EDB Postgres™ Migration Portal Guide

Version 1.1.1

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EDB Postgres™ Migration Portal Guide
by EnterpriseDB® Corporation

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1 Introduction

EDB Postgres™ Migration Portal (Migration Portal) is a web-based tool for migrating Oracle database schemas to the EDB Postgres platform. The Migration Portal assesses and analyzes Oracle database schemas and converts types, tables, sequences, constraints, triggers, views, stored procedures, packages, dblinks, materialized views, and indexes, producing DDLs that are compatible with EDB Postgres Advanced Server.

The user-friendly portal interface simplifies migration; log on to the portal with your browser of choice and start the migration process.

The EDB Postgres™ Migration Portal guide provides a high-level description of the steps involved in the migration process. The guide also includes solutions to common migration problems, and details unsupported features and their potential workarounds.

EnterpriseDB has helped companies migrate their existing database systems to Postgres for years. For more information, visit the EnterpriseDB website at:

https://www.enterprisedb.com/

1.1 Typographical Conventions Used in this Guide

Certain typographical conventions are used in this manual to clarify the meaning and usage of various commands, statements, programs, examples, etc. This section provides a summary of these conventions.

In the following descriptions a *term* refers to any word or group of words that are language keywords, user-supplied values, literals, etc. A term's exact meaning depends upon the context in which it is used.

- *Italic font* introduces a new term, typically, in the sentence that defines it for the first time.
- `Fixed-width (mono-spaced) font` is used for terms that must be given literally such as SQL commands, specific table and column names used in the examples, programming language keywords, etc. For example, `SELECT * FROM emp;`
- *`Italic fixed-width font`* is used for terms for which the user must substitute values in actual usage. For example, `DELETE FROM` *`table_name`*;
- A vertical pipe | denotes a choice between the terms on either side of the pipe. A vertical pipe is used to separate two or more alternative terms within square brackets (optional choices) or braces (one mandatory choice).
- Square brackets [ ] denote that one or none of the enclosed term(s) may be substituted. For example, `[ a | b ]`, means choose one of "`a`" or "`b`" or neither of the two.
- Braces {} denote that exactly one of the enclosed alternatives must be specified. For example, `{ a | b }`, means exactly one of "`a`" or "`b`" must be specified.
- Ellipses ... denote that the proceeding term may be repeated. For example, `[ a | b ] ...` means that you may have the sequence, "`b a a b a`".

1.2 What's New

The following enhancement is added to the EDB Postgres Migration Portal v1.1.1:

- **Duplicate schemas/DDLs issue fixed:**
  If the EDB DDL Extractor script was run on SQL Developer more than once in the same session, duplicate schemas/DDLs were extracted.

1.3 Supported Browsers, Operating Systems, and Database

The Migration Portal supports migration from Oracle 11 and 12c to EDB Advanced Server 10 or 11. Migration Portal is supported on the following browsers and operating systems:

Supported Browsers

For the best user experience, we recommend using the Google Chrome browser. Migration Portal is supported on the following browsers:

Browser	Supported Version
Apple Safari on Macintosh OS	11 and above
Google Chrome	68 and above
Microsoft Edge	42 and above
Mozilla Firefox	60 and above
Internet Explorer	11 and above

Supported Operating Systems

Operating Systems	Supported Version
Macintosh	OSX Sierra
Windows	10
Linux	CentOs 7

2 Using the EDB Migration Portal

The Migration Portal allows you to easily migrate your database from Oracle to Advanced Server. You can upload schemas for assessment and get immediate feedback and suggestions. The portal allows you to download assessed DDLs for all objects and create your EDB Postgres database on-premises or in the cloud.

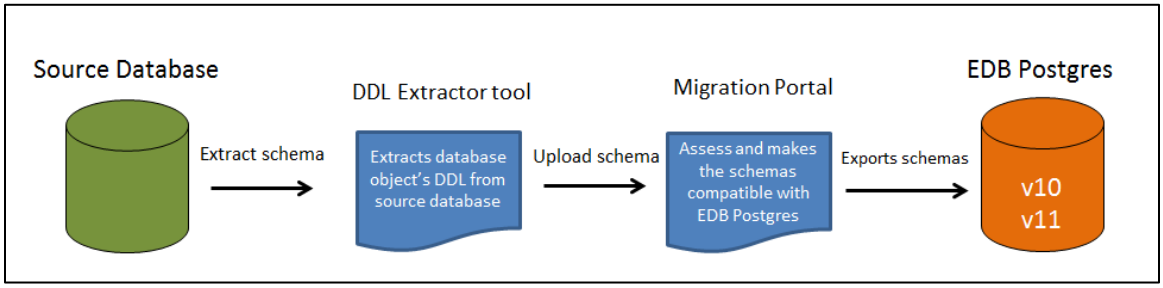


Figure 2 – The migration process.

To access the migration portal, open any of the browsers and navigate to:

https://migration.enterprisedb.com/

2.1 Overview of the Migration Portal

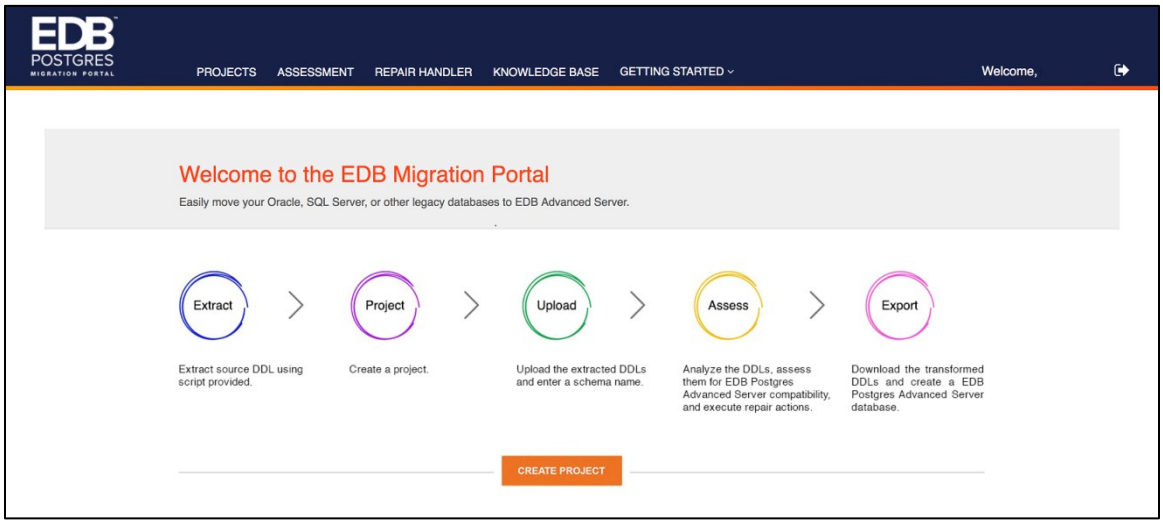


Figure 2.1 – Migration Portal

The following list provides information about the tabs displayed on the Migration Portal.

- **Projects**: The `Project` tab is used to create a project for assessing the existing schema.

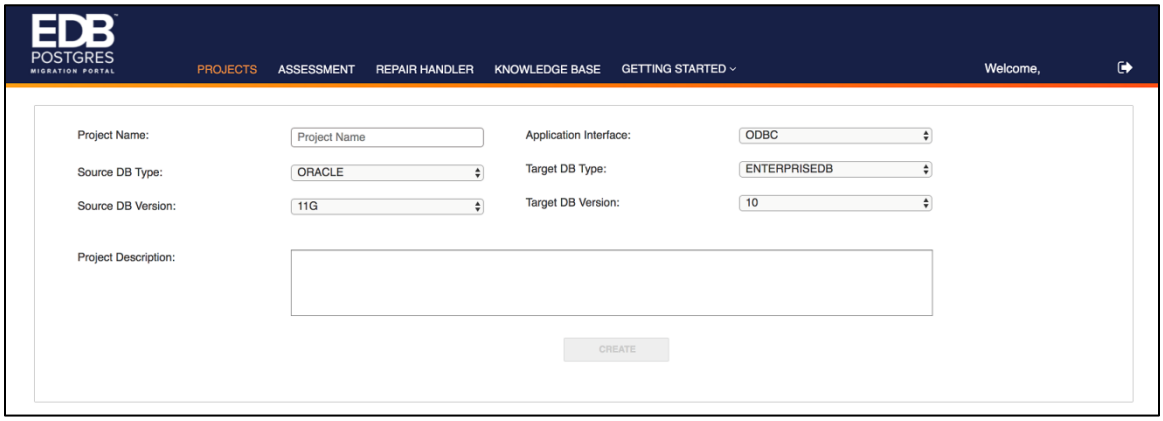
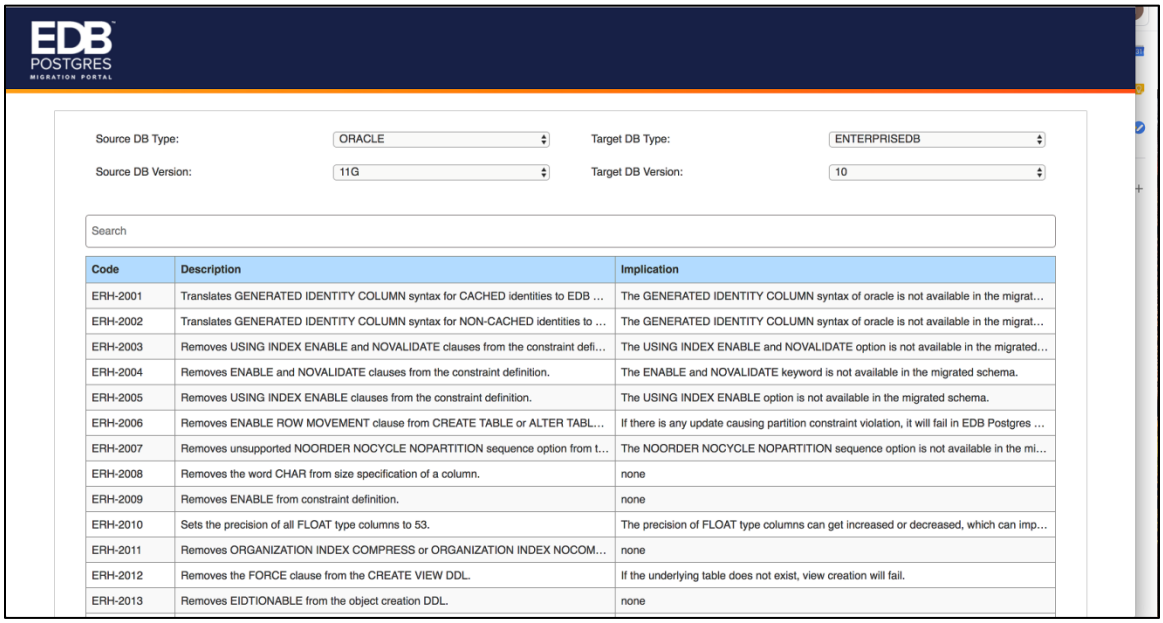


Figure 2.2 – Project page

- **Assessment**: The `Assessment` tab is used to assess the migrated schema. You can check the details for already assessed projects or schemas, and reassess the individual DDLs.

Figure 2.3 –Assessment page

- **Repair Handler**: The `Repair Handler` tab is used to review the transformations that the migration portal performs to make the source DDL compatible with the target database.



Code	Description	Implication
ERH-2001	Translates GENERATED IDENTITY COLUMN syntax for CACHED identities to EDB …	The GENERATED IDENTITY COLUMN syntax of oracle is not available in the migrat…
ERH-2002	Translates GENERATED IDENTITY COLUMN syntax for NON-CACHED identities to …	The GENERATED IDENTITY COLUMN syntax of oracle is not available in the migrat…
ERH-2003	Removes USING INDEX ENABLE and NOVALIDATE clauses from the constraint defi…	The USING INDEX ENABLE and NOVALIDATE option is not available in the migrated…
ERH-2004	Removes ENABLE and NOVALIDATE clauses from the constraint definition.	The ENABLE and NOVALIDATE keyword is not available in the migrated schema.
ERH-2005	Removes USING INDEX ENABLE clauses from the constraint definition.	The USING INDEX ENABLE option is not available in the migrated schema.
ERH-2006	Removes ENABLE ROW MOVEMENT clause from CREATE TABLE or ALTER TABL…	If there is any update causing partition constraint violation, it will fail in EDB Postgres …
ERH-2007	Removes unsupported NOORDER NOCYCLE NOPARTITION sequence option from t…	The NOORDER NOCYCLE NOPARTITION sequence option is not available in the mi…
ERH-2008	Removes the word CHAR from size specification of a column.	none
ERH-2009	Removes ENABLE from constraint definition.	none
ERH-2010	Sets the precision of all FLOAT type columns to 53.	The precision of FLOAT type columns can get increased or decreased, which can imp…
ERH-2011	Removes ORGANIZATION INDEX COMPRESS or ORGANIZATION INDEX NOCOM…	none
ERH-2012	Removes the FORCE clause from the CREATE VIEW DDL.	If the underlying table does not exist, view creation will fail.
ERH-2013	Removes EIDTIONABLE from the object creation DDL.	none

Figure 2.4 – Repair Handler page

- **Knowledge Base**: The `Knowledge Base` tab is used to find workarounds or solutions for the objects that failed in the assessment process.

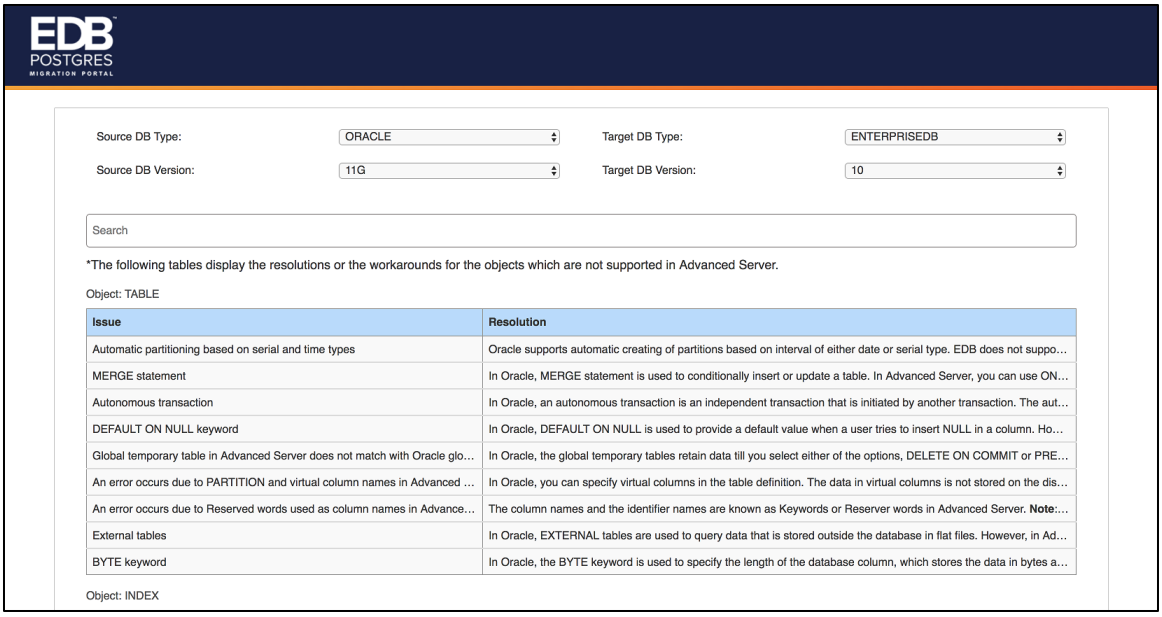


Figure 2.5 – Knowledge Base page

- **Getting Started**: The options in the `Getting Started` tab provide access to documentation and other information links.

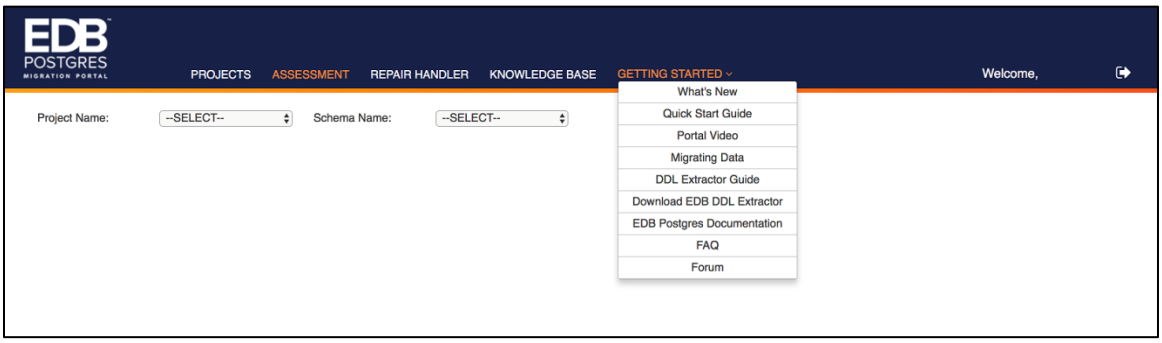


Figure 2.6 – Getting Started tab

3 Migrating a Database

To migrate a database, you must complete the following steps:

- Schema Extraction
- Schema Assessment
- Schema Migration
- Data Migration

3.1 Schema Extraction

Prerequisites

For schema extraction, you must download the latest EDB DDL Extractor tool from the Getting Started menu on the EnterpriseDB website:

www.migration.enterprisedb.com

The SQL script will extract data definitions, stored procedures, views, etc., from an Oracle database into text file.

The DDL Extractor for Oracle database is used as a part of EDB Migration Portal. The EDB DDL extractor creates the DDL file that will be uploaded to the portal and analyzed for EDB Postgres compatibility.

The EDB DDL Extractor for Oracle database uses Oracle's DBMS_METADATA built-in package when extracting DDL.

Please note: You must have `SELECT CATALOG ROLE` and `SELECT ANY DICTIONARY` privileges in the Oracle database.

You can use EDB DDL Extractor either with SQL*Plus or SQL Developer to extract the schema; perform the following steps:

Prerequisites

Download the EDB DDL Extractor tool for Oracle database (`edb_ddl_extractor.sql`).

For SQL*Plus

1. Connect to SQL*Plus and run the command:

   ```
   SQL>@edb_ddl_extractor.sql
   ```

2. Provide the schema name and the path\directory in which the extractor will store the extracted DDL. For multiple schema extraction, you must use (‘,’) delimiter.

   For example, on Linux:

   Enter `SCHEMA NAME[S]` (use ‘,’ delimiter for multiple schemas) to extract DDLs: `HR, SCOTT, FINANCE`
   Enter the `PATH` to store DDL file: `/home/oracle/extracted_ddls/`

   On Windows:

   Enter `SCHEMA NAME[S]` (use ‘,’ delimiter for multiple schemas) to extract DDLs: `HR, SCOTT, FINANCE`
   Enter the `PATH` to store DDL file: `c\Users\Example\Desktop\`

For SQL Developer

1. Connect to the SQL server and run the following command:

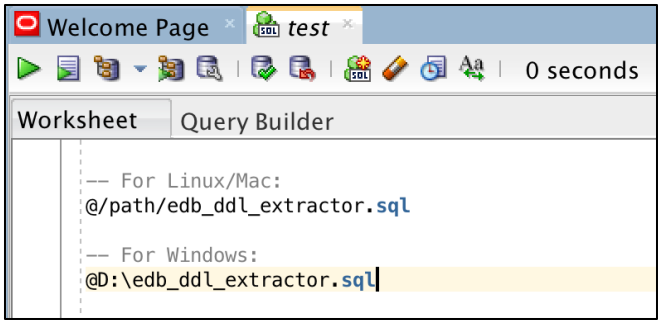


Figure 3.1.1 Path for Linux or Windows

2. Enter a comma separated list of schemas:

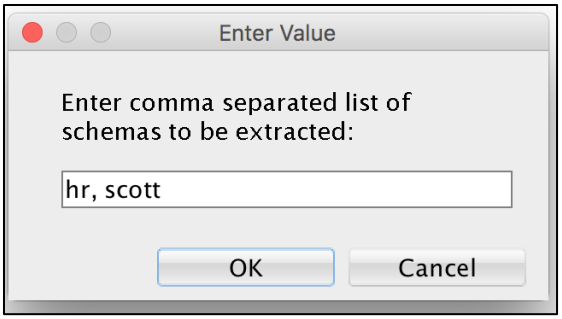


Figure 3.1.2 List of schemas

3. Enter file path for the output file:

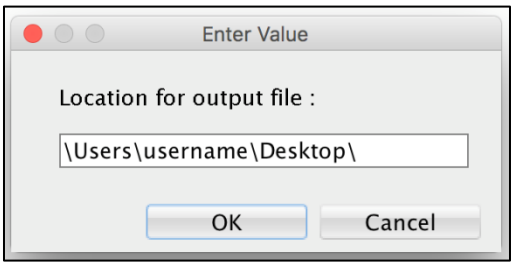


Figure 3.1.3 Output file path

Please note: You can also enter a single schema name in both SQL*Plus and SQL Developer tools.

The script iterates through the object types in the database and once the task is completed, the .SQL output is stored at the entered location, (i.e., `c:\Users\Example\Desktop\`).

The EDB DDL Extractor does not extract objects that have names like `BIN$b54+4XIEYwPgUAB/AQBWwA= =$0`. If you want to extract these objects, you must change the name of the objects and re-run the extraction process.

3.1.1 Supported and Unsupported Object Types

The migration portal supports migration of the following object types:

- Synonyms
- DB Links
- Types and Type Body
- Sequences
- Tables
- Constraints
- Indexes (Except LOB indexes and indexes on materialized views)
- Views
- Materialized Views
- Triggers
- Functions
- Procedures
- Packages

The portal does not support migration of the following object types:

- Editions
- Operators
- Schedulers
- LOB indexes and indexes on materialized views
- XML Schemas
- Profiles
- Role and Object Grants
- Tablespaces
- Directories
- Users
- RLS Policy
- Queues

3.2 Schema Assessment

To assess an Oracle database schema for compatibility with Advanced Server, you must:

1. Use SQL*Plus or SQL Developer to connect to your Oracle database. You must connect with a database role that has `SELECT_CATALOG_ROLE or SELECT ANY DICTIONARY` privileges.

2. Run the DDL Extractor with the command: `SQL>@edb_ddl_extractor.sql.`

   The EDB DDL Extractor uses the SQL*Plus `ACCEPT` command to retrieve a list containing one or more schema names; the list should use a comma (,) delimiter. Maximum 240 bytes can be accepted. The maximum length of a schema name is 30 characters and you can provide 7 to 8 schema names.

3. Enter the path where the extraction file will be created.

   On Linux:
   Enter the schema name to extract the DDLs : `schema_name`
   Enter the path to store DDL file: `/home/oracle/extracted_ddls/`

   On Windows:
   Enter schema name to extract the DDLs : HR
   Enter the path to store DDL file: `C:/Extracted_DDL/`

4. Go to https://migration.enterprisedb.com.

5. Enter your EDB credentials.

6. Click `CREATE PROJECT` to create a new project.

7. Enter the project name, project description, and click `Assess.`

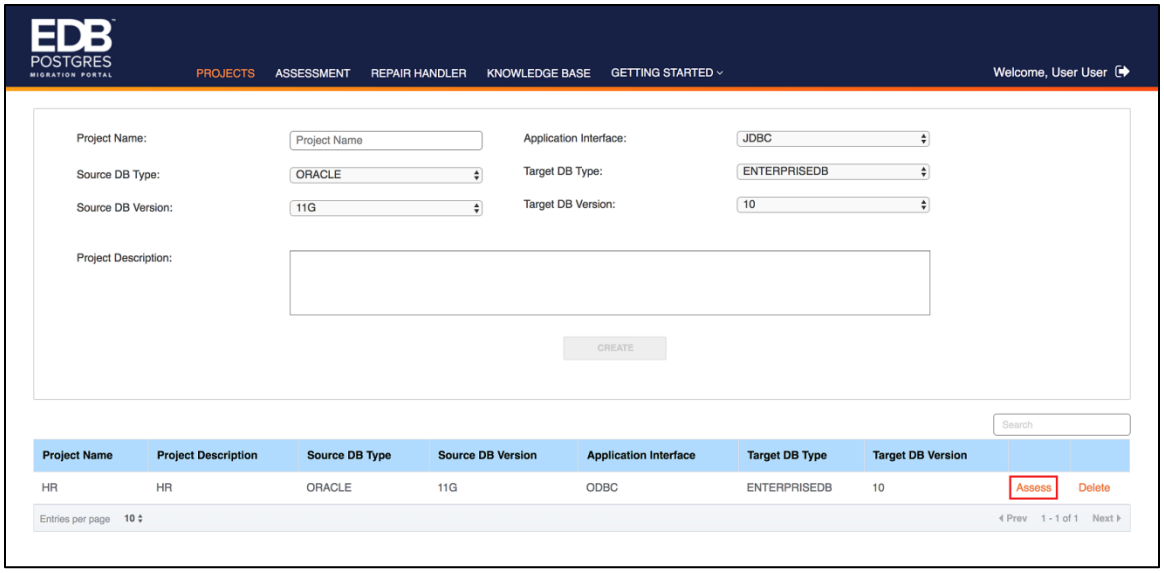


Figure 3.1 – Assessing the extracted schema.

8. Upload the `.SQL` file generated by the `EDB DDL Extractor` for Oracle Database. **Please Note**: You should not modify the `.SQL` file.

9. Click `RUN ASSESSMENT`.

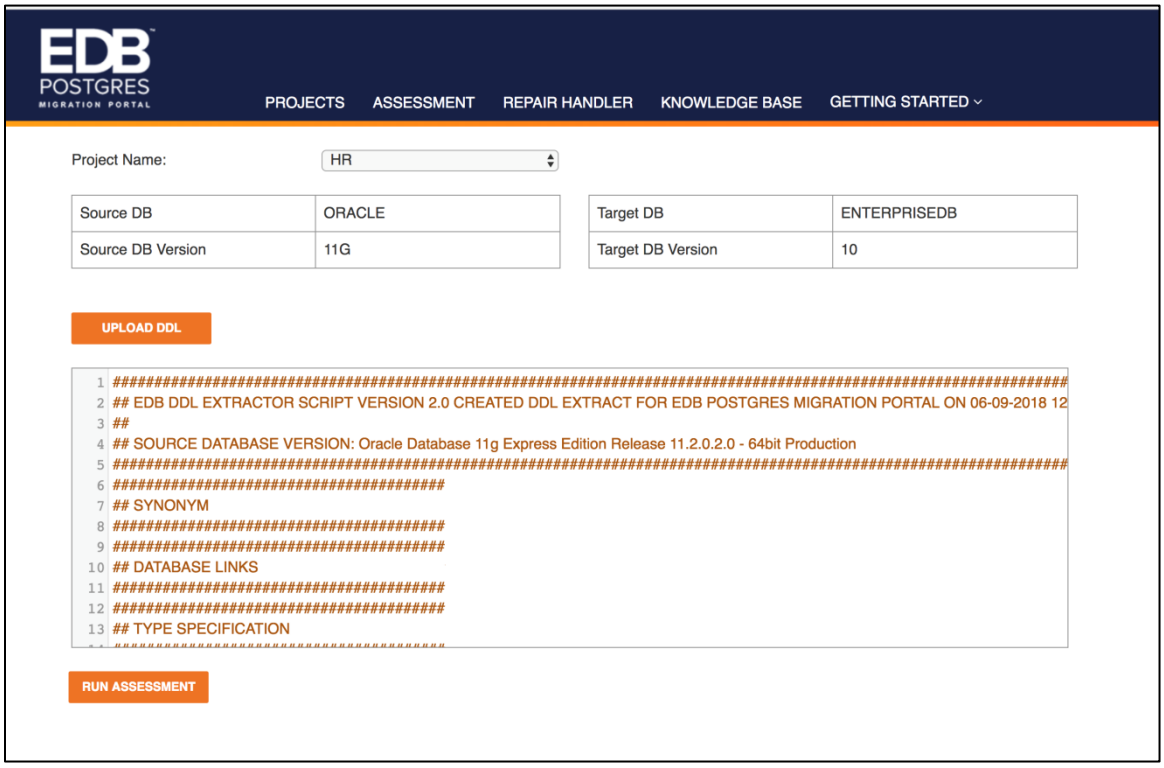


Figure 3.2 – Uploading the extracted DDL.

The analysis tool will review every construct, execute repair actions to improve compatibility with Advanced Server, and flag any remaining errors that require manual intervention.

10. Verify the DDL objects (e.g., TABLES) that do not show a 100% success ratio.

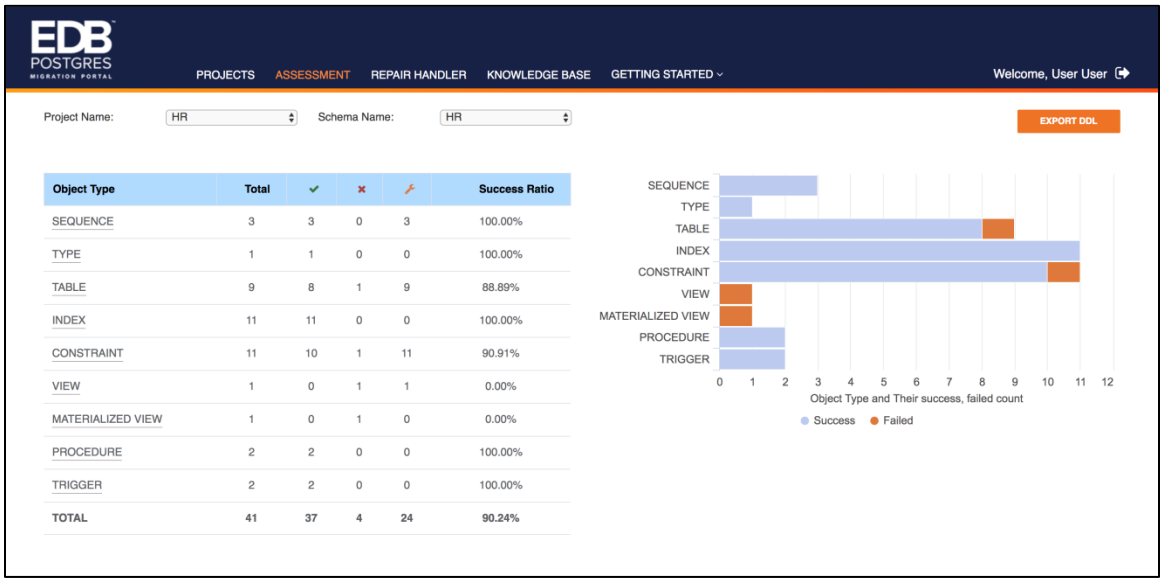


Figure 3.3 – Verifying the DDL objects.

11. Click the objects that are not compatible with EDB Postgres and view the details.

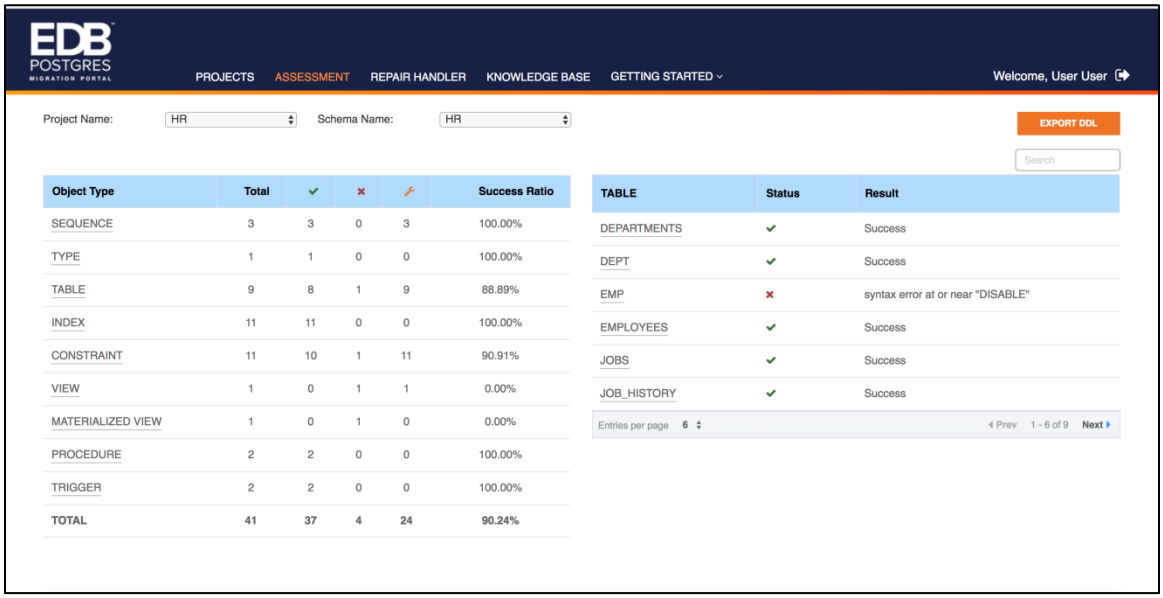


Figure 3.4 – Non-compatible objects.

12. Refer to the Knowledge Base information to check the possible workarounds for the objects that are not immediately compatible with Advanced Server.

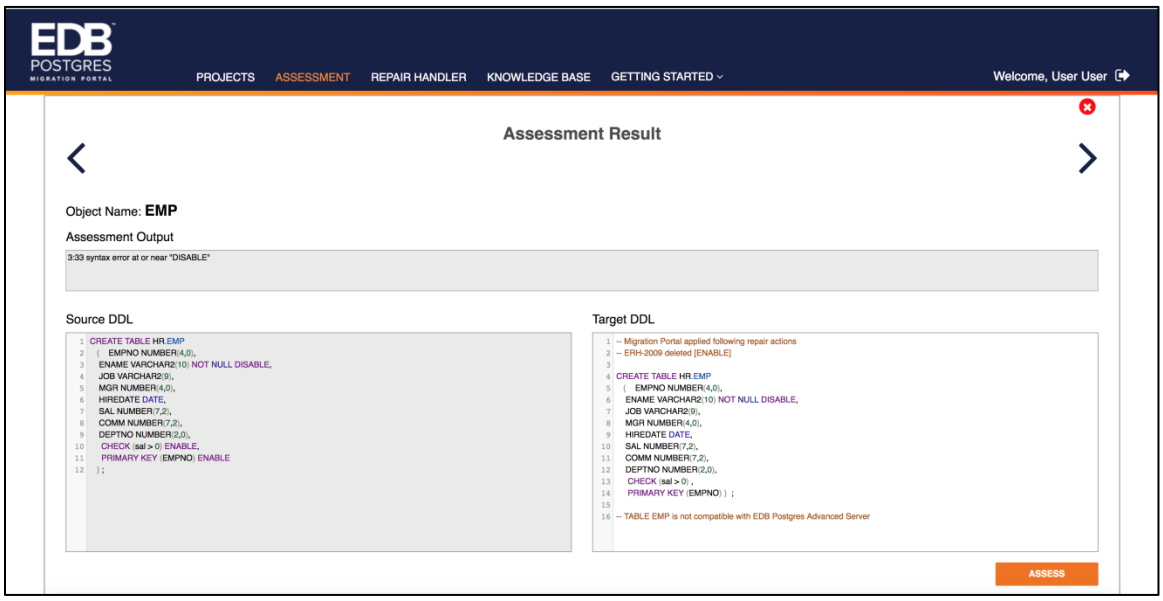


Figure 3.5 – Assessment result with errors.

13. On the `Knowledge Base` tab, you can enter the object name which is not compatible with Advanced Server and click `Search`.

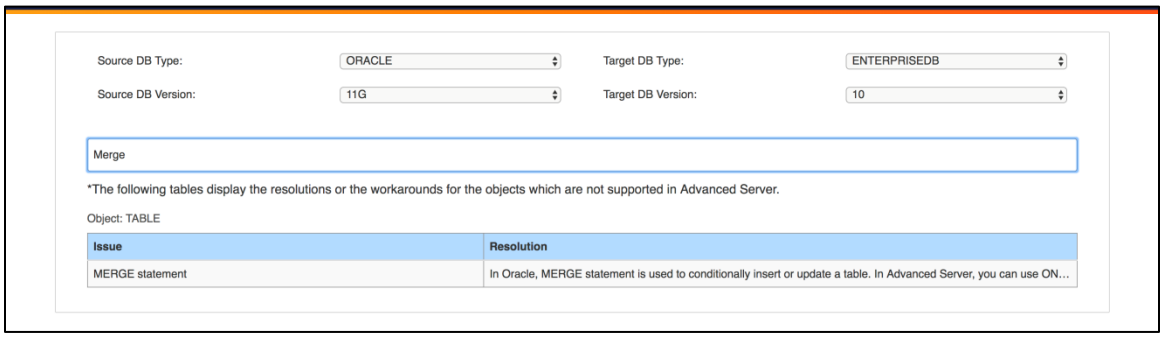


Figure 3.6 – Searching for object name

14. The object detailed panel displays the workaround or the resolution for the mentioned object. You can manually make the changes on the `Assessment` tab for that object, and click `Assess`.

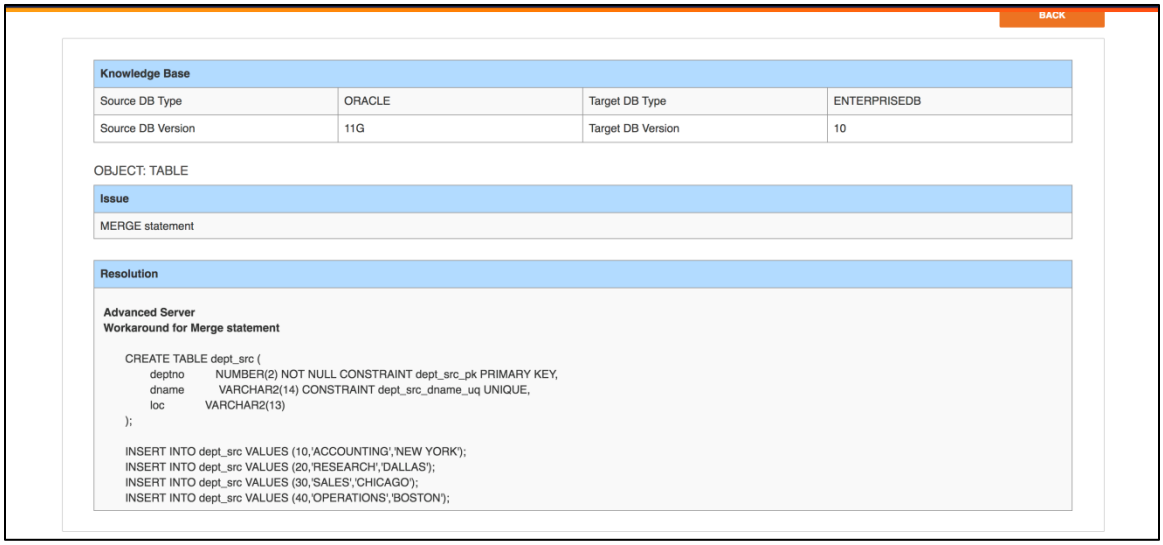


Figure 3.7—Workaround or resolution for non-compatible object

Similarly, you can make all the non-compatible objects compatible.

Please note: If the object is not available in the Knowledge Base, please contact the support team for assistance.

When you have finished working with the DDL, you can download the modified EDB compatible DDL as a text file and apply it to an existing Advanced Server instance.

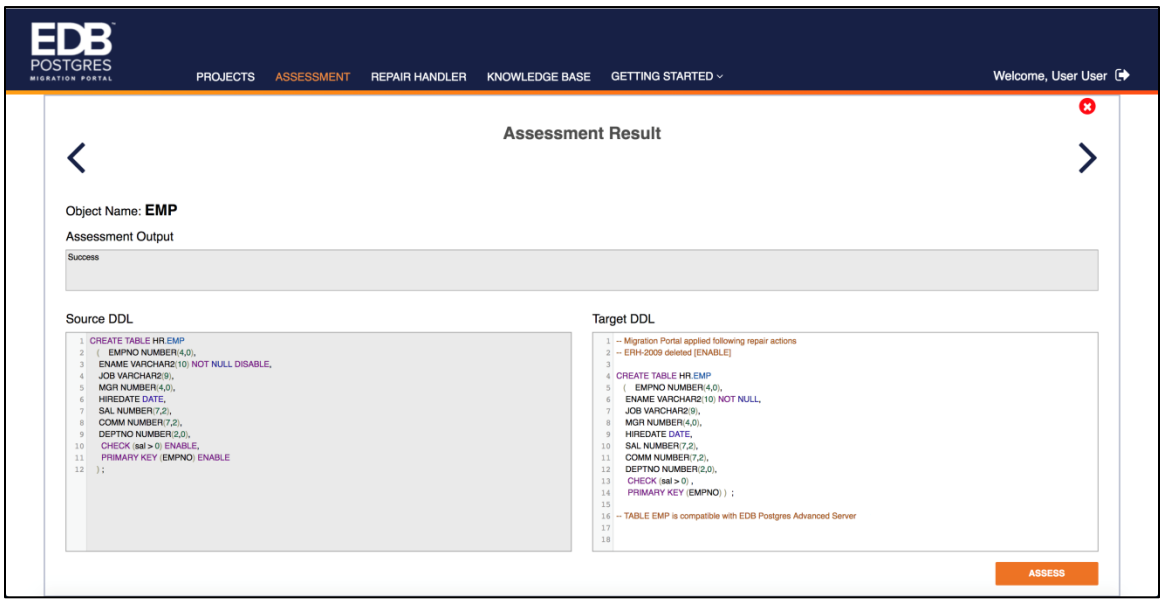


Figure 3.8 – Assessment result after resolving the errors.

3.3 Schema Migration

After resolving errors in your schemas, you can use the schemas with a client application such as pgAdmin, ToadEdge, or PSQL client or migrate the schema to an EDB Cloud Database Service (CDS) cluster.

Please Note: For more information, about using Toad Edge with Advanced Server, see Toad Edge® for Postgres.

The Advanced Server instance must be installed in Oracle Mode to enable native compatibility with key Oracle capabilities.

3.3.1 Migrating schema to CDS cluster

Perform the following steps to migrate your database to a CDS cluster:

1. On the `Assessment` page, click `Export/Deploy`.

2. Select the `Migrate to existing CDS cluster` option.

   For information about creating a new cluster, see Creating a Server Cluster.

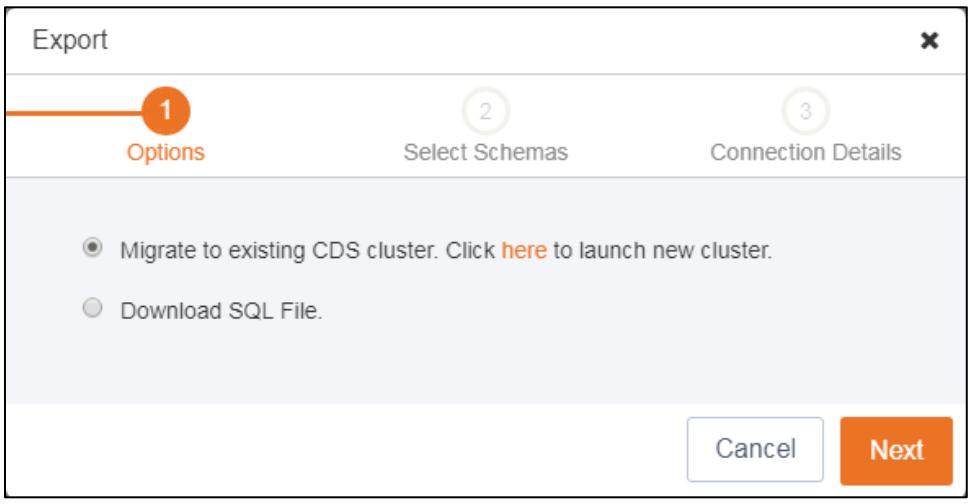


Figure 4.1 Migrating database to CDS cluster

3. Click `Next`.

4. Select the required schemas.

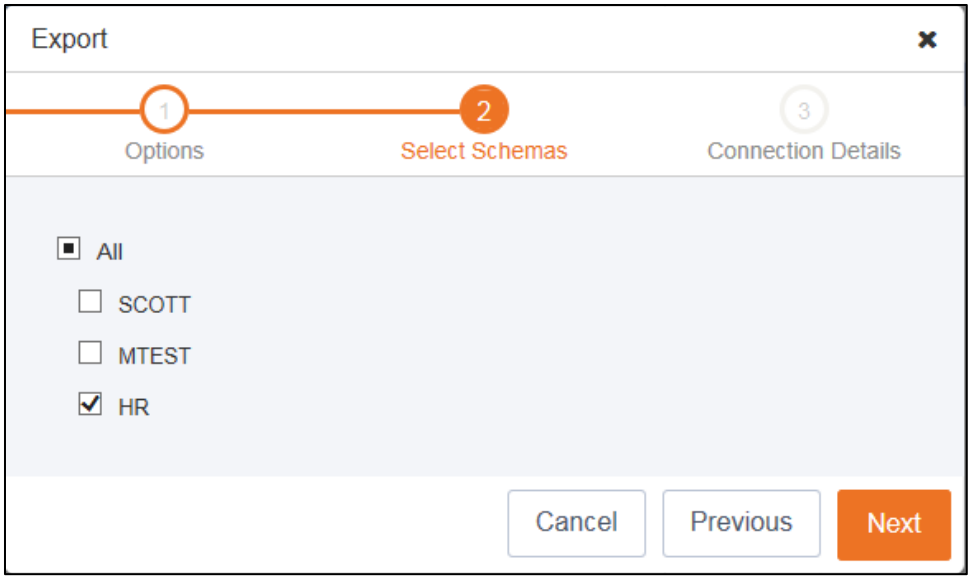


Figure 4.2: Select schemas

5. Click `Next`.

6. Enter the following details in the Connection Details:

- Enter the host name or IP address in the `Host name/address` field.
- Enter the port number in the `Port` field.
- Enter the database name in the `Maintenance database` field.
- Enter the user name in the `Username` field.
- Enter the password associated with the user in the `Password` field.

Figure 4.3 Connection details

7. Click `Test Connection` to verify the connection details.

   Note: You can click `Edit` to make changes to the connection details and retest the connection details.

8. Once the connection is successful, click `Deploy`.

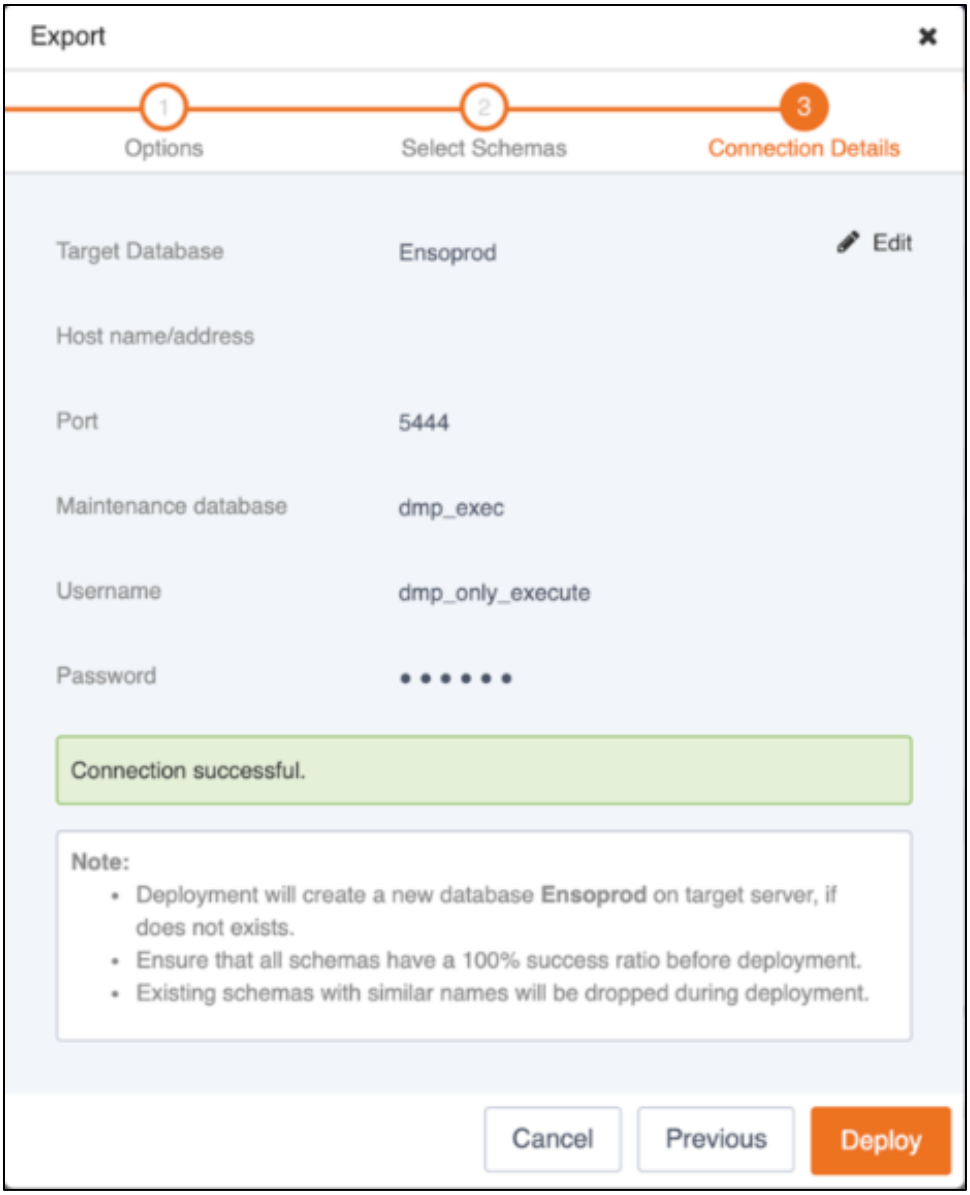


Figure 4.4: Connection successful

9. You can view the deployment details on the Deploy dialog; click `Download Summary` to download the deployment log.

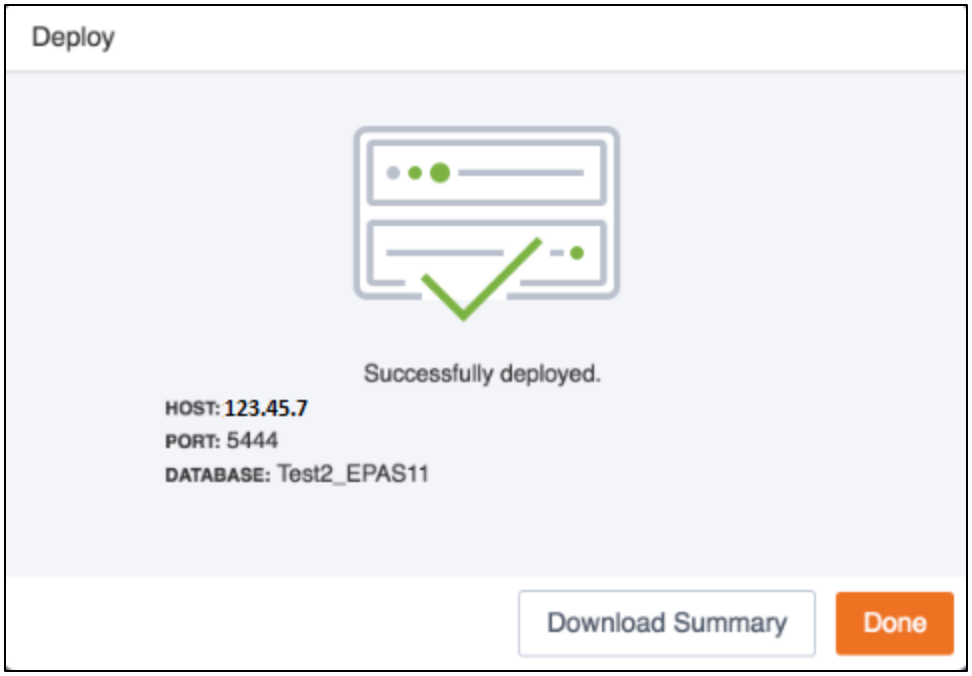


Figure 4.5: Deployment details

10. Click `Done` to close the window

3.4 Data Migration

After performing the schema migration, complete the following steps to migrate data:

1. Use EDB Migration Toolkit to migrate the table data. For detailed information about using Migration Toolkit, see EDB Postgres Migration Guide.

2. Configure the `toolkit.properties` file, ensuring that connection information for the source and target databases is available in the property file:

   ```
   SRC_DB_URL = jdbc: oracle:thin:@localhost:1521:ORCL
   SRC_DB_USER = user_name
   SRC_DB_PASSWORD = password

   TARGET_DB_URL= jdbc:edb://localhost:5444/migration
   TARGET_DB_USER = enterprisedb
   TARGET_DB-PASSWORD = password
   ```

   For more information, see Building the toolkit.properties File.

3. Invoke Migration Toolkit in `–dataOnly` mode; include the `–truncLoad` keyword to resolve foreign key dependencies across tables.

   For example, the following command:

   ```
   runMTK.sh -dataOnly -targetSchema hr -truncLoad HR
   ```

   The command migrates the specified source_schema to the target_schema. The data is loaded into the locally installed EDB Postgres instance with a database superuser named `enterprisedb` and the password as `password`.

   Please Note: The tables are truncated before attempting the data load.

4 Advanced Data Migration

For larger databases that require a parallel data load, you can use one of the following methods:

- Use the EDB Postgres Advanced Server database link feature (for compatibility with Oracle databases).

  Or

- Use a Dblink or a database link style migration (if your data contains CLOB data).

For more information, see the EDB Postgres Migration Guide.