# Database and Application Migration UGO

# **Best Practices**

 Issue
 01

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# Migrating Schemas from Oracle to GaussDB

# 1.1 Purpose

### Scenario

Database and Application Migration UGO (referred to as UGO) can help you migrate the schemas of on-premises Oracle databases to Huawei Cloud GaussDB instances. UGO provides database evaluation and object migration for simple, cost-effective database migration.

This document describes how to use UGO to migrate an on-premises Oracle-11g database to a Huawei Cloud Distributed GaussDB 2.7 Enterprise Edition instance. Currently, only the public network can be used to connect source and target databases.



Figure 1-1 Public network+SSL connection

#### **Resolved Issues**

- Enterprise workloads have been growing and evolving fast, and traditional databases lack the scalability needed to keep up. Enterprises need distributed databases.
- Building a traditional database means purchasing and installing servers, systems, databases, and other software. The O&M is expensive and difficult.
- The performance for complex queries on traditional databases is poor.
- Database schema migration is costly and requires professional knowledge.

#### Service List

- Database and Application Migration UGO (UGO)
- Virtual Private Cloud (VPC)
- GaussDB
- Data Admin Service (DAS)

#### Notes on Usage

- The details shown in the resource planning table are just examples. The actual resource details will depend on your specific migration.
- The end-to-end test data is for reference only.
- Oracle syntax is complex and flexible, so the workload evaluation and object evaluation statistics are for reference only.

# **1.2 Resource Planning**

Category	Subcateg ory	Planned Value	Remarks
VPC	VPC name	vpc-src-172	Specify a name that is easy to identify.
	Region	Test region	For low network latency and quick resource access, select the region nearest to you.
	AZ	AZ3	-
	Subnet	172.16.0.0/16	Select a subnet with sufficient network resources.
	Subnet name	subnet-src-172	Specify a name that is easy to identify.
Oracle	Name	orcl	Specify a name that is easy to identify.
	Specificati ons	16 vCPUs   32 GB	-

Category	Subcateg ory	Planned Value	Remarks
	Database version	11.2.0.1	-
	Database user	ugo	Specify a user with at least CONNECT, SELECT_CATALOG_ROLE, and ANY DICTIONARY permissions
GaussDB	Instance name	Auto-ugo-gaussdbv5- tar-1	Specify a name that is easy to identify.
	Database version	GaussDB 2.7 Enterprise Edition	-
	Instance type	Distributed (1 CN, 3 DN shards, and 3 replicas)	Select a distributed instance for the test.
	Storage type	Ultra-high I/O	-
	AZ	AZ3	Select a single AZ for the test. For the actual migration, you are advised to select multiple AZs to improve instance availability.
	Specificati ons	General-purpose 2 vCPUs   16 GB	Select small specifications for the test. For the actual migration, you are advised to configure specifications based on service requirements.
	Destinati on database name	ugo	Specify a name for easy identification, but the name must be compatible with the Oracle database name.
UGO migratio n task	Database evaluatio n project	Oracle-GaussDB	Specify a name that is easy to identify.
	Object migration project	Oracle-GaussDB	Specify a name that is easy to identify.
	Source DB engine	Oracle-11g	-
	Target DB engine	GaussDB Distributed - 2.7	-

Category	Subcateg ory	Planned Value	Remarks
	Network type	Public	Select the public network for the test.

# **1.3 Process Flow**

**Figure 1-2** shows the main operation process. A complete database object migration consists of database evaluation (**Figure 1-3**) and object migration (**Figure 1-4**).







#### Figure 1-3 Evaluation process flow



#### Figure 1-4 Migration process flow

# **1.4 Object Migration**

# 1.4.1 Preparing for the Migration

### Permissions

• The permission check for the source database must be passed. Table 1-1 lists the permissions that need to be checked when the source database type is Oracle.

Checked item	Description	Mandatory
DBMS_MET ADATA	Permission to retrieve metadata from the Oracle database dictionary. This permission is used to obtain the DDL of schema objects.	Yes
	Granting the DBA permission:	
	<ol> <li>Create a user.</li> <li>CREATE USER user IDENTIFIED BY password;</li> </ol>	
	<ol> <li>Grant the login permission to the user.</li> <li>GRANT CONNECT TO user;</li> </ol>	
	<ol> <li>Grant the DBA permission to the user.</li> <li>GRANT DBA TO user;</li> </ol>	
Dynamic View	Permission to access various dynamic performance views. This permission is used to obtain basic database information.	Yes
	DBA permission needs to be granted.	
Schema Objects	Permission to check schema objects to be evaluated. At least one object needs to be evaluated.	Yes
DBA	DBA permission required for subsequent operations.	No If <b>Check Result</b> is <b>Alarm</b> , some objects could not be collected because of permissions, but the evaluation project can still be created successfully.

 Table 1-1 Required checks

• When connecting to the target database, you must have the permissions needed to create, delete, and modify databases objects, such as schemas, tables, programs, indexes, users, functions, and views.

For details, see Viewing the Permission Check Report.

• You have the permissions needed to create an evaluation project. For details, see **Permission Management**.

### **Network Settings**

• Network settings for the source database:

Currently, Oracle databases can be migrated to Huawei Cloud GaussDB only through a public network, which is more convenient and cost-effective.

You need to enable public accessibility for your on-premises Oracle database.

• Network settings for the target database:

If the source database attempts to access the target database through a public network, you do not need to configure GaussDB.

#### **Security Rules**

• Security rules for the source database:

You need to add the UGO EIP to the network whitelist of Oracle to enable the source database to communicate with Huawei Cloud GaussDB. Before configuring the network whitelist, you need to obtain the UGO EIP.

Log in to the UGO console and choose **Schema Migration** > **DB Evaluation** and click **Create Project**. On the **Basic Details** tab page, obtain the UGO EIP.

If the source DB network is restricted by the IP address trustlist, add the IP address ( ) to the source DB network trustlist to ensure that the UGO can connect to the source DB

• Security rules for the target database:

By default, the target database and UGO are in the same VPC and can communicate with each other. No further configuration is required.

The IP address whitelist is used for migration and can be deleted after the migration is complete.

#### Other

- You are advised to use a database in a non-production environment.
- You have obtained the IP address, port number, account, and password of the Oracle database to be migrated.
- System databases are maintained by the database itself and no creations can be performed on them.
- The target database to be connected is normal and has no arrears or suspension.

### 1.4.2 Creating a GaussDB Instance

Public Network

#### **NOTE**

- If a VPC and a security group are available, skip **Creating a VPC** and **Creating a Security Group**.
- For details about how to create a GaussDB instance, see **Buying a DB Instance**.

#### **Creating a VPC**

**Step 1** Log in to the **console**.

- **Step 2** Click Singapore. Singapore.
- **Step 3** Under the service list, choose **Networking** > **Virtual Private Cloud**.

The VPC console is displayed.

#### Step 4 Click Create VPC.

Basic Information	
Region	♥ ▼
	Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.
Name	vpc-01
CIDR Block	192       ·       168       ·       0       ·       16       •
	Recommended: 10.0.0.0/8-24 (Select) 172.16.0.0/12-24 (Select) 192.168.0.0/16-24 (Select)
	A The CIDR block 192.168.0.0/16 overlaps with a CIDR block of another VPC in the current region. If you intend to enable communication between VPCs or between a VPC and an on-premises data center, change the CIDR block. View VPC CIDR blocks in current region
Enterprise Project	Select   C Create Enterprise Project
<b>Default Su</b> AZ	AZ3
Name	subnet-1d4e
CIDR Block	192 $\cdot$ $\cdot$ $0$ $\cdot$ $0$ $/$ $24$ $\bigcirc$ Available IP Addresses: 25The CIDR block cannot be modified after the subnet has been created.
Associated R	Route Table Default 🕐
Advanced Se	ettings 💌 Gateway   DNS Server Address   DHCP Lease Time   Tag   Description

🕂 Add Subnet

#### **Step 5** Configure parameters as needed and click **Create Now**.

**Step 6** Return to the VPC list and check whether the VPC is created.

If the VPC status becomes available, the VPC has been created.

----End

### **Creating a Security Group**

**Step 1** Log in to the **console**.

- **Step 2** Click Singapore. Singapore.
- **Step 3** Under the service list, choose **Networking** > **Virtual Private Cloud**.

Х

The VPC console is displayed.

- **Step 4** In the navigation pane, choose **Access Control** > **Security Groups**.
- Step 5 Click Create Security Group.
- **Step 6** Configure parameters as needed.

#### Create Security Group \* Name sg-01 C Create Enterprise Project (?) default \* Enterprise Project • ★ Template General-purpose web server • Description The security group is for general-purpose web servers and includes default rules that allow all inbound ICMP traffic and inbound traffic on ports 22, 80, 443, and 3389. The security group is used for remote login, ping, and hosting a website on ECSs. 0/255 Show Default Rule OK Cancel

- Step 7 Click OK.
- **Step 8** Return to the security group list and click the security group name (**sg-01** in this example).
- Step 9 Click the Inbound Rules tab, and then click Add Rule.

Summary	Inbound Rules	Outbound Rules Associated Instances			
Add Rule	Fast-Add Rule	Delete Allow Common Ports	Inbound Rules: 3 Learn more about security group configuration.		

**Step 10** Configure an inbound rule, add the IP address of the source database, and click **OK**.

dd Inbound Rule Learn mo	<b>re</b> about security group configuration		
() Inbound rules allow incoming traf	fic to instances associated with the security (	group.	
curity Group cse-engine-7f93			
a can import multiple rules in a batch.	Source (?)	Description	Operation
TCP v	IP address	•	operation
Example: 22 or 22-30	0.0.0.0/0		Operation •
	🕀 Add Rule		
	ОК	Cancel	

----End

#### **Creating a GaussDB Instance**

- **Step 1** Log in to the **console**.
- **Step 2** Click <sup>(2)</sup> in the upper left corner of the console and select the region **AP-Singapore**.
- Step 3 Under the service list, choose Databases > GaussDB.
- **Step 4** In the navigation pane on the left, click **Instances**.
- Step 5 Click Buy DB Instance.
- **Step 6** Configure the instance name and basic information.



#### **Step 7** Configure instance specifications.

Instance Specifications	General-enhanced II
	Flavor Name
	8 vCPUs   64 GB Unavailable for production environment
	0 16 vCPUs   128 GB
	32 vCPUs   256 GB (Sold Out)
	64 vCPUs   512 GB (Sold Out)
	DB Instance Specifications General-enhanced II   8 vCPUs   64 GB
Storage Type	Ultra-high I/O Learn more about storage types.
	480 GB
Storage Space (GB)	
	480 9,950 19,450 28,950 48,000
Disk Encryption	Disable Enable ?

Select small specifications for the test. You are advised to configure specifications based on service requirements in actual use.

**Step 8** Select a VPC and security group for the instance and configure the database port.

	Relationship among VPCs, subnets, security groups, and DB instances
VPC 💮	demo-vpc • C subnet-5377(10.1.0.0/24) • C
	If you want to create a VPC, go to the VPC console.
	Make sure there are enough private IP addresses available for future scale-ups. After the DB instance is created, the subnet cannot be changed. Available private IP addresses in the selected subnet: 240
Security Group 🕐	asddsaas-cce-node-p0jcl    View Security Group
	Inbound: ICMP/; TCP/20-21, 443, 10250, 10250, 10250, 30000-32767, 3389, 22; UDP/30000-32767, 4789   Outbound: In a security group, rules that authorize connections to DB instances apply to all DB instances associated with the security group.
Database Port	Default port: 8000

#### **Step 9** Configure password and other information.

Administrator	root	
Administrator Password		Keep your password secure. The system cannot retrieve your password.
Confirm Password		
Parameter Template	Default-GaussDB(for openGauss)-Enterprise 💌	C View Parameter Template
Enterprise Project 🕥	Select 💌	C Create Enterprise Project
Tag	It is recommended that you use TMS's predefined tag f	function to add the same tag to different cloud resources. $\mathrm C$ $$ View predefined tags
	Tag key Tag value	
	You can add 10 more tags	

#### Step 10 Click Next.

**Step 11** Go to the instance list.

If the instance status becomes available, the instance has been created.

----End

#### Creating a database in the GaussDB Instance

**Step 1** Log in to the **console**.

- **Step 2** Click Singapore. Singapore.
- **Step 3** Under the service list, choose **Databases** > **Data Admin Service**.
- **Step 4** In the navigation pane on the left, click **Development Tool** to go to the login list page.
- Step 5 Click Add Login.
- **Step 6** On the displayed page, select the DB engine, source database, and target DB instance, enter the login username, password, and description (optional), and enable **Collect Metadata Periodically** and **Show Executed SQL Statements**.

Add Login				
* DB Engine	GaussDB 🔹			
* Source Database	GaussDB			
			Enter a DB instance name.	QC
	DB Instance Name	DB Engine Version	DB Instance Type	Status
	Auto-drs-gaussdbv5-src-2	GaussDB(for openGauss)	Distributed	<ul> <li>Available</li> </ul>
	O Auto-drs-gaussdbv5HA-src-1	GaussDB(for openGauss)	Primary/Standby	<ul> <li>Available</li> </ul>
	O Auto-drs-gaussdbv5HA-star-1	GaussDB(for openGauss)	Primary/Standby	<ul> <li>Available</li> </ul>
	O Auto-drs-gaussdbv5HA-src-2	GaussDB(for openGauss)	Primary/Standby	Storage
	Auto-ugo-gaussdbv5-tar-1	GaussDB(for openGauss)	Distributed	<ul> <li>Available</li> </ul>
	5 💌 Total Records: 6 < 1	2 >		
* Database Name	postgres			
* Login Username	root			
Password		Test Connect	ion	
	<ul> <li>Connection is successful.</li> </ul>			
	Remember Password Select to remem	nber your password in an encry	pted form. Otherwise, the metada	ata collection
		OK Cancel		

#### Step 7 Click Test Connection.

If a message is displayed indicating connection successful, continue with the operation. If a message is displayed indicating a connection failed and the failure cause is provided, make modifications based on the error message.

#### Step 8 Click OK.

**Step 9** Locate the added instance, click **Log In** in the **Operation** column.

My DB Instance Logins D	B Instance Logins Shared by Others ⑦							
Add Login				All DB insta	nces 🔻	GaussDB	▼ Enter an instance	e addres:
DB Instance ↓Ξ	DB Engine Version ↓Ξ			Source Database	Login Username	Remember	Description ↓Ξ	Cri
GaussDB	Auto-drs-gaussdbv5-tar-1(	/test_database_info)		GaussDB	root	Yes	🖉	Oc
GaussDB	Auto-drs-gaussdbv5HA-src-1(		/postgres)	GaussDB	root	Yes	🖉	Oc
GaussDB	Auto-drs-gaussdbv5-src-2(	'postgres)		GaussDB	root	Yes	🖉	Oc
GaussDB	Auto-drs-gaussdbv5HA-star-1(		/postgr	GaussDB	root	Yes	created by sync rds instance $\underline{\mathscr{D}}$	Au
GaussDB	Auto-drs-gaussdbv5HA-src-2(1		//postgres)	GaussDB	root	Yes	created by sync rds instance $\underline{\mathscr{D}}$	Au
GaussDB	Auto-drs-gaussdbv5-src-1 (	)		GaussDB	root	Yes	created by sync rds instance $ ot\!$	Jul
GaussDB	Auto-ugo-gaussdbv5-tar-1 (	(postgres)		GaussDB	root	Yes	created by sync rds instance 🖉	Jur

**Step 10** Choose **SQL Operation** > **SQL Window** on the top menu bar.

Step 11 Run the following statement to create a database compatible with Oracle:
 ugo indicates the database name. Replace it based on the site requirements.
 CREATE DATABASE ugo DBCOMPATIBILITY 'ORA';

----End

### **1.4.3 Creating a Database Evaluation Task**

Create a database evaluation project and select a target database.

#### Procedure

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

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

Basic Information — 2	) Precheck — 3 Eva	aluation Scope Selection -	(4) Confirmation	n
* Project Name				
Exception Notification Mode	SMN Topic			
	Select	• C Create	e SMN Topic	
	After you create and subscri	be to an SMN topic, UGO o	can send alarm notifications	to your configured subscription end
Target DB Analysis	Skip Target DB Evaluation Select this option: Only data is of Deselect this option: UGO will p	collected and target databa roduce summary and eval	ises are not evaluated. (Sele uation reports about the targ	et this option if you already have c et databases. Database analysis tr
Source DB Type	Oracle	MySQL	DB2 for LUW	Microsoft SQL Server
Network Type	Public Network			
	If the source DB network is rest	ricted by the IP address wh	nitelist, add (100.85.124.231)	) to the whitelist to ensure that UG(
Connection Method	Service name Service name, IP address, and	Connection string	e DB connection.	
* Source DB Name				
Host Type	Hostname	Host IP Address		
* Host IP Address		0		
* Host Port				
* Username				
* Password		Ø		
SSL Type	No SSL	One-way SSL		
	Enter the SSL truststore p	assword 🙋		

#### Figure 1-5 Creating an evaluation project

#### Table 1-2 Parameter description

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

Parameter	Description					
Enterprise Project	If you have been associated with an enterprise project, select the target project from the <b>Enterprise Project</b> drop-down list.					
	You can also go to the project management console to create a project. For details about how to create a project, see <i>Enterprise Management User Guide</i> .					
(Optional) Target DB Analysis	• Select <b>Skip Target DB Evaluation</b> : UGO will only collect data and not analyze the target database. There are only recommended target databases in the <b>Target DB Analysis</b> tab when you <b>view evaluation project details</b> . Select this option if you already have a confirmed target database.					
	<ul> <li>Deselect Skip Target DB Evaluation: UGO will analyze different target databases to produce summary and evaluation reports. Database analysis takes some time after data collection.</li> </ul>					
	This option is selected by default.					
(Optional) Source DB Type	Select <b>ORACLE-11g</b> as the source database type.					
(Optional) Network	<b>Public Network</b> : An elastic IP address (EIP) is used to connect to the source database.					
Туре	If the source database network is restricted by an IP address whitelist, add the EIP to the source database network whitelist to ensure that the UGO can connect to the source database.					
(Ontional)	Select Service Name or Connection string Service Name is used					
Connection	by default. Service Name is used as an example.					
Method	Subsequent parameters vary depending on your selection of this parameter.					
	<b>NOTE</b> For connection string, the standard JDBC is used to connect to the source database.					
(Optional) Host Type	Use Host IP Address as an example.					
Source DB Name	Enter the name of the database to be evaluated.					
Hostname or Host IP Address	Enter the host name or host IP address based on the selected host type.					
Host Port	Enter a database port.					
User Name	Enter the username of the source database. You are advised to use the administrator username.					

Parameter	Description
Password	Enter the password of the source database. The password can contain up to 50 characters.
(Optional)	Select <b>No SSL</b> . Currently, <b>One Way SSL</b> is unavailable.
SSL Type	• <b>No SSL</b> : SSL is disabled. There may be potential security risks.
	• <b>One Way SSL</b> : The target database will be authenticated and the transmission will be encrypted.
	<ul> <li>Upload: Upload the root certificate file in JKS format.</li> </ul>
	<ul> <li>Trust Store Password: Enter the password of the trust store used to access the certificate.</li> </ul>
	NOTE
	<ul> <li>If you select <b>One Way SSL</b>, enter the correct uploaded file and entered password, which are private information of users.</li> </ul>
	<ul> <li>Secure Socket Layer (SSL) is an encryption-based Internet security protocol for encrypting the connection between a server and a client. It ensures the privacy, authentication, and integrity of Internet communications.</li> </ul>
Data Collected	Specifies whether to collect data from the <b>DBA views</b> or <b>ALL views</b> .
From	• <b>DBA views</b> : UGO collects data from objects in the entire source DB instance.
	• All views (default value): UGO collects data from all objects owned and accessed by the source DB user.
(Optional) Tag	Use predefined tags in Tag Management Service (TMS). Predefined tags are visible to all service resources that support the tagging function. For details, see <i>Tag Management Service</i> <i>User Guide</i> .
	Enter a key and a value, and click <b>Add</b> .
	You can add up to 20 tags. For details, see Managing Tags.

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

- If the connection succeeds, the **Next** button is available.
- If the connection test fails, the message "Unable to connect to DB" is displayed.
- Step 7 (Optional) Test network stability. A successful network stability test only means that there is little network latency or packet loss, or no packet loss at the current time. It takes 10s to 15s to complete.
- **Step 8** Click **Next** to go to the **Precheck** page.

The check result of each check item is displayed. You can also click **Recheck All Permissions** to check the permissions again.

Figure 1-6 Prechecking permissions of Oracle 11g

1 Basic Details -	Precheck 3 Select Assessment Scope 4	Confirmation	
	Start the evaluation task with confidenc The pre-check has passed.	e!	Recheck All Permissions Pre-check deadline: 2023/03/28 10:39:51 GMT+08:00
🤝 5 item	s were checked. The following 5 items pass the check.		
No.	Check Item	Description	Check Result
1	DBMS_METADATA Permission	Check whether the user has the DBA Provides mechanism to retrieve metadata from the databi- permission. If the DBA permission check	Success
2	Dynamic View Permission	Checks select access to various Dynamic views fail to be collected due to insufficient	Success
3	DDL Object Count Check	Checks for at least one Schema Object which have DDL c	Success
4	DBA Privilege	Check whether the user has the DBA permission. If the DBA permission check result is Alarm, the evaluation project can be created successfully, but some objects m	Success
5	Setting DBMS_METADATA SQL Formatting Parameters	Check whether the user can run the SQL formatting command of DBMS_METADATA. If the check result is warning, the evaluation project can be created successful	Success

#### **NOTE**

If there are any failed checks, click **Details**, modify the item based on the information provided, and click **Re-verification**.

Step 9 After all check items are passed, click Next.

#### Figure 1-7 Selecting evaluation scope

Basic Details ——	(2) Precheck	- 3 Select Assessment Scop	8	(4) Confirmation		
By default,	UGO supports the evaluation of	of the following objects. You can se	lect spe	ific object types you want to evaluate.		
Select Object Typ	e for Collection					
TABLE V I	NDEX 🔽 SEQUENCE 🔽	SYNONYM 🔽 TYPE 🔽 TY	PE_BOD	Y 🔽 VIEW 🗹 MATERIALIZED_VIEW 🔽 PROCEDUR	E V FUNCTION	🛛 PACKAGE 🗹 PACKAGE_BODY 🗹 TRIGGER 🗹 ROLE 🔽 USER 🗹 GRANT 💟 DIRECTORY 💟 CREDENTIAL
PROGRAM	SCHEDULE 🔽 JOB_CL	LASS 🗹 JOB				
Select Target Data	abase					
Available Ta	rget Databases	0 / 12		Selected Target Database	0/1	
RDS for My	SQL - 5.7			GaussDB Distributed - 2.7 Enterprise Edition		
GaussDB(fo	r MySQL) - 8.0					
RDS for Pos	stgreSQL - 11					
RDS for Pos	stgreSQL - Enhanced Edition					
GaussDB P	rimary/Standby - 1.4 Enterprise	e Edition				
GaussDB D	istributed - 1.4 Enterprise Editi	on				
GaussDB P	rimary/Standby - 2.0 Enterprise	e Edition 👻				
1. If there a	Yes: The dynamic	c SQL statements in objects are an	alyzed. I	to: The dynamic SQL statements are not analyzed.		
2. Oracle Li	ightweight Jobs are collected a	as part of PROGRAM object type.				
Select Schema for	r Collection					
Source Sche	ema List	0/115		Selected Schema List	0/0	
Enter a keywor	rd.	Q		Enter a keyword.	Q	
ABHI						
ABL_TEST						
ACESSOPR	RD					
ADMIN				No data available		
ANDRE VAS	SCONCELOS					
AUDIT_DBA	wv					
AUDIT_DB/	VPS					
AUDIT_DBA	ASGU					
1		-				

Table 1-3 Parameter description

Parameter	Description
Select Object Type for Collection	By default, all object types are selected. You can also manually select the object types to be collected if needed.
Select Target Database	Select GaussDB Distributed - 2.7 as an example.

Parameter	Description					
Dynamic SQL	<b>Enable</b> : The dynamic SQL statements in objects are analyzed. <b>Disable</b> : The dynamic SQL statements are not analyzed.					
Evaluation	Currently, UGO only identifies dynamic SQL statements and does not perform any processing.					
(Optional) Select Schema for	Manually select schemas to be collected and click $\triangleright$ . You can also select all schemas.					
Collection	If there are many schemas, you can search for them by schema name. The names and number of selected schemas are displayed on the right list.					
	NOTICE					
	<ul> <li>If there are multiple schemas with the same name (case-insensitive), select one of them.</li> </ul>					
	<ul> <li>Oracle Lightweight Jobs are collected as part of PROGRAM object type.</li> </ul>					

#### D NOTE

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

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

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

sic Details —— ② Pro	echeck (3) Select Assessment Scope	- d Confirmation			
asic Details					
roject Name	Oracle-GaussDB	Connection To Source	Online	Connection Method	Service Name
roet DB Analysis	Yes	SSL Type	No SSL	Source DB Name	Oracle
urce DB Version	110	Host IP Address		Host Port	
/IN Topic	_	Data Collected From	Disabled		
recheck					
BMS_METADATA Permission	Success	Dynamic View Permission	Success	DDL Object Count Check	Success
3A Privilege	Success				
chema selected					
ABHI ABL_TEST ACH DBMAINTAIN DDZ_CS ORCL19C_TO_GAUSSDB2 SYNTAX_MIG_SVNTAX_ SYNTAX_MIG_SUPPORT_ XUELEI YJXT YWSJI	ESSOPRD ADMIN ANDREVASCINCELOS AUDIT_ DIFF_XMLVISS_USER DXTCDEFUG DXTCDESUG 20: ORC.TO_14002_20222816959 ORC.TO_14 MIG1 SVITALXMD19 SVITALXMD1 SVITALXM1 MIG1 SVITALXMD19 SVITALXMD1 SVITALXM1 SCHEMA 9Y8 TEST TESTI TESTI2 SCHEMA 9Y8 TEST TESTI TESTI2 XX YWWFFZ ZOCLBO_LIYUMA ZDCL_0B_AU Z	DBAMW AUDIT_DBAPS AUDIT_DBAPG ENFERMEIRO ETC GCMMV GPI 10002_20221223162132 ORCL_TO_140_F 1002 SYNTAX_MIG3 SYNTAX_MIG4 S 34 TEST2YH01 TMPUSEH1 TO_GA DRY_JIZHENG ZDRYGK ZDRYGK CX	U AUTO_TEST AUTOMATION_SCHEMA AUTOMAT NA INC'P ING'K INRX JUZX IMISSION IM MSSWORDONA OBET OBETSO OBESO INTXL JMOS STYNLAKJMOS STYNLAKJMOT STNI USSDR23C_ETE UGO UGOT UGOZ UJBOJ UG QZLO ZDRYGN_DS ZDRYGN_JINGZHEN ZDRYG	100-USER BAYU CARTORIO OMISI WAGENDA MVCONT MVINITEGRA OG I OXUSER ROHL SZF ROHL XFJ I TAX_MIG8 SYNTAX_MIG9 syntax_mg_n 30_3 UG0_ETE UG0_POC UG0_2HI K_JMZK ZDRYGK_JZ ZDRYGK_LDYY	DRAMY DRAPS DRASOU DRATUALIZA DADMM ORACIE INC. TO VIOLISTRIBUTED23 REMVER RLOB RANLIJAZ, HI SIAK SOE SY, MAIN SYNTAX MAIN SCHEMA DI UDOT UMMAS USERI USR, BUGBZH VIOI ZDRYOKTE ZDRYDKKT_CX ZJGAZHCX ZMYTES
bject type selected					

**Figure 1-8** Confirming the information

- **Step 11** Verify the settings and click **Create**. A message is displayed, indicating that the project is created successfully.
- **Step 12** Click **OK** to go to the **DB Evaluation** page. You can view the evaluation project you created in the list.

Data collection, project evaluation, pre-migration evaluation are required. You can view the status in the **Evaluation Status** column.

Figure 1-9 Viewing the created project

B Evaluatio	Se Function Introduc	tion 🧠 Process Guid	ance						Create Project
You can create	e 10 more evaluation projects.				All project statuses -	Project Name	▼ Ente	er a project name. Q	Search by tags 🗸
SI No.	Project Name/ID	Connection Type	Project Status	Source DB Type	Created	Differential A	SQL Size	Operation	
1		<ul> <li>Online</li> </ul>	Completed Create Migration Project	Oracle	Dec 22, 2023 12:55:10 GMT+08:00	-	111 KB	Trace   Run Differential Analysis	i Delete

#### **NOTE**

- Before Evaluation Status of an evaluation project becomes Evaluation Success. Confirm Target DB Pending, you can stop and then continue the creation of the project. When Evaluation Status is Evaluation - Success. Confirm Target DB Pending, you can confirm a target database or re-evaluate objects as needed.
- The evaluation time varies depending on the number of objects selected.
- After the evaluation is complete, you can click the project name to view its details. For details, see Viewing Project Details.
- During data collection, the system periodically automatically retries the connection to the source database. Next connection retry time: Current time + Time required for checking the connection and network stability + Sleep retry interval. After a connection test, there is several second delay before a network stability check can be performed. You may see a few seconds difference between the two retry times.

#### Step 13 When Evaluation Status is Evaluation - Success. Confirm Target DB Pending, and click the project name or click Confirm Target DB Pending.

- **Step 14** On the displayed page, select **GaussDB Distributed-2.7** as the target database and click **Confirm Database Selection**.
- Step 15 Click Confirm.
- **Step 16** After the target database is confirmed, a dialog box is displayed. You can click:
  - Create Now to go to the Create Migration Project page.
  - **Create Later** to stay on the current page.

----End

#### **Follow-up Operations**

You can view the detailed information about the evaluation project .

### 1.4.4 Creating an Object Migration Task

Create an object migration task based on the created evaluation project.

#### Procedure

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

Crasta Draiaet	
Create Project	
* Project Name	Orade-GaussD8
Exception Notification Mode	SMN Topic
	Please select   C. Create SMN Tonic
	Specify the start time and end time for the collection of source DB schema. Connection to the source DB will be established at the start time you specify and will be closed at the end time you s
* Enterprise Project	
Check Permissions	Skip Permission Check
	System Admin Object Owner
	reminission check nu objects will be performed based on object owner.
★ Select An Evaluation Project	Oracle-GaussDB •
Target DB	GaussDB Distributed 🕥
Target DB Version	2.7 Enterprise Edition
DB Information Input Type	Select Instance Manual Input
* Database Instance	Filease select Database Instance 🔻 🗸 View DB Instance View Unselectable DB Instance
+ DP Namo	
A DD Name	
* User Name	
* Password	
	China al
Schemas to Migrate	Select shemas to be collected by UGO from the source database.
SSL Type	No SSL SSL No Auth One Way SSL
	Target database will be authenticated and the communication will be encrypted.
	Add File
	Umy a PEM certificate can be uploaded.
Tags	It is recommended that you use TMS's predefined tag function to add the same tag to different cloud resources. View predefined tags To add a tag, enter a tag key and a tag value below.
	Enter a tag key Enter a tag value Add
	20 tags available for addition.
* Test Connection	Test Connection
	lest the connection between UGO and the target DB.

Figure 1-10 Creating a migration project

Parameter	Description					
Project Name	The project name must be unique. In this example, the project name is <b>Oracle-GaussDB</b> .					
	The name must contain 5 to 50 characters, start with a letter, and end with a letter or number. Only letters, numbers, underscores (_), and hyphens (-) are allowed.					
(Optional)	SMN Topic					
Exception Notification Mode	Specifies whether to report exceptions through Simple Message Notification (SMN).					
Widde	To create an SMN topic, see <b>Creating a Topic</b> .					
	NOTE Follow-up Operations					
	After the topic is created, you can <b>add a subscription</b> . After the subscription has been confirmed, alarm notifications will be sent to the subscription endpoint via SMN.					
Enterprise Project	If you have been associated with an enterprise project, select the target project from the <b>Enterprise Project</b> drop-down list.					
	You can also go to the project management console to create a project. For details about how to create a project, see <i>Enterprise Management User Guide</i> .					
Check Permissions	• Select <b>Skip Permission Check</b> : The generated permission check report will have no content.					
	• Deselect Skip Permission Check: You can select system administrator or object owner only when the target database is GaussDB.					
	<ul> <li>System Admin: A check for system administrator permission to create objects.</li> </ul>					
	<ul> <li>Object Owner: A check for current user permissions to create objects.</li> </ul>					
	By default, Skip Permission Check is not selected.					
	<b>NOTE</b> To create objects in the target database, you must have certain database permissions, such as those needed for creating tables and functions. If you skip the permission check, the system does not check whether you have these permissions.					
	The migration may fail due to lack of permissions when SQL statements are converted on the target database.					

### Table 1-4 Parameter description

Parameter	Description
Select An Evaluation Project	<ul> <li>Select an evaluation project from the drop-down list.</li> <li>Target DB: The confirmed target database type is displayed, for example GaussDB Distributed.</li> </ul>
	• <b>Target DB Version</b> : The confirmed target database version is displayed, for example <b>2.7</b> .
	• DB Information Input Type Select Instance
	<ul> <li>DB Instance: Select a DB instance of the target database. If no DB instance is available, create one on the console. View DB Instance: Click View DB Instance to go to the instance list page of the target database and view instance information.</li> </ul>
	View Unavailable Instances: Click View Unavailable Instance. A dialog box is displayed, showing the unavailable instance names and reasons.
	<ul> <li>DB Name: Enter the database name based on the selected target DB instance. The name contains up to 50 characters. You are advised to use a target database that is compatible with the source database.</li> </ul>
	<ul> <li>User Name: Enter the username of the target database.</li> <li>It is recommended that the user has administrator.</li> </ul>
	- <b>Password</b> : Enter the password of the target database.
	Manually Input
	<ul> <li>Network Type: An elastic IP address (EIP) is used to connect to the source database.</li> <li>If the target database network is restricted by the IP address whitelist, add the EIP to the target database network whitelist to ensure that UGO can connect to the target database.</li> </ul>
	EIP in AP-Singapore: 110.238.109.54
	<ul> <li>Host IP Address: Enter the IP address of the target database host.</li> </ul>
	<ul> <li>Host Port: Enter the port of the target database.</li> </ul>
	<ul> <li>DB Name: Enter the database name. The name contains up to 50 characters.</li> </ul>
	<ul> <li>User Name: Enter the username of the target database.</li> <li>It is recommended that the user has administrator.</li> </ul>
	- <b>Password</b> : Enter the password of the target database.
Schemas to Migrate	• Select <b>Select all</b> : Select all schemas to be collected by UGO from the source database.
	<ul> <li>Deselect Select all: Reselect the schemas selected in the evaluation project.</li> </ul>
	By default, <b>Select all</b> is selected.

Parameter	Description						
(Optional) SSL Type	• <b>No SSL</b> : SSL is disabled and there may be potential security risks.						
	• <b>SSL No Auth</b> : Transmission will be encrypted without authentication.						
	• <b>One Way SSL</b> : The target database will be authenticated and the transmission will be encrypted.						
(Optional) Tag	Use predefined tags in Tag Management Service (TMS). Predefined tags are visible to all service resources that support the tagging function. For details, see <i>Tag Management</i> <i>Service User Guide</i> .						
	Enter a key and a value, and click <b>Add</b> .						
	A maximum of 10 tags can be added. For details, see Managing Tags.						

#### Step 5 Click Test Connection.

- If the connection test is successful, the **Create** button is available.
- If the connection test fails, an error message is displayed.
- **Step 6** Click **Create** in the lower right corner.
- **Step 7** After the creation is successful, click **OK** to go to the object migration page. The project status is **Ready**.

Object Migr	ation 🧠 Function Intro	duction 🛛 🕸 Process Guid	ance					Create Project
You can creat	le 6 more Migration projects.			All Project	Status 👻 All Target DB Type	Project Name	Please enter a project name     Q	Search by tags ~ C
SI No.	Project Name/ID	Evaluation Project	Project Status		Target DB Type	Created Date	Operation	
1	Oracle-GaussDB 58db37a4-a486-4e12	Oracle-GaussDB	Ready		GaussDB Distributed 2.7 Enterprise Edition	Nov 10, 2022 11:04:14 GMT+08:00	Migrate   Delete   More 👻	

----End

## 1.4.5 Migrating the Objects

Migrate the objects based on the created migration task.

#### Procedure

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

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

Figure 1-11 Conversion plan

1 Conversion Plan	— (2) Conversion Config —	3 Syntax Conversion	(4) Object Correction	- (5) Migrate & Verify			
User Password	D						
DB Objects (94	42)	Select Migration Object Types	Skip Conversion Convert				
- E Storage O	bjects (510)	All schemas	▼ All object statuses ▼	All conversion statuses	Start Date - End D	late 🛗 Pie	ase enter object name Q C
E SEQU	JENCE (2)	□ ∨ Schema	Object Name	Object Type	Object Status (?)	Conversion Status	Update Time
TABL	E (458)	UGO_ETE	fe_00140_675_test_view	VIEW	Ormal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
	x (39)	UGO	CR_APP_RUNTIME_PKG_REQ324	PACKAGE	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
E TYPE	(10)	UG02	USERTABLE2	TABLE	🐵 Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
Code Obje	ects (413)	UGO	BAS_DML_LOOKUP_PKG_REQ	PACKAGE	Ormal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
	RIALIZED_VIEW (0)	UGO	BAS_DML_LOOKUP_PKG_REQ	PACKAGE_BODY	Abnormal	😨 Skip	Oct 14, 2022 11:04:13 GMT+08:00
	GER (15)	UGO	BAS_DML_LOOKUP_PKG_REQ	PACKAGE	Ormai	Convert	Oct 14, 2022 11:04:13 GMT+08:00
PROC	CEDURE (147)	UGO_ETE	FE_00064_673_T_RESV_RATE	TABLE	Ormal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
E FUNC	(AGE (65)	UGO	BAS_DML_LOOKUP_PKG_REQ	PACKAGE_BODY	Ormal	Convert	Oct 14, 2022 11:04:13 GMT+08:00

- User password:
  - If you want to convert the object type USER, you must set a password to complete the conversion. The same password will be used for all USER object creation on the target database. After the migration, the individual user passwords must be changed manually. If you do not want to convert the object type USER, select the desired USER objects and click Skip Conversion. Then, the Conversion Status of the objects becomes Skip. To continue the conversion, select the desired objects and click Convert.
  - SSL connection must be selected. If Non-SSL connection is selected, the password will be transmitted as plain text as part of the database connection and any SQL statements involving a password will be insecure.
  - After the password is configured, it cannot be changed again until after the migration is complete.
  - The password can consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters ( ~!@#\$%^&\*()-\_=+\|[{}];:,<.>/?). Spaces are not allowed. The password can contain up to three consecutive characters.
- If **Object Status** of objects is **Abnormal**, their **Conversion Status** is **Skip**. It means that abnormal objects cannot be converted. If **Object Status** of objects is **Duplicate**, these objects are not migrated by default.
- Step 2 Click Next to view and edit the configuration information.

(1) Conversion Plan ——— (2) Conversion Config ———	(3) Syntax Conversion — (4) Object Correction —	(5) Migrate & Venty	
Configuration Tablespace Mapping			
Version: V5R2C10			
Deployment Mode: Distributed			
Category: Default Maximum	compatible Customize temptate		
Selecte Configuration:	Delete		
You can create 9 more parameter templates.			
Apply			
Features	Affected Object Types 🖓	Current Configuration	Operation
Support for NOLOGGING in partitioned table	TABLE	This config will raise the error.	Edit Configuration
Support for special character objectnames case format.	table index, Package materialized view, function, procedure, tri	If the object name contains special character, the object name would be relained in the target db. $\textcircled{0}$	Edit Configuration
Support for reserved keyword objectnames case format.	table, index, Package, materialized view, function, procedure, tri	The object names which are reserved keywords in the target do would converted to UPPERCASE (2)	Edit Configuration

- Configure Category and click Apply.
- When **Category** is set to **Default** or **Maximum compatible**, the current configuration cannot be modified.
- When **Category** is set to **Customize template**, you can select an existing template or create a new template. The template name can contain 5 to 50 characters and can only include letters, numbers, underscores (\_), and hyphens (-). It must start with a letter and end with a letter or number.
- After you select a template, locate a feature and click Edit Configuration in the Operation column to modify the current configuration of the feature. If the target database version and deployment mode in different migration projects are the same, you can apply or modify a template you created in previous projects.

#### Step 3 Click Next.

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

#### Figure 1-12 Syntax conversion

(1) Conversion	Plan (2) Convers	ion Config ——— 🔇	Syntax Conversion —	④ Object Correct	ion (5) Mig	rate & Verify						
Syntax C	Syntax Conversion Conversion Holary											
Start	Resume Pa	use									Download Reports	2
A Sta	A Starting Conversion spain will overrents the objects which are manually modified before.											
Conversion	Progress :						100.00%	Start Time: Mar i	, 2023 16:36:07 GMT+08:00 End Time	Mar, 2023 16:36:58 GI	/T+08:00	
	Object Type	Total Count	Skip	Conversion Succe	Conversion Failed	Ignored	Manual	Remaining	Success (%)		Operation	
	Total	961	55	864	0	42	0	0		95.63%		
	FUNCTION	58	5	50	0	3	0	0		94.34%	Details	
	GRANT	3	0	1	0	2	0	0		33.33%	Details	
	INDEX	41	0	33	0	8	0	0		80.49%	Details	
	JOB	3	0	3	0	0	0	0		100.00%	Details	

- Click **Download Reports**, locate the required report, and click **Download** to download the report to the local PC for analysis.
  - Conversion Error Report: This report contains details about objects that could not be converted to equivalent syntax in the target database.
  - Anonymized Conversion Error Report: This report contains the details about objects, in anonymized form, that could not be converted to equivalent syntax in the target database.
  - Conversion Risk Report: This report contains the details about objects that were converted with risks based on selected configuration options.
  - Anonymized Conversion Risk Report: This report contains details about objects, in anonymized form, that were converted with risks based on the selected configuration options. This report contains the details about objects that were converted with risks based on selected configuration options.
  - Converted Script Parse Failures Report: This report contains the details about objects that could not be parsed using the conversion script for the target database syntax. However, there are function differences after the conversion.

- Anonymized Converted Script Parse Failures Report: This report contains details about objects, in anonymized form, that could not be parsed using the conversion script for the target database syntax.
- Locate an object type that failed to be converted, and click **Details** in the **Operation** column to go to the **Object Correction** page to view details about the object type.

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

#### Figure 1-13 Object correction

Conversion Plan	(2) Conversion Config	3 Syntax Conversion —	Object Correction	(5) Migrate & Ve	erify			
Bulk Statement Upda	ate Bulk Status Update							
🖃 🖹 DB Objects	(269)	Skip Migration	Undo Skip Rerun Corr	ersion Export •	•	All schemas	All conversion stat      All Migration Stat	tus • SearchObject Name Q C
🖃 🖻 Storage	e Objects (119)	🗌 🗸 Schema	Object Name		Object Type	Conversion Sta	tus Migration Status	Operation
- 🗎 SE	QUENCE (4)	UG0	FN_CONCAT	STR	FUNCTION	ending	ending	Modily   View Details
TAI	BLE (90)	1100	EN GETDER	NO	FUNCTION	O Deading	Pandina	Medily   Mean Datable
E INC	DEX (5)	000	Th_OLIDER		Tononon	• Ferrainy	• Ferding	mony   the Dealer
🖹 SY	NONYM (0)	UGO	FN_GET_EM	NAMES	FUNCTION	ending	ending	Modify   View Details
B TM	'PE (20)	UGO	FN_GET_EM	NAMES2	FUNCTION	( Pending	Pending	Modity   View Details
Code O	(147) (147)							
E VIE	EW (2)	UGO	FN_GET_EM	NAMES3	FUNCTION	ending	ending	Modify   View Details
E MA	ATERIALIZED_VIEW (0)	UGO	FN_GET_EM	_BY_ENO	FUNCTION	ending	Pending	Modify   View Details
TR	IIGGER (1)						0.1	
TY	'PE_BODY (1)	UGU	FN_IPRODUC	1_AMOUNT	FUNCTION	( Pending	(e) Pending	Modity   View Decails
PR	ROCEDURE (28)	U00	FN_IPRODUC	T_AMOUNT2	FUNCTION	ending	Pending	Modify   View Details
🗎 FU	INCTION (34)	UGO	EN MYMONT	н	FUNCTION	Pending	Pending	Modify   View Details
PA	CKAGE (48)		-				• · · · · ·	
🗎 PA	CKAGE_BODY (33)	UGO	FINDCOURS		FUNCTION	ending	Pending	Modify   View Details
🖹 DIF	RECTORY (0)	10 V Total Rec	ords: 269 < 1 2 3 4					
- 🖃 🗎 Job Obj	jects (0) 🕝		· · · · · · · · · · · · · · · · · · ·					

• Select object types or objects you want to rerun conversion for and click **Rerun Conversion**. The SQL modification of other objects is not overwritten

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

- Batch update: You can click **Batch Statement Update** to search for and modify objects with the similar issues in batches. For details, see **Updating Statements in Batches**.
- Bulk Update Status: Change the statuses of all failed objects to Manual or Ignore.
  - Manual: If an object fails to be converted or migrated but migration verification is required for the object, you can select this option to convert its migration status to Manual.
  - Ignore: If an object fails to be converted or migrated but migration verification is not required for the object, you can select this option to convert its migration status to Ignore. If you click Undo Skip, the Conversion Status will change to Manual.
- Select an object and click **Modify** to modify the selected objects.
  - Select a schema and click **View Details** to view the object details and object correction information. You can also copy the code as needed.
  - Single modification: You can manually modify objects one by one. For details, see **Modifying Objects**.

#### 

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

#### Step 6 Click Next.

#### NOTICE

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

**Step 7** Click **Start** to start the verification. The migration progress is displayed in a progress bar and as a percentage. When the migration progress reaches 100%, the migration is complete.

#### Figure 1-14 Verification

(1) Conversi	on Plan	<ol> <li>Conversion Config ———</li> </ol>	— (3) Syntax Conversion		5 Migrate & Verify				
Migration Migration History									
Start	Stop								Download Reports C
Total So	Total Seurce SQL line								
Migration	Progress :					100.00%	Start Time: , 2022 16:15:	12 GMT+08:00 End Time: Sep 06, 2022 16	15:27 GMT+08:00
	Object Type	Total Cour	it	Successfully Migrated	Migration Failed	Remaining	Ignored	Success (%)	Operation
	TOTAL	817		35	766	0	16	4.28%	
	PROCEDURE	102		99	1	0	2	97.06%	Details

- If a message is displayed, indicating that there were errors or risks during the migration, the system will automatically stop the verification process.
- View Empty Stored Procedure: You can view objects that fail to be created and failure occurrences.
- Click Download Reports, locate the required report, and click Download to download the report to the local PC for analysis.
  - Migrate and Verify Report: This report includes a summary of object statuses during migration and verification.
  - Migrate and Verify Error Report: This report includes failure details, such as statuses, migrated statements, and error details for each object.
  - Migrate and Verify Anonymized Error Report: This report consists of failure details, such as statuses, migrated statements, and error details for each object, but the original statement and migrated statements will be anonymized.
- Locate an object type that failed to be migrated, click **Details** to return to the object correction page and view details about the object type.
- Step 8 After the migration verification is complete, if any item fails the verification, return to the object correction page. You can modify the items one by one or click Bulk Statement Update to modify them in batches.

#### D NOTE

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

----End

#### **Follow-up Operations**

- You can view the conversion success rates and SQL statements. For details, see Viewing Syntax Conversion History and Viewing Migration Verification History Details.
- After the migration is complete, you can delete the corresponding database evaluation and object migration project. When the projects are deleted, the database connection information and source database schema information are also deleted. Deleted projects cannot be recovered. Exercise caution when performing this operation.

### 1.4.6 Checking the Migration Results

This section uses the PROCEDURE object type as an example to describe how to confirm the migration results.

#### Procedure

**Step 1** When the migration verification progress reaches 100%, view the migration results of PROCEDURE.

1) Conversion Plan ——— (2) Conversion Config ——— (3) Syntax Conversion ——— (4) Object Convection ——— (5) Migrade & Venity								
Mgration Migration History								
Start Stop								
Total Source SQL lineTotal SQL lines converted								
Migration Progress :				100.00%	Start Time: , 202	22 16:15:12 GMT+08:00 End Time: Sep 0	5, 2022 16:15:27 GMT+08:00	
Object Tune	Total Count	Sussaafully Higgstod	Meratics Failed	Demaining	Import	Cusson (V.)	Oneration	
Object type	Total Count	Successiony migrated	migration ralieu	Rendering	ignored	3000855 (70)	Operation	
TOTAL	817	35	766	0	16	4	28%	
PROCEDURE	102	99	1	0	2	97	7.06% Details	

**Step 2** Go to the **Object Correction** page, select **PROCEDURE**, and locate an object in the object list. **PROC\_REQ197** is used as an example.

nversion Plan (2) Conversion Config		Object Correction (5) Migrat	e & Verify			
Bulk Statement Update Bulk Status Update						
DB Objects (550)	Skip Migration Undo Skip	Rerun Conversion		All schemas 👻 All conve	rsion stat 💌 All Migration Status	SearchObject Name
E Storage Objects (342)	✓ Schema	Object Name	Object Type	Conversion Status	Migration Status	Operation
<ul> <li>B SEQUENCE (0)</li> <li>TABLE (324)</li> </ul>	SYNTAX_MIG_SCHEMA	PROC_REQ197	PROCEDURE	C Success	© Success	Modify   View Details
INDEX (18)	SYNTAX_MIG3	PROC1_REQ684	PROCEDURE	C Success	C Success	Modify   View Details
SYNONYM (0) TYPE (0)	SYNTAX_MIG3	PROC1_REQ685	PROCEDURE	Success	C Success	Modify   View Details
Code Objects (198)	SYNTAX_MIG3	PROC_FLOAT_DATATYPE	PROCEDURE	Success	Success	Modify   View Details
VIEW (46)     AMATERIALIZED VIEW (0)	SYNTAX_MIG3	LARGEDATA_INSERT_REQ408	PROCEDURE	O Success	Success	Modify   View Details
TRIGGER (1)	SYNTAX_MIG3	PROC_REQ125	PROCEDURE	Success	Success	Modify   View Details
TYPE_BODY (0)	SYNTAX_MIG3	PROC_REQ148	PROCEDURE	Success	O Success	Modify   View Details
FUNCTION (14)	SYNTAX_MIG3	PROC_REQ160	PROCEDURE	Success	Success	Modify   View Details
PACKAGE (28)	SYNTAX_MIG3	PROC_REQ184	PROCEDURE	O Success	Success	Modify   View Details
Eh DIRECTORY (II)	SYNTAX_MIG3	PROC1_REQ667	PROCEDURE	Success	Success	Modify   View Details

**Step 3** Click **View Details** in the **Operation** column to view the details and the SQL statements.

View SQL - Object Name PROC_REQ197           Object Details         Object Correction				
Schema Name SYNTAX_MIG_SCHEMA	Object Type PROCEDURE	Object Name PROC_REQ197	Split Object Name SYNTAX_MIG_SCHEMA.PROC_REG197	Migration Status Success
Source 1 CREATE OR REPLACE PROCEDURE 2 as 3 begin 4 EXCOME INVEDIATE VALUE VAL SUPPLISENTAL LOY DATA (ALL) 5 end; 6 / 7	"SYNTAX_HTG_SOHEM", "PROC_REQ157" R.K. "Syntax_htg_schwaa", "AGY_AD1H51_HKARER COLUMNS ;	Targ	t CREATE ON REPLACE PROXIMINE SWITCH FILE SCHEME, MOX. BUDY 2 at 3 begin 4 EXECUTE DREDIATE "ALTER VALUE "Synthes, mig. scheme."."REV 3000-THERMIN, ION BUTH (ML), COURSE 1; 5 end;	97

**Step 4** Use DAS to connect to **ugo** in the **Auto-ugo-gaussdbv5-tar-1** instance.

For details about how to connect to a DB instance, see **Adding Login Information**.

- **Step 5** Check that there is the schema **syntax\_mig\_schema**.
- Step 6 On the Objects tab, view the stored procedure proc\_req197.

Data Admin Service Gauss	DB	SQL Operations	Database Management	Import and Export	Account Management	
Home Database Management-ugo X						
Current Database: UGO Change   192.168.0.140.8000   Character Set: UTF8 SQL Window						
Schemas Objects M	letadata Collection					
• The object list data comes from the DAS background timing collection task, the last acquisition time: 2022-11-10 04:03:30 Collect Now Clear Collected Data						
Tables Sc	chema: syntax_mig_schema	× +	Create Stored Procedure			
Views	Name		Parameter		Operation	
Stored Procedures	get_emp_new_salary_req167		(IN I_empno numeric)		Alter or Execute   Drop   View Del	tails
Triggers	pr_sb_ycsbkzcs_req172		(OUT o_rc refcursor)		Alter or Execute   Drop   View Del	tails
Sequences	proc_req197		0		Alter or Execute   Drop   View Det	tails

----End

#### **Follow-up Operations**

- You can use Data Replication Service (DRS) to migrate data online. It is a complete solution where UGO works with DRS to migrate heterogeneous databases with complex stored procedures and functions to Huawei Cloud databases. For details about how to use DRS to migrate data from the Oracle database to GaussDB, see Best Practices of Migrating Data from Oracle to GaussDB.
- After the migration is complete, test the performance of the target database. For details, see **GaussDB Performance White Paper**.