

# OCI Database Migration Service End-To-End Online Migration Tutorial for Oracle Databases

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

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## 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 instance, and an Oracle Autonomous Database (ADB) instance to perform an online 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:

Homogeneous migration of data from MySQL or Oracle databases into OCI.

Provides enterprise-level logical Online and Offline migrations with minimal downtime based on industry leading GoldenGate for data replication.

### DMS Documentation:

Please review the documentation [here](#).

### Task 0 – Understand New DMS Concepts

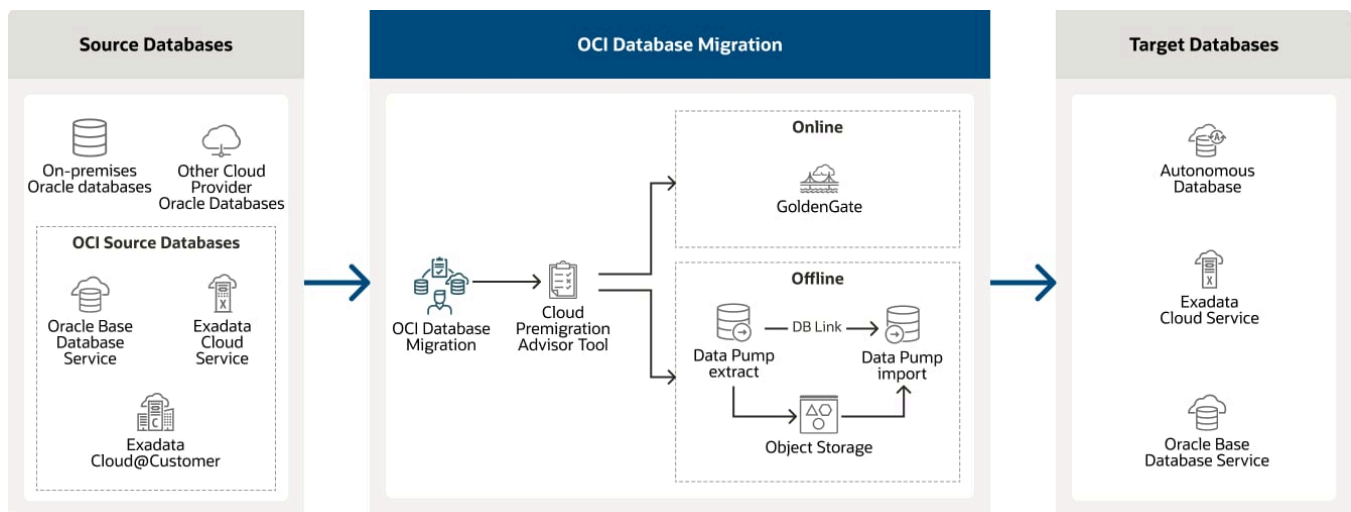
DMS provides a fully managed approach to migrating databases from various locations into OCI-hosted databases.

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. For Oracle migrations the source databases can be located on-premises, in 3<sup>rd</sup> party clouds, or on Oracle OCI. The supported targets can be Oracle Autonomous Database shared or dedicated, Oracle Base Database and Exadata Database Service on dedicated infrastructure.

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.



DMS Simplified Topology

**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 Database Connection 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 of 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.

**Database Connection:** A Database Connection represents information about a source or target database, such as connection and authentication credentials. DMS uses the OCI Vault to store credentials. A **Database Connection** 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.

## PERMISSIONS REQUIRED BY DMS TO USE DATABASES, VAULTS, AND NETWORKING

Allow group DMS\_LA to manage virtual-network-family in compartment DMS\_LA  
Allow group DMS\_LA to manage vaults in compartment DMS\_LA  
Allow group DMS\_LA to manage keys in compartment DMS\_LA  
Allow group DMS\_LA to manage database-family in compartment DMS\_LA  
Allow group DMS\_LA to manage autonomous-database-family in compartment DMS\_LA  
Allow group DMS\_LA to manage object-family in compartment DMS\_LA  
Allow group DMS\_LA to manage secret-family in compartment DMS\_LA  
Allow group DMS\_LA to manage goldengate-connections in compartment DMS\_LA  
Allow group DMS\_LA to manage odms-connection in compartment DMS\_LA  
Allow group DMS\_LA to manage odms-migration in compartment DMS\_LA  
Allow group DMS\_LA to manage odms-job in compartment DMS\_LA

### Task 2 – Sign In and Open DMS Console

To perform this guide, 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/> for available regions.

- Open the browser with URL <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 Actions >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.

Navigate to the Subnets tab, pick Public Subnet-VCN NAME.

Navigate to Security tab, in the Security Lists list pick Default Security List for *VCN NAME*.

Navigate to Security rules tab, 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**.

<input type="checkbox"/>	Stateless	Source	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
<input type="checkbox"/>	No	0.0.0.0/0	TCP	All	22		TCP traffic for ports: 22 SSH Remote Login Protocol	
<input type="checkbox"/>	No	0.0.0.0/0	ICMP			3, 4	ICMP traffic for: 3, 4 Destination Unreachable: Fragmentation Needed and Don't Fragment was Set	
<input type="checkbox"/>	No	10.0.0.0/16	ICMP			3	ICMP traffic for: 3 Destination Unreachable	
<input type="checkbox"/>	No	0.0.0.0/0	TCP	All	443		TCP traffic for ports: 443 HTTPS	OGG HTTPS
<input type="checkbox"/>	No	10.0.0.0/16	TCP	All	1521		TCP traffic for ports: 1521	Oracle DB access for PEs

0 Selected Showing 5 Items < 1 of 1 >

## 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** tab.

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 Base Database with Oracle Database 19c.

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
- Leave VM.Standard.E5.Flex as default shape.
- Select generate SSH key pair, you need to save the private and public keys.
- 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.

Click in the database system SourceDB in the DB Systems page.

Click in the database sourcedb in the Databases page

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. Press PDB Connection. Like with CDB steps copy the string after the /, this is the service name of your PDB a string like:

`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.

These values **can be used** later during database connection creation.

Name	State	Public IP Address	Floating IP Address	Private IP Address & DNS Name	Fault Domain
sourcedb	Available	129.213.162.34	-	10.0.0.3 (sourcedb... <a href="#">Show</a> <a href="#">Copy</a> )	FAULT-DOMAIN-3

## 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 click on your VCN.
2. Navigate to Security tab, **Network Security Groups**.
3. Press **Create Network Security Group**.
4. Enter Name such as **DMS\_NS**G 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 Applied filters.
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
  - Workload type: Transaction Processing
  - Create administrator credentials – Password: password of your choice
  - Network access > Access Type: Private endpoint access only
  - Virtual cloud network: VCN\_DMS\_LA (Or your VCN name)
  - Client subnet: Private Subnet-VCN\_DMS\_LA (Or your subnet name)
  - Advanced options> Network security group: DMS\_NGS (Or your NSG name)
11. Close the dialog by pressing **Create Autonomous Database**.

## Task 8 – Prepare Source

This task prepares required user accounts and settings for Migration in the Source DB. It assumes default settings in the database. If you changed the 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\_LRRpLxcSuSM6yRjO9u1TDuDy8wuiawEI18Q\_xPYFmvap\_tPFdtm\_c6TskV\_/n/axsdric7bk0y/b/SSL-Wallet-For-No-SSH-Migrations-Setup/o/walletSSL.zip`
  - i. This [link](#) is also available in the official documentation in the “Managing migrations section”
- 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 CDB\$ROOT. Replace `clouduser` and `sslwalletdir` accordingly:

```
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;
/
```

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;
```

	HOST	LOWER_PORT	UPPER_PORT	PRIVILEGE	STATUS
1	*	443	443	http	GRANTED
2	*	443	443	http-proxy	GRANTED

Follow the next [link](#) for a reference to the documentation.

The next step will prepare the source database. It will create the user C##GGADMIN on the CDB and the user GGADMIN on the PDB and will provide all the required grants, these users will be provided to perform the replication during **source connection creation**:

- 1) Download the preparation script from this [link](#)
- 2) Locate the file and run it `./dms-db-prep-v2.sh`
- 3) Follow the instructions:
  - a) Database type [(s)ource/(t)arget]?: s
  - b) Is your source database hosted in AWS RDS (Amazon Relational Database Service)? [y/n]: n
  - c) Is your database multi-tenant or single-tenant? [(m)ulti/(s)ingle]: m
  - d) Please provide your PDB service name (e.g. amer.subnet1.alimavcn.oraclevcn.com):  
pdb.sub03132344240.vcndmssj.oraclevcn.com
  - e) Password for system user:
  - f) Migration type [(on)line/(off)line]: on
  - g) Password for ggadmin/c##ggadmin user:

```
-- Oracle Cloud Infrastructure Database Migration Service --
This script will help you prepare your source and target databases for migration.
Please answer the following questions to proceed:

Database type [(s)ource/(t)arget]?: s
Is your source database hosted in AWS RDS (Amazon Relational Database Service)? [y/n]: n
Is your database multi-tenant or single-tenant? [(m)ulti/(s)ingle]: m
Please provide your PDB service name (e.g. amer.subnet1.alimavcn.oraclevcn.com): [REDACTED].oraclevcn.com
Password for system user:
Migration type [(on)line/(off)line]: on
Password for ggadmin/c##ggadmin user:

Sql script /home/[REDACTED]/dms_prep_db.sql generated.
Please connect to your database's root container (CDB) as sysdba (role) and run the above generated sql script.
This script will analyze your database and will generate a subsequent sql script that you must review, modify (if needed) and
run in order to get your database set up for the migration.
[ info] When setting up your migration through the OCI Console:
[ info] Use system user as the Initial Load Database Username when Creating a Database Connection for Source Database throug
h the Database Migration Service
[ info] Create one Database Connection for the Container Database (CDB) and another one for the Pluggable Database (PDB)
[ info] Use ggadmin as the Replication Database Username for the Source Pluggable Database when creating the Migration throug
h the Database Migration Service
[ info] Use c##ggadmin as the Replication Database Username for the Source Container Database when creating the Migration throug
h the Database Migration Service
```

The next step is to locate the output file **dms\_prep\_db.sql** generated by the script, you should see the path on the screen. Connect to your database's root container (CDB) as sysdba (role) and run the above generated sql script.

This script will analyze your database and will generate a subsequent sql script (**DMS\_Configuration.sql**) that you must review, modify (if needed) and run in order to get your database set up for the migration.

```
GRANT ALTER ANY SEQUENCE TO GGADMIN CONTAINER=CURRENT;
GRANT ALTER ANY TRIGGER TO GGADMIN CONTAINER=CURRENT;
GRANT ALTER ANY TYPE TO GGADMIN CONTAINER=CURRENT;
GRANT ALTER ANY SEQUENCE TO GGADMIN CONTAINER=CURRENT;
GRANT CREATE DATABASE LINK TO GGADMIN CONTAINER=CURRENT;
GRANT EXECUTE ON dbms_lock TO GGADMIN CONTAINER=CURRENT;
EXEC DBMS_GOLDENGATE_AUTH.GRANT_ADMIN_PRIVILEGE('GGADMIN',CONTAINER=>'CURRENT');
--
--
-- Script DMS\_Configuration.sql generated. Please review this script, modify as appropriate and run it in your database.
-- Your source database will be ready for migration after execution of these operations.
--
```

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:

```
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:

```
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.

### Task 9 – Prepare Target

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 **network** details of your Autonomous database:

Click 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 the **source** database as in Task 8, once connected we should be able to connect to the target and run SQL commands:

```
ssh -i <private_key_file> opc@<dbnode_public_ip>
sudo su - oracle
```

Now 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 10 – Create Object Store Bucket for Data Pump Storage

Object Store is used as temporary storage between source and target databases with Data Pump. 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 11 – Create a Database Connection for the Source CDB

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**
- Type: **Oracle Database**
- Vault: **DMS\_Vault**
- Encryption Key: **DMS\_Key**

Select Database details: **Select an OCI database**

- Database System: **SourceDB**
- 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**.
- Don’t check create private endpoint option.

Press **Create**

Once your newly created connection is in Active state, test it by clicking “Actions >Test connection” :

## Task 12 – Create Database Connection for Source PDB

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**
- Type: **Oracle Database**
- Vault: **DMS\_Vault**
- Encryption Key: **DMS\_Key**

Select Database details: **Select an OCI database**

- Database System: **SourceDB**



- Database: **sourcedb**
- Pluggable database: **pdb**
- 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**.
- Don’t check create private endpoint option.

Press **Create**

Test your connection as in the previous task.

### Task 13 – 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**
  - Type: **Oracle Autonomous Database**
  - Vault: **DMS\_Vault**
  - Encryption Key: **DMS\_Key**
- Select the Autonomous database name in your compartment i.e: **dmsatp2**
- 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**.
  - Network connectivity: **Create** private endpoint to access this database

Press **Create**

Test your connection as in the previous task.

## Task 14 – 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**

On the **Source Database**, fill in the following entries:

- Database connection in the compartment: **SourcePDB**

- Check Database is pluggable database (PDB)
- Container Database connection in the compartment: **SourceCDB**
- Target Database: **TargetATP**

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

- In Initial Load: Datapump via Object Storage
- Export Directory Object:  
Name: **dumpdir**  
Path: **/u01/app/oracle/dumpdir**
- Source database file system SSL wallet path: **/u01/app/oracle/dumpdir/wallet**
- Object Storage Bucket: **DMSStorage**
- **Check** Use Online Replication

Click **Create**

The image displays two screenshots of the 'Create migration' form in the OCI console. The left screenshot shows the 'Source database' and 'Target database' sections. The 'Source database' section includes a 'Compartment' dropdown, a 'Database connection' dropdown set to 'SourcePDB', and a checkbox for 'Database is pluggable database (PDB)' which is checked. Below this, there is another 'Compartment' dropdown and a 'Container database connection' dropdown set to 'SourceCDB'. The 'Target database' section includes a 'Compartment' dropdown and a 'Database connection' dropdown set to 'TargetATP'. The right screenshot shows the 'Transfer medium for initial load' section with three options: 'Data Pump via Object Storage', 'Data Pump via database link', and 'Data Pump via file storage'. Below this, the 'Source database' section includes an 'Export directory object name' field set to 'dumpdir', an 'Export directory object path' field set to '/u01/app/oracle/dumpdir', and a 'Source Database file system SSL wallet path' field set to '/u01/app/oracle/dumpdir/wallet'. The 'Advanced options' section includes a 'Use online replication' checkbox which is checked, and a 'Create' button.

## Task 15 – Validate Migration

In this step you will validate a migration prior to running it. It will check the connections and settings for the source and target. Cloud pre-migrator advisor will look for source and target incompatibilities.

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

Select TestMigration.

If the migration is still being created, wait until Lifecycle State is Active.

Press **Validate** button

Click on the **Jobs** tab

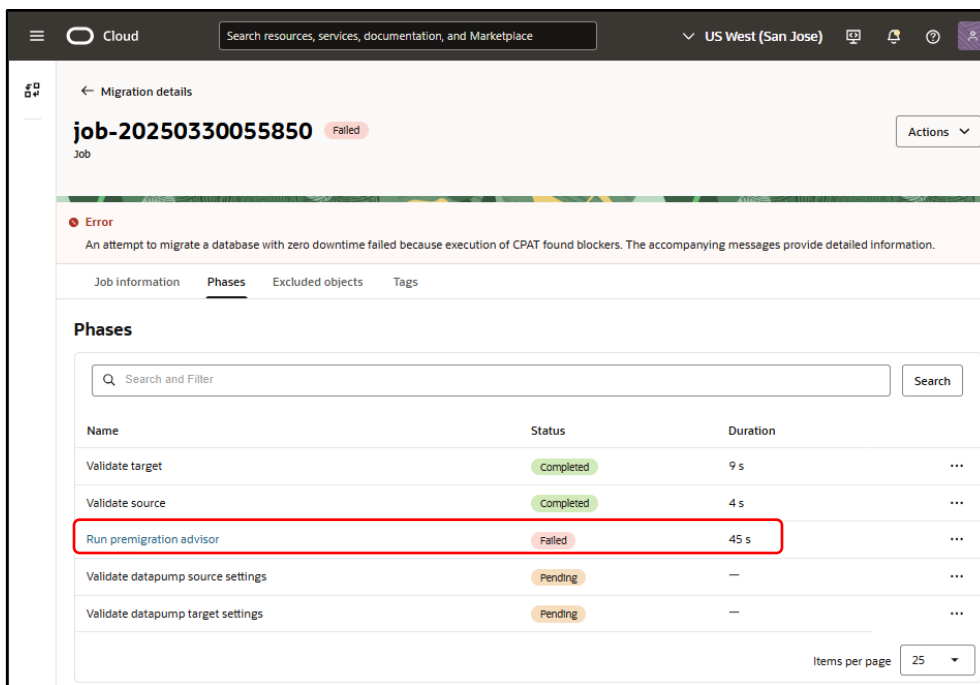
Click on most recent Evaluation Job

Click on the **Phases** tab

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 Actions>**Download Log** to learn more about the reason of failure.

Click **Run premigration advisor** phase name to open the Validation premigration 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 advisor report as a text file, but now you can also navigate through the different checks. The summary view is displayed as follows:

← Job details

## Run premigration advisor Failed

Advisor report Download advisor report

Advisor report information **Checks**

### Checks

Q Search and Filter Search

Name	Result ↕	Reviewed ↕	Object count	
Has refs to user objects in sys	Action required	No	3	...
Has java objects	Action required	No	1	...
Has java source	Action required	No	1	...
Has columns with media data types adb	Action required	No	1	...
Has role privileges	Action required	No	1	...
Has sys privileges	Action required	No	1	...
Has libraries serverless	Action required	No	1	...
Has data in other tablespaces serverless	Review suggested	No	0	...
Has default tablespace not data	Review suggested	No	0	...
Standard traditional audit adb	Review suggested	No	0	...
Dp has low streams pool size	Passed	No	3	...

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:

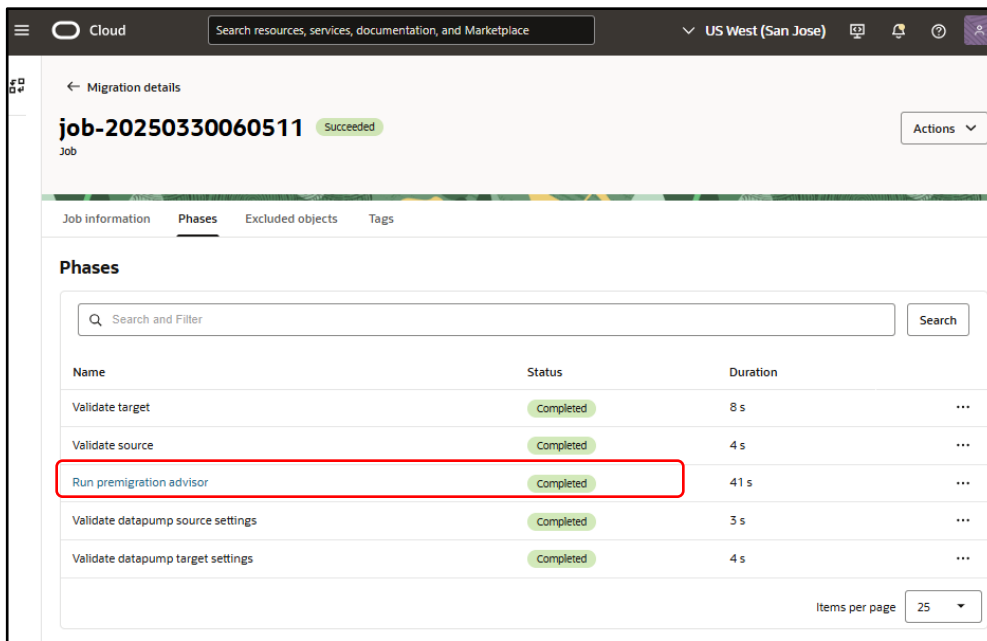
### View check details

<b>Name</b>	Has columns with media data types adb
<b>Result</b>	Action required
<b>Reviewed</b>	No
<b>Issue</b>	Multimedia object types such as those from ORDSYS cannot be used in Autonomous databases.
<b>Impact</b>	Columns with Media data types are not allowed in Autonomous Database. Migration of tables with multimedia columns will fail.
<b>Action</b>	Follow the instructions in the Oracle Multimedia README.txt file in <ORACLE_HOME>/ord/im/admin/README.txt, or Oracle Support Document ID 2555923.1 to determine if Oracle Multimedia methods and packages are being used. If Oracle Multimedia is being used, refer to Oracle Support Document ID 2347372.1 for suggestions on replacing Oracle Multimedia. Refer to Oracle Support Document ID 2375644.1 "How To Migrate Data From Oracle Multimedia Data Types to BLOB columns" for information on how to move data stored in Oracle Multimedia object types to SecureFiles LOBs.
<b>Objects</b>	—

<input type="checkbox"/>	OWNER	TABLE_NAME	COLUMN_NAME	DATA_TYPE	Is excluded	Is excluded
<input type="checkbox"/>	H_R_P_41	IMAGE_TABLE2	IMAGE	ORDIMAGE	No	No

Items per page

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:



## Task 16 – Run Migration

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

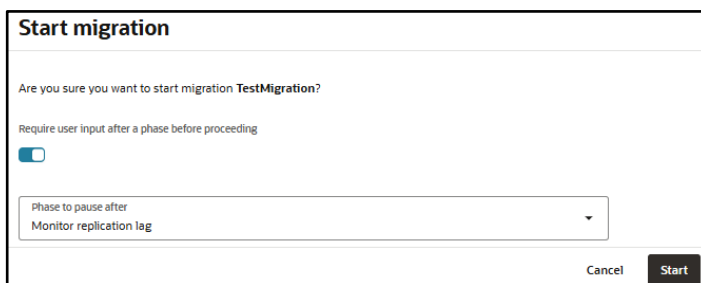
In the OCI Console Menu, go to Migration & Disaster Recovery > Database Migration > Migrations.

Select TestMigration.

Press Start to begin the migration.

The Start Migration dialog is shown. Select the phase Monitor replication 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 the **Jobs** tab

Click on the most recent migration Job

Click on the **Phases** tab

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** phase and press **Resume**. The Switchover phase will gracefully stop replication and signal the target application to initiate transactions to the target DB. Find more information about the switchover phase in our [documentation](#).

**Resume job**

Are you sure you want to resume job job-20250330142812

Require user input after a phase before proceeding

Phase to pause after  
Switchover

Cancel Resume

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

**Resume job**

Are you sure you want to resume job job-20250330142812

Require user input after a phase before proceeding

Phase to pause after

Cancel Resume

The migration runs the final cleanup phases and shows as Succeeded when finished.



**job-20250330142812** Succeeded Actions

Job

Job information **Phases** Excluded objects Monitoring Tags

### Phases

Q Search and Filter Search

Name	Status	Duration	
Initialize replication infrastructure	Completed	14 m	...
Validate	Completed	29 s	...
Prepare	Completed	2 m 13 s	...
Export initial load	Completed	43 s	...
Upload data	Completed	1 s	...
Import initial load	Completed	1 m 46 s	...
Post initial load	Completed	2 s	...
Prepare replication target	Completed	2 m 9 s	...
Monitor replication lag	Completed	1 s	...
Switchover	Completed	1 m 38 s	...
Cleanup	Completed	14 s	...

Items per page 25

Your migration is now complete!

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