Oracle® Zero Downtime Migration

Zero Downtime Migration Release Notes

Release 21c (21.4)

F58902-03

August 2023

Zero Downtime Migration 21.4 Release Notes

These release notes provide downloading instructions for the latest product software and documentation, and describe new features, fixed bugs, known issues, and troubleshooting information for Zero Downtime Migration Release 21c (21.4).

What's New in This Release

Zero Downtime Migration Release 21.4 improves the existing 21c functionality with the following enhancements.

- **Physical migration job can pause for Redo Apply to catch up**

  In a physical migration job, a new response file parameter, `ZDM_APPLY_LAG_MONITORING_INTERVAL`, allows Zero Downtime Migration to monitor redo apply lag after standby database creation. This new phase queries the current redo apply lag, and waits until redo apply is finished before resuming the job.

  See ZDM_APPLY_LAG_MONITORING_INTERVAL.

- **Physical migration job can upgrade Target time zone file**

In a physical migrations job, a new response file parameter, `ZDM_TGT_UPGRADE_TIMEZONE`, allows you to add a post-migration task which upgrades the target database time zone file. This upgrade reverts the target database time zone file to the pre-migration time zone file version that was in the original target database.

See ZDM_TGT_UPGRADE_TIMEZONE_FILE.

- **Ignore checks option in ZDMCLI MIGRATE DATABASE command enhanced**

  An enhancement to the `ZDMCLI migrate database` command `-ignore` option allows you to pass a comma-separated list of ignore checks.

  A new check, `VAULT_CHECK`, has been added to the types of checks that can be ignored.

  See migrate database.

- **Logical migration GOLDENGATESETTINGS_REPLICAT_* parameters simplified**

  A new logical migration response file parameter, `GOLDENGATESETTINGS_REPLICAT_PERFORMANCEPROFILE`, simplifies Oracle GoldenGate Replicat configuration. This parameter replaces the need to configure four separate `GOLDENGATESETTINGS_REPLICAT_*` parameters listed below.

  Starting with Oracle Zero Downtime Migration 21c (21.4) release, the following parameters are deprecated and will be desupported in a future release:

  - `GOLDENGATESETTINGS_REPLICAT_MAPPARALLELISM`
  - `GOLDENGATESETTINGS_REPLICAT_APPLYPARALLELISM`
  - `GOLDENGATESETTINGS_REPLICAT_MAXAPPLYPARALLELISM`
  - `GOLDENGATESETTINGS_REPLICAT_MINAPPLYPARALLELISM`

  If you configure the `GOLDENGATESETTINGS_REPLICAT_PERFORMANCEPROFILE` parameter, then you do not have to configure these deprecated parameters.

  See GOLDENGATESETTINGS_REPLICAT_PERFORMANCEPROFILE.

- **Logical migration response file parameter for source database administrator wallet path**

  A new logical migration response file parameter, `WALLET_SOURCEADMIN`, specifies the path to the directory that contains the auto login wallet file `cwallet.sso`, which provides the source database administrator password.

  See WALLET_SOURCEADMIN.

- **CPAT terminology updates adopted**

  CPAT terminology for pre-migration analysis reports is updated as follows:

  - "PASS" with "Passed"
  - "INFORMATIONAL" with "Review Suggested"
  - "WARNING" with "Review Required"
  - "BLOCKER" with "Action Required"

- "FATAL" with "Failed"

Note that earlier Zero Downtime Migration releases allow you to upgrade CPAT, but do not support this new CPAT terminology.

You can see updated example output in Zero Downtime Migration Schema Analysis with Cloud Premigration Advisor Tool

- **Support for tables with XML types stored as CLOBS**

  Zero Downtime Migration now leverages the Oracle Data Pump CLOB to BINARY STORAGE conversion for XML types.

  The logical migration response file parameter, `DATAPUMPSETTINGS_METADATATRANSFORMS`, is enhanced to let you set `XMLTYPE_STORAGE_CLAUSE` to 'BINARY XML'.

  ```
  DATAPUMPSETTINGS_METADATATRANSFORMS-1=name:XMLTYPE_STORAGE_CLAUSE,
  value:'BINARY XML'
  ```

  With this enhancement all XML types can now be converted as part of the migration.

  See DATAPUMPSETTINGS_METADATATRANSFORMS-LIST_ELEMENT_NUMBER

- **Logical migration access to CPAT logs simplified**

  A new logical migration response file parameter, `COPYCPATREPORTTOZDMHOST`, lets Zero Downtime Migration automatically copy the CPAT report log from the source database server to the ZDM server host job log directory for easier access to logs and more efficient troubleshooting.

  See COPYCPATREPORTTOZDMHOST

- **DB_NK_CACHE_SIZE values handling enhanced**

  Zero Downtime Migration now automates the copy of these values from the source init file to the target database. This automation benefits migrations where the source database uses any tablespace of variable block size other than db_block_size. In such cases, without Zero Downtime Migration handling of `DB_NK_CACHE_SIZE`, the restore process would fail.

  Note that for migrations where non-CDB to PDB conversion takes place, you must set this value in the target placeholder database.

  See "Handling of `DB_nK_CACHE_SIZE`" in Source Database Prerequisites

- **OCI Object Storage Pre-Authenticated URL supported**

  Zero Downtime Migration now supports use of OCI Object Storage Pre-Authenticated URL (PAR) to upload Data Pump dump files to an Object Storage bucket. Zero Downtime Migration also supports the PAR URL to download and import Data Pump dump files from the bucket to the target database.

  See "Using the Oracle Cloud Object Storage Transfer Medium" in Configuring the Transfer Medium and Specifying Transfer Nodes

- **NoSudo migration**

A new authentication plugin, `dbuser`, allows you to perform migrations without sudo access. You can now perform a migration as "oracle" user for all actions on the source and target database hosts for certain migration paths.

See Migrating with Database User Privileges

- **METADATA and DATA can be migrated in separate phases**

  Zero Downtime Migration lets you migrate METADATA and DATA as separate phases.

  Workflow performs regular EXPORT and multi-phased import that involves Pre-data Metadata Import to handle USER and PROFILE creation, followed by phase handling METADATA creation and finally the DATA import. This helps with inserting workflow customization in the workflow after user or metadata is created.

  See Migrating Metadata

- **Specify the Data Pump job export version**

  A new logical migration parameter, `DATAPUMPSETTINGS_EXPORTVERSION`, allows you to specify the Data Pump job export version.

  For example, when migrating a legacy database upgraded from before Oracle 11g (11.2.0.4) and including 11.2.0.4, and that has Workspace manager, it needs the export version "12" to be set in Data Pump Export `VERSION` parameter.

  See DATAPUMPSETTINGS_EXPORTVERSION

- **Automatic Tablespace Creation**

  Zero Downtime Migration allows auto creation of user DATA, TEMP, and UNDO tablespaces.

  See TABLESPACEDETAILS_AUTOCREATE and Automatic Tablespace Creation

- **Ignore errors on job resumption**

  In a logical migration job, upon Data Pump job completion, Zero Downtime Migration analyzes the export/import log and identifies the non-ignorable ORA- errors and reports them to the user in the ZDM job log. You can review and ignore these additional export or import errors and proceed to next phase, skipping the export or import operation using new option in `ZDMCLI RESUME JOB`.

  See Resume a Migration Job

  If there are additional Data Pump errors that you want to ignore by default, those can be specified using the parameters IGNOREEXPORTERRORS and IGNOREIMPORTERRORS.

- **Logical Migration without SSH Access**

  You can perform logical migration to the target database server host without requiring SSH credentials. See Logical Migration without SSH Access.

- **Migrating to Co-Managed Database Server with NFS Data Transfer Medium**

  This logical migration scenario is supported when the requirements are met in Migrating to Co-Managed Database Server with NFS Data Transfer Medium

- **Resume capability after manual Data Guard switchover**

In case of failure during the switchover phase, you can fix any issues and perform a manual switchover. In order to avoid any issues with the migration workflow, this new functionality allows you to specify that a manual switchover has been performed and that Zero Downtime Migration should skip the switchover phase. This can be achieved by resuming the migration job with:

```
zdmcli resume job -jobid <jobid> -skip SWITCHOVER
```

See resume job

- **Migrate source databases without SPFILE**

  Physical Offline migration now supports migrating source databes without SPFILE.

  For online migration, Zero Downtime Migration still requires an SPFILE.

  See Preparing the Source and Target Databases

- **Physical migration supports TDE wallet specified using WALLET_ROOT**

  A physical migration can migrate all of the wallet files and sub-directories configured under `WALLET_ROOT`. If the source has PDB wallets in isolated mode, Zero Downtime Migration migrates all of the wallet's files in sub-directories under `WALLET_ROOT`.

- **Disable backup compression and encryption**
  Zero Downtime Migration allows you to disable backup compression and encryption for physical migration. You can turn off the encryption when migrating between on-premises databases only.

  See ZDM_RMAN_ENCRYPT_BACKUP

- **Configurable RMAN section size**

  You can manually configure the Oracle RMAN section size using the new response file parameter `ZDM_RMAN_SECTION_SIZE`.

  See ZDM_RMAN_SECTION_SIZE

- **Define PDB target name on non-CDB to PDB conversions**

  Physical migration allows for conversion between Non-CDB sources and PDB targets, and it is now possible to define the name of the target PDB before starting the migration with the response file parameter `ZDM_NONCDBTOPDB_PDB_NAME`

  See ZDM_NONCDBTOPDB_PDB_NAME

- **Support for wallet credentials for running a useraction**

  In a logical migration you can provide an auto login wallet path, which contains the username and its password.

  See Registering User Actions and WALLET_USERACTION

- **Pass source export directory name and dump name to a useraction script**

You can use the following useraction parameters to pass information to a useraction script

```
ZDM_DATAPUMP_EXPORT_DIR_NAME=DATA_PUMP_DIR_NAME
ZDM_DATAPUMP_EXPORT_DIR_PATH=data_pump_dir_path
ZDM_DATAPUMP_DUMP_PREFIX=data_pump_prefix
```

See Parameters Supplied for Custom Plug-ins with Shell Script User Actions

- **Reload objects**
  You can reload objects and specify the **Reload** rules. See Selecting Objects for Migration.
- **Migrating Objects With Different Oracle GoldenGate Support Modes**

  You can migrate objects with different Oracle GoldenGate support modes.

  See Migrating Objects With Different Oracle GoldenGate Support Modes
- **Extract and Replicat processes auto start enabled**

  By default, Zero Downtime Migration ensures that Oracle GoldenGate Extract and Replicat are auto start enabled for resiliency of any unexpected failures for logical migrations.
- **Auto-purge jobs disabled on target**

  Disable auto-purge jobs on the target database immediately after instantiation (Data Pump Import). Otherwise, the purge jobs will cause data inconsistency condition on the target database causing GoldenGate Replicat to fail. Some of these jobs will purge data. During the ZDM_POST_DATAPUMP_TGT phase, ZDM will disable purge jobs in the target database. ZDM enables the purge jobs in the target database during the ZDM_POST_SWITCHOVER_TGT phase.
- **Logical Migration Best Practices Documentation**

  Zero Downtime Migration documentation now includes best practice recommendations to help you achieve successful logical migrations.

  See Best Practices for Logical Database Migration for more information.
- **Installing Zero Downtime Migration on VM in Oracle Cloud Infrastructure**
  Install ZDM on a VM in OCI by referring to the steps available at Installing Zero Downtime Migration on VM in Oracle Cloud Infrastructure.
- **Variables Supplied for Custom Plug-ins with SQL Based User Actions**
  Information about the SQL based user actions is available at Variables Supplied for Custom Plug-ins with SQL Based User Actions.
- **Review for new patches if required by reviewing Patch 33509650: ZDM PATCH USING MOS**
  Review the latest patch if required by referring to the Install Zero Downtime Migration Software topic.
- **Installing Zero Downtime Migration on Red Hat Enterprise Linux 8 in an Oracle Cloud Infrastructure Instance**
  Refer to the steps available at Installing Zero Downtime Migration on Red Hat Enterprise Linux 8.

Bugs Fixed

Zero Downtime Migration Release 21.4 introduces the bug fixes listed in the following table.

Table Bugs Fixed In Zero Downtime Migration Release 21.4

Bug Number	Description
34979586	LNX-21.3 - ZDM: VALIDATE RDS TO ADB-S MIGRATION FAILS WITH PARAMETER RHPHELPERUTIL-CONSTR-OHOME VALUE IS NOT VALID
34996189	ZDM VALIDATION SOURCE FAILS WITH SOURCE AS AIX
35261857	ZDM MIGRATION WITH APPLICATION CONTAINER FAILS.
35325728	ZDM FAILURE - RMAN-07551: DATA FILE 857 MUST BE RESTORED
35186823	PHYSICAL MIGRATION FAILS FOR 11.2.0.4 SOURCES WITH DIRECT DATA TRANSFER -> PRGZ-3635 : ISOLATED MODE KEYSTORE WITHOUT AUTOLOGIN DETECTED FOR PDBS "0" OF DATABASE DBNAME
35195827	ZDM: LOGICAL MIGRATION FROM SOLARIS TO EXACC FAILS WITH PRGZ-1141 & PRCZ-4002 ILLEGAL OPTION
35309075	ZDM: DBUSER PLUGIN FAILS WITH AN ERROR ON COPY STEP PRCZ-2123 PRCZ-4002
35182080	PRCZ-4002 : FAILED TO EXECUTE COMMAND "/BIN/CP" USING THE PRIVILEGED EXECUTION PLUGIN "DBUSER
33124731	ZDM WRONGLY SETS FAL_SERVER ON STANDBY SYSTEM
33453726	GG SETUP FOR ID_KEY
33629992	ZDM: NONCDB TO PDB CONVERSION FAILS WITH ORA-65122: PLUGGABLE DATABASE GUID CONFLICTS WITH THE GUID OF AN EXISTING CONTAINER
33647475	INTERNAL EXCEPTION: JAVA.SQL.SQLNONTRANSIENTCONNECTIONEXCEPTION: TOO MANY CONNECTIONS
33967375	ZDM: MIGRATION TO EXACC 12.1 FAILS WITH PRCR-1001 : RESOURCE ORA.ZDM_AUX_SIERRA.DB DOES NOT EXIST
33991550	EDZI : ZDM LOGICAL MIGRATION TO ADBD - EVAL OPTION FAILED WITH ERROR PRGZ-1320 : FAILED TO DISCOVER ORACLE DATABASE {0} OBJECTS
34002538	ZDM MIGRATION FAILED AT PHASE ZDM_RESTORE_TGT WITH RMAN-11003 ORA-01511 ORA-00261
34013080	MIGRATION -EVAL IGNORING PARAMETER SRC_DB_LISTENER_PORT WHILE EXECUTING PHASE ZDM_PRECHECKS_TGT
34020210	ZDM ALLOW NOSUDO DBUSER LOGICAL MIGRATION
34082591	SOURCE DB ON OLDER LINUX DISTRIBUTIONS MIGHT FACE ISSUES DUE TO DEPRECATED KEXALGORITHMS
34082818	'CUT' IS NOT LOCATED AT /BIN/CUT IN SEVERAL LINUX DISTRIBUTIONS -? ORADISCOVER.SH FAILS AND SUBSEQUENTLY THE MIGRATION FAILS

Table (Cont.) Bugs Fixed In Zero Downtime Migration Release 21.4

Bug Number	Description
34123897	ZDM: RESUME ZDM JOB PICKING UP WRONG CASE ORACLE_SID
34141215	AS PART OF POST CLOING JOB ON TARGET, SRVCTL RUNS MODIFY COMMAND CHANGING DATABASE NAME TO SAME AS DB UNIQUE NAME
34209964	ZDM EVAL - CHARACTER SET PRECHECK
34241041	ZDM RESTORE DB PICKS WRONG LOC FOR FIRST ATTEMPT
34485179	OCIPROXY_* SETTINGS ARE NOT PASSED TO OCI SDK CAUSES ERROR "JAVA.NET.CONNECTEXCEPTION: CONNECTION REFUSED (CONNECTION REFUSED)"
34496249	ZDM: -EVAL FAILS WITH PRCT-1014 : INTERNAL ERROR: RHPHELP_TOOL_ERROR-03
34500541	ZDLRA - DUPLICATE DB FAILING WITH RMAN-06569 WHILE MIGRATION TO EXACC
34523536	ZDMLOGICAL: ADD SCHEMA.* TO EXTRACT FOR DDL REPLICATION
34564746	ZDMLOGICAL: UPLOAD DUMP FILES FIX IS NEEDED FOR ZDM_UPLOAD_HELPER.SH SCRIPT
34569153	ZDMLOGICAL: DBUSER PLUGIN FAILING WITH PRCZ-4001 : FAILED TO EXECUTE COMMAND "/BIN/CHOWN"
34590652	ZDM: LOGICAL MIGRATION OF ONE TABLE FAILING WITH ERROR ORA-39038 & ORA-39038
34669782	REVIEW SEGMENT_ATTRIBUTES TRANSFORM FOR ADBCC MIGRATION USING ZDM
34760462	BUG FIXES WHILE GETTING ADBCONNECTION DURING VALIDATE_TARGET PHASE
34860340	DBUNIQUE_NAME DIFFERENT THAT DB_NAME AT SOURCE REQUIRES MANUAL WORKAROUND
34893354	ZDM FAILURE WHEN ZDM JOB DIRECTORY IS HOSTED ON NFS SHARE DUE TO FLOCK() USAGE

Downloading the Zero Downtime Migration Installation Software

For a fresh installation of the latest Zero Downtime Migration software version, go to https://www.oracle.com/database/technologies/rac/zdm-downloads.html.

Downloading the Zero Downtime Migration Documentation

You can browse and download Zero Downtime Migration documentation at https://docs.oracle.com/en/database/oracle/zero-downtime-migration/

General Information

At the time of this release, there are some details and considerations about Zero Downtime Migration behavior that you should take note of.

Running RHP and Zero Downtime Migration Service on the Same Host

If the Zero Downtime Migration service is installed on the same host where RHP server is deployed, note that there are some workarounds.

If you have has started an RHP server/client on the same node as the Zero Downtime Migration service, using the default port, you must either

- Stop RHPS/RHPC
- Modify the port for RHPS/RHPC

This is to avoid port collision between RHP and Zero Downtime Migration. If you don't want to change RHP configuration, you can also modify the port for Zero Downtime Migration before starting the Zero Downtime Migration service.

To identify the ports being used by Zero Downtime Migration:

```
ZDMinstallation/home/bin/zdmservice status
```

To stop the Zero Downtime Migration service:

```
ZDMinstallation/home/bin/zdmservice stop
```

To modify the ports:

```
ZDMinstallation/home/bin/zdmservice modify -help
Modifies configuration values.
USAGE: zdmservice modify
Optional parameters:
                    transferPortRange=<Range_of_ports>
                    rmiPort=<rmi_port>
                    httpPort=<http_port>
                    mysqlPort=<mysql_port>
```

For example:

```
ZDMinstallation/home/bin/zdmservice modify mysqlPort=8899
Editing MySQL port...
Successfully edited port=.* in file my.cnf
Successfully edited ^\(CONN_DESC=\).* in file rhp.pref
Successfully edited ^\(MYSQL_PORT=\).* in file rhp.pref
```

Cloud Premigration Advisor Tool Support

Cloud Premigration Advisor Tool (CPAT) is supported with Zero Downtime Migration for the following use cases:

- CPAT is run automatically on the source database environment during logical migration jobs from Oracle Cloud and on-premises Oracle Database sources (default behavior)
- CPAT is run manually from a remote server against an Amazon Web Services RDS Oracle Database source; in other words, CPAT is not run by `ZDMCLI migrate database` (see Running CPAT with a Remote Connection)

CPAT is not supported in the following use cases:

- Physical migration jobs
- Generating fixup scripts for Amazon Web Services RDS Oracle Database sources

UNDO Tablespaces Added to the Source Database

Zero Downtime Migration adds UNDO tablespaces to the production database to match the target instance count if the production database has fewer instances.

To prevent Zero Downtime Migration from adding UNDO tablespaces to the source database, you can match the target database nodes count to that of the source database until the switchover, then you can add additional nodes to the target database after the switchover.

Cross-Edition Migration

Zero Downtime Migration cannot be used to migrate an Enterprise Edition database to a Standard Edition database. In the converse case, Standard Edition databases can be migrated to Enterprise Edition databases, but only using the logical migration work flow.

EXT3 File System Support

There is a known issue which prevents Zero Downtime Migration from being installed in EXT3 file systems. The root cause is MySQL bug 102384. This is not a limitation of Zero Downtime Migration, but a constraint from MySQL. When that bug is resolved, Zero Downtime Migration is expected to work on EXT3 file systems.

Known Issues

At the time of this release, the following are known issues with Zero Downtime Migration that could occur in rare circumstances. For each issue, a workaround is provided.

Skip the ZDM RELOAD of empty schema or schema with no qualifying objects

Solution: ZDM filters objects for reload and if there are no objects to be reloaded for any specific schema post applying the following conditions, then avoid the reload feature or do not include the particular schema.

ZDM filters the following objects:

- Objects from `DBA_GOLDENGATE_SUPPORT_MODE` that have `SUPPORT_MODE=NONE` or `SUPPORT_MODE=PLSQL` or `SUPPORT_MODE= INTERNAL`.
- Objects from `DBA_GOLDENGATE_NOT_UNIQUE` that are marked `BAD_COLUMN=Y`. ZDM skips `QUEUE_TABLES` from reload.

  When there are no objects are listed for reload from specific schema, then skip the reload feature or do not include the particular schema.

PREMIGRATION ADVISOR COMPILATION FAILURES DURING DRY RUN - PRCZ-2103 CAN'T LOCATE JSON/PP.PM

Issue: The `OPRCZ-2103 CAN'T LOCATE JSON/PP.PM` error occurs during the `ZDM_PRE_MIGRATION_ADVISOR` phase.

Solution: When the source database is Oracle Database 11.2.0.4, for performing a logical migration, specify the following parameters in the response file:

- `RUNCPATREMOTELY=TRUE`
- `COPYCPATREPORTTOZDMHOST=FALSE`

ORA-23605: INVALID VALUE "" FOR GOLDENGATE PARAMETER PARALLELISM.

Issue: The Oracle GoldenGate Extract startup fails when the source database is Oracle Standard Edition 2, due to the following error:

```
ORA-23605: INVALID VALUE "" FOR GOLDENGATE PARAMETER PARALLELISM.
```

Solution: If you do not apply the patch on the source database, then specify `GOLDENGATESETTINGS_EXTRACT_PARALLELISM=1` parameter in the ZDM response file. ZDM will set `TRANLOGOPTIONS INTEGRATEDPARAMS (parallelism 1)` for Oracle GoldenGate Extract.

PRCZ-4002 : failed to execute command "/bin/cp" using the privileged execution plugin "zdmauth" on nodes "dbserver"

Issue: The `ZDMCLI RESUME JOB` command fails during migration and the ZDM job pauses at the `ZDM_CONFIGURE_DG_SRC` phase. The error occurs when you update the `/etc/hosts` file of the source database server with a different IP address or alias for the source database server.

Solution: Ensure that the IP address of the source database server is correctly updated in the `/etc/hosts` file of the source database server and the ZDM server.

Migrating from Amazon Web Services RDS Oracle Database to Oracle Autonomous Database on Shared Exadata Infrastructure fails in validate phase with error PARAMETER]] RHPHELPERUTIL-CONSTR-OHOME VALUE IS NOT VALID

Issue: Migrating from Amazon Web Services RDS Oracle Database to Oracle Autonomous Database on Shared Exadata Infrastructure fails in the `ZDM_VALIDATE_SRC` phase with error `PARAMETER]] RHPHELPERUTIL-CONSTR-OHOME VALUE IS NOT VALID`.

Solution: This issue occurs when `-srcauth` details are provided in the command.

Remove the `-srcauth` parameter when the source environment is Amazon Web Services RDS Oracle Database.

TLS Service is required for Fractional OCPU Services in Oracle Autonomous Database

Issue: The TLS service is required for **fractional OCPU** services in Oracle Autonomous Database service alias which is to be specified in the response file parameter. Specifying non-TLS alias is not supported.

Solution: If the target database is Oracle Autonomous Database on Dedicated Exadata Infrastructure or Oracle Autonomous Database on Exadata Cloud@Customer using **fractional OCPU** services, then you can specify `TP_TLS` or `LOW_TLS` aliases for the TARGETDATABASE_CONNECTIONDETAILS_SERVICENAME parameter.

For more information about specifying the requirement for the service alias for the target database, see Setting Logical Migration Parameters.

Migrating from AIX to EXACC using NFS with Non-readable Dump Fails to CHOWN

Issue: Migrating from AIX to EXACC using NFS with non-readable dump fails to CHOWN in source AIX host.

Solution: Use an alternate option for migrating using NFS which is documented in Migrating to Co-Managed Database Server with NFS Data Transfer Medium.

However the following scenario is not supported for IBM AIX: If the IDs do not match, Zero Downtime Migration automatically discovers the primary group of the target database user and changes the group of the dump to the primary group of the target database user.

Logical migration with DBUSER plugin must also set RUNCPATREMOTELY

Solution: To perform a logical migration using database user authentication plug-in as `dbuser`, you must set value of the `RUNCPATREMOTELY` parameter to `TRUE`.

See RUNCPATREMOTELY for information about this parameter.

Warnings shown when running zdminstall

Issue: If home and base directories are not precreated, a warning similar to the following is shown when running the zdminstall.sh script.

```
/bin/df: '/ [...] /zdm21.3.1/home/..': No such file or directory
/ [...] /zdm3rdparty/zdminstall.sh: line 2092: [: -lt: unary operator
expected
```

Solution: This warning message can be ignored because the Zero Downtime Migration installer creates the home and base directories if they are not present. The warning does not affect the outcome of the installation or cause any issues for migration.

Warnings shown when running zdmservice operations

Issue: A warning similar to the following is shown when running zdmservice operations `start`, `stop`, `status`, or `deinstall`.

```
Use of uninitialized value in concatenation (.) or string at / [...]
 /zdm21.3.1/home/lib/jwcctl_lib.pm line 571.
CRS_ERROR: Invalid data ALWAYS_ON= in _USR_ORA_ENV
```

Note that the line number in the output may vary.

Solution: This warning message can be ignored. It does not affect the use of the `zdmservice` operations or cause any issues for migration.

Logical Migration Using DBLINK Fails with PRGZ-1177

Issue: "PRGZ-1177 : Database link "dblink_name" is invalid and unusable" error causes failure in a logical migration using a database link in a PDB or multitenant database in version 12.1.0.x.

Solution: See 12c PDB or Multitenant Only: ORA-02085: Database Link "LINK_NAME_HERE" Connects To "TARGET_DB" (Doc ID 2344831.1)

PRGZ-1161 : Predefined database service "TP" does not exist

Issue: PRGZ-1161 : Predefined database service "TP" does not exist for Autonomous Database *ocid* is a known issue for fractional OCPU configuration

If you choose to configure ‘Fractional ADB’ (Fraction of OCPU per DB instead of integer OCPU) – this flavor does not provide standard service alias HIGH and

Solution: Set the RSP parameter `TARGETDATABASE_CONNECTIONDETAILS_SERVICENAME` to **LOW_TLS** or **TP_TLS**

The available services are - ‘low’ or ‘low_tls’ for Autonomous Data Warehouse with fractional OCPU, and ‘tp’ or ‘tp_tls’ for Autonomous Transaction Processing with fractional OCPU.

PRGG-1043 : No heartbeat table entries were found for Oracle GoldenGate Replicat process

Issue: An online logical migration job can report error PRGG-1043: No heartbeat table entries were found for Oracle GoldenGate Replicat process *process_name* due to one of the following causes:

1. Initialization parameter `job_queue_processes` was set to zero in the source or target database.

   Solution: Run the following statements on the database:

   ```
   show parameter job_queue_processes;
   alter system set job_queue_processes=100 scope=both;
   exec
   dbms_scheduler.set_scheduler_attribute('SCHEDULER_DISABLED','FALSE')
   ;
   ```

2. Scheduled job `GG_UPDATE_HEARTBEATS` is not active in the source database.
3. The server hosting Oracle GoldenGate deployments has a different time zone than the source database.

Solution: First, do one of the following solutions:

- Modify the time zone for the server hosting Oracle GoldenGate deployments, OR
- Use the web UI for the Oracle GoldenGate deployment to add Extract parameter `TRANLOGOPTIONS SOURCE_OS_TIMEZONE` and restart Extract.

  For example, if the source database time zone is UTC-5, then set parameter `TRANLOGOPTIONS SOURCE_OS_TIMEZONE -5`. For more information, see TRANLOGOPTIONS in *Reference for Oracle GoldenGate*.

Then, ensure that the `DST_PRIMARY_TT_VERSION` property in the source database is up to date.

Restore Fails When Source Uses WALLET_ROOT

Issue: Zero Downtime Migration does not currently handle the migration of the TDE wallet from the source database to the target when the source database is using the `wallet_root` initialization parameter. Without the wallets available on the target database, the restore phase fails with an error similar to the following:

```
RMAN-00571: ===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============
RMAN-00571: ===========================================================
RMAN-03002: failure of restore command at 06/15/2021 07:35:11
ORA-19870: error while restoring backup piece
/rman_PRD1/ZDM/IQPCZDM/c-3999816841-20210614-00
ORA-19913: unable to decrypt backup
```

Solution: Manually copy the wallet to the target and resume the job.

PRCZ-4026 Thrown During Migration to Oracle Database 19.10 Target

Issue: When attempting to migrate to an Oracle Database 19.10 home at target, the migration job fails at phase `ZDM_FINALIZE_TGT` with error PRCZ-4026, because of Oracle Clusterware (OCW) Bug 31070231.

```
PRCZ-4026 : Resource ora.db_unique_name.db is already running on nodes
node.
```

Solution: Apply the Backport Label Request (BLR) for Bug#32646135 to the target 19.10 dbhome to avoid the reported issue. Once the BLR is applied, you can resume the failed migration job to completion.

Precaution: For physical migrations, you can avoid this issue by ensuring that your target database home is not on Oracle Database 19.10.

Environments With Oracle 11.2.0.4 Must Apply Perl Patch

Issue: Before using Zero Downtime Migration, you must apply a PERL patch if your source database environment meets either of the following conditions.

- Clusterware environment with Oracle Grid Infrastructure 11.2.0.4
- Single instance environment with Oracle Database 11.2.0.4

Solution: Download and apply Perl patch version 5.28.2 or later. Ensure that both the source and target Oracle Database 11g home include the patch for BUG 30508206 - UPDATE PERL IN 11.2.0.4 DATABASE ORACLE HOME TO V5.28.2.

ORA-39006 Thrown During Logical Migration to Oracle Autonomous Database on Dedicated Exadata Infrastructure Over Database Link

Issue: When attempting to migrate a database to an Oracle Autonomous Database on Dedicated Exadata Infrastructure target over a database link, the migration job fails with error ORA-39006.

```
ORA-39006: internal error
```

Solution: This is a Data Pump issue that is being tracked with Bug 31830685. Do not perform logical migrations over a database link to Oracle Autonomous Database on Dedicated Exadata Infrastructure targets until the bug is fixed and the fix is applied to the Autonomous target database.

Zero Downtime Migration Service Fails To Start After Upgrade

Issue: The following scenario occurs:

1. Perform migration jobs with Zero Downtime Migration 19.7
2. Response files used in those jobs are removed
3. Upgrade to Zero Downtime Migration 21.1
4. Attempt to run a migration

The following errors are seen.

```
CRS_ERROR:TCC-0004: The container was not able to start.

CRS_ERROR:One or more listeners failed to start. Full details will be
found in the appropriate container log fileContext [/rhp] startup failed
due to previous errors sync_start failed with exit code 1.
```

A similar error is found in the log files located in *zdm_installation_location*/base/crsdata/*hostname*/rhp/logs/.

```
Caused by: oracle.gridhome.container.GHException: Internal
error:PRGO-3003 : Zero downtime migration (ZDM) template file /home/jdoe/
zdm_mydb.rsp does not exist.
```

Solution: To recover, manually recreate the response files listed in the log, and place them in the location specified in the log.

Troubleshooting

If you run into issues, check here in case a solution is published. For each issue, a workaround is provided.

Installation Issues

INS-42505 Warning Shown During Installation

Issue: The following warning is shown during installation.

```
/stage/user/ZDM_KIT_relnumber>./zdminstall.sh setup
oraclehome=/stage/user/grid oraclebase=/stage/user/base
ziploc=/stage/user/ZDM_KIT_relnumber/rhp_home.zip -zdm
---------------------------------------
Unzipping shiphome to gridhome
---------------------------------------
Unzipping shiphome...
Shiphome unzipped successfully..
---------------------------------------
##### Starting GridHome Software Only Installation #####
---------------------------------------
Launching Oracle Grid Infrastructure Setup Wizard...

[WARNING] [INS-42505] The installer has detected that the Oracle Grid
Infrastructure home software at (/stage/user/grid) is not complete.
   CAUSE: Following files are missing:
...
```

Solution: This warning message can be ignored. It does not affect the installation or cause any issues for migration.

Connectivity Issues

General Connectivity Issues

Issue: If connectivity issues occur between the Zero Downtime Migration service host and the source or target environments, or between source and target environments, check the following areas.

Solution: Verify that the SSH configuration file (`/root/.ssh/config`) has the appropriate entries:

```
Host *
  ServerAliveInterval 10
  ServerAliveCountMax 2

Host ocidb1
  HostName 192.0.2.1
  IdentityFile ~/.ssh/ocidb1.ppk
  User opc
  ProxyCommand /usr/bin/nc -X connect -x www-proxy.example.com:80 %h %p
```

Note that the proxy setup might not be required when you are not using a proxy server for connectivity. For example, when the source database server is on Oracle Cloud Infrastructure Classic, you can remove or comment the line starting with `ProxyCommand`.

If the source is an Oracle RAC database, then make sure you copy the `~/.ssh/config` file to all of the source Oracle RAC servers. The SSH configuration file refers to the first Oracle RAC server host name, public IP address, and private key attributes.

Communications Link Failure

Issue: If the MySQL server crashes you will see errors such as this one for the ZDM operations:

```
$ ./zdmcli query job -jobid 6
Exception [EclipseLink-4002] (Eclipse Persistence Services -
2.7.7.qualifier): org.eclipse.persistence.exceptions.DatabaseException
Internal Exception:
com.mysql.cj.jdbc.exceptions.CommunicationsException:
Communications link failure
The last packet sent successfully to the server was 0 milliseconds
ago. The
driver has not received any packets from the server.
Error Code: 0
Query: ReadAllQuery(referenceClass=JobSchedulerImpl sql="SELECT
JOB_IDENTIFIER, M_ACELIST, ARGUMENTS, ATTRIBUTES, CLIENT_NAME,
COMMAND_PROVIDED, COMPARTMENT, CONTAINER_TYPE, CREATEDATE, CREATOR,
CURRENT_STATUS, DB_OCID, DBNAME, DEPLOYMENT_OCID,
DISABLE_JOB_EXECUTION,
ELAPSED_TIME, END_TIME, EXECUTE_PHASES, EXECUTION_TIME, IS_EVAL,
IS_PAUSED,
JOB_TYPE, METHOD_NAME, METRICS_LOCATION, OPERATION, PARAMETERS,
PARENT_JOB_ID, PAUSE_AFTER_PHASE, RESULT, PHASE, JOB_SCHEDULER_PHASES,
REGION, REST_USER_NAME, RESULT_LOCATION, SCHEDULED_TIME, SITE,
SOURCEDB,
SOURCENODE, SOURCESID, SPARE1, SPARE2, SPARE3, SPARE_A, SPARE_B,
SPARE_C,
START_TIME, STOP_AFTER_PHASE, TARGETNODE, JOB_THREAD_ID, UPD_DATE,
```

```
USER_NAME,
ENTITY_VERSION, CUSTOMER FROM JOBSCHEDULER WHERE (PARENT_JOB_ID = ?)")
```

Solution: If such Communications errors are seen, restart the Zero Downtime Migration service so that the MySQL server is restarted, after which the pending jobs will resume automatically.

Stop the Zero Downtime Migration service:

```
zdmuser> $ZDM_HOME/bin/zdmservice stop
```

Start the Zero Downtime Migration service:

```
zdmuser> $ZDM_HOME/bin/zdmservice start
```

Evaluation Fails in Phase ZDM_GET_TGT_INFO

Issue: During the evaluation (`-eval`) phase of the migration process, the evaluation fails in the `ZDM_GET_TGT_INFO` phase with the following error for the Oracle RAC instance migration.

```
Executing phase ZDM_GET_TGT_INFO
Retrieving information from target node "trac11" ...
PRGZ-3130 : failed to establish connection to target listener from
nodes [srac11, srac12]
PRCC-1021 : One or more of the submitted commands did not execute
successfully.
PRCC-1025 : Command submitted on node srac11 timed out after 15
seconds.
PRCC-1025 : Command submitted on node srac12 timed out after 15
seconds.
```

Solution:

1. Get the SCAN name of source database and add it to the `/etc/hosts` file on both target database servers, with the public IP address of the source database server and the source database SCAN name. For example:

   ```
   192.0.2.3 source-scan
   ```

2. Get the SCAN name of the target database and add it to the `/etc/hosts` file on both source database servers, with the public IP address of the target database server and target database SCAN name. For example:

   ```
   192.0.2.1  target-scan
   ```

> **Note:**
>
> This issue, where the SCAN IP address is not added to `/etc/hosts` file, might occur because in some cases the SCAN IP address is assigned as a private IP address, so it might not be resolvable.

Object Storage Is Not Accessible

Issue: When Object Storage is accessed from the source or target database server, it may fail with the following error.

```
About to connect() to swiftobjectstorage.xx-region-1.oraclecloud.com
port 443 (#0)
Trying 192.0.2.1... No route to host
Trying 192.0.2.2... No route to host
Trying 192.0.2.3... No route to host
couldn't connect to host
Closing connection #0
curl: (7) couldn't connect to host
```

Solution: On the Zero Downtime Migration service host, in the response file template (`$ZDM_HOME/rhp/zdm/template/zdm_template.rsp`), set the Object Storage Service proxy host and port parameters listed below, if a proxy is required to connect to Object Storage from the source database server. For example:

```
SRC_OSS_PROXY_HOST=www-proxy-source.example.com
SRC_OSS_PROXY_PORT=80
```

In the response file template (`$ZDM_HOME/rhp/zdm/template/zdm_template.rsp`), set the Object Storage Service proxy host and port parameters listed below, if a proxy is required to connect to Object Storage from the target database server. For example:

```
TGT_OSS_PROXY_HOST=www-proxy-target.example.com
TGT_OSS_PROXY_PORT=80
```

SSH Error "EdDSA provider not supported"

Issue: The following error messages appear in `$ZDM_BASE/crsdata/`*`zdm service hostname`*`/rhp/zdmserver.log.0`.

```
[sshd-SshClient[3051eb49]-nio2-thread-1] [ 2020-04-04 00:26:24.142
GMT ]
 [JSChChannel$LogOutputStream.flush:1520]  2020-04-04: WARNING:
org.apache.sshd.client.session.C:
 globalRequest(ClientConnectionService[ClientSessionImpl[opc@samidb-db/
140.238.254.80:22]])[hostkeys-00@openssh.com,
 want-reply=false] failed (SshException) to process: EdDSA provider
```

```
not supported

[sshd-SshClient[3051eb49]-nio2-thread-1] [ 2020-04-04 00:26:24.142
GMT ]
 [JSChChannel$LogOutputStream.flush:1520]  2020-04-04: FINE   :
org.apache.sshd.client.session.C:
 globalRequest(ClientConnectionService[ClientSessionImpl[opc@samidb-db/
140.238.254.80:22]])[hostkeys-00@openssh.com,
 want-reply=false] failure details
org.apache.sshd.common.SshException: EdDSA provider not supported
    at
org.apache.sshd.common.util.buffer.Buffer.getRawPublicKey(Buffer.java:4
46)
    at
org.apache.sshd.common.util.buffer.Buffer.getPublicKey(Buffer.java:420)
    at
org.apache.sshd.common.global.AbstractOpenSshHostKeysHandler.process(Ab
stractOpenSshHostKeysHandler.java:71)
    at
org.apache.sshd.common.global.AbstractOpenSshHostKeysHandler.process(Ab
stractOpenSshHostKeysHandler.java:38)
    at
org.apache.sshd.common.session.helpers.AbstractConnectionService.global
Request(AbstractConnectionService.java:723)
    at
org.apache.sshd.common.session.helpers.AbstractConnectionService.proces
s(AbstractConnectionService.java:363)
    at
org.apache.sshd.common.session.helpers.AbstractSession.doHandleMessage(
AbstractSession.java:400)
    at
org.apache.sshd.common.session.helpers.AbstractSession.handleMessage(Ab
stractSession.java:333)
    at
org.apache.sshd.common.session.helpers.AbstractSession.decode(AbstractS
ession.java:1097)
    at
org.apache.sshd.common.session.helpers.AbstractSession.messageReceived(
AbstractSession.java:294)
    at
org.apache.sshd.common.session.helpers.AbstractSessionIoHandler.message
Received(AbstractSessionIoHandler.java:63)
    at
org.apache.sshd.common.io.nio2.Nio2Session.handleReadCycleCompletion(Ni
o2Session.java:357)
    at
org.apache.sshd.common.io.nio2.Nio2Session$1.onCompleted(Nio2Session.ja
va:335)
    at
org.apache.sshd.common.io.nio2.Nio2Session$1.onCompleted(Nio2Session.ja
va:332)
    at
```

```
org.apache.sshd.common.io.nio2.Nio2CompletionHandler.lambda$completed$
0(Nio2CompletionHandler.java:38)
    at java.security.AccessController.doPrivileged(Native Method)
    at
org.apache.sshd.common.io.nio2.Nio2CompletionHandler.completed(Nio2Comp
letionHandler.java:37)
    at sun.nio.ch.Invoker.invokeUnchecked(Invoker.java:126)
    at sun.nio.ch.Invoker$2.run(Invoker.java:218)
    at
sun.nio.ch.AsynchronousChannelGroupImpl$1.run(AsynchronousChannelGroupI
mpl.java:112)
    at
java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.ja
va:1149)
    at
java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.j
ava:624)
    at java.lang.Thread.run(Thread.java:748)
Caused by: java.security.NoSuchAlgorithmException: EdDSA provider not
supported
    at
org.apache.sshd.common.util.security.SecurityUtils.generateEDDSAPublicK
ey(SecurityUtils.java:596)
    at
org.apache.sshd.common.util.buffer.keys.ED25519BufferPublicKeyParser.ge
tRawPublicKey(ED25519BufferPublicKeyParser.java:45)
    at
org.apache.sshd.common.util.buffer.keys.BufferPublicKeyParser$2.getRawP
ublicKey(BufferPublicKeyParser.java:98)
    at
org.apache.sshd.common.util.buffer.Buffer.getRawPublicKey(Buffer.java:4
44)
    ... 22 more
[sshd-SshClient[3051eb49]-nio2-thread-1] [ 2020-04-04 00:26:24.142
GMT ]
 [JSChChannel$LogOutputStream.flush:1520]  2020-04-04: FINE   :
org.apache.sshd.client.session.C:

sendGlobalResponse(ClientConnectionService[ClientSessionImpl[opc@samidb
-db/140.238.254.80:22]])[hostkeys-00@openssh.com]
 result=ReplyFailure, want-reply=false

[sshd-SshClient[3051eb49]-nio2-thread-2] [ 2020-04-04 00:26:24.182
GMT ]
 [JSChChannel$LogOutputStream.flush:1520]  2020-04-04: FINE   :
org.apache.sshd.common.io.nio2.N:
 handleReadCycleCompletion(Nio2Session[local=/192.168.0.2:41198,
remote=samidb-db/140.238.254.80:22])
 read 52 bytes
```

Solution: Zero Downtime Migration uses the RSA format.

Transparent Data Encryption Related Issues

Transparent Data Encryption General Information

Depending on your source database release, Transparent Data Encryption (TDE) wallet configuration may be required.

- **Oracle Database 12c Release 2 and later**
  For Oracle Database 12c Release 2 and later releases, TDE wallet configuration is mandatory and must be enabled on the source database before migration begins.

  If TDE is not enabled, the database migration will fail.

  Upon restore, the database tablespaces are encrypted using the wallet.
- **Oracle Database 12c Release 1 and earlier**
  On Oracle Database 12c Release 1 and Oracle Database 11g Release 2 (11.2.0.4), TDE configuration is not required.

For information about the behavior of TDE in an Oracle Cloud environment, see My Oracle Support document Oracle Database Tablespace Encryption Behavior in Oracle Cloud (Doc ID 2359020.1).

Job Fails in Phase ZDM_SETUP_TDE_TGT

Issue: The phase `ZDM_SETUP_TDE_TGT` fails with one of the following errors.

```
Executing phase ZDM_SETUP_TDE_TGT
Setting up Oracle Transparent Data Encryption (TDE) keystore on the
target node oci1121 ...
oci1121: <ERR_FILE><Facility>PRGZ</
Facility><ID>ZDM_KEYSTORE_NOT_SETUP_ERR</ID><ARGS><ARG>oci112_phx1z3</
ARG></ARGS></ERR_FILE>
PRGO-3007 : failed to migrate database "db11204" with zero downtime
PRCZ-4002 : failed to execute command "/u01/app/18.0.0.0/grid/perl/bin/
perl" using the privileged execution plugin "zdmauth" on nodes
"oci1121"
PRCZ-2103 : Failed to execute command "/u01/app/18.0.0.0/grid/perl/bin/
perl" on node "oci1121" as user "root". Detailed error:
<ERR_FILE><Facility>PRGZ</Facility><ID>ZDM_KEYSTORE_NOT_SETUP_ERR</
ID><ARGS><ARG>oci112_phx1z3</ARG></ARGS></ERR_FILE>
```

```
Error at target server in /tmp/zdm749527725/zdm/log/
mZDM_oss_standby_setup_tde_tgt_71939.log
2019-06-13 10:00:20: Keystore location /opt/oracle/dcs/commonstore/
wallets/tde/$ORACLE_UNQNAME does not exists for database
'oci112_region'
2019-06-13 10:00:20: Reporting error:
<ERR_FILE><Facility>PRGZ</Facility><ID>ZDM_KEYSTORE_NOT_SETUP_ERR</
ID><ARGS><ARG>oci112_region</ARG></ARGS></ERR_FILE>
```

Solution:

- **Oracle Database 12c Release 1 and later**
  On the target database, make sure that `$ORACLE_HOME/network/admin/sqlnet.ora` points to the correct location of the TDE wallet. For exmaple:

  ```
  ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/
  wallets/tde/$ORACLE_UNQNAME)
  ```

- **Oracle Database 11g Release 2 (11.2.0.4) only**
  On the target database, make sure that `$ORACLE_HOME/network/admin/sqlnet.ora` points to the correct location of the TDE wallet, and replace the `$ORACLE_UNQNAME` variable with the value obtained from the `SHOW PARAMETER DB_UNIQUE_NAME` SQL command.

  For example, run

  ```
  SQL> show parameter db_unique_name
  db_unique_name         string      oci112_region
  ```

  and replace

  ```
  ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/
  wallets/tde/$ORACLE_UNQNAME)))
  ```

  with

  ```
  ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/wallets/tde/
  oci112_region)))
  ```

Full Backup Phase (ZDM_BACKUP_FULL_SRC) Issues

Backup Fails with ORA-19836

Issue: Source database full backup fails with one of the following errors.

```
</ERRLINE><ERRLINE>ORA-19836: cannot use passphrase encryption for
this backup
</ERRLINE><ERRLINE>RMAN-03009: failure of backup command on C8 channel
at 04/29/2019
      20:42:16


</ERRLINE><ERRLINE>ORA-19836: cannot use passphrase encryption for
this backup
```

```
</ERRLINE><ERRLINE>RMAN-03009: continuing other job steps, job failed
will not be
      re-run
```

Solution 1: This issue can occur if you specify the `-sourcedb` value in the wrong case. For example, if the value obtained from SQL command `SHOW PARAMETER DB_UNIQUE_NAME` is `zdmsdb`, then you need to specify it as `zdmsdb` in lower case, and not as `ZDMSDB` in upper case, as shown in the following example.

```
zdmuser> $ZDM_HOME/bin/zdmcli migrate database -sourcedb zdmsdb -
sourcenode ocicdb1 -srcroot
-targetnode ocidb1 -targethome /u01/app/oracle/product/12.1.0.2/
dbhome_1
-backupuser backup_user@example.com -rsp /u01/app/zdmhome/rhp/zdm/
template/zdm_template_zdmsdb.rsp
-tgtauth zdmauth -tgtarg1 user:opc
-tgtarg2 identity_file:/home/zdmuser/.ssh/zdm_service_host.ppk
-tgtarg3 sudo_location:/usr/bin/sudo
```

Solution 2: For Oracle Database 12c Release 1 and later, ensure that `$ORACLE_HOME/network/admin/sqlnet.ora` points to the correct location of the TDE wallet, as shown here.

```
ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
(METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/
wallets/tde/$ORACLE_UNQNAME)))
```

For Oracle Database 11g Release 2 (11.2.0.4) only, ensure that `$ORACLE_HOME/network/admin/sqlnet.ora` points to the correct location of the TDE wallet as shown below, and replace the variable `$ORACLE_UNQNAME` with the value obtained with the SQL statement `SHOW PARAMETER DB_UNIQUE_NAME`.

```
ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
(METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/
wallets/tde/$ORACLE_UNQNAME)))
```

For example:

```
SQL> show parameter db_unique_name
db_unique_name    string      oci112_region


ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
(METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/wallets/tde/
oci112_region)))
```

Solution 3: Run the following query and make sure that the wallet status is `OPEN`.

```
SQL> select * from v$encryption_wallet
WRL_TYPE
-------------
WRL_PARAMETER
-------------
STATUS
-------------
file
/opt/oracle/dcs/commonstore/wallets/tde/abc_test
OPEN
```

Backup Fails with ORA-19914 and ORA-28365

Issue: Source database full backup fails with the following errors.

```
channel ORA_SBT_TAPE_3: backup set complete, elapsed time: 00:00:15
channel ORA_SBT_TAPE_3: starting compressed full datafile backup set
channel ORA_SBT_TAPE_3: specifying datafile(s) in backup set
input datafile file number=00005 name=+DATA/
ODA122/7312FA75F2B202E5E053050011AC5977/DATAFILE/system.382.1003858429
channel ORA_SBT_TAPE_3: starting piece 1 at 25-MAR-19
RMAN-03009: failure of backup command on ORA_SBT_TAPE_3 channel at
03/25/2019 19:09:30
ORA-19914: unable to encrypt backup
ORA-28365: wallet is not open
continuing other job steps, job failed will not be re-run
channel ORA_SBT_TAPE_3: starting compressed full datafile backup set
channel ORA_SBT_TAPE_3: specifying datafile(s) in backup set
```

Solution: Ensure that the wallet is opened in the database, and in case of CDB, ensure that the wallet is opened in the CDB, all PDBs, and PDB$SEED. See Setting Up the Transparent Data Encryption Wallet in the Zero Downtime Migration documentation for information about setting up TDE.

Either the Bucket Named *Object Storage Bucket Name* Does Not Exist in the Namespace *Namespace* or You Are Not Authorized to Access It

See Oracle Support Knowledge Base article "Either the Bucket Named '<Object Storage Bucket Name>' Does not Exist in the Namespace '<Namespace>' or You are not Authorized to Access it (Doc ID 2605518.1)" for the desciption and workarounds for this issue.

https://support.oracle.com/rs?type=doc&id=2605518.1

Restore Phase (ZDT_CLONE_TGT) Issues

Restore Database Fails With Assert [KCBTSE_ENCDEC_TBSBLK_1]

Issue: Due to RDBMS Bugs 31048741, 32697431, and 32117834 you may see assert [kcbtse_encdec_tbsblk_1] in the alert log during restore phase of a physical migration.

Solution: Apply patches for RDBMS Bugs 31048741 and 32697431 to any Oracle Database 19c migration target previous to the 19.13 update.

Restore Database Fails With AUTOBACKUP does not contain an SPFILE

Issue: During the execution of phase `ZDT_CLONE_TGT`, restore database fails with the following error.

```
channel C1: looking for AUTOBACKUP on day: 20200427
channel C1: AUTOBACKUP found: c-1482198272-20200427-12
channel C1: restoring spfile from AUTOBACKUP c-1482198272-20200427-12
channel C1: the AUTOBACKUP does not contain an SPFILE
```

The source database is running using `init.ora` file, but during the restore target phase, the database is trying to restore the server parameter file (SPFILE) from autobackup, therefore it fails.

Solution: Start the source database using an SPFILE and resubmit the migration job.

Restore Database Fails With ORA-01565

Issue: During the execution of phase `ZDT_CLONE_TGT`, restore database fails with the following error.

```
</ERRLINE><ERRLINE>With the Partitioning, Real Application Clusters,
Automatic Storage Management, OLAP
</ERRLINE><ERRLINE>and Real Application Testing options
</ERRLINE><ERRLINE>
</ERRLINE><ERRLINE>CREATE PFILE='/tmp/zdm833428275/zdm/PFILE/
zdm_tgt_mclone_nrt139.pfile' FROM SPFILE
</ERRLINE><ERRLINE>*
</ERRLINE><ERRLINE>ERROR at line 1:
</ERRLINE><ERRLINE>ORA-01565: error in identifying file '?/dbs/
spfile@.ora'
</ERRLINE><ERRLINE>ORA-27037: unable to obtain file status
</ERRLINE><ERRLINE>Linux-x86_64 Error: 2: No such file or directory
</ERRLINE><ERRLINE>Additional information: 3
</ERRLINE><ERRLINE>
</ERRLINE><ERRLINE>
</ERRLINE><ERRLINE>Disconnected from Oracle Database 11g Enterprise
Edition Release 11.2.0.4.0 - 64bit Production
```

```
</ERRLINE><ERRLINE>With the Partitioning, Real Application Clusters,
Automatic Storage Management, OLAP
```

Solution: Start the target database using an SPFILE and resume the migration job.

Post Migration Automatic Backup Issues

Troubleshooting Post Migration Automatic Backup Failures

Issue: Post migration, on the target database, Automatic Backup might fail.

You can verify the failure using the console in **Bare Metal, VM and Exadata > DB Systems > DB System Details > Database Details > Backups**.

Solution: Get the RMAN configuration settings from one of the following places.

- Zero Downtime Migration documentation in Target Database Prerequisites, if captured
- The log files at `/opt/oracle/dcs/log/`*`hostname`*`/rman/bkup/`*`db_unique_name`*`/`
- `/tmp/zdmXXX/zdm/zdm_`*`TDBNAME`*`_rman.dat`

For example, using the second option, you can get the RMAN configuration settings from `/opt/oracle/dcs/log/ocidb1/rman/bkup/ocidb1_abc127/rman_configure*.log`, then reset any changed RMAN configuration settings for the target database to ensure that automatic backup works without any issues.

If this workaround does not help, then debug further by getting the RMAN job ID by running the DBCLI command, `list-jobs`, and describe the job details for more error details by running the DBCLI command `describe-job -i` *`JOB ID`* from the database server as the root user.

For example, during the test, the following highlighted settings were modified to make Automatic Backup work.

```
rman target /
Recovery Manager: Release 12.2.0.1.0 - Production on Mon Jul 8
11:00:18 2019
Copyright (c) 1982, 2017, Oracle and/or its affiliates.  All rights
reserved.
connected to target database: ORCL (DBID=1540292788)
RMAN> show all;
using target database control file instead of recovery catalog
RMAN configuration parameters for database with db_unique_name
OCIDB1_ABC127 are:
CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 30 DAYS;
CONFIGURE BACKUP OPTIMIZATION OFF;
CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default
CONFIGURE CONTROLFILE AUTOBACKUP ON;
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE SBT_TAPE TO
'%F'; # default
```

```
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F';
# default
CONFIGURE DEVICE TYPE 'SBT_TAPE' PARALLELISM 4 BACKUP TYPE TO
COMPRESSED BACKUPSET;
CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; #
default
CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE SBT_TAPE TO 1; #
default
CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default
CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE SBT_TAPE TO 1; #
default
CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default
CONFIGURE CHANNEL DEVICE TYPE DISK MAXPIECESIZE 2 G;
CONFIGURE CHANNEL DEVICE TYPE 'SBT_TAPE' MAXPIECESIZE 2 G FORMAT
'%d_%I_%U_%T_%t' PARMS
 'SBT_LIBRARY=/opt/oracle/dcs/commonstore/pkgrepos/oss/odbcs/libopc.so
ENV=(OPC_PFILE=/opt/oracle/dcs/commonstore/objectstore/opc_pfile/
1245080042/opc_OCIDB1_ABC127.ora)';
CONFIGURE MAXSETSIZE TO UNLIMITED; # default
CONFIGURE ENCRYPTION FOR DATABASE ON;
CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default
CONFIGURE COMPRESSION ALGORITHM 'MEDIUM' AS OF RELEASE 'DEFAULT'
OPTIMIZE FOR LOAD TRUE;
CONFIGURE RMAN OUTPUT TO KEEP FOR 7 DAYS; # default
CONFIGURE ARCHIVELOG DELETION POLICY TO BACKED UP 1 TIMES TO
'SBT_TAPE';
CONFIGURE SNAPSHOT CONTROLFILE NAME TO '+RECO/ OCIDB1_ABC127/
controlfile/snapcf_ocidb1_abc127.f';
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK clear;
RMAN>
```

Post Migration Automatic Backup Fails With DCS-10045

Issue: Post migration, Automatic Backup fails with the following error for non-TDE enabled migrated Oracle Database releases 11.2.0.4 and 12.1.0.2.

```
DCS-10045: Validation error encountered: Backup password is mandatory
to take OSS backup for non-tde enabled database...
```

You can verify this error by getting the RMAN job ID by running DBCLI command `list-jobs`, and describe the job details to get the error details by running DBCLI command `describe-job -i` *`JOB ID`* from the database server as the root user.

Solution:

1. Find the TDE wallet location.

The Oracle Cloud Infrastructure provisioned database instance will have following entry in `sqlnet.ora`.

```
ENCRYPTION_WALLET_LOCATION=(SOURCE=(METHOD=FILE)
(METHOD_DATA=(DIRECTORY=/opt/oracle/dcs/commonstore/
wallets/tde/$ORACLE_UNQNAME)))
```

2. Remove the `cwallet.sso` file from the wallet location.
   For example, `/opt/oracle/dcs/commonstore/wallets/tde/$ORACLE_UNQNAME`.
3. For Oracle Database 11g Release 2, do the folowing steps.
   a. Connect to database using SQL*Plus as sysdba and verify the current wallet location.

      ```
      SQL> select * from v$encryption_wallet;
      WRL_TYPE
      WRL_PARAMETER                                                STATUS
      file        /opt/oracle/dcs/commonstore/wallets/tde/
      ocise112_region  OPEN
      ```

   b. Close the wallet in the database.

      ```
      SQL> alter system set wallet close;
      ```

   c. Open the wallet using the wallet password.

      ```
      SQL> alter system SET WALLET open IDENTIFIED BY "walletpassword"
      ```

   d. Set the master encryption key.

      ```
      SQL> alter system set encryption key identified by
      "walletpassword"
      ```

   e. Recreate the autologin SSO file.

      ```
      /home/oracle>orapki wallet create -wallet /opt/oracle/dcs/
      commonstore/wallets/tde/$ORACLE_UNQNAME -auto_login
      Oracle PKI Tool : Version 11.2.0.4.0 - Production
      Copyright (c) 2004, 2013, Oracle and/or its affiliates. All
      rights reserved.
      Enter wallet password:           #
      ```

   f. Retry Automatic Backup.
4. For Oracle Database 12c, do the folowing steps.
   a. Connect to database using SQL*Plus as sysdba and verify the current wallet location and status.

      ```
      SQL> SELECT wrl_parameter, status, wallet_type FROM
      v$encryption_wallet;
      WRL_PARAMETER
      ```

```
STATUS              WALLET_TYPE
/opt/oracle/dcs/commonstore/wallets/tde/ocise112_region
OPEN_NO_MASTER_KEY  OPEN
```

If the STATUS column contains a value of OPEN_NO_MASTER_KEY, you must create and activate the master encryption key.

b. Close the wallet in the database.

```
SQL> alter system set wallet close;
```

c. Open the wallet-using password.

```
SQL> ADMINISTER KEY MANAGEMENT SET KEYSTORE open IDENTIFIED BY
"walletpassword" CONTAINER=all;
```

d. Set the master encryption key.

```
SQL> ADMINISTER KEY MANAGEMENT SET KEY IDENTIFIED BY
"walletpassword" with backup;
```

Log in to each PDB and run

```
SQL> ALTER SESSION SET CONTAINER = PDB_NAME;
SQL> ADMINISTER KEY MANAGEMENT SET KEY IDENTIFIED BY
"walletpassword" with backup;
```

e. Create the auto login keystore.

```
SQL> ADMINISTER KEY MANAGEMENT CREATE AUTO_LOGIN KEYSTORE FROM
KEYSTORE 'path to wallet directory' IDENTIFIED BY
"walletpassword";
```

f. Retry Automatic Backup.

Post Migration Automatic Backup Fails With DCS-10096

Issue: Post migration, Automatic Backup fails with the following error.

```
DCS-10096:RMAN configuration 'Retention policy' must be configured as
'configure retentio n
      policy to recovery window of 30 days'
```

You can verify this error by getting the RMAN job ID by running DBCLI command `list-jobs`, and describe the job details for more error details by running DBCLI command `describe-job -i JOB ID` from the database server as the root user.

Solution: Log in into RMAN prompt and configure the retention policy.

```
[oracle@racoci1 ~]$ rman target /
Recovery Manager: Release 12.2.0.1.0 - Production on Wed Jul 17
11:04:35 2019
Copyright (c) 1982, 2017, Oracle and/or its affiliates.  All rights
reserved.
connected to target database: SIODA (DBID=2489657199)
RMAN> CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 30 DAYS;

old RMAN configuration parameters:
CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 7 DAYS;

new RMAN configuration parameters:
CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 30 DAYS;

new RMAN configuration parameters are successfully stored
```

Retry Automatic Backup.

Miscellaneous Issues

Migration from Existing Data Guard Standby Fails

Issue: Using an existing standby, Zero Downtime Migration job fails when Data Guard broker configuration uses TNS aliases.

In a Data Guard broker configuration, every database needs to be reachable from every other database in the configuration. When Zero Downtime Migration creates a new standby at the target and adds it to the existing Data Guard broker configuration, Zero Downtime Migration adds the target with connect identifier specified in the form of the connect string. Zero Downtime Migration does not update the tnsnames.ora on the target with other databases is in the configuration. Because the tnsnames.ora entries are missing, other databases may not be reachable if the configuration was created with TNS aliases.

Solution: Ensure that all TNS aliases in the broker configuration corresponding to the primary and any existing standby databases are defined in the target tnsnames.ora file.

Alternatively, ensure that the broker configuration is made up of connect strings instead of TNS aliases. The connect identifier string can be identified using the command below:

```
show database db_name dgconnectidentifier;
```

If the connect identifier is a TNS alias, the identifier can be updated using the command below and specifying the connect string in the form of EZconnect string.

For cluster databases:

```
edit database db_name set property
 dgconnectidentifier='scan_name:scan_port/service_name';
```

For non cluster database:

```
edit database db_name set property
dgconnectidentifier='listener_host:listener_port/service_name';
```

The TNS aliases are not required once the connect identifiers are specified as connect strings that are reachable from every database instance in the broker configuration. This is because the broker needs to be able to manage the primary/standby relationship in case any standby switches roles and becomes the primary.

PDB in Failed State After Migration to ExaCS or ExaCC

Issue: ExaCS and ExaCC recently added functionality to display the PDBs of the CDB. When the target database is provisioned with the same PDB name as the source before the migration, then after the migration, the PDB names report status as failed.

This is because when the target is provisioned the PDBID of the PDB is different. During the migration, Zero Downtime Migration drops the target and recreates it. So if the PDB names were the same but now have different internal PDBIDs, the control plane reports the PDB as failed.

Solutions: To avoid this problem, when provisioning the target:

1. If the source is non-CDB, provision a non-CDB target through dbaascli
2. If the source is a CDB with PDBs, provision the target without any PDBs

If the PDB is reported in the failed state post migration, the resolution would be to follow Pluggable Database(PDB) Resource Shows Failed Status In Cloud Console while it is Available in VM (Doc ID 2855062.1).

Oracle GoldenGate Hub Certificate Known Issues

Issue: Oracle Zero Downtime Migration leverages Oracle GoldenGate for its logical online migration work flow; an Oracle GoldenGate hub is set up on OCI compute for this purpose.

The Oracle GoldenGate hub NginX Reverse Proxy uses a self-signed certificate which will cause the following error:

```
SunCertPathBuilderException: unable to find valid certification path to
requested target when ZDM Server makes a REST API call.
```

Solution: See My Oracle Support document Zero Downtime Migration - GoldenGate Hub Certificate Known Issues (Doc ID 2768483.1)

Source Discovery Does Not Find 'cut' in Default Location

Issue: Discovery at the source database server fails to find `cut` in the standard location.

The source database deployment's standard `cut` location is `/bin/cut`. If `cut` is not in the location, Zero Downtime Migration cannot discover the source database information correctly, and the migration fails in its initial phases.

Solution: To resolve the issue, ensure that `cut` is installed in the standard `/bin/cut` path or create a symbolic link to the installed location, for example:

```
ln -sf <installed_location_of_the_cut> /bin/cut
```

Evaluation Fails in Phase ZDM_GET_SRC_INFO

Issue: During the evaluation (`-eval`) phase of the migration process, the evaluation fails in the `ZDM_GET_SRC_INFO` phase with the following error for the source single instance deployed without Grid infrastructure.

```
Executing phase ZDM_GET_SRC_INFO
retrieving information about database "zdmsidb" ...
PRCF-2056 : The copy operation failed on node: "zdmsidb".
Details: {1}
PRCZ-4002 : failed to execute command "/bin/cp" using the privileged
execution plugin "zdmauth" on nodes "zdmsidb"
scp: /etc/oratab: No such file or directory
```

Solution: Make an `ORACLE_HOME` value entry in file `/etc/oratab` with value *`db_name`*`:`*`$ORACLE_HOME`*`:N`, as shown in this example.

```
zdmsidb:/u01/app/oracle/product/12.2.0.1/dbhome_1:N
```

Migration Evaluation Failure with Java Exception Invalid Key Format

Issue: The following conditions are seen:

- Zero Downtime Migration `migration -eval` command fails with the following error.

  ```
  Result file path contents:
  "/u01/app/zdmbase/chkbase/scheduled/job-19-2019-12-02-03:46:19.log"
  zdm-server.ocitoolingsn.ocitooling.oraclevcn.com: Processing
  response
  file ...
  null
  ```

- The file `$ZDM_BASE/<zdm service host>/rhp/rhpserver.log.0` contains the following entry.

  ```
  Verify below error message observed in file $ZDM_BASE/<zdm service
  host>/rhp/rhpserver.log.0
  rhpserver.log.7:[pool-58-thread-1] [ 2019-12-02 02:08:15.178 GMT ]
  [JSChChannel.getKeyPair:1603]  Exception :
  java.security.spec.InvalidKeySpecException:
  java.security.InvalidKeyException: invalid key format
  ```

- The Zero Downtime Migration installed user (For example: zdmuser) private key (id_rsa) file has the following entries.

  ```
  -----BEGIN OPENSSH PRIVATE KEY----------
  MIIEogIBAAKCAQEAuPcjftR6vC98fAbU4FhYVKPqc0CSgibtMSouo1DtQ06ROPN0
  XpIEL4r8nGp+c5GSDONyhf0hiltBzg0fyqyurSw3XfGJq2Q6EQ61aL95Rt9CZh6b
  JSUwc69T4rHjvRnK824k4UpfUIqafOXb2mRgGVUkldo4yy+pLoGq1GwbsIYbS4tk
  uaYPKZ3A3H9ZA7MtZ5M0sNqnk/4Qy0d8VONWozxOLFC2A8zbbe7GdQw9khVqDb/x
  END OPENSSH PRIVATE KEY-----
  ```

Solution: Authentication key pairs (private and public key) are not generated using the `ssh-keygen` utility, so you must generate authentication key pairs using steps in Generating a Private SSH Key Without a Passphrase.

After generating authentication key pairs, the private key file content looks like the following.

```
-----BEGIN RSA PRIVATE KEY-----
MIIEogIBAAKCAQEAuPcjftR6vC98fAbU4FhYVKPqc0CSgibtMSouo1DtQ06ROPN0
XpIEL4r8nGp+c5GSDONyhf0hiltBzg0fyqyurSw3XfGJq2Q6EQ61aL95Rt9CZh6b
JSUwc69T4rHjvRnK824k4UpfUIqafOXb2mRgGVUkldo4yy+pLoGq1GwbsIYbS4tk
uaYPKZ3A3H9ZA7MtZ5M0sNqnk/4Qy0d8VONWozxOLFC2A8zbbe7GdQw9khVqDb/x
-----END RSA PRIVATE KEY-----
```

Set up connectivity with the newly generated authentication key pairs and resume the migration job.

Migration Evaluation Fails with Error PRCG-1022

Issue: The following conditions are seen:

```
$ZDM_HOME/bin/zdmcli migrate database -sourcedb zdmsdb -sourcenode
ocicdb1
-srcauth zdmauth -srcarg1 user:opc
-srcarg2 identity_file:/home/zdmuser/.ssh/zdm_service_host.ppk
-srcarg3 sudo_location:/usr/bin/sudo -targetnode ocidb1 -backupuser
backup_user@example.com
-rsp /u01/app/zdmhome/rhp/zdm/template/zdm_template_zdmsdb.rsp -
tgtauth zdmauth
-tgtarg1 user:opc -tgtarg2 identity_file:/home/zdmuser/.ssh/
```

```
zdm_service_host.ppk
-tgtarg3 sudo_location:/usr/bin/sudo -eval

PRCG-1238 : failed to execute the Rapid Home Provisioning action for
command  'migrate database'
PRCG-1022 : failed to connect to the Rapid Home Provisioning daemon
for cluster anandutest
Failed to retrieve RMIServer stub:
javax.naming.ServiceUnavailableException
[Root exception is java.rmi.ConnectException: Connection refused to
host:
anandutest; nested exception is: java.net.ConnectException: Connection
refused (Connection refused)]
```

Solution: Start the Zero Downtime Migration service using the `$ZDM_HOME/bin/zdmservice START` command, then run any `ZDMCLI` commands.

ORA-01031 on Full Export from an Oracle 12.1 Source

Issue: When performing a full database export with Export Data Pump from an Oracle Database 12c (12.1) source database, the following errors occur:

```
05-AUG-21 10:36:12.483: ORA-31693: Table data object "SYS"."TABLE" failed
to load/unload and is being skipped due to error: ORA-01031: insufficient
privileges
```

Solution: See My Oracle Support document EXPDP - ORA-31693 ORA-01031 (Insufficient Privileges) On Some Tables When Exporting from 12cR1 (Doc ID 1676411.1)

Data Transfer Medium COPY Issues

Issue: Migrating data using logical migration with `DATA_TRANSFER_MEDIUM=COPY` set in the Zero Downtime Migration response file fails.

Solution: When you specify `DATA_TRANSFER_MEDIUM=COPY` you must also specify the following `DUMPTRANSFERDETAILS_SOURCE_*` parameters.

```
DUMPTRANSFERDETAILS_TRANSFERTARGET_DUMPDIRPATH=<Target path to
transferthe dumps to >
DUMPTRANSFERDETAILS_TRANSFERTARGET_HOST=<Target Db server or Target
sidetransfer node >
DUMPTRANSFERDETAILS_TRANSFERTARGET_USER=<user having write access to
specified path>
DUMPTRANSFERDETAILS_TRANSFERTARGET_USERKEY=<user authentication
keypath on zdm node>
```

Unable to Rerun MIGRATE DATABASE Command

Issue: Zero Downtime Migration blocks attempts to rerun the `MIGRATE DATABASE` command for a specified database if that database is already part of an ongoing migration job.

Workaround: If you want to resubmit a database migration, you can stop the ongoing migration job in either `EXECUTING` or `PAUSED` state using the ZDMCLI `ABORT JOB` command as follows.

```
-bash-4.2$ ./zdmcli abort job -jobid 70
server.example.com: Audit ID: 189
```

Unable to Resume a Migration Job

Issue: Zero Downtime Migration writes the source and target log files to the `/tmp/zdm-unique id` directory in the respective source and target database servers.

If you pause a migration job and and then resume the job after several (sometimes 15-20 days), the `/tmp/zdm-unique id` directory might be deleted or purged as part of a clean up or server reboot that also cleans up /tmp.

Solution: After pausing a migration job, back up the `/tmp/zdm-unique id` directory. Before resuming the migration job, check the `/tmp` directory for `/zdm-unique id`, and if it is missing, restore the directory and its contents with your backup.

Migration Job Fails at ZDM_GET_SRC_INFO

Issue: A migration job fails with the following error.

```
[opc@zdm-server rhp]$ cat /home/opc/zdm_base/chkbase/scheduled/
job-34-2021-01-23-14:10:32.log
zdm-server: 2021-01-23T14:10:32.155Z : Processing response file ...
zdm-server: 2021-01-23T14:10:32.262Z : Starting zero downtime migrate
operation ...
PRCZ-4002 : failed to execute command "/bin/cp" using the privileged
execution plugin "zdmauth" on nodes "PROD.compute-
usconnectoneb95657.oraclecloud.internal"
```

Solution: You must set up SSH connectivity without a passphrase for the oracle user.

Migration Job Fails at ZDM_SWITCHOVER_SRC

Issue: A migration job fails at `ZDM_SWITCHOVER_SRC` phase.

Solutions:

1. Ensure that there is connectivity from PRIMARY database nodes to STANDBY database nodes so the redo log are shipped as expected.
2. A job will fail at `ZDM_SWITCHOVER_SRC` if the recovery process (MRP0) is not running at the target. The recovery process reason for failure should be corrected if MRP0 is not running at Oracle Cloud Database Standby Instance, and then the process

should be started manually at Oracle Cloud Database Standby Instance before the migration job can be resumed.

Additional Information for Migrating to Oracle Exadata Database Service

Read the following for general information, considerations, and links to more information about using Zero Downtime Migration to migrate your database to Oracle Exadata Database Service on Dedicated Infrastructure.

Considerations for Migrating to Oracle Exadata Database Service on Dedicated Infrastructure

For this release of Zero Downtime Migration be aware of the following considerations.

- If the source database is release 18c, then the target home should be at release 18.6 or later to avoid issues such as Bug 29445548 Opening Database In Cloud Environment Fails With ORA-600.
- If a backup was performed when one of the configured instances is down, you will encounter Bug 29863717 - DUPLICATING SOURCE DATABASE FAILED BECAUSE INSTANCE 1 WAS DOWN.
- The TDE keystore password must be set in the credential wallet. To set the password as part of the Zero Downtime Migration workflow, specify the `-tdekeystorewallet` *`tde_wallet_path`* or `-tdekeystorepasswd` argument irrespective of whether the wallet uses `AUTOLOGIN` or `PASSWORD`. In either case the password is stored in the credential wallet. If the `-tdekeystorepasswd` argument is not supplied, then Zero Downtime Migration skips the setting `tde_ks_passwd` key in the credential wallet, and no error is thrown.
- The target environment must be installed with latest DBaaS Tooling RPM with `db_unique_name` change support to be installed.
- Provision a target database from the console without enabling auto-backups. In the **Configure database backups** section do not select the **Enable automatic backups** option.

Oracle Exadata Database Service on Dedicated Infrastructure Database Registration

Post migration, register the Oracle Exadata Database Service on Dedicated Infrastructure database, and make sure its meets all of the requirements.

Run the following commands on the Oracle Exadata Database Service on Dedicated Infrastructure database server as the root user.

```
/root>dbaascli registerdb prereqs --dbname db_name --db_unique_name
db_unique_name
```

```
/root>dbaascli registerdb begin  --dbname db_name --db_unique_name
db_unique_name
```

For example

```
/root>dbaascli registerdb prereqs --dbname ZDM122 --db_unique_name
ZDM122_phx16n
DBAAS CLI version 18.2.3.2.0
Executing command registerdb prereqs --db_unique_name ZDM122_phx16n
INFO: Logfile Location: /var/opt/oracle/log/ZDM122/registerdb/
registerdb_2019-08-14_05:35:31.157978280334.log
INFO: Prereqs completed successfully
/root>

/root>dbaascli registerdb begin --dbname ZDM122 --db_unique_name
ZDM122_phx16n
DBAAS CLI version 18.2.3.2.0
Executing command registerdb begin --db_unique_name ZDM122_phx16n
Logfile Location: /var/opt/oracle/log/ZDM122/registerdb/
registerdb_2019-08-14_05:45:27.264851309165.log
Running prereqs
DBAAS CLI version 18.2.3.2.0
Executing command registerdb prereqs --db_unique_name ZDM122_phx16n
INFO: Logfile Location: /var/opt/oracle/log/ZDM122/registerdb/
registerdb_2019-08-14_05:45:29.000432309894.log
INFO: Prereqs completed successfully
Prereqs completed
Running OCDE .. will take time ..
OCDE Completed successfully.
INFO: Database ZDM122 registered as Cloud database
/root>
```

Oracle Exadata Database Service on Dedicated Infrastructure Automatic Backup Issues

Check the backup configuration before you enable automatic backup from the console. You can use the `get config` command as shown in the first step below. You should see `bkup_oss=no` before you enable automatic backup.

You might see the error message in the console, "A backup configuration exists for this database. You must remove the existing configuration to use Oracle Cloud Infrastructure's managed backup feature."

To fix this error, remove the existing configuration.

First, make sure the automatic backup is disabled from the UI, then follow these steps to remove the existing backup configuration.

1. Generate a backup configuration file.

   ```
   /var/opt/oracle/bkup_api/bkup_api get config --file=/tmp/db_name.bk
   --dbname=db_name
   ```

   For example:

   ```
   /var/opt/oracle/bkup_api/bkup_api get config --file=/tmp/zdmdb.bk --
   dbname=zdmdb
   ```

2. Open the /tmp/*db_name*.bk file you created in the previous step.
   For example: Open /tmp/zdmdb.bk

   change bkup_oss=yes from bkup_oss=no

3. Disable OSS backup by setting `bkup_oss=no`.

   ```
   /var/opt/oracle/bkup_api/bkup_api set config --file=/tmp/db_name.bk
   --dbname=db_name
   ```

   For example:

   ```
   /var/opt/oracle/bkup_api/bkup_api set config --file=/tmp/zdmdb.bk --
   dbname=zdmdb
   ```

4. Check reconfigure status.

   ```
   /var/opt/oracle/bkup_api/bkup_api configure_status --dbname=db_name
   ```

   For example:

   ```
   /var/opt/oracle/bkup_api/bkup_api configure_status --dbname=zdmdb
   ```

Now enable automatic backup from console.

Verify the backups from the console. Click **Create Backup** to create a manual backup, and a backup should be created without any issues. and also Automatic Backup should be successful.

Additional Information for Migrating to Oracle Exadata Database Service on Cloud@Customer

Read the following for general information, considerations, and links to more information about using Zero Downtime Migration to migrate your database to Oracle Exadata Database Service on Cloud@Customer.

Considerations for Migrating to Oracle Exadata Database Service on Cloud@Customer

For this release of Zero Downtime Migration be aware of the following considerations.

- You must apply the regDB patch for Bug 29715950 - "modify regdb to handle db_unique_name not same as db_name" on all Oracle Exadata Database Service on Cloud@Customer nodes. This is required for the `ZDM_MANIFEST_TO_CLOUD` phase. Please note that the regDB tool is part of DBaaS Tooling.
- If the source database is release 18c, then the target home should be at release 18.6 or later to avoid issues such as Bug 29445548 Opening Database In Cloud Environment Fails With ORA-600.
- PDB conversion related phases are listed in `-listphases` and can be ignored. Those are no-op phases.
- If the backup medium is Zero Data Loss Recovery Appliance, then all configured instances should be up at the source when a `FULL` or `INCREMENTAL` backup is performed.
- If a backup was performed when one of the configured instances is down, you will encounter Bug 29863717 - DUPLICATING SOURCE DATABASE FAILED BECAUSE INSTANCE 1 WAS DOWN.
- The TDE keystore password must be set in the credential wallet. To set the password as part of the Zero Downtime Migration workflow, specify the `-tdekeystorewallet` *`tde_wallet_path`* or `-tdekeystorepasswd` argument irrespective of whether the wallet uses `AUTOLOGIN` or `PASSWORD`. In either case the password is stored in the credential wallet. If the `-tdekeystorepasswd` argument is not supplied, then Zero Downtime Migration skips the setting `tde_ks_passwd` key in the credential wallet, and no error is thrown.
- The target environment must be installed with latest DBaaS Tooling RPM with `db_unique_name` change support to be installed.

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Oracle Zero Downtime Migration Zero Downtime Migration Release Notes, Release 21c (21.4)
F58902-03