

OCI Database Migration Service Step by Step Guide: Online Migration for Autonomous Databases on Oracle Database@Azure

Scenarios where applications are online
and source database is connected 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 Oracle or databases into OCI.

Enterprise-level logical online and offline migrations with minimal downtime into OCI targets.

Based on industry leading GoldenGate for data replication.

DMS Documentation:

Please review the documentation [here](#).

Prerequisites for this guide:

- Azure permissions to accept private offers on the Azure Marketplace
- Azure Virtual Network with a delegated subnet to the Oracle Database@Azure service: (Oracle.Database/networkAttachments)
- A deployed Oracle@Azure Autonomous Database Service
- Federated SSO user to sign in into OCI

More details can be found on [Onboarding with Oracle Database@Azure](#).

Task 0 – Understand New DMS Concepts

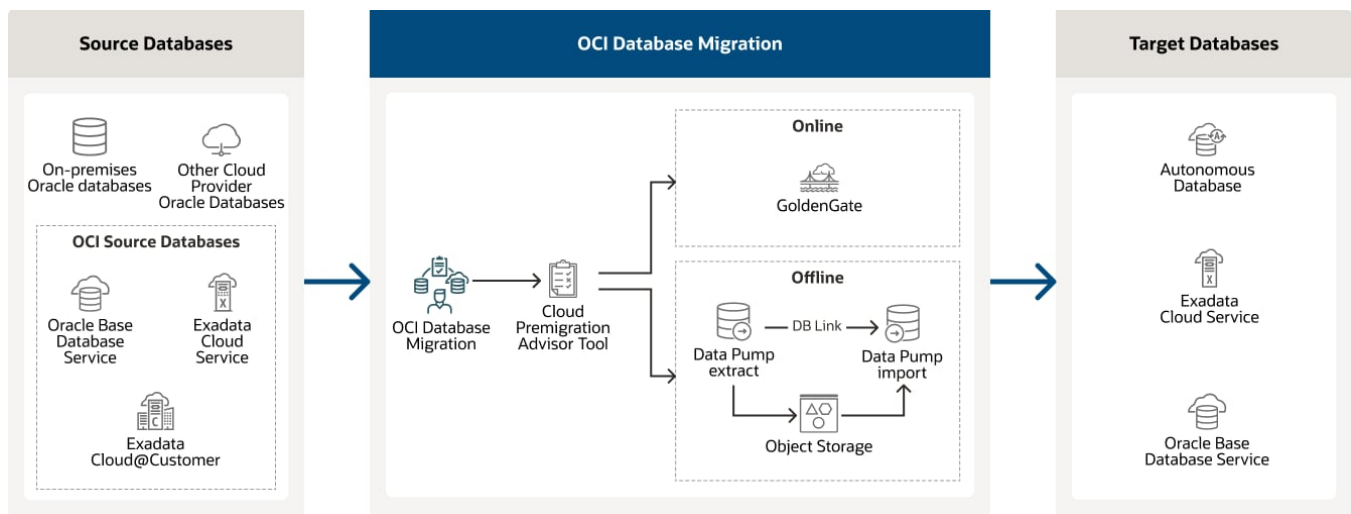
DMS provides a fully managed approach to migrating databases from various locations into OCI-hosted databases.

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 3rd 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.

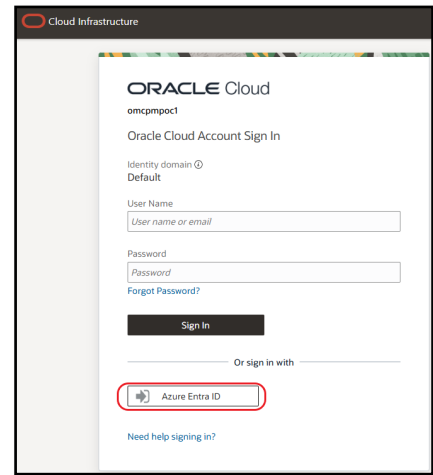
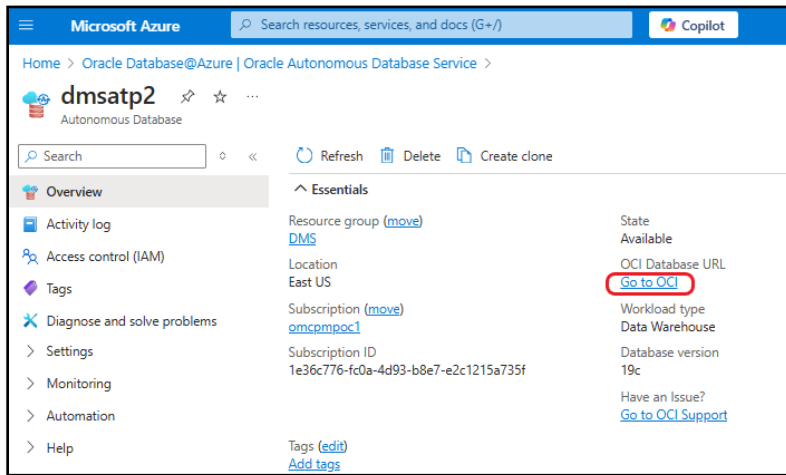
Migration: A Migration contains metadata for migrating one database. It contains information about source, target, and migration methods and is the central object for users to run migrations. After creating a migration, a user can validate the correctness of the environment and then run the migration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

Migration Job: A Migration Job displays the state 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.

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 – Sign in to OCI and Open DMS Console

- On the Azure portal navigate to Home > Oracle Database@Azure | Oracle Autonomous Database Service > Select your database > Click on the Go to OCI link
- Log in using your Azure Entra id credentials.
- In the OCI console title bar change region if applicable.



Task 2 – Have the Administrator Set Required Permissions

The following permissions need to be set in OCI 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. Review the following documentation on [Required Policies](#) if required

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
- Allow group DMS_LA to manage cloud-shell in compartment DMS_LA

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.

Click on 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**.

Ingress Rules								
<input type="button" value="Add Ingress Rules"/> <input type="button" value="Edit"/> <input type="button" value="Remove"/>								
<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** 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 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.

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.

Press DB 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... Show Copy)	FAULT-DOMAIN-3

Displaying 1 Node < 1 of 1 >

Task 7 – Create an Oracle Database@Azure Oracle Autonomous Database as Target

The following task is optional since an autonomous database should already be present.

1. On the Azure portal navigate to Home> Oracle Database@Azure | Oracle Autonomous Database Service
2. Click on Create
3. Select the subscription, resource group and give a name to your instance.
4. For this testing we are leaving the default values on the configuration tab: Data Warehouse as workload type and database version 19c.
5. Provide a password for the Admin user
6. On the Networking tab, select the virtual network and a subnet with the required subnet delegation.
7. Click on Review + create

Task 8 – Prepare Source

This task prepares the 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 store the database export files:

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

In this guide for your non-ADB source no SSH details will be provided during the creation of the **database connection**, to achieve HTTPS connectivity, the following steps need to be followed:

- a. Create a new directory: `mkdir /u01/app/oracle/dumpdir/wallet`
- b. Download a pre created SSL wallet: `curl -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 th
rough 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**), you must review, modify (if needed) and run it 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;
    END LOOP;

```

```

        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

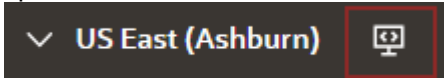
The next steps will connect to the target ADB instance and enable the standard gadmin user, you can skip these steps if the user is already enabled.

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.

Click Download wallet from the section “Download client credentials (Wallet)”

Open cloud shell in OCI, this icon is available in the top ribbon, next to the region:



In the Cloud Shell, click on the Upload button (it looks like a cloud with an up arrow).

Upload the wallet zip file you downloaded.

In the Cloud Shell, unzip the wallet file using the following command:

```
unzip Wallet_<your_db_name>.zip -d wallet
```

Set the TNS_ADMIN environment variable to point to the directory where you unzipped the wallet, i.e:

```
export TNS_ADMIN=$HOME/wallet
```

One of the extracted files from the wallet is sqlnet.ora, make sure that in the content the directory path is the same path where you decompressed the wallet file, i.e:

```
WALLET_LOCATION = (SOURCE = (METHOD = file) (METHOD_DATA =  
(DIRECTORY="/home/cloudshell-user/wallet")))
```

Connect to sqlplus using the next command, get the connection string from your database “Connection strings” section:

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

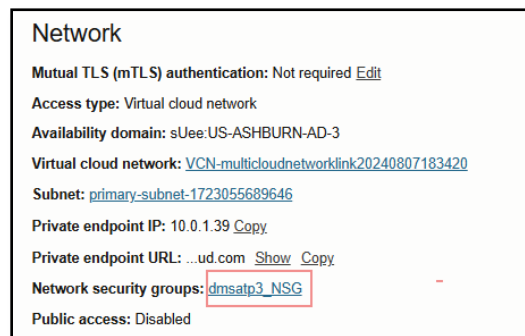
In SQL Plus enter the following commands:

```
SQL> alter user ggadmin identified by <new password> account unlock;
```

```
User altered.
```

```
SQL> quit
```

Now click on the Network security group:



- Select Add Rules, enter the following entries, otherwise leave defaults:
- Direction: Ingress
- Source Type: CIDR
- Source CIDR: 0.0.0.0/0
- IP Protocol: All Protocol
- Press Add.

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: **DMStorage**

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**

Create connection

Name
SourceCDB

Description *Optional*

Compartment

Type
Oracle Database

Vault in **jorge** ⓘ [\(Change compartment\)](#)
DMS_Vault

Encryption key in **jorge** ⓘ [\(Change compartment\)](#)
DMS_Key

Enter connection details for Oracle Database.

Database details
 Select an OCI database
 Enter database connection details

Database system in **jorge** [\(Change compartment\)](#)
SourceDB

Database home

Database
sourcedb

Initial load database username
system

Initial load database password
.....

Use different credentials for replication

Replication database username
c##ggadmin

Replication database password
.....

Database wallet *Optional*

Database auto login wallet (.sso) files only

Network connectivity
 Create private endpoint to access this database ⓘ

[Show advanced options](#)

Create [Cancel](#)

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**

Create connection

Name
SourcePDB

Description *Optional*

Compartment

ggsstage (root)DMS/jorge

Type
Oracle Database

Vault in **jorge** ⓘ [\(Change compartment\)](#)
DMS_Vault

Encryption key in **jorge** ⓘ [\(Change compartment\)](#)
DMS_Key

Enter connection details for Oracle Database.

Database details
 Select an OCI database
 Enter database connection details

Database system in **jorge** [\(Change compartment\)](#)
SourceDB

Database home
dbhome20240717004625

Database
sourcedb

Pluggable database *Optional*
pdb

Initial load database username
system

Initial load database password
••••

Use different credentials for replication

Replication database username
ggadmin

Replication database password
••••

Database wallet *Optional*

Drop a file or [select one](#)
Database auto login wallet (.sso) files only

Network connectivity
 Create private endpoint to access this database ⓘ

[Show advanced options](#)

Create [Cancel](#)

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

Test connection

Diagnostic tests passed, connection to your database was successful.

Close

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**

Create connection

Name
TargetATP

Description *Optional*

Compartment
1e36c776-fc0a-4d93-b8e7-e2c1215a735f
omcpmpoc1 (root)/MulticloudLink_ODBAA_20240105042431/1e36c776-fc0a-4d93-b8e7-e2c1215a735f

Type
Oracle Autonomous Database

Vault in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f ⓘ
[\(Change compartment\)](#)
DMS_Vault

Encryption key in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f ⓘ
[\(Change compartment\)](#)
DMS_Key

Enter connection details for Oracle Autonomous Database.
Database in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f
[\(Change compartment\)](#)
dmsatp2

Initial load database username
admin

Initial load database password
.....

Use different credentials for replication

Replication database username
ggadmin

Replication database password
.....

Network connectivity

Create private endpoint to access this database ⓘ

Subnet in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f
[\(Change compartment\)](#)
primary-subnet-1723055689646 (in VCN-multiclo... ⌵

[Show advanced options](#)

Create [Cancel](#)

Once the newly created connection is in Active state, press the Add network security rules button and select the one attached to your Autonomous database.

Test your connection.

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**

Create migration Help

Name
TestMigration

Description *Optional*

Compartment
1e36c776-fc0a-4d93-b8e7-e2c1215a735f
omcpmpoc1 (root)/MulticloudLink_ODBAA_20240105042431/1e36c776-fc0a-4d93-b8e7-e2c1215a735f

Source database

Database connection in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f
[\(Change compartment\)](#)

SourcePDB

Database is pluggable database (PDB)

Container database connection in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f
[\(Change compartment\)](#)

SourceCDB

Target database

Database connection in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f ?
[\(Change compartment\)](#)

TargetATP

Transfer medium for initial load

Data Pump via database link
Use a direct SQL*Net connection between the source and the target databases.

Data Pump via Object Storage
Use Data Pump to temporarily store the exported database in an Object Storage bucket.

Data Pump via file storage
Use a shared NFS mount between the source and the target databases using the File Storage Service.

Source database

Export directory object name ?
dumpdir

Export directory object path ?
/u01/app/oracle/dumpdir

Source Database file system SSL wallet path ?
/u01/app/oracle/dumpdir/wallet

To upload dump files using HTTPS, you require an SSL wallet.
Click the [link](#) to view the steps to download a pre-created wallet or to create a wallet.

Object Storage bucket in 1e36c776-fc0a-4d93-b8e7-e2c1215a735f ?
[\(Change compartment\)](#)
DMSStorage

Use online replication ?

[Show advanced options](#)

Task 15 – 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 you can click on it or click **Download Log** to learn more about the reason of failure.

Click **Validate Pre-migration Advisor** phase name to open the Validation pre-migration advisor detail page (You should not find issues 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:

Database Migration > Migrations > Migration details > Job details

JOB
FAILED

job-20250208042821

Resume Abort Download log Add tags Delete

Job information Tags

OCID: ...3b37rq [Show](#) [Copy](#)
Created: Sat, Feb 8, 2025, 04:28:21 UTC

Migration: TestMigration
Compartment: omcpmpoc1 (root)/MulticloudLink_ODBAA_20240105042431/1e36c776-fc0a-4d93-b8e7-e2c1215a735f
Type: Evaluation

Resources

Phases

Name	Status	Duration
Validate target	Completed	14 s
Validate source	Completed	21 s
Run premigration advisor	Failed	1 m 33 s
Validate datapump source settings	Pending	—
Validate datapump target settings	Pending	—

Showing 5 items < 1 of 1 >

You can download the report as a text file, but you can also navigate through the different checks. The summary view is displayed as follows:

Cloud Search resources, services, documentation, and Marketplace US East (Ashburn)

Database Migration > Migrations > Migration details > Job details > Advisor report details

Run premigration advisor

Download advisor report

Advisor report information

Action required count: 7
Review required count: 0
Review suggested count: 4

Resources

Checks

A check is a compatibility test for source database objects in the target database environment. Checks result in a passed, review suggested, review required, action required, or failed result. [Learn more](#).

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 compression disabled for objects	Review suggested	No	6
Has data in other tablespaces serverless	Review suggested	No	0

Filters

Result type

- Action required
- Review required
- Review suggested
- Passed

Reviewed state

- Reviewed
- Unreviewed


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:

Cloud Search resources, services, documentation, and Marketplace US East (Ashburn)

Database Migration > Migrations > Migration details > Job details > Advisor

View check details



Run premigration

Download advisor report

Advisor report information

Action required count: 7

Review required count: 0

Review suggested count: 0

FAILED

Resources

Checks

Filters

Result type

- Action required
- Review required
- Review suggested
- Passed

Reviewed state

- Reviewed
- Unreviewed

Name: Has columns with media data types adb

Result: Action required

Reviewed: No

Issue: Multimedia object types such as those from ORDSYS cannot be used in Autonomous databases.

Impact: Columns with Media data types are not allowed in Autonomous Database. Migration of tables with multimedia columns will fail.

Action: 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.

Objects:

Exclude all Exclude selected Include selected

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

0 selected Showing 1 item < Page 1 >

Close Mark as reviewed

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:

Cloud Search resources, services, documentation, and Marketplace US East (Ashburn)

Database Migration > Migrations > Migration details > Job details

JOB

SUCCEEDED

Resume Abort Download log Add tags Delete

Job information Tags

OCID: ...h2rfq [Show](#) [Copy](#) Migration: TestMigration
 Created: Sat, Feb 8, 2025, 04:51:31 UTC
 Compartment: omcpmpoc1 (root)/MulticloudLink_ODBAA_20240105042431/1e36c776-fc0a-4d93-b8e7-e2c1215a735f
 Type: Evaluation

Resources

Phases

Name	Status	Duration
Validate target	Completed	14 s
Validate source	Completed	22 s
Run_pre migration advisor	Completed	1 m 25 s
Validate datapump source settings	Completed	18 s
Validate datapump target settings	Completed	4 s

Showing 5 items < 1 of 1 >

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 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.

Start migration

Are you sure you want to start migration **TestMigration**?

Require user input after a phase before proceeding

Phase to pause after

Monitor replication lag

Start [Cancel](#)

Click on **Jobs** in left-hand **Resources** list

Click on most recent 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.

Resume job

Are you sure you want to resume job **job-20250214202007**

Require User Input After

Switchover

Resume [Cancel](#)

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

Resume job

Are you sure you want to resume job job-20250214202007

Phase to pause after

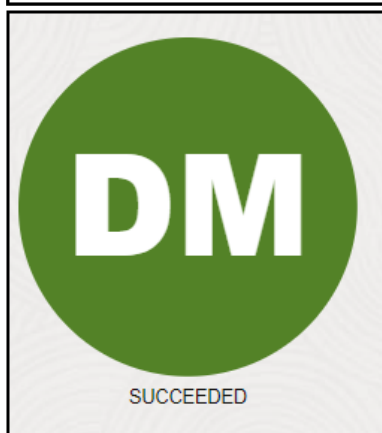
Cleanup

Resume [Cancel](#)

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

Phases			
Name	Status	Duration	
Initialize replication infrastructure	● Completed	18 m 1 s 18 ms	⋮
Validate	● Completed	48 s	⋮
Prepare	● Completed	2 m 14 s	⋮
Export initial load	● Completed	49 s	⋮
Upload data	● Completed	35 s	⋮
Import initial load	● Completed	1 m 41 s	⋮
Post initial load	● Completed	3 s	⋮
Prepare replication target	● Completed	2 m 19 s	⋮
Monitor replication lag	● Completed	2 s	⋮
Switchover	● Completed	6 m 45 s	⋮
Cleanup	● Completed	15 s	⋮

Showing 11 items < 1 of 1 >



Your Migration is now completed!

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