Oracle HAMI, MySQL, and Oracle FPP. You can expand each section to view the details. Only components that have logs are displayed. If no errors are found, then the message No errors or exceptions found in logs is displayed in the Log Messages section.
  - Failed Task Messages: Displays the specific error message displayed when the task failed.
  - Release Notes: Displays relevant Known Issues from *Oracle Database Appliance Release Notes* to help resolve the issue. You can click each of these links to view the Release Notes entry. If no relevant Known issues are found, then the message No matching results were found. is displayed.
  - **Documentation:** Displays relevant topics from the Oracle Database Appliance Documentation Library to help resolve the error. You can click each of these links to view the documentation topic from the Oracle Database Appliance documentation.

To view the Error Correlation Report from the Diagnostics page in the BUI:

- In the BUI, click the Diagnostics tab.
- 2. In the Diagnostics page, click **Collect Diagnostic Data** for a failed job.
- The Collect Diagnostics page displays the Error Correlation Report and Job Details in separate tabs for the failed DCS job. Click the Report File Name link to download the Error Correlation Report to your local system.



4. The Job details tab displays the steps in the job and the Error Correlation Report contains the Log Messages, Failed Task Messages, Release Notes, and Documentation tabs.

#### **Related Topics**

odacli describe-job
 Use the odacli describe-job command to display details about a specific job, including the job ID, status, tasks, and the job created date and time stamp.

# Viewing Details About DCS Error Messages

Understand how to view details about DCS errors for troubleshooting them.

#### **About Viewing Information About DCS Errors**

To view more details about any errors during DCS operations, use the command dcserr error code.

```
# /opt/oracle/dcs/bin/dcserr
dcserr error_code

# dcserr 10001
10001, Internal_Error, "Internal error encountered: {0}."
// *Cause: An internal error occurred.
// *Action: Contact Oracle Support Services for assistance.
/
# dcserr 1001
Unknown error code
```

To view more details about DCS errors in the Browser User Interface (BUI), you can provide the DCS error code in the Search box in the BUI. The Search results display the Cause and Action of DCS error codes.

# Collecting Diagnostics Data Using the BUI

Understand how to collect diagnostics data to troubleshoot errors.

#### **About Collecting Diagnostics Data**

Use the **Diagnostics** tab in the Browser User Interface to view diagnostic information about your deployment and the installed components.

In the Diagnostic Collection page, you can view the available diagnostics collections. Click **Collect Diagnostic Data** to start diagnostics collection. Once the data is collected, click on the collection file path to download the file.

In the Collect Diagnostics page, specify the Job ID for the diagnostics data collection. Optionally, specify a tag and a description for the collection. The details of the Job ID are displayed. Click **Collect** to start the diagnostics data collection.

You can also collect diagnostics from the Activity page, by selecting **Collect Diagnostics** from the **Actions** drop down for a specific job. Click **Collect** to start the diagnostics data collection.

To delete a diagnostic collection, from the Diagnostic Collection page, select the specific collection, and click **Delete**.

This diagnostic collection feature does not replace the <code>odaadmcli</code> manage <code>diagcollect</code> command. You can use the <code>odaadmcli</code> manage <code>diagcollect</code> command also to enable diagnostics collections, independently of this new feature from the BUI. The <code>odaadmcli</code> manage <code>diagcollect</code> command and the diagnostics collection from BUI use the <code>tfactl</code> command internally. The diagnostics collection from BUI is aimed to collect other data from DCS metadata that is not collected through <code>tfactl</code> and provide greater context for root cause analysis of related DCS jobs failures.

# Resolving Errors When Updating DCS Components During Patching

Understand how to troubleshoot errors when updating DCS components during patching.

.

#### **About DCS Components**

When you run the <code>odacli update-dcscomponents</code> command during patching, pre-checks for MySQL installation are automatically verified before update of Oracle HAMI, MySQL, and DCS components. If any of the pre-checks fail, then the command errors out with a reference to the pre-check report log file location <code>/opt/oracle/dcs/log/jobfiles/jobId/dcscomponentsPreCheckReport.log</code>. Review the pre-check report and take corrective actions and then rerun the <code>odacli update-dcscomponents</code> command. If there are no pre-check errors, then the patching process proceeds with updating Oracle HAMI, MySQL, and DCS components such as the DCS Agent, DCS CLI, and DCS Controller.



Run the odacli update-dcsadmin command prior to running the odacli update-dcscomponents command.

#### When the odacli update-dcscomponents command completes successfully:

The command output is as follows:

```
# ./odacli update-dcscomponents -v 19.27.0.0.0
{
   "jobId" : "3ac3667a-fa22-40b6-a832-504a56aa3fdc",
   "status" : "Success",
   "message" : "Update-dcscomponents is successful on all the node(s):DCS-Agent shutdown is successful. MySQL upgrade is done before. Metadata migration is successful. Agent rpm upgrade is successful. DCS-CLI rpm upgrade is successful.
DCS-Controller rpm upgrade is succ",
   "reports" : null,
   "createTimestamp" : "March 8, 2025 02:37:37 AM CST",
   "description" : "Update-dcscomponents job completed and is not part of Agent job list",
   "updatedTime" : "March 8, 2025 02:39:10 AM CST"
}
```

The pre-check report log file at the location /opt/oracle/dcs/log/jobfiles/jobId/dcscomponentsPreCheckReport.log contains the following:

```
Pre-check Name: Space check
Status: Success
Comments: Required space 3 GB is available in /opt
Pre-check Name: Port check
Status: Success
Comments: Port 3306 is available for running ODA MySQL
Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Success
Comments: ODA MySQL rpm dry-run passed
Pre-check Name: Check for the existence of MySQL connector/J library
Status: Success
Comments: ODA MySQL connector/J library found
Pre-check Name: Check for the existence of Metadata migration utility
Status: Success
Comments: Metadata migration utility found
dcs-admin version:
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.27.0.0.0
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
Validate scheduler cron expressions:
Pre-check Name: Validate scheduler cron expressions
Status: Success
Comments: Scheduler cron expressions for existing job schedules are up to date
```

#### When the odacli update-dcscomponents command fails:

On Oracle Database Appliance single-node systems, the command output is as follows:

```
# ./odacli update-dcscomponents -v 19.27.0.0.0

DCS-10008:Failed to update DCScomponents: 19.26.0.0.0
Internal error while patching the DCS components:
DCS-10231:Cannot proceed. Pre-checks for update-dcscomponents failed. Refer to
```

/opt/oracle/dcs/log/jobfiles/jobId/dcscomponentsPreCheckReport.log on node 0 for details.

# ./odacli update-dcscomponents -v 19.27.0.0.0

## On Oracle Database Appliance high-availability systems, the command output is as follows:

Internal error while patching the DCS components:

DCS-10231:Cannot proceed. Pre-checks for update-dcscomponents failed. Refer to /opt/oracle/dcs/log/jobfiles/jobId/dcscomponentsPreCheckReport.log on node 0 and /opt/oracle/dcs/log/jobfiles/jobId/dcscomponentsPreCheckReport.log on node 1 for details.

The command runs all pre-checks one by one, and errors out at the end if any of the pre-checks is marked as Failed. When a pre-check fails, the error message is displayed on to the console along with the reference to pre-check report log location. The pre-check report log file is at the location /opt/oracle/dcs/log/jobfiles/jobId/dcscomponentsPreCheckReport.log.

```
Pre-check Name: Space check
Status: Failed
Comments: Available space in /opt is 2 GB but minimum required space in /opt
is 3 GB
Pre-check Name: Port check
Status: Success
Comments: Port 3306 is available for running ODA MySQL
Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Success
Comments: ODA MySQL rpm dry-run passed
Pre-check Name: Check for the existence of MySQL connector/J library
Status: Success
Comments: ODA MySQL connector/J library found
Pre-check Name: Check for the existence of Metadata migration utility
Status: Success
Comments: Metadata migration utility found
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.20.0.0.0
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
```

Validate scheduler cron expressions:

Pre-check Name: Validate scheduler cron expressions

Status: Success

Comments: Scheduler cron expressions for existing job schedules are up to date

## When the odacli update-dcscomponents command fails due to space check error:

#### The pre-check report log contains the following:

Pre-check Name: Space check Status: Failed Comments: Available space in /opt is 2 GB but minimum required space in /opt Pre-check Name: Port check Status: Success Comments: Port 3306 is available for running ODA MySQL Pre-check Name: ODA MySQL rpm installation dry-run check Status: Success Comments: ODA MySQL rpm dry-run passed Pre-check Name: Check for the existence of MySQL connector/J library Status: Success Comments: ODA MySQL connector/J library found Pre-check Name: Check for the existence of Metadata migration utility Status: Success Comments: Metadata migration utility found Pre-check Name: dcs-admin version validation Status: Success Comments: dcs-admin is already updated :19.20.0.0.0 Config File Exist dcscontroller: Pre-check Name: Check DCS config files exists for dcscontroller Status: Success Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/ conf/dcs-controller-logback.xml exist Config File Exist dcsagent: Pre-check Name: Check DCS config files exists for dcsagent Status: Success Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/ dcs-agent-logback.xml exist Validate scheduler cron expressions: Pre-check Name: Validate scheduler cron expressions Status: Success Comments: Scheduler cron expressions for existing job schedules are up to date

### When the odacli update-dcscomponents command fails due to port check error:

#### The pre-check report log contains the following:

```
Pre-check Name: Space check
Status: Success
Comments: Required space 3 GB is available in /opt
Pre-check Name: Port check
Status: Failed
Comments: No port found in the range ( 3306 to 65535 )
Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Success
Comments: ODA MySQL rpm dry-run passed
Pre-check Name: Check for the existence of MySQL connector/J library
Status: Success
Comments: ODA MySQL connector/J library found
Pre-check Name: Check for the existence of Metadata migration utility
Status: Success
Comments: Metadata migration utility found
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.20.0.0.0
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
Validate scheduler cron expressions:
Pre-check Name: Validate scheduler cron expressions
Status: Success
Comments: Scheduler cron expressions for existing job schedules are up to date
```

## When the odacli update-dcscomponents command fails due to MySQL RPM installation dry-run check error:

#### The pre-check report log contains the following:

```
Pre-check Name: Space check
Status: Success
Comments: Required space 3 GB is available in /opt
Pre-check Name: Port check
```



```
Status: Success
Comments: Port 3306 is available for running ODA MySQL
Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Failed
Comments: ODA MySQL rpm dry-run failed. Failed due to the following error :
Exception details are displayed below
Pre-check Name: Check for the existence of MySQL connector/J library
Status: Success
Comments: ODA MySQL connector/J library found
Pre-check Name: Check for the existence of Metadata migration utility
Status: Success
Comments: Metadata migration utility found
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.20.0.0.0
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
Validate scheduler cron expressions:
Pre-check Name: Validate scheduler cron expressions
Status: Success
Comments: Scheduler cron expressions for existing job schedules are up to date
```

## When the odacli update-dcscomponents command fails due to MySQL connector/J library check error:

#### The pre-check report log contains the following:

```
Pre-check Name: Space check
Status: Success
Comments: Required space 3 GB is available in /opt

Pre-check Name: Port check
Status: Success
Comments: Port 3306 is available for running ODA MySQL

Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Success
Comments: ODA MySQL rpm dry-run passed

Pre-check Name: Check for the existence of MySQL connector/J library
Status: Failed
```

```
Comments: MySQL connector/J library does not exist. Ensure update-repository
with latest serverzip bundles ran first without any issues prior to running
update-dcscomponents
Pre-check Name: Check for the existence of Metadata migration utility
Status: Success
Comments: Metadata migration utility found
dcs-admin version:
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.20.0.0.0
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
Validate scheduler cron expressions:
Pre-check Name: Validate scheduler cron expressions
Status: Success
Comments: Scheduler cron expressions for existing job schedules are up to date
```

## When the odacli update-dcscomponents command fails due to Metadata migration utility check error:

## The pre-check report log contains the following:

```
Pre-check Name: Space check
Status: Success
Comments: Required space 3 GB is available in /opt
Pre-check Name: Port check
Status: Success
Comments: Port 3306 is available for running ODA MySQL
Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Success
Comments: ODA MySQL rpm dry-run passed
Pre-check Name: Check for the existence of MySQL connector/J library
Status: Success
Comments: ODA MySQL connector/J library found
Pre-check Name: Check for the existence of Metadata migration utility
Status: Failed
Comments: Metadata migration utility does not exist. Ensure update-repository
with latest serverzip bundles ran first without any issues prior to running
update-dcscomponents.
```

```
dcs-admin version:
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.20.0.0.0
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
Validate scheduler cron expressions:
Pre-check Name: Validate scheduler cron expressions
Status: Success
Comments: Scheduler cron expressions for existing job schedules are up to date
```

## When the odacli update-dcscomponents command displays a warning due to scheduler cron expression:

When patching from Oracle Database Appliance release 19.19 or earlier to the latest release, and you run the odacli update-dcscomponents command, there may be a warning in the precheck report log file if the default cron expressions from the existing list of job schedules are modified. The pre-check report log contains the following:

```
Pre-check Name: Space check
Status: Success
Comments: Required space 3 GB is available in /opt
Pre-check Name: Port check
Status: Success
Comments: Port 3306 is available for running ODA MySQL
Pre-check Name: ODA MySQL rpm installation dry-run check
Status: Success
Comments: ODA MySQL rpm dry-run passed
Pre-check Name: Check for the existence of MySQL connector/J library
Status: Success
Comments: ODA MySQL connector/J library found
Pre-check Name: Check for the existence of Metadata migration utility
Status: Success
Comments: Metadata migration utility found
dcs-admin version:
Pre-check Name: dcs-admin version validation
Status: Success
Comments: dcs-admin is already updated :19.20.0.0.0
```

```
Config File Exist dcscontroller:
Pre-check Name: Check DCS config files exists for dcscontroller
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-controller.yml and /opt/oracle/dcs/
conf/dcs-controller-logback.xml exist
Config File Exist dcsagent:
Pre-check Name: Check DCS config files exists for dcsagent
Status: Success
Comments: Files /opt/oracle/dcs/conf/dcs-agent.yml and /opt/oracle/dcs/conf/
dcs-agent-logback.xml exist
Validate scheduler cron expressions:
Pre-check Name: Validate scheduler cron expressions
Status: Warning
Comments: Following cron expressions in the scheduler were modified from
their default values. Starting 19.20, DCS Agent converts 7 fields cron
expression into 6 fields cron expression. No further action needed.
Schedule ID: 3f671ee7-1a03-43fd-b98b-ce33eb09de08, Custom cron expression:
25 * 1/1 * ? 2023
```

Note that the Status: Warning means the update-dcscomponents pre-check has detected custom cron expressions from the existing list of job schedules. The DCS agent automatically converts from the 7 fields custom cron expression to the equivalent 6 fields cron expression after patching DCS components.

#### **Related Topics**

 Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.

## Viewing Component Information on the Appliance

View details of all the components installed on the appliance, and the RPM drift information.

## Collecting and Viewing the Bill of Materials in the Browser User Interface

Use the Appliance tab in the Browser User Interface to collect and view information about your deployment and the installed components. The Advanced Information tab displays information about the following components:

- Grid Infrastructure Version, and the home directory
- Database Version, Home location, and Edition
- Location and details about the databases configured
- All patches applied to the appliance
- Firmware Controller and Disks
- ILOM information
- BIOS version
- List of RPMs



In the List of RPMs section, click **Show** and then click **RPM Drift** to view the differences between the RPMs installed on the appliance, and the RPMs shipped in the latest Oracle Database Appliance Patch Bundle Update release.

Click **Collect Bill of Materials** to initiate a collection and submit the job. The job ID is displayed. After the collection is complete, click **Refresh** to refresh the information.

Click **Download** to save the components report. You can use this report to help diagnose any deployment issues.

## Viewing the Bill of Materials from the Command Line

The bill of materials is also available through the command line for bare metal and virtualized platforms deployments. The information about the installed components is collected according to a set schedule, and stored in the location <code>/opt/oracle/dcs/Inventory/</code> for bare metal deployments and in the <code>/opt/oracle/oak/Inventory/</code> directory for virtualized platforms. The file is stored in the format <code>oda\_bom\_TimeStamp.json</code>. Use the command <code>describe-system</code> to view the bill of materials on the command line. See the <code>Oracle Database Command-Line Interface</code> chapter for command options and usage notes.

## Example 20-1 Example Command to View the Bill of Materials from the Command Line for Bare Metal Deployments

```
# odacli describe-system -b
ODA Components Information
Component Name
                              Component
Details
NODE
                               Name : oda1
                               Domain Name : testdomain.com
                               Time Stamp: April 21, 2020 6:21:15 AM UTC
RPMS
                               Installed RPMS: abrt-2.1.11-55.0.1.el7.x86 64,
                                                abrt-addon-
ccpp-2.1.11-55.0.1.el7.x86 64,
                                                abrt-addon-
kerneloops-2.1.11-55.0.1.el7.x86 64,
                                                abrt-addon-
pstoreoops-2.1.11-55.0.1.el7.x86 64,
                                                abrt-addon-
python-2.1.11-55.0.1.el7.x86 64,
                                                abrt-addon-
vmcore-2.1.11-55.0.1.el7.x86 64,
                                                abrt-addon-
xorg-2.1.11-55.0.1.el7.x86 64,
                                                abrt-
cli-2.1.11-55.0.1.el7.x86 64,
                                                abrt-console-
notification-2.1.11-55.0.1.el7.x86 64,
                                                abrt-
dbus-2.1.11-55.0.1.el7.x86 64,
                                                abrt-
libs-2.1.11-55.0.1.el7.x86 64,
```



	abrt-
python-2.1.11-55.0.1.el7.x86_64,	abrt-
tui-2.1.11-55.0.1.el7.x86_64,	abit-
	acl-2.2.51-14.el7.x86_64, adwaita-cursor-
theme-3.28.0-1.el7.noarch,	adwalta-cursor-
theme-3.28.0-1.el7.noarch,	adwaita-icon-
theme-3.20.0-1.el/.moalch,	aic94xx-
firmware-30-6.el7.noarch,	aida 0 15 1 12 0 1 al706 64
	aide-0.15.1-13.0.1.el7.x86_64, alsa-
firmware-1.0.28-2.el7.noarch,	alaa lib 1 1 0 1 al7 a00 04
	alsa-lib-1.1.8-1.el7.x86_64, alsa-tools-
firmware-1.1.0-1.el7.x86_64,	at 2 1 12 24 al7
	at-3.1.13-24.e17.x86_64, at-spi2-
atk-2.26.2-1.el7.x86_64,	at ani 0
core-2.28.0-1.el7.x86 64,	at-spi2-
_	atk-2.28.1-1.el7.x86_64,
	attr-2.4.46-13.e17.x86_64, audit-2.8.5-4.e17.x86_64,
	audit-libs-2.8.5-4.el7.x86_64,
python-2.8.5-4.el7.x86 64,	audit-libs-
_	augeas-libs-1.4.0-9.e17.x86_64,
	<pre>authconfig-6.2.8-30.e17.x86_64, autogen-</pre>
libopts-5.18-5.el7.x86_64,	avahi-
libs-0.6.31-19.el7.x86_64,	avani-
basesystem-10.0-7.0.1.el7.noarch,	
basesystem-10.0-7.0.1.e17.moatcm,	bash-4.2.46-33.el7.x86_64,
completion-2.1-6.el7.noarch,	bash-
completion-2.1-0.el/.noalcn,	bc-1.06.95-13.el7.x86_64,
libs-9.11.4-9.P2.e17.x86_64,	bind-export-
11DS-9.11.4-9.12.617.800_04,	bind-
libs-9.11.4-9.P2.el7.x86_64,	bind-libs-
lite-9.11.4-9.P2.e17.x86_64,	DING TIDS
license-9.11.4-9.P2.el7.noarch,	bind-
	bind-
utils-9.11.4-9.P2.el7.x86_64,	
binutils-2.27-41.base.0.7.el7_7.2.x86_64,	
	biosdevname-0.7.3-2.e17.x86_64, blktrace-1.0.5-9.e17.x86 64,
	bnxtnvm-1.40.10-1.x86_64,
	boost-date-

```
time-1.53.0-27.el7.x86_64, boost-filesystem-1.53.0-27.el7.x86_64, boost-iostreams-1.53.0-27.el7.x86_64, ....
```

## Example 20-2 Example Command to View the Bill of Materials from the Command Line for Virtualized Platforms

```
# oakcli describe-system -b
```

## Example 20-3 Example Command to View the Bill of Materials Report from the Stored Location

```
# ls -la /opt/oracle/dcs/Inventory/
total 264
-rw-r--r- 1 root root 83550 Apr 26 05:41 oda bom 2018-04-26 05-41-36.json
```

## Errors When Logging into the Browser User Interface

If you have problems logging into the Browser User Interface, then it may be due to your browser or credentials.



Oracle Database Appliance uses self-signed certificates. Your browser determines how you log into the Browser User Interface. Depending on the browser and browser version, you may receive a warning or error that the certificate is invalid or not trusted because it is self-signed, or that the connection is not private. Ensure that you accept the self-signed certificate for the agent and Browser User Interface.

Follow these steps to log into the Browser User Interface:

- Open a browser window.
- 2. Go to the following URL: https://ODA-host-ip-address:7093/mgmt/index.html
- Get the security certificate (or certificate), confirm the security exception, and add an exception.
- 4. Log in with your Oracle Database Appliance credentials.
  - If you have not already set the oda-admin password, then a message is displayed, advising you to change the default password to comply with your system security requirements.
- 5. If you have not added an exception for the agent security certificate, then a message about accepting agent certificate is displayed.
- 6. Using a different tab in your browser, go to the following URL: https://ODA-host-ip-address:7070/login

- Get the security certificate (or certificate), confirm the security exception, and add an exception.
- 8. Refresh the Browser User Interface URL: https://ODA-host-ip-address:7093/mgmt/index.html



If you have any issues logging into the Oracle Database Appliance Browser User Interface on browsers such as macOS Catalina and Google Chrome, then you may need to use any workaround as described on the official site for the product.

### **Related Topics**

- Creating the Appliance
   Create the appliance using the Browser User Interface or ODACLI commands.
- http://www.oracle.com/technetwork/indexes/products/browser-policy-2859268.html

## Errors when re-imaging Oracle Database Appliance

Understand how to troubleshoot errors that occur when re-imaging Oracle Database Appliance.

If re-imaging Oracle Database Appliance fails, with old header issues such as errors in storage discovery, or in running GI root scripts, or disk group RECO creation, then use the force mode with cleanup.pl.

```
# cleanup.pl -f
```

To ensure that re-imaging is successful, remove the old headers from the storage disks by running the secure erase tool. Verify that the OAK/ASM headers are removed.

```
# cleanup.pl -erasedata
# cleanup.pl -checkHeader
```

Retry the re-imaging operation.

#### **Related Topics**

Re-imaging Oracle Database Appliance
 Bare metal operating system re-imaging installs Oracle Database Appliance operating system software on the local (boot) drive.

## Using Oracle Autonomous Health Framework for Running Diagnostics

Oracle Autonomous Health Framework collects and analyzes diagnostic data collected, and proactively identifies issues before they affect the health of your system.

- About Installing Oracle Autonomous Health Framework
   Oracle Autonomous Health Framework is installed automatically when you provision or
   patch to Oracle Database Appliance release 19.27.
- Using the Oracle ORAchk Health Check Tool
  Run Oracle ORAchk to audit configuration settings and check system health.
- Generating and Viewing Oracle ORAchk Health Check Tool Reports in the Browser User Interface
  - Generate Oracle ORAchk Health Check Tool reports using the Browser User Interface.
- Generating and Viewing Database Security Assessment Reports in the Browser User Interface
  - Generate and view Database Security Assessment Reports using the Browser User Interface.
- Running Oracle Trace File Analyzer (TFA) Collector Commands
   Understand the installed location of tfactl and the options for the command.
- Sanitizing Sensitive Information in Diagnostic Collections
   Oracle Autonomous Health Framework uses Adaptive Classification and Redaction (ACR) to sanitize sensitive data.
- Enabling Adaptive Classification and Redaction (ACR)
   Oracle Database Appliance supports Adaptive Classification and Redaction (ACR) to sanitize sensitive data.
- Sanitizing Sensitive Information in Oracle Trace File Analyzer Collections
   You can redact (sanitize or mask) Oracle Trace File Analyzer diagnostic collections.
- Redacting and Sanitizing Entities in the BUI
   Enable and disable trace file redaction, redact files, and show or hide sanitized entities using the Browser User Interface.
- Sanitizing Sensitive Information in Oracle ORAchk Output You can sanitize Oracle ORAchk output.

## About Installing Oracle Autonomous Health Framework

Oracle Autonomous Health Framework is installed automatically when you provision or patch to Oracle Database Appliance release 19.27.

When you provision or patch your appliance to Oracle Database Appliance release 19.27, Oracle Autonomous Health Framework is installed in the path /opt/oracle/dcs/oracle.ahf.

You can verify that Oracle Autonomous Health Framework is installed by running the following command:

```
[root@oak ~]# rpm -q oracle-ahf
oracle-ahf-193000-########.x86 64
```



When you provision or patch to Oracle Database Appliance release 19.27, Oracle Autonomous Health Framework automatically provides Oracle ORAchk Health Check Tool and Oracle Trace File Analyzer Collector.

Oracle ORAchk Health Check Tool performs proactive health checks for the Oracle software stack and scans for known problems. Oracle ORAchk Health Check Tool audits important configuration settings for Oracle RAC deployments in the following categories:

- Operating system kernel parameters and packages
- Oracle Database Database parameters, and other database configuration settings
- Oracle Grid Infrastructure, which includes Oracle Clusterware and Oracle Automatic Storage Management

Oracle ORAchk is aware of the entire system. It checks the configuration to indicate if best practices are being followed.

Oracle Trace File Collector provides the following key benefits and options:

- Encapsulation of diagnostic data collection for all Oracle Grid Infrastructure and Oracle RAC components on all cluster nodes into a single command, which you run from a single node
- Option to "trim" diagnostic files during data collection to reduce data upload size
- Options to isolate diagnostic data collection to a given time period, and to a particular product component, such as Oracle ASM, Oracle Database, or Oracle Clusterware
- Centralization of collected diagnostic output to a single node in Oracle Database Appliance, if desired
- On-Demand Scans of all log and trace files for conditions indicating a problem
- Real-Time Scan Alert Logs for conditions indicating a problem (for example, Database Alert Logs, Oracle ASM Alert Logs, and Oracle Clusterware Alert Logs)

## Using the Oracle ORAchk Health Check Tool

Run Oracle ORAchk to audit configuration settings and check system health.



Before running ORAchk, check for the latest version of Oracle Autonomous Health Framework, and download and install it. See My Oracle Support Note 2550798.1 for more information about downloading and installing the latest verion of Oracle Autonomous Health Framework.

## Running ORAchk on Oracle Database Appliance 19.27 Baremetal Systems for New Installation

When you provision or upgrade to Oracle Database Appliance 19.27, ORAchk is installed using Oracle Autonomous Framework in the directory /opt/oracle/dcs/oracle.ahf.

To run orachk, use the following command:

[root@oak bin]# orachk

When all checks are finished, a detailed report is available. The output displays the location of the report in an HTML format and the location of a zip file if you want to upload the report. For example, you can choose the filter to show failed checks only, show checks with a Fail, Warning, Info, or Pass status, or any combination.



Review the Oracle Database Appliance Assessment Report and system health and troubleshoot any issues that are identified. The report includes a summary and filters that enable you to focus on specific areas.

## Running ORAchk on Oracle Database Appliance 19.27 Virtualized Platform

When you provision or upgrade to Oracle Database Appliance 19.27, ORAchk is installed using Oracle Autonomous Framework in the directory /opt/oracle.ahf.

To run orachk, use the following command:

[root@oak bin]# oakcli orachk

## **Related Topics**

https://support.oracle.com/rs?type=doc&id=2550798.1

## Generating and Viewing Oracle ORAchk Health Check Tool Reports in the Browser User Interface

Generate Oracle ORAchk Health Check Tool reports using the Browser User Interface.

Log into the Browser User Interface with the oda-admin username and password.

https://Node0-host-ip-address:7093/mgmt/index.html

- 2. Click the **Monitoring** tab.
- In the Monitoring page, on the left navigation pane, click ORAchk Report.
   On the ORAchk Reports page, a list of all the generated ORAchk reports is displayed.
- 4. In the Actions menu for the ORAchk report you want to view, click **View**.
  - The Oracle Database Appliance Assessment Report is displayed. It contains details of the health of your deployment, and lists current risks, recommendations for action, and links for additional information.
- 5. To create an on-demand ORAchk report: On the ORAchk Reports page, click Create and then click Yes in the confirmation box.
  - The job to create an ORAchk report is submitted.
- 6. Click the link to view the status of the job. Once the job completes successfully, you can view the Oracle Database Appliance Assessment Report on the ORAchk Reports page.
- 7. To delete an ORAchk report: In the Actions menu for the ORAchk report you want to delete, click Delete.

## Generating and Viewing Database Security Assessment Reports in the Browser User Interface

Generate and view Database Security Assessment Reports using the Browser User Interface.

1. Log into the Browser User Interface with the oda-admin username and password.

https://Node0-host-ip-address:7093/mgmt/index.html



- Click the Security tab.
- 3. In the Security page, on the left navigation pane, click DBSAT Reports.
  - On the Database Security Assessment Reports page, a list of all the generated DBSAT reports is displayed.
- 4. In the Actions menu for the ORAchk report you want to view, click **View**.
  - The Oracle Database Security Assessment Report is displayed. It contains details of the health of your deployment, and lists current risks, recommendations for action, and links for additional information.
- To create a DBSAT report: On the DBSAT Reports page, click Create and then click Yes in the confirmation box.
  - The job to create a DBSAT report is submitted.
- 6. Click the link to view the status of the job. Once the job completes successfully, you can view the Oracle Database Appliance Assessment Report on the DBSAT Reports page.
- To delete a DBSAT report: In the Actions menu for the DBSAT report you want to delete, click Delete.

## Running Oracle Trace File Analyzer (TFA) Collector Commands

Understand the installed location of tfact1 and the options for the command.

#### **About Using tfactl to Collect Diagnostic Information**

When you provision or upgrade to Oracle Database Appliance 19.27, Oracle Trace File Analyzer (TFA) Collector is installed in the directory /opt/oracle.ahf/bin/tfactl. You can invoke the command line utility for TFA, tfactl from the directory /opt/oracle.ahf/bin/tfactl, or simply type tfactl.

You can use the following command options to run tfactl:

```
/opt/oracle.ahf/bin/tfactl diagcollect -ips|-oda|-odalite|-dcs|-odabackup|
-odapatching|-odadataguard|-odaprovisioning|-odaconfig|-odasystem|-
odastorage|-database|
-asm|-crsclient|-dbclient|-dbwlm|-tns|-rhp|-procinfo|-crs|-cha|-wls|
-emagent|-oms|-ocm|-emplugins|-em|-acfs|-install|-cfgtools|-os|-ashhtml|-
ashtext|
-awrhtml|-awrtext -mask -sanitize
```

Table 20-1 Command Options for tfactl Tool

Option	Description
-h	(Optional) Describes all the options for this command.
-ips	(Optional) Use this option to view the diagnostic logs for the specified component.
-oda	(Optional) Use this option to view the logs for the entire Appliance.
-odalite	(Optional) Use this option to view the diagnostic logs for the odalite component.
-dcs	(Optional) Use this option to view the DCS log files.



Table 20-1 (Cont.) Command Options for tfactl Tool

Option	Description
-odabackup	(Optional) Use this option to view the diagnostic logs for the backup components for the Appliance.
-odapatching	(Optional) Use this option to view the diagnostic logs for patching components of the Appliance.
-odadataguard	(Optional) Use this option to view the diagnostic logs for Oracle Data Guard component of the Appliance.
-odaprovisioning	(Optional) Use this option to view provisioning logs for the Appliance.
-odaconfig	(Optional) Use this option to view configuration- related diagnostic logs.
-odasystem	(Optional) Use this option to view system information.
-odastorage	(Optional) Use this option to view the diagnostic logs for the Appliance storage.
-database	(Optional) Use this option to view database-related log files.
-asm	(Optional) Use this option to view the diagnostic logs for the Appliance.
-crsclient	(Optional) Use this option to view the diagnostic logs for the Appliance.
-dbclient	(Optional) Use this option to view the diagnostic logs for the Appliance.
-dbwlm	(Optional) Use this option to view the diagnostic logs for the specified component.
-tns	(Optional) Use this option to view the diagnostic logs for TNS.
-rhp	(Optional) Use this option to view the diagnostic logs for Rapid Home Provisioning.
-crs	(Optional) Use this option to view the diagnostic logs for Oracle Clusterware.
-cha	(Optional) Use this option to view the diagnostic logs for the Cluster Health Monitor.
-wls	(Optional) Use this option to view the diagnostic logs for Oracle WebLogic Server.
-emagent	(Optional) Use this option to view the diagnostic logs for the Oracle Enterprise Manager agent.
-oms	(Optional) Use this option to view the diagnostic logs for the Oracle Enterprise Manager Management Service.
-ocm	(Optional) Use this option to view the diagnostic logs for the specified component.
-emplugins	(Optional) Use this option to view the diagnostic logs for Oracle Enterprise Manager plug-ins.
-em	(Optional) Use this option to view the diagnostic logs for Oracle Enterprise Manager deployment.



Table 20-1 (Cont.) Command Options for tfactl Tool

Option	Description
-acfs	(Optional) Use this option to view the diagnostic logs for Oracle ACFS storage.
-install	(Optional) Use this option to view the diagnostic logs for installation.
-cfgtools	(Optional) Use this option to view the diagnostic logs for the configuration tools.
-os	(Optional) Use this option to view the diagnostic logs for the operating system.
-ashhtml	(Optional) Use this option to view the diagnostic logs for the specified component.
-ashtext	(Optional) Use this option to view the diagnostic logs for the Appliance.
-awrhtml	(Optional) Use this option to view the diagnostic logs for the Appliance.
-awrtext	(Optional) Use this option to view the diagnostic logs for the specified component.
-mask	(Optional) Use this option to choose to mask sensitive data in the log collection.
-sanitize	(Optional) Use this option to choose to sanitize (redact) sensitive data in the log collection.

#### **Usage Notes**

You can use Trace File Collector (the tfactl command) to collect all log files for the Oracle Database Appliance components.

You can also use the command odaadmcli manage diagcollect, with similar command options, to collect the same diagnostic information.

For more information about using the -mask and -sanitize options, see the next topic.

## Sanitizing Sensitive Information in Diagnostic Collections

Oracle Autonomous Health Framework uses Adaptive Classification and Redaction (ACR) to sanitize sensitive data.

After collecting copies of diagnostic data, Oracle Trace File Analyzer and Oracle ORAchk use Adaptive Classification and Redaction (ACR) to sanitize sensitive data in the collections. ACR uses a Machine Learning based engine to redact a pre-defined set of entity types in a given set of files. ACR also sanitizes or masks entities that occur in files and directory names. Sanitization replaces a sensitive value with random characters. Masking replaces a sensitive value with a series of asterisks ("\*").

ACR currently sanitizes the following entity types:

- Host names
- IP addresses
- MAC addresses
- Oracle Database names



- Tablespace names
- Service names
- Ports
- Operating system user names

ACR also masks user data from the database appearing in block and redo dumps.

## Example 20-4 Block dumps before redaction

```
14A533F40 00000000 00000000 00000000 002C00000 [...............]
14A533F50 35360C02 30352E30 31322E37 380C3938 [..650.507.2189.8]
14A533F60 31203433 37203332 2C303133 360C0200 [34 123 7310,...6]
```

## Example 20-5 Block dumps after redaction

#### Example 20-6 Redo dumps before redaction

```
col 74: [ 1] 80
col 75: [ 5] c4 0b 19 01 1f
col 76: [ 7] 78 77 06 16 0c 2f 26
```

### Example 20-7 Redo dumps after redaction

```
col 74: [ 1] **
col 75: [ 5] ** ** ** **
col 76: [ 7] ** ** ** ** **
```

#### Redaction of Literal Values in SQL Statements in AWR, ASH and ADDM Reports

Automatic Workload Repository (AWR), Active Session History (ASH), and Automatic Database Diagnostic Monitor (ADDM) reports are HTML files, which contain sensitive entities such as hostnames, database names, and service names in the form of HTML tables. In addition to these sensitive entities, they also contain SQL statements, that can contain bind variables or literal values from tables. These literal values can be sensitive personal information (PI) stored in databases. ACR processes such reports to identify and redact both usual sensitive entities and literal values present in the SQL statements.

#### Sanitizing Sensitive Information Using odaadmcli Command

Use the <code>odaadmcli</code> manage <code>diagcollect</code> command to collect diagnostic logs for Oracle Database Appliance components. During collection, ACR can be used to redact (sanitize or mask) the diagnostic logs.

```
odaadmcli manage diagcollect [--dataMask|--dataSanitize]
```

In the command, the --dataMask option blocks out the sensitive data in all collections, for example, replaces myhost1 with \*\*\*\*\*\*. The default is None. The --dataSanitize option

replaces the sensitive data in all collections with random characters, for example, replaces myhost1 with orzhmv1. The default is None.

## Enabling Adaptive Classification and Redaction (ACR)

Oracle Database Appliance supports Adaptive Classification and Redaction (ACR) to sanitize sensitive data.

After collecting copies of diagnostic data, Oracle Database Appliance use Adaptive Classification and Redaction (ACR) to sanitize sensitive data in the collections. You can use the commands odacli enable-acr and odacli disable-acr to enable or disable ACR across both nodes, not just on the local node.



For more information about setting up the staging server for Adaptive Classification and Redaction (ACR), see My Oracle Support note 2882798.1.

#### Example 20-8 Describing current status of ACR

```
bash-4.2# odacli describe-acr
Trace File Redaction: Enabled
```

## Example 20-9 Enabling ACR:

```
bash-4.2# odacli enable-acr
```

Job details

\_\_\_\_\_\_

ID: 12bbf784-610a-40a8-b409-e74c58bc35aa

Description: Enable ACR job

Status: Created

Created: April 8, 2021 3:04:13 AM PDT

#### Example 20-10 Disabling ACR

bash-4.2# odacli disable-acr

Job details

\_\_\_\_\_\_

ID: 1d69f8b3-3989-4192-bbb9-6518e425061a

Description: Disable ACR job

Status: Created

Created: April 8, 2021 3:04:13 AM PDT



#### Example 20-11 Enabling ACR during provisioning of the appliance

You can enable ACR during provisioning of the appliance by adding the acr option to the JSON file used for provisioning. Specify true or false for the field acrEnable in the JSON file. If the acr option is not specified, then ACR is disabled.

```
"acr": {
     "acrEnable": true
}
```

## **Related Topics**

https://support.oracle.com/rs?type=doc&id=2882798.1

## Sanitizing Sensitive Information in Oracle Trace File Analyzer Collections

You can redact (sanitize or mask) Oracle Trace File Analyzer diagnostic collections.

#### **Enabling Automatic Redaction**

To enable automatic redaction, use the command:

```
tfactl set redact=[mask|sanitize|none]
```

In the command, the <code>-mask</code> option blocks out the sensitive data in all collections, for example, replaces <code>myhost1</code> with <code>\*\*\*\*\*\*\*</code>. The <code>-sanitize</code> option replaces the sensitive data in all collections with random characters, for example, replaces <code>myhost1</code> with <code>orzhmv1</code>. The <code>none</code> option does not mask or sanitize sensitive data in collections. The default is <code>none</code>.

## **Enabling On-Demand Redaction**

You can redact collections on-demand, for example, tfactl diagcollect -srdc ORA-00600 - mask or tfactl diagcollect -srdc ORA-00600 -sanitize.

To mask sensitive data in all collections:

```
tfactl set redact=mask
```

2. To sanitize sensitive data in all collections:

```
tfactl set redact=sanitize
```

#### Example 20-12 Masking or Sanitizing Sensitive Data in a Specific Collection

```
tfactl diagcollect -srdc ORA-00600 -mask tfactl diagcollect -srdc ORA-00600 -sanitize
```

## Redacting and Sanitizing Entities in the BUI

Enable and disable trace file redaction, redact files, and show or hide sanitized entities using the Browser User Interface.

Log into the Browser User Interface with the oda-admin username and password.

```
https://Node0-host-ip-address:7093/mgmt/index.html
```

- Click the Security tab.
- 3. In the Security page, on the left navigation pane, click **Trace File Redaction**.
- 4. Click the Trace File Redaction Status tab.

The current ACR status is displayed.

- You can enable or disable ACR status based on the current ACR status. For example, if the ACR status is disabled, then click **Enable** to enable ACR. The job to change the ACR status is submitted.
- Click Refresh Status to refresh the ACR status display.
- 7. Click the Redact Files tab.
- 8. Specify the Input File Path of the file to be redacted. The file must be in the .tar, or .gz, or .zip file format.
- 9. Select either Sanitize or Mask for the Redaction Mode.
- 10. Click **Redact**. The job to redact files is submitted.
- 11. Click the Show Sanitized Entities tab.
- Specify the List of sanitized entities and click Show. The list of sanitized entities are displayed.

## Sanitizing Sensitive Information in Oracle ORAchk Output

You can sanitize Oracle ORAchk output.

To sanitize Oracle ORAchk output, include the -sanitize option, for example, orachk - profile asm -sanitize. You can also sanitize post process by passing in an existing log, HTML report, or a zip file, for example, orachk -sanitize file name.

#### Example 20-13 Sanitizing Sensitive Information in Specific Collection IDs

```
orachk -sanitize comma_delimited_list_of_collection_IDs
```

#### Example 20-14 Sanitizing a File with Relative Path

```
orachk -sanitize new/orachk_node061919_053119_001343.zip
orachk is sanitizing
/scratch/testuser/may31/new/orachk_node061919_053119_001343.zip. Please
wait...

Sanitized collection is:
/scratch/testuser/may31/orachk_aydv061919_053119_001343.zip
orachk -sanitize ../orachk_node061919_053119_001343.zip
orachk is sanitizing
/scratch/testuser/may31/../orachk_node061919_053119_001343.zip. Please wait...

Sanitized collection is:
/scratch/testuser/may31/orachk_aydv061919_053119_001343.zip
```



## Example 20-15 Sanitizing Oracle Autonomous Health Framework Debug Log

```
orachk -sanitize new/orachk_debug_053119_023653.log
orachk is sanitizing /scratch/testuser/may31/new/
orachk_debug_053119_023653.log.
Please wait...
Sanitized collection is: /scratch/testuser/may31/
orachk_debug_053119_023653.log
```

## **Example 20-16 Running Full Sanity Check**

```
orachk -localonly -profile asm -sanitize -silentforce

Detailed report (html) -
/scratch/testuser/may31/orachk_node061919_053119_04448/
orachk_node061919_053119_04448.html

orachk is sanitizing /scratch/testuser/may31/orachk_node061919_053119_04448.
Please wait...

Sanitized collection is: /scratch/testuser/may31/
orachk_aydv061919_053119_04448

UPLOAD [if required] - /scratch/testuser/may31/
orachk node061919_053119_04448.zip
```

#### To reverse lookup a sanitized value, use the command:

```
orachk -rmap all|comma delimited list of element IDs
```

You can also use orachk -rmap to lookup a value sanitized by Oracle Trace File Analyzer.

## **Example 20-17 Printing the Reverse Map of Sanitized Elements**

orachk -rmap MF\_NK1, fcb63u2

Entity Type	Substituted Entity Name	Original Entity Name
dbname	MF\_NK1	HR\_DB1
dbname	fcb63u2	rac12c2
orachk -rmap all		



## Running the Disk Diagnostic Tool

Use the Disk Diagnostic Tool to help identify the cause of disk problems.

The tool produces a list of 14 disk checks for each node. To display details, where n represents the disk resource name, enter the following command:

```
\# odaadmcli stordiag n
```

For example, to display detailed information for NVMe pd\_00:

```
# odaadmcli stordiag pd 00
```

## Running the Oracle Database Appliance Hardware Monitoring Tool

The Oracle Database Appliance Hardware Monitoring Tool displays the status of different hardware components in Oracle Database Appliance server.

The tool is implemented with the Trace File Analyzer collector. Use the tool both on bare-metal and on virtualized systems. The Oracle Database Appliance Hardware Monitoring Tool reports information only for the node on which you run the command. The information it displays in the output depend on the component that you select to review.

#### **Bare Metal Platform**

You can see the list of monitored components by running the command odaadmcli show -h

To see information about specific components, use the command syntax <code>odaadmcli show component</code>, where <code>component</code> is the hardware component that you want to query. For example, the command <code>odaadmcli show power shows</code> information specifically about the Oracle Database Appliance power supply:

#### Virtualized Platform

You can see the list of monitored components by running the command oakcli show -h

To see information about specific components, use the command syntax <code>oakcli show component</code>, where <code>component</code> is the hardware component that you want to query. For example,



the command oakcli show power shows information specifically about the Oracle Database Appliance power supply:

## Note:

Oracle Database Appliance Server Hardware Monitoring Tool is enabled during initial startup of ODA\_BASE on Oracle Database Appliance Virtualized Platform. When it starts, the tool collects base statistics for about 5 minutes. During this time, the tool displays the message "Gathering Statistics..." message.

## Disabling the Browser User Interface

You can also disable the Browser User Interface. Disabling the Browser User Interface means you can only manage your appliance through the command-line interface.

Log in to the appliance:

```
ssh -l root oda-host-name
```

2. Stop the DCS controller. For High-Availability systems, run the command on both nodes.

```
systemctl stop initdcscontroller
```

## Preparing Log Files for Oracle Support Services

If you have a system fault that requires help from Oracle Support Services, then you may need to provide log records to help Oracle support diagnose your issue.

You can collect diagnostic information for your appliance in the following ways:

- Use the Bill Of Materials report saved in the /opt/oracle/dcs/Inventory/ directory, to enable Oracle Support to help troubleshoot errors, if necessary.
- You can use Trace File Collector (the tfact1 command) to collect all log files for the Oracle Database Appliance components.
- Use the command odaadmcli manage diagcollect to collect diagnostic files to send to Oracle Support Services.
- Use the Error Correlation report available in the /opt/oracle/dcs/da/da\_repo directory.

The odaadmcli manage diagcollect command consolidates information from log files stored on Oracle Database Appliance into a single log file for use by Oracle Support Services. The location of the file is specified in the command output.

## Example 20-18 Collecting log file information for a time period, masking sensitive data

# odaadmcli manage diagcollect --dataMask --fromTime 2019-08-12 --toTime
2019-08-25
DataMask is set as true
FromTime is set as: 2019-08-12
ToTime is set as: 2019-08-25
TFACTL command is: /opt/oracle/tfa/tfa\_home/bin/tfactl
Data mask is set.
Collect data from 2019-08-12
Collect data to 2019-08-25



A

# Oracle Database Appliance Software Configuration Defaults

Oracle Database Appliance software configuration defaults.

- Directory Paths for Oracle Database Appliance
   Understand the storage and mount configuration file paths for Oracle Database Appliance.
- Port Numbers and Protocols of Oracle Database Appliance Components
   Understand the port numbers and protocols of Oracle Database Appliance components.
- Location of Log Files
   Log files are available for actions performed in the command-line interface and Browser
   User Interface and are useful when you need to track and debug jobs.
- Oracle Groups and User Configurations for Oracle Database Appliance
  Review the groups and default users created when you deploy the appliance. All
  passwords are set to the password that you define during deployment.

## Directory Paths for Oracle Database Appliance

Understand the storage and mount configuration file paths for Oracle Database Appliance.

Oracle homes on Oracle Database Appliance follow Optimal Flexible Architecture guidelines.

## **Directory Paths for Oracle Database Appliance**

Item	Directory Path
Grid home	/u01/app/release-specific_name/gi owner
Grid base	/u01/app/gi owner
Oracle home	<pre>/u01/app/odaorahome/rdbms owner/product/ rdbms_version/ dbhome_home_sequence_number</pre>
Oracle base	/u01/app/odaorabase/ <i>rdbms owner</i>
Oracle Inventory	/u01/app/oraInventory
Java Runtime Environment (JRE)	<pre>/opt/oracle/dcs/java/ release_specific_JRE_version/</pre>
Java SDK	/opt/oracle/dcs/odajavasdk/
Oracle ACFS file system	<pre>/opt/oracle/oak/pkgrepos/orapkgs/clones</pre>
	Starting with Oracle Database Appliance release 19.12, a new Oracle ACFS file system is created to store the Oracle Database and Oracle Grid Infrastructure clone files. The DATA disk group provides a space of 150 GB for the file system.



# Port Numbers and Protocols of Oracle Database Appliance Components

Understand the port numbers and protocols of Oracle Database Appliance components.

Table A-1 Port Numbers and Protocols of Oracle Database Appliance Components

Component	Description	Default Port Number	Protocol	Network
BUI	A web-based application to administer and manage the Oracle Database Appliance.	7093	TCP	public
dcs-agent	The DCS agent is a REST application that performs various operations on the appliance.	7070, 7071	ТСР	public and private
dcs-admin	This application performs lifecycle management operations on the DCS agent, DCS controller, ODACLI, and other components.	7060	TCP	public and private
MySQL	The metadata store used by DCS agent.	3306	TCP	private
Oracle HAMI	Oracle High Availability Metadata Infrastructure service providing distributed services required by DCS including locking and synchronizing configuration details in the cluster.	22001	TCP	private
oakd	Managing the storage components of Oracle Database Appliance.	Dynamic	TCP	private



Table A-1 (Cont.) Port Numbers and Protocols of Oracle Database Appliance Components

Component	Description	Default Port Number	Protocol	Network
Oracle ASR Manager	Oracle Auto Service Request. Refer to Oracle Auto Service Request documentation for other ports used by ASR Manager.	16161	TCP	public
Oracle ILOM/IPMI	Oracle ILOM for Oracle Database Appliance servers.	623	UDP	public
Oracle Database listeners	Database listeners, including local listener and SCAN listener.	1521	ТСР	public
Oracle ASM Listener	Oracle ASM listener	1525	TCP	private
EM Express	Oracle Enterprise Manager Database Express (EM Express).	5500 and increment one per database	TCP	public
ssh	SSH connection to the Oracle Database Appliance servers.	22	SSH over TCP	public and private
VNC Server	The VNC server created by KVM for KVM virtual guest machines	5900+	TCP	localhost (127.0.0.1)
NFS	The central repository on bare metal system is shared by the DB Systems using NFS. Refer to the Oracle Linux documentation to identify ports used by NFS.	2049 - nfs	TCP	private

**Note:** IP addresses of the private network that Oracle Database Appliance uses are 192.168.16.0/24 and 192.168.17.0/24.

## **Related Topics**

Port Numbers and Protocols of Oracle Components



## See Also:

Oracle Real Application Clusters Installation Guide for Linux and UNIX for port numbers and protocols used by Oracle Database components

## **Location of Log Files**

Log files are available for actions performed in the command-line interface and Browser User Interface and are useful when you need to track and debug jobs.

You can also use the Oracle Appliance Manager Browser User Interface to view job activity, including the tasks that make up the job. The status of each task appears in the Browser User Interface and you can drill down to get greater details.

If you log a Service Request, upload all of the logs in the /opt/oracle/dcs/log, /opt/oracle/dcs/da/da repo, and /opt/oracle/dcs/dcscli/log directories.

## **Patching Log Files**

All patching-related information is logged in the dcs-agent log in the directory /opt/oracle/dcs/log/.

## **Error Correlation Reports**

If a DCS job fails, an Error Correlation report is generated and is available in the /opt/oracle/dcs/da/da\_repo directory.

#### **DCS Agent Log Directories**

Agent-specific activities are logged in the dcs-agent log.

The DCS Agent, controller, and command-line interface output are stored in the directory /opt/oracle/dcs/log/.

If an error occurs in the command-line interface layer, then the output will show in the /opt/oracle/dcs/dcscli/log/dcscli.log file first.

## **DCS Components Log Directories**

The Oracle HAMI logs are stored in the directory /opt/oracle/hami/base, /opt/oracle/hami/obase, and /opt/oracle/dcs/hami/log. The Oracle HAMI logs are hamiws\_pid\_n.trc, hamictl timestamp pid.log, and hamiwsmkwallets pid.trc.

The MySQL logs are stored in the log /opt/oracle/dcs/mysql/log/mysqldb.log. The log contains information about MySQL such as startup, shutdown, connection transaction details, and errors encountered when running MySQL.

#### Storage Logs

Storage-related activity is logged in the oakd log file.

/opt/oracle/oak/log/hostname/oak/oakd.log

For example, /opt/oracle/oak/log/myhost/oak/oakd.log



Use the odaadmcli manage diagcollect command to collect diagnostic logs for storage components. The files are saved in the oakdiag directory.

/opt/oracle/oak/log/hostname/oakdiag/file name.tar.gz

For example, /opt/oracle/oak/log/myhost/oakdiag/oakStorage-myhost-20161120\_2217.tar.gz

#### **Upgrade using Data Preserving Reprovisioning Logs**

The odaupgradeutil utility logs are stored at opt/oracle/oak/restore/log.

### **Database Logs**

Online logs are stored in the /u03/app/db user/redo/ directory.

Oracle Fast Recovery Area (FRA) is located in the /u03/app/db\_user/fast\_recovery\_area directory.

Database alert logs are stored in the location <code>\$ORACLE\_BASE/diag/rdbms/database unique name.</code>

## Oracle Auto Service Request (Oracle ASR) Log Files

All log files for Oracle ASR are located in the /var/opt/asrmanager/log/ directory.

## Oracle Groups and User Configurations for Oracle Database Appliance

Review the groups and default users created when you deploy the appliance. All passwords are set to the password that you define during deployment.

**Default Operating System Groups and User Configurations** 

Table A-2 Default Operating System Groups and Users Configuration for Oracle Database Appliance

Groups and Users	Default Value
Oracle Grid Infrastructure installation owner	grid, <b>UID 1001</b>
Oracle Database installation owner	oracle, UID 1000
Oracle Database system administrator	sys
Oracle Database generic administrator	system
Oracle Inventory system privileges group	oinstall, GID 1001
Oracle ASM Administrators system privileges	asmadmin, GID 1004
Oracle ASM Users system privileges	asmdba, GID 1006
Oracle ASM Operator system privileges	asmoper, GID 1005
Oracle Database Administrators system privileges	dba, GID 1003
Oracle Database Operator system privileges	dbaoper, GID 1002



## **Oracle Groups and User Configurations**

You can use the Browser User Interface or the odacli create-appliance command and a JSON file to deploy the appliance. The following configurations are supported:

- 2 Users with 6 groups (operating system role separation)
- Single User with 6 groups (no operating system role separation)
- Single user with 2 groups (no operating system role separation)

You can customize groupname, username, and UID.



B

## Oracle Database Appliance Storage Defaults

Review this section to understand Oracle Database Appliance storage architecture and options and how to determine usable storage.

- About Database File Storage
  - Use Oracle Automatic Storage Management (Oracle ASM) or Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for database files storage.
- Oracle ACFS Mount Points and Storage Space
   Review Oracle ASM Cluster file system (ACFS) mount points for Oracle Database
   Appliance.
- Displaying Mounted Disk Details
  - Use the Oracle Automatic Storage Management lsdg command to display mounted disk groups and their information for Oracle Database Appliance.
- Usable Space on Oracle Database Appliance X10-S and X10-L
  Review the table for the approximate amount of usable space for Oracle Database
  Appliance X10-S and X10-L.
- Usable Space on Oracle Database Appliance X10-HA
   Review the table for the approximate amount of usable space for high performance and high capacity storage on Oracle Database Appliance X10-HA.
- Usable Free Space with Oracle ASM
   When Oracle ASM calculates usable Free Space, it determines the amount of space to reserve in the case of a disk failure.

## About Database File Storage

Use Oracle Automatic Storage Management (Oracle ASM) or Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for database files storage.

Database file systems are used exclusively for storing database files, and they include separate file systems for data files and archive files or backups. You determine the type of database storage when you create the database.

#### **About Oracle ASM Database Storage**

With Oracle ASM, database datafiles are stored in DATA disk group. On X8-2, X7-2S, X7-2M, and X6-2 S/M/L systems, which do not have REDO disk group, redo and archive files are stored in RECO disk group. X7-2-HA and other older High-Availability systems have dedicated disks for REDO disk group; redo logs are stored in the REDO disk group.

Reserved storage is the amount of Oracle Automatic Storage Management (Oracle ASM) storage required to restore redundancy in the event of a disk failure. If you use the reserve storage capacity, then the system continues to run, and it is protected through Oracle ASM mirroring. However, in the event of a disk failure, the system is then running in a non-protected and degraded mode. In this event, you must replace disks immediately. If there is no reserved space available, then rebalance cannot restore redundancy after a disk failure.

If you specify mirroring for a file, then Oracle ASM automatically stores redundant copies of the file extents in separate failure groups. Failure groups apply to normal, high, and flex

redundancy disk groups. You can define the failure groups for each disk group when you create or alter the disk group.



Oracle Automatic Storage Management Administrator's Guide in the Oracle Database documentation library for information about Oracle ASM Mirroring and Disk Group Redundancy.

## **About Oracle ACFS Database Storage**

With Oracle ACFS, an Oracle ACFS file system is created from DATA disk group for each database to store datafiles, and an Oracle ACFS file system is created from RECO disk group for redo and fast recovery area for all databases.

Each database created under ACFS has it own mount points, /u02/app/oracle/oradata/dbid. When you delete a database, you should clean up the files.

### **Storage Configuration Options**

When Oracle Database Appliance is deployed, you can configure how the storage capacity is shared between DATA disk group and RECO disk group. You can choose anywhere from 10% to 90% for DATA and the remainder for RECO. The amount of usable storage is determined by the percentage configured for DATA. You can run the command <code>lsdg</code> to determine the usable storage on the DATA disk group. You can also run the command <code>odacli list-dbstorages</code> command to determine the storage available.

## Oracle ACFS Mount Points and Storage Space

Review Oracle ASM Cluster file system (ACFS) mount points for Oracle Database Appliance.

If you select Oracle Automatic Storage Management (Oracle ASM) for database storage when you create a database, then an Oracle ASM Cluster file system (ACFS) is not created. All files are in an Oracle ASM disk group.

If you select Oracle ACFS for database storage, then each database has its own Oracle ACFS mount point:

- DATA disk group: /u02/app/oracleuser/oradata/db name
- RECO disk group: /u03/app/oracleuser.
- REDO disk group: /u04/app/oracleuser/redo/db name

With Oracle ACFS, the following are created:

- A 100G ACFS is created from +DATA diskgroup for each database. This Oracle ACFS automatically extends the space on demand.
- A common Oracle ACFS with 25% of +RECO diskgroup is created with auto extension on. This file system is used for fast recovery area.
- For Oracle Database Appliance single-node and High-Availability High Performance systems, the REDO volume is created on the RECO disk group. For Oracle Database Appliance High-Availability High Capacity system, the REDO volume is created on FLASH disk group. The REDO volume stores redo logs.



Table B-1 Oracle ACFS Mount Points and Related Oracle ASM Disk Groups and Volume Information

File System	Oracle ASM Disk Group	Oracle ASM Dynamic Volume	Mount Point
DATA	DATA +DATA /dev/asm/datdbname-nnn For example: /dev/asm/		/u02/app/oracleuser/oradata/ dbname
		datodacn-123	For example: /u02/app/example/ oradata/odacn
RECO	+RECO	/dev/asm/reco-nn	/u03/app/ <i>oracleuser</i>
			This mount point is shared by all databases for fast_recovery_area and redo logs.
			For fast_recovery_area, the path is: /u03/app/oracleuser/ fast_recovery_area/db_name
REDO	+RECO/ +FLASH	/dev/asm/rdo/dbName-nnn	/u04/app/ <i>oracleuser</i> /redo/ <i>db_name</i> For example:
	depending on environment type (High Capacity or High Performance)		/u04/app/oracle/redo/mydb

## Example B-1 Oracle ACFS Storage Space

When the Oracle ACFS file systems are created, they do not initially consume all of the storage in the appliance. Space is preserved for additional repositories, or in some cases, database files stored directly in Oracle ASM. You can check for available storage space in your file systems by running the operating system command  $\mathtt{df}_{-k}$  as shown in the following example.

# df -k					
Filesystem	1K-blocks	Used	Available	Use%	Mounted
on					
/dev/mapper/VolGroupSys-LogVolRoot	30963708	14203568	15187276	49%	/
tmpfs	65952292	647800	65304492		
1% /dev/shm					
/dev/sda1	495844	43872	426372	10%	/boot
/dev/mapper/VolGroupSys-LogVolOpt	61927420	18594420	40187272	32%	/opt
/dev/mapper/VolGroupSys-LogVolU01	103212320	49621560	48347880	51%	/u01
/dev/asm/reco-62	76546048	1469676	75076372		
2% /u03/app/oracle					
/dev/asm/datrdb2-268	104857600	3872368	100985232		
4% /u02/app/oracle/oradata/rdb2					
/dev/asm/datndb11-268	104857600	247160	104610440		
1% /u02/app/oracle/oradata/ndb11					
/dev/asm/datndb12-268	104857600	247160	104610440		
1% /u02/app/oracle/oradata/ndb12					

## Displaying Mounted Disk Details

Use the Oracle Automatic Storage Management lsdg command to display mounted disk groups and their information for Oracle Database Appliance.

To display information about a specific disk group, specify the disk group in the command.

- 1. Log in as a grid user.
- 2. Run the Oracle Automatic Storage Management lsdg command.

### **Example B-2** Determining Storage on the DATA Disk Group

## Usable Space on Oracle Database Appliance X10-S and X10-L

Review the table for the approximate amount of usable space for Oracle Database Appliance X10-S and X10-L.

Oracle Database Appliance X10-S and X10-L use 6.8TB NVMe. The storage capacity is the aggregate for DATA and RECO disk groups. The raw storage capacity in the table is based on disk hardware terabytes (based on 1 kilobyte equals 1000 bytes). Approximate usable storage capacity is shown in software storage terabytes (based on 1 kilobyte equals 1024 bytes). Approximate usable storage also accounts for 15% reserved space required to restore full redundancy in case of disk failure (not applicable to the two-drive configuration). The high redundancy values in the table describe the space needed to recover from one failure only.



The usable storage space described in this topic are approximate values, and may vary as per your deployment.

Table B-2 Usable Disk Capacity on Oracle Database Appliance X10-S and X10-L

Number of Drives	Raw Storage	Usable Storage with Normal Redundancy (Double Mirroring)	Usable Storage with High Redundancy (Triple Mirroring)
X10-S/X10-L (2 drives)	13.6 TB	6.2 TB	Not Applicable
X10-L (4 drives)	27.2 TB	10.5 TB	7.0 TB
X10-L (6 drives)	40.8 TB	15.8 TB	10.5 TB
X10-L (8 drives)	54.4 TB	21.0 TB	14.0 TB



### Usable Space on Oracle Database Appliance X10-HA

Review the table for the approximate amount of usable space for high performance and high capacity storage on Oracle Database Appliance X10-HA.

#### **Usable Space for High Performance**



The usable storage space described in this topic are approximate values, and may vary as per your deployment.

Oracle Database Appliance X10-HA with high performance configuration uses 7.68TB solid state drives (SSDs). The storage capacity is the aggregate for DATA and RECO disk groups. The raw storage capacity in the table is based on disk hardware terabytes (based on 1 kilobyte equals 1000 bytes). Approximate usable storage capacity is shown in software storage terabytes (based on 1 kilobyte equals 1024 bytes). Approximate usable storage also accounts for 15% reserved space required to restore full redundancy in case of disk failure. The high redundancy values in the table describe the space needed to recover from one failure only.

Table B-3 Usable Disk Capacity for High Performance on Oracle Database Appliance X10-HA

Number of Drives	Raw Storage	Usable Storage with Normal Redundancy (Double Mirroring)	Usable Storage with High Redundancy (Triple Mirroring)
6 SSD drives	46 TB	17.8 TB	11.9 TB
12 SSD drives	92 TB	35.6 TB	23.7 TB
18 SSD drives	138 TB	53.4 TB	35.6 TB
24 SSD drives	184 TB	71.2 TB	47.5 TB
48 SSD drives	369 TB	142.5 TB	95.0 TB

#### **Usable Space for High Capacity**

Oracle Database Appliance X10-HA with high capacity configuration uses 7.68TB solid state drives (SSDs) and 22TB hard disk drives (HDDs). SSD storage capacity is allocated to the FLASH disk group. HDD storage capacity is the aggregate for DATA and RECO disk groups. The raw storage capacity in the table is based on disk hardware terabytes (based on 1 kilobyte equals 1000 bytes). Approximate usable storage capacity is shown in software storage terabytes (based on 1 kilobyte equals 1024 bytes). Approximate usable storage also accounts for 15% reserved space required to restore full redundancy in case of disk failure. The high redundancy values in the table describe the space needed to recover from one failure only.



The usable storage space described in this topic are approximate values, and may vary as per your deployment.



Table B-4 Usable Disk Capacity for High Capacity on Oracle Database Appliance X10-HA

Number of Drives	Raw Storage	Usable Storage with Normal Redundancy (Double Mirroring)	Usable Storage with High Redundancy (Triple Mirroring)
6 SSD drives and 18 HDD	SSDs: 46 TB	SSDs: 17.8 TB	SSDs: 11.9 TB
drives	HDDs: 396 TB	HDDs: 153.1 TB	HDDs: 102 TB
12 SSD drives and 36 HDD	SSDs: 92 TB	SSDs: 35.6 TB	SSDs: 23.7 TB
drives	HDDs: 792 TB	HDDs: 306.1 TB	HDDs: 204.1 TB

## Usable Free Space with Oracle ASM

When Oracle ASM calculates usable Free Space, it determines the amount of space to reserve in the case of a disk failure.

For Oracle Database Appliance with 2 or 4 NVMe drives, this reserved space is not required. When you query Oracle ASM or Oracle Database Appliance commands to view the amount of storage available, the usable File MB value may report a negative number.

Table B-5 Oracle ASM Calculations

Number of Drives	Redundancy	Total_MB	Free_MB	Req_mir_free_ MB	Usable_file_MB	Name
2	NORMAL	4894016	4893372	0	1220644	RECO/
4	NORMAL	1231176	1230996	610468	305150	RECO/

Note:

Note: 1TB = MB divided by  $1024^2$ 

#### **How Oracle ASM and Oracle Database Appliance Define Capacity**

The following table describes how capacity terms are defined by Oracle ASM and Oracle Database Appliance.

Table B-6 Definition of Terminology

Term	Oracle ASM Definition	Oracle Database Appliance Definition
Total_MB	Size of the disk group in MB	Total usable storage. For example, for 2 NVMe drives, total usable storage is 5.8TB.
Free_MB	Free space in the disk group in MB, without regard to redundancy.	Total usable storage after formatting to Oracle ASM disk groups. For example, for 2 NVMe drives, total usable storage is 5.8TB.



Table B-6 (Cont.) Definition of Terminology

Term	Oracle ASM Definition	Oracle Database Appliance Definition
Req_mir_free_MB	Amount of space that must be available in the disk group to restore full redundancy after the worst failure that can be tolerated by the disk group.	Amount of space that must be available in the disk group to restore full redundancy after the most severe failure that can be tolerated by the disk group. This is the REQUIRED_MIRROR_FREE_MB column from the V\$ASM_DISKGROUP view.
Usable_file_MB	Amount of free space, adjusted for mirroring, that is available for new files.	Total usable space taking into consideration the mirroring level. Oracle ASM also calculates the amount of space required.



C

# Creating an Appliance Using JSON File

Understand the process to create an appliance using the command odacli create-appliance and view an example JSON file.

- Loading and Saving Appliance Configurations
   You can load a saved JSON file and use it to configure your appliance from the Browser User Interface.
- Readme for the Command odacli create-appliance
   If you want to create the appliance outside of the Browser User Interface, then review the readme file for details on how to create a JSON file to use with the command-line interface.
- Example JSON Files to Create a Single Node Appliance with the CLI
  Follow these JSON file examples to create a JSON file to deploy a single node appliance
  with the command odacli create-appliance.
- Example JSON File to Create a High-Availability Appliance with the CLI Follow the JSON file example to create a JSON file to deploy a high-availability appliance with the command odacli create-appliance.

### **Loading and Saving Appliance Configurations**

You can load a saved JSON file and use it to configure your appliance from the Browser User Interface.

#### Using a Saved Configuration to Create a New Appliance in the Browser User Interface

You can load a saved configuration from your client machine, and create a new appliance.

- Log into the Browser User Interface.
- 2. In the Create Appliance page, click **Browse** next to Load Configuration.
- Select the JSON file from the local machine, being used to access the Browser User Interface.
- 4. The appliance configuration values from the JSON file are populated in the fields on the Create Appliance page.
- Make any changes required, and submit the request to create the appliance Note that for security requirements, you must enter passwords manually.

## Readme for the Command odacli create-appliance

If you want to create the appliance outside of the Browser User Interface, then review the readme file for details on how to create a JSON file to use with the command-line interface.

You can use the command odacli create-appliance and a JSON file that includes your appliance configuration settings to deploy the appliance instead of using the Browser User Interface.



It is important to review the readme and the examples carefully before creating your JSON file. If you do not enter your network and Oracle ILOM information correctly based on your setup, you will lose network access to both the host and Oracle ILOM.

#### Readme

The readme is located in the <code>/opt/oracle/dcs/sample</code> directory. Review the readme carefully along with the provided JSON example files. Create a JSON file with the necessary changes based on your environment and requirements.

# Example JSON Files to Create a Single Node Appliance with the CLI

Follow these JSON file examples to create a JSON file to deploy a single node appliance with the command odacli create-appliance.

Use the example JSON files and the information located in the readme as a template to create a file for your environment. Examples and the readme are located in the /opt/oracle/dcs/sample directory.

#### Note:

If you do not enter your network and Oracle ILOM information correctly based on your setup, then network access is lost to both the host and Oracle ILOM.

When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

**Note:** To configure Oracle ASR during provisioning, always specify the asrType parameter in the JSON file.

## Example C-1 JSON File to Create a Single Node Oracle Database Appliance with Role Separation

The following is an example of a JSON file that creates a single node appliance on Oracle Database Appliance. The example uses role separation.

```
"instance" : {
   "name" : "odambox",
   "instanceBaseName" : "odambox-c",
   "dbEdition" : "EE",
   "timeZone" : "UTC",
   "ntpServers" : ["xx.xx.xx.xx"],
   "dnsServers" : ["xx.xx.xx.xx","xx.xx.xx","xx.xx.xx"],
   "domainName" : "example.com",
   "isRoleSeparated" : true,
   "osUserGroup" : {
        "groups" : [ {
```



```
"groupId" : 1001,
      "groupName" : "oinstall",
      "groupRole" : "oinstall"
      "groupId" : 1002,
      "groupName" : "dbaoper",
      "groupRole" : "dbaoper"
    }, {
      "groupId" : 1003,
      "groupName" : "dba",
      "groupRole" : "dba"
    }, {
      "groupId" : 1004,
      "groupName" : "asmadmin",
      "groupRole" : "asmadmin"
    }, {
      "groupId" : 1005,
      "groupName" : "asmoper",
      "groupRole" : "asmoper"
      "groupId" : 1006,
      "groupName" : "asmdba",
      "groupRole" : "asmdba"
    } ],
    "users" : [ {
      "userId" : 1000,
      "userName" : "oracle",
      "userRole" : "oracleUser"
    }, {
      "userId" : 1001,
      "userName" : "grid",
      "userRole" : "gridUser"
   } ]
 }
},
"sysOraHomeStorage": {
      "volumeSize": "160",
      "diskgroup": "DATA"
"nodes" : [ {
  "nodeNumber" : "0",
  "nodeName" : "odambox",
  "network" : [ {
     "nicName" : "btbond1",
     "ipAddress" : "xx.xx.xx.xx",
     "subNetMask" : "xx.xx.xx.xx",
     "gateway" : "xx.xx.xx.xx",
     "networkType" : [ "Public" ],
     "isDefaultNetwork" : true
   },
 ],
  "ilom" : {
    "ilomName": "odambox-c",
    "ipAddress": "xx.xx.xx.xx",
    "subNetMask": "xx.xx.xx.xx",
    "gateway":"xx.xx.xx.xx"
```

```
} ],
"grid" : {
  "diskGroup" : [ {
    "diskGroupName" : "DATA",
    "redundancy" : "NORMAL",
    "diskPercentage" :80
    "diskGroupName" : "RECO",
    "redundancy" : "NORMAL",
    "diskPercentage" :20
  } ],
"scan" : {
   "scanName": "odambox-scan",
   "ipAddresses":[
  "xx.xx.xx"
   ]
  },
"vip":[
  {
  "nodeNumber":"0",
  "vipName": "odambox-vip",
  "ipAddress":"xx.xx.xx"
  ],
  "language" : "en"
"database" : {
  "dbName" : "myTestDb",
  "databaseUniqueName": "myTestDb sealkj",
  "dbEdition" : "EE",
  "dbVersion" : "19.26.0.0.0",
  "dbHomeId":null,
  "instanceOnly" : false,
  "isCdb" : true,
  "pdBName" : "pdb1",
  "pdbAdminuserName" : "pdbuser",
  "enableTDE":true,
  "adminPassword" : "password",
  "dbType" : "SI",
  "dbTargetNodeNumber" : null,
  "dbClass" : "OLTP",
  "dbShape" : "odb1",
  "dbStorage" : "ACFS",
  "dbCharacterSet" : {
    "characterSet" : "AL32UTF8",
    "nlsCharacterset" : "AL16UTF16",
    "dbTerritory" : "AMERICA",
    "dbLanguage" : "AMERICAN"
  },
  "dbConsoleEnable" : false,
  "backupConfigId":null,
  "rmanBkupPassword": null
},
"asr" :{
  "asrType": "INTERNAL",
```

```
"userName":"john.smith@example.com",
    "password":"password",
    "proxyServerName":"www-proxy.example.com",
    "proxyPort":"80",
    "proxyUserName":"proxy-user",
    "proxyPassword":"proxy-password",
    "snmpVersion":"v2"
}
```

# Example C-2 JSON File to Create a Single Node Oracle Database Appliance without Role Separation

The following is an example of a JSON file that creates an Oracle Database Appliance without using role separation. This example creates two groups (oinstall and dba) and one user ("oracle").

```
{
  "instance" : {
    "name" : "odambox",
    "instanceBaseName" : "odambox-c",
    "dbEdition" : "EE",
    "timeZone" : "UTC",
    "ntpServers" : ["xx.xx.xx.xx"],
    "dnsServers" : ["xx.xx.xx","xx.xx.xx","xx.xx.xx"],
    "domainName" : "example.com",
    "isRoleSeparated" : false,
    "osUserGroup" : {
      "groups" : [ {
        "groupId" : 1001,
        "groupName" : "oinstall",
        "groupRole" : "oinstall"
      }, {
        "groupId" : 1002,
        "groupName" : "dba",
        "groupRole" : "dba"
     } ],
     "users" : [ {
        "userId" : 1000,
        "userName" : "oracle",
        "userRole" : "oracleUser"
      } ]
    }
  },
  "nodes" : [ {
    "nodeNumber" : "0",
    "nodeName" : "odambox",
    "network" : [ {
       "nicName" : "btbond1",
       "ipAddress" : "xx.xx.xx",
       "subNetMask" : "xx.xx.xx.xx",
       "gateway" : "xx.xx.xx.xx",
       "networkType" : [ "Public" ],
       "isDefaultNetwork" : true
      },
    ],
```



```
"ilom" : {
    "ilomName": "odambox-c",
    "ipAddress": "xx.xx.xx.xx",
    "subNetMask": "xx.xx.xx.xx",
    "gateway": "xx.xx.xx.xx"
} ],
"grid" : {
 "diskGroup" : [ {
    "diskGroupName" : "DATA",
    "redundancy" : "NORMAL",
    "diskPercentage" :80
  }, {
    "diskGroupName" : "RECO",
    "redundancy" : "NORMAL",
    "diskPercentage" :20
  } ],
"scan" : {
   "scanName": "odambox-scan",
   "ipAddresses":[
  "xx.xx.xx"
 },
"vip":[
  "nodeNumber":"0",
  "vipName": "odambox-vip",
  "ipAddress":"xx.xx.xx"
 ],
 "language" : "en"
"database" : {
  "dbName" : "myTestDb",
  "databaseUniqueName": "myTestDb sealkj",
  "dbEdition" : "EE",
  "dbVersion": "19.26.0.0.0",
 "dbHomeId":null,
  "instanceOnly" : false,
  "isCdb" : true,
  "pdBName" : "pdb1",
  "pdbAdminuserName" : "pdbuser",
  "enableTDE":true,
  "adminPassword" : "password",
  "dbType" : "SI",
  "dbTargetNodeNumber" : null,
  "dbClass" : "OLTP",
  "dbShape" : "odb1",
  "dbStorage" : "ACFS",
  "dbCharacterSet" : {
    "characterSet" : "AL32UTF8",
    "nlsCharacterset" : "AL16UTF16",
    "dbTerritory" : "AMERICA",
    "dbLanguage" : "AMERICAN"
  },
  "dbConsoleEnable" : false,
```

```
"backupConfigId":null,
    "rmanBkupPassword": null
},
"asr" :{
    "asrType": "INTERNAL",
    "userName":"john.smith@example.com",
    "password":"password",
    "proxyServerName":"www-proxy.example.com",
    "proxyPort":"80",
    "proxyUserName":"proxy-user",
    "proxyPassword":"proxy-password",
    "snmpVersion":"v2"
}
```

# Example JSON File to Create a High-Availability Appliance with the CLI

Follow the JSON file example to create a JSON file to deploy a high-availability appliance with the command odacli create-appliance.

Use the example JSON files and the information located in the readme as a template to create a file for your environment. Examples and the readme are located in the /opt/oracle/dcs/sample directory.

#### Note:

It is important to review the readme and the examples carefully before creating your JSON file. If you do not enter your network and Oracle ILOM information correctly based on your setup, then network access is lost to both the host and Oracle ILOM.

# Example C-3 JSON File to Create a high-availability Oracle Database Appliance with Role Separation

The following is an example of a JSON file that creates a high-availability appliance on Oracle Database Appliance bare metal platform. The example uses role separation. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.



```
"groupId":1001,
             "groupName": "oinstall",
             "groupRole": "oinstall"
         },
             "groupId":1002,
            "groupName": "dbaoper",
             "groupRole": "dbaoper"
         },
             "groupId":1003,
             "groupName": "dba",
             "groupRole": "dba"
         },
             "groupId":1004,
             "groupName": "asmadmin",
             "groupRole": "asmadmin"
         },
            "groupId":1005,
             "groupName": "asmoper",
             "groupRole":"asmoper"
         },
            "groupId":1006,
             "groupName": "asmdba",
             "groupRole": "asmdba"
      ],
      "users":[
         {
            "userId":101,
             "userName": "grid",
             "userRole":"gridUser"
         },
             "userId":102,
            "userName": "oracle",
            "userRole": "oracleUser"
   },
   "objectStoreCredentials":null
"sysOraHomeStorage": {
     "volumeSize": "160",
     "diskgroup": "DATA"
"nodes":[
   {
      "nodeNumber":"0",
      "nodeName": "odahaboxc1n2",
      "network":[
            "nicName": "btbond1",
```

},

```
"ipAddress":"xx.xx.xx.xx",
             "subNetMask": "xx.xx.xx.xx",
             "gateway": "xx.xx.xx.xx",
             "networkType":[
               "Public"
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox2-c",
         "ipAddress": "xx.xx.xx.xx",
         "subNetMask": "xx.xx.xx.xx",
         "gateway": "xx.xx.xx.xx"
   },
      "nodeNumber":"1",
      "nodeName": "odahaboxc1n1",
      "network":[
         {
            "nicName": "btbond1",
            "ipAddress":"xx.xx.xx.xx",
            "subNetMask": "xx.xx.xx.xx",
            "gateway": "xx.xx.xx.xx",
            "networkType":[
               "Public"
            ],
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox1-c",
         "ipAddress": "xx.xx.xx.xx",
         "subNetMask": "xx.xx.xx.xx",
         "gateway": "xx.xx.xx.xx"
],
"grid":{
   "diskGroup":[
      {
         "diskGroupName":"DATA",
         "redundancy": "HIGH",
         "diskPercentage":80
      },
         "diskGroupName": "RECO",
         "redundancy": "HIGH",
         "diskPercentage":20
      },
         "diskGroupName": "REDO",
         "redundancy": "HIGH",
         "diskPercentage":null
```

```
"scan":{
      "scanName": "odahaboxc1-scan",
      "ipAddresses":[
         "xx.xx.xx",
         "xx.xx.xx"
      1
   },
   "vip":[
      {
         "nodeNumber":"0",
         "vipName": "odahaboxc1n2-vip",
         "ipAddress":"xx.xx.xx.xx"
      },
         "nodeNumber":"1",
         "vipName": "odahaboxc1n1-vip",
         "ipAddress":"xx.xx.xx"
   ],
   "language": "en"
},
"database":{
   "dbName": "myTestDb",
   "databaseUniqueName": "myTestDb sea1kj",
   "dbVersion": "19.26.0.0.0",
   "dbHomeId":null,
   "instanceOnly":false,
   "isCdb":true,
   "pdBName": "pdb1",
   "pdbAdminuserName": "pdbuser",
   "enableTDE":true,
   "adminPassword": "password",
   "dbType": "RAC",
   "dbTargetNodeNumber":null,
   "dbClass": "OLTP",
   "dbShape": "odb1",
   "dbStorage": "ACFS",
   "dbCharacterSet":{
      "characterSet": "AL32UTF8",
      "nlsCharacterset": "AL16UTF16",
      "dbTerritory": "AMERICA",
      "dbLanguage": "AMERICAN"
   },
   "dbConsoleEnable":false,
   "backupConfigId":null
},
"asr":null
```

# Example C-4 JSON File to Create a high-availability Oracle Database Appliance with Enterprise Edition High Availability Enabled

The following is an example of a JSON file that creates a high-availability appliance on Oracle Database Appliance bare metal platform. The example shows enabling of Enterprise Edition

High Availability. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
"instance":{
  "name": "odahabox",
  "instanceBaseName": "odahabox",
   "dbEdition": "EE",
  "timeZone":"UTC",
   "ntpServers": ["10.0.3.14"],
   "dnsServers" : ["xx.xx.xx","xx.xx.xx","xx.xx.xx"],
   "domainName": "example.com",
  "isRoleSeparated":true,
   "osUserGroup":{
      "groups":[
            "groupId":1001,
            "groupName": "oinstall",
            "groupRole": "oinstall"
         },
         {
            "groupId":1002,
            "groupName": "dbaoper",
            "groupRole": "dbaoper"
            "groupId":1003,
            "groupName": "dba",
            "groupRole": "dba"
         },
            "groupId":1004,
            "groupName": "asmadmin",
            "groupRole": "asmadmin"
         },
            "groupId":1005,
            "groupName": "asmoper",
            "groupRole": "asmoper"
         },
            "groupId":1006,
            "groupName": "asmdba",
            "groupRole": "asmdba"
      ],
      "users":[
         {
            "userId":101,
            "userName": "grid",
            "userRole": "gridUser"
         },
            "userId":102,
            "userName": "oracle",
            "userRole": "oracleUser"
```



```
},
   "objectStoreCredentials":null
"sysOraHomeStorage": {
     "volumeSize": "160",
     "diskgroup": "DATA"
"nodes":[
   {
      "nodeNumber":"0",
      "nodeName": "odahaboxc1n2",
      "network":[
         {
            "nicName": "btbond1",
            "ipAddress":"xx.xx.xx.xx",
            "subNetMask": "xx.xx.xx.xx",
            "gateway": "xx.xx.xx.xx",
            "networkType":[
               "Public"
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox2-c",
         "ipAddress":"xx.xx.xx.xx",
         "subNetMask": "xx.xx.xx.xx",
         "gateway": "xx.xx.xx.xx"
   },
      "nodeNumber":"1",
      "nodeName": "odahaboxc1n1",
      "network":[
         {
            "nicName": "btbond1",
            "ipAddress":"xx.xx.xx.xx",
            "subNetMask": "xx.xx.xx.xx",
            "gateway": "xx.xx.xx.xx",
            "networkType":[
               "Public"
            ],
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox1-c",
         "ipAddress":"xx.xx.xx.xx",
         "subNetMask": "xx.xx.xx.xx",
         "gateway": "xx.xx.xx.xx"
   }
],
"grid":{
```

```
"diskGroup":[
      {
         "diskGroupName": "DATA",
         "redundancy": "HIGH",
         "diskPercentage":80
      },
         "diskGroupName": "RECO",
         "redundancy": "HIGH",
         "diskPercentage":20
      },
         "diskGroupName": "REDO",
         "redundancy": "HIGH",
         "diskPercentage":null
   ],
   "scan":{
      "scanName": "odahaboxc1-scan",
      "ipAddresses":[
         "xx.xx.xx",
         "xx.xx.xx"
      ]
   },
   "vip":[
      {
         "nodeNumber":"0",
         "vipName": "odahaboxc1n2-vip",
         "ipAddress":"xx.xx.xx"
      },
         "nodeNumber":"1",
         "vipName": "odahaboxc1n1-vip",
         "ipAddress":"xx.xx.xx.xx"
   ],
   "language": "en"
},
"database":{
   "dbName": "myTestDb",
   "databaseUniqueName": "myTestDb sea1kj",
   "dbVersion": "19.26.0.0.0",
   "dbHomeId":null,
   "instanceOnly":false,
   "isCdb":true,
   "pdBName": "pdb1",
   "pdbAdminuserName": "pdbuser",
   "enableTDE":true,
   "adminPassword": "password",
   "dbType": "RAC",
   "dbTargetNodeNumber":null,
   "dbClass": "OLTP",
   "dbShape": "odb1",
   "dbStorage": "ACFS",
   "dbCharacterSet":{
      "characterSet": "AL32UTF8",
```

```
"nlsCharacterset":"AL16UTF16",
        "dbTerritory":"AMERICA",
        "dbLanguage":"AMERICAN"
    },
        "dbConsoleEnable":false,
        "backupConfigId":null
    },
        "asr":null
}
```

# Example C-5 JSON File to Create a high-availability Oracle Database Appliance with Standard Edition High Availability Enabled

The following is an example of a JSON file that creates a high-availability appliance on Oracle Database Appliance bare metal platform. The example shows enabling of Standard Edition High Availability. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
   "instance":{
      "name": "odahabox",
      "instanceBaseName": "odahabox",
      "dbEdition": "SE",
      "timeZone":"UTC",
      "ntpServers" : ["10.0.3.14"],
      "dnsServers" : ["xx.xx.xx.xx","xx.xx.xx","xx.xx.xx"],
      "domainName": "example.com",
      "isRoleSeparated":true,
      "osUserGroup":{
         "groups":[
            {
                "groupId":1001,
               "groupName": "oinstall",
                "groupRole": "oinstall"
            },
                "groupId":1002,
                "groupName": "dbaoper",
                "groupRole": "dbaoper"
            },
                "groupId":1003,
                "groupName": "dba",
                "groupRole": "dba"
            },
                "groupId":1004,
                "groupName": "asmadmin",
                "groupRole": "asmadmin"
            },
                "groupId":1005,
                "groupName": "asmoper",
                "groupRole": "asmoper"
            },
```

```
"groupId":1006,
             "groupName": "asmdba",
             "groupRole": "asmdba"
      ],
      "users":[
         {
            "userId":101,
             "userName": "grid",
            "userRole":"gridUser"
         },
             "userId":102,
            "userName": "oracle",
            "userRole": "oracleUser"
   },
   "objectStoreCredentials":null
},
"sysOraHomeStorage": {
     "volumeSize": "160",
     "diskgroup": "DATA"
"nodes":[
   {
      "nodeNumber":"0",
      "nodeName": "odahaboxc1n2",
      "network":[
         {
            "nicName": "btbond1",
            "ipAddress":"xx.xx.xx.xx",
            "subNetMask": "xx.xx.xx.xx",
             "gateway": "xx.xx.xx.xx",
             "networkType":[
                "Public"
            ],
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox2-c",
         "ipAddress": "xx.xx.xx.xx",
         "subNetMask": "xx.xx.xx.xx",
         "gateway": "xx.xx.xx.xx"
   },
      "nodeNumber":"1",
      "nodeName": "odahaboxc1n1",
      "network":[
         {
            "nicName": "btbond1",
            "ipAddress": "xx.xx.xx.xx",
            "subNetMask": "xx.xx.xx.xx",
             "gateway": "xx.xx.xx.xx",
```

```
"networkType":[
               "Public"
            "isDefaultNetwork":true
      ],
      "ilom":{
         "ilomName": "odahabox1-c",
         "ipAddress":"xx.xx.xx.xx",
         "subNetMask": "xx.xx.xx.xx",
         "gateway": "xx.xx.xx.xx"
],
"grid":{
   "diskGroup":[
      {
         "diskGroupName": "DATA",
         "redundancy": "HIGH",
         "diskPercentage":80
      },
         "diskGroupName": "RECO",
         "redundancy": "HIGH",
         "diskPercentage":20
      },
         "diskGroupName": "REDO",
         "redundancy": "HIGH",
         "diskPercentage":null
   ],
   "scan":{
      "scanName": "odahaboxc1-scan",
      "ipAddresses":[
         "xx.xx.xx",
         "xx.xx.xx"
      ]
   },
   "vip":[
      {
         "nodeNumber":"0",
         "vipName": "odahaboxc1n2-vip",
         "ipAddress":"xx.xx.xx"
      },
         "nodeNumber":"1",
         "vipName": "odahaboxc1n1-vip",
         "ipAddress":"xx.xx.xx.xx"
   ],
   "language": "en"
"database":{
   "dbName": "myTestDb",
   "databaseUniqueName": "myTestDb sea1kj",
```

```
"dbVersion":"19.26.0.0.0",
   "dbHomeId":null,
   "instanceOnly":false,
   "isCdb":true,
   "pdBName": "pdb1",
   "pdbAdminuserName": "pdbuser",
   "enableTDE":true,
   "adminPassword": "password",
   "dbType": "RAC",
   "dbTargetNodeNumber":null,
   "dbClass":"OLTP",
   "dbShape": "odb1",
   "dbStorage": "ACFS",
   "dbCharacterSet":{
      "characterSet": "AL32UTF8",
      "nlsCharacterset": "AL16UTF16",
      "dbTerritory": "AMERICA",
      "dbLanguage": "AMERICAN"
   },
   "dbConsoleEnable":false,
   "backupConfigId":null
},
"asr":null
```



D

# Database Shapes for Oracle Database Appliance

Use the information in this appendix to select database shapes, or templates, for your planned databases.

- About Database Shapes and Classes
  - Review this information to help determine the database shape (also known as a database template) and class to use based on the common workload your databases perform.
- Database Shapes for the OLTP Class
   Use Oracle Database Appliance OLTP Database Shapes if your database workload is primarily online transaction processing (OLTP).
- Database Shapes for the In-Memory Class
   Use Oracle Database Appliance In-Memory (IMDB) database shapes if your database workload can fit in memory, and can benefit from in-memory performance capabilities.
- Database Shapes for the DSS Class
   Use DSS database shapes if your database workload is primarily decision support services
   (DSS) or data warehousing.

### **About Database Shapes and Classes**

Review this information to help determine the database shape (also known as a database template) and class to use based on the common workload your databases perform.

Oracle Database Appliance shapes define databases with parameters selected specifically to optimize performance on Oracle Database Appliance. In addition, these shapes help you to set up appropriate instance caging.

Oracle Database Appliance enables you to consolidate many databases into a single system. Consolidation can minimize idle resources, maximize efficiency, and lower costs. By using instance caging in conjunction with Oracle Database Resource Manager (the Resource Manager), you can provide desired levels of service across multiple instances on a single Oracle Database Appliance.

Oracle Database Appliance shapes are already tuned for the size of each database instance workload. They are designed to run on a specific number of cores. Caging ensures that each database workload is restricted to the set of cores allocated by the shape, enabling multiple databases to run concurrently with no performance degradation, up to the capacity of Oracle Database Appliance. You can select database shape sizes larger than your current needs to provide for planned growth, which you accommodate later by adjusting System Global Area (SGA) and Program Global Area (PGA) sizes as well as the number of cores.

#### Note:

Oracle strongly recommends that you use the Oracle Database Appliance shapes, because they implement best practices and are configured specifically for Oracle Database Appliance.

#### Important:

Except for the largest database shape, all other database shapes supported on the Oracle Database Appliance bare metal system are also supported on Oracle Database Appliance DB system.

#### **Choosing a Database Shape**

Database shapes are configured specifically for the type of database workload that you want to carry out on your databases on Oracle Database Appliance. Choose the shape that best matches the common workload your databases perform (OLTP, DSS, In-Memory).

The database sizing tables provide shape names and sizing based on the number of CPUs and memory attributes for each type of database workload.

Identify the shape type that is appropriate to your database workload and hardware:

- Use Oracle Database Appliance OLTP Database Shapes if your database workload is primarily online transaction processing (OLTP).
- Use Oracle Database Appliance DSS database shapes if your database workload is primarily decision support services (DSS) or data warehousing.
- Use Oracle Database Appliance In-Memory (IMDB) database shapes if your database workload can fit in memory, and can benefit from in-memory performance capabilities.

Use the database shape tables to help select the best shapes for your databases. When using these tables remember the following:

- The information in the tables assumes that you are creating local disk backups. Consider the space requirements for your database and the policy for local disk backups versus external backups. Typically, external backups have more space available for the database than local backups.
- The log file size assumes three (3) REDO log groups for each instance with a log switch every 15 minutes when the system is running at full capacity.

#### Database Shapes for the OLTP Class

Use Oracle Database Appliance OLTP Database Shapes if your database workload is primarily online transaction processing (OLTP).

The tables list the online transaction processing (OLTP) database shape sizes for Oracle Database Appliance X10-2S, X10-2L, and X10-2-HA.

The information in the table assumes the following:



• You are creating local disk backups. Consider the space requirements for your database and the policy for local disk backups versus external backups. Typically, external backups have more space available for the database than local backups.

Table D-1 Oracle Database Appliance X10-S OLTP Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	2	1	200	4	32
odb1	1	4	2	200	4	32
odb2	2	8	4	400	4	32
odb4	4	16	8	800	4	64
odb6	6	24	12	1200	8	256
odb08	8	32	16	1600	8	256
odb10	10	40	20	2000	8	256
odb12	12	48	24	2400	16	256
odb16	16	64	32	3200	16	256
odb20	20	80	40	4000	16	256
odb24	24	96	48	4800	16	256
odb28	28	112	56	5600	16	256
odb32	32	128	64	6400	16	256

Table D-2 Oracle Database Appliance X10-L and X10-HA OLTP Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	2	1	200	4	32
odb1	1	4	2	200	4	32
odb2	2	8	4	400	4	32
odb4	4	16	8	800	4	64
odb6	6	24	12	1200	8	256
odb08	8	32	16	1600	8	256
odb10	10	40	20	2000	8	256
odb12	12	48	24	2400	16	256
odb16	16	64	32	3200	16	256
odb20	20	80	40	4000	16	256
odb24	24	96	48	4800	16	256
odb28	28	112	56	5600	16	256
odb32	32	128	64	6400	16	256
odb36	36	144	72	7200	32	256
odb42	42	168	84	8400	32	256
odb48	48	192	96	9600	32	256
odb56	56	224	112	11200	32	256



Table D-2 (Cont.) Oracle Database Appliance X10-L and X10-HA OLTP Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb64	64	256	128	12800	32	256

#### Database Shapes for the In-Memory Class

Use Oracle Database Appliance In-Memory (IMDB) database shapes if your database workload can fit in memory, and can benefit from in-memory performance capabilities.

The tables list the In-Memory database shape sizes for Oracle Database Appliance X10-2S, X10-2L, and X10-2-HA.

The information in the table assumes the following:

 You are creating local disk backups. Consider the space requirements for your database and the policy for local disk backups versus external backups. Typically, external backups have more space available for the database than local backups.

Table D-3 Oracle Database Appliance X10-S In-Memory Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes n - M e m o r	Redo log file size (GB)	Log buffer (MB)
odb1s	1	2	1	200	4	32
odb1	1	4	2	<b>2</b> 00	4	32
odb2	2	8	4	<b>4</b> 00	4	32
odb4	4	16	8	<b>8</b> 00	4	64
odb6	6	24	12	<b>1</b> 200 2	8	256
odb08	8	32	16	<b>1</b> 600 6	8	256
odb10	10	40	20	<b>2</b> 000 0	8	256
odb12	12	48	24	<b>2</b> 400 4	16	256
odb16	16	64	32	<b>3</b> 200 2	16	256
odb20	20	80	40	<b>4</b> 000 2	16	256
odb24	24	96	48	<b>4</b> 800 8	16	256
odb28	28	112	56	<b>5</b> 600	16	256



Table D-3 (Cont.) Oracle Database Appliance X10-S In-Memory Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes n - M e m o r	Redo log file size (GB)	Log buffer (MB)
odb32	32	128	64	<b>6</b> 400 4	16	256

Table D-4 Oracle Database Appliance X10-L and X10-HA In-Memory Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes n - M e m o r	Redo log file size (GB)	Log buffer (MB)
odb1s	1	2	1	200	4	32
odb1	1	4	2	<b>2</b> 00	4	32
odb2	2	8	4	<b>4</b> 00	4	32
odb4	4	16	8	<b>8</b> 00	4	64
odb6	6	24	12	<b>1</b> 200 2	8	256
odb08	8	32	16	<b>1</b> 600 6	8	256
odb10	10	40	20	<b>2</b> 000 0	8	256
odb12	12	48	24	<b>2</b> 400 4	16	256
odb16	16	64	32	<b>3</b> 200 2	16	256
odb20	20	80	40	<b>4</b> 000 2	16	256
odb24	24	96	48	<b>4</b> 800 8	16	256
odb28	28	112	56	<b>5</b> 600	16	256
odb32	32	128	64	<b>6</b> 400 4	16	256
odb36	36	144	72	<b>7</b> 200 2	32	256
odb42	42	168	84	<b>8</b> 400 4	32	256

Table D-4 (Cont.) Oracle Database Appliance X10-L and X10-HA In-Memory Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes n - M e m o r	Redo log file size (GB)	Log buffer (MB)
odb48	48	192	96	<b>9</b> 600 6	32	256
odb56	56	224	112	<b>1</b> 1200 1 2	32	256
odb64	64	256	128	<b>1</b> 2800 2 8	32	256

#### Database Shapes for the DSS Class

Use DSS database shapes if your database workload is primarily decision support services (DSS) or data warehousing.

The tables list the DSS database shape sizes for Oracle Database Appliance X10-S, X10-L, and X10-HA.

The information in the table assumes the following:

 You are creating local disk backups. Consider the space requirements for your database and the policy for local disk backups versus external backups. Typically, external backups have more space available for the database than local backups.

Table D-5 Oracle Database Appliance X10-S DSS Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	1	2	200	4	32
odb1	1	2	4	200	4	32
odb2	2	4	8	400	4	32
odb4	4	8	16	800	4	64
odb6	6	12	24	1200	8	256
odb08	8	16	32	1600	8	256
odb10	10	20	40	2000	8	256
odb12	12	24	48	2400	16	256
odb16	16	32	64	3200	16	256
odb20	20	40	80	4000	16	256
odb24	24	48	96	4800	16	256
odb28	28	56	112	5600	16	256

Table D-5 (Cont.) Oracle Database Appliance X10-S DSS Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb32	32	64	128	6400	16	256

Table D-6 Oracle Database Appliance X10-L and X10-HA DSS Database Shapes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	1	2	200	4	32
odb1	1	2	4	200	4	32
odb2	2	4	8	400	4	32
odb4	4	8	16	800	4	64
odb6	6	12	24	1200	8	256
odb08	8	16	32	1600	8	256
odb10	10	20	40	2000	8	256
odb12	12	24	48	2400	16	256
odb16	16	32	64	3200	16	256
odb20	20	40	80	4000	16	256
odb24	24	48	96	4800	16	256
odb28	28	56	112	5600	16	256
odb32	32	64	128	6400	16	256
odb36	36	72	144	7200	32	256
odb42	42	84	168	8400	32	256
odb48	48	96	192	9600	32	256
odb56	56	112	224	11200	32	256
odb64	64	128	256	12800	32	256



# Glossary



# Index

Numerics	bond		
	network interface, 12-1, 12-2		
10GBase-T (copper) network ports, 3-4, 3-6	bridge		
25GbE SFP28 (fiber) network ports, 3-4, 3-6	network interface, 12-1		
	Browser User Interface, <i>C-1</i>		
A	about, <i>2-4</i>		
	actions, 2-4		
ACFS, <i>B-1</i> , <i>B-2</i>	BUI		
ACFS mount points, B-2	clone vdisk, 16-43		
ACR, 20-26, 20-28	clone vm, 16-52		
administrative account users, 9-2	create CPU pool, 15-3		
administrative accounts, 9-2	create dbsystem, 16-17		
agent	create vdisk, 16-41		
update, 17-80–17-83	create vm, 16-45, 16-49		
agent proxy setting, 13-17	create vmstorage, 16-34 create vnetwork, 16-37		
ASM, B-1	delete cpupool, 15-6		
ASM Cluster File System	delete chupooi, 15-6 delete dbsystem, 16-29		
See Oracle ACFS ASR	delete ubsystem, 10-23 delete vdisk, 16-44		
configure, 17-259, 17-263, 19-3, 19-5, 19-7	delete vm, 16-55		
delete, 17-262	delete vnetwork, 16-40		
details, 17-262 details, 17-261	delete-vmstorage, 16-36		
documentation, 19-13	describe CPU pool, 15-5		
modify, 17-263	describe dbsystem, 16-24		
register, 19-3, 19-5, 19-7	describe storage, 16-35		
test, 17-265	describe vdisk, 16-42		
Automatic Storage Management	describe vm, 16-54		
See Oracle ASM	describe vnetwork, 16-39		
oo o alase nom	list dbsystems, 16-23		
D	modify cpupool, 15-6		
В	modify dbsystem, 16-24, 16-26, 16-30		
back up database, 13-19	modify vdisk, 16-44		
backup and recovery	modify vm, 16-53		
CLI commands, 17-110	modify vmstorage, 16-36		
RMAN, 9-3	modify vnetwork, 16-40		
backup databases, 13-1	remap cpupools, 15-4		
backup location	start dbsystem, 16-27		
disk group, 1-1	start vm, 16-55		
backup policy, 13-22, 13-23	start vnetwork, 16-39		
update, 13-19	stop dbsystem, 16-28		
backup to external FRA, 13-18			
backup to internal FRA, 13-18	С		
backup to NFS location, 13-18	<u> </u>		
backup to Object Store, 13-18	cabling, 3-1, 3-4		
bare metal patching, 8-9, 8-18, 8-43, 8-46	validate, <i>17-280</i>		
bill of materials, 20-16	cleanup, <i>8-50</i>		



cleanup utility, 7-1, 7-7	database <i>(continued)</i>
cleanup.pl, <i>7-1</i> , <i>7-7</i> , <i>20-20</i>	register, 17-194
CLI commands	template
configure, 17-13	See shape, database
cloning database, 9-15	territory, 1-1
Configuration Audit Tool (ORAchk), 20-22	upgrade, 9-20
configure CLI commands	database backup
configure-firstnet, 17-13	delete, 13-21
configure-firstnet, 4-4	database classes, <i>D-1</i>
CPU	database home
commands, 17-160	acfs, 9-11
CPU core	create, 9-29
current configuration, 17-161	details, 9-29
enable, <i>17-161</i>	display details, 17-208
CPU cores	list, 9-29
configuration history, 17-160	database home storage
list, 17-160	configure, 17-203
cpu pool	describe, 17-205
creating, 15-3	list, 17-204
CPU pool	modify, 17-206
audit record, 15-7	database homes
deleting, 15-6	ACFS, 9-3
modifying, 15-6	Database Security Assessment report, 20-23
over-subscribed, 15-7	database shapes, D-1, D-2, D-4, D-6
remapping, 15-4	about, D-1
viewing, 15-5	database storage, <b>B-1</b>
cpu pools	commands, 17-210
about, <i>15-1</i>	create, 17-211
cpupool	display details, 17-212, 17-213
create, 17-163, 18-30	list, 17-216
delete, 17-167, 18-34	database, register, 9-34
describe, 17-166, 18-33	db system
modify, 17-166, 18-33	modifying, 16-24
cpupools	DB system
auditrecord, <i>17-168</i> , <i>17-169</i> , <i>18-34</i> , <i>18-35</i>	backup, restore and recovery, 16-30
list, 17-166, 18-32	creating, 16-17
remap, 17-165, 18-31	delete, 16-29
create appliance, 4-9	describing, 16-24
ordate appliance, 4 o	modifying, 16-30
5	network, 16-26
D	Oracle Data Guard, 16-33
DATA diek group P 2	start, 16-27
DATA disk group, <i>B-3</i>	stop, 16-28
database, 1-1, 9-28, D-2, D-4, D-6	db system patching, 8-33
backup policy, 13-19	DB systems
block size, 1-1	list, 16-23
clone from backup, 9-14	dbsystem
create, 9-9	create, 18-6
delete, 9-28, 9-30	delete, 18-21
details, 9-8	describe, 18-12, 18-18
home, 9-28	modify, 18-7, 18-10
create multiple, 9-28	start, 18-19
multiple, 9-28	stop, 18-20
language, 1-1	dbsystems
list, 9-8	list, 18-11
modify, 9-17	dcserr, 20-2, 20-7
move, 9-19	463611, 20-2, 20-7

default groups and users, A-5	installed version
deleting backups, 13-31	display, 17-49, 17-52, 17-62, 17-64
DHCP (Dynamic Host Configuration Protocol)	instance caging, 9-35
connect to Oracle ILOM, 3-9	enable, 9-35
Oracle ILOM configuration, 3-9	Integrated Lights Out Manager
diagnostics, 20-7	See Oracle ILOM
directory paths, A-1	internal FRA, 13-1
disk	
replace, 11-3, 11-8, 11-22	1
disk group redundancy, <i>B-1</i>	J
disk group sizes, A-5	ICON 610 F 12 F 17 F 21 F 25 16 F6 16 65
disk group storage	JSON file, 5-12, 5-17, 5-21, 5-25, 16-56, 16-65,
• •	C-1, C-2, C-7
describe, 17-214	
list, 17-217	K
domain	
definition, 16-4	key vault
downloading software, 4-6	about, <i>10-3</i>
DSS	KVM, 18-1, 18-3
database shape, <i>D-6</i>	definition, 16-3
dynamic default parameters	deploying, 16-33
using Browser User Interface, 8-51	overcomit, 16-56
Dynamic Host Configuration Protocol	KVM commands
See DHCP	odacli clone-vdisk, 18-28
	odacii clone-vuisk, 10-20 odacii clone-vm, 18-47
Г	
E	odacli create-cpupool, 17-163, 18-30
electrical power cords	odacli create-dbsystem, 18-6
·	odacli create-vdisk, 18-26
connecting, 3-9	odacli create-vm, 18-41
EM Express, 9-36	odacli create-vmstorage, 18-23
Enterprise Edition High Availability, 9-6	odacli create-vnetwork, 18-37
error correlation report, 20-5	odacli delete-cpupool, 17-167, 18-34
external FRA, 13-1	odacli delete-dbsystem, 18-21
	odacli delete-vdisk, 18-29
F	odacli delete-vm, 18-48
•	odacli delete-vmstorage, 18-25
flex diskgroup, 9-9, 9-11, 9-17	odacli delete-vnetwork, 18-40
	odacli describe-auditrecord, 17-169, 18-35
C	odacli describe-cpupool, 17-166, 18-33
G	odacli describe-dbsystem, 18-12
Grid user, 9-2	odacli describe-dbsystem-image, 18-18
groups and users defaults, A-5	odacli describe-vdisk, 18-27
• .	odacli describe-vm, 18-43
guest virtual machine	odacii describe vm, 10 40 odacii describe-vmstorage, 18-24
definition, 16-4	odacii describe vinstolage, 18-24
	odacii describe-viietwork, 10-36 odacii list-auditrecords, 17-168, 18-34
H	
	odacii list-cpupools, 17-166, 18-32
Host Public Addresses	odacli list-dbsystems, 18-11
IP address, 1-8	odacli list-vdisks, 18-27
	odacli list-vms, 18-42
I.	odacli list-vmstorages, 18-24
I	odacli list-vnetworks, 18-37
IMDP	odacli migrate-vm, 18-47
IMDB	odacli modify-cpupool, 17-166, 18-33
database shape, <i>D-4</i>	odacli modify-dbfileattributes, 18-10
install software, 4-7	odacli modify-dbsystem, 18-7
	odacli modify-vdisk, 18-28
	, s <del>, s , s =</del>



KVM commands (continued) odacli modify-vm, 18-43 odacli modify-vmstorage, 18-25	My Oracle Support, 20-33 send log files for troubleshooting, 20-33		
odacli modify-vnetwork, 18-39 odacli remap-cpupools, 17-165, 18-31	N		
odacli start-dbsystem, 18-19	network		
odacli start-vm, 18-46	configure, 17-13		
odacli start-vnetwork, 18-38	create, 12-4, 12-5		
odacli stop-dbsystem, 18-20	delete, 12-6, 12-7		
odacli stop-vm, 18-46	interfaces, 12-4		
odacli stop-vnetwork, 18-39	list, 12-4		
	update, 12-5		
1	network cabling, 3-6		
L	network cabing, 3-0 network infrastructure, 12-1, 12-2		
 LED	network infrastructure, 12-1, 12-2		
status when blinking, 3-11	add, 12-6		
status when steady, 3-11	default values, <i>12-1</i> , <i>12-2</i>		
status when steady on, 3-11	delete, 12-6		
LED indicators	network ports, 3-4, 3-6		
NVMe, 11-3, 11-8, 11-22	network time protocol service (NTP service), 1-1		
Linux	NFS backup, 13-9, 13-12, 13-15		
and virtualization, <i>16-2</i> , <i>16-7</i> , <i>16-10</i>	NTP service		
listener.ora, configure, 9-31	See network time protocol service		
load configuration, <i>C-1</i>	NVMe		
log files, <i>A-4</i>	disk location, <i>11-3</i> , <i>11-8</i> , <i>11-22</i>		
sending to Oracle Support Services, <i>20-33</i>	LED indicators, 11-3, 11-8, 11-22		
• • • • • • • • • • • • • • • • • • • •	LLD maicators, 11 5, 11 6, 11 22		
logs storage diagnostic, 17-94, 17-251			
LOGVOLOPT, <i>4-15</i>	0		
LOGVOLU01, 4-15	aakali aammanda		
LOG VOLOUI, 4-15	oakcli commands		
	show power		
M	example, 20-32		
	Object Store, 13-17 credentials, 17-115, 17-121, 17-130, 17-138		
migration	odaadmcli commands		
from an existing database, 9-3			
multi-node system, 11-23	asmops diskgroup, 17-277		
multi-user access	expand storage, 17-278 hardware configuration, 17-270		
appliance, 5-2, 5-7			
create user, 5-10, 5-32, 10-46	hardware monitoring, 17-270		
entitlements, 5-35	manage diagcollect, 17-251, 20-33		
manage database, 5-36	orachk, 17-94		
manage database homes, 5-36	power disk, 17-281		
manage password, 5-11, 5-38	show controller, 17-282		
odacli commands, 17-6	show cooling, 17-271		
passwordless, 5-7	show disk, 17-282		
provisioning, 5-9, 5-29	show diskgroup, 17-284		
reset-password, 5-33, 5-38	show env_hw, 17-272		
resources, 5-34	show fs, 17-272		
roles, 5-35	show localdisk, 17-271		
shared resource, 5-5	show memory, 17-273		
user roles, 5-4	show network, 17-274		
multiple database instances	show power, 17-275		
instance caging, 9-35	show processor, 17-275		
multiple Oracle homes, 9-28	show raidsyncstatus, 17-285		
create, <i>9-28</i>	show server, 17-276		
	show storage, 17-286		



odaadmcli commands (continued)	odacli commands (continued)
storage, 17-277	delete-network, 17-18
stordiag, 17-287	delete-networkinterface, 17-19
odacli cleanup-patchrepo, 8-50	delete-objectstoreswift, 17-121
odacli commands	delete-okvserverconfig, 17-244
acr, 17-265	delete-prepatchreport, 17-62
appliance, 17-95	delete-vdisk, 16-44
apply patch, 17-46	delete-vm, 16-55
backup, <i>17-110</i>	delete-vmstorage, 16-36
cleanup-patchrepo, 17-48	delete-vnetwork, 16-40
clone-database, 17-170	describe-asr, 17-261
clone-vdisk, 16-43	describe-backupconfig, 17-116
clone-vm, 16-52	describe-backupreport, 17-118
configure-asr, 17-259	describe-component, 17-64
configure-dataguard, 17-140	describe-cpucore, 17-161
configure-dbhome-storage, 17-203	describe-cpupool, 15-5
CPU core, 17-160	describe-database, 17-188
cpu pool, 17-162, 18-29	describe-dataguardstatus, 17-154
create database, 9-28	describe-dbhome, 17-209
create vdisk, 16-41	describe-dbhome-storage, 17-205
create-appliance, 17-104	describe-dbstorage, 17-213
create-auto-logclean-policy, 17-253	describe-dbsystem, 16-24
create-backup, 17-112	describe-dgstorage, 17-214
create-backupconfig, 17-114	describe-diagcollection, 17-222
create-cpupool, 15-3	describe-job, 17-231
create-database, 17-180	describe-latestpatch, 17-71
create-dbhome, 17-207	describe-logcleanjob, 17-256
create-dbstorage, 17-211	describe-network, 17-20
create-dbsystem, 16-17	describe-networkinterface, 17-22
create-diagcollection, 17-221	describe-objectstoreswift, 17-121
create-jobdata-retention-policy, 17-224	describe-okvserverconfig, 17-245
create-logcleanjob, 17-254	describe-prepatchreport, 17-52
create-network, 17-16	describe-schedule, 17-122
create-objectstoreswift, 17-115	describe-system, 17-104
create-okvserverconfig, 17-241	describe-vdisk, 16-42
create-prepatchreport, 17-49	describe-vm, 16-54
create-purge-jobdata-job, 17-226	describe-vmstorage, 16-35
create-vm, 16-45, 16-49	describe-vnetwork, 16-39
create-vmstorage, 16-34	diagnostics, 17-220
create-vnetwork, 16-37	export-asrconfig, 17-263
database, 17-169	failover-dataguard, 17-156
database storage, 17-210	irestore-database, 17-122
dataguard, 17-140	jobs, 17-224
DBHome, 17-202	key vault, <i>17-240</i>
dbsystem, 18-5	list scheduler jobs, 17-239
deconfigure-dataguard, 17-152	list-auto-logclean-policy, 17-256
delete-asr, 17-262	list-backupconfig, 17-129
delete-backup, 17-117	list-backupreports, 17-129
delete-backupconfig, 17-118	list-cpucores, 17-160
delete-cpupool, 15-6	list-cpupools, 15-5
delete-database, 17-186	list-databases, 17-189
delete-dbhome, 17-208	list-dataguardstatus, 17-157
delete-dbstorage, 17-212	list-dbhome-storage, 17-204
delete-dbsystem, 16-29	list-dbhomes, <u>17-209</u>
delete-diagcollection, 17-223	list-dbstorages, 17-216
delete-jobdata-retention-policy, 17-229	list-dbsystems, 16-23
• • • •	•

odacli commands <i>(continued)</i>	odacli commands (continued)
list-dgdisks, 17-279	odacli describe-resource-access,
list-diagcollections, 17-222	17-42
list-featuretracking, 17-108	odacli describe-tenant, 17-29
list-jobdata-retention-policy, 17-237	odacli describe-user, 17-33
list-jobs, 17-233	odacli describe-user-entitlement,
list-logcleanjobs, 17-257	17-39
list-logspaceusage, 17-258	odacli describe-user-operation, 17-40
list-networkinterfaces, 17-23	odacli describe-user-role, 17-37
list-networks, 17-23	odacli disable-acr, 17-268
list-okvserverconfigs, 17-246	odacli enable-acr, 17-266
list-osconfigurations, 17-268	odacli extend-localvolume, 17-97
list-prepatchreports, 17-62	odacli grant-resource-access, 17-43
list-purge-jobdata-jobs, 17-238	odacli list-acr, 17-267
list-scheduled-executions, 17-239	odacli list-agentconfig-parameters,
list-schedules, 17-130	17-72
list-tdebackupreports, 17-132	odacli list-availablepatches, 17-63
list-vdisks, 16-42	odacii list-dyaliabiepateries, 17-03
list-vms, 16-54	odacii list-domains, 17-217
list-vmstorages, 16-35	odacli list-localvolumes, 17-99
list-vnetworks, 16-39	odacli list-nodes, 17-107
modify-asr, 17-263	odacli list-objectstoreswifts, 17-130
modify-backupconfig, 17-136	odacli list-pendingjobs, 17-237
modify-cpupool, 15-6, 16-30	odacii list tenente 17 20
modify-database, 17-190	odacii list tenants, 17-29
modify-dbhome-storage, 17-206	odacli list-user-entitlements, 17-38
modify-dbstorage, 17-218	odacli list-user-operations, 17-40
modify-dbsystem, 16-24, 16-26	odacii list-user-roles, 17-36
modify-dgstorage, 17-219	odacli list-users, 17-32
modify-network, 17-24	odacli modify-agentconfig-parameters,
modify-objectstoreswift, 17-138	17-73
modify-osconfigurations, 17-269	odacli modify-asmport, 17-101
modify-schedule, 17-139	odacli modify-cpucore, 17-161
modify-vdisk, 16-44	odacli ping-agent, 17-107
modify-vm, 16-53	odacli redact-acr, 17-267
modify-vmstorage, 16-36	odacli reset-password, 17-45
modify-vnetwork, 16-40	odacli revoke-resource-access, 17-44
move-database, 17-193	odaconfigcli collectconfig, 17-96
multi-user access, 17-26	Oracle ASR, 17-259
network, 17-13	OS, 17-268
odacli activate-user, 17-31	recover-database, 17-132
odacli authorize-user, 17-34	recovery, 17-110
odacli change-password, 17-46	register-database, 17-194
odacli copy-okvtdewallet, 17-241	register-dataguard, 17-159
odacli create-appliance, 5-12, 5-17,	reinstate-dataguard, 17-158
C-1, C-2, C-7	remap-cpupools, 15-4
odacli create-dbsystem, 5-21, 5-25,	restore-archivelog, 17-135
16-56, 16-65	restore-tdewallet, 17-135
odacli create-user, 17-30	set-credential, 17-103
odacli delete-agentconfig-parameters,	show -h
17-76	with Oracle Database Appliance
odacli delete-auto-logclean-policy,	Hardware Monitoring Tool,
17-254	20-32
odacli delete-user, 17-35	start-dbsystem, 16-27
odacli describe-acr, 17-266	start-vm, 16-55
odacli describe-domain, 17-28	start-vnetwork, 16-39

odacli commands (continued)	Oracle Data Guard (continued)
stop-dbsystem, 16-28	deconfigure, 14-63, 14-67
stop-vm, 16-55	failover, <i>14-29</i> , <i>14-30</i>
stop-vnetwork, 16-39	migrating, 14-32
storage, 17-277	network, <i>14-31</i>
switchover-dataguard, 17-159	patching, 14-38
test-asr, 17-265	register, 14-40, 14-61
update, 17-46	reinstate, 14-29, 14-30
update database, 17-77	status, 14-28, 14-29
update database home, 17-79	switchover, 14-29, 14-30
update repository, 17-90	Oracle Database
update-dcsadmin, 17-80	See database
update-dcsagent, 17-81	Oracle Database Appliance Hardware Monitoring
update-dcscomponents, 17-82	Tool, <i>20-32</i>
update-okvendpoints, 17-247	Oracle Database Appliance Manager
update-registry, 17-83	software inventory, 2-3
update-server, 17-92	Oracle Database Resource Manager
update-storage, 17-93	instance caging, 9-35
upgrade-database, 17-201	Oracle Enterprise Manager Database Express,
validate storage topology, 17-280	9-36
validate-storagetopology, 17-280	Oracle home
vdisk, 18-26	multiple, 9-28
vm, 18-40	Oracle ILOM (Oracle Integrated Lights Out
vmstorage, 18-23	Manager), <i>1-1</i>
vnetwork, 18-36	configure, 3-9
odacli create-appliance	Oracle Integrated Lights Out Manager
example JSON files, 5-12, 5-17, C-1, C-2, C-7	See Oracle ILOM
readme, C-1	oracle key vault
odacli create-dbsystem	create database, 10-5, 10-10, 10-47, 10-51,
example JSON files, 5-21, 5-25, 16-56, 16-65	10-56, 10-65
odaeraser.py, 7-6	manage database, 10-18, 10-21, 10-22,
OINSTALL group, 9-2	10-26, 10-34, 10-45
OLTP	manage server configuration, 10-16, 10-65,
database shape, <i>D-2</i>	10-66
Optimal Flexible Architecture	migrate acfs cdb database, 10-123
and Oracle homes, A-1	migrate acfs database, 10-67, 10-83, 10-112
ORAchk report, 20-23	migrate asm database, 10-75, 10-93, 10-117,
Oracle ACFS, 16-4	10-130
Oracle ACFS (Oracle Automatic Storage	migrate keystore, 10-102
Management Cluster File System)	Oracle Ksplice, 8-47
virtual storage, 16-4	Oracle KVM, 16-2, 16-7, 16-10
Oracle ASM, <i>11-1</i> , <i>A-5</i>	Oracle KVM command-line interface
Oracle ASM (Oracle Automatic Storage	alphabetical list of commands, 18-1
Management)	Oracle ORAchk, 20-30
data migration, 9-3	Oracle ORAchk Health Check Tool, 20-22
user group, A-5	Oracle Support Services
Oracle ASR	See My Oracle Support
commands, <i>17-259</i>	Oracle Trace File Analyzer Collection, 20-29
configure, 17-259, 17-263, 19-3, 19-5, 19-7	Oracle user, 9-2
register, 19-3, 19-5, 19-7	OS configuration
Oracle ASR (Oracle Auto Service Request), 1-1	current, 17-268, 17-269
configuring, 19-1	suggested, 17-268, 17-269
Oracle Data Guard, 14-2, 14-3	OSASM group, 9-2
active data guard, 14-40	OSDBA, 9-2
CLI commands, 17-140	OSDBA for ASM group, 9-2
configure, 14-3, 14-26	OSDBA group, 9-2

OSOPER groups, 9-2	shapes, <i>D-1</i>
over-subscribed CPU pool, 15-7	database
	choosing, <i>D-1</i>
P	OLTP, <i>D-2</i> , <i>D-4</i> , <i>D-6</i>
<u> </u>	SI (Support Identifier)
password	Oracle ASR requirement, 19-1
appliance, 6-1	software keystore
patches	register database, 10-62
software inventory, 2-3	space management, B-2
patching	SQL*Loader, 9-3
	ssh configuration, 20-5
appliance, 8-2, 8-7	Standard Edition High Availability, 9-5
using Browser User Interface, 8-40, 8-41,	start up the system, 3-11
8-44, 8-45	static listener, configure, 9-31
patching Oracle Database Appliance, 8-9, 8-18,	
8-33, 8-43, 8-46	storage, 11-1, 11-23, B-3
performance tuning, 15-7	expand, 11-3, 11-8, 11-22
plumb network, 4-4	single-node, 11-2
port numbers, A-2	storage cables, 3-1
power cords	storage disks
connecting, 3-9	location, 11-3, 11-8, 11-22
processor_group_name, 15-1	
protocols, A-2	Т
proxy setting, 13-17	1
proxy county, 10 17	TDE, 10-2
	TFA command, 20-24
R	
	TFA options, 20-24
readme, <i>C-1</i>	Trace File Analyzer (TFA) Collector, 20-24
recover database, 13-26	trace file redaction, 20-29
recovering database, 13-20	troubleshooting, 20-2, 20-5, 20-7, 20-8, 20-20
register	log files for Oracle Support Services, 20-33
Oracle ASR, 19-3, 19-5, 19-7	turning on Oracle Database Appliance, 3-11
reimage appliance, 7-4	
resource management	U
CPU pools, 15-7	U
Oracle KVM, 16-2, 16-7, 16-10	uninstall, 7-1, 7-7
supported virtual operating systems, <i>16-2</i> ,	update
	·
16-7, 16-10	database, 8-8
restore archivelog, 13-31	update-dcscomponents, 20-8
restore baremetal system, 7-4	upgrade
restore database, 13-28	database, 8-51
RMAN (Recovery Manager utility)	usable storage, <i>B-3</i>
database management, 9-3	
RPM drift, 20-16	V
,	V
C	viewing backup reports, 13-20
S	virtual disk
capitize diagnostics 20.26, 20.29	vii tuai uisk
sanitize diagnostics, 20-26, 20-28	olono 19 20
	clone, 18-28
sanitize entities, 20-29	cloning, 16-43
save configuration, <i>C-1</i>	cloning, 16-43 create, 18-26
save configuration, <i>C-1</i> scheduler	cloning, 16-43 create, 18-26 creating, 16-41
save configuration, <i>C-1</i> scheduler jobs, <i>17-239</i>	cloning, 16-43 create, 18-26 creating, 16-41 delete, 18-29
save configuration, <i>C-1</i> scheduler	cloning, 16-43 create, 18-26 creating, 16-41
save configuration, <i>C-1</i> scheduler jobs, <i>17-239</i>	cloning, 16-43 create, 18-26 creating, 16-41 delete, 18-29
save configuration, <i>C-1</i> scheduler jobs, <i>17-239</i> Scheduling Database Backups, <i>13-25</i> secure erase tool, <i>7-6</i>	cloning, 16-43 create, 18-26 creating, 16-41 delete, 18-29 deleting, 16-44 describe, 18-27
save configuration, <i>C-1</i> scheduler jobs, <i>17-239</i> Scheduling Database Backups, <i>13-25</i> secure erase tool, <i>7-6</i> odaeraser.py, <i>7-6</i>	cloning, 16-43 create, 18-26 creating, 16-41 delete, 18-29 deleting, 16-44 describe, 18-27 list, 18-27
save configuration, <i>C-1</i> scheduler jobs, <i>17-239</i> Scheduling Database Backups, <i>13-25</i> secure erase tool, <i>7-6</i>	cloning, 16-43 create, 18-26 creating, 16-41 delete, 18-29 deleting, 16-44 describe, 18-27



virtual disk (continued)	virtualization, 16-2, 16-7, 16-10
viewing, 16-42	VLAN, <i>12-1</i>
virtual disks, 16-4	vm storage
virtual local area network, 12-1, 12-2	creating, 16-34
virtual machine	deleting, 16-36
about, <i>16-4</i>	modifying, 16-36
assemblies, 16-4	viewing, <i>16-35</i>
clone, 18-47	vmstorage
cloning, 16-52	create, 18-23
create, <i>18-41</i>	delete, 18-25
creating, 16-45, 16-49	describe, 18-24
delete, 18-48	modify, 18-25
deleting, 16-55	vmstorages
describe, 18-43	list, <i>18-24</i>
kickstart file, 16-49	vnetwork
list, 18-42	create, <i>18-37</i>
migrate, <i>18-47</i>	delete, 18-40
modify, 18-43	describe, 18-38
modifying, 16-53	modify, 18-39
start, 16-55, 18-46	start, <i>18-38</i>
stop, 16-55, 18-46	stop, 18-39
templates, 16-4	vnetworks
viewing, 16-54	list, 18-37
virtual network	
creating, 16-37	W
deleting, 16-40	
modifying, 16-40	web interface
start, 16-39	Oracle Enterprise Manager Database
stop, 16-39	Express, 9-36
viewing, 16-39	•
virtual storage	



about, **16-4**