OCI Database Migration Service End-To-End Online Migration Tutorial

Aimed for scenarios where your application must remain online, and your source database has a direct connection to OCI.

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Public
**Purpose statement**

This document walks you through all the steps to get started using Oracle Cloud Infrastructure (OCI) Database Migration (DMS). You will provision a Virtual Cloud Network (VCN), an Oracle Database 19c instance, and an Oracle Autonomous Database (ADB) instance to perform a database migration using DMS.

With DMS we make it quick and easy for you to migrate databases from on-premises, Oracle, or third-party cloud into Oracle databases on OCI.

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Introduction to OCI Database Migration – DMS

OCI Database Migration (DMS) provides a high performant, self-service experience to achieve migrations, which include:

Migration of data from on-premises, Oracle, or 3rd party cloud databases into Oracle databases on OCI.

Logical Online and Offline Migrations providing enterprise-level migration with minimal downtime and on-premises to cloud migration.

Based on industry leading GoldenGate for data replication.

DMS Documentation:

Please review the documentation here:
https://docs.oracle.com/en/cloud/paas/database-migration

Task 0 – Understand New DMS Concepts

DMS provides a fully managed approach to migrating databases from various locations into OCI-hosted databases.

Migrations can be either one of the following modes:

- **Offline**: The Migration makes a point-in-time copy of the source to the target database. Any changes to the source database during migration are not copied, requiring any applications to stay offline for the duration of the migration.

- **Online**: The Migration makes a point-in-time copy and replicates all subsequent changes from the source to the target database. This allows applications to stay online during the migration and then be switched over from source to target database.

DMS supports both offline and online mode. In the first release, we will support Oracle databases located on-premises, in 3rd party clouds, or on Oracle OCI as source and Oracle Autonomous Database shared or dedicated as target.

The DMS service runs as a managed cloud service separate from the user’s tenancy and resources. The service operates as a multi-tenant service in a DMS Service Tenancy and communicates with the user’s resources using Private Endpoints (PEs). PEs are managed by DMS and are transparent to the user.
Compartment: A compartment is a collection of related resources (such as cloud networks, compute instances, or block volumes) that can be accessed only by those groups that have been given permission by an administrator in your organization. For example, one compartment could contain all the servers and storage volumes that make up the production version of your company's Human Resources system. Only users with permission to that compartment can manage those servers and volumes.

Data region: A geographical region that's associated with one or more data centers. When you sign up for an Oracle Cloud account, you select a default data region, where your services will be hosted.

DMS Control Plane: Used by DMS end user to manage Migration and Registered Database objects. The control plane is exposed through the DMS Console UI as well as the Rest API.

DMS Data Plane: Managed by DMS Control Plane and transparent to the user. The GGS Data Plane manages ongoing migration jobs and communicates with the user's databases and GoldenGate instance using PEs. The DMS data plane does not store any customer data, as data flows through GoldenGate and Data Pump directly within the user’s tenancy.

Migration: A Migration contains metadata for migrating one database. It contains information about source, target, and migration methods and is the central object for users to run migrations. After creating a migration, a user can validate the correctness of the environment and then run the migration to perform the copy of database data and schema metadata from source to target.

Migration Job: A Migration Job displays the state or a given Migration execution, either for validation or migration purposes. A job consists of several sequential phases, users can opt to wait after a given phase for user input to resume with the following phase.
**Registered Database:** A Registered Database represents information about a source or target database, such as connection and authentication credentials. DMS uses the OCI Vault to store credentials. A registered database is reusable across multiple Migrations.

**Task 1 – Have the Administrator Set Required Permissions**

The following permissions need to be set to have access to the necessary objects, unless you have administrative privileges. The following permissions assume that the user is part of group DMS_LA and all resources are created in a compartment called DMS_LA. Have your tenancy administrator set these permissions.

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<tr>
<td>Allow group DMS_LA to manage odms-job in compartment DMS_LA</td>
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</tbody>
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**Task 2 – Sign In and Open DMS Console**

To perform this learning path you need to have access to an OCI tenancy with access to a region where DMS is released, such as the US-Ashburn-1 region. Please review [https://www.oracle.com/cloud/data-regions/](https://www.oracle.com/cloud/data-regions/) for available regions.

Open browser with URL [https://console.us-ashburn-1.oraclecloud.com/](https://console.us-ashburn-1.oraclecloud.com/) (Adjust for home region)

Log in using your tenancy name and username/password.

In the OCI console title bar change region if applicable.

**Task 3 – Create Virtual Cloud Network**

The following task is optional if a suitable VCN is already present.

In the OCI Console Menu, go to Networking > Virtual Cloud Networks

Pick a compartment on the left-hand side Compartment list. You need to have the necessary permissions for the compartment.

Press Start VCN Wizard and pick VCN with Internet Connectivity.
Enter a VCN Name, such as VCN_DMS_LA. Leave CIDR block defaults, unless you need non-overlapping addresses for peering later. Press Next.

Review Summary and press Create.

**Task 4 – Update Security List for Virtual Cloud Network Subnet**

This task assumes default permissions in your public subnet. If you disabled or restricted your default permissions such as port 22 SSH access or restricted egress, please add default permissions as needed.

In the OCI Console Menu, go to **Networking > Virtual Cloud Networks** and pick your VCN.

In the Subnets list, pick Public Subnet-VCN NAME.

In the Security Lists list, pick Default Security List for VCN NAME.

In the Ingress Rules list press Add Ingress Rules.

Enter the following values, otherwise leave defaults:

- Source CIDR: 0.0.0.0/0
- Destination Port Range: 443
- Description: OGG HTTPS

Close dialog by pressing **Add Ingress Rules**.

In the Ingress Rules list press Add Ingress Rules.

Enter the following values, otherwise leave defaults:

- Source CIDR: 10.0.0.0/16
- Destination Port Range: 1521
- Description: Oracle DB access for PEs

Close dialog by pressing **Add Ingress Rules**.
Task 5 – Create Vault

The following task is optional if a Vault is already present.

In the OCI Console Menu, go to **Identity & Security > Vault**.

Pick a compartment on the left-hand side **Compartment list**.

Press Create Vault.

In the **Create Vault** dialog, enter a Name such as **DMS_Vault**.

Close the dialog by pressing **Create Vault**.

Wait until the state of the new vault is **Active**.

Click on the new vault and press **Create Key** in the **Master Encryption Keys** list.

In the **Create Key** dialog, enter a Name such as **DMS_Key**.

Close the dialog by pressing **Create Key**.

Task 6 – Create Source Database

The following task is optional if a source database is already present. In this example the source database is a DBCS VM with Oracle Database 19c.

You will need an SSH key pair for logging into your database and GoldenGate environments. If you don’t already have one, please create one. **Important:** The key needs to be in RSA key in PEM format, other formats like OpenSSL are currently not supported. You can use a command like:

```
ssh-keygen -t rsa -N "" -b 2048 -C "<key_name>" -f <path/root_name>
```

Review the following link for a reference.

[https://docs.oracle.com/en-us/iaas/Content/API/Concepts/apisigningkey.htm#RequiredKeysandOCIDs](https://docs.oracle.com/en-us/iaas/Content/API/Concepts/apisigningkey.htm#RequiredKeysandOCIDs)

In the OCI Console Menu, go to **Oracle Database > Oracle Base Database Service**.

Press Create DB System.

Enter the following values, otherwise leave defaults. You can adjust shapes and storage to your use case requirements and available quota.

- **Name:** SourceDB
- Add public SSH keys: Upload the public key file you use.
- Choose a license type: BYOL
- Virtual cloud network: VCN_DMS_LA (Or your VCN name)
- Client subnet: Public Subnet-VCN_DMS_LA (Or your subnet name)
- Hostname prefix: sourcedb

Press **Next**
Enter the following values, otherwise leave defaults.

- Database name: sourcedb
- PDB name: pdb
- Create administrator credentials – Password: password of your choice

Press Create DB System

The provisioning of the database can take 30 or more minutes. Wait for the Lifecycle State of the database to change to Active.

Open the database system SourceDB in the DB Systems table

Open the database sourcedb in the Databases table

Press DB Connection

Press Show next to the Easy Connect Connection String. A string like:

```
sourcedb.sub12062328210.vcndmsla.oraclevcn.com:1521/sourcedb_iad158.sub12062328210.vcndmsla.oraclevcn.com
```

should be shown. Copy the string after the /, in this case:

```
sourcedb_iad158.sub12062328210.vcndmsla.oraclevcn.com
```

This is the service name of your CDB, you will need this string later for accessing your database and creating migrations. Close the dialog.

Click on Pluggable Databases link on the left side under Resources section and click on pdb.

Repeat steps 11 and 12. This is the service name of your PDB a string similar to

```
pdb.sub12062328210.vcndmsla.oraclevcn.com
```

Go back to the DB Systems Details page of your database and select Nodes on the left-hand side Resources list.

The Nodes list shows the sourcedb node. Note the Public IP Address and Private IP Address of the node, in this case 129.213.162.34 and 10.0.0.3.

You will need these IP addresses later.

### Task 7 – Create Target Autonomous Database

The following task is optional if a target autonomous database is already present. In the first phase of DMS LA an autonomous database with private IP address is required. In this example the target database is an ATP-shared instance.
1. You first need to create a Network Security Group for use in a Private IP ADB instance. In the OCI Console Menu, go to Networking > Virtual Cloud Networks and pick your VCN.

2. In the left-hand Resources list, pick Network Security Groups.


4. Enter Name such as DMS_NSG and press Next.

5. In the Rule box please enter the following entries, otherwise leave defaults:
   - Source Type: CIDR
   - Source CIDR: 0.0.0.0/0

6. Press Create.

7. Now you can create the ADB instance. In the OCI Console Menu, go to Oracle Database > Autonomous Transaction Processing.

8. Pick a compartment on the left-hand side Compartment list.

9. Press Create Autonomous Database.

10. Enter the following values, otherwise leave defaults. You can adjust shapes and storage to your use case.
    - Display Name: TargetATP
    - Database name: TargetATP
    - Create administrator credentials – Password: password of your choice
    - Access Type: Private endpoint access only
    - Virtual cloud network: VCN_DMS_LA (Or your VCN name)
    - Client subnet: Public Subnet-VCN_DMS_LA (Or your subnet name)
    - Network security group: DMS_NGS (Or your NSG name)
    - Choose a license type: Bring Your Own License (BYOL)

11. Close the dialog by pressing Create Autonomous Database.

**Task 8 – Prepare Source and Target Databases**

This task prepares required user accounts and settings for Migration in the Source DB. It assumes default settings in the database. If you changed default settings, further settings might be necessary.

Open an SSH terminal to the source database instance. The instructions are for Unix-style ssh command:

```
ssh -i <private_key_file> opc@<dbnode_public_ip>
```

Create a new directory in the user volume, this directory will be used to temporary storage of database export files:

```
sudo su - oracle
mkdir /u01/app/oracle/dumpdir
```

For your non-ADB source if you won't provide SSH details during the creation of the database connection, to achieve HTTPS connectivity, you must perform the following steps:

a. Create a new directory: `mkdir /u01/app/oracle/dumpdir/wallet`

b. Download a pre created SSL wallet: `curl -o walletSSL.zip https://objectstorage.us-phoenix-1.oraclecloud.com/p/FSBC_LRRpLxcSuSM6yRj09u1TDuDY8wuiawEI18Q_xPYFmvap_t`
c. Unzip the files: `unzip walletSSL.zip`

d. Make sure these files are present in your desired directory path:
   - 2022 ewallet.p12.lck
   - cwallet.sso.lck
   - ewallet.p12
   - cwallet.sso
   - addedCertificates.txt
   - Save this path location, you will need it during the migration creation to populate the SSL Wallet Path with it, i.e: `/u01/app/oracle/dumpdir/wallet`

The user performing the export or import requires the necessary network ACL to be granted to access the network from the source and target database host. Create the script file `acl.sql` with the following content, for this guide, run the following script as SYS if the export or import user is SYSTEM. If your database is multitenant, then run the script in `CDBS$ROOT`. Replace `clouduser` and `sslwalletdir` accordingly:

```sql
define clouduser='system'; /* user performing export at source or import at target */
define sslwalletdir='/u01/app/oracle/dumpdir/wallet'; /* OCI wallet path */
begin
    dbms_network_acl_admin.append_host_ace(
        host => '*',
        lower_port => 443,
        upper_port => 443,
        ace => xs$ace_type(
            privilege_list => xs$name_list('http', 'http_proxy'),
            principal_name => upper('&clouduser'),
            principal_type => xs_acl.ptype_db));

    dbms_network_acl_admin.append_wallet_ace(
        wallet_path => 'file:&sslwalletdir',
        ace => xs$ace_type(
            privilege_list => xs$name_list('use_client_certificates', 'use_passwords'),
            principal_name => upper('&clouduser'),
            principal_type => xs_acl.ptype_db));
end;
/
```

Create the script file `create_ggadmin_cdbroot.sql` with the following content (Replace `<password>` with actual password, use double quotes to delimit it i.e `"*********"`):

```sql
create user c##ggadmin identified by <password> default
    tablespace users temporary tablespace temp;
grant connect, resource to c##ggadmin container=all;
grant select on sys.ccol$ to c##ggadmin container=all;
grant select on sys.cdef$ to c##ggadmin container=all;
grant select on sys.col$ to c##ggadmin container=all;
grant select on sys.con$ to c##ggadmin container=all;
grant select on sys.deferred_stg$ to c##ggadmin container=all;
grant select on sys.icol$ to c##ggadmin container=all;
grant select on sys.ind$ to c##ggadmin container=all;
```

grant select on sys.lob$ to c##ggadmin container=all;
grant select on sys.lobfrag$ to c##ggadmin container=all;
grant select on sys.obj$ to c##ggadmin container=all;
grant select on sys.seg$ to c##ggadmin container=all;
grant select on sys.tab$ to c##ggadmin container=all;
grant select on sys.tabcompart$ to c##ggadmin container=all;
grant select on sys.tabpart$ to c##ggadmin container=all;
grant select on sys.tabsубpart$ to c##ggadmin container=all;
grant create view to c##ggadmin container=all;
grant execute on dbms_lock to c##ggadmin container=all;
alter user c##ggadmin quota 100M on USERS container=all;
grant unlimited tablespace to c##ggadmin container=all;
exec dbms_goldengate_auth.GRANT_ADMIN_PRIVILEGE
('c##ggadmin',container=>'all');
alter system set streams_pool_size=2G scope=both
SID='sourcedb';
ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;
alter system switch logfile;
ALTER SYSTEM SET ENABLE_GOLDENGATE_REPLICATION=TRUE
SCOPE=BOTH;

Create the script file create_ggadmin_pdbroot.sql with the following content (Replace <password> with actual password, use double quotes to delimit it i.e "********")

create user ggadmin identified by <password> default tablespace
users temporary tablespace temp;
grant connect, resource to ggadmin;
grant select on sys.ccol$ to ggadmin;
grant select on sys.cdef$ to ggadmin;
grant select on sys.col$ to ggadmin;
grant select on sys.con$ to ggadmin;
grant select on sys.deferred_stg$ to ggadmin;
grant select on sys.icol$ to ggadmin;
grant select on sys.ind$ to ggadmin;
grant select on sys.lob$ to ggadmin;
grant select on sys.lobfrag$ to ggadmin;
grant select on sys.obj$ to ggadmin;
grant select on sys.seg$ to ggadmin;
grant select on sys.tab$ to ggadmin;
grant select on sys.tabcompart$ to ggadmin;
grant select on sys.tabpart$ to ggadmin;
grant select on sys.tabsубpart$ to ggadmin;
grant create view to ggadmin;
grant execute on dbms_lock to ggadmin;
alter user ggadmin quota 100M on USERS;
grant unlimited tablespace to ggadmin;
exec dbms_goldengate_auth.GRANT_ADMIN_PRIVILEGE('ggadmin');
Enter the following commands:

. oraenv

ORACLE_SID enter your database details.

sqlplus sys/<db password>@<db private ip>/<db cdb service> as sysdba

In SQL Plus enter the following commands:

SQL> @acl.sql

PL/SQL procedure successfully completed.

Once the connect privilege is granted, connect as the relevant user such as, SYSTEM, and verify if the privilege is granted using the following query:

SELECT host, lower_port, upper_port, privilege, status
FROM user_network_acl_privileges;

Follow the next link for a reference to the documentation.

https://docs.oracle.com/en/cloud/paas/database-migration/dmsus/managing-migrations.html#GUID-A288C5E1-AF44-4436-8493-08C7E343BEBE

SQL> @create_ggadmin_cdbroot.sql

User created.

[...]

System altered.

SQL> show pdbs

<table>
<thead>
<tr>
<th>CON_ID</th>
<th>CON_NAME</th>
<th>OPEN MODE</th>
<th>RESTRICTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>PDB$SEED</td>
<td>READ ONLY</td>
<td>NO</td>
</tr>
<tr>
<td>3</td>
<td>PDB</td>
<td>READ WRITE</td>
<td>NO</td>
</tr>
</tbody>
</table>

SQL> alter session set container=PDB;

Session altered.

SQL> @create_ggadmin_pdbroot.sql

User created.

[...]

Grant succeeded.
The next steps add a user HR01 with a sample table and data. If your database already contains data for migration, you can skip these steps.

Create the script file `create_hr01.sql` with the following content:

```sql
DROP USER HR01 CASCADE;
CREATE USER HR01 IDENTIFIED BY HR##hr01123;
GRANT CONNECT,RESOURCE,CREATE TABLE,CREATE SEQUENCE to HR01;
GRANT CREATE ANY PROCEDURE to HR01;
ALTER USER HR01 quota unlimited on users;
CREATE TABLE HR01.EMPL (col1 number, col2 varchar2(9), col3 varchar2(100), col4 timestamp);
ALTER TABLE HR01.EMPL ADD CONSTRAINT EMPL_i1 PRIMARY KEY (col1,col2);
```

Create the script file `data_hr01.sql` with the following content:

```sql
SET ECHO OFF;
SET HEADING OFF;
SET FEEDBACK OFF;
SET SERVEROUTPUT ON;
DECLARE
    SCN     HR01.EMPL.COL1%TYPE;
    RND1    HR01.EMPL.COL2%TYPE;
    RND2    HR01.EMPL.COL3%TYPE;
    RND3    HR01.EMPL.COL4%TYPE;
    ROWSNUM NUMBER;
    DBNAME VARCHAR2(60);
    i INTEGER;
BEGIN
    i := 0;
    LOOP
        SELECT COUNT(*) INTO ROWSNUM FROM HR01.EMPL;
        SELECT DBMS_RANDOM.STRING('P', 9) INTO RND1 FROM DUAL;
        SELECT DBMS_RANDOM.STRING('P', 10) INTO RND2 FROM DUAL;
        SELECT TO_DATE(TRUNC (DBMS_RANDOM.VALUE (2451545, 5373484)),
            'J') INTO RND3 FROM DUAL;
        INSERT INTO HR01.EMPL(col1, col2, col3, col4) VALUES (ROWSNUM, RND1, RND2, RND3);
        COMMIT;
        DBMS_OUTPUT.PUT_LINE('Number of rows = ' || ROWSNUM);
        IF ( i >= 1000 ) THEN
            EXIT;
        END IF;
        i := i + 1;
    END LOOP;
END;
/
```

Enter the following commands:
sqlplus sys/ <db password>@<db private ip>/<db pdb service> as sysdba

In SQL Plus enter the following commands:

```
SQL> @create_hr01.sql
DROP USER HR01 CASCADE
      (You can ignore this error)
ERROR at line 1:
ORA-01918: user 'HR01' does not exist

SQL> @data_hr01.sql
Number of rows = 0
[...]
Number of rows = 1000
SQL> quit
```

Your source DB now has a user HR01 with a table EMPL that has 1000 rows.

The next steps will connect to the target ADB instance and enable the standard ggadmin user, you can skip these steps if the user is already enabled.

Make sure that your Autonomous Database mTLS authentication option is marked as ‘Not required’, you can check this in the following navigation path:

Overview/Autonomous Database/Autonomous Database details

Go to Database connection/ Connection settings section and select TLS from the TLS authentication list of values, then copy the connection string for one of the TNS names.

Connect to sqlplus:

```
sqlplus admin/ <ATP password>@ ATP connection string
```

In SQL Plus enter the following commands:

```
SQL> alter user ggadmin identified by <new password> account unlock;
```
User altered.
SQL> quit

Task 9 – Create Object Store Bucket for Datapump Storage

Object Store is used as temporary storage between source and target databases with Datapump. This task is creating an empty bucket for use in the migration.

In the OCI Console Menu, go to Storage > Object Storage & Archive…

Press Create Bucket.

On the page Create Bucket, fill in the following entries, otherwise leave defaults:
- Bucket Name: DMSStorage

Press Create Bucket

Task 10 – Create a Database Connection for the Source CDB

For this task you need the following info from previous steps:
- Source DB Private IP
- Source DB CDB Service Name

In the OCI Console Menu, go to Migration & Disaster Recovery > Database Migration > Database Connections.

Press create connection.

On the section Database Details, fill in the following entries, otherwise leave defaults:
- Name: SourceCDB
- Vault: DMS_Vault
- Encryption Key: DMS_Key
- Database Type: Oracle Base Database
- Database System: SourceDB
- Database: sourcedb
- Connect String: Change existing string by replacing the qualified hostname with the private IP of the database node. This is important as DMS does not accept FQDNs or hostnames in the connect string.
- Subnet: Pick the Subnet that the DB is located in.

Press Next.
On the page Connection Details, fill in the following entries, otherwise leave defaults:

- Initial load database username: **system**
- Initial load database password: `<Admin password>
  - A user that has the DATAPUMP_EXP_FULL_DATABASE role is required for the source Database connection.
- Check “Use different credentials for replication” and provide `c##ggadmin` and password.
Optionally if you prefer you can enter SSH credentials under “Show optional SSH settings”:

- SSH Database Server Hostname: < DB Node Private IP Address>
- SSH Private Key: Select private key file
- SSH Username: opc
- SSH Sudo Location: /usr/bin/sudo

Press Create

**Task 11 – Create Database Connection for Source PDB**

For this task you need the following info from previous steps:

- Source DB Private IP
- Source DB PDB Service Name

In the OCI Console Menu, go to Migration & Disaster Recovery> Database Migration > Database Connections. Press create connection.

On the section Database Details, fill in the following entries, otherwise leave defaults:

- Name: SourcePDB
- Vault: DMS_Vault
• Encryption Key: **DMS_Key**
• Database Type: Oracle Base Database
• Database System: **SourceDB**
• Database: **sourcedb**
• Connect String: Change existing string by replacing the qualified hostname with the private IP of the database node. This is important as DMS does not accept FQDNs or hostnames in the connect string. Then replace service name with PDB service name, for example 10.0.0.3:1521/pdb.subXXXXXXXX.xvndmsla.oraclevcn.com
• Subnet: Pick the Subnet that the DB is located in.

Press Next.

On the page Connection Details, fill in the following entries, otherwise leave defaults:

- Initial load database username: system
- Initial load database password: <Admin password>
  - A user that has the DATAPUMP_EXP_FULL_DATABASE role is required for the source Database connection.
  - Check “Use different credentials for replication” and provide ggadmin and password.
Optionally if you provided SSH credentials for the Container database connection then provide the same under “Show optional SSH settings”:

- SSH Database Server Hostname: < DB Node Private IP Address>
- SSH Private Key: Select private key file
- SSH Username: opc
- SSH Sudo Location: /usr/bin/sudo

Press Create

Task 12 – Create Database Connection for Target

In the OCI Console Menu, go to Migration & Disaster Recovery> Database Migration > Database Connections. Press Create connection.

On the section Database Details, fill in the following entries, otherwise leave defaults:

- Name: TargetATP
- Vault: DMS_Vault
- Encryption Key: DMS_Key
- Database Type: Autonomous Database
- Database: **TargetATP**
- Select Network Connectivity via Private Endpoint

Press **Next.**

On the section Connection Details, fill in the following entries, otherwise leave defaults:

- Initial load database username: **admin**
- Initial load database password: `<Admin password>`
  - A user with the DATAPUMP_IMP_FULL_DATABASE role is required for the target Database connection.
- Check “Use different credentials for replication” and provide ggadmin and password.

Press **Create**

**Task 13 – Create Migration**

In the OCI Console Menu, go to Migration & Disaster Recovery > Database Migration > Migrations.

Press Create Migration.

On the page **Add Details**, fill in the following entries, otherwise leave defaults:

- Name: TestMigration
- Vault: DMS_Vault
• Encryption Key: **DMS_Key**

Press **Next**

On the page **Select Databases**, fill in the following entries, otherwise leave defaults:

- Source Database: **SourcePDB**
- Check Database is pluggable database (PDB)
- Registered Container Database: **SourceCDB**
- Target Database: **TargetATP**

Press **Next**
On the page **Migration Options**, fill in the following entries, otherwise leave defaults:

- In Initial Load select Datapump via Object Storage
- Object Storage Bucket: **DMSStorage**
- Export Directory Object:
  - Name: **dumpdir**
  - Path: `/u01/app/oracle/dumpdir`
- Source database file system SSL wallet path: `/u01/app/oracle/dumpdir/wallet`
Task 14 – Validate Migration

In this step you will validate a migration prior to running it. It will check that all associated database and GoldenGate environments are correctly set up.

In the OCI Console Menu, go to Migration & Disaster Recovery > Database Migration > Migrations.
Select TestMigration.
If Migration is still being created, wait until Lifecycle State is Active.
Press Validate button
Click on Jobs in left-hand Resources list
Click on most recent Evaluation Job
Click on Phases in left-hand Resources list
Phases will be shown, and status will be updated as phases are completed. It can take 2 minutes before the first phase is shown.
If a phase has failed, it will show with status **Failed**. In this case press **Download Log** to learn more about the reason of failure. Press **Abort** on a failed job to allow further jobs or deleting of the migration.

Click **Validate Pre-migration Advisor** phase name to open the Validation pre-migration advisor detail page (You should not find issues in for this exercise but below lines would walk you thru an event when the phase fails). From this page you can download the CPAT report, view the report statistics, and drill down in the Checks list as shown:

You can still download the report as a text file, but now you can also navigate through the different checks. The summary view is displayed as follows:
You can click a check name in the list to display details about a specific check from the CPAT report. You can mark a check as **Reviewed** or **Unreviewed**, this state is only for your convenience to track each check. For certain checks, CPAT generates a remedial script on the file system of the source database server. You can run the script on the source database to resolve the issue identified by the check. The checks page will also let you filter by this state (left side of screen):

The **View check details** panel is displayed as follows:

![View check details panel](image)

Once you have cleared all “Action Required” checks then the validation Job can be run again. Repeat the process until **Validate premigration advisor** phase completes with no error as shown:

![Validation Job completion](image)

**Excluded Objects**: View the report of all excluded objects based on static exclusion rules as well as dynamic exclusion settings made by the user. The excluded objects list displays objects that are excluded from migration as shown:
**Task 15 – Run Migration**

After successful validation, a Migration can be run to perform the data transfer.

In the OCI Console Menu, go to Migration & Disaster Recovery > Database Migration > Migrations.

Select TestMigration.

Press Start to begin the migration

The Start Migration dialog is shown. Select the phase Monitor GoldenGate Lag in the Require User Input After list. This will cause the replication to run continuously until the Migration is resumed.

Press Start to begin the Migration.

Click on **Jobs** in left-hand **Resources** list
Click on most recent Evaluation Job
Click on **Phases** in left-hand **Resources** list
Job phases are updated as the migration progresses
When the migration has reached the state to wait for user input, the migration job changes to **Waiting** state. This is the point where a migration user would stop the source application so that no more transactions are applied to the source DB. You can now press **Resume** on the job to complete replication.

In the Resume Job dialog, chose the **Switchover App** phase and press **Resume**. The Switchover App phase will gracefully stop replication and signal the target application to initiate transactions to the target DB.

After Job resumes and waits after Switchover App phase, press Resume. Select the last phase **Cleanup** and press **Resume**.

The migration runs the final cleanup phases and shows as Succeeded when finished.
Your Migration is now completed!