Oracle® Enterprise Manager

Introduction

24ai Release 1 (24.1)
F97198-02
December 2024

Oracle Enterprise Manager Introduction, 24ai Release 1 (24.1)

F97198-02

Contents

Preface

This manual introduces Oracle Enterprise Manager. It provides a brief overview of the system architecture and describes the key features of the product. The manual also details new features in this release.

Audience

This manual is intended for all users of Oracle Enterprise Manager.

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 customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Resources

For detailed information on Oracle Enterprise Manager architecture and focus areas, see the documentation available in Oracle Help Center:

https://docs.oracle.com/en/enterprise-manager/index.html

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 text or the glossary.
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.

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Overview of Oracle Enterprise Manager

This chapter provides an overview of Oracle Enterprise Manager and helps you understand its architecture and the various core components that are integrated within the product. It contains the following sections:

About Enterprise Manager

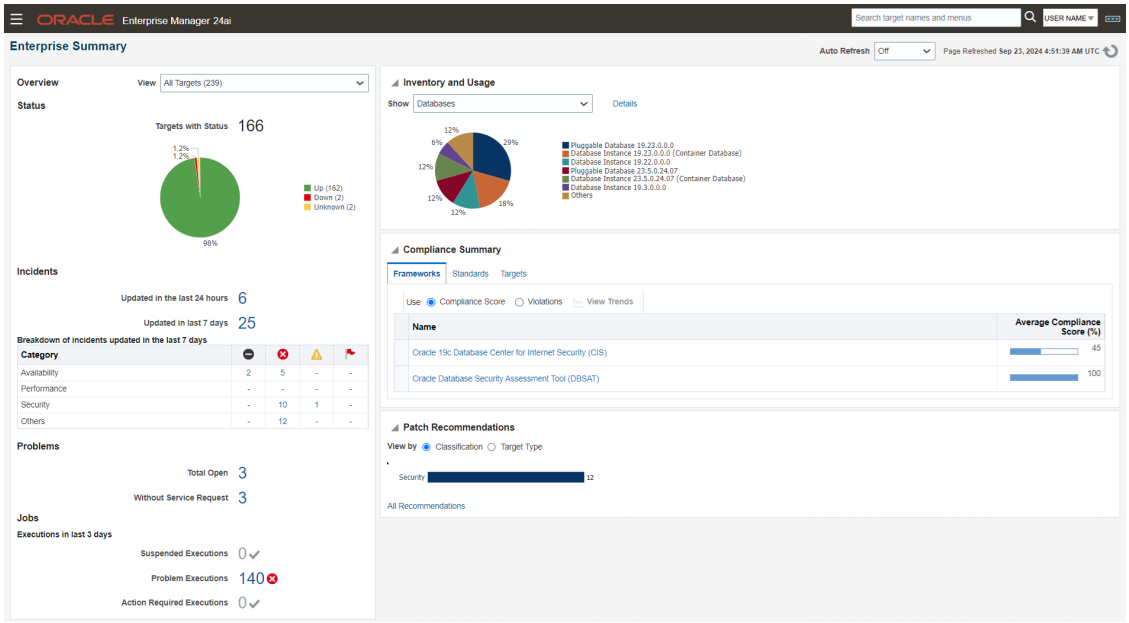
Enterprise Manager is Oracle's integrated enterprise information technology (IT) management product line, which provides a complete, integrated, and business-driven enterprise cloud management solution. Enterprise Manager creates business value for IT by leveraging the built-in management capabilities of the Oracle stack for traditional and cloud environments, enabling customers to achieve unprecedented efficiency gains while dramatically increasing service levels.

The key capabilities of Enterprise Manager include:

- A complete cloud lifecycle management solution enabling you to quickly set up, manage, and support enterprise clouds and traditional Oracle IT environments from applications to disk.
- Maximum return on IT management investment through the best solutions for intelligent management of the Oracle stack and engineered systems with real-time integration of Oracle's knowledge base with each customer environment.
- Best service levels for traditional and cloud applications through business-driven application management.

Figure 1-1 illustrates how Enterprise Manager offers a solution that enables you to monitor and manage the complete Oracle IT infrastructure from a single console.

Figure 1-1 Enterprise Manager Console



For more information, see Enterprise Manager.

Enterprise Manager Terminology

The following table lists some of the basic Enterprise Manager terms and concepts.

Term	Description
Association	An association is a relationship between two targets. For example, if a host target uses and depends on a web server target, an association should be created between the web server and the host.
Dashboard	A dashboard is a data visualization tool that gathers real-time data from the enterprise and displays them in easy-to-interpret widgets.
Event	An event is a significant occurrence on a managed target that typically indicates something has occurred outside normal operating conditions in an environment managed by Enterprise Manager. For example, events are raised when a target is detected to be down or when its performance metrics cross specified thresholds. For more information on events, see Event Management in *Oracle Enterprise Manager Monitoring Guide*.
Groups	Groups are an efficient way to organize, manage, and query the targets in your environment. There are two types of groups: static groups and dynamic groups. Static groups contain a fixed list of targets managed by the user and dynamic groups have their list calculated dynamically based upon filters the user provides.
Incident	An incident is a significant event or set of related significant events that need to be managed because it can potentially impact your business applications. These incidents typically need to be tracked, assigned to appropriate personnel, and resolved as quickly as possible. You perform these incident management operations through Incident Manager. For more information on incidents, see Using Incident Management in *Oracle Enterprise Manager Monitoring Guide*.

Term	Description
Metrics	Metrics are how you evaluate your targets. Metrics are separated into two main categories: configuration metrics and performance metrics. Configuration metrics represent slowly changing data about a target such as the host operating system version. Performance metrics represent dynamic data about a target which may change rapidly such as the host CPU Utilization (%).
Target	A target represents a monitored resource such as a database, a host, or an application server. Enterprise Manager collects configuration, availability, and performance metrics for each target and defines associations between different targets to represent their relationships.
Target Type	A target type describes the characteristics of the monitored resource.

Enterprise Manager Architecture

This section introduces you to the architecture of Enterprise Manager and describes the core components of the product. It includes the following sections:

- Architecture of Enterprise Manager
- About Oracle Management Agent
- About Oracle Management Service (OMS)
- About Oracle Management Repository
- About Plug-ins
- About Oracle JVMD Engine
- About Oracle Analytics Server
- About Enterprise Manager Console
- About EMCTL
- About EM CLI

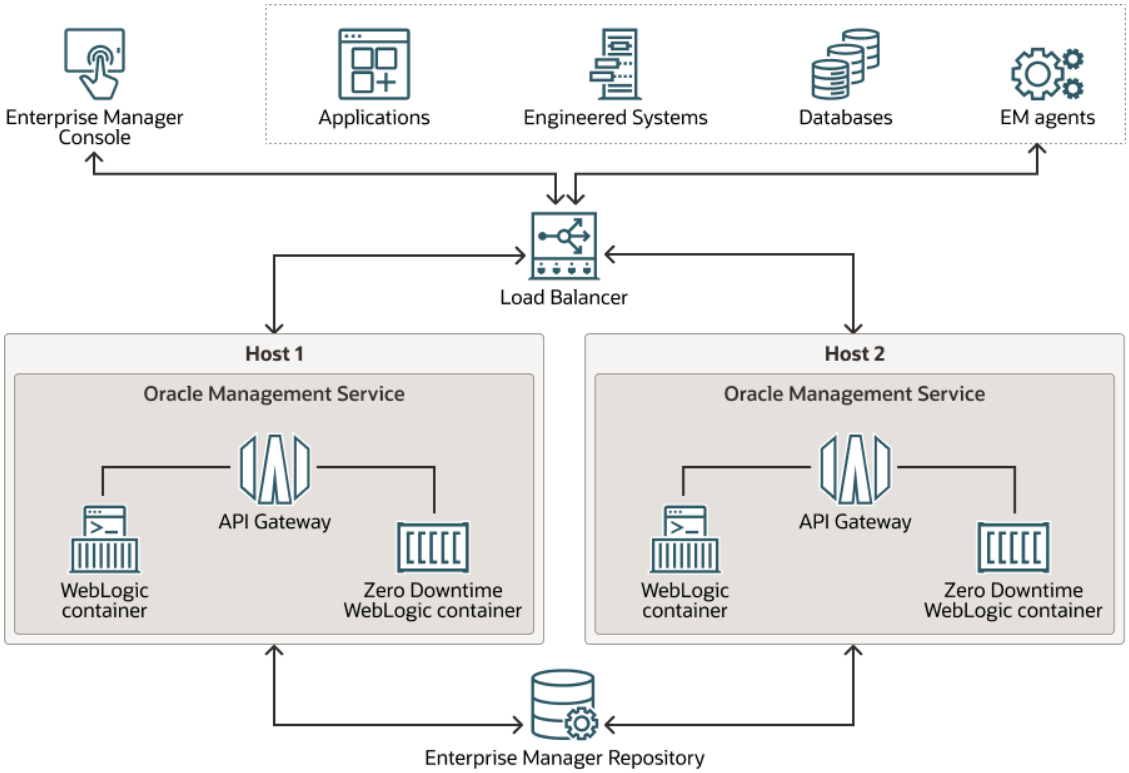
Architecture of Enterprise Manager

Enterprise Manager includes the following components:

- Oracle Management Agent
- Oracle Management Service
- Oracle Management Repository
- Plug-ins
- Enterprise Manager Console

Figure 1-2 shows a sample Enterprise Managerconfiguration and illustrates how these core components fit into the architecture.

Figure 1-2 Enterprise Manager Architecture



> **Note:**
>
> In Figure 1-2, the load balancer and the multiple Oracle Management Service (OMS) instances are depicted only to indicate how a sample Enterprise Manager architecture would look in a large organization. They are not a prerequisite or a requirement for an Enterprise Manager system installation. If you do not have a load balancer, then the Management Agents communicate directly with the OMS instances.

About Oracle Management Agent

The Management Agent is an integral software component that enables you to convert an unmanaged host to a managed host in the Enterprise Manager system. The Management Agent works in conjunction with the plug-ins to monitor the targets running on that managed host.

With the first Oracle Management Service (OMS) you install, by default you receive a Management Agent called the *Central Agent*. The *Central Agent* is used for monitoring only the first OMS host, the first OMS, and the other targets running on the first OMS host. To monitor other hosts and the targets running on those hosts, you must install a separate *Standalone Management Agent* on each of those hosts. Starting with Enterprise Manager 24ai, you can also install *Remote Agents* that allow you to monitor targets on remote hosts. *Remote Agents* can significantly reduce the number of agents you need to deploy on your managed environments, therefore simplifying the deployment and maintenance tasks.

About Oracle Management Service (OMS)

Oracle Management Service (OMS) is a Web-based application that orchestrates with the Management Agents and the plug-ins to discover targets, monitor and manage them, and store the collected information in a repository for future reference and analysis. The OMS also renders the user interface for Enterprise Manager.

The OMS is deployed to the middleware home, which is the parent directory that contains Oracle WebLogic Server, OMS, plug-ins, Java Development Kit (JDK), Oracle WT directory, Oracle Common, and other relevant configuration files and directories. While installing the OMS, the Enterprise Manager installation wizard automatically installs Oracle WebLogic Server and JDK. Starting with Enterprise Manager 24ai, you can apply Enterprise Manager software updates without incurring any downtime. The detection of events on all managed targets, alerts, incidents, notifications, or connector processing can continue with no interruptions because all the monitoring components run inside of an independent application container, the Zero Downtime (ZDT) WebLogic container.

About Oracle Management Repository

The Oracle Management Repository (Management Repository) is a storage location where all the information collected by the Management Agent gets stored. It consists of objects such as database jobs, packages, procedures, views, and tablespaces.

The OMS uploads the monitoring data it receives from the Management Agents to the Management Repository. The Management Repository then organizes the data so that it can be retrieved by the OMS and displayed in the Enterprise Manager console. Since data is stored in the Management Repository, it can be shared between any number of administrators accessing Enterprise Manager.

At the time of installation, the Enterprise Manager installation wizard configures the Management Repository in your existing, certified database. The wizard, however, does not install a new database.

About Plug-ins

Plug-ins are pluggable entities that offer special management capabilities customized to suit specific target types. In Enterprise Manager, the plug-ins work in conjunction with the OMS and the Management Agent to monitor every target in your environment. Therefore, they are deployed to the OMS as well as the Management Agent. In Enterprise Manager, plug-ins enable you to monitor all types of targets in your environment.

Plug-ins have independent release cycles, so every time you have a new version of an Oracle product released, you will have a new version of the plug-in released to support monitoring of that new product version in Enterprise Manager. An independent release cycle simplifies things because you no longer have to wait to upgrade your Enterprise Manager system to support a new product version; instead you can upgrade your plug-ins to monitor the new product version.

Table 1-1 lists the default plug-ins that are installed with a new Enterprise Manager system. In addition to these plug-ins, you can optionally install other plug-ins available in the software kit (DVD, downloaded software bundle, and so on). The installer offers a screen where you can select the optional plug-ins and install them.

Table 1-1 Default Plug-ins Installed with Enterprise Manager

Name	Description
Oracle Database	Enables you to discover, monitor, and manage Oracle Database and related targets such as Oracle Real Application Clusters (Oracle RAC), Oracle Automatic Storage Management (Oracle ASM), and so on.
Oracle Fusion Middleware	Enables you to discover, monitor, and manage Oracle Fusion Middleware products such as Oracle WebLogic Domain, Oracle WebLogic Server, Oracle SOA Suite, and so on.
Oracle Exadata	Enables you to discover, monitor, and manage Oracle Exadata targets.
Oracle Cloud Framework	Enables you to access basic features that are common across cloud services.
Systems Infrastructure	Enables you to discover, monitor, and manage Oracle hardware systems and Super Cluster engineered systems, including server hardware, chassis, racks, power distribution unit, network equipment, operating systems, and so on.

For a complete list of the plug-ins available with Enterprise Manager, see Plug-ins Included In This Release in *Oracle Enterprise Manager Release Notes*.

About Oracle JVMD Engine

Java Virtual Machine Diagnostics (JVMD) Engine enables you to diagnose performance problems in Java applications in the production environment. By eliminating the need to reproduce problems, it reduces the time required to resolve these problems, thus improving application availability and performance.

As part of the Oracle Fusion Middleware plug-in deployment, one JVMD Engine is installed and configured by default on the OMS. For every additional OMS you deploy, you receive one JVMD Engine by default with that OMS.

While JVMD Engine is installed by default on the OMS host, you will still need JVMD Agents to be manually deployed on the targeted JVMs.

About Oracle Analytics Server

Starting with Enterprise Manager 13.5, Oracle Business Intelligence (BI) Publisher is no longer bundled with the EM installation or managed by the EM utilities, EMCTL and EMCLI. BI Publisher, rebranded as Oracle Analytics Server (OAS) must be installed independently of Enterprise Manager and managed by OAS utilities. Update all your EMCTL or EMCLI scripts that make references to BI Publisher verbs.

For more information, see Oracle Analytics Server Technical Brief.

About Enterprise Manager Console

The Enterprise Manager console is the user interface you see after you install Enterprise Manager (Figure 1-1). With the help of the console, you can monitor and administer your entire computing environment from one location on the network. All the systems and services including enterprise application systems, databases, hosts, middleware application servers, listeners, and so on, are easily managed from one central location.

About EMCTL

EMCTL is a command-line tool that enables you to execute certain tasks on the OMS and Management Agents. You can use it for tasks such as starting or stopping OMS instances, setting properties on OMS instances, or getting a list of targets being monitored by a specific Management Agent. EMCTL commands are executed on a specific OMS or Management Agent.

About EM CLI

The Enterprise Manager Command Line Interface (EM CLI) is a command-line tool that is accessible through classic programming language constructs, enabling tasks to be created and run either from the command-line or programatically. EM CLI enables you to access Enterprise Manager functionality from text-based consoles (shells and command-line windows) for a variety of operating systems.

Enterprise Manager Management Focus Areas

This section provides brief descriptions of the following management focus areas:

- Framework and Infrastructure
- Enterprise Monitoring
- Application Management
- Database Management
- Middleware Management
- Hardware and Virtualization Management
- Heterogeneous (Non-Oracle) Management
- Cloud Management
- Hybrid Cloud Management
- Lifecycle Management
- Application Performance Management
- Application Quality Management

Framework and Infrastructure

Enterprise Manager is a critical tool for data center management. It has a framework that is secure, scalable, and highly available. With a next-generation user interface, it provides a rich, intuitive console that can be customized to suit different roles. Enterprise Manager framework also has advanced capabilities such as self-update where key components such as target plug-ins, compliance policies, and deployment procedures can be updated automatically as newer versions become available.

Enterprise Manager framework is enterprise-ready and is designed to manage and monitor critical business operations to ensure smooth running of enterprise data centers.

Enterprise Monitoring

World class enterprise monitoring is about monitoring the status of your infrastructure and applications, notifying the appropriate IT staff when incidents occur, and reporting on status, history, and trends to interested parties throughout IT and the business. Enterprise Manager provides rich monitoring features as a foundation for monitoring all components of your IT infrastructure (Oracle and non-Oracle) as well as the applications and services that are running on them. These features enable IT to proactively monitor and resolve issues by business priority, implement operational best practices for monitoring, and provide consistent, high quality service in support of business goals.

Application Management

Oracle provides advanced, out-of-the-box application management solutions for applications such as Oracle E-Business Suite, Siebel, and Peoplesoft. They provide end-to-end, integrated application monitoring and management capabilities, resulting in improved availability, predictability, and reliability. Enterprise Manager's management capabilities include user experience management, performance management, change and configuration management, patching, provisioning, testing, integrated diagnostics, and automatic tuning.

Enterprise Manager also offers advanced management capabilities for managing custom applications, integrations, and extensions.

Database Management

Enterprise Manager is the premier tool for managing your Oracle Database environment.

Database management involves the monitoring, administration, and maintenance of the databases and database groups in your enterprise and with Enterprise Manager you receive:

- A complete set of integrated features for managing Oracle Database, which enables you to:
  - Perform day-to-day tasks and run repetitive jobs
  - Detect problems and use the available guided resolution workflows
- Unparalleled scalability that lets you manage a single database or thousands of instances.
- An intuitive management product that leads the industry in ease of deployment and use.

Enterprise Manager supports the management of Oracle Database Standard Edition One, Oracle Database Standard Edition, and Oracle Database Enterprise Edition. However, you must have the Oracle Database Enterprise Edition to use the entire breadth of database management features that Enterprise Manager provides with the following management packs:

- Oracle Diagnostics Pack
- Oracle Tuning Pack
- Oracle Database Lifecycle Management Pack
- Oracle Data Masking and Subsetting Pack
- Oracle Real Application Testing
- Exadata Management Pack
- Zero Data Loss Recovery Appliance Management Pack
- Legacy: Configuration Management Pack for Oracle Database

- Legacy: Change Management Pack for Oracle Database
- Legacy: Provisioning and Patch Automation Pack for Oracle Database

For information on generic Enterprise Manager and Oracle Database concepts, see:

- Enterprise Database Management in *Oracle Enterprise Manager Licensing Information User Manual*
- *Oracle Database Concepts*

The following sections provide information on some of the Database Management capabilities provided by Enterprise Manager with links to more information:

- Database Administration
- Database Maintenance
- Database Performance Management
- Database Security Management
- Database Lifecycle Management

Database Administration

Using Enterprise Manager you can keep your Oracle Databases available and running efficiently.

You can use the available administration tools to manage database objects and initiate database operations inside an Oracle Database.

The following list provides some of the database administration tasks you can perform:

- Allocate system storage and plan future storage requirements.
- Use Oracle Scheduler to control when and where various tasks occur in the database environment.
- Migrate your database storage to use Oracle Automatic Storage Management.
- Use Database Resource Manager to control the distribution of resources among various sessions by controlling the execution schedule inside the database.
- Create and manage primary database objects such as tables, views, and indexes.
- Perform administration tasks for Oracle XML DB, such as viewing or editing parameters for the Oracle XML DB configuration file.
- Create, manage, and perform specific actions against materialized views, which are schema objects that can be used to summarize, compute, replicate, and distribute data.

For detailed information, see:

- Managing Database Storage Structures in *Oracle Database 2 Day DBA*
- Administering Oracle ASM with Oracle Enterprise Manager in *Oracle Automatic Storage Management Administrator's Guide*
- Managing Resources with Oracle Database Resource Manager in *Oracle Database Administrator's Guide*
- Oracle Scheduler Concepts in *Oracle Database Administrator's Guide*
- Administration of Oracle XML DB in *Oracle XML DB Developer's Guide*

Database Maintenance

Enterprise Manager provides functions to maintain Oracle Databases.

The following list provides some of the database maintenance tasks you can perform:

- Use backup and recovery features such as:
  - Physical backup and recovery that is built on Oracle's Recovery Manager (RMAN) command-line client.
  - Complete or point-in-time media recovery.
  - Flashback recovery, which provides a range of physical and logical data recovery tools as efficient, easy-to-use alternatives to physical and logical backups.
- Configure Oracle Data Guard and use its comprehensive capabilities to manage and monitor primary and standby databases.
- Use the Transport Tablespaces wizard to copy a set of tablespaces from one Oracle Database to another.
- Monitor Oracle Real Application Clusters.
- Use the Database High Availability (HA) console to monitor database HA.
- Use the Database Maximum Availability Architecture (MAA) Advisor page to view recommended Oracle solutions for outage types such as computer failures, storage failures, and human errors.

For detailed information, see:

- Introduction to Backup and Recovery in *Oracle Database Backup and Recovery User's Guide*
- Using Oracle Enterprise Manager in *Oracle Data Guard Concepts and Administration*
- Oracle Data Guard Broker User Interfaces in *Oracle Data Guard Broker*
- Transporting Tablespaces Between Databases in *Oracle Database Administrator's Guide*
- Monitoring Oracle Clusterware with Oracle Enterprise Manager in *Autonomous Health Framework User's Guide*
- Oracle Maximum Availability Architecture

Database Performance Management

Enterprise Manager offers a comprehensive database performance management solution, which includes real-time and automatic performance diagnostics and monitoring capabilities.

This solution comes as a part of the Oracle Diagnostics and Oracle Tuning packs, which enable you to identify the problem areas in your database environment and use the tuning capabilities to tune your database's performance.

The following list provides some of the performance management tasks you can perform:

- Monitor database health and performance, analyze the workloads running against the database, and identify issues.
- Use the Performance Hub to view the Active Session History (ASH) analytics, monitored SQL statement data for a specified time period.
- Detect and diagnose performance issues automatically using Automatic Database Diagnostic Monitor (ADDM).

- Use Automatic Workload Repository (AWR) and automate database statistics gathering by collecting, processing, and maintaining performance statistics for database problem detection and self-tuning purposes.
- Use the following tuning advisors to examine a SQL statement or set of statements and determine how to address issues and optimize database performance:
  - SQL Tuning Advisor
  - SQL Access Advisor
- Use the following Real Application Testing components to perform real-world testing of your Oracle Database:
  - SQL Performance Analyzer
  - Database Replay

For detailed information, see:

- Monitoring and Tuning the Database in *Oracle Database 2 Day DBA*
- *Oracle Database 2 Day + Performance Tuning Guide*
- *Oracle Database SQL Tuning Guide*
- *Oracle Database Testing Guide*
- Oracle Diagnostics Pack in *Oracle Enterprise Manager Licensing Information User Manual*
- Oracle Tuning Pack in *Oracle Enterprise Manager Licensing Information User Manual*

Database Security Management

Enterprise Manager provides security features to protect data and control how a database is accessed and used.

The following list provides some of the database security tasks you can perform:

- Restrict user access to data using flexible database access control and fine-grained privilege control.
- Manage database users and authorizations in one location using the Enterprise user security feature.
- Use Transparent Data Encryption (TDE) to automatically encrypt data when it is written to the database and automatically decrypt data when accessed.
- Use Oracle Label Security (OLS) to classify data and control access using security labels.
- Use Virtual Private Database (VPD) to enforce data access at the row and column level, using security conditions to protect the data.
- Use Oracle Database Vault for strong security controls to prevent unauthorized access to sensitive information by privileged users and protect against unintended changes to the database.
- Use data redaction to protect data by presenting a masked version of the data to non-privileged users. The masked version of the data pre-serves the format and referential integrity of the data, so any application that uses the data continues to work as expected.
- Use Oracle Data Masking and Subsetting (DMS) to discover sensitive data, mask the data with fictitious yet realistic looking data and subset the data based on specific conditions, ensuring secure and efficient use in non-production environments.

For detailed information, see:

- Security Best Practices for Database Management in Enterprise Manager in *Oracle Enterprise Manager Security Guide*
- Database Security in *Oracle Enterprise Manager Database Lifecycle Management Administrator's Guide*
- Managing Security for a Multitenant Environment in Enterprise Manager in *Oracle Database Security Guide*
- Administering Enterprise User Security in *Oracle Database Enterprise User Security Administrator's Guide*
- About Oracle Data Masking and Subsetting in *Oracle Data Masking and Subsetting Guide* or Database Security Data Masking and Subsetting workshop
- Oracle Data Masking and Subsetting Pack in *Oracle Enterprise Manager Licensing Information User Manual*

Database Lifecycle Management

Enterprise Manager provides a full database lifecycle management solution with its Database Lifecycle Management Pack.

This solution provides complete lifecycle management for Oracle Databases deployed on an on-premises, cloud, or hybrid environment, and includes:

- Automated discovery of assets
- Fleet maintenance for patching and upgrades
- Database configuration and compliance management
- Schema change management
- Hybrid cloud management

For detailed information, see:

- *Oracle Enterprise Manager Database Lifecycle Management Administrator's Guide*
- Database Lifecycle Management Pack for Oracle Database in *Oracle Enterprise Manager Licensing Information User Manual*

Middleware Management

Enterprise Manager provides a comprehensive management solution for Oracle WebLogic Server, Oracle Fusion Middleware, and non-Oracle middleware technologies. Oracle's offering encompasses out-of-the-box availability and performance monitoring, robust diagnostics, administration, and lifecycle management that includes configuration and compliance management as well as provisioning and patching across middleware software such as:

- WebLogic Server
- Coherence
- Identity Management
- WebCenter
- Web Tier
- Non-Oracle Middleware (for example, JBoss Application Server and IBM WebSphere Application Server)

Hardware and Virtualization Management

Enterprise Manager provides an integrated and cost-effective solution for complete physical and virtual server lifecycle management. By delivering comprehensive provisioning, patching, monitoring, administration, and configuration management capabilities through a web-based user interface, Enterprise Manager significantly reduces the complexity and cost associated with managing Oracle VM, Linux, UNIX, and Windows operating system environments. In addition, enterprises using Oracle Sun hardware can obtain deep insight into their server, storage, and network infrastructure layers and manage thousands of systems in a scalable manner. Enterprise Manager helps customers to accelerate the adoption of virtualization and cloud computing to optimize IT resources, improve hardware utilization, streamline IT processes, and reduce costs. Enterprise Manager is integrated with OVM 3.0 and higher.

Heterogeneous (Non-Oracle) Management

Enterprise Manager, besides being the best suite of management products for Oracle technologies, also provides a comprehensive solution for the management of heterogeneous data centers (including Microsoft SQL Server and JBoss Application Server) through its rich collection of extensions known as plug-ins and connectors. The Self Update mechanism in Enterprise Manager enables customers to download /import and deploy extensions built by Oracle, Oracle's numerous partners, and customers themselves. These extensions are built upon the same management framework that is used for Oracle products, and therefore provides the same level of stability and richness as the Oracle products.

For more information, see Oracle Enterprise Manager Extensibility Exchange.

Cloud Management

Enterprise cloud presents new management challenges. With a move to virtualization, a top benefit expected from private cloud adoption is cost savings through standardization for operational efficiency. However, without proper management capabilities, expected economic benefits of cloud computing will not be realized.

Enterprise Manager is Oracle's complete cloud lifecycle management solution. It is the industry's first complete solution including self-service provisioning balanced against centralized, policy-based resource management, integrated chargeback, and capacity planning, and complete visibility of the physical and virtual environment from applications to disk.

For more information, see Cloud Management in *Oracle Enterprise Manager Licensing Information User Manual*.

Hybrid Cloud Management

With Hybrid Cloud Management, Enterprise Manager provides you with a "single pane of glass" for monitoring and managing on-premise as well as Oracle Cloud deployments, all from the same management console. By deploying Hybrid Cloud Agents onto the Oracle Cloud virtual hosts serving your Oracle Cloud services, you are able to manage Oracle Cloud targets just as you would any other. The communication between Management Agents and your on-premise Oracle Management Service instances is secure from external interference. In addition to a hardened architecture of its own, Enterprise Manager supports the use of additional external HTTP proxies that support tunneling, which can be configured to connect to the Oracle Cloud.

Lifecycle Management

Lifecycle Management is a comprehensive solution that helps database, system, and application administrators automate the processes required to manage the lifecycle of Oracle technology. It eliminates manual and time-consuming tasks related to discovery, initial provisioning, patching, configuration management, and ongoing change management. In addition, the solution provides compliance frameworks for reporting and managing industry and regulatory compliance standards. Finally, all of the on-premise instrumentation can be connected in real-time to My Oracle Support for complete communication between Oracle and customers.

Application Performance Management

Enterprise Manager provides a complete Application Performance Management (APM) solution for custom applications and Oracle applications. The APM solution is designed for both cloud and enterprise data center deployments and is supported on Oracle and non-Oracle platforms.

Oracle APM delivers Business Driven Application Management with end-to-end monitoring that includes:

- User Experience Management
- Java monitoring and diagnostics
- Multi-layer discovery of infrastructure and application topology
- Rich reporting and analytic capabilities on real user activities and transaction monitoring data

Application Quality Management

Oracle's Application Quality Management products provide a complete testing solution for Oracle Database, Oracle Packaged Applications, and custom Web applications.

- Infrastructure Testing: Real Application Testing enables realistic, production-scale testing of the database infrastructure. It uses real, production workloads to generate load against databases under test and does not require any script development or maintenance. With Real Application Testing you can reduce your testing time by more than 80%. It provides the most efficient, optimized and highest quality testing for validating database infrastructure changes.
- Test Data Management: Oracle Test Data Management and Data Masking provide efficient, automated, and secure test system creation capabilities for Oracle and non-Oracle databases, with out-of-the-box templates for Oracle packaged applications.

Enterprise Manager Certification Information

This section describes how to obtain information about the targets supported by Enterprise Manager in a release.

1. Sign in to My Oracle Support and click the **Certifications** tab.
2. In the **Certification Search** region, select one of the following from the **Product** list:
   - **Enterprise Manager Base Platform - OMS**, to view the certification for OMS.

- **Enterprise Manager Base Platform - Agent**, to view the certification for Management Agent.

3. From the **Release** list, select the release you are interested in, for example, 24.1.0.0.0.
4. Click **Search**.
5. In the **Certification Results** region, locate a target's supported versions by expanding its corresponding list. For example, expand the **Databases** list to view the supported versions of **Oracle Database (Managed Target)** and **MySQL Server (Managed Target)**.

2

New Features in Oracle Enterprise Manager 24ai

This chapter provides an overview of the new features available in Oracle Enterprise Manager 24ai Release 1 (24.1) and the subsequent release updates.

The new features are categorized by release (base release and future release updates) and focus area.

- New Features by Release
- New Features by Focus Area

In addition, Enterprise Manager 24ai includes all the new capabilities introduced in Enterprise Manager 13.5 and prior versions. For a complete list of the new features in Enterprise Manager 13.5 and 13.4, see:

- New Features In Oracle Enterprise Manager 13c Release 5
- New Features In Oracle Enterprise Manager 13c Release 4

New Features by Release

This section lists new features categorized by the Enterprise Manager 24ai base release and future release updates.

Only information on major enhancements is available in the following section. For information on all the enhancements available in the base release and subsequent release updates, see the corresponding README file.

- New Features in Enterprise Manager 24ai

New Features in Enterprise Manager 24ai

This section lists the new features available in Enterprise Manager 24ai.

- Enhanced Enterprise Manager Federation
- New Navigation Menu
- Enterprise Manager Dashboard Enhancements
- Monitoring Using Remote Agents
- Zero Downtime Monitoring
- New Job System Console
- Support for Oracle Key Vault
- Guided Discovery Process for Autonomous Databases
- Automatic Database Diagnostic Monitor (ADDM) Tab in Performance Hub
- New Swim Lanes Visualization in ADDM Spotlight
- Data Masking and Subsetting Enhancements in Enterprise Manager

New Features by Focus Area

This section lists new features categorized by focus area.

Configuration, Security, and Maintenance

This section describes new features and enhancements for Configuration, Security, and Maintenance.

- **Enhanced Enterprise Manager Federation**: Enterprise Manager Federation allows you to have a consolidated view of multiple Enterprise Manager sites deployed across your enterprise. This version includes enhancements that significantly reduce the configuration steps, improve the security of EM Federation, and eliminate the ongoing credential management for secondary sites.
  For more information, see Configuring Enterprise Manager Federation in *Oracle Enterprise Manager Advanced Installation and Configuration Guide*.

Enterprise Monitoring

This section describes new features and enhancements for Enterprise Monitoring.

- **New Navigation Menu**: This release introduces a modern, new navigation menu that allows you to easily search and access the various monitoring and administration options from anywhere in the Enterprise Manager console.
- **Enterprise Manager Dashboard Enhancements**: The following Enterprise Manager Dashboard enhancements are now available:
  - **Time Selector Capability**: When creating a custom dashboard, you can use the time selector to select the duration of time for which you want to display data in the widgets in the dashboard. You also have the option of increasing or decreasing the number of days in the time selector or deleting it.

When customizing an out-of-the-box dashboard, you can click **+ Add time selector** to add the time selector.

  - **EM Federation Data Source for Custom SQL**: When creating a widget using custom SQL, you can now select **EM Federation** as the data source and the SQL query then retrieves the data from federated Enterprise Manager sites.

For more information, see Using Dashboards in *Oracle Enterprise Manager Monitoring Guide*.

- **Monitoring Using Remote Agents**: Enterprise Manager remote agents allow the remote monitoring and management of targets without requiring an agent to be installed on the same host as the targets. Remote agents can significantly reduce the number of agents needed to be deployed on managed environments, therefore simplifying deployment and maintenance tasks.
  For more information, see Discovering and Monitoring Using Remote Agents in *Oracle Enterprise Manager Monitoring Guide*.
- **Zero Down Time Monitoring**: The Zero Downtime (ZDT) Monitoring service is a new service in Enterprise Manager, responsible for processing and handling all event management, incident management and notification capabilities. Because it is a ZDT service, this means it will continue to be operational even during planned maintenance events such as updating to a new Release Update (RU).
  For more information, see Zero Downtime Monitoring in *Oracle Enterprise Manager Monitoring Guide*.
- **New Job System Console**: The new and improved Job System Console displays critical information at a glance with two main sections, Job System Health and Job System Performance, which provide an overall summary of the respective sections. Going deeper into each section provides detailed information regarding your Job System in a clear and coherent manner.
  For more information, see Job System Console: Overview in *Oracle Enterprise Manager Monitoring Guide*.
- **Support for Oracle Key Vault**: Oracle Key Vault is a key and secrets management appliance to store, manage and share security objects such as encryption keys, Oracle wallets, Java keystores, SSH keys, passwords, and other secrets in a secure, fault-tolerant, highly available and scalable environment.
  Two new target types have been added to enable the monitoring of Oracle Key Vault (OKV):
  - Oracle Key Vault Cluster (`oracle_kv_cluster`) - assists in the monitoring of OKV clusters
  - Oracle Key Vault Server (`oracle_kv_server`) - assists in the monitoring of individual OKV nodes (or a standalone server for non-cluster deployments)

  For more information, see Discovering and Adding Oracle Key Vault in *Oracle Enterprise Manager Monitoring Guide*.

Database Management

This section describes new features and enhancements for Database Management.

- **Guided Discovery Process for Autonomous Databases**: You can now discover Autonomous Databases using the guided process. This simplified process enables you to discover multiple Autonomous Databases at the same time, use advanced search functionality to filter and search for Autonomous Databases, and navigate through Oracle Cloud Infrastructure regions and compartments in the Enterprise Manager console.

For more information, see Discover Autonomous Databases as Non-host Targets Using the Guided Process in the *Oracle Enterprise Manager Administrator's Guide for Oracle Autonomous Databases*.

- **Automatic Database Diagnostic Monitor (ADDM) Tab in Performance Hub**: You can now use the **ADDM** tab in Performance Hub to access the information stored by ADDM. ADDM analyzes the AWR data on a regular basis, locates the root causes of performance problems, provides recommendations for correcting any problems, and identifies non-problem areas of the application. As AWR is a repository of historical performance data, ADDM can be used to analyze performance issues after the event, often saving time and resources that would be needed to reproduce a problem.
  For more information, see Automatic Database Diagnostic Monitor (ADDM) in Oracle Cloud Infrastructure documentation.
- **New Swim Lanes Visualization in ADDM Spotlight**: In **ADDM Spotlight**, the **Swim Lanes** visualization uses time series data aggregated for the selected time range to display findings by overall impact (%) for ADDM tasks. To use this visualization option, click the (swim lanes) icon in the upper-right corner of the **Summary** chart in the **Findings** tab. In the **Swim Lanes** visualization, the size of the bubbles indicates the overall impact of the finding and you can hover the mouse over each bubble for detailed information regarding the analysis period and findings.
- **Data Masking and Subsetting Enhancements in Enterprise Manager**: The following Oracle Data Masking and Subsetting enhancements in Enterprise Manager are now available:
  - **Modernized UI for Data Discovery and Data Masking with Oracle Javascript Extension Toolkit (JET)**
    - **Unified Console Experience**: Easily switch between key Data Masking and Subsetting components, Overview, Data Discovery, Data Masking, and Data Subsetting, all within a single, streamlined interface.
    - **Simplified Navigation**: Access features with a reorganized menu, enabling direct and intuitive navigation within each component.
    - **Workflow Diagrams**: Visualize typical workflows with newly introduced, clean and easy-to-understand diagrams.
    - **Enterprise-Level Overview Dashboard**: Gain insights with the all-new Data Masking and Subsetting Overview dashboard, offering metrics to effectively manage discovery and masking activities across your databases.
  - **UI Performance Enhancements for Data Discovery and Data Masking**
    - **Optimized Workflow Execution**: Perform workflows without unnecessary delays by loading only the data required for the requested operation, reducing resource usage and user wait time.
    - **Responsive Design**: Use a UI that seamlessly adapts to devices of various sizes, ensuring a consistent experience across desktops, tablets, and smartphones.
    - **Faster Workflow Execution**: Use enhanced flow execution time for operations like creating masking formats or definitions, leveraging Oracle JET UI, and optimizations such as lazy loading.
    - **Improved Filtering**: Use faster, client-side searches by loading data, removing the dependency on server-side filtering.
    - **Support for Bulk Operations**: Perform simplified repetitive tasks with bulk operations, such as adding sensitive columns in bulk, minimizing clicks and effort.

        - **Intuitive Masking Format Creation**: Use the simplified workflow for the creation of custom masking formats with drag-and-drop support for reorganizing format entries.

    For more information, see About Data Masking and Subsetting in *Oracle Database Data Masking and Subsetting Guide*.

- **New Metrics to Monitor Raft-based Sharding**: For Oracle Database 23c and later, you can now use the following metrics to monitor shard replication units in Enterprise Manager:
    - For Sharded Databases
        - **Shard Replication Units Summary**: Provides a summary of the replication units in an Oracle Globally Distributed Database.
    - For Pluggable Databases
        - **Shard Apply Lag**: Provides information regarding the shard replication apply coordinator process and replication unit apply lag.
        - **Shard Replication Units**: Provides details of the replication units in the shard.
        - **Shard Transport Lag**: Provide information regarding the shard replication transport lag.

    For more information, see Sharded Databases and Pluggable Databases in *Oracle Enterprise Manager Oracle Database Metric Reference Manual*.

Database Lifecycle Management

This section describes new features and enhancements for Database Lifecycle Management.

- **New SCAP Standards for Oracle Linux 7, 8, and 9**: This release features the latest Security Content Automation Protocol (SCAP) enabled compliance standards for Oracle Linux 7, 8, and 9.
  For more information, see SCAP Supported Standards in *Oracle Enterprise Manager Compliance Standards Reference*.
- **New DBSAT 3.1 Standards**: DBSAT 3.1 is now integrated as the latest Compliance Standard. DBSAT 3.1 allows you to associate your database targets, run the security assessment through the existing Compliance functionality and view its results directly in Enterprise Manager through the Security Assessment Report.
  For more information, see Oracle DBSAT Compliance Standard in *Oracle Enterprise Manager Compliance Standards Reference*.
- **Upload Gold Images from External Sources**: You can now upload Gold Images from external sources, allowing you to send updates, software images and their metadata across separate Enterprise Manager installations by migrating the Gold Images between fleet deployments.
  For more information, see Migrating Fleet Maintenance Gold Images Between Enterprise Manager Deployments in *Oracle Enterprise Manager Database Lifecycle Management Administrator's Guide*.
- **Remote Agent Support for Database Lifecycle Management Activities**: The new Remote Agent functionality is supported for Database Lifecycle Management activities.
  For more information, see Deploying Agents on OCI Resources (Optional) in *Oracle Enterprise Manager Database Lifecycle Management Administrator's Guide*.
- **New EMCLI Verb `set_cs_rule_lifecycle_status`**: This new verb allows for bulk changes in the compliance standard rules status.
  For more information, see set_cs_rule_lifecycle_status in *Oracle Enterprise Manager Command Line Interface*.

Engineered Systems Management

This section describes new features and enhancements for Engineered Systems Management.

- **Configure Backups for Data Guard Databases with More Than One Standby Database**: With this enhancement, you can configure Data Guard configurations with more than one standby database to backup to Recovery Appliance by using Maximum Availability Architectures such as *GOLD* and *GOLD with replication*. This option is available if the Zero Data Loss Recovery Appliance Management Pack is enabled for the respective Recovery Appliances.
  For information on the EMCLI verb that can be used to perform this task, see `configure_db_ha -configureBackupToRA` in *Oracle Enterprise Manager Command Line Interface*.

Extensibility and Integration

This section describes new features and enhancements for Extensibility and Integration.

- **REST APIs for Blackouts Management**: You can now use the Blackouts Management REST API to perform maintenance operations such as create, edit, or stop a blackout, as well as retrieve various information and statistics on your defined blackouts.
  For more information, see Blackouts Management APIs in *REST API for Oracle Enterprise Manager*.
- **Redesigned Plug-ins**: Plug-ins available with Oracle Enterprise Manager or via Self Update extend the Enterprise Manager monitoring capabilities to non-Oracle components. This release includes new or redesigned plug-ins for Microsoft Internet Information Services (IIS), JBoss Enterprise Application Platform (EAP), Apache Tomcat, and IBM WebSphere.

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