Database and Application Migration UGO(UGO) 25.1.0

Working with UGO

 Issue
 01

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Database Evaluation

UGO collects basic information and performance data of a source database, as well as SQL statements of specific object types, and provides an overview of the source database. Based on the analysis of factors such as compatibility and object complexity, UGO provides an analysis report on the compatibility and reconstruction cost of the source and target databases, helping you select a suitable target database and evaluate migration workloads.

1.1 Viewing Data Collection Logs

Scenarios

Data collection logs record the events that occur in a project and the time when the events occur.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- **Step 3** In the evaluation project task list, select the project to be analyzed and click **Trace** in the **Operation** column. The collection trace list is displayed.

The detailed information includes the schema names, number of collected logs, and log collection statuses of events.

Figure 1-1 Collection log details

Traced Events			\times
Event	Details	Event Time	
Object Collection Started		15:00:23 GMT+08:00	
Schema DDL Count Collection Started	{ "Schema": "AUTO_BULK_HISTORY_001" }	15:00:23 GMT+08:00	
Schema DDL Count Collection Completed	{ "Schema": "AUTO_BULK_HISTORY_001", "DDL Object Count": 12, "Status": "	15:00:23 GMT+08:00	
Schema DDL Collection Started	{ "Schema": "AUTO_BULK_HISTORY_001" }	15:00:23 GMT+08:00	
Schema DDL Collection Completed	{ "Schema": "AUTO_BULK_HISTORY_001", "Status": "Success" }	15:00:23 GMT+08:00	
Schema DDL Collection Started	{ "Schema": "PUBLIC" }	15:00:23 GMT+08:00	
Schema Dependency Count Collection Started	{ "Schema": "AUTO_BULK_HISTORY_001" }	15:00:24 GMT+08:00	
Schema Dependency Count Collection Completed	{ "Schema": "AUTO_BULK_HISTORY_001", "Dependency Count": 0, "Status": "	15:00:24 GMT+08:00	
Schema Dependency Collection Started	{ "Schema": "AUTO_BULK_HISTORY_001" }	15:00:24 GMT+08:00	
Schema Dependency Collection Completed	{ "Schema": "AUTO_BULK_HISTORY_001", "Status": "Success" }	15:00:24 GMT+08:00	
T-1-1 D4 40			
		Cit	ose

- Schema: schema name.
- **DDL Object Count**: Number of collection objects in the schema.
- Status: log collection status.

----End

1.2 Re-Collecting Objects

Prerequisites

- The **Connection Type** of a project is **Online**.
- You have required permissions of a project.
- An evaluation project has been created but the target database has not been confirmed.
- There are objects that are not collected in the source database of a project.
- Frozen accounts cannot re-collect objects.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- Step 3 In the evaluation project list, click the name of an online project whose Project Status is In Progress-Object Collection Error. The Source DB Analysis page is displayed.
- **Step 4** Click **View Object Details** on the right of the **Object Statistics** area. The database object list page is displayed.
- **Step 5** Select objects that are not collected and click **Re-collect** above the list.
- **Step 6** In the displayed dialog box, click **OK**. A message is displayed, indicating that the re-collection task is submitted.

The re-collection is performed asynchronously. You need to wait until the re-collection is complete and refresh the page.

----End

1.3 Re-Evaluate a Project

Prerequisites

The **Project Status** of an evaluation project is **In progress. Confirm Target DB Pending**.

Frozen accounts cannot re-evaluate objects.

NOTE

This function is not available for Microsoft SQL Server databases.

Scenarios

You can re-evaluate the information of your project, including dynamic SQL statements, workloads, object conversion, top incompatible syntax points, and system objects.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- Step 3 In the evaluation project task list, select the project to be analyzed and choose More > Re-Evaluate in the Operation column.
- **Step 4** (If the source database type is Oracle) In the displayed box, click **Edit** and configure **Dynamic SQL Evaluation**.
 - Yes: The dynamic SQL statements in objects are analyzed.
 - No: The dynamic SQL statements are not analyzed.

Step 5 Click OK.

- **Project Status** of the evaluation project is **In progress**. The detailed project status and progress are also displayed.
- To stop or resume the re-evaluation, click **Stop** or **Resume**.
- ----End

1.4 Performing an Incremental Evaluation

NOTE

- This function is available only for the source databases Oracle and MySQL.
- If the source database is MySQL, the incremental USER, GRANT, and ROLE objects cannot be collected.

Prerequisites

- You have required permissions of a project.
- An evaluation project has been created but the target database has not been confirmed.
- Tables, functions and other data are added to the source database in a project. Deleted or modified data cannot be identified.
- Before performing incremental evaluation, you must perform differential analysis.
- Frozen accounts cannot perform an incremental evaluation.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- Step 3 In the evaluation project task list, select the project to be analyzed and choose More > Run Differential Analysis in the Operation column.
- **Step 4** After the differentiation analysis is complete, choose **More** > **Perform Incremental Evaluation** in the **Operation** column
- Step 5 After the incremental evaluation is complete, view the updated project information. For details about the project, see Viewing the Database Evaluation Result.

----End

1.5 Resuming a Stopped Project

Prerequisites

- Project Status of an evaluation project is Stopped.
- Frozen accounts cannot resume a stopped project.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- **Step 3** In the evaluation project list, locate the project in the **Stopped** status and click **Resume** in the **Operation** column.

Figure 1-2 Resuming a project

Resume Operation -	×
The project will be resumed. You can use the existing configuration values or click Edit to modify DB Connection Timeout and Data Collection.	
Modify the existing configuration values? Edit $$	
Cancel	

Step 4 To prevent database collection from occupying resources for a long time, you can configure the collection timeout period. To modify DB Connection Timeout, click Edit. Then, select Skip Collection Timeout Object for Data collection.

Figure 1-3 Editing settings

The project will be resume modify DB Connection Ti Modify the existing configu	ed. You can use the exi imeout and Data Colle uration values? Close	sting configuration values or clic action.	k Edit to
DB Connection Timeout	300,000	ms	
	The connection atte after this threshold v second = 1000 millis	mpt to the database will be termi alue.Value Range : 30000-3600 seconds.	inated 000 ms 1
Data collection	Skip Collection	Timeout Object	
Data collection	true: If the database some objects and re collected, and contir the database conne creation will be stop connection timeout i	connection times out, the system cords the objects that failed to b nues to create an evaluation proj ction times out, the evaluation pr ped. You need to change the dat nterval and resume the creation	m skips e ect.false: oject abase of the

• **DB Connection Timeout**: time limit within which the system attempts to connect to the database, in millisecond. The value ranges from **30000** to **3600000**.

• Skip Collection Timeout Object

- Select this option: If the database connection times out, the system skips some objects and records the objects that failed to be collected, and continues to create an evaluation project.
- Deselect this option: If the database connection times out, the evaluation project creation will be stopped. You need to change the database connection timeout and resume the creation of the project.

Step 5 To apply the current settings, click **OK**.

----End

1.6 Running Differentiation Analysis and Viewing the Generated Report

D NOTE

This function is not available for Microsoft SQL Server and PostgreSQL databases.

Prerequisites

- The **Project Status** of a project is **Completed. Create Migration Project**.
- Frozen accounts cannot run differentiation analysis.

Scenarios

You can run a difference analysis of collected data during database evaluation.

Running differentiation analysis is to learn about the differences between the recent evaluation and the previous evaluation. The added or deleted objects can be displayed in the differentiation analysis, but the modified objects cannot be displayed.

If collected data does not change, the difference analysis report remains unchanged when you run the analysis.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- Step 3 In the evaluation project task list, select the project to be analyzed and choose More > Run Differential Analysis in the Operation column.

A message **Differential Analysis Scheduled** is displayed.

- Step 4 After the Project Status shows Differential Analysis Generated, choose More > View Differential Analysis Report in the Operation column.
- **Step 5** In the **Differential Analysis Report** page, view the schema names, object types, object names, and supported operations.

----End

1.7 Managing a Tag

Scenarios

Tag Management Service (TMS) enables you to use tags on the management console to manage resources. TMS works with other cloud services to manage tags. TMS manages tags globally, and other cloud services manage their own tags.

- You are advised to configure predefined tags on the TMS console.
- A tag consists of a key and value. You can add only one value for each key.
- Each DB instance can have up to 10 tags.
- You can add tags when creating an evaluation project or a migration project, or add tags after the project is created.

Adding a Tag

Step 1 Log in to the UGO console.

Figure 1-4 Adding a tag

- **Step 2** In the navigation pane on the left, choose **Schema Migration** > **DB Evaluation** or **Schema Migration** > **Object Migration**.
- **Step 3** Click the project name.
- **Step 4** On the **Tags** page, click **Add Tag**. In the displayed dialog box, enter a tag key and value, and click **Add**.
- **Step 5** After all tags are added, click **OK** in the lower part of the dialog box. You can view and manage your tags of the current page.

To add a tag, enter a tag key a	and a tag value below.	
Enter a tag key	Enter a tag value	Add
Tags you can still add: 10		

- When you enter a tag key and value, the system automatically displays all predefined tags associated with the tag.
- The tag key cannot be empty and must be unique. It can contain up to 128 characters, including letters, digits, spaces, and special characters (_.:=+-@), but cannot start with **_sys_** or a space and end with a space.
- A tag value can contain up to 255 characters, including letters, digits, spaces, and special characters (_.:/=+-@), but cannot start and end with a space.

----End

Editing a Tag

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **Schema Migration** > **DB Evaluation** or **Schema Migration** > **Object Migration**.
- **Step 3** Click the project name.
- **Step 4** Locate the tag to be edited and click **Edit** in the **Operation** column. In the displayed dialog box, change the tag value and click **OK**.
 - Only the tag value can be edited.
 - A tag value can contain up to 43 characters, cannot start and end with a space, and cannot contain the special characters (=*<>,|/).
- **Step 5** After the tag is edited, view and manage it in the current page.

----End

Deleting a Tag

- Step 1 Log in to the UGO console.
- Step 2 In the navigation pane on the left, choose Schema Migration > DB Evaluation or Schema Migration > Object Migration.
- **Step 3** Click the project name.
- **Step 4** Locate the tag to be deleted and click **Delete** in the **Operation** column. In the displayed dialog box, click **OK**.
- **Step 5** After the tag is deleted, view that there is no the tag in the current page.

----End

NOTE

Tag information cannot be deleted by accounts frozen for security reasons. All frozen accounts cannot modify and add tags.

1.8 Deleting an Evaluation Project

- Deleted projects cannot be recovered.
- Evaluation projects frozen for security reasons cannot be deleted.

Prerequisites

- The **Project Status** of an evaluation project is **Completed. Create Migration Project** or **In progress. Confirm Target DB Pending**.
- The evaluation project is not associated with any migration project.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **DB Evaluation**.
- **Step 3** In the evaluation project list, locate the project you want to delete and click **Delete**.
- **Step 4** In the displayed dialog box, click **OK**.

----End

2 Object Migration

After the database evaluation is complete and the target database is confirmed, you can start to migrate database objects with a few clicks. In this module, UGO guides you to make a conversion plan and design a solution to automatically convert syntax. For objects that fail to be converted or migrated, you can edit and batch modify them to simplify manual reconstruction. Each modification is recorded, so that you can view and roll back historical modifications.

2.1 Object Migration Implementation

2.1.1 Making a Conversion Plan

Scenarios

After a migration project is created, select objects to be migrated on the conversion plan page. You can select an object or a type of objects in batches.

Constraints

- If the source database type is GoldenDB or MySQL (earlier than 8.0), there is no ROLE object in the source database. UGO does not collect ROLE objects and the number of ROLE objects is displayed as **0**.
- To migrate data, you are advised to skip the trigger migration temporarily. Otherwise, triggers may change data during migration. After data is migrated, migrate the triggers.
- If **Object Status** of objects is **Abnormal**, their **Conversion Status** is **Skip**. It means that abnormal objects cannot be converted.

Prerequisites

- The project status is **Ready**, the target database information is correct, and the connection test is successful.
- The user connected to the target database must have the permissions to create, delete, and modify objects such as schemas, tables, programs, indexes, users, functions, and views.

Х

Converting Specified Objects

Step 1 Log in to the UGO console.

Conversion Plan _____ (2) Conversion Config _____ (3) S

- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**.
- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column.

Figure 2-1 Conversion plan

User Passward)						
B DB Objects (551)	Select Migration Object Types Convert Spe	ctied Objects Skip Conversion Convert	All schemas	V All object statuses V	All conversion statuses	iste – End Date 🔄 Enter an object name. Q. Q
Storage (542)	🗌 🗸 Schema	Object Name	Object Type	Object Status ③	Conversion Status	Update Time
BEQUENCE (8)	UGO_ETE	TEST	PROCEDURE	0 Normal	Convert	Jul 23, 2024 17:07:10 GMT+00:00
TABLE (482)	1150 ETE	ARM RIGHT INFO	T401 E	0 Normal	0. Crewet	No. 23, 2024 17-02 10 GMT+00 00
- B INDEX (38) (3)		AND CONDINO	Date	· Maria	Contrast	Server, and there is an even of
SYNONYM (1)	U901	IDX_HTHLABER_01_mq803	INDEX	O Normal	Convert	Jul 23, 2024 17:07 10 GMT+08:00
 TYPE (12) 	UG01	CRDATA_JOB_PK0_reg353	PACKAGE_BODY	Absornal	4 Skp	Jul 23, 2024 17:07:10 GMT+00:00
sequence (a)						
 TABLE (482) 	0001	TASK_DETAIL_reg507	TABLE	0 Normal	 Convert 	Jul 23, 2024 17:07:10 GMT+08:00
- (a) INDEX (38) (2)	U30_ETE	FE0725_SCEN1157_EMP	TABLE	0 Normal	Convert	Jul 23, 2024 17:07:10 GMT+08:00
SYNONYM(1)	0					
TYPE (12)	0301	10%_102	INDEX	o Normal	 Convert 	30/23, 2024 17:07:10 0M1+08:00
- (i) Code (222)	U902	COCTEST	TABLE	Normal	Convert	Jul 23, 2024 17:07:10 GMT+08:00
WEW (88) MATERIALIZED_VEW (0)	US0_ETE	FE0725_SCEN1157_PROC	PROCEDURE	Normal	Convert	Jul 23, 2024 17:07:10 (SMT+08:00
TRUDGER (13)	U90_ETE	TEST88	TABLE	Normal	Convert	Jul 23, 2024 17:07:10 GMT+08:00
 	Total Records: 661 10 v < 1 2 3	4 5 6 ~ 95 >				

Step 4 Click **Convert Specified Objects**. The **Convert Specified Objects** dialog box is displayed.

Figure 2-2 Converting specified objects

Convert Specified Objects	
You can import the objects to be converted in an Excel file (use the first column for the Schema, the second column for Object Type, and the third column for Object Name). The system loads and parses the file content. Download file template.	×
Add File 3	
Not started After the file is processed, the scope of objects to be converted will be changed.	

- Click **Download file template** to download a template.
 - In the Excel file, the first column indicates schema, the second column indicates object type, and the third column indicates object name. The three columns specify an object and cannot be empty.
 - Click Convert Specified Objects to upload an Excel file. Identify all objects that meet the schema, object type, and object name requirements in the list with Convert displayed.
- Click Add File to upload a file where there are objects to be converted.

- The maximum size of the file is 30 MB, and the maximum number of rows is 65,535 (excluding the table header). If the content is incorrect, you can click **View Error** in the upload result to view the error cause. After the error is rectified, you can upload the file again.
- After the file is uploaded successfully, the conversion status of objects is automatically updated.

----End

Distribution Mapping of Table Objects

If the source database type is Oracle, Db2, or MySQL and the target database type is GaussDB Distributed, you can perform the following operations:

- Replicating tables: Select one or more objects and click **Replicate Table** above the list. The object name is suffixed with "Replicate Table".
- Modifying distribution mapping information: Locate an object whose Object Type is TABLE and click Distribution Mapping in the Object Type column. Change the distribution type to HASH or REPLICATION and click Apply. The object name is suffixed with "replicate table" or "hash (*Column name*)".
- Deleting distribution mapping information: Browse to a table object and click Distribution Mapping in the Object Type column. In the displayed dialog box, select Delete distributed mapping and click Apply. Distribution Mapping next to the object name will not be displayed.

NOTE

If you select **Hash**, all fields that meet the data type constraints of GaussDB distribution columns are displayed.

2.1.2 Setting Conversion Configuration Items

Conversion configuration items directly affect the success rate of syntax conversion and migration result verification. Therefore, you need to correctly set these configuration items and select a suitable conversion plan.

Syntax Conversion Configuration

The conversion scenarios controlled by each feature parameter are different. It is difficult for users and service personnel to systematically and comprehensively understand the conversion. Multiple reworks affect migration efficiency and user experience. You can use conversion configuration to reduce the manual update configuration and quickly and accurately complete the migration. You also need to map tablespaces between the source and target database.

Step 1 Log in to the UGO console.

Step 2 In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.

- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. Click **Conversion Config**.
- Step 4 Select a value from the Baseline Template drop-down list. Create a custom conversion configuration template. For details, see 4.1 Creating a Configuration Template.
 - Two templates are preset: default template and maximum compatibility template.
 - After you select a template, the preset values in the template are imported to the configuration item list.

Step 5 Set the configuration items based on the actual conversion scenario.

- In the **Current Configuration** column, move the cursor to ^⑦ of each feature to view the impact of the feature. You can click **View Sample** to view details about the configuration information and the current configuration conversion example.
- Locate a feature and click **Edit** in the **Operation** column to modify the current configuration of the feature and click **OK**.
- After you import configuration parameters, the configuration status of features is **Default value**. If you edit the configuration of a feature, the configuration status will become **Modified**.
- If the custom template in your project is deleted, the template configurations are still used, but **Parameter Configuration** is displayed as **Default value**.

----End

NOTE

The system view and advanced package are converted based on the latest GaussDB version. If the target database is of an earlier version, the SQL statements after conversion may be incompatible.

Mapping Tablespaces

The source and target databases may have different tablespace names. Before migration, you need to map tablespaces between the source and target databases. Tablespace names of the source statement can be converted to the mapped tablespace names of the target database.

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.
- **Step 3** Locate a project you want to migrate and click **Migrate** in the **Operation** column. On the **Conversion Config** page, click **Tablespace Mapping**.

Figure 2-3 Tablespace Mapping

Conversion Plan 2 Conversion Contg 3 Syntax	Convenies () Object Convection () Migration & Ventication						
Configuration Tablespace Mapping							
Source and Target Tolespece Mapping (C) Stand a source Ma							
5M	Source Tablespace	Tarpet Tablospace	Operation				
1	SMU	pg_felault	Delete				

Step 4 Select the source and target database tablespaces from the drop-down list boxes and click **Map Tablespace**. The tablespaces are mapped.

----End

NOTE

- The tablespace to be mapped has been created in the target database.
- The following migration flows support the tablespace mapping function.
 - From Oracle to GaussDB
 - From Oracle to PostgreSQL
- You can map one tablespace of the source database to one tablespace of the target database or map multiple tablespaces of the source database to one tablespace of the target database.

2.1.3 Converting Syntax

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.
- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. Click the **Syntax Conversion** tab.
- **Step 4** Click **Start** to start the conversion.
- **Step 5** Before the conversion is complete, click **Pause** to pause the conversion. Click **Resume** to continue the conversion.
- **Step 6** After the conversion is complete, 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 source database objects whose syntax could not be converted to syntax compatible with the target database.
 - Anonymized Conversion Error Report: This report contains details about anonymous source database objects whose syntax could not be converted to syntax compatible with the target database.
 - **Conversion Risk Report**: This report contains details about objects converted with risks based on configurations. However, there are function differences after the conversion.
 - Anonymized Conversion Risk Report: This report contains details about anonymous objects converted with risks. However, there are function differences after the conversion.
 - 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.

----End

Viewing Syntax Conversion History

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.
- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. On the displayed page, click the **Syntax Conversion** tab.

Step 4 Click Conversion History.

The conversion information is displayed in chronological order.

Figure 2-4 Conversion history

Conversion Plan —	O Conversion Config	🚯 Syntax Conversion	(4) Object Correction	(6) Migration & Veri	fcation						
Syntax Conversion	Conversion History										
											۵
SI No.	Total	Ship	Conversion Successful	Conversion Failed	Ignored	Manual	Remaining	Conversion Status 🛛	Start Time 0	End Time	Operation
4	951	277	290	384	0	0		o Success	Jul 23, 2024 14:44:45 GMT+08:00	Jul 23, 2024 14:45:21 GMT+08:00	Details

Step 5 Click **Details** to view information such as the object type, conversion plan, and conversion status (successful or failed).

Figure 2-5 Conversion details

Bytacomesaa Colversion Habry											
A The sys	🛕 The system will be converted dages and all converted dages, will be executives.										
•	Syntax conversion	completed								e 100 _% (stat Stat End	Plase Plase Inne: 15.52.33 GMT+08.00 Inne: 15.53.30 GMT+08.00
Dovriced	Reports										0
	Object Type	Total Count	Skip	Conversion Successful	Conversion Failed	Ignored	Marxaal	Remaining	Success (%)		Operation
	Tatal	121	23	73	25	0	0	0		74.49%	
	D6_LINK	1	0	1	0	•	0	0		100.00%	Details
	FUNCTION	11	4	5	2	0	0	0		71.43%	Details
	GRANT	2	2	0	0	•	0	0		100.00%	Details
	INDEX	4	0	4	0	0	0	0	-	100.00%	Details
	108	4	0	0	4	0	0	0		0.00%	Details
	PACKAGE	5	4	4	0	•	0	0		100.00%	Details
	PACKAGE_BODY	3	2	1	0	•	0	0		100.00%	Details
	PROCEDURE	54	7	5	2	•	0	0		71.42%	Details
	PROGRAM	4	0	4	0	•	0	0		 100.00% 	Details
	SYNONYM	4	0	1	0	0	0	0		100.00%	Debaltz
	TABLE	59	0	43	16	0	0	0		72.89%	Details
	TRIGGER	5	3	2	0	0	0	0		100.00%	Debaltz
	TYPE	5	0	6	0	0	0	0		100.00%	Details
	USER	1	4	0	0	0	0	0		100.00%	Details
	WEW	2	0	1	1		0	0		50.00%	Details

Step 6 Locate an object type and click **Details** to view its details, including the schema, object name, migration status, and conversion status. You can search for an object by name or view details about each schema.

Figure 2-6 Object type details

Conversion Plan	- 🖉 Conversion Config	3 Syntax Conversion	4 Object Correction	- (5) Migration & Verificatio							
Syntax Conversion	Conversion History										
Conversion History / No	d										Q
Object Type	Conversion Plan	SNIp	Conversion Successful	Conversion Failed	Ignored	Monual	Remaining	Success (%)		Operation	
Total	121	23	73	25	0	0	0		74.48%		
DB_LINK	1	0	1	0	0	0	0		102.00%	Details	
FUNCTION	11	4	5	2	0	0	0		71.43%	Details	

Step 7 Locate an object and click **Details** to view the code.





----End

2.1.4 Correcting Objects

The modified statements will run on the target database. Do not use statements that cause the drop of other tables and object types, or statements that cause malicious activities such as consuming too much CPU, memory and other side effects over the target database.

Correcting Objects That Failed to Be Converted

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.
- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. On the displayed page, click the **Object Correction** tab.

- na resure interi	Ship Migration Undo Ship	Reve Conversion Expert 50L				
B. Stream (223)	C. Search by Object Name by default					
G SEQUENCE (244)	C × Schema	Object Name	Object Type	Conversion Status	Migration Status	Corration
Di TABLE (825) T FOREION KEY (5)	U00_ETE	DAMATYPEUST	TABLE	O Falled	Pending	View Details (*)
() INDEX (329) ()	U00_ETE	DVS_TEMP	TABLE	O Success	C Pending	View Details 💿
🕐 🗁 NON-UNIQUE (313)	UG0_ETE	FE00140_VSR2_675	TABLE	O Success	C Pending	View Details (1)
	UGO_ETE	FE0094_1164_PROC_FUNCTION	PROCEDURE	O Success	C Pandro	Vev Details
Code (112)	U00_ETE	FE0304_MAG_MAGE_CONTENT	TABLE	O Success	C Pendrg	Vev Details (*)
(i) VIEW (28)	000_ETE	FE0304_MAD_MADE_TRACELOD	TABLE	O Buccess	Pendrg	View Details (*)
In MATERIALIZED_VIEW(I)	U00_ETE	FEIGH_PRO_MM0_IMAGE_CONTENT	PROCEDURE	O Faled	C Pending	Wew Details
	O UGO_ETE	FE0397_001_1102_MARCHAR_CHAR	TYPE	O Success	C Pending	View Details
B PROCEDURE (34)		FE0397_PLSQL_1100_PROC_TEST	PROCEDURE	O Success	C Pending	Vev Details
D FUNCTION (17)	U00_ETE	FE_00053_1128_SALES	TABLE	O Success	C Pendrg	Vev Details ()
IN PACKAGE (20)	Table Connector & 200					
DIRECTORY (8)	1000 (1000/00), 1,000					
D DB_LINK(2)						
B Job Objects (0) ⑦						
G CREDENTIAL (8)						
PROGRAM (0)						
 i) SCHEDULE (8) 						
B JOB_CLASS (0)						
- B .08(0)						
Management (17)						
G USER (R)						

Figure 2-8 Object correction

• You can view the schema name, object name, object type, conversion status, and migration status.

- You can select a filter (Object Type, Schema, Conversion Status, Migration Status, Object Name, SQL Content Includes, SQL Content Excludes, Conversion Errors Include, or Migration Errors Include) to search for objects. If you select Object Name, fuzzy search is supported. If you select SQL Content Includes or SQL Content Excludes, you can enter up to three keywords and each keyword contains up to 10 characters. If there are a large number of objects in a project, the query slows.
- If you search for the desired object by schema, the schema name cannot contain whitespace characters.
- Objects such as TABLE and INDEX may be split into multiple subobjects.
 - Splitting objects can control the migration sequence of multiple features of an object.
 - To view the status and content of all child objects, click View Details next to the parent object.
 - Splitting objects depends on the conversion function of UGO. If an error occurs during script parsing or conversion, objects are not split.
 - The statuses of subobjects and other objects are different.
 - If the conversion status of a parent object is Success, the conversion status its child object is also Success.
 - If the conversion status of a parent object is Failed, the conversion status of at least one child object is Failed.
 - If the conversion status of a parent object is Manual, the conversion status of at least one child object is Manual.
 - If the migration status of a parent object is Success, the migration status of its child objects is Success or Ignore.
 - If the migration status of a parent object is Failed, the migration status of at least one child object is Failed.
 - If the migration status of all child objects is Ignore, the migration status of their parent objects is also Ignore.
- Step 4 Locate an object and click View Details in the Operation column.

NOTE

Correct management, storage, code, and job objects in sequence.

- **Step 5** View the conversion or migration error information. If any, modification suggestions are displayed.
 - Locate an object whose Conversion Status is Failed, click View Details in the Operation column to view conversion errors.
 - Locate an object whose **Migration Status** is **Failed**, click **View Details** in the **Operation** column to view migration errors.

NOTE

If the target database is GaussDB, database object names must meet start with a letter or underscore (_) and can contain letters, digits, underscores (_), dollar signs (\$), and number signs (#). The length of a non-time series table cannot exceed 63 bytes, and the length of a time series table cannot exceed 53 characters.



Figure 2-9 Conversion errors on the object details page

Step 6 Modify SQL statements.

- Click **Export SQL** to export the SQL file of the target database. Exported file name: *Object name*.sql.
- Click **Import SQL** to directly import the modified SQL file. After the SQL file is uploaded, all changes are automatically saved.
- **Compare**: This switch is disabled by default. If this function is enabled, the detailed code comparison between the source and target databases is displayed. In this case, the SQL statements cannot be edited.
- Click ^{II} next to **Source** or **Target** to copy the SQL statements to the clipboard.
- Click next to the target end to enter the full-screen editing mode. To exit

the full-screen editing, click $\boxed{\ }$ or click the edit box and press **Esc**.

- **Update Dependency Data**: If this switch is enabled, all dependent objects will also be verified. This function is enabled by default and can be disabled.
- Before saving the modified code, you can click **Reset** to clear all modifications. If the modification has been saved, you can only perform a rollback operation.
- Click **Save** to save the modifications for target database code. The modification records will be generated and saved on the **Modification History** page.
- **Step 7** After the modification is complete, click **Save** to generate a modification record. Click **Modification History** to view historical records.

In the **Modification History** area, locate the history record and click **Rollback** in the **Operation** column to roll back to the latest modification record.

Step 8 Click the drop-down icon next to **History ID** to compare the code before and after modification.

Figure 2-10 Modification history

Modification History									
	History	Object Name	Split Object Name	Modification Time	Operation				
~	2	BAS_DML_LOOKUP_PKG	BAS_DML_LOOKUP_PKG	May 14, 2024 15:14:	Rollback				
					Close				

----End

NOTE

- If you select Oracle as the source database type, DB_LINK objects can only be converted and cannot be migrated, and their migration status is **Ignore** by default.
- After the modification, the conversion status or migration status of the object changes from **Failed** to **Manual**.

Updating Statements in Batches

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.
- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. On the displayed page, click the **Object Correction** tab.
- Step 4 Click Bulk Statement Update.

Figure 2-11 Batch modification

arch Criteria		SQL Key	Words Replacement		
Search Type 🕚 💿 Normal 🔿 R	Regular Expression		Replace W	8h Enter new SQL keywords.	
BOL Key Words GENERATE	X Q				
Error String1 Search by error	٩				
Error Sking2 Search by error	Q				4
Reset	Search			Replace	
Search results					
C. Search by Schema by default					
Schema	Object Name	Object Type	Conversion Status	Migration Status	Mat
53	diagnostics	PROCEDURE	o Failed	Pending	1.GE
695	ps_trace_statement_digest	PROCEDURE	 Failed 	Pending	<u>1.0EN</u>
3)5	statement_performance_analyzer	PROCEDURE	O Failed	D Pending	1.0EN

Step 5 On the **Search results** area, locate an object and click **View Details** in the **Operation** column.

You can view the schema name, object type, object name, split object name, conversion status, and migration status.

- **Step 6** View the conversion or migration error information. If any, modification suggestions are displayed.
 - Locate an object whose **Conversion Status** is **Failed**, click **View Details** in the **Operation** column to view conversion errors.
 - Locate an object whose **Migration Status** is **Failed**, click **View Details** in the **Operation** column to view migration errors.

Figure 2-12 Object details

	Schema Name	Object Type	Object Name	Split Object Name	Migratice Status 😨	
^	2/2	PROCEDURE	ps_trace_statement_digest	ps_trace_statement_digest	Pending	
a a b						
Vedification	n History Export SQL Import SQL Company	🕥 Update Dependency Data 🕐 🂽			Read	
Source			đ	Tarpet	02	
1 C 2 3 4 5 6 7 8 9 18	Call of OHMS "spail cycl (addited "Housed") II for digits (not observed) II for digits (not ob	ng processification of lifest for all locations and the section of the section of the section of the section of the section of the section all locations and the section of the sectio	er a soutificational based to a south state in a south state south state in a south state south state in a south state in a south Data Maria at south state in a south state in a south	(diff) = (diff)	e_statemet_filent(

Click the **Object Correction** tab. The SQL statements of the source and target databases are displayed.

Click downward next to **Source** or **Target** to copy the SQL statements to the clipboard.

Step 7 Copy a SQL keyword or character string, return to the batch modification page, and configure parameters as needed/

Figure 2-13 Batch modification

Batch Modification	History			
A Warning: The mos	lified statements will run directly on the target database. Yo	are not advised to use statements that can cause tables and object types to be lost, which will affect target database performance, such as statements that consum	te too much CPU or memory.	
Search Criteria		SQL Key Wo	rds Replacement	
Search Type 🕥	Normal Regular Expression	Replace With	Enter new SQL keywords.	
SQL Key Words	SQL Key Words Q			
Error String1	Search by error Q			
Error String2	Search by error Q			
	Reset		Replace	

Table 2-1 Parameter description

Parameter	Manda tory	Description					
Search	Yes	Normal: simple search text type					
Туре		Regular Expression: regular expression search text type					
		NOTE					
							 Incorrect use of regular expressions may cause unpredictable changes to SQL statements. Therefore, exercise caution when using regular expressions.
		 For details about regular expression specifications, see Java Regex. 					

Parameter	Manda tory	Description
SQL Key Words	Yes	Search for keywords obtained in the Object Details page. Click View SQL in the Operation column to go to the Object Details page.
		For example, if you select Regular Expression and enter DEFAULT* as a keyword, the system searches for all target statements with the structure DEFAULT <i>Any SQL statement</i> .
Error String 1	No	Search for migration error messages obtained in the Object Details page. Click View SQL in the Operation column to go to the Object Details page.
Error String 2	No	Further search for migration error messages obtained in the Object Details page. Click View SQL in the Operation column to go to the Object Details page.

NOTE

- After the parameters are configured, click **Search**. Objects that meet search criteria are displayed in the lower part of the page.
- All error strings can be viewed in **Migration Errors** or **Conversion Errors** area, as shown in **Figure 2-12**.
- If the user connected to the target database is different from the schema owner, UGO will change the schema owner name to the username.
- **Step 8** Click **Search**. The objects that meet the search criteria are displayed.

Figure	2-14	Search	results
--------	------	--------	---------

Search results								
Q. Search by Schema by default						00		
Schema	Object Name	Object Type	Conversion Status	Migration Status	Match results	Operation		
U001	IDX_HTHLABER_01_reg803	INDEX	o Success	C Pending	114	View Details		
ugot	IDV_ID2	INDEX	o Success	Pending	int	Very Details		
UG01	YOUR_TABLE2	TABLE	o Failed	Pending	int	View Details		
U901	IND_TABK_DETAIL2_H0598	INDEX	Buccess	D Pending	1.84	View Details		
U001	IND_TADK_DETAIL3_Hep599	INDEX	o Success	D Pending	1.84	View Details		
UGOI	IND_TASK_DETAIL3_mq500	INDEX	o Success	 Pending 	int	Vev Details		
U901	IND_TASK_DETAIL_reg543	INDEX	Success	Pending	int	View Details		
U901	IND_TABK_DETAIL_reg907	INDEX	Buccess	D Pending	1.84	View Details		
U001	DEPT_T_Net603	TABLE	o Success	D Pending	1.84	Very Details		
UG01	CTP_BRANCH_NLS_req385	TABLE	o Failed	Pending	1.84	Vev Details		
Telal Records: 104 10 - C 1 - C	2 3 4 8 8 ~ 11 5							

You can search for objects by schema, object type, conversion status, and migration status.

Click the content in the **Match Results** column to view detailed matching information.

- **Step 9** Enter the modified SQL statement in the **Replace With** text box and click **Replace**.
- **Step 10** After the replacement is complete, click **Bulk Statement Update** and then click the **History** tab. On the displayed page, view the batch replacement records.

Figure 2-15 History

Batch Modification History					
History					٩
History ID	Started	Ended	SQL Key Words	Replacement SQL	Operation
0	Jul 25, 2824 15:04:08 GMT+08:00	Jul 25, 2024 15:04:08 GMT+08:00	000000000000000000000000000000000000000	2147483547	Vervillet Roll Back

Table 2-2 Parameter description

Parameter	Description
History ID	The number of modification times is displayed in descending order.
Started	Time when the modification started, for example: 2021/09/15 16:28:15 GMT+08:00
Ended	Time when the modification ended, for example: 2021/09/15 16:28:16 GMT+08:00
SQL Key Words	SQL keywords to be searched for
Replacement SQL	Scripts or keywords to replace the original SQL statements
Operation	 Roll Back: You can roll back the last modification. View List: You can view the history ID, schema, object name, and object type. Click View SQL to view the modified SQL statement.

Step 11 Click **View List**. On the displayed **History** page, click **View SQL** in the **Operation** column to view the SQL statements before and after the replacement.

Figure 2-16 History



----End

2.1.5 Verifying the Migration Result

Prerequisites

There is a project for which migration has been completed.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**. The migration project list is displayed.
- **Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. On the displayed page, click the **Migration & Verification** tab.

The **Migration** tab page is displayed by default.

Figure 2-17 Going to the migration tab page

🕗 car	version Plan 🕑 Conversion Config -	Syntax Conversion	Citied Correction 6	Migration & Verification					
Migratio	n Migration History								
SQL	Migration Succeeded							100s Myster V	Vification Start Pasco Starbot, Step 26, 2024 18:23 52 CMT+08:00 Ended: Step 28, 2024 18:21:29 GMT+08:00
e	1114 Mar SCR. Lines		1027 Read PL/SQL Rees			507 Migrated SQL Lines		93 Migrated Stored Procedure Lines	
Dev	niced Reports								٩
	Object Type	Total Count	Migration Succeeded	Migration Failed	Remaining	Ignored	Objects Not Migrated upon Conv	Success (%)	Operation
	TOTAL	680	72	550	•	0	40	10.50%	
	DIRECTORY	1	0	1		0	0	0.00%	Details
	PUNCTION	4	2	0	•	0	2	50.00%	Defails
	GRANT	6	5	0	0	0	1		Details
~	INDEX	39	0	32	•	0	τ	0.00%	Defails
	PADKAGE	5	0	5	•	0	0	0.00%	Defails
	PACKAGE_BODY	34	0	39	•	0	4	0.00%	Details
	PROCEDURE	13	8	5	•	0	2	48.15%	Details
	SEQUENCE	8	0	1	0	0	7	0.00%	Details
	SYNONYM	1	1	0	•	0	0	100.00%	Details
	TABLE	468	3	455	•	0	19	0.61%	Details
	TYPE	10	0	10	•	0	0	0.00%	Dataits
	TYPE_BODY	4	0	1	•	0	0	0.00%	Details
	USER	4	0	4		0	0	0.00%	Datails

- Click **Migration Verification** to set the migration process. This parameter can be set only when the migration task is in the **Pending**, **The migration is being paused**, or **Migration Succeeded** state.
- The detailed information about the migration project is displayed, including object types, total objects, objects that have been migrated, objects that failed to be migrated, and objects that have not been migrated. If objects that failed to be converted will not be migrated, **Objects Not Migrated upon Conversion Failure** is also displayed.
- If the migration fails, click **Details** in the **Operation** column to go to the **Object Correction** page and view migration details of the object type.
- View Empty Stored Procedure: If the source database type is Oracle, 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. Data related to sub-objects is not included in the migration report.
 - Migration statistical report: This report includes a summary of object statuses during migration and verification.
 - **Migration error report**: This report includes failure details, such as statuses, migrated statements, and error details for each object.
 - Anonymized error report: This report consists of failure details, such as statuses, migrated statements, and error details for each object, but the original and migrated SQL statements will be anonymized.
 - Full migration report: This report includes failure details, such as statuses, migrated statements, and error details for each object.

Step 4 Click Migration History.

Detailed information of the migrated projects is displayed in the descending order. The information includes the serial number, total count, migration succeed, migration failed.

Figure 2-18 Migration history

Conversion Plan	- 🖉 Conversion Config 🖉 Byrtlan	Conversion (Conversion	6 Mgration & Verification					
Migration Hist	ory							
								Q
SI No.	Total Count	Migration Succeeded	Migration Failed	Migration Status	Started O	Ended	Operation	
1	632	72	560	o Success	Sep 20, 2024 18:20:52 GMT-08:00	Sep 20, 2024 10:21:29 GMT+00:00	Details	

- **Step 5** Click **Details** to view information such as the total count, migration succeed, and migration failed.
- Step 6 Locate an object type and click Details to view its details. The detailed information includes the schema, object name, object types, and migration status. You can search for an object by name or view details about each schema.

Figure 2-19 Object type details

Conversion Plan 🐼 Conversion 1	Carlig (C) Syntax Conversion (C) Object Connection	5 Migration 8 Verification			
Migration History					
Migration History / No. 1 / WEW					Search Object Name Q. Q
Schema 🖓	Object Name	Object Type	Migration Status 🖓	Operation	
U90	CD_IOB_SYNC_DELAY_V_REQ356	WEW	o Success	Details	
000	MY_WEW_RED186	VIEW	0 Failed	Defails	
000	OPS_TASK_QUEUE_INFO_V_REQ353	WEW	o Success	Details	
000	VEW_RED100	WEW	0 Success	Defails	
U90	VEW_RE05258	WEW	o Success	Details	
000	VEW_RE0246	WEW	0 Success	Defails	
U90	VIEW_REG101	WEW	o Success	Details	
000	VEW_RECISIO	WEW	0 Success	Details	
ugo	VIEW_REGIS1	WEW	o Success	Details	
U80	VEW_REG103	WEW	0 Success	Details	
Tatal Records: 57					0 - ↓ (1) 2 - 3 - 4 - 6 - 6 - >

Step 7 Locate an object and click **Details** to view the code.

Figure 2-20 Object details

🛇 Conversion Plan ————————————————————————————————————	
Magazion Magazion Helioy	
Napolas Holay / No. 1 / VEV / MC.NEW,HODIA	0
test in the finite is before in the set of the set	
A REAL SERVER / SERVE / SERVER / S SERVER / SERVER / S	

----End

2.2 Object Migration Project Management

2.2.1 Deleting an Object Migration Project

Scenarios

There is an upper limit on the number of migration projects that can be created. You can delete completed migration projects to release resources.

Constraints

Deleted projects cannot be recovered.

Prerequisites

- A migration project has been created.
- Migration projects frozen for security reasons cannot be deleted.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**.
- **Step 3** In the migration project list, locate the project you want to delete and click **Delete**.
- **Step 4** In the displayed dialog box, click **OK**.

----End

2.2.2 Viewing Object Migration Details

To create a migration project, see Migration Project.

Scenarios

This section describes how to view details of created migration objects and the estimated migration success rate so that you can determine whether to implement the migration.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Schema Migration** > **Object Migration**.

If there is no migration project, the function introduction and process guidance are displayed by default. If there are migration projects, the function introduction and process guidance are hidden by default. You can expand them.

The following information is displayed in the migration project list: project name, project ID, evaluation project name, project status, target database type, creation date, and operation. You can directly copy the project ID.

If there are many projects, you can search for the project by database type, tag, project name, or ID.

Figure 2-21 Object migration

You can create 36	more migration projects.			All Target DB Type v Project Name	✓ Enter a project name. Q Search by tags Q
SI No.	Project Name/D	Evaluation Project	Target DB Type	Created	Operation
1	Auto_stion_download_report_001_20241107085656_wbs4 e2aa2655645-44bb-9663-bc0a881bbb7	AUTO_MYSQL80_TO_GRUSSDB_FOR_DIST_3_2	GaussDB DistributedV2.0-3.2 Enterprise Edition	Nov 07, 2024 08:51:10 GMT+06:00	Migrate Delete
2	Auto_ton_pause_and_resume_001_20241106213841_ighd 9e8dace7-34be-445e-ed06-34945bd1b200	AUTO_ORACLE11g_TO_GeneraDB_FOR_DIST_8_9	GaussDB DistributedV2.0-8.0 Enterprise Edition	Nov 06, 2024 21:39:02 GMT+00:00	Migratie Delete

- **Step 3** Click the project name in the **Evaluation Project** column to view the detailed evaluation information of the project. For details, see **Viewing the Database Evaluation Result**.
- **Step 4** Click the project name in the **Project Name** column to view the information of the migration project.

Figure 2-22 Migration object details

Conversion Plan Vev Detexts	Conversion Config Very Details	(3) Syntax Conversion	(1) Object Correction (5)	Migration & Verification Very Details
Project Summary				
Evaluation Project Name e_le_g	Project Type	Cracle To DaussOB Centralized/V2	Source DE Type Oracle	
Migration Project Name e_le_g &	Created AL	Nov 07, 2024 11.32 82 GMT+08.00	Target D0 Type GeziaC6 Centralized/V2.0-8.100 E	
Source Connection Infor 193.85.219.142.1521/ORCLPDB11	Target Connection Inform	jdbc:opengauss:/100.53.9.128.400	Target DD Time Zone PRC	
Target DB Character Set UTF8	Destruitor DE Storage E	Ustore		
Migration Dashboard				
Syntax Conversion		Migration & Verification		
\bigcirc	 Success 107 23.31% Falled 33 2.27% Minual 0 60% Step 32 68.37% 	(Galoris 20 26176 Galoris 27 71265 Uppond 2 16776 	

Table 2-3 Parameter description

Name	Description
Conversio n Progress	Displays the project conversion progress. It consists of five steps: conversion plan, conversion configuration, syntax conversion, object correction, and migration & verification.
	If a step is complete, you can click View Details under the step to view its details.
	If a step is not performed, you can perform this step.
Project Summary	Displays the evaluation project name, project type, source database type, and target database type.
Migration Dashboar d	Displays doughnut charts, percentages, specific values, and status of the syntax conversion and migration & verification. The migration & verification includes four statuses: Success , Failed , In progress , and Ignored .

Step 5 Click the **Tags** tab to add or modify tags. For details, see **1.7 Managing a Tag**.

----End

2.3 Migration Pre-check

When creating a migration project, check the permissions, character set, and other parameters that affect compatibility of the target database to prevent migration failures caused by improper parameter settings. You can modify the check items according to prompts.

2.3.1 Checking the Compatibility Mode

If the target database type is GaussDB, the compatibility mode will be checked. Different source databases adapt to different compatibility modes. If the target

database uses a compatibility mode different from a recommended one, a risk is reported. **Table 2-4** lists the GaussDB compatible modes.

Table 2-4 Co	mpatible modes
--------------	----------------

Source Database	GaussDB Compatibility Mode
MySQL or GoldenDB	MySQL-compatible
Others	Oracle-compatible

NOTE

The MySQL-compatible mode includes GaussDB Centralized (B-compatible), GaussDB Centralized (M-compatible), and GaussDB Distributed (MySQL-compatible). The Oracle-compatible mode includes GaussDB Centralized (A-compatible) and GaussDB Distributed (Oracle-compatible).

2.3.2 Checking Character Sets

The system checks character sets of the source and target databases. This check result does not affect subsequent operations. Table 2-5 to Table 2-7 describe the character set compatibility.

NOTE

Character set compatibility result:

- Alarm: The character sets of the source and target databases are incompatible.
- **Success**: The character sets of the source and target databases are compatible.

	deter set comp		
Source Datab		arget Database	Docult

 Table 2-5 Character set compatibility between Oracle and GaussDB

Source Database	Target Database	Result
SQL_ASCII	SQL_ASCII	Success
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm
US7ASCII	SQL_ASCII	Alarm

Source Database	Target Database	Result
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm
ISO-8859-1	SQL_ASCII	Alarm
	ISO-8859-1	Success
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm
LATIN1	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Success
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm
GB2312	SQL_ASCII	Alarm

Source Database	Target Database	Result
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Success
	GBK	Success
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
ZHS16GBK	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Success
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
GBK	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Success
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
ZHS32GB18030	SQL_ASCII	Alarm

Source Database	Target Database	Result
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
GB18030	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
AL16UTF16	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF16	SQL_ASCII	Alarm

Source Database	Target Database	Result
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
AL32UTF8	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF8	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF32	SQL_ASCII	Alarm

Source Database	Target Database	Result
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
Other character sets	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm

Table 2-6 Character set compatibility between MySQL and GaussDB

Source Database	Target Database	Result
ISO-8859-1/LATIN1	SQL_ASCII	Alarm
	ISO-8859-1	Success
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
Source Database	Target Database	Result
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	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm
GB2312	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Success
	GBK	Success
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
GBK	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Success
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
GB18030	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Success
	UTF16	Success

Source Database	Target Database	Result
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF16	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF8	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF32	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success

Source Database	Target Database	Result
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
ASCII	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm
UTF8MB3	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Success
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF8MB4	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success

Source Database	Target Database	Result
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
UTF16LE	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF8	Success
	UTF32	Success
	Other character sets	Alarm
Other character sets	SQL_ASCII	Alarm
	ISO-8859-1	Alarm
	LATIN1	Alarm
	GB2312	Alarm
	GBK	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF8	Alarm
	UTF32	Alarm
	Other character sets	Alarm

	Table 2-7	Character set	compatibility	between	Oracle a	and MySQL
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Source Database	Target Database	Result
SQL_ASCII	ASCII	Success
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm

Source Database	Target Database	Result
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF16LE	Alarm
	UTF8	Alarm
	UTF32	Alarm
	UTF8MB4	Alarm
	Other character sets	Alarm
US7ASCII	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF16LE	Alarm
	UTF8	Alarm
	UTF32	Alarm
	UTF8MB4	Alarm
	Other character sets	Alarm
ISO-8859-1	ASCII	Alarm
	LATIN1/ISO-8859-1	Success
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF16LE	Alarm
	UTF8	Alarm

Source Database	Target Database	Result
	UTF32	Alarm
	UTF8MB4	Alarm
	Other character sets	Alarm
LATIN1	ASCII	Alarm
	LATIN1/ISO-8859-1	Success
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF16LE	Alarm
	UTF8	Alarm
	UTF32	Alarm
	UTF8MB4	Alarm
	Other character sets	Alarm
GB2312	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Success
	GBK	Success
	UTF8MB3	Success
	GB18030	Success
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
ZHS16GBK	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm

Source Database	Target Database	Result
	GBK	Success
	UTF8MB3	Success
	GB18030	Success
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
GBK	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Success
	UTF8MB3	Success
	GB18030	Success
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
ZHS32GB18030	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Success
	UTF8MB3	Success
	GB18030	Success
	UTF16	Success
	UTF16LE	Success
	UTF8	Success

Source Database	Target Database	Result
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
GB18030	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Success
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
AL16UTF16	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
UTF16	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm

Source Database	Target Database	Result
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
AL32UTF8	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
UTF8	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF16LE	Success
	UTF8	Success

Source Database	Target Database	Result
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
UTF32	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Success
	UTF16LE	Success
	UTF8	Success
	UTF32	Success
	UTF8MB4	Success
	Other character sets	Alarm
Other character sets	ASCII	Alarm
	LATIN1/ISO-8859-1	Alarm
	GB2312	Alarm
	GBK	Alarm
	UTF8MB3	Alarm
	GB18030	Alarm
	UTF16	Alarm
	UTF16LE	Alarm
	UTF8	Alarm
	UTF32	Alarm
	UTF8MB4	Alarm

2.3.3 Checking GUC Parameters

GaussDB provides many GUC parameters to manage behaviors of the database system. UGO converts SQL syntax based on a group of GUC parameters that are compatible with the source database. Set GUC parameters as prompted during the

object migration pre-check. Otherwise, the success rate and availability of the final object migration may be affected.

This check item is displayed when the target database type is GaussDB V2.0-3.1 or later and the source database type is Oracle, Microsoft SQL Server, or MySQL. Check whether GUC parameters are configured. For details, see Table 2-8.

NOTE

- The GUC parameter check is performed based on the target database version you selected during evaluation project creation, instead of the target database version that is actually connected.
- If the target database type is GaussDB Centralized (M-compatible mode), GUC parameters cannot be checked.
- For details about how to set the GaussDB GUC parameters, see the check item prompt on the pre-check page or see **How Do I Set GaussDB GUC Parameters?**

Source DB Type	Target DB Version	Check Item
MySQL	GaussDB Centralized V2.0-3.1 Enterprise Edition	-
	GaussDB Centralized V2.0-3.2 Enterprise Edition	b_format_behavior_compat_options
	GaussDB Distributed V2.0-3.2 Enterprise Edition	-
	GaussDB Centralized V2.0-8.0 Enterprise Edition	b_format_version, b_format_dev_version
	GaussDB Distributed V2.0-8.0 Enterprise Edition	b_format_version, b_format_dev_version

Table 2-8 GUC parameter check items

Source DB Type	Target DB Version	Check Item
	GaussDB Centralized V2.0-8.100 Enterprise Edition	b_format_version, b_format_dev_version
	GaussDB Distributed V2.0-8.100 Enterprise Edition	b_format_version, b_format_dev_version
	GaussDB Centralized (M- compatible mode) V2.0-8.100 Enterprise Edition	m_format_behavior_compat_options, m_format_dev_version
	GaussDB Centralized (M- compatible mode) V2.0-8.200 Enterprise Edition	m_format_behavior_compat_options, m_format_dev_version
	GaussDB Centralized (M- compatible mode) V2.0-9.0 Enterprise Edition	m_format_behavior_compat_options, m_format_dev_version
Oracle	GaussDB Centralized V2.0-3.1 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Centralized V2.0-3.2 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Distributed V2.0-3.2 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version

Source DB Type	Target DB Version	Check Item	
	GaussDB Centralized V2.0-3.3 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version	
	GaussDB Distributed V2.0-3.3 Enterprise Edition	behavior_compat_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version	
	GaussDB Centralized V2.0-8.0 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version	
	GaussDB Distributed V2.0-8.0 Enterprise Edition	behavior_compat_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version	
	GaussDB Centralized V2.0-8.100 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version	
	GaussDB Distributed V2.0-8.100 Enterprise Edition	behavior_compat_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version	
	GaussDB Centralized V2.0-8.200 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version, a_format_date_timestamp	
	GaussDB Distributed V2.0-8.200 Enterprise Edition	behavior_compat_options, sql_beta_feature, IntervalStyle, a_format_version, a_format_dev_version, a_format_date_timestamp	

Source DB Type	Target DB Version	Check Item
	GaussDB Centralized V2.0-9.0 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, IntervalStyle, mapping_date_to_datea, a_format_version, a_format_dev_version, a_format_date_timestamp
	GaussDB Distributed V2.0-9.0 Enterprise Edition	behavior_compat_options, sql_beta_feature, IntervalStyle, mapping_date_to_datea, a_format_version, a_format_dev_version, a_format_date_timestamp
Microsoft SQL Server	GaussDB Centralized V2.0-3.1 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Centralized V2.0-3.2 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Distributed V2.0-3.2 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Centralized V2.0-8.0 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Distributed V2.0-8.0 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version
	GaussDB Centralized V2.0-8.100 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, a_format_version, a_format_dev_version

Source DB Type	Target DB Version	Check Item	
	GaussDB Distributed V2.0-8.100 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version	
	GaussDB Centralized V2.0-8.200 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, a_format_version, a_format_dev_version	
	GaussDB Distributed V2.0-8.200 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version	
	GaussDB Centralized V2.0-9.0 Enterprise Edition	behavior_compat_options, plsql_compile_check_options, sql_beta_feature, a_format_version, a_format_dev_version	
	GaussDB Distributed V2.0-9.0 Enterprise Edition	behavior_compat_options, sql_beta_feature, a_format_version, a_format_dev_version	

The **plsql_compile_check_options** parameter of GaussDB Centralized is used to verify all statements in functions, procedures, and packages. If there are undefined objects in the statements, an alarm is reported. To avoid false alarms in the production environment, this parameter is recommended only in the test environment.

2.3.4 Checking User Permissions

Separation of Permissions

Separation of permissions will be checked when the target database type is GaussDB. After separation of permissions is enabled, the system administrator (or a user with the sysadmin permission) does not have the CREATEROLE (security administrator) or AUDITADMIN (audit administrator) permissions, so the system administrator can neither create roles and users nor view or maintain database audit logs. After separation of permissions is enabled, a sysadmin user cannot migrate USER, ROLE, and GRANT objects.

NOTE

- This check item is displayed only when the target database type is GaussDB, separation of permissions is enabled, and the migration user is granted the sysadmin permission.
- If the permission models are switched repeatedly, a sysadmin user still has security administrator (CREATEROLE) and audit administrator permissions after separation of permissions is enabled. If you need to switch model from non-separation of permissions to separation of permissions, review the permissions of existing users and tailor some permissions as needed.

Sysadmin Permission

This check item is only displayed when the target database type is GaussDB, separation of permissions is disabled, and the migration user is granted the sysadmin permission. The check result must be **Success**.

Permission of Creating Schemas

This check item is displayed when the target database type is GaussDB and the migration user is granted the sysadmin permission. It is used to check whether the migration user has the permission to create schemas in the target database. Database objects must be created in schemas.

GRANT CREATE ON DATABASE <db_name> TO <user>;

NOTE

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions. This check item is mandatony.

This check item is mandatory.

Permissions of Creating and Modifying Users and Roles

This check item is displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and the USER, ROLE, and GRANT objects are migrated. It is used to check whether the migration user has the permissions to create or modify users and roles in the target DB instance.

ALTER USER <user> WITH CREATEROLE;

NOTE

- When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.
- This check item is mandatory.

Permission of Creating Objects Using PUBLIC SCHEMA

This check item is displayed when the target database type is GaussDB and the migration user is a common or sysadmin user (separation of permissions enabled). This check item involves complex permission combination.

In GaussDB V2.0-2.7 and earlier versions, CREATE permissions on public schemas are required to create objects such as tables, views, indexes, sequences, packages, types, and triggers.

In GaussDB V2.0-3.1 and later versions, the sysadmin (used when separation of permission is enabled) user must have the CREATE permission on public schemas to create objects such as tables, views, indexes, sequences, packages, types, and triggers.

In GaussDB V2.0-3.1 and later versions, a common user must have the CREATE permission on public schemas and ANY permission on objects, to create objects such as tables, views, indexes, sequences, packages, types, and triggers.

In separation of permissions, only initial users have the permissions to create functions, stored procedures, and synonyms on public schemas.

In non-separation of permissions, initial and sysadmin users have the permissions to create functions, stored procedures, and synonyms on public schemas.

CREATE permissions: GRANT CREATE ON SCHEMA public TO <user>;

ANY permissions:

GRANT CREATE ANY TABLE TO *<user>;*//Users can create tables or views in public and user schemas.

GRANT CREATE ANY SEQUENCE TO *<user>*,//Users can create sequences in public and user schemas.

GRANT CREATE ANY INDEX TO *<user>*,//Users can create indexes in public and user schemas.

GRANT CREATE ANY PACKAGE TO *<user>*,//Users can create packages in public and user schemas.

GRANT CREATE ANY TYPE TO *<user>;*//Users can create types in public and user schemas.

GRANT CREATE ANY TRIGGER TO *<user>;*//Users can create triggers in public and user schemas.

NOTE

- A DB instance contains multiple databases. Each database has its own public schema. Permission assignment must be performed in the corresponding database.
- When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.
- This check item is not mandatory. Based on the GaussDB permission design, the check result is always **Warning**.

Permissions of Existing Schemas

This check item is displayed when the target database type is GaussDB and the migration user is a common or sysadmin user (separation of permissions enabled).

It is used to check whether the migration user has the permissions to grant the owner of the existing schemas to the migration user.

GRANT <schema_owner> TO <user>

NOTE

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user or schema owner is used to grant permissions.

If the migration user does not have sufficient permissions, the schema owner cannot be queried.

Granting Tablespace Permissions

This check item is only displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and GRANT objects are migrated.

Statements:

GRANT <privilege> ON TABLESPACE <tablespace_name> TO <user>;

GRANT <privilege> ON TABLESPACE <tablespace_name> TO <user> WITH GRANT OPTION;

If **WITH GRANT OPTION** is specified, a grantee can grant this permission to others.

Permissions include CREATE, ALTER, DROP, COMMENT, CREATE WITH GRANT OPTION, ALTER WITH GRANT OPTION, DROP WITH GRANT OPTION and COMMENT WITH GRANT OPTION.

NOTE

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.

Granting Database Permissions

This check item is only displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and GRANT objects are migrated.

Statements:

GRANT <privilege> ON DATABASE <db_name> TO <user>;

GRANT <privilege> ON DATABASE <db_name> TO <user> WITH GRANT OPTION;

If **WITH GRANT OPTION** is specified, a grantee can grant this permission to others.

Permissions include CREATE, CONNECT, TEMPORARY, ALTER, DROP, COMMENT, CREATE WITH GRANT OPTION, CONNECT WITH GRANT OPTION, ALTER WITH GRANT OPTION, TEMPORARY WITH GRANT OPTION, DROP WITH GRANT OPTION and COMMENT WITH GRANT OPTION.

NOTE

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.

Granting ANY Permissions

This check item is displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and GRANT objects are migrated. It checks whether the migration user can grant ANY permissions on the target database to other users.

GRANT <privilege> TO <user> WITH ADMIN OPTION;

If **WITH ADMIN OPTION** is specified, the granted user can grant the permission to other roles or users.

Permissions include CREATE ANY TABLE, ALTER ANY TABLE, DROP ANY TABLE, SELECT ANY TABLE, UPDATE ANY TABLE, INSERT ANY TABLE, DELETE ANY TABLE, CREATE ANY SEQUENCE, ALTER ANY SEQUENCE, DROP ANY SEQUENCE, SELECT ANY SEQUENCE, CREATE ANY INDEX, ALTER ANY INDEX, DROP ANY INDEX, CREATE ANY FUNCTION, EXECUTE ANY FUNCTION, CREATE ANY PACKAGE, EXECUTE ANY PACKAGE, CREATE ANY TYPE, ALTER ANY TYPE, DROP ANY TYPE, CREATE ANY SYNONYM, DROP ANY SYNONYM, CREATE ANY TRIGGER, ALTER ANY TRIGGER and DROP ANY TRIGGER.

NOTE

A DB instance contains multiple databases. The ANY permissions are bound to databases. You need to grant the ANY permissions in the corresponding database.

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.

Granting Permissions on the pg_catalog Schema

This check item is displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and GRANT objects are migrated. It checks whether the migration user can grant the query permission on all tables in the pg_catalog schema in the target database to other users.

GRANT <privilege> TO <user> WITH ADMIN OPTION;

NOTE

A DB instance contains multiple databases. Each database has its own pg_catalog schema. Permission assignment must be performed in the corresponding database.

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.

Granting the Database Link Permission

This check item is displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and GRANT objects are migrated. It checks whether the migration user can grant the permission on creating database connections in the target database to other users.

GRANT CREATE PUBLIC DATABASE LINK TO <user> WITH GRANT OPTION;

D NOTE

A DB instance contains multiple databases. You need to grant permissions in the corresponding database.

When separation of permissions is enabled, initial user is used to grant permissions. When separation of permissions is disabled, SYSADMIN user is used to grant permissions.

Granting Permissions to Check Role and User Authorization

This check item is displayed when the target database type is GaussDB, the migration user is not granted the sysadmin permission, and GRANT objects are migrated. It is used to check whether the migration user has the permissions to grant or modify other users' permissions.

NOTE

If a sysadmin user is created after separation of permissions is disabled, you can execute migration tasks as the user.

2.3.5 Setting Check Items

Setting a Character Set and Compatibility

Step 1 Connect to a source database and run the following SQL statements to query the character set type of schemas in the source database:

Oracle SELECT value FROM nls_database_parameters WHERE parameter = 'NLS_CHARACTERSET';

MySQL

#databaseName indicates the name of a schema to be queried. SELECT default_character_set_name FROM information_schema.schemata WHERE SCHEMA_NAME = databaseName;

Step 2 Create a compatible target database based on the character set compatibility rules in **Table 2-5** to **Table 2-7**.

CREATE DATABASE *DATABASENAME* ENCODING 'UTF8' DBCOMPATIBILITY = 'B' ;

NOTE

- You can replace **UTF8** with other character sets based on character compatibility rules.
- The DBCOMPATIBILITY parameter is used to set compatibility. For details, see How Do I Create GaussDB Databases Compatible with Source Databases?

----End

2.4 Converting Syntax

Converting DATE and TIME Functions

When you convert syntax to GaussDB V2.0-3.2 and earlier versions, the DATE and TIME functions listed in **Table 2-9** return the transaction start time. The time you

obtained in the source database is the current system time. In long transactions, the time obtained from the source database is different from that obtained from the target GaussDB database. If the converted statement contains these functions, you need to analyze whether there are long transactions and confirm the impact. If yes, manually modify the functions to ensure final accuracy.

No.	Function
1	CURRENT_DATE
2	CURRENT_TIME
3	CURRENT_TIME(precision)
4	CURRENT_TIMESTAMP(precision)
5	LOCALTIME
6	LOCALTIMESTAMP
7	LOCALTIME(precision)
8	LOCALTIMESTAMP(precision)

Oracle -> GaussDB

GaussDB supports only common synonyms and does not support public synonyms. UGO will convert public synonyms in an Oracle database to common synonyms of the public schema in a GaussDB database. For details, see **Table 2-10**.

If different users in your database have public synonyms with the same name, there are synonym conflicts. You need to reconstruct the synonyms with the same name before migrating them. For details, see **Table 2-11**.

Table 2-10 Syntax conversion	Table 2-10 Syntax cor	version 1
------------------------------	-----------------------	-----------

Source SQL in Oracle	Converted SQL in GaussDB
CREATE PUBLIC SYNONYM u1.syn FOR u1.object1;	CREATE SYNONYM public.syn FOR u1.object;

Table 2-11 Syntax conversion 2

Source SQL in Oracle	Converted SQL in GaussDB	Whether Synonyms Conflict
CREATE PUBLIC SYNONYM u1.syn FOR u1.object1;	CREATE SYNONYM public.syn FOR u1.object1;	No

Source SQL in Oracle	Converted SQL in GaussDB	Whether Synonyms Conflict
CREATE PUBLIC SYNONYM u2.syn FOR u1.object2;	CREATE SYNONYM public.syn FOR u2.object2;	Yes

Converting Syntax from PostgreSQL to GaussDB

Mode compatibility:

- Syntax can be migrated from PostgreSQL to GaussDB (O-compatible mode).
- In the GaussDB (O-compatible mode) database, an empty string is stored as null. If **True** is returned in the result after **select '' is null;** is executed, an empty string is also stored as null in the Oracle database.

Impact scope:

- If the source database type is PostgreSQL and the target database type is GaussDB (O-compatible mode), SQL statements containing empty character strings or null need to be reconstructed.
- The impact scope includes DML, DDL, and system functions, such as **select'' is null;** and **select regexp_matches('test1', 'test1', '');**.
- UGO can evaluate the IS NULL syntax and empty string syntax during migration from PostgreSQL to GaussDB.

Converting Syntax from Microsoft SQL Server to MySQL

The DATETIME data type of Microsoft SQL Server supports addition and subtraction operations. However, UGO cannot accurately identify this scenario, so the DATE_ADD function is recommended in the MySQL database for reconstruction.

2.5 Converting Data Types

2.5.1 From MySQL to GaussDB

Source Data Type	Converted Data Type (GaussDB V2.0-8.0 and Earlier Versions)	Converted Data Type (GaussDB V2.0-8.0 and Later Versions)	Conversion Configuration
CHAR	CHAR	CHAR	Character set length conversion If you select This config will extend the character data type length, the storage of characters converted by DRS and UGO is equivalent.

Source Data Type	Converted Data Type (GaussDB V2.0-8.0 and Earlier Versions)	Converted Data Type (GaussDB V2.0-8.0 and Later Versions)	Conversion Configuration
VARCHAR	VARCHAR	VARCHAR	Character set length CONVERSION. If you select This config will extend the character data type length, the storage of characters converted by DRS and UGO is equivalent.
BINARY	BYTEA	BYTEA	-
VARBINARY	BYTEA	BYTEA	-
TINYBLOB	BYTEA	TINYBLOB	-
BLOB	BLOB	BLOB	BLOB If you select BLOB data type will retain, the storage of characters converted by DRS and UGO is equivalent.
MEDIUMBL OB	BYTEA	MEDIUMBLOB	-
LONGBLOB	BYTEA	LONGBLOB	LONGBLOB If you select LONGBLOB will convert to BYTEA, the storage of characters converted by DRS and UGO is equivalent.
TINYTEXT	TEXT	TINYTEXT	-
TEXT	TEXT	TEXT	TEXT datatype CONVERSION If you select Not conversion, retain the text data type, and comment out the length, the storage of characters converted by DRS and UGO is equivalent.
MEDIUMTE XT	TEXT	MEDIUMTEXT	-
LONGTEXT	CLOB	LONGTEXT	LONGTEXT If you select This config will convert LONGTEXT to CLOB, the storage of characters converted by DRS and UGO is equivalent.
ENUM	VARCHAR	VARCHAR	-
SET	SET	SET	-

Source Data Type	Converted Data Type (GaussDB V2.0-8.0 and Earlier Versions)	Converted Data Type (GaussDB V2.0-8.0 and Later Versions)	Conversion Configuration
TINYINT	SMALLINT	TINYINT	TINYINT If you select This data type will be converted to TINYINT. , the storage of characters converted by DRS and UGO is equivalent.
			Check Constraint If you select Do not add the check constraint , the storage of characters converted by DRS and UGO is equivalent.
SMALLINT	SMALLINT	SMALLINT	UNSIGNED INTEGER If you select The type remains unchanged , the storage of characters converted by DRS and UGO is equivalent.
			Check Constraint If you select Do not add the check constraint , the storage of characters converted by DRS and UGO is equivalent.
MEDIUMIN T	INTEGER	MEDIUMINT	SIGNED INTEGER If you select The type remains unchanged, the storage of characters converted by DRS and UGO is equivalent.
			UNSIGNED INTEGER If you select The type remains unchanged , the storage of characters converted by DRS and UGO is equivalent.
			Check Constraint If you select Do not add the check constraint , the storage of characters converted by DRS and UGO is equivalent.
INT	INT	INT	-
BIGINT	BIGINT	BIGINT	-

Source Data Type	Converted Data Type (GaussDB V2.0-8.0 and Earlier Versions)	Converted Data Type (GaussDB V2.0-8.0 and Later Versions)	Conversion Configuration
FLOAT	FLOAT4	FLOAT	FLOAT If you select Convert type to DOUBLE PRECISION, comment out precision and scale, comment out sign and padding keywords (UNSIGNED, SIGNED, ZEROFILL), the storage of characters converted by DRS and UGO is equivalent. Check Constraint If you select Do not add the check constraint, the storage of characters converted by DRS and UGO is equivalent.
DOUBLE	DOUBLE PRECISION	DOUBLE	DOUBLE If you select Convert type to DOUBLE PRECISION, comment out precision and scale, comment out sign and padding keywords (UNSIGNED, SIGNED, ZEROFILL), the storage of characters converted by DRS and UGO is equivalent. Check Constraint If you select Do not add the check constraint the storage
			of characters converted by DRS and UGO is equivalent.
DATE	DATE	DATE	-
DATETIME	TIMESTAMP	DATETIME	-
TIMESTAM P	TIMESTAMP WITH TIME ZONE	TIMESTAMP	-
TIME	TIME	TIME	-
BIT	BIT	BIT	-
JSON	JSONB	JSONB	JSON data type conversion If you select No conversion. Retain the JSON data type., the storage of characters converted by DRS and UGO is equivalent.
YEAR	SMALLINT	SMALLINT	Check Constraint If you select Do not add the check constraint , the storage of characters converted by DRS and UGO is equivalent.
DECIMAL	DECIMAL	DECIMAL	-

Source Data Type	Converted Data Type (GaussDB V2.0-8.0 and Earlier Versions)	Converted Data Type (GaussDB V2.0-8.0 and Later Versions)	Conversion Configuration
NUMERIC	NUMERIC	NUMERIC	-

2.5.2 From Oracle to GaussDB

Source Data Type	Converted Data Type	Conversion Configuration
CHAR	CHAR	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), VARCHAR2(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
VARCHAR	VARCHAR	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), VARCHAR2(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
VARCHAR2	VARCHAR2	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), VARCHAR2(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
NCHAR	NCHAR	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), VARCHAR2(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
NVARCHAR2	NVARCHAR2	-
NUMBER	NUMBER	-
NUMBER (6, 3)	NUMBER (6, 3)	-
NUMBER (6, 0)	NUMBER (6, 0)	-
NUMBER (3)	NUMBER (3)	-
NUMBER (6, -2)	NUMBER (6, -2)	-
BINARY_FLOAT	REAL	-
BINARY_DOUBLE	BINARY_DOUBLE	-

Source Data Type	Converted Data Type	Conversion Configuration
FLOAT	DOUBLE PRECISION	Float datatype If you select The FLOAT/FLOAT(n) will be converted to DOUBLE PRECISION, the storage of characters converted by DRS and UGO is equivalent.
INT	NUMBER(38)	Integer datatype If you select This config will convert INT, INTEGER, and SMALLINT to NUMBER(38), , the storage of characters converted by DRS and UGO is equivalent.
INTEGER	NUMBER(38)	Integer datatype If you select This config will convert INT, INTEGER, and SMALLINT to NUMBER(38), , the storage of characters converted by DRS and UGO is equivalent.
DATE	DATE	-
TIMESTAMP	TIMESTAMP(6)	-
TIMESTAMP_TZ	TIMESTAMP(6) WITH TIME ZONE	-
TIMESTAMP_LTZ	TIMESTAMP(6) WITH TIME ZONE	-
INTERVAL_YM	INTERVAL YEAR TO MONTH	-
INTERVAL_DS	INTERVAL DAY TO SECOND	-
BLOB	BLOB	-
CLOB	CLOB	-
NCLOB	TEXT	NCLOB datatype If you select The NCLOB will be converted into TEXT datatype, the storage of characters converted by DRS and UGO is equivalent.
LONG	TEXT	LONG data type If you select The LONG type will be converted into TEXT data type, the storage of characters converted by DRS and UGO is equivalent.
LONG_RAW	BYTEA	LONG RAW data type If you select The LONG RAW will be converted into BYTEA data type, the storage of characters converted by DRS and UGO is equivalent.
RAW	RAW	-

Source Data Type	Converted Data Type	Conversion Configuration
RowID	CHAR(18)	-
NUMBER(*, 0)	NUMBER(38, 0)	-

2.5.3 From PostgreSQL to GaussDB

Source Data Type	Converted Data Type	Conversion Configuration
SMALLINT	SMALLINT	-
INTEGER	INTEGER	-
BIGINT	BIGINT	-
INTEGER	INTEGER	-
REAL	REAL	-
DOUBLE PRECISION	DOUBLE PRECISION	-
NUMERIC	NUMERIC	-
CHARACTER VARYING	CHARACTER VARYING	Character datatype conversion If you select Extended character data type char/varchar length, the storage of characters converted by DRS and UGO is equivalent.
CHARACTER	CHARACTER	Character datatype conversion If you select Extended character data type char/varchar length, the storage of characters converted by DRS and UGO is equivalent.
BIT	BIT	-
BIT VARYING	BIT VARYING	-
BOOLEAN	BOOLEAN	-
BYTEA	BYTEA	-
TEXT	TEXT	-
TIME WITHOUT TIME ZONE	TIME WITHOUT TIME ZONE	-
TIME WITH TIME ZONE	TIME WITH TIME ZONE	-
TIMESTAMP WITHOUT TIME ZONE	TIMESTAMP WITHOUT TIME ZONE	-

Source Data Type	Converted Data Type	Conversion Configuration
TIMESTAMP WITH TIME ZONE	TIMESTAMP WITH TIME ZONE	-
INTERVAL	INTERVAL	-
CIDR	CIDR	-
РАТН	РАТН	-
ВОХ	BOX	-
LSEG	LSEG	-
MACADDR	MACADDR	-
POINT	POINT	-
POLYGON	POLYGON	-
INET	INET	-
TSQUERY	TSQUERY	-
TSVECTOR	TSVECTOR	-
UUID	UUID	-
JSON	JSON	-
JSONB	JSONB	-

2.5.4 From Microsoft SQL Server to GaussDB

Source Data Type	Converted Data Type	Conversion Configuration
TINYINT	TINYINT	-
SMALLINT	SMALLINT	-
INT	INT	-
BIGINT	BIGINT	-
DECIMAL	DECIMAL	-
NUMERIC	NUMERIC	-
FLOAT	FLOAT	-
REAL	REAL	-
SMALLMONEY	numeric(10, 4)	-
MONEY	numeric(19, 4)	-

Source Data Type	Converted Data Type	Conversion Configuration
BIT	BOOLEAN	Bit datatype If you select Convert the bit type to boolean data type, the storage of characters converted by DRS and UGO is equivalent.
DATE	DATE	-
SMALLDATETIME	SMALLDATETIME	-
DATETIME	TIMESTAMP(3)	-
DATETIME2(n)	TIMESTAMP(n)	-
DATETIMEOFFSET(n)	TIMESTAMPTZ(n)	datetimeoffset datatype If you select Convert the datetimeoffset type to timestamptz, the storage of characters converted by DRS and UGO is equivalent.
TIME(p)	TIME(p)	-
TIMESTAMP	BYTEA	-
XML	XML	XML datatype If you select Convert XML data type to TEXT data type, the storage of characters converted by DRS and UGO is equivalent.
CHAR(n)	CHAR(n)	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
VARCHAR(n)	VARCHAR(n)	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
varchar(max)	TEXT	VARCHAR(MAX) datatype If you select Convert VARCHAR(MAX) data type to TEXT data type, the storage of characters converted by DRS and UGO is equivalent.
NCHAR(n)	NCHAR(n)	Mismatch character set If you select This config will adjust the size of CHAR(n), VARCHAR(n), and NCHAR(n) such that there will not be overflow, the storage of characters converted by DRS and UGO is equivalent.
NVARCHAR(n)	NVARCHAR2(n)	-

Source Data Type	Converted Data Type	Conversion Configuration
NVARCHAR(max)	TEXT	NVARCHAR(MAX) datatype If you select Convert NVARCHAR(MAX) data type to TEXT data type, the storage of characters converted by DRS and UGO is equivalent.
BINARY(n)	BYTEA	-
VARBINARY(n)	BYTEA	-
VARBINARY(MAX)	BYTEA	VARBINARY(MAX) datatype If you select Convert VARBINARY(MAX) data type to BYTEA data type, the storage of characters converted by DRS and UGO is equivalent.
IMAGE	BYTEA	IMAGE datatype If you select Convert IMAGE data type to BYTEA data type, the storage of characters converted by DRS and UGO is equivalent.
HIERARCHYID	BYTEA	HIERARCHYID datatype If you select Convert HIERARCHYID data type to BYTEA data type, the storage of characters converted by DRS and UGO is equivalent.
NTEXT	ТЕХТ	NTEXT datatype If you select Convert NTEXT data type to TEXT data type, the storage of characters converted by DRS and UGO is equivalent.
ТЕХТ	ТЕХТ	TEXT datatype If you select Convert TEXT data type to TEXT data type, the storage of characters converted by DRS and UGO is equivalent.
UNIQUEIDENTIFIER	UUID	-

3 SQL Statement Conversion

Scenarios

You can check whether a specific SQL statement can be converted in the source and target databases and view the SQL statement after conversion.

Prerequisites

The SQL text provided for UGO must be syntactically correct, can be successfully compiled on the source database, and contains up to 100,000 characters.

Frozen accounts cannot view or modify target database types or conversion configurations.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, click **SQL Conversion**.
- **Step 3** Select the source and target database types and enter the SQL statements to be converted.
- **Step 4** (Optional) Click **Modify Conversion Configuration** to import the configuration parameters to be used. The conversion configuration in the default template is used by default.
 - You can set Parameter Configuration to Default value or Max compatibility, or import a created conversion configuration template. For details about how to create a conversion configuration template, see 4.1 Creating a Configuration Template.
 - In the **Current Configuration** column, move the cursor to ^⑦ of each feature to view the impact of the feature. You can click **Edit** to view details about configuration information and the current configuration conversion example.
 - Locate a feature, click **Edit** in the **Operation** column to modify the current configuration, and then click **OK**.
 - After you import configuration parameters, the configuration status of features is **Default value**. If you edit the configuration of a feature, the configuration status will become **Modified**.

Figure 3-1 Feature configuration settings

Feature Configuration		
Parameter Configuration	Default value	V Import SQL
 After importing cor After you import ne After your import, t 	figuration parameters, you can adjust the feature w parameter settings, the existing settings will b he configuration status of features is Default . If y	configuration based on the current project requirements. The adjusted configuration does not affect the original template. e overwritten. you edit the configuration of a feature, the configuration status will become Modified.

Step 5 Click **SQL Conversion** and view the converted SQL statement on the right.

If any, the unsupported features are displayed in the **Unsupported Item** area in the lower right part.



Convert Text Convert File			
1 SQL statements are converted based on the default configuration. If you need to modify the configuration, click Configure Co 2 Leaving this page will invalidate your configured conversion, and SQL statements will be converted based on the default config	nversion Configuration. guration.		×
Source SQL Statement	1	arget SQL Statement	
Oracle V 💿		GaussDB CentralizedV2 V	Compare Mode ()
1	Sci. Conversion Modily Conversion Co	1	

NOTE

- You can clear SQL statements on the source end and replicated SQL statements on the target end in a few clicks.
- For details about how to edit conversion configurations, see **Editing Conversion Configurations**.

Step 6 Enable **Compare Mode** (disabled by default).

After the source SQL statement is converted, enable **Compare Mode** to view the source SQL statement and converted SQL statement in comparison mode. In comparison mode, the source SQL statements cannot be modified.

Convert Text Convert File	
1. SQL statements are converted based on the default configuration. If you need to modify the configuration, click Config 2. Leaving this page will invalidate your configured conversion, and SQL statements will be converted based on the defau	ure Conversion Configuration.
Source SQL Statement	Target SQL Statement
Orade V 💿	🙃 GaussDB CentralizedV2 🗸 Compare Mode 🕥 🂽 📑
1-CRAIT TABLE "FE203207030025 _sub_template" 2-{ [10] MURRE(10,0), 3- R.LWARE' UARCHAR(10) 4-) FCTHE LO PCTUBED 40 INITIANS 1 NATIANS 255 5- BUFFER 5- BUFFER 5- BUFFER 5- BUFFERTION [STAILST (FL. LWARE 5- SUBPARTITION THE STAIL (ACHE DEFAULT CELL FLASH_CACHE DEFAULT) 5- SUBPARTITION THE STAIL (ACHE DEFAULT CELL FLASH_CACHE DEFAULT) 5- SUBPARTITION "IS (FL. LWARE 5- SU	1-CREATE TABLE FE222307809256_sub_template 2-(C ID NUMEED (18,0), 3-RL_UAME VARCHAR2(10) 4-) PCTTREE 10 PCFUSED & 04/PCTUSED & 04/PC
20 STORAGE(21-EUFER)D DEFAULT FLASH,CACHE DEFAULT CELL FLASH,CACHE DEFAULT), 22-PARTITION [T_R_P3] WALKES LESS THAM (VAXVALUE) 23-PCTFREE 10 PCTUSEO 40 DINTRAUS 1 MAXTANIS 255	24 STONAGE(25-BUFFER_DOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)*//*SUBPARTITION TEMPLATE*/ (26-SUBPARTITION T_R_P_2 L1 VALUES ('bb'), 28-SUBPARTITION T_R_P_2 L2 VALUES ('bc') 29-), 30-PARTITION T_R_P_2 L3 VALUES ('cc') 30-PARTITION T_R_P_2 L3 VALUES ('bc'), 30-PARTITION T_R_P_2 L3 VALUES ('bc') 31-PARTITION T_R_P_2 L3 VALUES ('bc') 31-PARTITION T_R_P_2 (bc) L555 THAW (MAX/AUE)) 31-PARTITION T_R_P_2 L3 VALUES (bc) (

Figure 3-3 Text comparison mode

----End

4 Conversion Configuration

4.1 Creating a Configuration Template

To use a conversion configuration solution to migrate multiple databases, you can create and set a conversion configuration template before creating a migration project. The template can be easily reused in subsequent migration projects.

Selecting a Template

Generally, you need to set **Template Type** to **Select** to create a conversion template.

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Conversion Configuration**.
- **Step 3** Click **Create Configuration Template**. **Template Type** is set to **Select** by default on the displayed page.

NOTE

- Each user can create up to 10 templates. If more than 10 templates have been created in an earlier version, all templates can be properly displayed after the upgrade.
- Only user **admin** can edit and delete templates created by other users.

Figure 4-1 Selecting a template	
---------------------------------	--

Basic Information					
Template Type					
Select					
Template Name					
Enter a template name.					
Source DB Type					
Olacie v					
Tanget DB Type					
GaussDB Centralized(compatible with A/V2 v					
Density Terrinte					
Defectively					
Feature Conflouration					
After your import, the comparation status of reatures is Defeat. If you edit the co	intiguration of a feature, the configuration status will become Modified.				×
Q. Search by item by default					00
New	Affected Object Tores	Conferentian Fisher	Connect Conference in a	Overalise	
1011	Harcas Oper Iper	Congrador Salas	Carrier Companyon	Operation	
Support for special character objectnames case format	Table, Index, Package, Materialized View, Function, Procedure, Trigger, User Defined	 Detsuit value 	If the object name contains special character, the object name would be conve	Edit	
Support for reserved keyword objectnemes case format.	Table, Index, Package, Materialized View, Function, Procedure, Trigger, User Defined	 Detault value 	The object names which are reserved keywords in the target do would be conv ③	Dat	
Support for common object names case (non-keywords and without special chara	Schema, Table, Vev	 Default value 	Object name is stored as lowercase in the target database.	Ddl	
Support for object level privileges	System	 Default value 	This config will raise the error.	Eat	
Support for system privilege	System	 Default value 	This config will throw the error for the system privileges which are not supported.	Edit	
Support for grant Any privileges	System	 Default value 	throws an error.	Edit	
Support for system role	System	 Default value 	This config will retain the script as it is without logging any error.	Edit	
Support for target character set	All Objects	 Default value 	This config will select UTF8 as characterset for target do.	Eat	
Support for mismatch character set	All Objects	 Detault value 	This config will retain the script without conversion. (r)	Edit	

Table 4-1	Parameter	description
-----------	-----------	-------------

Paramete r	Description
Template	Enter a template name.
Name	The name can contain 5 to 50 characters and must start with a letter and end with a digit or letter. Only letters (case-insensitive), digits, underscores (_), and hyphens (-) are allowed.
Source DB Type	Select the type of the source database to be configured.
Target DB Type	Select the type of the target database to be configured.
Baseline Template	Select Default value , Max compatibility , or an existing template used for the same migration flow.

Step 4 You can select a preset configuration template from the Baseline Template dropdown list to quickly import conversion configurations. After you import configuration parameters, the configuration status of features is Default value. If you edit the configuration of a feature, the configuration status will become Modified.

After you import new parameter settings, the existing settings will be overwritten. Exercise caution when performing this operation.

Step 5 Set the configuration items based on the actual conversion scenario.

• In the **Current Configuration** column, move the cursor to ^⑦ of each feature to view the impact of the feature. You can click **View Sample** to view details about the configuration information and the current configuration conversion example.
- Locate a feature, click **Edit** in the **Operation** column to modify the current configuration, and then click **OK**.
- **Step 6** Click **Create**. You can view the created template in the template list.

----End

Importing a Template File

To import a conversion template file preset and exported by another account, select **Import** for **Template Type** and create a conversion template. For details about how to export a conversion configuration template, see **4.2 Exporting a Conversion Configuration Template**.

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Conversion Configuration**.
- Step 3 Click Create Configuration Template. On the displayed page, select Import for Template Type.
- **Step 4** On the displayed page, click **Add File** and upload the .ugotmplt template file exported from other instances. The system will identify and display the template name, source database type, target database type, and preset feature configurations.

Figure 4-2 Creating a configuration template by importing a template file

Basic Information				
Template Type Select Import				
Add File				
🕞 a_ta_g ugatmpli				
Supported: ugotmpit; Max. size: 10 KB				
Template Name				
() Item				
Source DB Type				
Oracle				
Target DB Type				
GaussDB CentralizedV2.0-8.200 Enterprise Edition				
Feature Configuration				
After your import, the configuration status of features is Default. If y	ou edit the configuration of a feature, the configuration status will become Me	dified.		x
 Search by item by default 				00
Item	Affected Object Types	Configuration Status	Current Configuration	Operation
Support for special character objectnames case format.	Table, Index, Package, Materialized View, Function, Procedure, Trigger,	 Default value 	If the object name contains special character, the object name \dots	Edit
Support for reserved keyword objectnames case format.	Table, Index, Package, Materialized View, Function, Procedure, Trigger,	Default value	The object names which are reserved keywords in the target db \odot	Eat
Support for common object names case (non-keywords and without	Schema, Table, View	Default value	Object name is stored as lowercase in the target database. $\textcircled{\begin{target}{c} \hline \end{target}}$	Eat
Support for object level privileges	System	Default value	This config will raise the error. ③	Edit

Step 5 (Optional) In the configuration item list, fine-tune the configuration based on the database to be migrated.

----End

4.2 Exporting a Conversion Configuration Template

Scenarios

If a configuration template has been created using the current Huawei Cloud account and needs to be reused by other accounts, you can export the template from the current UGO instance.

Prerequisites

You have created a template.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Conversion Configuration**.
- Step 3 Click Export in the Operation column to download the .ugotmplt template file.

4.3 Viewing Conversion Configuration Templates

Scenarios

You can view custom conversion configuration templates, which are displayed in descending order of creation time.

Constraints

Only custom templates are displayed. System templates (including default values and maximum compatibility configurations) are not displayed.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Conversion Configuration**.
- **Step 3** View the custom templates displayed in the list.

You can search for templates by template name, source database type, target database type, or creator. Fuzzy search is supported by template name and creator.

Figure 4-3 Viewing conversion configuration templates

Delete Q. Search by Template Name by defa	ut			Q (@)
Template ID	Template Name	Source DB Type	Target DB Type Created By	Operation
35	o_to_g	Oracle	GaussDB CentralizedV2.0-8.100 Enterpris admin	Edt Delete
Гюd				
Ena				

4.4 Modifying a Conversion Configuration Template

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane, choose **Conversion Configuration**.

Step 3 Locate a template that you want to modify and click **Edit** in the **Operation** column.

NOTE

- You can edit only the templates that you create.
- Only the value of a configuration item can be changed. The template name, source database type, and destination database type cannot be changed.
- After you import configuration parameters, the configuration status of features is **Default value**. If you edit the configuration of a feature, the configuration status will become **Modified**.
- Frozen accounts cannot be used to modify configuration templates.

Figure 4-4 Editing a template

Basic Information					
Template Name o_to_g Source DB Type Oracle	Target DB Type GaussDB CentralizedV2.0-8.100 En	terprise Edition			
After your import, the configuration status of features is Dev	fault. If you edit the configuration of a feature, the configuration statu	s will become Modified.			×
Q Search by Item by default					00
Item	Affected Object Types	Configuration Status	Current Configuration	Operation	
Support for special character objectnames case format.	Table.Index,Package,Materialized View,Function,Procedure,T	Default value	If the object name contains special character, the object n	Edt	
Support for reserved keyword objectnames case format.	Table, Index, Package, Materialized View, Function, Procedure, T	Default value	The object names which are reserved keywords in the tar	③ Edt	
Support for common object names case (non-keywords and w	Schema, Table, View	Default value	object name is stored as lowercase in the target database.	O Edt	
Support for object level privileges	System	Default value	This config will raise the error.	Edt	
Support for system privilege	System	Default value	This config will throw the error for the system privileges w	Edt	
Support for grant Any privileges	System	Default value	throws an error.	Edt	
Support for system role	System	Default value	This config will retain the script as it is without logging any	③ Edt	
Support for target character set	All Objects	Default value	This config will select UTF8 as characterset for target db.	⑦ Edt	
Support for mismatch character set	All Objects	Default value	This config will retain the script without conversion.	Edt	

- **Step 4** Locate a feature and click **Edit** in the **Operation** column to modify the current configuration of the feature.
- Step 5 Click OK.
- **Step 6** After the modification, click **Back**.

----End

4.5 Deleting a Conversion Configuration Template

Scenarios

You can delete conversion configuration templates. Deleted templates cannot be restored. Exercise caution when performing this operation.

Prerequisites

You have created a template.

Templates frozen for security reasons cannot be deleted.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane, choose **Conversion Configuration**.
- **Step 3** Locate a template that you want to delete and click **Delete** in the **Operation** column. You can also select multiple templates and click **Delete** above the list.
- Step 4 Click OK.

----End

5 SQL Audit

SQL audit helps users detect SQL standardization, design rationality, and performance issues hidden in code at the development phase. More than 300 audit rules are preset for various SQL statements such as DML, DDL, and PL/SQL. You can adjust the risk level, threshold, and suggestion in a rule and create a custom audit template by combining multiple rules. GaussDB, PostgreSQL, and MySQL databases can be audited. You can use a single statement, upload code files in batches (SQL statements are automatically extracted), or directly connect to the database to audit SQL statements. UGO also prevents inappropriate SQL statements from flowing into the production environment.

5.1 Statement Audit

5.1.1 Viewing Text Audit History

Scenarios

You can view details about the text to be audited.

Prerequisites

A text has been submitted for audit.

Procedure

- Step 1 Log in to the UGO console.
- Step 2 In the navigation pane on the left, choose SQL Audit > Statement Audit. The SQL Text page is displayed by default.
- **Step 3** In the **History** area, view the historical records, including the database type, data source, SQL statement, and audit time.

Only the latest 10 records are displayed.

Figure 5-1 Viewing text audit history

History									
Only the latest 10 records are di	splayed.								×
Delete Record									C
No.	Database Type	Source DB information	Rule Template	SQL Statement	Status	Risk Level	Audited	Operation	
214	MySQL	-	MySQL audit template	select id.name from test_keep where	Completed	No risk	May 11, 2024 10:54:51 GMT+08:00	View Details	
213	MySQL	-	MySQL audit template	select id.name from test_keep group	Completed	Critical	May 11, 2024 10:54:29 GMT+08:00	View Details	
212	GausaDB	-	GaussDB audit template	CREATE TABLE range_interval (prod	Completed	Critical	May 11, 2024 10:51:29 GMT+08:00	View Details	
211	GaussDB	-	GaussDB audit template	CREATE TABLE range_interval (prod	Completed	Critical	May 11, 2024 10:50:38 GMT+08:00	View Details	
210	GaussDB	-	GaussDB audit template	CREATE #EDITIONABLEY TYPE T	Completed	No risk	May 11. 2024 10:50:05 GMT+08:00	View Details	

Step 4 Click **Review Details**. The basic information, violation rules, and table structure of the SQL statement are displayed.

If the audit fails, the failure cause is displayed.

• Violated Rules: Based on the selected rule template, the system provides the violated rule name, risk level, and suggestions.

Click the content in the **Problem Segment** column to highlight the problem segment in the text. To cancel the highlight, click the content again. The PL/SQL code may have multiple problem fragments. Click on the left to display all problem fragments.

- **Unmatched Rules**: The rules related to the source database are not matched because:
 - No data source is selected.
 - Data source connection fails.
 - The user permission is insufficient.
 - The schema is incorrectly selected.
 - The table is not found.

The displayed information includes the rule name, risk level, and unmatched reason.

- **Table Structure**: Based on the selected rule template, the system provides the table structure information that the SQL statement to be audited depends on, including the object name, object type, and owner.
- **Execution Plans**: The execution plans of the SELECT, UPDATE, DELETE, and INSERT statements are displayed.
- **Recommended Indexes**: Information (including table names, schemas, index columns, CREATE statements, and statuses) about indexes recommended for tables that the SQL statement to be audited relies on is displayed.
- Click the value next to **Rule Template** to go to the specific template information.

NOTE

To obtain the table structure, you must have the permissions to read system catalogs and system views.

- GaussDB system catalogs: tables, pg_class, pg_namespace, relnamespace, pgxc_class, pg_settings, pg_get_viewdef, columns, pg_tables, pg_index, table_constraints, pg_partition, pg_get_tabledef, check_constraints, key_column_usage, pg_get_keywords, gs_package, db_constraints, and adm_ind_columns.
- MySQL system catalogs: information_schema.tables, information_schema.columns, information_schema.statistics, and information_schema.table_constraints
- PostgreSQL system catalogs: pg_class, pg_namespace, information_schema, pg_index, pg_inherits, and pg_attribute

View Details					×
Basic Information	'n				
Result	o Completed				
Database Type	GaussDB				
Data Source					
Rule Template	GaussDB audit templ	ate			
SQL Statement	select * from tab				
Violated Rules	Table Structure	Unmatched Rules	Execution Plans	Recommended Indexes	
Q Search by Ru	le Name by default				0
Rule Name	Descript	tion Risk Leve	I Threshold	Problem Fragm	Suggestion

----End

5.1.2 Deleting All Audit Records

Scenarios

You can delete all audit records at a time. Deleted records cannot be restored. Exercise caution when performing this operation.

Prerequisites

A text has been submitted for audit.

Procedure

- Step 1 Log in to the UGO console.
- Step 2 In the navigation pane on the left, choose SQL Audit > Statement Audit. The SQL Text page is displayed by default.

In the **History** area, view the historical records.

- Step 3 Click Delete Record above the list.
- **Step 4** Click **OK** to clear all the records.

----End

5.1.3 Viewing File Details

Scenarios

You can view details about the uploaded SQL files.

Prerequisites

A file has been uploaded.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Statement Audit**. Click the **SQL from Files** tab.
- **Step 3** Locate a task and click **View Details** in the **Operation** column. The file audit information, index recommendation information, and collected SQL statements are displayed. You can export SQL statements.
- **Step 4** In the **File Audit Information** area, you can view the file name, audit status, and data source information.

Figure 5-3 File Audit Information

File Audit Information	1		
File Name	tpcds_out.sql	Status	• Audit completed
Database Type	GaussDB	Data Source	/tpcds
Uploaded	Dec 17, 2024 14:45:15 GMT+08:00	Audit completed	Dec 17, 2024 14:45:21 GMT+08:00
Rule Template	GaussDB audit template	Description	- 2

- To modify the task description, click $\overset{\frown}{=}$ next to **Description**.
- Click the value next to **Rule Template** to view template information.
- **Step 5** Check index recommendation information. You can click tabs to view recommended indexes, redundant indexes, and risky SQL statements.
 - Tables: tables with recommended indexes in the uploaded file
 - **Recommended Indexes**: recommended indexes in all tables in the uploaded file = indexes not found + available indexes + inconsistent indexes + others

NOTE

- Indexes are recommended only for GaussDB.
- The index recommendation information is displayed only when **Recommend Index** is enabled during file audit task creation.
- Click the **Recommended Indexes** tab to view indexes recommended based on SQL statements in the uploaded file. The table names, recommended index columns, statuses, and CREATE statements are displayed in the list.

Figure 5-4 Recommended index list

Index Recom	mendation							
24 Tables		56 Recommended indexes	33 Indexes Not Faund	4 Available indexes	19 Inconsistent	t indexes	0 Others	
Recommende	d Indexes Redundant Indexes Risky SQL							
Select Schem	k v Selection v	 Select a property or order a keyword. 						00
51 No.	Teble		Recommended Index Column		Status 💮	CREATE Stationed		
1	public catalog_returns		cr_order_number.cr_item_sk		index not found	CREATE INDEX ups_recommend_index ON public catal	og_returno(or_order_number, cr_itern_sk);	
2	public catalog_nitums		ct_starring_custome_sk		Index not found	CREATE INDEX upp_ncommend_index ON public catal	og_nturns(or_nturning_customer_sis);	
3	public catalog_returns		cr_returning_addr_sk		Index not found	CREATE INDEX ups_recommend_index ON public catal	og_returns(or_returning_addr_sk);	
4	public catalog_returns		cr_miumed_date_sk		index not found	CREATE INDEX ups_recommend_index ON public catal	og_returns(or_returned_claim_sk)	
5	public catalog_sales		ca_bll_cdeme_sk		Index not found	CREATE INDEX upg_recommend_index ON public catal	log_sales(cs_bll_cdemo_sk);	
6	public catalog_sales		05_008_088_08		Index not found	CREATE INDEX ups_noommend_index ON public catal	00_5486505_5086_688_592	
7	public catalog_sales		cs_order_number		index not found	CREATE INDEX ups_recommend_index ON public catal	og_sales/cs_arder_number);	
	public catalog_sales		cs_ship_curiteree_sk		index not found	CREATE INDEX ups_recommend_index ON public catal	log_sales(cs_ship_customer_sk);	
9	public catalog_sales		cs_bll_customer_sk		Index not found	CREATE INDEX upp_ncommend_index ON public catal	bg_salles(cs_bll_customer_sk);	
10	public catalog_sales		cs_solt_time_sk		Index not found	CREATE INDEX ups_recommend_index ON public catal	0g_54865(05_5686_5896_58)	
Total Records: 5	5						10 V C 1 2 3 4	6 6 5

NOTE

- The status can be Index available, Index not found, Inconsistent, or Table not found.
 - Index available: There are same indexes in a database.
 - Index not found: Indexes in a database are different.
 - Inconsistent: An index consistent with the first column of the current index is in a database.
 - **Table not found**: The table with the current index is not in a database.
- After you select schema and table names from the drop-down lists, the SQL statement of the table is displayed in the SQL list in **Step 6**.
- If no data source is selected during task creation, -- is displayed in the schema drop-down list.
- Click the Redundant Indexes tab to view redundant indexes based on SQL statements in the uploaded file. Table names, index names, and index fields are displayed in the list.

Figure 5-5 Redundant index list

Recommende	d Indexes Redundant Indexes Risky SQL			
Select Schem	a. v) [Select Table. v] [O, Select a property or entire a keyword.			08
Si No.	Table	Index	Index Field	
1	99_calailing.pg_princ	pg_proc_promame_arpi_mag_index	prename, prearghpes, pronamespace, propachaged	
2	pg_stating_pg_price	pg_proc_proteine_prop_mog_mov_index	prename, preorghypes, pronamespace, propachapeld	
3	uga audt_collection_statulase_objects	audi_collection_dollabore_objects_id=_enric_task_id	1964_M	
4	uga audt_pixol_sbjects_depend	audt_pitol_shjects_depend_idc_depend_task_sol_id	task_id.sqLid	
5	upp audt_texic_ceptury	audt_toix_capture_pkey	task_i4	
4	opo audt_texic_cepture	audt_baik_capture_index_baikid	tani_di	
Transformer 6				

NOTE

- If no data source is selected during task creation or no index is created for the selected data source, no data is displayed in the redundant index list.
- If no data source is selected during task creation, -- is displayed in the schema drop-down list.
- Click the **Risky SQL** tab to view condition columns specified in risky SQL statements in the uploaded file. These condition columns cannot improve query efficiency even if indexes are created for them. Table names and condition columns are displayed.

Figure 5-6 Risky SQL list

Recommended Index	Redundant Indexes Risky SQL		
Select Schema.	✓) [Solid Table. ✓] [C], Solid a property or enter a hippword.)(0	
SI No.	Table	Condition Column	
0.1	lige audt_defeaterer	folloource_name	
0.2	lige audit_project	ever	
0.1	uge chanset_servert_record	ever	
O 4	uga db_appmig_antjects	project_status	
0.5	upa dh_appreig_projects	data_file_parre_staba	
0.6	uga da_aspring_projects	dala_processing_status	
07	uge db_eppmig_antjects	anapite_rer_johtquere	
0.8	upa dh_esperig_projects	preveijulika	
O P	uga db_appmig_projects	1/32_300si	
0.11	uga dh_wm_uow_bogn_who	Not_success_diardp	
Fotel Records: 15			2 >

D NOTE

- After you select schema and table names from the drop-down lists, the SQL statement of the table is displayed in the SQL list.
- If no data source is selected during task creation, -- is displayed in the schema drop-down list.
- After you select before a sequence number, the SQL statement of the table is displayed in the SQL list in **Step 6**.
- **Step 6** Check the SQL list, including SQL IDs, SQL statements, descriptions, risk levels, and statuses.

Figure 5-7 SQL list

SQL Statements						
Q Search by SQL ID by default						Q ()
SQL ID	SQL Statement	Description	Status Θ	Failure Reason	Risk Level	Operation
aee53a1b-db1c-4648-95f7-b	with customer_total_return as (select sr_customer_sk as ctr_customer_sk ,sr_store_s	tpcds_out sqt:2	Completed		Critical	View Details
2ed43819-2a97-4e65-b6ec-6	with wscs as (select sold_date_sk ,sales_price from (select ws_sold_date_sk sold_dat	tpcds_out.sqt:27	Completed	-	Critical	View Details
ac815cc8-437c-4c85-9301-6	select * from (select dt.d_year_item.i_brand_id brand_id ,item.i_brand brand ,sum(ss	tpcds_out.sql::87	Completed	-	Critical	View Details
68te2t47-dd93-4cd8-9eta-bc	with year_total as (select c_customer_id customer_id,c_first_name customer_first_n	tpcds_out.sql::108	Completed	-	Critical	View Details
cddb6828-da7c-4fb2-a2e0-4	with sor as (select s_store_id, sum(seles_price) as seles, sum(profit) as profit, sum(ret	tpcds_out sqt: 224	Completed	-	Critical	View Details
2244d7ad-a6ce-4c8f-afd2-78	select * from (select a.ca_state state, count(*) cnt from customer_address a ,customer	tpcds_out.sqt:352	Completed	-	Critical	View Details
2bdc8294-b49b-4f3c-a3c2-3	select * from (select i_item_id, avg(ss_quantity) agg1, avg(ss_list_price) agg2, avg(ss	tpcds_out.sqt::378	Completed	-	Critical	View Details
eb404319-7dde-4055-8342-5	select * from (select s_store_name ,sum(ss_net_profit) from store_sales ,date_dim ,st	tpcds_out sql: 399	Completed		Critical	View Details
a43443ea-32da-4092-8577-c	select * from (select cd_gender, cd_marital_status, cd_education_status, count(*) cnt1	tpcds_out.sqt::558	Completed	-	Critical	View Details
f4d39f86-e131-4dd0-9b55-39	with year_total as (select c_customer_id customer_id ,c_first_name customer_first_n	tpcds_out.sqt::617	Completed	-	Critical	View Details
Total Records: 103					10 ~ < 1 2 3	4 5 6 11 >

Status indicates the audit status of the current statement. The status can be **New**, **Completed**, **Analysis_error**, **Error**, or **Ignore**.

- New: The collected SQL statement is waiting for audit.
- **Completed**: The audit is complete.
- **Analyze_error**: The SQL statement failed to be parsed.
- Error: There is an exception during the audit.
- **Ignore**: The SQL statement cannot be audited, or the size of a single SQL statement exceeds the threshold. The default threshold is 100 KB.

Parsing failure cause:

- **line:1, position:14, token:table** indicates a SQL statement contains **table**.
- line:1, position:3, token:<EOF>: indicates a SQL statement is incomplete.

Export SQL: Select one or more SQL statements to be exported and click **Export SQL** to export them to a **.tar.gz** file.

- By default, all SQL files are exported. You can also select SQL files or set search criteria to export desired SQL files.
- By default, **The exported Excel file contains existing SQL statements** is selected. If the existing SQL statements are too large, do not select this option.
- If the existing SQL statements in the exported file are too large, save them in a separate file whose name will be displayed in the **SQL Statement** column in the Excel file.
- The exported Excel file contains a maximum of 5000 records. If there are more than 5000 records, they are saved in multiple Excel files.
- If table structure information which the SQL statement to be audited depends on contains more than 30,000 characters, the information is exported to a SQL file.
- **Step 7** Locate a SQL statement and click **View Details** in the **Operation** column. The basic information, violated rules, and table structure of the SQL statement are displayed.
 - If multiple SQL statements are collected, you can click **Previous** or **Next**.

View Detail	s - 571d1e41-1237	-4fa1-b6e5-37502	981bc3f		2
 Some rule 	s are not matched due to da	ta source problems.			×
Basic Informat	ion				
SQL Statement	create database test2;				
Description	auto_sql_audit_error_file	_002.xml::createDatabase12			
Violated Rules	Table Structure	Unmatched Rules	Execution Plans		
Q Search by R	Rule Name by default) (3)
Rule Na	me Description	Risk Level	Threshold	Problem Fragme Suggestion	
✓ Use the	UTF8 cha To meet glot	oalizat • Alarm	-	create database test2 N/A	Next

Figure 5-8 Viewing SQL audit details

- **Basic Information**: The specific SQL statement and description are displayed.
- **Violated Rules**: Based on the selected rule template, the system provides the violated rule name, risk level, and suggestions.

Click the content in the **Problem Segment** column to highlight the problem segment in the text. To cancel the highlight, click the content again. The PL/SQL code may have multiple question fragments. Click v to display all question fragments.

- Unmatched Rules: The rules related to the source database are not matched because no data source is selected, the data source connection fails, user permissions are insufficient, schemas are incorrectly selected, or a table is not found. The displayed information includes the rule name, risk level, and unmatched reason.
- Table Structure: Table structure information which the SQL statement to be audited depends on is displayed, including the object name, object type, and owner.
- **Execution Plans**: Execution plans of the SELECT, UPDATE, DELETE, and INSERT statements are displayed.

NOTE

To obtain the table structure, you must have the permissions to read system catalogs and system views.

- GaussDB system catalogs: tables, pg_class, pg_namespace, relnamespace, pgxc_class, pg_settings, pg_get_viewdef, columns, pg_tables, pg_index, table_constraints, pg_partition, pg_get_tabledef, check_constraints, key_column_usage, pg_get_keywords, gs_package, db_constraints, and adm_ind_columns.
- MySQL system catalogs: information_schema.tables, information_schema.columns, information_schema.statistics, and information_schema.table_constraints
- PostgreSQL system catalogs: pg_class, pg_namespace, information_schema, pg_index, pg_inherits, and pg_attribute

----End

5.1.4 Viewing Error Files

Scenarios

You can view the error files and error information during the audit.

Prerequisites

A file has been uploaded.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Statement Audit**. Click the **SQL from Files** tab.
- Step 3 Locate the target task and choose More > View Error Files.

Figure 5-9 Viewing error files



----End

5.1.5 Deleting a File Audit Task

Scenarios

You can delete file audit tasks. Deleted audit tasks cannot be restored. Exercise caution when performing this operation.

Prerequisites

A file has been uploaded.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Statement Audit**. Click the **SQL from Files** tab.
- **Step 3** Locate the task you want to delete and choose **More** > **Delete** in the **Operation** column.
- **Step 4** In the displayed dialog box, click **OK**.

----End

5.2 Database Audit

5.2.1 Querying Audit Task Details

Scenarios

You can view details about a database audit task.

Prerequisites

A database audit task has been created

Procedure

- Step 1 Log in to the UGO console.
- Step 2 In the navigation pane on the left, choose SQL Audit > Database Audit.
- **Step 3** Locate a task, and click **View Details** in the **Operation** column to view the audit details, object statistics, SQL risk statistics, and SQL statements.
- Step 4 View information on the Database Audit Details area.

Figure 5-10 Viewing database audit details

Database Audit Details								
Task Name	tesr123	Status	• Audit completed					
Source DB Type	GaussDB	Database Version	GaussDB Primary/Standby-8.0 Enterprise Edition					
Data Source	:4000/test_ysh	Schema	All					
Started	Nov 05, 2024 19:47:13 GMT+08:00	Ended	Nov 05, 2024 19:47:15 GMT+08:00					
Rule Template	GaussDB database audit template	Description	123 🖉					

- Click the value next to **Rule Template** to view template information.
- To modify the task description, click \angle next to **Description**.

Step 5 View information on the Object Type Statistics area.

Figure 5-11 Viewing object type statistics

Object Type Statistics							
Object Statistics	٥	Object Types I	wolved in Risky SQLs that Violate Rules				TOP5 V O
		FUNCTION					
AL AND A	TABLE SEQUENCE						
771	24 10 INDEX VIEW	INDEX		INDEX			
Total Count	• 21 • 3 PROCEDURE TRIODER	PACKAGE B		5			
	PACKAGE FUNCTION	PACKAGE					
	< 12 → >		3		 12	15	18

The statistics are displayed only when the task status is **Audit completed**.

- Object Statistics: The number of object types to be audited in the database are displayed.
- **Object Types Involved in Risky SQLs that Violate Rules**: Objects that violate rules are displayed. You can move the cursor to the bar chart to view the number of objects.
 - You can click the drop-down list box in the upper right corner to view the first 5 or 10 object types that violate rules. By default, the first 5 objects are displayed.

Step 6 View information on the **Risky SQL Statistics** area.

Figure 5-12 Viewing risky SQL statistics

NO:	sky sol, statistics								
	Risk Object Statistics	G	Violation Rules for Risk	y SQLs					TOP 5 V G
			Make knowneds in						
		• 725 • 7 90Ls (Risk SQLs (Risk	Specify a primary						
	786	• 38 • 15	Use the NUMERIC -						
	Total Count	• 0	Do and use OFFAU						
		Others	001000000000						
			Do not use CACHE						
			0	100	200	300	400	500	600

D NOTE

Others refer to statements that cannot be parsed.

- Risk Object Statistics: Total number of risky objects in the audit database is collected.
- Violation Rules for Risky SQLs: Rules that are violated in DDL statements are displayed. You can move the cursor to the bar chart to view the number of rules.
 - You can click the drop-down list box in the upper right corner to view the first 5 or 10 rules that are violated. By default, the first 5 rules are displayed.

Step 7 View information on the **SQL Statements** area.

Figure 5-13 Viewing SQL statements

SQL Statements													
60 08 00(etts (771) 0 Statupe (644)	786 Total SQLs		38 SQLs	(Risk Level Critical)	726 SQLs (Risk Level Ak	em)	0 SQL (Risk Level Suggestion)	7 SQLs (F	isk Levet. Na risk)	15 SQLs Failed to Pare	ed	0 Others	
TABLE (470) SEQUENCE (152) UNITAR (46)	Expert SQL	CREATE TAI	ILE CREATE SEQUENCE CI	REATE INDEX CREATE VIE	W CREATE PROCEDURE CREAT	E TROQER OREATE I	SCRADE CREATE FUNCTION OREATE PACK	ADE BODY >	Add ffler				× 0 0
NEW (18) D Gode (107) D SEARCE (21)		SI No.	SQL 10 31a84e0a-848c-4911-8695	Audit Object TABLE	SQL Type CREATE TABLE	SQL Statement CREATE TABLE 1101	5_3ab (a integer, b integer, c integer NOT NULL, "	aa Aa' inte	Status e Fe Completed	allure Reason	Risk Level 8	Operation View Details	
		2	20668837-2c54-4a34-864 06d89810-3c77-45df-ea30	FUNCTION	CREATE FUNCTION	CREATE OR REPLAC	E FUNCTION al., d.func_increment_plog_10130) E FUNCTION al., d.func_increment_plog0_10130	i characta	Completed Completed		Ortical Ortical	Vew Details	
 PACKAGE BCCY (4) PACKAGE BCCY (4) 		4 5	20022001038-4873-atb 9224005-aa72-020-882	TABLE	CREATE TABLE	CREATE TABLE 1109	0_large_storage (a bigint, b bigint, c bigint, d bigin E FUNCTION opc_so(_wadt_at hanc_increment_at	t, o bigint, sqQ(Net c	Completed Completed		Critical Critical	View Details	
		6	00030903-3003-4434-823	PACKAGE BODY PACKAGE BODY	CREATE PACKAGE BODY CREATE PACKAGE BODY	CREATE OR REPLAC	E PACKAGE BODY 'my_peckage3' IS var3 int =3 E PACKAGE BODY 'my_peckage2' IS var3 int =3	var4 int =	Completed Completed		Ortical Ortical	View Details	
		9	36083267-1985-42e1-add 6x843115-678c-47c4-935	PACKAGE BODY PROCEDURE	CREATE PACKAGE BODY CREATE PROCEDURE	CREATE OR REPLAC	E PACKAGE BODY 'no_inf' 15 wa3 int=3; wa4 in E PROCEDURE dba.so_helpdiagrams(upo_diagr	t=4 – ¥	Completed Completed		Critical Critical	Vew Details	
	Total Records: 77	10 1 10	92468031-3811-4956-a108	PROCEDURE 6 ··· 78 →	CREATE PROCEDURE	CREATE OR REPLAC	E PROCEDURE des tiugs_TableName NV/RCH/	R2(200))	Completed		Ortical	View Details	

View the audited object types in the left navigation tree. After you click an object type, the **Object Statistics** and **Risky SQL Statistics** areas show the object type details.

- **Export SQL**: Select one or more SQL statements to be exported and click **Export SQL** to export them to a **.tar.gz** file.
 - By default, all SQL statements are exported. You can also select SQL statements to export, or set search criteria to export desired ones.
 - By default, The exported Excel file contains existing SQL statements is selected. If the existing SQL statements are too large, do not select this option.
 - If the existing SQL statements in the exported file are too large, save them in a separate file whose name will be displayed in the SQL Statement column in the Excel file.
 - You can export a maximum of 5,000 objects to an Excel file.
 - If the table structure information which the SQL statement to be audited depends on contains more than 30,000 characters, it is exported as a SQL file.
- The status can be:
 - New: The object SQL statement has just been collected and is waiting for audit.
 - **Completed**: The audit is complete.
 - **Analyze_error**: Failed to parse SQL statements.

- **Error**: An exception occurred during the audit.
- **Ignore**: The SQL statement cannot be audited or the size of a single SQL statement exceeds the threshold. The default threshold is 100 KB.

Failure cause:

- line:1, position:14, token:table indicates the SQL statement contains table.
- **line:1, position:3, token:<EOF>** indicates that the SQL statement is incomplete.
- **Step 8** Locate a SQL statement and click **View Details** in the **Operation** column. The basic information, violated rules, and table structure of the SQL statement are displayed.
 - If multiple SQL statements are collected, you can click **Previous** or **Next**.

Figure 5-14 Viewing SQL audit details

0	Some rules ar	e not matc	hed due to data source p	roblems.			×
SQL Sta	atement atement	CREATE T. a integer b integer c integer "aa. Aa" i "b.Bb" in u integer Table \$	ABLE t10175_tab (, NOT NULL, nteger, teger, Structure Unmai	tched Rules	Execution Plans		
Q s	earch by Rule	Name by	default				0
	Rule Name		Description	Risk Level	Threshold	Problem Fragme	Suggestion
\sim	Do not use (charac	You cannot use ch	 Critical 	-	"aa.Aa"	N/A
\sim	Make keywo	ords in	In SQL statements	• Alarm	-	integer	N/A
~	Use a consi	stent n	The naming style	 Suggestion 	-	<u>"aa.Aa"</u>	N/A
\sim	The name o	f a dat	The database obje	 Suggestion 	-	<u>"aa.Aa"</u>	N/A

- **SQL Statement**: The SQL statements for object creation are displayed.
- **Violated Rules**: Based on the selected rule template, the system provides the violated rule name, risk level, and suggestions.
 - Click the content in the **Problem Segment** column to highlight the problem segment in the text. To cancel the highlight, click the content again. The PL/SQL code may have multiple problem fragments. Click \checkmark on the left to display all problem fragments.
- **Table Structure**: Based on the selected rule template, the system provides the table structure information that the SQL statement to be audited depends on, including the object name, object type, and owner.
- **Execution Plans**: The execution plans of the SELECT, UPDATE, DELETE, and INSERT statements are displayed.

NOTE

To obtain the table structure, you must have the permissions to read system catalogs and system views.

- GaussDB system catalogs: tables, pg_class, pg_namespace, relnamespace, pgxc_class, pg_settings, pg_get_viewdef, columns, pg_tables, pg_index, table_constraints, pg_partition, pg_get_tabledef, check_constraints, key_column_usage, pg_get_keywords, db_constraints, and adm_ind_columns.
- Currently, table structures supported by index and view objects can be viewed.

```
----End
```

5.2.2 Deleting an Audit Task

Scenarios

You can delete an audit task. Deleted tasks cannot be restored. Exercise caution when performing this operation.

Prerequisites

An audit task has been created.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Database Audit**.
- **Step 3** Locate the task you want to delete and choose **More** > **Delete** in the **Operation** column.
- Step 4 In the displayed dialog box, click OK.

----End

5.3 Rules

5.3.1 Viewing Rule Template Details

Scenarios

You can only view the details of each rule in system templates, but you can modify the threshold and severity of a single rule in a custom template as needed.

Prerequisites

There is a system template or custom template.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Rules**. The **Templates** page is displayed by default.
- Step 3 Locate a template and click View Details in the Operation column.
 - System templates:

You can only view the template details, including the rule name, description, applicable database, and audited object types, but cannot modify them. You can click **Previous** or **Next** to view the information.

• Custom templates: You can add, modify, or delete rules in the templates.

To modify the template description, click \checkmark next to **Description**. There are up to 100 characters.

To modify a rule, click **Edit** in the **Operation** column to modify the rule risk level, threshold, and suggestion.

Search for rules by rule name or rule ID.

Step 4 (Optional) Locate a rule of the custom template and click **Edit** in the **Operation** column.

Figure 5-15 Editing an existing rule in a custom template

Edit			
Name:	Use WHERE clauses in	SQL statements	
Description:	If there are no WHERE	clauses, operatior	ns on the entire tabl
Applicable Database:	MySQL		
Audited Object Type:	sqitext		
Risk Level:	Suggestion	Alarm	Critical
Threshold:			
Suggestion:	Enter a description.		0/2,000;
			Cancel

Step 5 Modify risk level, threshold, and suggestion of the rule, and click **OK**.

NOTE

- In the custom template details, the projects in which the current template has been applied are displayed. After the modification is complete, new threshold is applied.
- Threshold:
 - The value can contain up to 100 characters. The value ranges from **0** to **2147483647**.
 - The value can contain nine decimal places. If the threshold is of the decimal type and does not contain the decimal part, the decimal point cannot be omitted, for example, **3.0**. If the threshold is an integer, the decimal point cannot be added, for example, **3**.
- Suggestion: There are up to 2,000 characters.

----End

Adding a Rule

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Rules**. The **Templates** page is displayed by default.
- **Step 3** Locate a custom template and click **View Details** in the **Operation** column.
- Step 4 Click Add Rule. The rules that are not contained in the template are displayed.

Figure 5-16 Adding a rule

Rules	es						
Templates Rules							
Create Template							
C. Search by Template Name by default							
Template ID	Template Name	Description	Турне	Applicable Database	Operation		
1	MySQL audit template	MySQL audit template	System template	Ny60L	Vew Details Copy Export SQL		
2	GaussOB audit template	GaussDG audt template	System template	GaussDB	Vew Details Copy Export SQL		
3	GaussDB database audit templatie	GaussDB database audit template	System template	QaussC8	Vew Details Dopy Export SQL		

Step 5 Select the required rules and click **OK**.

----End

Deleting a Rule

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Rules**. The **Templates** page is displayed by default.
- Step 3 Locate a custom template and click View Details in the Operation column.
- Step 4 Locate the rule to be deleted and click **Delete** in the **Operation** column.
- Step 5 Click OK.

----End

5.3.2 Copying a Rule Template

Scenarios

You can copy an existing template to create a custom template.

Prerequisites

There is a rule template.

Procedure

Step 1 Log in to the UGO console.

- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Rules**. The **Templates** page is displayed by default.
- **Step 3** Select the template to be copied and click **Copy** in the **Operation** column.

The template name must be unique and cannot be empty. The baseline template is the template to be copied.

Figure 5-17 Copying a template

Сору	
Template Name	Enter a template name.
Baseline Template	GaussDB database audit 🗸
	Applicable Database GaussDB
Description (Optional)	GaussDB database audit template
	31/100
	Cancel OK

Step 4 Click OK. The copied template is displayed in the template list.

----End

5.3.3 Exporting a Rule Template

Scenarios

You can export a rule template based on service requirements, modify the threshold and risk level in the exported Excel template, and upload the template again.

Procedure

- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Rules**. The **Templates** page is displayed by default.
- **Step 3** In the list, select the template to be exported and click **Export** in the **Operation** column to export the rule template to the local PC.

----End

5.3.4 Deleting a Rule Template

Scenarios

You can delete custom templates. Deleted templates cannot be restored. Exercise caution when performing this operation.

Prerequisites

There is a custom template.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane on the left, choose **SQL Audit** > **Rules**. The **Templates** page is displayed by default.
- **Step 3** Locate a custom template to be deleted and click **Delete** in the **Operation** column.
- Step 4 In the displayed dialog box, click OK.

----End

5.3.5 Viewing System Rule Details

Scenarios

You can view existing system rules.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane, choose SQL Audit > Rules. Click the System Rules tab. All existing system rules are displayed in descending order of risk level. GaussDB rules are followed by MySQL and PostgreSQL rules in sequence.

Figure 5-18 Viewing all rules

Role Name	Rule ID	Description	Applicable Database	Audited Object Type	Risk Level	Operation
Do not use too many combined index fields	10055	The number of composite index fields cannot exceed the	GaussDB	squart	Critical	View Details
Do not use too long database object name	10077	The length of the database object name cannot exceed $\boldsymbol{t}_{\cdot,\cdot}$	GaussDB	dditext	Critical	Vew Details
Do not use character strings enclosed in double quotatio	10389	You cannot use character strings enclosed in double quo	GaussDB	ddfaxt	Critical	View Details
Use distribution keys for primary keys and unique indexe	10117	For distributed hash tables, primary keys and unique ind	GaussDB	dditext	Critical	Vew Details
Do not use user-defined tablespace	10132	To isolate I/O resources that can be used by different ser	GaussDB	ddfaxt	Critical	View Details

Step 3 Locate a rule and click **View Details** in **Operation** column.

You can click **Previous** or **Next** to view rules as needed.

Figure 5-19 System rule details

View Detail	s	×
Name:	Design composite indexes appropriately to avoid redundancy	
Description:	Do not create multiple composite indexes with the same first i	
Applicable Database:	GaussDB	
Audited Object Type:	sqltext	
Risk Level:	Critical	
Threshold:		
Suggestion:	-	
	Previous Next)

----End

6 Data Source Management

6.1 Testing Data Source Connection

Scenarios

You can check whether a data source is properly connected.

Prerequisites

At least one data source has been created.

Procedure

- Step 1 Log in to the UGO console.
- Step 2 In the navigation pane, choose Data Source Management.
- **Step 3** In the data source management list, locate the data source to be tested and click **Test Connection** in the **Operation** column.
 - If the test is successful, a message is displayed, indicating that the connection is successful.
 - If the test fails, a message is displayed, indicating that the connection fails.

NOTE

If a data source is being tested, its **Test Connection** and **Delete** buttons are unavailable.

----End

6.2 Deleting a Data Source

Deleted data sources cannot be recovered. Exercise caution when performing this operation.

Prerequisites

A data source has been created and is not in the test connection state.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Data Source Management**.
- **Step 3** In the data source management list, locate the data source to be deleted and click **Delete** in the **Operation** column.
- **Step 4** In the displayed dialog box, click **OK**.

----End

6.3 Modifying a Data Source

You can modify the IP address, port number, username, and password of a data source.

Procedure

- Step 1 Log in to the UGO console.
- **Step 2** In the navigation pane, choose **Data Source Management**.
- **Step 3** In the data source management list, locate the data source and click **Edit** in the **Operation** column.
- **Step 4** Modify the data source IP address, port number, username, and password.
- Step 5 Click Modify. In the displayed dialog box, click OK.

----End

7 Permissions Management

7.1 Creating a User and Granting Permissions

This section describes how to use **IAM** to implement fine-grained permissions control for your UGO resources. With IAM, you can:

- Create IAM users for employees based on your enterprise's organizational structure. Each IAM user will have their own security credentials for accessing UGO resources.
- Grant only the permissions required for users to perform specific tasks.
- Entrust a Huawei Cloud account or cloud service to perform efficient O&M on your UGO resources.

If your Huawei Cloud account does not require individual IAM users, skip this section.

Figure 7-1 describes the process for granting permissions.

Prerequisites

Before assigning permissions to user groups, you should learn about the systemdefined roles and policies listed in **Supported system roles**. For the system policies of other services, see **System Permissions**.

Process Flow



Figure 7-1 Process for granting UGO permissions

1. Create a user group and assign permissions.

Create a user group on the IAM console, and assign the UGO ReadOnlyAccess policy to the group.

2. Create an IAM user.

Create a user on the IAM console and add the user to the group created in 1.

3. Log in as an IAM user and verify permissions.

Log in to the management console using the newly created user, and verify that the user only has read permissions for UGO.

In the service list, choose **Databases** > **Database and Application Migration UGO**. On the UGO page, choose **Schema Migration** > **Database Evaluation**, and click **Create Project** to create an evaluation project. If the evaluation project can be created (assume that the current permission contains only UGO Administrator), the evaluation project is UGO Administrator. The permission has taken effect.

7.2 Creating a Custom Policy

You are advised to use system-defined policies. If you need to create custom policies, see **Permission Management**.

You can create a custom policy in either of the following ways:

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Create a policy in JSON format or edit the JSON strings of an existing policy.

For details, see **Creating a Custom Policy**. This section contains examples of common UGO custom policies.

Example Custom Policies

• Example 1: Allowing a user to create an evaluation project

```
{
    "Version": "1.1",
    "Statement": [{
        "Action": ["ugo:evaluationJob:create"]
            "Effect": "Allow",
    }]
}
```

• Example 2: Denying a user to delete an evaluation project

A policy with only "Deny" permissions must be used in conjunction with other policies to take effect. If the policies assigned to a user contain both "Allow" and "Deny", the "Deny" permissions take precedence over the "Allow" permissions.

The following method can be used if you need to assign permissions of the **UGO FullAccess** policy to a user but you want to prevent the user from deleting UGO instances. Create a custom policy for denying evaluation project deletion, and attach both policies to the group to which the user belongs. Then, the user can perform all operations on evaluation projects except deleting evaluation projects. The following is an example of a deny policy:

```
{
    "Version": "1.1",
    "Statement": [{
        "Action": ["ugo:evaluationJob:delete"],
        "Effect": "Deny"
    }]
}
```

8 Interconnection with CTS

8.1 Key Operations Recorded by CTS

Cloud Trace Service (CTS) records operations on UGO resources for query, audit, and backtrack.

Operation	Resource Type	Trace Name
Creating a database evaluation project	evaluate	createEvaluationJob
Creating an object migration project	migrate	createMigrationJob
Testing connection for the database evaluation project	evaluate	testConnection
Testing connection for an object migration project	migrate	testConnection
Deleting a database evaluation project	evaluate	deleteEvaluationJob
Deleting an object migration project	migrate	deleteMigrationJob
Starting object migration verification	migrate	startVerify
Stopping object migration verification	migrate	stopVerify
Starting object migration	migrate	startMigrate
Stopping object migration	migrate	stopMigrate

Table 8-1 UGO operations supported by CTS

Operation	Resource Type	Trace Name
Stopping a database evaluation project	evaluate	stopEvaluationJob
Resuming a database evaluation project	evaluate	resumeEvaluationJob
Confirming the target database	evaluate	confirmEvaluationJob
Re-evaluating the database	evaluate	reanalyzeEvaluation
Performing a pre-check	evaluate	preCheck
Uploading a certificate	evaluate	uploadCertFile
Testing the network stability	evaluate	testNetwork

8.2 Viewing Traces

After CTS is enabled, CTS starts recording operations on cloud resources. You can view the operation records of the last seven days on the CTS console.

This section describes how to view operation records for the last 7 days on the CTS console.

Prerequisites

The CTS service has been enabled.

Procedure

- **Step 1** Log in to the console.
- **Step 2** Click ¹ on the upper left to select the desired region and project.
- Step 3 Click Service List. Under Management & Governance, choose Cloud Trace Service.
- **Step 4** Choose **Trace List** in the navigation pane on the left.
- **Step 5** Click **Filter** and specify filter criteria as needed. The following filters are available:
 - Trace Source, Resource Type, and Search By Select a filter from the drop-down list.
 When you select Trace name for Search By, you also need to select a specific trace name.

When you select **Resource ID** for **Search By**, you also need to select or enter a specific resource ID.

When you select **Resource name** for **Search By**, you also need to select or enter a specific resource name.

- **Operator**: Select a specific operator (a user rather than a tenant).
- **Trace Status**: Available options include **All trace statuses**, **Normal**, **Warning**, and **Incident**. You can only select one of them.
- Start time and end time: You can specify a time period for querying traces.
- **Step 6** Click \checkmark on the left of the target record to expand its details.
- **Step 7** Click **View Trace** in the **Operation** column. On the displayed dialog box, the trace structure details are displayed.

----End