

OCI Database Migration Service Tutorial - Online Migration to Oracle Autonomous AI Database Serverless in AWS

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

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Purpose statement

This document walks you through the steps to get started using Oracle Cloud Infrastructure (OCI) Database Migration Service (DMS). You will provision a Virtual Cloud Network (VCN), an Oracle Database instance, and an Oracle Autonomous AI Database Serverless on Oracle AI Database@AWS 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 service – DMS

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

- Homogeneous migration of data from Oracle databases into OCI.
- Enterprise-level logical online and offline migrations with minimal downtime into OCI targets.
- Data replication based on industry leading GoldenGate.

DMS Documentation:

Please review the documentation [here](#).

Prerequisites for this guide:

Complete the [onboarding](#) process within your AWS account. To begin onboard, contact your Oracle representative and request a Private Offer. After you agree on pricing, terms and conditions, you complete the purchase through AWS Marketplace. After the purchase is complete, you link your AWS account with an OCI tenancy. This is called multicloud linking.

After you complete onboarding, you can begin provisioning the Oracle AI Database@AWS system.

Provision an [ODB network](#) and [Autonomous AI Database Service Serverless](#).

Review DMS port requirements [here](#).

Task 0 – Understand New DMS Concepts

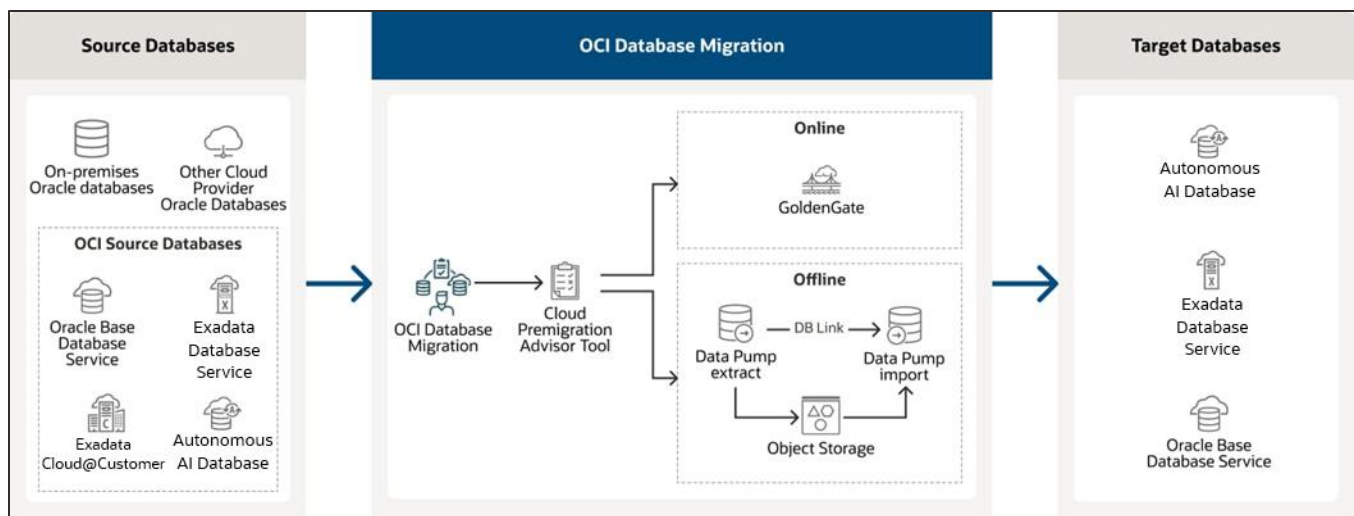
DMS provides a fully managed approach to migrating databases from various locations into OCI-hosted databases.

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 3rd party clouds, or on Oracle OCI. The supported targets can be Oracle Autonomous AI Database dedicated Exadata infrastructure or serverless, Oracle Base Database Service 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.

Assessment: Uses the metadata provided by the customer to to:

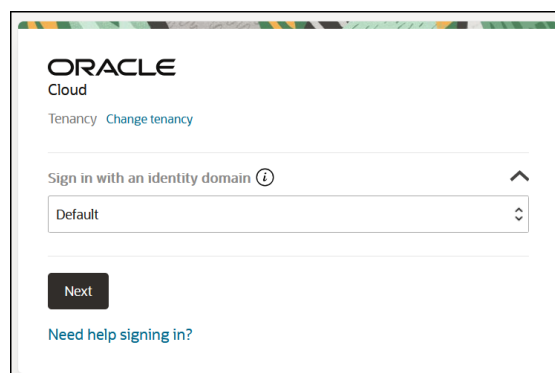
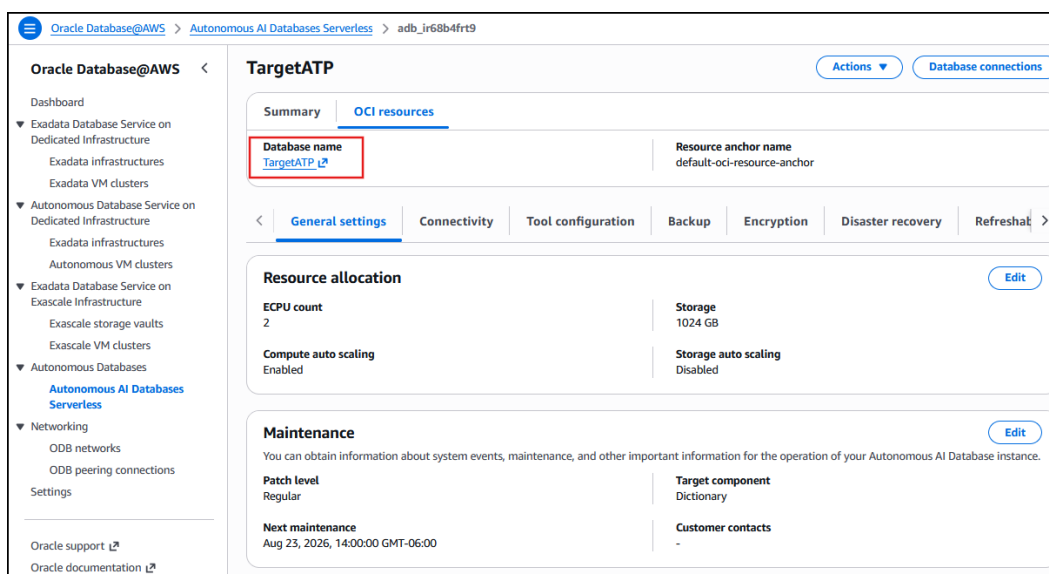
- Recommend the best migration type.
- Identify incompatible objects between source and target and provides relevant information about the issue, impact, and recommended action. Some checks provide a fix-up script and allows the customer to provide acceptance on the same.
- Prepares the source and target databases.
- Optionally, allows single table migration testing to validate end to end configuration.

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.

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 AWS portal

- On the AWS portal search for Oracle Database@AWS dashboard > Click your Autonomous AI Database Serverless.
- Navigate to OCI resources tab and click again in your database link name.
- Log in using your OCI 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 manage odms-assessment in compartment DMS_LA

Task 3 – Create Virtual Cloud Network (to be used with our source database)

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.

For this tutorial we will use the same ODB network created in AWS, you should see it in OCI side with the “VCN-” prefix.

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 (only recommended for testing purposes)
- 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: 0.0.0.0/0 (only recommended for testing purposes)
- Destination Port Range: **1521**
- Description: Oracle DB access for PEs

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

Ingress Rules								
<button>Add Ingress Rules</button><button>Edit</button><button>Remove</button>								
☐	Stateless ▾	Source	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
☐	No	0.0.0.0/0	TCP	All	22		TCP traffic for ports: 22 SSH Remote Login Protocol	⋮
☐	No	0.0.0.0/0	ICMP			3, 4	ICMP traffic for: 3, 4 Destination Unreachable Fragmentation Needed and Don't Fragment was Set	⋮
☐	No	10.0.0.0/16	ICMP			3	ICMP traffic for: 3 Destination Unreachable	⋮
☐	No	0.0.0.0/0	TCP	All	443		TCP traffic for ports: 443 HTTPS	OGG HTTPS ⋮
☐	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 as applicable: License included
- Virtual cloud network: VCN_DMS_LA (Or your ODB VCN name)
- Client subnet: Public Subnet-VCN_DMS_LA (Or your ODB 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. Close the dialog.

For online migrations and when the source database is multitenant architecture, and the database version is < 19.23 then one connection to the CDB and one for the PDB are required. When the database version is >= 19.23 then only one connection to the PDB is required.

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.

Nodes					
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 AI Database@AWS as Target

The following task is optional since an Oracle Autonomous AI Database Serverless should already be present.

1. On the AWS navigate to Oracle Database@AWS>Autonomous AI Databases Serverless and click on Create Autonomous AI Database Serverless.
2. Enter the display name: TargetATP
3. Enter the display name: TargetATP
4. Workload type: Transaction process
5. For this testing we are leaving the default values on the configuration tab: Data Warehouse as workload type and database version 19c.
6. Provide a password for the admin user
7. On the Networking access: Private endpoint access only
8. Select your previously created ODB network (refer to the prerequisites section of this guide)
9. Review and click “Create autonomous AI database.”

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 Oracle Base Database Service 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 https://objectstorage.us-phoenix-1.oraclecloud.com/p/YYkalHlLbbrfOAMlor-Mzl1qcFxaAZOvrYABKzRQYPERFQdzJrVjmalcUg4SIXEu/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. Run the script connected to the pluggable database and not to CDB\$ROOT . Replace `clouduser` and `sslwalletdir` accordingly with GGADMIN.

```
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$name_list('http', 'http_proxy'),
        principal_name => upper('&clouduser'),
        principal_type => xs_acl.ptype_db));
dbms_network_acl_admin.append_wallet_ace(
    wallet_path => 'file:&sslwallet_dir',
    ace => xs$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, GGADMIN, 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 or unlock GGADMIN user in the PDB and will provide all the required grants, this user will be provided during **source database connection creation**:

- 1) Download the preparation script from database creation connection screen.
- 2) Locate the file and run it dms-userprep-analyze.sql
 - Provide a password for the GGADMIN user.

You should see an output like this, this ran in SQL Developer.

```
-- Privilege CREATE ANY SEQUENCE already granted TO DMSROLE
-- Privilege CREATE ANY TRIGGER already granted TO DMSROLE
-- Privilege CREATE ANY TYPE already granted TO DMSROLE
-- Privilege CREATE ANY VIEW already granted TO DMSROLE
-- Privilege ALTER ANY TABLE already granted TO DMSROLE
-- Privilege ALTER ANY INDEX already granted TO DMSROLE
-- Privilege ALTER ANY CLUSTER already granted TO DMSROLE
-- Privilege ALTER ANY INDEXTYPE already granted TO DMSROLE
-- Privilege ALTER ANY OPERATOR already granted TO DMSROLE
-- Privilege ALTER ANY PROCEDURE already granted TO DMSROLE
-- Privilege ALTER ANY SEQUENCE already granted TO DMSROLE
-- Privilege ALTER ANY TRIGGER already granted TO DMSROLE
-- Privilege ALTER ANY TYPE already granted TO DMSROLE
-- Privilege CREATE DATABASE LINK already granted TO DMSROLE
-- Privilege ALTER SYSTEM already granted TO DMSROLE
-- Privilege ALTER DATABASE already granted TO DMSROLE
GRANT DMSROLE TO GGADMIN;
-- Privilege SELECT ON V_$SESSION already granted TO GGADMIN
-- Privilege SELECT ON V_$TRANSACTION already granted TO GGADMIN
-- Privilege SELECT ON V_$DATABASE already granted TO GGADMIN
--
--
-- Execution finished. See summary below.
--
--#####
--      Execution Summary
--#####
-- Total attempted: 1
-- Succeeded      : 1
-- Skipped        : 0
-- Failed         : 0
-- End of execution summary

PL/SQL procedure successfully completed.
```

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> CREATE JAVA SOURCE NAMED "Welcome" AS
  public class Welcome {
    public static String welcome() {
      return "Welcome World"; /*This will allow to test the
assessment*/
    }
  };
/
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 Oracle Autonomous AI Database Serverless instance, enable, and prepare the standard GGADMIN user. Like in Task 8, **the preparation script needs to be downloaded** and placed wherever accessible.

You need to download the wallet, modify the sqlnet.ora so that it points to the wallet location, this step is not covered in this guide.

Make sure that your Autonomous AI Database mTLS authentication option is marked as 'Not required', you can check this in the **network** details of your Autonomous AI 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.

There are different approaches to connect to the database, if you have an instance in the same VCN then you can SSH into that machine, use it as a jump host and connect to your target, once connected we should be able to run SQL commands:

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

```
export TNS_ADMIN=/home/oracle/<Directory where you placed the wallet>
```

Now connect to sqlplus:

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

In SQL Plus enter the following commands:

```
SQL> @ dms-userprep-analyze.sql
```

```
SQL> PL/SQL procedure successfully completed.
```

```
SQL> quit
```

For connection instructions on the AWS side you can review the next [link](#). Once connected you can open the above-mentioned script and execute it.

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 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 AI Database**
- Vault: **DMS_Vault**
- Encryption Key: **DMS_Key**

Select Database details: **Enter database connection details**

- Database connection string (Private IP:port/service name):
10.0.0.15:1521/pdb.sub11250000540.vcndms.oraclevcn.com
- Initial load database username: **ggadmin**
- Initial load database password: **< password>**
- Create private endpoint to access this database : **Enable**
- Subnet: Select your private subnet as previously created.

Press Create

The screenshot shows the 'Create connection' form in the OCI Console. The form is divided into several sections:

- Name:** SourcePDB
- Description:** (empty)
- Compartment:** (dropdown menu)
- Type:** Oracle AI Database
- Vault details:**
 - Vault in compartment:** (dropdown menu)
 - Vault:** DMS_Vault
 - Encryption key in compartment:** (dropdown menu)
 - Encryption key:** DMS_Key
- Connection details:**
 - Database details:**
 - ☐ Select an OCI database
 - ☒ Enter database connection details
 - Database connection string:** 10.0.0.15:1521/pdb.sub11250000540.vcndms.oraclevcn.com
 - Initial load database username:** ggadmin
 - Initial load database password:** (masked with dots)
 - Use different credentials for replication:** ☐
 - Database wallet:** Drop a file or select a file. Choose a file with the proper extension.
- Network connectivity:**
 - Create private endpoint to access this database:** ☒
 - Private endpoints enable connection to databases with private IPs. Check this box if your database has a private IP address. [Learn more](#)**
 - Subnet in compartment:** (dropdown menu)
 - Subnet:** private subnet-VCN_DMS (in VCN_DMS VCN)

At the bottom right, there are 'Cancel' and 'Create' buttons.

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

Test connection

Diagnostic tests passed, connection to your database was successful.

Close

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**
- Type: **Oracle Autonomous AI Database**
- Vault: **DMS_Vault**
- Encryption Key: **DMS_Key**

Select the Autonomous AI Database name in your compartment i.e: **dmsatp2**

- Initial load database username: **GGADMIN**
- Initial load database password: **<Admin password>**
- Network connectivity: **Create** private endpoint to access this database
- Subnet: Select your previously created private subnet ODB network.
 - Make sure the selected subnet allows connections through port 1522.

Press **Create**

Create connection

Name Required

Description

Compartment

Type
Oracle Autonomous AI Database

Vault details

Vault in compartment Vault
DMS_Vault

Encryption key in compartment Encryption key
DMS_Key

Connection details

Enter connection details for Oracle Autonomous AI Database.

Autonomous AI Database in compartment Autonomous AI Database
TargetATP

Initial load database username
ggadmin

Initial load database password

Use different credentials for replication

Network connectivity

Create private endpoint to access this database

Private endpoints enable connection to databases with private IPs. Check this box if your database has a private IP address. [Learn more](#)

Subnet in compartment Subnet
private subnet-VCN_DMS (in VCN_DMS VCN)

Cancel Create

Test your connection as in the previous task.

Task 13 – Create Assessment

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

Press **Create Assessment** and provide the following details:

- Name: DMS Assessment
- Source database: Select **SourcePDB**
- Target database: Select **TargetATP**

Migration options (leave defaults)

- Data size for migration: Less than 1 GB
- DDL changes expected: No

Click create to create and run the assessment.

Click Confirm in step 1. Determine recommended migration method.

- Select online migration and click confirm.

Click Run in step 2, Analyze compatibility.

- Click on the link of *Checks require review*
- Review and Approve the Java Objects and Java Sources check, this will enable the JAVAVM on your target database, changes will be applied during “Prepare target database step”.

Review issues

Name	Java Objects
Status	Pending approval
Issue	Java objects will not migrate by default.
Impact	When the JAVAVM feature is not enabled on the target system, any applications relying on Java objects will fail.
Action	Approve fixup execution on target instance database
Objects	1

Objects to review

OWNER	OBJECT_NAME	OBJECT_TYPE	STATUS
H_I_S_31	Welcome	JAVA CLASS	INVALID

Page 1 of 1 (1 - 1 of 1 total items)
Items per page 10

Cancel Previous issue Next issue Approve

If your database is missing settings this step will identify them, resolve any Manual action required ones following the onscreen instructions i.e :

OGG Replication Not Enabled : ALTER SYSTEM SET ENABLE_GOLDENGATE_REPLICATION=TRUE SCOPE=BOTH;

OGG Minimal Supplemental Logging Not Enabled: ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;

Then click Run again the step 2, once fixed the step should complete.

Click Configure on step 3, Complete migration configuration.

- Choose a name for the Migration i.e DMS Migration
- Select **Data Pump via Object Storage** as transfer medium
- Source Data Pump settings:
- Export directory objects name: dumpdir
- Export directory object path: /u01/app/oracle/dumpdir
- Source database file system SSL wallet path: /u01/app/oracle/dumpdir/wallet
- These values come from Task 8 – Prepare Source.
- Select Object storage bucket: DMSStorage

- Click configure.

Configure Migration

Create a migration and specify how the migration should run, select the source and target databases, and then configure the data transport settings. [Learn more.](#)

Data Pump via Object Storage

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

Data Pump via database link

Use a direct SQL*Net connection between the source and the target databases.

Data Pump via file storage

Use a shared NFS mount between the source and the target databases using the File Storage Service.

Source Data Pump settings

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.

Storage settings

Object Storage bucket is used for temporary storage of database export files or logs.

Object Storage bucket in compartment
assessment-demo

Object Storage bucket
DMSStorage

Online replication

Use online replication

☐

Cancel

Configure

- Click Configure on 4, Prepare source database. No review is expected, if you get some review them, follow the instructions and proceed.
- Click Review checks in step 5, Prepare target database.
- Check the “I have reviewed the SQL script and am aware of the changes it will apply to my database”
- Click Run SQL, this should enable the JAVAVM in your target.
- Your target database needs to be restarted to take effect:
 - Oracle AI Database>Autonomous AI Database> Select your database> More actions menu> Click restart
- Go back to the Assessment and click Recheck on step 5, Prepare target database, the step should complete this time.

5. Prepare target database

Java Objects

Approved

Review

Java Sources

Approved

Review

Preparation script

▲ Review script

The following script prepares and will make changes to your database. Ensure that you review it completely before running it. After running the script the database needs to be restarted.

SQL script

Copy

```

5  --
6  -- Fixup Script Execution Context Notes:
7  --     Execute this Fixup on the Target Instance
8  --     The instance must be restarted after applying this Fixup
9  --
10 -- Action:
11 --     Enable the JAVAVM feature on the target system by executing this SQL
12 --     and then restart your instance
13 --
14 -- BEGIN

```

☒ I have reviewed the SQL script and am aware of the changes it will apply to my database

Run SQL

Download SQL

Close

- Go to step 7, Create Migration and click the button Create migration.
 - You should see the following banner at the top, click view details to go to the migration object.

▲ Information

The assessment has created the migration. Go to the migration details to view the migration progress.

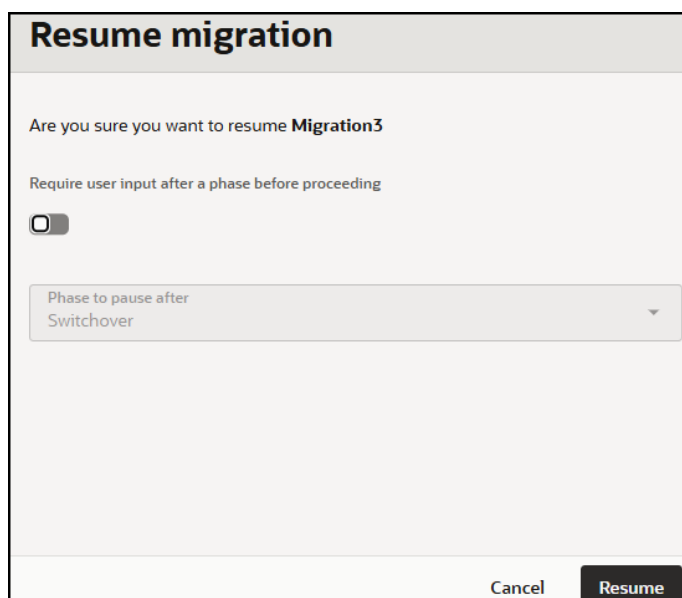
View details

Task 14 – Run Migration

From the Progress tab, click Start to initiate the actual data movement workflow. 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.

When the migration has reached the state to wait for user input, the migration 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 click the **Resume** button to complete the replication.



The image shows a 'Resume migration' dialog box. At the top, the title 'Resume migration' is displayed. Below the title, the text 'Are you sure you want to resume Migration3' is shown. Underneath, there is a label 'Require user input after a phase before proceeding' followed by a toggle switch that is currently turned off. Below the toggle switch is a dropdown menu labeled 'Phase to pause after' with 'Switchover' selected. At the bottom right of the dialog, there are two buttons: 'Cancel' and 'Resume'.

In the Resume migration dialog, disable “Require user input after a phase before proceeding” and press **Resume**. The Switchover phase will gracefully stop replication and signal the target application to initiate transactions to the target DB, then it will complete the Cleanup phase. The migration status will change to **Succeeded** when finished.

DMS Migration

Succeeded

Start

More actions

Migration

Details

Progress

Migration history

Selected objects

Monitoring

Work requests

Tags

Progress

Q Search and Filter

Search

Resume

Name	Status	Duration	
Initialize replication infrastructure	Completed	26 m 57 s	...
Validate	Completed	33 s	...
Prepare	Completed	2 m 13 s	...
Export initial load	Completed	1 m	...
Upload data	Completed	1 s	...
Import initial load	Completed	50 s	...
Post initial load	Completed	6 s	...
Prepare replication target	Completed	2 m 5 s	...
Monitor replication lag	Completed	1 s	...
Switchover	Completed	2 m 57 s	...
Cleanup	Completed	13 s	...

Your migration is now completed!

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