

Database and Application Migration UGO

Quick Start

Issue 01
Date 2023-03-14



Copyright © Huawei Technologies Co., Ltd. 2023. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: <https://www.huawei.com>

Email: support@huawei.com


Contents

1 Logging In to the Console.....	1
2 Operation Guide.....	2
3 Evaluation Project.....	6
3.1 Step 1: Create an Evaluation Project.....	6
3.2 Step 2: Confirm the Target Database.....	14
4 Migration Project.....	16
4.1 Step 1: Create a Migration Project.....	16
4.2 Step 2: Implement Project Migration.....	21
5 Change History.....	27

1 Logging In to the Console

Procedure

Step 1 Log in to the console.

Step 2 Click  in the upper left corner and select a region and project.

For details about the regions supported by UGO, see [Global Products and Services](#).

Step 3 In the service list, choose **Databases > Database and Application Migration UGO**. The UGO dashboard page is displayed.

----End

2 Operation Guide

This section describes the UGO dashboard page, migration process, and task status.

Dashboard

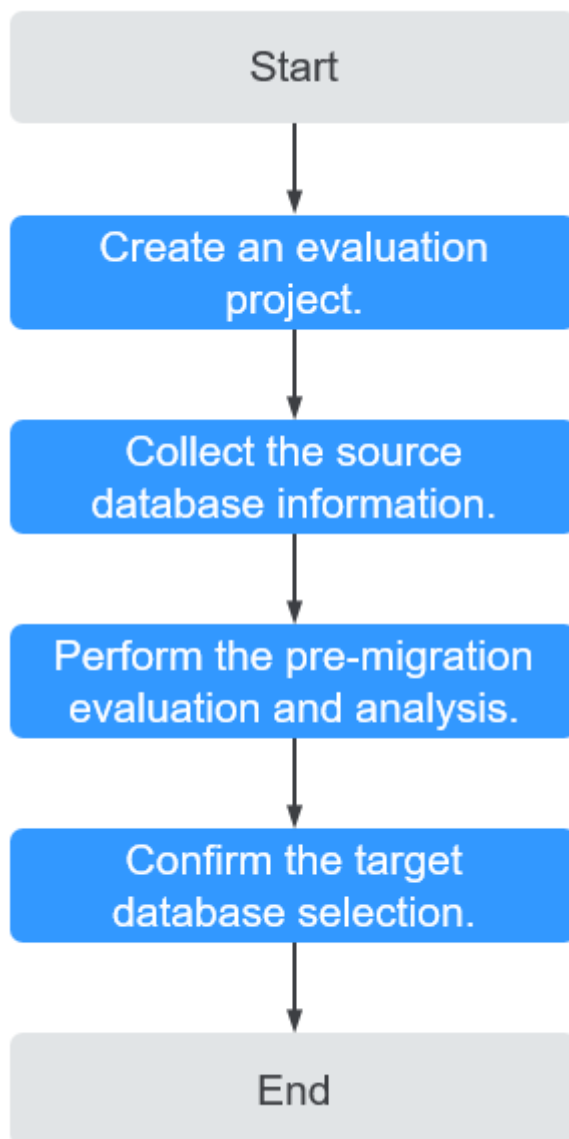
On the dashboard page, you can view UGO overview and application scenarios, database migration process guidance, and evaluation and migration project statuses. The service overview and process guidance are displayed by default. You can also hide them.

You can view statuses and quantity of existing projects. You can also click a status to view all projects in this status.

Migration Process

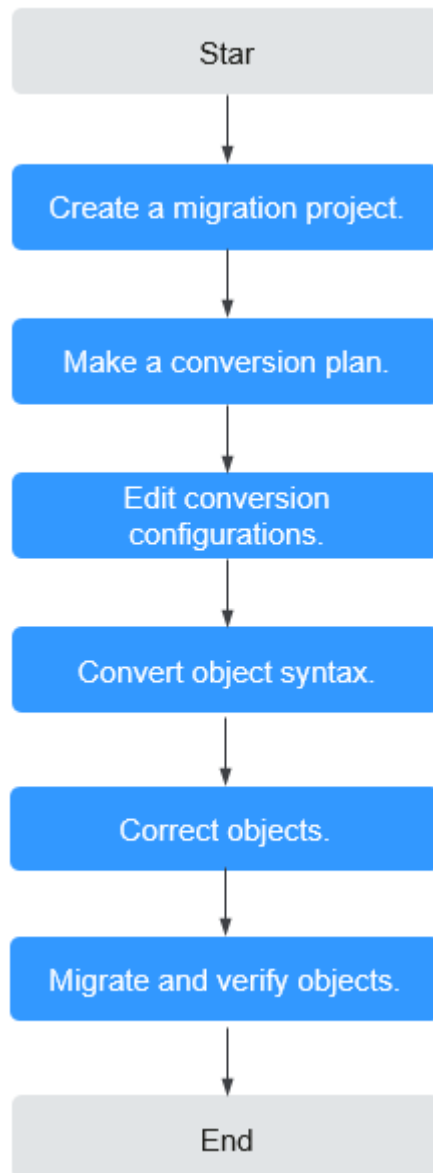
A complete database object migration consists of evaluation and migration. The processes are as follows.

Figure 2-1 Evaluation process



For details, see [Evaluation Project](#).

Figure 2-2 Migration process



For details, see [Migration Project](#).

Task Statuses

There are multiple task statuses that indicate different evaluation phases.

Different statuses are displayed in different colors in the dashboard. The following table describes the statuses.

Table 2-1 Evaluation project statuses

Project	Status	Description
Evaluation project	In progress	The project has been created, but the target database has not been selected.

Project	Status	Description
	Stopped	The project being created or re-evaluated was manually stopped.
	Completed	A target database has been selected and confirmed.
	Failed	An exception occurs during the evaluation.

Table 2-2 Migration project statuses

Project	Status	Description
Migration project	Ready	The project passes the permission check of the target database.
	Not ready	The project failed to pass the permission check of the target database.

3 Evaluation Project

3.1 Step 1: Create an Evaluation Project

Scenarios

This section describes the process of creating an evaluation project.

An evaluation project evaluates source databases and allows you to migrate the database objects to the selected target database.

Prerequisites

- Connection to the source database is successful, and all pre-check items are passed.
- You have permissions to create an evaluation project. To obtain permissions, see [Permission Management](#).
- You must have the following permissions for the source database to be migrated: DBMS_METADATA, Dynamic View, and Schema Object Count Check. If the source database type is DB2, you must have the DBADM or DATAACCESS permission. Otherwise, the pre-check fails and the next step cannot be performed.

NOTE

You are advised to use a database in a non-production environment.

Procedure

- Step 1** [Log in to the UGO console](#).
- Step 2** In the navigation pane on the left, choose **Schema Migration > DB Evaluation**.
- Step 3** Click **Create Project** in the upper right corner.
- Step 4** Read **Source Database Preparation and Authorization Tips** and click **Start Create**.
- Step 5** Enter the basic information on the **Basic Details** page. For details about the parameters, see [Table 3-1](#).

After the basic information is entered, the **Test Connection** button is available.

Figure 3-1 Evaluation project creation

Table 3-1 Parameter description

Parameter	Description
Project Name	Specifies the project name displayed in the project list. The name must contain 5 to 50 characters, start with a letter, and end with a digit or letter. Only letters, digits, underscores (_), and hyphens (-) are allowed.
(Optional) Exception Notification Mode	<p>SMN Topic</p> <p>Specifies whether to report exceptions through Simple Message Notification (SMN). To create an SMN topic, see Creating a Topic.</p> <p>NOTE</p> <p>Follow-up Operation</p> <p>After the topic is created, you can add a subscription. After the subscription has been confirmed, alarm notifications will be sent to the subscription endpoint via SMN.</p>

Parameter	Description
(Optional) Target DB Analysis	<ul style="list-style-type: none"> • Select Skip Target DB Evaluation: UGO will only collect data and not analyze the target database. There are only recommended target databases in the Target DB Analysis tab when you view evaluation project details. Select this option if you already have a confirmed target database. • Deselect Skip Target DB Evaluation: UGO will analyze different databases to produce summary and evaluation reports. Database analysis takes some time after data collection. <p>This option is selected by default.</p> <p>NOTE If the source database type is DB2, this option is selected by default and cannot be deselected.</p>
(Optional) Source DB Type	<p>Select a source database type. Currently, the supported source database are ORACLE 10g, 11g, 12c, 18c, and 19c and MySQL 5.6, 5.7 and 8.0. By default, the source database type is ORACLE-11g.</p> <p>If you want to select DB2 11.1, PostgreSQL 11, or PostgreSQL 12 as the source database, submit an application by choosing Service Tickets > Create Service Ticket in the upper right corner of the management console.</p> <p>NOTE If the source database type is MySQL, run the following command on the source database to enable the CPU count function.</p> <p>SET GLOBAL innodb_monitor_enable = cpu_n;</p>
(Optional) Network Type	<p>Public Network: An elastic IP address (EIP) is used to connect to the source database.</p> <p>If the source database network is restricted by the IP address trustlist, add the EIP to the source database network trustlist to ensure that the UGO can connect to the source database.</p> <ul style="list-style-type: none"> • EIP in CN South-Guangzhou: 124.71.59.255 • EIP in AP-Singapore: 110.238.109.54 • EIP in LA-Santiago: 159.138.116.198
(Optional) Connection Method	<p>Select Service Name or Connection string. Service Name is used by default. The following uses the service name as an example. Subsequent parameters vary depending on your selection of this parameter.</p> <p>NOTE</p> <ul style="list-style-type: none"> • For connection string, the standard JDBC is used to connect to the source database. • If the source database type is DB2, only Service Name can be selected for connection.
(Optional) Host Type	<p>Select Hostname or Host IP Address.</p>

Parameter	Description
Source DB Name	Enter the name of the database to be evaluated. NOTE This parameter is not displayed when the source database type is MySQL.
Hostname or Host IP Address	Enter the host name or host IP address based on the selected host type.
Host Port	Enter a database port.
User Name	Enter the username of the source database. You are advised to use the administrator username.
Password	Enter the password of the source database. The value contains up to 50 characters.
(Optional) SSL Type	Select No SSL . Currently, One Way SSL is unavailable. <ul style="list-style-type: none"> • No SSL: The SSL security protocol is disabled. There may be potential security risks. • One Way SSL: The target database will be authenticated and transmission will be encrypted. <ul style="list-style-type: none"> - Upload: Upload the root certificate file in JKS format. - Trust Store Password: Enter the password of the trust store used to access the certificate. NOTE <ul style="list-style-type: none"> • If you select One Way SSL, enter the correct uploaded file and entered password, which are private information of users. • Secure Socket Layer (SSL) is an encryption-based Internet security protocol for establishing an encrypted link between a server and a client. It provides privacy, authentication, and integrity to Internet communications.
Data Collected From (Optional)	Select DBA views or All views (default value). <ul style="list-style-type: none"> • DBA views: UGO collects data from objects in the entire source DB instance. • All views: UGO collects data from all objects owned and accessed by the source DB user.
(Optional) Tag	Use predefined tags in Tag Management Service (TMS). Predefined tags are visible to all service resources that support the tagging function. For details, see Tag Management Service User Guide . Enter a key and a value, and click Add . You can add up to 20 tags. For details, see Managing Tags .

Step 6 Click **Start Test** next to the **Test Connection** field.

- If the connection succeeded, the **Next** button is available.
- If the connection test failed, error message "Unable to connect to DB" is displayed.

Step 7 (Optional) Test network stability. A successful network stability test only means that there is little network latency or packet loss, or no packet loss at the current time. It takes 10s to 15s to complete.

Step 8 Click **Next** to go to the **Precheck** page.

All item check results are displayed. If the result of a check item is **Failed** or **Alarm**, the related reasons and suggestions are displayed. You can also click **Recheck All Permissions** to check the permissions again.

Figure 3-2 Prechecking permissions of Oracle 11g

No.	Check Item	Description	Check Result
1	DBMS_METADATA.Permission	Provides mechanism to retrieve metadata from the database dictionary as creation DDL to re-create the object	Success
2	Dynamic View Permission	Checks select access to various Dynamic views	Success
3	DDL Object Count Check	Checks for at least one Schema Object which have DDL objects to fetch can be accessed	Success
4	DBA Privilege	Check whether the user has the DBA permission. If the DBA permission check result is Alarm, the evaluation project can be created successfully, but some obje...	Success

NOTE

If any item fails to be checked, the failure cause and modification suggestions are displayed. After the modification is complete, click **Recheck All Permissions**.

Oracle as the source database type:

- If the permission check for **DBMS_METADATA**, **Dynamic View** or **Schema Object Count Check** fails, the next step cannot be performed.
- If **Check Result** is **Alarm**, some objects could not be collected because of permissions, but the evaluation project can still be created successfully.

MySQL as the source database type: All check item results must be **Success**, or you cannot go to the next step.

DB2 as the source database type: There is only one check item **DB2 Object Collection Check**. If the check item fails, you cannot go to the next step.

Step 9 After all check items are passed, click **Next** to go to the **Schema Assessment Scope** page.

Figure 3-3 Selecting evaluation scope

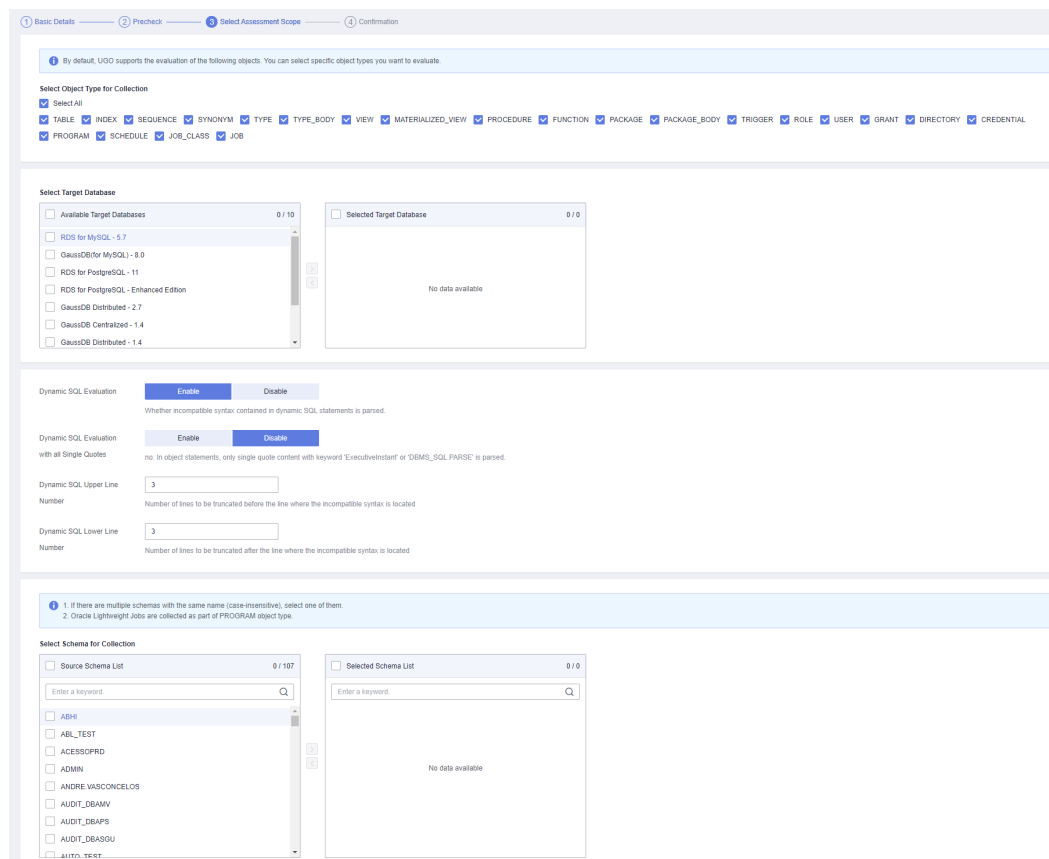




Table 3-2 Parameter description

Parameter	Description
Select Object Type for Collection	By default, all object types are selected. You can also manually select the object types to be collected as required.
Select Target Database	Select your required target databases. To select all target databases, click  . The target databases that you did not select will not be evaluated.
Dynamic SQL Evaluation	Yes: Incompatible syntax contained in dynamic SQL statements of an object is parsed. No: Incompatible syntax contained in dynamic SQL statements of an object is not parsed.
Dynamic SQL Evaluation with all Single Quotes	Yes: Single quote content of all object statements is parsed. No: In object statements, only single quote content with keyword EXECUTE IMMEDIATE or DBMS_SQL.PARSE is parsed.

Parameter	Description
Dynamic SQL Upper Line Number	Number of lines to be truncated before the line where the incompatible syntax is located
Dynamic SQL Lower Line Number	Number of lines to be truncated after the line where the incompatible syntax is located
Select Schema for Collection	<p>(Optional) Manually select schemas to be collected and click  . You can also select all schemas.</p> <p>If there are many schemas, you can search for them by schema name. The names and number of selected schemas are displayed on the right list.</p> <p>NOTICE</p> <ul style="list-style-type: none"> • If there are multiple schemas with the same name (case-insensitive), select one of them. • Oracle Lightweight Jobs are collected as part of PROGRAM object type.

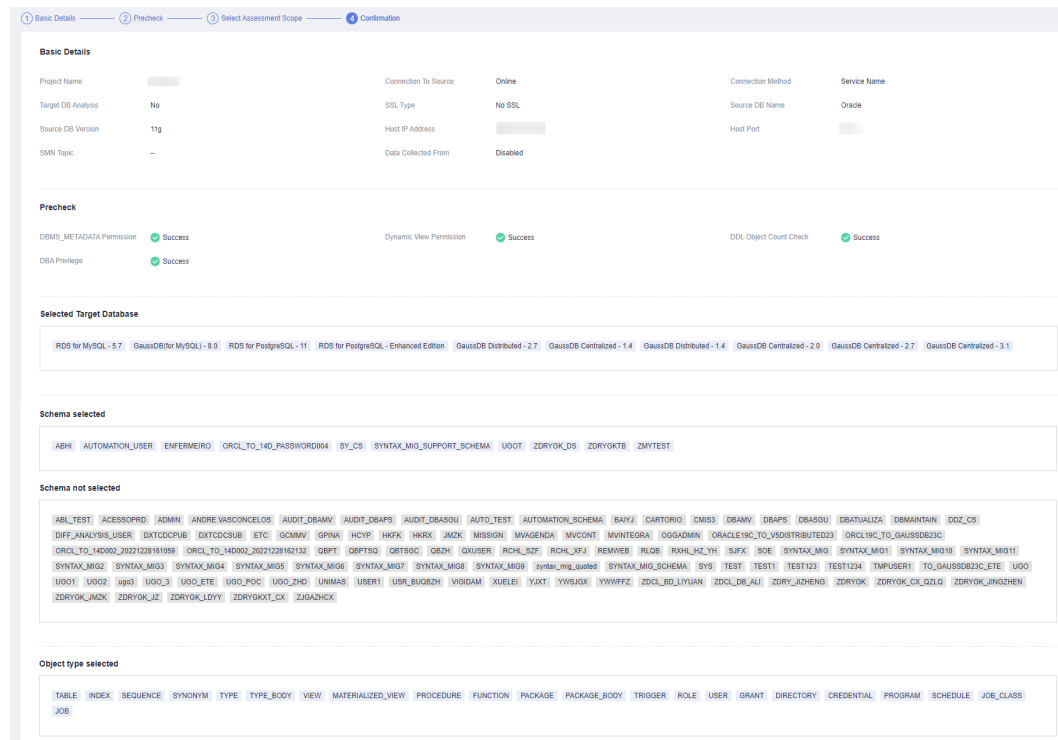
 **NOTE**

- Only the database objects are collected within the user permission scope, that is, within the selected schemas.
- After you select object types to be collected, UGO will evaluate their compatibility with the target object types and then migrate them.
- All collected data is stored in the source database of the tenant. The database password encrypted before being saved. Related data is visible only to you on the UGO console.
- After you delete migration tasks or deregister UGO, the data is deleted.
- Dynamic SQL evaluation is available only for Oracle databases.

Step 10 Click **Next** to go to the **Confirmation** page.

The basic information, pre-check results, selected target databases, selected and unselected schemas and object types are displayed.

Figure 3-4 Confirmation

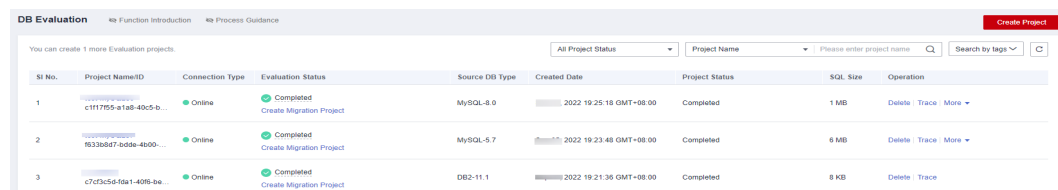


Step 11 Verify the settings and click **Create**. A message is displayed, indicating that the project is created successfully.

Step 12 Click **OK** to go to the **DB Evaluation** page. You can view the evaluation project you created in the list.

Data collection, project evaluation, pre-migration evaluation are required. You can view the status in the **Evaluation Status** column. You can stop a project that is being evaluated or resume a stopped project.

Figure 3-5 Viewing the created project



 NOTE

- You can create up to 10 evaluation projects.
- Before **Evaluation Status** of an evaluation project becomes **Evaluation - Success. Confirm Target DB Pending**, you can stop and continue the creation of the project. When **Evaluation Status** becomes **Evaluation - Success. Confirm Target DB Pending**, you can **confirm a target database** or re-evaluate objects as needed. However, if the source database type is DB2, re-evaluation is not supported.
- The evaluation time varies depending on the number of objects selected.
- After the evaluation is complete, you can click the project name to view its details. For details, see [Viewing Project Details](#).
- During data collection, the system periodically automatically retries the connection to the source database. Next connection retry time: Current time + Time required for checking the connection and network stability + Sleep retry interval. After a connection test, there is several second delay before a network stability check can be performed. You may see a few seconds difference between the two retry times.

----End

3.2 Step 2: Confirm the Target Database

This section describes how to confirm the target database.

NOTICE

The source database syntax is complex and flexible, so the workload evaluation and object evaluation statistics are for reference only.

Prerequisites

The source database is successfully evaluated.

Procedure

- Step 1** [Log in to the UGO console](#).
- Step 2** In the navigation pane on the left, choose **Schema Migration > DB Evaluation**.
- Step 3** Locate the project whose **Evaluation Status** is **Evaluation - Success. Confirm Target DB Pending**, and click the project name or click **Confirm Target DB Pending**.
- Step 4** On the displayed page, select your desired target database and click **Confirm Database Selection**.
- Step 5** Click **Confirm**.
- Step 6** After the target database is confirmed, a dialog box is displayed. You can click:
 - **Create Now** to go to the **Create Migration Project** page.
 - **Create Later** to remain the current page.

----End

 **NOTE**

- After you confirm the target database, **Confirm Database Selection** and **Re-evaluation** buttons are unavailable. The confirmed target database cannot be modified. Exercise caution when you confirm a target database.
- After you confirm the target database, **Project Status** changes to **Completed. Create Migration Project**.

4 Migration Project

4.1 Step 1: Create a Migration Project

Scenarios

This section describes how to create a migration project based on an evaluation project of the source database to migrate the objects from the source database to the target database.

You need to select the target database to which the source database objects are to be migrated.

Each migration project corresponds to an evaluation project. You can create multiple migration projects based on an evaluation project.

Constraints

System databases are maintained by the database itself and no creations can be performed on them. The MySQL system databases include **performance_schema**, **information_schema**, **mysql**, and **sys**. The PostgreSQL system database includes **postgres**.

If you use a system database to create a migration project, the permission check may fail.

Prerequisites

- You have permissions to create a migration project in the UGO console. To obtain permissions, see [Permission Management](#).
- There is at least one evaluation project whose **Evaluation Status** is **Completed**. **Create Migration Project**.
- The target database to be connected is normal and has no arrears or suspension.
- You as a target database user must have the permission to create, delete, and modify databases objects, such as schemas, tables, programs, indexes, users, functions, and views. For details, see [Viewing the Permission Check Report](#).

 NOTE

You are advised to use a database in a non-production environment as the target database.

Procedure

- Step 1** [Log in to the UGO console.](#)
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Migration**.
- Step 3** Click **Create Project** in the upper right corner.
- Step 4** On the **Create Migration Project** page, enter the required information. For details, see [Table 4-1](#).

Figure 4-1 Creating a migration project

The screenshot shows the 'Create Project' form with the following fields and options:

- Project Name:** A text input field with the placeholder 'Please Enter'.
- Exception Notification Mode:** A button labeled 'SMN Topic'.
- Exception Notification Mode (Secondary):** A dropdown menu with 'Please select' and a 'Create SMN Topic' link.
- Check Permissions:** A checkbox labeled 'Skip Permission Check'.
- Select An Evaluation Project:** A dropdown menu.
- Target DB:** A text input field with the value 'GaussDB Centralized'.
- Target DB Version:** A text input field.
- DB Information Input Type:** Two buttons: 'Select Instance' and 'Manual Input'.
- Database Instance:** A dropdown menu with 'Please select Database Instance' and links for 'View DB Instance' and 'View Unselectable DB Instance'.
- DB Name:** A text input field.
- User Name:** A text input field with the value 'root' and a help icon.
- Password:** A text input field with masked characters '*****'.
- Schemas to Migrate:** A checkbox labeled 'Select all' with the text 'Select schemas to be collected by UGO from the source database.'
- SSL Type:** Three buttons: 'No SSL', 'SSL No Auth', and 'One Way SSL'. Below them is the text 'Target database will be authenticated and the communication will be encrypted.'
- Add File:** A button labeled 'Add File' with the text 'Only a PEM certificate can be uploaded.'
- Tags:** A section with a note: 'It is recommended that you use TMS's predefined tag function to add the same tag to different cloud resources. View predefined tags'. Below this is a text input field and three buttons: 'Enter a tag key', 'Enter a tag value', and 'Add'. A note at the bottom says '20 tags available for addition.'
- Test Connection:** A button labeled 'Test Connection' with the text 'Test the connection between UGO and the target DB.'

Table 4-1 Parameter description

Parameter	Description
Project Name	<p>The project name must be unique.</p> <p>The name must contain 5 to 50 characters, start with a letter, and end with a digit or letter. Only letters, digits, underscores (_), and hyphens (-) are allowed.</p>
(Optional) Exception Notification Mode	<p>SMN Topic</p> <p>Specifies whether to report exceptions through Simple Message Notification (SMN).</p> <p>To create an SMN topic, see Creating a Topic.</p> <p>NOTE</p> <p>Follow-up Operation</p> <p>After the topic is created, you can add a subscription. After the subscription has been confirmed, alarm notifications will be sent to the subscription endpoint via SMN.</p>
Check Permissions	<ul style="list-style-type: none"> ● Select Skip Permission Check: The generated permission check report will have no content. ● Deselect Skip Permission Check: You can select system administrator or object owner only when the target database is GaussDB. <ul style="list-style-type: none"> – System Admin: Check the permission of the system administrator to create objects. – Object Owner: Check the permission of current user to create objects. <p>By default, Skip Permission Check is not selected.</p> <p>NOTE</p> <p>To create objects in the target database, you must have certain database permissions, such as those needed for creating tables and functions. If you skip the permission check, the system does not check whether you have these permissions.</p> <p>The migration may fail due to lack of permissions when SQL statements are converted on the target database.</p>

Parameter	Description
<p>Select An Evaluation Project</p>	<p>Select an evaluation project from the drop-down list.</p> <ul style="list-style-type: none"> ● Target DB: The confirmed target database type is displayed. Each tenant can connect to a maximum of five target databases at the same time. ● Target DB Version: The confirmed target database version is displayed. ● DB Information Input Type <p>NOTE When the target database is GaussDB Centralized 3.1, select Manually Input.</p> <p>Select Instance</p> <ul style="list-style-type: none"> - DB Instance: Select a DB instance of the target database. If no DB instance is available, create one on the console. View DB Instance: Click View DB Instance to go to the instance list page of the target database and view instance information. - View Unavailable Instances: Click View Unavailable Instance. A dialog box is displayed, showing the unavailable instance names and reasons. - DB Name: Enter the database name based on the selected target DB instance. The name contains up to 50 characters. - User Name: Enter the username of the target database. It is recommended that the user has administrator. - Password: Enter the password of the target database. <p>Manually Input</p> <ul style="list-style-type: none"> - Network Type: An elastic IP address (EIP) is used to connect to the source database. If the target database network is restricted by the IP address trustlist, add the EIP to the target database network trustlist to ensure that UGO can connect to the target database. EIP in CN South-Guangzhou: 124.71.59.255 EIP in AP-Singapore: 110.238.109.54 EIP in LA-Santiago: 159.138.116.198 - Host IP Address: Enter the IP address of the target database host. - Host Port: Enter the port of the target database. - DB Name: Enter the database name. The name contains up to 50 characters. - User Name: Enter the username of the target database. It is recommended that the user has administrator. - Password: Enter the password of the target database.

Parameter	Description
Schemas to Migrate	<ul style="list-style-type: none"> • Select Select all: Select schemas to be collected by UGO from the source database. • Deselect Select all: whether to reselect the schemas selected in the evaluation project. <p>By default, Select all is selected.</p>
(Optional) SSL Type	<ul style="list-style-type: none"> • No SSL: SSL is disabled and there may be potential security risks. • SSL No Auth: Transmission will be encrypted without authentication. • One Way SSL: The target database will be authenticated and transmission will be encrypted. <p>NOTE If the target database type is GaussDB, upload a PEM root certificate file. No password is required.</p>
(Optional) Tag	<p>Use predefined tags in Tag Management Service (TMS). Predefined tags are visible to all service resources that support the tagging function. For details, see Tag Management Service User Guide.</p> <p>Enter a key and a value, and click Add.</p> <p>A maximum of 10 tags can be added. For details, see Managing Tags.</p>

Step 5 Click **Test Connection**.

- If the connection test is successful, the **Create** button is available.
- If the connection test fails, an error message is displayed.

Step 6 Click **Create** in the lower right corner.

 **NOTE**

You can create up to 10 migration projects.

Step 7 After the creation is successful, click **OK** to go to the **Object Migration** page.

 **NOTE**

After a migration project is created, the permission check is automatically triggered. If the permission check is successful, the project status is **Ready**.

If the permission check fails, the project status is **Not ready**. You can manually perform a [permission check](#).

----End

4.2 Step 2: Implement Project Migration

This section describes how to implement a migration project. For details about the impact of UGO migration on the source database, see [Impact of Migration on the Source Database](#).

Prerequisites

The project status is **Ready**, the target database information is correct, and the connection test is successful.

Procedure

- Step 1** On the **Object Migration** page, locate the project that you want to migrate and click **Migrate** in the **Operation** column.

On the **Conversion Plan** page, the collection objects and types for the project are displayed on the left. For details about the object information, see [Viewing Evaluation Project Details](#).

Figure 4-2 Conversion plan

Schema	Object Name	Object Type	Object Status	Conversion Status	Update Time
UGO	FN_CONCAT_STR	FUNCTION	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	COLUMNS_OBJECT	TYPE	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	EMP_SEQ	SEQUENCE	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	FN_GETCOUNT	FUNCTION	Abnormal	Skip	Feb 22, 2023 10:55:04 GMT+08:00
UGO	FN_GETDEPTNO	FUNCTION	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	FN_GET_EMPNAMES	FUNCTION	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	APP_BULLETIN_T	TABLE	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	AAA	TABLE	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	FN_GET_EMPNAMES2	FUNCTION	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00
UGO	ARRYTYPE	TYPE	Normal	Convert	Feb 22, 2023 10:55:04 GMT+08:00

NOTE

If the source database type is Oracle and the target database type is distributed GaussDB, you can select a distributed mapping for objects of the TABLE object type.

- You can search for objects by date or object name, or filter objects by schema, object status, or conversion status.
- User Password** is unavailable if the target database is RDS for PostgreSQL Enhanced Edition.
 - If you want to convert the object type USER, you must set a password to complete the conversion. The same password will be used for all USER object creation on the target database. After the migration, the individual user passwords must be changed manually. If you do not want to convert the object type USER, select the desired USER objects and click **Skip Conversion**. Then, the **Conversion Status** of the objects becomes **Skip**. To continue the conversion, select the desired objects and click **Convert**.
 - SSL connection must be selected. If Non-SSL connection is selected, the password will be transmitted as plain text as part of the database connection and any SQL statements involving a password will be insecure.
 - After the password is configured, it cannot be changed again until after the migration is complete.
 - The password can consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#\$%^&*()-_+=+|[{}];,;<.>/?). Spaces are

not allowed and there are up to three consecutive characters in the password.

- To select the type of objects to be migrated, click **Select Migration Object Types**. At least one object type must be selected for migration.
- If **Object Status** of objects is **Abnormal**, their **Conversion Status** is **Skip**. It means that abnormal objects cannot be converted.
- If **Object Status** of objects is **Duplicate**, these objects are not migrated by default. For example, if the source database Oracle contains tables with the same name but different cases, they cannot be migrated to GaussDB. Tables and views with the same name cannot migration to GaussDB. However, UGO will rename indexed and triggers with the same name but different cases.
- Oracle as the source database type and GaussDB as the target database type: If you locate an object whose type is USER and click **Skip Conversion**, the following message is displayed, indicating that after USER migration is ignored, you need to locate the **Support for connection** feature in the **Conversion Config** page, and set sysadmin as the user to create and execute the GaussDB script. Otherwise, the migration may fail.

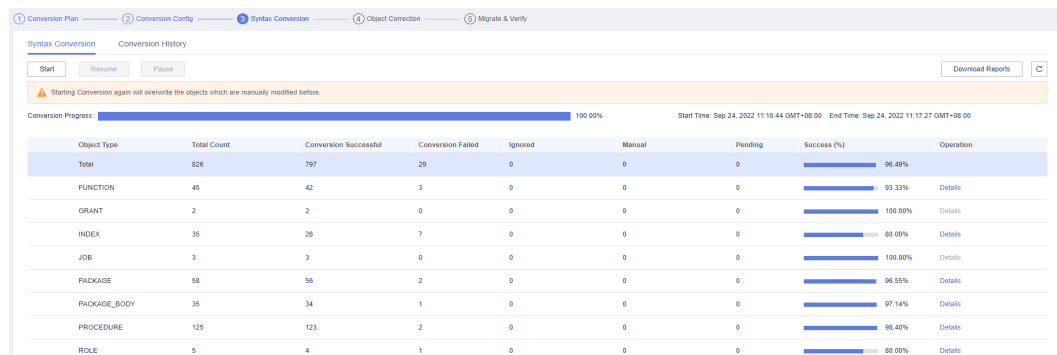
Step 2 Click **Next**.

For details, see [Introducing Basic Functions of Conversion Configuration](#).

Step 3 Click **Next**.

Step 4 Click **Start** to start the migration. The following information is displayed: object type, the number of total objects, the number of objects converted successfully, the number of objects that failed to be converted, conversion start time, and conversion end time.

Figure 4-3 Syntax conversion



- The migration progress is displayed in a progress bar and as a percentage.
- Click **Download Reports**, locate the required report, and click **Download** to download the report to the local PC for analysis.
 - **Conversion Error Report:** This report contains details about objects that could not be converted to equivalent syntax in the target database.
 - **Anonymized Conversion Error Report:** This report contains the details about objects, in anonymized form, that could not be converted to equivalent syntax in the target database.
 - **Conversion Risk Report:** This report contains the details about objects that were converted with risks based on selected configuration options.

- **Anonymized Conversion Risk Report:** This report contains details about objects, in anonymized form, that were converted with risks based on the selected configuration options. However, there are function differences after the conversion.
- **Converted Script Parse Failures Report:** This report contains the details about objects that could not be parsed using the conversion script for the target database syntax. However, there are function differences after the conversion.
- **Anonymized Converted Script Parse Failures Report:** This report contains details about objects, in anonymized form, that could not be parsed using the conversion script for the target database syntax.
- Locate an object type that failed to be converted, and click **Details** in the **Operation** column to go to the **Object Correction** page to view details about the object type.
- For details about how to view the migration history, see [Viewing Syntax Conversion History](#).
- Click **Pause** to pause the process. You can query the migration tasks that have been executed in the conversion history.
- Click **Start** to start a new conversion process. Click **Resume** to continue the conversion process.



If you click **Start**, the data that has been processed in the task will be overwritten. Exercise caution when performing this operation.

Step 5 Click **Next** to go to the **Object Correction** page.

Figure 4-4 Object correction

Schema	Object Name	Object Type	Conversion Status	Migration Status	Operation
UGO	FN_CONCAT_STR	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_GETDEPTNO	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_GET_EMPNAMES	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_GET_EMPNAMES2	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_GET_EMPNAMES3	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_GET_EMP_BY_ENO	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_PRODUCT_AMOUNT	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_PRODUCT_AMOUNT2	FUNCTION	Pending	Pending	Modify View Details
UGO	FN_MYMONTH	FUNCTION	Pending	Pending	Modify View Details
UGO	FINDCOURSE	FUNCTION	Pending	Pending	Modify View Details

- You can search for objects by name, or filter objects by schema, migration status, or conversion status.
- Locate objects and click **Skip Migration** to ignore the objects that you do not want to verify.
- Select object types or objects you want to rerun conversion for and click **Rerun Conversion**. The SQL modification of other objects is not overwritten

On the **Rerun Conversion** page, select the objects you want to rerun conversion, and click **Rerun Conversion** to perform **Step 4**.

NOTICE

When **Migration Status** of objects is **Success** and you re-run the conversion, an error message indicating that the objects already exist in the target database will be displayed. To avoid this problem, manually delete these objects from the target database. If you select a new DB object type, all objects of the selected type are converted again.

- **Bulk Update Status:** Change the statuses of all failed objects to **Manual** or **Ignore**.
 - **Manual:** If an object fails to be converted or migrated but migration verification is required for the object, you can select this option to convert its migration status to **Manual**.
 - **Ignore:** If an object fails to be converted or migrated but migration verification is not required for the object, you can select this option to convert its migration status to **Ignore**. If you click **Undo Skip**, the **Conversion Status** will change to **Manual**.
- Select an object and click **Modify** to modify the selected objects. For details, see [Modifying Objects](#).

 **NOTE**

- Select the schema that can be ignored and click **Skip Migration**. Their **Conversion Status** or **Migration Status** changes to **Ignore**. You can also click **Undo Skip** to roll back to the original status.
- If you click **Ignore**, the migration status of the object changes to **Ignore**. If you click **Undo Skip**, the migration status changes to **Manual**.
- If there are features commented out in the migration, that may affect functions. You can click **Modify** to see the details.

Step 6 Click Next.

NOTICE

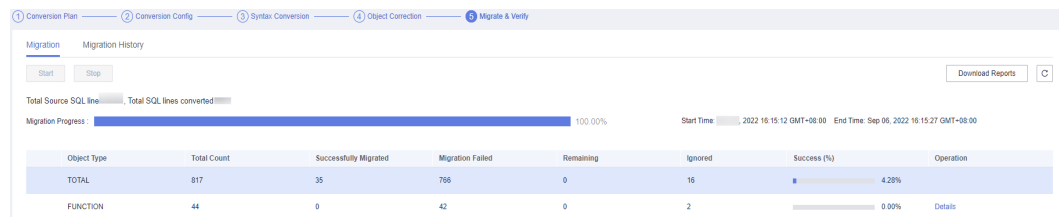
Correct all failed conversion items in the **Object Correction** page before starting migration verification.

Step 7 Click Start to start the verification. The migration progress is displayed in a progress bar and as a percentage.

After the migration verification is complete, the total number of SQL lines, the number of successfully migrated SQL lines, and the number of failed SQL lines are displayed.

For details about how to view the migration history, [Viewing Migration History](#).

Figure 4-5 Verification



- If a message is displayed, indicating that there were errors or risks during the migration, the system will automatically stop the verification process.
- After the migration is stopped, click **Start** to continue the migration.
- **View Empty Stored Procedure:** You can view objects that fail to be created and failure occurrences.
- Click **Download Reports**, locate the required report, and click **Download** to download the report to the local PC for analysis.
 - **Migrate and Verify Report:** This report includes a summary of object statuses during migration and verification.
 - **Migrate and Verify Error Report:** This report includes failure details, such as statuses, migrated statements, and error details for each object.
 - **Migrate and Verify Anonymized Error Report:** This report consists of failure details, such as statuses, migrated statements, and error details for each object, but the original statement and migrated statements will be anonymized.
- Locate an object type that failed to be migrated, click **Details** to return to the object correction page and view details about the object type.

Step 8 After the migration verification is complete, if any item fails the verification, return to the object correction page. You can modify the items one by one or click **Bulk Statement Update** to modify them in batches.

- Batch update: You can click **Batch Statement Update** to search for and modify objects with the similar issues in batches. For details, see [Updating Statements in Batches](#).
- Single modification: You can manually modify objects one by one. For details, see [Modifying Objects](#).

NOTE

If no item fails the verification, the **Batch Statement Update** and **Modify** buttons on the **Object Correction** page are unavailable.

----End

5 Change History

Released On	Description
2023-02-28	<ul style="list-style-type: none"> Optimized the console and updated the GUI elements and screenshots. Added the migration from Oracle to RDS for PostgreSQL 12, 13, and 14 in Step 1: Create an Evaluation Project. Added the migration from PostgreSQL 11 and 12 to GaussDB Centralized 3.1 in Step 1: Create an Evaluation Project. Optimized the description of check items on the precheck page in Step 1: Create an Evaluation Project. Optimized the password rules in Step 2: Implement Project Migration.
2023-01-30	<ul style="list-style-type: none"> Optimized the re-conversion process in Step 2: Implement Project Migration. Modified the check items when MySQL is used as the source database type in Step 1: Create an Evaluation Project.
2022-12-30	<ul style="list-style-type: none"> Added the source database MySQL 5.6 in Step 1: Create an Evaluation Project. Changed GaussDB 2.3 to GaussDB 2.7 in Step 1: Create an Evaluation Project. Deleted the TPS, QPS, and table complexity displayed in the source database profile Step 1: Create an Evaluation Project. Step 1: Create a Migration Project: Added the type of the certificate to be uploaded for the target database GaussDB.

Released On	Description
2022-11-30	<ul style="list-style-type: none"> Added the target database GaussDB Centralized 3.1 and modified the related screenshots in Step 1: Create an Evaluation Project. Added such a description that when the target database is GaussDB Centralized 3.1, DB Information Input Type is set to Manually Input. Added the description that One Way SSL is not suitable for the target database GaussDB in Step 1: Create a Migration Project.
2022-10-30	<ul style="list-style-type: none"> Updated the pre-check items of the source database MySQL in Step 1: Create an Evaluation Project. Added a notice that SQL object types are not collected for object evaluation in Step 1: Create an Evaluation Project. Updated the description of conversion configuration in Step 1: Create a Migration Project. Allowed Select Instance for DB Information Input Type when the target database type is GaussDB.
2022-09-30	<ul style="list-style-type: none"> Added the LA-Santiago region in Logging In to the Console. Updated GaussDB versions, GUI elements and screenshots in Step 1: Create an Evaluation Project. Updated the GUI elements and screenshots in Step 1: Create a Migration Project.
2022-08-30	<ul style="list-style-type: none"> Added the description of MySQL and DB2 as source database types in Step 1: Create an Evaluation Project. Updated the GUI elements in Step 1: Create an Evaluation Project. Updated the GUI elements in Step 1: Create a Migration Project. Added the description of MySQL and DB2 in Step 2: Implement Project Migration. Updated the GUI elements in Step 2: Implement Project Migration. Updated Summary Report to Migrate and Verify Report.
2022-07-30	<p>Added source database types and updated screenshots in Step 1: Create an Evaluation Project.</p>

Released On	Description
2022-06-30	<ul style="list-style-type: none"> ● Added Source Database Preparation and Authorization Tips in Step 1: Create an Evaluation Project. ● Updated GUI elements in Step 1: Create an Evaluation Project. ● Added user password usage restrictions and report description in Step 2: Implement Project Migration. ● Updated GUI elements in Step 2: Implement Project Migration.
2022-05-30	This issue is the first official release.