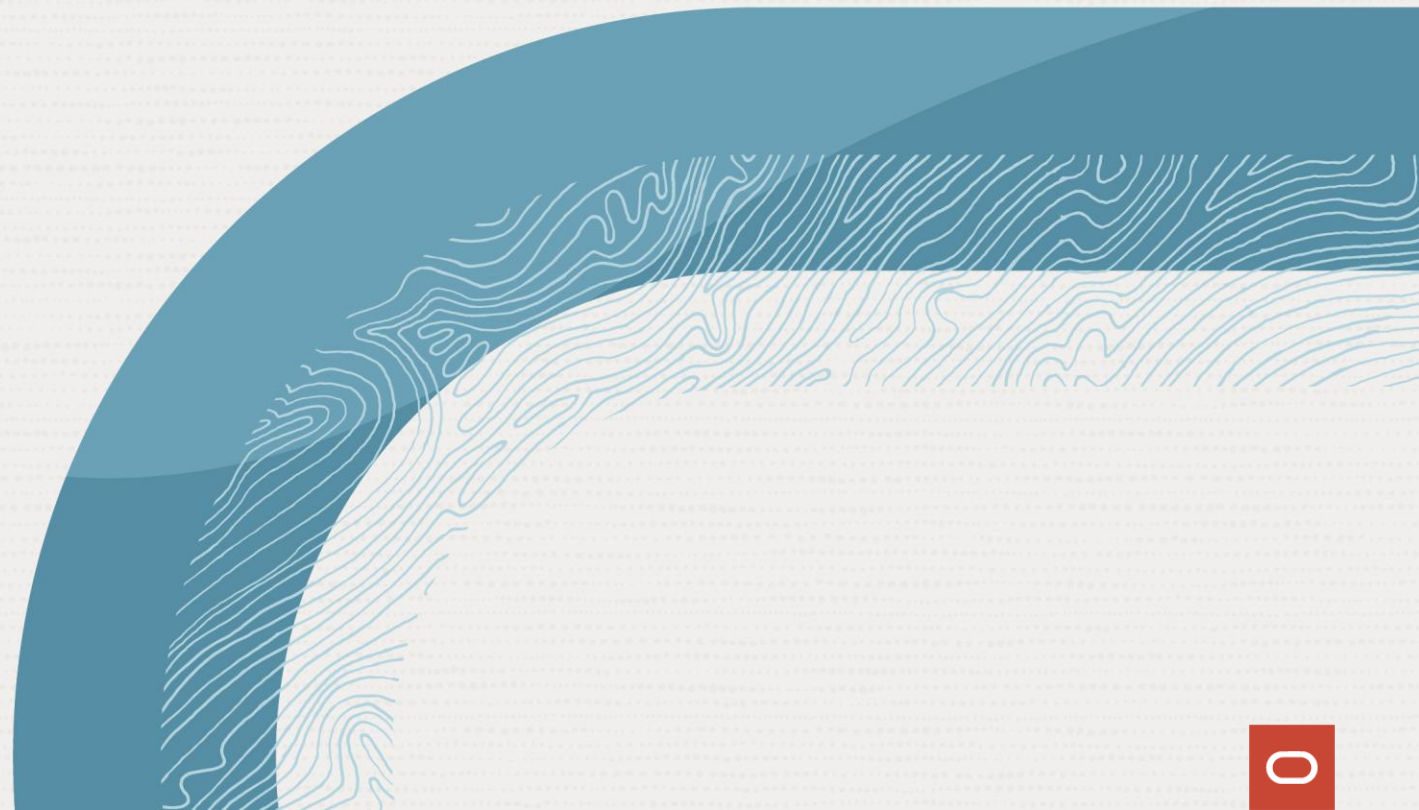


# Cloud Database Migrations the Easy Way

Introduction to OCI Database Migration for Oracle Databases

for Oracle Databases



# Safe harbor statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing, and pricing of any features or functionality described for Oracle's products may change and remains at the sole discretion of Oracle Corporation.



# Resources to learn more

Oracle migration documentation

[Click here](#)

MySQL migration documentation

[Click here](#)

More information on Oracle.com

[Click here](#)



# OCI Database Migration migrates to the following OCI targets:

An easy to use fully managed service



# OCI Database Migration

Fully managed, easy-to-use homogeneous Oracle and MySQL database migrations

## Database migrations

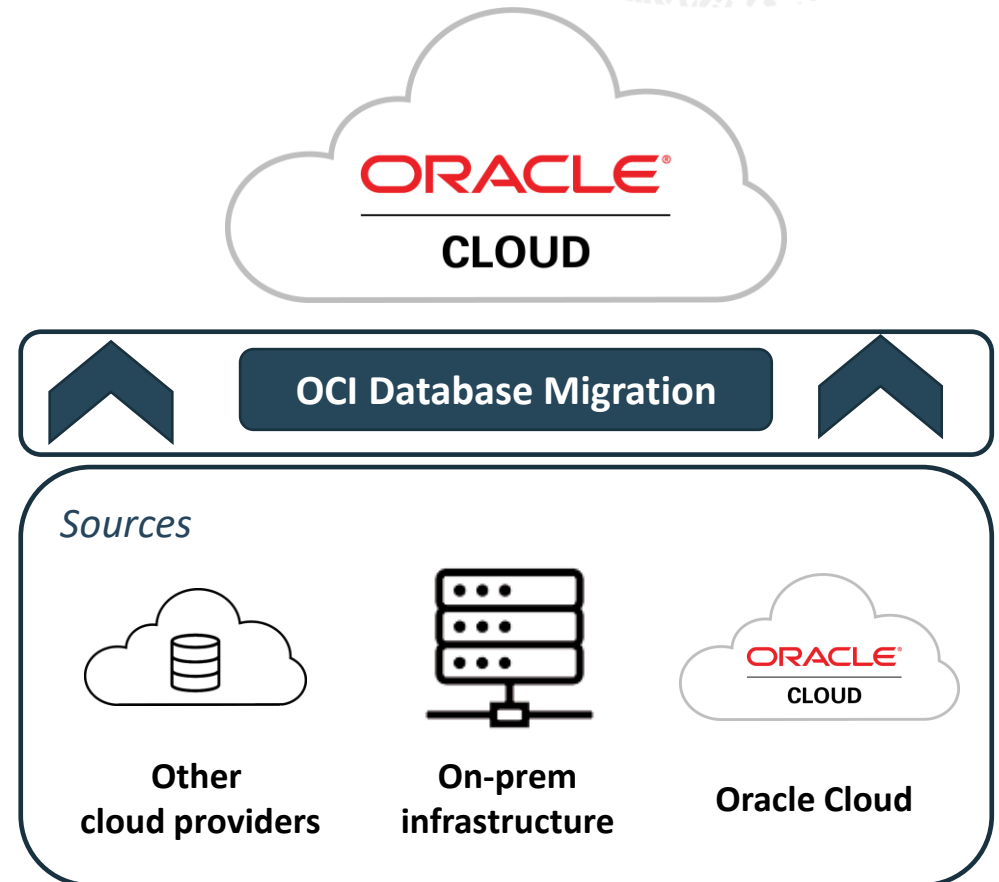
- Reduce cost and improve performance in Oracle Cloud
- Migrate databases, free for 6 months per migration

## Core use cases

- Machine-assisted migrations for Oracle and MySQL Databases, Data Marts and Data Warehouses into Oracle Cloud Infrastructure

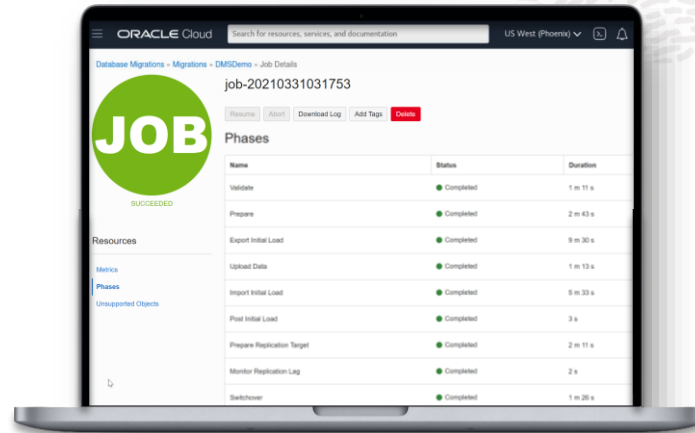
## Differentiated use cases

- Simplifies underlying technologies and resources
- Logical *offline* and *online* migrations
- Schema/metadata migration



# OCI Database Migration based on enterprise-strength tools

Single  
Workflow



Simple Online  
Experience

## Oracle Databases

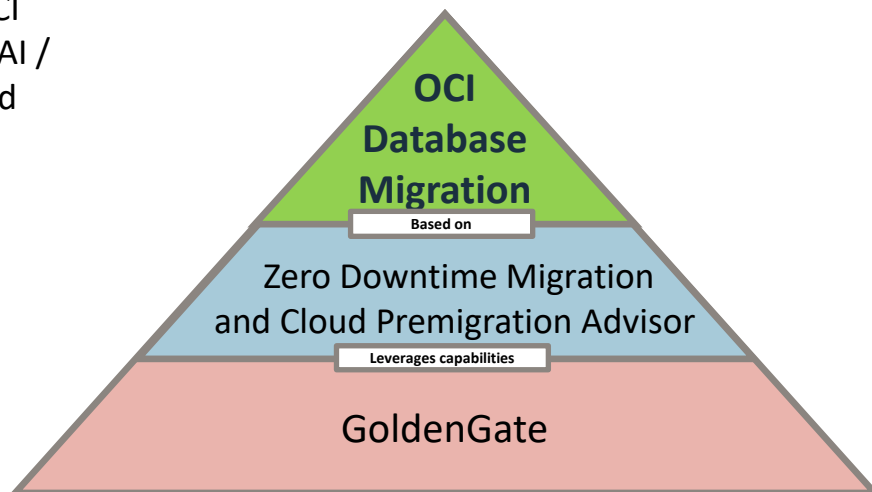
## MySQL Databases

Move to OCI  
Autonomous AI /  
Co-managed

Move to  
MySQL HeatWave



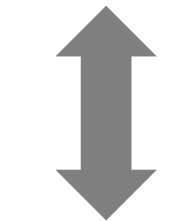
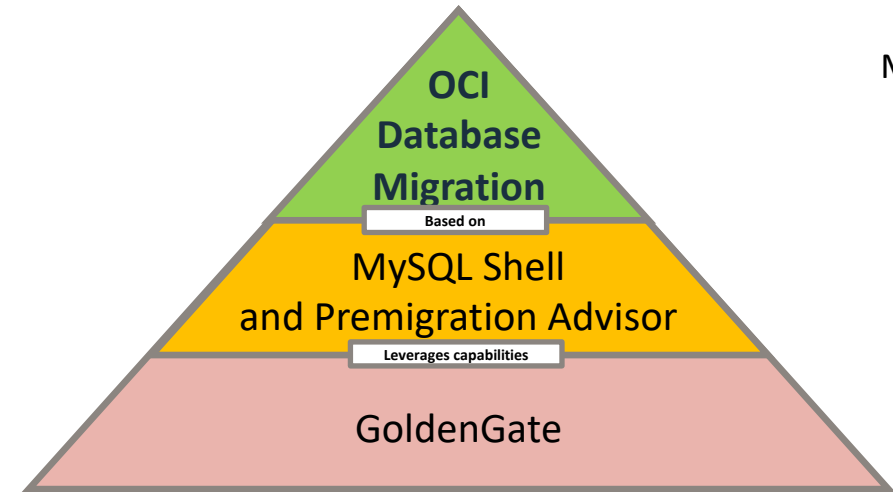
Flexible  
Fleet-level



UI-led  
experience



Expert  
use



Flexible  
Fleet-level



# Different migration types



## **Offline Migration**

- One-time copy of the database
- Requires applications to be offline during migration

## **Physical Migration (Not available in OCI DM)**

- Block wise copy of database files
- Requires database vendors and versions to be same on source and target
- No filtering or transformation
- Oracle DB Tools: RMAN, Data Guard, ZDM

## **Online Migration**

- Initial copy of database followed by change data capture during migration
- Applications can stay online during migration

## **Logical Migration**

- Logically interpret database contents and copy to database in target format
- Source and target can be different
- Oracle DB Tools: Datapump, GoldenGate, ZDM
- MySQL Tools: MySQL Shell, GoldenGate



# Oracle Database migration process and tools

## OCI Database Migration



### Profile Estate

Review and prioritize by least effort and ongoing TCO

- [Oracle Estate Explorer\\*](#)
- [Cloud Services Advisor](#)



### Methods

Select the simplest migration method

- [Migration Method Advisor](#)
- [Cloud Migration Advisor\\*](#)



### Preparation

Review object compatibility from source to target and database readiness

- Assessment



### Execution

Choose minimum downtime or offline migrations

- Migration



### Validation

Ensure synchronization for ongoing online migrations

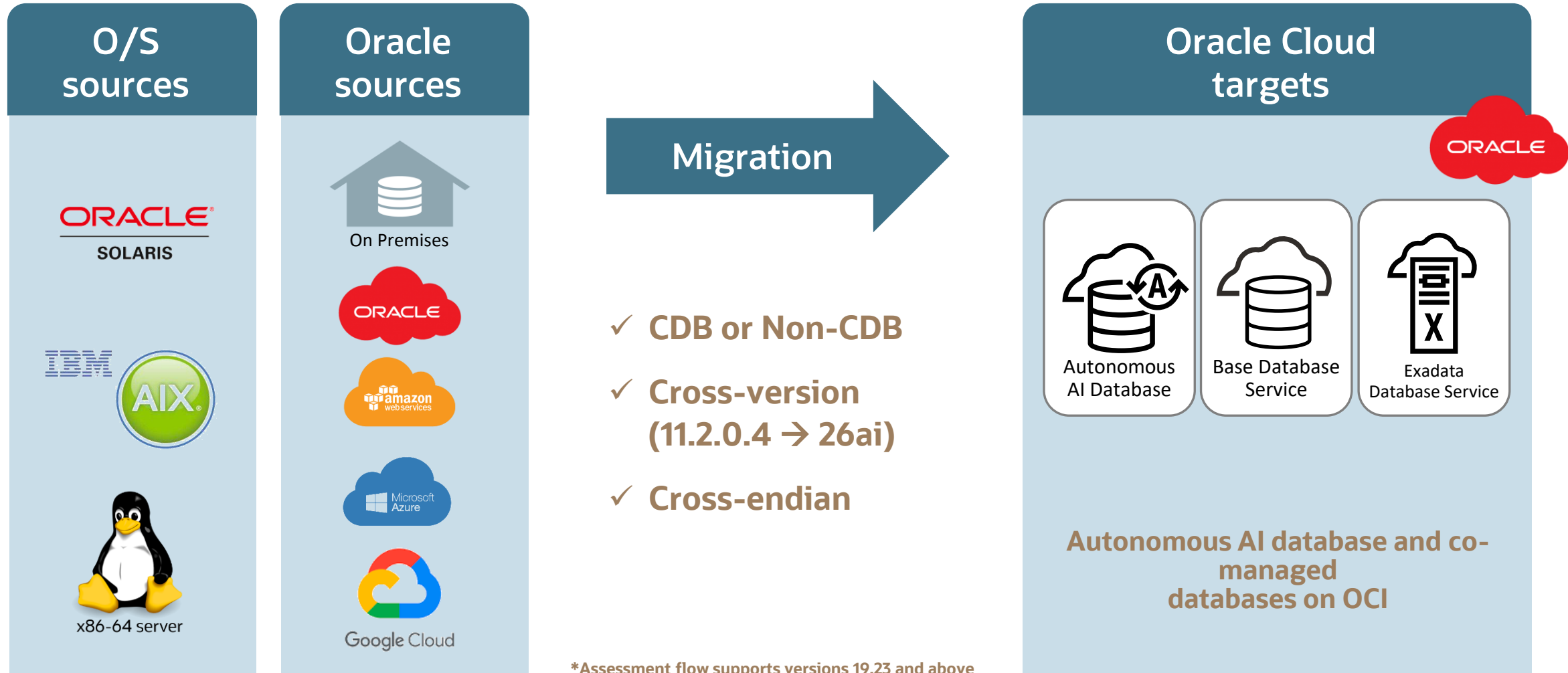
- GoldenGate Veridata

\*Requires Oracle for access



# OCI Database Migration – Native OCI Cloud Service

## Supported sources, database versions, and targets



# Migration steps



# 1

## Prerequisites:

- Setup VPN or FastConnect
- Provision Target DB, Object Store, and Vault

## Optional for online:

- OGG Marketplace

# 2

## Setup

- Database connection creation for source and target.

# 3

## Validate and prepare

- Assessment to identify incompatible objects between source and target
- Database readiness for migration

# 4

## Start

- Fully automated

## Optional controls

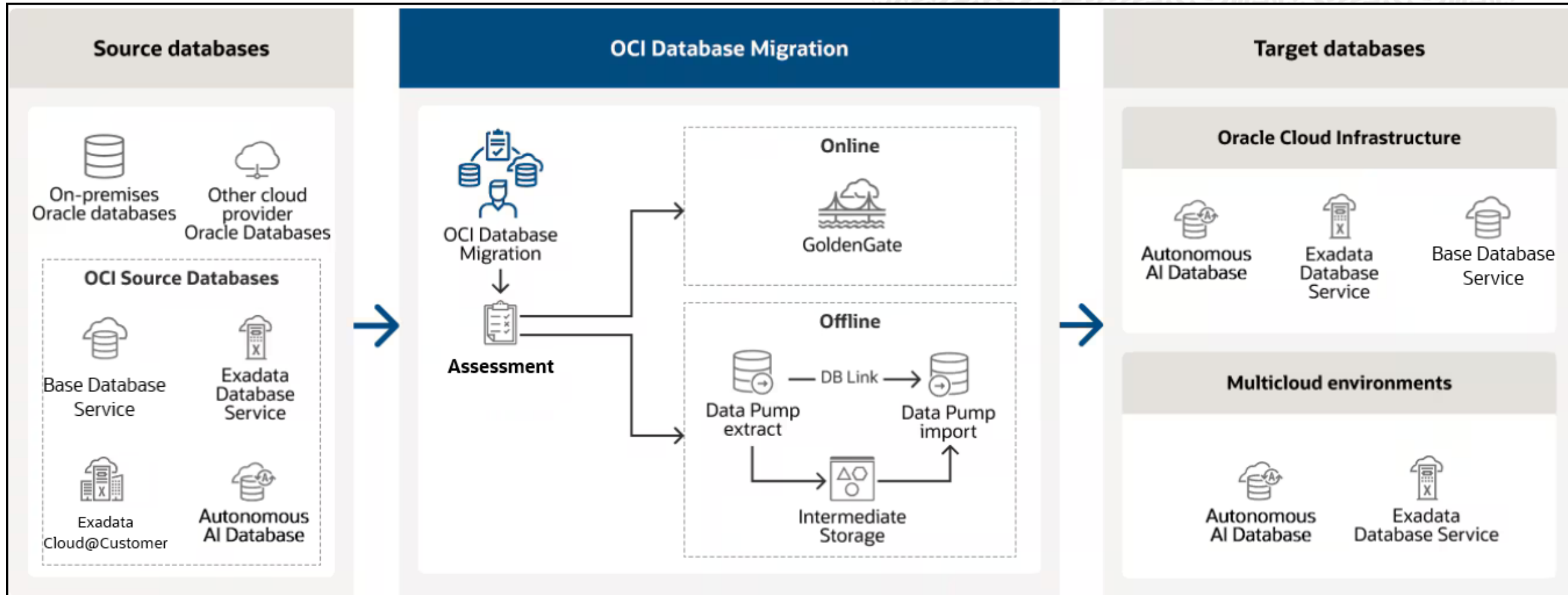
- Initial load
- Online replication
- Restarts

# 5

## Complete

- Switch operations to new database

# How it works for Oracle Cloud migrations



\*Autonomous sources can only migrate to Autonomous targets.



# Pricing: **FREE** for all common Oracle use cases

## Included:

- OCI Database Migration service operations and supporting infrastructure
- OCI GoldenGate usage for online migrations
- *Oracle GoldenGate Marketplace for Database Migrations* license

## Not included:

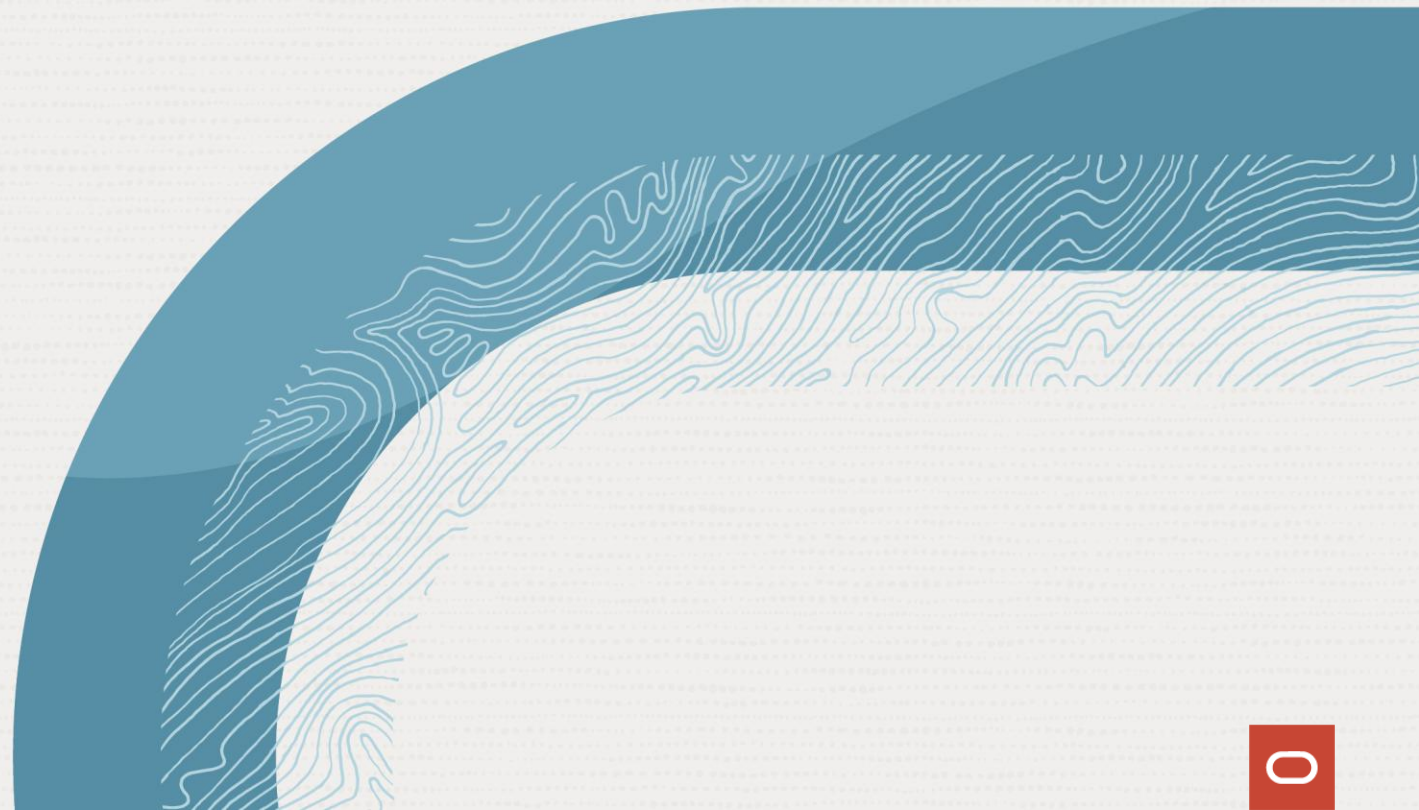
- Customer managed OCI resources used for database migration operations
  - Compute used for OCI GoldenGate, OCI Object Storage, File Storage Service, etc.
- FastConnect or other on-premise-to-cloud network connectivity
- Source or target database service costs

## Exceptions:

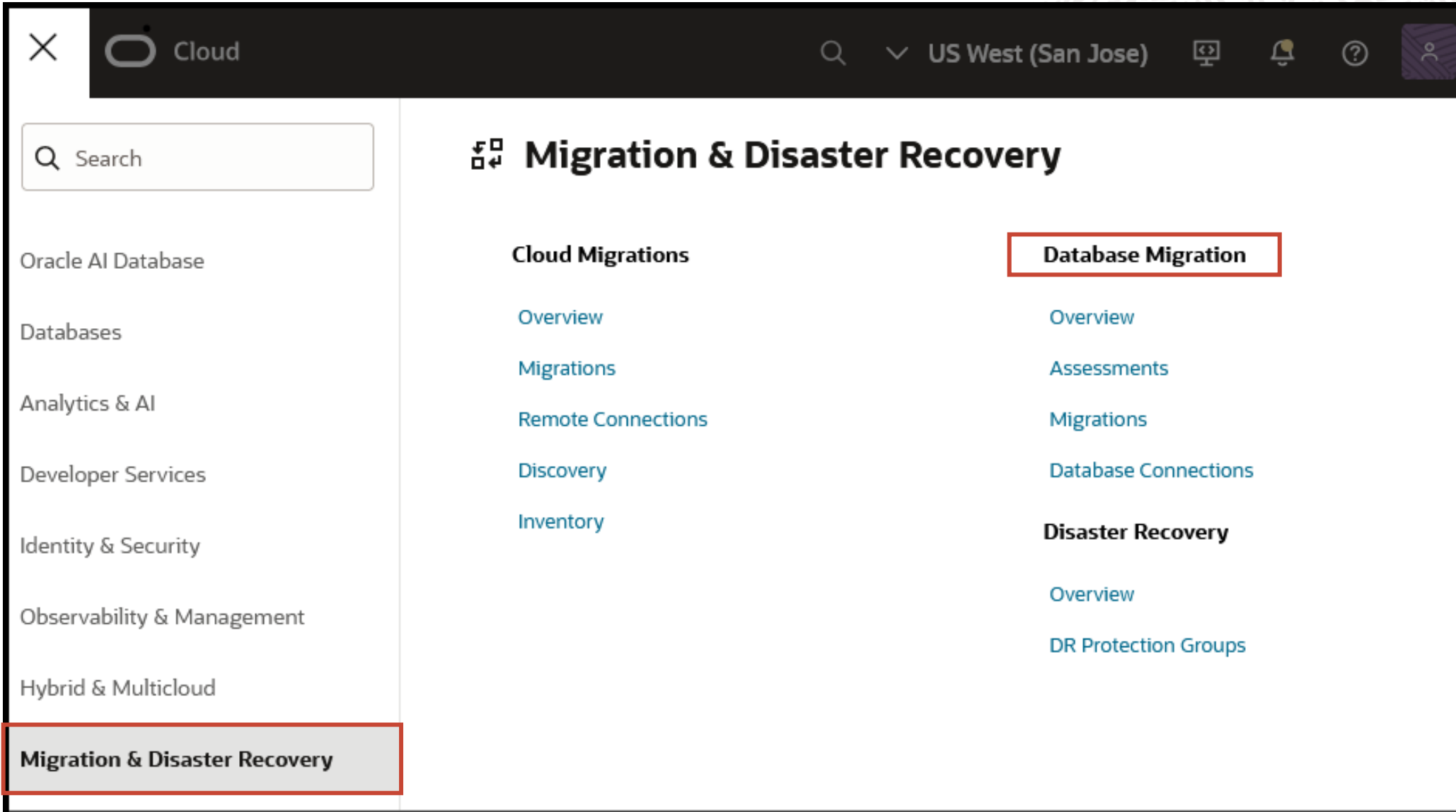
- Migrations that run more than 183 days (6 months) after they have been created
- Migrations running for more than 60 days idle (no data transferred)
- Billing starts after time limits have been exceeded with \$0.20 / hour per migration



# A walkthrough



# Step 1: *Select* Database Migration menu on the OCI Console



The screenshot shows the OCI Console interface. At the top, there is a navigation bar with a search icon, a dropdown menu set to 'US West (San Jose)', and several utility icons. On the left side, there is a sidebar menu with a search box and several categories: Oracle AI Database, Databases, Analytics & AI, Developer Services, Identity & Security, Observability & Management, and Hybrid & Multicloud. The 'Migration & Disaster Recovery' category is highlighted with a red border. The main content area is titled 'Migration & Disaster Recovery' and is divided into two columns. The left column is titled 'Cloud Migrations' and contains links for Overview, Migrations, Remote Connections, Discovery, and Inventory. The right column is titled 'Database Migration' (highlighted with a red border) and contains links for Overview, Assessments, Migrations, and Database Connections. Below these is a section titled 'Disaster Recovery' with links for Overview and DR Protection Groups.

# Step 2: Create Connections for source and target

## Provide reusable connection information and credentials for databases

### Create connection

**Warning**  
Before creating a database connection, ensure that your databases are [prepared for migration](#).

[Download preparation script](#)

Name Required

Description

Compartment  
Demo

Type  
Oracle Autonomous AI Database

#### Vault details

Vault in compartment  
Demo

Vault Required

Encryption key in compartment  
Demo

Encryption key Required

### Connection details

Enter connection details for Oracle Autonomous AI Database.

Autonomous AI Database in compartment  
Demo

Autonomous AI Database Required

Initial load database username Required

Initial load database password Required

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  
Demo

Subnet Required

> **Advanced options**

[Cancel](#) [Create](#)



# Step 3: Assessment creation

Select source and target connection details, provide migration parameters.

### Create assessment

Name

Required

Description

Compartment

Database type

#### Source database

Compartment  Database connection

Required

Database objects

#### Target database

Target type

**Connect to the database**  
Select this option if you have already created a connection.

**Select the target database type**  
Select this option if you do not have a target database or if Oracle Cloud Infrastructure (OCI) Console cannot connect to the database.

Compartment  Database connection

### Migration options

Network speed

Acceptable downtime

Data size for migration

Required

DDL changes expected

Required

Create and run assessment

Turning this off will only create the assessment and you will need to manually run the first assessment step.

> **Advanced options**



## Step 4: Migration method selection

Based on the provided inputs, a migration method is recommended, confirm your selection.

### Review recommended migration method

The recommended migration method is Online migration, (recommended based on settings selected)  
Would you like to proceed with this recommendation, or choose a different migration method? [Learn more.](#)

**Migration method**

- Select offline migration ⓘ
- Proceed with online migration (recommended) ⓘ
- Select online migration with Snapshot Standby database ⓘ

Cancel **Confirm**

# Step 5: Analyze compatibility

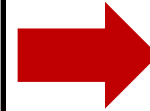
Incompatibilities between source and target are identified as well as validation of database configuration readiness.

## 2. Analyze compatibility

Service will evaluate that source and target databases are suitable for the OCI Database Migration Service.

- Manual action required (1)
  - Multimedia Type Columns for ADB Pending resolution ⋮
- Review required (1)
  - Non-Exported Object Grants Not acknowledged ⋮
- Review is suggested (2)
  - Modified Database Parameters for Serverless Not acknowledged ⋮
  - Standard Traditional Audit for ADB Not acknowledged ⋮
- Passed checks (36)
  - Validate Selected Objects Passed ⋮
  - Streams Pool Size for Data Pump Passed ⋮

Close



## Review issues

Name	Multimedia Type Columns for ADB
Status	<span>Pending resolution</span>
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 Oracle Support Document ID 2555923.1 ( <a href="https://support.oracle.com/epmos/faces/DocumentDisplay?id=2555923.1">https://support.oracle.com/epmos/faces/DocumentDisplay?id=2555923.1</a> ) 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 ( <a href="https://support.oracle.com/epmos/faces/DocumentDisplay?id=2347372.1">https://support.oracle.com/epmos/faces/DocumentDisplay?id=2347372.1</a> ) for suggestions on replacing Oracle Multimedia. Refer to Oracle Support Document ID 2375644.1 ( <a href="https://support.oracle.com/epmos/faces/DocumentDisplay?id=2375644.1">https://support.oracle.com/epmos/faces/DocumentDisplay?id=2375644.1</a> ) "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. If you determine that the identified files are not required to be migrated, you can also exclude them from the migration. You can also consider excluding these objects from the migration. <a href="#">Learn more</a>
Objects	1

### Objects to review

Exclude all Actions ▾

<input type="checkbox"/>	OWNER	TABLE_NAME	COLUMN_NAME	DATA_TYPE	Is excluded
<input type="checkbox"/>	H_C_W_M_D_T_12	IMAGE_TABLE	IMAGE	ORDIMAGE	No

Cancel Previous issue Next issue

You can review each check and take appropriate actions since a clear issue, impact and action is displayed. Once blockers are resolved the step will complete.



# Step 6: Complete migration configuration

Provide additional details to complete your migration configuration

Database connections details and online replication options will be displayed; they are not updatable in this screen as they come from the provided inputs. You can select a transfer medium for your initial load, and you can access the advanced options for initial load and replication.

### 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.](#)

#### Connection details

Source database connection

Target database connection

Transfer medium for initial load

**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 Required

Export directory object path Required

#### Storage settings

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

Object Storage bucket in compartment Required

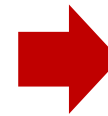
Object Storage bucket Required

#### Online replication

Use online replication

**> Advanced options**

Cancel **Configure**



#### Advanced options

- > Initial load
- > Replication
- > Tags

Cancel **Configure**



# Step 7: Prepare source and target steps

Approved checks during Analyze compatibility will be executed in these steps

SQL script can be reviewed, when ready the service can run it or the user can select to download it and run it locally. Any pending database configuration will be displayed with clear user actions.

### 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



# Step 8: Advanced assessment steps (optional)

Currently a table migration can be completed to validate the migration configuration

### 6. Advanced assessment steps (optional)

Select and run any of the following optional steps as needed. Each step operates independently and enables a specific feature. Refer to the description of each step to learn more about its functionality.

<b>Migrate table</b>	Not started	Run
This step will test the assessment, it will create a table named DMS_MIGRATION_TEST_2XINCQ in the GGADMIN schema and transfer it to the target database.		

Close

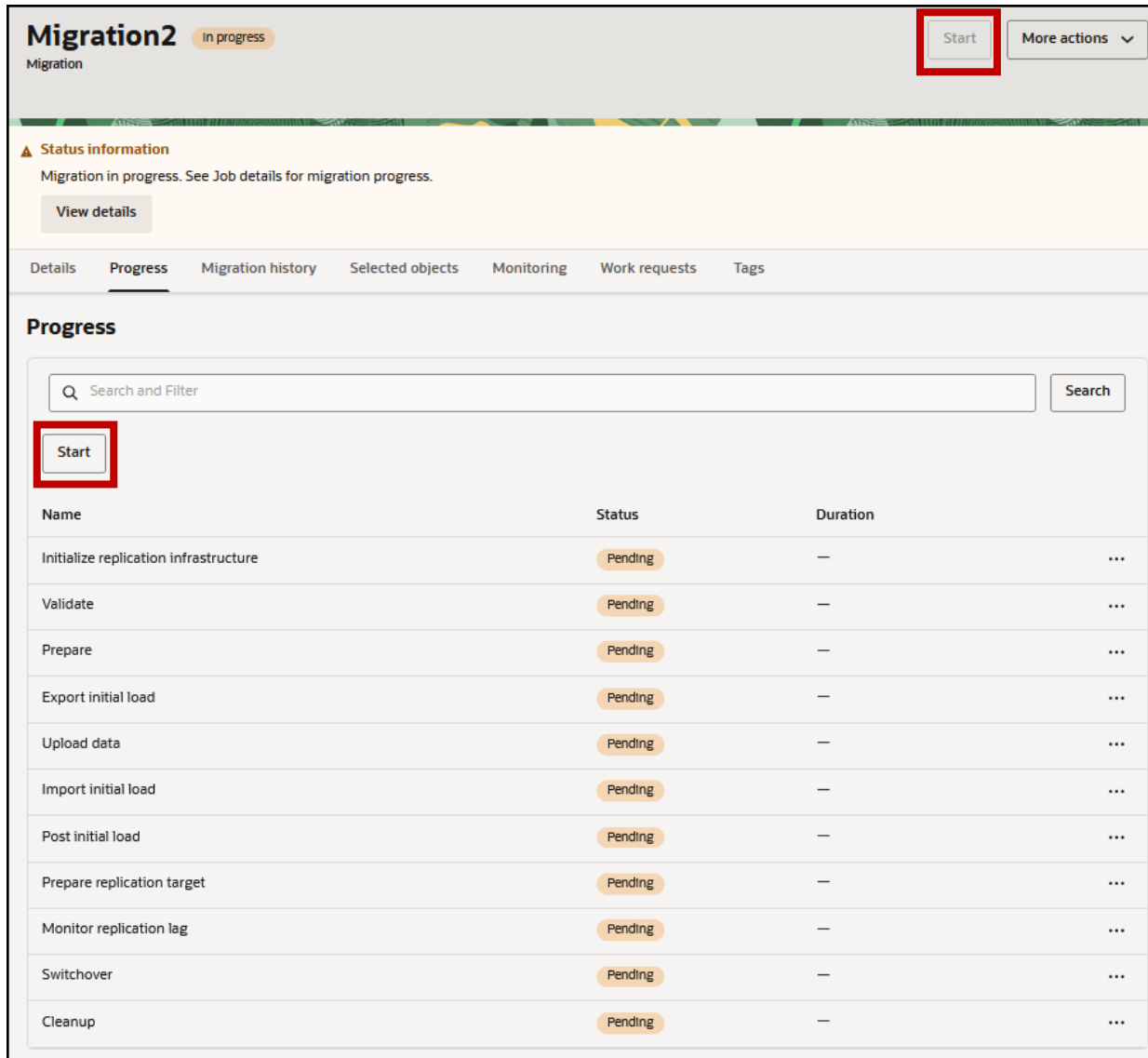
This step will create a table in the GGADMIN schema and transfer it to the target database.

In case failures, a clear description of the issue, impact and resolution is provided, the log file can be downloaded.



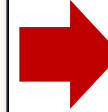
# Step 9: Start Migration

Initiate the migration job to migrate the database to the cloud



The screenshot shows the 'Migration2' interface. At the top right, there is a 'Start' button highlighted with a red box. Below this, there is a 'Status information' section with a 'View details' button. A navigation bar includes 'Details', 'Progress', 'Migration history', 'Selected objects', 'Monitoring', 'Work requests', and 'Tags'. The 'Progress' section is active, showing a search bar and a 'Start' button highlighted with a red box. Below the search bar is a table with columns for Name, Status, and Duration.

Name	Status	Duration
Initialize replication infrastructure	Pending	—
Validate	Pending	—
Prepare	Pending	—
Export initial load	Pending	—
Upload data	Pending	—
Import initial load	Pending	—
Post initial load	Pending	—
Prepare replication target	Pending	—
Monitor replication lag	Pending	—
Switchover	Pending	—
Cleanup	Pending	—



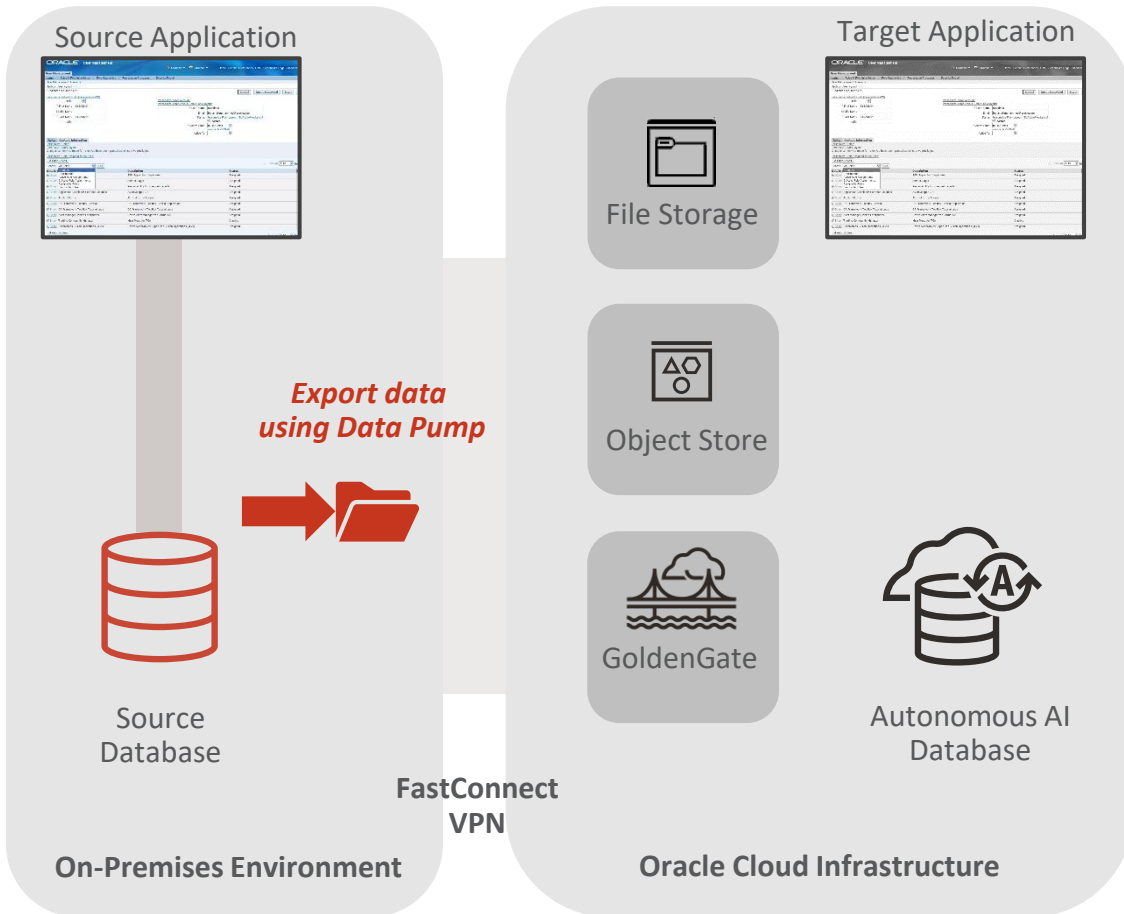
The 'Start migration' dialog box asks 'Are you sure you want to start migration Migration?'. It includes a toggle for 'Require user input after a phase before proceeding' which is currently turned on. Below this is a dropdown menu for 'Phase to pause after' with 'Monitor replication lag' selected. At the bottom right are 'Cancel' and 'Start' buttons.

User can select a phase to pause after.



# Start Migration – Export Initial Load

Current DB state is exported to files using Oracle Data Pump



## Phases

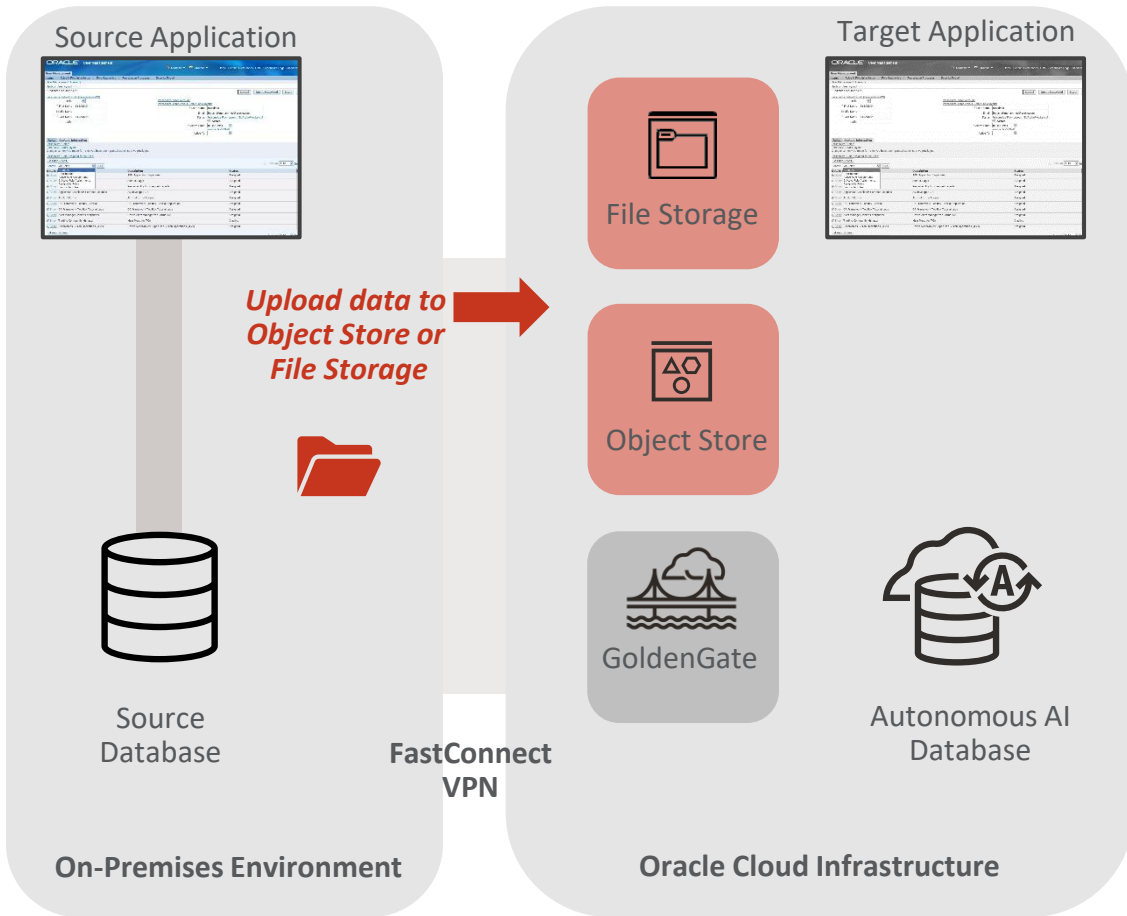
Name	Status	Duration
Validate	● Completed	1 m 11 s
Prepare	● Completed	2 m 43 s
Export Initial Load	● Started <input type="range" value="66%"/>	3 m 38 s
Upload Data	● Pending	—
Import Initial Load	● Pending	—
Post Initial Load	● Pending	—
Prepare Replication Target	● Pending	—
Monitor Replication Lag	● Pending	—
Switchover	● Pending	—
Cleanup	● Pending	—

Showing 10 Items < 1 of 1 >



# Start Migration – Upload Data

Data Pump export is uploaded to the intermediate storage



## Phases

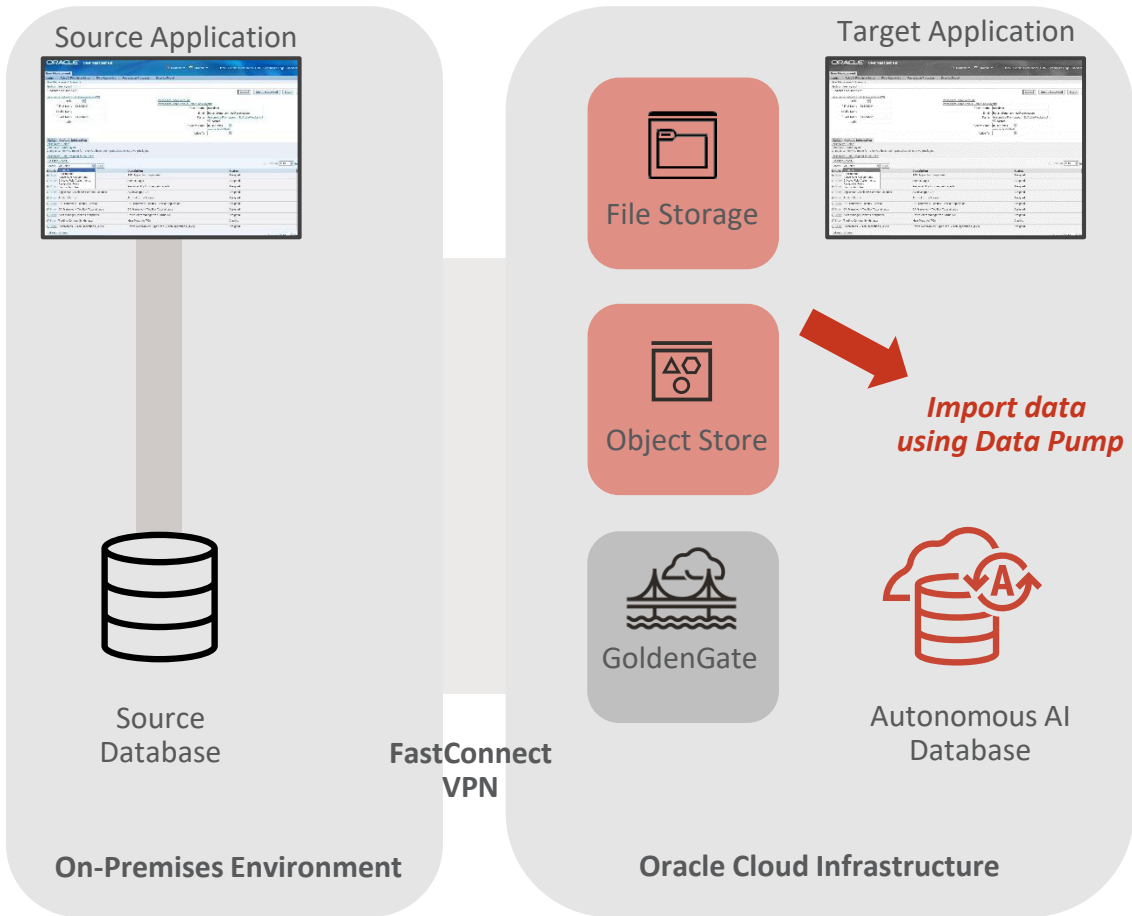
Name	Status	Duration
Validate	● Completed	1 m 11 s
Prepare	● Completed	2 m 43 s
Export Initial Load	● Completed	9 m 30 s
Upload Data	● Started	26 s
Import Initial Load	● Pending	—
Post Initial Load	● Pending	—
Prepare Replication Target	● Pending	—
Monitor Replication Lag	● Pending	—
Switchover	● Pending	—
Cleanup	● Pending	—

Showing 10 Items < 1 of 1 >



# Start Migration – Import Initial Load

Exported dump files are imported to ADB



## Phases

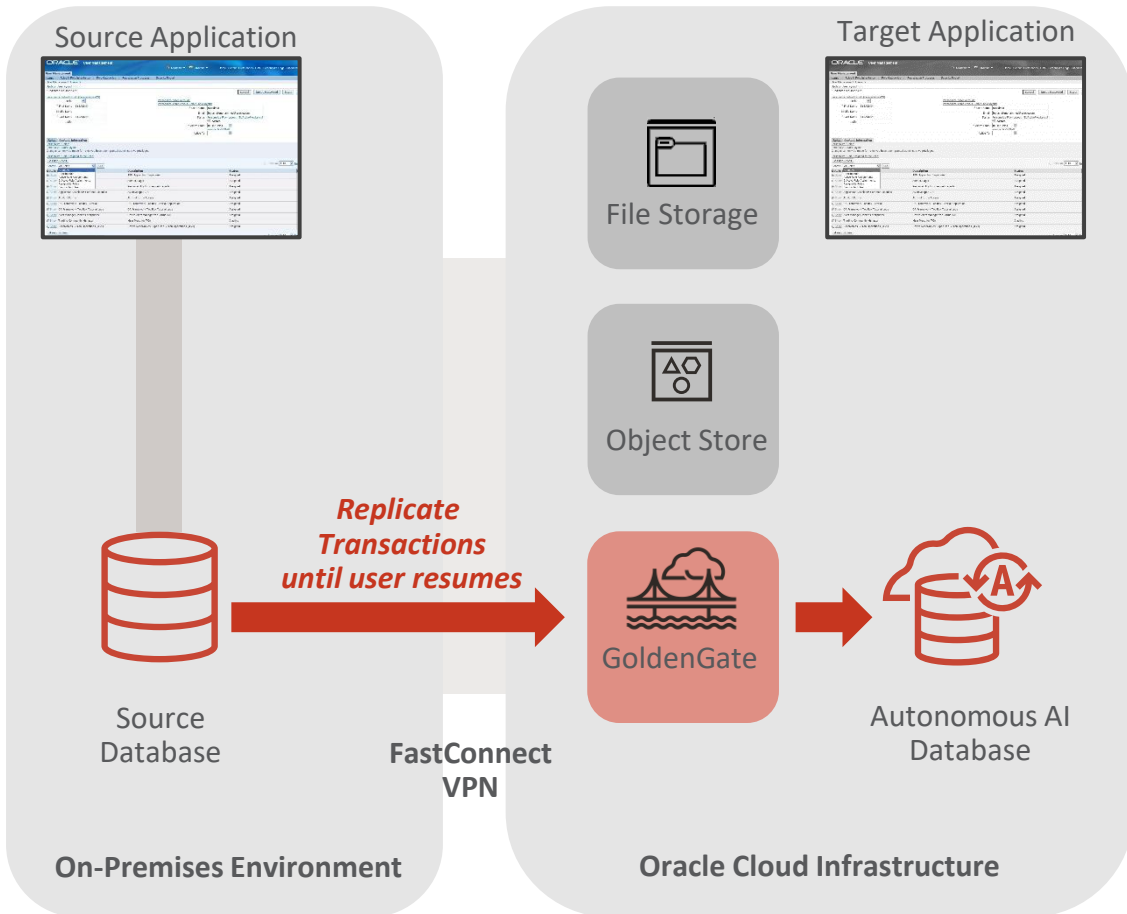
Name	Status	Duration
Validate	● Completed	1 m 11 s
Prepare	● Completed	2 m 43 s
Export Initial Load	● Completed	9 m 30 s
Upload Data	● Completed	1 m 13 s
Import Initial Load	● Started <input checked="" type="checkbox"/> 50%	3 m 30 s
Post Initial Load	● Pending	—
Prepare Replication Target	● Pending	—
Monitor Replication Lag	● Pending	—
Switchover	● Pending	—
Cleanup	● Pending	—

Showing 10 Items < 1 of 1 >



# Start Migration – Replication

DB transactions are replicated using GoldenGate until user resumes the next phase



## Phases

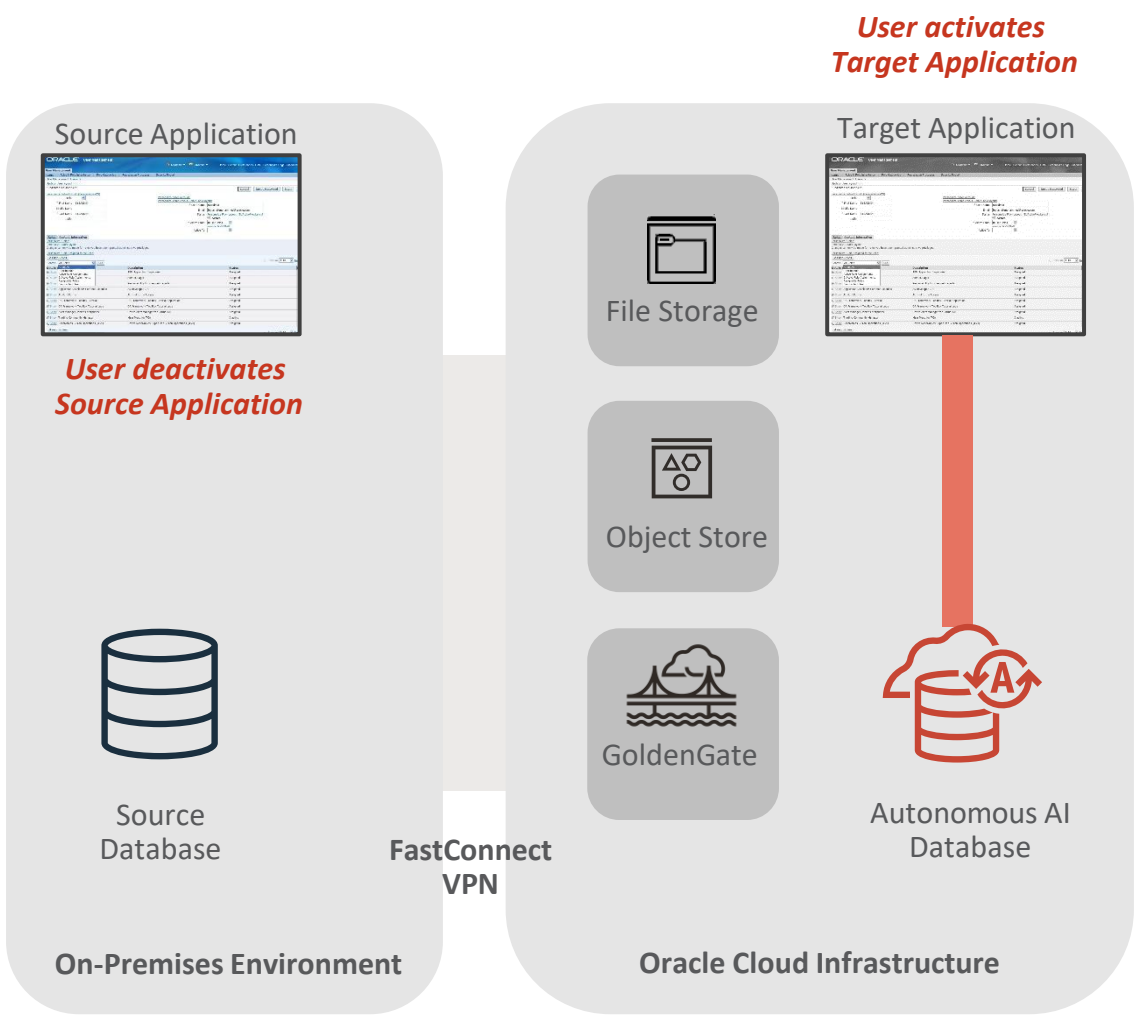
Name	Status	Duration
Validate	● Completed	1 m 11 s
Prepare	● Completed	2 m 43 s
Export Initial Load	● Completed	9 m 30 s
Upload Data	● Completed	1 m 13 s
Import Initial Load	● Completed	5 m 33 s
Post Initial Load	● Completed	3 s
Prepare Replication Target	● Completed	2 m 11 s
Monitor Replication Lag	● Completed	2 s
Switchover	● Pending	—
Cleanup	● Pending	—

Showing 10 Items < 1 of 1 >



# Start Migration – Switchover

Wait until last transaction is replicated to switch over applications



### Phases

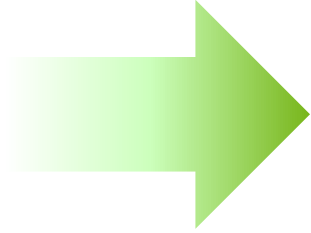
Name	Status	Duration
Validate	● Completed	1 m 11 s
Prepare	● Completed	2 m 43 s
Export Initial Load	● Completed	9 m 30 s
Upload Data	● Completed	1 m 13 s
Import Initial Load	● Completed	5 m 33 s
Post Initial Load	● Completed	3 s
Prepare Replication Target	● Completed	2 m 11 s
Monitor Replication Lag	● Completed	2 s
Switchover	● Completed	1 m 26 s
Cleanup	● Pending	—

Showing 10 Items < 1 of 1 >



# Migration Succeeded!

Once all phases including switchover, and cleanup, the migration is marked as succeed.



## Migration2 Succeeded

Migration

Start More actions

### Progress

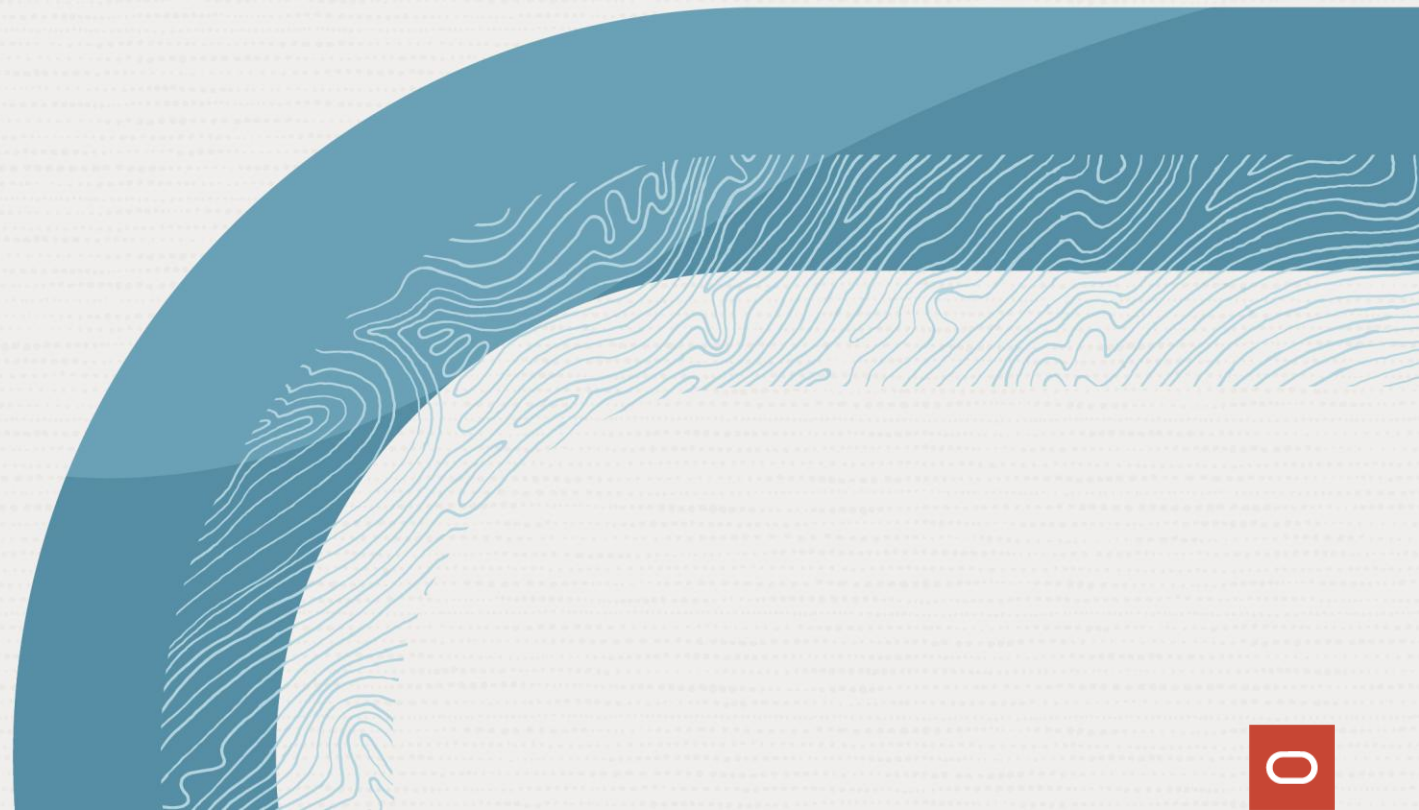
Search and Filter Search

Resume

Name	Status	Duration	
Initialize replication infrastructure	Completed	27 m 41 s	...
Validate	Completed	38 s	...
Prepare	Completed	2 m 11 s	...
Export initial load	Completed	1 m	...
Upload data	Completed	1 s	...
Import initial load	Completed	1 m 26 s	...
Post initial load	Completed	2 s	...
Prepare replication target	Completed	2 m 6 s	...
Monitor replication lag	Completed	1 s	...
Switchover	Completed	2 m 53 s	...
Cleanup	Completed	12 s	...



Thank You!



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