Table of Contents

1. Introduction

1.1. What is CMA?

Cloud Migration Advisor (CMA) is an Oracle-developed tool that helps organizations plan and optimize their database migration journey to Oracle Cloud Infrastructure (OCI). CMA consolidates metadata from various sources, evaluates migration scenarios, and provides actionable recommendations for selecting the most suitable target environment and migration method.

1.2. Key Features and Use Cases

- Automates the analysis of source database metadata
- Supports data collection via CPAT, CSV Exporter, OEM, and manual spreadsheet
- Provides guided recommendations for Autonomous Database (ADB) targets
- Offers visual and textual migration reports
- Enables scenario modeling with method prioritization and downtime scoring
- Assists in preparing technical reports for internal planning or customer presentation

1.3. Guided Mode vs. Standard Mode

Guided Mode is intended for quick, high-level analysis where either the target is not known, or the user seeks fast migration recommendations:

- *Best Candidate Mode*: Identify which databases are best suited for migration to any type of ADB.
- *Best Method Mode*: Recommend optimal migration methods when the target database type is known.

Standard Mode is a comprehensive planning process involving project setup, database metadata upload, scenario modeling, method scoring, and solution reporting. It allows detailed customization and scenario comparison for complex migrations.

2. CMA Guided Mode HowTo

2.1. Overview of Guided Mode

Cloud Migration Advisor (CMA) Guided Mode is designed for quick and automated migration planning. It supports two main flows depending on whether a target database type is already known:

- **Best Candidate Mode**: Helps identify which source databases are most compatible with migration to Oracle Autonomous Database (ADB).
- **Best Migration Method Mode**: Recommends the most effective migration methods based on a specified target database platform.

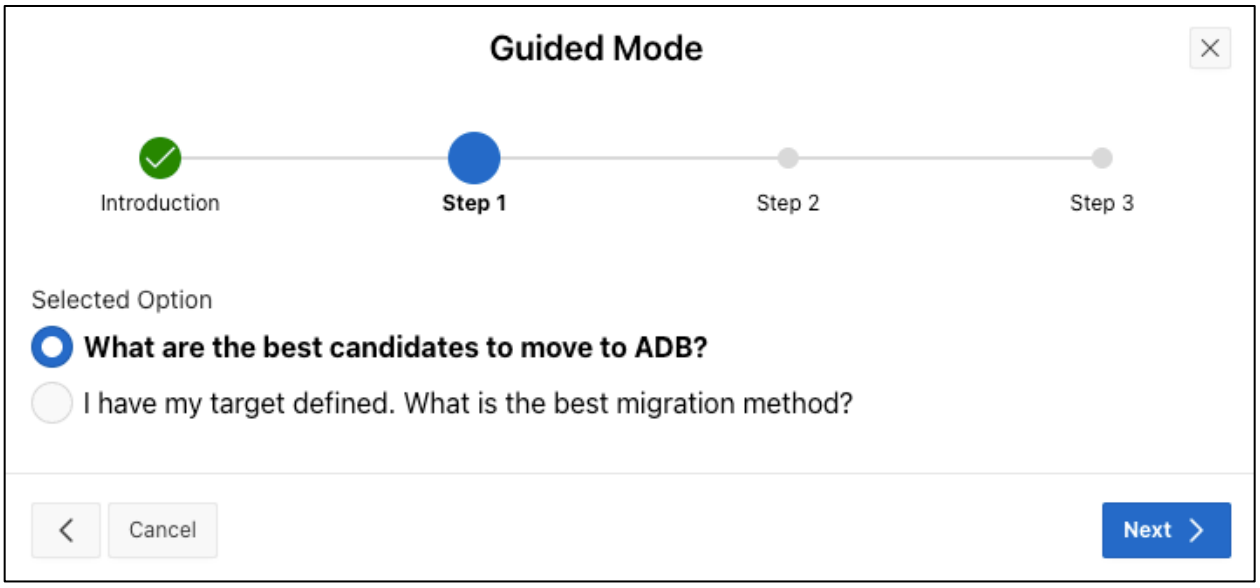
Both guided modes require source database input. You can supply this data by:

- Uploading output files from the **Cloud Premigration Advisor Tool (CPAT)** or running the **CMA Exporter** or **OEM Exporter** to generate the required metadata.

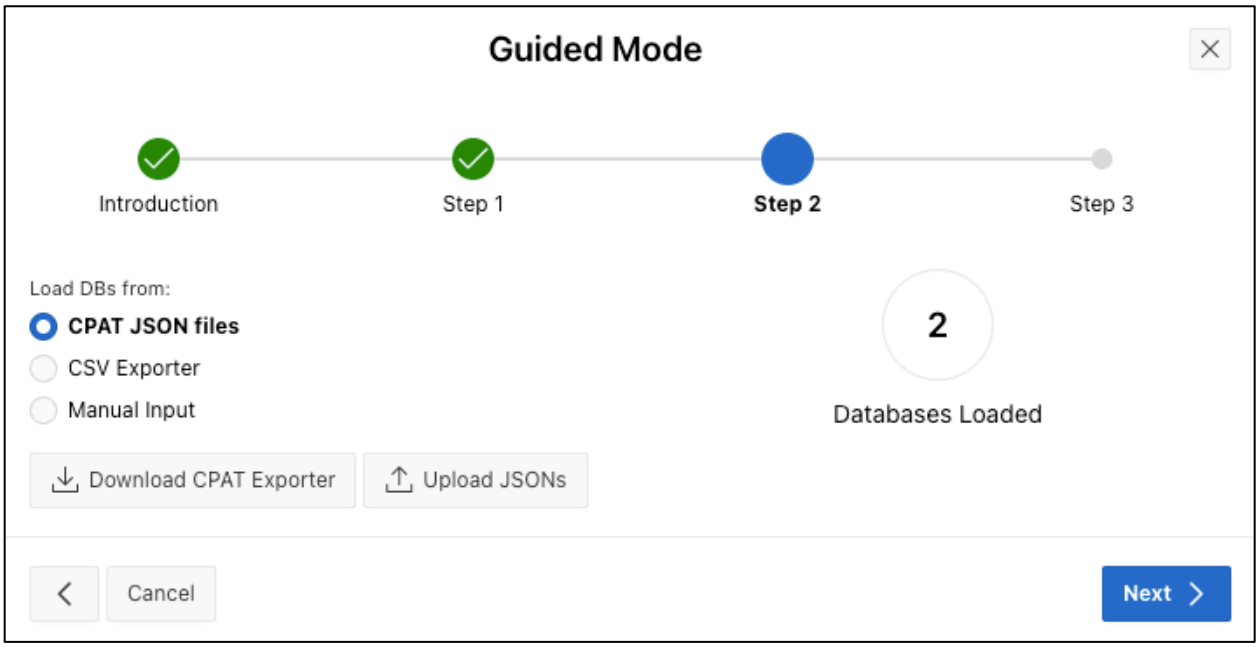
2.2. Identifying the Best Candidates for ADB

To use this mode:

1. From the CMA main screen, select **What are the best candidates to move to ADB?**



2. Upload source database metadata via:
   - CPAT JSON files
   - CSV exports
   - Manual entries (optional)

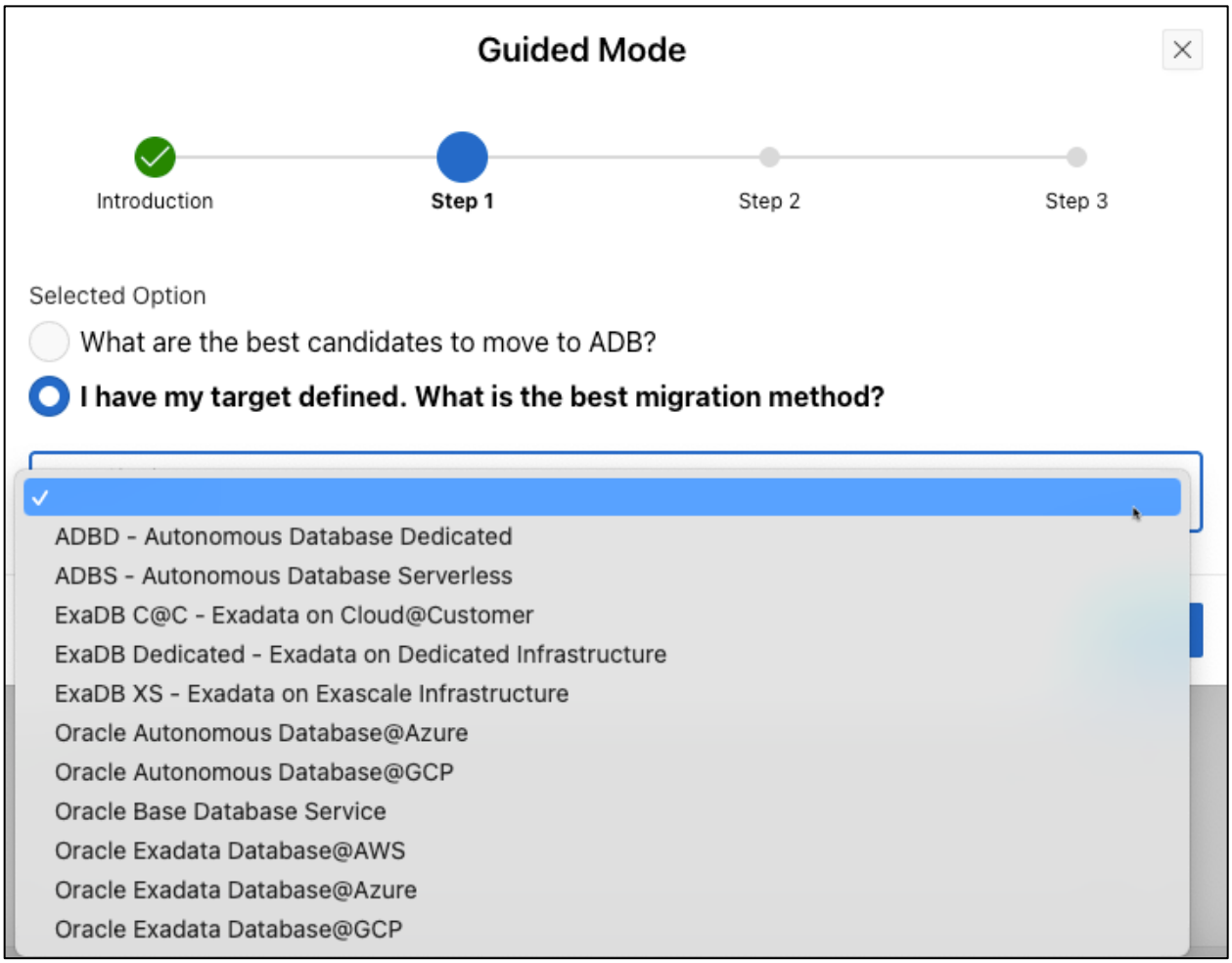


3. Click **Finish**. CMA will evaluate the uploaded databases and generate a compatibility report indicating which databases are best suited for ADB. The output includes:
   - Target fit score
   - Readiness level
   - Recommended next steps

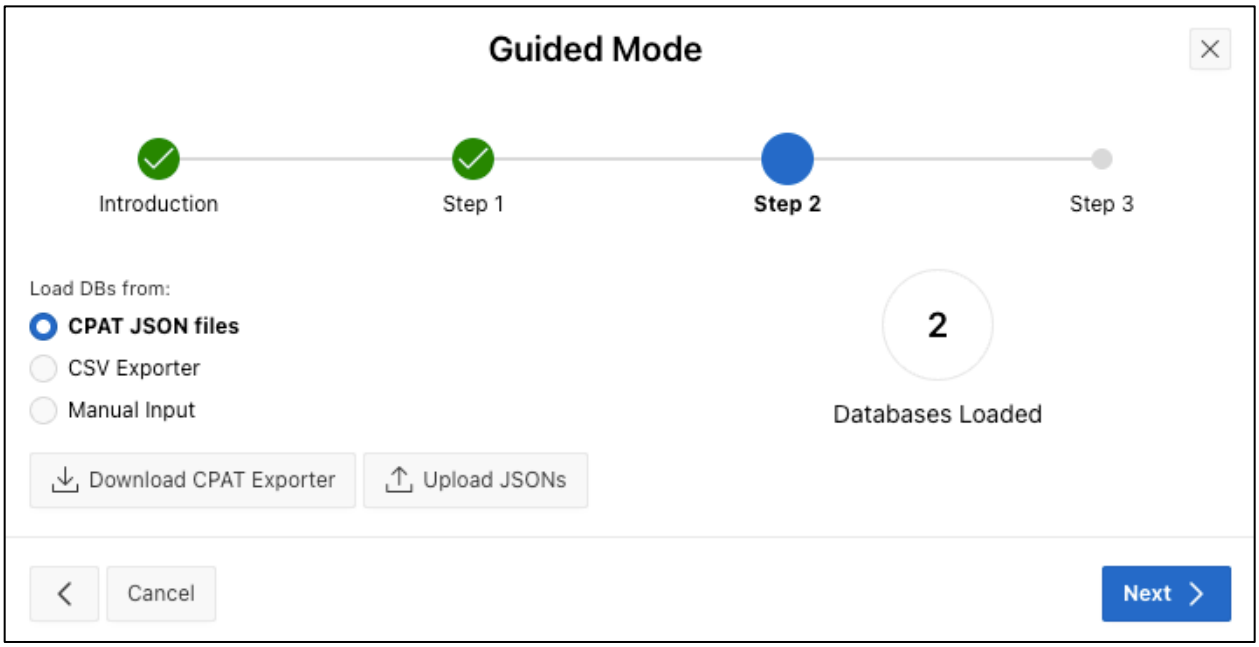
2.3. Selecting the Best Migration Method

To use this mode:

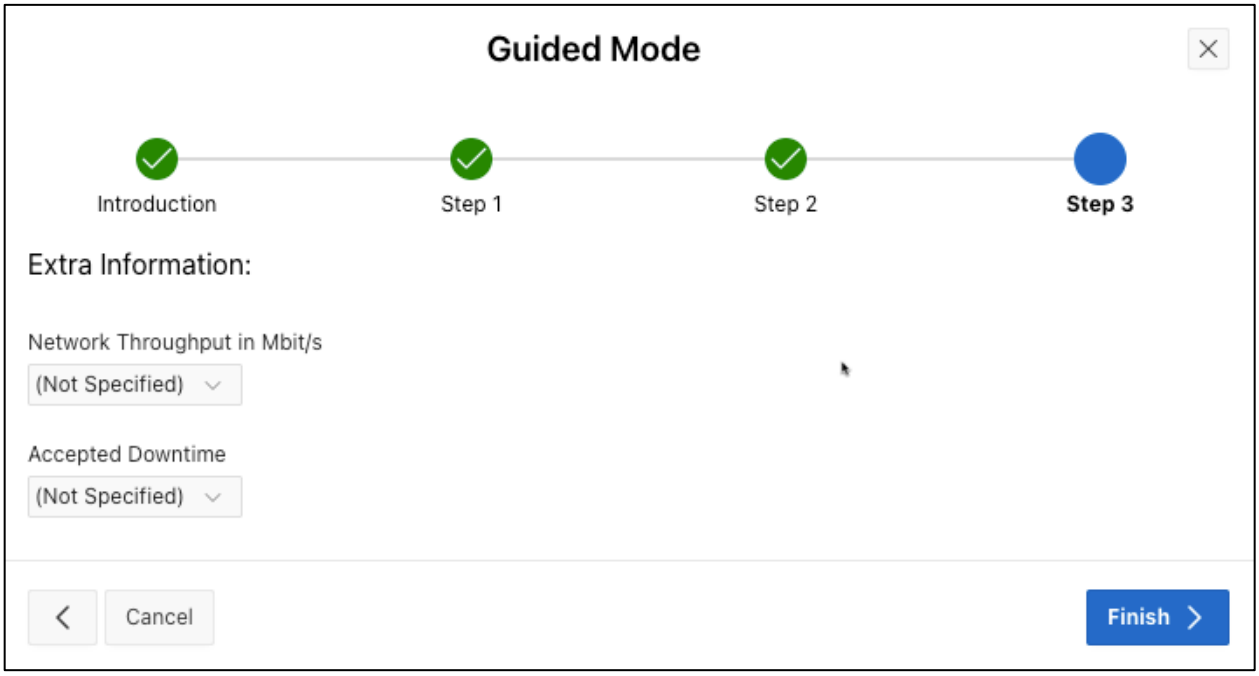
1. From the CMA main screen, select the migration target from the drop-down list:



2. Upload source database metadata via:
   - CPAT JSON files
   - CSV exports
   - Manual entries (optional)



3. (Optional) Provide network throughput and configuration details.



4. Click **Finish** to receive a tailored list of migration methods ranked by:
    - Downtime
    - Complexity
    - Data volume
    - Connectivity constraints

3. CMA Workflow HowTo

3.1. Overview of How to Use CMA

CMA enables precise and comprehensive migration planning. This step-by-step workflow outlines how to use CMA effectively:

Step 1: Collect Source Database Metadata

- Use CPAT, CMA CSV Exporter, OEM, or Spreadsheet to gather metadata from your source environments.

Step 2: Create a Project in CMA

- Start a new project and define its scope. Each project may include one or more databases.

Step 3: Upload Metadata to CMA

- Load your collected data into CMA using the appropriate method: JSON (CPAT), CSV (Exporter or OEM), or manual entry.

Step 4: Build a Scenario

- Group databases, configure migration preferences, prioritize criteria like downtime or complexity, and define solution constraints.

Step 5: Generate a Solution

- Run the scenario to evaluate migration paths. CMA calculates the best target environments and methods.

Step 6: Review Reports

- Analyze solution reports (graphical, textual, or CPAT check summaries) to validate your migration plan or share with stakeholders.

3.2. Colleting Source Database Metadata

Before you can start using CMA you need to collect metadata information about the source database(s) you want to migrate.

There are currently four ways in CMA to collect details about a source database:

- CPAT's JSON output
- CSV using a collector script
- CSV generated from OEM repository & emcli
- an Excel Spreadsheet

All files available for download and a PDF with the instructions how to use it can be found also on oracle.com/goto/upgrade

Side Note: We strongly recommend using the CPAT or CSV collector scripts rather than the Excel spreadsheet as the first two methods automatically collect metadata from the source database and the generated output files and you can upload the generated output directly into CMA.

A common way to exchange large files is either by uploading it to a service request or to use the Oracle sftp server. A note how Oracle employees can access the sftp server is Primary Document for Oracle SFTP (Doc ID 2671535.1). Although this note contains also information how customers can access the sft site we prefer to share this note with customers: External Access to Oracle SFTP (Doc ID 2813938.1)

3.2.1. Using CPAT (Cloud Premigration Advisor Tool)

1. Download CPAT from Oracle Support (Patch 32613591).
2. Run `cma.sh` with the parameters `-targetcloud ALL --migrationmethod ALL` to generate a JSON report:

```
$ cd <folder-where-premigration-zip-file-was-expanded>
$ ./bin/cma.sh --outfileprefix EDU12_JSON -targetcloud ALL --
migrationmethod ALL --outdir .  --connectstring
'jdbc:oracle:thin:@localhost:1521:EDU12' --sysdba  --username sys
Enter password for sys user:
Cloud Premigration Advisor Tool Version 24.9.0
Cloud Premigration Advisor Tool completed with overall result: Action
Required
Cloud Premigration Advisor Tool generated report
location: ./EDU12_JSON_premigration_advisor_report.json
```

3. Upload the generated JSON file to CMA.

3.2.2. Using the CSV Exporter

1. Download the `cma_csv_exporter.zip` file from https://www.oracle.com/goto/upgrade.
2. Upload the ZIP file to the host(s) containing the database(s) you want to migrate and unzip the file: `unzip cma_csv_exporter.zip`
3. You have two choices to collect source database metadata depending on how many databases you want to migrate on this host and whether an `oratab` file exists in your environment.
   a. **If you want to migrate all databases on this host and an `oratab` file exists**: Execute the shell script `sh ./cma_<platform>.sh` located in the cma_csv_exporter directory that matches your platform. The script will step through the oratab file and collect metadata from all databases mentioned in it.

```
[ORACLE@LOCALHOST CMA/CSV_EXPORTER]$ cat /ETC/ORATAB
EBSDB:/U01/INSTALL/APPS/12.1.0:N
[ORACLE@LOCALHOST CMA/CSV_EXPORTER]$
[ORACLE@LOCALHOST CMA/CSV_EXPORTER]$ sh ./CMA_LINUX.sh
START CMA CSV EXPORTER.
EBSDB: INSTANCE NAME = DB_UNIQUE_NAME (SINGLE INSTANCE DATABASE)
THE ORACLE BASE HAS BEEN SET TO /U01/INSTALL/APPS/12.1.0
EXECUTING CMA_COLLECTOR
PLEASE WAIT ...
...
```

b. **If you want to migrate one database on this host or no oratab file exists:**
Go to the environment of the database from which you want to collect metadata information, go to the `cma_csv_exporter/sql` directory and execute the SQL script.

```
[ORACLE@LOCALHOST CMA/CSV_EXPORTER/SQL]$ sqlplus SYSTEM/MANAGER
@CMA_COLLECT.sql

SQL*PLUS: RELEASE 12.1.0.2.0 PRODUCTION ON FRI FEB 10 08:09:53 2023

COPYRIGHT (C) 1982, 2014, ORACLE.  ALL RIGHTS RESERVED.

LAST SUCCESSFUL LOGIN TIME: WED FEB 08 2023 10:15:35 +00:00

CONNECTED TO:
ORACLE DATABASE 12C ENTERPRISE EDITION RELEASE 12.1.0.2.0 - 64BIT
PRODUCTION
WITH THE PARTITIONING, OLAP, ADVANCED ANALYTICS AND REAL APPLICATION
TESTING OPTIONS

EXECUTING CMA_COLLECTOR
PLEASE WAIT ...
...
```

4. The script generates a ZIP file containing a `.csv` file.
5. Upload CSV file to CMA.

3.2.3. Using OEM and EMCLI

1. Download the `cma-oem-collector.zip` file from www.oracle.com/goto/upgrade.
2. Unzip the zip file into your working directory. You will find a SQL script named `cma_oem_repo_exporter.sql`.
3. Connect to your OEM repository database with SQL*Plus and execute this script, for example:

```
sqlplus sysman/<OEM password>@<OEM repo>:<listener port of the
OEM repository listener>/<service name of your OEM repository
database> @cma_oem_repo_exporter.sql
```

4. Generates an CSV output file csv in your working directory that lists all available databases in the OEM repository.

```
[ORACLE@LOCALHOST CMA/COLLECT_REPOSITORY]$ sqlplus sysman/<OEM
password>@LOCALHOST/EMREP @OEM_REPO_EXPORTER.SQL
SQL*PLUS: RELEASE 19.0.0.0.0 - PRODUCTION ON FRI FEB 10 09:11:04 2023
VERSION 19.3.0.0.0
COPYRIGHT (C) 1982, 2019, ORACLE.  ALL RIGHTS RESERVED.
LAST SUCCESSFUL LOGIN TIME: FRI FEB 10 2023 09:04:57 +00:00
CONNECTED TO:
ORACLE DATABASE 19C ENTERPRISE EDITION RELEASE 19.0.0.0.0 -
```

```
PRODUCTION
VERSION 19.3.0.0.0
HOST_NAME,TARGET_NAME,TARGET_TYPE,TARGET_GUID,DATABASE_NAME,GLOBAL_NA
ME,BANNER,INSTANCE_NAME,RELEASE,EDITION,DBVERSION
HOL3T.CMAAPP.CMAVCN.ORACLEVCN.COM,CDB1.CMAAPP.CMAVCN.ORACLEVCN.COM,OR
ACLE_DATABASE,FDE759B85FEEB951E7A3F8783E782230,CDB1,CDB1.CMAAPP.CMAVC
N.ORACLEVCN.COM,ORACLE DATABASE 21C ENTERPRISE EDITION RELEASE
21.0.0.0.0 - PRODUCTION,CDB1,ORACLE DATABASE 21C,ENTERPRISE
EDITION,21.0.0.0.0
…
HOL1S.CMAAPP.CMAVCN.ORACLEVCN.COM,EDU12,ORACLE_DATABASE,EE4971CCE5DE6
924E0531000000AB958,EDU12,EDU12,ORACLE DATABASE 12C ENTERPRISE
EDITION RELEASE 12.1.0.2.0 - 64BIT PRODUCTION,EDU12,ORACLE DATABASE
12C,ENTERPRISE EDITION,12.1.0.2.0
HOL2S.CMAAPP.CMAVCN.ORACLEVCN.COM,EDU121,ORACLE_DATABASE,A9E7B7730E53
482557B0A62B98DC7F75,EDU12,EDU12,ORACLE DATABASE 12C ENTERPRISE
EDITION RELEASE 12.1.0.2.0 - 64BIT PRODUCTION,EDU12,ORACLE DATABASE
12C,ENTERPRISE EDITION,12.1.0.2.0
…
[ORACLE@LOCALHOST CMA/COLLECT_REPOSITORY]$
```

5. **Optionally, edit this CSV file** and remove databases that aren't migration candidates before uploading into CMA.
6. Upload this CSV output file into the Cloud Migration Advisor using **Generate OEM collector csv** to generate an emcli script `oem_emcli_control.csv`.

Collect migration details

Use the `oem_emcli_control.csv` script with OEM emcli to collect database metadata from your migration candidates.

1. Download the csv and together with an `emcli_collector.zip` file from CMA.
2. Store csv and unzip `emcli_collector.zip` into the same working directory on the host that has emcli installed. Please ensure those files are in the same directory or emcli will not execute properly.
3. Ensure your `PATH` variable contains the emcli directory
4. Set and export the `EMCLI_HOME` environment variable to the emcli directory – for example:

```
export EMCLI_HOME=/u01/app/oracle/emcli/bin
```

5. Run emcli using the driver script and the CSV file containing the list of databases from which to collect, for example:

```
sh ./oem_emcli_control.sh <OMS username> <OEM SQL Credentials
for dbsnmp>
```

where

<OMS username>: is the owner of the OEM repository, e.g. sysman

<OEM SQL Credentials for dbsnmp>: Valid OEM SQL credentials for dbsnmp usually are DBCredsNormal or DBCredsSYSDBA. If you require assistance setting up these credentials, please consult:

MOS Note 1639266.1: Emcli Execute_sql Fails With Error 'Preferred Credentials Do Not Exist For Some Targets" in EM

```
[ORACLE@LOCALHOST CMA/EMCLI_COLLECTOR> EXPORT
EMCLI_HOME=/ORACLE/SOFTWARE/APP/MIDDLEWARE/BIN
[ORACLE@LOCALHOST CMA/EMCLI_COLLECTOR> SH ./OEM_EMCLI_CONTROL.SH
SYSMAN DBCREDSNORMAL
PASSWORD FOR USER SYSMAN:
WORKING ON:  EDU12:ORACLE_DATABASE:EE4971CCE5DE6924E0531000000AB958
USING DBCREDSNORMAL CREDENTIALS
SUCCESSFULLY LOGGED IN
GATHERING SYSDATE
WRITING OUTPUT TO
FILE:./CMA_EE4971CCE5DE6924E0531000000AB958_20230210_0913.OUT
RUNNING CMA COLLECTOR SCRIPT
WORKING ON:  EDU121:ORACLE_DATABASE:A9E7B7730E53482557B0A62B98DC7F75
USING DBCREDSNORMAL CREDENTIALS
…
```

6. emcli generates a separate output file for each database containing the metadata needed by Cloud Migration Advisor to give migration advice for that database. Collecting the metadata with emcli may take several minutes depending on the number of databases being processed. The files will be named: cma_<ID>_<DATE>.out
7. Upload the output into CMA.

3.2.4. Using a Spreadsheet

1. Download the template from https://www.oracle.com/goto/upgrade.
2. Fill out row per source database with required attributes.
3. Generate a CSV file and manually input into CMA under the **Database** tab.

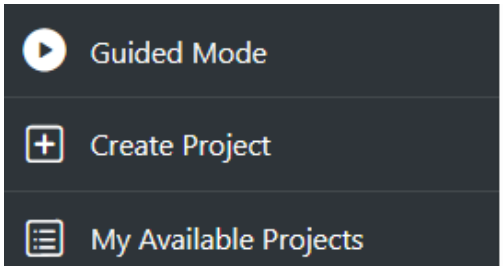
Note: Oracle recommends using CPAT or the CMA CSV exporter for automation and accuracy.

3.3. Creating and Managing Projects

3.3.1. Project Creation and Options

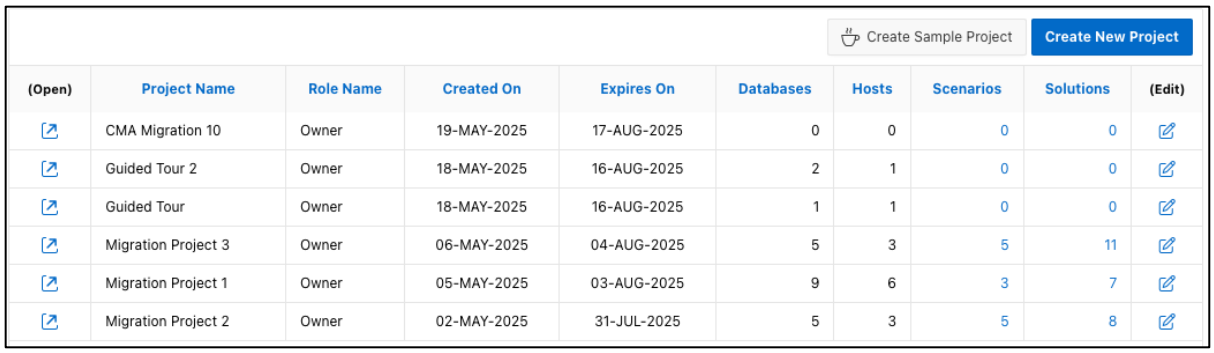
1. From the CMA homepage, click **Create New Project**.

   Alternatively, you can use the menu bar on the left:



2. Enter a project name and optional description.

3. From the CMA homepage, click **My Available Projects**.
4. Use the pencil icon to:
   - Rename the project
   - Add or remove users
   - Transfer ownership
   - Delete or extend project duration



(Open)	Project Name	Role Name	Created On	Expires On	Databases	Hosts	Scenarios	Solutions	(Edit)
	CMA Migration 10	Owner	19-MAY-2025	17-AUG-2025	0	0	0	0	
	Guided Tour 2	Owner	18-MAY-2025	16-AUG-2025	2	1	0	0	
	Guided Tour	Owner	18-MAY-2025	16-AUG-2025	1	1	0	0	
	Migration Project 3	Owner	06-MAY-2025	04-AUG-2025	5	3	5	11	
	Migration Project 1	Owner	05-MAY-2025	03-AUG-2025	9	6	3	7	
	Migration Project 2	Owner	02-MAY-2025	31-JUL-2025	5	3	5	8	

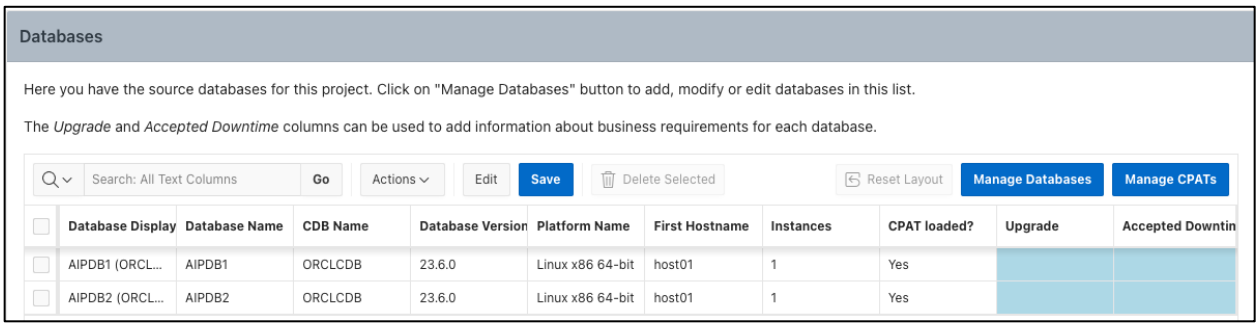
3.3.2. Uploading Metadata to CMA

1. Open your project and navigate to the **Load Source Database section**.

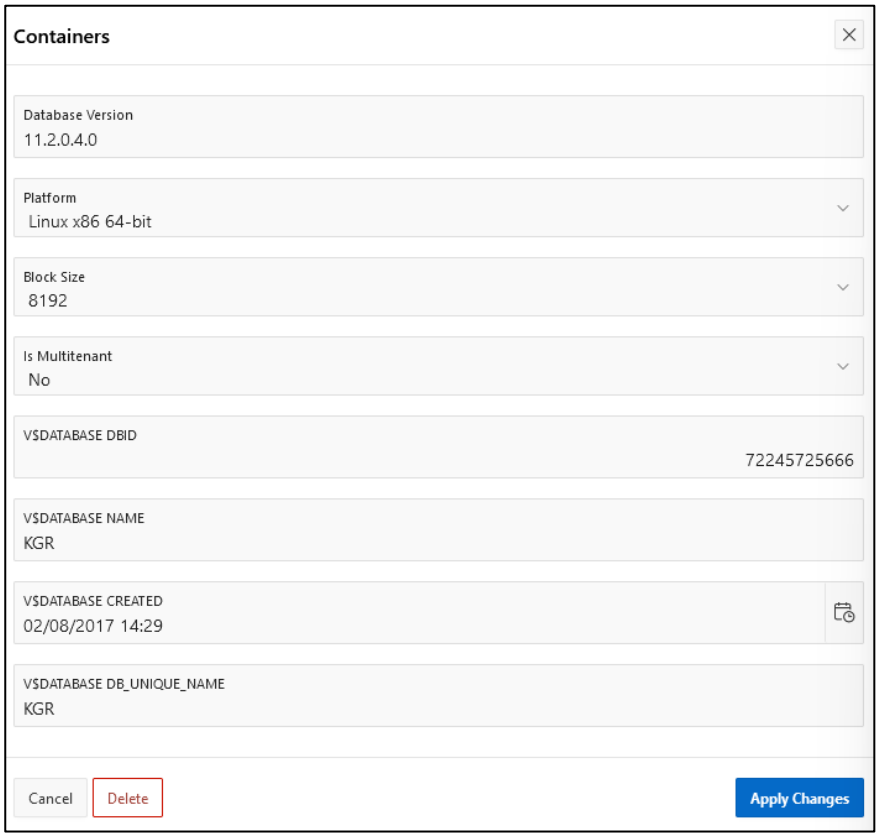
2. Choose one of the following options.
   - Load database from CVS
   - Load database from JSON
   - Generate OEM emcli Driving File
3. Browse the file location and click **Upload**.

3.3.3. Managing Databases and Hosts

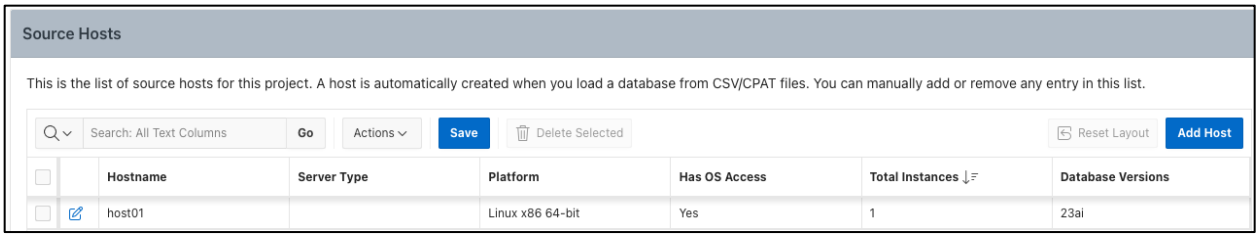
1. Use the **Databases** section to view imported databases.



2. Click **Manage Databases** to manually add or edit entries.



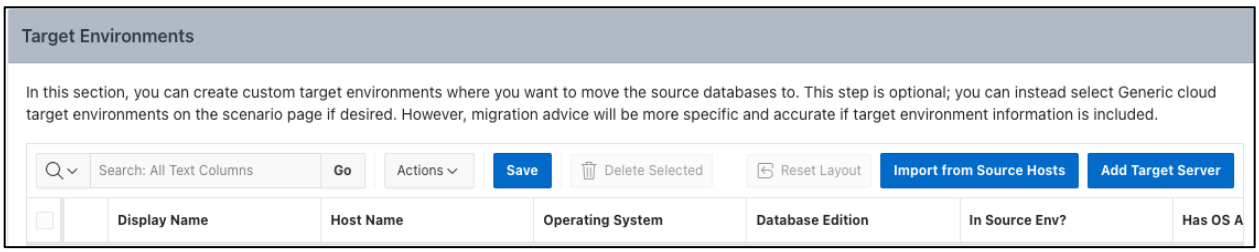
3. Source hosts are auto-created when database is loaded.



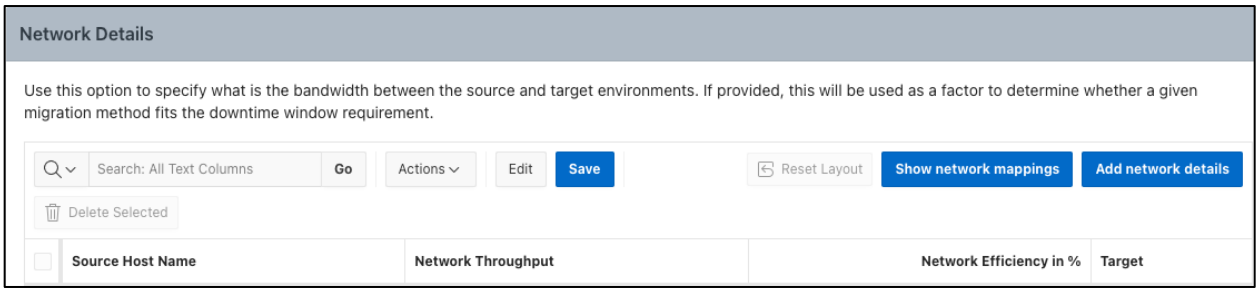
4. To remove a host, select it and click **Save** to confirm deletion.

3.3.4. Target Environments and Network Details

1. Navigate to **Target Environments** to define available targets (e.g. ADB, ExaCC).



2. Use the **Network Details** section to input:
   - Bandwidth
   - Latency
   - Network efficiency



3. Existing mappings can be updated or removed.

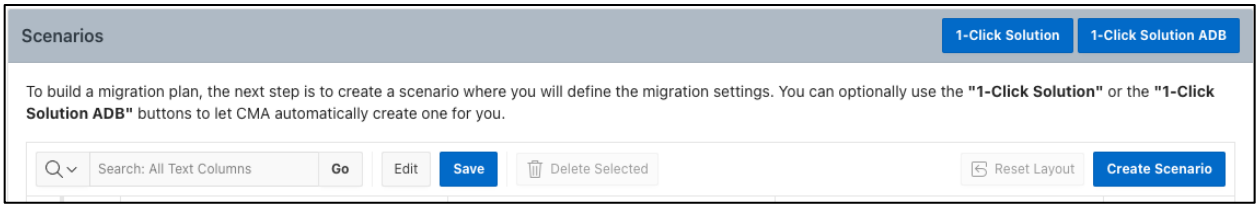
3.3.5. Validating Source Environments

1. Click **Check Inconsistencies** on the project page.

2. This checks for missing data or invalid entries before proceeding to scenario creation.

3.3.6. Scenarios

1. To create a migration plan, we need to define a scenario. This can be done using the **Create Scenario**, the **1-Click Solution** or the **1-Click Solution ADB** button.



- To open an existing scenario, click on the arrow button on the left. To delete or to duplicate a scenario, click on the row selector.

2. **1-Click Solution**
   - This option automatically creates a migration solution for all source databases in this project using all available target types and all available migration methods.
3. **1-Click Solution ADB**
   - This option automatically creates for all source databases in the current project a migration plan to all available ADB targets.
4. **Create Scenario**
   - The **Create Scenario** button is just adding an empty scenario with a name you can choose on your own. Once added you need to open the scenario (by clicking on the arrow icon on the left) and assign the source databases, choose possible migration targets, if wanted to change the solution priorities and create a solution on your own based on those criteria.

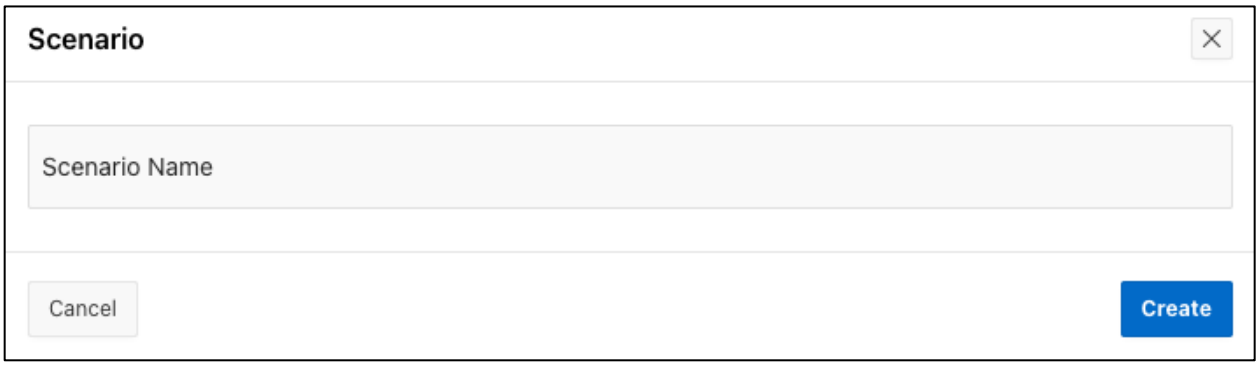
3.4 Building Scenarios

Once databases are uploaded and validated, you can begin building scenarios to evaluate migration options.

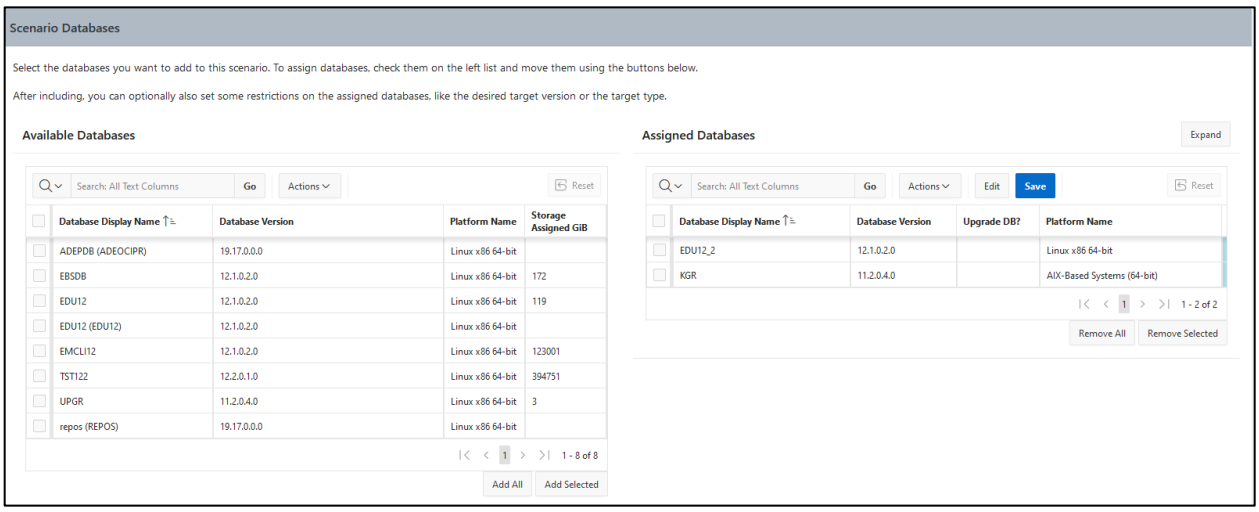
3.4.1. Adding Databases

5. Navigate to the **Scenarios** section and click **Create Scenario.**

6. Provide a scenario name.

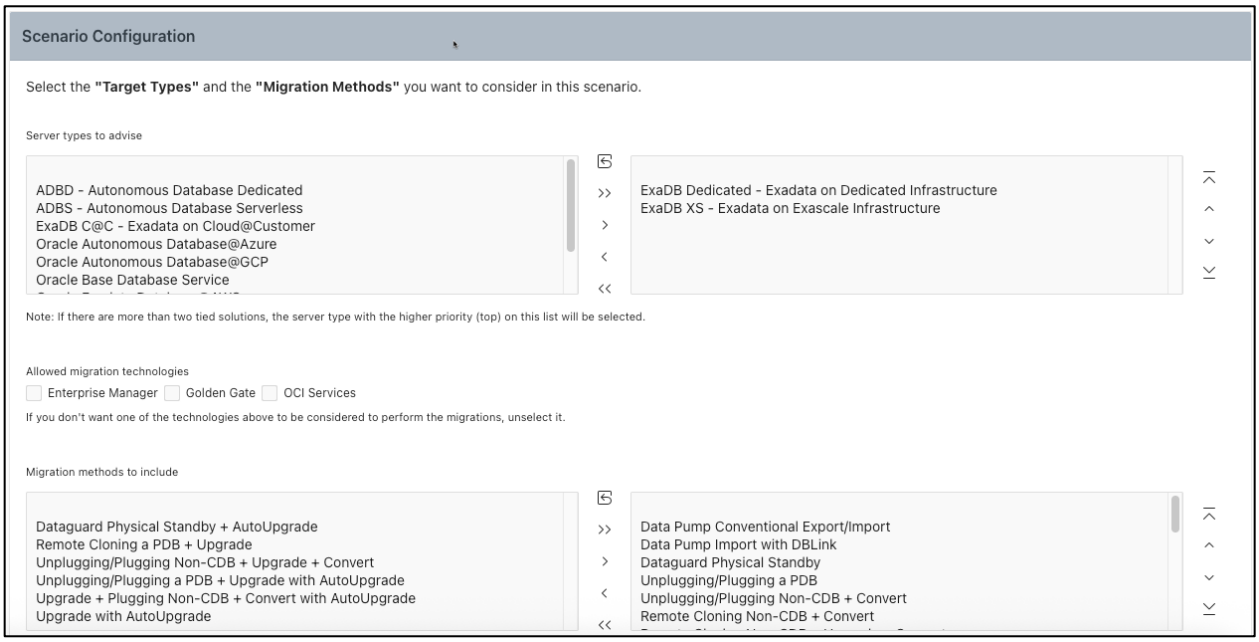


7. Assign source databases by selecting from the list and clicking **Add Selected** or **Add All**.



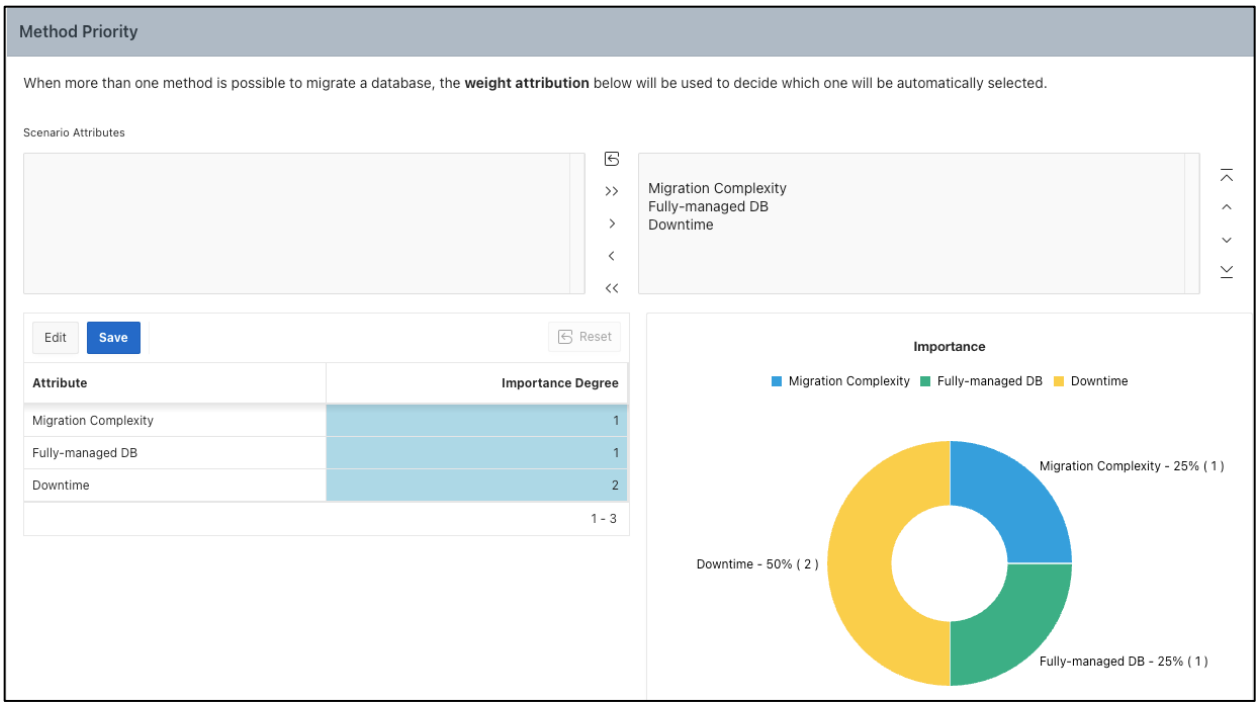
3.4.2. Scenario Configuration

1. Select the **Target Type** you want to consider.
2. Select the **Migration Methods** you want to consider.



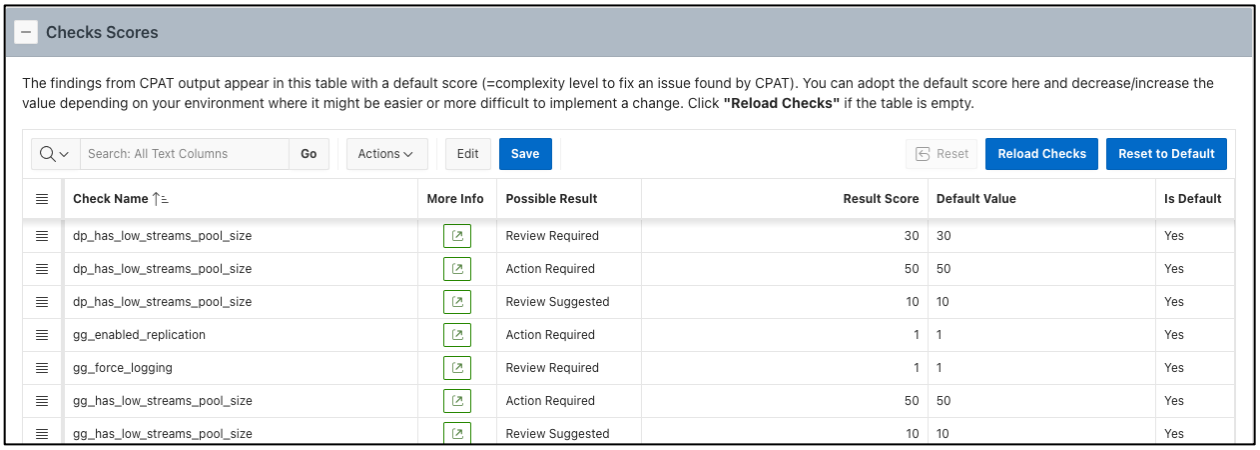
3.4.3. Prioritizing Migration Methods

3. Navigate to **Method Priority**.
4. Adjust ranks for attributes such as Downtime, Migration complexity, Management preferences. **Note:** These weighting influences CMA's solution ranking.



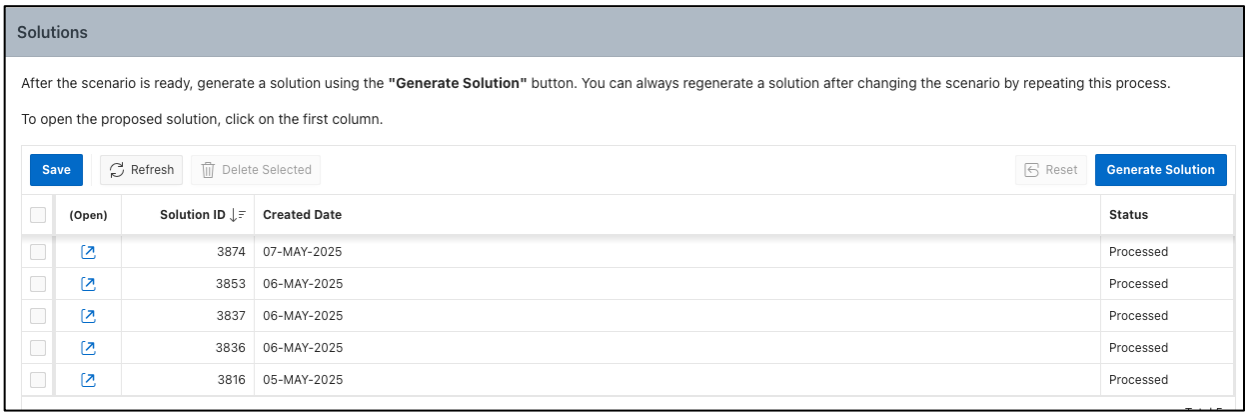
3.4.4. Using Complexity Scores

1. If CPAT data was uploaded, navigate to **Scores**.
2. Review and adjust the default scores assigned to technical findings (e.g., presence of database links or unsupported features). **Note:** Modifying a score will affect all databases sharing that CPAT issue



3.4.5. Generating Solutions

1. Once configuration is complete, go to the **Solutions** tab.
2. Click **Generate Solution** to let CMA evaluate all target and method combinations.
   Note: The solution is processed in the background; check status as **Running** or **Processed**.
   You may generate multiple solutions to compare different settings or priorities

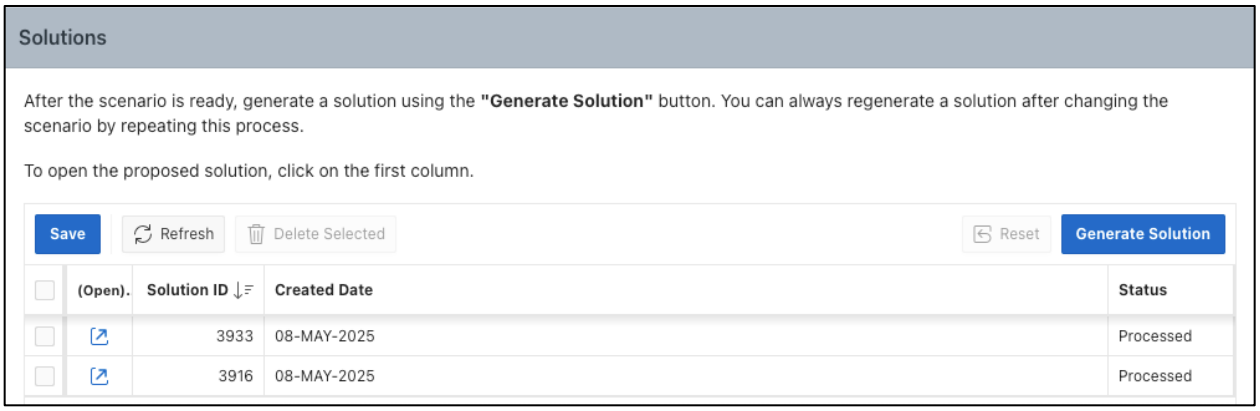


3.5. Reviewing Solution

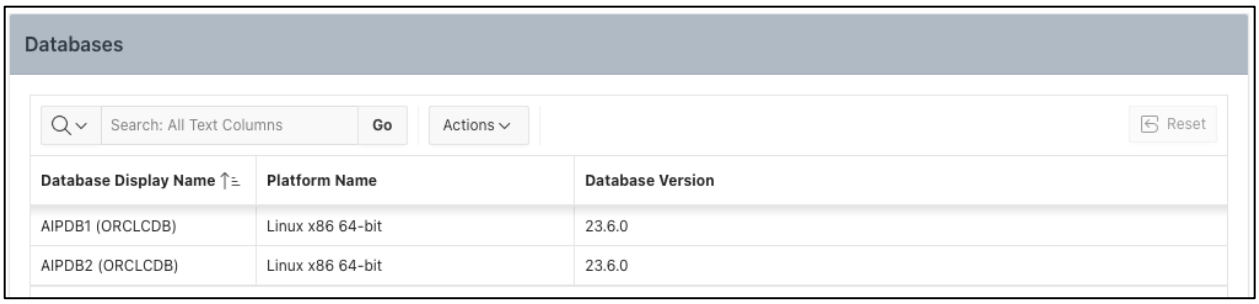
After generating a solution, CMA presents a detailed view of recommended target environments and migration methods.

3.5.1. Databases

1. Go to the **Solutions** tab and select a solution by clicking the arrow icon.

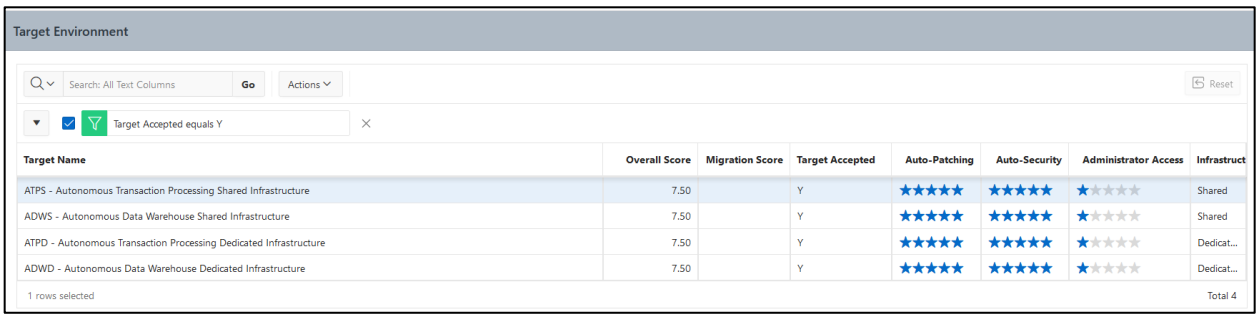


2. In the Database section you get a list of all the source databases part of this migration scenario. Clicking on one of the listed databases will automatically change the rest of the page showing only the results for this selected database.



3.5.2. Target Environment Evaluation

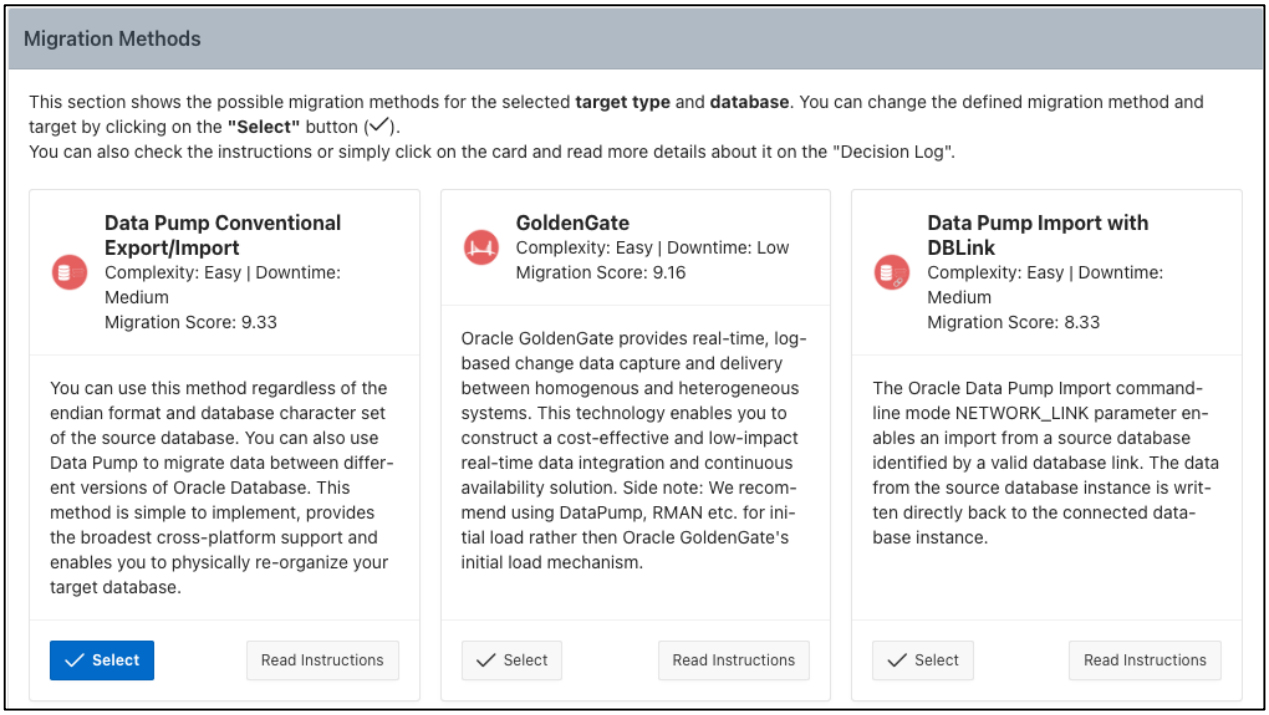
1. View the **Target Environment** tab within the solution.



2. Compare different targets (e.g., ADB, ExaCC) based on:
   - Supported versions
   - SLA or performance tiers
   - Estimated cost and management level

3.5.3. Evaluation Migration Methods

1. Access the **Migration Methods** tab.



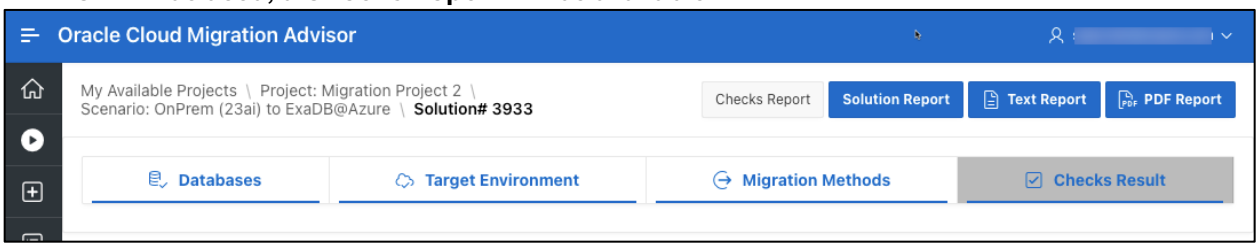
2. Each method includes:

   - Description and compatibility notes
   - Links to Oracle documentation or MOS notes
   - System-based scores for downtime, complexity, and fit

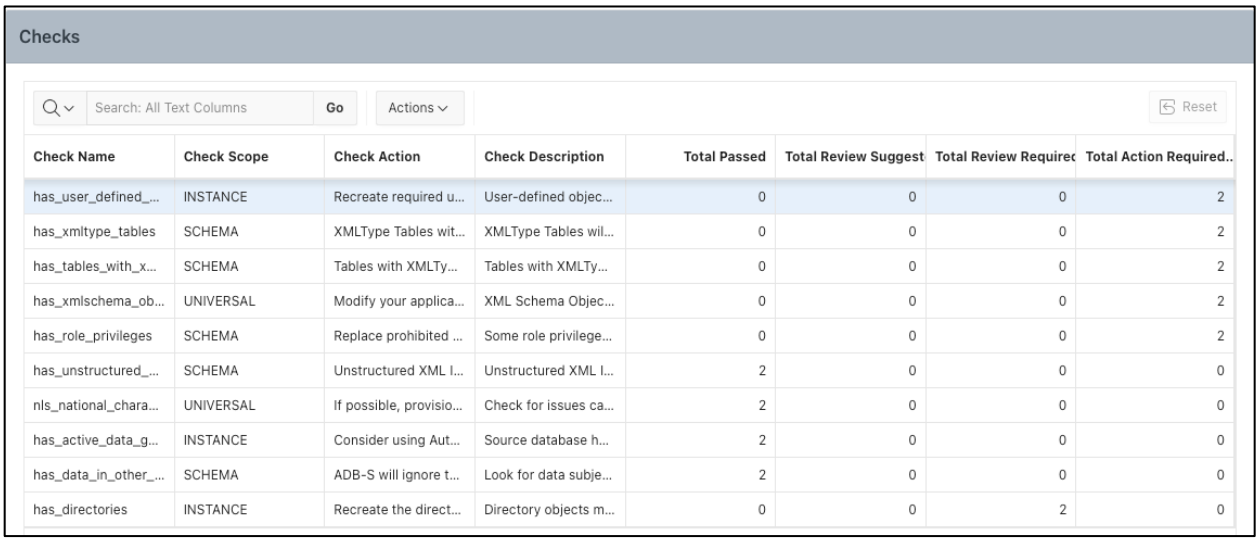
3. You can override the suggested method if needed

3.5.4. Review of CPAT Checks (if available)

1. If CPAT was used, a **Checks Report** will be available.



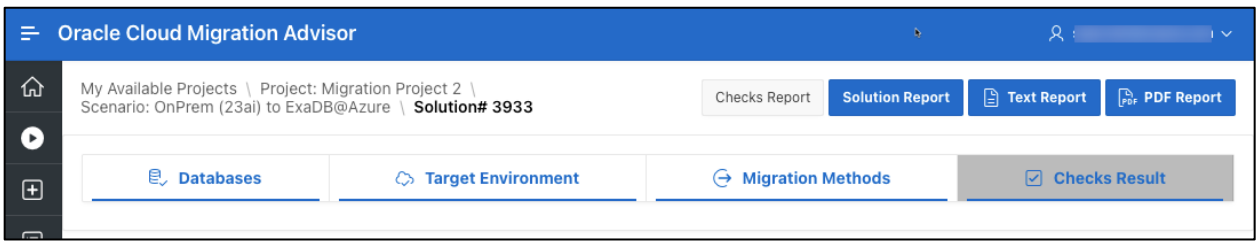
2. This includes:
   - Detected blockers or manual steps
   - Score impact per issue (editable in earlier step)
   - Justification for recommendation or exclusions



Check Name	Check Scope	Check Action	Check Description	Total Passed	Total Review Suggest	Total Review Requirec	Total Action Required..
has_user_defined_...	INSTANCE	Recreate required u...	User-defined objec...	0	0	0	2
has_xmltype_tables	SCHEMA	XMLType Tables wit...	XMLType Tables wil...	0	0	0	2
has_tables_with_x...	SCHEMA	Tables with XMLTy...	Tables with XMLTy...	0	0	0	2
has_xmlschema_ob...	UNIVERSAL	Modify your applica...	XML Schema Objec...	0	0	0	2
has_role_privileges	SCHEMA	Replace prohibited ...	Some role privilege...	0	0	0	2
has_unstructured_...	SCHEMA	Unstructured XML I...	Unstructured XML I...	2	0	0	0
nls_national_chara...	UNIVERSAL	If possible, provisio...	Check for issues ca...	2	0	0	0
has_active_data_g...	INSTANCE	Consider using Aut...	Source database h...	2	0	0	0
has_data_in_other_...	SCHEMA	ADB-S will ignore t...	Look for data subje...	2	0	0	0
has_directories	INSTANCE	Recreate the direct...	Directory objects m...	0	0	2	0

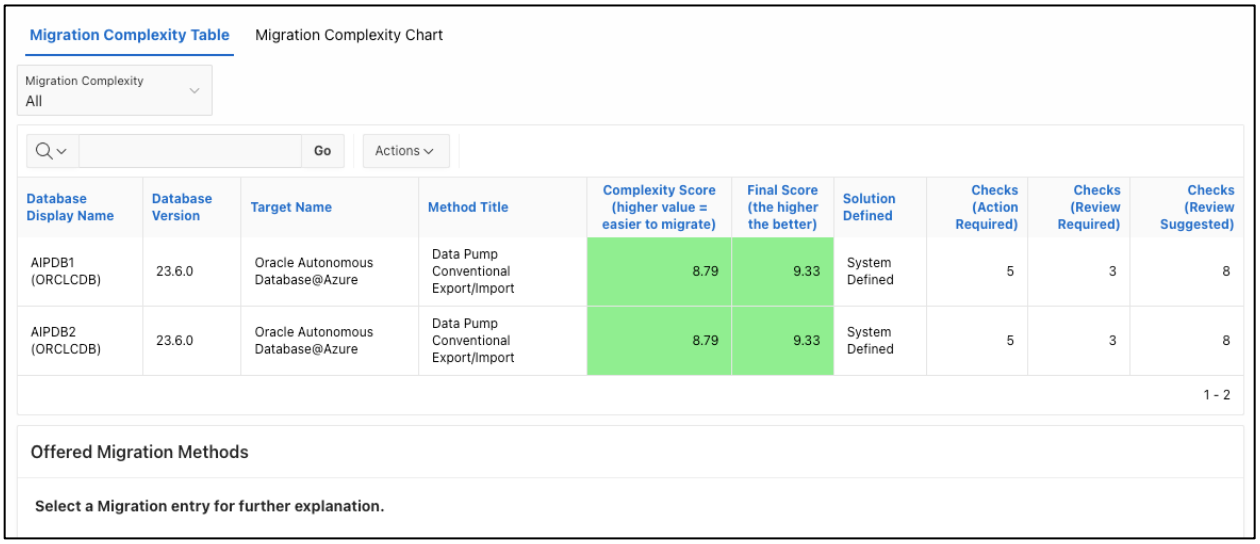
3.6. Reports

Once a solution is generated, CMA provides multiple report formats to help communicate findings and guide execution.



3.6.1. Solution Report

- A visual summary of the generated solution
- Displays:
  - Source databases
  - Target environment mapping
  - Chosen migration methods
  - Color-coded indicators for suitability and complexity
- Best used for executive or non-technical review



3.6.2. Text Report

- A detailed, printable report for all databases in a scenario
- Includes:
  - Source-to-target compatibility
  - Preselected migration method and rationale
  - Downtime estimates
  - Excluded options and their reasons
- Ideal for migration planning meetings or handoffs to implementation teams