

Database and Application Migration UGO
2.23.07.200

Usage Guide

Issue 01
Date 2023-09-22



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1 Service Overview

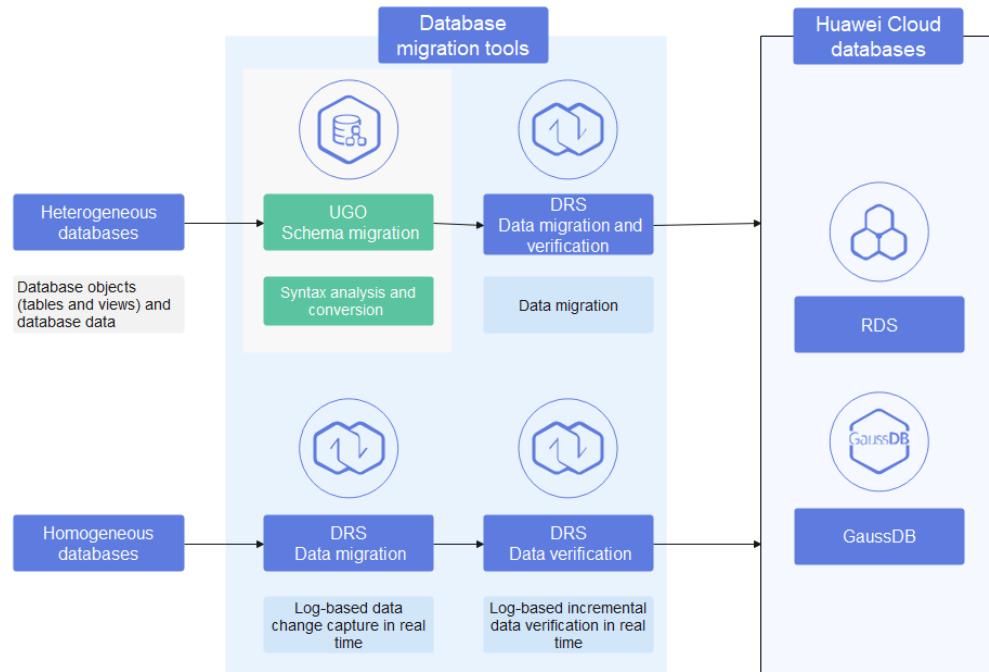
1.1 Overview

Database and Application Migration UGO, referred to as UGO, is a professional cloud service that focuses on heterogeneous database schema migration and application migration. It can automatically convert the syntax of the DDL, DML and DCL in the source database and SQL statements encapsulated in service programs into statements compatible with databases such as GaussDB and RDS. With the functions of database evaluation, object migration, and automatic syntax conversion, UGO can help you evaluate your reconstruction workload in advance, improve the conversion rate, and minimize the costs of database migration.

In heterogeneous database migration, UGO is for structure migration and syntax conversion, and Data Replication Service (DRS) is for data online migration. UGO and DRS form a complete and smooth end-to-end heterogeneous database migration solution, helping you migrate mainstream commercial databases to Huawei Cloud databases easily and smoothly.

You can use UGO and DRS to migrate heterogeneous databases with complex stored procedures and functions to the Huawei Cloud.

Figure 1-1 Database migration solution



1.2 Basic Concepts

Source Database

Source database is the database to be migrated.

Target Database

Target database is the database that receives the data migrated from the source database. It can be a Huawei Cloud GaussDB or RDS database.

Database Evaluation

Database evaluation covers the compatibility analysis, target database recommendation, workload evaluation, and migration risk identification on the object collection of the source database to identify the feasibility and risks of migrating data from the source database to the target database.

Structure Migration

Based on the selected target database and source database, equivalent syntax conversion is performed on the collected objects, including DDL, DML, and PL/SQL objects.

Application Migration

Through traffic capture or static source code collection, SQL statements in applications can be obtained and performed with equivalent syntax conversion.

based on the selected source and target databases. A conversion report is then generated to guide you through application reconstruction.

Source Database Profiling

Source database profiling uses massive service scenarios as samples and key database metrics as features for training to abstract the database information, providing the data basis for further accurate and quick analysis of important information such as application scenarios and user operation habits of the source database.

Compatibility Analysis

Based on the selected source and target databases and full syntax tree analysis of the source database, compatibility analysis analyzes and evaluates the convertibility of the collected objects in the target database, and provides the analysis result.

1.3 Supported Databases

Constraints

When selecting GaussDB as the target database type, you need to create a GaussDB database compatible with the source database. For details, see [How Do I Create GaussDB Databases Compatible with Source Databases?](#)

Software Requirements

Table 1-1 lists the types and versions of the source and target databases during database evaluation and migration. [Database Types and Versions](#) lists the types and versions of the source and target databases during object comparison.

Table 1-1 Database types and versions

Source DB Engine	Source DB Version	Target DB Type and Version
Oracle	10g	RDS for PostgreSQL 11
	11g, 12c, 18c, and 19c	RDS for MySQL 5.7
		RDS for PostgreSQL 11, 12, 13, 14, and Enhanced Edition
		GaussDB(for MySQL) 8.0

Source DB Engine	Source DB Version	Target DB Type and Version
		GaussDB Primary/Standby 1.4 Enterprise Edition, 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
		GaussDB Distributed 1.4 Enterprise Edition, 2.7 Enterprise Edition, and 3.2 Enterprise Edition
MySQL	5.6	GaussDB Primary/Standby 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
	5.7 and 8.0	GaussDB Distributed 3.2 Enterprise Edition
		GaussDB Primary/Standby 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
		GaussDB Distributed 2.7 Enterprise Edition and 3.2 Enterprise Edition
DB2 for LUW	11.1	GaussDB Primary/Standby 2.0 Enterprise Edition

NOTE

Primary/standby GaussDB 2.7 Enterprises Edition includes primary/standby GaussDB 2.1 enterprise edition, primary/standby GaussDB 2.2 enterprise edition, and primary/standby GaussDB 2.7 enterprise edition.

Distributed GaussDB 2.7 Enterprises Edition includes distributed GaussDB 2.1 enterprise edition, distributed GaussDB 2.2 enterprise edition, and distributed GaussDB 2.7 enterprise edition.

1.4 Highlights

Easy to Use

Wizard-based, visualized guidance runs through the entire migration process. You can perform database structure migration and verification without professional database syntax knowledge, which significantly lowers the knowledge requirements.

Two core functions, database evaluation and object migration, as well as automatic syntax conversion allows for one-stop heterogeneous database migration.

Low Risk

The current usage information of the source database can be obtained through source database analysis and profiling. UGO can recommend target databases based on the source database information and evaluate their compatibility and migration risks, helping you identify possible reconstruction points in advance. UGO can help you visualize the migration process and quantify migration capability.

Low Cost

UGO can automatically collect and convert data, and trace and locate errors of objects that fail to convert, reducing labor costs.

High Conversion Rate

By training hundreds of millions of code samples in massive service scenarios, UGO achieves an industry-leading conversion rate for mainstream commercial databases.

High Security

User operations and critical information are protected to maximize data and operation security. The entire migration process is manageable, visible, and controllable.

1.5 Functions

Source Database Profiling

Source database profiling uses massive service scenarios as samples and key database metrics as features for training to abstract the database information, providing the data basis for further accurate and quick analysis of important information such as application scenarios and user operation habits of the source database.

Target Database Compatibility Analysis

Compatibility analysis is carried out on 14 core object types based on the source database profiling and the conversion rate of the UGO kernel to the target database. The compatibility analysis includes compatible and incompatible objects. For the objects not supported, UGO lists the top features and provides reconstruction suggestions. Through continuous kernel construction in the past few years and training with hundreds of millions of samples, UGO delivers high syntax conversion rate.

Workload Evaluation

The migration labor cost in massive service scenarios is used as a baseline workload. The accumulated migration workload of large numbers of service scenarios in automated migration is used as the input. The evaluated migration workload is based on the amount of code, the conversion rate, and on how hard it is to reconstruct incompatible features.

Target Database Type and Specification Recommendation

Based on the source database profile, UGO recommends target database types by priority, as well as the specifications and costs of different types considering the compatibility, performance, object complexity, and application scenarios.

Database Schema Migration

Schema migration uses pre-migration evaluation as input and guidance. Before the conversion, you can filter the objects to migrate. After the conversion is complete, you can mark the failed objects and failure causes. Failed objects can be corrected according to the failure causes. After the correction, you can perform the verification test. If the verification fails, you can correct the objects and submit for verification again until all objects are successfully verified and the entire migration process is complete.

Application SQL Migration

Application SQL migration consists of two parts:

Part 1: Deploy the agent on the application to capture traffic, collect SQL statements submitted from the application to the database, and dynamically convert the SQL statements using the UGO kernel. Replay the converted SQL statements on the target application to generate the performance analysis report.

Part 2: Collect the SQL statements submitted from the application to the source database, convert the SQL statements using the kernel, verify the conversion accuracy in the target database, and generate the SQL translation report for developers to reconstruct the application.

1.6 Application Scenarios

Financial/Internet Industry

UGO is suitable for migrating bank's core transaction services and Internet transaction services from traditional commercial databases to cloud databases.

Advantages:

- High syntax conversion rate
UGO supports automatic syntax conversion from mainstream commercial databases to cloud databases. By training hundreds of millions of code samples in massive service scenarios, the syntax conversion rate of UGO reaches the industry-leading level, greatly reducing migration costs and improving efficiency.
- Exception locating and reconstruction suggestions
UGO automatically locates objects that fail to convert and analyzes the root causes, and provides manual reconstruction suggestions for syntax that cannot be adapted to heterogeneous databases based on the DBA knowledge base.

Government/Large Enterprises

UGO is suitable for migrating operating businesses and operational businesses of government organizations and enterprises. Government organizations and enterprises have complex scenarios. During the migration from traditional commercial databases to cloud databases, they demand solutions that best suit their needs and businesses.

Advantages:

- Target database recommendation
Target database type and specifications are recommended based on the source database service running scenarios. This helps resolve the difficulties in database selection.
- Migration verification
All migrated objects are automatically replayed in the target database for reconstruction verification, ensuring that the objects in the source database are equivalent to those in the target database.

1.7 Constraints

Table 1-2 shows the constraints designed to ensure the stability and security of UGO.

Table 1-2 Function constraints

Function	Constraints
Pre-migration	<ul style="list-style-type: none"> Database service commands, such as SQL*Plus command PROMPT, are not supported. There are some dynamic constraints in target databases, such as RDS for MySQL and GaussDB(for MySQL). For example, the total size of all Varchar columns cannot exceed 64,000.
Object collection	<ul style="list-style-type: none"> System objects starting with SYS_PLSQL are not collected. Objects containing back quotes and blank characters cannot be collected, parsed, evaluated, converted, or migrated. Deleted objects starting with BIN\$ are not collected. Oracle nested tables are not collected. Schema objects within the user permission scope are not collected. For details about other objects that are not collected, see section "Which of the Following Schemas Are Not Considered During the Source Oracle Database Object Collection?" in the <i>User Guide</i>.
SQL conversion	For command line and online converter usage scenarios, you need to input SQL according to the source database syntax documentation. Because current SQL Parser or Identifier checks the syntax of input SQL with respect to source database syntax documentation, it cannot match with source database engine functionality completely due to certain dynamic behavior.
Maximum number of connections to the source database	UGO occupies session connections of the source database. If the number of connections occupied by UGO exceeds the upper limit of connections to the source database, some workloads will be unable to access the source database. It will affect source database functions.
Source database object collection	Collecting objects using UGO occupies source database resources. You are advised to do this operation during off-peak hours.
No incremental data migration performed	UGO converts database schemas based on the collected data. Any schema changes after the data is collected will not be migrated. After the migration, the changes must be synchronized between the source and target databases, or, the changed functions will be affected.
Migration and verification	UGO is used to reduce costs and improve migration efficiency. After database objects are migrated, strict tests must be performed to ensure that the functions and performance of the migrated objects on the target database meet service requirements. Otherwise, the target database cannot be used to replace the source database.

1.8 Compliance Description

UGO needs to access your data, including database connections and schema information.

1. Connection information includes database IP address, port number, username, and password, and SSL certificate and password.
2. UGO only accesses and obtains information about database schema, which is displayed on the console. Table data in the source database is not accessed.

There are a wide range of security measures, such as authentication, encrypted storage, and internal data isolation, to ensure data security. After you delete related projects after the migration, UGO will delete data related to the projects.

Service Compliance

You understand and agree that your use of this service complies with laws and regulations, including but not limited to legal compliance requirements for data content, data transfer, and cross-border data transfer. UGO only provides a standard service when requested and is not responsible for the legal compliance of your use. If you use the services illegally or engage in illegal actions using the services, you shall bear all consequences arising therefrom.

1.9 Change History

Released On	Description
2021-09-30	This issue is the first official release.

2 Installation Guide

2.1 Installation Overview

2.1.1 Service Overview

Database and Application Migration UGO, referred to as UGO, is a professional cloud service that focuses on heterogeneous database schema migration and application migration. It can automatically convert the syntax of the DDL, DML and DCL in the source database and SQL statements encapsulated in service programs into statements compatible with databases such as GaussDB and RDS. With the functions of database evaluation, object migration, and automatic syntax conversion, UGO can help you evaluate your reconstruction workload in advance, improve the conversion rate, and minimize the costs of database migration.

Table 2-1 lists the types and versions of the source and target databases supported by UGO.

Table 2-1 Database types and versions

Source DB Engine	Source DB Version	Target DB Version
Oracle	10g	RDS for PostgreSQL 11
	11g, 12c, 18c, and 19c	RDS for MySQL 5.7
		RDS for PostgreSQL 11, 12, 13, 14, and Enhanced Edition
		GaussDB(for MySQL) 8.0

Source DB Engine	Source DB Version	Target DB Version
		GaussDB Primary/Standby 1.4 Enterprise Edition, 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
		GaussDB Distributed 1.4 Enterprise Edition, 2.7 Enterprise Edition, and 3.2 Enterprise Edition
MySQL	5.6	GaussDB Primary/Standby 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
	5.7 and 8.0	GaussDB Distributed 3.2 Enterprise Edition
		GaussDB Primary/Standby 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
	5.7 and 8.0	GaussDB Distributed 2.7 Enterprise Edition and 3.2 Enterprise Edition
DB2 for LUW	11.1	GaussDB Primary/Standby 2.0 Enterprise Edition

2.1.2 Intended Audience

This document is intended for the following personnel who convert the database schemas:

- Database migration engineer
- database administrator (DBA)
- Technical support engineer

They understand the following information:

- Basic concepts and policies of database migration
- Oracle, MySQL, PostgreSQL, and GaussDB

2.2 Installing UGO

This section provides information on system requirements such as software, hardware, operating system details and so on. This section also illustrates installation scenario, configuration part, installation process, and verification process.

2.2.1 System Requirements

Software Requirements

[Table 2-2](#) lists the software requirements.

Table 2-2 Software requirements

Software	Version	Description
MySQL	8.0.20 or later	
Python	3.8 or later	<ul style="list-style-type: none">Local database installation: The MySQL database is automatically installed on a local PC when UGO is being installed. MySQL and Python are included in the UGO installation package. For details about how to obtain the UGO installation package, see Tools and Software Packages.Remote database installation: An existing MySQL database is used to install UGO. For details about how to create an UGO database user in the installed MySQL database, see How to Create a Database User for UGO in the Installed MySQL Database?
JDK	1.8.0_161 or later	<p>Obtain a JDK package from the following link and install it. Ensure that the non-root user used to install UGO has the permissions to access Java.</p> <ul style="list-style-type: none">Download Java SE development tool packageDownload and install prebuilt JDK packages

Hardware Requirements

[Table 2-3](#) lists the hardware requirements for physical machines.

Table 2-3 Hardware requirements

Hardware	Specification	
CPU	Minimum	4 vCPUs
	Recommended	16 vCPUs

Hardware		Specification
Memory	Minimum	16 GB
	Recommended	32 GB
Storage	Minimum	64 GB

OS Requirements

Table 2-4 lists the operating system (OS) requirements.

Table 2-4 Supported OSs

Server Type	OS	Version	Description
Generic x86 servers	SUSE Linux Enterprise Server 12	SP4	The standard image or JeOS image is installed by default.
	CentOS	7.5	Minimal installation
		7.6	Minimal installation
	EulerOS	2.5.12, 2.9.5, or 2.10.3 NOTE In the following section, EulerOS 2.5.12 is used as an example.	Standard image of the management plane
Generic x86 and Arm servers	Kylin	V10 SP1 and V10 SP2	Minimal installation
	UnionTech OS Server 20 Euler	20	Minimal installation

2.2.2 Preparing for Installation

2.2.2.1 Installation Process

The following describes the installation process of UGO.

Figure 2-1 Installation process

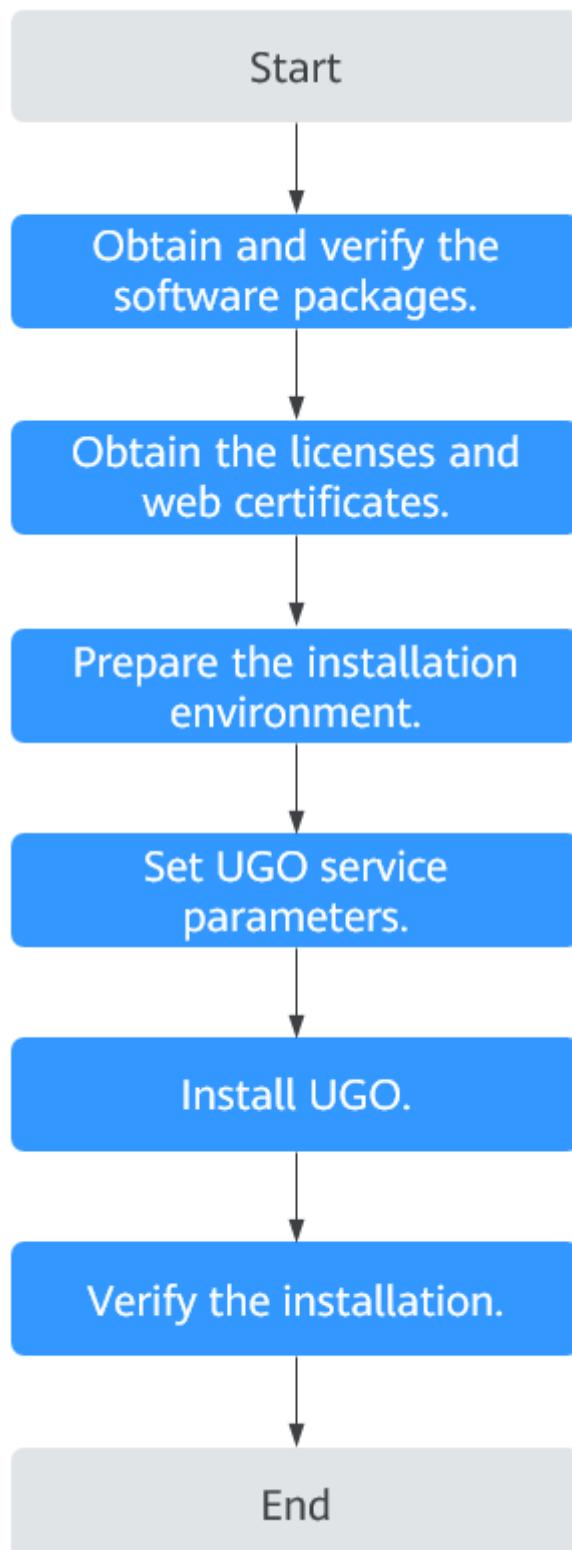


Table 2-5 UGO installation process

No.	Process	Description
1	Obtain and verify the software packages.	For details, see Tools and Software Packages .
2	Obtain the licenses and web certificates.	For details, see Applying for a License Certificate and Obtaining a Web Certificate .
3	Prepare the installation environment.	For details, see Preparing the Installation Environment .
4	Set UGO service parameters.	For details, see Configuring Installation Parameters .
5	Install UGO.	For details, see Installing UGO .
6	Verify the installation.	For details, see Logging In to the UGO WebUI .

2.2.2.2 Tools and Software Packages

Preparing Software Packages

Download the following UGO software packages, third-party dependent software, and corresponding verification files based on the OS.

Table 2-6 UGO software packages

Software Package	Description	How to Obtain
UGO.tar.gz	Software package for installing UGO	Enterprise users: Download
UGO.tar.gz.sha256.txt	File for verifying the reliability of the UGO software package For details about how to verify the downloaded software packages, see Reliability Verification File .	Carrier users: Download
ThirdPartySoftware.tar.gz	Dependent software package for installing UGO	
ThirdPartySoftware.tar.gz.sha256.txt	File for verifying the reliability of the UGO dependent software package For details about how to verify the downloaded software packages, see Reliability Verification File .	

Software Package Structure

The UGO software package structure is as follows:

Table 2-7 Structure description

Folder/File	Description
script	Files required for UGO installation
software	Folder that stores software information, including service information, required external tools, and related database information <ul style="list-style-type: none">• db: includes the schema information to be executed after UGO and the MySQL database are created.• services: contains the service packages used for UGO.• tools: contains the tools required for installing UGO.• web: includes the browser for users.
cleanup_residual_file.sh	Script used to delete residual files and processes after UGO is uninstalled
install.py	Script used to install UGO
install-default.conf	Installation configuration file
README.txt	File that contains the installation information

2.2.2.3 Applying for a License Certificate

Scenarios

A license certificate determines for how long a user can use UGO.

Method 1

Step 1 Log in to the server where UGO is to be installed as the **root** user.

Step 2 Run either of the following commands to obtain the MAC address corresponding to the IP address configured for UGO installation.

- **ifconfig**

Information similar to the following is displayed:

```
[root@drs_service1 ~]# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.XX.XX.XX netmask 255.255.255.0 broadcast 192.XX.XX.XX
              ether 28:6e:d4:88:d6:53 txqueuelen 1000 (Ethernet)
                    RX packets 18464317 bytes 3439357477 (3.2 GiB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 5458646 bytes 2154375489 (2.0 GiB)
                    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 100.YY.YY.YY netmask 255.255.248.0 broadcast 100.XX.XX.XX
        ether 28:6e:d4:88:d6:54 txqueuelen 1000 (Ethernet)
          RX packets 7427100 bytes 366714614 (349.7 MiB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 2517 bytes 105714 (103.2 KiB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.XX.XX.XX netmask 255.YY.YY.YY
        loop txqueuelen 0 (Local Loopback)
          RX packets 4550041 bytes 1671652036 (1.5 GiB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 4550041 bytes 1671652036 (1.5 GiB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Multiple MAC addresses may be returned in the command output. If 100.YY.YY.YY is used, you can apply for the license file corresponding to the 28:6e:d4:88:d6:54 MAC address.

The value of **service.ip_address** is set to this IP address. For details, see [Configuring Installation Parameters](#).

- **ip addr**

Information similar to the following is displayed:

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.XX.XX.XX/8 scope host lo
        valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether fa:16:3e:76:cf:ea brd ff:ff:ff:ff:ff:ff
    inet 192.YY.YY.YY/24 brd 192.168.1.255 scope global dynamic noprefixroute ens3
        valid_lft 86371sec preferred_lft 86371sec
        inet6 fe80::22b9:973:162:c822/64 scope link noprefixroute
            valid_lft forever preferred_lft forever
3: enp4s4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether fa:16:3e:08:1e:d9 brd ff:ff:ff:ff:ff:ff
```

Multiple MAC addresses may be returned in the command output. If 192.YY.YY.YY is used, you can apply for the license file corresponding to the fa:16:3e:76:cf:ea MAC address.

The value of **service.ip_address** is set to this IP address. For details, see [Configuring Installation Parameters](#).

Step 3 Convert all lowercase letters to uppercase letters for the obtained MAC address and provide the modified MAC address to technical support engineers to apply for a UGO license.

----End

Method 2

Step 1 Install Java and contact technical support engineers to obtain the **GetMacAddress.class** file.

Step 2 Open the **GetMacAddress.class** file and run the following command to obtain the MAC address:

java GetMacAddress

Step 3 Provide the obtained MAC address to technical support engineers to apply for a UGO license.

----End

 NOTE

If you fail to obtain the MAC address after trying both methods, contact technical support.

2.2.2.4 Obtaining a Web Certificate

Scenarios

A Web certificate is used to ensure user data security, verify the ownership of the website, and prevent attackers from using trusted websites by disguising requests from trusted users.

A keystore file is required to support the HTTPS and SSL protocols.

Prerequisites

Java has been installed.

How to Obtain

Method 1: Use a trusted **Certificate Authority (CA)** to generate a digital certificate and keystore file.

Method 2: Generate a self-signed web certificate. For details, see [Generating a Self-Signed Web Certificate](#).

 NOTE

- It is recommended that you generate a web certificate, digital file, and keystore file from a trusted **CA**.
- If a self-signed certificate is used, an alarm will be displayed on the console after UGO is installed. This does not affect user operations.

2.2.2.5 Preparing the Installation Environment

NOTICE

- You can specify the installation directory. The usernames and user directories mentioned in this document are only examples.
- A non-root user is required for installing UGO, but the installation can be triggered from the **root** or non-root user. Even if all the dependent software is installed as the **root** user, UGO is installed as a non-root user.
- In this section, the **ugo** user created during third-party software package installation is used as the non-root user.

Prerequisites

Before installing third-party software, ensure that AWK, GCC, Make, which, Perl, crontab, unzip, tar, numactl, rsync, cut, IP, logrotate, sed, sha256sum, wc and xargs have been installed. Or, the following information is displayed:
XXX is not installed. Unable to Proceed. Please install the tar latest version.

If YUM is used to manage software packages, run the following command to install UGO:

```
yum install gawk gcc make which perl crontabs unzip tar numactl rsync cut ip  
logrotate sed sha256sum wc xargs
```

If another package management method is used, use the corresponding tool for installation.

Procedure

Step 1 Log in to the server where UGO is to be installed as the **root** user.

Step 2 Create the **package** directory.

```
mkdir package
```

Step 3 Upload the third-party software package to the **package** directory.

Step 4 Go to the **package** directory.

```
cd package
```

Step 5 Install the required software.

Decompress the third-party software package, go to the directory, and then execute **install.sh**.

Enter the name of the non-root user. You do not need to create this user in advance and can enter any name here, for example, **ugo**. Then **install.sh** will automatically create this user and use it to install UGO.

```
tar -xf ThirdPartySoftware.tar.gz
```

```
cd ThirdPartySoftware
```

```
bash install.sh
```

NOTE

- Executing the **install.sh** script will automatically check Python versions and required Python modules. If **install.sh** fails to be executed or the Python modules fail to be imported, manually install the UGO dependent software. For details, see [Manually Installing Dependency Software](#).
- The non-root user created by the **install.sh** script does not have the login permission. Switch to this user if needed.

sudo su ugo -s /bin/bash

If a non-root user with the sudo permission is used, the system may prompt you to enter the password of this user.

- If multiple Python versions are installed in the system, check whether the **python3** command meets the requirements by referring to [What Should I Do If python3 Fails to be Executed or UGO Installation Fails After python3 and Required Python Modules Are Installed?](#)

----End

2.2.3 Installing UGO

NOTE

If you need to change to SM series cryptographic algorithms, replace **python3 install.py install** with the related command provided in [How Do I Switch to SM Series Cryptographic Algorithms?](#)

2.2.3.1 Local Database

2.2.3.1.1 Installing UGO as the root User

Scenarios

A non-root user is required for installing UGO, but the installation can be triggered from the **root** or non-root user.

You can run the installation command as the **root** user, but set **-os-user** in the command to a non-root user.

It is recommended that **ugo** be used as the UGO installation user, which is created during dependent software installation. If you enter a non-root user that does not exist, the system will create and configure the non-root user.

Procedure

Step 1 Log in as the **root** user, upload the **UGO.tar.gz** package, run the following commands, decompress the package, and go to the **UGO** folder:

tar -xf UGO.tar.gz

cd UGO

Step 2 Upload the UGO license and Web certificate to any directory accessible to the current user.

Step 3 Configure parameters in the **install-default.conf** file as required.

vi install-default.conf

For details, see [Configuring Installation Parameters](#).

After the parameters have been configured, run the following command to exit the file:

:wq

Step 4 Install the UGO service.

Set valid passwords by referring to [How Do I Configuration Passwords During UGO Installation?](#) The password of **DB User** is required during the upgrade and rollback. To log in to the UGO console, the password of **IAM User** is required.

```
python3 install.py install --install-repo-db --license <license_path> --web-cert <web_cert_path> --os-user <username where ugo is going to be installed>
```

For example:

```
python3 install.py install --install-repo-db --license ~/LICUGO.xml --web-cert ~/UGOWebKeystore --os-user ugo
```

Keep secure the password of **DB User**. Information similar to the following is displayed:

PreCheck => Java		OK Java - (Version: 1.8.0_211, Distribution: java)
Triggering install for given user ...		
PreCheck => OS User		OK Current user verified successfully.
PreCheck => Java		OK Java - (Version: 1.8.0_181, Distribution: openjdk)
PreCheck => openssl		OK openssl verified successfully.
PreCheck => keytool		OK keytool verified successfully.
PreCheck => curl		OK curl verified successfully.
PreCheck => unzip		OK unzip verified successfully.
PreCheck => gzip		OK gzip verified successfully.
PreCheck => rsync		OK rsync verified successfully.
PreCheck => cut		OK cut verified successfully.
PreCheck => ip		OK ip verified successfully.
PreCheck => sed		OK sed verified successfully.
PreCheck => sha256sum		OK sha256sum verified successfully.
PreCheck => wc		OK wc verified successfully.
PreCheck => xargs		OK xargs verified successfully.
PreCheck => Cron job		OK Cron job verified successfully.
PreCheck => Locale		OK Verified Locale Successfully.
PreCheck => CPU Cores		OK No. of CPU Cores : 16
PreCheck => License		OK License is valid till 30-Sep-2022 23:59:59 CST.
Enter the password for Certificate :		
PreCheck => WebCert		OK Web Certificate is valid for 3361 day(s).
PreCheck => Disk		OK Available disk space : 24.66GB
PreCheck => Ports		OK Input ports verified successfully.
PreCheck => Memory		OK Available Memory : 11GB
Enter DB Name: <i>DB Name</i>		
Enter DB UserName: <i>DB UserName</i>		
Enter the password for DB User -> <i>DB UserName</i> .		
Retype password:		
Enter the password for IAM User -> admin:		
Retype password:		
Installation started.		
Cron => Python access check.		OK Cron access check for Python started...
Cron => Java access check.		OK Cron access check for Java started...
PreCheck => openssl		OK openssl verified successfully.
Create config => logrotate		OK Config file created: /home/ugouser/ugoserver/bin/script/mysql.conf

Configure => DB		OK Properties configured.
Configure => WebUI		OK Properties configured.
Configure => UGO_DbObjectCollection		OK Properties configured.
Configure => UGO_PreMigration		OK Properties configured.
Configure => UGO_Migration		OK Properties configured.
Configure => UGO_Verification		OK Properties configured.
Configure => UGO_IAMService		OK Properties configured.
Configure => UGO_AppMigration		OK Properties configured.
Start => DB		OK Service started successfully.
Test => DB connection		OK DB connection tested successfully.
Start => Create DataBase		OK Database created successfully.
Start => WebUI		OK Service started successfully.
Configure => IAM User Details		OK IAM User details Configured.
Start => UGO_IAMService		OK Service started successfully.
Cron => Verify Python access Check		OK Python access Check for Cron Verified.
Cron => Cleanup Python access check.		OK Cleanup done for Python access check Cron.
Cron => Verify Java access Check		OK Java access Check for Cron Verified.
Cron => Cleanup Java access check.		OK Cleanup done for Java access check Cron.
URL to access the Web: https://XX.XX.XX.XX:8090/ugo/		
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL. Configured DB Object Collection Port: 9040 Configured Pre Migration Port: 9010 Configured Migration Port: 9000 Configured Verification Port: 9005 Configured IAM Port: 9001 Configured Application Migration Port: 9006 Please refer installer log for more Information.		
Installed in below mentioned Directory: ----- path: /home/ugouser/ugoserver		
Total Execution time 0:02:17.479698 Installation completed.		
Send => Audit Log		OK Audit log sent Successfully.

----End

2.2.3.1.2 Installing UGO as a Non-root User

Step 1 Log in to the server where UGO is to be installed as the **root** user. Upload the UGO software package to the directory **ugo** specified when dependent software was installed.

Step 2 Change the owner and permissions of the directory:

```
chown -R ugo:ugo /home/ugo
```

```
chmod -R +755 /home/ugo
```

Step 3 Switch to the **ugo** user.

```
sudo su ugo -s /bin/bash
```

Step 4 Go to the directory where the UGO software package is saved and run the following commands to decompress the **UGO.tar.gz** package and go to the **UGO** folder:

```
tar -xf UGO.tar.gz
```

```
cd UGO
```

Step 5 Upload the UGO license and Web certificate to any directory accessible to the current user.

Step 6 Configure parameters in the **install-default.conf** file as required:

vi install-default.conf

For details, see [Configuring Installation Parameters](#).

After the parameters have been configured, run the following command to exit the file:

:wq

Step 7 Install the UGO service.

Set valid passwords by referring to [How Do I Configuration Passwords During UGO Installation?](#) The password of **DB User** is required during the upgrade and rollback. To log in to the UGO console, the password of **IAM User** is required.

```
python3 install.py install --install-repo-db --license <license_path> --web-cert <web_cert_path>
```

For example:

```
python3 install.py install --install-repo-db --license ~/LICUGO.xml --web-cert ~/UGOWebKeystore
```

Keep secure the password of **DB User**. Information similar to the following is displayed:

PreCheck => OS User		OK Current user verified successfully.
PreCheck => Java		OK Java - (Version: 1.8.0_181, Distribution: openjdk)
PreCheck => openssl		OK openssl verified successfully.
PreCheck => keytool		OK keytool verified successfully.
PreCheck => curl		OK curl verified successfully.
PreCheck => unzip		OK unzip verified successfully.
PreCheck => gzip		OK gzip verified successfully.
PreCheck => rsync		OK rsync verified successfully.
PreCheck => cut		OK cut verified successfully.
PreCheck => ip		OK ip verified successfully.
PreCheck => sed		OK sed verified successfully.
PreCheck => sha256sum		OK sha256sum verified successfully.
PreCheck => wc		OK wc verified successfully.
PreCheck => xargs		OK xargs verified successfully.
PreCheck => Cron job		OK Cron job verified successfully.
PreCheck => Locale		OK Verified Locale Successfully.
PreCheck => CPU Cores		OK No. of CPU Cores : 16
PreCheck => License		OK License is valid till 30-Sep-2022 23:59:59 CST.
Enter the password for Certificate :		
PreCheck => WebCert		OK Web Certificate is valid for 3367 day(s).
PreCheck => Disk		OK Available disk space : 6.81GB
PreCheck => Ports		OK Input ports verified successfully.
PreCheck => Memory		OK Available Memory : 12GB
Enter DB Name: ugodb		
Enter DB UserName: ugouser		
Enter the password for DB User -> ugouser:		
Retype password:		
Enter the password for IAM User -> admin:		
Retype password:		
Installation started.		
Cron => Python access check.		OK Cron access check for Python started...
Cron => Java access check.		OK Cron access check for Java started...
PreCheck => openssl		OK openssl verified successfully.
Create config => logrotate		OK Config file created: /home/ugouser/ugoserver/bin/script/

```
mysql.conf
Configure => DB | OK | Properties configured.
Configure => WebUI | OK | Properties configured.
Configure => UGO_DbObjectCollection | OK | Properties configured.
Configure => UGO_PreMigration | OK | Properties configured.
Configure => UGO_Migration | OK | Properties configured.
Configure => UGO_Verification | OK | Properties configured.
Configure => UGO_IAMService | OK | Properties configured.
Configure => UGO_AppMigration | OK | Properties configured.
Start => DB | OK | Service started successfully.
Test => DB connection | OK | DB connection tested successfully.
Start => Create DataBase | OK | Database created successfully.
Start => WebUI | OK | Service started successfully.
Configure => IAM User Details | OK | IAM User details Configured.
Start => UGO_IAMService | OK | Service started successfully.
Cron => Verify Python access Check | OK | Python access Check for Cron Verified.
Cron => Cleanup Python access check. | OK | Cleanup done for Python access check Cron.
Cron => Verify Java access Check | OK | Java access Check for Cron Verified.
Cron => Cleanup Java access check. | OK | Cleanup done for Java access check Cron.
```

URL to access the Web:

<https://XX.XX.XX.XX:8090/ugo/>

Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.

Configured DB Object Collection Port: 9040

Configured Pre Migration Port: 9010

Configured Migration Port: 9000

Configured Verification Port: 9005

Configured IAM Port: 9001

Configured Application Migration Port: 9006

Please refer installer log for more Information.

Installed in below mentioned Directory:

path: /home/ugouser/ugoserver

Total Execution time 0:02:12.931283

Installation completed.

Send => Audit Log | OK | Audit log sent Successfully.

NOTE

If an error message [Errno 13] is displayed, perform operations by following the instructions provided in [What Can I Do If Error \[Errno 13\] Permission denied: 'pwd_tool.jar' Is Reported During Installation?](#)

----End

2.2.3.2 Remote Database

2.2.3.2.1 Installing UGO as the root User

Scenarios

A non-root user is required for installing UGO, but the installation can be triggered from the **root** or non-root user.

Prerequisites

The MySQL database has been installed. For details, see [How Do I Install MySQL 8?](#)

Procedure

- Step 1** Log in as the **root** user, upload the **UGO.tar.gz** package, run the following commands, decompress the package, and go to the **UGO** folder:

```
tar -xf UGO.tar.gz
```

```
cd UGO
```

- Step 2** Upload the UGO license and Web certificate to any directory accessible to the current user.

- Step 3** Configure parameters in the **install-default.conf** file as required:

```
vi install-default.conf
```

For details, see [Configuring Installation Parameters](#).

After the parameters have been configured, run the following command to exit the file:

```
:wq
```

- Step 4** Install the UGO service.

Set valid passwords by referring to [How Do I Configuration Passwords During UGO Installation?](#) The password of **DB User** is required during the upgrade and rollback. To log in to the UGO console, the password of **IAM User** is required.

```
python3 install.py install --license <license_path> --web-cert <web_cert_path>
--ssl-db-ca <ssl_db_cert_path> --os-user <username where ugo is going to be
installed>
```

For example:

```
python3 install.py install --license ~/LICUGO.xml --web-cert ~/UGOWebKeystore --ssl-db-ca ~/cert/ca.pem --os-user ugo
```

Keep secure the password of **DB User**. Information similar to the following is displayed:

PreCheck => OS User		OK Current user verified successfully.
PreCheck => Java		OK Java - (Version: 1.8.0_181, Distribution: openjdk)
PreCheck => openssl		OK openssl verified successfully.
PreCheck => keytool		OK keytool verified successfully.
PreCheck => curl		OK curl verified successfully.
PreCheck => unzip		OK unzip verified successfully.
PreCheck => gzip		OK gzip verified successfully.
PreCheck => rsync		OK rsync verified successfully.
PreCheck => cut		OK cut verified successfully.
PreCheck => ip		OK ip verified successfully.
PreCheck => sed		OK sed verified successfully.
PreCheck => sha256sum		OK sha256sum verified successfully.
PreCheck => wc		OK wc verified successfully.
PreCheck => xargs		OK xargs verified successfully.
PreCheck => Cron job		OK Cron job verified successfully.
PreCheck => Locale		OK Verified Locale Successfully.
PreCheck => CPU Cores		OK No. of CPU Cores : 16
PreCheck => License		OK License is valid till 30-Sep-2022 23:59:59 CST.
Enter the password for Certificate :		
PreCheck => WebCert		OK Web Certificate is valid for 3615 day(s).
PreCheck => Disk		OK Available disk space : 13.83GB
PreCheck => Ports		OK Input ports verified successfully.
PreCheck => Memory		OK Available Memory : 26GB

```
Enter DB IP address: XX.XX.XX.XX
Enter DB Name: DB Name
Enter DB UserName: DB UserName
Enter the password for DB User -> DB User.
Enter the password for IAM User -> admin:
Retype password:
Test => DB connection | OK | DB connection tested successfully.
Installation started.
Cron => Python access check. | OK | Cron access check for Python started...
Cron => Java access check. | OK | Cron access check for Java started...
Create config catalina => logrotate | OK | Config file created: /home/ugo/ugoserver/bin/script/catalina.conf
Configure => WebUI | OK | Properties configured.
Configure => UGO_DbObjectCollection | OK | Properties configured.
Configure => UGO_PreMigration | OK | Properties configured.
Configure => UGO_Migration | OK | Properties configured.
Configure => UGO_Verification | OK | Properties configured.
Configure => UGO_IAMService | OK | Properties configured.
Configure => UGO_AppMigration | OK | Properties configured.
Start => Create DataBase | OK | Database created successfully.
Grant Permission To => DB | WARN | Failed to add permission for DB user.
Start => WebUI | OK | Service started successfully.
Configure => IAM User Details | OK | IAM User details Configured.
Start => UGO_IAMService | OK | Service started successfully.
Cron => Verify Python access Check | OK | Python access Check for Cron Verified.
Cron => Cleanup Python access check. | OK | Cleanup done for Python access check Cron.
Cron => Verify Java access Check | OK | Java access Check for Cron Verified.
Cron => Cleanup Java access check. | OK | Cleanup done for Java access check Cron.
URL to access the Web:
https://XX.XX.XX.XX:XXXX/ugo/
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Configured DB Object Collection Port: 9040
Configured Pre Migration Port: 9010
Configured Migration Port: 9000
Configured Verification Port: 9005
Configured IAM Port: 9001
Configured Application Migration Port: 9006
Please refer installer log for more Information.
Installed in below mentioned Directory:
-----
path: /home/ugo/ugoserver
Total Execution time 0:05:31.385675
Installation completed.
```

NOTE

- In the command output, **DB IP address** indicates the IP address of the remote database. For details, see [How to Create a Database User for UGO in the Installed MySQL Database?](#)
- You are advised to set **DB Name** to a new database name. If **DB Name** is set to an existing database name, ensure that it is managed by **DB UserName**.

----End

NOTE

If SSL is not enabled for a remote MySQL database connection, **--skip-ssl-db** is required during the installation. (Note that a remote database using a non-SSL connection has potential security risks.) For example:

```
python3 install.py install --license ~/LICUGO.xml --web-cert ~/UGOWebKeystore --skip-ssl-db --os-user ugo
python3 install.py install --license LICUGO.xml --web-cert UGOWebKeystore --skip-ssl-db
```

2.2.3.2.2 Installing UGO as a Non-root User

Prerequisites

The MySQL database has been installed. For details, see [How Do I Install MySQL 8?](#)

Procedure

Step 1 Log in to the server where UGO is to be installed as the **root** user. Upload the UGO software package to the directory **ugo** specified when dependent software was installed.

Step 2 Change the owner and permissions of the directory:

```
chown -R ugo:ugo /home/ugo
```

```
chmod -R +755 /home/ugo
```

Step 3 Switch to the **ugo** user.

```
sudo su ugo -s /bin/bash
```

Step 4 Go to the directory where the UGO software package is located, run the following commands, decompress the **UGO.tar.gz** package, and go to the **UGO** folder:

```
tar -xf UGO.tar.gz
```

```
cd UGO
```

Step 5 Upload the UGO license, web certificate, and SSL certificate of the source database to any directory accessible to the current user.

Step 6 Configure parameters in the **install-default.conf** file as required:

```
vi install-default.conf
```

For details, see [Configuring Installation Parameters](#).

After the parameters have been configured, run the following command to exit the file:

```
:wq
```

Step 7 Install the UGO service.

Set valid passwords by referring to [How Do I Configuration Passwords During UGO Installation?](#) The password of **DB User** is required during the upgrade and rollback. To log in to the UGO console, the password of **IAM User** is required.

```
python3 install.py install --license <license_path> --web-cert <web_cert_path>  
--ssl-db-ca <db_ssl_cert_path>
```

For example:

```
python3 install.py install --license ~/LICUGO.xml --web-cert ~/  
UGOWebKeystore --ssl-db-ca ~/cert/ca.pem
```

Keep secure the password of **DB User**. Information similar to the following is displayed:

PreCheck => OS User		OK Current user verified successfully.
PreCheck => Java		OK Java - (Version: 1.8.0_181, Distribution: openjdk)
PreCheck => openssl		OK openssl verified successfully.
PreCheck => keytool		OK keytool verified successfully.
PreCheck => curl		OK curl verified successfully.
PreCheck => unzip		OK unzip verified successfully.
PreCheck => gzip		OK gzip verified successfully.
PreCheck => rsync		OK rsync verified successfully.
PreCheck => cut		OK cut verified successfully.
PreCheck => ip		OK ip verified successfully.
PreCheck => sed		OK sed verified successfully.
PreCheck => sha256sum		OK sha256sum verified successfully.
PreCheck => wc		OK wc verified successfully.
PreCheck => xargs		OK xargs verified successfully.
PreCheck => Cron job		OK Cron job verified successfully.
PreCheck => Locale		OK Verified Locale Successfully.
PreCheck => CPU Cores		OK No. of CPU Cores : 16
PreCheck => License		OK License is valid till 30-Sep-2022 23:59:59 CST.
Enter the password for Certificate :		
PreCheck => WebCert		OK Web Certificate is valid for 3615 day(s).
PreCheck => Disk		OK Available disk space : 13.83GB
PreCheck => Ports		OK Input ports verified successfully.
PreCheck => Memory		OK Available Memory : 26GB
Enter DB IP address: XX.XX.XX.XX		
Enter DB Name: <i>DB Name</i>		
Enter DB UserName: <i>DB UserName</i>		
Enter the password for DB User -> <i>DB User</i> :		
Enter the password for IAM User -> admin:		
Retype password:		
Test => DB connection		OK DB connection tested successfully.
Installation started.		
Cron => Python access check.		OK Cron access check for Python started...
Cron => Java access check.		OK Cron access check for Java started...
Create config catalina => logrotate		OK Config file created: /home/ugo/ugoserver/bin/script/catalina.conf
Configure => WebUI		OK Properties configured.
Configure => UGO_DbObjectCollection		OK Properties configured.
Configure => UGO_PreMigration		OK Properties configured.
Configure => UGO_Migration		OK Properties configured.
Configure => UGO_Verification		OK Properties configured.
Configure => UGO_IAMService		OK Properties configured.
Configure => UGO_AppMigration		OK Properties configured.
Start => Create DataBase		OK Database created successfully.
Grant Permission To => DB		WARN Failed to add permission for DB user.
Start => WebUI		OK Service started successfully.
Configure => IAM User Details		OK IAM User details Configured.
Start => UGO_IAMService		OK Service started successfully.
Cron => Verify Python access Check		OK Python access Check for Cron Verified.
Cron => Cleanup Python access check.		OK Cleanup done for Python access check Cron.
Cron => Verify Java access Check		OK Java access Check for Cron Verified.
Cron => Cleanup Java access check.		OK Cleanup done for Java access check Cron.
URL to access the Web:		
https://XX.XX.XX.XX:XXXX/ugo/		
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.		
Configured DB Object Collection Port: 9040		
Configured Pre Migration Port: 9010		
Configured Migration Port: 9000		
Configured Verification Port: 9005		
Configured IAM Port: 9001		
Configured Application Migration Port: 9006		
Please refer installer log for more Information.		
Installed in below mentioned Directory:		

path: /home/ugo/ugoserver		
Total Execution time 0:05:31.385675		
Installation completed.		

NOTE

- In the command output, **DB IP address** indicates the IP address of the remote database. For details about how to obtain the IP address, see [How to Create a Database User for UGO in the Installed MySQL Database?](#)
- You are advised to set **DB Name** to a new database name. If **DB Name** is set to an existing database name, ensure that it is managed by **DB UserName**.

----End

NOTE

If SSL is not enabled for a remote MySQL database connection, **--skip-ssl-db** is required during the installation. (Note that a remote database using a non-SSL connection has potential security risks.) For example:

```
python3 install.py install --license <license_path> --web-cert <web_cert_path> --skip-ssl-db
```

2.2.4 Configuring Installation Parameters

Table 2-8 Parameter configuration

Parameter	Description	Default Value
Common Configurations		
NOTE If a user-defined path is set, ensure that the ugo user has permissions for accessing its parent directory and creating a directory.		
common.install.path	Path for installing UGO.	~/ugoserver/
common.log.path	Path for storing UGO common logs.	~/ugoserver/logs/
common.error.level	Common log levels, including DEBUG , INFO , WARNING , and ERROR .	ERROR
common.upgrade.backup.path	Backup directory before UGO is upgraded. This parameter is commented out by default. If you want to back up data in another path or disk, use this parameter.	~/ugobackup/
Database parameter configurations		
NOTE <ul style="list-style-type: none">• If a remote database is used, enter remote database information, including the database name, IP address, username, and port number.• If a local database is used, enter the database name, username, port number, and path for storing database data as required. IP address is not required		
db.db_name	Name of the database for connecting to the UGO database. If this parameter is not specified, the value of DB User entered during UGO installation is used.	-

Parameter	Description	Default Value
db.ip_address	IP address for connecting to the UGO database. This parameter is required only when a remote database is used.	-
db.user_name	Username of the database for connecting to the UGO database. If this parameter is not specified, the value of DB UserName entered during UGO installation is used.	-
db.listen_port	Database listening port.	3306
db.data_dir	Directory for storing database data. This parameter is used only when a local database is used. Ensure that there are at least 64 GB of disk space in your selected directory. If a user-defined directory is configured, ensure that the non-ugo user has permissions for accessing its parent directory and creating a directory.	-
Microservice parameter configuration		
service.ip_address	IP address of the host OS. The installation program automatically reads the IP address. You are advised not to configure this parameter.	-
service.web_port	Web UI port.	8090
service.dbobjectcollection	Database object collector port.	9040
service.premigration	Pre-migration port.	9010
service.migration	Migration port.	9000
service.verification	Verification port.	9005
service.iam	IAM port (for standalone).	9001
service.appmigration	Application migration port.	9006
Product parameter configuration		
product.techsupport.name.en-us	English version of the UGO technical support interface. You are advised not to configure this parameter.	-
product.techsupport.name.zh-cn	Chinese version of the UGO technical support interface. You are not advised to configure this parameter.	-

 NOTE

- UGO is installed in the /home directory by default. You can change **common.install.path** to install UGO into a new directory, but you must have the permissions to access the new installation directory and its subdirectories. Run the following commands to change the access permissions:
chown -R ugo:ugo
chmod -R +755
- In the current version, **common.upgrade.backup.path**, **db.data_dir**, **service.ip_address**, **product.techsupport.name.en-us**, and **product.techsupport.name.zh-cn** are commented out by default.
- If a remote database is used, enter remote database information, including the IP address, port, username, and database name.
- If a local database is used, enter the database name, username, and database port as required. You do not need to configure **db.ip_address**. The database is installed during UGO installation, the IP address of the local host is used.

2.2.5 Logging In to the UGO WebUI

You can visit <https://XX.XX.XX.XX:<>YYYY>/ugo/#/login> to access the installation directory.

 NOTE

- *XX.XX.XX.XX* indicates the IP address of the server for installing UGO, and *YYYY* indicates the port number. The default port number is 8090. You can obtain the values from the URL generated after the UGO is installed. If *XX.XX.XX.XX* is a private IP address, you can use its associated EIP to log in to the UGO Web UI.
- Chrome 48 or later, Firefox 95 or later, or Microsoft Edge are recommended.
- The default username for logging to UGO is **admin** and the password is the same as that of IAM user set during the installation.
- After the installation is complete, wait 4 to 5 minutes to load Tomcat and then log in to the UGO.

2.3 Uninstalling UGO

Procedure (Local Database)

Step 1 Go to the **<ugoserver>/bin** directory as a non-root user. You are advised to set **<ugoserver>** to the **/home/ugo** directory.

cd <ugoserver>/bin

Step 2 Uninstall UGO.

python3 ugoserver.py uninstall

Information similar to the following is displayed:

```
Do you want to Un-Install (Yes/No)? y
Un-installation      |      START | Un-Installation process started.
DB                  |      OK    | Service stopped successfully.
WebUI              |      OK    | Service stopped successfully.
```

UGO_IAMService		OK Service stopped successfully.
Un-installation		STOP Uninstalled successfully.

----End

Procedure (Remote Database)

Step 1 Log in to the host where UGO is installed.

Step 2 Go to the `<ugoserver>/bin` directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Step 3 Uninstall UGO.

```
python3 ugoserver.py uninstall
```

Information similar to the following is displayed:

Do you want to Un-Install (Yes/No)? y	
Un-installation	START Un-Installation process started.
Enter the password for DB User -> ugouser:	
Test => DB connection	OK DB connection tested successfully.
DB	OK Service stopped successfully.
WebUI	OK Service stopped successfully.
UGO_IAMService	OK Service stopped successfully.
Delete Database	OK Database Deleted successfully.
Un-installation	STOP Uninstalled successfully.

----End



NOTE

Executing the uninstallation command will not delete the user created during the installation.

To delete the created user, run the following command as the **root** user:

```
userdel -r ugo
```

2.4 Upgrading UGO

You can upgrade UGO from an earlier version to a later version.

Constraints

- The UGO version can only be upgraded from 2.23.01.200 to 2.23.07.200. To query the UGO version, you need to go to the `<ugoserver>/bin` directory as the **ugo** user and run the following command:

```
python3 ugoserver.py version
```



NOTE

If the current version is not 2.23.01.200, upgrade it to 2.23.01.200.

- You are advised not to perform an upgrade or rollback during database evaluation and object migration. Otherwise, an exception will occur.
- If the upgrade fails, the version of UGO remains unchanged.
- The Kylin OS and UOS do not support the upgrade.

Prerequisites

You have obtained the new **ThirdPartySoftware.tar.gz** package by referring to [Preparing the Installation Environment](#).

Procedure

Step 1 Log in to the server where UGO is to be upgraded as the **root** user and upload required software packages to any directory of the **ugo** user.

Step 2 Change the owner and permissions of the directory:

chown -R ugo:ugo <Path of the software package to be upgraded>

chmod -R +700 <Path of the software package to be upgraded>

Step 3 Switch to the **ugo** user.

sudo su ugo -s /bin/bash

Step 4 Go to the directory where the UGO software package is located, run the following commands, decompress the **UGO.tar.gz** package, and go to the **UGO** folder:

tar -xf UGO.tar.gz

cd UGO

Step 5 Upgrade UGO.

python3 install.py upgrade

Information similar to the following is displayed. You need to enter the password of the **ugo** user, that is, the password you specified during installation.

PreCheck => OS User		OK Current user verified successfully.
PreCheck => Java		OK Java - (Version: 1.8.0_181, Distribution: openjdk)
PreCheck => openssl		OK openssl verified successfully.
PreCheck => keytool		OK keytool verified successfully.
PreCheck => curl		OK curl verified successfully.
PreCheck => unzip		OK unzip verified successfully.
PreCheck => gzip		OK gzip verified successfully.
PreCheck => rsync		OK rsync verified successfully.
PreCheck => cut		OK cut verified successfully.
PreCheck => ip		OK ip verified successfully.
PreCheck => sed		OK sed verified successfully.
PreCheck => sha256sum		OK sha256sum verified successfully.
PreCheck => wc		OK wc verified successfully.
PreCheck => xargs		OK xargs verified successfully.
PreCheck => Cron job		OK Cron job verified successfully.
PreCheck => Locale		OK Verified Locale Successfully.
PreCheck => CPU Cores		OK No. of CPU Cores : 16
PreCheck => License		OK License is valid till 30-Sep-2022 23:59:59 CST.
Upgrade		START Upgrade process started.
PreCheck => Memory		OK Available Memory : 15GB
Enter the password for DB User -> ugouser:		
Test => DB connection		OK DB connection tested successfully.
Upgrade Backup		OK Directory created.
Cron => Python access check.		OK Cron access check for Python started...
Cron => Java access check.		OK Cron access check for Java started...
Services		OK Services stopped.
Backup		OK Service backup started.
Backup		OK web directory backup finish.
Backup		OK bin directory backup finish.
Backup		OK services directory backup finish.
Backup		OK download directory backup finish.

Backup		OK .meta directory backup finish.
Backup		OK user directory backup finish.
Backup		OK auditlogsbackup directory backup finish.
Backup		OK db directory backup finish.
Backup		OK Services backup done.
Create config catalina => logrotate catalina.conf		OK Config file created: /home/DYS/ugoserver/bin/script/catalina.conf
Configure => UGO_AppMigration		OK Properties configured.
Configure => UGO_IAMService		OK Properties configured.
Start => DB		OK Service started successfully.
Test => DB connection		OK DB connection tested successfully.
Create config DB => logrotate mysql.conf		OK Config file created: /home/DYS/ugoserver/bin/script/mysql.conf
Start => WebUI		OK Service started successfully.
Start => UGO_IAMService		OK Service started successfully.
Cron => Verify Python access Check		OK Python access Check for Cron Verified.
Cron => Cleanup Python access check.		OK Cleanup done for Python access check Cron.
Cron => Verify Java access Check		OK Java access Check for Cron Verified.
Cron => Cleanup Java access check.		OK Cleanup done for Java access check Cron.
Upgrade		STOP Upgrade finished successfully.
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.		
Send => Audit Log		OK Audit log sent Successfully.

----End

NOTE

- Modified conversion configurations in a migration project become default configurations and need to be re-applied in the following configuration path after the upgrade:

<ugoserver>/web/webapps/migration/WEB-INF/classes/config/oracle

Go to the **ugoserver/bin** directory as the **ugo** user.

cd <ugoserver>/bin

Restart the UGO service.

python3 ugoserver.py restart

You can also modify the configurations on the UGO console. For details, see "**User Guide**" > "**Object Migration**" > **Editing Conversion Configurations**".

- After the upgrade, it takes 4 to 5 minutes to load Tomcat.
- If you have logged in to UGO of an earlier version using a browser, press **Ctrl+F5** to refresh the browser or restart the browser.

Rollback Operations

Step 1 Go to the **<ugoserver>/bin** directory as the **ugo** user.

cd <ugoserver>/bin

Step 2 Roll back the upgrade operation.

python3 ugoserver.py rollback

Information similar to the following is displayed:

Rollback		START Rollback process started.
Enter the password for DB User -> ugouser:		
Test => DB connection		OK DB connection tested successfully.
Restore		OK Service directories rolled back.
Services		OK Services started.
Rollback		STOP Rollback done successfully.

----End

 NOTE

If UGO fails to be started after the rollback, run the following command to manually start UGO:

```
python3 <ugoserver>/bin/ugoserver.py start
```

Run the following command to check the UGO status:

```
python3 <ugoserver>/bin/ugoserver.py status
```

2.5 FAQ

2.5.1 How Do I Check Whether the Memory Space Is Insufficient?

Run the following command to query the memory space. Check whether the available memory space is less than the required minimum memory space. For details, see [System Requirements](#).

```
free -h
```

2.5.2 How Do I View Available Disk Space?

Run the following command to view the disk space usage. If the available disk space is less than the required minimum space, check the resource plan.

```
df -PH <UGOserver installation path>
```

2.5.3 How Do I Install MySQL 8?

Step 1 Download the MySQL 8 software package from the MySQL Support website.

Step 2 Install MySQL as prompted.

 NOTE

- It is recommended that the MySQL 8 and UGO servers use the same system.
- The username can contain up to 32 characters, and cannot contain single quotation marks ('') and double quotation marks ("").

Step 3 Configure the value of the **sql_mode** attribute in the MySQL configuration file **my.cnf**.

```
sql-mode =
STRICT_ALL_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION
```

```
[mysqld]
socket=/var/lib/mysql/mysql.sock
tmpdir=/var/lib/mysql/tmp
datadir=/var/lib/mysql/data
default_authentication_plugin=mysql_native_password
port=3306
user=mysql
sql-mode=STRICT_ALL_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION
```

----End

2.5.4 How Do I Log In to MySQL 8?

Installing UGO in the Local Database

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Log in to the database.

```
cd <ugoserver>/db/server/bin/  
.mysql -u <db_user_name> -h 127.0.0.1 -P <db_port> -p  
Enter the database password.
```

Step 3 Run the following command after logging in to the database:

```
use <db_name>;
```



Run the following command to exit the MySQL client console:

```
quit;
```

----End

Installing UGO in the Remote Database

The MySQL client has been installed. To install the client, see [Installing a MySQL Client](#).

Step 1 Log in to the database.

```
mysql -u <db_user_name> -h <dest_ip_addr> -P <db_port> -p  
Enter the database password.
```

Step 2 Run the following command after logging in to the database:

```
use <db_name>;
```



Run the following command to exit the MySQL client console:

```
quit;
```

----End

Installing a MySQL Client

Step 1 Download and decompress the MySQL installation package.

Step 2 Extract required files to the **bin** folder.

Step 3 Run the following commands:

```
echo "export PATH=$PATH:<mysql_package>/bin/" >> ~/.bashrc  
source ~/.bashrc  
----End
```

2.5.5 Reliability Verification File

NOTE

Before installing the dependent package, ensure that the system has the following basic system software installed, such as GCC, make, cron, which, unzip, and numactl.

Step 1 Download the **UGO.tar.gz.sha256.txt** and **ThirdPartySoftware.tar.gz.sha256.txt** files to the local PC and view the verification codes.

Step 2 View the verification codes of **UGO.tar.gz** and **ThirdPartySoftware.tar.gz**.

sha256sum UGO.tar.gz

sha256sum ThirdPartySoftware.tar.gz

Step 3 If the verification code saved in the **ThirdPartySoftware.tar.gz.sha256.txt** file is the same as that in **ThirdPartySoftware.tar.gz**, the downloaded dependent package can be used directly. If they are not same, download the dependent package and verify it again.

If the verification code in the **UGO.tar.gz.sha256.txt** file is the same as that in **UGO.tar.gz**, the downloaded software package can be used directly. If they are not same, download the software package and verify it again.

----End

2.5.6 How Do I Configuration Passwords During UGO Installation?

Database Password

Password of the **ugo** user set during UGO installation.

The password must:

- Consist of 8 to 128 characters.
- Contain at least one uppercase character.
- Contain at least one lowercase character.
- Contain at least one digit.
- Contain at least one of the following special characters:~!@#\$%^&*()_-+=\|\[\{\};:<.>/?
- Cannot be the same as the database username or username spelled backwards.
- Pass the weak password dictionary check.

Login Password

Password of IAM user (**admin**) set during UGO installation

The password must:

- Consist of 8 to 128 characters.
- Contain at least one uppercase character.

- Contain at least one lowercase character.
- Contain at least one digit.
- Contain at least one of the following special characters:~!@#\$%^&*()_-+=\|\[{}];,<.>/?
- Pass the weak password dictionary check.

2.5.7 How Do I Update or Replace the Expired Web Certificate?

This section describes how to update or replace the expired certificate in the keystore file. Before performing the following operations, back up the old certificate to the **\$UGO_HOME** directory.

Step 1 Use the new certificate to generate a keystore file **UGOCoreWebKeystore**.

Step 2 Run the following command:

```
python3 ugoserver.py update-cert --cert-file=<UGO KeyStore File>
```

For example:

```
[ugouser@blrlabvms_171_29 ~]python3 ugoserver.py update-cert --cert-file ~/UGOWebKeystore
```

Service Name	Operation Details
Please enter password for Certificate:	
WebUI	Service stopped successfully.
WebUI	Certificate updated successfully.
WebUI	Service started successfully.

NOTE

In the preceding command, the **--cert-file** parameter is mandatory.

--cert-file indicates the path where the parameter is generated, for example, **package/package/UGO/software/cert/UGOWebKeystore**.

Step 3 Download and import the root certificate (client certificate) during UGO startup.

Step 4 Delete files, such as **.csr**, **.ext**, and **.pem** from the **cert** folder after the backup. This step is recommended.

----End

2.5.8 How Do I Switch to SM Series Cryptographic Algorithms?

Procedure

You can perform SM series cryptographic algorithms switchover for confidential data and Tomcat-based channels. Select one of the following methods based on the site requirements.

- For details about how to switch to SM series cryptographic algorithms, see [How Do I Switch to SM Series Cryptographic Algorithms?](#)

Ensure that the prerequisites have been met. After the switchover, you need to use a browser that supports SM series cryptographic algorithms to log in to UGO.

- For details about how to use SM series cryptographic algorithms to encrypt confidential data, see [How Do I Switch the Encryption Algorithm for Confidential Data?](#)
- For details about how to enable SM series cryptographic algorithms for Tomcat-based channels, see [How Do I Configure Communication Using SM Series Cryptographic Certificate for Tomcat?](#)

Ensure that the prerequisites have been met. After the switchover, you need to use a browser that supports SM series cryptographic algorithms to log in to UGO.

Prerequisites

- The version of the JDK package you have obtained is 1.8.0_302 or later.
- You have obtained the **bgmprovider-x.x.x-jar-with-dependencies.jar** package and copied it to the **\$JAVA_HOME/jre/lib/ext** directory.
- You have added the following statement to the **\$JAVA_HOME/jre/lib/security/java.security** file and adjusted the priority of other applications by one level down:

security.provider.1=org.openeuler.BGMPProvider

```
security.provider.1=org.openeuler.BGMPProvider
security.provider.2=sun.security.provider.Sun
security.provider.3=sun.security.rsa.SunRsaSign
security.provider.4=sun.security.ec.SunEC
security.provider.5=com.sun.net.ssl.internal.ssl.Provider
security.provider.6=com.sun.crypto.provider.SunJCE
security.provider.7=sun.security.jgss.SunProvider
security.provider.8=com.sun.security.sasl.Provider
security.provider.9=org.jcp.xml.dsig.internal.dom.XMLDSigRI
security.provider.10=sun.security.smartcardio.SunPCSC
```

- You have obtained the Web certificate that supports SM series cryptographic algorithms.

NOTE

Contact technical support engineers to obtain the JDK package, JAR package, and Web certificate that supports SM series cryptographic algorithms.

2.5.8.1 How Do I Switch to SM Series Cryptographic Algorithms?

NOTE

- The default value is **aes-256-gcm** for a reversible algorithm and **pbkdf2-sha256** for an irreversible algorithm.
 - A reversible algorithm is used with the text and can be encrypted or decrypted in its original form, for example, AES.
 - An irreversible algorithm is an algorithm that cannot be reversed back to its original, unencrypted form. Hash algorithm is irreversible, for example, pbkdf2.
- You can view the available algorithm of the current system in the **\${UGO_HOME}/install_summary.json** file.
- The value of **<algorithm_type>** in the command can be:
 - reverse-algo cryptographic algorithm: used to encrypt passwords. The value can be **aes-256-gcm** or **sm4-128-gcm**.
 - irreverse-algo hash algorithm: used to hash passwords. The value can be **pbkdf2-sha256** or **sm3**.

One-click SM series cryptographic algorithms switchover can be set only during installation.

Configuring SM Series Cryptographic Algorithms During Installation

Local database:

- If UGO is installed as the **root** user, run the following command:

```
python3 install.py install --install-repo-db --license <license_file> --web-cert <keystore-file-path for Chinese algorithm> --web-cert-type=GMTLS --web-cert-alias=<common separated alias> --os-user <username where ugo is going to be installed> --reverse-algo <algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --install-repo-db --license LICUGO.xml --web-cert server-sm2.keystore --web-cert-type=GMTLS --web-cert-alias=server-sm2-enc,server-sm2-sig --os-user ugo --reverse-algo sm4-128-gcm --irreverse-algo sm3
```

- If UGO is installed as a non-root user, run the following command:

```
python3 install.py install --install-repo-db --license <license_file> --web-cert <keystore-file-path for Chinese algorithm> --web-cert-type=GMTLS --web-cert-alias=<common separated alias> --reverse-algo <algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --install-repo-db --license LICUGO.xml --web-cert server-sm2.keystore --web-cert-type=GMTLS --web-cert-alias=server-sm2-enc,server-sm2-sig --reverse-algo sm4-128-gcm --irreverse-algo sm3
```

Remote database:

- If UGO is installed as the **root** user, run the following command:

```
python3 install.py install --license <license_file> --ssl-db-ca <db_ssl_cert_path> --web-cert <keystore-file-path for Chinese algorithm> --web-cert-type=GMTLS --web-cert-alias=<common separated alias> --os-
```

```
user <username where ugo is going to be installed> --reverse-algo
<algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --license LICUGO.xml --ssl-db-ca ~/cert/ca.pem
--web-cert server-sm2.keystore --web-cert-type=GMTLS --web-cert-
alias=server-sm2-enc,server-sm2-sig --os-user ugo --reverse-algo
sm4-128-gcm --irreverse-algo sm3
```

- If UGO is installed as a non-root user, run the following command:

```
python3 install.py install --license <license_file> --ssl-db-ca
<db_ssl_cert_path> --web-cert <keystore-file-path for Chinese algorithm>
--web-cert-type=GMTLS --web-cert-alias=<comma separated alias> --
reverse-algo <algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --license LICUGO.xml --ssl-db-ca ~/cert/ca.pem
--web-cert server-sm2.keystore --web-cert-type=GMTLS --web-cert-
alias=server-sm2-enc,server-sm2-sig --reverse-algo sm4-128-gcm --
irreverse-algo sm3
```

2.5.8.2 How Do I Switch the Encryption Algorithm for Confidential Data?

The SMS series cryptographic algorithm can be enabled for sensitive data during installation or upgrade.

Configuring SM Series Cryptographic Algorithms During Installation

During the installation, run the following command to set the encryption and hash algorithms for UGO:

Local database:

- Run the **install-repo-db** command as the **root** user.

```
python3 install.py install --install-repo-db --license <license_file> --web-
cert <keystore-file-path for Chinese algorithm> --os-user <username
where ugo is going to be installed> --reverse-algo <algorithm_type> --
irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --install-repo-db --license LICUGO.xml --web-
cert server-sm2.keystore --os-user ugo --reverse-algo sm4-128-gcm --
irreverse-algo sm3
```

- Run the **install-repo-db** command as a non-root user.

```
python3 install.py install --install-repo-db --license <license_file> --web-
cert <keystore-file-path for Chinese algorithm> --reverse-algo
<algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --install-repo-db --license LICUGO.xml --web-
cert server-sm2.keystore --reverse-algo sm4-128-gcm --irreverse-algo sm3
```

Remote database:

- Run the **remote-db** command as the **root** user.

```
python3 install.py install --license <license_file> --ssl-db-ca  
<db_ssl_cert_path> --web-cert <keystore-file-path for Chinese algorithm>  
--os-user <username where ugo is going to be installed> --reverse-algo  
<algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --license LICUGO.xml --ssl-db-ca ~/cert/ca.pem  
--web-cert server-sm2.keystore --os-user ugo --reverse-algo sm4-128-gcm  
--irreverse-algo sm3
```

- Run the **remote-db** command as a non-root user.

```
python3 install.py install --license <license_file> --ssl-db-ca  
<db_ssl_cert_path> --web-cert <keystore-file-path for Chinese algorithm>  
--reverse-algo <algorithm_type> --irreverse-algo <algorithm_type>
```

For example:

```
python3 install.py install --license LICUGO.xml --ssl-db-ca ~/cert/ca.pem  
--web-cert server-sm2.keystore --reverse-algo sm4-128-gcm --irreverse-  
algo sm3
```

Configuring SM Series Cryptographic Algorithms During the Upgrade

Step 1 During the upgrade, run the following command as a non-root user:

```
python3 install.py upgrade --reverse-algo <algorithm_type> --irreverse-algo  
<algorithm_type>
```

For example:

```
python3 install.py upgrade --reverse-algo sm4-128-gcm --irreverse-algo sm3
```

Step 2 Switch to the **<ugoserver>/bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Update the encryption algorithm.

```
python3 ugoserver.py updatekeys
```

```
python3 ugoserver.py update-wk
```

----End

2.5.8.3 How Do I Configure Communication Using SM Series Cryptographic Certificate for Tomcat?

With UGO Deployed

If UGO has been installed, run the following command as a non-root user to replace the Web certificate type. You can use a browser that supports SM series cryptographic algorithms to log in to UGO.

```
python3 ugoserver.py update-cert --cert-file=< keystore-file-path for Chinese  
algorithm> --web-cert-type=GMTLS --web-cert-alias=<comma separated  
alias>
```

For example:

```
python3 ugoserver.py update-cert --cert-file=/opt/chinese_web_cert/server-sm2.keystore --web-cert-type=GMTLS --web-cert-alias=server-sm2-enc,server-sm2-sig
```

For details, see [How Do I Update or Replace the Expired Web Certificate?](#)

Installing UGO with the SM Series Cryptographic Web Certificate

Run the following command as a non-root user to install UGO with the SM series cryptographic Web certificate. You can use a browser that supports SM series cryptographic algorithms to log in to UGO.

```
python3 install.py install --install-repo-db --license=<license file path> --web-cert=<keystore-file-path for Chinese algorithm> --web-cert-type=GMTLS --web-cert-alias=<common separated alias>
```

For example:

```
python3 install.py install --install-repo-db --license LICUGO.xml --web-cert server-sm2.keystore --web-cert-type=GMTLS --web-cert-alias=server-sm2-enc,server-sm2-sig
```

For details, see [Installing UGO](#).



NOTE

- You can run the following command as the **root** user to obtain the value of **<common separated alias>** from the SM series cryptographic web certificate:

```
keytool -list -keystore <UGOWebKeystore>
```

In the following command output, if multiple values of *common separated alias* are displayed, use a comma (,) to separate each value.

```
[root@host-192-168-0-195 1]# keytool -list -keystore server-sm2.keystore
Enter keystore password:
Keystore type: jks
Keystore provider: SUN

Your keystore contains 2 entries

server-sm2-enc, Jan 20, 2022, PrivateKeyEntry,
Certificate fingerprint (SHA-256): [REDACTED]
server-sm2-sig, Jan 20, 2022, PrivateKeyEntry,
Certificate fingerprint (SHA-256): [REDACTED]
```

- After the installation is complete, wait for 4 to 5 minutes and log in to UGO. If the login fails, clear the browser cache and try again.

2.5.9 What Should I Do to Connect the Target Database to PostgreSQL or GaussDB?

You need to add the IP address of the target database in the **pg_hba.conf** file for PostgresSQL or GaussDB. To connect to the target database, enter **password/trust/md5/host name** for verification.



This method applies only to Postgres or Gauss DB serving as the target database.

2.5.10 How to Create a Database User for UGO in the Installed MySQL Database?

Step 1 Create a database user.

```
create user '<username>'@'<host_ipaddress>' IDENTIFIED WITH  
mysql_native_password BY '<password>';
```

For example, # create user 'testuser'@'10.10.10.10' IDENTIFIED WITH
mysql_native_password BY 'testpassword';

Step 2 Authorize database user permissions.

- GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES,
INDEX, ALTER, SHOW DATABASES, CREATE TEMPORARY TABLES, LOCK
TABLES, EXECUTE, REPLICATION CLIENT, CREATE VIEW, SHOW VIEW,
CREATE ROUTINE, ALTER ROUTINE, EVENT, TRIGGER, CREATE
TABLESPACE, SHOW_ROUTINE, SYSTEM_VARIABLES_ADMIN ON ** TO
'<username>'@'<host_ipaddress>';

For example:

```
GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES,  
INDEX, ALTER, SHOW DATABASES, CREATE TEMPORARY TABLES, LOCK  
TABLES, EXECUTE, REPLICATION CLIENT, CREATE VIEW, SHOW VIEW,  
CREATE ROUTINE, ALTER ROUTINE, EVENT, TRIGGER, CREATE  
TABLESPACE, SHOW_ROUTINE, SYSTEM_VARIABLES_ADMIN ON ** TO  
'testuser'@'10.10.10.10';
```

- GRANT CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE,
REPLICATION CLIENT, CREATE VIEW, SHOW VIEW, CREATE
ROUTINE, ALTER ROUTINE, EVENT, TRIGGER, CREATE TABLESPACE,
SHOW_ROUTINE, SYSTEM_VARIABLES_ADMIN ON ** TO
'<username>'@'<host_ipaddress>' WITH GRANT OPTION;

For example:

```
GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES,  
INDEX, ALTER, SHOW DATABASES, CREATE TEMPORARY TABLES, LOCK  
TABLES, EXECUTE, REPLICATION CLIENT, CREATE VIEW, SHOW VIEW,  
CREATE ROUTINE, ALTER ROUTINE, EVENT, TRIGGER, CREATE  
TABLESPACE, SHOW_ROUTINE, SYSTEM_VARIABLES_ADMIN ON ** TO  
'testuser'@'10.10.10.10' WITH GRANT OPTION;
```

Step 3 Update the permissions.

```
FLUSH PRIVILEGES;
```

Step 4 Disable ONLY_FULL_GROUP_BY sqlmode.

```
SET GLOBAL sql_mode=(SELECT  
REPLACE(@@sql_mode,'ONLY_FULL_GROUP_BY',''));
```

Step 5 Enable log_bin_trust_function_creators.

```
SET GLOBAL log_bin_trust_function_creators = 1;
```

Step 6 Change the value of regexp_time_limit.

```
SET GLOBAL regexp_time_limit = 1024
```

Step 7 Configure remote database information in the **install-default.conf** file.

----End

2.5.11 What Can I Do If Error [Errno 13] Permission denied: 'pwd_tool.jar' Is Reported During Installation?

Scenario

The following information is displayed during UGO installation:

```
[ugo@ecs-ugo-centos76 UGO]$ python3 install.py install --install-repo-db --license <UGO extracted directory>/LICUGO.xml --web-cert <UGO extracted directory>/UGOWebKeystore  
ERROR:root:Error occurred while copying file. Reason:[Errno 13] Permission denied: 'pwd_tool.jar'  
[UGOIE-0047] Copy failed. Please refer to logs for more details.
```

Fault Analysis

The license file was uploaded to the server as the **root** user, but the command for installing the license was executed as a non-root user. As a result, an error message was displayed due to insufficient permissions.

Procedure

Run the following command as the **root** user and install the license:

chown -R {user}:{user} UGO



In the preceding command, replace **{user}:{user}** with the os-user created for installing UGO.

For example, the os-user created in the previous section is **ugo**, and the command is **chown -R ugo:ugo UGO**.

2.5.12 What Can I Do If Error Invalid Zip file found ugo.war. Please download correct package to continue Is Reported During Installation?

Description

The following information is displayed during UGO installation:

```
[ugo@ecs-ugo-centos76 UGO]$ Invalid Zip file found ugo.war. Please download correct package to continue
```

Procedure

1. Go to the **.bashrc** file as the **root** user.

```
cd /home/{user}
```

```
vi .bashrc
```

Comment out the following two parameters.

```
# export HISTFILE =/dev/null
```

```
# export HISTFILE =0
```

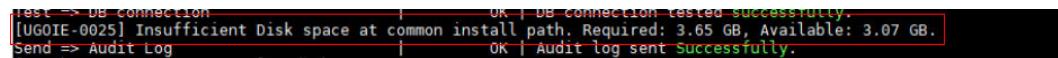
2. Comment out the following information in the **archive_utility.py** file from the **UGO/script/utils/** directory.

```
# cmd = "{src_cmd} unzip {war} -d {dest}".format(src_cmd=CONST_BASH_SOURCE_CMD,war=shlex.quote(war_path), dest=shlex.quote(target_path))
# return server_utils.execute_with_status(cmd, target_path,
shellflag=True)
```

2.5.13 What Can I Do If Error [UGOIE-0025] Insufficient Disk space at common install path Is Reported During the Upgrade?

Description

An error message "[UGOIE-0025] Insufficient Disk space at common install path" is displayed when the UGO service is being upgraded.



```
test => DB CONNECTION | OK | DB connection tested successfully.
[UGOIE-0025] Insufficient Disk space at common install path. Required: 3.65 GB, Available: 3.07 GB.
Send => Audit Log | OK | Audit log sent Successfully.
```

Fault Analysis

The disk space in the upgrade path is insufficient.

Procedure

Check whether the disk space required for the upgrade is twice the actual disk space required for the upgrade.

If so, skip the disk check.

Step 1 Go to the *<package>* directory as the **ugo** user.

```
cd <package>
```

Step 2 Decompress the **UGO.tar.gz** package.

```
tar -xf UGO.tar.gz
```

Step 3 Go to the UGO software package directory.

```
cd UGO
```

Step 4 Disable disk check during the upgrade.

```
python3 install.py upgrade --skip-disk-check
```

Step 5 Perform the upgrade.

```
python3 install.py upgrade
```

----End

2.5.14 What Can I Do If Error [UGOIE-0095] Unsupported locale installed Is Reported During Installation?

Description

The UGO service failed to be installed and an error message "[UGOIE-0095]Unsupported locale installed" is displayed.

```
newuser@dgghisprg00319:~/pkg/UGO> python3 install.py install --install-repo-db  
[UGOIE-0095] Unsupported locale installed
```

Fault Analysis

The installation area is incorrectly configured.

Configurations for the installation area should match those of the following figure.

```
newuser@dgghisprg00319:~/pkg/UGO> locale  
LANG=en_US.UTF-8  
LC_CTYPE="en_US.UTF-8"  
LC_NUMERIC="en_US.UTF-8"  
LC_TIME="en_US.UTF-8"  
LC_COLLATE="en_US.UTF-8"  
LC_MONETARY="en_US.UTF-8"  
LC_MESSAGES="en_US.UTF-8"  
LC_PAPER="en_US.UTF-8"  
LC_NAME="en_US.UTF-8"  
LC_ADDRESS="en_US.UTF-8"  
LC_TELEPHONE="en_US.UTF-8"  
LC_MEASUREMENT="en_US.UTF-8"  
LC_IDENTIFICATION="en_US.UTF-8"  
LC_ALL=en_US.UTF-8
```

Procedure

Step 1 Go to the *<package>/UGO* directory as the **ugo** user.

```
cd <package>/UGO
```

Step 2 Run the following commands to rectify the fault:

```
echo 'export LANG=en_US.UTF-8' >> ~/.bashrc  
echo 'export LC_ALL=en_US.UTF-8' >> ~/.bashrc  
source ~/.bashrc
```

Step 3 Verify that the installation area is correctly configured.

```
locale
```

----End

2.5.15 What Can I Do if Alarm Cron => Verify Java access Check or Cron => Verify Python access Check Is Generated?

Description

The alarm "Cron => Verify Java access Check" or "Cron => Verify Python access Check" is generated when the UGO service is being installed.

```
newuser@s2xphisprd01525:/run/newuser/newpkg/UGO> python3 install.py install -install-repo-db --license ~/LICUGO.xml --web-cert ~/UGOWebKeystore --skip-memory-check
PreCheck => OS
PreCheck => Locale
PreCheck => License
Enter the password for Certificate :
PreCheck => WebCert
Enter DB Name: ugodb
Enter DB Username: ugouser
Enter the password for DB User -> ugouser:
Retype password:
Enter the password for IAM User -> admin:
Retype password:
Installation started.
Cron => Python access check.
Cron => Java access check.
Configure &gt; logrotate
Configure &gt; DB
Configure => WebUI
Configure => UGO_DBOBJECTCollection
Configure => UGO_PreMigration
Configure => UGO_Migration
Configure => UGO_Verification
Configure => UGO_IAMService
Configure => UGO_AppMigration
Start => DB
Test => DB connection
Start => Create Database
Start => Web
Configure => IAM User Details
Start => UGO_IAMService
Cron => Verify Python access Check
Cron => Cleanup Python Cron check.
Cron => Verify Java access Check
Cron => Cleanup Java access check.
OK | Current OS : SUSE Linux Enterprise Server 12 SP5
OK | Verified Locale Successfully.
OK | License is valid till 13-Sep-2021 23:59:59 CST.
OK | Web Certificate is valid for 3369 day(s).
OK | Cron access check for Python started...
OK | Cron access check for Java started...
OK | Config file created: /run/newuser/ugoserver/bin/script/mysql.conf
OK | Properties configured.
OK | Service started successfully.
OK | DB connection tested successfully.
OK | Database created successfully.
OK | Service started successfully.
OK | IAM user details Configured.
OK | Service started successfully.
OK | Python access Check for Cron Verified.
OK | Cleanup done for Python access check Cron.
OK | Java access not present for Cron. Pls configure it manually else Auto service start operation won't work.
OK | Cleanup done for Java access check Cron.

URL to access the Web:
https://100.100.152.191:7090/ugo/
Configured DB Object Collection Port: 8040
Configured Pre Migration Port: 8010
```

Fault Analysis

This alarm is generated because Java or Python commands failed to be executed.

Procedure

Step 1 Export the Java or Python path to the `~/.profile` or `~/.bashrc` file.

Step 2 Add the following commands to the `~/.bashrc` file:

```
JAVA_HOME=<jdk path>
export PATH=$PATH:$JAVA_HOME/bin
CLASSPATH=$JAVA_HOME/lib jar:$JAVA_HOME/jre/lib
export CLASSPATH
```

Step 3 Configure the Python path. Add the following commands to the `~/.bashrc` file:

```
export PATH=/usr/local/bin:$PATH
export LD_LIBRARY_PATH=/usr/local/lib:/usr/local/lib64:$LD_LIBRARY_PATH
----End
```

Impact Range

Cron operations such as ugo-health monitoring and ugo-service-auto-start that are performed during UGO installation may not work properly.

2.5.16 How Do I Obtain detailed Information of UGO Operations?

Step 1 Go to the `<package>/UGO` directory as the `ugo` user.

```
cd <package>/UGO
```

Step 2 Learn about information of the required commands.

```
python3 install.py help
```

Information similar to the following is displayed:

```
UGO package installation help:  
Utility to support installation of UGO.  
This script should not be run with root permission.  
Usage:  
install.py install --license=<license file path> --web-cert=<web cert path> [--skip-memory-check] [--install-repo-db]  
[--whitelist-ip-list=<list of IPs COMMA separated>] [--skip-disk-check]  
[--root-cert-path=<root certificate folder>] [--audit-log-file=<audit log file location>]  
[--product=<product name>] [-shared-disk-path=<shared disk mount path>]  
[--ssl-db-ca=<db ssl cert path>] [--skip-ssl-db]  
[--web-cert-type=<web-cert-type>] [--web-cert-alias=<certificate alias>]  
install.py upgrade [--skip-disk-check] [--skip-memory-check] [--root-cert-path=<root certificate folder>]  
[--audit-log-file=<audit log file location>] [-license=<license file path>]  
[--web-cert=<web cert path>] [-os-user=<os_username>] [--delete-pkg]  
install.py license-check --ip=<ip_address> --license=<license file path>  
install.py [-version | -v]  
install.py [help | --help | -h]  
Commands:  
install Installs UGO in configured location.  
For cloud deployment, PAAS_APP_NAME environment variable must be set.  
upgrade Upgrades UGO.  
Refers the configuration file for backup path and new settings.  
license-check Prints the license status of given license file. It will take ip and license path as arguments.  
help Prints this help text.  
version | -v Prints version string.  
Options:  
--install-repo-db Installs Repo DB on local machine listening on localhost IP.  
Available with Standalone installation only.  
--skip-disk-check Skip the default disk pre check. This option to be used only during application debug.  
Recommended not to use this for production environment.  
--skip-memory-check Skip the default memory pre check. This option to be used only during application debug.  
Recommended not to use this for production environment.  
--ip The IP Address for license validation.  
--license Configures the License from the given license path. This is applicable only for standalone deployment.  
--web-cert Configures the Web Certificate from the given path. This is applicable only for standalone deployment.  
--web-cert-type Web Certificate type to support Chinese national algorithm [GMTLS].  
This is applicable only for standalone deployment  
--web-cert-alias Alias name for Web Certificate. This option to be used along with web-cert-type.  
This is applicable only for standalone deployment.  
--product Specify the product name for which UGO is being deployed. This is applicable only for standalone deployment. Currently supported value: bbit  
--whitelist-ip-list Only allows the list of mentioned ip's to access the tomcat server of webui.  
This option is mandatory for cloud deployment and optional for standalone.  
Maximum allowed list of ip address for this option is 20.  
IPs can also have a wildcard entry '*' (Ex:- 10.23.*.*)  
--audit-log-file Location of the audit log file to which all the Audit and Operation logs will be logged. Not applicable for standalone deployment.  
--ssl-db-ca DB Certificate path for establishing one way ssl connection. Only applicable for standalone with remote db case  
--skip-ssl-db Allows standalone installation without ssl for remote-db case. This option cannot be used with option install-repo-db case or for cloud deployment.  
--os-user The target os user where ugo is going to be installed. If the target os user doesn't exists
```

```
then a new user with the given username will be created, necessary environment variables  
will be set and ugo will be installed in that username. Only applicable when triggering  
install from root user in standalone deployment  
--delete-pkg Specifies whether the UGO Installation package should be deleted or not when installation  
is complete  
--shared-disk-path Location of the shared disk path. Not applicable for standalone deployment.  
--root-cert-path Configures certificate of webui from the given root-certificate and configures ssl from  
the other root certificate.  
Mandatory for Cloud deployment and Not Applicable for Standalone.  
root certificate should contain files ca.crt, ca.pem and a folder named agent which contains the  
files agent_server.crt, agent_server.key.  
root-cert-path  
|----ca.crt  
|----ca.pem  
|----agent  
|----agent_server.crt  
|----agent_server.key
```

Step 3 If UGO has been installed, go to the <ugoserver>/bin directory.

```
cd <ugoserver>/bin
```

Step 4 Obtain information of UGO operations.

```
python3 ugoserver.py help
```

Information similar to the following is displayed:

```
UGO package installation help:  
Utility to support Operation on UGO.  
This script should not be run with root permission.  
  
Usage:  
ugoserver.py start    [ [--service | -s <service-name> ] ]  
ugoserver.py stop     [ [--service | -s <service-name> ] ]  
ugoserver.py restart   [ [--service | -s <service-name> ] ]  
ugoserver.py status    [ [--service | -s <service-name> ] ]  
ugoserver.py service-version [ [--service | -s <service-name> ] ]  
ugoserver.py uninstall  [ --skip-db-delete-data ] [ --force | -f ]  
ugoserver.py      (version | --version | -v)  
ugoserver.py      [help | --help | -h]  
ugoserver.py rollback  
ugoserver.py irencrypt  
ugoserver.py upgrade-backup-cleanup  
ugoserver.py updatekeys [ --no-restart ]  
ugoserver.py update-pwd  
ugoserver.py update-cert ( --cert-file <keystore-file-path> | --root-cert-path <root-certificate-folder-path>  
                           [ --web-cert-type=<web-cert-type> ] [ --web-cert-alias=<certificate alias> ] )  
ugoserver.py update-db-cert --ssl-db-ca <db ssl cert path>  
ugoserver.py weakdictionary ( --add <dictionary-file> | --delete | --export <export-file> )  
ugoserver.py monitor  
ugoserver.py license-status  
ugoserver.py update-license --license=<new license file path>  
  
Commands:  
start      Start all the backend services or given service.  
stop       Stop all the backend services or given service.  
restart    Restart all the backend services or given service.  
status     Print the running status of bare minimum backend services or given service.  
service-version  Print the service version and build details.  
uninstall  Uninstalls UGO.  
help      Prints this help text.  
version    Prints version string.  
irencrypt  Encrypts the input password using irreversible encryption and displays it.  
rollback   Rollback the installation to previous backup copy (if any).  
upgrade-backup-cleanup Cleans the upgrade backup (if any). After this software rollback cannot be  
performed.  
updatekeys  Update the keys used by the system.  
update-wk   Update the working keys used by the system.
```

update-pwd	Changes the password of UGO Installation.
update-cert	Changes the Webui certificate.
update-db-cert	Changes the DB SSL certificate.
weakdictionary	Add/Delete/Export data from weak password dictionary table.
monitor resource	Monitors system resources and UGO services status and raises alarm when the max threshold is reached or service status is down. Only applicable for standalone, Operation will fail for cloud case.
license-status	Display the status of current license which is being used.
update-license	Updates the current license to the new license which is provided
 Services:	
Webui	
Db	
IAM	For Standalone deployment only.
UGO_DbObjectCollection	
UGO_PreMigration	
UGO_Migration	
UGO_Verification	
UGO_AppMigration	
 Options:	
--force -f	Forcefully uninstall the applicable service.
--service -s	Selective service. User can pass multiple services as a comma separated list.
--skip-db-delete-data	For skipping the database deletion during uninstall. It is ignored if Repo DB has been installed.
--cert-file	Path of the Keystore file. Available with Standalone installation only.
--root-cert-path	Path of the Root certificate folder. Available with Cloud installation only.
--web-cert-type	Web Certificate type to support chinese national algorithm [GMTLS]. This is applicable only for standalone deployment
--web-cert-alias	Alias name for Web Certificate. This option to be used along with web-cert-type. This is applicable only for standalone deployment.
--ssl-db-ca	Path of the new ssl db certificate.
--no-restart	Does not restart the services.
--add	Add weak password from given file to weak password dictionary table.
--delete	Delete a given password from weak password dictionary table.
--export	Export list of weak password from password dictionary table to given file.
--license	Upgrades the License from the given license path. This is applicable only for
standalone	deployment.

----End

2.5.17 How Do I Grant crontab Permissions for Users?

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Run the following command to allow target users to access crontab:

```
echo "ugo" >> /etc/cron.allow
```

----End

2.5.18 How Do I Manually Configure Log-Rotate?

Step 1 Check whether you have the required crontab permission.

crontab -l

- If "no crontab for" or "list of configured cron commands" is displayed in the command output, you have the crontab permission.
- If you have no crontab permission, perform the operations described in this section.

Step 2 Go to the `<ugoserver>/bin/script/` directory. Replace `<ugoserver>` with the actual ugo path. The default ugo path is `~/ugoserver/`.

```
cd <ugoserver>/bin/script/
```

Step 3 Create and edit the `mysql.conf` file in the directory.

```
touch mysql.conf
```

```
vi mysql.conf
```

Step 4 Add the following content to the `mysql.conf` file.

```
<ugolog-path>/db/repodb.err
{
    copytruncate
    size 10M
    rotate 5
    missingok
    nocompress
    notifempty
    postrotate
        ps ux | grep <ugoserver-path>/db/server/bin/mysqld |grep -v <ugoserver-
        path>/db/server/bin/mysql_safe |grep -v grep | tr -s ' ' | cut -d ' ' -f 2 | xargs
        kill -SIGUSR1
    endscript
}
```

Step 5 Save the change to the `mysql.conf` file and exit.

```
:wq
```

Step 6 Go to the `cronjob` file.

```
vi cronjob
```

Step 7 Add the following content to the `cronjob` file:

```
echo "00 1 * * * /usr/sbin/logrotate <ugoserver>/bin/script/mysql.conf > /dev/
null 2>&1" > <ugoserver>/bin/script/cronjob
```

Step 8 Save the change to the file and exit.

```
:wq
```

Step 9 Configure **Log-rotate**.

```
crontab <ugoserver>/bin/script/cronjob
```

```
----End
```

2.5.19 How Do I Restore UGO When the updatekeys Operation Fails?

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Check whether the **./meta/ugo_bkp** directory is available.

```
ls <ugoserver>/meta/ugo_bkp
```

If yes, go to the next step. If no, no further action is required.

Step 3 Delete the following directories:

```
rm -r <ugoserver>/meta/ugo_new
```

```
rm -r <ugoserver>/meta/ugo
```

Step 4 Rename the **./meta/ugo_bkp** directory to **./meta/ugo**.

```
mv <ugoserver>/meta/ugo_bkp <ugoserver>/meta/ugo
```

Step 5 Restart the UGO service.

```
python3 ugoserver.py restart
```

----End

2.5.20 What Should I Do If python3 Fails to be Executed or UGO Installation Fails After python3 and Required Python Modules Are Installed?

Check whether the installation path of the **python3** command is the same as that of other Python modules.

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Run the following command to find the installation path of **python3**:

```
# python3
```

```
Python 3.9.10 (main, Oct 11 2022, 11:40:05)
[GCC 7.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import sys
>>> print(sys.executable)
/usr/local/bin/python3
```

If the command output is not **/usr/local/bin/python3**, perform either of the following operations:

1. Exit the current shell session, log in again, and verify the installation path of **python3**.
2. Use the **/usr/local/bin/python3** path to execute the Python command.

----End

2.5.21 How Do I Update the Working Key as the ugo User and Restore UGO When the update-wk Process Fails?

Step 1 Go to the `<ugoserver>` directory as the **ugo** user.

```
cd <ugoserver>
```

Step 2 Update the working key.

```
python3 ugoserver.py update-wk
```

Information similar to the following is displayed:

```
Enter the password for DB User -> ugouser:  
Test => DB connection | OK | DB connection tested successfully.
```

```
-----  
Service Name | Operation Details
```

```
Update => WEAK_DICT WK | WK updated successfully.
```

```
Update => USER WK | WK updated successfully.
```

```
Update => TOMCAT WK | WK updated successfully.
```

```
Update => DB WK | WK updated successfully.
```

```
PreCheck => openssl | OK | openssl verified successfully.
```

```
DB | Service stopped successfully.
```

```
WebUI | Service is not running.
```

```
UGO_IAMService | Service is not running.
```

```
PreCheck => openssl | OK | openssl verified successfully.
```

```
DB | Service started successfully.
```

```
WebUI | Service started successfully.
```

```
UGO_IAMService | Service started successfully.
```

```
-----  
Send => Audit Log | OK | Audit log sent Successfully.
```

-----End

How Do I Restore UGO When the update-wk Process Fails?

Step 1 Go to the `<ugoserver>/bin` directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Step 2 Run the following command to update update-wk:

```
python3 ugoserver.py update-wk
```

For example:

```
Enter the password for DB User -> ugouser:  
Test => DB connection | OK | DB connection tested successfully.
```

```
-----  
Service Name | Operation Details
```

```
Update => WEAK_DICT WK | WK updated successfully.
```

```
Update => USER WK | WK updated successfully.
```

```
Update => TOMCAT WK | WK updated successfully.
```

```
Update => DB WK | WK updated successfully.
```

```
PreCheck => openssl | OK | openssl verified successfully.
```

```
DB | Service stopped successfully.
```

```
WebUI | Service is not running.
```

```
UGO_IAMService | Service is not running.
```

```
PreCheck => openssl | OK | openssl verified successfully.
```

```
DB | Service started successfully.
```

```
WebUI | Service started successfully.
```

```
UGO_IAMService | Service started successfully.
```

```
-----  
Send => Audit Log | OK | Audit log sent Successfully.
```

----End



If the update-wk process fails or is stopped, the UGO service cannot work properly until the update-wk process is triggered again and successfully completed.

2.5.22 How Do I Update the Key Component?

Step 1 Go to the `<ugoserver>/bin` directory as the `ugo` user.

```
cd <ugoserver>/bin
```

Step 2 Update key components:

```
python3 ugoserver.py updatekeys
```

Information similar to the following is displayed:

UpdateKeys		START Keys update started.
Db Keys		OK Keys update finished.
Tomcat Keys		OK Keys update finished.
User Keys		OK Keys update finished.
Weak Dict Keys		OK Keys update finished.
UpdateKeys		STOP Keys update finished.

Service Name		Operation Details
DB		Service stopped successfully.
WebUI		Service stopped successfully.
UGO_IAMService		Service stopped successfully.
DB		Service started successfully.
WebUI		Service started successfully.
UGO_IAMService		Service started successfully.

```
Send => Audit Log | OK | Audit log sent Successfully.
```

----End

2.5.23 What Requirements Are Required for a Username in the remote-db-case Scenario?

- Contain a maximum of 32 characters.
- Cannot include single or double quotation marks.

2.5.24 How Do I Restore UGO When the Key Fails to Be Updated?

Step 1 Go to the directory of the UGO server as the `ugo` user and check whether the `<ugoserver>/.meta/ugo_bkp` directory exists:

```
cd <ugoserver>/.meta/ugo_bkp
```

If yes, go to the next step. If no, no further action is required.

Step 2 Delete the following directories:

```
<ugoserver>/meta/ugo_new  
<ugoserver>/meta/ugo
```

Step 3 Rename the `./meta/ugo_bkp` directory to `./meta/ugo`.

```
<ugoserver>/meta/ugo_bkp ---> <ugoserver>/meta/ugo
```

Step 4 Restart the UGO service.

```
python3 ugoserver.py restart
```

----End

2.5.25 What Do I Do If the UGO Service fails to Listen on Ports?

Run the `python3 ugoserver.py status` command, message "Service not listening on port" is displayed in the command output.

Service Name	Status
DB	UP
WebUI	UP
WebUI	Service not listening on port : 8090
UGO_DbObjectCollection	Service not listening on port : 9040
UGO_PreMigration	Service not listening on port : 9010
UGO_Migration	Service not listening on port : 9000
UGO_Verification	Service not listening on port : 9005
UGO_IAMService	UP

Run the following command to rectify the fault:

```
python3 ugoserver.py restart
```

2.5.26 What Do I Do If the License Status Is Unknown?

Service Name	Operation Details
WebUI	Service is not running.
WebUI	Service start failed. License status : Unknown.

Step 1 Go to the `<ugoserver>/bin` directory as the `ugo` user.

```
cd <ugoserver>/bin
```

Step 2 Check the license status.

```
python3 ugoserver.py status -s webui
```

- If the status is **UP**, the UGO service is normal.
- If the status is **DOWN**, check the following logs:
 - License status log: `ugoserver/logs/web/WebUI.log`

- Error logs generated during WebUI startup: **ugoserver/bin/logs/operation.log**

----End

2.5.27 How Do I Check the UGO License Status?

Step 1 Go to the **<ugoserver>/bin** directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Step 2 View the UGO license status.

```
python3 ugoserver.py license-status
```

Information similar to the following is displayed:

License	Status
Status	Valid
Message	License is valid
Validity	Fri Jul 9 00:00:00 2021

----End

2.5.28 How Do I Renew the UGO License that Has Expired?

Scenario

When UGO is restarted, a message indicating that the license has expired is displayed or the following log is generated in **<ugoserver>/logs/web/WebUI.log**.

```
[ERROR][WebUI][]][LICENSE**ERROR Current License is expired please update your license.]  
[com.huawei.gauss.dsc.webui.license.util.AdaptiveLicenseUtils.checkLicenseValidity  
(AdaptiveLicenseUtils.java:57): main]
```

Fault Analysis

The UGO license certificate has expired.

Procedure

Step 1 Apply for a new license by following the instructions provided in [Applying for a License Certificate](#)

Step 2 If the license file is saved in the **package** directory, go to the directory as the **ugo** user.

```
cd <package>
```

Step 3 Update the license file.

```
python3 ugoserver.py update-license --license <new_license_path>
```

For details about how to apply a license, see [Applying for a License Certificate](#).

----End

2.5.29 How Do I Check the License Status in a Specific License File Before Installing UGO?

If the UGO license has expired, perform the following steps to renew the license. For details about how to check the license status, see [How Do I Check the UGO License Status?](#)

Step 1 Go to the **UGO** directory under `/home/ugo/package` as the **ugo** user.

```
cd <package>/UGO
```

Step 2 Check the license status in a specified license file.

```
python3 install.py license-check --ip <ip_Addr> --license <license_path>
```

Information similar to the following is displayed:

License	Status
Status	Valid
Message	License is valid
Validity	Fri Jul 9 00:00:00 2021

----End

2.5.30 How Do I Update the UGO License?

Step 1 Go to the `<ugoserver>/bin` directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Step 2 Update the license file.

```
python3 ugoserver.py update-license --license <new_license_path>
```

Information similar to the following is displayed:

PreCheck => License	OK License is valid till Fri Jul 9 00:00:00 2021.
Update => License	OK License updated successfully.
Service Name	Operation Details
WebUI	Service already running.
UGO_IAMService	Service already running.

----End

2.5.31 How Do I Modify the UGO Operation Memory Parameter After the Server Specifications Are Changed?

Step 1 Go to the `$UGO_HOME/web/bin` directory as the **ugo** user.

```
cd $UGO_HOME/web/bin
```

Step 2 Set the following parameters based on resource specifications of the UGO server:

```
vim setenv.sh
```

```
-XmsXXXXm -Xmx YYYYm
```

In the preceding command, **-Xms** and **-Xmx** indicate the minimum and maximum heap size for operating a Java VM, respectively.

Step 3 Restart the UGO service.

```
python3 ugoserver.py restart
```

----End

2.5.32 Where Are the Log Files Generated by the UGO Service Stored?

The UGO logs are stored in the following directories:

- Installation logs:
 - If the UGO service is installed as the **root** user, the logs are generated in **/home/< user >/ugo_pkg_Specific_time_logs**.
 - If the UGO service is installed as a non-root user, the logs are generated in **<UGO_Installation_Package>/install.log**.
- Upgrade logs: **<UGO_Upgrade_Package>/upgrade.log**
- Operation logs: **<ugoserver>/bin/logs/operation.log**
Run the following commands on **ugoserver.py** to generate operation logs:
start/stop/status/restart/irencrypt/update-pwd/update-wk/update-cert/weakdictionary/license-status/update-license
- Key update logs: **<ugoserver>/bin/logs/updatekeys.log**
- Monitoring logs: **<ugoserver>/bin/logs/monitor.log**
- Service logs: **<ugoserver>/logs**
The following services are included: DB/WEBUI/IAMService/DBObjectCollection/Database Evaluation/Conversion/Verification
- Uninstallation logs: **<user_home_directory>/uninstall.log**
- Rollback logs: **<user_home_directory>/rollback.log**

Following are the operations which generate corresponding logs :-

Commands	Operated on	Corresponding log
install, license-check	install.py	Installation log
upgrade	install.py	Upgrade log
start, stop, restart,status,service-version, irencrypt,update-pwd, update-cert, update-db-cert, weakdictionary, license-status, update-license	ugoserver.py	Operation log
updatekeys	ugoserver.py	Updatekeys log
monitor	ugoserver.py	Monitor log
uninstall	ugoserver.py	Uninstallation log
rollback	ugoserver.py	Rollback log

All the logs generated by ugo services will be stored in Service logs folder.

2.5.33 How Do I Update the SSL Certificate Used by a Remote Database?

Step 1 Go to the `<ugoserver>/bin` directory as the `ugo` user.

```
cd <ugoserver>/bin
```

Step 2 Update the SSL certificate.

```
python3 ugoserver.py update-db-cert --ssl-db-ca <new ssl db certificate path>
```

Information similar to the following is displayed:

```
ugouser@sxzphisprd01525:/dev/shm/ugouser/ugoserver/bin> python3 ugoserver.py update-db-cert --ssl-db-ca ~cert/ca.pem
Enter the password for DB User -> ugouser:
Test => DB connection | OK | DB connection tested successfully.
Update => DB Cert | OK | DB Certificate Updated.

-----  
Service Name | Operation Details  
-----  
WebUI | Service stopped successfully.  
UGO_IAMService | Service stopped successfully.  
WebUI | Service started successfully.  
UGO_IAMService | Service started successfully.  
-----  
Send => Audit Log | WARN | Failed to send Audit log, retrying .....  
Send => Audit Log | OK | Audit log sent Successfully.
```

----End

2.5.34 How Do I configure UGO for Best Performance After Expanding the memory?

If the memory of the server where UGO is installed has been expanded, perform the following operations for UGO to achieve better performance:

Step 1 Log in to the server where UGO is installed as a non-root user.

Step 2 Switch to the `<ugoserver>/web/bin/` directory.

```
cd <ugoserver>/web/bin/
```

Step 3 Open and edit the `setenv.sh` file and set the `-Xmx` parameter based on the JVM memory update rules.

```
#!/bin/bash
umask 0077
export LOGGING_HOME=/home/ugouser/ugoserver/logs/services
export UGO_HOME=/home/ugouser/ugoserver
export UGO_DB_DRIVER_LIB=/home/ugouser/ugoserver/web/shared/UGO_DBDriver.Lib
export JAVA_OPTS="-$JAVA_OPTS -Xms3072m -Xmx2048m -XX:+PrintGCDetails -XX:+PrintGCApplicationStoppedTime -XX:+PrintGCApplicationConcurrentTime -XX:+PrintGCDateStamps -XX:+LogGCTimeStamp -XX:+UseCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=$LOGGING_HOME/"
export CATALINA_OUT=/home/ugouser/ugoserver/logs/web/catalina.out
export CATALINA_PID=/home/ugouser/ugoserver/web/HwEolrl0d.tcatpid
~
```

vi setenv.sh

In the image, `-Xmx` indicates the maximum heap size of a Java VM. **20480m** indicates that the UGO server can occupy a maximum of 20 MB memory.

Step 4 Restart the UGO service.

```
python3 ugoserver.py restart
```

----End

Rules for Updating JVM Memory

- For servers with 62 GB RAM or larger: maxJVMMemory or Xmx
- For servers with 32 GB RAM: maxJVMMemory or Xmx
- For servers with 16 GB RAM: maxJVMMemory or Xmx
- For servers with the memory size larger than 16 GB RAM: maxJVMMemory or Xmx

2.5.35 Why Cannot I Log In to UGO?

Scenario

After UGO has been installed, there are three files in the `<ugoserver>/ugoserver/logs/web/` directory and the UGO service can be started.

However, the UGO home page fails to be accessed.

Fault Analysis

The firewall was enabled.

Procedure

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Disable the firewall.

systemctl stop firewalld

Step 3 Log in to UGO using a browser.

----End

2.6 Appendix

2.6.1 Command Reference

The following table lists descriptions, functions, and related parameters of common commands.

Table 2-9 Commands

Comm and	Function	Example	Parameter Description
install	Installs the UGO in a specified path.	<pre>python3 install.py install --license --license=<license file path> --web-cert=<web cert path> [--skip-memory-check] [--install-repo-db] [--whitelist-ip-list=<list of IPs COMMA separated>] [--skip-disk-check] [--root-cert-path=<root certificate folder>] [--audit-log-file=<audit log file location>] [--product=<product name>] [--shared-disk-path=<shared disk mount path>] [--ssl-db-ca=<db ssl cert path>] [--skip-ssl-db] [--reverse-algo=<algorithm_type>] [--irreverse-algo=<algorithm_type>]</pre>	<p>--license: specifies the license in a given license file path.</p> <p>--web-cert: specifies the web certificate configured in a specified path.</p> <p>--skip-disk-check: skips the default disk precheck. This parameter is used only during application debugging.</p> <p>You are advised not to use it in production environments.</p> <p>--skip-memory-check: skips the default memory precheck. This parameter is used only during application debugging.</p> <p>You are advised not to use it in production environments.</p> <p>--install-repo-db: Installs the Repo database on a local PC for listening on the IP address in the configuration.</p> <p>--whitelist-ip-list: Specifies the the IP addresses to access the Tomcat Web server. This parameter is mandatory for online deployments and is optional for offline deployments. The IP address list contains a maximum of 20 IP addresses. The IP address can contain the wildcards (*), for example, 10.23.*.*.</p>

Comm and	Function	Example	Parameter Description
			<p>--ssl-db-ca: establishes a path for connecting to the database certificate in unidirectional SSL authentication mode. It is suitable for remote database connection.</p> <p>--skip-ssl-db: allows independent installation of remote databases without SSL. This parameter cannot be used with install-repo-db case.</p> <p>--product: specifies the product name.</p> <p>--reverse-algo: specifies the cryptographic algorithm that encrypts various passwords.</p> <p>The value can be - aes-256-gcm or sm4-128-gcm.</p> <p>--irreverse-algo: specifies the hash algorithm for passwords.</p> <p>The value can be - pbkdf2-sha256 or sm3.</p>

Comm and	Function	Example	Parameter Description
ugoserver	Executes UGO operations.	python3 install.py upgrade [--skip-disk-check] [--skip-memory-check] [--root-cert-path=<root certificate folder>] [--audit-log-file=<audit log file location>] [--license=<license file path>] [-web-cert=<web cert path>]	<p>--skip-disk-check: skips the default disk precheck. This parameter is used only during application debugging. You are advised not to use it in the production environment.</p> <p>--skip-memory-check: skips the default memory precheck. This parameter is used only during application debugging.</p> <p>--root-cert-path: specifies the root certificate file path. This parameter is applicable only for cloud-based installation.</p> <p>--audit-log-file: specifies the audit file path.</p> <p>--license: upgrades the license from a specified license path. This parameter is applicable only for standalone deployment.</p> <p>--web-cert: specifies the web certificate configured in a specified path.</p>

Comm and	Function	Example	Parameter Description
upgrade	Upgrades UGO.	<code>python3 install.py upgrade [--skip-disk-check] [--skip-memory-check] [--license=<license file path>] [--web-cert=<web cert path>] [--reverse-algo=<algorithm_type>] [--irreverse-algo=<algorithm_type>]</code>	<p>--install-repo-db: Installs the Repo database on a local PC for listening on the IP address in the configuration.</p> <p>--skip-disk-check: skips the default disk precheck. This parameter is used only during application debugging.</p> <p>You are advised not to use it in production environments.</p> <p>--skip-memory-check: skips the default memory precheck. This parameter is used only during application debugging.</p> <p>You are advised not to use it in production environments.</p> <p>--license: Installs the license.</p> <p>--web-cert: specifies the web certificate configured in a specified path.</p> <p>--reverse-algo: specifies the cryptographic algorithm that encrypts various passwords.</p> <p>The value can be -aes-256-gcm or sm4-128-gcm.</p> <p>--irreverse-algo: specifies the hash algorithm for passwords.</p> <p>The value can be -pbkdf2-sha256 or sm3.</p>

Comm and	Function	Example	Parameter Description
version	Prints the version number.	python3 install.py version -v	--version -v: prints the version number.
help	Prints the help text.	python3 install.py help -h	--help -h: prints the help text.
license-check	Displays the license status in a specified license file. The command contains the IP address and path for storing the license.	python3 install.py license-check [-- ip=<ip_address>] [-- license=<license file path>]	--ip: specifies the IP address for verifying the license. --license: specifies the license configured in a specified license file path (for standalone deployment only).

2.6.2 Manually Installing Dependency Software

Run the following commands as the **root** user to compile and install Python and the database connected to Python modules.

Step 1 Compile and install zlib.

```
tar -xf zlib-1.2.12.tar.gz
cd zlib-1.2.12
./configure --prefix=/usr/local
make
make install
```



After the **make** command is executed, ensure that there is no any failure message in the command output.

Step 2 Return to a random directory.

```
cd ..
```

Step 3 Compile and install libffi.

```
tar -xf libffi-3.3.tar.gz
cd libffi-3.3
./configure --prefix=/usr/local
make
make install
```

 NOTE

After the **make** command is executed, ensure that there is no any failure message in the command output.

Step 4 Return to a random directory.

cd ..

Step 5 Compile and install libaio.

tar -xf libaio-0.3.112.tar.gz

cd libaio-0.3.112

make prefix=/usr/local install

 NOTE

After the **make** command is executed, ensure that there is no any failure message in the command output.

Step 6 Return to a random directory.

cd ..

Step 7 Compile and install OpenSSL.

tar -xf openssl-1.1.3m.tar.gz

cd openssl-1.1.3m

./config --prefix=/usr/local

make

make install

 NOTE

After the **make** command is executed, ensure that there is no any failure message in the command output.

Step 8 Return to a random directory.

cd ..

Step 9 Compile and install Python.

tar -xf Python-3.9.10.tar.xz

cd Python-3.9.10

LDFLAGS="-L/lib -L/lib64 -L/usr/local/lib -L/usr/local/lib64" ./configure --with-openssl=/usr/local --prefix=/usr/local

make

make install

 NOTE

- Executing the **make** command will display all modules that fail to be compiled. Ensure that no error is reported from the ssl and zip modules.
 - If a fault occurs in **Step 9**, run the following commands to install Python:
LDFLAGS="-L/lib -L/usr/local/lib -L/usr/local/lib64" ./configure --with-openssl=/usr/local --prefix=/usr/local
make
make install
- End

Installing Python Modules

Run the following commands as the **root** user:

```
cd python_modules
pip3 install six-1.15.0-py2.py3-none-any.whl
pip3 install protobuf-3.14.0-py2.py3-none-any.whl
pip3 install PyMySQL-1.0.2-py3-none-any.whl
pip3 install pycparser-2.21-py2.py3-none-any.whl
pip3 install x86_64/cffi-1.15.1-cp39-cp39-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl
pip3 install x86_64/cryptography-37.0.4-cp36-abi3-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl
pip3 install defusedxml-0.6.0-py2.py3-none-any.whl
pip3 install XlsxWriter-3.0.2-py3-none-any.whl
```

 NOTE

The general **whl** installation package is not available for the cffi and cryptography modules. In this case, an installation package suitable for the platform and system is required. If the required installation package is unclear, try to install all packages for cffi and cryptography one by one until the installation is successful. The installation package that does not meet the requirements will not be installed.

Configuring Permissions for lib

Run the following command as the **root** user to grant a non-root user the permission to access Python libraries:

```
chmod +755 -R /usr/local/
```

Configuring the Installation Path for the root User

Run the following commands as the **root** user:

```
echo 'export PATH=/usr/local/bin:$PATH' >> ~/.bashrc
echo 'export LD_LIBRARY_PATH=/usr/local/lib:/usr/local/
lib64:$LD_LIBRARY_PATH' >> ~/.bashrc
```

Configuring the Python Path for a UGO User

Step 1 Log in as a UGO user.

Step 2 Open the `~/.bashrc` file.

Step 3 Go to the end of the file.

Step 4 Update the values of `PATH` and `LD_LIBRARY_PATH`.

If all software mentioned in [Software Requirements](#) is installed in the `/usr/local` directory. Add the following commands to the `~/.bashrc` file:

```
export LANG=en_US.UTF-8
```

```
export LC_ALL=en_US.UTF-8
```

Step 5 Run the `source ~/.bashrc` command for the configuration to take effect.

Step 6 Perform the following steps to configure parameters for the installation area:

1. Configure the installation area.

```
echo 'export LANG=en_US.UTF-8' >> ~/.bashrc echo 'export  
LC_ALL=en_US.UTF-8' >> ~/.bashrc source ~/.bashrc
```

2. Verify that the installation area is correctly configured.
`locale`

Step 7 Check whether the Python version is 3.8 or later.

```
python3 --version
```

Step 8 Test Python modules. Open python3 and import the following modules: ssl, defusedxml, zlib, gzip, pymysql, pycparser, cffi, and cryptography.

```
python3 -c "import ssl"
```

```
python3 -c "import defusedxml"
```

```
python3 -c "import zlib"
```

```
python3 -c "import gzip"
```

```
python3 -c "import pymysql"
```

```
python3 -c "import pycparser"
```

```
python3 -c "import cffi"
```

```
python3 -c "import cryptography"
```

NOTE

- All these commands must be executed by the user who installs UGO.
- No error is allowed during the installation.

----End

2.6.3 Generating a Self-Signed Web Certificate

Step 1 Go to the `home` directory.

```
cd /home
```

Step 2 Generate a keystore file with a self-signed certificate.

```
keytool -genkey -alias UGOWebKeystoreCRT -validity 3650 -keyalg RSA -keystore "./UGOWebKeystore" -keysize 2048 -storetype PKCS12
```

Step 3 Enter the keystore password and other detailed information, such as first name, last name, domain name (for example, **myserver.mycompany.com**), organizational unit, organization name, city, province/state, and country/region.

Step 4 The keystore file **UGOWebKeystore** is successfully generated in the **home** directory.

----End



NOTE

The file name *UGOWebKeystore* in the command is the same as that mentioned in the procedure for creating the keystore file.

2.6.4 Resetting the Database Password During UGO Installation

If you forget the password of the **ugo** user, the UGO service cannot be installed.

Perform the following steps to reset the password. The **update-pwd** parameter is added.

Step 1 Go to the **<ugoserver>/bin** directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Step 2 Reset the password of the **ugo** user.

```
python3 ugoserver.py update-pwd
```

The output is as follows:

Local database

Enter the original password, and then enter the new password as prompted. The password is successfully changed.

```
Enter the password for DB User -> ugouser:*****
Test => DB connection | OK | DB connection tested successfully.
Enter the new password for DB User -> ugouser:*****
Retype password:*****
```

Service Name	Operation Details
DB	Password changed successfully.
UGO_Verification	Password updated successfully.
UGO_PreMigration	Password updated successfully.
UGO_Migration	Password updated successfully.
UGO_DbObjectCollection	Password updated successfully.
UGO_IAMService	Password updated successfully.
UGO_AppMigration	Password updated successfully.
DB	Service stopped successfully.
WebUI	Service stopped successfully.
UGO_IAMService	Service stopped successfully.
DB	Service started successfully
WebUI	Service started successfully.

```
UGO_IAMService | Service started successfully.
```

Remote database

After the preceding commands are successfully executed, the password of the remote database is successfully changed.

----End

How Do I Reset the Administrator Password of UGO_IAMService?

If you forget the password of IAMService, you cannot log in to UGO.

To reset the password of IAMService, perform the following steps:

Procedure (Local Database)

Step 1 Go to the `<ugoserver>/bin` directory as the `ugo` user.

```
cd <ugoserver>/bin
```

Step 2 Enter a new password of IAMService.

```
python3 ugoserver.py irencrypt
```

Information similar to the following is displayed:

```
Enter the password to be encrypted : *****
Retype password:*****
Generated salt : *****
Generated hash : *****
```

Step 3 Copy the values of **hash** and **salt** generated from the preceding command output.

Step 4 Log in to the database.

```
cd <ugoserver_path>/db/server/bin/
```

```
.mysql -u <db_user_name> -h 127.0.0.1 -P <db_port> -p
```

Enter the database password.

Step 5 Run the following command after logging in to the database:

```
use <db_name>;
```

```
update DB_IAM_USER set PASSWORD=<hash>, IV=<salt> where
USER_NAME="admin";
```

```
quit;
```

In the preceding command, replace `<hash>` and `<salt>` with the values obtained in **Step 2**.

Step 6 Restart the service.

```
python3 ugoserver.py restart
```

Step 7 The password is successfully changed.

----End

Procedure (Remote Database)

Step 1 Go to the `<ugoserver>/bin` directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Step 2 Enter a new password of IAMService.

```
python3 ugoserver.py irencrypt
```

Information similar to the following is displayed:

```
Enter the password to be encrypted : *****
Retype password:*****
Generated salt : *****
Generated hash : *****
```

Step 3 Copy the values of **hash** and **salt** generated from the preceding command output.

Step 4 Log in to the database. It is recommended that the same host where the remote database is installed be used.

```
mysql -u <ugo_user> -h <db_ip> -P <db_port> -p
```

Enter the database password.

Step 5 Run the following command after logging in to the database:

```
use <db_name>;
```

```
update DB_IAM_USER set PASSWORD="<hash>", IV="<salt>" where
USER_NAME="admin";
```

```
quit;
```

In the preceding command, replace *<hash>* and *<salt>* with the values obtained in [Step 2](#).

Step 6 Restart the service.

```
python3 ugoserver.py restart
```

Step 7 The password is successfully changed.

NOTE

- `<db_username>, <db_port>, <db_name>, and <db_ip>` are stored in `<ugoserver_path>/install_summary.json`.
- After the password of the database is manually updated, restart the IAM service. Five consecutive invalid password attempts will cause the account to be locked. At the same time, the user name and IP address are locked. A different user with the same IP address cannot log in the database until the account is unlocked.

----End

3 User Manual

3.1 Getting Started

3.1.1 Security Tips

To ensure system security, read the following suggestions before using UGO:

1. You need to select appropriate database accounts for evaluation and migration. Database accounts with minimum permissions need to be used when service requirements are met.
2. The user password must be changed periodically. The maximum period is 90 days.
3. After the migration is complete, delete the task information in a timely manner to prevent the database account leakage.

3.1.2 Operation Guide

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

Dashboard

When you log in to UGO to go to the dashboard page, the latest login time is displayed.

The **Dashboard** page displays the service overview, copyright, application scenarios, and process guidance on database schema migration, object comparison, and application migration. The service overview and process guidance are displayed by default. You can also hide them.

- You can view statuses and quantity of existing projects. Click a status to view all projects in this status.
- You can view all alarms. Click an alarm severity to view the alarm details. If there are alarms, the number of alarms will be displayed in the upper right corner of the page.

- The username for logging in to the console is displayed in the upper right corner of the page. Move the cursor to a username to view license information, user management, configuration management, audit, alarms, and software version. You can also switch the language between Chinese and English, change the password, and log out of the system.

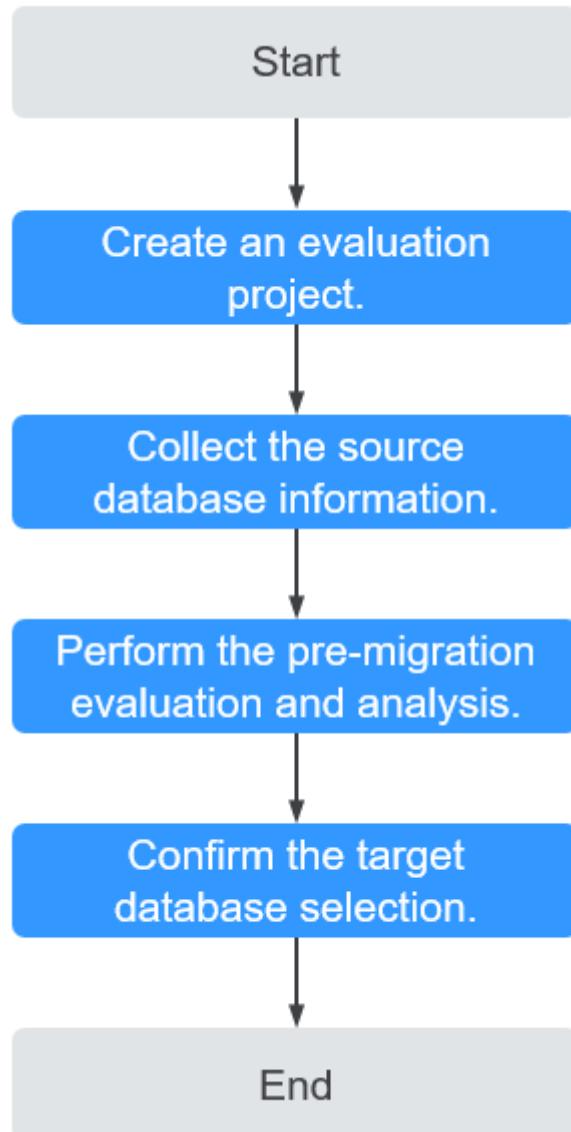
Service Overview

- DB evaluation:
Covers the compatibility analysis, target database selection, workload evaluation, and migration risk identification, syntax reconstruction suggestions on the collection objects of the source database.
It can help you migrate schemas of the source database to a proper target database. You can create a migration project only after the source database pre-check is passed and an evaluation project are created.
- Object migration:
Converts the syntax of database objects and migrates database objects from the source database to the target database using DDL, DML, and PL/SQL statements. Each migration project corresponds to an evaluation project of the source database, but you can create multiple migration projects based on one evaluation project.
- Object comparison:
Compares the equivalency of objects from source and target databases by using object properties and statements.
- Application migration:
Helps you extract and analyze SQL statements in your applications and determines the location of the SQL statements to be modified.

Migration Process

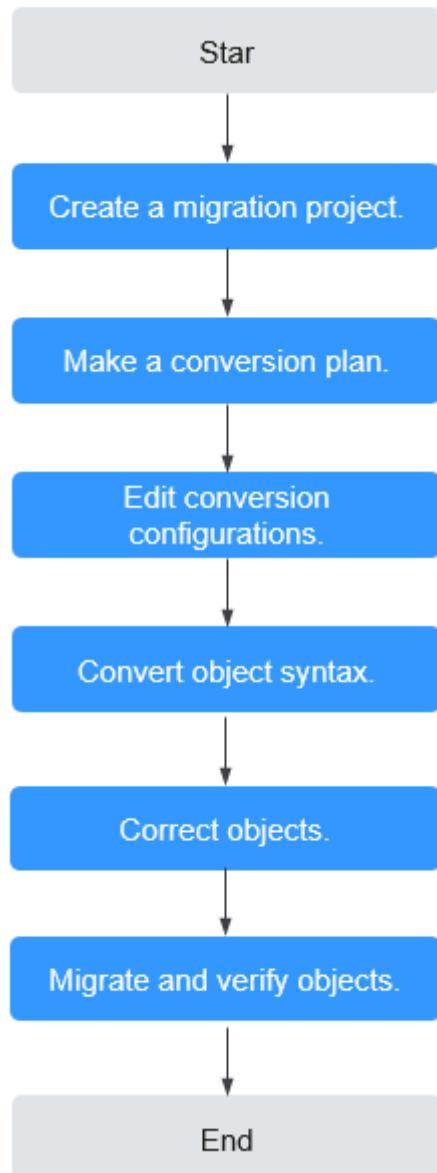
A complete database object migration consists of evaluation and migration. The processes are as follows.

Figure 3-1 Evaluation process



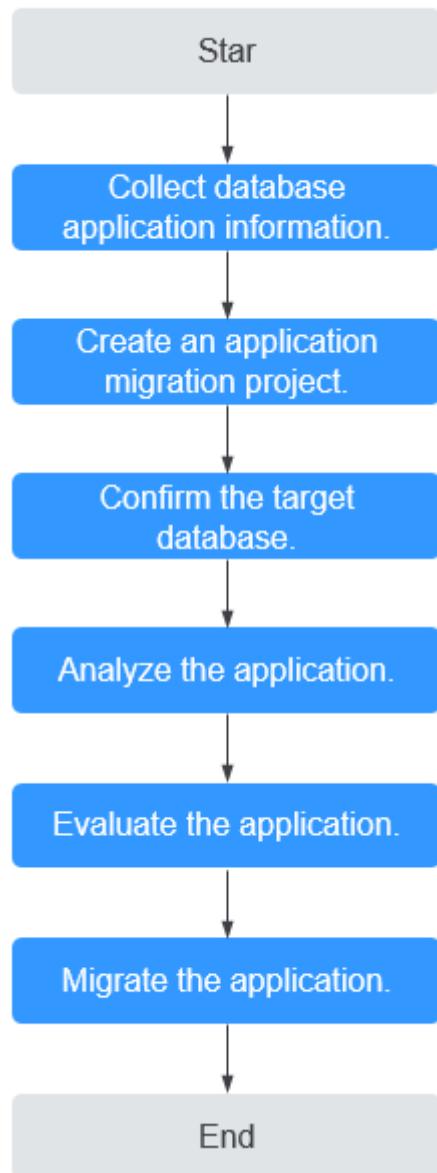
For details, see [Evaluation Project](#).

Figure 3-2 Migration process



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

Figure 3-3 Application migration



For details, see section [Application Migration](#).

Task Statuses

There are multiple task statuses that indicate different evaluation phases.

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

Table 3-1 Evaluation project status

Project	Status	Description
Evaluation project	In progress	The project has been created, but the target database has not been selected.
	Stopped	The project being created or re-evaluated was manually stopped.
	Completed	A target database has been selected, and the selection is confirmed.
	Failed	An exception occurs during the evaluation.

Table 3-2 Migration project statuses

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

Table 3-3 Object comparison project status

Project	Status	Description
Object comparison	In progress	The equivalence comparison between the source and target databases is in progress.
	Stopped	The equivalence comparison between the source and target databases was stopped.
	In Queue	The equivalence comparison between the source and target databases is pending.
	Completed	The equivalence comparison between the source and target databases is completed.
	Failed	The equivalence comparison between the source and target databases failed.

Table 3-4 Application migration status

Project	Status	Description
Application migration project	To be converted	The target database type has been confirmed, but the application SQL conversion has not been started.
	In progress	The application SQL conversion is in progress.
	Completed	Applications have been converted and migrated.
	Failed	An exception occurs during the evaluation.

3.1.3 Evaluation Project

3.1.3.1 Step 1: Create an Evaluation Project

Scenarios

This section describes the process of creating an evaluation project.

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

Prerequisites

- Connection to the source database is successful, and all pre-check items are passed.
- You must have the following permissions for the source database to be migrated: DBMS_METADATA, Dynamic View, and Schema Object Count Check. If the source database type is DB2, you must have the DBADM or DATAACCESS permission. Otherwise, the pre-check fails and the next step cannot be performed.



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

Procedure

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

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

Figure 3-4 Evaluation project creation

Table 3-5 Parameter description

Parameter	Description
Project Name	<p>Specifies the project name displayed in the project list.</p> <p>The name must contain 5 to 50 characters, start with a letter, and end with a digit or letter. Only letters (case-insensitive), digits, underscores (_), and hyphens (-) are allowed.</p>
Collection Time (optional)	<p>Start time and end time for collecting schemas of the source database.</p> <ul style="list-style-type: none"> All Time: The start time and end time are not specified. Data collection is started immediately after the project is created and ends after the data collection is complete. By Time Segment: The start time and end time are specified. The UGO connects to the source database at the start time and disconnects from the source database at the end time. You are advised to collect and evaluate the database during off-peak hours. The tool collects data at the specified time every day until all data is collected.

Parameter	Description
Skip Target DB Evaluation (optional)	<p>Specifies whether to skip the evaluation of the target database. Yes (default value): The summary and evaluation reports of the target database cannot be generated. On the Target DB Analysis page, only recommended target databases are displayed. For details, see Viewing Evaluation Project Details.</p> <p>NOTE If the source database is DB2, this parameter can only be set to Yes.</p>
(Optional) Source DB Type	<p>Select a source database type. Currently, the following source database types are supported: ORACLE-11g, ORACLE-12c, ORACLE-18c, ORACLE-19c, MySQL-5.7, MySQL-8.0, and DB2-11.1. By default, the source database type is ORACLE-11g.</p> <p>NOTE</p> <ul style="list-style-type: none"> If the source database type is MySQL-5.7, run the following commands on the source database to collect its TPS data: <code>UPDATE performance_schema.setup_instruments SET ENABLED = 'YES', TIMED = 'YES';</code> <code>UPDATE performance_schema.setup_consumers SET ENABLED = 'YES';</code> If the source database type is MySQL, run the following command on the source database to enable the CPU count function. <code>SET GLOBAL innodb_monitor_enable = cpu_n;</code>
Connection Method	<p>Select Service Name or Connection string. Service Name is used by default. The following uses the service name as an example. Subsequent parameters vary depending on your selection of this parameter.</p> <p>NOTE</p> <ul style="list-style-type: none"> For connection string, the standard JDBC is used to connect to the source database. If the source database type is DB2, only Service Name can be selected for connection.
Source DB Name	<p>Enter the name of the database to evaluate.</p> <p>NOTE This parameter is not displayed when the source database type is MySQL.</p>
(Optional) Host Type	Select Hostname or Host IP Address .
Hostname or Host IP Address	Enter the host name or host IP address based on the selected host type.
Host Port	Database port
User Name	Enter the username of the source database. You are advised to use the administrator username.
Password	Enter the password of the source database. The value contains up to 50 characters.

Parameter	Description
SSL Type	<ul style="list-style-type: none"> No SSL: SSL is disabled and there may be potential security risks. One Way SSL: The target database will be authenticated and transmission will be encrypted. <ul style="list-style-type: none"> Upload: Upload the root certificate file in JKS format. Trust Store Password: Enter the password of the trust store used to access the certificate. <p>NOTE</p> <ul style="list-style-type: none"> If you select One Way SSL, enter the correct uploaded file and entered password, which are private information of users. Secure Socket Layer (SSL) is an encryption-based Internet security protocol for establishing an encrypted link between a server and a client. It provides privacy, authentication, and integrity to Internet communications. If the source database type is DB2, pay attention to the SSL protocol version when using SSL. If the JDK version is later than 1.8.0_271, TLSv1 and TLSv1.1 are disabled by default and the SSL connection fails. For details about how to resolve this issue, see How Can I Resolve SSL Connection Failure Caused by a High JDK Version?
(Optional) DBA Collection	<p>Specifies whether to collect data from the DBA views or ALL views. This function is disabled by default.</p> <ul style="list-style-type: none"> Enabled: Data is collected from the DBA view. Only object data of the current user is collected. Disabled: All evaluation data is collected from ALL views.

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

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

 **NOTE**

If a message is displayed during the connection test, indicating the IP address (or hostname) and port number are incorrect, or the database is abnormal, resolve this issue by referring to [What Should I Do If the Source Database Cannot Be Connected Because DNS Resolution Takes a Long Time?](#)

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 15s to 20s 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 3-5 Prechecking permissions of Oracle database

The screenshot shows a pre-checking interface for Oracle. At the top, a green checkmark icon indicates "Start the evaluation task with confidence! The pre-check has passed." A blue button "Recheck All Permissions" and a note "Pre-check deadline: 2022/06/29 14:32:11" are visible. Below this, a table lists four items checked, all with "Success" status:

No.	Check Item	Description	Check Result
1	DBMS_METADATA Permission	Provides mechanism to retrieve metadata from the database dictionary as creation DDL to re...	Success
2	Dynamic View Permission	Checks select access to various Dynamic views	Success
3	DDL Object Count Check	Checks for at least one DDL Object to be present in DB for fetching	Success
4	DBA Privilege	Checks for Database Administrator Privilege	Success

Figure 3-6 Prechecking permissions of MySQL database

The screenshot shows a pre-checking interface for MySQL. At the top, a green checkmark icon indicates "Start the evaluation task with confidence! The pre-check has passed." A blue button "Recheck All Permissions" and a note "Pre-check deadline: 2022/10/24 09:42:12 GMT+00:00" are visible. Below this, a table lists six items checked, all with "Success" status:

No.	Check Item	Description	Check Result
1	MySQL System Table Permission	Checks SELECT access to mysql db system tables	Success
2	DDL Object Count Check	Checks for at least one DDL Object to be present in DB for fetching	Success
3	MySQL User Table Permission	Checks SELECT access to mysql user system tables	Success
4	Permission to generate DDL scri...	Checks SELECT and SHOW VIEW privileges to user schema(s)	Success
5	MySQL metrics permission	Checks SELECT access to sys metrics	Success
6	MySQL PROCESS privilege	Checks PROCESS privilege to user	Success

Figure 3-7 Pre-checking permissions of DB2 database

The screenshot shows a pre-checking interface for DB2. At the top, a green checkmark icon indicates "Start the evaluation task with confidence! The pre-check has passed." A blue button "Recheck All Permissions" and a note "Pre-check deadline: 2022/08/21 10:26:09 GMT+08:00" are visible. Below this, a table lists one item checked, with "Success" status:

No.	Check Item	Description	Check Result
1	DB2 Object Collector Check	Checks Object Collection permission	Success

BOOK NOTE

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

Oracle as the source database type:

- If the permission check for **DBMS_METADATA**, **Dynamic View** or **Schema Object Count Check** fails, the next step cannot be performed.
- If **Check Result** for the DBA Privilege is **Alarm**, the evaluation project can still be created successfully. However, some objects may fail to be collected due to insufficient permissions.

MySQL as the source database type: If any check item fails, the next step cannot be performed.

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

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

Figure 3-8 Selecting evaluation scope

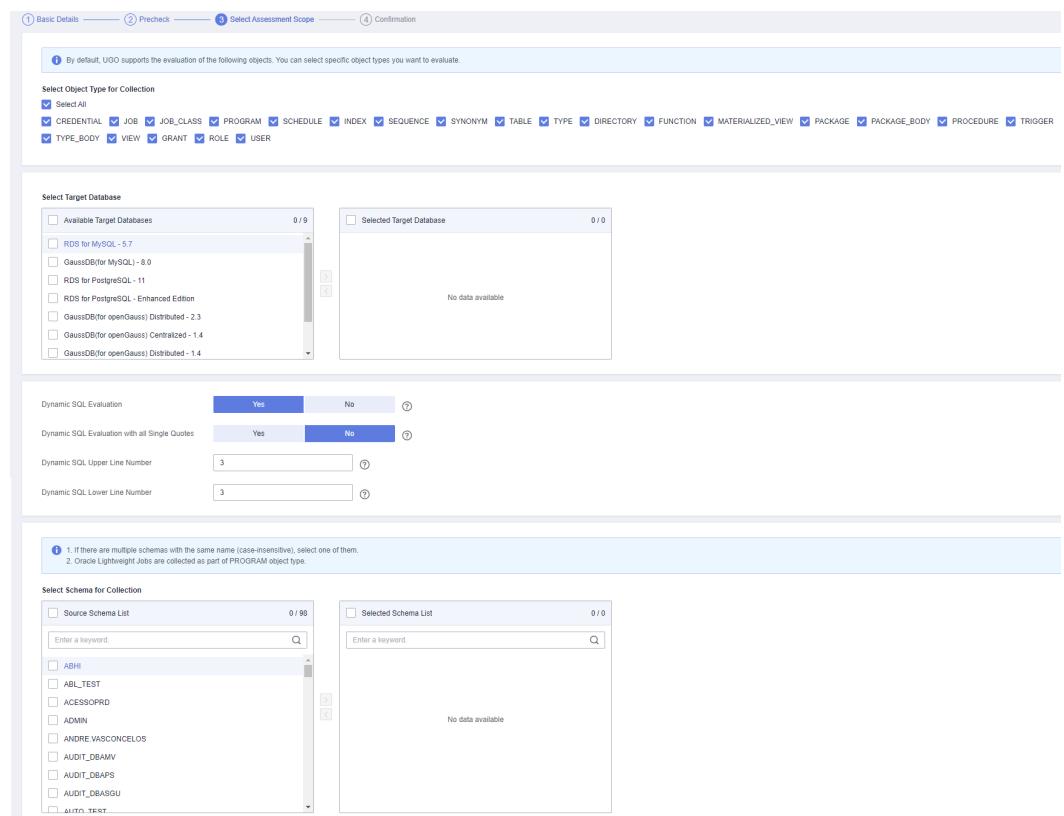


Table 3-6 Parameter description

Parameter	Description
Select Object Type for Collection	By default, all object types are selected. You can also manually select the object types to be collected as required.
Select Target Database	By default, all supported database types are selected. If you do not want to use a database as the target database, you can remove it from the Selected Target Database list.
Dynamic SQL Evaluation	Yes: Incompatible syntax contained in dynamic SQL statements of an object is parsed. No: Incompatible syntax contained in dynamic SQL statements of an object is not parsed.
Dynamic SQL Evaluation with all Single Quotes	Yes: Single quote content of all object statements is parsed. No: In object statements, only single quote content with keyword EXECUTE IMMEDIATE or DBMS_SQLPARSE is parsed.
Dynamic SQL Upper Line Number	Number of lines to be truncated before the line where the incompatible syntax is located

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

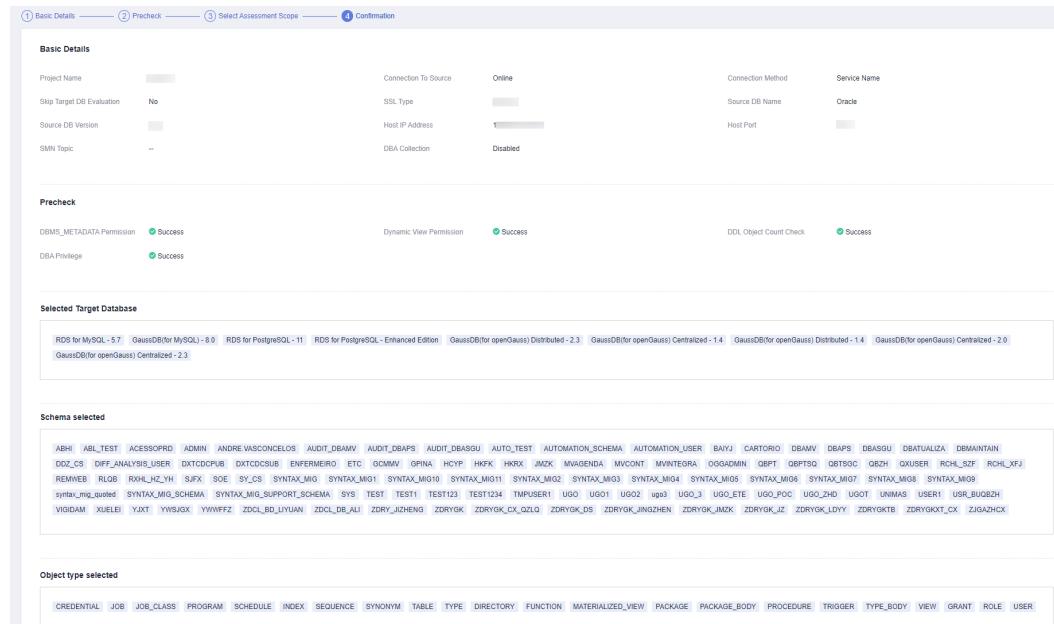
 **NOTE**

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

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

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

Figure 3-9 Confirmation



Step 11 Verify the settings and click **Create**. A message is displayed, indicating that the project was 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 and pre-migration evaluation are required. You can view the real-time status in the **Evaluation Status** column.

Figure 3-10 View the created project

DB Evaluation								Create Project	
You can create 1 more Evaluation projects. <div style="float: right;"> All Project Status Project Name Please enter project name Search by tags </div>								Create Project	
Sl No.	Project Name/ID	Connection Type	Evaluation Status	Source DB Type	Created Date	Project Status	SQL Size	Operation	
1	c1f17f55-a1a8-40c5-b...	● Online	● Completed Create Migration Project	MySQL-8.0	2022-19-25-18 GMT+08:00	Completed	1 MB	Delete Trace More	
2	f833b0d7-6dd6-4t00-...	● Online	● Completed Create Migration Project	MySQL-5.7	2022-19-23-48 GMT+08:00	Completed	6 MB	Delete Trace More	
3	c7cf3c5d-fda1-40ff-be...	● Online	● Completed Create Migration Project	DB2-11.1	2022-19-21-36 GMT+08:00	Completed	8 KB	Delete Trace	

NOTE

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

----End

3.1.3.2 Step 2: Confirm the Target Database

This section describes how to confirm the target database.

NOTICE

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

Prerequisites

The source database is successfully evaluated.

Procedure

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

----End

NOTE

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

3.1.4 Migration Project

3.1.4.1 Step 1: Create Migration Project

Scenarios

This topic describes how to create a migration project based on the evaluation project of the source database to migrate the schemas from the source database to the target database.

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

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

Constraints

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

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

Prerequisites

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



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

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Migration**.
- Step 3** Click **Create Project** in the upper right corner.
- Step 4** On the **Create Migration Project** page, enter the required information. For details, see [Table 3-7](#).

Figure 3-11 Creating a migration project

The screenshot shows the 'Create Project' interface. At the top, there is a 'Project Name' field with a placeholder 'Please Enter'. Below it is a 'Check Permissions' section with a checkbox for 'Skip Permission Check'. The next section is 'Select An Evaluation Project', which has a dropdown menu. Under 'Target DB', it says 'GaussDB Centralized'. 'Target DB Version' is shown as a dropdown. The following sections are for connection details: 'Host IP Address', 'Host Port', 'DB Name', 'User Name', and 'Password'. Below these is a section for 'Schemas to Migrate' with a 'Select all' checkbox and a note about selecting schemas from the source database. The 'SSL Type' section includes 'No SSL', 'SSL No Auth', and 'One Way SSL' (which is selected). A note states that the target database will be authenticated and communication will be encrypted. There is also an 'Add File' button and a note about uploading a PEM certificate. The final section is 'Test Connection' with a 'Test Connection' button and a note about testing the connection between UGO and the target DB.

Table 3-7 Parameter description

Parameter	Description
Project Name	<p>The project name must be unique.</p> <p>The name is unique. It 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.</p>

Parameter	Description
<p>Checking Permissions</p>	<ul style="list-style-type: none"> ● Select Skip Permission Check: The generated permission check report will have no content. ● Deselect Skip Permission Check: You can select System Admin or Object Owner only when the target database is GaussDB. <ul style="list-style-type: none"> - System Admin: Check the permission of the system administrator to create objects. - Object Owner: Check the permission of current user to create objects. <p>By default, Skip Permission Check is not selected.</p> <p>NOTE</p> <p>To create objects in the target database, you must have certain database permissions, such as those needed for creating tables and functions. If you skip the permission check, the system does not check whether you have these permissions.</p> <p>The migration may fail due to lack of permissions when SQL statements are converted on the target database.</p>
<p>Select An Evaluation Project</p>	<p>Select an evaluation project from the drop-down list.</p> <ul style="list-style-type: none"> ● Target DB: The confirmed target database type is displayed. Each tenant can connect to a maximum of five target databases at the same time. ● Target DB Version: The confirmed target database version is displayed. ● Host IP Address: Enter the IP address of the target database host. When the target database is primary/standby GaussDB, you can enter the IP address of the primary node or the IP addresses of the primary node and multiple standby nodes. Use commas (,) to separate IP addresses. When the target database is distributed GaussDB, you can enter the IP address of a CN or the IP addresses of multiple CNs. Use commas (,) to separate IP addresses. ● Host Port: Enter the port of the target database. ● DB Name: Enter the database name. The name contains up to 50 characters. <p>NOTE</p> <p>If the target database type is GaussDB, you are advised to select a GaussDB database that is compatible with the source database.</p> <ul style="list-style-type: none"> ● User Name: Enter the username of the target database. It is recommended that the user has the administrator permissions. ● Password: Enter the password of the target database.

Parameter	Description
Schemas to Migrate	<ul style="list-style-type: none"> Select Select all: Select all schemas to be collected by UGO from the source database. Deselect Select all: Reselect the schemas selected in the evaluation project. <p>By default, Select all is selected.</p>
SSL Type	<ul style="list-style-type: none"> No SSL: SSL is disabled and there may be potential security risks. SSL No Auth: Transmission will be encrypted without authentication. One Way SSL: The target database will be authenticated and transmission will be encrypted. <ul style="list-style-type: none"> Upload a SQL file: Click Add File. On the displayed page, select All Files (*.*) for the file type, select the root certificate of the target database in JKS format, and upload it. Trust Store Password: Enter the password of the trust store used to access the certificate. <p>NOTE</p> <ul style="list-style-type: none"> If you select One Way SSL, enter the correct uploaded file and entered password, which are private information of users. If the target database type is GaussDB, upload a PEM root certificate file. No password is required. Secure Socket Layer (SSL) is an encryption-based Internet security protocol for establishing an encrypted link between a server and a client. It provides privacy, authentication, and integrity to Internet communications. If the source database type is DB2 for LUW, pay attention to the SSL protocol version when using SSL. If the JDK version is later than 1.8.0_271, TLSv1 and TLSv1.1 are disabled by default and the SSL connection fails. For details about how to resolve this issue, see How Can I Resolve SSL Connection Failure Caused by a High JDK Version?

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.
- Compatibility mode check: If the source database is Oracle, MySQL or Postgres and target database is GaussDB, the system checks the GaussDB compatibility mode. If the selected compatibility mode is different from that of the source database, the system notifies you of risks. This check result does not affect subsequent operations. For details about how to create GaussDB compatible with source databases, see [How Do I Create GaussDB Databases Compatible with Source Databases?](#)

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.

NOTE

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

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

- Step 8** (Optional) Move the mouse pointer to a project name and click  to change the project name. The project name must be valid and unique.

----End

3.1.4.2 Step 2: Implement Project Migration

This topic describes how to implement a migration project.

Prerequisites

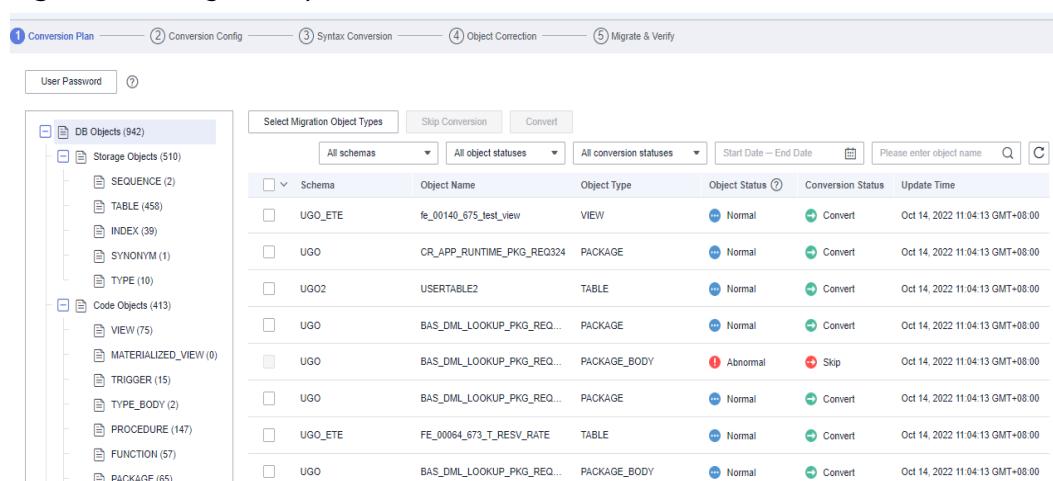
The project status is **Ready**, the target database information is correct, and the connection test is successful.

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

On the **Migration Plan** page, 17 types of collected objects are displayed on the left. For details about the object information, see [Table 3-15](#).

Figure 3-12 Migration plan



The screenshot shows the 'Migration Plan' interface. At the top, there are five tabs: 1 Conversion Plan, 2 Conversion Config, 3 Syntax Conversion, 4 Object Correction, and 5 Migrate & Verify. The first tab is selected. Below the tabs is a search bar labeled 'User Password' and a help icon. A sidebar on the left lists categories: DB Objects (942), Storage Objects (510), SEQUENCE (2), TABLE (458), INDEX (39), SYNONYM (1), TYPE (10), Code Objects (413), VIEW (75), MATERIALIZED_VIEW (0), TRIGGER (15), TYPE_BODY (2), PROCEDURE (147), FUNCTION (57), and PACKAGE (65). The main area displays a table titled 'Select Migration Object Types'. The table has columns: Object Name, Object Type, Object Status, Conversion Status, and Update Time. The table lists several objects with their details:

Object Name	Object Type	Object Status	Conversion Status	Update Time
fe_00140_075_test_view	VIEW	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
CR_APP_RUNTIME_PKG_REQ324	PACKAGE	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
USERTABLE2	TABLE	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
BAS_DML_LOOKUP_PKG_REQ...	PACKAGE	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
BAS_DML_LOOKUP_PKG_REQ...	PACKAGE_BODY	Abnormal	Skip	Oct 14, 2022 11:04:13 GMT+08:00
BAS_DML_LOOKUP_PKG_REQ...	PACKAGE	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
FE_00064_673_T_RESV_RATE	TABLE	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00
BAS_DML_LOOKUP_PKG_REQ...	PACKAGE_BODY	Normal	Convert	Oct 14, 2022 11:04:13 GMT+08:00

NOTE

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

- You can search for objects by date or object name, or filter objects by schema, object status, or conversion status.
- **User Password:** It is available only when the target database is GaussDB.
 - 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 transferred as plain text as part of database connection and SQL involving password and will have potential security risks.
 - After the password is configured, it cannot be changed again during the migration.
 - The password must contain 8 to 32 characters. The password must contain at least one uppercase letter, one lowercase letter, one digit, and one special character (~!@#\$%^&*()_-+=\|[{}];,<.>/?), but cannot contain spaces.
- **Export Source SQL:** You can export the SQL file to [download list](#). The file name is in the format of *Project name_Specific time.tar.gz*.
- **Export Source GRANT SQL:** You can export the SQL file of GRANT statements to [download list](#). The file name is in the format of *Project name_Specific time.tar.gz*. This function is available only when the source database type is Oracle and the target database type is GaussDB.
- To select the type of objects to be migrated, click **Select Migration Object Types**. At least one object type must be selected for migration.
- If **Object Status** of objects is **Abnormal**, their **Conversion Status** is **Skip**. It means that abnormal objects cannot be converted.
- If **Object Status** of objects is **Duplicate**, these objects are not migrated by default. For example, if the source database Oracle contains tables with the same name but different cases, they cannot be migrated to GaussDB. Tables and views with the same name cannot migration to GaussDB. However, UGO will rename indexed and triggers with the same name but different cases.
- GaussDB as the target database type: If you locate an object whose type is USER and click **Skip Conversion**, the following message is displayed, indicating that after USER migration is ignored, you need to locate the **Support for connection** feature in the **Conversion Config** page, and set sysadmin as the user to create and execute the GaussDB script. Otherwise, the migration may fail.

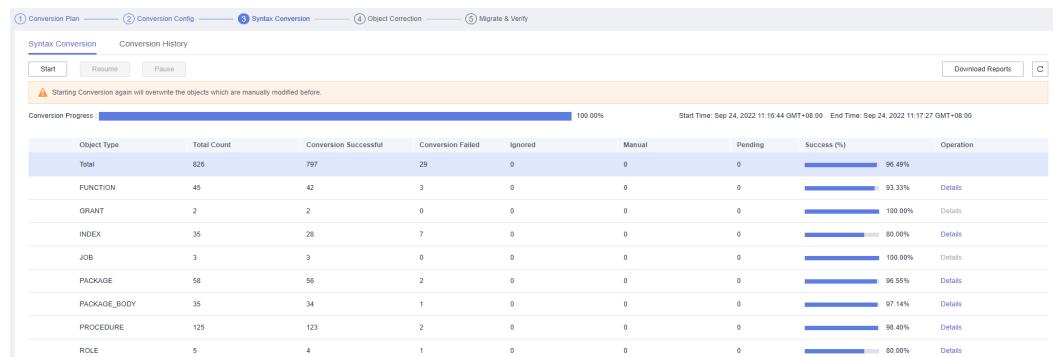
Step 4 Click **Next** to view and edit the configuration information.

For details, see Introducing Basic Functions of Conversion Configuration.

Step 5 Click **Next**.

Step 6 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 3-13 Syntax conversion



- The migration progress is displayed in a progress bar and as a percentage.
- Click **Download Reports**, locate the required report, and click **Download** to download the report to the local PC for analysis.
 - Conversion Error Report:** This report contains details about objects that could not be converted to target database equivalent syntax.
 - 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 the user 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 failed to parse the converted script with 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, where the converted script could not be parsed with 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.
- To view the migration history, see [Viewing Syntax Conversion History](#).
- Click **Pause** to pause the process. You can query the migration tasks that have been executed in the conversion history.
- Click **Start** to start a new conversion process. Click **Resume** to continue the conversion process.

⚠️ WARNING

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

Step 7 Click **Next** to go to the **Object Correction** page.

Figure 3-14 Object correction

The screenshot shows the 'Object Correction' tab of the migration interface. It displays two SQL code snippets: 'Source' and 'Target'. The Source code is for a table named 'UGO_AOPEN_APIDOC_INFO_REQ209' with various columns and constraints. The Target code is a modified version of the Source code, including changes like 'NOCOMPRESS' and 'LOGGING'. Below the code, a 'Modification History' table shows two entries: one for the creation of the table and another for a modification made on April 24, 2022, at 17:27:51 GMT+08:00, both labeled as 'Rollback' operations.

History ID	Object Name	Split Object Name	Modification Time	Operation
18	AOPEN_APIDOC_INFO_REQ209	UGO.AOPEN_APIDOC_INFO_REQ209	Apr 24, 2022 17:27:51 GMT+08:00	Rollback
19	AOPEN_APIDOC_INFO_REQ209	UGO.AOPEN_APIDOC_INFO_REQ209	Apr 24, 2022 17:28:04 GMT+08:00	Rollback

- You can search for objects by name, or filter objects by schema, migration status, or conversion status.
- Locate objects and click **Skip Migration** to ignore the objects that you do not want to verify.
- **Export Target SQL:** You can export all SQL files to [download list](#). The file name is in the format of *Project name_Specific time.tar.gz*. By default, an SQL file is generated for each object. For details about how to generate SQL files by statement type, see [How Do I Export SQL Files from the Target Database by Statement?](#)
- **Batch Statement Update:** After the migration verification is complete, this button is highlighted. You can update the statements of the objects that fail to be migrated 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**.
- **Export Target GRANT SQL:** You can export the SQL file of GRANT statements to [download list](#). The file name is in the format of *Project name_Specific time.tar.gz*. This function is available only when the source database type is Oracle and the target database type is GaussDB.
- 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 **Return Conversion page**, select the objects you want to return conversion, and click **Return Conversion** to perform [Step 6](#).
- Select an object and click **Modify** to modify the selected objects. For details, see [Modifying 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.

 **NOTE**

- 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 roll back to the original status.
- After you click **Ignore**, the migration status of the object changes to **Ignore**. If you click **Undo Skip**, the migration status changes to **Manual**.
- If there are features commented out in the migration, that may affect functions. You can click **Modify** to see the details.

Step 8 Click **Next**.

NOTICE

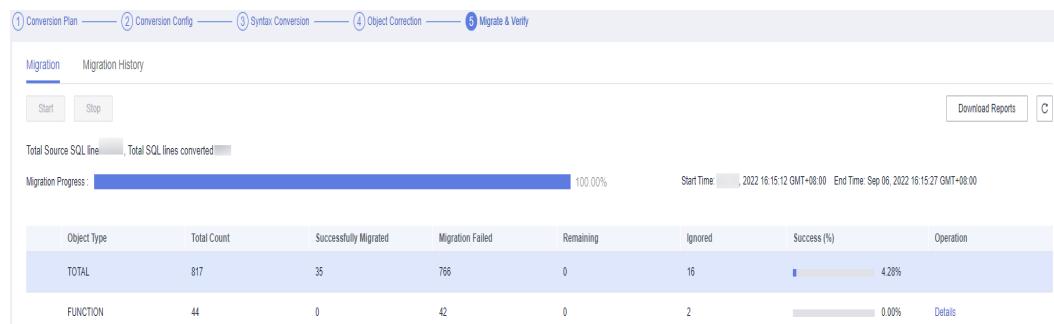
Correct all failed conversion objects in the **Object Correction** page before starting migration verification.

Step 9 Click **Start** to implement the migration. The migration progress is displayed in a progress bar and as a percentage.

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

To view the verification history, see [Viewing Migration and Verification Details](#).

Figure 3-15 Verification



- If a message is displayed, indicating that there were errors or risks during the migration, the system will automatically stop the verification process.
- After the migration is stopped, click **Start** to continue the migration.
- **View Empty Stored Procedure:** 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.
 - **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 10** After the migration verification is complete, if any item fails the verification, return to the object correction page and modify the item.
- Batch update: You can click **Batch Statement Update** to search for and modify objects with the similar issues in batches. For details, see [Updating Statements in Batches](#).
 - Single modification: You can manually modify objects one by one. For details, see [Modifying Objects](#).

 **NOTE**

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

----End

3.1.5 Object Comparison

Description

Object properties and statements are used to compare the equivalence of objects in the source database and target database.

Database Types and Versions

Table 3-8 Database types and versions

Source DB Engine	Source DB Version	Target DB Type and Version
Oracle	11g, 12c, 18c, and 19c	GaussDB Primary/Standby 1.4 Enterprise Edition, 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition
		GaussDB Distributed 1.4 Enterprise Edition, 2.7 Enterprise Edition, and 3.2 Enterprise Edition
MySQL	5.6, 5.7, and 8.0	GaussDB Primary/Standby 1.4 Enterprise Edition, 2.0 Enterprise Edition, 2.7 Enterprise Edition, 3.1 Enterprise Edition, and 3.2 Enterprise Edition

Source DB Engine	Source DB Version	Target DB Type and Version
		GaussDB Distributed 1.4 Enterprise Edition, 2.7 Enterprise Edition, and 3.2 Enterprise Edition

Constraints

- Ensure that the source database user is permitted to query system catalogs, or object comparison projects cannot be created.
- Ensure that target database GaussDB have the sysadmin role permission, or object comparison projects cannot be created.
- GaussDB 1.4 Enterprise Edition does not support the JOB type.
- Offline evaluation projects cannot be used for object comparison.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Comparison**.
- Step 3** Click **Create Project** in the upper right corner.
- Step 4** Enter the basic information on the **Basic Details** page. For details about the parameters, see [Table 3-9](#).

Figure 3-16 Configuring basic information

The screenshot shows the 'Basic Details' step of a migration project setup. It includes fields for Project Name, DB Information Input Type (Auto Selected), Migration Project selection, and connection details for both Source and Target databases. The Source Database section shows IP Address, Port, User Name, and Database Name. The Target Database section shows IP Address, Port, User Name, and Database Name. There are also sections for Test Connection and Start Test.

Table 3-9 Parameter description

Parameter	Description
Project Name	<p>Specifies the project name displayed in the project list. The name is unique. It 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.</p>
DB Information Input Type	<ul style="list-style-type: none"> • Auto assigned: Database connection information will be obtained from existing migration projects. The database type of the project must comply with the database version restrictions for object comparison. • Manual update: You need to enter the connection information between the source and target databases. For details, see Step 1: Create an Evaluation Project and Step 1: Create Migration Project. <p>NOTICE You do not need to select the versions of the source and target databases. When you click Test Connection, the system automatically checks whether their versions match.</p> <p>The default value is Auto assigned.</p>
Migration Project	<p>If DB Information Input Type is set to Auto assigned, select an existing migration project from the drop-down list. UGO can read the connection information about the source and target databases from the selected project.</p> <p>After you select a project, the existing source and target database information is displayed.</p>

Step 5 Click **Start Test** to check the connection between the source and target databases.

Step 6 Click **Next** to go to the **Comparison Scope Selection** page.

Select the object types and schemas to be compared from the source database. The system automatically matches the object types and schemas of the target database based on the selected source database object types and schemas.

All object types are selected by default.

Figure 3-17 Selecting comparison scope

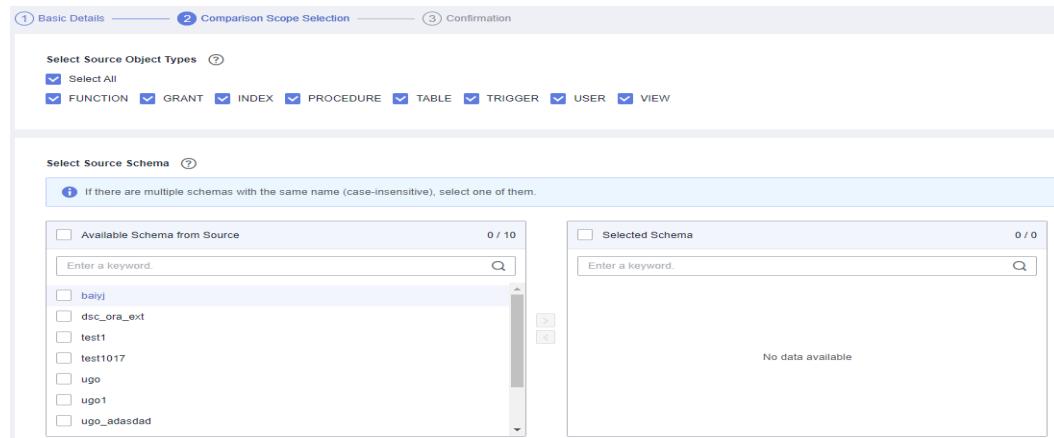


Table 3-10 Object types

Source Database Type	Available Database Objects
Oracle	CONTEXT, DIRECTORY, FUNCTION, GRANT, INDEX, JOB, PACKAGE, PROCEDURE, PROGRAM, SCHEDULE, SEQUENCE, SYNONYM, TABLE, TRIGGER, TYPE, USER, and VIEW NOTE Schemas without any objects cannot be compared.
MySQL	GRANT, INDEX, PROCEDURE, TABLE, TRIGGER, USER, and VIEW

Step 7 Click **Next** to enter the **Confirmation** page.

Figure 3-18 Confirming information

Step 8 Confirm the information and click **OK**.

After the creation is complete, the time required for the comparison depends on the selected object types and schemas.

During the comparison, you can stop or resume the process. After the comparison is complete, click **Re-Compare** to compare the objects.

Figure 3-19 Viewing the created project



BOOK NOTE

If the target database user does not have the sysadmin permission or no target database schemas are selected, the object comparison project fails to be created.

----End

3.1.6 Application Migration

Application migration is supported only when the advanced edition license is used.

3.1.6.1 Step 1: Collect Application Data

Scenarios

Oracle-based applications are web applications or independent Java applications. You can use the database collector agent provided by UGO to dynamically collect SQL statements and application information generated during the execution of the Java applications. After collecting data, you need to compress the data into a ZIP file on the local PC and upload the ZIP file to the UGO service for parsing.

Prerequisites

- Java 1.6 or later is supported.
- Oracle driver version is ojdbc8, and MySQL driver version is mysql-connector-java 8.
- The JAVA_HOME environment variable has been configured. Otherwise, set **JAVA_HOME** in **~/collector/agent/attachappagent.sh** to the absolute path of the JDK.

BOOK NOTE

If you use JRE instead of JDK, you must copy **appagent.jar** to ***\${JAVA_HOME}/lib/***.

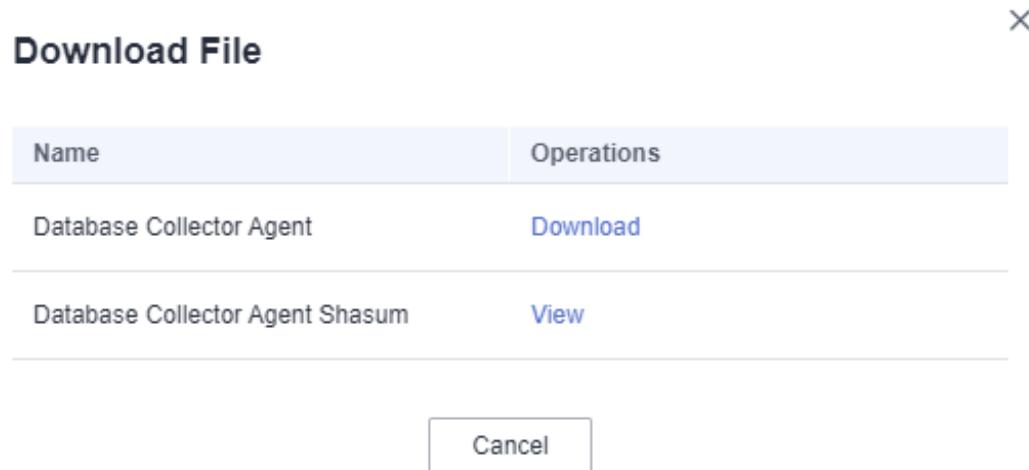
Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, click **Application Migration**.

Step 3 On the **Application Migration** page, click **Download File** in the upper right corner and select **Database Collector Agent**.

Figure 3-20 Download a file.



Step 4 Click **Download File** and select **Database Collector Agent Shasum**. The **SHA Checksum** is displayed.

The checksum is used to check whether **collector.zip** has been tampered with.

Step 5 Verify the security and correctness of the collection tool package.

1. Upload the tool package **collector.zip** to the server where data is to be collected, for example, to the **home** directory.
2. Log in to the server as the **root** user and go to the **home** directory.
cd /home
3. Run the following command to view the verification code:
cat collector.zip.sha256
sha256sum collector.zip
4. If the verification codes are the same, the tool package has not been tampered with and can be used. If they are not same, download the tool package and verify it again.

Step 6 Decompress **collector.zip**.

unzip collector.zip

Step 7 Switch to the directory containing **agent**. Configure **appagentconfig.properties** in the **agent** folder.

vi appagentconfig.properties

Table 3-11 Parameter description

Parameter	Description	Example
ugo.collector.app.agent.dataPath	Path for storing data collection files.	/tmp

Parameter	Description	Example
ugo.collector.app agent.application name	<p>Name of the folder for storing the collected data. The name must contain fewer than 20 characters. Only letters and digits are allowed. It is located in the path specified by datapath.</p> <p>NOTE To collect data of another application, rename the folder, for example, app_agent2. Otherwise, the collected data of the two applications is saved in the same folder.</p>	app_agent 1

Retain the default values for other parameters.

Step 8 Save the file and exit.

:wq

Step 9 Collect data.

- Scenario 1: (Recommended) Collect data when the application is restarted. Go to [Step 10](#).
- Scenario 2: Collect data of a running application. Go to [Step 11](#).



If a message is displayed, indicating the agent is connected, the collector has been started.

Step 10 (Recommended) Collect data when the application is restarted.

Scenario 1: Tomcat is not used in the Java application.

1. Run the following command to restart the application:

**java -javaagent: \${javaagent_path}/appagent.jar -jar /app_path/
app_name.jar**

Replace *javaagent_path* with the actual path of **appagent.jar** in the **collector/agent** folder.

Replace *app_path/app_name* with the actual path and name of the application.

2. After the collection is started, go to [Step 12](#).

Scenario 2: Tomcat is used in the Java application.

1. Go to the **Tomcat/bin** directory.

cd <Tomcat installation bin directory>

2. Edit the **catalina.sh** file.

vi catalina.sh

3. Add the following information to the end of the last **CATALINA_OPTS** configuration item:

**CATALINA_OPTS="\$CATALINA_OPTS -javaagent:\${javaagent_path}/
appagent.jar"**

Replace \${javaagent_path} with the path where **appagent.jar** is stored.

4. Save the file and exit.
:wq!
5. Run the following command to start the application:
java -jar app_name.jar &
Replace *app_name* with the name of your application.
6. After the collection is started, go to [Step 12](#).

Step 11 Collect data of a running application.

1. Query the PID of the running application.

ps -ef |grep java

Command output:

```
[root@host-192-168-5-97 ~]# ps -ef |grep java
0913  24792  1  0 Sep13 ?    00:17:51 /usr/local/java/jdk1.8.0_252/jre/bin/java -Dnop -
Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Xms3072m -Xmx20480m -
XX:+PrintGCDetails -XX:+PrintGCApplicationStoppedTime -XX:+PrintGCApplicationConcurrentTime -
XX:+PrintGCDateStamps -Xloggc:/home/0913/ugoserver/logs/services/gclog.log -
XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=5m -
XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=/home/0913/ugoserver/logs/services/ -
Djdk.tls.ephemeralDHKeySize=2048 -Djava.protocol.pkgs=org.apache.catalina.webresources -
Dorg.apache.catalina.security.SecurityListener.UMASK=0077 -Djava.net.preferIPv4Stack=true -
Djava.net.preferIPv4Addresses -Dorg.apache.catalina.connector.RECYCLE_FACADES=true -
Dorg.apache.catalina.STRICT_SERVLET_COMPLIANCE=true -
Dorg.apache.tomcat.util.http.ServerCookie.FWD_SLASH_IS_SEPARATOR=false -
Dorg.apache.tomcat.util.http.ServerCookie.STRICT_NAMING=false -Dignore.endorsed.dirs= -classpath /
home/0913/ugoserver/web/bin/bootstrap.jar:/home/0913/ugoserver/web/bin/tomcat-juli.jar -
Djava.security.manager -Djava.security.policy==/home/0913/ugoserver/web/conf/catalina.policy -
Dcatalina.base=/home/0913/ugoserver/web -Dcatalina.home=/home/0913/ugoserver/web -
Djava.io.tmpdir=/home/0913/ugoserver/web/temp org.apache.catalina.startup.Bootstrap start
0913  24825  1  0 Sep13 ?    00:06:03 java -XX:+PrintGCDetails -Djava.net.preferIPv4Addresses -
-Djava.net.preferIPv4Stack=true -XX:+PrintGCApplicationStoppedTime -
XX:+PrintGCApplicationConcurrentTime -XX:+PrintGCDateStamps -Xloggc:/home/0913/ugoserver/logs/
services/UGO_IAMService/gclog.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -
XX:GCLogFileSize=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=/home/0913/
ugoserver/logs/services/UGO_IAMService/ -Xms512m -Xmx1024m -DIAM_HOME=/home/0913/
ugoserver/services/UGO_IAMService -DLOGFILE_PATH=/home/0913/ugoserver/logs/services/
UGO_IAMService -cp /home/0913/ugoserver/services/UGO_IAMService/../../web/shared/
3rd_party_lib/*:/home/0913/ugoserver/services/UGO_IAMService/../../web/shared/UGO_lib/*:/home/
0913/ugoserver/services/UGO_IAMService/lib/* com.huawei.gauss.dsc.iamservice.IAMServiceApplication
root   106289 106222  0 18:59 pts/0  00:00:00 grep --color=auto java
```

For example, in the command output, **24792** and **24825** are the PIDs of the applications. Select the PID of the target application.

2. Start the agent to capture application information.

sh attachappagent.sh -p *PID*



Ensure that application PID is correct.

Step 12 Go to the collection path **/tmp** which is specified in the **agent** folder, and view the **app_agent1** folder.

cd /data01/app_collector/appdata/app_agent1

Step 13 After a period of time (3 to 5 minutes), check whether there is collected data in the folder.

ll

If a file prefixed with **app_agent1** exists, the collected content has been generated.

Step 14 Download the generated collection file to the local host and compress the file into a ZIP file.

The compressed file will be used when you create an application migration project and upload data files.

----End

3.1.6.2 Step 2: Create an Application Migration Project

Prerequisites

You have obtained the data collection files.

NOTICE

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

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, click **Application Migration**.

Step 3 Click **Create Project** in the upper right corner.

Step 4 Configure required information.

Figure 3-21 Creating an application migration project

< | Create Project

The screenshot shows a user interface for creating a new project. At the top, there's a back arrow and a 'Create Project' button. Below that is a form with three main fields: 'Project Name' (with a placeholder 'Enter a project name.'), 'Source DB Type' (with a placeholder 'Select the source database type.' and a dropdown arrow), and 'Upload Data File' (with a 'Add File' button and a question mark icon).

Table 3-12 Application migration parameters

Parameter	Description
Project Name	Enter a project name. The name is unique. It 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 Oracle , MySQL , or DB2 for LUW .
Upload Data File	Only ZIP files are supported. The maximum size is 50 MB. There are up to 10,000 files in the ZIP package. Before uploading a file, perform the following operations: <ul style="list-style-type: none">• Delete binary files. Only text files are supported.• Delete files that contain critical data such as passwords and keys for data security.• Supported file types: java, sql, xml, yaml, yml, json, properties, agent, and cql.• Ensure that maximum size of each text file is 10 MB.

⚠ CAUTION

- After the UGO version is upgraded, you need to obtain the application data files of the current version, or the upload will fail.
 - The size of the uncompressed files must be the same as the actual file size.
-

Step 5 Click **Create**. A message is displayed, indicating that the project was created successfully.

- After the project is created, view the basic project information on the **Application Migration** page. **Conversion Status** changes from **File Parse Scheduled** to **Data process in progress** and **Confirm Target DB Pending**. **Project Status** is **In progress**.
- When **Conversion Status** is **Data process in progress**, you can click **Stop** or **Resume**. In other status, the **Stop** button is unavailable.
- If the files fail to be parsed, the **Project Status** is **In progress** and  is displayed. You can move the cursor to the icon to view the name of the files that fail to be parsed.

----End

3.1.6.3 Step 3: Confirm the Target Database

This section describes how to confirm the target database for application migration.

NOTICE

The source database syntax is complicated and adaptable, so the conversion success rate, workload evaluation, object evaluation and other information are for reference only.

Prerequisites

The application migration project has been complete.

Procedure

- Step 1** Log in to the UGO service.
- Step 2** In the navigation pane on the left, click **Application Migration**.
- Step 3** Locate the project whose **Conversion Status** is **Confirm Target DB Pending**, and click the project name.
- Step 4** On the **Application Evaluation** page, select your desired target database and click **Confirm DB Selection**.
- Step 5** In the displayed dialog box and click **OK** to confirm the target database.

----End

NOTE

- After you confirm the target database, it cannot be modified. Exercise caution when you confirm the target database.
- On the **Application Migration** page, **Conversion Status** changes from **Confirm Target DB Pending** to **Conversion Pending**, and **Project Status** is **In Progress**.

3.1.6.4 Step 4: Start the Application SQL Conversion

This section describes how to start an application SQL conversion.

Prerequisites

The target database has been confirmed.

Procedure

- Step 1** Log in to the UGO service.
- Step 2** In the navigation plane on the left, click **Application Migration**.
- Step 3** Locate the project whose **Project Status** is **Conversion Pending**, and click the project name.
- Step 4** Click **Application SQL Conversion**. In the **Syntax Conversion** tab, click **Start**.
 - The conversion progress is displayed in a progress bar and as a percentage.
 - You can click **Stop** or **Start**.
 - After the conversion is complete, the start time and end time are displayed.

- You can download the conversion report to the local PC.
- To view the conversion details of an object, locate the object and click **Details** in the **Operation** column

 **NOTE**

The application migration list is displayed. The project status is **Completed**.

----End

3.1.6.5 Creating an SQL Extraction Task

Scenarios

The compressed file for application source code can be uploaded to UGO server.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, click **Application Migration**.
- Step 3** On the **Application Migration** page, click **Create SQL Extraction Task** in the upper right corner.

Figure 3-22 Creating an SQL extraction task

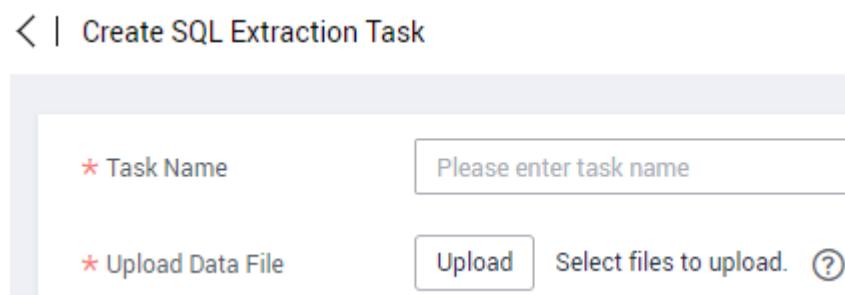


Table 3-13 Parameter description

Parameter	Description
Task Name	Enter the name of the task. You can view the task in the Source SQL File tab of the Downloads page. The name must contain 5 to 50 characters, start with a letter and end with a letter or digit. Only letters (case-insensitive), digits, underscores (_), and hyphens (-) are allowed.

Parameter	Description
Upload Data File	<p>Upload the compressed file for the application source code.</p> <p>Only ZIP files are supported. The ZIP package consists of up to 5000 files and its size is up to 50 MB. Before uploading the ZIP package, you need to:</p> <ul style="list-style-type: none">• Delete binary files. Only text files are supported.• Delete files that contain critical data such as passwords and keys for data security.• Ensure that the file types are java, sql, sh, py, txt, and xml.• Ensure that the file name is up to 5,000 characters.• Ensure that maximum size of each text file is 10 MB.

Step 4 Click **Initiate SQL Extraction Task** in the lower right corner.

----End

Follow-up Operations

Step 1 Log in to the UGO console.

Step 2 In the navigation tree on the left, choose **Downloads > Source SQL File**.

Step 3 View the task extraction progress, and download or delete the task.



If the downloaded extraction file does not contain an Excel file, no SQL statement is extracted. Rectify the fault by referring to Why Is There No SQL Statements in a SQL Extraction Task?.

----End

3.2 User Guide

3.2.1 Database Evaluation

3.2.1.1 Viewing Evaluation Project Details

For how to create an evaluation project, see [Step 1: Create an Evaluation Project](#).

Scenarios

This section describes how to view the detailed information of an evaluated project, including the source database analysis, database schema, and target database analysis. This helps you select the target database.

Prerequisites

Evaluated projects have been created.

Constraints

If **Skip Target DB Evaluation** is set to **Yes** (default value) when you create an evaluation project, there are only the basic information of recommended target databases on the **Target DB Analysis** tab.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, choose **Schema Migration > DB Evaluation**.

All the evaluation projects are displayed in the list. You can view the project basic information, including the project name, connection type, and project status.

If there are many projects, you can search for them by project status, tag, and project name/ID.

If the **Project Status** of a project is **Completed**, you click **Create Migration Project** to create a migration project.

Figure 3-23 Online database evaluation

SI No.	Project Name/ID	Connection Type	Project Status	Source DB Type	Created Date	Differential An...	SQL Size	Operation
1	Redacted	Online	Completed Create Migration Project	Oracle-11g	2023-09-18 19:38:12 GMT+08:00	Redacted	165 KB	Trace Run Differential Analysis Delete

Step 3 Click the name of the online project that you want to view. The **Source DB Analysis** and **Target DB Analysis** tabs are displayed.

Figure 3-24 Evaluation information classification

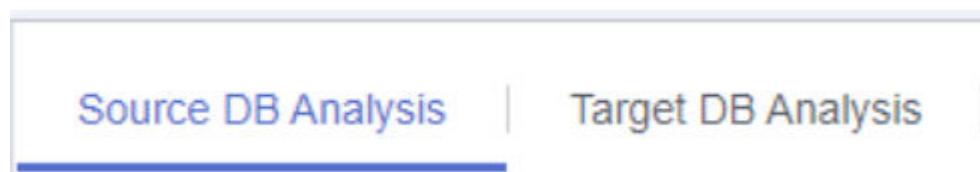


Table 3-14 Function description of the Source DB Analysis tab

Function	Description
Basic Information	Displays basic information, including the project name, source database type, database version, database name, number of instances, and database memory.

Function	Description
Object Statistics	<p>Displays the number of database objects. The objects displayed vary depending on the source database type.</p> <p>Click View Object Details to view details about the database schemas. For details, see Table 3-15.</p> <p>NOTE The numbers of object types such as Cluster are not displayed.</p>
Database Objects Distribution	Displays the database object statistics in a bar chart. Hovering over on a bar shows the exact value.

NOTE

Source DB analysis provides a reference for you to select a target database.

Table 3-15 Function description of the DB Schema tab

Function	Description
Schema list	<p>Displays the schema, object name, object type, and operation.</p> <ul style="list-style-type: none"> If there is a large amount of data, you can search for your desire data by DDL collection status, schema, wrapped object status (only available for Oracle database), or object name. Incremental evaluation: The SQL data has to be incrementally evaluated if: <ul style="list-style-type: none"> The DDL collection status is Not collected. The wrapped objects are edited. Click View Details in the Operation column to view the detailed information and SQL script of the object. Locate a schema and click Edit SQL in the Operation column to edit the SQL script of the object. <p>NOTE</p> <ul style="list-style-type: none"> Edit SQL is available only when the target database is not confirmed and any of the following conditions is met: <ul style="list-style-type: none"> The wrapped objects are edited. The DDL Collection Status of objects is Collected. If Object Type is SQL for a schema, View Details is unavailable. When the source database type is DB2 for LUW, incremental evaluation and SQL editing are not supported.

Function	Description
DB Objects (for Oracle database)	<p>Include storage objects, code objects, job objects, and management. You can click an object to view the corresponding information.</p> <ul style="list-style-type: none"> • Storage Objects: include SEQUENCE, TABLE, INDEX, SYNONYM, and TYPE. • Code Objects: include VIEW, MATERIALIZED_VIEW, TRIGGER, TYPE_BODY, PROCEDURE, FUNCTION, PACKAGE, PACKAGE_BODY, and DIRECTORY. • Job Objects: include CREDENTIAL, PROGRAM, SCHEDULE, JOB_CLASS, and JOB. • Management: include USER, ROLE, and GRANT.
DB Objects (for MySQL database)	<p>Include storage objects, code objects, and management objects. You can click an object to view the corresponding information.</p> <ul style="list-style-type: none"> • Storage Objects: include TABLE, VIEW, and SCHEMA. • Code Objects: include FUNCTION, PROCEDURE, and TRIGGER. • Management Objects: includes GRANT, ROLE, and USER.
DB Objects (for DB2 for LUW database)	<p>Include storage objects and code objects. You can click an object to view the corresponding information.</p> <ul style="list-style-type: none"> • Storage Objects: include SCHEMA, SEQUENCE, TABLE, INDEX, SYNONYM, and TYPE. • Code Objects: include VIEW, VARIABLE, TRIGGER, PROCEDURE, and FUNCTION. <p>NOTE Table objects are occasionally not collected when you collect data from a newly created DB2 for LUW database. In this case, create an evaluation project again until the collection is successful.</p>

Table 3-16 Function description of the Target DB Analysis tab

Function	Sub-function	Description
Target database selection	Summary Report	<p>Click Summary Report to download the compatibility evaluation summary report in PDF format to the local PC. You can view basic information about the source database and analysis results of the target database in the report.</p> <p>If the source database type is DB2 for LUW, this function is unavailable.</p>

Function	Sub-function	Description
	Database List	<p>Displays the names, versions, and success rates of the target databases that you can select.</p> <p>NOTE</p> <ul style="list-style-type: none"> By default, the database with the highest success rate is selected. You can also select a database. The database compatibility evaluation changes as you change the target database. Comprehensive evaluation facilitates you to make a choice.
	Confirm DB Selection	<p>You can determine the target database type to complete the evaluation.</p> <p>If the target database has been confirmed, the button is unavailable.</p>
	Re-evaluate	<p>This function is displayed only when Project Status is In progress. Confirm Target DB Pending.</p> <p>You can re-evaluate objects as needed.</p> <p>The time required depends on the number of objects.</p> <p>NOTE</p> <ul style="list-style-type: none"> After the re-evaluation, the target database selection, workload evaluation, object conversion statistics, and partially compatible/unsupported syntax are displayed on the current page. This function is not available for DB2 for LUW databases.
Compatibility analysis	Current Dynamic SQL Evaluation Config	<p>Only when the source database is Oracle in an evaluation project online, information such as object type, schema name, object name, and dynamic SQL information are displayed.</p> <p>Click Dynamic SQL Evaluation Report to download the evaluation report, which contains the object type, object name, keyword, location, and statements.</p>
	Workload Evaluation	The estimated workloads required for reconstructing common objects, system objects and other objects during database migration are displayed.

Function	Sub-function	Description
	Conversion Statistics	<p>Only when the source database is Oracle, supported objects and unsupported objects are displayed. Supported objects include native-supported objects, UGO-supported objects, and supported objects with risks.</p> <p>Move the cursor to a bar chart to view the conversion details. You can click a bar chart to view the conversion analysis details, which are displayed by supported objects with risks and unsupported objects.</p> <p>Click View details to view supported objects with risks and unsupported objects.</p> <p>Click Report on Partially Compatible and Unsupported Objects. This report includes all source SQL statements and details on any syntax conversion failures.</p> <p>Click Anonymous Report on Partially Compatible and Unsupported Objects. This report includes all source SQL statements and details about any failure points in the SQL statements, but the statements will be anonymized. The actual syntax will not be exposed.</p>
	Partially Compatible/ Unsupported Syntax	<p>All partially compatible or unsupported syntax points during database object conversion are displayed. The detailed information includes Partially Compatible/Unsupported Syntax, Object Scope, Type (not supported or partially compatible syntax points), Risk Level (risk level of partially compatible syntax points), Count (number of occurrences of a syntax point), and Operation (for viewing definition of syntax points).</p> <p>Locate a syntax point and click View Definition in the Operation column to view its explanation. If a syntax point is partially compatible, UGO provides different conversion configuration items for the syntax point. During the migration, you can select a configuration item as needed.</p> <p>If no modification suggestion is provided, you can click the syntax point name to view details.</p> <p>This function is not available for DB2 for LUW databases.</p>

Function	Sub-function	Description
	System Objects	<p>The page displays the types of system objects, occurrence count, and compatibility if the source database type is Oracle, MySQL or DB2 for LUW and the target database type is primary/standby GaussDB. You can click a system object name to view its database objects.</p> <p>Click System Object Report, a compressed package is downloaded to the local PC. You can extract an excel file from the package. There are two sheet System Data Report and System Table or View Details in the file.</p> <ul style="list-style-type: none">• System Data Report describes the compatibility of all system objects. The following information includes: target database type and version, system object type, name and quantity, supported type, and SQL statements. If a SQL character string is greater than the maximum value of a cell in the excel file, an independent SQL file is generated and stored in the compressed package.• System Table or View Details describes the column compatibility of all system views. The following information includes system object name, column name, quantity, and supported type.

----End

NOTICE

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

3.2.1.2 Viewing Unsupported Syntaxes and Supported Syntaxes with Risks

3.2.1.2.1 Oracle -> GaussDB

Parameter	Feature Name	Description	Affected Object	Suggestion
long_support	LONG data type	It is applicable if tables contain one or more LONG columns. In Oracle, the maximum size of LONG data type is 2 GB. In GaussDB, the maximum size of TEXT data type is 1 GB.	Table, function, stored procedure , trigger, and user-defined type	<p>Oracle LONG supports up to 2 GB data, There is no equivalent in GaussDB. Based on the long_support value you configured, UGO converts LONG to TEXT, whose maximum size is 1 GB in GaussDB. If the column/variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown.</p> <p>Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.</p>
longraw_support	LONG RAW data type	It is applicable if tables contain one or more LONG RAW columns. In Oracle, the maximum size of LONG RAW data type is 2 GB. In GaussDB, BYTEA data type supports a maximum of 53862709 bytes.	Table, function, stored procedure , trigger, and user-defined type	<p>Oracle LONG RAW supports up to 2 GB data; but there is no equivalent data type in GaussDB. Based on the long_support value you configured, UGO converts LONG RAW to BYTEA whose maximum size is 536862709 bytes (512 MB-8203 bytes). If the column/variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown.</p> <p>Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
clob_datatype_show_error	CLOB data type	It is applicable if tables contain one or more CLOB columns. In Oracle, the maximum size of CLOB data type is 4 GB. In GaussDB, the maximum size of CLOB/ TEXT data type is 1 GB.	Table, function, stored procedure , trigger, and user-defined type	<p>Oracle CLOB supports a maximum of 4 GB data. Even CLOB is supported by GaussDB, but it supports a maximum of 1 GB data. Based on the clb_datatype_show_error value you configured, UGO logs an error. If the column/ variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown.</p> <p>Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.</p>
nclob_support	NCLOB data type	It is applicable if tables contain one or more NCLOB columns. In Oracle, the maximum size of NCLOB data type is 4 GB. In GaussDB, the maximum size of TEXT data type is 1 GB.	Table, function, stored procedure , trigger, and user-defined type	<p>Oracle NCLOB supports a maximum of 4 GB data, There is no equivalent in GaussDB. Based on the nclob_support value you configured, UGO converts NCLOB to TEXT whose maximum size is 1 GB in GaussDB. If the column/ variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown.</p> <p>Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
float_support	FLOAT data type	It is applicable if tables contain one or more FLOAT columns and FLOAT is specified as FLOAT/FLOAT(n), where $n > 53$. If n is not provided, the default value 126 is used.	Table, function, stored procedure, trigger, and user-defined type	<p>In Oracle, the default (maximum) precision of FLOAT is 126. GaussDB supports FLOAT, which is implicitly converted as DOUBLE PRECISION. Based on the float_support value you configured, UGO converts FLOAT to DOUBLE PRECISION (whose maximum precision is 53) or NUMBER (up to 131,072 digits before the decimal point and up to 16,383 digits after the decimal point). If it is converted to DOUBLE PRECISION, the precision specified above 53 will throw an error and the statement will fail.</p> <p>You can configure the parameter based on the actual precision value. If the precision is not specified or it is greater than 53, you can configure the parameter to NUMBER.</p>
xml_support	XMLTYPE data type	It is applicable if tables contain one or more XMLTYPE columns.	Table, function, stored procedure, trigger, and user-defined type	<p>Oracle XMLTYPE supports a maximum of 4 GB data, There is no equivalent in GaussDB. Based on the xml_support value you configured, UGO converts XMLTYPE to TEXT or JSON. Both the types support the maximum size of 1 GB in GaussDB and do not match with Oracle XMLTYPE.</p> <p>Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred. It can be handled by writing the user-defined functions or writing application-side code.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
number_with_zero_scale	NUMBER data type with zero scale	It is applicable if tables contain NUMBER with zero scale or NUMBER without scale.	Table, function, stored procedure, trigger, and user-defined type	For NUMBER with zero scale, UGO converts NUMBER to INTEGER (smallint, int, bigint).
SDO_GEOMETRY	SDO_GEOMETRY object type	It is applicable if tables contain SDO_GEOMETRY object type. There is no equivalent for GEOMETRY in GaussDB.	Table, function, stored procedure, trigger, and user-defined type	There is no equivalent in GaussDB. Since GaussDB supports user-defined data type, GEOMETRY can be converted into an appropriate user-defined data type and do the appropriate change wherever a column/variable with this type is referred.
MBRCOORDLIS	MDSYS.MBRCOORDLIST object type	It is applicable if table scripts contain MDSYS.MBRCOORDLIST object type. There is no equivalent in GaussDB.	Table, function, stored procedure, trigger, and user-defined type	There is no equivalent in GaussDB. Since GaussDB supports user-defined data type, it can be converted into an appropriate user-defined data type and do the appropriate change wherever a column/variable with this type is referred.
GEOMETRY	GEOMETRY object type	It is applicable if the table script contains GEOMETRY object type. There is no equivalent in GaussDB.	Table, function, stored procedure, trigger, and user-defined type	There is no equivalent in GaussDB. Since GaussDB supports user-defined data type, SDO_GEOMETRY can be converted into an appropriate user-defined data type and do the appropriate change wherever a column/variable with this type is referred.

Parameter	Feature Name	Description	Affected Object	Suggestion
partition_columns_with_unique_constraint	Table column partition with unique constraint	It is applicable if table scripts contain the partition syntax and primary keys or unique keys.	Table, index	<p>There is a limitation in GaussDB that the columns specified in unique keys (including primary keys) should be a super set of partition key columns. Because of this limitation, tables will fail to be created if unique constraints do not contain any one of the partition key columns.</p> <p>The unique constraints will be commented or the partition columns will be added to the unique constraints based on the partition_columns_with_unique_constraint value. Because of this conversion, there is a possibility of creating duplicate records in tables and so it will also raise issues in creating referential integrity constraints in child tables. It is not supported by GaussDB.</p>
mig_interval_partition	Interval partition in tables	It is applicable if table scripts contain interval partition syntax.	Table	<p>Since GaussDB does not support interval partition, this syntax can be commented during the conversion based on the mig_interval_partition value you configured. After the partition syntax is commented, the table will become a normal table (not a partitioned table) and you will miss out the partition benefits such as performance, manageability and availability.</p> <p>It can be handled manually by creating multiple tables (on different tablespaces) based on the interval partition conditions specified and do the appropriate changes wherever a table with partition syntax is referred.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
on_null_support	DEFAULT ON NULL clause	It is applicable if the input table scripts contain DEFAULT ON NULL keyword. A DEFAULT ON NULL clause will configure DEFAULT for a column even when a null value has been explicitly included in the INSERT statement. There is no equivalent in GaussDB.	Table	There is no equivalent in GaussDB. It can be handled by writing an INSERT trigger on a table.
generated_identity_support	IDENTITY columns	It is applicable if input table scripts contain IDENTITY columns using GENERATED AS IDENTITY.	Table, sequence	You can set this parameter to an appropriate value (such as, Serial , Small Serial , BIG Serial , or Default sequence).

Parameter	Feature Name	Description	Affected Object	Suggestion
read_only_table	Read only clause in tables	<p>It is applicable if the input table scripts contain read only keyword. In Oracle, tables are marked as read only using the ALTER TABLE command. When a table is in read-only mode, operations that attempt to modify table data are not allowed.</p>	Table	You can set this parameter to a proper value, for example, Comment , Ignore , or Trigger .

Parameter	Feature Name	Description	Affected Object	Suggestion
global_temp_table_support	Global temporary tables	<p>It is applicable if the input table scripts contain GLOBAL TEMPORARY keyword. A global temporary table is a permanent database object. Its table structure will be retained in the database even after the session is disconnected. A local temporary table is scoped to the session in which you created it. Its table is deleted once the session disconnects. GaussDB supports only local temporary tables.</p>	Table	<p>GaussDB distributed version does not support global temporary tables. So global temporary tables will be converted to local temporary tables based on the global_temp_table_support value. When a session ends, data in the local temporary tables is deleted, and the tables are deleted. However, only the data in global temporary tables is deleted.</p> <p>You call one user-defined function to check whether a temporary table exists in the places wherever the table is referred and create a table if not exists.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
comment_foreign_key	FOREIGN KEY constraints	It is applicable if the input scripts contain foreign keys.	Table, index	The distributed GaussDB does not support foreign keys. Foreign keys will be commented based on the comment_foreign_key value you configured. Comment foreign keys does not ensure that data remains consistent. This can be handled manually by writing applicable DML (Insert, Update, Delete) triggers on the source tables.
unused_column_support	UNUSED keyword	It is applicable if the input table scripts contain UNUSED keyword.	Table	You can set this parameter to a proper value. The value 0 indicates that no conversion is performed, and the value 1 indicates that unused columns are deleted.
bitmap_index	BITMAP index	It is applicable if CREATE INDEX statements contains BITMAP keyword.	Index	You can set this parameter to a proper value. The value 0 indicates that BITMAP index is not converted. The value 1 indicates that BITMAP index is commented. The value 2 indicates that BTREE index is created.
reverse_support	REVERSE keyword in CREATE INDEX statements	It is applicable if CREATE INDEX statements contain REVERSE keyword.	Index	You can set this parameter to a proper value. IGNORE indicates that REVERSE is not converted. COMMENT indicates that REVERSE is commented.
unsupported_func_index	Functions in indexes	It is applicable if CREATE INDEX statements contain unsupported functions like TRUNC function.	Index	You can set this parameter to a proper value. The value 0 indicates that no conversion is performed. The value 1 indicates that the CREATE INDEX statement is commented.

Parameter	Feature Name	Description	Affected Object	Suggestion
comment_table_space	Tablespace (Tablespace mapping has higher priority than this configuration)	It is applicable if CREATE TABLE and CREATE INDEX statements contain TABLESPACE keyword.	Tablespace, table	You can set this parameter to a proper value. The value FALSE indicates that TABLESPACE is not converted, and the value TRUE indicates that TABLESPACE is commented.
viewEditioning	EDITIONING views	It is applicable if the input view scripts contain EDITIONING keyword. In Oracle, it is allowed to create DML triggers on EDITIONING views.	View	You can set this parameter to a proper value. The value 0 indicates that EDITIONING is not converted. The value 1 indicates that EDITIONING is commented.

Parameter	Feature Name	Description	Affected Object	Suggestion
seq_max_min_value	Sequence value beyond the limit	It is applicable if sequence scripts contain MAXVALUE or MINVALUE, which is beyond the limits supported by GaussDB.	Sequence, table	<p>Oracle supports MAXVALUE and MINVALUE up to 10^{27} and -10^{26} respectively. If the input MINVALUE/MAXVALUE of a sequence goes beyond the limits (-9223372036854775808 to 9223372036854775807), it will be replaced with the boundary value based on the seq_max_min_value value you specified. If MINVALUE or MAXVALUE is beyond the limit, compiling the scripts on GaussDB will fail.</p> <p>Exceeding the size limit would be a very rare scenario. It can be handled by introducing a table which holds sequence details including the last sequence value, ascending/descending, increment value. Besides, the user-defined functions can be provided to match with NEXTVAL and CURRVAL functions in Oracle.</p>
otherthan_gregorian	Calendar types other than GREGORIAN	It is applicable if the input TO_DATE function contains calendar type other than GREGORIAN.	Table	<p>GaussDB supports only GREGORIAN calendar for TO_DATE and TO_TIMESTAMP. If other than GREGORIAN calendar is specified as third parameter in Oracle TO_DATE, it will be commented based on otherthan_gregorian you configured.</p> <p>Alternate solution is not available.</p>
default_schema	Setting default schema names	It is applicable if schema names are not provided in creating database objects.	schema	You need to set schema names to default names as required.

Parameter	Feature Name	Description	Affected Object	Suggestion
package_name_delimiter	Setting package name delimiters	It is applicable if the input scripts contain CREATE PACKAGE statements.	Function, trigger, and stored procedure	GaussDB supports packages in some versions. You can associate object names with the sub objects.
pkg_naming	Package	It is applicable for packages. Based on parameter configuration , you can use packages as schemas or merge package names along with procedure and function names.	Package	GaussDB supports packages in some versions. You can associate object names with the sub objects.
varray_size	PL/SQL tables	It is applicable if PL/SQL tables are used in stored procedures, functions and packages.	Package, function, and stored procedure	You can set the VARRAY size as required.
record_type_usage_handling	RECORD type	It is applicable when RECORD type is used in stored procedures, functions and packages.	Package, function, and stored procedure	-

Parameter	Feature Name	Description	Affected Object	Suggestion
deployment_type	Deployment mode	It is applicable for features supported by a deployment mode.	Package, function, and stored procedure	<p>There is a limitation in GaussDB that it supports only a list of data types for distribution key columns. If a table does not contain any of the columns with these data types, this table will fail to be created. Besides, if the data type of the first column (as primary key or unique constraint) is not any of the supported data types, this table will fail to be created.</p> <p>It is rare that all data types in a table are not supported. Based on configuration, the data type of the identified distribution column can be converted an equivalent and supported data type. For example, if the identified distribution column is defined with DOUBLE PRECISION data type (which is an unsupported data type for the distribution column), it can be converted to NUMBER.</p>
clob_function_support	CLOB in functions	It is applicable if functions contain one or more CLOB columns. In Oracle, the maximum size of CLOB data type is 4 GB. In GaussDB, the maximum size of CLOB/TEXT data type is 1 GB.	Function, stored procedure, trigger, and user-defined type	You can set this parameter to a proper value. IGNORE indicates no conversion is performed, and MIGRATE indicates CLOB data type is converted to a proper data type.

Parameter	Feature Name	Description	Affected Object	Suggestion
blob_datatype_show_error	BLOB data type	It is applicable if functions contain one or more BLOB columns. In Oracle, the maximum size of BLOB data type is 4 GB. In GaussDB, the maximum size of BLOB data type is 530 MB.	Table, function, stored procedure , trigger, and user-defined type	Oracle BLOB supports a maximum of 4 GB data. Even BLOB data type is supported by GaussDB, but it supports a maximum of 536862709 bytes (512 MB–8203 bytes). Based on the blob_datatype_show_error value you configured, UGO logs an error. If the column/variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown. Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.

Parameter	Feature Name	Description	Affected Object	Suggestion
temptable_schema_name_support	Conversion of global temporary table names	It is applicable if input table scripts contain GLOBAL TEMPORARY keyword and the instance is a distributed instance. A global temporary table will be converted to a local temporary table. In distributed mode, GaussDB does not support schema names for temporary tables.	Table	-

Parameter	Feature Name	Description	Affected Object	Suggestion
unique_in_distributed_env	Unique constraints and indexes in a distributed database with multiple data nodes	It is applicable if target databases with multiple data nodes contain unique constraints or indexes.	Table, index	<p>There is a limitation in GaussDB that the column list specified in primary key constraints or unique constraints or indexes should be a super set of distribution key column list. Due to this limitation, CREATE TABLE, ALTER TABLE ADD CONSENT and CREATE UNIQUE INDEX statements can fail in the distributed environment. Based on the unique_in_distributed_env value you configured, unique constraints/indexes will be commented, unique indexes will be converted to normal indexes (by commenting UNIQUE keyword), or distribution columns will be added to unique constraints/indexes. Because of this conversion, there is a possibility of creating duplicate records in tables and so it will also raise issues in creating referential integrity constraints in child tables.</p>
materialized_view_support	Materialized views	Materialized views are not migrated.	Materialized views	<p>GaussDB does not support materialized views. Materialized views will be converted as normal views. This is not equivalent conversion. Since data is precomputed and stored in materialized views, the query performance will be fast. After the materialized views are converted to common views, the performance is affected. To avoid affecting database performance, you can create denormalized tables and use triggers to maintain the tables.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
migrate_distributed_table	Migrating distributed tables and indexes	Tables and indexes in the distributed environment are not migrated.	Table, index	-
external_global_user_support	Global or external users	Based on configuration , you can ignore or comment GLOBAL or EXTERNAL USER statements or convert external/global users to normal database users.	System	-
system_role_support	System-defined roles	System roles cannot be granted to users. This configuration will handle such type of requirements.	System	-
gauss_version	GaussDB versions	Based on the configuration , UGO will migrate packages.	Package	-

Parameter	Feature Name	Description	Affected Object	Suggestion
list_partition_support	LIST partition	LIST partition is supported in some versions of GaussDB. This configuration will handle such type of requirements.	Table, index	<p>Distributed GaussDB does not support LIST partition. You can comment the LIST partition syntax during the conversion. After the partition syntax is commented, the table will become a normal table (not a partitioned table) and you will miss out the partition benefits such as performance, manageability and availability.</p> <p>It can be handled manually by creating multiple tables (on different tablespaces) based on the LIST partition conditions specified and do the appropriate changes wherever a table with partition syntax is referred.</p>
reserved_keyword_objectname_support	Case format of object names (as reserved keywords)	If object names contain reserved keywords, they will be converted to UPPERCASE or LOWERCASE based on this configuration .	Table, index, package, materialized view, function, stored procedure, trigger, user-defined type, view	-
udt_support	User-defined type	Some GaussDB versions do not support user-defined type. This configuration will handle such type of requirements.	Package, function, and stored procedure	-

Parameter	Feature Name	Description	Affected Object	Suggestion
hierarchical_clause_support	Hierarchical query	Some GaussDB versions do not support hierarchical query. This configuration will handle such type of requirements.	Package, materialized view, function, stored procedure, trigger, and view	-
bulk_collect_support	BULK COLLECT syntax	GaussDB V5R2 and later versions support the BULK COLLECT syntax. Based on this configuration, you can convert the BULK COLLECT syntax.	Package, function, stored procedure, and trigger	-
savepoint_support	SAVEPOINT syntax	GaussDB V5R2 and later versions support the SAVEPOINT syntax. This configuration will handle such type of requirements.	Package, function, stored procedure, and trigger	-
autonomous_transaction_support	AUTONOMOUS TRANSACTION syntax	GaussDB V5R2 does not support the AUTONOMOUS TRANSACTION syntax. This configuration will handle such type of requirements.	Package, stored procedure, function, and trigger	-

Parameter	Feature Name	Description	Affected Object	Suggestion
large_sq_cycle	CYCLE IN SEQUENCE syntax	GaussDB V5R1 does not support the CYCLE IN SEQUENCE syntax. This configuration will handle such type of requirements.	Sequence	-
udt_support_inside_package	User-defined type inside packages	GaussDB does not support the user-defined type. This configuration will handle such type of requirements.	Package, function, and stored procedure	-
insert_record_variable_support	RECORD VARIABLE in INSERT statements	GaussDB V5R2 does not support RECORD VARIABLE in INSERT statements. This configuration will handle such type of requirements.	Package, stored procedure, and function	-
forall_support	FOR ALL	GaussDB V5R2 does not support the FOR ALLSEQUENCE syntax. This configuration will handle such type of requirements.	Package, stored procedure, and function	-

Parameter	Feature Name	Description	Affected Object	Suggestion
rownum_support	ROWNUM	Some GaussDB V5R2 versions do not support ROWNUM. This configuration will handle such type of requirements.	Package, stored procedure, and function	-
pkg_cursor_variable_support	Cursor variables	GaussDB V5R2 does not support cursor variables defined in package specifications . This configuration will handle such type of requirements.	Package	-
subpartition_support	Sub partition	Some GaussDB V5R2 versions do not support the sub partition. This configuration will handle such type of requirements.	Table	-

Parameter	Feature Name	Description	Affected Object	Suggestion
subpartition_index_support	Index sub partition	Some GaussDB V5R2 versions do not support the index sub partition. This configuration will handle such type of requirements.	Table, index	-
utl_file_file_type_support	FILE_TYPE	GaussDB V5R2 does not fully support FILE_TYPE. This configuration will handle such type of requirements.	Package, stored procedure, and function	In Oracle, UTL_FILE.FILE_TYPE holds two columns. In GaussDB, FILE_TYPE holds only one column and the data types of available columns are different. GaussDB does not fully support UTL_FILE.FILE_TYPE. The parameter can be set to IGNORE or NUMBER . You are advised set it to NUMBER because it does not affect functions.
interval_partition_support	Interval partition	Some GaussDB V5R2 versions do not support the interval partition. This configuration will handle such type of requirements.	Table	-

Parameter	Feature Name	Description	Affected Object	Suggestion
hash_partition_support	Hash partition	Some GaussDB V5R2 versions do not support the hash partition. This configuration will handle such type of requirements.	Table	-
alter_synonym_owner	Synonyms	Some GaussDB V5R2 versions do not support synonyms. This configuration will handle such type of requirements.	Synonyms	-
any_index_privilege_support	Index privileges	GaussDB V5R2 provides different syntaxes for index privileges. This configuration will handle such type of requirements.	Index	-
any_trigger_privilege_support	Trigger privileges	GaussDB V5R2 provides different syntaxes for trigger privileges. This configuration will handle such type of requirements.	Trigger	-

Parameter	Feature Name	Description	Affected Object	Suggestion
create_any_object_privilege_support	Object privileges	GaussDB V5R2 provides different syntaxes for object privileges. This configuration will handle such type of requirements.	All objects	-
use_user_connection	User connection	It is applicable for users who need to execute objects on GaussDB V5R2	All objects	-
sqlplus_unsupported_command	SQL PLUS	GaussDB V5R2 does not support SQL PLUS commands. This configuration will handle such type of requirements.	SQL PLUS commands	<p>SQL PLUS tool used in Oracle has a set of commands which are not supported in GaussDB. This will have impact on file creation and alteration and the final results. SQL PLUS is used to avoid errors during UGO migration.</p> <p>GaussDB does not support SQL PLUS commands. You need to re-write the scripts using the GaussDB commands.</p>

Parameter	Feature Name	Description	Affected Object	Suggestion
unsupported_set_attributes_support	DBMS_SCHEDULER.SET_ATTRIBUTE	GaussDB V5R2 does not fully support DBE_SCHEDULER.SET_ATTRIBUTE which is equivalent to DBMS_SCHEDULER.SET_ATTRIBUTE in Oracle. This configuration will handle such type of requirements.	Stored procedure, function, trigger, package, job, schedule, program, credential, and job class	-
supported_set_attributes	DBMS_SCHEDULER.SET_ATTRIBUTE	This configuration will contain all the set-attributes supported by GaussDB to migrate Oracle DBMS_SCHEDULER.SET_ATTRIBUTE.	Stored procedure, function, trigger, package, job, schedule, program, credential, and job class	-
create_db_destination_support	DBMS_SCHEDULER.CREATE_DATABASE_DESTINATION	There is no equivalent for DBMS_SCHEDULER.CREATE_DATABASE_DESTINATION in GaussDB V5R2. This configuration will handle such type of requirements.	Stored procedure, function, trigger, package, job, schedule, program, credential, and job class	-

Parameter	Feature Name	Description	Affected Object	Suggestion
authid_support	AUTHID clause of PL/SQL objects	If AUTHID DEFINER/ INVOKER is not specified, you can determine whether AUTHID DEFINER is added or not based on the parameter configuration . In GaussDB V5R2C00 and later versions, the default value is AUTHID DEFINER , which matches the Oracle configuration . In GaussDB V5R1, the default value is AUTHID INVOKER .	Stored procedure , function, package, type	-
systemview_case_support	Object name case	GaussDB V5R2 stores database objects in lowercase, while Oracle stores objects in uppercase. This configuration will handle such type of requirements.	System view	-

Parameter	Feature Name	Description	Affected Object	Suggestion
special_character_objectname_support	Case format of object names containing special characters	The object names which include special characters in the target DB can be converted to UPPERCASE and LOWERCASE based on the parameter configuration .	Table, index, package, materialized view, function, stored procedure , trigger, user-defined type, view	-
create_object_privilege_support	Object-level privileges	GaussDB V5R2 does not support object-level privileges. This configuration will handle such type of requirements.	System	-
package_name_same_schema	Package name	It is applicable if packages and schemas have the same names.	Package	-
system_privilege_support	System privileges	GaussDB V5R2 does not support system privileges. This configuration will handle such type of requirements.	System	-

Parameter	Feature Name	Description	Affected Object	Suggestion
mismatch_charset_support	Mismatch character set	The source character set does not match the target character set. This configuration will handle such type of requirements.	All objects	-
src_character_set	Source character set	It is used to select the character set of the source database.	All objects	-
target_character_set	Target database character set	It is used to select the character set of the target database.	All objects	-

3.2.1.2.2 Oracle -> RDS for MySQL/GaussDB(for MySQL)

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
partition_columns_with_unique_constraint	Unique constraints for table column partition	It is applicable if the input table scripts contain the partition syntax with primary or unique keys.	Table, index	0	Ignore the migration. (Default value)	The migration is ignored, and compiling the migrated scripts on MySQL will fail. You need to manually change the value.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	Comment the partition syntax.	Partition can provide many benefits to applications by improving performance, manageability, and availability. After the partition syntax is commented, tables will become normal tables (not partitioned tables) and you will miss out the partition benefits specified above.
				2	Comment unique constraints (primary keys and unique keys).	Unique constraints help: <ul style="list-style-type: none"> • Avoid creating duplicate records in a table • Create referential integrity constraints • Accelerate database operations such as searching for records because indexes are created based on unique keys. After the unique constraints (primary keys and unique keys) are commented, you will miss out the benefits specified above.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				3	Add partition keys to the unique constraints (primary keys and unique keys).	After partition columns are added to the unique constraints (primary keys and unique keys), duplicate records may be created in the table.
plsql_delimiter	Setting PL/SQL delimiter	It is applicable if the input scripts contain PL/SQL blocks	Stored procedure, function, and trigger	\$\$	Use default delimiter for PL/SQL blocks	Thanks to delimiters, stored procedures, functions and triggers are executed as a single unit. Therefore, delimiters cannot be used in any PL/SQL scripts (procedures, functions, or triggers).

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
sql_mode_ansi_quotes	Setting SQL modes for handling object names	<p>It is applicable if different SQL modes are used to handle object names. In Oracle, if an object name contains any special character, is case-sensitive, or uses Oracle reserved words, the object name is quoted using double quotation marks ("")</p> <p>In MySQL, if ANSI_QUOTES (one of the sql_mode parameters) is set to false, replace "with `. If it is set to true, use ".</p>	Table	FALSE	Add ` as a prefix and suffix to the object name. (Default value)	In MySQL, ANSI_QUOTES (one of the sql_mode parameters) is set to false by default. If the value is false , replace "with `.
				TRUE	Add " as a prefix and suffix to the object name.	In MySQL, ANSI_QUOTES (one of the sql_mode parameters) is set to false by default. If the value is true, " in the object name remains unchanged.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
view_editing	EDITIONING views	It is applicable if the input view scripts contain EDITIONING keyword. In Oracle, it is allowed to create DML triggers on EDITIONING views.	View	0	No conversion will be happened. EDITIONING keyword will be retained as it is. (Default value)	MySQL does not support the EDITIONING keyword and the keyword remains unchanged. Compiling the migrated scripts on MySQL will fail. You need to manually change the value. If a DML trigger is created in views, the trigger should be rewritten in the base table without affecting the business logic.
				1	Comment EDITIONING keyword in view statements	MySQL does not support EDITIONING keyword, and this keyword will be commented. If a DML trigger is created in views, the trigger should be rewritten in the base table without affecting the business logic.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
error_backtrace	DBMS_UTILITY.FORMAT_ERROR_BACKTRACE	It is applicable if scripts contain DBMS_UTILITY.FORMAT_ERROR_BACKTRACE. It returns a string that traces the error back to the line where it occurred. There is no equivalent clause in MySQL.	Stored procedure, function, and trigger	0	Ignore the migration. (Default value)	The migration is ignored, and compiling the migrated scripts on MySQL will fail. You need to manually change the value.
				1	Convert and generate an error message by concatenating the RETURNED_SQLSTATE, MySQL_ERRNO, and MESSAGE_TEXT utilities in MySQL.	If the value is true , a MySQL error and the PL/SQL object name in the error location are returned.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
float_support	FLOAT data type	It is applicable if tables contain one or more FLOAT columns and FLOAT is specified as FLOAT/FLOAT(n), where n > 53 and if n is not provided, default value 126 is used.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	No conversion will happen. (Default value)	MySQL supports FLOAT type, which will be implicitly converted as DOUBLE PRECISION when 25 <= precision <= 53. The default (maximum) precision of FLOAT type in Oracle is 126. In MySQL, if the precision is greater than 53, an error is reported and the statement fails to be executed.
				DOUBLE	Convert the FLOAT type to the DOUBLE type.	The FLOAT type supports the precision ranging from 0 to 23. After it is converted to DOUBLE, the maximum precision is 53. If the precision of FLOAT is greater than 53, it is considered as 53.
bitmap_index	BITMAP index	It is applicable if CREATE INDEX statements contains BITMAP keyword.	Index	0	No conversion will be happened. BITMAP keyword will be retained as it is. (Default value)	Since BITMAP indexes are not supported by MySQL and will not be converted, compiling the migrated scripts on MySQL will fail. You need to manually correct the error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	Comment BITMAP indexes.	MySQL does not support BITMAP indexes, and the indexes are commented. This may cause performance issue when the indexed columns are used in search condition. Therefore, you should create proper indexes.
				2	Create BTREE indexes instead of BITMAP indexes.	BITMAP indexes are typically used for columns with a large number of duplicate values (low cardinality), while BTREE indexes are suitable for high cardinality columns. There is no exact equivalent for BITMAP indexes in MySQL. You can create BTREE indexes.
				3	Create HASH indexes instead of BITMAP indexes.	There is no exact equivalent for BITMAP indexes in MySQL. The HASH index can be considered if an indexed column is used only when = operator is used for comparison.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
large_table	Data type conversion when the sum of bytes used for string (CHAR & RAW) columns specified in a table exceeds the max_varchar_size_in_create_table value.	It is applicable if the sum of bytes used for string (CHAR & RAW) columns specified in a table exceeds the max_varchar_size_in_create_table value.	Table	0	Ignore the migration. (Default value)	Ignore the migration. Compiling the migrated scripts on MySQL will fail. You should manually correct the error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	If the sum of bytes used for string (CHAR & RAW) columns specified in a table exceeds the max_varchar_size_in_create_table value, the CHAR columns are converted to TEXT, and the RAW columns are converted to BLOB. As the storage size may increase slightly, the performance may decrease slightly.	

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
max_varchar_size_in_create_table	Setting the maximum size of VARCHAR columns in tables.	It is applicable if the input scripts on CREATE TABLE statements involve in setting the maximum size of VARCHAR columns.	Table	64000	The maximum size for the sum of VARCHAR and VARCHAR2 data types in CREATE TABLE statements should be considered as the value of large_table . If the value is large and exceeds the limit, the type will be	Every database has limitation on storage. Based on this configuration, the default maximum size of CHARACTER columns is 64000. If the value exceeds the limit, the column type will be converted to TEXT.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
					converted to TEXT.	
on_commit_delete_rows	ON COMMIT DELETE ROWS clause	It is applicable if the input scripts on CREATE TABLE statements contain ON COMMIT DELETE ROWS clause.	Table	0	Ignore the migration. (Default value)	The migration is ignored, and compiling the migrated scripts on MySQL will fail.
				1	Comment COMMIT DELETE ROWS in CREATE TABLE statements.	In Oracle, ON COMMIT DELETE ROWS specifies that the created global temporary table is a transaction-level temporary table. This means that each time a transaction is committed, the table is truncated (all rows are deleted). MySQL does not support ON COMMIT DELETE ROWS.
temp_table_global	Global temporary tables	It is applicable if scripts on CREATE TABLE statements contain the GLOBAL TEMPORAR Y clause.	Table	0	Ignore the migration. (Default value)	The migration is ignored, and compiling the migrated scripts on MySQL will fail.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	Comment the GLOB AL keyword in CREA TE GLOB AL TEMP ORAR Y TABL E state ment s.	Different from MySQL temporary tables, Oracle global temporary tables are permanent database objects. Data is stored in disks and visible to all sessions. However, data stored in global temporary tables is private to sessions. In MySQL, when sessions or connections end, temporary tables are automatically deleted and database objects are not stored permanently. MySQL does not support global temporary tables. Data access methods vary according to temporary tables.
unable_index	UNUSABLE index	It is applicable if input ALTER INDEX commands contain UNUSABLE keyword	Index	0	Ignore the migration. (Default value)	The migration is ignored, and compiling the migrated scripts on MySQL will fail.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	Comment the UNUSABLE keyword.	Oracle indexes may be in the UNUSABLE state after a maintenance operation is performed on tables or when ALTER INDEX statements are used to mark indexes as UNUSABLE. Loading tables or partitions by a direct path also leave indexes UNUSABLE. In MySQL, indexes cannot become UNUSABLE when ALTER INDEX statements are used. This configuration will comment the UNUSABLE keyword. You should manual update indexes.
				2	Make indexes invisible.	Indexes are invisible.
index_column_size_limit	Setting the maximum size of columns supported by an index	It is used for setting the maximum size of VARCHAR and VARCHAR2 columns supported by MySQL in CREATE INDEX statements.	Index, table	3072	Maximum size of index columns in CREATE INDEX statements.	You can specify the maximum size of an index column. The default value is 3072. If the index size is greater than the default value, the default value (3072) is used. This parameter limits the maximum size of indexes.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
index_column_size_exceed_limit	Big indexes	It is applicable to the scenario where CREATE INDEX statements are converted when the column size exceeds the specified limit.	Index	0	Ignore the migration.	The migration is ignored. Compiling the migrated scripts will fail.
				1	Comment CREATE INDEX statement.	CREATE INDEX statements are commented. No indexes will be created. You must manually create indexes. Otherwise, the performance is affected.
				2	Comment index expressions.	Index expressions will be commented.
				3	Reduce the size of index expressions.	If the size of an index expression exceeds 3072 bytes, this configuration reduces the size of the index expression. The part that exceeds the limit is deleted.
				4	Raise an error. (Default value)	If the index size exceeds the limit, the error log will be updated.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
default_schemma	Setting default schema names	It is applicable if schema names are not provided.	schema	-	The default schema name is used. The schema name cannot be empty.	
package_name_delimiter	Setting package name delimiters	It is applicable if scripts contain package names.	Stored procedure, function, and trigger	\$	Set a delimiter to form the name of a sub-object of a package during the Oracle package migration.	Delimiters are used for package conversion. For example, if the dollar sign (\$) is used as a delimiter, the name of the specified stored procedure or function in a package will be converted to packageName \$procedureName or packageName \$functionName. Sample delimiters are: \$#_ A delimiter string can contain a maximum of four characters. DOT(.) and any other special characters cannot be used as the delimiters.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
partition_with_multiple_columns	Table partitioning with multiple columns	It is applicable if input scripts contain partition syntax with multiple columns. The column data type is DECIMAL, DOUBLE or DATETIME.	Table	0	Ignore the migration. The input scripts remain unchanged. (Default value)	Ignore the migration. It is applicable if input scripts contain partition syntax with multiple columns. The column data type is DECIMAL, DOUBLE or DATETIME.
				1	Comment the entire partition.	The entire partition is commented. When the data volume is large, the performance is affected.
				2	Generate virtual columns.	Virtual columns are generated and the same virtual columns are used in the partition.
seqMode	Allowing / Restricting the conversion of SEQUENCE objects in statements	Allowing/Restricting the conversion of SEQUENCE objects in statements	Sequence	TRUE	Use functions to perform sequence operations. (Default value)	Sequences will be created using a tool. The operation is not supported by MySQL.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				FALSE	Ignore the migration.	The migration is ignored. Compiling the migrated scripts on MySQL will fail.
comment_tablespace	Tablespace	It is applicable if CREATE TABLE and CREATE INDEX statements contain TABLESPACE clause.	Tablespace, table	FALSE	Do not convert TABLESPACE. (Default value)	In MySQL, CREATE TABLE and CREATE INDEX statements support TABLESPACE clause. However, if the specified tablespace does not exist in MySQL, the CREATE TABLE and CREATE INDEX statements will fail to be executed. Before compiling the migrated scripts on MySQL, you need to create the required tablespace.
				TRUE	Comment TABLESPACE clauses.	The TABLESPACE clauses are commented. The default tablespace is used when a table or index is created.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
grant_support	GRANT	Object privileges	Table, view, index, stored procedure, and function	ignore	Do not convert GRANT statements. The scripts will be retained unchanged. (Default value)	In MySQL, object privileges are granted separately. This configuration will ignore the migration and script will be retained as it is.
				comment	Comment the entire GRANT statements.	In MySQL, object privileges are granted separately. This configuration will comment the entire GRANT statements.
sqlplus_unsupported_command	SQL PLUS	MySQL does not fully support SQL PLUS commands. This configuration will handle such type of requirements.	SQL PLU S commands	IGNORE	Ignore the migration. The script will be retained as it is.	MySQL does not support SQL PLUS commands. This configuration will ignore the script.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				COMMENT	Comment the SQL PLUS commands. (Default value)	MySQL does not support SQL PLUS commands. This configuration will comment the script.
				ERROR	Raise an error.	MySQL does not support SQL PLUS commands. This configuration will raise an error.
large_table	Big table	MySQL does not support tables with more than 65535 characters.	Table	0	Raise an error. (Default value)	MySQL does not support tables with more than 65535 characters.
				1	Migrate the script.	This configuration will migrate scripts.
				2	Ignore the migration. The script will be retained as it is.	This configuration will ignore the migration and the script remains unchanged.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
external_global_user_support	External and global users	MySQL does not support external and global users. Based on configuration, you can ignore global or external users, comment global or external users, or convert global or external users to common database users.	System	IGNORE	Ignore the migration. The script will be retained as it is. (Default value)	MySQL does not support external and global users. This configuration will ignore the migration.
				COMMENT	Comment the migration script.	MySQL does not support external and global users. This configuration will comment the script.
				DBUSER	Convert global or external users to common database users.	MySQL does not support external and global users. This configuration will convert global or external users to common database users.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
system_role_support	System-defined roles	In MySQL, system roles cannot be granted to users. This configuration will handle such type of requirements.	System	IGNORE	Ignore GRANT statements. (Default value)	In MySQL, system roles cannot be granted to users. This configuration will log an error during migration and ignore the GRANT statements.
				COMMENT	Comment GRANT statements.	In MySQL, system roles cannot be granted to users. This configuration will comment GRANT statements during migration.
				ERROR	Ignore the migration and log an error.	In MySQL, system roles cannot be granted to users. This configuration will ignore migration and log an error.
grant_support	GRANT	MySQL does not fully support GRANT. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is. (Default value)	MySQL does not fully support GRANT. This configuration will ignore the migration and the script remains unchanged.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				COMMENT	Comment the migration script.	MySQL does not fully support GRANT. Comment the script in the migration .
				IGNORE	Ignore the migration and log an error.	MySQL does not fully support GRANT. This configuration will ignore migration and log an error.
xmltype_support	XMLTYPE	MySQL does not support XMLTYPE. This configuration will handle such type of requirements.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Ignore the migration. The script will be retained as it is. (Default value)	MySQL does not support XMLTYPE. This configuration will ignore the migration and the script remains unchanged.
				LONGTEXT	Convert XMLTYPE to LONGTEXT.	MySQL does not support XMLTYPE. This configuration converts XMLTYPE to LONGTEXT.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				ERROR	Ignore the migration and log an error.	MySQL does not support XMLTYPE. This configuration will ignore migration and log an error.
bfile_support	BFILE	MySQL does not support BFILE. This configuration will handle such type of requirements.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Ignore the migration. The script will be retained as it is. (Default value)	MySQL does not support BFILE. This configuration will ignore the migration and the script remains unchanged.
				LONGTEXT	Convert BFILE to LONGTEXT.	MySQL does not support BFILE. This configuration converts BFILE to LONGTEXT.
				ERROR	Ignore the migration and log an error.	MySQL does not support BFILE. This configuration will ignore migration and log an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
user_name_case	User name case	The username in MySQL can contain uppercase letters and lowercase letters. This configuration will handle such type of requirements.	System	UPPER	Migrate the username in uppercase.	The username in MySQL can contain uppercase letters and lowercase letters. This configuration will migrate the username in uppercase.
				LOWER	Migrate the username in lowercase.	The username in MySQL can contain uppercase letters and lowercase letters. This configuration will migrate the username in lowercase.
				IGNORE	Ignore the uppercase and lowercase and no migration will happen.	The username in MySQL can contain uppercase letters and lowercase letters. This configuration will ignore the uppercase and lowercase and no migration will happen.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
role_name_case	Role name case	The role name in MySQL can contain uppercase letters and lowercase letters. This configuration will handle such type of requirements.	System	UPPER	Migrate the role name in UPPERCASE.	The role name in MySQL can contain uppercase letters and lowercase letters. This configuration will migrate the role name in UPPERCASE.
				LOWER	Migrate the role name in LOWERCASE.	The role name in MySQL can contain uppercase letters and lowercase letters. This configuration will migrate the role name in LOWERCASE.
				IGNORE	Ignore the UPPERCASE and LOWERCASE and no migration will happen.	The role name in MySQL can contain uppercase letters and lowercase letters. This configuration will ignore the UPPERCASE and LOWERCASE and no migration will happen.
user_profile_support	PROFILE	MySQL does not support PROFILE in users. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is.	MySQL does not support PROFILE in users. This configuration will ignore the migration and the script remains unchanged.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				COMMENT	This configuration will comment the script.	MySQL does not support PROFILE in users. Comment the script in the migration.
				ERROR	Ignore the migration and log an error. (Default value)	MySQL does not support PROFILE in users. This configuration will ignore migration and log an error.
role_support	Role	MySQL 5.7 does not fully support MySQL roles. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is.	MySQL 5.7 does not fully support MySQL roles. This configuration will ignore the migration and the script remains unchanged.
				COMMENT	Comment the script.	MySQL 5.7 does not fully support MySQL roles. This configuration will comment the script.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				ERROR	Ignore the migration and log an error. (Default value)	MySQL 5.7 does not fully support MySQL roles. This configuration will ignore migration and log an error.
grant_delegate_option_support	Delegate option	MySQL does not support DELIGATE option in grants. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is.	MySQL does not support DELIGATE option in grants. This configuration will ignore the migration and the script remains unchanged.
				COMMENT	Comment the script.	MySQL does not support DELIGATE option in grants. This configuration will comment the script partially in the migration.
				ERROR	Ignore the migration and log an error. (Default value)	MySQL does not support DELIGATE option in grants. This configuration will ignore migration and log an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
debug_priv_support	DEBUG privilege	MySQL does not support DEBUG privilege. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is.	MySQL does not support DEBUG privilege. This configuration will ignore the migration and the script remains unchanged.
				COMMENT	Comment the script.	MySQL does not support DEBUG privilege. This configuration will comment the script partially in the migration.
				ERROR	Ignore the migration and log an error. (Default value)	MySQL does not support DEBUG privilege. This configuration will ignore migration and log an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
grant_identify_support	GRANT IDENTIFIED BY	MySQL 8.0 does not support GRANT IDENTIFIED BY password. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is.	MySQL 8.0 does not support GRANT IDENTIFIED BY password. This configuration will ignore the migration and the script remains unchanged.
				COMMENT_IDEN_TIFIED_BY_STATEMENTS	Comment IDENTIFIED BY statements.	MySQL 8.0 does not support GRANT IDENTIFIED BY password. This configuration will comment IDENTIFIED BY statements.
				COMMENT_GRANT_STATEMENTS	Comment the entire GRANT statements.	MySQL 8.0 does not support GRANT IDENTIFIED BY password. This configuration will comment the entire GRANT statements.
				ERROR	Ignore the migration and log an error. (Default value)	MySQL 8.0 does not support GRANT IDENTIFIED BY password. This configuration will ignore migration and log an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
user_auth_support	Role authorization	MySQL roles do not support user authorization. This configuration will handle such type of requirements.	System	IGNORE	Ignore the migration. The script will be retained as it is. (Default value)	MySQL roles do not support user authorization. This configuration will ignore the migration and the script remains unchanged.
				COMMENT	Comment the script partially.	MySQL roles do not support user authorization. This configuration will comment the script partially.
				ERROR	Ignore the migration and log an error.	MySQL roles do not support user authorization. This configuration will ignore migration and log an error.

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Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
long_support	LONG data type	It is applicable if tables contain one or more LONG columns. In Oracle, the maximum size of LONG data type is 2 GB. In PostgreSQL, the maximum size of TEXT data type is 1 GB.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert LONG data type. (Default value)	PostgreSQL does not support LONG data type. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				TEXT	Convert LONG to TEXT.	In Oracle, the maximum size of LONG data type is 2 GB, but in PostgreSQL, the maximum size of TEXT data type is 1 GB. There is no equivalent for LONG data type in PostgreSQL. If the table column data is beyond the limit, the data change operations (INSERT/ UPDATE) fail and an error is thrown.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
longraw_support	LONG RAW data type	It is applicable if tables contain one or more LONG RAW columns. In Oracle, the maximum size of LONG RAW data type is 2 GB. In PostgreSQL, the maximum size of BYTEA data type is 1 GB.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert LONG RAW type. (Default value)	PostgreSQL does not support LONG RAW data type. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				BYTEA	Convert LONG RAW to BYTEA.	In Oracle, the maximum size of LONG RAW data type is 2 GB, but in PostgreSQL, the maximum size of BYTEA data type is 1 GB. There is no equivalent for LONG RAW data type in PostgreSQL. If the table column data is beyond the limit, the data change operations (INSERT/UPDATE) fail and an error is thrown.
clob_support	CLOB data type	It is applicable if tables contain one or more CLOB columns. In Oracle, the maximum size of CLOB data type is 4 GB. In PostgreSQL, the maximum size of TEXT data type is 1 GB.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert CLOB data type.	In Oracle, the maximum size of CLOB data type is 4 GB. PostgreSQL does not support CLOB data type. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				TEXT	Convert CLOB data type to TEXT.	In PostgreSQL, the maximum size of TEXT data type is 1 GB. If the table column data is beyond the limit, the data change operations (INSERT/UPDATE) fail and an error is thrown.
nclob_support	NCLOB data type	It is applicable if tables contain one or more NCLOB columns. In Oracle, the maximum size of NCLOB data type is 4 GB. In PostgreSQL, the maximum size of TEXT data type is 1 GB.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert NCLOB. (Default value)	PostgreSQL does not support NCLOB data type. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				TEXT	Convert NCLOB data type to TEXT.	In Oracle, the maximum size of NCLOB data type is 4 GB. In PostgreSQL, the maximum size of TEXT data type is 1 GB. If the table column data is beyond the limit, the data change operations (INSERT/UPDATE) fail and an error is thrown.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
blob_support	BLOB data type	It is applicable if tables contain one or more BLOB columns. In Oracle, the maximum size of BLOB data type is 4 GB. In PostgreSQL, the maximum size of BYTEA data type is 1 GB.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert BLOB data type. (Default value)	In Oracle, the maximum size of BLOB data type is 4 GB. PostgreSQL does not support BLOB data type. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				BYTEA	Convert BLOB data type to BYTEA.	In PostgreSQL, the maximum size of BYTEA data type is 1 GB. If the table column data is beyond the limit, the data change operations (INSERT/UPDATE) fail and an error is thrown.
float_support	FLOAT data type	It is applicable if tables contain one or more FLOAT columns and FLOAT is specified as FLOAT/FLOAT(n), where $n > 53$. If n is not provided, the default value 126 is used.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert FLOAT data type. (Default value)	PostgreSQL supports FLOAT data type, which is implicitly converted to DOUBLE PRECISION. In Oracle, the default precision (maximum precision) of FLOAT is 126. In PostgreSQL, if the FLOAT precision is greater than 53, an error will occur and the statement execution will fail.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				NUMERIC	Convert FLOAT / FLOAT(n) data type to NUMERIC.	In PostgreSQL, if no precision is specified for NUMERIC data type, the maximum number of digits before the decimal point is 131072, and the maximum number of digits after the decimal point is 16383. The stored values are more accurate.
				DOUBLE PRECISION	Convert FLOAT / FLOAT(n) data type to DOUBLE PRECISION.	DOUBLE PRECISION ranges from 1E-307 to 1E+308. The stored values may be approximately different. If there is a decimal part and the decimal digits are greater than 15, the remaining digits after the decimal point are rounded off.
number_with_zero_scale	NUMBER data type with zero scale	It is applicable if tables contain NUMBER with zero scale or NUMBER without scale.	Table, function, stored procedure, trigger, and user-defined type	0	Convert NUMBER to NUMERIC. (Default value)	PostgreSQL supports NUMERIC. The migration precision is exact.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	If the precision of NUMBER is between 1 and 4, it is converted to SMALLINT type. If the precision of NUMBER is between 5 and 9, it is converted to INT type. If the precision of NUMBER is between 10 and 18, it is converted to BIGINT type.	If the input script is whole numbers, INTEGER is a better option to improve performance, but its migration precision is not exact.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
SD_O_GEOOMETRY	SDO_GEOMETRY object type	It is applicable if tables contain SDO_GEOMETRY object type. There is no equivalent in PostgreSQL.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert SDO_GEOMETRY object type. (Default value)	PostgreSQL does not support SDO_GEOMETRY data type. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				TEXT	Convert SDO_GEOMETRY object type to TEXT.	Equivalent for SDO_GEOMETRY is not available in PostgreSQL. The DML statements should be corrected to store the TEXT data and to fetch the data into different object attributes.
MBRCOODLIST	MDSYS.MBRCOORDLIST object type	It is applicable if the table script contains MBRCOORDLIST object type. There is no equivalent in PostgreSQL.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert MBRCOODLIST object type. (Default value)	PostgreSQL does not support MBRCOORDLIST data type. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				TEXT	Convert MBRCOODLIST to TEXT.	There is no equivalent for MBRCOORDLIST in PostgreSQL. The DML statements should be corrected to store the TEXT data and to fetch the data into different object attributes.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
GEOMETRY	GEOMETRY object type	It is applicable if the table script contains GEOMETRY object type. There is no equivalent in PostgreSQL.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert GEOMETRY object type. (Default value)	PostgreSQL does not support GEOMETRY data type. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				TEXT	Convert GEOMETRY to TEXT.	There is no equivalent for GEOMETRY in PostgreSQL. The DML statements should be corrected to store the TEXT data and to fetch the data into different object attributes.
partition_columns_with_unique_constraint	Unique constraints for table column partition	It is applicable if table scripts contain the partition syntax and primary keys or unique keys.	Table, index	0	Ignore the migration. (Default value)	This configuration ignores the migration. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				1	Comment the partition syntax.	Partitions can provide many benefits to applications by improving performance, manageability, and availability. After the partition syntax is commented, tables will become normal tables (not partitioned tables) and you will miss out the partition benefits specified above.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				2	Comment unique constraints (primary keys and unique keys).	<p>Unique constraints help:</p> <ul style="list-style-type: none"> • Avoid creating duplicate records in a table • Create referential integrity constraints • Accelerate database operations such as searching for records because indexes are created based on unique keys. <p>After the unique constraints (primary keys and unique keys) are commented, you will miss out the benefits specified above.</p>
				3	Add partition keys to the unique constraints (primary keys and unique keys).	After partition columns are added to the unique constraints (primary keys and unique keys), duplicate records may be created in the table.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
mig_interval_partition	Interval partition in tables	It is applicable if table scripts contain interval partition syntax.	Table	IGNORE	Do not convert the INTERVAL partition syntax. (Default value)	PostgreSQL does not support the INTERVAL partition syntax. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				COMMENT	Comment the INTERVAL partition syntax.	After the INTERVAL partition syntax is commented, you will miss out the partition benefits in performance, manageability and availability.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
on_null_support	DEFAULT ON NULL clauses	It is applicable if the input table scripts contain DEFAULT ON NULL clauses. A DEFAULT ON NULL clause will configure DEFAULT for a column even when a null value has been explicitly included in the INSERT statement. There is no equivalent in PostgreSQL.	Table	IGNORE	Do not convert the DEFAULT ON NULL keyword. (Default value)	PostgreSQL does not support DEFAULT ON NULL clause. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				COMMENT	Comment the DEFAULT ON NULL keyword.	DEFAULT ON NULL does not support the DEFAULT ON NULL clause in PostgreSQL. It will be commented. If NULL is provided explicitly, the DML statements should be changed to store appropriate values.
generated_id_identity_support	IDENTITY columns	It is applicable if input table scripts contain IDENTITY columns using GENERATED AS IDENTITY.	Table, index	IGNORE	Do not convert IDENTITY columns. (Default value)	PostgreSQL does not support the GENERATED AS IDENTITY syntax. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				SERIAL	Convert IDENTITY columns to SERIAL columns.	SERIAL data type is four-byte auto-incrementing integer. Its range is 1 to 2,147,483,647. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.
				SMA LL SERI AL	Convert IDENTITY columns to small SERIAL columns.	Small SERIAL data type is two-byte auto-incrementing integer. Its range is 1 to 32,767. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.
				BIG SERI AL	Convert IDENTITY columns to big SERIAL columns.	Big SERIAL data type is eight-byte auto-incrementing integer. Its range is 1 to 9,223,372,036,854,775,807. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.
				DEF AUL T_SE Q	Create a sequence and use it as the default value.	The maximum and minimum values are $2^{63}-1$ and $-2^{63}-1$. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
read_only_table	Read-only keyword in tables	It is applicable if the input table scripts contain read only keyword. In Oracle, tables are marked as read only using the ALTER TABLE command. When a table is in read-only mode, operations that attempt to modify table data are not allowed.	Table	IGNORE	Do not convert the READ ONLY keyword	PostgreSQL does not support the READ ONLY keyword. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				COMMENT	Comment the READ ONLY keyword in ALTER TABLE statements. (Default value)	PostgreSQL does not support the READ ONLY keyword. It will be commented. The keyword is generally not used in application scripts, but is used in database maintenance. It can be handled by creating a trigger.
				TRIGGER	Create a trigger to support the READ ONLY mode.	If the parameter value is TRIGGER , a trigger can be created in READ ONLY mode.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
global_temp_table_support	Global temporary tables	It is applicable if the input table scripts contain GLOBAL TEMPORARY keyword. A global temporary table is a permanent database object. Its table structure will be retained in the database even after the session is disconnected. A local temporary table is scoped to the session in which you created it. Its table is deleted once the session disconnects. PostgreSQL supports only local temporary tables.	Table	0	Do not convert the GLOBAL keyword. (Default value)	A local temporary table will be created by PostgreSQL regardless of whether a global or local table is specified. If no temporary table exists, create it manually.
				1	Create a local temporary table.	A global temporary table will be converted to a local temporary table. If no temporary table exists, create it manually.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
bitmap_index	BITMAP index	It is applicable if CREATE INDEX statements contains BITMAP keyword.	Index	0	No conversion will be happened. BITMAP keyword will be retained as it is. (Default value)	PostgreSQL does not support BITMAP indexes. The indexes are not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				1	Comment BITMAP indexes.	PostgreSQL does not support BITMAP indexes. The indexes will be commented. When indexed columns are used in search criteria, performance problems may occur. Therefore, you should create proper indexes.
				2	Create BTREE indexes instead of BITMAP indexes.	BITMAP indexes are typically used for columns with a large number of duplicate values (low cardinality), while BTREE indexes are suitable for high cardinality columns. There is no exact equivalent for BITMAP indexes in PostgreSQL. You can create BTREE indexes.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				3	Create HASH indexes instead of BITMAP indexes.	There is no exact equivalent for BITMAP indexes in PostgreSQL. The HASH index can be considered if an indexed column is used only when = operator is used for comparison.
reverse_support	REVERSE keyword in CREATE INDEX statements	It is applicable if CREATE INDEX statements contain REVERSE keyword.	Index	IGNORE	Do not convert the REVERSE keyword. (Default value)	PostgreSQL does not support REVERSE indexes. The indexes will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				COMMENT	Comment the REVERSE keyword.	PostgreSQL does not support REVERSE indexes. The keyword will be commented. REVERSE indexes will be converted to common indexes supported by PostgreSQL. There is no exact equivalent for REVERSE indexes for PostgreSQL. You can use BETREE indexes.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
viewEditioning	EDITIONING views	It is applicable if the input view scripts contain EDITIONING keyword. In Oracle, it is allowed to create DML triggers on EDITIONING views.	View	0	Do not convert the EDITIONING keyword. (Default value)	PostgreSQL does not support the EDITIONING keyword. It will not be converted. Compiling the migrated scripts on PostgreSQL will fail. You should manually correct it. If a DML trigger is created in views, the trigger should be rewritten in the base table without affecting the business logic.
				1	Comment EDITIONING keyword in view statements	PostgreSQL does not support the EDITIONING keyword. It will be commented. If a DML trigger is created in views, the trigger should be rewritten in the base table without affecting the business logic.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
seq_max_minn_value	Sequence value beyond the limit	It is applicable if the sequence scripts contain MAXVALUE and MINVALUE. Their values are beyond the limits supported by PostgreSQL.	Table, sequence	0	Do not change the value of MINVALUE or MAXVALUE even if its value exceeds the lower or upper limit (9223372036854775808 or 9223372036854775807), compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.	Oracle supports MAXVALUE and MINVALUE up to 10^{27} and -10^{26} respectively. If the input MINVALUE/MAXVALUE of a sequence goes beyond the limit (-9223372036854775808 or 9223372036854775807), compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	If the input MINVALUE/MAXVALUE of a sequence goes beyond the limit (-9223372036854775808 or 9223372036854775807), the boundary value is used. The generated sequence value does not exceed the upper and lower limits of PostgreSQL.	

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
other than gregorian	Calendar types other than GREGORIAN	It is applicable if the input TO_DATE function contains calendar type other than GREGORIAN.	Table	0	If the third parameter is specified in TO_DATE and TO_TIMESTAMP, do not comment GREGORIAN calendar. (Default value)	PostgreSQL supports only the GREGORIAN calendar and the TO_DATE and TO_TIMESTAMP parameters. If other than GREGORIAN calendar is specified as a third parameter in Oracle TO_DATE function, GREGORIAN calendar will not be commented, but compiling the migrated scripts on PostgreSQL will fail. You should manually correct it.
				1	If the third parameter is specified in TO_DATE and TO_TIMESTAMP, comment GREGORIAN calendar.	If other than GREGORIAN calendar is specified as a third parameter in Oracle TO_DATE function, GREGORIAN calendar will be commented. Compiling the migrated scripts on PostgreSQL will success.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
object_name_combiner	Setting Object name combiners	It is applicable if the CREATE INDEX scripts contain schema names or the CREATE TABLE scripts contain partition syntax.	Function, stored procedure, and trigger	\$	Merge: - Schema names and index names in CREATED INDEX statements - Table names and partition names in CREATE PARTITION TABLE statements	Sample delimiters are: \${#}_ A delimiter string can contain a maximum of four characters. DOT(.) and any other special characters are not allowed for object_name_combiner .

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
default_schema	Setting default schema names	It is applicable if schema names are not provided in creating database objects.	schema	-	The default schema name is used for a database object whose schema name is not specified.	The default schema name is used and the schema name cannot be empty.
pls_ql_delimiter	Setting PL/SQL delimiter	It is applicable when the scripts contain PL/SQL object blocks (in stored procedures, functions, and packages).	Function, stored procedure, and trigger	\$\$	\$\$ is the default PL/SQL delimiter. You can change it.	Thanks to delimiters, stored procedures, functions and triggers are executed as a single unit. Therefore, delimiters cannot be used in any PL/SQL scripts (procedures, functions, or triggers).

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
package_name_delimiter	Setting package name delimiters	It is applicable if the input scripts contain CREATE PACKAGE statements.	Function, stored procedure, and trigger	\$	Set a delimiter to form the name of a sub-object of a package during the Oracle package migration.	Delimiters are used for package conversion. For example, if the dollar sign (\$) is used as a delimiter, the name of the specified stored procedure or function in a package will be converted to packageName \$procedureName or packageName \$functionName. Sample delimiters are: \$_ A delimiter string can contain a maximum of four characters. DOT(.) and any other special characters cannot be used as the delimiters.
commit_comment	COMMIT/ROLLBACK keyword	It is applicable if procedures or functions contain the COMMIT/ROLLBACK statements. According to PostgreSQL documentation, stored procedures and functions support COMMIT and ROLLBACK statements.	Stored procedure	FALSE	Do not convert COMMIT/ROLLBACK statements. (Default value)	According to PostgreSQL documentation, stored procedures and functions support COMMIT and ROLLBACK statements. However, in some PostgreSQL versions (earlier versions), stored procedures and functions do not support COMMIT & ROLLBACK. As a result, the stored procedures and functions fail to be executed. You should manually correct the error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				TRUE	Comment the COMMIT/ROLLBACK statements.	According to PostgreSQL documentation, stored procedures and functions support COMMIT and ROLLBACK statements. However, in some (earlier) versions of PostgreSQL, stored procedures and functions do not support COMMIT and ROLLBACK. COMMIT and ROLLBACK will be commented. You need to correct the PL/SQL code to ensure that the service logic, especially the rollback logic, is not affected.
comment_tablespace	Tablespace	It is applicable if CREATE TABLE and CREATE INDEX statements contain TABLESPACE clauses.	Tablespace, table	FALSE	Do not convert TABLESPACE . (Default value)	In PostgreSQL, the CREATE TABLE and CREATE INDEX statements supports TABLESPACE clauses. However, if the specified tablespace does not exist in PostgreSQL, the CREATE TABLE and CREATE INDEX statements will fail to be executed. Before compiling the migration scripts on PostgreSQL, you need to create the required tablespace.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				TRUE	Comment TABLESPACE .	The TABLESPACE clauses are commented. The default tablespace is used when a table or index is created.
pkg_naming	Package	It is applicable for packages. Based on parameter configuration, you can use packages as schemas or merge package names along with procedure and function names.	Package	pkg_as_schema	Convert packages to schemas.	PostgreSQL does not support packages. Package stored procedures and functions are converted into independent stored procedures and functions. These objects will be created in schemas with the same name as packages. They are not part of packages, so there may be performance issues.
grant_support	GRANT	Object privileges	Table, view, index, stored procedure, and function	ignore	Do not convert GRANT statements. The scripts will be retained unchanged. (Default value)	In PostgreSQL, object privileges are granted separately. This configuration will ignore the migration and scripts will be retained unchanged.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				comment	Comment the entire GRANT statements.	In PostgreSQL, object privileges are granted separately. This configuration will comment the entire GRANT statements.
sqlplus_unsupporated_command	SQL PLUS	PostgreSQL does not fully support SQL PLUS commands. This configuration will handle such type of requirements.	SQL PLUS commands	IGNORE	Ignore the migration. The script will be retained as it is.	PostgreSQL does not support SQL PLUS commands. This configuration will ignore the script.
				COMMENT	Comment the SQL PLUS commands. (Default value)	PostgreSQL does not support SQL PLUS commands. This configuration will comment the script.
				ERROR	Raise an error.	PostgreSQL does not support SQL PLUS commands. This configuration will raise an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
unlogued_table_support	NOLOGGING table	PostgreSQL does not support NOLOGGING tables. This configuration converts NOLOGGING tables to UNLOGGED tables.	Table	COMMENT	Comment NOLOGGING. (Default value)	PostgreSQL does not support NOLOGGING tables. This configuration will comment NOLOGGING and performance is affected.
				UNLOGGED	Convert NOLOGGING to UNLOGGED.	PostgreSQL does not support NOLOGGING tables. This configuration converts NOLOGGING to UNLOGGED and does not affect performance.
external_global_user_support	Global or external users	Based on configuration, you can ignore global or external users, comment global or external users, or convert global or external users to common database users.	System	IGNORE	Ignore the statements. (Default value)	PostgreSQL does not support global or external users. This configuration will log an error during migration and ignore the statements.
				COMMENT	Comment the entire CREATE USER statements.	PostgreSQL does not support global or external users. This configuration will comment CREATE USER statements. You should manually update the users as needed.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				DBUSER	Convert global or external users to common database users.	PostgreSQL does not support global or external users. This configuration will convert global or external users to common database users.
use_r_profile_support	PROFILE in CREATE USER statements	It is used to support the use of PROFILE in CREATE USER statements. Base on the configuration, you can choose to ignore the statements, comment the statements, or raise an error.	System	IGNORE	Ignore the statements. (Default value)	PostgreSQL does not support PROFILE. This configuration will ignore the statements.
				COMMENT	Comment the CREATE USER statements partially.	PostgreSQL does not support PROFILE. This configuration will comment the CREATE USER statements partially.
				ERROR	Raise an error.	PostgreSQL does not support PROFILE. This configuration will raise an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
user_edition_support	EDITION in CREATE USER statements	It is used to support the use of EDITION in CREATE USER statements. Base on the configuration, you can choose to ignore the statements, comment the statements, or raise an error.	System	IGNORE	Ignore the statements. (Default value)	PostgreSQL does not support EDITION. This configuration will ignore the statements.
				COMMENT	Comment the CREATE USER statements partially.	PostgreSQL does not support EDITION. This configuration will comment the CREATE USER statements partially.
				ERROR	Raise an error.	PostgreSQL does not support EDITION. This configuration will raise an error.
role_idendified_support	Use IDENTIFIED BY in CREATE ROLE statements.	This configuration is used to ensure role security.	System	RETAIN	Ignore the statements.	PostgreSQL does not fully support IDENTIFIED BY in the CREATE ROLE statements. This configuration will ignore the statements.
				COMMENT	Comment the CREATE ROLE statements partially.	PostgreSQL does not fully support IDENTIFIED BY in the CREATE ROLE statements. This configuration will comment the CREATE ROLE statements partially.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				Pass word	Use the password generated by the system to create a role.	PostgreSQL does not fully support IDENTIFIED BY in the CREATE ROLE statements. This configuration uses the password generated by the system to create a role.
				ERROR	Raise an error. (Default value)	PostgreSQL does not fully support IDENTIFIED BY in the CREATE ROLE statements. This configuration will raise an error.
local_temp_tablespace_support	LOCAL TEMPORARY TABLESPACE	This configuration is used to support LOCAL TEMPORARY TABLESPACE in CREATE USER or CREATE ROLE statements. Base on the configuration, you can choose to ignore the statements, comment the statements, or raise an error.	System	RETRAIN	Ignore the statements.	PostgreSQL does not support LOCAL TEMPORARY TABLESPACE. This configuration will ignore the statements.
				COMMENT	Comment CREATE ROLE or CREATE USER statements partially.	PostgreSQL does not support LOCAL TEMPORARY TABLESPACE. This configuration will comment CREATE USER or CREATE ROLE statements partially.
				ERROR	Raise an error. (Default value)	PostgreSQL does not support LOCAL TEMPORARY TABLESPACE. This configuration will raise an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
use_idendified_support	Use IDENTIFIED BY in the CREATE USER statements.	This configuration is used to support CREATE USER statements.	System	RETAIN	Ignore the statements. (Default value)	PostgreSQL does not fully support IDENTIFIED BY in CREATE USER statements. This configuration will ignore the statements.
				MIGRATE	Convert IDENTIFIED BY to PASSWORD.	PostgreSQL does not fully support IDENTIFIED BY in CREATE USER statements. This configuration will convert IDENTIFIED BY to PASSWORD.
				ERROR	Raise an error.	PostgreSQL does not fully support IDENTIFIED BY in CREATE USER statements. This configuration will raise an error.

3.2.1.2.4 Oracle -> RDS for PostgreSQL 11.5

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
longra_w_support	LONG RAW data type	It is applicable if tables contain one or more LONG RAW columns. In Oracle, the maximum size of LONG RAW data type is 2 GB. In RDS for PostgreSQL 11.5, the size of BYTEA data type is variable.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert LONG RAW type. (Default value)	RDS for PostgreSQL 11.5 does not support LONG RAW and it is not converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail.
				BYTEA	Convert LONG RAW to BYTEA.	Oracle LONG RAW supports up to 2 GB data; but the maximum size of BYTEA data type may vary in RDS for PostgreSQL 11.5. There is no equivalent for LONG RAW in RDS for PostgreSQL 11.5. If the table column data is beyond the limit, the data change operations (INSERT/UPDATE) fail and an error is thrown.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
long_data_type_shown_error	LONG data type	It is applicable if the database objects contain one or more LONG columns. In Oracle, the maximum size of LONG data type is 2 GB. In RDS for PostgreSQL 11.5, the maximum size of LONG data type is 1 GB.	Table, function, stored procedure, trigger, and user-defined type	TRUE	Do not convert LONG data type. LONG data type will remain as it is, and you will receive an error message. (Default value)	If Oracle supports 2 GB data for LONG data type. RDS for PostgreSQL 11.5 supports LONG data type, but internally converts it to the TEXT data type. If the data in a table column exceeds 1 GB, data change operations (INSERT/UPDATE) will fail and an error will be thrown.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				FALSE	Do not convert LONG data type. LONG data type will remain as it is, and you will not receive an error message.	If the data in a table column exceeds 1 GB, an error is thrown.
float_support	FLOAT data type	It is applicable if tables contain one or more FLOAT columns and FLOAT is specified as FLOAT/FLOAT(n), where $n > 53$. If n is not provided, the default value 126 is used.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert FLOAT data type. (Default value)	RDS for PostgreSQL 11.5 supports the FLOAT data type. In Oracle, the default precision (maximum precision) of FLOAT is 126. In RDS for PostgreSQL 11.5, if the FLOAT precision is greater than 53, an error will occur and the statement execution will fail.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				NUMBER	Convert FLOAT/FLOAT(n) to NUMBER.	In RDS for PostgreSQL 11.5, if no precision is specified for NUMBER data type, the maximum number of digits before the decimal point is 131072, and the maximum number of digits after the decimal point is 16383. RDS for PostgreSQL 11.5 internally converts NUMBER to NUMERIC. The stored values are more accurate.
				DOUBLE PRECISION	Convert FLOAT/FLOAT(n) data type to DOUBLE PRECISION.	RDS for PostgreSQL 11.5 supports DOUBLE PRECISION, but internally converts it to FLOAT8. FLOAT8 is a 4-byte floating point number.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
number_with_zero_scale	NUMBER data type with zero scale	It is applicable if tables contain NUMBER with zero scale or NUMBER without scale.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert NUMBER. RDS for PostgreSQL 11.5 supports NUMBER, but it is internally converted to NUMBERIC. (Default value)	Do not convert NUMBER. RDS for PostgreSQL 11.5 supports NUMBER. The migration precision is exact.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				INT	If the precision of NUMBER is between 1 and 4, it is converted to SMALLINT type. If the precision of NUMBER is between 5 and 9, it is converted to INT type. If the precision of NUMBER is between 10 and 18, it is converted to	If the input script is whole numbers, INTEGER is a better option to improve performance, but its migration precision is not exact.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
					BEGIN T type.	
SDO_GEOOMETRY object type		It is applicable if tables contain SDO_GEOMETRY object type.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert SDO_GEOMETRY object type. (Default value)	RDS for PostgreSQL 11.5 does not support SDO_GEOMETRY and it is not converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				TEXT	Convert SDO_GEOMETRY object type to TEXT.	There is no equivalent for SDO_GEOMETRY in RDS for PostgreSQL 11.5. The DML statements should be corrected to store the TEXT data and to fetch the data into different object attributes.
MBRCOODLIST object type	MDSYS.MBRCOODLIST object type	It is applicable if table scripts contain MDSYS.MBRCOODLIST object type.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert MBRCOODLIST object type. (Default value)	RDS for PostgreSQL 11.5 does not support MBRCOODLIST and it is not converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				TEXT	Convert MBR COORDLIST to TEXT.	There is no equivalent for MBRCOORDLIST in RDS for PostgreSQL 11.5. The DML statements should be corrected to store the TEXT data and to fetch the data into different object attributes.
GEOMETRY	GEOMETRY object type	It is applicable if the table script contains GEOMETRY object type.	Table, function, stored procedure, trigger, and user-defined type	IGNORE	Do not convert GEOMETRY object type. (Default value)	RDS for PostgreSQL 11.5 does not support GEOMETRY and it is not converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				TEXT	Convert GEOMETRY to TEXT.	There is no equivalent for GEOMETRY in RDS for PostgreSQL 11.5. The DML statements should be corrected to store the TEXT data and to fetch the data into different object attributes.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
partition_columns_with_unique_constraint	Unique constraints for table column partition	It is applicable if table scripts contain the partition syntax and primary keys or unique keys.	Table, index	0	Ignore the migration. (Default value)	This configuration ignores the migration. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				1	Comment the partition syntax.	Partitions can provide many benefits to applications by improving performance, manageability, and availability. After the partition syntax is commented, tables will become normal tables (not partitioned tables) and you will miss out the partition benefits specified above.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				2	Comment unique constraints (primary keys and unique keys).	<p>Unique constraints help:</p> <ul style="list-style-type: none"> • Avoid creating duplicate records in a table • Create referential integrity constraints (not supported by RDS for PostgreSQL 11.5). • Accelerate database operations such as searching for records because indexes are created based on unique keys. <p>After the unique constraints (primary keys and unique keys) are commented, you will miss out the benefits specified above.</p>
				3	Add partition keys to the unique constraints (primary keys and unique keys).	After partition columns are added to the unique constraints (primary keys and unique keys), duplicate records may be created in the table.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
mig_interval_partition	Interval partition in tables	It is applicable if table scripts contain interval partition syntax.	Table	IGNORE	Do not convert the INTERVAL partition syntax. (Default value)	RDS for PostgreSQL 11.5 does not support the INTERVAL partition syntax. It will not be converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				COMMENT	Comment the INTERVAL partition syntax.	After the INTERVAL partition syntax is commented, you will miss out the partition benefits in performance, manageability and availability.
on_nul_l_support	DEFAULT ON NULL clause	It is applicable if the input table scripts contain DEFAULT ON NULL keyword. A DEFAULT ON NULL clause will configure DEFAULT for a column even when a null value has been explicitly included in the INSERT statement.	Table	IGNORE	Do not convert the DEFAULT ON NULL keyword. (Default value)	RDS for PostgreSQL 11.5 does not support the DEFAULT ON NULL clause. It will not be converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				COMMENT	Comment the ON NULL keyword.	RDS for PostgreSQL 11.5 does not support the DEFAULT ON NULL clause. It will be commented. If NULL is provided explicitly, the DML statements should be changed to store appropriate values.
generate_identity_support	IDENTITY columns	It is applicable if input table scripts contain IDENTITY columns using GENERATED AS IDENTITY.	Table, sequence	IGNORE	Do not convert IDENTITY columns. (Default value)	RDS for PostgreSQL 11.5 does not support the GENERATED AS IDENTITY syntax. It will not be converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				SERIAL	Convert IDENTITY columns to SERIAL columns.	SERIAL data type is four-byte auto-incrementing integer. Its range is 1 to 2,147,483,647. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				SMA LL SERI AL	Convert IDEN TITY colu mns to small SERIA L colu mns.	Small SERIAL data type is two-byte auto-incrementing integer. Its range is 1 to 32,767. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.
				BIG SERI AL	Convert IDEN TITY colu mns to big SERIA L colu mns.	Big SERIAL data type is eight-byte auto-incrementing integer. Its range is 1 to 9,223,372,036,854,775,807. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.
				DEF AUL T_SE Q	Create a sequence and use it as the default value.	The maximum and minimum values are $2^{63}-1$ and $-2^{63}-1$. If the upper limit or lower limit is exceeded, an error will be reported and DML statements fail to be executed.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
read_only_table	Read-only keyword in tables	It is applicable if the input table scripts contain read only keyword. In Oracle, tables are marked as read only using the ALTER TABLE command. When a table is in read-only mode, operations that attempt to modify table data are not allowed.	Table	IGNORE	Do not convert the READ ONLY keyword	RDS for PostgreSQL 11.5 does not support the READ ONLY keyword. It will not be converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				COMMENT	Comment the READ ONLY keyword in ALTER TABLE statement. (Default value)	RDS for PostgreSQL 11.5 does not support the READ ONLY keyword. It will be commented. The keyword is generally not used in application scripts, but is used in database maintenance. It can be handled by creating a trigger.
				TRIGGER	Create a trigger to support the READ ONLY mode .	A trigger will be created to support the READ ONLY mode.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
bitmap_index	BITMAP index	It is applicable if CREATE INDEX statements contains BITMAP keyword.	Index	0	No conversion will be happened. BITMAP keyword will be retained as it is. (Default value)	RDS for PostgreSQL 11.5 does not support BITMAP indexes. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				1	Comment BITMAP indexes.	RDS for PostgreSQL 11.5 does not support BITMAP indexes. The indexes will be commented. When indexed columns are used in search criteria, performance problems may occur. Therefore, you should create proper indexes.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
rev_e_s_uppor_t	REVERSE keyword in CREATE INDEX statements	It is applicable if CREATE INDEX statements contain REVERSE keyword.	Index	IGNORE	Do not convert the REVERSE keyword. (Default value)	BITMAP indexes are typically used for columns with a large number of duplicate values (low cardinality), while BTREE indexes are suitable for high cardinality columns. There is no exact equivalent for BITMAP indexes in RDS for PostgreSQL 11.5. You can create BTREE indexes.
						There is no exact equivalent for BITMAP indexes in RDS for PostgreSQL 11.5. The HASH index can be considered if an indexed column is used only when = operator is used for comparison.
rev_e_s_uppor_t	REVERSE keyword in CREATE INDEX statements	It is applicable if CREATE INDEX statements contain REVERSE keyword.	Index	IGNORE	Do not convert the REVERSE keyword. (Default value)	RDS for PostgreSQL 11.5 does not support REVERSE indexes. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				COMMENT	Comment the REVERSE keyword.	RDS for PostgreSQL 11.5 does not support REVERSE indexes. The REVERSE keyword will be commented. The REVERSE indexes will be converted to common indexes supported by RDS for PostgreSQL 11.5. There is no exact equivalent for REVERSE index for RDS for PostgreSQL 11.5. You can use BTREE indexes.
vIEW EDITIONING	EDITIONING views	It is applicable if the input view scripts contain EDITIONING keyword. In Oracle, it is allowed to create DML triggers on EDITIONING views.	View	0	Do not convert the EDITIONING keyword. (Default value)	RDS for PostgreSQL 11.5 does not support the EDITIONING keyword. It will not be converted. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it. If a DML trigger is created in views, the trigger should be rewritten in the base table without affecting the business logic.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	Comment EDITI ONIN G keyword in view statements	RDS for PostgreSQL 11.5 does not support the EDITIONING keyword. It will be commented. If a DML trigger is created in views, the trigger should be rewritten in the base table without affecting the business logic.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
seq_max_min_value	Sequence value beyond the limit	It is applicable if the sequence scripts contain MAXVALUE and MINVALUE.	Sequence, table	0	Do not change the value of MINVALUE or MAXVALUE even if its value exceeds the lower or upper limit (9223372036854775808 or 9223372036854775807). (Default value)	Oracle supports MAXVALUE and MINVALUE up to 10^{27} and -10^{26} respectively. If the input MINVALUE/MAXVALUE of a sequence goes beyond the limit (-9223372036854775808 or 9223372036854775807), compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				1	If the input MINVALUE / MAXVALUE of a sequence goes beyond the limit (-9223372036854775808 or 9223372036854775807), the boundary value is used. The generated sequence value does not exceed the upper and lower limits of RDS for PostgreSQL 11.5.	

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
other than GREGORIAN	Calendar types other than GREGORIAN	It is applicable if the input TO_DATE function contains calendar type other than GREGORIAN.	Table	0	If the third parameter is specified in TO_DATE and TO_TIMESTAMP, do not comment GREGORIAN calendar. (Default value)	RDS for PostgreSQL 11.5 supports only GREGORIAN calendar and it supports only TO_DATE and TO_TIMESTAMP. If other than GREGORIAN calendar is specified as a third parameter in Oracle TO_DATE function, GREGORIAN calendar will not be commented, but compiling the migrated scripts on RDS for PostgreSQL 11.5 will fail. You should manually correct it.
				1	If the third parameter is specified in TO_DATE and TO_TIMESTAMP, comment GREGORIAN calendar.	If other than GREGORIAN calendar is specified as a third parameter in Oracle TO_DATE function, GREGORIAN calendar will be commented. Compiling the migrated scripts on RDS for PostgreSQL 11.5 will success.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
object_name_combiner	object_name_combiner parameter	It is applicable if the CREATE INDEX scripts contain schema names or the CREATE TABLE scripts contain partition syntax.	Function, stored procedure, and trigger	\$	Merge: - Schema names and index names in CREATEx state ment s - Table names and partition names in CREATEPARTITIONTABLE state ment s	Sample delimiters are: \${#}_ The name contains up to 4 characters. All special characters are not allowed.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
default_schema	Setting default schema names	It is applicable if schema names are not provided in creating database objects.	schema	-	The default schema name is used for a database object whose schema name is not specified.	The default schema name is used. The schema name cannot be empty.
varray_size	PL/SQL tables	It is applicable if PL/SQL tables are used in stored procedures, functions and packages.	Package, function, and stored procedure	1024	Change the size of VARRAY as required.	RDS for PostgreSQL 11.5 does not support table type. Therefore, PL/SQL tables will be converted to VARRAY tables. There will be no performance impact.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
package_name_delimiter	Setting package name delimiters	It is applicable if the input scripts contain CREATE PACKAGE statements.	Function, trigger, and stored procedure	\$	Set a delimiter to form the name of a sub-object of a package during the Oracle package migration.	Delimiters are used for package conversion. For example, if the dollar sign (\$) is used as a delimiter, the name of the specified stored procedure or function in a package will be converted to packageName \$procedureName or packageName \$functionName. Sample delimiters are: \$\#_ A delimiter string can contain a maximum of four characters. DOT(.) and any other special characters cannot be used as the delimiters.
comment_commit	COMMENT / ROLLBACK keyword	It is applicable if procedures or functions contain the COMMIT/ ROLLBACK statements.	Stored procedure	FALSE	Do not convert COMMIT/ ROLLBACK statements. (Default value)	RDS for PostgreSQL 11.5 does not support COMMIT and ROLLBACK in stored procedures/ functions. The stored procedures/ functions will fail to be executed. You should manually correct the error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				TRUE	Comment the COMMIT/ROLLBACK statements.	RDS for PostgreSQL 11.5 does not support COMMIT and ROLLBACK in stored procedures/functions. COMMIT and ROLLBACK statements will be commented. You need to correct the PL/SQL code to ensure that the service logic, especially the rollback logic, is not affected.
comment_tablespace	Tablespace	It is applicable if CREATE TABLE and CREATE INDEX statements contain TABLESPACE clauses.	Tablespace, table	FALSE	Do not convert TABLESPACE clauses. (Default value)	RDS for PostgreSQL 11.5 supports the tablespace clauses in CREATE TABLE and CREATE INDEX statements. However, if the specified tablespace does not exist in RDS for PostgreSQL 11.5, the CREATE TABLE and CREATE INDEX statements will fail to be executed. Before compiling the migration scripts on RDS for PostgreSQL 11.5, you need to create the required tablespace.
				TRUE	Comment TABLESPACE clauses.	The TABLESPACE clauses are commented. The default tablespace is used when a table or index is created.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
pk_g_naming	Package	It is applicable for packages. Based on parameter configuration, you can use packages as schemas or merge package names along with procedure and function names.	Package	pkg_as_schema	Convert packages to schemas.	RDS for PostgreSQL 11.5 does not support packages. Package stored procedures and functions are converted into independent stored procedures and functions. These objects will be created in schemas with the same name as packages. They are not the part of packages, performance may be affected.
				merge_pkg_packages	Merge the package names with package procedure names. (Default value)	RDS for PostgreSQL 11.5 does not support packages. Package stored procedures and functions are converted into independent stored procedures. The package names are merged with package procedure names. Independent stored procedures are not part of packages, performance may be affected.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
global_temp_table_support	Global temporary tables	<p>It is applicable if the input table scripts contain GLOBAL TEMPORARY keyword. A global temporary table is a permanent database object. Its table structure will be retained in the database even after the session is disconnected. A local temporary table is scoped to the session in which you created it. Its table is deleted once the session disconnects. RDS for PostgreSQL 11.5 supports only local temporary tables.</p>	Table	0	Do not convert the GLOBAL keyword. (Default value)	A local temporary table will be created by RDS for PostgreSQL 11.5 regardless of whether a global or local table is specified. If no temporary table exists, create it manually.
				1	Create a local temporary table.	A global temporary table will be converted to a local temporary table. If no temporary table exists, create it manually.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
grant_support	GRANT	Object privileges	Table, view, index, stored procedure, and function	ignore	Do not convert GRANT statement s. The script s will be retained unchanged. (Default value)	In RDS for PostgreSQL 11.5, object privileges are granted separately. This configuration will ignore the migration and scripts will be retained unchanged.
				comment	Comment the entire GRANT statement s.	In RDS for PostgreSQL 11.5, object privileges are granted separately. This configuration will comment the entire GRANT statements.
sql_plus_unsupported_command	SQL PLUS	RDS for PostgreSQL 11.5 does not fully support the SQL PLUS command. This configuration will handle such type of requirements.	SQL PLUS commands	IGNORE	Ignore the migration. The script will be retained as it is.	RDS for PostgreSQL 11.5 does not support the SQL PLUS command. This configuration will ignore the script.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				COMMENT	Comment the SQL PLUS commands. (Default value)	RDS for PostgreSQL 11.5 does not support the SQL PLUS command. This configuration will comment the script.
				ERROR	Raise an error.	RDS for PostgreSQL 11.5 does not support the SQL PLUS command. This configuration will raise an error.

3.2.1.2.5 MySQL -> GaussDB

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
long_text_support	LONGTEXT data type	GaussDB does not support LONGTEXT. This configuration will handle such type of requirements.	Table	Ignore	Ignore the migration. The scripts remain unchanged (default value).	GaussDB does not support LONGTEXT. This configuration will not migrate scripts.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				error	Raise an error and record the error information.	GaussDB does not support LONGTEXT. This configuration does not migrate the scripts and logs an error.
				text	Convert LONGTEXT to TEXT. A warning message is displayed.	The scripts will be migrated and a warning message is displayed during the migration. GaussDB TEXT supports a maximum size of 1 GB, whereas MySQL LONGTEXT supports 4 GB.
charset_support	Character set	GaussDB does not support character sets for database objects. This configuration will handle such type of requirements.	Schema, table	retain	Ignore the migration. The scripts remain unchanged (default value).	GaussDB does not support character sets for database objects. This configuration will not migrate scripts.
				comment	Comment charset statements	GaussDB does not support character sets for database objects. This configuration will comment the scripts.
				error	Ignore the migration. An error is recorded.	GaussDB does not support character sets for database objects. This configuration does not migrate the scripts and logs an error.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
integer_support	Integer	It is applicable if tables contain one or more INTEGER columns.	Table	integer	Convert INTEGER to INTEGER or SMALLINT.	The INTEGER type is converted to INTEGER or SMALLINT based on the precision of the integer type.
				numeric	Convert INTEGER to NUMERIC (default value).	The INTEGER type is converted to NUMERIC type with the corresponding precision based on the precision of the INTEGER type.
parser_gauss_sql_support	Parsing converted SQL statements	It is applicable to parse the converted SQL statements.	All objects	ignore	Ignore parsing (default value).	The converted scripts are not parsed.
				parse	Parse converted scripts.	The converted scripts are parsed.
default_on_update_support	DEFAULT ON UPDATE in tables	GaussDB does not support ON UPDATE in columns of tables. This configuration will handle such type of requirements.	Table	retain	Ignore the migration. The scripts remain unchanged.	The scripts remain unchanged.
				MIGRATE	Migration script and use triggers to implement ON UPDATE.	Migrate the script and use triggers to implement ON UPDATE.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				ERR OR	Ignore the migration and record the error information (default value).	GaussDB does not support ON UPDATE in columns of tables. This configuration does not migrate the scripts and logs an error.
long blob _support	LONG BLOB	GaussDB does not support LONGBLOB. This configuration will handle such type of requirements.	Table	ignore	Ignore the migration. The scripts remain unchanged (default value).	GaussDB does not support LONGBLOB. This configuration will not migrate scripts.
				error	Ignore the migration. An error is recorded.	GaussDB does not support LONGBLOB. This configuration does not migrate the scripts and logs an error.
				BLOB	Convert LONGBLOB to BLOB. The script will be migrated and a warning message will be displayed.	The scripts will be migrated and a warning message is displayed during the migration. GaussDB BLOB supports a maximum size of 1 GB, whereas MySQL LONGBLOB supports 4 GB.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
view_security_definer	SECURITY clauses in views	GaussDB does not support SECURITY clauses in views. This configuration will handle such type of requirements.	View	retain	(Default value) Do not migrate SECURITY clauses. The scripts remain unchanged.	GaussDB does not support SECURITY clauses in views. This configuration will not migrate scripts.
				error	Do not migrate SECURITY clauses. The scripts remain unchanged and an error is recorded.	GaussDB does not support SECURITY clauses in views. This configuration does not migrate the scripts and logs an error.
				comment	Comment SECURITY clauses. The scripts are migrated.	GaussDB does not support SECURITY clauses in views. This configuration will comment the scripts.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
view_wit_h_ch_eck_opti_on	CHECK OPTION in views	GaussDB does not support CHECK OPTION in views. This configuration will handle such type of requirements.	View	retain	Do not migrate CHECK OPTION and remain the scripts unchanged.	GaussDB does not support CHECK OPTION in views. This configuration will not migrate scripts.
				error	Do not migrate CHECK OPTION, remain the scripts unchanged, and log an error.	GaussDB does not support CHECK OPTION in views. This configuration does not migrate the scripts and logs an error.
				comment	Comment CHECK POINT and migrate the scripts.	GaussDB does not support CHECK OPTION in views. This configuration will comment the scripts.
collate_support	COLLATE	GaussDB does not support COLLATE in tables. This configuration will handle such type of requirements.	Schema, table	retain	Ignore the migration. The scripts remain unchanged.	GaussDB does not support COLLATE in tables. This configuration will not migrate scripts.
				comment	Comment COLLATE.	GaussDB does not support COLLATE in tables. This configuration will comment the scripts.

Parameter	Feature Name	Description	Affected Object	Parameter Value	Value Description	Remarks
				error	Ignore the migration. An error is recorded.	GaussDB does not support COLLATE in tables. This configuration does not migrate the scripts and logs an error.
real_as_float_in_sqLmodel	REAL type conversion	It is applicable if tables contain one or more REAL columns.	Table	TRUE	Convert REAL to FLOAT.	The REAL data type is converted to FLOAT.
				FALSE	Convert REAL to DOUBLE PRECISION.	The REAL data type is converted to DOUBLE PRECISION.

3.2.1.2.6 DB2 for LUW -> GaussDB

Parameter	Feature Name	Description	Affected Object	Remarks
blob_datatype_show_error	BLOB show_error	It is applicable if tables contain one or more BLOB columns. In DB2 for LUW, the BLOB data type can store a maximum of 2 GB data. In GaussDB, the BLOB data type can store a maximum of 1 GB data.	Table, function, stored procedure, trigger, and user-defined type	In DB2 for LUW, the BLOB data type can store a maximum of 2 GB data. In GaussDB, the BLOB data type can store a maximum of 1 GB data. Based on the blob_datatype_show_error value you configured, an error is reported. If the column/variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown. Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.
clob_datatype_show_error	CLOB show_error	It is applicable if tables contain one or more CLOB columns. In DB2 for LUW, the CLOB data type can store a maximum of 2 GB data. In GaussDB, the CLOB data type can store a maximum of 1 GB data.	Table, function, stored procedure, trigger, and user-defined type	In DB2 for LUW, the CLOB data type can store a maximum of 2 GB data. In GaussDB, the CLOB data type can store a maximum of 1 GB data. Based on the clob_datatype_show_error value you configured, an error is reported. If the column/variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown. Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.

Parameter	Feature Name	Description	Affected Object	Remarks
graphic_support	GRAPHIC	It is applicable if tables contain one or more GRAPHIC columns. GaussDB does not support GRAPHIC. You can modify this parameter to convert GRAPHIC to character string type.	Table, function, stored procedure, trigger, and user-defined type	GaussDB does not support GRAPHIC. This configuration will do the migration and GRAPHIC will be converted to NVARCHAR2 or RAW. There will be no impact as GRAPHIC columns contain string type values.
clob_support	DBCLOB	It is applicable if tables contain one or more DBCLOB columns. GaussDB does not support DBCLOB. You convert DBCLOB to CLOB type.	Table, function, stored procedure, trigger, and user-defined type	GaussDB does not support DBCLOB. This configuration will migrate the scripts and convert the data type to BLOB or CLOB. In DB2 for LUW, DBCLOB can store a maximum of 2 GB data. In GaussDB, BLOB/CLOB can store a maximum of 1 GB data. If the column/variable data size is beyond the limit, the data operations (Insert, Update and Variable assignment) will fail and an error will be thrown. Exceeding the size limit would be a very rare scenario. You can verify the actual data size and understand the maximum data size to be supported. If it is required, you can add one additional column and do appropriate changes wherever the column is referred.

Parameter	Feature Name	Description	Affected Object	Remarks
decfloat_support	DECFLOAT	It is applicable if tables contain one or more DECFLOAT columns. GaussDB does not support DECFLOAT columns. You can convert DECFLOAT columns to DOUBLE PRECISION columns.	Table, function, stored procedure, trigger, and user-defined type	GaussDB does not support DECFLOAT. This configuration will migrate the scripts and convert the data type to DOUBLE PRECISION.
xml_support	XML	It is applicable if tables contain one or more XML columns. GaussDB does not support XML. You can convert XML to a data type compatible with GaussDB.	Table, function, stored procedure, trigger, and user-defined type	GaussDB does not support XML. This configuration will migrate the scripts and convert the data type to TEXT or JSON.

Parameter	Feature Name	Description	Affected Object	Remarks
comment_tablespace	TABLESPACE	It is applicable if tables or indexes contain TABLESPACE. The TABLESPACE syntax of GaussDB is different from that of DB2 for LUW. You can comment the TABLESPACE syntax of DB2 for LUW or use the corresponding syntax instead.	Table, index	This configuration will migrate the scripts and comment TABLESPACE. The conversion does not affect functions.
schema_auth_support	AUTHORIZATION in schema creation	It is applicable if there is AUTHORIZATION in CREATE SCHEMA statements. If there is no user, GaussDB does not support AUTHORIZATION during schema creation.	schema	Comment AUTHORIZATION. The conversion does not affect functions.
cache_support	Cache in sequences	It is applicable to CACHE in sequences. GaussDB supports partial CACHE in sequences.	Sequence	Comment CACHE. The conversion does not affect functions.

Parameter	Feature Name	Description	Affected Object	Remarks
order_support	ORDER in sequences	It is applicable to ORDER in sequences. GaussDB does not support ORDER in sequences.	Sequence	Comment ORDER. The conversion does not affect functions.
index_random_support	RANDOM in indexes	It is applicable to RANDOM in indexes. GaussDB does not support RANDOM in indexes.	Index	Comment RANDOM. The conversion does not affect functions.
cluster_support	CLUSTER in indexes	It is applicable to CLUSTER in indexes. GaussDB does not support CLUSTER in indexes.	Index	Comment CLUSTER. The conversion does not affect functions.
long_comment_tablespace	LONG TABLESPACE	It is applicable if tables contain one or more LONG TABLESPACE columns. GaussDB does not support LONG TABLESPACE in tables.	Table	Comment LONG TABLESPACE. The conversion does not affect functions.
organize_by_with_columns	ORGANIZE BY	It is applicable if tables contain one or more ORGANIZE BY columns. GaussDB does not support ORGANIZE BY in tables.	Table	Convert ORGANIZE BY to ORIENTATION. The conversion does not affect functions.

Parameter	Feature Name	Description	Affected Object	Remarks
comment_check_option	WITH CHECK OPTION in views	It is applicable if there is WITH CHECK OPTION in CREATE VIEW statements. GaussDB does not support WITH CHECK OPTION.	View	Comment WITH CHECK OPTION. The conversion does not affect functions.
comment_rowmovement	ROW MOVEMENT in views	It is applicable if there is ROW MOVEMENT in CREATE VIEW statements. GaussDB does not support ROW MOVEMENT.	View	Comment ROW MOVEMENT. The conversion does not affect functions.
data_capture_support	DATA CAPTURE in schema creation	It is applicable if there is DATA CAPTURE in CREATE SCHEMA statements. GaussDB does not support DATA CAPTURE.	schema	Comment DATA CAPTURE. The conversion does not affect functions.
insert_select_support	SELECT in INSERT statements	It is applicable if there is SELECT in INSERT statements. GaussDB does not support SELECT when INSERT statements are executed.	View	Migrate SELECT in INSERT statements.

Parameter	Feature Name	Description	Affected Object	Remarks
update_order_support	ORDER BY in UPDATE statements	It is applicable if there is ORDER BY in UPDATE statements. GaussDB does not support ORDER BY when UPDATE statements are executed.	Table, view	Comment ORDER BY in UPDATE statements.
update_offset_support	OFFSET in UPDATE statements	It is applicable if there is OFFSET in UPDATE statements. GaussDB does not support OFFSET when UPDATE statements are executed.	Table, view	Comment OFFSET in UPDATE statements.
update_fetch_support	FETCH in UPDATE statements	It is applicable if there is FETCH in UPDATE statements. GaussDB does not support FETCH when UPDATE statements are executed.	Table, view	Comment FETCH in UPDATE statements.
delete_order_support	ORDER BY in DELETE statements	It is applicable if there is ORDER BY in DELETE statements. GaussDB does not support ORDER BY when DELETE statements are executed.	Table, view	Comment ORDER BY in DELETE statements.

Parameter	Feature Name	Description	Affected Object	Remarks
delete_offset_support	OFFSET in DELETE statements	It is applicable if there is OFFSET in DELETE statements. GaussDB does not support OFFSET when DELETE statements are executed.	Table, view	Comment OFFSET in DELETE statements.
delete_fetch_support	FETCH in DELETE statements	It is applicable if there is FETCH in DELETE statements. GaussDB does not support FETCH when DELETE statements are executed.	Table, view	Comment FETCH in DELETE statements.
insert_include_support	INCLUDE in INSERT statements	It is applicable if there is INCLUDE in INSERT statements. GaussDB does not support INCLUDE when INSERT statements are executed.	Table, view	Comment INCLUDE in INSERT statements.
delete_include_support	INCLUDE in DELETE statements	It is applicable if there is INCLUDE in DELETE statements. GaussDB does not support INCLUDE when DELETE statements are executed.	Table, view	Comment INCLUDE in DELETE statements.

Parameter	Feature Name	Description	Affected Object	Remarks
update_include_support	INCLUDE in UPDATE statements	It is applicable if there is INCLUDE in UPDATE statements. GaussDB does not support INCLUDE when UPDATE statements are executed.	Table, view	Comment INCLUDE in UPDATE statements.
query_optimization_support	QUERY OPTIMIZATION in CREATE VIEW statements	It is applicable if there is QUERY OPTIMIZATION in CREATE VIEW statements. GaussDB does not support QUERY OPTIMIZATION when CREATE VIEW statements are executed.	Table, view	Comment ENABLE QUERY OPTIMIZATION in CREATE VIEW statements.
comment_on_aliases_support	COMMENT	It is applicable to adding comments to synonyms. GaussDB does not support adding comments to synonyms.	Synonyms	Comment out the entire statements. The conversion does not affect functions.

Parameter	Feature Name	Description	Affected Object	Remarks
parser_gauss_sql_support	Parsing converted SQL statements	It is applicable to parse converted objects based on the GaussDB syntax and then check whether the converted syntax is correct.	All objects	Parse the converted SQL statement, and check whether the converted syntax is correct.

3.2.1.3 Viewing Logs

Scenarios

Data collection logs record the events that occur in an online evaluation project and the time when the events occur.

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** In the evaluation project task list, select the online project to be analyzed and choose **More > 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 3-25 Collection log details

The screenshot shows a table titled "Collection Trace" with three columns: "Event", "Details", and "Event Time". The table contains three rows of log entries:

Event	Details	Event Time
Object Collection Started	--	[redacted], 2022 10:35:55 GMT+08:00
Schema DDL Count Collection Started	{"Schema": "UGO"}	[redacted], 2022 10:35:55 GMT+08:00
Schema DDL Count Collection Completed	{"Schema": "UGO", "DDL Object Count": 821, "Status": "Su..."} [redacted], 2022 10:35:56 GMT+08:00	[redacted], 2022 10:35:56 GMT+08:00

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

----End

3.2.1.4 Running Differentiation Analysis and Viewing the Generated Report



This function is available when the source database type is Oracle or MySQL.

Scenarios

You can run a difference analysis of collected data during online 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 on the left, choose **Schema Migration > DB Evaluation**.

Step 3 In the evaluation project task list, select the online 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

3.2.1.5 Performing an Incremental Evaluation



- 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

- **Connection Type is Online.**
- 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.

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 In the evaluation project task list, select the online project to be analyzed and choose **More > Run Differential Analysis** in the **Operation** column.

Step 4 After the differentiation analysis is complete, choose **More > 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 Evaluation Project Details](#).

----End

3.2.1.6 Resuming a Stopped Project

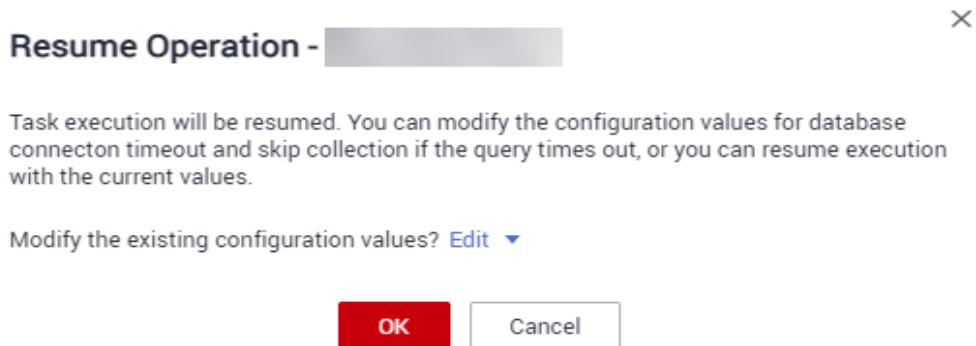
Prerequisites

Project Status of a online evaluation project is **Stopped**.

Procedure

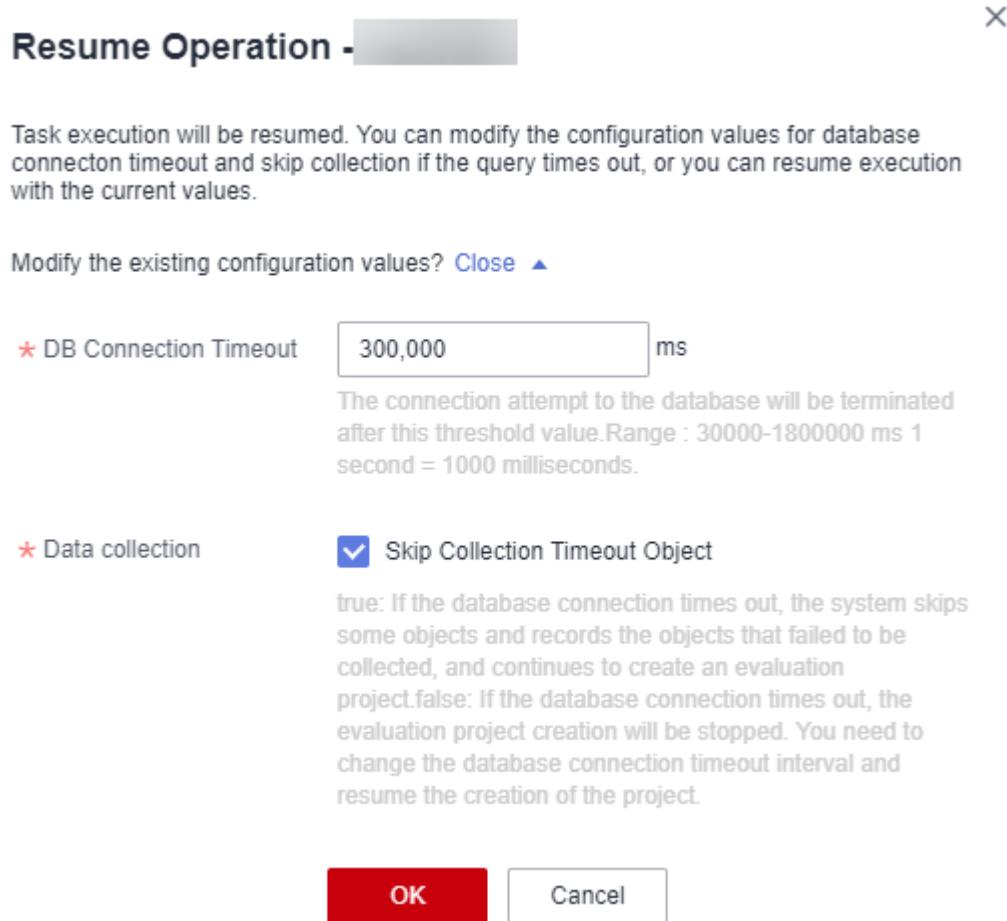
- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > DB Evaluation**.
- Step 3** In the evaluation project list, locate the online project whose **Project Status** is **Stopped** and click **Resume** in the **Operation** column.

Figure 3-26 Resuming an evaluation task



- Step 4** To use the current settings, click **OK**.
- Step 5** (Optional) To modify the current settings, click **Edit**. Then, configure **DB Connection Timeout** and **Data Collection**, and click **OK**.

Figure 3-27 Editing settings



- **DB Connection Timeout:** specifies the time limit within which the system attempts to connect to the database, in millisecond. Value: **30000** to **1800000**.
- **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 interval and resume the creation of the project.

----End

3.2.1.7 Deleting an Evaluation Project

Deleted projects cannot be recovered. Exercise caution when performing this operation.

Prerequisites

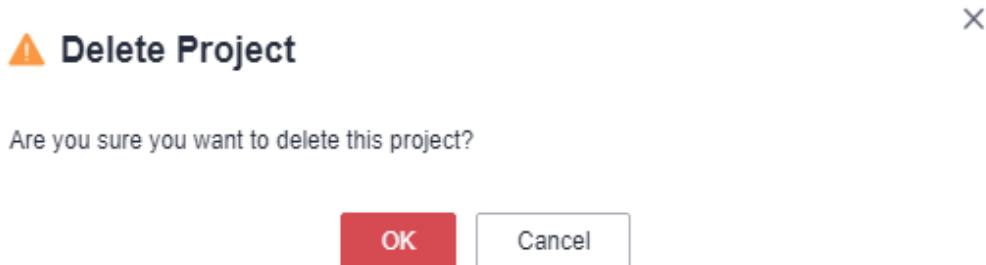
- The **Project Status** of an evaluation project is **Completed**. **Create Migration Project** or **In progress**. **Confirm Target DB Pending**.

- 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 on the left, 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**.

Figure 3-28 Deleting a project



----End

3.2.2 Object Migration

3.2.2.1 Viewing a Permission Check Report

Scenarios

Permission check reports describe the permissions and statuses of a user.

Prerequisites

When creating a migration project, set **Skip Permission Check** to **No** and ensure that the permission check is complete.

Procedure

- Step 1** In the navigation pane on the left, choose **Schema Migration > Object Migration**. The migration project list is displayed.
- Step 2** Locate a project and choose **More > View Permission Check Report** in the **Operation** column.

The list displays the permission type, schema name, description, and status.

The permission status can be **Pass**, **Fail**, or **Alarm**. If there is a permission whose **Status** is **Fail**, the project status is **Not ready**.

Figure 3-29 Permission check list

Permission Type	Schema Name	Description	Status
SYSADMIN Privilege		Check whether user has the sysadmin privilege	Pass
SCHEMA Create Permission		Permission to Create/Drop SCHEMA	Pass
SPECIFIC SCHEMA Create Permission	dsc_ora_public	Permission to Create/Drop SCHEMA	Pass

Close

Step 3 If there is a permission whose **Status** is **Alarm**, click to view its failure cause, details, solution, and hint.

----End

3.2.2.2 Checking Permissions



During the permission check, UGO will create a stored procedure in the target database for permission check. After the check is complete, the stored procedure will be automatically deleted.

Prerequisites

After a migration project is created or the target database connection is modified in a project, the automatic permission check fails and the project status is **Not ready**.

Procedure

- Step 1** In the navigation pane on the left, choose **Schema Migration > Object Migration**. The migration project list is displayed.
- Step 2** Locate a project and click **More > Check Permissions** in the **Operation** column. A message is displayed, indicating that the permission check of the target database is started successfully.
- If the check is successful, **Project Status** is **Ready**.
 - If the check fails, [view the permission check report](#), modify the failed permissions in the target database, and check the permissions again.

----End

3.2.2.3 Modifying the Target Database Connection

Scenarios

You can modify the target database connection, but the target database type cannot be modified.

Procedure

- Step 1** In the navigation pane on the left, choose **Schema Migration > Object Migration**. The migration project list is displayed.

Step 2 Locate the project and choose **More > Modify Target DB Connection** in the **Operation** column.

Figure 3-30 Modifying the target DB connection

The screenshot shows a configuration interface for modifying a target database connection. It consists of several sections:

- Top Section:** Contains fields for "Target DB Type" and "Target DB Version". Below these is a row with a red asterisk next to "Skip Permission Check" followed by "Yes" and "No" buttons. The "No" button is highlighted in blue.
- Middle Section:** Contains fields for "Host IP Address", "Host Port", "DB Name", "User Name", and "Password". Each field has a red asterisk indicating it is required. The "Password" field includes a visibility toggle icon.
- Section with Permission Check:** Contains a red asterisk next to "Permission Check" followed by two buttons: "System Admin" (highlighted in blue) and "Object Owner". A note below states: "Permission check for objects will be performed based on object owner."
- SSL Configuration Section:** Contains a "SSL Type" dropdown with three options: "No SSL" (highlighted in blue), "SSL No Auth", and "One Way SSL". A note below states: "Target database will be authenticated and the communication will be encrypted." It includes a text input field for "Enter the SSL truststore" with a visibility toggle icon and a "Add File" button. A note below the file upload area states: "Only upload JKS type certificate."
- Bottom Section:** Contains a red asterisk next to "Test Connection" followed by a "Start Test" button.

Table 3-17 Parameters description

Parameter	Description
Target DB Type	Target database type selected when you create an evaluation project.
Target DB Version	Target database version selected when you create an evaluation project.
(Optional) Skip Permission Check	<p>Whether to skip the permission check. The default value is No. If you select Yes, the generated permission check report is empty.</p> <p>NOTE To create objects in the target database, you must have some database permissions, such as creating tables and functions. If you skip the permission check, the system does not check whether you have these permissions.</p> <p>However, the migration may fail due to lack of permissions when SQL statements are converted on the target database.</p>
Host IP Address	<p>Host IP address of the new target database.</p> <p>For primary/standby GaussDB databases, you can enter the IP address of a primary node or IP addresses of all nodes. Separate multiple IP addresses with commas (,).</p>
Host Port	Port of the new target database.
DB Name	Database name of the new target database. The name contains up to 50 characters.
User Name	Username of the new target database. The user must have sysadmin role.
Password	Password of the new target database.
Checking Permissions	<p>System Admin: Check the permission of the system administrator to create objects.</p> <p>Object Owner: Check the permission of current user to create objects.</p> <p>NOTE Permission check is available only when the target database is GaussDB.</p>

Parameter	Description
(Optional) SSL Type	<ul style="list-style-type: none">No SSL: SSL is disabled and there may be potential security risks.SSL No Auth: SSL-encrypted database connection without authenticationOne Way SSL: SSL-encrypted database connection that uses a trust store certificate for server authentication<ul style="list-style-type: none">Upload a SQL file: Click Add File. On the displayed page, select All Files (*.*) for the file type, select the root certificate of the target database in JKS format, and upload it.Trust Store Password: Enter the password of the trust store used to access the certificate. <p>NOTE</p> <ul style="list-style-type: none">If you select One Way SSL, enter the correct uploaded file and entered password, which are private information of users.Secure Socket Layer (SSL) is an encryption-based Internet security protocol for establishing an encrypted link between a server and a client. It provides privacy, authentication, and integrity to Internet communications.

Step 3 Click Change Target DB connection.

- If the target database is GaussDB, the system checks the GaussDB compatibility mode. If the selected compatibility mode is different from that of the source database, the system notifies you of risks. This check result does not affect subsequent operations. For details about how to create GaussDB compatible with source databases, see [How Do I Create GaussDB Databases Compatible with Source Databases?](#)

NOTE

After the target database connection is modified, the permission check is automatically triggered. If the permission check is passed, the project status is **Ready**.

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

----End

3.2.2.4 Editing Conversion Configurations

3.2.2.4.1 Introducing Basic Functions of Conversion Configuration

Conversion Config

Scenarios

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. As a result, multiple reworks are required, affecting migration efficiency and user experience. Therefore, you can use conversion

configuration to reduce the manual update configuration and quickly and accurately complete the migration.

Constraints

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.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, 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. In the **Conversion Config** page, you can view the features, affected object types, and current configurations of the target database.

The features are sorted in ascending order based on the usage frequency (which may be used in the actual environment).

In the **Current Configuration** column, move the cursor to 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.

For details about the configuration items, see [Editing the Configurations During Migration from Oracle to GaussDB](#), [Editing the Configurations During Migration from MySQL to GaussDB](#) and [Editing the Configurations During Migration from DB2 for LUW to GaussDB](#).

- If the source database type is Oracle and the target database type is GaussDB:

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, tr...	If the object name contains special character, the object name would be retained in the target db.	Edit Configuration
Support for reserved keyword objectnames case format	table, index, Package, materialized view, function, procedure, tr...	The object names which are reserved keywords in the target db would be converted to UPPERCASE	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, including only letters, digits, underscores (_), and hyphens (-). It must start with a letter and end with a letter or digit.
- 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 the template you created in previous projects.
 - You can create up to 10 custom templates.
 - Deleted templates cannot be restored. Exercise caution when performing this operation.
 - If the source database type is MySQL or DB2 and the target database is GaussDB:
-
- | Features | Affected Object Types | Current Configuration | Operation |
|----------------------|-----------------------|---|--------------------|
| Support for LONGTEXT | Table | This config will do any migration and Error log will be written. | Edit Configuration |
| Support for charset | Schema, Table | This config will comment the charset feature. | Edit Configuration |
| Support for LONGLOB | Table | This config will do the migration along with the warning message. | Edit Configuration |
- Configure **Category** and click **Apply**.
 - To modify current configuration of a feature, locate the feature and click **Edit Configuration** in the **Operation** column.
- If the source database type is Oracle and the target database type is not GaussDB, you can directly modify the current configuration of a feature.

Features	Affected Object Types	Current Configuration	Operation
allow/restrict conversion of statement of SEQUENCE objects	sequence	It will use a function for perform sequence operations.	Edit Configuration
Support for Delegate option	system	This config will ignore the migration and error message will be updated in the log.	Edit Configuration
Support of float datatype	table, function, procedure, trigger, user defined types	If it is IGNORE, no conversion will happen.	Edit Configuration
Support for Grant IDENTIFIED BY	system	This config will do any migration and log the error in the error log.	Edit Configuration

----End

Tablespace Mapping

Scenarios

You need to create mappings between tablespaces in the source and target database. You can also use the default tablespaces without creating mappings.

Constraints:

- If the source database type is MySQL, disable the tablespace mapping function.
- If the target database type is GaussDB(for MySQL) or RDS for MySQL, disable the tablespace mapping function.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, 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 **Table Mapping**.

Figure 3-31 Tablespace mapping

The screenshot shows a software interface for managing database tablespaces. At the top, there are tabs for 'Configuration' and 'Tablespace Mapping', with 'Tablespace Mapping' being the active tab. Below the tabs is a section titled 'Source and Target tablespace mapping'. It contains two dropdown menus: 'Please select source tablespace' and 'Please select target tables...', followed by a 'Map Tablespace' button. A table below lists the mappings:

SN	Source Tablespace	Target Tablespace	Operations
1	SOE	DSC_DATA	Delete
2	XDATA_DEV_DATA	GDATA_DEV_DAT	Delete

Step 4 To add a tablespace mapping, select the required tablespaces of the source and target databases.

Step 5 Click **Map Tablespace**.

----End

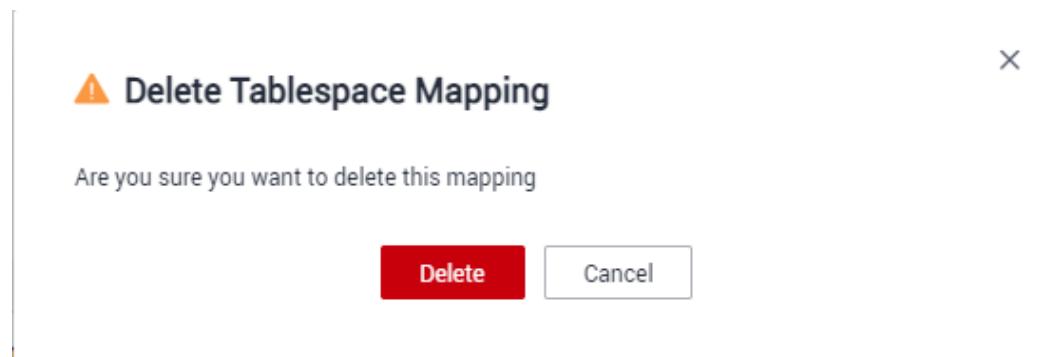


The tablespace mapping from source database to target database can be one-to-one or many-to-one.

Deleting a tablespace mapping:

Locate the tablespace to which the mapping has been added in the list, click **Delete** in the **Operation** column. In the displayed dialog box, click **Delete**.

Figure 3-32 Deleting a tablespace mapping



3.2.2.4.2 Editing the Configurations During Migration from Oracle to GaussDB

Symptom	Feature Name	Recommended Setting
When table structure of all Oracle features is collected, the verification success rate is low. All features cannot be covered due to a huge difference of the source and target databases.	Table structure conversion mode NOTE This feature can be configured only when the source database is Oracle and the target database is Primary/Standy GaussDB 2.7 Enterprise Edition.	Collect only the table names, column names, column constraints, index, and primary keys of tables. Impacts: 1. Table names, column names, column constraints, unique indexes, and primary keys are retained, but foreign keys, tablespaces, and physical storage are ignored. 2. LIST and RANGE partitions are remained, but HASH, INTERVA, automatic, level-2, and virtual column partitions are ignored. 3. If the conversion configuration items related to the feature are ignored, the processing will also be ignored.
For Oracle tables with the UNLOG attribute, logs can be recorded when the log level is FORCE LOGGING. However, after UNLOG is specified for GaussDB, logs are not recorded. As a result, data cannot be restored.	NOLOGGING	If logs are not required, convert NOLOGGING to UNLOGGED. Impact: GaussDB does not support NOLOGGING tables. This configuration converts NOLOGGING to UNLOGGED. After the conversion, the performance is not affected. The GAUSSDB UNLOGGED tables do not record logs.

Symptom	Feature Name	Recommended Setting
During object creation, the field values are in uppercase by default in Oracle, but are in lowercase in GaussDB. However, the field values in the quotation marks remain unchanged.	Case conversion for object names	Convert object names to lowercase letters.
If an object name is reserved keywords in GaussDB, the case of the object name will need to be converted.	Case form of reserved keywords in object names	If the object name contains reserved keywords written in uppercase, convert the keywords to lowercase. If the object name contains reserved keywords written in uppercase and lowercase, do not make any changes. If an object name contains reserved keywords, the object name remains unchanged and the double quotation marks ("") of the object name are not retained. The error information is recorded.
The distributed GaussDB does not support Oracle packages.	Package	Merge the package names along with the stored procedure names.
Primary/standby GaussDB 1.4 and all distributed GaussDB versions do not support FOREIGN KEY constraints.	FOREIGN KEY constraints	Comment FOREIGN KEY constraints.
GaussDB does not support CHARACTER_SET.	CHARACTER_SET	Comment CHARACTER_SET.
The character set size of GaussDB is different from that of Oracle.	Mismatch character set. (When converting SQL statement conversion, you need to configure the character sets of the source and target databases.)	Adjust the size of VARCHAR2(n).

Symptom	Feature Name	Recommended Setting
GaussDB 1.4 does not support the CYCLE IN SEQUENCE syntax.	CYCLE IN SEQUENCE	Comment CYCLE IN SEQUENCE in GaussDB V5R2 and earlier versions. The migrated script is compiled and no error is reported.
By default, the object names in system views created by the Oracle database are in uppercase, and object names in system views created by the GaussDB are in lowercase. If the object names with quotation marks are forcibly in uppercase, they cannot be referenced.	Object name case in system views	Convert object names to lowercase letters.
GaussDB V5R2 does not support CREATE privileges for objects such as tables, types, triggers, synonyms, sequences, and procedures. If the grants are not provided to the respecting objects, the object creation will fail.	Object-level privileges	Grant schema-level privileges.
GaussDB supports TABLESPACE causes in CREATE TABLE and CREATE INDEX statements. However, if the specified tablespace does not exist in GaussDB, the CREATE TABLE and CREATE INDEX statements will fail to be executed. The default tablespace is recommended.	TABLESPACE (Tablespace mapping has higher priority than this configuration.)	Comment TABLESPACE clauses.
Object cannot be executed in the target database due to insufficient privileges.	User connections	Set sysadmin to the user having the privilege to create and execute the GaussDB script.

Symptom	Feature Name	Recommended Setting
GaussDB 1.4 does not support the FOR ALL syntax used in stored procedures.	FOR ALL syntax	Migrate the script. FOR ALL is converted to FOR LOOP.
Oracle supports MAXVALUE and MINVALUE up to 10^{27} and -10^{26} respectively. MINVALUE/MAXVALUE of the input sequence goes beyond limit (-9223372036854775808 to 9223372036854775807) .	Sequence value beyond the limit	If the input MINVALUE or MAXVALUE of a sequence goes beyond the limits (-9223372036854775808 to 9223372036854775807), the MINVALUE or MAXVALUE will be replaced with the boundary value for distributed and primary/standby GaussDB 1.4 Enterprise Edition and the LARGE SEQUENCE value for primary/standby GaussDB 2.0 Enterprise Edition or later.
GaussDB does not support DBMS_SCHEDULER.CREATE_DATABASE_DESTINATION.	DBMS_SCHEDULER.CREATE_DATABASE_DESTINATION	Do not make any change for DBMS_SCHEDULER.CREATE_DATABASE_DESTINATION and do not migrate the script. An error message will be recorded.
GaussDB does not support the READ ONLY keywords. As a result, the migrated script fails to be compiled.	READ ONLY keywords	Comment the READ ONLY keywords in ALTER TABLE statements.
GaussDB 1.4 does not support RECORD VARIABLE used in the INSERT statements.	RECORD VARIABLE in INSERT statements	Migrate the script. RECORD VARIABLE in the INSERT statements will be split based on columns.

Symptom	Feature Name	Recommended Setting
Versions earlier than GaussDB 1.4 do not support AUTONOMOUS TRANSACTION and there is no equivalent.	AUTONOMOUS TRANSACTION	Comment AUTONOMOUS TRANSACTION. This configuration is used for GaussDB V5R1C20 and earlier versions. Compiling the migrated script will not throw any error.
If a table name does not contain schema, duplicate tables exist. As a result, the table fails to be created. NOTE This problem does not occur in primary/standby GaussDB.	Global temporary tablename conversion	A converted table name is a new name formed by merging schema name and table name separated by a delimiter.
GaussDB 1.4 does not support the SAVEPOINT syntax.	SAVEPOINT syntax	Comment SAVEPOINT. This configuration is used for GaussDB V5R1C20 and earlier versions. Compiling the migrated script will not throw any error.
GaussDB does not support system privileges. No system privileges will be given.	System privileges	Comment the entire SQL script.
GaussDB does not support the LONG data type. Compiling the migrated script will fail.	LONG data type	Convert LONG to TEXT.
Primary/standby GaussDB 1.4 and all distributed GaussDB versions do not support the SUB partition.	SUB partition	Migrate the script. The SUB partition is commented.
GaussDB does not support the LONG RAW data type.	LONG RAW data type	Convert LONG RAW to BYTEA.

Symptom	Feature Name	Recommended Setting
GaussDB supports the FLOAT data type, which is implicitly converted to DOUBLE PRECISION. In Oracle, the default precision (maximum precision) of FLOAT is 126. In GaussDB, if the FLOAT precision is greater than 53, an error will occur and the statement execution will fail.	FLOAT data type	Convert FLOAT/FLOAT(n) to NUMBER. If you want to retain the FLOAT type and want the precision to be greater than 53 or be empty, convert FLOAT/FLOAT(n) to FLOAT(53).
The distributed GaussDB does not support the LIST partition.	LIST partition	Ignore the LIST partition.
System roles cannot be granted to the users in GaussDB.	System roles	Comment the entire Grant statement.
GaussDB V5R1 does not support ROWNUM used in stored procedures and DML statements. The distributed GaussDB does not support ROWNUM.	ROWNUM	Convert the script. ROWNUM is covered to LIMIT.
Primary/standby GaussDB 1.4 and all distributed GaussDB versions do not support Oracle hash partitions.	HASH partition	Comment the HASH partition.
For distributed GaussDB, if there are no distribution keys, the execution fails.	Unique constraints and indexes in a distributed (multi data nodes) environment	Add distribution keys.
The name of the user who creates the synonym is different from the name of the object owner.	Synonym	Add ALTER statement to change the owner details.
GaussDB does not support the GENERATED AS IDENTITY syntax.	IDENTITY columns	Convert IDENTITY columns to SERIAL columns.

Symptom	Feature Name	Recommended Setting
GaussDB V5R1 does not support user-defined types.	User-defined types	Convert user-defined types.
GaussDB 1.4 does not support the BULK COLLECT syntax.	BULK COLLECT syntax	Convert the BULK COLLECT syntax. This configuration applies to GaussDB V5 R1C20 and earlier versions.
If GaussDB does not support SET_ATTRIBUTE specified by Oracle, the migration will fail. SET_ATTRIBUTE supported by GaussDB includes: START_DATE, REPEAT_INTERVAL, END_DATE, COMMENTS, PROGRAM_TYPE, PROGRAM_ACTION, NUMBER_OF_ARGUMENTS, SCHEDULE_NAME, JOB_TYPE, JOB_ACTION, JOB_CLASS, ENABLED, AUTO_DROP, CREDENTIAL_NAME, DESTINATION_NAME, PROGRAM_NAME, JOB_STYLE.	DBMS_SCHEDULER.SET_ATTRIBUTE	If the given SET_ATTRIBUTES is not supported by GaussDB, comment DBMS_SCHEDULER.SET_ATTRIBUTE.
GaussDB does not support REVERSE indexes.	REVERSE keywords	Comment REVERSE
GaussDB V5R1 and GaussDB V5R2 do not support the AUTHID clauses.	AUTHID clauses of the PL/SQL objects	If AUTHID DEFINER/INVOKER is not specified, add AUTHID DEFINER to match the Oracle configurations. This configuration applies to GaussDB V5R2 because this version does not match the Oracle configuration by default.
GaussDB does not support the NCLOB data type.	NCLOB data type	Convert NCLOB to TEXT.

Symptom	Feature Name	Recommended Setting
GaussDB does not support the XMLTYPE data type.	XMLTYPE data type	Convert XMLTYPE to JSON.
If functions specified in CREATE INDEX statements are not supported by GaussDB, an error is reported during index creation.	Functions in indexes	Comment the CREATE INDEX statements with unsupported functions.
GaussDB V5R1 does not support the INTERVAL partition.	INTERVAL partition	Comment the INTERVAL partition.
GaussDB does not support external and global users.	Global or external users	Comment the entire CREATE USER statements.
GaussDB does not support the MBRCOORDLIST object type.	MDSYS.MBRCOORDLIST object type	Convert MBRCOORDLIST to TEXT.
GaussDB does not support BITMAP indexes.	BITMAP indexes	Create BTREE indexes instead of BITMAP indexes.
Distributed GaussDB does not support global temporary tables.	Global temporary tables	Create local temporary tables
GaussDB does not support the DEFAULT ON NULL clauses.	DEFAULT ON NULL clauses	Comment the ON NULL keywords.
In Oracle, the maximum size of CLOB data type is 4 GB. GaussDB supports the CLOB data type. In primary/standby GaussDB V5R2C10 and later versions, a maximum of 32 TB data can be stored. In other versions, a maximum of 1 GB data can be stored. If the value exceeds the threshold, an error is reported.	CLOB data type	Do not convert the CLOB data type. GaussDB supports the CLOB data type. In Oracle, the maximum size of CLOB data type is 4 GB. GaussDB supports the CLOB data type. In primary/standby GaussDB V5R2C10 and later versions, a maximum of 32 TB data can be stored. In other versions, a maximum of 1 GB data can be stored.

Symptom	Feature Name	Recommended Setting
GaussDB V5R2 does not support SQL PLUS commands.	SQL PLUS	Comment SQL PLUS.
In Oracle, the maximum size of BLOB data type is 4 GB. GaussDB supports the BLOB data type. In primary/standby GaussDB V5R2C10 and later versions, a maximum of 32 TB data can be stored. In other versions, a maximum of 1 GB data can be stored. If the table column data is beyond the limit, the data change operations (INSERT/UPDATE) fail and an error is thrown.	BLOB data type	Do not convert BLOB. GaussDB supports the BLOB data type. In Oracle, the maximum size of BLOB data type is 4 GB. GaussDB supports the BLOB data type. In primary/standby GaussDB V5R2C10 and later versions, a maximum of 32 TB data can be stored. In other versions, a maximum of 1 GB data can be stored.
GaussDB does not support the GEOMETRY data type.	GEOMETRY data type	Convert GEOMETRY to TEXT.
GaussDB supports only GREGORIAN calendar and it supports only TO_DATE and TO_TIMESTAMP. If the third parameter is specified in TO_DATE and TO_TIMESTAMP, compiling the script will fail.	Calendar type other than GREGORIAN	If the third parameter is specified in TO_DATE and TO_TIMESTAMP, comment GREGORIAN calendar.
GaussDB partially supports UPDATE PHYSICAL VIEW.	PHYSICAL VIEW REFRESH	Comment UPDATE PHYSICAL VIEW.
GaussDB V5R1 does not support hierarchical queries.	Hierarchical queries	Migrate the hierarchical queries.
GaussDB does not support the SDO_GEOMETRY data type.	SDO_GEOMETRY	Convert SDO_GEOMETRY object type to TEXT.
GaussDB does not support the EDITIONING keywords.	EDITIONING keywords	Comment the EDITIONING keywords in view statements.

Symptom	Feature Name	Recommended Setting
GaussDB does not support the UNUSED keywords in the ALTER TABLE statements.	UNUSED keywords	Delete unused columns from tables.
The distributed GaussDB 1.4 and 2.7 do not support the same name of the Oracle schema and package.	Package names	Migrate the script. Double quotation marks are added to package names.
Tables in Oracle contain NUMBER data type with zero scale, for example, NUMBER(10)	NUMBER data type with zero scale	If the precision of NUMBER is between 1 and 4, it is converted to SMALLINT type. If the precision of NUMBER is between 5 and 9, it is converted to INT type. If the precision of NUMBER is between 10 and 18, it is converted to BIGINT type.
GaussDB does not support the SYS_OP_C2C functions.	SYS_OP_C2C	Comment the names of the SYS_OP_C2C functions.
For natively supported objects, if there are some syntax compatibility problems, it is required to verify them.	Parsing converted SQL statements	Parse the converted SQL statements.
GaussDB does not support the MONITORING clauses in the CREATE TABLE statements.	MONITORING	Comment MONITORING in the CREATE TABLE statements.
GaussDB does not support automatic table partitioning.	Automatic partitioning for tables	Comment the automatic partitioning statements.
The ctids in GaussDB supports the conversion of partially rowids in Oracle.	rowid expression	GaussDB supports only some HINT scenarios.
GaussDB supports only some HINT scenarios.	HINT Tuning	Comment HINT clauses and provide a risk warning.

Symptom	Feature Name	Recommended Setting
GaussDB does not support NOLOGGING in partitioned tables.	NOLOGGING in partitioned tables	Comment NOLOGGING.
GaussDB does not support generated columns.	Generated columns as partition keys	Comment the partitioned table scripts and convert tables to non-partitioned tables.
The invoking permission of some GaussDB objects of earlier versions is INVOKER.	AUTHID clauses of the PL/SQL objects	In GaussDB R2, if AUTHID DEFINER/ INVOKER is not specified, add AUTHID DEFINER to match the Oracle configurations. In GaussDB R2, do not add AUTHID DEFINER.
In Oracle, the maximum size of CLOB data type is 4 GB. GaussDB supports the CLOB data type. In GaussDB 1.4, a maximum of 32 TB data can be stored. In other versions, a maximum of 1 GB data can be stored. If the size exceeds the limit, the process fails and an error is reported.	CLOB data type in functions	Do not convert CLOB data type, but its storage is limited.
GaussDB does not allow GRANT ANY OBJECT PRIVILEGE clauses.	GRANT ANY OBJECT PRIVILEGE clauses	Convert the script based on the target database syntax.
For a table with both a partition key and a unique index, the partition key must appear in the unique index. NOTE This feature can be configured only when the source database is Oracle and the target database is GaussDB 1.4 Enterprise Edition or earlier.	Table column partition with unique constraint	Add partition columns to the unique constraints (primary keys and unique keys).
GaussDB does not support external tables.	External table conversion	Comment external tables and convert them to ordinary tables.

3.2.2.4.3 Editing the Configurations During Migration from MySQL to GaussDB

Symptom	Feature Name	Recommended Setting
GaussDB 3.2 Enterprise Edition and later versions support the character set of specified tables.	CHARSET	Comment CHARSET.
GaussDB 3.2 Enterprise Edition and later versions support COLLATE of specified tables.	COLLATE	Comment COLLATE.
GaussDB does not support SECURITY clauses in views.	SQL SECURITY clauses	Migrate SECURITY clauses.
GaussDB does not support CHECK OPTION clauses in views.	CHECK OPTION clauses	Migrate CHECK OPTION clauses.
In GaussDB, there are multiple types of integer variables.	INTEGER data type	Set INTEGER to NUMERIC.
GaussDB does not support LONGTEXT data type in CREATE TABLE statements.	LONGTEXT data type	Convert LONGTEXT to CLOB. The script will be migrated and a warning message will be displayed.
GaussDB does not support LONGBLOB data type in CREATE TABLE statements.	LONGBLOB data type	Migrate the script and convert LONGBLOB to BYTEA.
GaussDB does not support REAL data type in CREATE TABLE statements.	REAL data type	Convert REAL to DOUBLE PRECISION.
GaussDB does not support ON UPDATE in columns of tables.	ON UPDATE	Migration script and use triggers to implement ON UPDATE.
The distributed GaussDB does not support generated columns.	Generated columns NOTE This feature is available only in distributed GaussDB.	Comment generated columns.

Symptom	Feature Name	Recommended Setting
In GaussDB, multiple columns cannot be used as the partition key in a table.	Multi-column partition keys of partitioned tables	Use the first column of the primary key or unique key as the partition key.
In GaussDB, partition keys cannot be same as sub-partition keys.	Same partition keys and sub-partition keys	Comment SUB partitions.
GaussDB temporary tables do not support AUTO INCREMENT.	AUTO INCREMENT in temporary tables	Comment AUTO INCREMENT.
Distributed GaussDB does not support FOREIGN KEY constraints.	FOREIGN KEY constraints NOTE This feature is available only in distributed GaussDB.	Comment FOREIGN KEY constraints.
The character set length of GaussDB is different from that of MySQL.	Character set length conversion	Comment or extend character data type length.
In distributed GaussDB, distribution keys are part of the constraints.	Unique constraints and indexes in a distributed environment NOTE This feature is available only in distributed GaussDB 2.7 enterprise edition.	If no distribution key exists in a unique constraint and unique index, add a distribution key.
GaussDB does not support DEFINER in database objects.	Definer	If a user is specified when an object is created, convert it to ALTER OWNER.
In GaussDB, Ustore tables do not support B-tree indexes.	B-tree index conversion NOTE This feature is available only in primary/standby GaussDB and distributed GaussDB 3.2 enterprise edition.	If enable_default_ustore_table of the target database version is set to OFF , generate common tables during table creation and support B-tree indexes.
Data types are enlarged after being converted by UGO.	CHECK constraints	Add CHECK constraints.
BLOB data types in GaussDB and MySQL are different.	Binary BLOB data type	Migrate the script and convert BLOB to BYTEA.

3.2.2.4.4 Editing the Configurations During Migration from DB2 for LUW to GaussDB

Symptom	Feature Name	Recommended Setting
When table structure of all DB2 for LUW features is collected, the verification success rate is low. All features cannot be covered due to a huge difference of the source and target databases.	Table structure conversion mode	Retain only the table name, column name, data type, constraint, primary key, and partition information. ↳ Impact: Foreign key, tablespaces, and physical storage of a table are ignored. ↳
In DB2 for LUW, the BLOB data type can store a maximum of 2 GB data. In GaussDB V5R2, the BLOB data type can store a maximum of 1 GB data.	BLOB show error	No error information is displayed.
In DB2 for LUW, the CLOB data type can store a maximum of 2 GB data. In GaussDB V5R2, the CLOB data type can store a maximum of 1 GB data.	CLOB show error	No error information is displayed.
GaussDB V5R2 does not support GRAPHIC. You can convert GRAPHIC to the character string type.	GRAPHIC	Do the migration and convert the data type to NVARCHAR2.
GaussDB V5R2 does not support DBCLOB. You can convert DBCLOB to CLOB.	DBCLOB	Do the migration and convert the data type to CLOB.
GaussDB V5R2 does not support DECFLOAT. You can convert DECFLOAT to DOUBLE PRECISION.	DECFLOAT	Do the migration and convert the data type to DOUBLE PRECISION.
GaussDB V5R2 does not support XML. You can convert XML to a data type compatible with GaussDB V5R2.	XML	Do the migration and convert the data type to TEXT.
The TABLESPACE syntax of GaussDB V5R2 is different from that of DB2 for LUW. You can comment the TABLESPACE syntax of DB2 for LUW or use the corresponding syntax instead.	TABLESPACE	Replace TABLESPACE.

Symptom	Feature Name	Recommended Setting
If the user does not exist, GaussDB V5R2 does not support AUTHORIZATION during schema creation.	AUTHORIZATION in Create Schema statements	Comment AUTHORIZATION
GaussDB V5R2 supports partial CACHE in sequences.	CACHE in sequences	Comment CACHE in sequences.
GaussDB V5R2 does not support ORDER in sequences.	ORDER in sequences	Comment ORDER in sequences.
GaussDB V5R2 does not support RANDOM in indexes.	RANDOM in indexes	Comment RANDOM in indexes.
GaussDB V5R2 does not support CLUSTER in indexes.	CLUSTER in indexes	Comment CLUSTER in indexes.
GaussDB V5R2 does not support LONG TABLESPACE in tables.	LONG TABLESPACE in tables	Comment LONG TABLESPACE in tables.
GaussDB V5R2 does not support ORGANIZE BY in tables.	ORGANIZE BY in tables	Convert ORGANIZE BY to ORIENTATION.
GaussDB V5R2 does not support WITH CHECK OPTION in CREATE VIEW statements.	WITH CHECK OPTION in views	Comment WITH CHECK OPTION.
GaussDB V5R2 does not support ROW MOVEMENT in CREATE VIEW statements.	ROW MOVEMENT in views	Comment ROW MOVEMENT
GaussDB V5R2 does not support DATA CAPTURE in CREATE SCHEMA statements.	DATA CAPTURE in CREATE SCHEMA statements	Comment DATA CAPTURE
GaussDB V5R2 does not support SELECT in INSERT statements.	SELECT in INSERT statements	Migrate SELECT statements
GaussDB V5R2 does not support ORDER BY in UPDATE statements.	ORDER BY in UPDATE statements	Comment ORDER BY in UPDATE statements.
GaussDB V5R2 does not support OFFSET in UPDATE statements.	OFFSET in UPDATE statements	Comment OFFSET in UPDATE statements.
GaussDB V5R2 does not support FETCH in UPDATE statements.	FETCH in UPDATE statements	Comment FETCH in UPDATE statements.

Symptom	Feature Name	Recommended Setting
GaussDB V5R2 does not support ORDER BY in DELETE statements.	ORDER BY in DELETE statements	Comment ORDER BY in DELETE statements.
GaussDB V5R2 does not support OFFSET in DELETE statements.	OFFSET in DELETE statements	Comment OFFSET in DELETE statements.
GaussDB V5R2 does not support FETCH in DELETE statements.	FETCH in DELETE statements	Comment FETCH in DELETE statements.
GaussDB V5R2 does not support INCLUDE in INSERT statements.	INCLUDE in INSERT statements	Comment INCLUDE in INSERT statements.
GaussDB V5R2 does not support INCLUDE in DELETE statements.	INCLUDE in DELETE statements	Comment INCLUDE in DELETE statements.
GaussDB V5R2 does not support INCLUDE in UPDATE statements.	INCLUDE in UPDATE statements	Comment INCLUDE in UPDATE statements.
GaussDB V5R2 does not support QUERY OPTIMIZATION in CREATE VIEW statements.	QUERY OPTIMIZATION in CREATE VIEW statements	Comment ENABLE QUERY OPTIMIZATION
GaussDB V5R2 does not support COMMENT for synonyms.	COMMENT	Comment entire statements.
The converted objects are parsed based on the syntax of GaussDB V5R2. Check whether the conversion is correct.	Parse Converted SQL.	Ignore parsing.
The character set size of GaussDB R2 is different from that of the source database.	Source Database Character Set, Target Database Character Set, and Mismatch Character Set	Adjust the sizes of CHAR(n), VARCHAR(n), VARCHAR2(n), and NCHAR(n).

3.2.2.5 Modifying Objects

Scenarios

If a project is migrated for the first time, you need to manually modify the objects whose **Conversion Status** is **Failed** during object correction. Otherwise, the next step cannot be performed.

If a project is not migrated the first time, you need to manually modify the objects whose **Migration Status** is **Failed**. Otherwise, the next step cannot be performed.

⚠ WARNING

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 target database.

Procedure

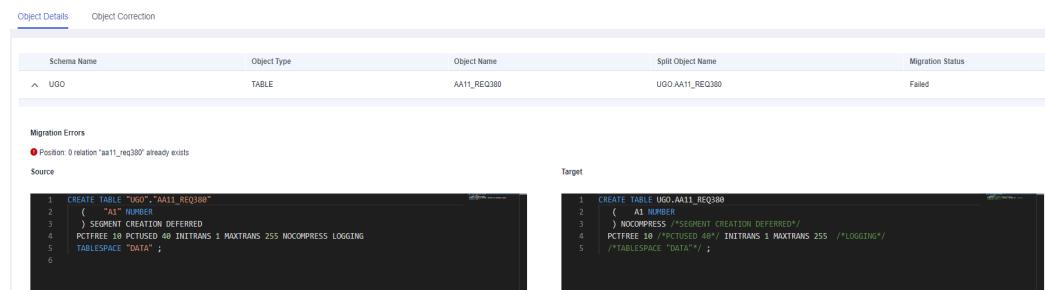
- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Migration**. The migration project list is displayed.
- Step 3** Locate the project to be migrated and click **Migrate** in the **Operation** column. On the displayed page, click the **Object Correction** tab.
- Step 4** Locate an object you want to modify and click **Modify** in the **Operation** column. You can view the schema name, object type, object name, split object name, and migration status on the page.

📖 NOTE

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

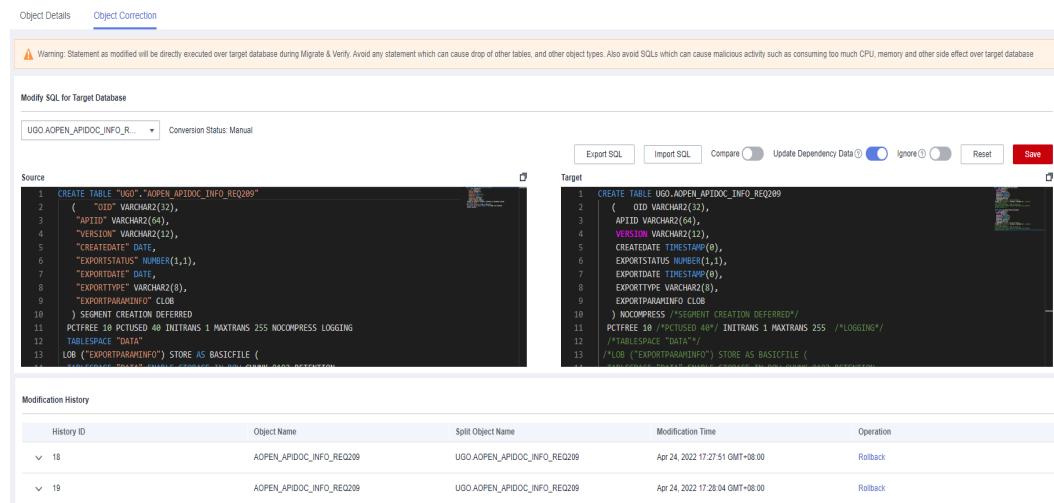
- Step 5** Click the drop-down icon before the schema name to view the migration error information. If any, modification suggestions are displayed.

Figure 3-33 Object details



- Step 6** Click **Modify** in the **Operations** column to go to the **Object Correction** page or directly click the **Object Correction** tab.

Figure 3-34 Object correction



Step 7 Modify SQL statements.

- Export: Click **Export SQL** to export the SQL file of the target database. Exported file name: *Object name.sql*.
- Import: Click **Import SQL** to directly import the modified SQL file. After the SQL file is uploaded, all changes are automatically saved.
- Compare: This function 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.
- Copy: Click next to **Source** or **Target** to copy the SQL statements to the clipboard.
- Update dependency data: If this function is enabled, all dependent objects are also verified. This function is enabled by default and can be disabled. It is available only after the object migration is verified.
- Ignore: If you enable this function, the modifications will not be saved. This function is disabled by default and can be enabled.
- Reset: 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.
- Save: Click **Save** to save the modifications for target database code. The modification records will be generated and saved in the history.

Step 8 After the modification, click **Save**. The modification record is saved in the **Modification History** area in the current page.

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

Figure 3-35 Modification history

Modification History				
History ID	Object Name	Split Object Name	Modification Time	Operation
18	AOPEN_APIDOC_INFO_REQ0209	UGO AOPEN_APIDOC_INFO_REQ0209	Apr 24, 2022 17:27:51 GMT+08:00	Rollback
1	<pre>CREATE TABLE UGO.AOPEN_APIDOC_INFO_REQ0209 ([APIDOC_ID] VARCHAR(32), [APIDOC_NAME] NVARCHAR(100), [VERSION] VARCHAR(12), [CREATEDATE] TIMESTAMP(0), [EXPORTSTATUS] NUMBER(1,1), [EXPORTNAME] NVARCHAR(100), [EXPORTTYPE] VARCHAR(8), [EXPORTPARAMINFO] CLOB) NOCOMPRESS /*SEQUENT CREATION DEFERRED*/;</pre>	<pre>1 CREATE TABLE UGO.AOPEN_APIDOC_INFO_REQ0209 2 (3 [APIDOC_ID] VARCHAR(32), 4 [APIDOC_NAME] NVARCHAR(100), 5 [VERSION] VARCHAR(12), 6 [CREATEDATE] TIMESTAMP(0), 7 [EXPORTSTATUS] NUMBER(1,1), 8 [EXPORTNAME] NVARCHAR(100), 9 [EXPORTTYPE] VARCHAR(8), 10 [EXPORTPARAMINFO] CLOB 11) NOCOMPRESS /*SEQUENT CREATION DEFERRED*/;</pre>		

----End



NOTE

- After the modification, the conversion status or migration status of the object changes from **Failed** to **Manual**.
- If there are failed items in the migration status, migration verification cannot be started.
- For details about batch object modification, see [Updating Statements in Batches](#).

3.2.2.6 Updating Statements in Batches

Scenarios

- After the migration verification is complete, you can go to the **Object Correction** page and click **Bulk Statement Update** to quickly modify the scripts or SQL statements that fail to be migrated in batch. You can search for objects in batches by text or regular expression.
- After the syntax conversion is complete, you can go to the **Object Correction** page and click **Bulk Statement Update** to quickly modify the scripts or SQL statements that fail to be converted in batch. You can search for objects in batches by text or regular expression.

You can also view the modification results or roll back the last modification. For details, see [Viewing History Records](#).

You can also change the scripts or SQL syntax that fail to be converted or migrated one by one. For details, see [Modifying 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 target database.

Procedure

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

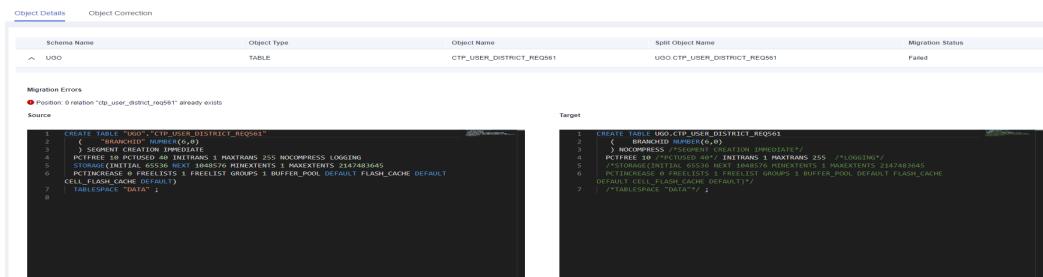
Step 5 Locate an object and click **View SQL** on the **Operation** column. The object details page is displayed.

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

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.

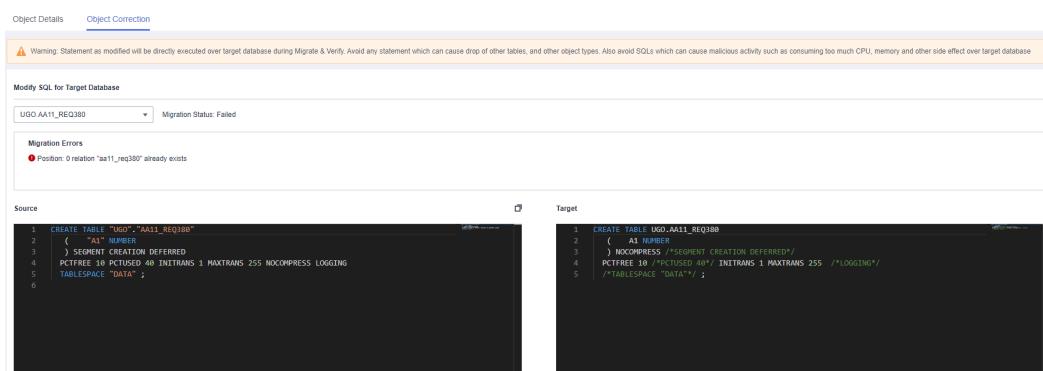
Figure 3-36 Migration errors in the object details page



Step 7 Click the **Object Correction** tab. The SQL statements of the source and target databases are displayed.

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

Figure 3-37 Migration errors in the object correction page



Step 8 Copy a SQL keyword or character string, return to the batch modification page, and configure parameters as needed/

Figure 3-38 Batch modification

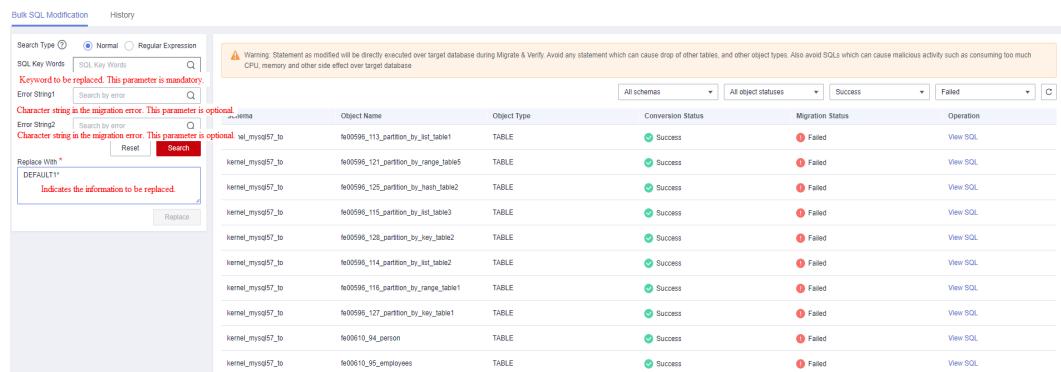


Table 3-18 Parameter description

Parameter	Mandatory	Description
Search Type	Yes	<ul style="list-style-type: none"> Normal: simple search text type Regular Expression: regular expression search text type <p>NOTE</p> <ul style="list-style-type: none"> 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.
SQL Key Words	Yes	<p>Search for keywords obtained in the Object Details page. Click View SQL in the Operation column to go to the Object Details page.</p> <p>For example, if you select Regular Expression and enter DEFAULT* as a keyword, the system searches for all statements with the structure DEFAULT Any SQL statement.</p>
Error String 1	No	<p>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.</p>
Error String 2	No	<p>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.</p>

 NOTE

- After the parameters are configured, the objects that meet search criteria are displayed in the right pane.
- All keywords can be viewed in the code display area, as shown in [Figure 3-37](#). All error strings can be viewed in **Migration Errors** or **Conversion Errors** area, as shown in [Figure 3-36](#).
- If the user connected to the target database is different from the schema owner, UGO will change the schema owner name to be the same as the user name.

Step 9 Click **Search**. The objects that meet the search criteria are displayed on the right pane.

Step 10 Enter the modified SQL statement in the **Replace with** text box and click **Replace**.

 WARNING

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 target database.

Step 11 After the replacement is complete, view the modified SQL information by referring to [Viewing History Records](#).

 NOTE

- On the **Object Correction** page, locate an object whose **Migration Status** is **Manual** and click **View SQL** to check whether the modification is successful.
- You can roll back to the latest modification record. For details, see [Viewing History Records](#).

----End

Viewing History Records

You can view all modified SQL statements in historical records.

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, 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 Choose **Batch Statement Update > History**.

Figure 3-39 Viewing history records

History						Operations
History ID	Start Time	End Time	SQL Key Words	Replacement SQL	View List Roll Back	
1	2022-09-22 16:40:45 GMT+08:00	2022-09-22 16:40:48 GMT+08:00	①			

Table 3-19 Parameter description

Parameter	Description
History ID	The number of modification times is displayed in descending order.
Start Time	Start time of the modification Example: 2021/09/15 16:28:15 GMT+08:00.
End Time	End time of the modification Example: 2021/09/15 16:28:16 GMT+08:00.
SQL Key Words	SQL keywords to be searched for. Place the cursor on  to view the search criteria.
Replacing SQL	Scripts or keywords to replace the original SQL statements.
Operations	<ul style="list-style-type: none">• 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.

----End

3.2.2.7 Viewing Object Migration Details

For details how to create a migration project, see [Migration Project](#).

Scenarios

This topic 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 on the left, choose **Schema Migration > Object Migration**.

If there is no migration project, the function introduction and process guidance are displayed by default. You can hide them. 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, evaluation project, product status, target database type, creation date, created by and operations.

Search for your desired project name by target database type or project name if there are a large number of projects.

Figure 3-40 Object migration

The screenshot shows a table titled "Object Migration" with columns: SI No., Project Name, Evaluation Project, Project Status, Target DB Type, Created Date, Created By, and Operation. There are two rows, both labeled "Ready". The "Operation" column for the first row contains "Migrate | Delete | More".

SI No.	Project Name	Evaluation Project	Project Status	Target DB Type	Created Date	Created By	Operation
1		● Ready	GaussDB Centralized2.0	Feb 22, 2023 14:42:04 GMT+08:00	AutoUser2023022...	Migrate Delete More	
2		● Ready	GaussDB Centralized2.0	Feb 22, 2023 14:39:33 GMT+08:00	AutoUser2023022...	Migrate Delete More	

- Step 3** Click the project name in the **Evaluation Project** column to view the detailed evaluation information of the project. For details, see [Viewing Evaluation Project Details](#).
- Step 4** Click the name of the project whose objects you want to migrate in the **Project Name** column.

Figure 3-41 Migration object details

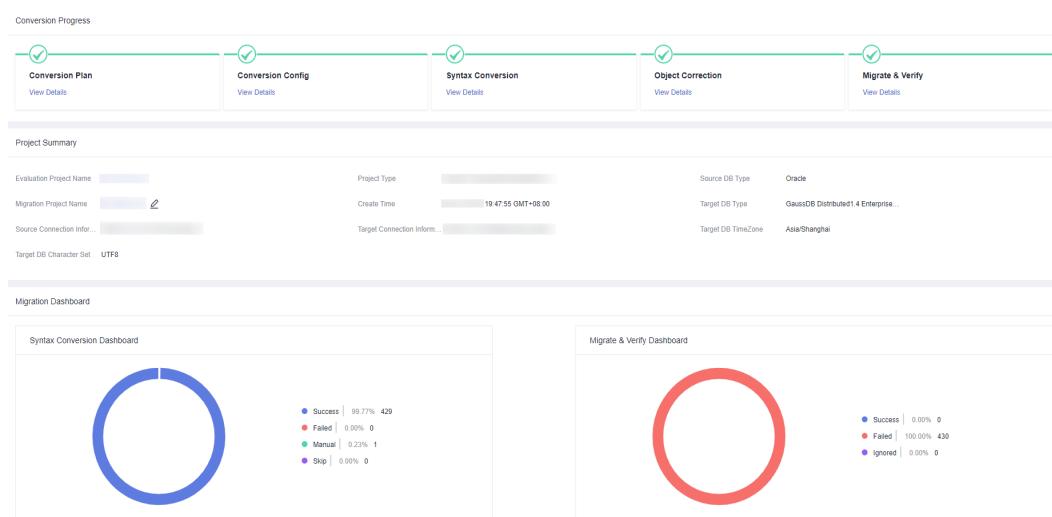


Table 3-20 Migration information description

Name	Description
Conversion 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. Click next to a project name to change the project name. The project name must be valid and unique.
Migration Dashboard	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 .

----End

3.2.2.8 Viewing Syntax Conversion History

Prerequisites

The syntax conversion of a project has been executed.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, 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 orders.

Figure 3-42 Conversion history

SI No.	Total	Skip	Conversion Success...	Conversion Failed	Ignored	Manual	Remaining	Conversion Status ...	Start Time	End Time	Operation
1	981	55	884	42	0	0	0	Success	Mar 20, 2023 16:36:07 GMT+08:00	Mar 20, 2023 16:36:58 GMT+08:00	Details

- Step 5** Click **Details** to view detailed information, including the object type, conversion planned, conversion successful, and conversion failed.

Figure 3-43 Detailed information of each conversion

Object Type	Conversion Planned	Conversion Successful	Conversion Failed	Ignored	Manual	Pending	Success (%)	Operations
Total	774	734	40	0	0	0	88.76%	
FUNCTION	41	37	4	0	0	0	90.24%	Details
INDEX	27	25	2	0	0	0	92.59%	Details
PACKAGE	58	56	2	0	0	0	98.55%	Details
PACKAGE_BODY	36	35	1	0	0	0	97.22%	Details
PROCEDURE	120	115	5	0	0	0	95.83%	Details

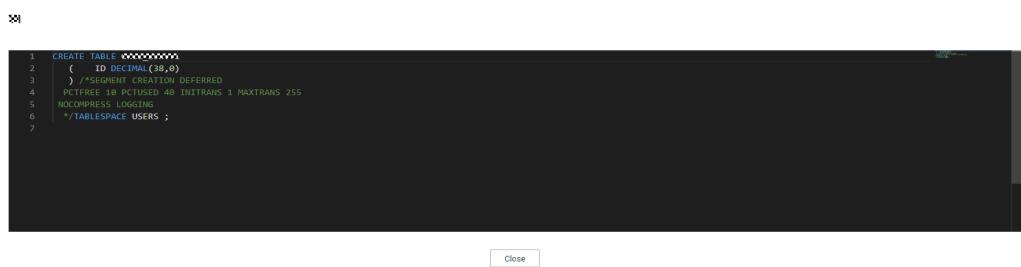
- Step 6** Locate an object type and click **Details** to view its details. The detailed information includes the schema, object name, migration status, and verification status. You can search for an object by object name or view details about each schema.

Figure 3-44 Detailed information of an object type

Migration	Migration History	Operations
UGO	T_SPR_PMA_REQ012	Details
UGO	INST_NOC_TYPE,_REQ013	Details
UGO	PHONE_LIST_TYPE_DEMO_REQ014	Details
UGO	TYPE_AMT_LARAVTYPE_REQ016	Details
UGO	TX_T_VAL_LIST_REQ0731	Details

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

Figure 3-45 Object details



```
1 CREATE TABLE XXXXXXXX
2   (
3     ID DECIMAL(38,0)
4   ) /*SEGMENT CREATION DEFERRED
5   PCTFREE 10 PCTUSED 40 INITTRANS 1 MAXTRANS 255
6   NOCOMPRESS LOGGING
7   */TABLESPACE USERS ;
```

----End

3.2.2.9 Viewing Migration and Verification Details

Prerequisites

There are projects that have been migrated.

Procedure

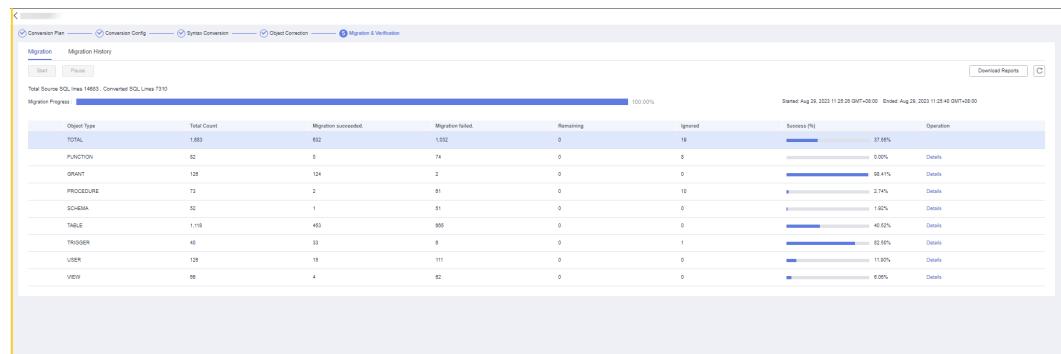
Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, 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.

Step 4 The **Migration** tab page is displayed by default.

Figure 3-46 Migration



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.

Click **View Details** in the **Operation** column to view the migration details.

Step 5 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. Click **Details** to view details.

Figure 3-47 Migration history

Si No.	Total Count	Successfully Migrated	Migration Failed	Remaining	Migration Status	Start Time	End Time	Operations
2	734	298	436	0	Success	2022-10-15 16:15:22 GMT+08:00	2022-10-15 16:15:33 GMT+08:00	Details
1	734	298	436	0	Success	2022-10-12 16:02:46 GMT+08:00	2022-10-12 16:02:57 GMT+08:00	Details

Step 6 Click **Details** to view information such as the total count, migration succeed, and migration failed of each object type.

Figure 3-48 Detailed information of each migration

Object Type	Total Count	Successfully Migrated	Migration Failed	Remaining	Operations
TOTAL	734	298	436	0	
TYPE	7	5	2	0	Details
TABLE	388	0	388	0	Details
VIEW	58	57	1	0	Details
TYPE_BODY	1	0	1	0	Details
FUNCTION	37	36	1	0	Details

Step 7 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 object name or view details about each schema.

Figure 3-49 Detailed information of an object type

Schema	Object Name	Object Type	Migration Status	Operations
UGO	T_SPR_PMA_REQ152	TYPE	Failed	Details
UGO	INST_NO_TYPE_REQ133	TYPE	Success	Details
UGO	PHONE_LIST_TYP_DEMO_REQ134	TYPE	Success	Details
UGO	TYPE_RMTS_ARRAYTYPE_REQ145	TYPE	Success	Details
UGO	TY_T_VAL_LIST_REQ731	TYPE	Success	Details

Step 8 Locate an object and click **Details** to view the code.

Figure 3-50 Object details

```
SEQ_MANAGED_OBJ_TYPE_VERSION
1 CREATE SEQUENCE CDATA10.SEQ_MANAGED_OBJ_TYPE_VERSION MINVALUE 1 MAXVALUE 10000000000 INCREMENT
BY 1 START WITH 9 NO CYCLE /*NOPARTITION*/;
```

关闭

----End

3.2.2.10 Deleting an Object Migration Project

Deleted projects cannot be recovered. Exercise caution when performing this operation.

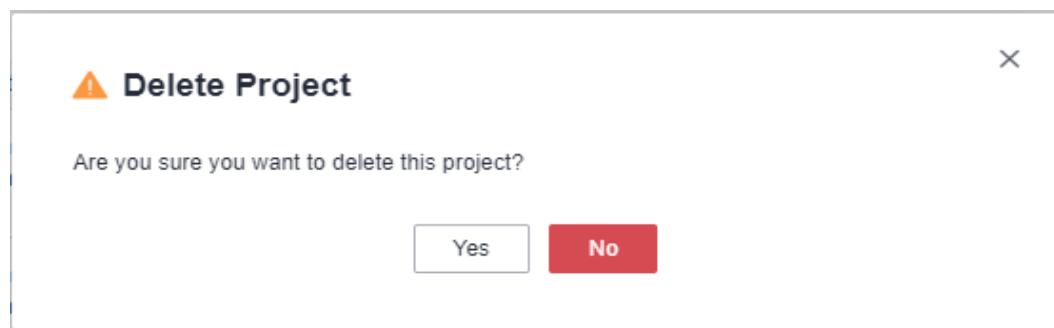
Prerequisites

A migration project has been created.

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** In the migration project list, locate the project you want to delete and click **Delete**.
- Step 4** In the displayed dialog box, click **Yes**.

Figure 3-51 Deleting a project



----End

3.2.3 Object Comparison

3.2.3.1 Viewing Comparison Project Details

For details about how to create an object comparison project, see [Object Comparison](#).

Scenarios

You want to view the basic information and comparison information about a comparison project.

Prerequisites

There are comparison projects.

Procedure

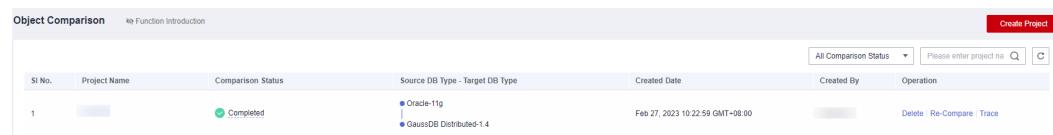
Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, choose **Schema Migration > Object Comparison**.

The basic information about all existing projects, including the project name, comparison status, source database type, and target database type, is displayed.

If there are many projects, you can search for them by project status, tag, or project name.

Figure 3-52 Object comparison projects



Step 3 Locate a project and click the project name to view its information.

Figure 3-53 Details of a project



Table 3-21 Information on the Basic Information page

Function	Description
Basic Information	Displays basic information about object comparison project, including the project name, project status, creation time, and complete time.
Source Database Information	Displays the basic information about the source database.
Target Database Information.	Displays the basic information about the target database.
Source Database Object Type Selected for Comparison	Displays the source database object types selected when you create the project.
Source Database Object Type Not Selected for Comparison	Displays the source database object types that are not selected when you create the project. No data available is displayed if you click Select All in the Comparison Scope Selection page during the project creation.
Source Database Schema Selected for Comparison	Displays the source database schemas that are selected in Comparison Scope Selection page during the project creation.

Function	Description
Source Database Schema Not Selected for Comparison	<p>Displays the source database schemas that are not selected in Comparison Scope Selection page during the project creation.</p> <p>No data available is displayed if you select all schemas in the Comparison Scope Selection page during the project creation.</p>
Target Schema Matching Source Schema	Displays the target schemas that match the source schemas after comparison.
Target Schema Not Selected for Comparison	Displays schemas that do not match the source schemas after comparison.

Table 3-22 Information on the Object Comparison page

Function	Description
Dashboard	<p>Displays the comparison result from the following aspects:</p> <ul style="list-style-type: none"> • Object Matching Success Rate: <ul style="list-style-type: none"> - High: Matching success rate > 80% - Medium: $60\% \leq$ Matching success rate $\leq 80\%$ - Low: Matching success rate < 60% • Objects compared: displays the number of objects that are compared successfully and fail to be compared. • Statistics for failed schemas: Displays the number and percentage of job, code, storage, management, and other failed objects. <p>Click Download Report to export a SQL file in .tar.gz format. You can view the exported file on the download list page.</p>
DB Object Distribution	<p>Displays the number of successful and failed schemas sorted by default in bar charts.</p> <p>You can also click Objects in Source/Target Database and Success/Failure Objects.</p> <p>You can also move the cursor to a bar chart to view the number and percentage of comparison success items and comparison failed items.</p>

Function	Description
DB Object Comparison Details	<p>Displays database object comparison details by database type. The information includes object type, source database schema, source database object name, target database schema, and target database object name.</p> <p>If there are many types of projects to be compared, you can search for the projects by schema, project status, or object name.</p> <p>Locate an object type, click View Details in the Operation column to view details about the object type and code comparison between the source and target databases. For details about object comparison rules, see Object Comparison Rules.</p>

----End

Object Comparison Rules

NOTICE

- Object matching policy: All attributes of an object type are meet the matching rules.
- If the source database type is Oracle, hidden columns are not collected during table structure comparison.
- During object matching, if the object name contains only uppercase letters or lowercase letters, the system preferentially matches the object with the same schema name and object name. If no object is matched, the system converts the character case and continues to match the object, for example, lowercase letters are converted to uppercase letters or lowercase letters are converted to uppercase letters. If the name contains both uppercase and lowercase letters, only objects with the same name are matched. During object matching, the schema name is matched first, and then the object name is matched.
- UGO object comparison rules are a subset of UGO migration rules. For details about UGO object comparison rules, see [Object Comparison Rules](#).

Table 3-23 Oracle comparison rules

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
SEQUENCE	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), SeqName, cycleFlag, orderFlag, and incrementBy</p> <p>minValue: The minimum length in the Oracle database is less than that of GaussDB, but the minimum length allowed by GaussDB is used after conversion. The matching is successful.</p> <p>maxValue: The maximum length in the Oracle database is greater than that of GaussDB, but the maximum length allowed by GaussDB is used after conversion. The matching is successful.</p>		
TABLE	<p>The matching is successful if the following attribute names are the same between the source and target databases: Name and Owner (schema)</p> <p>Column: If the quantity, sequence, name, and data type of column fields between the source and target databases are equivalent, the matching is successful.</p>		
INDEX	<p>The matching is successful if the following attribute names are the same between the source and target databases: Index Name, Index Owner (schema) and Table Name</p> <p>Column: If the number and names of column fields between the source and target databases are the same, the matching is successful.</p> <p>NOTE If the column sequence is inconsistent, an error message is displayed, indicating that the names do not match.</p>		
SYNONYM	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Synonym Name, Table Owner, and Table Name		
TYPE	The matching is successful if the following attribute names are the same between the source and target databases: Type Owner (schema) and Type Name		
VIEW	The matching is successful if the following attribute names are the same between the source and target databases: ViewName and Owner (schema)		
TRIGGER	The matching is successful if the following attribute names are the same between the source and target databases: TableOwner (schema), TriggerName, and TableName		

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
PROCEDURE	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), ProcedureName, Parallel/Deterministic, AuthId, and Overload		
FUNCTION	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), FunctionName, Parallel, Deterministic, AuthId, Overload, Aggregate, and Pipelined		
PACKAGE	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Package Name Subprogram: If the number, name and type (functions or procedures) of the subprograms between the source and target databases are the same, the matching is successful.	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema) and Name Subprogram: If the target database contains all subprograms of the source database, and name and type (functions or procedures) of the subprograms between the source and target databases are the same, the matching is successful. GaussDB 1.4 and distributed GaussDB 2.7 enterprise edition do not support packages. If the name of the subprograms between the source and target databases are the same, or the name of subprograms is <i>PackageName \$ SubProgramName</i> .	
DIRECTORY	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema) and DirName		
CONTEXT	It is not collected by GaussDB.		
PROGRAM	It is not collected by GaussDB.		
SCHEDULE	It is not collected by GaussDB.		

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
JOB	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Job Name, Job Style, programName, and Job Action		It is not collected.
USER	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema) and UserName NOTE Schemas are not compared, so schemas are named as - by default.		
GRANT	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Name, Grantee, Grantor, Privilege, Grantable, Hierarchy, Column Name, and Common Number of permissions: If the number of permissions for tables and columns between the source and target databases are the same, the matching is successful. NOTE Only GRANT statements of tables and columns are collected for object comparison.		

Table 3-24 MySQL comparison rules

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.0 and 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
FUNCTION	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), FunctionName, Deterministic, ParameterName, and ParameterMode	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), FunctionName, Deterministic, ParameterName, and ParameterMode	The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), FunctionName, Deterministic, ParameterName, and ParameterMode
GRANT	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Name, Grantee, Grantor, Privilege, Grantable, Hierarchy, Column Name, and Common</p> <p>Number of permissions: If the number of permissions for tables and columns between the source and target databases are the same, the matching is successful.</p> <p>NOTE Only GRANT statements of tables and columns are collected for object comparison.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Name, Grantee, Grantor, Privilege, Grantable, Hierarchy, Column Name, and Common</p> <p>Number of permissions: If the number of permissions for tables and columns between the source and target databases are the same, the matching is successful.</p> <p>NOTE Only GRANT statements of tables and columns are collected for object comparison.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), Name, Grantee, Grantor, Privilege, Grantable, Hierarchy, Column Name, and Common</p> <p>Number of permissions: If the number of permissions for tables and columns between the source and target databases are the same, the matching is successful.</p> <p>NOTE Only GRANT statements of tables and columns are collected for object comparison.</p>

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.0 and 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
INDEX	<p>The matching is successful if the following attribute names are the same between the source and target databases: Index Owner (schema), Index Name, and Table Name</p> <p>Column: If the number and names of column fields between the source and target databases are the same, the matching is successful.</p> <p>NOTE If the column sequence is inconsistent, an error message is displayed, indicating that the names do not match.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Index Owner (schema), Index Name, and Table Name</p> <p>Column: If the number and names of column fields between the source and target databases are the same, the matching is successful.</p> <p>NOTE If the column sequence is inconsistent, an error message is displayed, indicating that the names do not match.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Index Owner (schema), Index Name, and Table Name</p> <p>Column: If the number and names of column fields between the source and target databases are the same, the matching is successful.</p> <p>NOTE If the column sequence is inconsistent, an error message is displayed, indicating that the names do not match.</p>
PROCEDURE	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), ProcedureName, Deterministic, ParameterName, and ParameterMode</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), ProcedureName, Deterministic, ParameterName, and ParameterMode</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema), ProcedureName, Deterministic, ParameterName, and ParameterMode</p>

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.0 and 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
TABLE	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema) and Name</p> <p>Column: If the quantity, sequence, name, and data type of column fields between the source and target databases are equivalent, the matching is successful.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema) and Name</p> <p>Column: If the quantity, sequence, name, and data type of column fields between the source and target databases are equivalent, the matching is successful.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: Owner (schema) and Name</p> <p>Column: If the quantity, sequence, name, and data type of column fields between the source and target databases are equivalent, the matching is successful.</p>
TRIGGER	<p>The matching is successful if the following attribute names are the same between the source and target databases: TableOwner (schema), TriggerName, TableName, TriggerEvent, and TriggerTime</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: TableOwner (schema), TriggerName, TableName, TriggerEvent, and TriggerTime</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: TableOwner (schema), TriggerName, TableName, TriggerEvent, and TriggerTime</p>
USER	<p>The matching is successful if the following attribute names are the same between the source and target databases: UserName (schema) and Owner</p> <p>NOTE Schemas are not compared, so schemas are named as - by default.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: UserName (schema) and Owner</p> <p>NOTE Schemas are not compared, so schemas are named as - by default.</p>	<p>The matching is successful if the following attribute names are the same between the source and target databases: UserName (schema) and Owner</p> <p>NOTE Schemas are not compared, so schemas are named as - by default.</p>

Object Type	Primary/Standby GaussDB 2.0 Enterprise Edition or Later and Distributed GaussDB 3.2 Enterprise Edition	Distributed GaussDB 2.0 and 2.7 Enterprise Edition	Primary/Standby GaussDB 1.4 Enterprise Edition and Distributed GaussDB 1.4 Enterprise Edition
VIEW	The matching is successful if the following attribute names are the same between the source and target databases: ViewName (schema) and Owner	The matching is successful if the following attribute names are the same between the source and target databases: ViewName (schema) and Owner	The matching is successful if the following attribute names are the same between the source and target databases: ViewName (schema) and Owner

UGO does not support comparison of some objects. For details, see the following table.

Table 3-25 Filter rules

Object Type	GaussDB	MySQL	Oracle
INDEX	Index ending with _pkey	Index named PRIMAY	Indexes starting with SYS_C or SYS_IC
SYNO NYM	Synonyms whose owner is pg_catalog	-	-
TYPE	Naming format: \$dddddd.xxxxx or ddddddd.xxxxx, where d is a digit and the number of d is 6 to 10.	-	-

If the following is met, the objects between the source and target databases are matched by default.

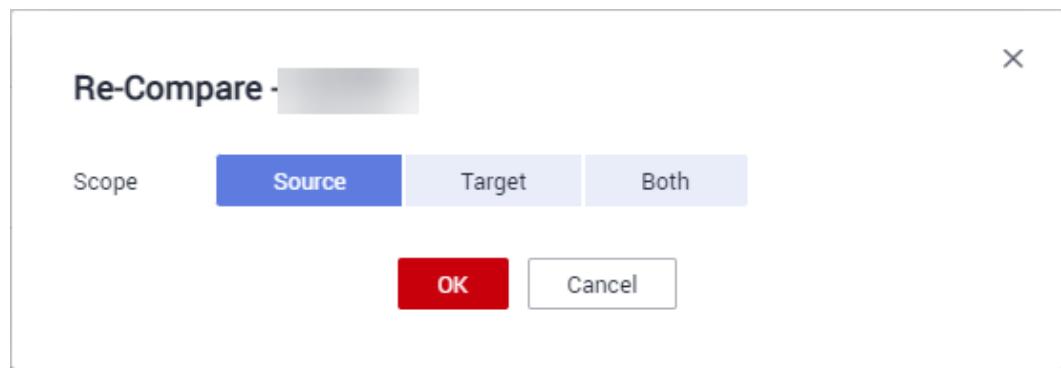
Table 3-26 Matching rules

Database	Rule
GaussDB	Function object name containing dsc_fn_

3.2.3.2 Re-comparing Objects

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Comparison**.
- Step 3** Locate the project to be re-compared and click **Re-compare** in the **Operation** column.

Figure 3-54 Selecting a scope



- Step 4** Select a scope and click **OK**.

----End

3.2.3.3 Viewing Logs

Scenarios

The events and event time of projects are recorded.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Comparison**.
- Step 3** Locate a project and click **Trace** in the **Operation** column. The collection trace list is displayed.
- Step 4** Click  next to an event to view details about the event.

Figure 3-55 Viewing events

Collection Trace

Event	Event Time
Source metadata collection started	Oct 31, 2022 15:03:27 GMT+08:00
Target metadata collection started	Oct 31, 2022 15:03:27 GMT+08:00
Target metadata collection completed	Oct 31, 2022 15:03:28 GMT+08:00
Target data collection started	Oct 31, 2022 15:03:28 GMT+08:00
^ Collection at object type level started	Oct 31, 2022 15:03:28 GMT+08:00
{ "Type": "TARGET", "Object Type": "FUNCTION" }	

- **Type:** indicates the source database or the target database.
- **Object Type:** indicates the type of the objects to be collected.

----End

3.2.3.4 Deleting a Comparison Project

Deleted projects cannot be recovered. Exercise caution when performing this operation.

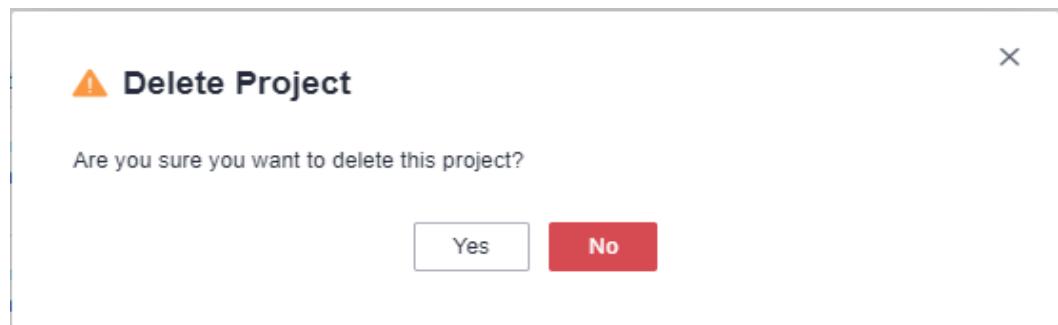
Prerequisites

The **Comparison Status** of the project is **Completed** or **Failed**.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > Object Comparison**.
- Step 3** Locate the project you want to delete and click **Delete** in the **Operation** column.
- Step 4** In the displayed dialog box, click **Yes**.

Figure 3-56 Deleting a project



----End

3.2.4 Application Migration

3.2.4.1 Viewing Application Migration Project Details

For details about how to create an application migration project, see [Application Migration](#).

Scenarios

You can view details about application migration projects, including application analysis, application SQL, and application evaluation, to select an ideal database.

Prerequisites

- An application migration project has been created.
- The **Application SQL Conversion** tab page is available only after the syntax conversion is complete.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, click **Application Migration**.

The basic information about all existing projects is displayed, including the project name, project status, and conversion status.

If there are too many files in the ZIP package, no SQL statement is collected, or the decompression fails, the **Project Status** becomes **Failed**.

Figure 3-57 Application migration project list

SI No.	Project Name	Source DB Type	Create Date	Project Status	Conversion Status	Created By	Operation
1	[REDACTED]	Oracle	Feb 27, 2023 11:04:15 GMT+08:00	In progress	Confirm Target DB Pending	[REDACTED]	Delete Stop
2	[REDACTED]	Oracle	Feb 27, 2023 11:03:56 GMT+08:00	In progress	Confirm Target DB Pending	[REDACTED]	Delete Stop

Step 3 Locate the project that you want to view. If there are a large number of projects, you can search for the desired project by source database type, project status, or project name.

Step 4 Click the project name. You can view the [Application Analysis](#), [Application SQL](#), and [Application Evaluation](#) tabs.

If you have confirmed the target database of the project, the [Application SQL Conversion](#) tab is available.

Figure 3-58 Classification of application migration information

[Application Analysis](#) | [Application SQL](#) | [Application Evaluation](#) | [Application SQL Conversion](#)

Table 3-27 Information on the Application Analysis tab

Function	Description
Basic Information	Project name and creation date are displayed.
Application Object Statistics	Types and numbers of objects are displayed. Application object statistics and SQL complexity distribution are displayed in a bar chart. Hovering over on a bar shows the exact value.
Top 100 Frequent SQL Statistics	Information is displayed by schema, SQL type, frequency, and SQL execution time. You can click View Details of object to view its details.
Application SQL and Database Association	Information is displayed by database IP address, SQL subtype, and number of SQL statements. You can click View Details of object to view its details.

Table 3-28 Information on the Application SQL tab

Function	Description
Schema list	<p>The columns Schema, File Name, Object Type, Sub Type, Object Name, Modified, and Operation are displayed.</p> <ul style="list-style-type: none"> If there is a large amount of data, you can search for the desired data by schema, object type, modification status, file name, SQL object, or object name. Export SQL: You can export the SQL file to download list. The file name is in the format of <i>Project name_Specific time.tar.gz</i>. Locate an object and click View/Modify in the Operation column to view the object details, including source database statements, call stack, and modification history. <ul style="list-style-type: none"> Before confirming the target database, you can edit the source database statements and click Save. You can click Reset to restore to the default source database statements. After the modification is saved, the Modified column of the object changes to Yes and a modification record is generated. The modification time and editor are displayed. There are the latest five modifications in the modification history. After you save the modification, go to the Application Evaluation tab and in the Partially Compatible/Unsupported Syntax area, view that the modification is synchronized to the same object in the current page. Before confirming the target database, locate an object and click Delete in the Operation column to delete the selected object
DB objects	<p>Application SQL and others objects are displayed. You can click an object to view the corresponding information.</p> <ul style="list-style-type: none"> Application SQL includes DELETE, IMPORT, INSERT, LODA, REPLACE, SELECT and UPDATE. Others includes ALTER, CALL, CREATE, DROP, MISC, RENAME, and TRUNCATE.

Table 3-29 Information on the Application Evaluation tab

Function	Sub-function	Description
Objects Compatibility	Database list	<p>The name, version, and success rate of the recommended target databases are displayed.</p> <p>NOTE</p> <ul style="list-style-type: none"> By default, the database with the highest success rate is selected. You can also select a database as required. The database compatibility evaluation information changes as you change the target database.
	Report download	<p>Click Download Reports and download Summary Report or SQL Fail Report to the local PC for analysis.</p> <ul style="list-style-type: none"> Summary Report: The report is downloaded in PDF format and displays basic information such as the database capacity and target database selection. Failed SQL Report: The report is downloaded in .tar.gz format and displays SQL statements that fail to be migrated. The information includes the database type, object type, object name, failed statements, and unsupported items, collected file name and location. Anonymous Failed SQL Report: The report is downloaded in .tar.gz format and displays SQL statements that fail to be migrated. The information includes the database type, object type, anonymous object name, anonymous failed statements, and unsupported items, collected file name and location. Full SQL Report: The report is downloaded in .tar.gz format and Displays the database type, schema, object type, object name, statement, unsupported items, partially compatible items, file name and location, and dynamic variables.
	Re-evaluation	<p>This function is displayed only when Project Status is In progress. Confirm Target DB Pending.</p> <p>Click Re-Evaluate, all objects will be re-evaluated and any previous evaluations will be overwritten. Exercise caution when performing this operation.</p> <p>The operation is recorded in audit logs.</p>
	Target database confirmation	Application migration can be started only after the target database is confirmed.

Function	Sub-function	Description
Compatibility Evaluation	Conversion statistics	<p>The information of supported objects and unsupported objects is displayed. Supported objects include native-supported objects, UGO-supported objects, and supported objects with risks.</p> <p>Move the cursor to a bar chart to view the conversion details. Click the bar chart to view the details of supported objects with risks and unsupported objects.</p> <p>Click  next to the object type to view the collected SQL statements and source file content. The left screen displays the collected SQL statements, and the right screen displays the source file content. If the Agent file is used, only the file name is displayed. If the source file contains less than 5000 lines, the content of the source file is displayed. If the source file contains more than 5000 lines, the path of the source file is displayed. If the collected SQL content is in the last 20 lines of the source file, the content cannot be displayed in the top line.</p>

Function	Sub-function	Description
	Partially compatible/unsupported syntax	<p>All partially compatible or unsupported syntax points during database object conversion are displayed. The detailed information includes syntax, object scope, type, risk level, quantity, and definition. The type indicates that syntax points are not supported or partially compatible. The risk level indicates the risk level of partially compatible syntax points. The quantity indicates the total number of occurrences of the syntax point. The explanation is the explanation of the partially compatible or not supported syntax point.</p> <p>Locate a syntax point and click View Definition in the Operation column to view its explanation. If a syntax point is partially compatible, UGO provides different conversion configuration items for the syntax point. During the migration, you can select a configuration item as needed.</p> <p>If no modification suggestion is provided, you can click the syntax point name in the Partially Compatible/Unsupported Syntax column. The following information is displayed: schema, object type, object name, unsupported syntax or partially compatible syntax, and SQL file location.</p> <p>Click  before a schema to view the collected SQL statements and source file content on the Source tab. The left screen displays the collected SQL statements, and the right screen displays the source file content. If the Agent file is used, only the file name is displayed. If the source file contains less than 5000 lines, the content of the source file is displayed. If the source file contains more than 5000 lines, the path of the source file is displayed. If the collected SQL content is in the last 20 lines of the source file, the content cannot be displayed in the top line.</p> <p>Before confirming the target database, you can edit the collected SQL statements and click Save. You can click Reset to restore to the default SQL statements. After the modification is saved, the Modified column of the object changes to Yes and a modification record is generated. The modification time and editor are displayed. There are the latest five modifications in the modification history. After you save the modification, go to the Application SQL tab, locate the object that you modified and click View/Modify in the Operation column, and view that the Modified column of the object changes to Yes.</p>

Function	Sub-function	Description
	Files to be modified	<p>The source SQL files and the number of SQL statements to be modified in the files are displayed.</p> <p>Click a file name to view the detailed information about the SQL statement to be modified, including the object type, object subtype, evaluation result, line number, and suggestion.</p> <ul style="list-style-type: none"> • If the Evaluation Result is Supported after UGO conversion, modify the statement by referring to conversion solution provided by UGO. • If the Evaluation Result is not Supported after UGO conversion, manually modify the statement.

Table 3-30 Information on the Application SQL Conversion tab

Function	Description
Syntax Conversion	<p>You can start, pause, and resume application migration. After the conversion is complete, the conversion start time and end time are displayed.</p> <p>Click Download Reports to download the conversion report in .tar.gz format to the local PC.</p> <p>Click Conversion Config to view the features, affected object types, and current configurations of the target database.</p> <ul style="list-style-type: none"> • In the Current Configuration column, move the cursor to  of each feature to view the impact of the feature. • Choose Edit Config in the Operation column to view the description and impact of a specific feature. If you want to modify a configuration, select it and click Confirm. • After modifying the version, deployment mode, or category, click Apply to confirm the modification. <p>Locate an object type and click Details in the Operation column to view the migration details of a specific object type.</p>

Function	Description
Conversion Details	<p>The conversion details of all object types, including the schema, file name, object type, and conversion status, is displayed.</p> <p>If the SQL statements at the source and target databases are different, the value of the Modified Statement column is No. If the SQL statements at the source and target databases are the same, the value of the Modified Statement column is Yes.</p> <ul style="list-style-type: none">• If there is a large number of objects, you can search for the object by schema, object type, statement, conversion status, or file name.• Export SQL: You can export the SQL file to download list. The file name is in the format of <i>Project name_Specific time.tar.gz</i>.• Click View Details in the Operation column.<ul style="list-style-type: none">– Check the SQL code of the target database, source database, and call stack, and comparison results of the code between source and target databases.– The name and conversion status of the target database objects are displayed.– You can copy the SQL code on the source and target databases.

----End

3.2.4.2 Deleting an Application Migration Project

Deleted projects cannot be recovered. Exercise caution when performing this operation.

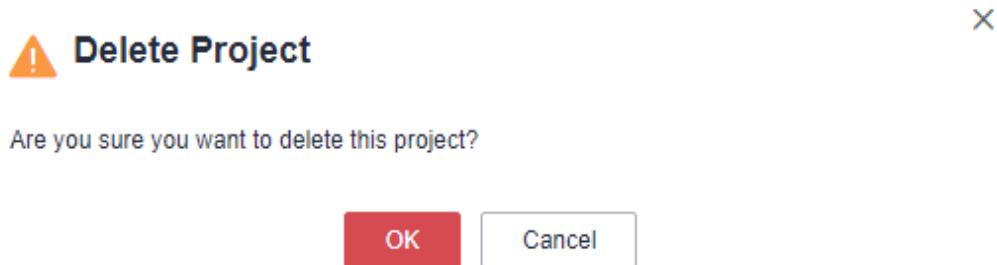
Prerequisites

An application migration project has been created.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, click **Application Migration**.
- Step 3** Locate the project you want to delete and click **Delete**.
- Step 4** In the displayed dialog box, click **OK**.

Figure 3-59 Deleting an application migration project



----End

3.2.5 SQL Conversion

3.2.5.1 Converting Text

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

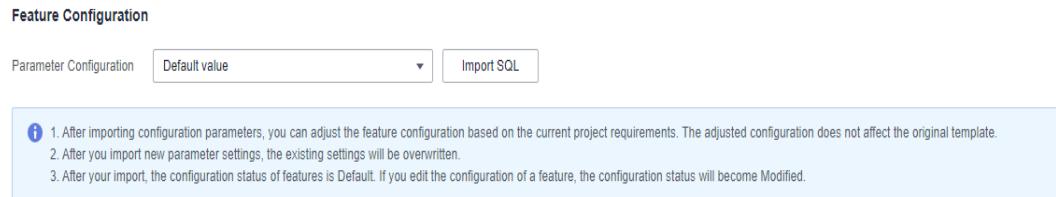
The SQL text provided for UGO must be syntactically correct, can be successfully compiled on the source database, and contains up to 100,000 characters.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, click **SQL Conversion > Convert Text**.
- Step 3** Select the source and target database types and enter the SQL statements to be converted.
- Step 4** (Optional) Click **SQL Conversion** to import the configuration 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 [Creating a Configuration Template](#).
 - In the **Current Configuration** column, move the cursor to 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**. For details, see [Editing the Configurations During Migration from Oracle to GaussDB](#) to [Editing the Configurations During Migration from DB2 for LUW to GaussDB](#).

- After you import configuration parameters, the configuration status of features is **Default**. If you edit the configuration of a feature, the configuration status will become **Modified**.

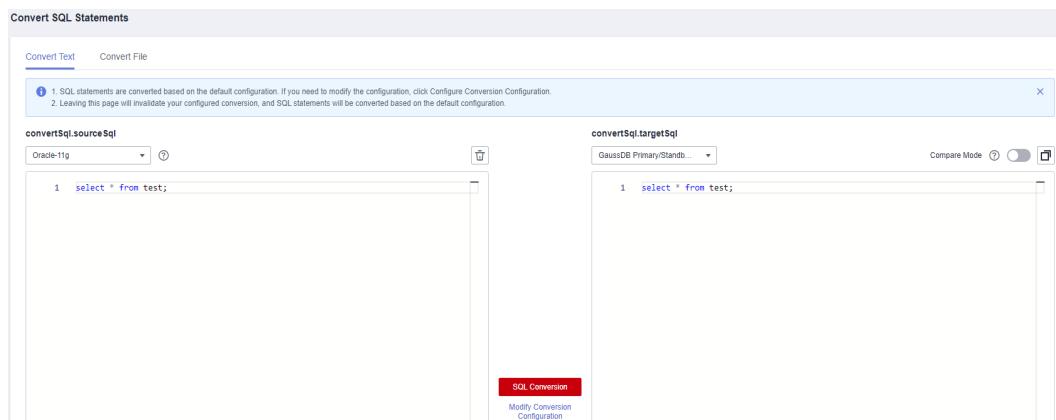
Figure 3-60 Converting configuration



Step 5 Click **Convert** and view the converted SQL statements on the right.

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

Figure 3-61 Converting text



NOTE

- Clear** and **Copy**: One-click clearing and copy of SQL statements are supported.
- For details about how to edit configurations, see [Editing Conversion Configurations](#).

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

This mode can be enabled only after the conversion is complete. It is used to compare the source SQL statement with the converted SQL statement. In comparison mode, the source SQL statements cannot be modified.

Figure 3-62 Text comparison mode



----End

3.2.5.2 Converting a File

Scenarios

You upload a ZIP package, convert the SQL file in the package, and download the conversion results.

Constraints

- The package to be uploaded must be in ZIP format and can contain up to 1,000 files.
- The maximum size of the ZIP package is 10 MB and the maximum size of each file in the package is 1 MB.
- Only SQL files are supported.
- Sensitive data such as plaintext passwords and keys in the ZIP package needs to be deleted to ensure data security.
- You can view and operate the files created by yourself. The **admin** user cannot view and operate files created by other users.
- There are up to 100 file conversion tasks.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, click **SQL Conversion > Convert File**.

Step 3 Choose **Create Conversion Task**.

Figure 3-63 Creating a conversion task

The screenshot shows the 'Create Conversion Task' interface. At the top, there is a back arrow and the title 'Create Conversion Task'. Below this is a 'Summary' section with four input fields:

- Project Name:** A text input field with the placeholder 'Please enter project name'.
- Source DB Type:** A dropdown menu set to 'Oracle'.
- Target DB Type:** A dropdown menu set to 'GaussDB Primary/Standby - 3.2 Enterprise ...'.
- Upload Data File:** A button labeled 'Add File' with a question mark icon in a tooltip.

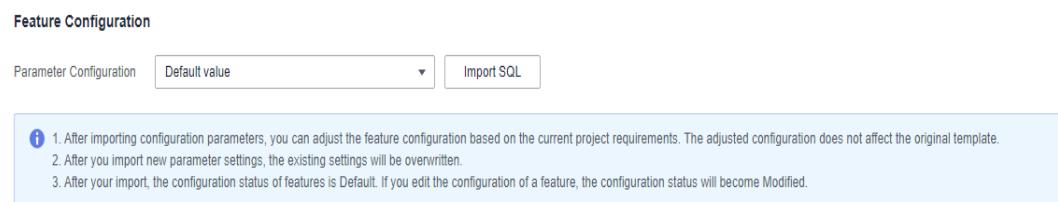
Table 3-31 Parameter description

Parameter	Description
Task Name	Enter a task name. The name is unique. It 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.
Target DB Type	Select the type of the target database.
Upload Data File	Click Add File to upload the local package to be converted. Only ZIP packages can be uploaded. Each file name in the package can contain up to 32 characters, including only letters, digits, underscores (_), and hyphens (-).

Step 4 In the **Feature Configuration** area,

- Set **Parameter Configuration** to **Default value** (default value) or **Max compatibility**, or import a created conversion configuration template. For details about how to create a conversion configuration template, see [Creating a Configuration Template](#).
- In the **Current Configuration** column, move the cursor to 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**. For details, see [Editing the Configurations During Migration from Oracle to GaussDB](#) and en-us_topic_0000001621010832.xml.
- After you import configuration parameters, the configuration status of features is **Default**. If you edit the configuration of a feature, the configuration status will become **Modified**.

Figure 3-64 Converting configuration



Step 5 Click **Create**.

All uploaded files are displayed. The file name, source database, target database, target database version, and status are displayed.

Figure 3-65 Converting a file



The **Status** column indicates the conversion status of the uploaded files. The status can be one of the following:

- **Queuing:** The file has been uploaded and is waiting for conversion.
- **In progress:** The file is being converted.
- **Completed:** The SQL files in the package are converted.
- **Failed:** All SQL files in the package fail to be converted or the package does not contain SQL files.

Step 6 Locate a file and click **Download** in the **Operation** column to download the converted file to the local host.

- If the **Status** of the task is **Failed**:
 - If the uploaded package contains SQL files, the downloaded package contains Excel files and the number of Excel files is the same as the number of SQL files in the uploaded file. The failure cause is that the files fail to be parsed.
 - If the uploaded package does not contain SQL files, the downloaded package contains Excel files and the number of Excel files is the same as the number of SQL files in the uploaded file. The failure cause is that the files are not SQL files and cannot be converted.
- If the **Status** is **Completed** and there are no unsupported items or supported items with risks, the downloaded package contains only converted SQL files whose number is the same as that of SQL files in the uploaded file. No Excel file is available.
- If **Status** is **Completed** and there are unsupported items or supported items with risks, the downloaded package contains SQL and Excel files. The Excel file displays the location, unsupported items, supported items with risks, and corresponding suggestions.

Step 7 Locate a task and click **View Details** in the **Operation** column to view the basic information and configuration parameters of the conversion.

Step 8 Locate a task and click **Delete** in the **Operation** column to delete files.

Select one or more tasks and click **Delete** in the upper left corner of the list to delete multiple tasks at a time.

NOTE

Deleted tasks cannot be restored. Exercise caution when performing this operation.

----End

3.2.6 Downloads

Scenarios

You can download the SQL file and view the download records.

Prerequisites

You have required permissions to download files.

Procedure

Step 1 Log in to the UGO console.

Step 2 In the navigation pane on the left, click **Downloads**.

- There are **Object Migration**, **Application Migration**, **Object Comparison**, and **Source SQL Extraction** tabs in the **Downloads** page.

Figure 3-66 Downloads

Downloads							
Object Migration Application Migration Object Comparison Source SQL Extraction UGO-defined Functions							
Delete							
	File Name	Project Name	Export Type	Started At	Finished At	Status	Operation
<input type="checkbox"/>	Auto_kemeLOn_export_grant.sql	Auto_kemeLOn_export...	Source Grant SQL	2022-10-22 16:23:31 GMT+08:00	-	Pending	Download Delete
<input type="checkbox"/>	Auto_kemeLOn_export_grant.sql	Auto_kemeLOn_export...	Source SQL	2022-10-22 16:23:25 GMT+08:00	-	Pending	Download Delete
<input type="checkbox"/>	Auto_kemeLOn_export_grant.sql	Auto_kemeLOn_export...	Converted SQL	2022-10-22 16:19:45 GMT+08:00	Oct 31, 2022 16:20:00 GMT+08:00	Success	Download Delete

- Click in front of a file name to view the application filter criteria for downloading the file.
- Locate a file and click **Download** in the **Operation** column to download the file.
- Locate a file and click **Delete** in the **Operation** column to delete the file.
- Select multiple files to be deleted and click **Delete** in the upper left corner of the list to delete the selected files in batches.
- The admin user can view and download system logs.

Step 3 Click **UGO-Defined Function**, select a source DB type and target DB type, and click **Download** to download SQL files in UGO-defined functions to the local host in targz format.

- If the **Download** button is unavailable after you configure the source and target DB types, there are no UGO-defined functions.
- Currently, only Procedure and Function objects can be downloaded.

NOTE

- A maximum of six files can be downloaded at a time.
- Deleted files cannot be restored. Exercise caution when performing this operation.

----End

3.2.7 Management

3.2.7.1 License Information

Step 1 Log in to the UGO console.

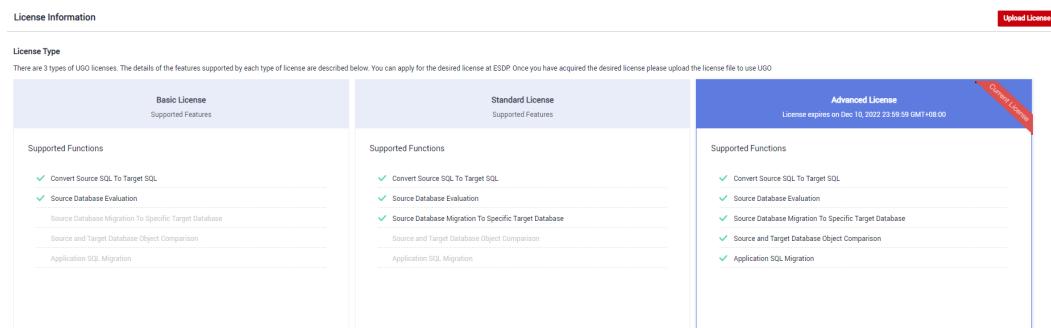
Step 2 Move the cursor to the username in the upper right corner and click **License Information**. The license information page is displayed.

The current license version, expiration time, and supported functions are displayed. You can click **Upload License** to upload a new license.

 **NOTE**

Only the super administrator can change the license.

Figure 3-67 License information



----End

Functions of Different Licenses

-	Basic License	Standard License	Advanced License
Convert source SQL statements to target SQL statements	✓	✓	✓
Evaluate the source database	✓	✓	✓
Migrate the source database to target database	x	✓	✓
Compare objects of source and target databases	x	x	✓
Migrate application SQL	x	x	✓
<small>✓: Supported x: Not supported</small>			

License Expiration

If you view that your license has expired on the **License Information** page, perform the following steps:

- Step 1** Log in to the UGO console as a super administrator.
 - Step 2** On the **License Information** page, click **Upload License** to upload a new license.
- End

3.2.7.2 User Management

Creating a User

- Step 1** Log in to the UGO console.
- Step 2** Move the cursor to the username in the upper right corner and click **User Management**. The **User Management** page is displayed.
- Step 3** Click **Create User** in the upper right corner of the page.
- Step 4** Configure required parameters.

Figure 3-68 Creating a user

The screenshot shows a user interface for creating a new user. It includes the following fields:

- User Name:** A text input field with a red asterisk indicating it is required.
- Password:** A text input field with a red asterisk and a visibility toggle icon.
- Confirm Password:** A text input field with a red asterisk and a visibility toggle icon.
- User Role:** A selection dropdown with three options: Admin, Operator (which is highlighted in blue), and Project Admin.
- Evaluation:** A selection dropdown with three options: All Projects (selected), Selected Projects, and No Access.
- Application Migration:** A selection dropdown with three options: All Projects (selected), Selected Projects, and No Access.
- Object Comparison:** A selection dropdown with three options: All Projects (selected), Selected Projects, and No Access.

Table 3-32 Parameter description

Parameter	Description
User Name	The name must contain 5 to 64 characters and start with a letter. Only letters and digits are allowed.

Parameter	Description
Password	The password must consist of 8 to 32 characters, including uppercase letters, lowercase letters, digits, and special characters ('~!@#\$%^&*()_-+=\ [{}];"';,<.>/?). The password cannot be empty and can contain up to three consecutive characters. It cannot be the username or the username spelled backwards.
Confirm Password	Confirm Password must be same as Password .
User Role	The user roles include administrator, operator, and project administrator.
Evaluation	You can select All Projects , Selected Projects , or No Access .
Application Migration	You can select All Projects , Selected Projects , or No Access .
Object Comparison	You can select All Projects , Selected Projects , or No Access .

Step 5 Click **Create User** in the lower right corner.

 **NOTE**

When a new user logs in to UGO, the initial password needs to be changed. If you enter incorrect passwords for five consecutive times, the account will be locked. Contact the administrator to unlock the account.

The number of login attempts can only be modified by the super administrator in the **Configuration** page.

If you have logged in to the system but are locked due to a password change, the current session will not be logged out immediately. However, after you log out the session, a message is displayed, indicating that the user is locked and cannot log in.

----End

Accounts and Passwords

Step 1 Log in to the UGO console.

Step 2 Move the cursor to the username in the upper right corner and click **User Management**. The **User Management** page is displayed.

Step 3 View the created users. User name, user roles, and accessible projects are displayed. You can search for your desired user by role or user name.

Step 4 Modify the information of a user. Locate a user, click:

- **Modify Project Access** to modify the project type and project access permissions.
- **Reset Password** to change the password.
- **Delete** to delete the user.

- **Lock User** to lock the user. The user cannot log in to the service. To unlock the user, contact the administrator. Exercise caution when performing this operation.
- **Kill Session** to stop the session but retain the user. The user can log in to the service again.

----End

Permissions of Different User Roles

- The administrator has all permissions for UGO.
- The project administrator has the permissions to operate projects, but is not allowed to manage users and audit logs.
- The operator has the following permissions:
 - Test and delete data sources.
 - View database evaluation projects, object migration projects, object comparison projects, and application migration projects. Start application SQL conversion.
Perform some management operations on object migration projects, such as starting syntax conversion, starting migration verification, and modifying target database statements.
 - Perform the following operations in the **SQL Audit** page:
 - Using all functions in text review and file review.
 - Add, replicate, view, delete, and filter templates.
 - Add, edit, delete, and filter rules.
 - Use the **Convert Text** function in the **SQL Conversion** page, but cannot use the **Convert File** function.
 - Create, modify, and delete your own conversion configuration templates.

3.2.7.3 Configuration



This function is available only to the super administrator.

Table 3-33 Parameters in the system configuration page

Configuration Name	Description	Default Value	Value Range	Current Value
Maximum Number of History Passwords	Maximum number of previously used passwords disallowed	3	0-10	Set the current value as required.
Maximum Number of User Accounts	Maximum number of users that can be created	50	0-100	
Session Timeout	Period of time (in milliseconds) after which the session will expire if the user does not perform any operation	180000	90000-3600000 ms	
Session Timeout Grace Period	Period of time (in milliseconds) before session timeout value, session can be renewed	60000	1000-60000 ms	
Maximum Number of Failed Captcha Attempts	Maximum number of failed consecutive login attempts after which the Captcha field will be enabled	3	3-5	
Maximum Number of Attempts to Lock User	Maximum number of failed consecutive login attempts after which the user account will be locked	5	5-10	
Captcha Disable Time Interval	Period of time (in minutes) after which the Captcha field will be disabled	5	1-10 min	
Time Period to Unlock Super Admin User	Period of time (in minutes) after which the super admin account will be unlocked	20	1-30 min	
Maximum Number of Attempts to Lock IP	Maximum number of failed login attempts from an IP address. If the number of times exceeds the value of this parameter, the IP address is locked.	8	5-15	

Configuration Name	Description	Default Value	Value Range	Current Value
Database connection timeout interval	The system attempts to reconnect to the database until the value of this parameter is reached. The unit is millisecond (1 second = 1000 milliseconds). (This parameter value is only applied to new evaluation tasks.)	300000	30000-1800000 (ms)	
Skipping data collection	true: 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. false: If the database connection times out, the evaluation project creation will be stopped. You need to change the database connection timeout interval and resume the creation of the project. (This parameter value is only applied to new evaluation tasks.)	true	boolean	

Table 3-34 Parameters in the application migration configuration page

Configuration Name	Description	Default Value	Value Range	Current Value
Maximum SQL Size to Mark Complex	Query sizes larger than this value are marked as complex	10000	500-5000	Set the current value as required.
File Retention Period	Duration for storing uploaded files. Files that are older than the specified period are deleted.	24	1-24 h	
Execute Auto Recovery	Whether to automatically resume running tasks upon restart of kernel node	true	true / false	

Configuration Name	Description	Default Value	Value Range	Current Value
Maximum Number of Tries to Run Auto Recovery	Number of retries to resume running tasks upon restart of kernel node	2	2-5	

Changing the Parameter Value

Step 1 Log in to the UGO console.

Step 2 Move the cursor to the user name in the upper right corner and click **Configuration**. On the **System Configuration** or **Application Migration Configuration** page, locate the configuration that you want to change.

Click **Download System Logs** to export the log file in .tar.gz format. You can view the downloaded logs in the **Downloads** page.



The disk space must be at least 1 GB when you download system logs.

Step 3 Click **Modify** in the **Operation** column and enter a new value.

Step 4 Click **Save** to confirm the change. A message is displayed, indicating that the configuration is updated.

Click **Cancel** to cancel the change.

----End

3.2.7.4 Audit

The audit function is used to monitor the UGO usage in real time.

You can search for information by column, audit type, or importance. You can set the number of records displayed on each page. You can click next to a column to change the display sequence.

Table 3-35 Audit list

Column Name	Description
User Name	User name for logging in to UGO.
Action	Action performed on UGO.
IP	IP address of the local host where UGO is installed.
Audit Time	Time when the action was performed
Importance	High/Medium/Low: importance of audit logs.

Column Name	Description
Audit Type	<ul style="list-style-type: none">Task: action initiated by scheduled tasks.Platform: action initiated by UGO, such as stopping, starting, and restarting UGO.User: action initiated by the user.
Object	Object on which the action is performed.
Result	Operation result, which can be success or failure .
App Instance	Application module or service that is responsible for performing the action and auditing.

3.2.7.5 Alarms

You can view alarms generated by monitoring tools.

You can search for alarms by severity and alarm type, change the alarm display sequence, and manually clear alarms.

Click  of an alarm to view the alarm details.

The alarm types are as follows:

- Memory: This alarm is generated when the system memory usage exceeds 95%. This alarm is cleared when the system memory usage is less than 85%.
- Disk: This alarm is generated when the disk usage exceeds 85%. This alarm is cleared when the disk usage is lower than 75%.
- Certificate: This alarm is generated when
 - The current certificate is self-signed.
 - The web certificate will expire in 7 days or has expired.
 - The web certificate is tampered with or invalid.
- License: This alarm is generated when:
 - The license is invalid.
 - The license will expire in 30 days or has expired.

NOTE

- UGO also monitors three processes. For details, see [UGO Process Monitoring](#).
- To clear an alarm, see *Database and Application Migration UGO (UGO) 2.23.07.200 Maintenance Guide (for Huawei Cloud Stack 8.1.0)* > *Database and Application Migration UGO (UGO) 2.23.07.200 Troubleshooting (for Huawei Cloud Stack 8.1.0)* > *Alarm Reference*.

3.3 FAQs

3.3.1 Product Consulting

3.3.1.1 Which of the Following Schemas Are Not Considered During the Source Database Object Collection?

Oracle as the Source Database Type

UGO does not migrate the following schemas:

```
'APEX_050000', 'AUDSYS', 'ADAMS', 'ANONYMOUS',
'AURORA$ORB$UNAUTHENTICATED', 'AWR_STAGE', 'APEX_030200', 'APEX_040200',
'APEX_PUBLIC_USER', 'APPQOSSYS', 'BI', 'BLAKE', 'CLARK', 'CSMIG',
'CTXSYS', 'DBSNMP', 'DIP', 'DMSYS',
'DSSYS', 'DEMO', 'DVSYS', 'DVF',
'DBSFWUSER', 'EXFSYS', 'FLOWS_FILES',
'GGSYS', 'GSMADMIN_INTERNAL', 'GSMCATUSER', 'GSMUSER', 'HR',
'IX', 'JONES', 'LBACSYS', 'MDDATA', 'MDSYS', 'MGMT_VIEW',
'OE', 'OLAPSYS', 'ORACLE_OCM', 'ORDDATA', 'ORDPLUGINS',
'ORDSYS', 'OUTLN', 'OWBSYS', 'OWBSYS_AUDIT', 'OJVMYSYS',
'PERFSTAT', 'PM', 'REMOTE_SCHEDULER_AGENT', 'SCOTT', 'SH',
'SI_INFORMTN_SCHEMA', 'SPATIAL_CSW_ADMIN_USR',
'SPATIAL_WFS_ADMIN_USR', 'SYS', 'SYSMAN', 'SPATIAL_CSW_ADMIN_USR', 'SYSBACKUP',
'SYSKM', 'SYSDG', 'SYSRAC', 'SYS$UMF', 'SYSTEM',
'TRACESVR', 'TSMSYS', 'WMSYS', 'XDB', 'XS$NULL', 'GSMROOTUSER'
```

MySQL as the Source Database Type

- information_schema
- mysql
- performance_schema
- sys

DB2 for LUW as the Source Database Type

- NULLID, SQLJ
- SYSCAT, SYSFUN
- SYSIBM, SYSIBADM
- SYSIBMINTERNAL
- SYSIBMTS
- SYSPROC
- SYSPUBLIC
- SYSSTAT
- SYSTOOLS

3.3.1.2 What Are the Database Schema Changes After an Oracle Database Is Migrated to the Target Database?



Syntax conversion is the conversion of SQL scripts of source database objects into SQL scripts of the target database objects. The SQL scripts are not executed in the target database.

Migrate & Verify is the sending of converted SQL statements to the target database for execution.

3.3.1.3 What Are Structure Changes After Oracle Databases Are Migrated to the Target Database?

- The Oracle schemas are converted into the PostgreSQL schemas.
- The Oracle schemas are converted into the MySQL databases.

3.3.1.4 What Is the Function of the `dsc_ora_ext` Schema Generated After Migration to the Target Database?

`dsc_ora_ext` is a custom schema compiled by UGO to enable the target database to implement certain functions in the Oracle source database.

If the source database is MySQL, the custom schema is `dsc_mys_ext`.

For example, UGO creates custom target database functions that provide the same functions as Oracle system functions, and it converts Oracle system function calls to custom function calls during migration.

3.3.1.5 What Should I Do If Data Collection Fails or Is Slow Due to the Small Values of Certain Oracle SGA Parameters?

If data collection fails or is slow because certain parameters in the Oracle system global area (SGA) are set to small values, run the following command:

show parameter SGA

Command output:

NAME	TYPE	VALUE
sga_max_size	big integer	796M
sga_target	big integer	0

Contact the database administrator to increase the values of the SGA parameters.

ALTER SYSTEM SET MEMORY_TARGET=5G scope=spfile;

ALTER SYSTEM SET sga_max_size=5G scope=spfile;



The preceding parameter values are for reference only. If their value is too large, more resources are occupied. Contact the database administrator to set the parameters to appropriate values.

For details about the parameters, see the [Oracle official documentation](#).

3.3.1.6 What Should I Do If the Collection Fails and the Message "Snapshot Too Old" Is Displayed?

If the collection fails or the error message "ORA-01555: snapshot too old" is displayed, check the UNDO parameters of the source Oracle database. Run the following command:

show parameter undo

Command output:

```
NAME TYPE VALUE
undo_management string AUTO
undo_retention integer 28800
```

Contact the database administrator to increase the UNDO_RETENTION value.

ALTER SYSTEM SET UNDO_RETENTION =N

Replace N with an appropriate value.

3.3.1.7 What Should I Do If Garbled Characters Are Displayed On the Collection Script or Configuration Page?

When you install UGO for the first time, the language setting is incorrect.

Switch to the user who installs UGO and run the following command:

LANG=en_US.UTF-8

export LANG

```
[root@szxphisprc03126 ugo0315]# su - ugo0315
Last login: Wed Apr 7 16:35:51 CST 2021 on pts/0
[ugo0315@zxphisprc03126 ~]$ LANG=en_US.UTF-8
[ugo0315@zxphisprc03126 ~]$ export LANG
```

Run the locale command. If the following information is displayed, the setting is complete.

```
[ugo0315@zxphisprc03126 ~]$ locale
LANG=en_US.UTF-8
LC_CTYPE="en_US.UTF-8"
LC_NUMERIC="en_US.UTF-8"
LC_TIME="en_US.UTF-8"
LC_COLLATE="en_US.UTF-8"
LC_MONETARY="en_US.UTF-8"
LC_MESSAGES="en_US.UTF-8"
LC_PAPER="en_US.UTF-8"
LC_NAME="en_US.UTF-8"
LC_ADDRESS="en_US.UTF-8"
LC_TELEPHONE="en_US.UTF-8"
LC_MEASUREMENT="en_US.UTF-8"
LC_IDENTIFICATION="en_US.UTF-8"
LC_ALL=
```

3.3.1.8 How Do I Resolve the java.util.concurrent.TimeoutException Error?

```
[2021-09-30 19:34:43.271][ERROR][Migration][][]|[Interrupt|TimeOut Exception while waiting for the thread execution, ex:*** java.util.concurrent.TimeoutException : null ***, projectId:2
, SrcseqId:36822][com.huawei.gauss.dsc.converter.a.AbsConversionProcessStarter.java:285]:ConversionProjectStarterPool-1]
[2021-09-30 19:34:43.271][ERROR][Migration][][]|[Interrupt|TimeOut Exception while waiting for the thread execution, ex:*** java.util.concurrent.TimeoutException : null ***, projectId:2
, SrcseqId:36822][com.huawei.gauss.dsc.converter.a.AbsConversionProcessStarter.java:285]:ConversionProjectStarterPool-1]
```

If a timeout exception occurs during the migration, log in to the server where UGO is installed and go to the following path:

\$USER_HOME/ugoserver/web/webapps/migration/WEB-INF/classes/config

Go to the **application.properties** file. Add the value of **OBJECT_PROCESS_TIME_OUT**.

vi application.properties

Save the file and exit.

:wq!

3.3.1.9 What Is the Mapping Between the GaussDB Versions Displayed on the UGO Console and Self-Managed GaussDB Versions?

Log in to your self-managed GaussDB database and run the following command to query the version:

select version();

Table 3-36 describes the mapping between self-managed GaussDB database versions and the GaussDB versions displayed on the UGO console.

Table 3-36 Version mapping

Self-Managed GaussDB Version	GaussDB Version on the UGO Console
V500R001C20	GaussDB 1.4 Enterprise Edition
V500R002C00	GaussDB 2.0 Enterprise Edition
V500R002C10	GaussDB 2.7 Enterprise Edition
503.0.x	GaussDB 3.1 Enterprise Edition
503.1.x	GaussDB 3.2 Enterprise Edition

3.3.2 Database Connections

3.3.2.1 What Should I Do If I Cannot Connect to the Source Database During Database Evaluation Project Creation?

Check:

- If the source database is deployed in RAC mode, you are advised to enable the firewalls of IP addresses of all nodes or enable only the firewall of the public IP address. UGO can directly connect to the source database.
- Whether the network between the source database and UGO is connected. Currently, UGO can connect to the source database through a public network.
- Whether the network is stable (including the packet loss rate and delay). If the network quality of the source database is poor, the evaluation project may fail.
- Whether UGO is allowed by the source database firewall settings.
- Whether the database connection information is correct.

3.3.2.2 What Should I Do If I Failed To Connect to the Source Database as User sys?

User **sys** is the super administrator of Oracle databases. Generally, the Oracle database restricts the remote login of user **sys**. You are advised to connect to the source database as other database users.

3.3.2.3 What Should I Do If the Source Database Cannot Be Connected Because DNS Resolution Takes a Long Time?

Scenario

When the parameters are correctly configured during the evaluation project creation, the message "detail:Connect timeout" is displayed.

Cause

DNS resolution takes a long time.

Solution

Step 1 Go to the file.

```
vi /etc/resolv.conf
```

Step 2 Comment out the following content:

```
options timeout:1
; generated by /usr/sbin/dhclient-script
search openstacklocal
#nameserver 172.202.100.143
#nameserver 172.202.100.144
~
```

----End

3.3.2.4 How Can I Resolve SSL Connection Failure Caused by a High JDK Version?

Symptom

When a database evaluation project is created using DB2 for LUW as the source database, the SSL connection fails.

Cause

If the JDK version is later than 1.8.0.271, TLSv1 and TLSv1.1 are disabled by default and the SSL connection fails.

Solution

Method 1

Use the JDK whose version is 1.8.0.271 or earlier.

Method 2

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Switch to the **/jre/lib/security** directory in the **jdk** folder.

```
cd /jdk path/jre/lib/security
```

Step 3 Change the value of **jdk.tls.disabledAlgorithms** in the **java.security** file to delete the versions that require protocol.

```
vim java.security
```

```
jdk.tls.disabledAlgorithms=SSLv3, TLSv1, RC4, DES, MD5withRSA, \
DH keySize < 1024, EC keySize < 224, 3DES_EDE_CBC, anon, NULL, \
include jdk.disabled.namedCurves
```

Step 4 Save the file and exit.

```
:wq
```

Step 5 Go to the **/ugoserver/bin** directory.

Step 6 Switch to the non-root user entered during installation, that is, **ugo**.

```
sudo su ugo -s /bin/bash
```

Step 7 Restart the UGO service.

```
python3 ugoserver.py restart
```

----End

3.3.2.5 How Do I Create GaussDB Databases Compatible with Source Databases?

Oracle as the Source Database Type

Step 1 Log in to your GaussDB instance as a user who has the permission to create databases.

Step 2 Create a GaussDB database compatible with Oracle schemas.

Primary/standby:

```
create database databasename dbcompatibility = 'A';
```

Distributed:

```
create database databasename dbcompatibility = 'ORA';
```

Step 3 Check whether the database is created.

```
select * from pg_database where datname = 'databasename';
```

- Primary/standby: If the value of **datcompatibility** is **A**, the database is created.

- Distributed: If the value of **datcompatibility** is **ORA**, the database is created.
- End

MySQL as the Source Database Type

Step 1 Log in to your GaussDB instance as a user who has the permission to create databases.

Step 2 Create a GaussDB database compatible with MySQL schemas.

Primary/standby:

```
create database databasename dbcompatibility = 'B';
```

Distributed:

```
create database databasename dbcompatibility = 'MySQL';
```

Step 3 Check whether the database is created.

```
select * from pg_database where datname = 'databasename';
```

- Primary/standby: If the value of **datcompatibility** is **B**, the database is created.
- Distributed: If the value of **datcompatibility** is **MySQL**, the database is created.

----End

DB2 for LUW as the Source Database Type

Step 1 Log in to your GaussDB instance as a user who has the permission to create databases.

Step 2 Create a GaussDB database compatible with Oracle schemas.

```
create database databasename dbcompatibility = 'A';
```

Step 3 Check whether the database is created.

```
select * from pg_database where datname = 'databasename';
```

If the value of **datcompatibility** is **A**, the database is created.

----End



NOTE

GaussDB databases are incompatible with DB2 for LUW databases, but are compatible with Oracle databases by default. The migration link from GaussDB to DB2 for LUW is developed based on the Oracle databases, so when the source database type is DB2 for LUW, you can select a GaussDB database that is compatible with Oracle databases.

3.3.3 Evaluation Project

3.3.3.1 How Do I Select a Connection Method?

- **Service Name:** You need to specify the source database name, host IP address or host name, username and other parameters. UGO constructs a connection string based on these parameters.
- **Connection String:** JDBC URL, which must comply with the format specifications of the source or target database. You also need to specify database name, host name, and IP address.
For the target database, you can reference the JDBC URL syntax based on the database document. For example, the format of MySQL is **jdbc:mysql://DBIP:Port/DBName**.

3.3.3.2 What Can I Do If A Message Is Displayed Indicating That the Account Is Locked During the Connection Test?

Symptom

Parameters are configured correctly during the evaluation project creation. After you click **Start Test**, a message is displayed, indicating the account is locked.

Possible Causes

The source database login is locked because the number of incorrect password attempts exceeds the upper limit.

Solution

To unlock the Oracle source database, perform the following steps:

Step 1 Log in to the database as the Oracle user.

su - oracle

Step 2 Access the SQL*Plus console.

sqlplus /nolog

Step 3 Log in to the console as the system administrator.

connect / as sysdba

Step 4 Unlock the account.

alter user ugo account unlock

----End

3.3.3.3 What Check Items Are Included In a Pre-check? What Should I Do If the Pre-check Fails?

Oracle as the Source Database Type

Pre-check includes four check items: If any of check items fails, you need to take proper measures as prompted.

- DBMS_METADATA permission: The system checks whether a user has the permission to retrieve meta data from the Oracle database dictionary. This permission is used to obtain the DDL of schema objects.
- Dynamic view permission: The system checks whether a user has the permission to access various dynamic performance views. This permission is used to obtain basic database information.
- Schema objects: The system checks whether there are schema objects to be evaluated. At least one object needs to be evaluated.
- DBA permission: The system checks whether a user has the DBA permission to perform subsequent operations.

If the pre-check fails, require the target database user (you specified when you create an evaluation project) to obtain required permissions.

MySQL as the Source Database Type

Pre-check includes five check items shown here: If any of check items fails, you need to take proper measures as prompted.

- MySQL system database privilege: The system checks whether a user has the permission to query the MySQL system databases. By default, UGO uses the MySQL system databases for connection test.
- DDL object count: The system checks whether a user has the permission to access at least one schema where DDL objects need to be evaluated.
- Permission to generate DDL scripts: The system checks whether a user has the permission to access database objects.
- MySQL PROCESS privilege: The system checks whether a user has the permission to view all tables in information_schema. This permission is used to obtain basic database information.
- MySQL8.0 SHOW_ROUTINE privilege: The system checks whether a user has the SHOW_ROUTINE permission. Since MySQL 8.0.20, the SHOW_ROUTINE permission allows user to access stored procedures and function definitions.

3.3.3.4 What Are the Possible Causes for an Object Collection Failure?

Object collection can fail for various reasons. Some of the possible reasons are as follows:

- The network to the source database is unavailable.
In this case, restore the network connection between UGO and the source database and re-create an evaluation project.
- The target database could not be verified.
If a namespace is specified in the table creation statement, check whether the namespace exists in the target database. If no, create it.
If a view or function fails to be created, check whether it depends on the target database table. If yes, ensure that the table is successfully created.

3.3.3.5 In GaussDB, How Do I Configure a Search Path If A Statement Without Schema Name Fails To Be Executed?

You can execute the following command in GaussDB to see if the **aa** table exists.

```
create schema sch1;  
create table sch1.aa(col int);  
select * from aa;
```

If it does not exist, the actual error message is as follows: -ERROR: The table **aa** does not exist.

LINE 1: select * from aa;

^

SQL state: 42P01

Character: 15

This is because there is no **sch1** in the search path.

Run following statement to add **sch1** to the search path:

```
set search_path = "$user",public,sch1;
```

Run the SELECT statement.

```
select * from aa;
```

In this case, no error occurs.



To obtain the current **search_path**:

```
show search_path;
```

3.3.3.6 What Is Native Supported, UGO Supported, Supported with Risk, or Unsupported Objects?

- **Native Supported:** The object syntaxes of source and target databases are compatible.
- **UGO Supported:** UGO can convert the object syntax of source database to be compatible with the target database.
- **Supported with Risk:** UGO can convert the object syntax of source database to be compatible with the target database, but there may be some performance or functional differences after conversion.
- **Unsupported Objects:** UGO cannot convert the object syntax of source database to be compatible with the target database.

Supported objects include **Native Supported**, **UGO Supported**, and **Supported with Risk** objects.

3.3.3.7 What Is the Relationship Between Migration Risk (Top 10 risk SQL) and Risky SQL Summary?

There is no relationship between migration risk and risky SQL summary.

Migration Risks (Top 10 risk SQL): describes the 10 slow SQL statements using up the most CPU and memory resources on the source database over the past 7 days.

Risky SQL Summary: describes migration risks from the perspective of the target database. You need to pay attention to some functions that are not directly supported by the target database.

Risks are classified into functional and performance risks.

- Functional risks: risks that affect the database functions. For example, data types (such as value ranges) that are not directly supported by the target database can be summarized in terms of data_type_mismatch, table_def_mismatch and sequence_limitation.
- Performance risks: risks that affect the database performance. For example, GaussDB does not support partition intervals, which can be summarized in terms of distribution and partitioning.

3.3.3.8 What Are Reconstruction Statistics and How Are Reconstruction Points Measured?

Each clause or keyword in the source syntax can be considered a reconstruction point in the migration.

Successful reconstruction points are collected based on native-supported objects, UGO-supported objects, and supported objects with risks.

Failed reconstruction points are collected based on UGO-unsupported objects.

3.3.3.9 What Should I Do If an Object Collection Error (Closed Connection) Is Displayed During Evaluation Project Creation?

Symptom

When an evaluation project is being created, **Project Status** becomes **Stopped**. **Object Collection Error**. After you click **Object Collection Error**, **Closed Connection** is displayed in the **Error** column.

Figure 3-69 Error display



Schema Name	Object Type	Object Name	Error
CDATA10	TABLE	BASE_SERVICE_EVENT_T	Closed Connection
CDATA10	TABLE	BASE_SITEMAP_T	Closed Connection
CDATA10	TABLE	BASE_TABLE_BACKUP_IGNORE_T	Closed Connection

Causes

The collection time for UGO to collect DDL information from the source database was set to 60 seconds. If the size of the database objects to be collected are too large or no data is returned within 60 seconds due to poor database performance or network connection, there may be an object collection error.

Solution

Method 1: Manually submit the SQL statements of the objects that fail to be collected.

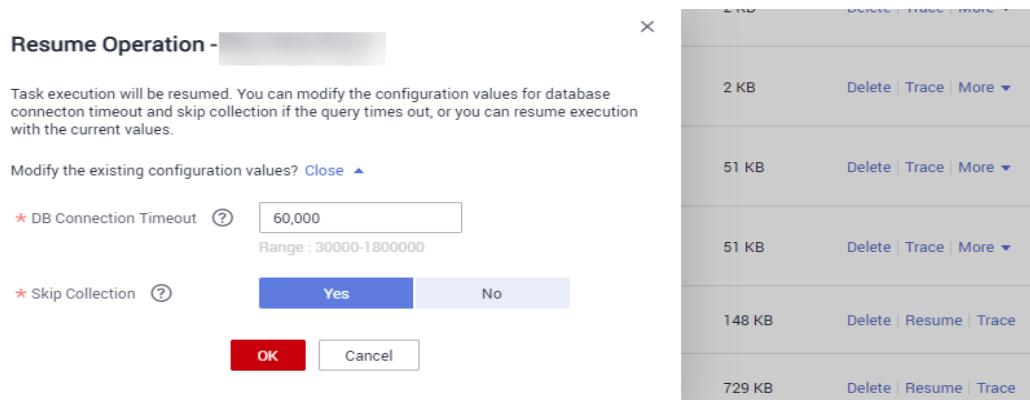
- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, choose **Schema Migration > DB Evaluation**.
- Step 3** Click the project name to go to the **Source DB Analysis** page.
- Step 4** Click **View Object Details** in the **Object Statistics** area and select a failed schema.
- Step 5** Click **Edit SQL** in the **Operation** column and manually import the SQL statement, and save it.
- Step 6** Locate the desired project on the project list page and click **Resume** in the **Operation** column.

----End

Method 2: Change the collection time.

- Step 1** Locate the desired project and click **Resume** in the **Operation** column.

Figure 3-70 Resuming an evaluation task



- Step 2** Change the value of **DB Connection Timeout**.

- Step 3** Click **OK**.

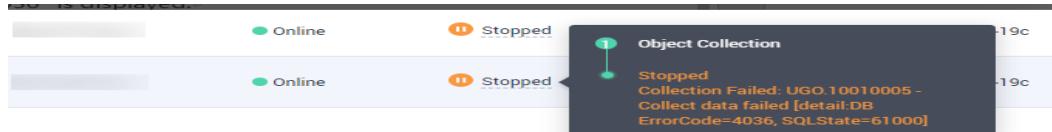
----End

3.3.3.10 What Should I Do If "ErrorCode=4036" Is Displayed During Evaluation Project Creation?

Symptom

When an evaluation project is being created, **Project Status** becomes **Stopped**. After you move the mouse to **Stopped**, the error message "ErrorCode=4036" is displayed.

Figure 3-71 Error message



Causes

The value of **pga_aggregate_limit** is inappropriate and there is an error **pga-memory-used-by-the-instance-exceeds-pga-aggregate-limit** in the database.

Solution

Step 1 Log in to the source Oracle database as the **oracle** user.

Step 2 Run the following command to query the value of **pga_aggregate_limit**.

```
show parameter pga_aggregate_limit;
```

Step 3 Run the following command to change the value of **pga_aggregate_limit**.

```
alter system set pga_aggregate_limit = 0;
```

Step 4 Log in to the UGO console and resume the project.

----End

3.3.3.11 What Should I Do If "ErrorCode=17002" Is Displayed During Evaluation Project Creation?

Symptom

When an evaluation project is being created, **Project Status** becomes **Stopped**. After you move the mouse to **Stopped**, the error message "ErrorCode=17002" is displayed.

Causes

During peak hours or when multiple database evaluation tasks are being created at the same time, the number of database connections will reach the upper limit. As a result, UGO cannot obtain valid connections from the source database and several projects are in the **Stopped** status.

Solution

Step 1 Log in to the source Oracle database as the **oracle** user.

Step 2 Query the maximum number of database connections.

```
show parameter processes;
```

Step 3 Create **spfile**.

```
create spfile from pfile;
```

Step 4 Restart the source database.

```
shutdown immediate;
```

```
startup
```

Step 5 Run the following command to change the maximum number of connections for the source database:

```
alter system set processes = 2000 scope = spfile;
```

Step 6 Restart the source database and check whether the maximum number of connections is changed successfully.

```
shutdown immediate;
```

```
startup
```

```
show parameter processes;
```

Step 7 Log in to the UGO console and resume the project.

----End

3.3.4 Migration Project

3.3.4.1 Why Is There No Available Evaluation Project During Migration Project Creation?

The evaluation project creation is not yet complete. Before creating a migration project, ensure that there is at least one evaluation project where the target database has been confirmed.

3.3.4.2 When Should I Use the Conversion Config Function?

Before the migration, if multiple migration solutions are available in the source database application system, you can click **Conversion Config** to select the optimal configuration solution (based on the source database system and your requirements).

3.3.4.3 How Do I Export SQL Files from the Target Database by Statement?

Step 1 Log in to the UGO server as a non-root user.

Step 2 Switch to the following directory:

```
cd ${UGOHOME}/ugoserver/web/webapps/migration/WEB-INF/classes/  
config/
```

```
[ugo@host-      ~]$ cd /home/ugo/ugoserver/web/webapps/migration/WEB-INF/classes/config/  
[ugo@host- config]$ ll  
total 56  
-r----- 1 ugo ugo 1806 Sep 26 16:50 application.properties  
-r----- 1 ugo ugo 695 Sep 26 16:25 database.properties  
drwx---- 3 ugo ugo 4096 Sep 26 16:25 db2  
-r----- 1 ugo ugo 992 Sep 26 16:25 dbconfig.properties  
-r----- 1 ugo ugo 320 Sep 26 16:25 drs_dbversion.properties  
-r----- 1 ugo ugo 9167 Sep 26 16:25 error_message_en-us.properties  
-r----- 1 ugo ugo 7969 Sep 26 16:25 error_message_zh-cn.properties  
drwx---- 3 ugo ugo 4096 Sep 26 16:25 mysql  
drwx---- 7 ugo ugo 4096 Sep 26 16:25 oracle  
-r----- 1 ugo ugo 323 Sep 26 16:50 ugysql.properties  
-r----- 1 ugo ugo 79 Sep 26 16:25 version.properties
```

Step 3 Go to the **application.properties** file.

```
vim application.properties
```

Step 4 Change the value of **exportSqlIntoOneFile**.

- If this parameter is set to **true** (default value), SQL files are generated by object.
- If this parameter is set to **false**, SQL files are generated by statement.
A single SQL file is generated for each statement and saved in the same folder by object. The folder name is the object name.

Step 5 Save the configuration and exit.

```
:wq!
```

Step 6 Switch to the **<ugoserver>/bin** directory.

```
cd <ugoserver>/bin
```

Step 7 Restart the UGO service.

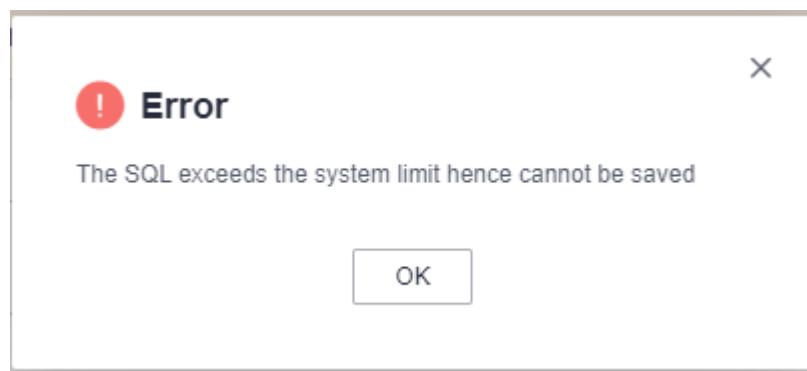
```
python3 ugoserver.py restart
```

----End

3.3.4.4 What Should I Do If SQL Modifications Failed to Be Saved During Object Correction?

After you modify a SQL statement on the object correction page and save the modifications, an error message shown in the following figure may be displayed:

Figure 3-72 Error message



Reason: The statement length exceeds the upper limit of 1 MB.

Suggestion: Adjust the statement length.

3.3.4.5 Why Is a Name Error Reported During Database Migration?

Symptom

When DB2 for LUW is used as the source database and GaussDB is used as the target database, an error similar to the following picture is reported during object correction.



```
1 CREATE OR REPLACE TRIGGER TEST.FE2022051000290_EXTRATRIG4
2 BEFORE DELETE ON TEST.emp_t
3 REFERENCING OLD AS oobj
4 FOR EACH ROW
5 BEGIN
6     DECLARE REVSTR VARCHAR(16) DEFAULT 'ABC';
7     DECLARE "REV STR" , "REV STR" BOOLEAN DEFAULT FALSE; -- (2)
8
9     DECLARE LEN INT;
10    INSERT INTO emp_bk
11        VALUES ( oobj.empno, oobj.ename, oobj.deptno );
12
13 ;
```

```
1 CREATE OR REPLACE TRIGGER TEST.FE2022051000290_EXTRATRIG4
2 BEFORE DELETE ON TEST.emp_t
3 REFERENCING OLD AS oobj
4 FOR EACH ROW
5 BEGIN
6     DECLARE REVSTR VARCHAR(16) DEFAULT 'ABC';
7     DECLARE "REV STR" , "REV STR" BOOLEAN DEFAULT FALSE; -- (2)
8
9     DECLARE LEN INT;
10    INSERT INTO emp_bk
11        VALUES ( oobj.empno, oobj.ename, oobj.deptno );
12
13 ;
```

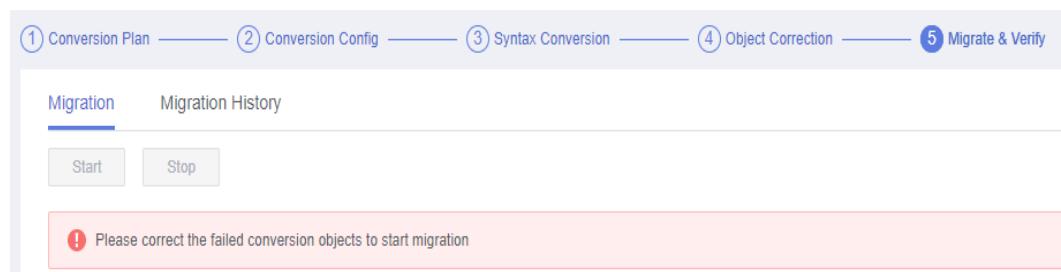
Cause

DB2 for LUW supports variables in DECLARE statements with same name followed by a different number of spaces, UGO does not support this scenario for conversion to GaussDB.

Solution

Manually delete redundant spaces during object correction.

3.3.4.6 What Should I Do If Migrate & Verify Failed to be Performed?



You need to modify the objects that failed to be migrated. Alternatively, change the migration status of all objects that fail to be migrated to **Ignore**. The verification process will be skipped.

3.3.4.7 What Is the Impact of the Migration on the Source Database?

- When a UGO evaluation task connects to the source database to collect objects, the execution time of the select or alter statement in the source Oracle database increases by about 0.1s.
- The following table describes the impact on the source database performance.

Table 3-37 Impact on the source database performance

Source Database Type	Configuration	CPU Usage	Memory Usage	I/O Usage	Application Query Impact
Oracle database without application load	vCPUs: 48 Memory: 188 GB Storage: 511 GB	0.04% -> 17.03%	1.5% -> 2.56%	0.1% -> 2.8%	N/A
Oracle database with application load simulated in TPC-H	vCPUs: 48 Memory: 188 GB Storage: 511 GB	0.04% -> 19.63%	1.52% -> 2.54%	0.1% -> 10.2%	Increased by 5%

 **NOTE**

- Source: Lab test data. The specific impact depends on the actual situation.
- The TPC-H is a well-known benchmark used by many database vendors. It consists of a suite of business oriented ad-hoc queries and concurrent data modifications. The queries and the data populating the database have been chosen to have broad industry-wide relevance.

3.3.5 Application Migration

3.3.5.1 What Can I Do If an Error Is Reported When I Start Agent Collection?

Symptom

When the agent is started, the message "Error opening zip file or JAR manifest missing" is displayed and the agent cannot be loaded.

```
error opening zip file or JAR manifest missing : /opt/appmig/1223/collector/agent/appagent.jar
error occurred during initialization of VM
agent library failed to init: instrument
error opening zip file or JAR manifest missing : /opt/appmig/1223/collector/agent/appagent.jar
error occurred during initialization of VM
agent library failed to init: instrument
error opening zip file or JAR manifest missing : /opt/appmig/1223/collector/agent/appagent.jar
error occurred during initialization of VM
agent library failed to init: instrument
```

Cause

The owner group of the folder where the agent is located is different from that of the current application startup user. The user has no the permission to access the folder.

Solution

Step 1 Log in to the server as the **root** user.

Step 2 Go to the directory where the agent file is stored.

Step 3 Run the following command to check the owner group of the folder where the agent is located:

ll

```
[root@ecs-f62a-test appmig]# ll
total 146380
drwxr-xr-x 3 guoww guoww 4096 Dec 22 15:21 1222
drwxr-xr-x 3 guoww guoww 4096 Dec 22 16:01 1222247
drwxr-xr-x 3 root root 4096 Dec 23 10:31 1223
drwxr-xr-x 6 guoww guoww 4096 Dec 20 17:31 collector
-rwxr-xr-x 1 guoww guoww 149873662 Dec 20 19:04 collector (3).zip
[root@ecs-f62a-test appmig]#
```

Step 4 Run the following command to check the user that the application belongs to:

ps -ef|grep java

```
[root@ecs-lixitong-using ~]# ps -ef|grep java
root 1537 1 0 Jun17 ? 02:00:55 /CloudResetPwldUpdateAgent/bin/.wrapper /CloudResetPwldUpdateAgent/bin//conf/wrapper.conf wrapper.syslog.ident=<CloudResetPwldUpdateAgent> wrapper.pidfile=/CloudResetPwldUpdateAgent/bin/.cloudResetPwldUpdateAgent.pid wrapper.name=<CloudResetPwldUpdateAgent> wrapper.displayName=<CloudResetPwldUpdateAgent> wrapper.daemonize=true wrapper.statusfile=/CloudResetPwldUpdateAgent/bin/.cloudResetPwldUpdateAgent.status wrapper.java.statusfile=/CloudResetPwldUpdateAgent/bin/.cloudResetPwldUpdateAgent.java.wrapper.lockfile=/var/lock/subsys/cloudResetPwldUpdateAgent wrapper.script.version=3.5.26
root 1706 1537 0 Jun17 ? 03:26:34 /CloudResetPwldUpdateAgent/depend/jre1.8.0_131/bin/java -Dorg.tanukisoftware.wrapper.WrapperSimpleApp.mainStartMainWait=40 -Djava.library.path=/lib/resetPwldUpdateAgent.jar..,/lib/wrapper.jar..,/lib/json-20160810.jar..,/lib/log4j-api-2.8.2.jar..,/lib/log4j-core-2.8.2.jar -Dwrapper.key=QMTlk-d0BPYjtP -Dwrapper.backend=pipe -Dwrapper.disable_console_input=true -Dwrapper.pid=1537 -Dwrapper.version=3.5.26 -Dwrapper.native_library=wrapper -Dwrapper.arch=x86 -Dwrapper.service=true -Dwrapper.cpu.timeout=10 -Dwrapper.jvmid=1 org.tanukisoftware.wrapper.WrapperSimpleApp CloudResetPwldUpdateAgent
root 11263 11229 0 11:35 pts/0 0:00:00 grep --color=auto java
root 11465 1 0 Nov28 ? 00:27:24 java -XX:+PrintGCDetails -Dlog4j2.formatMsgNoLookups=true -Djava.net.preferIPv4Addresses -Djava.net.preferIPv4Stack=true -XX:+PrintGCApplicationStoppedTime -XX:+PrintGCDateStamps -Xloggc:/root/collector/server/logs/gc.log.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=/root/collector/server/logs/ -DCOLLECTOR_HOME=/root/collector/server/_DLOGFILE_PATH=/root/collector/server/logs/_jar_collector.jar
ago 18087 1 2 Dec22 ? 00:24:28 /usr/local/java/bin/java -Dnop -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Dlog4j2.formatMsgNoLookups=true -Djava.security.properties=/home/ugo/ugoserver/web/conf/provider.security -Xms3072m -Xmx10240m -XX:+PrintGCDetails -XX:+PrintGCApplicationStoppedTime -XX:+PrintGCApplicationConcurrentTime -XX:+PrintGCDateStamps -Xloggc:/home/ugo/ugoserver/logs/services/gc.log.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=/home/ugo/ugoserver/logs/services/_Djdk.tls.ephemeralIDForKeySize=2048 -Djava.protocol.handler.pkgs=org.apache.catalina.webresources -Dorg.apache.catalina.security.SecurityListener.UMASK=0777 -java.net.preferIPv4Stack=true -Djava.net.preferIPv4Addresses -Dorg.apache.catalina.connector.RECYCLE_FACADES=true -Dorg.apache.catalina.STRICT_SERVLET_COMPLIANCE=true -Dorg.apache.tomcat.util.http.ServerCookie.FWD_SLASH_IS_SEPARATOR=false -Dorg.apache.tomcat.util.http.ServerCookie.STRICT_NAMING=false -Dignoro.endorsed.dirs=-classpath/home/ugo/ugoserver/web/bin/bootstrap.jar:/home/ugo/ugoserver/web/bin/tomcat-juli.jar -Djava.security.policy=/home/ugo/ugoserver/web/conf/catalina.policy -Dcatalina.base=/home/ugo/ugoserver/web -Dcatalina.home=/home/ugo/ugoserver/web -Djava.io.tmpdir=/home/ugo/ugoserver/web/temp org.apache.catalina.startup.Bootstrap start
ago 18121 1 0 Dec22 ? 00:01:56 java -Dlog4j2.formatMsgNoLookups=true -XX:+PrintGCDetails -Djava.net.preferIPv4Addresses -Djava.net.preferIPv4Stack=true -XX:+PrintGCApplicationStoppedTime -XX:+PrintGCApplicationConcurrentTime -XX:+PrintGCDateStamps -Xloggc:/home/ugo/ugoserver/logs/UGO_IAMService/gc.log.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=/home/ugo/ugoserver/logs/services/UGO_IAMService/_DLOGFILE_PATH=/home/ugo/ugoserver/logs/services/UGO_IAMService/_cp /home/ugo/ugoserver/services/UGO_IAMService/.../_web/shared/_UGO_11b/*;/home/ugo/ugoserver/services/UGO_IAMService/11b/* com.huawei.gauss.dsc.IAMService.IAMServiceApplication
```

- If the owners are the same, go to **Step 5**.
- If the owners are different, run the following command to grant the permission on the folder where the agent is located to the application startup user:

chown -R user:user /agent path

Step 5 Check whether the user of the application has the permission on the path specified by **ugo.collector.appagent.dataPath**. Grant the required permission.

For details, perform **Step 2** to **Step 4**.

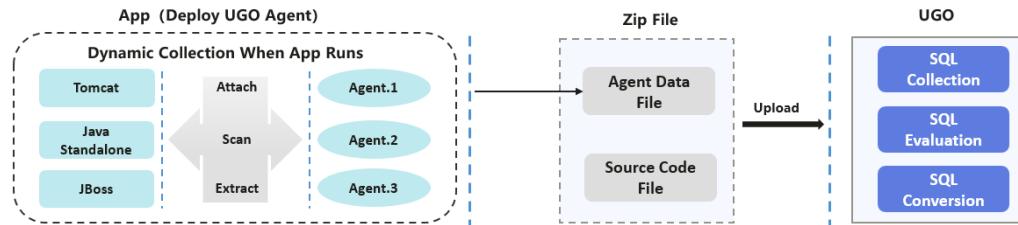
----End

3.3.5.2 What Are the Application Scenarios and Collection Rules of SQL Collection for Application Migration?

UGO provides SQL application collection and evaluation.

- Dynamic SQL collection: You need to deploy agent on the application side to intercept and obtain the SQL statements executed by applications through the JDBC APIs. For details, see [Step 1: Collect Application Data](#).
- Static SQL collection: UGO scans files of the application source code, parses file syntax and format rules, and extracts SQL statements. You need to upload the compressed files for the application source code.

Figure 3-73 Overall design of application migration



Collection Type Selection

Resource Type	Applicable Scenario	Inapplicable Scenario
Dynamic SQL collection	There is high coverage rate of application cases.	1. Applications run on JVM and use non-Java language. 2. There is low coverage rate of application cases.
Static SQL collection	1. Dynamic collection cannot meet desired requirements. 2. Data can be collected by static SQL collection.	1. The ORM framework is JPA, such as Hibernate. 2. Applications use mapper plugins (such as tkmybatis and mybatis plus).

Source Code Types Supported by Static SQL Collection

UGO can scan, analyze, and extract SQL statements from application source code files. Currently, MyBatis Mapper XML files, Java source code files, and SQL script files are supported.

Source Code Type	File Name Extension	Version	Collection Result Format
MyBatis Mapper XML files	.xml	Mybatis 3.5.11 and earlier versions	Delete comments and redundant blanks.

Source Code Type	File Name Extension	Version	Collection Result Format
Java source code files	.java	Java 1.8 or earlier versions	Delete comments and redundant blanks.
SQL script files	.sql	Not limited. The source database type can be Oracle, MySQL, PostgreSQL, and DB2 for LUW	If the SQL script contains a stored procedure, retain the original value. If the SQL script does not contain the stored procedure, delete comments.
YML files	.yml/.yaml	The version is not restricted. The files must comply with the YML file requirements.	Remain the SQL statement unchanged. It is not formatted.
Properties files	.properties	The version is not restricted. The files must comply with the Properties file requirements.	Display the information in the source files.
JSON files	.json	The version is not restricted. The files must comply with the JSON file requirements.	Display the information in the source files.
cql files	.cql	The version is not restricted. The files must comply with the XML file requirements.	Format the information in the source Java file and display the information that complies with the syntax.

- MyBatis Mapper XML files

SQL statements in MyBatis Mapper XML files are not the final SQL statements executed by the program and may be incomplete. According to the official usage method of MyBatis, UGO can collect the SQL statements based on some customized rules.

Table 3-38 Scenario description

Scenario	Collection Rule	Example
<if>	Condition judgment. UGO sets the conditions of all <if> statements to true by default and extracts the <if> content.	<pre><select id="selectList"> select id, name from t_product <where> <if test="v.name != null and v.name != ""> and name = #{v.name} </if> <if test="v.type != null and v.type != ""> and type = #{v.type} </if> </where> </select> Collection result: select id, name, type from t_product where name = ? and type = ?</pre>
<choose>, <when>, <otherwise>	Mutually exclusive conditions. When the first condition is true, the subsequent branches are not executed. UGO sets the first condition to true by default. It means that the UGO exits after extracting the content of the first <when> condition.	<pre><select id="selectList"> select id, name from t_product <choose> <when test="val.size() gt 0"> order by id desc </when> <when test="val.size() lt 1000"> where id = #{v.id} </when> <otherwise> order by id asc </otherwise> </choose> </select> Collection result: select id, name from t_product order by id desc</pre>
<foreach>	Loop. Because the size of the input array cannot be determined, UGO sets the default array size to 1 to cyclically extract the content in <foreach>.	<pre><select id="selectList"> select id, name from t_product where id in <foreach collection="ids" item="item" open="(" separator="," close=")"> #{item} </foreach> </select> Collection result: select id, name from t_product where id in (?)</pre>
<![CDATA[>	MyBatis ignores the content of <![CDATA[> < during parsing. UGO complies with the MyBatis rule and cannot process the content in [CDATA].	<pre><select id="selectList"> select id, name from t_product where id in <![CDATA[>]]> #{id} </select> Collection result: select id, name from t_product where id >= ?;</pre>
#{}{xxx}	A placeholder (SQL precompilation symbol). UGO replaces it with a question mark (?).	<pre><select id="selectList"> select id, name from t_product where type = #{type} </select> Collection result: select id, name from t_product where type = ?</pre>

Scenario	Collection Rule	Example
`\${xxx}`	A character string replacement character. It is used in SQL concatenation scenarios. UGO cannot determine the concatenated character string. To distinguish the concatenated character string from the precompilation scenario, UGO replaces it with UGO_VARIABLE_TAG (fixed user-defined character string).	<pre><select id="selectList"> select id, name from \${tableName} </select></pre> <p>Collection result: select id, name from UGO_VARIABLE_TAG</p>

The following is an example of the Mapper XML file:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE mapper PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN" "http://mybatis.org/dtd/mybatis-3-
mapper.dtd">
<mapper namespace="com.xxx.xxx">
    <resultMap id="BaseResultMap" type="com.xxx.xxx.Xxx">
        <id column="ID" jdbcType="VARCHAR" property="id" />
        <result column="NAME" jdbcType="VARCHAR" property="name" />
    </resultMap>
    <select id="selectAll" parameterType="java.util.Map" resultMap="BaseResultMap">
        select id, name from t_product
        <where>
            <if test="param.containsKey('filter') and param.get('filter').size() > 0">
                <foreach collection="param.get('filter').entrySet()" index="key" item='val' separator="and">
                    open=" " close=" "
                    <choose>
                        <when test="val.size()>0">
                            <if test="val == -1">
                                type = #{$type}
                            </if>
                            <if test="val == 1">
                                order by ${key} desc
                            </if>
                        </when>
                        <when test="val != null">
                            ${key} like "%"${status}": ${val}%
                        </when>
                    </choose>
                </foreach>
            </if>
        </where>
        <if test="param.containsKey('limit') and param.containsKey('skip')">
            limit #{param.get("skip")}, #{param.get("limit")}
        </if>
    </select>
```

```
<insert id="insertProduct">
    <selectKey keyProperty="productId" resultType="Long" order="BEFORE">
        select nextval('DB.PRODUCT')
    </selectKey>
    INSERT INTO db.t_product(id, name) VALUES(#{id, jdbcType=BIGINT}, #{name,
jdbcType=VARCHAR})
</insert>
</mapper>
```

SQL collection result: The preceding Mapper XML sample file collects three SQL statements.

- a. ID: selectAll
select id, name from t_product WHERE type = ? order by UGO_VARIABLE_TAG desc limit ?, ?
 - b. ID: insertProduct
INSERT INTO db.t_product(id, name) VALUES(?, ?)
 - c. ID: insertProduct!selectKey
select nextval('DB.PRODUCT')
- Java source code files
UGO can collect SQL statements in Java source code files.

Table 3-39 Scenario description

Scenario	Description	Example
String variable definition	<p>String constants are supported.</p> <p>There are member variables, local variables, and static variables. The String, StringBuilder, and StringBuffer types are supported.</p>	String QUERY_PRODUCT_SQL = "select id, name form t_product";
String constant concatenation	String constants are concatenated.	String DELETE_PRODUCT_SQL = "delete from t_product " + "where id = ?";
String variable concatenation	Variables of the string type in the same file can be concatenated.	String where = "where id = ?"; String selectSql = "select name form t_product " + where;

Scenario	Description	Example
MyBatis annotation	<p>The following MyBatis annotations are supported:</p> <ul style="list-style-type: none"> ● @Select ● @Update ● @Insert ● @Delete ● @SelectKey <p>The rules for extracting SQL statements in annotations are the same as those for extracting MyBatis Mapper XML files.</p>	<pre>@Select("select name from t_product where id = #{id}") String selectNameById(long id);</pre>
StringBuilder, StringBuffer variable concatenation	<p>The value of StringBuilder or StringBuffer is concatenated by APPEND syntax.</p>	<pre>StringBuilder stringBuilder = null; stringBuilder = new StringBuilder("select").append(" c, "); stringBuilder.append("column").append("1 "); stringBuilder.append("from "); stringBuilder.append("table"); as shown in the following figure. select c, column1 from table</pre>

Example

```

1. package com.xxx.xxx;
2.
3. import org.apache.ibatis.annotations.Delete;
4. import org.apache.ibatis.annotations.Insert;
5. import org.apache.ibatis.annotations.Param;
6. import org.apache.ibatis.annotations.Select;
7. import org.apache.ibatis.annotations.SelectKey;
8. import org.apache.ibatis.annotations.Update;
9.
10. public interface TestDao {
11.
12.     String QUERY_PRODUCT_SQL = "select id, name form t_product";
13.
14.     String DELETE_PRODUCT_SQL = "delete from t_product " + "where id = ?";
15.
16.     String[] STRINGS = new String[]{
17.         "select max(id) from t_product",
18.         "common product",
19.         String.valueOf("alter table t_product")
20.     };
21.
22.     default void updateNameById(long id, String name) {
23.         String sql = "update t_product set name = ? where id = ?";
24.         DBUtils.doUpdate(sql, name, id);
25.     }
26.
27.     default void insertProduct(long id, String name) {
28.         StringBuilder stringBuilder = null;
29.         stringBuilder = new StringBuilder("select").append(" c, ");
30.         stringBuilder.append("column").append("1 ");
31.         stringBuilder.append("from ");
32.         stringBuilder.append("table");

```

```
33.     DBUtils.doUpdate("insert into t_product(id, name) values (?, ?)", id, name);
34. }
35.
36.     @SelectKey(statement = "select max(id)+1 as id from t_product", before = true,
37.             keyColumn = "id", resultType = long.class, keyProperty = "id")
38.     @Insert(value = "insert into t_product(id, name) values(#{id}, #{name})")
39. void insert(String name);
40.
41.     @Delete({"delete from t_product where name = #{name}"})
42. void deleteByName(String name);
43.
44.     @Update({"<script> ",
45.             "update t_product set name = 'name1' ",
46.             "  <where>",
47.             "    <if test='id > 1000'>id=#{id}</if>",
48.             "  </where>",
49.             "</script>"}
50. )
51. void update(@Param("id") long id);
52.
53.     @Select("select name from t_product where id = #{id}")
54. String selectNameById(long id);
55. }
```

SQL collection result: The preceding example file collects 11 SQL statements.

- a. Line number: 12.
select id, name form t_product
- b. Line number: 14.
delete from t_product where id = ?
- c. Line number: 17.
select max(id) from t_product
- d. Line number: 19.
alter table t_product
- e. Line number: 23.
update t_product set name = ? where id = ?
- f. Line number: 28.
select c, column1 from table
- g. Line number: 33.
insert into t_product(id, name) values (?, ?)
- h. Line number: 36.
select max(id)+1 as id from t_product
- i. Line number: 38.
insert into t_product(id, name) values(?, ?)
- j. Line number: 41.
delete from t_product where name = ?
- k. Line number: 44.
update t_product set name = 'name1' WHERE id=?
- l. Line number: 53.
select name from t_product where id = ?

- SQL script files

If an SQL script contains stored procedures, UGO does not split the script file.
If there are no stored procedures in a SQL script file, UGO splits the script file.

Table 3-40 Scenario description

Scenario	Description
Stored procedures	No processing is performed. The original SQL script content is evaluated as an entire SQL script.
No stored procedures	UGO deletes comments and splits the SQL script content into independent SQL statements for evaluation.

Example 1 of a source code file

```

1. select substr(dump(val,16,0,32),1,120) ep, cnt from (select /*+ comment */max("CAX_RSV_C04")
val,count(*) cnt from "DB"."CSI_SCN_CAX_T" t) order by nlssort(val,'NLS_SORT = binary');
2.
3. INSERT into tpl_lookup_class_t
4. (`class_id`,
5. class_code,
6. class_name)
7. select nextval('tpl_lookup_class_s'),--line comment
8.     src.class_code,
9.     src.class_name
10.from (select 'ELEMENT_LEVEL' class_code,
11.         1 status,
12.         "iPricing\"P\MS" app_name) src #line comment
13. where not exists (SELECT 1
14.                 FROM tpl_lookup_class_t t
15.                 WHERE t.class_code = src.class_code
16.                 AND t.app_name = src.app_name);
17.
18/*
19. * block comment
20.*/
21. select src.PARENT_CODE,
22.     src.PARENT_CLASS_CODE,
23.     src.PARENT_CLASS_NAME,
24. from src;SELECT x.* ,x.ROWID FROM PL_XWXW_MGM_M1DM2 x; ;select *
25.
26.from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (41)

```

SQL collection result: The SQL script in example 1 does not contain stored procedures. The SQL script is split into five SQL statements.

- a. Line number: 1.

```
select substr(dump(val,16,0,32),1,120) ep, cnt from (select max("CAX_RSV_C04")
val,count(*) cnt from "DB"."CSI_SCN_CAX_T" t) order by nlssort(val,'NLS_SORT = binary')
```

- b. Line number: 3.

```
INSERT into tpl_lookup_class_t
(`class_id`,
class_code,
class_name)
select nextval('tpl_lookup_class_s'),
src.class_code,
src.class_name
from (select 'ELEMENT_LEVEL' class_code,
1 status,
"iPricing\"MS" app_name) src
where not exists (SELECT 1
                FROM tpl_lookup_class_t t
                WHERE t.class_code = src.class_code
                AND t.app_name = src.app_name)
```

- c. Line number: 21.

```
select src.PARENT_CODE,
src.PARENT_CLASS_CODE,
```

```
src.PARENT_CLASS_NAME,
from src
```

- d. Line number: 24.
SELECT x.*x.ROWID FROM PL_XW.XW_MGM_M1DM2 x

- e. Line number: 24.
select *
from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (41)

Example 2 of a source code file.

```
/*This is a block comment*/
create or replace procedure output_date is
begin
dbms_output.put_line(sysdate);
end output_date;

create or replace procedure get_username(v_id in number, v_username out varchar2)
as
begin
select username into v_username
from tab_user where id=v_id; -- This is a line comment
exception
when no_data_found then
raise_application_error(-2001,'procedure');
end get_username;
```

SQL collection result: The SQL script in example 2 contains stored procedures. The collection result is one SQL statement.

```
/*This is a block comment*/
create or replace procedure output_date is
begin
dbms_output.put_line(sysdate);
end output_date;

create or replace procedure get_username(v_id in number, v_username out varchar2)
as
begin
select username into v_username
from tab_user where id=v_id; -- This is a line comment
exception
when no_data_found then
raise_application_error(-2001,'procedure');
end get_username;
```

- Properties files

UGO can read the **Properties** files in the key-value format. If **value** is **sql**, the results in key-value format are returned.

Table 3-41 Scenario description

Scenario	Description
Comment lines in a file	The comment content is not extracted.

Example

```
#1 ??
name = select * from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (2)

db.link.password=select * from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (20)
password=CREATE INDEX hash_name_index ON hash_name_heap USING hash (random name_ops)\;
```

SQL collection results: The SQL script in the example contains the Value = SQL statement. The SQL script is split into three SQL statements.

- a. Line number: **key:name**.
select * from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (2)
 - b. Line number: **key db.link.password**.
select * from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (20)
 - c. Line number: **password**.
password=CREATE INDEX hash_name_index ON hash_name_heap USING hash (random name_ops)\
- JSON files

UGO can read the **JSON** files based on the JSON parsing format. If **value** is **sql**, the results including line number are returned.

Table 3-42 Scenario description

Scenario	Description
Key-value pair parsing in a JSON file	SQL statements are parsed and extracted from string values.

Example

```
1 {
2   "type": "1",
3   "features": [
4     [
5       {
6
7         "type": "INSERT into tpl_lookup_classify_t(`classify_id`,classify_code,classify_name)",
8         "geometry": {
9           "type": "3",
10          "bodu": {
11            "sql": "select * from table where id in (20)",
12            "sql3": "sql"
13          }
14        },
15      },
16      "properties": {
17        "id": "4",
18        "q": "5"
19      }
20    ]
21  ]
22 }
```

- a. Line number: 7.
INSERT into tpl_lookup_classify_t(`classify_id`,classify_code,classify_name)
 - b. Line number: 12.
"select * from table where id in (20)",
- YML and YAML files

UGO can read the **YAML** files based on the YAML parsing format. If **value** is **sql** in one key or multiple keys, the results including line number are returned.

Table 3-43 Scenario description

Scenario	Description
Key-value pair parsing in a file	SQL statements are parsed and extracted from string values.
Comment lines in a file	The comment content is not extracted.

Example

```
1 # swagger: '2.0'
2 info:
3   title: "CREATE INDEX hash_name_index ON hash_name_heap USING hash (random name_ops);"
4   key3:
5   key4:
6
7   key5:
8     x-request-examples-url-1: >-
9       GET
10      https://rds.cn-north-1.myhuaweicloud.com/rds
11      ti: select * from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (41);
a. Line number: 3.
   "CREATE INDEX hash_name_index ON hash_name_heap USING hash (random name_ops);"
b. Line number: 11.
   select * from "USER_EXTRAS" where "USER_EXTRAS"."USER_ID" in (41);
```

3.4 Appendixes

3.4.1 External Database Security Channel - Authenticating Target Database Using Two-Way SSL

Scenarios

It is required to design and implement the establishment of secure channels (SSL-based) for connecting to target databases, including MySQL and PostgreSQL.

Application Scope

- testConnection API in the dbcollection module needs to use the SSL interface provided by the UI to establish a secure channel between the client (UGO application) and the target database (MySQL and PostgreSQL).
- UGO supports only the following SSL modes for the establishment of secure communication:
 - SSL_NOAUTH
 - SSL_1WAY_AUTH (server authentication by client)
- Only JKS certificate files can be uploaded. If your certificate file is in a different format, you need to convert the file format to JKS using keytool or any other open-source tool before uploading the file.
- The size of a JKS certificate file to be uploaded cannot exceed 500 KB. If the file size exceeds 500 KB, UGO displays an error message for the user.

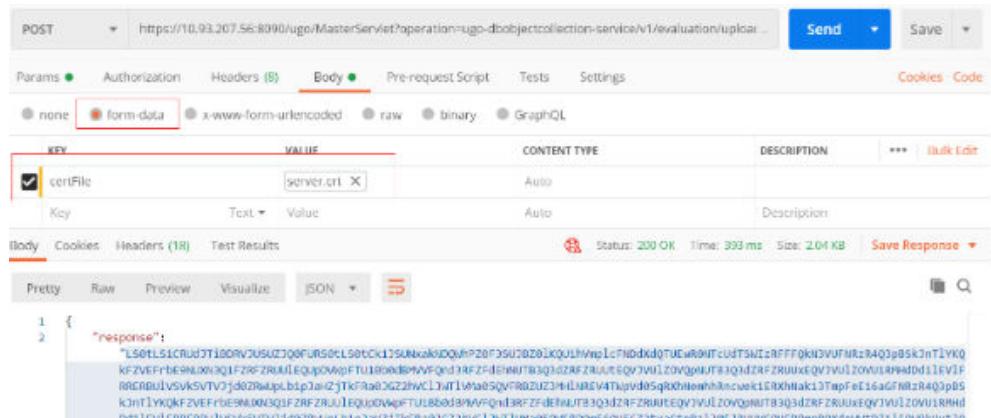
- You need to enter the following UGO information related to SSL connection:
 - Authentication type
 - Certificate password

UI Solution Points

- UI should expose all the respective fields to be entered by user and certificate file upload options.
 - UI needs to call the **uploadCertFile** API with the following interface:

```
@PostMapping("/uploadCertFile")
public UploadFileResponse uploadFile(@RequestParam("certFile")
    MultipartFile file)
```

The preceding upload API is used to read the certificate file content, perform Base64 encoding, and return the content in the response to the UI. Sample JSON request for **uploadCertFile** is as follows:



- Then, UI calls the **testSSLConn** API.

```
@PostMapping("testSSLConn")
```

```
public ResponseMessage testSSLConn(@RequestBody DBObj dbObj)
```

Sample JSON request for **testSSLConn** is as follows:

"ip": "10.243.67.86",

```
"port": "5435",
"userName": "sumit",
"passwd": "sumit@123",
"serviceName": "sumittest",
"connectionString": "",
"dbType": "POSTGRESQL",
"dbversion": "11.2",
"configuration": {
"serverCertConf": {
"authType": 3,
"trustStoreType": "JKS",
"trustStore": "LS0tLS1CRUdjTibDRVJUSUZJQ0FURS0tLS0tCk1JSUNxakNDQWhPZ0F3SUJBZ0lkQU1hVmplcFNDdXdQ
TUewR0NTCu0TSWlzRFFFQkN3VUFNrzR4Q3pBSkJnTlYKQkfZvEFrbe9NUXN3Q1TFZRFZRUUleQu0pDVW
pFTU1Bb0dBMVVVFQnd3RFZFdEhNUTB3Q3dZRFZRUUteEQJVJuIZOVQpNUTB3Q3dZRFZRUUxEQJVU1Z
OUV1RMhdDd1lEVlFRRERBUlVSvK5TVJd0ZRWUpLb1pJaHzjTkFRa0JGZ2hVCUWTlVMa05QVFRBZUZ3
MHlNREV4TWPw05qRXhNemhhRncwek1ERXhNak13TmptFeE16aGFNRzR4Q3pBSkJnTlYKQkfZvEFrbe9
NUXN3Q1FZRFZRUUjeQu0pFtu1Bb0dBMVVVFQnd3RFZFdEhNUTB3Q3dZRFZRUUteEQJVU1ZOVQ
pNUTB3Q3dZRFZRUUxEQJVU1ZOVQ1RMhdDd1lEVlFRRERBUlVSvK5TVJd0ZRWUpLb1pJaHzjTkFRa0
JGZ2hVCUWTlVMa05QVFRDQm56QU5CZ2txaGtpRzl3MEJBuuVgQufPQmpRQxdnWWtDZ1FQW9kUy
tJOFPcHvBqNIBBaVMKdTBiRnQzUUU5OUZFZE1wd3RIL0ZwSFYyU3JdbGZZQ1JxeHNiRjlYc0Y3K2srRGtz
YVBwako4SlVuczYwRIV5eQp3RWf5SkN3NWR0SEtYu2xUNEdvR1hk3hPwNz1MExiTdhVQW1jZW1Zct
Nabk3bytLVjVQN0NZLzRxUUREeFNKCi0qWhUeGVxL3VCTzcxcXlXOEpURVvXmVk4a0Nb0VbQWFOU
```

```
U1FNHdiUVlEVlwlwT0JCWUVGR1Z1eE4vTzdJTUYKWHBtdU03V2IxaDZCWE9peU1COEdBMVVksXdRWU1
CYUFGR1Z1eE4vTzdJTUZYcG11TTdXYjFoNkJYT2l5TUF3RwpBMVVkRXdRRk1BTUJBZh3RFFZSkTvWklodm
NOQVFFTEJRQRnWUVBwk5oR0l3XF1OU5JMnFDa2RQTDc5anJ3CkNuUW9UNEplSVEvcXJHSIRkamM
vzWVuUjdOdE1CWTdudC5N3RzdHA5Q1FzVll1WEo1OW15TGNRdVjhWHV0M0IKOGtCV2pmcVFSaU1
NNE9qKzVJUm5UVGLUWDZSb3FkcG5TY2pySlhWRDAycm9FcmRqa2FqvkFNMHJua0xmMGRtYQpmQm
wchHNlWnRsa3FjZFpQa3lBPQotLS0tLUVORCBDRVJUSUZJQ0FURS0tLS0tCg==",
"trustStorePwd": "UgoService@123",
"keyStorePwd": "UgoService@123"
}
```

In the request, Base64 encoded content of the certificate file sent again in the **testSSLConn** API must be included in the **trustStore** attribute.

- API changes and sample JSON request for **createevalproject** are as follows:

```
{
  "evaluationProjectName": "evalproj12",
  "projectType": "1",
  "sourceDB": {
    "ip": "100.80.34.23",
    "port": "1521",
    "userName": "books_admin",
    "passwd": "MyPassword",
    "serviceName": "xcloudtest_srv",
    "connectionString": "",
    "dbType": "ORACLE",
    "dbversion": "12.2",
    "isSourceDB": "true",
    "configuration": {
      "serverCertConf": {
        "authType": 3,
        "trustStoreType": "JKS",
        "trustStore": "LS0tLS1CRUdjTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUNxakNDQWhPZ0F3SUJBZ0lKQU1hVmplcFNDdXdQ
TUEwR0NTcUdTSWlzRFFFQkN3UFNRzR4Q3pBSkJnTlYKQkFZVEFrB9NUXN3Q1FZRFZRUUxEQVJVUIZ
pFTU1Bb0dBMVVFQnd3RFZFdEhNUTB3Q3dZRFZRUUteQVJVUIZOVPnUTB3Q3dZRFZRUUxEQVJVUIZ
OVU1RMHdDd1lEVlFRRERBUlVSvk5VTVjd0ZRWUpLb1pJaHzjTkFRa0JGZ2hVCUWTlVMa05QVFRBZUZ3
MHINREV4TWpVd05qRXhNemhhRncwek1ERXhNak13TmpFeE16aGFNRzR4Q3pBSkJnTlYKQkFZVEFrB9
NUXN3Q1FZRFZRUUIEQUpDVWpFTU1Bb0dBMVVFQnd3RFZFdEhNUTB3Q3dZRFZRUUteQVJVUIZOVP
pNUTB3Q3dZRFZRUUxeQVJVUIZOVV1RMHdDd1lEVlFRRERBUlVSvk5VTVjd0ZRWUpLb1pJaHzjTkFRa0
JGZ2hVCUWTlVMa05QVFRDQm56QU5CZ2txaGtpRzl3MEJBuuVgQUPFPQmpRQXdnWWtDZ1fQW9kUy
tjOFpHcVBqNlBBaVMKdTbiRnQzUUU5OZFZE1wd3RIL0ZwSFYyU3JdbGZZQ1JxeHNiRjIyc0Y3K2srRGtz
YVBwako4SIVuczYwRlV5eQp3RWF5SkN3NWR0SEtYU2xUNEdvR1hkd3hPWNZ1MExIDhVQW1jZW1ZcT
NabkJ3bytLvjVQN0NZLzRxUUREeFNKCjdiQWhUeGVxL3VCTzcxlXOEpURVXVMV4a0Nb0vBQWFOU
U1FNHdiUVlEVlwlwT0JCWUVGR1Z1eE4vTzdJTUYKWHBtdU03V2IxaDZCWE9peU1COEdBMVVksXdRWU1
CYUFGR1Z1eE4vTzdJTUZYcG11TTdXYjFoNkJYT2l5TUF3RwpBMVVkRXdRRk1BTUJBZh3RFFZSkTvWklodm
NOQVFFTEJRQRnWUVBwk5oR0l3XF1OU5JMnFDa2RQTDc5anJ3CkNuUW9UNEplSVEvcXJHSIRkamM
vzWVuUjdOdE1CWTdudC5N3RzdHA5Q1FzVll1WEo1OW15TGNRdVjhWHV0M0IKOGtCV2pmcVFSaU1
NNE9qKzVJUm5UVGLUWDZSb3FkcG5TY2pySlhWRDAycm9FcmRqa2FqvkFNMHJua0xmMGRtYQpmQm
wchHNlWnRsa3FjZFpQa3lBPQotLS0tLUVORCBDRVJUSUZJQ0FURS0tLS0tCg==",
        "trustStorePwd": "UgoService@123",
        "keyStorePwd": "UgoService@123"
      }
    }
  }
}
```

- API changes and sample JSON request for **createmigrationproject** are as follows:

```
{
  "projectName": "migProj3",
  "evalProjectId": 12,
  "migrationotype": "ORACLETOPOSTGRESQL",
  "targetDB": {
    "ip": "10.243.67.86",
    "port": "5435",
    "userName": "sumit",
    "passwd": "sumit@123",
    "serviceName": "sumittest",
    "connectionString": ""
  }
}
```

- Modifications are required for the `getSrcObj` API which collects the source database objects. The current design uses mybatis SQLSessionFactory, which is non-SSL based and insecure. This operation is required for SSL connections.

Backend Solution Points

Test the SSL connections of the following two modes (SSL_NOAUTH and ONEWAY_SSL) for the target databases:

- MySQL
 - Protection group

MySQL

The following system attributes need to be set:

One-way SSL authentication

```
System.setProperty("javax.net.ssl.trustStore", trustStorePath);
```

```
System.setProperty("javax.net.ssl.trustStorePassword", trustStorePwd);
```

```
System.setProperty("javax.net.ssl.trustStoreType", storeType.getValue());
```

The following parameters need to be transmitted in URL for both GET and POST requests:

Importing Server Certificate to the Keystore JKS File Before Upload

The following steps use a MySQL database as the sample database. This procedure is also suitable for Oracle and PostgreSQL databases.

Step 1 `openssl x509 -in ca.pem -out cert.der -outform der` where `ca.pem` is the server certificate installed on the MySQL server.

Before uploading the certificate, import the certificate to the keystore JKS file.

Step 2 Run the `keytool -importcert -alias mysql -file cert.der -keystore server_trust.jks` command.

----End

3.4.2 UGO Process Monitoring

3.4.2.1 6050015_Database Availability

Alarm Description

This alarm is generated when the database disables five consecutive polling requests.



This alarm can be viewed in logs. The alarm can be sent to the IAM service and stored in the database. If the database is shut down, the storage fails.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050015	High	Yes

Alarm Parameters

Parameter	Description
Name	High disk usage (The database will be unavailable.)
Type	UGO
Occurrence Time	Time when the alarm is generated
Location	None

Impact on the System

Operations become slow or may fail to start.

Possible Cause

Some system processes may occupy a large amount of memory.

Handling Procedure

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Delete unnecessary files.

```
rm -f <filename>
```

The following files are unnecessary and need to be deleted when the disk space is insufficient:

- UGO installation package and decompression package created during the installation
- Backup file in `~/ugobackup/`
- Additional UGO log backup files in `~/ugoservice/log/**`.
- Java dump files (which can be transferred if required for analysis) in `<ugoserver>/logs/services/java_**.hprof`.

Step 4 Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name | Operation Details
-----|-----
DB           | Service stopped successfully.
WebUI        | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB           | Service started successfully.
WebUI        | Service started successfully.
UGO_IAMService | Service started successfully.

Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

Step 5 Log in to the UGO console and delete the evaluation projects that are not used.

----End

Alarm Clearance

This alarm is automatically cleared when the disk usage is lower than 85%.

Reference Information

None

3.4.2.2 6050016_Network Availability

Alarm Description

This alarm is generated when the web disables five consecutive polling requests.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050016	High	Yes

Alarm Parameters

Parameter	Description
Name	The Tomcat does not exist.
Type	UGO
Occurrence Time	Time when the alarm is generated
Location	None

Impact on the System

Requests cannot be processed.

Possible Cause

- The Tomcat process is stopped.
- The Tomcat process is not started.

Handling Procedure

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Check the process status.

```
python3 ugoserver.py status -s WEBUI
```

Step 4 If the status is still **down** or the startup fails, contact O&M personnel to rectify the fault.

You can provide your feedback using either of the following ways:

- Calling the hotline of a local office.

- Visiting the cloud support website and providing feedback on the **Contact Us** page.

----End

Alarm Clearance

This alarm is automatically cleared when the web request is successful.

Reference Information

None

3.4.2.3 6050017_IAM Availability

Alarm Description

This alarm is generated when the IAM service disables five consecutive polling requests.



This alarm can be viewed in logs and can be sent to the IAM service.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050017	High	Yes

Alarm Parameters

Parameter	Description
Name	The IAM service does not exist.
Type	UGO
Occurrence Time	Time when the alarm is generated
Location	None

Impact on the System

The system cannot be used.

Possible Cause

- The IAM service is stopped.
- The IAM service is not started.

Handling Procedure

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Run **ugoserver.py --help** to learn about IAM information.

Step 4 Check the process status.

```
python3 ugoserver.py status -s IAM
```

Step 5 If the status is still **down** or the startup fails, contact O&M personnel to rectify the fault.

You can provide your feedback using either of the following ways:

- Calling the hotline of a local office.
- Visiting the cloud support website and providing feedback on the **Contact Us** page.

----End

Alarm Clearance

This alarm is automatically cleared when the IAM request is successful.

Reference Information

None

4 Emergency Handling Guide

4.1 About this Document

Overview

Database and Application Migration UGO, referred to as UGO, is a professional cloud service that focuses on heterogeneous database schema migration and application migration. It automatically converts the syntax of the DDL in databases and the database SQL statements encapsulated in service programs into the SQL syntax of Huawei Cloud GaussDB or RDS. It uses pre-migration evaluation, schema migration, and automatic syntax conversion to identify possible reconstruction in advance, improve the conversion rate, and minimize the database migration cost.

This document describes the emergency measures that O&M personnel must take to ensure proper service running when an emergency fault occurs in UGO.

Intended Audience

This document is intended for O&M engineers, who should learn about:

- Technical support engineers
- O&M engineers

Symbol Convention

Symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Symbol	Description
 CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or other unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices, and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Release History

Issue	Date	Description
01	2021-09-30	This is the first official release.

4.2 Overview

4.2.1 Purpose

Handle emergencies effectively to recover services with minimized impact according to emergency planning.

4.2.2 Scenario

Provide guidance for technical support and maintenance engineers to rectify faults on the live network.

4.2.3 Definition

Emergency handling is a process of taking measures to recover services without delay after a critical fault occurs.

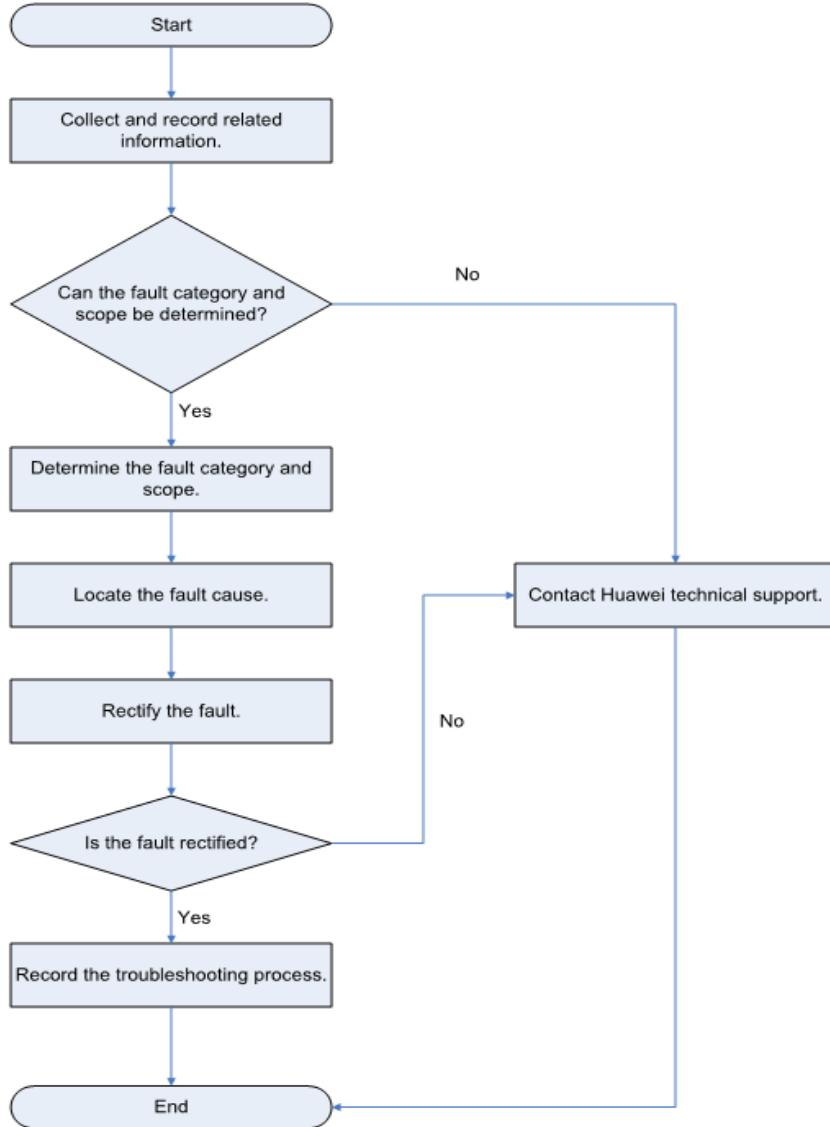
A critical fault refers to a device or network fault that suddenly occurs, causing wide and serious impact on the network security and the quality of service (QoS). For example, the primary and standby nodes become faulty at the same time.

4.2.4 Emergency Handling Process and Principles

Process

Emergency handling aims to promptly recover device operating and service provisioning. [Figure 4-1](#) shows the emergency handling process.

Figure 4-1 Emergency handling process



Principles

- Emergency Handling Principles

Critical faults may result in massive user VM failures or device breakdown. To efficiently handle critical faults and minimize losses, adhere to the following principles:

- Prepare emergency handling proposals, and periodically organize management and maintenance personnel to learn emergency handling knowledge and participate in drilling activities.
- Resume customer services as soon as possible and minimize the impact. Locate and rectify the fault, and collect data after services are recovered.
- Receive pre-job training about emergency handling to better understand basic knowledge and skills for critical fault diagnosis and rectification.
- During critical fault handling, contact customer service center or local office in a timely manner to obtain technical support.
- After handling critical faults, collect alarm information related to device faults and send fault handling reports, device alarm files, and log files to headquarters for analysis. This helps improve after-sales services.
- Quick Service Recovery Principles
When selecting an operation to recover services, consider the recovery success probability and duration of each operation. The recommended operation order is as follows:
 - Operations that will be completed in a short period of time and more likely to succeed
 - Operations that will be completed in a short period of time but less likely to succeed
 - Operations that will be completed in a long period of time but more likely to succeed

4.3 Emergency Cases

4.3.1 UGO Abnormal

Symptom

UGO is abnormal if any of the following problems occurs:

- The UGO service cannot be connected.
- Operations failed.
- The system cannot be used.

Impact

- The connection test for the database evaluation project failed.
- The UGO functions are affected.
- The target database cannot be connected.

Estimated Handling Duration

About 60 minutes

Log Collection

The UGO logs are stored in the following directories:

- Installation logs: <UGO_Installation_Package>/install.log
- Upgrade logs: <UGO_Upgrade_Package>/upgrade.log
- Operation logs: <ugoserver>/bin/logs/operation.log
Operation logs are generated by running the following commands on **ugoserver.py: start/stop/status/restart/irencrypt/update-pwd/update-wk/update-cert/weakdictionary/license-status/update-license**
- Application logs: <UGO_HOME>/logs/services/
- Rollback logs: <user_home_directory>/rollback.log

 NOTE

If the software package is deleted after the installation, view the log information in the backup files stored in **~/ugobackup/**.

Handling Method

Check whether the disk and memory are available, and then check error logs.

 NOTE

To expand disk capacity, upgrade the disk or resolve other errors, contact Huawei maintenance engineers.

Fault Location

Step 1 Log in to the UGO server as the UGO installation user.

 NOTE

In this example, use **ugo** as the UGO installation user.

Step 2 Switch to the **bin** directory.

cd <ugoserver>/bin

Step 3 Check the service status.

python3 ugoserver.py status

Example:

:~/ugoserver/bin> python3 ugoserver.py status	
Service Name	Status
DB	UP
WebUI	UP
WebUI	Service not listening on port : 8090
UGO_DbObjectCollection	Service not listening on port : 9040
UGO_PreMigration	Service not listening on port : 9010
UGO_Migration	Service not listening on port : 9000
UGO_Verification	Service not listening on port : 9005
UGO_IAMService	UP

- If the status is **Service listening on port: port**, the service is listening and the status is normal.

- If the status is **Service not listening on port: port**, the service is not listened on. Rectify the fault by referring to [Fault Rectification](#).

----End

Fault Rectification

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Check the disk space.

```
df -k
```

Command output:

```
:~> df -k
Filesystem      1K-blocks   Used Available Use% Mounted on
/dev/xd01       41021664 12915664 25992516  95% /
ugouser@szxphisprd01525:~>
```

- If the **Use%** value is **95%** or greater, the disk usage is high. Go to [Step 4](#).
- If the **Use%** value is less than **95%**, go to [Step 5](#) to check whether the system memory is normal.

Step 4 If the disk is full, delete unnecessary files to release disk space.

```
rm -f <filename>
```

For more information, see [Fault Rectification](#).

Step 5 Check the system memory.

```
free -g
```

```
:~> free -g
              total        used        free      shared  buff/cache   available
Mem:       62          16         25          2         20         43
Swap:        3           0           3
```

If the **available** value is less than 1 GB, the memory is full. In this case, stop unnecessary processes.

Unnecessary processes refer to the processes that are not started by UGO and occupy memory. Run the following command to check the processes triggered by the UGO:

```
ps -eaf | grep ugoserver | awk '{print $1" "$2}'
```

For more information, see [Handling Method](#).

Step 6 Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name | Operation Details
-----
DB           | Service stopped successfully.
WebUI        | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB           | Service started successfully.
WebUI        | Service started successfully.
UGO_IAMService | Service started successfully.

-----
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

Step 7 If the service still cannot run properly, go to the log file path and check error logs.

View the error information in the log file to locate the fault cause, and contact technical support ([Contacting Technical Support](#)).

For example, the **DbObjectCollection.log** file is as follows:

```
[2021-08-17 15:08:49.046][ERROR][DbObjectCollection][][] [For security constraints with URL pattern /**
the HTTP methods *POST GET* are uncovered.]
[org.apache.juli.logging.DirectJDKLog.log(DirectJDKLog.java:173):main]
[2021-08-17 15:32:20.791][ERROR][DbObjectCollection][][] [For security constraints with URL pattern /**
the HTTP methods *POST GET* are uncovered.]
[org.apache.juli.logging.DirectJDKLog.log(DirectJDKLog.java:173):main]
[2021-08-17 17:36:40.740][ERROR][DbObjectCollection][][] [file name:*unknown* line:1, position:110, no
viable alternative at input 'END']
[com.huawei.gauss.dsc.sqlparser.factory.CustomErrorListener.syntaxError(CustomErrorListener.java:75):pool-2
3-thread-1]
[2021-08-17 17:40:42.603][ERROR][DbObjectCollection][][] [Error while deleting ev**uation project for
Project Id. 1]
[com.huawei.gauss.dsc.collector.api.service.evaluation.ProjectControllerServiceImpl.a(ProjectControllerService
impl.java:894):http-nio-127.0.0.1-9040-exec-6]
[2021-08-17 17:40:42.795][ERROR][DbObjectCollection][][] [**
com.huawei.gauss.dsc.collector.exception.DBObjectCollectionException : Server Error ***]
[com.huawei.gauss.dsc.collector.api.common.b.a(ValidationHandler.java:157):http-nio-127.0.0.1-9040-exec-6]
[2021-08-17 17:40:42.795][ERROR][DbObjectCollection][][] [20203 :::: Migration Projects Exists Linked to
Evaluation Project][com.huawei.gauss.dsc.collector.api.common.b.a(ValidationHandler.java:157):http-
nio-127.0.0.1-9040-exec-6]
```

----End

Verification

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

cd <ugoserver>/bin

Step 3 Check the service status. If **Service listening on port: port** is displayed, the service status is normal.

python3 ugoserver.py status

[rc17166 bin]\$ python3 ugoserver.py status	
Service Name	Status
DB	UP
DB	Service listening on port : 3306
WebUI	UP
License	License is valid till 31-Aug-2021 23:59:59 CST.
WebUI	Service listening on port : 8090
UGO_DbObjectCollection	Service listening on port : 9040
UGO_PreMigration	Service listening on port : 9010
UGO_Migration	Service listening on port : 9000
UGO_Verification	Service listening on port : 9005
UGO_AppMigration	Service listening on port : 9006
UGO_IAMService	UP
UGO_IAMService	Service listening on port : 9001

Step 4 Use a browser to access the installation environment: <https://XX.XX.XX.XX:<>/ugo/#/login>

Enter the correct username and password, and click **Login**.

If the home page is displayed properly, the UGO service is normal.

NOTE

The default username is **admin** and the password is the same as that set for the IAM user during the installation.

----End

4.3.2 Disk Space Full

Symptom

The disk space may be full if any of the following problems occurs:

- Basic operations failed.
- The system cannot be used.
- The available storage is less than 1 GB.

Impact

Some service functions are affected.

Estimated Handling Duration

About 60 minutes

Handling Method

Delete unnecessary files in the **bin** directory.

Log in to the UGO console and delete unused projects. For details about how to delete a project, see **User Manual > User Guide > Database Evaluation > Deleting an Evaluation Project or Deleting an Object Migration Project** in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide (for Huawei Cloud Stack 8.3.0)* 01

 NOTE

- The UGO service occupies about 10 GB of disk space. Generally, the disk space is sufficient. If the disk space is insufficient, check whether other files occupy a large amount of space on the server.
- To expand the disk capacity, contact Huawei engineers.

Fault Location

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Check the disk space.

```
df -k
```

```
:~> df -k ~/ugoserver/
Filesystem      1K-blocks   Used Available Use% Mounted on
/dev/xvda1      41021664 12915664 25992516  95% /
ugouser@szxphisprd01525:~>
```

If the **Use%** value is **95%** or greater, the disk usage is high. In this case, clear the disk space.

Step 4 Check the disk space occupied by each file system.

```
du -sh <directory name>
```

```
[ugouser@szxphisprd01525:~] ugoserver]$ du -sh *
4.0K    auditlogsbackup
18M     bin
553M    db
77M     download
4.0K    install_summary.json
6.4M    logs
3.9M    services
249M   web
```

Step 5 Check the files that occupy too much disk space.

```
find . -type f -size +50M
```

```
[ugoserver]$ !find  
find . -type f -size +50M  
. ./download/collector_pkg/collector.zip  
. ./db/data/sumit22/DB_PREMIG_OBJECTSTAT.ibd  
. ./db/data/sumit22/DB_SRC_CATALOG.ibd  
. ./db/server/bin/mysql
```

----End

Fault Rectification

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Delete unnecessary files.

```
rm -f <filename>
```

The following are unnecessary files, which should not appear in normal cases.

- UGO installation package and decompression package created during the UGO installation
- Backup file in **~/ugobackup/**
- Additional UGO log backup files in **~/ugoservice/log/****
- Java dump files (which can be transferred if required for analysis) in **<ugoserver>/logs/services/java_**.hprof**.

Step 4 Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[6 bin]$ python3 ugoserver.py restart  
-----  
Service Name | Operation Details  
-----  
DB           | Service stopped successfully.  
WebUI        | Service stopped successfully.  
UGO_IAMService | Service stopped successfully.  
DB           | Service started successfully.  
WebUI        | Service started successfully.  
UGO_IAMService | Service started successfully.  
-----  
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.  
Send => Audit Log | OK | Audit log sent Successfully.
```

Step 5 Log in to the UGO console and delete the evaluation projects that are not used any more.

Step 6 If the service is still not running properly or the disk space needs to be expanded, contact technical support ([Contacting Technical Support](#)).

----End

Verification

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Run the following command to check whether the disk usage is normal:

```
df -k
```

If the **Use%** value is less than **85%**, the disk usage is normal.

```
[root@ugoserver bin]$ df -k .
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/vdb        41153760 10058516 28981708 26% /opt
```

Step 4 Use a browser to access the installation environment: <https://XX.XX.XX.XX:<>YYYY>/ugo/#/login>

Enter the correct username and password, and click **Login**.

If the home page is properly displayed, the UGO service is running properly and the disk space is available.

NOTE

The default username is **admin** and the password is the same as that set for the IAM user during the installation.

----End

4.3.3 Insufficient Memory

Symptom

The memory may be insufficient if any of the following problems occurs:

- Basic operations are slow, and the query response is slow.
- The start operation failed.
- The memory usage is very high, and the available memory for the operating system is low.

Impact

Some system processes occupy a large amount of memory. As a result, the operation response is slow.

Estimated Handling Duration

About 60 minutes

Handling Method

Check the UGO status and stop unnecessary processes.

Fault Location

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Check whether the process memory is sufficient.

Check whether the heap dump file **~/ugoserver/logs/services/java*.hprof** is generated.

- If yes, perform **Step 4** to **Step 5** to check whether the available system memory is sufficient.
- If the system memory is insufficient, configure more memory space.

Step 4 Check the system memory based on the configured process memory.

Check the available system memory.

```
free -m
```

or

```
free -g
```

```
[root@ugoserver ~]# free -m
total        used        free      shared  buff/cache   available
Mem:       31994         312       31517          4        164       31369
Swap:          0          0          0
[root@ugoserver ~]# free -g
total        used        free      shared  buff/cache   available
Mem:        31          0         30          0          0         30
Swap:          0          0          0
[~]#
```

If the value of **available** is less than 1 GB, the memory is full. Go to the next steps to locate the fault.

Step 5 If the process memory is insufficient:

1. Obtain the locations of all running processes in the system.

```
top
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
17496		20	0	124576	2284	148	R	100.0	0.0	203100:03	bash
17497		20	0	124576	2284	148	R	100.0	0.0	203100:04	bash
17498		20	0	124576	2284	148	R	100.0	0.0	203100:06	bash
17499		20	0	124576	2284	148	R	100.0	0.0	203099:57	bash
17687		20	0	124576	2288	152	R	100.0	0.0	203099:11	bash
27572		20	0	828920	108884	8248	S	2.0	0.2	4377:54	gsd-color
6135		20	0	163312	2472	1616	R	0.3	0.0	0:00.03	top
11110		20	0	1308988	47500	5660	S	0.3	0.1	245:21.90	haccservice
14509		20	0	5292088	1.1g	19128	S	0.3	1.8	4:34.66	mysqld
15081		20	0	7141184	897180	22656	S	0.3	1.4	3:33.72	java

- **RES**: actual memory usage of a process.

- **PID**: process identifier.

- **KiB Mem:** total system memory (free memory, and buff memory)
- 2. Check the configured memory in the **setenv.sh** file of the UGO server.

vi web/bin/setenv.sh

```
17166 ugoserver]$ vi web/bin/setenv.sh
#!/bin/bash
umask 0077
export LOGGING_HOME=/opt/[REDACTED]/ugoserver/logs/services
export UGO_HOME=/opt/[REDACTED]/ugoserver
export UGO_DB_DRIVER_LIB=/opt/[REDACTED]/ugoserver/web/shared/UGO_DBDriver_Lib
export JAVA_OPTS="$JAVA_OPTS -Xms3072m [-Xmx35840m] -XX:+PrintGCDetails -XX:+PrintGCApplicationStoppedTime -XX:+PrintCurrentTime -XX:+PrintGCDetails -Xloggc:$LOGGING_HOME/gclog.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=5 -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=$LOGGING_HOME/"
export CATALINA_OUT=/opt/[REDACTED]/ugoserver/logs/web/catalina.out
export CATALINA_PID=/opt/[REDACTED]/ugoserver/web/HwEoLrLl0d.tcatpid
```

- If "Configured memory - RES memory > Available system memory" is displayed, the process memory is sufficient. Perform **Step 6** to check the system memory.
- Otherwise, the process memory is insufficient. Configure more memory for UGO. For details, see **Step 1**.

Step 6 If the system memory is insufficient:

1. Check the UGO service process.

ps -eaf | grep ugoserver | awk '{print \$1" "\$2" "\$8" "\$9" "\$10" "\$11}'

The processes listed in the figure above are triggered by the UGO service.

```
[root@host-192-X-X ~]# ps -eaf | grep ugoserver | awk '{print $1" "$2" "$8" "$9" "$10" "$11}'
ugo 1408135 /bin/sh /home/ugo/ugoserver/db/server/bin/mysqld_safe --defaults-file=/home/ugo/ugoserver/db/server/my.cnf
ugo 1408923 /home/ugo/ugoserver/db/server/bin/mysqld --defaults-file=/home/ugo/ugoserver/db/server/my.cnf --basedir=/home/ugo/ugoserver/db/server --datadir=/home/ugo/ugoserver/db/data
ugo 1409572 java -Dlog4j2.formatMsgNoLookups=true -XX:+PrintGCDetails -
Djava.net.preferIPv4Addresses
ugo 1414565 /usr/bin/java -Dnop -
Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -
Dlog4j2.formatMsgNoLookups=true
```

Contact technical support ([Contacting Technical Support](#)) to check unnecessary processes.

2. Check all processes that consume a large amount of memory (RES). The processes that are not the UGO processes can be deleted. For details, see **Step 1**.

----End

Fault Rectification

Insufficient process memory

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Access the UGO server.

cd <ugoserver>

Step 3 Edit the **setenv.sh** file to configure more memory space for UGO:

vi web/bin/setenv.sh

```
:17166 ugoserver]$ vi web/bin/setenv.sh
#!/bin/bash
umask 0077
export LOGGING_HOME=/opt/[REDACTED]/ugoserver/logs/services
export UGO_HOME=/opt/[REDACTED]/ugoserver
export UGO_DB_DRIVER_LIB=/opt/[REDACTED]/ugoserver/web/shared/UGO_DBDriver_Lib
export JAVA_OPTS=$JAVA_OPTS -Xms3072m -Xmx35840m -XX:+PrintGCDetails -XX:+PrintGCApplicationStoppedTime -XX:+PrintCurrentTime -XX:+PrintGCDateStamps -Xloggc:$LOGGING_HOME/gclog.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=$LOGGING_HOME/
export CATALINA_OUT=/opt/[REDACTED]/ugoserver/logs/web/catalina.out
export CATALINA_PID=/opt/[REDACTED]/ugoserver/web/HwEoLrLl0d.tcatpid
```

----End

Insufficient system memory

- Step 1** Switch to the **bin** directory. Contact technical support ([Contacting Technical Support](#)) to check unnecessary processes.

```
cd <ugoserver>/bin
```

- Step 2** Stop unnecessary processes to release memory.

```
Kill -9 <PID>
```

- Step 3** Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name | Operation Details
-----
DB           | Service stopped successfully.
WebUI        | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB           | Service started successfully.
WebUI        | Service started successfully.
UGO_IAMService | Service started successfully.
-----
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

- Step 4** If the service is still not running properly, contact technical support ([Contacting Technical Support](#)).

----End

Verification

- Step 1** Log in to the server where UGO is installed as the **ugo** user.

- Step 2** Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

- Step 3** Check whether there is sufficient memory.

```
free -g
```

```
$ free -g
total       used      free      shared   buff/cache    available
Mem:        62         16        25          2         20        43
Swap:        3          0          3
```

Step 4 Check the service status.

python3 ugoserver.py status

If **Service license on port: port** is displayed in the command output, the UGO service is restored.

[rc17166 bin]\$ python3 ugoserver.py status	
Service Name	Status
DB	UP
DB	Service listening on port : 3306
WebUI	UP
License	License is valid till 31-Aug-2021 23:59:59 CST.
WebUI	Service listening on port : 8090
UGO_DbObjectCollection	Service listening on port : 9040
UGO_PreMigration	Service listening on port : 9010
UGO_Migration	Service listening on port : 9000
UGO_Verification	Service listening on port : 9005
UGO_AppMigration	Service listening on port : 9006
UGO_IAMService	UP
UGO_IAMService	Service listening on port : 9001

Step 5 Use a browser to access the installation environment: **https://XX.XX.XX.XX:<<YYYY>>/ugo/#/login**

Enter the correct username and password, and click **Login**.

If the home page is properly displayed, the UGO service is running properly and there is sufficient memory.

 **NOTE**

The default username is **admin** and the password is the same as that set for the IAM user during the installation.

----End

4.4 Appendix

4.4.1 Contacting Technical Support

You can provide your feedback using either of the following ways:

- Calling the hotline of a local office.
- Visiting the cloud support website and providing feedback on the **Contact Us** page.

5 Maintenance Guide

5.1 High-Risk Operations

Table 5-1 High-risk operations

Categor y	Operation	Risk	Risk Level	Workaround
System	Change the internal database password	Services are interrupted.	High	After the internal database password is changed, change the database password accordingly in the configuration files on each management-plane node. After the operation, check whether UGO is normal.
	Clear firewall rules, restart firewall, and add or delete firewall rules without permission	Service access requests are rejected.	High	Check the firewall configuration rules and do not modify them unless it is necessary. After the operation, check whether the VM network is normal.

Category	Operation	Risk	Risk Level	Workaround
	Change the file permissions in a service directory	Services are interrupted.	High	<p>Check the belonged group and permissions of files in the service directory.</p> <p>After the operation, check whether UGO is normal.</p>
	Change the private IP address	Access requests may be rejected.	High	<p>If the private IP address of the host where UGO is located is changed, UGO cannot be accessed. If the private IP address of the source or target database is changed, the service process is abnormal. Do not modify the private IP address unless necessary.</p> <p>After the operation, check whether UGO is normal.</p>
	Change the database port	Access requests may be rejected.	High	<p>After the database port is changed, adapt the application layer to the change. Do not modify the database port unless necessary.</p> <p>After the operation, check whether UGO is normal.</p>
	Change the security group	Access requests may be rejected.	High	<p>Check the security group configuration rules. Do not modify the security group rules unless necessary.</p> <p>After the operation, check whether UGO is normal.</p>

Category	Operation	Risk	Risk Level	Workaround
	Restart the service	Intermittent disconnection occurs.	High	Restart the service during off-peak hours. After the operation, check whether UGO is normal.
	Change the specifications	Intermittent disconnection occurs.	High	Change the specifications during off-peak hours. After the operation, check whether UGO is normal.
	Perform a switchover	Intermittent disconnection occurs.	High	Perform a switchover during off-peak hours. After the operation, check whether UGO is normal.
	Restore the database data	Incorrect operations may lead to data loss.	Medium	Restore the database data from the backups at a required point in time. After the data is restored, check whether UGO is normal.
	Shorten the backup retention period	Existing backup files that exceed the retention period are deleted.	Medium	Before shortening the backup retention period, check whether the new retention period meets service requirements. Check whether the expected backup files are retained after the backup retention period is shortened.

Category	Operation	Risk	Risk Level	Workaround
O&M	Upgrade the database kernel	Intermittent disconnection occurs.	High	<p>Perform the upgrade during off-peak hours. Before the upgrade, perform a comprehensive inspection on the database to eliminate key metric risks in advance. Communicate with the customer about the impact and upgrade time window before performing the upgrade.</p> <p>Ensure there is a rollback mechanism.</p>
	Kill the mysqld process	Services are interrupted.	High	<p>Exercise caution when determining the necessity of killing processes during O&M. If you need to kill a process, notify the user in advance.</p>
	Kill the Tomcat and IAM processes	Services are interrupted.	High	<p>Exercise caution when determining the necessity of killing processes during O&M. If you need to kill a process, notify the user in advance.</p>
Configuration file	Manually modify the my.cnf file	If important configurations such as the port number in the file are modified, the database may fail to be started or connected.	High	<p>Do not manually modify the configuration file. If you need to modify the file, use the corresponding database operation command and get knowledge of the risks.</p>

Category	Operation	Risk	Risk Level	Workaround
Database	Modify some database configuration parameters	If some parameters are incorrectly modified, unexpected database behaviors may occur, including but not limited to statement latency increase, memory usage increase, and service connection errors.	Medium	Before modifying parameters, carefully read the product documentation and accurately evaluate the impact. If the impact cannot be evaluated, contact technical support. Observe key metrics such as the SQL response latency, CPU usage, and memory usage.
	Perform DDL operations	Most DDL statements hold high-level locks, blocking queries and DML statements. As a result, services are blocked for a long time.	High	Before performing DDL operations, evaluate the impact with caution. Perform DDL operations offline if possible. If DDL operations cannot be performed offline, configure parameters to reduce the waiting time and prevent DDL from blocking services. Observe key metrics such as the SQL response latency, CPU usage, and memory usage.
	Import a large amount of data	A severe primary/standby delay may occur and storage pool resources may be exhausted.	High	Observe the primary/standby delay and storage pool resource usage, and import data in multiple batches.

Category	Operation	Risk	Risk Level	Workaround
	Perform a large number of write operations	A severe primary/standby delay may occur.	High	If there are more than 1 million rows of write operations, perform them in multiple batches.

5.2 Troubleshooting

5.2.1 About this Document

Overview

This document describes how to collect and categorize troubleshooting information, and provides frequently asked questions (FAQs) and common troubleshooting methods to help the Database and Application Migration UGO (UGO) administrator troubleshoot simple system faults.

Intended Audience

This document provides the UGO system administrator with common troubleshooting guidance.

- Be familiar with the networking and versions of NEs on the network.
- Have device maintenance experience and skills.

Symbol Convention

Symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or other unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	Calls attention to important information, best practices, and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Release History

Issue	Date	Description
01	2021-09-30	This issue is the first official release.

5.2.2 Overview

Overview

Database and Application Migration UGO, referred to as UGO, is a professional cloud service that focuses on heterogeneous database schema migration.

With the functions of pre-migration evaluation, schema migration, and automatic syntax conversion, UGO can help you identify risks in advance, improve the conversion rate, and minimize database migration costs. You can migrate mainstream commercial databases to Huawei Cloud databases easily and smoothly.

This document describes the methods for resolving UGO common faults and troubleshooting cases.

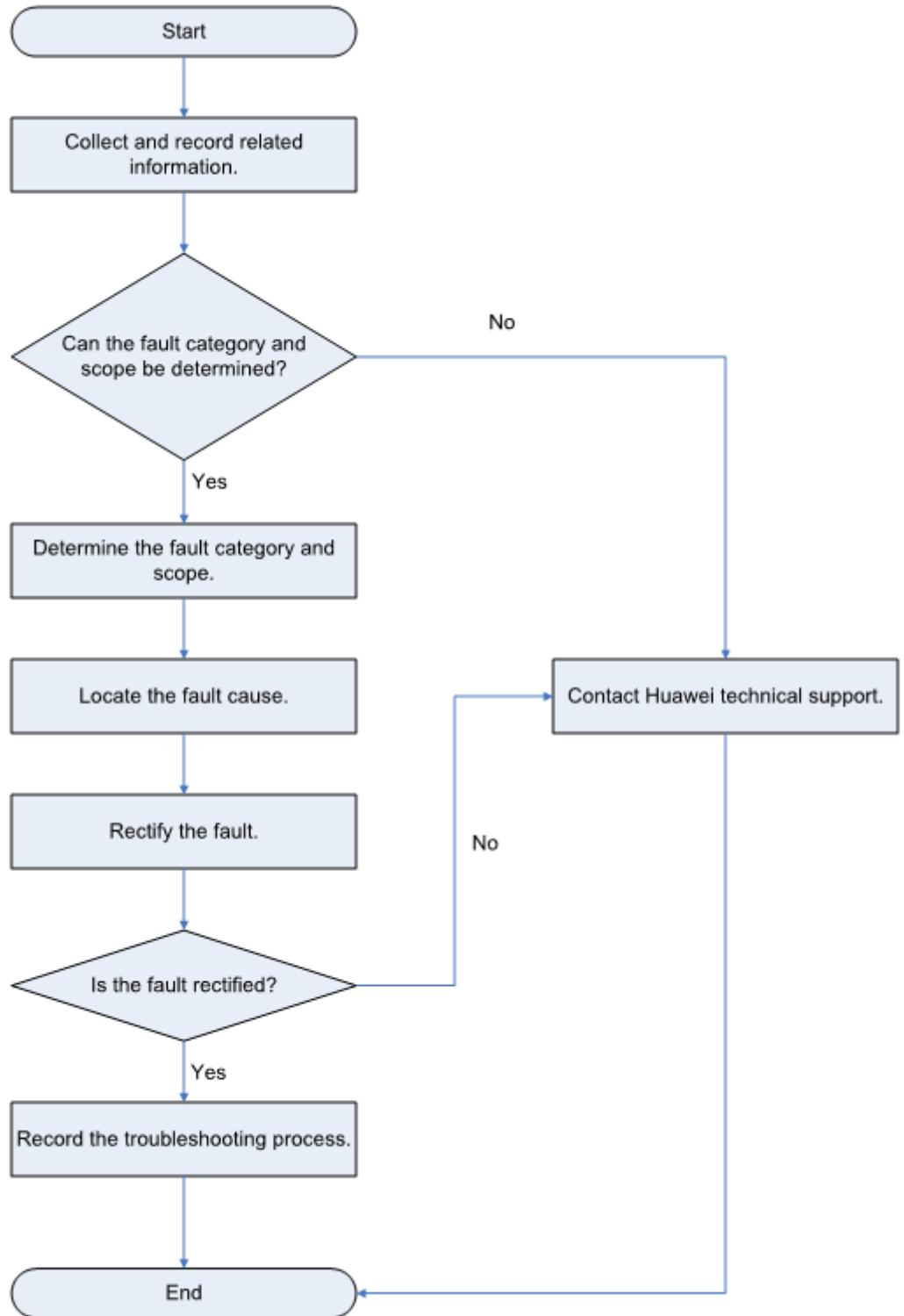
5.2.2.1 Troubleshooting Process

The troubleshooting process consists of the following operations: collecting fault information, determining the fault scope and type, locating the fault, and rectifying the fault.

 NOTE

1. Before handling a critical fault, contact technical support ([Contacting Technical Support](#)) for assistance.
2. During the troubleshooting, maintenance engineers may perform important operations, such as modifying configuration data and restarting virtual machines (VMs). To ensure data security, save onsite data, and back up related databases, alarm information, and log files before the troubleshooting.

Figure 5-1 Troubleshooting process



Collecting Fault Information

Collect as much fault information as possible to help maintenance engineers locate and handle faults.

Determining the Fault Scope and Type

Determine the scope and type of the fault based on the collected fault information before rectifying the fault.

This document categorizes faults based on fault symptoms for the ease of use. UGO fault categories are as follows:

- Service-related faults
 - Failed to access the UGO console.
 - Failed to test the network connectivity.
 - Pre-check error.
 - Failed to collect objects of the evaluation project.
 - Failed to save the SQL statement modifications of the migration project.
- Key service faults:
 - UGO console service fault: Users cannot log in to the UGO console.
 - UGO-Service faults: Users cannot create, view, modify, or delete tasks.

Locating the Fault

Identify the possible causes for the fault. Analyze and compare these possible causes and determine the specific root cause.

Locating key service faults

The causes of key service faults are easy to locate. Service logs, alarms, error messages, and monitoring status are available. Generally, users can locate key service faults based on log information, alarm handling suggestions, and error messages and by restarting processes.

Locating service-related faults

- Failed to access the UGO console: Check whether the server is normal, the UGO service is running properly, and the network between the UGO server and the access node is normal.
- Failed to test the network connectivity: Check whether the network, firewall, access whitelist, access port, and database service are normal, and check whether the DNS resolution takes a long time.
- Pre-check exception: Check whether the database user has permissions required for creating an evaluation project.
- Failed to collect objects of the evaluation project: Check whether the database is normal, the network connectivity is normal, and the database user is locked.

Rectifying the Fault

After the fault cause is identified, rectify the fault. Fault rectification is a process of clearing a fault and recovering the system by taking appropriate measures, such as checking process status, viewing logs, modifying configuration files, and restarting services.

Rectify faults based on their categories by following different operation regulations.

Verifying Fault Rectification

After the fault is rectified, verify the rectification.

Query the logs, operations repeatedly causing faults, and alarms to check whether the system is running properly. Perform function tests to ensure that the fault has been rectified and the service is running properly.

Recording the Troubleshooting Process

After the fault is rectified, record the troubleshooting process and preventative measures taken to prevent the same or similar faults from recurring.

NOTE

If system maintenance personnel cannot rectify the fault, see [Contacting Technical Support](#).

Contacting Technical Support

- Email: support@huawei.com
- Technical support website: <http://support.huawei.com>

5.2.2.2 Fault Categories and Location Methods

UGO faults are categorized into operating system faults, network faults, and service faults on the management plane.

Table 5-2 Fault categories

Fault Category	Fault Location
Operating system	<ul style="list-style-type: none">● Use a remote login tool to log in to the UGO server using SSH. If the login fails, run the ping command to check the network status. If no output is returned, the server is down or is being restarted, or its network connection is abnormal. Try to connect the server five minutes later. If it cannot be connected after 20 minutes, it has been broken down or the network connection is abnormal. In this case, contact underlying service personnel for further locating.● Run ping to check the network. If the ping operation succeeds but SSH login is stuck or commands cannot be executed, the server does not respond to external connections. This may be because system resources are insufficient, for example, CPU or I/O resources are overloaded. In this case, log in again. If you cannot operate this server within five minutes, contact O&M personnel for further locating.● If the server cannot be remotely logged in to but responds slowly during operations, check the running status of the system and perform subsequent handling procedures, such as collecting system information and checking system hardware, parameter configuration, and login user. The following are common commands for reference:<ul style="list-style-type: none">- View login user: who- Check system version and kernel information: uname -a- Obtain the new DNS client configuration: cat /etc/resolv.conf- Obtain CPU and memory information: cat /proc/cpuinfo cat /proc/meminfo- View the CPU usage and check whether the CPU usage is high due to a specific process: top -H- View the I/O usage and check whether the disk is full. View the jobs being executed to determine whether to handle the jobs with a high I/O usage. iostat -x 1 3- Run the vmstat 1 3 command to query memory usage in the current system, and use the top command to obtain the processes with unexpectedly high memory usage. <p>Run the less command to view system log information (/var/log/messages) or dmesg information (/var/log/dmesg) and check whether errors have occurred in the system.</p>

Fault Category	Fault Location
Network	<p>UGO communicates with the source and target databases over the network. Due to network connectivity and database access restrictions, network exceptions or errors may occur.</p> <p>If a network fault occurs in the system, run route, ping, ifconfig, netstat, or lsof provided by the Linux system and check the database access restrictions.</p>
Service	<p>UGO can help users migrate database objects by creating evaluation and migration projects. UGO may experience service faults, which can be located as follows:</p> <ul style="list-style-type: none"> • Viewing alarm information. • Log in to the UGO server and view logs. <p>NOTE Contact technical support (Contacting Technical Support) for assistance when needed.</p>

5.2.3 Information Collection

Fault information provides a basis for troubleshooting. System maintenance personnel need to collect as much fault information as possible.

5.2.3.1 Precautions

Observe the following principles during information collection:

- Perform maintenance operations only after receiving explicit approval from the customer. Any operations without explicit customer approval are prohibited.
- Transfer data required for locating a fault out of the customer's network only after being approved by the customer.

5.2.3.2 Collecting Basic Fault Information

Collect basic fault information to learn about the site, the device status before the fault occurred, and possible causes of the fault.

Table 5-3 Basic fault information to be collected

Item	Collection Result
Symptom	-
Occurrence time	-
Occurrence frequency	-
Impact on services	-

Item	Collection Result
Whether the fault is rectified	-
Operations performed in the system when the fault occurs	-
Whether the fault occurred during site deployment	-
Procedure where the fault occurred (capacity expansion, migration, or upgrade)	-
Operations performed to resolve maintenance problems that occurred prior to the fault	-
Measures taken to handle the fault	-
Effect of the measures taken to handle the fault	-
Whether alarms are generated	-
Whether onsite alarm information is collected	-

5.2.3.3 Collecting Alarm Information

To view UGO alarm information, log in to the UGO console and choose your username > **Alarms** in the upper right corner of the console.

For details, see "User Manual" > "User Guide" > "Management" > "Alarms" in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide (for Huawei Cloud Stack 8.3.0) 01*.

5.2.3.4 Collecting Logs and System Information

For details, see [How Can I View UGO Service Logs?](#)

5.2.4 Service Troubleshooting

This section describes how to analyze causes for common service faults based on their symptoms and troubleshoot these faults.

5.2.4.1 Failed To Access the UGO Console

Symptom

After the UGO address is entered in the address bar of a web browser, the page cannot be accessed.

Possible Causes

- The UGO server breaks down or shuts down.
- Network cables are improperly connected.
- The UGO service is faulty.

Fault Locating

- Check whether the UGO server is normal.
- Check whether the network between the UGO server and the access node is normal.
- Check whether the UGO service is running properly.

Procedure

Step 1 Log in to the server where the UGO is installed as a non-root user, for example, **ugo**.

Step 2 Log in to the node where the UGO service is deployed and check whether the UGO server is normal.

- If the UGO server is abnormal, restore the server.
- If the server has been restarted, restart the UGO service.
python3 ugoserver.py start
- If the login is successful, go to **Step 3**.

Step 3 Run the following command on the current node as the **ugo** user to check whether the UGO service is normal:

python3 ugoserver.py status

Command output:

Service Name	Status
DB	UP
DB	Service listening on port : 3386
WebUI	UP
License	License is valid till 30-Oct-2021 23:59:59 CST.
WebUI	Service listening on port : 8090
UGO_DbObjectCollection	Service listening on port : 9040
UGO_PreMigration	Service listening on port : 9010
UGO_Migration	Service listening on port : 9000
UGO_Verification	Service listening on port : 9005
UGO_AppMigration	Service listening on port : 9006
UGO_IAMService	UP
UGO_IAMService	Service listening on port : 9001

- If the UGO service is abnormal (**Status** is **DOWN** in the command output)
 - Restart the service.
python3 ugoserver.py restart
 - Obtain the failure cause by referring to [How Can I View UGO Service Logs?](#)
- If the service is normal (**Status** is **UP** in the command output), go to **Step 4**.

Step 4 On the computer used to access the UGO service, run the **ping** command to connect to the IP address of the UGO server and check the network connectivity.

ping /P

- If the connection fails, check the network connectivity.
- If the connection is normal, run the **telnet** command to check whether the IP address and port of the UGO server can be pinged.

telnet /P

If the connection fails, disable the firewall of the UGO server and remove the restrictions on the access to the UGO server.

----End

5.2.4.2 Failed to Test the Network Connectivity

Symptom

When an evaluation or migration task is created, the network connection test fails.

Possible Causes

- The network between the UGO server and the database server is disconnected.
- Although the network between the UGO server and the database server is connected, the network is unstable and the latency is too long.
- The database connection information is incorrect, or the database service is abnormal.
- The database server is configured with a firewall or access whitelist.
There is a whitelist used to control access to the target GaussDB or RDS for PostgreSQL database. The IP address of the UGO server is not added in the whitelist.
- Source database Oracle is connected using user **sys**. The connection test fails because the Oracle database restricts the remote login of user **sys**.
- DNS resolution takes a long time.
- The UGO service is abnormal.

Fault Locating

- Check whether the network between the UGO server and the database server is normal and stable.
- Check whether the database connection information is correct (remote login is restricted for the **sys** user, and a new user needs to be created). Check whether the database service is normal.
- Check whether the database server is configured with firewall, access whitelist, and access port.
- If the target database is a GaussDB or RDS for PostgreSQL database, check whether the IP address of the UGO server has been added to the whitelist.
- Check whether the DNS resolution takes a long time.

- Check logs of the UGO_DbObjectCollection module to locate the fault.

Procedure

- Step 1** If the connection test fails when you create an evaluation project, check whether the source database service is normal. If the connection test fails when you create a migration task, check whether the target database service is normal.
- If the database service is abnormal, check the database service.
 - If the service is normal, go to [Step 2](#).
- Step 2** Use another client tool to check whether the database connection information is correct and check whether the **sys** user is used for remote login.
- If the **sys** user is used, create a new user.
 - If the database information is incorrect, modify it and try again.
 - If the database information is correct, go to [Step 3](#).
- Step 3** Check whether the database server is configured with firewall, access whitelist, and access port.
- If the access is restricted, allow the UGO server to access the database server.
 - If there is no access restriction, go to [Step 4](#).
- Step 4** Run the **ping** command on the UGO server to test the connectivity and network latency between the UGO server and the database server.
- If the connection fails, ensure that the network connection is normal.
 - If the packet loss rate of the command is greater than 5% and the round-trip latency is greater than 2,000 ms, the network is unstable, which affects data collection for UGO to connect to the source database. Therefore, the connection test fails. Before creating an evaluation project, ensure that the network is stable.
 - If the network is connected and stable, go to [Step 5](#).
- Step 5** If the target database is a GaussDB or RDS for PostgreSQL database, check whether the IP address of the UGO server has been added to the whitelist.
- If no, add the IP address of the UGO server to the database whitelist in the **pg_hba.conf** file.
 - If yes, go to [Step 6](#).
- Step 6** Check the DNS resolution file of the UGO server, open the file, and comment out the service name and IP address.

vi /etc/resolv.conf

Comment out the following content:

```
options timeout:1
; generated by /usr/sbin/dhclient-script
search openstacklocal
#nameserver 172.202.100.143
#nameserver 172.202.100.144
~
```

If the database still cannot be connected, check the logs of the UGO_DbObjectCollection module of the UGO service, obtain the error information, and send the error information to O&M personnel to rectify the bug.

----End

5.2.4.3 Pre-check Error

Symptom

The permission pre-check fails during the evaluation task creation.

Possible Causes

- The database user does not have the permission to query DDL objects in schemas.
- The database user does not have the permission to access the system dynamic views.
- The number of objects that a database user can access is 0.

Fault Locating

Check whether the database user has permissions required for creating an evaluation project.

Procedure



If the database user has the DBA permission, all permission checks can be passed. You do not need to check each permission separately.

Oracle as the source database type:

DBA permission authorization

Step 1 Log in to the database as the user who created the evaluation project and run the following statements to create a user:

CREATE USER <user> IDENTIFIED BY <password>;

Step 2 Run the following command to grant the login permission to the user:

GRANT CONNECT TO <user>;

Step 3 Run the following command to grant the DBA permission to the user:

GRANT DBA TO <user>;

----End

Non-DBA permission authorization

Step 1 Log in to the database as the user who created the evaluation project and run the following statements to create a user:

CREATE USER <user> IDENTIFIED BY <password>;

Step 2 Run the following command to grant the login permission to the user:

GRANT CONNECT TO <user>;

Step 3 Run the following command to grant the SELECT_CATALOG_ROLE role permission to the user to obtain DDL statements of objects from the data dictionary: If the user lacks the permission, the permission check will fail and the next step cannot be performed.

GRANT SELECT_CATALOG_ROLE TO <user>;

GRANT SELECT ANY DICTIONARY TO <user>;

----End

MySQL as the source database type:

Step 1 Run the following command in the database to create a user and use the user to create an evaluation task:

CREATE USER <db-user> IDENTIFIED BY <passwd>;

<db-user> indicates the username and the IP address of the UGO server. The default value is %.

Step 2 Run the following command to add the permissions for accessing the MySQL database: If the user lacks these permissions, the connection will fail.

GRANT SELECT ON mysql.* TO <db-user>;

Step 3 Run the following command to grant the PROCESS permission to a specified user so that the user can view all tables in the **information_schema** table:

GRANT PROCESS ON *.* TO <db-user>;

Step 4 Grant the user the following permissions to collect objects.

To collect global objects, replace <schema-name>.* with *.*

GRANT SELECT ON <schema-name>.* TO <db-user>;

GRANT SHOW VIEW ON <schema-name>.* TO <db-user>;

GRANT TRIGGER ON <schema-name>.* TO <db-user>;

Step 5 Run the following commands to grant permissions on stored procedures and stored functions (MySQL 8.0):

GRANT SHOW_ROUTINE ON *.* TO <db-user>;

----End

DB2 as the source database type:

Step 1 Log in to the database as the user who created the evaluation project and run the following statements on the OS where the DB2 database is installed to create a user:

useradd <user>;

passwd <user>;

Step 2 Run the following command to grant the DBADM or DATAACCESS permission:

GRANT DBADM ON DATABASE TO USER <user>;

or

GRANT DATAACCESS ON DATABASE TO USER <user>;

----End

5.2.4.4 Failed to Collect Objects of the Evaluation Project

Symptom

The source database objects failed to be collected during the evaluation project creation.

Possible Causes

The source database is disconnected during data collection (for example, the source database is abnormal or the user used to connect to the source database is locked).

Fault Locating

- Verify that the database is running properly.
- Check whether the network between the UGO server and the database server is normal.
- Check whether the database user is locked.

Procedure

Step 1 Check whether the source database is running properly.

Step 2 Run the **ping** command on the UGO server to test the connectivity and network latency between the UGO server and the source database server.

- If the connection fails, ensure that the network connection is normal.
- If the packet loss rate of the command is greater than 5% and the round-trip latency is greater than 2,000 ms, the network is unstable, which affects data collection for UGO to connect to the source database. Therefore, the connection test fails. Before creating an evaluation project, ensure that the network is stable.
- If the network is connected and stable, go to [Step 3](#).

Step 3 Log in to the database server and check whether the user *username* is locked.

SELECT lock_date, username FROM dba_users WHERE username='username';

If **LOCK_DATE** is empty, the user is not locked.

If **LOCK_DATE** is not empty, the user is locked. Run the following statement to unlock the user.

ALTER USER username ACCOUNT UNLOCK;

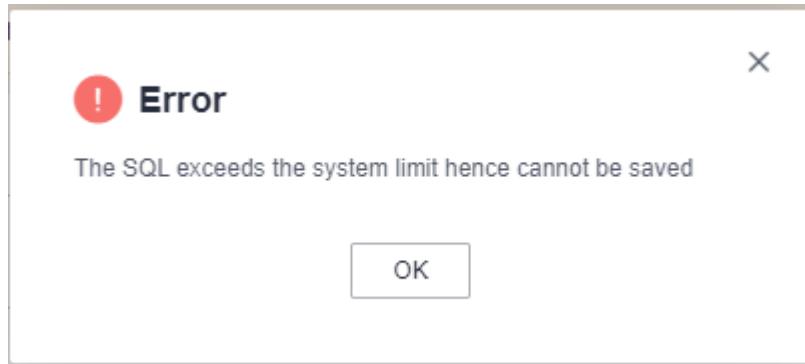
----End

5.2.4.5 Failed to Save the SQL Statement Modifications of the Migration Project

Symptom

After you modify a SQL statement on the object correction page and save the modifications, an error message shown in the following figure may be displayed:

Figure 5-2 Error message



Possible Causes

The length of the saved SQL statement exceeds the upper limit.

Fault Locating

Check whether the length of the SQL statement exceeds 1 MB.

Procedure

- Step 1** Log in to the UGO console.
- Step 2** In the navigation pane on the left, 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** Locate the object to be modified and click **Modify** in the **Operation** column.
- Step 5** Adjust the statement length and save it again.

----End

5.2.5 FAQs

5.2.5.1 How Do I Operate the UGO Service?

Log in to the UGO server as the **ugo** user and go to the **bin** directory.

```
[ugo_0621@hghphisprb07070 bin]$ pwd
/data01/ugo_0811/UGO/ugoserver/bin
[ugo_0621@hghphisprb07070 bin]$
[ugo_0621@hghphisprb07070 bin]$ ll
total 32
drwx----- 2 ugo_0621 ugo_0621 4096 Aug 17 10:39 logs
drwx----- 9 ugo_0621 ugo_0621 4096 Aug 11 15:09 script
-r----- 1 ugo_0621 ugo_0621 20984 Aug 11 00:15 ugoserver.py
[ugo_0621@hghphisprb07070 bin]$
[ugo_0621@hghphisprb07070 bin]$ python3 ugoserver.py help
ugo_0621@hghphisprb07070 bin]$
```

Run **python3 ugoserver.py help** to view commands related to the UGO service.

- **python3 ugoserver.py start**: Start the UGO service.
- **python3 ugoserver.py stop**: stop the UGO service.
- **python3 ugoserver.py restart**: restart the UGO service.
- **python3 ugoserver.py status**: view the UGO service status.
- **python3 ugoserver.py license-status**: view the status of the current license file.
- **python3 ugoserver.py update-license**: update the UGO license.
- **python3 ugoserver.py uninstall**: uninstall the UGO service.
- **python3 ugoserver.py help**: view help.

 NOTE

Stopping or restarting the UGO service affects the tasks that are running. Exercise caution when performing this operation.

5.2.5.2 How Can I View UGO Service Logs?

Log in to the UGO server and go to the log directory.

```
[ugo_0621@hghphisprb07070 logs]$ pwd
/data01/ugo_0811/UGO/ugoserver/logs
[ugo_0621@hghphisprb07070 logs]$
[ugo_0621@hghphisprb07070 logs]$ ll
total 12
drwx----- 2 ugo_0621 ugo_0621 4096 Aug 11 15:08 db
drwx----- 8 ugo_0621 ugo_0621 4096 Aug 15 11:05 services
drwx----- 2 ugo_0621 ugo_0621 4096 Aug 17 10:24 web
[ugo_0621@hghphisprb07070 logs]$
```

db, **services**, and **web** indicate the error logs of the UGO database, UGO service, and UGO console, respectively.

The **services** directory stores logs of each module for the UGO service.

```
[ugo_0621@hghphisprb07070 logs]$ cd services/
[ugo_0621@hghphisprb07070 services]$ ll
total 8524
-rw----- 1 ugo_0621 ugo_0621 5243126 Aug 15 11:05 gclog.log.0
-rw----- 1 ugo_0621 ugo_0621 3447143 Aug 17 11:05 gclog.log.1.current
drwx----- 2 ugo_0621 ugo_0621    4096 Aug 11 15:11 UGO_AppMigration
drwx----- 2 ugo_0621 ugo_0621    4096 Aug 12 16:42 UGO_DbObjectCollection
drwx----- 2 ugo_0621 ugo_0621    4096 Aug 11 15:09 UGO_IAMService
drwx----- 2 ugo_0621 ugo_0621    4096 Aug 12 16:43 UGO_Migration
drwx----- 2 ugo_0621 ugo_0621    4096 Aug 11 15:10 UGO_PreMigration
drwx----- 2 ugo_0621 ugo_0621    4096 Aug 11 15:10 UGO_Verification
[ugo_0621@hghphisprb07070 services]$
```

- **UGO_AppMigration**: service logs of application migration
- **UGO_DbObjectCollection**: service logs of data collection. The logs record the information generated in the data collection phase of a database evaluation task.
- **UGO_IAMService**: service logs of user management operations in Huawei Cloud Stack.
- **UGO_Migration**: service logs in the syntax conversion phase of an object migration task.
- **UGO_PreMigration**: service logs of pre-migration evaluation. The logs record the information generated in the evaluation phase of a database evaluation task.
- **UGO_Verification**: service logs generated in the migration verification phase of an object migration task.

5.3 Alarm Reference

5.3.1 6050013 Disk Usage

Alarm Description

This alarm is generated when the disk usage exceeds the threshold (85%). This alarm displays the current disk usage as a percentage.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050013	High	Yes

Alarm Parameters

Parameter	Description
Type	Storage
Subkey	Usage

Parameter	Description
Creation Time	Time when the alarm is generated
Update Time	Recent time when the alarm is modified

Impact on the System

Basic function operations may fail, and the system will be unavailable.

Possible Causes

- There is a large amount of data in the system.
- There are multiple UGO projects with a large number of objects.

Handling Procedure

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Check the disk space.

```
df -k
```

```
ugouser@szxphisprd01525:~> df -k ~/ugoserver/
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/xvda1        41021664 12915664   25992516  95% /
ugouser@szxphisprd01525:~>
```

If the value of **Use %** is **95%** or greater, the disk usage is high. In this case, clear the disk space.

Step 4 Check the disk space occupied by each file system.

```
du -sh <directory name>
```

```
[...@...:~] ugoserver]$ du -sh *
4.0K    auditlogsbackup
18M     bin
553M    db
77M     download
4.0K    install_summary.json
6.4M    logs
3.9M    services
249M   web
```

Step 5 Check the files that occupy too much disk space.

```
find . -type f -size +50M
```

```
[sumit@dgghisprc17166 ugoserver]$ !find  
find . -type f -size +50M  
. ./download/collector_pkg/collector.zip  
. ./db/data/sumit22/DB_PREMIG_OBJECTSTAT.ibd  
. ./db/data/sumit22/DB_SRC_CATALOG.ibd  
. ./db/server/bin/mysqld
```

Step 6 Delete unnecessary files.

rm -f <filename>

The following are unnecessary files, which should not appear in normal cases.

- UGO installation package and decompression package created during the installation
 - Backup file in `~/ugobackup/`
 - Additional UGO log backup files in `~/ugoservice/log/**.`
 - Java dump files (which can be transferred if required for analysis) in `<ugoserver>/logs/services/java_**.hprof.`

Step 7 Restart the UGO service.

python3 ugoserver.py restart

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name          | Operation Details
-----
DB                   | Service stopped successfully.
WebUI                | Service stopped successfully.
UGO_IAMService       | Service stopped successfully.
DB                   | Service started successfully.
WebUI                | Service started successfully.
UGO_IAMService       | Service started successfully.
-----
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log      |          OK | Audit log sent Successfully.
```

Step 8 Log in to the UGO console and delete the evaluation projects that are not used.

Step 9 If the service is still not running properly, [contact technical support](#).

-----End

Alarm Clearance

This alarm is automatically cleared when the disk usage is lower than 75%.

Reference Information

None

5.3.2 6050014 Memory Usage

Alarm Description

This alarm is generated when the memory usage exceeds the threshold (95%).
This alarm displays the current memory usage as a percentage.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050014	Medium	Yes

Alarm Parameters

Parameter	Description
Type	Memory
Subkey	Usage
Creation Time	Time when the alarm is generated
Update Time	Recent time when the alarm is modified

Impact on the System

Operations become slow or may fail to start.

Possible Causes

Some system processes may occupy a large amount of memory.

Handling Procedure

Check whether the process memory is sufficient.

- Step 1** Log in to the server where UGO is installed as the **ugo** user.
- Step 2** Check whether the heap dump file `~/ugoserver/logs/services/java*.hprof` is generated.
- If yes, perform **Step 4** to **Step 6** to check whether the available system memory is sufficient.
 - If the system memory is insufficient, go to **Step 6**.

- Step 3** Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

- Step 4** Check the system memory based on the configured process memory.

Check the available system memory.

free -m

free -g

```
[root@host-172-202-0-16 ~]# free -m
total        used        free      shared  buff/cache   available
Mem:       31994         312       31517          4       164       31369
Swap:          0          0          0
[root@host-172-202-0-16 ~]# free -g
total        used        free      shared  buff/cache   available
Mem:        31          0         30          0          0          30
Swap:          0          0          0
[root@host-172-202-0-16 ~]#
```

- If the value of **available** is less than 1 GB, the memory is full. Stop unnecessary processes to release memory.
Kill -9 <PID>
- If the value of **available** is greater than 1 GB, the memory is available. Go to the next step.

Step 5 Obtain the locations of all running processes in the system.

top

```
[17166 ugoserver]$ top
top - 17:26:45 up 343 days, 22:38,  2 users,  load average: 5.00, 5.01, 5.05
Tasks: 279 total,  6 running, 273 sleeping,  0 stopped,  0 zombie
%Cpu(s): 31.4 us,  0.0 sy,  0.0 ni, 68.6 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem: 65807036 total, 6114684 free, 36601792 used, 23090560 buff/cache
KiB Swap: 4194300 total, 4148476 free,    45824 used. 26313212 avail Mem

PID USER      PR  NI    VIRT   RES   SHR S %CPU %MEM     TIME+ COMMAND
17496 [REDACTED] 20   0 124576 2284 148 R 100.0  0.0 203100:03 bash
17497 [REDACTED] 20   0 124576 2284 148 R 100.0  0.0 203100:04 bash
17498 [REDACTED] 20   0 124576 2284 148 R 100.0  0.0 203100:06 bash
17499 [REDACTED] 20   0 124576 2284 148 R 100.0  0.0 203099:57 bash
17687 [REDACTED] 20   0 124576 2288 152 R 100.0  0.0 203099:11 bash
27572 [REDACTED] 20   0 828920 108884 8248 S  2.0  0.2 4377:54 gsd-color
6135 [REDACTED] 20   0 163312 2472 1616 R  0.3  0.0  0:00.03 top
11110 [REDACTED] 20   0 1308988 47500 5660 S  0.3  0.1 245:21.90 haccservice
14509 [REDACTED] 20   0 5292088 1.1g 19128 S  0.3  1.8  4:34.66 mysqld
15081 [REDACTED] 20   0 7141484 897180 22656 S  0.3  1.4  3:33.72 java
```

- **RES**: actual memory usage of a process.
- **PID**: process identifier.
- **KiB Mem**: total system memory, free memory, and buff/cache memory

Step 6 Check the configured memory in the **setenv.sh** file of the UGO server.

vi web/bin/setenv.sh

```
[17166 ugoserver]$ vi web/bin/setenv.sh
#!/bin/bash
umask 0077
export LOGGING_HOME=/opt/[REDACTED]/ugoserver/logs/services
export UGO_HOME=/opt/[REDACTED]/ugoserver
export UGO_DB_DRIVER_LIB=/opt/[REDACTED]/ugoserver/web/shared/UGO_DBDriver.Lib
export JAVA_OPTS=$JAVA_OPTS -Xms3072m -Xmx35840m -XX:+PrintGCDetails -XX:+PrintGCApplicationStoppedTime -XX:+PrintGCDateStamps -Xloggc:$LOGGING_HOME/gclog.log -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=5m -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=$LOGGING_HOME/
export CATALINA_OUT=/opt/[REDACTED]/ugoserver/logs/web/catalina.out
export CATALINA_PID=/opt/[REDACTED]/ugoserver/web/HwEoLrLIO.tcatpid
```

- If "Configured memory - RES memory > Available system memory" is displayed, the memory is sufficient. Perform **Step 7** to check the process.

- Otherwise, the available memory is insufficient. Delete unnecessary files.

Step 7 Check the UGO service process.

```
ps -eaf | grep ugoserver | awk '{print $1" "$2}'
```

```
[ ] ugoserver]$ ps -eaf | grep ugoserver | awk '{print "ugo "$2}'  
ugo 10488  
ugo 13765  
ugo 14509  
ugo 15081  
ugo 16164
```

The processes above are triggered by the UGO service. [Contact technical support](#) to check unnecessary processes.

Step 8 Check all processes (RES) that consume a large amount of memory. The processes are not the UGO processes and can be deleted.

Step 9 Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart  
-----  
Service Name | Operation Details  
-----  
DB | Service stopped successfully.  
WebUI | Service stopped successfully.  
UGO_IAMService | Service stopped successfully.  
DB | Service started successfully.  
WebUI | Service started successfully.  
UGO_IAMService | Service started successfully.  
-----  
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.  
Send => Audit Log | OK | Audit log sent Successfully.
```

Step 10 If the service is still not running properly, [contact technical support](#).

----End

Alarm Clearance

This alarm is automatically cleared when the memory usage is lower than 85%.

Reference Information

None

5.3.3 6050018 Certificate Validity Period

Alarm Description

The alarm is generated in any of the following cases:

- The current certificate is self-signed.
- The web certificate will expire in 7 days or has expired.
- The web certificate is tampered with or invalid.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050018	<ul style="list-style-type: none">High: The web certificate has expired or will expire in 14 days, or the web certificate has been tampered with or is invalid.Medium: The web certificate has expired or will expire in 90 days.Information: The current certificate is self-signed.	Yes

Alarm Parameters

Parameter	Description
Type	Certificate
Subkey	Validity period
Creation Time	Time when the alarm is generated
Update Time	Recent time when the alarm is modified

Impact on the System

- If the certificate is tampered with or invalid, the UGO system cannot be used.
- If the certificate is self-signed, the UGO system is still available, but it is advised to update the certificate obtained from the certification authority.
- If the certificate is about to expire, the UGO system is still available, but it is advised to update the certificate.
- If the certificate has expired, the UGO system cannot be used.

Possible Causes

- The certificate is not generated by a valid certificate authority.
- The certificate is about to expire or has expired.
- The certificate is maliciously tampered with. As a result, the service is unavailable.

Handling Procedure

Step 1 Obtain a new or renewed web certificate and upload it to the server where the UGO is installed. For details, see "Installation Guide" in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide 01*.

Step 2 Log in to the server where UGO is installed as the **ugo** user.

Step 3 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 4 Update the web certificate.

```
python3 ugoserver.py update-cert --cert-file <new web certificate path>
```

Step 5 Log in to the UGO console and check whether the alarm is cleared. If the alarm persists, [contact technical support](#).

----End

Alarm Clearance

This alarm is cleared when the certificate is available.

Reference Information

"Installation Guide" in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide (for Huawei Cloud Stack 8.3.0) 01*.

5.3.4 6050019 License Validity Period

Alarm Description

The alarm is generated in any of the following cases:

- The license is invalid.
- The license has expired.
- The license will expire in 30 days.

Alarm Attributes

Alarm ID	Alarm Severity	Auto Cleared
6050019	<ul style="list-style-type: none">• High: The license is invalid, the license has expired, or will expire in less than seven days.• Medium: The license will expire in seven to 30 days.	Yes

Alarm Parameters

Parameter	Description
Type	License
Subkey	Validity period
Creation Time	Time when the alarm is generated
Update Time	Recent time when the alarm is modified

Impact on the System

- If the license is invalid or has expired, the UGO system cannot be used.
- If the license is about to expire, the UGO system is still available, but it is advised to update the license.

Possible Causes

- The license file may have been deleted or tampered with.
- The certificate is about to expire or has expired.

Handling Procedure

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Check the license status.

```
python3 ugoserver.py license-status
```

- If the license is invalid, update the license.

```
python3 ugoserver.py update-license --license <new_license_path>
```

Command output:

PreCheck => License	OK License is valid till Fri Jul 9 00:00:00 2021.
Update => License	OK License updated successfully.

Service Name	Operation Details
--------------	-------------------

WebUI	Service already running.
UGO_IAMService	Service already running.

For details about how to obtain and upload a new license, see "Installation Guide" in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide (for Huawei Cloud Stack 8.3.0) 01*.

- If the license is valid, this alarm is cleared. If the alarm persists, [contact technical support](#).

----End

Alarm Clearance

This alarm is automatically cleared when the license becomes available.

Reference Information

"Installation Guide" in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide (for Huawei Cloud Stack 8.3.0) 01*.

5.3.5 Appendix

5.3.5.1 Contacting Technical Support

You can provide your feedback using either of the following ways:

- Calling the hotline of a local office.
- Visiting the cloud support website and providing feedback on the **Contact Us** page.

5.4 Log Reference

5.4.1 Before You Start

Purpose

This document details Database and Application Migration UGO (referred to as UGO) logs and describes how to view the logs.

Intended Audience

This document is intended for technical support engineers and maintenance engineers.

Symbol Conventions

Symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
 CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Symbol	Description
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or other unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices, and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Release History

Issue	Release Date	Change Description
01	2021-09-30	This issue is the first official release.

5.4.2 Overview

5.4.2.1 Introduction

Logs record UGO running status and process execution status. Log functions include:

- Recording system running status and action information.
- Detecting and recording internal errors, including the error conditions, environments, and trajectory.

5.4.2.2 Log Levels

Level	Description
DEBUG	Records the system working process, including the log information and related parameters of each operation.
INFO	Records the system running workflow and key steps involved in the workflow.
WARN	Records the problems or exceptions that may occur during the system running.
ERROR	Records the errors that occur during system running.

5.4.2.3 Log List

Service	Log Category	Log Name	Log Path
UGO	Application migration	UGO_AppMigration.log	{ugo-install-path}/ugoserver/logs/services/UGO_AppMigration/UGO_AppMigration.log
	Object collection	DbObjectCollection.log	{ugo-install-path}/ugoserver/logs/services/UGO_DbObjectCollection/DbObjectCollection.log
	IAM authentication	<ul style="list-style-type: none"> • IAMService.log • UGO_IAMService.log • gclog.log.0.current 	<ul style="list-style-type: none"> • IAM service operation logs: {ugo-install-path}/ugoserver/logs/services/UGO_IAMService/IAMService.log • Shell script log when the service is started: {ugo-install-path}/ugoserver/logs/services/UGO_IAMService/UGO_IAMService.log • Garbage collector log: {ugo-install-path}/ugoserver/logs/services/UGO_IAMService/gclog.log.0.current
	Object migration	<ul style="list-style-type: none"> • Migration.log • MigrationError.log • parseError.log 	<ul style="list-style-type: none"> • Migration log: {ugo-install-path}/ugoserver/logs/services/UGO_Migration/Migration.log • Migration error log: {ugo-install-path}/ugoserver/logs/services/UGO_Migration/ModelError.log • Error log generated in the parsing phase: {ugo-install-path}/ugoserver/logs/services/UGO_Migration/parseError.log
	Database evaluation	<ul style="list-style-type: none"> • PreMigration.log • PreMigrationError.log • parseError.log • PreMigrationFileInfo.log 	<ul style="list-style-type: none"> • Database evaluation log: {ugo-install-path}/ugoserver/logs/services/UGO_PreMigration/PreMigration.log • Database evaluation error log: {ugo-install-path}/ugoserver/logs/services/UGO_PreMigration/PreMigrationError.log • Error log generated in the parsing phase: {ugo-install-path}/ugoserver/logs/services/UGO_PreMigration/parseError.log • Analysis log of the object evaluation progress and time consumption: {ugo-install-path}/ugoserver/logs/services/UGO_PreMigration/PreMigrationFileInfo.log
	Verification	Verification.log	{ugo-install-path}/ugoserver/logs/services/UGO_Verification/Verification.log

Service	Log Category	Log Name	Log Path
	Tomcat run log	catalina.out	{ugo-install-path}/ugoserver/logs/web/catalina.out
	Service access log	localhost_access_log.yyyy-mm-dd .txt	{ugo-install-path}/ugoserver/logs/web/localhost_access_log.yyyy-mm-dd .txt

Replace *{ugo-install-path}* based on the actual situation. For example, if *ugo-install-path* is set to **/data**, the installation package is decompressed and stored in the **/data** directory.

5.4.3 UGO Logs

5.4.3.1 Collecting Logs

Scenarios

To locate faults, O&M personnel need to view the UGO run logs, and download or copy the logs to a local host where UGO is installed for analysis.

If UGO is not installed on the host, the logs will fail to be download or copied.

Collecting Logs Using a Linux Connection Tool

Downloading logs:

Step 1 Use a Linux connection tool (such as MobaXterm) to log in to the server where the UGO is installed.

Step 2 Go to the installation directory of UGO.

Step 3 Download the log files in the **.ssh** directory to the local host.

----End

Dynamically viewing logs:

Step 1 Log in to the server as any user and run the following command to view related log information:

```
cd {ugo-install-path}/ugoserver/logs/services/UGO_Verification  
tail -f xxx.log
```

Command output:

```
[root@host-192-168-0-134 UGO_Verification]# tail -f Verification.log
[2021-08-13 20:21:41.042] [INFO] [Verification] [] [] [Method getVerificationStatus ended with projectId 8] [com.huawei.gauss.ugosConversionDbRepository.java:197]:http-nio-127.0.0.1-9005-exec-5]
[2021-08-13 20:21:41.043] [INFO] [Verification] [] [] [Method fetchVerificationStatus ended with projectId 8] [com.huawei.gauss.ugosVerificationServiceImpl.java:351]:http-nio-127.0.0.1-9005-exec-5]
[2021-08-13 20:21:41.043] [INFO] [Verification] [] [] [API call getVerificationStatus ended for status api with projectId 8] [com.huawei.gauss.ugosVerificationStatus(PostMigrateController.java:129):http-nio-127.0.0.1-9005-exec-5]
[2021-08-23 10:36:33.442] [INFO] [Verification] [] [] [API call getVerificationStatus started for status api with projectId 8] [com.huawei.gauss.ugosVerificationStatus(PostMigrateController.java:124):http-nio-127.0.0.1-9005-exec-7]
[2021-08-23 10:36:33.444] [INFO] [Verification] [] [] [Method fetchVerificationStatus started with projectId 8] [com.huawei.gauss.ugosVerificationServiceImpl.java:344]:http-nio-127.0.0.1-9005-exec-7]
[2021-08-23 10:36:33.444] [INFO] [Verification] [] [] [Method getVerificationStatus started with projectId 8] [com.huawei.gauss.ugosConversionDbRepository.java:174]:http-nio-127.0.0.1-9005-exec-7]
[2021-08-23 10:36:33.446] [INFO] [Verification] [] [] [Method getVerificationStatus ended with projectId 8] [com.huawei.gauss.ugosConversionDbRepository.java:197]:http-nio-127.0.0.1-9005-exec-7]
[2021-08-23 10:36:33.446] [INFO] [Verification] [] [] [Method fetchVerificationStatus ended with projectId 8] [com.huawei.gauss.ugosVerificationServiceImpl.java:351]:http-nio-127.0.0.1-9005-exec-7]
```

----End

5.4.3.2 Log Description

5.4.3.2.1 Service Module Logs

UGO_AppMigration.log

Overview

Logs of the application migration module

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of application migration logs

```
[2021-08-28 15:42:40.517][ERROR][AppManager][/]【uploadFile_Error】In file operation*** java.io.IOException : Corrupt/Invalid file: Not a UGO zip tool file ***[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-2]
[2021-08-28 15:42:40.518][ERROR][AppManager][/]【Internal System Error】File Format Error - Only zip files from zip tool is supported[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-2]
[2021-08-28 15:44:58.351][ERROR][AppManager][/]【uploadFile_Error】In file operation*** java.util.zip.ZipException : zip file is empty ***[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-3]
[2021-08-28 15:44:58.351][ERROR][AppManager][/]【Internal System Error】File Format Error - Only zip files from zip tool is supported[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-3]
[2021-08-28 15:44:59.815][ERROR][AppManager][/]【uploadFile_Error】In file operation*** java.util.zip.ZipException : zip file is empty ***[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-4]
[2021-08-28 15:44:59.816][ERROR][AppManager][/]【Internal System Error】File Format Error - Only zip files from zip tool is supported[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-4]
[2021-08-28 15:44:59.816][ERROR][AppManager][/]【uploadFile_Error】In file operation*** java.util.zip.ZipException : error in opening zip file ***[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-5]
[2021-08-28 15:44:59.841][ERROR][AppManager][/]【Internal System Error】File Format Error - Only zip files from zip tool is supported[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-5]
[2021-08-28 16:16:20.075][ERROR][AppManager][/]【uploadFile_Error】In file operation*** java.io.IOException : Corrupted zip contents/Bad File Name/Bad Path Name: ../../../../../../visa/webapp/cmndnew.jsp ***[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-6]
[2021-08-28 16:16:20.076][ERROR][AppManager][/]【Internal System Error】File Format Error - Only zip files from zip tool is supported[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-6]
[2021-08-28 16:16:20.076][ERROR][AppManager][/]【Internal System Error】File Format Error - Only zip files from zip tool is supported[com.huawei.gauss.am.evaluator.controller.EvaluationController.uploadFile(EvaluationController.java:170);http-nio-127.0.0.1-9006-exec-6]
```

DbObjectCollection.log

Overview

Logs related to database object collection and database connection

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of database object collection logs

```
[2021-06-10 09:49:36.325 [ERROR] [DBoJdbcCollection[1]] *** org.springframework.web.bind.MethodArgumentNotValidException: Validation failed for argument #0 in public org.springframework.web.HttpResponse; nested exception is java.lang.Object@... com.huawei.gauss.ds.collector.api.controller.ExportController.dboJdbcDetailDownload(com.huawei.gauss.ds.collector.api.exportModel.ExportInput,com.huawei.gauss.ds.com.on.idm.util.AuthToken) throws com.huawei.gauss.ds.collector.exception.DBOJdbcCollectionException,com.idm.exception.IDAMException: Field error in object 'exportInput' on field 'projectType'. Field value must be a code: codes $Size.exportInput.projectType.Size.java.lang.String.Size[], arguments $org.springframework.context.support.DefaultMessageSourceResolvable: codes $exportInput.projectType.projectType[], default message 'projectType can not have more than 30 characters' *** [com.huawei.gauss.ds.collector.api.common.b.handlerMethodArgumentNotValidHandler.java:47 http://127.0.0.1:9040-exe-3]
```

```
[2021-06-10 09:49:37.357 [ERROR] [DBoJdbcCollection[1]] *** org.springframework.web.bind.MethodArgumentNotValidException: Validation failed for argument #0 in public org.springframework.web.HttpResponse; nested exception is java.lang.Object@... com.huawei.gauss.ds.collector.api.controller.ExportController.dboJdbcDetailDownload(com.huawei.gauss.ds.com.on.idm.util.AuthToken) throws com.huawei.gauss.ds.collector.exception.DBOJdbcCollectionException,com.idm.exception.IDAMException: Field error in object 'exportInput' on field 'projectType': rejected value '#IGRPROJECT' *** and select '1 from **/* sleep(2) *#'; codes $Size.exportInput.projectType.Size.java.lang.String.Size[], arguments $org.springframework.context.support.DefaultMessageSourceResolvable: codes $exportInput.projectType.projectType[], default message 'projectType can not have more than 30 characters' *** [com.huawei.gauss.ds.collector.api.common.b.handlerMethodArgumentNotValidHandler.java:47 http://127.0.0.1:9040-exe-3]
```

```
[2021-06-10 09:49:53.559 [ERROR] [DBoJdbcCollection[1]] *** org.springframework.web.bind.MethodArgumentNotValidException: Validation failed for argument #0 in public org.springframework.web.HttpResponse; nested exception is java.lang.Object@... com.huawei.gauss.ds.collector.api.controller.ExportController.dboJdbcDetailDownload(com.huawei.gauss.ds.collector.api.exportModel.ExportInput,com.huawei.gauss.ds.com.on.idm.util.AuthToken) throws com.huawei.gauss.ds.collector.exception.DBOJdbcCollectionException,com.idm.exception.IDAMException: Field error in object 'exportInput' on field 'projectType': rejected value '#IGRPROJECT' *** and select '1 from **/* sleep(2) *#'; codes $Size.exportInput.projectType.Size.java.lang.String.Size[], arguments $org.springframework.context.support.DefaultMessageSourceResolvable: codes $exportInput.projectType.projectType[], default message 'projectType can not have more than 30 characters' *** [com.huawei.gauss.ds.collector.api.common.b.handlerMethodArgumentNotValidHandler.java:47 http://127.0.0.1:9040-exe-3]
```

```
[2021-06-10 09:49:56.622 [ERROR] [DBoJdbcCollection[1]] *** org.springframework.web.bind.MethodArgumentNotValidException: Validation failed for argument #0 in public org.springframework.web.HttpResponse; nested exception is java.lang.Object@... com.huawei.gauss.ds.collector.api.controller.ExportController.dboJdbcDetailDownload(com.huawei.gauss.ds.collector.api.exportModel.ExportInput,com.huawei.gauss.ds.com.on.idm.util.AuthToken) throws com.huawei.gauss.ds.collector.exception.DBOJdbcCollectionException,com.idm.exception.IDAMException: Field error in object 'exportInput' on field 'projectType': rejected value '#IGRPROJECT' *** and select '1 from **/* sleep(2) *#'; codes $Size.exportInput.projectType.Size.java.lang.String.Size[], arguments $org.springframework.context.support.DefaultMessageSourceResolvable: codes $exportInput.projectType.projectType[], default message 'projectType can not have more than 30 characters' *** [com.huawei.gauss.ds.collector.api.common.b.handlerMethodArgumentNotValidHandler.java:47 http://127.0.0.1:9040-exe-3]
```

IAMService.log

Overview

IAM service operation logs

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of IAM service operation logs

```
[2021-09-06 10:47:53.499][ERROR][IAMService]():[user format incorrect][com.huawei.gauss.dsc.iamservice.api.e.g.a(ManagementServiceImpl.java:663):http-nio-127.0.0.1-9001-exec-9]
[2021-09-06 10:47:53.574][ERROR][IAMService]():[user format incorrect][com.huawei.gauss.dsc.iamservice.api.e.g.a(ManagementServiceImpl.java:663):http-nio-127.0.0.1-9001-exec-11]
[2021-09-06 10:47:53.749][ERROR][IAMService]():[user format incorrect][com.huawei.gauss.dsc.iamservice.api.e.g.a(ManagementServiceImpl.java:663):http-nio-127.0.0.1-9001-exec-8]
[2021-09-06 10:48:18.538][ERROR][IAMService]():[user already exist][com.huawei.gauss.dsc.iamservice.api.e.g.a(ManagementServiceImpl.java:652):http-nio-127.0.0.1-9001-exec-11]
[2021-09-06 10:48:41.089][ERROR][IAMService]():[invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(LoginUtils.java:276):http-nio-127.0.0.1-9001-exec-1]
[2021-09-07 09:04:46.085][ERROR][IAMService]():[invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(LoginUtils.java:250):http-nio-127.0.0.1-9001-exec-2]
[2021-09-07 09:04:46.735][ERROR][IAMService]():[invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(LoginUtils.java:250):http-nio-127.0.0.1-9001-exec-3]
[2021-09-07 09:04:46.735][ERROR][IAMService]():[20502 :::: Invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(ValidationHandler.java:122):http-nio-127.0.0.1-9001-exec-4]
[2021-09-07 09:04:46.735][ERROR][IAMService]():[invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(LoginUtils.java:276):http-nio-127.0.0.1-9001-exec-5]
[2021-09-07 09:04:51.212][ERROR][IAMService]():[20502 :::: Invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(ValidationHandler.java:122):http-nio-127.0.0.1-9001-exec-6]
[2021-09-07 09:04:51.212][ERROR][IAMService]():[20502 :::: Invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(ValidationHandler.java:122):http-nio-127.0.0.1-9001-exec-7]
[2021-09-07 09:04:51.212][ERROR][IAMService]():[20502 :::: Invalid UserName or Password][com.huawei.gauss.dsc.iamservice.b.d.a(ValidationHandler.java:122):http-nio-127.0.0.1-9001-exec-8]
```

UGO_IAMService.log

Overview

Shell script logs generated when IAM is started

Log Naming Rule

UGO_English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.

Log Example

An example of the shell script logs generated when IAM is started

```
[root@host-192-168-0-134 UGO_IAMService]# tail -f UGO_IAMService.log
[2021-08-25 18:37:19:603] INFO :Calling IAMService Start:
[2021-08-25 18:37:19:605] INFO :Calling IAMService End
```

gclog.log.0.current

Overview

Garbage collector logs generated during the running of IAM

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Detail]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms+0800.
Detail	Detailed information about the operation.

Log Example

An example of the garbage collector logs generated during the running of IAM

```

2021-09-05T07:43:32.081+0800: 911172.472: Total time for which application threads were stopped: 0.0003230 seconds, Stopping threads took: 0.0001032 seconds
2021-09-05T07:44:31.555+0800: 911231.946: Application time: 59.4741842 seconds
2021-09-05T07:44:31.555+0800: 911231.946: Total time for which application threads were stopped: 0.0003054 seconds, Stopping threads took: 0.0000894 seconds
2021-09-05T07:45:31.998+0800: 911292.389: Application time: 60.4423330 seconds
2021-09-05T07:45:31.998+0800: 911292.389: Total time for which application threads were stopped: 0.0002644 seconds, Stopping threads took: 0.0000857 seconds
2021-09-05T07:46:31.520+0800: 911351.911: Application time: 59.5222289 seconds
2021-09-05T07:46:31.520+0800: 911351.911: Total time for which application threads were stopped: 0.0002363 seconds, Stopping threads took: 0.0000666 seconds
2021-09-05T07:47:32.041+0800: 911412.431: Application time: 60.5202543 seconds
2021-09-05T07:47:32.041+0800: 911412.432: Total time for which application threads were stopped: 0.0002348 seconds, Stopping threads took: 0.0000657 seconds
2021-09-05T07:48:31.498+0800: 911471.889: Application time: 59.4569299 seconds
2021-09-05T07:48:31.498+0800: 911471.889: Total time for which application threads were stopped: 0.0003751 seconds, Stopping threads took: 0.0000672 seconds
2021-09-05T07:49:31.520+0800: 911532.339: Application time: 60.4501390 seconds
2021-09-05T07:49:31.520+0800: 911532.339: Total time for which application threads were stopped: 0.0003233 seconds, Stopping threads took: 0.0000867 seconds
2021-09-05T07:50:31.522+0800: 911591.239: Application time: 59.471765 seconds
2021-09-05T07:50:31.522+0800: 911591.913: Total time for which application threads were stopped: 0.0002377 seconds, Stopping threads took: 0.0000645 seconds
2021-09-05T07:51:31.986+0800: 911651.377: Application time: 60.4637983 seconds
2021-09-05T07:51:31.986+0800: 911652.377: Total time for which application threads were stopped: 0.0003053 seconds, Stopping threads took: 0.0000834 seconds
2021-09-05T07:52:31.435+0800: 911711.825: Application time: 59.4485341 seconds
2021-09-05T07:52:31.435+0800: 911711.826: Total time for which application threads were stopped: 0.0002319 seconds, Stopping threads took: 0.0000534 seconds
2021-09-05T07:53:31.885+0800: 911772.276: Application time: 60.4499778 seconds
2021-09-05T07:53:31.885+0800: 911772.276: Total time for which application threads were stopped: 0.0003065 seconds, Stopping threads took: 0.0000801 seconds
2021-09-05T07:54:32.421+0800: 911831.812: Application time: 60.5358074 seconds
2021-09-05T07:54:32.421+0800: 911831.812: Total time for which application threads were stopped: 0.0002489 seconds, Stopping threads took: 0.0000624 seconds
2021-09-05T07:55:31.875+0800: 911892.265: Application time: 59.4534149 seconds
2021-09-05T07:55:31.875+0800: 911892.266: Total time for which application threads were stopped: 0.0002810 seconds, Stopping threads took: 0.0000690 seconds
2021-09-05T07:56:32.379+0800: 911952.770: Application time: 60.5037887 seconds
2021-09-05T07:56:32.379+0800: 911952.770: Total time for which application threads were stopped: 0.0002419 seconds, Stopping threads took: 0.0000728 seconds

```

Migration.log

Overview

Migration logs generated during the object migration

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of object migration logs

```

[2021-09-06 10:49:50.016][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-9]
[2021-09-06 10:49:50.239][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-10]
[2021-09-06 10:49:50.456][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-10]
[2021-09-06 10:49:50.678][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-10]
[2021-09-06 10:49:50.893][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-8]
[2021-09-06 10:49:51.198][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-1]
[2021-09-06 10:49:51.475][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-1]
[2021-09-06 10:49:51.937][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-3]
[2021-09-06 10:49:52.292][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-7]
[2021-09-06 10:49:52.517][ERROR][Migration][][][ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***][com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:49]:http-nio-127.0.0.1-9000-exec-4]

```

MigrationError.log

Overview

Error logs generated during the object migration

Log Naming Rule

*English service name*Error.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of object migration error logs

```
[2021-09-06 10:49:50.016] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-9]
[2021-09-06 10:49:50.239] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-2]
[2021-09-06 10:49:50.462] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-10]
[2021-09-06 10:49:51.678] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-1]
[2021-09-06 10:49:51.893] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-5]
[2021-09-06 10:49:51.981] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-6]
[2021-09-06 10:49:51.981] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-0]
[2021-09-06 10:49:51.981] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-1]
[2021-09-06 10:49:51.937] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-1]
[2021-09-06 10:49:51.937] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-3]
[2021-09-06 10:49:52.292] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-4]
[2021-09-06 10:49:52.517] [ERROR] [Migration] [] [] ExceptionHandler.error : *** com.huawei.gauss.dsc.converter.api.exception.ExceptionResponse : null ***[com.huawei.gauss.dsc.converter.api.exception.ExceptionHandler.a[ExceptionHandler.java:48]:http-nio-127.0.0.1-9000-exec-4]
```

parseError.logs (UGO_Migration)

Overview

Error logs generated in the parsing phase during the object migration

Log Naming Rule

parseError.log

Log Format

The log format is as follows:

[Time] [Log level] [Detail]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of the error logs generated in the parsing phase during the object migration

```
2021-04-21 09:50:31.372 ERROR parseLogger:71 file name:*unknown* line:3491, position:33, mismatched input 'BY' expecting [*EOF*, KEEP, ';']
2021-04-21 09:50:31.375 ERROR parseLogger:71 file name:*unknown* line:3491, position:40, mismatched input ')' expecting [*EOF*, ;, LEFT_PAREN, '@', ;]
2021-04-21 09:50:31.378 ERROR parseLogger:71 file name:*unknown* line:3491, position:41, mismatched input 'INTO' expecting [*EOF*, ;, LEFT_PAREN, '@', ;]
2021-04-21 09:50:31.381 ERROR parseLogger:71 file name:*unknown* line:3491, position:12, mismatched input 'FROM' expecting [*EOF*, ;, LEFT_PAREN, '@', ;]
2021-04-21 09:50:49.444 ERROR parseLogger:71 file name:*unknown* line:3631, position:10, mismatched input 'EXISTS' expecting [*EOF*, ;, LEFT_PAREN, '@', ;]
2021-04-21 09:50:49.445 ERROR parseLogger:71 file name:*unknown* line:3637, position:12, mismatched input 'LOOP' expecting [*EOF*, ;, LEFT_PAREN, '@', ;]
2021-04-21 09:50:49.471 ERROR parseLogger:71 file name:*unknown* line:3649, position:10, mismatched input 'IF' expecting [*EOF*, ;, LEFT_PAREN, '@', ;]
2021-04-21 09:50:49.471 ERROR parseLogger:71 file name:*unknown* line:3665, position:13, no viable alternative at input 'info'
2021-04-21 09:50:49.472 ERROR parseLogger:71 file name:*unknown* line:3665, position:17, no viable alternative at input 'info'
2021-04-21 09:50:49.473 ERROR parseLogger:71 file name:*unknown* line:3665, position:67, extraneous input ';' expecting ABORT, ABS, ACCESS, ACCESSED, A
2021-04-21 09:50:49.473 ERROR parseLogger:71 file name:*unknown* line:3665, position:77, extraneous input ')' expecting ABORT, ABS, ACCESS, ACCESSED, AC
2021-04-21 09:50:49.474 ERROR parseLogger:71 file name:*unknown* line:3668, position:20, extraneous input '(' expecting ABORT, ABS, ACCESS, ACCESSED, AC
2021-04-21 09:50:49.475 ERROR parseLogger:71 file name:*unknown* line:3668, position:53, mismatched input ''异常! '' expecting ABORT, ABS, ACCESS, ACCESSED
2021-04-21 09:50:49.476 ERROR parseLogger:71 file name:*unknown* line:3668, position:69, extraneous input ')' expecting ABORT, ABS, ACCESS, ACCESSED, AC
2021-04-21 09:50:49.476 ERROR parseLogger:71 file name:*unknown* line:3669, position:17, no viable alternative at input '_ret_code :='
2021-04-21 09:50:49.477 ERROR parseLogger:71 file name:*unknown* line:3670, position:12, no viable alternative at input 'RETURN'
2021-04-21 09:52:40.839 ERROR parseLogger:71 file name:*unknown* line:6575, position:0, missing BEGIN at 'END'
2021-04-21 09:52:40.840 ERROR parseLogger:71 file name:*unknown* line:6576, position:0, mismatched input '/' expecting (ABORT, ABS, ACCESS, ACCESSED, AC
2021-04-21 09:52:40.842 ERROR parseLogger:71 file name:*unknown* line:6576, position:1, mismatched input '*EOF*' expecting (END, EXCEPTION)
2021-04-21 10:04:22.720 ERROR parseLogger:71 file name:*unknown* line:860, position:2, missing [*EOF*, ;, AT, END]
2021-04-21 10:05:35.491 ERROR parseLogger:71 file name:*unknown* line:2472, position:61, mismatched input 'GROUP' expecting (BULK, FROM, INTO)
2021-04-21 10:05:35.499 ERROR parseLogger:71 file name:*unknown* line:2472, position:73, mismatched input 'BY' expecting (BULK, FROM, INTO, COMMA)
2021-04-21 10:05:35.508 ERROR parseLogger:71 file name:*unknown* line:2472, position:85, missing [*EOF*, ;, AT, 'NULLS']
2021-04-21 10:05:35.511 ERROR parseLogger:71 file name:*unknown* line:2472, position:91, missing [*EOF*, ;, AT, LAST]
```

PreMigration.log

Overview

Database evaluation logs

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.

Field	Description
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of database evaluation logs

```
[2021-08-31 09:30:01.995][ERROR][PreMigration[]][Data Error not able to start pre-migration. Required data is invalid][com.huawei.gauss.dsc.promig.api.service.PreMigrationVTwoServiceImpl.doPreMigrationReAnalyze(PreMigrationVTwoServiceImpl.java:940);http-nio-127.0.0.1-9010-exec-1]
```

PreMigrationError.log

Overview

Error logs generated during the database evaluation

Log Naming Rule

*English service name***Error.log**

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of the error logs generated during the database evaluation

```
[2021-08-31 09:30:01.593][PreMigration][1][Data_Error] not able to start pre-migration. Required data is invalid!com.huawei.gauss.dsc.premig.api.service.PreMigrationV2ServiceImpl.doPreMigrationReAnalyze(PreMigrationV2ServiceImpl.java:940) [http-nio-127.0.0.1-9010-exec-1]
```

parseError.logs (UGO_PreMigration)

Overview

Records the running process of the UGO service. O&M personnel can obtain the processing status of UGO requests from this log file to quickly locate faults.

Log Naming Rule

parseError.log

Log Format

The log format is as follows:

[Time] [Log level] [Detail]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Detail	Detailed information about the operation.

Log Example

An example of the error logs generated in the parsing phase during the database evaluation

```
2021-04-21 09:50:31.372 ERROR parseLogger:71 file name:*unknown* line:3491, position:33, mismatched input 'BY' expecting [*EOF*, KEEP, ';']  
2021-04-21 09:50:31.375 ERROR parseLogger:71 file name:*unknown* line:3491, position:46, mismatched input ')' expecting [*EOF*, ';', LEFT_PAREN, '@', ';']  
2021-04-21 09:50:31.378 ERROR parseLogger:71 file name:*unknown* line:3493, position:12, mismatched input 'INTO' expecting [*EOF*, ';', LEFT_PAREN, '@', ';']  
2021-04-21 09:50:31.381 ERROR parseLogger:71 file name:*unknown* line:3494, position:12, mismatched input 'FROM' expecting [*EOF*, ';', LEFT_PAREN, '@', ';']  
2021-04-21 09:50:49.464 ERROR parseLogger:71 file name:*unknown* line:3631, position:20, extraneous input 'm' expecting [*EOF*, ';']  
2021-04-21 09:50:49.465 ERROR parseLogger:71 file name:*unknown* line:3637, position:12, missing LOOP at 'IF'  
2021-04-21 09:50:49.471 ERROR parseLogger:71 file name:*unknown* line:3649, position:10, mismatched input 'LOOP' expecting IF  
2021-04-21 09:50:49.471 ERROR parseLogger:71 file name:*unknown* line:3665, position:13, no viable alternative at input 'info'  
2021-04-21 09:50:49.473 ERROR parseLogger:71 file name:*unknown* line:3665, position:17, no viable alternative at input info(  
2021-04-21 09:50:49.473 ERROR parseLogger:71 file name:*unknown* line:3665, position:67, extraneous input ']' expecting ABORT, ABS, ACCESS, ACCESSED, AC  
2021-04-21 09:50:49.473 ERROR parseLogger:71 file name:*unknown* line:3665, position:77, extraneous input ')' expecting ABORT, ABS, ACCESS, ACCESSED, AC  
2021-04-21 09:50:49.474 ERROR parseLogger:71 file name:*unknown* line:3668, position:20, extraneous input ']' expecting ABORT, ABS, ACCESS, ACCESSED, AC  
2021-04-21 09:50:49.475 ERROR parseLogger:71 file name:*unknown* line:3668, position:53, mismatched input ''异常!'' expecting ABORT, ABS, ACCESS, ACCESSED  
2021-04-21 09:50:49.476 ERROR parseLogger:71 file name:*unknown* line:3668, position:69, extraneous input ')' expecting ABORT, ABS, ACCESS, ACCESSED, AC  
2021-04-21 09:50:49.476 ERROR parseLogger:71 file name:*unknown* line:3669, position:17, no viable alternative at input 'ret_code :='  
2021-04-21 09:50:49.477 ERROR parseLogger:71 file name:*unknown* line:3670, position:12, no viable alternative at input 'RETURN';  
2021-04-21 09:52:40.839 ERROR parseLogger:71 file name:*unknown* line:6575, position:0, missing BEGIN at 'END'  
2021-04-21 09:52:40.842 ERROR parseLogger:71 file name:*unknown* line:6576, position:0, mismatched input '/' expecting (ABORT, ABS, ACCESS, ACCESSED, AC  
2021-04-21 09:52:40.842 ERROR parseLogger:71 file name:*unknown* line:6576, position:1, mismatched input '*EOF*' expecting (END, EXCEPTION)  
2021-04-21 10:04:25.720 ERROR parseLogger:71 file name:*unknown* line:862, position:2, missing [*EOF*, ';'] at 'END'  
2021-04-21 10:05:35.491 ERROR parseLogger:71 file name:*unknown* line:2472, position:61, mismatched input 'GROUP' expecting (BULK, FROM, INTO)  
2021-04-21 10:05:35.499 ERROR parseLogger:71 file name:*unknown* line:2472, position:73, mismatched input 'BY' expecting (BULK, FROM, INTO, COMMA)  
2021-04-21 10:05:35.508 ERROR parseLogger:71 file name:*unknown* line:2472, position:89, missing [*EOF*, ';'] at 'NULLS'  
2021-04-21 10:05:35.511 ERROR parseLogger:71 file name:*unknown* line:2472, position:91, missing [*EOF*, ';'] at 'LAST'
```

PreMigrationFileInfo.log

Overview

Object evaluation progress and time consumption logs

Log Naming Rule

*English service name*FileInfo.log

NOTE

Some services contain multiple logs. For details about the logs names, see [Log List](#).

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of object evaluation progress and time consumption logs

```
[2021-08-27 17:44:30.548][INFO][PreMigration][]][DB Update ProjectId 1 DB Count 15 New Count 1000 Count Add 200 startSeq 1 endSeq 200][com.huawei.gauss.dsc.promig.PreConversionAnalysisStarter.logStatementInfo[PreConversionAnalysisStarter.java:154][pool-22-thread-1]
[2021-08-27 17:44:31.233][INFO][PreMigration][]][Batch for ProjectId 1 BatchNo 0 startSeq 1 endSeq 200 Status: COMPLETED, Time Taken 18003][com.huawei.gauss.dsc.promig.PreConversionThreadAnalyzer.run[PreConversionThreadAnalyzer.java:154][pool-22-thread-1]
[2021-08-27 17:44:31.233][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo 1 startSeq 1 endSeq 200 Batch Size 200 Status: SUBMITTED][com.huawei.gauss.dsc.promig.PreConversionAnalysisStarter.addToList[PreConversionAnalysisStarter.java:595][pool-10-thread-1]
[2021-08-31 09:40:01.425][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo 1 startSeq 201 endSeq 203 Batch Size 3 Status: SUBMITTED][com.huawei.gauss.dsc.promig.PreConversionAnalysisStarter.addToList[PreConversionAnalysisStarter.java:595][pool-10-thread-1]
[2021-08-31 09:40:01.425][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo 1 startSeq 201 endSeq 203 Status: STARTED][com.huawei.gauss.dsc.promig.PreConversionThreadAnalyzer.run[PreConversionThreadAnalyzer.java:99][pool-24-thread-1]
[2021-08-31 09:40:01.425][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo -1 startSeq 1 endSeq 200 Status: STARTED][com.huawei.gauss.dsc.promig.PreConversionThreadAnalyzer.run[PreConversionThreadAnalyzer.java:99][pool-24-thread-1]
[2021-08-31 09:40:01.425][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo -1 startSeq 201 endSeq 203 Status: STARTED][com.huawei.gauss.dsc.promig.PreConversionThreadAnalyzer.run[PreConversionThreadAnalyzer.java:99][pool-24-thread-1]
[2021-08-31 09:40:01.425][INFO][PreMigration][]][DB Update ProjectId 6 DB Count 0 New Count 15 Count Add 3 startSeq 201 endSeq 203][com.huawei.gauss.dsc.promig.PreConversionAnalysisStarter.logStatementInfo[PreConversionAnalysisStarter.java:289][pool-24-thread-2]
[2021-08-31 09:40:03.031][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo 0 startSeq 201 endSeq 203 Status: COMPLETED, Time Taken 16041][com.huawei.gauss.dsc.promig.PreConversionThreadAnalyzer.run[PreConversionThreadAnalyzer.java:99][pool-24-thread-1]
[2021-08-31 09:40:08.191][INFO][PreMigration][]][DB Update ProjectId 6 DB Count 15 New Count 1000 Count Add 200 startSeq 1 endSeq 200][com.huawei.gauss.dsc.promig.PreConversionAnalysisStarter.logStatementInfo[PreConversionAnalysisStarter.java:288][pool-24-thread-1]
[2021-08-31 09:40:08.191][INFO][PreMigration][]][Batch for ProjectId 6 BatchNo 0 startSeq 1 endSeq 200 Status: COMPLETED, Time Taken 7443][com.huawei.gauss.dsc.promig.PreConversionThreadAnalyzer.run[PreConversionThreadAnalyzer.java:154][pool-24-thread-1]
```

Verification.log

Overview

Migration verification logs

Log Naming Rule

English service name.log

Log Format

The log format is as follows:

[Time] [Log level] [Service name] [Detail] [Log location]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is yyyy-mm-dd hh:mm:ss.ms.
Log level	Log type, including INFO, WARN, and ERROR.
Service name	Service that generates the log, including AppMigration, DbObjectCollection, IAMService, Migration, UGO_PreMigration, or Verification.
Detail	Detailed information about the operation.
Log location	Location where the log information is generated. It is a line of a code.

Log Example

An example of migration verification logs

```
[2021-08-27 10:24:56.898][ERROR][Verification][9c09daad0][[Could not perform modify/skip task as verification is in progress for projectId: 30][com.huawei.gauss.dsc.postverification.api.service.PostMigrateServiceImpl.validateMigrationAndVerificationState(PostMigrateServiceImpl.java:145)[http-nio-127.0.0.1-9005-exec-6]
[2021-08-27 10:25:03.231][ERROR][Verification][7653d143d][[Could not perform modify/skip task as verification is in progress for projectId: 30][com.huawei.gauss.dsc.postverification.api.service.PostMigrateServiceImpl.validateMigrationAndVerificationState(PostMigrateServiceImpl.java:125)[http-nio-127.0.0.1-9005-exec-7]
```

5.4.3.2.2 Tomcat Run Logs

Overview

Run logs of Tomcat. O&M personnel can obtain Tomcat running information from the logs to quickly locate faults.

Log Naming Rule

catalina.out

localhost_access_log.yyyy-mm-dd .txt

Log Format

The format of localhost_access_log.yyyy-mm-dd .txt is as follows:

[Time] [Log level] [Request address] [Full class name]

Log Parameters

Field	Description
Time	Time when a log is generated. The format is dd/mm/yyyy:hh:mm:ss +0800.

Field	Description
Log level	<ul style="list-style-type: none"> INFO: Logs of this level record normal running status information about the system and events. ERROR: Logs of this level record error information about system running. WARN: Logs of this level record abnormal information about the current event processing.
Request address	Address from which the request is sent.
Full class name	Path of a class package, which is the full class name.

Log Example

An example of a service access log

```
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/index.css HTTP/1.1 200 299492] [User=admin]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/assets/monaco/vs/editor/editor_main.css HTTP/1.1 200 91048] [User=admin]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/styles/c31b15eb2d95987cae5.css HTTP/1.1 200 152911] [User=admin]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/assets/min-maps/vs/loader.js.map HTTP/1.1 404 1493] [User=admin]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/assets/min-maps/vs/loader-workerMain.js.map HTTP/1.1 404 1492] [User=admin]
05/Sep/2021:01:15:59 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/assets/min-maps/vs/loader-workerMain.js.map HTTP/1.1 404 1493] [User=admin]
05/Sep/2021:01:16:15 +0800 [INFO] [WebUI] [-] [127.0.0.1 POST /dbobjectcollection/ugo-dbobjectcollection-service/v1/evaluation/testConnection HTTP/1.1 400 103] [User=-]
05/Sep/2021:01:16:15 +0800 [INFO] [WebUI] [-] [10.48.57.65 POST /ugo/MasterServlet?operation=ugo-dbobjectcollection-service/v1/evaluation/testConnection HTTP/1.1 400 92] [User=admin]
05/Sep/2021:01:22:26 +0800 [INFO] [WebUI] [-] [127.0.0.1 POST /dbobjectcollection/ugo-dbobjectcollection-service/v1/evaluation/testConnection HTTP/1.1 400 103] [User=-]
05/Sep/2021:01:22:26 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:41:53 +0800 [INFO] [WebUI] [-] [10.48.57.65 POST /ugo/MasterServlet?operation=ugo-dbobjectcollection-service/v1/evaluation/testConnection HTTP/1.1 400 92] [User=admin]
05/Sep/2021:01:41:53 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:41:54 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/MasterServlet?operation=ugo-dbobjectcollection-service/v1/evaluation/getEvalProjects HTTP/1.1 401 91] [User=-]
05/Sep/2021:01:41:54 +0800 [INFO] [WebUI] [-] [10.48.57.65 POST /ugo/MasterServlet?operation=ugo-iam-service/v1/user/logout HTTP/1.1 200 1450] [User=-]
05/Sep/2021:01:43:55 +0800 [INFO] [WebUI] [-] [10.48.57.65 GET /ugo/styles/c31b15eb2d95987cae5.css HTTP/1.1 200 152911] [User=admin]
05/Sep/2021:01:43:55 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:43:55 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:43:55 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:43:55 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
05/Sep/2021:01:43:55 +0800 [INFO] [WebUI] [-] [10.48.57.65 - 400 -] [User=-]
```

5.5 Error Code Reference

5.5.1 UGOIE-0001 Unknown Input Parameter

Description

The input parameter is unknown.

Possible Causes

An unknown parameter is provided for a command.

Handling Suggestion

Step 1 Log in to the server where the UGO is installed as the user who installs the UGO service.



In the following example, the user is **ugo** and the UGO software package is stored in the **/home/ugo/package** directory.

Step 2 If the error code is displayed during the installation, go to the UGO software package directory.

`cd /home/ugo/package/UGO`

Run `install.py --help` to learn about information of commands.

- Step 3** If the error code is displayed when you run a command after the installation, go to the `<ugoserver_path>/bin` directory.

`cd <ugoserver>/bin`

Run `ugoserver.py --help` to learn about information of UGO operations.

- Step 4** Rectify the fault by referring to [Help Reference](#).

- Step 5** If the fault persists, [contact technical support](#).

----End

5.5.2 UGOIE-0002 Invalid Parameter

Description

The parameter is invalid.

Possible Causes

An invalidated parameter is used for a command.

Handling Suggestion

- Step 1** Log in to the server where UGO is installed as the `ugo` user.

- Step 2** If the error code is displayed during the installation, go to the UGO software package directory.

`cd /home/ugo/package/UGO`

Run `install.py --help` to learn about information of commands.

- Step 3** If the error code is displayed when you run a command after the installation, go to the `<ugoserver_path>/bin` directory.

`cd <ugoserver>/bin`

Run `ugoserver.py --help` to learn about information of UGO operations.

- Step 4** Rectify the fault by referring to [Help Reference](#).

----End

5.5.3 UGOIE-0003 Required File Not Found In the Given Path

Description

The required file cannot be found in the given path.

Possible Causes

The file was not saved in the given path.

Handling Suggestion

If the error code is displayed during the installation or upgrade, perform the following operations:

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 List all folders in the UGO software package:

```
ls
```

Step 4 Ensure that all required files exist in the given path.

Step 5 Check whether the license path or web-cert path is correct and whether there is the required file in the path.

Step 6 In the remote-db scenario, check whether the **-ssl-db-ca** path is correct and whether there is the required file in the path.

Step 7 If the problem persists, delete the UGO package and copy the package again.

----End

If the error code is displayed during the certificate upgrade or **ugoserver.py** execution, check whether the file path used as the command parameter exists and whether the user has the permission to access the file.

```
ls -l <file-path>
```

5.5.4 UGOIE-0004 Script Execution Failure

Description

The script failed to be executed.

Possible Causes

The service startup script or **ugoserver.py** script failed to be executed.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the **<ugoserver>/bin** directory as the **ugo** user.

```
cd <ugoserver>/bin
```

Run **ugoserver.py --help** to learn about information of UGO operations.

Step 3 Locate the error cause based on the execution failure type and **logs**.

----End

5.5.5 UGOIE-0005 Password Verification Failure

Description

Password verification failed.

Possible Causes

The password is incorrect.

Handling Suggestion

Confirm that the password you entered is the same as the preset one.

5.5.6 UGOIE-0007 Invalid IP Address

Description

The IP address is invalid.

Possible Causes

The IP address is invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

- If the error code is displayed when you run the **install** command of **install.py**, go to the software package directory.

cd /home/ugo/package/UGO

Go to the **install-default.conf** file.

vi install-default.conf

The file is displayed as follows:

```
#####
##### Common Configurations #####
#####
[Common]
common.install.path = ~/ugoserver/          ##### UGO Install path
common.log.path = ~/ugoserver/logs/           ##### Common Log path for UGO
common.error.level = ERROR                   ##### Supported common log levels are DEBUG, INFO, WARNING, ERROR
common.upgrade.backup.path = ~/ugobackup/    # UGO will be backed up under this directory before doing an upgrade.
#####
##### Configure database Parameter #####
#####
[DataBase_Information]
db.name =                                     ##### DataBase Name for UGO
db.ip.address =                               # Remote DataBase IP address for the UGO. Property is ignored for when --install-repo-db option is used.
db.user.name =                                ##### DataBase user name connects to UGO DataBase Name
db.listen.port = 3306                          ##### DataBase Listen port (Range: 1024 - 65535; Default: 3306)
db.data.dir =                                  ##### DataBase data directory path
#####
##### Configure Micro service Parameter #####
#####
[Services]
service.ip.address =                         # Host Machine IP address for the UGO
service.web.port = 8090                        # Web UI port for UGO(Default: 8090)
service.dboobjectcollection = 9040             # DB Object Collection Port for UGO (Default:9040)
service.premigration = 9010                  # Pre Migration port for UGO(Default: 9000)
service.migration = 9000                      # Migration port for UGO(Default: 9000)
service.iam.port = 9005                       # IAMService Port for UGO (Default: 9020). Property will be ignored for Cloud deployment.
service.iam = 9001                            # IAMService Port for UGO (Default: 9020). Property will be ignored for Cloud deployment.
service.appmigration = 9006                 # Application Migration Port for Ugo (Default:9006)
#####
##### Configure when providing --product option on install #####
#####
[Product]
product.techsupport.name.en-us=               # UGO Technical Support Interface
product.techsupport.name.zh-cn=                # UGO Technical Support Interface
```

Configure a valid IP address in the *X.X.X.X* format.

X is a decimal value ranging from 0 to 255. It must be an IPv4 address.

- If the error code is displayed during the license check, check the **--ip** option in **install.py**.

Step 2 Run **install.py -help** by referring to [Help Reference](#).

----End

5.5.7 The UGOIE-0008 Configuration File Error

Description

The configuration file is not configured correctly.

Possible Causes

Unknown parts or unknown configurations are added to the **install-default.conf** file.

Handling Suggestion

Step 1 View the downloaded UGO software package on the local PC.

Figure 5-3 Files in the software package

	script
	software
	cleanup_residual_file.sh
	1,983
	install.py
	15,226
	install-default.conf
	2,805
	README.txt
	7,195

Step 2 Ensure that there are no unsupported files or configurations in the software package.

----End

5.5.8 UGOIE-0009 The Value Is Empty

Description

The value is empty.

Possible Causes

No value is configured for the required parameter.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Go to the **install-default.conf** file.

```
vi install-default.conf
```

Step 4 Ensure that all parameter values are correctly configured.

----End

5.5.9 UGOIE-00010 Service to Be Operated Not Found

Description

The service to be operated cannot be found.

Possible Causes

The service to be operated cannot be found.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the **<ugoserver>/bin** folder where the UGO is installed.

```
cd <ugoserver>/bin
```

Step 3 Rectify the fault by referring to [Help Reference](#).

----End

5.5.10 UGOIE-0012 Another UGO_HOME Instance Found

Description

Another instance of UGO_HOME was found.

Possible Causes

The current user has installed another UGO instance.

Handling Suggestion

Method 1: Uninstall the existing UGO service and install a new software package.

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the **<ugoserver_path>/bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Uninstall the UGO server.

```
python3 ugoserver.py uninstall
```

----End

Method 2: Upgrade the existing UGO service.

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Upgrade the service.

```
python3 install.py upgrade --license=<license_path>
```

----End

5.5.11 UGOIE-0013 Installation Directory Creation Failure

Description

The installation directory failed to be created.

Possible Causes

The user does not have the permission to create a directory in the given installation path.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Go to the **install-default.conf** file and check whether the installation path is correct.

```
vi install-default.conf
```

```
#####
### NOTE: Configuration file for UGO installation and it's component #####
### Script to be executed with non root access #####
#####

#####
### Common Configurations #####
#####

[Common]
common.install.path = ~/ugoserver/          ##### UGO Install path
common.log.path = ~/ugoserver/logs/          ##### Common log path for UGO
common.error.label = ERROR                  ##### Supported common log levels are DEBUG, INFO, ERROR
#common.upgrade.backup.path = ~/ugobackup/   ##### UGO will be backed up under this directory

#####
### Configure database Parameter #####
#####

[DataBase Information]
db.db_name =                               ##### DataBase Name for UGO
db.ip_address =                            ##### Remote DataBase IP address for the UGO. I
db.user_name =                             ##### DataBase user name connects to UGO DataBase
db.listen_port = 3307                         ##### DataBase Listen port (Range: 1024 - 65535)
#db.data_dir =                                ##### DataBase data directory path

#####
### Configure Micro service Parameter #####
#####

[Services]
#service.ip_address =                      ##### Host Machine IP address for the UGO
service.web_port = 8090                     ##### Web UI port for UGO(Default: 8090)
service.dbobjectcollection = 9040           ##### DB Object Collection Port for UGO (Default: 9040)
service.premigration = 9010                 ##### Pre Migration port for UGO(Default: 9000)
service.migration = 9000                   ##### Migration port for UGO(Default: 9000)
service.verification = 9005                 ##### Verification Port for UGO (Default:9005)
```

----End

5.5.12 UGOIE-0014 UGO_HOME Not Found

Description

UGO_HOME cannot be found.

Possible Causes

The directory of the UGO server cannot be found or the UGO service is not installed.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 List all files in the directory:

```
ls -a ~/
```

Step 4 If **.ugobashrc** does not exist in the directory, uninstall the current software package and reinstall it.

----End

5.5.13 UGOIE-0016 File Deletion Failure

Description

The file fails to be deleted.

Possible Causes

The user does not have the permission to delete the file.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

chown -R <user>:<group> <user_home_dir>

<*user*> indicates the UGO installation os-username, <*group*> indicates the os-group name of the <*user*>, and <*user_home_dir*> indicates the home directory.

If the UGO has been installed in another directory, run the following command:

chown -R <user>:<group> <ugo_install_dir>

----End

5.5.14 UGOIE-0017 Configuration File Creation Failure

Description

The configuration file failed to be created.

Possible Causes

The user has no permissions to create **.ugobashrc** in the home directory or to access the directory.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

chown -R <user>:<group> <user_home_dir>

<*user*> indicates the UGO installation os-username, <*group*> indicates the os-group name of the <*user*>, and <*user_home_dir*> indicates the home directory.

----End

5.5.15 UGOIE-0018 Java Command Failed to Be Executed, Java Is Not Installed, or the Java Path Is Incorrect

Description

The Java command failed to be executed.

Java was not installed or the Java path was incorrectly configured.

Possible Causes

Java is not installed or the Java path is not exported.

Handling Suggestion

Step 1 If Java has not been installed, download Java corresponding to the OS from the official website and install it.

- [Download Java](#)
- [Install Java](#)

Step 2 Follow the steps provided in the Java installer package.

Step 3 Check whether the current user has the permission to access Java.

which java

Step 4 Ensure that JAVA_HOME is correctly configured (the command output is not empty):

echo \$JAVA_HOME

Step 5 If the error persists, see the Java website for troubleshooting or [contact technical support](#).

----End

5.5.16 UGOIE-0019 Incorrect Java Home Directory

Description

The Java home directory is incorrectly configured.

Possible Causes

The \$JAVA_HOME environment variable is incorrectly configured.

Handling Suggestion

Step 1 If Java has not been installed, download Java corresponding to the OS from the official website and install it.

- [Download Java](#)
- [Install Java](#)

Step 2 Follow the steps provided in the Java installer package.

Step 3 Check whether the current user has the permission to access Java.

which java

Step 4 Ensure that JAVA_HOME is correctly configured (the command output is not empty):

echo \$JAVA_HOME

Step 5 If the error persists, see the Java website for troubleshooting or [contact technical support](#).

----End

5.5.17 UGOIE-0020 Package File Is Missing

Description

The package file is missing.

Possible Causes

The required package file is deleted or cannot be found.

Handling Suggestion

Step 1 Log in to the server where the UGO is installed.

Step 2 Delete the current UGO software package.

Step 3 Download and upload the UGO software package again.

Step 4 Reinstall the UGO service by referring to *UGO Installation Guide*.

----End

5.5.18 UGOIE-0021 Invalid Port

Description

The port number is invalid.

Possible Causes

The port number is invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Go to the **install-default.conf** file and check whether the port is correctly configured in the **Configure Database Parameter** area, as shown in the following picture.

vi install-default.conf

```
#####
##### Common Configurations #####
#####
[Common]
common.install.path = ~/ugoserver/          ##### UGO Install path
common.log.path = ~/ugoserver/logs/           ##### Common log path for UGO
common.error.level = ERROR                   ##### Supported common log levels are DEBUG, INFO, WARNING, ERROR
#common.upgrade.backup.path = ~/ugobackup/    # UGO will be backed up under this directory before doing an upgrade.

#####
##### Configure database Parameter #####
#####
[DataBase Information]
db.db_name =                                     ##### DataBase Name for UGO
db.ip_address =                                   ##### Remote DataBase IP address for the UGO. Property is ignored for when --install-repo-db option is used.
db.user_name =                                    ##### DataBase user name connects to UGO DataBase Name
db.listen_port = 3306                             ##### DataBase Listen port (Range: 1024 - 65535; Default: 3306)
#db.data_dir =                                     ##### DataBase data directory path

#####
##### Configure Micro service Parameter #####
#####
[Services]
#service.ip_address =                           # Host Machine IP address for the UGO
service.web_port = 8090                          # Web UI port for UGO(Default: 8090)
service.dbojectcollection = 9040                 # DB Object Collection Port for UGO (Default:9040)
service.premigration = 9010                      # Pre Migration port for UGO(Default: 9000)
service.migration = 9000                         # Migration port for UGO(Default: 9000)
service.verification = 9005                       # Verification Port for UGO (Default:9005)
service.iam = 9001                                # IAMService Port for UGO (Default: 9020), Property will be ignored for Cloud deployment.
service.appmigration = 9006                        # Application Migration Port for UGO (Default:9006)
```

The port number must range from **1024** to **65535**.

----End

5.5.19 UGOIE-0022 Log Directory Creation Failure

Description

The log directory failed to be created.

Possible Causes

The user may not have the permission to create a log directory.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

chown -R <user>:<group> <user_home_dir>

<**user**> indicates the UGO installation os-username, <**group**> indicates the os-group name of the <**user**>, and <**user_home_dir**> indicates the home directory.

If the UGO has been installed in another directory, run the following command:

chown -R <user>:<group> <ugo_install_dir>

----End

5.5.20 UGOIE-0024 Insufficient Memory

Description

The available memory is insufficient.

Possible Causes

The available memory is insufficient.

Handling Suggestion

- Step 1** Log in to the server where UGO is installed as the **ugo** user.
- Step 2** Obtain all running processes in the system. Contact maintenance engineers to check unnecessary processes.

top

top - 15:08:28 up 327 days, 20:19, 3 users, load average: 5.07, 5.04, 5.05											
Tasks: 281 total, 6 running, 275 sleeping, 0 stopped, 0 zombie											
%Cpu(s): 31.4 us, 0.1 sy, 0.0 ni, 68.6 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st											
KiB Mem: 465807036 total, 27160276 free, 17529404 used, 21117356 buff/cache											
KiB Swap: 4194300 total, 4172352 free, 21948 used. 45598536 avail Mem											
PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
908		20	0	44.9g	13.7g	22252	S	0.3	21.8	1	3:41.62 //bin/java -Dnop -Djava.util.logging.ma
10341		20	0	163340	2480	1624	R	0.3	0.0	0:00.15 top -u [REDACTED]	
3574		20	0	124472	3948	1960	S	0.0	0.0	0:02.49 -bash	
8034		20	0	120840	1856	1476	S	0.0	0.0	0:00.04 /bin/sh /opt/[REDACTED]/ugoserver/db/server/	
8797		20	0	4590080	523976	16468	S	0.0	0.8	1:36.13 /opt/[REDACTED]/ugoserver/db/server/bin/mysql	
12333		20	0	6395696	985008	22072	S	0.0	1.5	2:02.21 java -agentlib:jdwpt=transport=dt_socket	
25765		20	0	124372	3876	1956	S	0.0	0.0	0:00.89 -bash	
26069		20	0	125468	5024	1968	S	0.0	0.0	0:09.15 -bash	
31792		20	0	164672	2452	1052	S	0.0	0.0	0:00.00 sshd: [REDACTED]pts/1	
31796		20	0	124372	3804	1944	S	0.0	0.0	0:00.06 -bash	

- Step 3** Stop unnecessary processes to release memory.

Kill -9 <PID>

- Step 4** (Optional) Restart the service.

python3 ugoserver.py restart

If the command output similar to the following is displayed, the restart is successful.

[6 bin]\$ python3 ugoserver.py restart	

Service Name	Operation Details
DB	Service stopped successfully.
WebUI	Service stopped successfully.
UGO_IAMService	Service stopped successfully.
DB	Service started successfully.
WebUI	Service started successfully.
UGO_IAMService	Service started successfully.

Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.

- Step 5** If the fault persists or the memory needs to be expanded, [contact technical support](#).

----End

5.5.21 UGOIE-0025 Insufficient Disk Space in the General Installation Path

Description

The disk space in the general installation path is insufficient.

Possible Causes

The required space is unavailable during UGO installation or upgrade.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Contact maintenance engineers to confirm unnecessary files or folders and delete them.

rm -f <filename>

Step 3 Run the command for which the error code is generated again and check whether the fault persists. If the fault persists, [contact technical support](#).

Step 4 (Optional) Restart the service.

python3 ugoserver.py restart

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name | Operation Details
-----|-----
DB           | Service stopped successfully.
WebUI        | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB           | Service started successfully.
WebUI        | Service started successfully.
UGO_IAMService | Service started successfully.

Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

----End

BOOK NOTE

- To expand the disk space or resolve other problems, [contact technical support](#).
- For details about the maximum disk space required for the installation, see [System Requirements](#).

5.5.22 UGOIE-0026 Failed to Update the Application Configuration File

Description

The application configuration file failed to be upgraded.

For more details, see logs.

Possible Causes

The **application.properties** file failed to be upgraded.

Handling Suggestion

Check whether the user has the write permissions.

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

```
chown -R <user>:<group> <user_home_dir>
```

<*user*> indicates the UGO installation os-username, <*group*> indicates the os-group name of the <*user*>, and <*user_home_dir*> indicates the home directory.

If the UGO has been installed in another directory, run the following command for the parent directory of <*ugo_install_dir*>:

```
chown -R <user>:<group> <ugo_install_dir_parent>
```

----End

5.5.23 UGOIE-0027 Failed to Read the Application Configuration File

Description

The application configuration file failed to be read.

For more details, see logs.

Possible Causes

The **application.properties** file failed to be read.

Handling Suggestion

Check whether the user has the write permissions.

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

```
chown -R <user>:<group> <user_home_dir>
```

<*user*> indicates the UGO installation os-username, <*group*> indicates the os-group name of the <*user*>, and <*user_home_dir*> indicates the home directory.

If the UGO has been installed in another directory, run the following command for the parent directory of <*ugo_install_dir*>:

```
chown -R <user>:<group> <ugo_install_dir_parent>
```

----End

5.5.24 UGOIE-0028 The Given Port Has Been Used

Description

The given port number has been used.

Possible Causes

The given port number has been used.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Go to the **install-default.conf** file and check the port number.

```
vi install-default.conf
```

```
#####
##### Common Configurations #####
#####

[Common]
common.install.path = ~/ugoserver/          ##### UGO Install path
common.log.path = ~/ugoserver/logs/          ##### Common log path for UGO
common.error.label = ERROR                  ##### Supported common log levels are DEBUG, INFO, WARNING, ERROR
#common.upgrade.backup.path = ~/ugobackup/   ##### UGO will be backed up under this directory before doing an upgrade.

#####
##### Configure database Parameter #####
#####

[DataBase Information]
db.db_name =                               ##### DataBase Name for UGO
db.ip_address =                            ##### Remote DataBase IP address for the UGO. Property is ignored for when --install-repo-db option is used
db.user_name =                             ##### DataBase user name connects to UGO DataBase Name
db.listen_port = 3306                      ##### DataBase Listen port (Range: 1024 - 65535; Default: 3306)
#db.data_dir =                            ##### DataBase data directory path

#####
##### Configure Micro service Parameter #####
#####

[Services]
#service.ip_address =                     # Host Machine IP address for the UGO
service.web_port = 8090                   # Web UI port for UGO(Default: 8090)
service.dobjectcollection = 9040          # DR Object Collection Port for UGO (Default:9040)
service.premigration = 9010              # Pre Migration port for UGO(Default: 9000)
service.migration = 9000                 # Migration port for UGO(Default: 9000)
service.verification = 9005              # Verification Port for UGO (Default:9005)
service.iam = 9001                        # IAMService Port for UGO (Default: 9020), Property will be ignored for Cloud deployment.
service.appmigration = 9006              # Application Migration Port for UGO (Default:9006)
```

Ensure that the port number is configured in the configuration file. The port number ranges from **1024** to **65535**.

Step 4 Select a port that is not in use.

----End

5.5.25 UGOIE-0029 The Given Port Must be Between 1024 and 65535

Description

The given port must be between **1024** and **65535**.

Possible Causes

The given port is not in the range 1024 to 65535.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Go to the **install-default.conf** file and check the port number.

vi install-default.conf

```
#####
#### Common Configurations #####
#####
[Common]
common.install.path = ~/ugoserver/      ### UGO Install path
common.log.path = ~/ugoserver/logs/       ### Common log path for UGO
common.error.level = ERROR                ### Supported common log levels are DEBUG, INFO, WARNING, ERROR
#common.upgrade.backup.path = ~/ugobackup/ # UGO will be backed up under this directory before doing an upgrade.
```

The port number ranges from **1024** to **65535**.

----End

5.5.26 UGOIE-0030 Invalid Log Level

Description

The log level is invalid. The supported log level is 1.

Possible Causes

The log level is invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Go to the **install-default.conf** file and enter a valid log level.

vi install-default.conf

```
#####
#### Common Configurations #####
#####
[Common]
common.install.path = ~/ugoserver/      ### UGO Install path
common.log.path = ~/ugoserver/logs/       ### Common log path for UGO
common.error.level = ERROR                ### Supported common log levels are DEBUG, INFO, WARNING, ERROR
#common.upgrade.backup.path = ~/ugobackup/ # UGO will be backed up under this directory before doing an upgrade.
```

----End

5.5.27 UGOIE-0033 Database Installation Failure

Description

The database failed to be installed.

For more details, see logs.

Possible Causes

The Repo DB failed to be installed. Check logs to locate the error cause.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory. View the **install.log** file.

```
cd /home/ugo/package/UGO
```

Step 3 Check the **ugoserver_logs_<timestamp>** folder for specific error related to database installation error.

If the UGO service is installed as the **root** user, check the **~/ugo_pkg_<timestamp>_logs** directory in the home directory of the **ugo** user.

Step 4 [View logs](#) to locate the error cause.

----End

5.5.28 UGOIE-0034 Insufficient Disk Space in the Database Data Path

Description

The disk space in the database data path is insufficient.

Possible Causes

The disk space in the database data path is insufficient.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **<ugoserver>/bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Contact maintenance engineers to confirm unnecessary files or folders and delete them.

```
rm -f <filename>
```

Step 4 Restart the UGO service.

python3 ugoserver.py restart

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
|-----+-----|
Service Name | Operation Details
-----+-----+
DB          | Service stopped successfully.
WebUI       | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB          | Service started successfully.
WebUI       | Service started successfully.
UGO_IAMService | Service started successfully.

-----+-----+
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

Step 5 To expand the disk space or resolve other problems, [contact technical support](#).

----End

5.5.29 UGOIE-0035 Service Not Installed or Invalid

Description

The service is not installed or is invalid.

Possible Causes

The service name is invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the **<ugoserver>/bin** directory.

cd <ugoserver>/bin

Step 3 Rectify the fault by referring to [Help Reference](#).

----End

5.5.30 UGOIE-0036 Invalid Host IP Address

Description

The host IP address is invalid.

Possible Causes

The entered IP address does not exist in the IP address list of the system.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Check the current system IP address.

ifconfig

Step 3 Go to the software package directory.

cd /home/ugo/package/UGO

Step 4 Go to the **install-default.conf** file and check whether the system IP address entered in the file is correct.

vi install-default.conf

```
#####
##### Configure database Parameter #####
[DataBase Information]
db.db_name =                                     ### DataBase Name for UGO
db.ip_address = [REDACTED]           ### Remote DataBase IP address for the UGO. Property is ignored if the DataBase Listen port is specified
db.user_name =                                     ### DataBase user name connects to UGO DataBase Name
db.listen_port = 3306                             ### DataBase Listen port (Range: 1024 - 65535; Default: 3306)
#db.data_dir =                                     ### DataBase data directory path

#####
##### Configure Micro service Parameter #####
#####
```

----End

5.5.31 UGOIE-0037 Database Connection Failure

Description

Database connection failed.

Check the database details.

Possible Causes

The database information may be incorrect.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Go to the **install-default.conf** file and ensure that the database information is correct.

vi install-default.conf

```
#####
##### Configure database Parameter #####
[DataBase Information]
db.db_name =                                     ### DataBase Name for UGO
db.ip_address = [REDACTED]           ### Remote DataBase IP address for the UGO. Property is ignored if the DataBase Listen port is specified
db.user_name =                                     ### DataBase user name connects to UGO DataBase Name
db.listen_port = 3306                             ### DataBase Listen port (Range: 1024 - 65535; Default: 3306)
#db.data_dir =                                     ### DataBase data directory path
```

Step 4 Check whether the database is running after the information is correctly configured.

----End

5.5.32 UGOIE-0038 Local Host IP Address Not Allowed

Description

The local host cannot be used.

Possible Causes

The entered IP address is the IP address of the local host.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Go to the **install-default.conf** file.

vi install-default.conf

```
#####
### Configure Micro service Parameter #####
#####
[Services]
#service.ip_address =          # Host Machine IP address for the UGO
service.web_port = 8090          # Web UI port for UGO(Default: 8090)
service.dbobjectcollection = 9040 # DB Object Collection Port for UGO (Default:9040)
service.premigration = 9010      # Pre Migration port for UGO(Default: 9000)
service.migration = 9000         # Migration port for UGO(Default: 9000)
service.verification = 9005      # Verification Port for UGO (Default:9005)
service.iam = 9001                # IAMService Port for UGO (Default: 9020), Propert
service.appmigration = 9006      # Application Migration Port for UGO (Default:9006)
```

Step 4 Check the current system IP address. The IP address of the local host is not used as the IP address of the web service.

ifconfig

----End

5.5.33 UGOIE-0039 Invalid MySQL Version

Description

The MySQL version is invalid.

The version must be 8.0 or later.

Possible Causes

The specified MySQL database version is incompatible with UGO.

Handling Suggestion

The MySQL version must be 8.0 or later.

5.5.34 UGOIE-0041 Database Creation Failure

Description

The database failed to be created.

For more details, see logs.

Possible Causes

The database failed to be created.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory. View the **install.log** file.

```
cd /home/ugo/package/UGO
```

Step 3 Check the **ugoserver_logs_<timestamp>** folder for specific error related to database installation error.

If the UGO service is installed as the **root** user, check the **~/ugo_pkg_<timestamp>_logs** directory in the home directory of the **ugo** user.

Step 4 [View logs](#) to locate the error cause.

----End

5.5.35 UGOIE-0042 Invalid Upgrade Backup Directory

Description

The upgrade backup directory is invalid.

Possible Causes

The backup directory is the same as the user's home directory, or the backup directory cannot be created under the existing deployment model.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Go to the **install-default.conf** file.

```
vi install-default.conf
```

```
#####
##### Common Configurations #####
#####
[Common]
common.install.path = ~/ugoserver/          ##### UGO Install path
common.log.path = ~/ugoserver/logs/          ##### Common log path for UGO
common.error.label = ERROR                   ##### Supported common log levels are DEBUG, INFO, WARNING, ERROR
#common.upgrade.backup.path= ~/ugobackup/    # UGO will be backed up under this directory before doing an upgrade.
```

Step 4 Use a correct backup directory path.

----End

5.5.36 UGOIE-0043 Directory Creation Failure

Description

The directory failed to be created.

Possible Causes

The user has no permissions to create a backup directory.

Handling Suggestion

Check whether the user has the write permissions.

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

chown -R <user>:<group> <user_home_dir>

<*user*> indicates the UGO installation os-username, <*group*> indicates the os-group name of the <*user*>, and <*user_home_dir*> indicates the home directory.

If the UGO backup directory is not in the home directory of the user, run the following command:

chown -R <user>:<group> <ugo_backup_dir_parent>

----End

5.5.37 UGOIE-0044 Backup Failure

Description

The backup file failed to be created.

For more details, see logs.

Possible Causes

The user may not have required permissions for the operation, or the file is being backed up.

Handling Suggestion

Ensure that the user have all required permissions.

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

```
chown -R <user>:<group> <user_home_dir>
```

<*user*> indicates the UGO installation os-username, <*group*> indicates the os-group name of the <*user*>, and <*user_home_dir*> indicates the home directory.

If the UGO backup directory is not in the home directory of the user, run the following command:

```
chown -R <user>:<group> <ugo_backup_dir_parent>
```

----End

5.5.38 UGOIE-0046 Versions Incompatible

Description

The version is incompatible.

For more details, see logs.

Possible Causes

The two UGO versions are incompatible for upgrade.

Handling Suggestion

Only the upgrade from an earlier version to a later version is supported. Check whether the version meets the requirements.

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the <*ugoserver_path*>/**bin** directory.

```
cd <ugoserver>/bin
```

Step 3 View the versions.

```
python3 ugoserver.py version
```

Step 4 [View logs](#) to locate the error cause. Contact [technical support](#) to obtain a compatible upgrade version.

----End

5.5.39 UGOIE-0047 Replication Failure

Description

The replication failed.

For more details, see logs.

Possible Causes

The user does not have the required permissions.

Handling Suggestion

Ensure that the user have all required permissions.

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Grant the required permissions to the user.

```
chown -R <user>:<group> <user_home_dir>
```

<user> indicates the UGO installation os-username, <group> indicates the os-group name of the <user>, and <user_home_dir> indicates the home directory.

If the UGO has been installed in another directory, run the following command:

```
chown -R <user>:<group> <ugo_install_dir>
```

----End

5.5.40 UGOIE-0049 Data Restoration Failure

Description

Data failed to be restored.

For more details, see logs.

Possible Causes

The dumped database data failed to be restored.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the <ugoserver>/bin directory.

```
cd <ugoserver>/bin
```

Step 3 Rectify the fault based on the error information in the **rollback.log** file.

----End

5.5.41 UGOIE-0051 Low Password Strength

Description

The database password is not complex enough.

Possible Causes

The password strength is low.

Handling Suggestion

Enter a strong password based on password complex requirements.

The password must:

- Consist of 8 to 128 characters.
- Contain at least one lowercase letter.
- Contain at least one uppercase letter.
- Contain at least one digit.
- Contain any of the following special characters (~! @# %^&*()_-+=\| [{}];,<.>/?).
- Cannot be the same as the database username or username spelled backwards.
- Pass the weak password dictionary check.

5.5.42 UGOIE-0052 Invalid Database Username

Description

The database username is invalid.

Possible Causes

The database username is invalid.

Handling Suggestion

Enter a database username based on the username naming rules. The username must contain:

- 4 to 63 characters
- Only letters, digits, and underscores (_).

5.5.43 UGOIE-0054 Service Start Failure

Description

The service failed to be started.

For more details, see logs.

Possible Causes

The service failed to be started.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the `<ugoserver_path>/bin` directory.

`cd <ugoserver>/bin`

Step 3 View following logs to locate the error cause and rectify the fault.

- Operation logs: <ugoserver>/bin/logs/operation.log
- Service logs: ~/<ugoserver>/logs

Step 4 [View logs](#) to further locate the error cause.

----End

5.5.44 UGOIE-0055 Failed to Read the Configuration File

Description

An exception occurred when reading the configuration file.

Possible Causes

An error occurred when reading the **install-default.conf** file.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Go to the **install-default.conf** file.

vi install-default.conf

Step 4 Ensure that parameters are configured correctly.

----End

5.5.45 UGOIE-0060 Password Mismatch

Description

Passwords do not match. Try again later.

Possible Causes

The two passwords do not match.

Handling Suggestion

When installing the UGO service, enter and confirm the password for multiple times.

Ensure that the password entered for the first time is the same as the confirmed password.

For more details, see *UGO Installation Guide*.

5.5.46 UGOIE-0062 Failed to Encrypt the Password

Description

The password failed to be encrypted.

Possible Causes

The password failed to be encrypted.

Handling Suggestion

Step 1 [View logs](#) to locate the error cause.

Step 2 Log in to the server where the UGO is installed.

Step 3 Ensure that Java has been installed and the Java path has been correctly configured.

Step 4 Verify that the current user has the permissions to access Java.

which java

Step 5 Ensure that JAVA_HOME is correctly configured.

echo \$JAVA_HOME

----End

5.5.47 UGOIE-0063 Backup Key Expired

Description

The backup key expired. Manually restore the key and then update it.

Possible Causes

The backup key exists in <ugoserver>/.meta/ugo_bkp.

Handling Suggestion

Step 1 If the UGO service has been installed, log in to the UGO server as the **ugo** user.

Step 2 Switch to the <ugoserver>/bin directory.

cd <ugoserver>/bin

Step 3 Update key components:

python3 ugoserver.py updatekeys

Command output:

UpdateKeys		START Keys update started.
Db Keys		OK Keys update finished.
Tomcat Keys		OK Keys update finished.
User Keys		OK Keys update finished.
Weak Dict Keys		OK Keys update finished.

UpdateKeys	STOP Keys update finished.
<hr/>	
Service Name	Operation Details
DB	Service stopped successfully.
WebUI	Service stopped successfully.
UGO_IAMService	Service stopped successfully.
DB	Service started successfully.
WebUI	Service started successfully.
UGO_IAMService	Service started successfully.
Send => Audit Log	OK Audit log sent Successfully.
<hr/>	
----End	

5.5.48 UGOIE-0064 Incompatible Java Version Found

Description

The Java version is incompatible.

Possible Causes

The Java version is incompatible.

Handling Suggestion

Step 1 Log in to the server where the UGO is installed.

Step 2 Check the Java version:

```
java -version
```

Step 3 Obtain the correct Java version and install it. For details, see [System Requirements](#).

- [Download Java SE development tool package](#)
- <https://openjdk.java.net/install/>

----End

5.5.49 UGOIE-0065 No permissions to Access crontab

Description

The current user does not have the required permissions to access crontab.

Possible Causes

- The user has no required permissions to access crontab.
- The user password has expired.

Handling Suggestion

Cause 1:

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Allow the user to access crontab.

```
echo "ugo" >> /etc/cron.allow
```



For more information about how to add crontab access permissions to a user, see the Linux documentation.

----End

Cause 2:

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Run the following command to change the password:

```
passwd ugo
```

----End

5.5.50 UGOIE-0066 Failed to Change the Password

Description

The password failed to be changed.

Possible Causes

The database password cannot be upgraded.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the `<ugoserver_path>/bin` directory.

```
cd <ugoserver>/bin/logs
```

Step 3 View the **operation log** file to locate the error cause.

----End

5.5.51 UGOIE-0067 The Old Password Is the Same as the New Password

Description

The old password and new password are same.

Possible Causes

The old password must be different from the new password.

Handling Suggestion

Configure a new password based on the password requirements.

The password must:

- Consist of 8 to 128 characters.
- Contain at least one lowercase letter.
- Contain at least one uppercase letter.
- Contain at least one digit.
- Contain any of the following special characters (~! @# %^&*()_-+=|\[{}];:<.>/?).
- Cannot be the same as the database username or username spelled backwards.
- Pass the weak password dictionary check.

5.5.52 UGOIE-0068 The Username Cannot Be Root

Description

The username cannot be **root**.

Possible Causes

root is used as the database username.

Handling Suggestion

When the message "Enter DB Name: " is displayed during the UGO installation, enter a non-root username.

5.5.53 UGOIE-0069 Both --cert-file and --root-cert-path Exist

Description

There are both **--cert-file** and **--root-cert-path**. They are not allowed to be used at the same time.

Possible Causes

--cert-file and **--root-cert-path** are used together.

Handling Suggestion

--cert-file and **--root-cert-path** cannot be used together. Use them separately.

For details, see [ugoserver.py --help](#).

5.5.54 UGOIE-0070 Mandatory Parameters Are Missing

Description

Mandatory parameters are missing.

Possible Causes

The mandatory parameters are not provided for the **update-cert** command.

Handling Suggestion

Step 1 Provide mandatory parameters. For more information, see [Help Reference](#).

Step 2 Run **ugoserver.py --help** to get information about the **update-cert** command.

----End

5.5.55 UGOIE-0071 This Option Is Unavailable for the Current Deployment

Description

This option is not available for the current deployment.

Possible Causes

This option is not available for the current deployment.

Handling Suggestion

Step 1 Run **ugoserver.py --help** to get information about the **update-cert** command.

Step 2 For more information, see [Help Reference](#).

----End

5.5.56 UGOIE-0072 Certificate Password Verification Failure

Description

The certificate password failed to be verified.

Possible Causes

An error occurred when the user obtains the web certificate password.

Handling Suggestion

Ensure that the password for web certificate authentication is provided.

Rectify the fault by referring to [Help Reference](#).

5.5.57 UGOIE-0073 The Keystore Is Tampered With or Password Is Incorrect

Description

The keystore has been tampered with or the password is incorrect.

Possible Causes

The web certificate has been tampered with or the password is incorrect.

Handling Suggestion

Ensure that the web certificate in **--web-cert** is valid and the password is correct.

Rectify the fault by referring to [Help Reference](#).

5.5.58 UGOIE-0075 Invalid IP Address in the Trustlist

Description

The IP addresses in the trustlist are invalid.

Possible Causes

The IP address format is invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Learn about the information of the required commands. For details, see [install.py --help](#).

```
python3 install.py help
```

Step 4 Configure the trustlist (**ip-list**). Example:

```
python3 install.py install --install-repo-db --license=LICUGO.xml --web-cert=UGOWebkeystore --whitelist-ip-list="10.*.34.45, 10.23.34.**"
```

The IP address trustlist must be in the format of *a.b.c.d*, where *a*, *b*, *c*, and *d* can be integers or wildcards.

(e.g., valid IP address: - 10.*.34.45, *.*.*., 10.*.*., 10.23.*., 10.23.34.* and invalid IP address- *.23.*.34, 10.*.23.34 , ...).

Step 5 Rectify the fault by referring to [Help Reference](#).

----End

5.5.59 UGOIE-0076 Trustlist IP Addresses Are Not Provided

Description

The trustlist IP addresses are not provided.

Possible Causes

The trustlist **-ip-list** is not provided.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Learn about the information of the required commands. For details, see [install.py --help](#).

```
python3 install.py help
```

Step 4 Configure the trustlist **ip-list** as required. Example:

```
python3 install.py install --install-repo-db --license=LICUGO.xml --web-cert=UGOWebkeystore --whitelist-ip-list="10.*.34.45, 10.23.34.**"
```

Step 5 Rectify the fault by referring to [Help Reference](#).

----End

5.5.60 UGOIE-0077 Too Many IP addresses in the Trustlist

Description'

The number of IP addresses in the trustlist has exceeded the maximum.

Possible Causes

The number of IP addresses in the trustlist has reached the maximum.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Learn about the information of the required commands. For details, see [install.py --help](#).

```
python3 install.py help
```

Step 4 Configure the trustlist **ip-list** as required. Example:

```
python3 install.py install --install-repo-db --license=LICUGO.xml -web-cert=UGOWebkeystore --whitelist-ip-list="10.*.34.45, 10.23.34.**"
```

There are up to 20 IP addresses in the whitelist.

Step 5 Rectify the fault by referring to [Help Reference](#).

----End

5.5.61 UGOIE-0080 OpenSSL Execution Failure

Description

The OpenSSL command failed to be executed.

Possible Causes

OpenSSL is not installed or is installed in an incorrect path, or **LD_LIBRARY_PATH** is incorrectly configured.

Handling Suggestion

- If OpenSSL is not installed, use the Linux repository to install the OpenSSL package.
Add references to the dependent software for installing OpenSSL and add detailed information about how to install OpenSSL.
- If OpenSSL has been installed, set **PATH** and **LD_LIBRARY_PATH** correctly.
Perform the following steps:

Step 1 Log in to the server where the UGO is installed.

Step 2 Open the `~/.bashrc` file.

Step 3 Go to the end of the file.

Step 4 Update the value of **PATH** and **LD_LIBRARY_PATH**. Add the following content into the `~/.bashrc` file.

```
export PATH=/usr/local/bin:$PATH
```

```
export LD_LIBRARY_PATH=/usr/local/lib:/usr/local/lib64:$LD_LIBRARY_PATH
```

----End

5.5.62 UGOIE-0081 Invalid Remote Database Username

Description

The username of the remote database is invalid.

Possible Causes

The remote database username is invalid.

Handling Suggestion

Enter a valid database username.

The username:

- Contains up to 32 characters
- Cannot include single or double quotation marks.

5.5.63 UGOIE-0082 Command Not Found

Description

The expected command cannot be found.

Possible Causes

The expected command is not obtained.

Handling Suggestion

Step 1 Obtain the expected command. For details, see section "Manually Installing Dependent Software" in *UGO Installation Guide*.

Step 2 Compile and install the command.

```
tar -xf expect5.45.4.tar.gz
cd expect5.45.4/
./configure --prefix=/usr/local
make
make install
----End
```

5.5.64 UGOIE-0083 Failed to Add a Scheduled Task in the Cron File

Description

A scheduled task failed to be added in the cron file.

For more details, see logs.

Possible Causes

A scheduled task failed to be added in the cron file.

Handling Suggestion

Step 1 [View logs](#) to locate the error cause.

Step 2 Log in to the server where UGO is installed as the **root** user.

Step 3 Allow the user to access crontab.

```
echo "ugo" >> /etc/cron.allow
```



For more information about how to add crontab access permissions to a user, see the Linux documentation.

----End

5.5.65 UGOIE-0085 Invalid Path Log Permissions

Description

The permission for the log path is invalid.

Possible Causes

The permission for the log path could not be found.

Handling Suggestion

Step 1 [View logs](#) and find the required log path.

Step 2 Change the permission for the log path to **700**.

```
chmod -R 700 <log_path>
```

----End

5.5.66 UGOIE-0086 Disk in the General Installation Path Is Full

Description

The disk in the general installation path is full.

Possible Causes

There is no available disk space in the installation path.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **<ugoserver>/bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Contact maintenance engineers to confirm unnecessary files or folders and delete them.

```
rm -f <filename>
```

Step 4 Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name          | Operation Details
-----
DB                   | Service stopped successfully.
WebUI                | Service stopped successfully.
UGO_IAMService       | Service stopped successfully.
DB                   | Service started successfully.
WebUI                | Service started successfully.
UGO_IAMService       | Service started successfully.
-----
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log      | OK | Audit log sent Successfully.
```

Step 5 If the fault persists or the disk capacity needs to be expanded, [contact technical support](#).

----End

5.5.67 UGOIE-0087 Disk on the Data Path Is Full

Description

The disk on the data path is full.

Possible Causes

There is no available disk space in the data path.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the **<ugoserver>/bin** directory.

```
cd <ugoserver>/bin
```

Step 3 Contact maintenance engineers to confirm unnecessary files or folders and delete them.

```
rm -f <filename>
```

Step 4 Restart the UGO service.

```
python3 ugoserver.py restart
```

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name | Operation Details
-----
DB           | Service stopped successfully.
WebUI        | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB           | Service started successfully.
WebUI        | Service started successfully.
UGO_IAMService | Service started successfully.

-----
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

Step 5 If the fault persists or the disk capacity needs to be expanded, [contact technical support](#).

----End

5.5.68 UGOIE-0088 Weak Dictionary Operation Failure

Description

An error occurred when the weak dictionary operation was performed.

Possible Causes

An error occurred when the weak dictionary operation was performed.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the `<ugoserver>/bin` directory.

`cd <ugoserver>/bin`

Step 3 View the logs in the following path to locate the error cause and rectify the fault.

The log file path is `/<ugoserver>/bin/logs/operation.log`.

----End

5.5.69 UGOIE-0090 Folder Not Found in the Given Path

Description

The folder cannot be found in the given path.

Possible Causes

There is no required folder in the given path.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 If the error code is displayed during the installation, go to the UGO software package directory.

```
cd /home/ugo/package/UGO
```

Run **install.py --help** to learn about information of commands.

Step 3 If the error code is displayed when you run a command after the installation, go to the **<ugoserver_path>/bin** directory.

```
cd <ugoserver>/bin
```

Run **ugoserver.py --help** to learn about information of UGO operations.

Step 4 Rectify the fault by referring to [Help Reference](#).

----End

5.5.70 UGOIE-0092 Failed to Obtain the REPO DB Version Information

Description

The REPO DB version information failed to be obtained.

For more details, see logs.

Possible Causes

- The **REPO_DB_VERSION_INFO** table may not exist.
- The remote database cannot be connected during the operation.
- If an error occurred during installation, the existing database provided as input during installation is not managed by UGO.

Handling Suggestion

Step 1 If a remote database is used, check whether the database service is normal and whether there is the **REPO_DB_VERSION_INFO** table in the database.

Step 2 If an existing database is used during the installation, use a new database to trigger the installation again.

Step 3 If the fault persists, log in to the server where the UGO is installed as the **ugo** user.

Step 4 Switch to the **<ugoserver>/bin** directory.

```
cd <ugoserver>/bin
```

Step 5 View the following logs to locate the error cause.

- Installation logs: **<UGO_Installation_Package>/install.log**
- Upgrade logs: **<UGO_Upgrade_Package>/upgrade.log**

----End

5.5.71 UGOIE-0093 Password Failed to Pass the Weak Dictionary Check

Description

The password does not pass the weak dictionary check.

Possible Causes

The password is a weak password.

Handling Suggestion

Enter a strong password based on password complex requirements.

The password must:

- Consist of 8 to 128 characters.
- Contain at least one lowercase letter.
- Contain at least one uppercase letter.
- Contain at least one digit.
- Contain any of the following special characters (~! @# %^&*()_-+=\| [{}];,<.>/?).
- Cannot be the same as the database username or username spelled backwards.

5.5.72 UGOIE-0095 Installation Area Not Supported

Description

The installation area is not supported.

Possible Causes

The current installation area is not supported.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

cd /home/ugo/package/UGO

Step 3 Set the installation area.

echo'export LANG=en_US.UTF-8' >> ~/.bashrc

echo'export LC_ALL=en_US.UTF-8' >> ~/.bashrc

source ~/.bashrc

Step 4 Verify that the installation area is configured correctly.

locale

----End

5.5.73 UGOIE-0096 No parameter Provided

Description

No parameter is provided.

Possible Causes

No parameter is provided.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 If the error code is displayed during the installation, go to the UGO software package directory.

cd /home/ugo/package/UGO

Learn about the information of the required commands.

python3 install.py help

Step 3 If the error code is displayed when you run a command after the installation, go to the **<ugoserver_path>/bin** directory.

cd <ugoserver>/bin

Run **ugoserver.py --help** to learn about information of UGO operations.

Step 4 Rectify the fault by referring to [Help Reference](#).

----End

5.5.74 UGOIE-0097 License Verification Failure

Description

The license failed to be verified.

Possible Causes

The license may be invalid or expired.

Handling Suggestion

Step 1 Apply for a new license by referring to the *UGO Installation Guide*.

Step 2 If this error code is displayed when the UGO service is being installed or upgraded:

Log in to the server where the UGO is installed as the **ugo** user, replace the license file with a new one, and go to the UGO installation package.

```
cd <package>/UGO
```

Run the installation or upgrade command again.

Step 3 Go to the **bin** directory.

```
cd <ugoserver>/bin
```

Update the license file.

```
python3 ugoserver.py update-license --license <new_license_path>
```

----End

5.5.75 UGOIE-0098 Invalid Product Value

Description

The product value is invalid.

Possible Causes

The product value is not supported or invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Run the **install.py --help** command to learn about the supported commands.
Rectify the fault by referring to [Help Reference](#).

----End

5.5.76 UGOIE-0099 Invalid Configuration Value

Description

The configured value is invalid.

Possible Causes

The configured value is invalid.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

```
cd /home/ugo/package/UGO
```

Step 3 Go to the **install-default.conf** file.

vi install-default.conf

```
#####
##### Configure when providing --product option on install #####
[Product]
#product.techsupport.name.en-us= # UGO Technical Support Interface
#product.techsupport.name.zh-cn= # UGO Technical Support Interface
```

If the product option has been used in the command line of **install.py**, reconfigure it.

Step 4 Ensure that the value contains fewer than 100 characters.

----End

5.5.77 UGOIE-0100 Web Certificate Verification Failure

Description

The web certificate failed to be verified.

Possible Causes

- This error code may be displayed during the installation or upgrade process.
- This error code may be displayed when the user attempts to update the web certificate in the installed system.

Handling Suggestion

Step 1 Check whether the **\$JAVA_HOME/jre/lib/security/java.security** file contains the following statement:

security.provider.1=org.openeuler.BGMProvider

- Yes: The SM series cryptographic algorithms are used. The JDK and related certificates must use SM series cryptographic algorithms.
- No: international cryptographic algorithms are used. Both JDK and related certificates must use international cryptographic algorithms.

Step 2 Modify JDK.

- If SM series cryptographic algorithms are used: Add the following statement to the **\$JAVA_HOME/jre/lib/security/java.security** file and lower the priorities of other programs by one level:

security.provider.1=org.openeuler.BGMProvider

```
security.provider.1=org.openeuler.BGMProvider
security.provider.2=sun.security.provider.Sun
security.provider.3=sun.security.rsa.SunRsaSign
security.provider.4=sun.security.ec.SunEC
security.provider.5=com.sun.net.ssl.internal.ssl.Provider
security.provider.6=com.sun.crypto.provider.SunJCE
security.provider.7=sun.security.jgss.SunProvider
security.provider.8=com.sun.security.sasl.Provider
security.provider.9=org.jcp.xml.dsig.internal.dom.XMLDSigRI
security.provider.10=sun.security.smartcardio.SunPCSC
```

For details about how to use SM series cryptographic algorithms, see section "Installation Guide" in *Database and Application Migration UGO (UGO) 2.23.07.200 Usage Guide 01*.

- If international cryptographic algorithms are used, Ensure that there is no the following statement in the `$JAVA_HOME/jre/lib/security/java.security` file.
`security.provider.1=org.openeuler.BGMPProvider`

Step 3 Replace certificates.

1. Log in to the server where UGO is installed as the **root** user.
2. Upload the valid UGO license, web certificate, and SSL certificate to any directory accessible to the current user.
3. Check the details of the certificates and ensure that they are valid.
4. Run the following command:

```
python3 install.py install --license <license_path> --web-cert <web_cert_path> --ssl-db-ca <ssl_db_cert_path> --os-user <username where ugo is going to be installed>
```



To install the local database, you do not need to enter `--ssl-db-ca <ssl_db_cert_path>`.

Step 4 Learn about the correct usage of the command, see [Help Reference](#).

----End

5.5.78 UGOIE-0102 curl Not Installed

Description

curl is not installed.

Possible Causes

curl is not preinstalled in the system.

Handling Suggestion

curl is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running curl, use the package management tools provided by the system, such as yum, zypper, and rpm, to install curl. The reference commands are as follows:

```
sudo yum install curl  
sudo zypper install curl  
sudo rpm -ivh curl***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
curl -V
```

5.5.79 UGOIE-0103 unzip Not Installed

Description

unzip is not installed.

Possible Causes

unzip is not preinstalled in the system.

Handling Suggestion

unzip is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running unzip, use the package management tools provided by the system, such as yum, zypper, and rpm, to install unzip. The reference commands are as follows:

```
sudo yum install unzip  
sudo zypper install unzip  
sudo rpm -ivh unzip***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
unzip -v
```

5.5.80 UGOIE-0104 gzip Not Installed

Description

gzip is not installed.

Possible Causes

gzip is not preinstalled in the system.

Handling Suggestion

gzip is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running gzip, use the package management tools provided by the system, such as yum, zypper, and rpm, to install gzip. The reference commands are as follows:

```
sudo yum install gzip  
sudo zypper install gzip  
sudo rpm -ivh gzip***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
gzip -V
```

5.5.81 UGOIE-0105 keytool Not Installed

Description

keytool is not installed.

Possible Causes

keytool is not installed.

Handling Suggestion

Step 1 If Java has not been installed, download Java corresponding to the OS from the official website and install it.

- [Download Java](#)
- [Install Java](#)

Step 2 Follow the steps provided in the Java installer package.

Step 3 Check whether the current user has the permission to access keytool.

which keytool

Step 4 If the error persists, see the Java website for troubleshooting or [contact technical support](#).

----End

5.5.82 UGOIE-0106 Invalid OS Username

Description

The OS username is invalid.

Possible Causes

The OS username does not comply with the OS username requirements.

Handling Suggestion

Enter a valid OS username.

The username:

- Contains at least three characters
- Contains only letters, digits, and underscores (_)
- Cannot be set to **root**

5.5.83 UGOIE-0107 Installation Failure as User root

Description

UGO failed to be installed as the **root** user.

Possible Causes

UGO is installed as the **root** user.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Go to the software package directory.

`cd /home/ugo/package/UGO`

Step 3 View the **install.log** file.



For details, see the log files in the **os-user** home directory where the UGO is to be installed.
The log file is stored in the `~/ugo_pkg_<timestamp>_logs/` folder.

----End

5.5.84 UGOIE-0108 Low IAM Password Strength

Description

The IAM password is weak.

Possible Causes

The IAM password is weak.

Handling Suggestion

Enter a strong password.

The password must:

- Consist of 8 to 128 characters.
- Contain at least one lowercase letter.
- Contain at least one uppercase letter.
- Contain at least one digit.
- Contain any of the following special characters (~! @# %^&*()_-+=\| [{}];:<.>/?).
- Pass the weak password dictionary check.

5.5.85 UGOIE-0109 Insufficient CPU Cores

Description

The number of CPU cores is insufficient.

Possible Causes

The number of CPU cores on the current computer is insufficient.

Handling Suggestion

Upgrade the current CPU to ensure that its cores meet requirements, or use a computer with a larger number of CPU cores.

The number of CPU cores is at least 4.

5.5.86 UGOIE-0110 Low OS User Password Strength

Description

The OS user password is weak.

Possible Causes

The current password does not meet the password requirements.

Handling Suggestion

Enter a strong password.

A strong password must contain at least eight characters, including at least one uppercase letter, one lowercase letter, a digital, and one special character (~!@#%^&*()_=+|{}<.>/?""").

5.5.87 UGOIE-0111 Mandatory Parameters Not Provided

Description

Mandatory parameters are not provided.

Possible Causes

Not all the required parameters are provided for a given command.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 If the error code is displayed during the installation, go to the UGO software package directory.

`cd /home/ugo/package/UGO`

Run `install.py --help` to learn about information of commands.

Step 3 If the error code is displayed when you run a command after the installation, go to the `<ugoserver_path>/bin` directory.

`cd <ugoserver>/bin`

Run `ugoserver.py --help` to learn about information of UGO operations.

Step 4 Rectify the fault by referring to [Help Reference](#).

----End

5.5.88 UGOIE-0112 Operation Not Allowed

Description

This operation is not allowed.

Possible Causes

The specified parameter or command is not supported by the current deployment project or the current user.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 If the error code is displayed during the installation, go to the UGO software package directory.

`cd /home/ugo/package/UGO`

Run **install.py --help** to learn about information of commands.

Step 3 If the error code is displayed when you run a command after the installation, go to the `<ugoserver_path>/bin` directory.

`cd <ugoserver>/bin`

Run **ugoserver.py --help** to learn about information of UGO operations.

Step 4 Rectify the fault by referring to [Help Reference](#).

----End

5.5.89 UGOIE-0113 Failed to Obtain the Host Address from the Host Name

Description

The host address failed to be obtained from the host name.

Possible Causes

The specified parameter or command is not supported by the current deployment or the current user.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **root** user.

Step 2 Check whether the host name is correctly configured.

`hostname`

Step 3 Check whether the host IP address is correctly configured:

`hostname -i`

Step 4 If an error is reported during any of the preceding steps, rectify the fault by referring to the Linux documentation.

----End

5.5.90 UGOIE-0114 The update-wk Operation Is Not Complete

Description

The update-wk operation is not complete.

Possible Causes

The process is interrupted or terminated when **update-wk** is being executed.

Handling Suggestion

Step 1 Log in to the server where UGO is installed as the **ugo** user.

Step 2 Switch to the `<ugoserver>/bin` directory.

`cd <ugoserver>/bin`

Step 3 Execute **update-wk** again.

`python3 ugoserver.py update-wk`

----End

5.5.91 UGOIE-0115 The Reversible Algorithm {} Is Invalid. Supported Algorithms: {}

Description

The reversible algorithm entered by the user is invalid.

Possible Causes

An invalid reverse algorithm is entered during installation or upgrade.

Handling Suggestion

Enter a valid reverse algorithm. For details about supported algorithms, see [install.py --help](#).

5.5.92 UGOIE-0116 The Irreversible Algorithm {} Is Invalid. Supported Algorithms: {}

Description

The reversible algorithm entered by the user is invalid.

Possible Causes

An invalid reverse algorithm is entered during installation or upgrade.

Handling Suggestion

Enter a valid reverse algorithm. For details about supported algorithms, see [install.py --help](#).

5.5.93 UGOIE-0117 Invalid Web Certificate Version

Description

The web certificate type is invalid.

Possible Causes

The web certificate type entered during certificate installation or update is invalid.

Handling Suggestion

Use the supported algorithms.

GMTLS will be provided as a certificate type to support SM series cryptographic algorithms.

5.5.94 UGOIE-0118 The Web Certificate Alias {} Is Invalid.

Description

The web certificate alias is invalid.

Possible Causes

The web certificate alias type entered during installation is invalid, or no alias information is entered during certificate installation or update.

Handling Suggestion

Enter a valid alias.



Both the web certificate type and the web certificate alias need to be provided as part of the installation or update authentication.

5.5.95 UGOIE-0119 Invalid Permissions

Description

The permissions are invalid. The license or Ugokeystore does not have the required permissions. The file does not belong to the user or the user does not have the required permissions.

Possible Causes

The user has no required permissions to read the file.

Handling Suggestion

Grant the user required permissions to read file path during the installation.

5.5.96 UGOIE-0120 rsync Not Installed

Description

rsync is not installed.

Possible Causes

rsync is not preinstalled in the system.

Handling Suggestion

rsync is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running rsync, use the package management tools provided by the system, such as yum, zypper, and rpm, to install rsync. The reference commands are as follows:

```
sudo yum install rsync  
sudo zypper install rsync  
sudo rpm -ivh rsync ***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
rsync -v
```

5.5.97 UGOIE-0121 cut Not Installed

Description

cut is not installed.

Possible Causes

cut is not preinstalled in the system.

Handling Suggestion

cut is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running cut, use the package management tools provided by the system, such as yum, zypper, and rpm, to install cut. The reference commands are as follows:

```
sudo yum install cut
```

```
sudo zypper install cut
sudo rpm -ivh cut***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
cut --v
```

5.5.98 UGOIE-0122 ip Not Installed

Description

ip is not installed.

Possible Causes

ip is not preinstalled in the system.

Handling Suggestion

ip is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running ip, use the package management tools provided by the system, such as yum, zypper, and rpm, to install ip. The reference commands are as follows:

```
sudo yum install ip
sudo zypper install ip
sudo rpm -ivh ip***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
ip -V
```

5.5.99 UGOIE-0123 logrotate Not Installed

Description

logrotate is not installed.

Possible Causes

logrotate is not preinstalled in the system.

Handling Suggestion

logrotate is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running logrotate, use the package management tools provided by the system, such as yum, zypper, and rpm, to install logrotate. The reference commands are as follows:

```
sudo yum install logrotate
```

```
sudo zypper install logrotate  
sudo rpm -ivh logrotate***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
logrotate -v
```

5.5.100 UGOIE-0124 sed Not Installed

Description

sed is not installed.

Possible Causes

sed is not preinstalled in the system.

Handling Suggestion

sed is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running sed, use the package management tools provided by the system, such as yum, zypper, and rpm, to install sed. The reference commands are as follows:

```
sudo yum install sed  
sudo zypper install sed  
sudo rpm -ivh sed***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
sed -V
```

5.5.101 UGOIE-0125 sha256sum Not Installed

Description

sha256sum is not installed.

Possible Causes

sha256sum is not preinstalled in the system.

Handling Suggestion

sha256sum is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running sha256sum, use the package management tools provided by the system, such as yum, zypper, and rpm, to install sha256sum. The reference commands are as follows:

```
sudo yum install sha256sum
```

```
sudo zypper install sha256sum  
sudo rpm -ivh sha256sum ***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
sha256sum --v
```

5.5.102 UGOIE-0126 wc Not Installed

Description

wc is not installed.

Possible Causes

wc is not preinstalled in the system.

Handling Suggestion

wc is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running wc, use the package management tools provided by the system, such as yum, zypper, and rpm, to install wc. The reference commands are as follows:

```
sudo yum install wc  
sudo zypper install wc  
sudo rpm -ivh wc***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
wc --v
```

5.5.103 UGOIE-0127 xargs Not Installed

Description

xargs is not installed.

Possible Causes

xargs is not preinstalled in the system.

Handling Suggestion

xargs is pre-installed with the operating system in general Linux releases. However, if you encounter problems when running xargs, use the package management tools provided by the system, such as yum, zypper, and rpm, to install xargs. The reference commands are as follows:

```
sudo yum install xargs
```

```
sudo zypper install xargs  
sudo rpm -ivh xargs***.rpm
```

After the installation is complete, run the following command as the **root** user to verify the software package.

```
xargs --version
```

5.5.104 Appendixes

5.5.104.1 Help Reference

5.5.104.1.1 install.py --help

Run the **python3 install.py help** command in the UGO software package directory as a non-root user. The command output is as follows:

```
UGO package installation help:  
Utility to support installation of UGO.  
This script should not be run with root permission.  
  
Usage:  
    install.py install      [--license=<license file path>] [--web-cert=<web cert path>] [--skip-memory-  
check] [--install-repo-db] [--whitelist-ip-list=<list of IPs COMMA separated>] [--skip-disk-check]  
    location>]           [--root-cert-path=<root certificate folder>] [--audit-log-file=<audit log file  
delete-pkg]          [--product=<product name>] [--shared-disk-path=<shared disk mount path>]  
    install.py upgrade     [--ssl-db-ca=<db ssl cert path>] [--skip-ssl-db] [--os-user=<os_username>] [--  
certificate folder]   [--reverse-algo=<algorithm_type>] [--irreverse-algo=<algorithm_type>]  
    algo=<algorithm_type>  [--skip-disk-check] [--skip-memory-check] [--root-cert-path=<root  
install.py license-check  [--audit-log-file=<audit log file location>] [--license=<license file path>]  
    install.py            [--web-cert=<web cert path>] [--reverse-algo=<algorithm_type>] [--irreverse-  
    install.py           --ip=<ip_address> --license=<license file path>  
    help | --help | -h]    [--version | -v]  
  
Commands:  
    install             Installs UGO in configured location.  
                      For cloud deployment, PAAS_APP_NAME environment variable must be set.  
    upgrade             Upgrades UGO.  
    license-check       Refers the configuration file for backup path and new settings.  
    arguments.          Prints the license status of given license file. It will take ip and license path as  
    help               Prints this help text.  
    version | -v       Prints version string.  
  
Options:  
    --install-repo-db  Installs Repo DB on local machine listening on localhost IP.  
                      Available with Standalone installation only.  
    --skip-disk-check  Skip the default disk pre check. This option to be used only during application  
debug.  
    --skip-memory-check Skip the default memory pre check. This option to be used only during  
application debug.  
    --ip                Recommended not to use this for production environment.  
    --license           Recommended not to use this for production environment.  
    standalone         The IP Address for license validation.  
                      Configures the License from the given license path. This is applicable only for  
deployment.
```

--web-cert	Configures the Web Certificate from the given path. This is applicable only for deployment.
--product for	Specify the product name for which UGO is being deployed. This is applicable only for standalone deployment. Currently supported value: bpit
--whitelist-ip-list	Only allows the list of mentioned ip's to access the tomcat server of webui. This option is mandatory for cloud deployment and optional for standalone. Maximum allowed list of ip address for this option is 20. IPs can also have a wildcard entry '*' (Ex:- 10.23.*.*)
--audit-log-file	Location of the audit log file to which all the Audit and Operation logs will be logged. Not applicable for standalone deployment.
--ssl-db-ca	DB Certificate path for establishing one way ssl connection. Only applicable for standalone with remote db case
--skip-ssl-db used	Allows standalone installation without ssl for remote-db case. This option cannot be used with option install-repo-db case or for cloud deployment.
--os-user exists	The target os user where ugo is going to be installed. If the target os user doesn't then a new user with the given username will be created, necessary environment variables will be set and ugo will be installed in that username. Only applicable when triggering install from root user in standalone deployment
--variables	Specifies whether the UGO Installation package should be deleted or not when is complete
--delete-pkg installation	The Cipher Algorithm used for the encryption of various passwords. Possible Values :- aes-256-gcm, sm4-128-gcm
--reverse-algo	The Hash Algorithm used for hashing various passwords. Possible Values :- pbkdf2-sha256, sm3
--irreverse-algo	Location of the shared disk path. Not applicable for standalone deployment.
--shared-disk-path	Configures certificate of webui from the given root-certificate and configures ssl from the other root certificate.
--root-cert-path	Mandatory for Cloud deployment and Not Applicable for Standalone. root certificate should contain files ca.crt, ca.pem and a folder named agent which contains the files agent_server.crt, agent_server.key.
from	root-cert-path <ul style="list-style-type: none"> -----ca.crt -----ca.pem -----agent <ul style="list-style-type: none"> -----agent_server.crt -----agent_server.key

5.5.104.1.2 ugoserver.py --help

Run the **python3 ugoserver.py help** command in the UGO software package directory as a non-root user. The command output is as follows:

UGO Operation help:
Utility to support Operation on UGO.
This script should not be run with root permission.

Usage:

```
ugoserver.py start    [(-service | -s <service-name>)]
ugoserver.py stop     [(-service | -s <service-name>)]
ugoserver.py restart  [(-service | -s <service-name>)]
ugoserver.py status   [(-service | -s <service-name>)]
ugoserver.py service-version [(-service | -s <service-name>)]
ugoserver.py uninstall [-skip-db-delete-data] [--force | -f]
ugoserver.py      (version | --version | -v)
ugoserver.py      [help | --help | -h]
ugoserver.py rollback
ugoserver.py irencrypt
ugoserver.py upgrade-backup-cleanup
ugoserver.py updatekeys [--no-restart]
ugoserver.py update-pwd
```

```

ugoserver.py update-cert (--cert-file <keystore-file-path> | --root-cert-path <root-certificate-folder-path>
ugoserver.py update-db-cert --ssl-db-ca <db ssl cert path>
ugoserver.py weakdictionary (--add <dictionary-file> | --delete | --export <export-file>)
ugoserver.py monitor
ugoserver.py license-status
ugoserver.py update-license --license=<new license file path>

Commands:
start          Start all the backend services or given service.
stop           Stop all the backend services or given service.
restart        Restart all the backend services or given service.
status          Print the running status of bare minimum backend services or given service.
service-version   Print the service version and build details.
uninstall       Uninstalls UGO.
help            Prints this help text.
version         Prints version string.
irencrypt       Encrypts the input password using irreversible encryption and displays it.
rollback        Rollback the installation to previous backup copy (if any).
upgrade-backup-cleanup  Cleans the upgrade backup (if any). After this software rollback cannot be
performed.
updatekeys     Update the keys used by the system.
update-wk       Update the working keys used by the system.
update-pwd      Changes the password of UGO Installation.
update-cert     Changes the Webui certificate.
update-db-cert  Changes the DB SSL certificate.
weakdictionary Add/Delete/Export data from weak password dictionary table.
monitor         Monitors system resources and UGO services status and raises alarm when the max
resource        threshold is reached or service status is down. Only applicable for standalone, Operation
will fail for cloud case.
license-status  Display the status of current license which is being used.
update-license  Updates the current license to the new license which is provided

Services:
Webui
Db
IAM           For Standalone deployment only.
UGO_DbObjectCollection
UGO_PreMigration
UGO_Migration
UGO_Verification
UGO_AppMigration

Options:
--force | -f      Forcefully uninstall the applicable service.
--service | -s    Selective service. User can pass multiple services as a comma separated list.
--skip-db-delete-data  For skipping the database deletion during uninstall.
It is ignored if Repo DB has been installed.
--cert-file       Path of the Keystore file. Available with Standalone installation only.
--root-cert-path  Path of the Root certificate folder. Available with Cloud installation only.
--ssl-db-ca       Path of the new ssl db certificate.
--no-restart      Does not restart the services.
--add             Add weak password from given file to weak password dictionary table.
--delete          Delete a given password from weak password dictionary table.
--export          Export list of weak password from password dictionary table to given file.
--license         Upgrades the License from the given license path. This is applicable only for
standalone        deployment.

```

5.5.104.1.3 Upgrade

Run the **python3 install.py upgrade --license </license_path>** command in the UGO software package directory as a non-root user. The command output is as follows:

Upgrade		START Upgrade process started.
Enter the password for DB User -> ugouser:		
Test => DB connection		OK DB connection tested successfully.
Upgrade Backup		OK Directory created.

Cron => Python access check.		OK Cron access check for Python started...
Services		OK Services stopped.
Backup		OK Service backup started.
Backup		OK web directory backup finish.
Backup		OK bin directory backup finish.
Backup		OK services directory backup finish.
Backup		OK download directory backup finish.
Backup		OK .meta directory backup finish.
Backup		OK db directory backup finish.
Backup		OK Services backup done.
Configure => UGO_IAMService		OK Properties configured.
Start => DB		OK Service started successfully.
Update => Conf		OK Conf updated successfully
Stop => DB		OK Service stopped successfully.
Start => DB		OK Service started successfully.
Create config => logrotate		OK Config file created: /run/dummy/ugoserver/bin/script/mysql.conf
Start => WebUI		OK Service started successfully.
Start => UGO_IAMService		OK Service started successfully.
Cron => Verify Python access Check		OK Python access Check for Cron Verified.
Cron => Cleanup Python access check.		OK Cleanup done for Python access check Cron.
Upgrade		STOP Upgrade finished successfully.

5.5.104.2 Log Reference

The UGO logs are stored in the following directories:

- Installation logs: <UGO_Installation_Package>/install.log
- Upgrade logs: <UGO_Upgrade_Package>/upgrade.log
- Operation logs (start/stop/status/restart/irencrypt/update-pwd/update-wk/update-cert/weakdictionary/license-status/update-license): <ugoserver>/bin/logs/operation.log
- Key update logs: <ugoserver>/bin/logs/updatekeys.log
- Monitoring logs: <ugoserver>/bin/logs/monitor.log
- Service logs: <ugoserver>/logs/services/ (/UGO_IAMService/UGO_DbObjectCollection/ UGO_PreMigration/ UGO_Migration/ UGO_Verification/ UGO_AppMigration)
- Database logs: <ugoserver>/logs/db/
- WebUI logs: <ugoserver>/logs/web/ (WebUI.log, catalina.out)
- Uninstallation logs: <user_home_directory>/uninstall.log
- Rollback logs: <user_home_directory>/rollback.log

5.5.104.3 System Requirements

Software Requirements

[Table 5-4](#) lists the software requirements.

Table 5-4 Software requirements

Software	Version
MySQL	>= 8.0.20
Python	>= 3.8

Software	Version
JDK	>= 1.8.0_161

Hardware Requirements

Table 5-5 lists the hardware requirements for physical machines.

Table 5-5 Hardware requirements

Hardware		Specification
CPU	Minimum	4 vCPUs 8 GB
	Recommended	16 vCPUs 32 GB
Memory	Minimum	16 GB
	Recommended	32 GB
Storage	Minimum	64 GB

5.5.104.4 Contacting Technical Support

You can provide your feedback using either of the following ways:

- Calling the hotline of a local office.
- Visiting the cloud support website and providing feedback on the **Contact Us** page.

6 Security Hardening Guide

6.1 About this Document

Overview

Database and Application Migration UGO, referred to as UGO, is a professional cloud service that focuses on heterogeneous database schema migration and application migration. It automatically converts the syntax of the DDL in databases and the database SQL statements encapsulated in service programs into the SQL syntax of Huawei Cloud GaussDB or RDS. It uses pre-migration evaluation, schema migration, and automatic syntax conversion to identify possible reconstruction in advance, improve the conversion rate, and minimize the database migration cost. You can migrate mainstream commercial databases to Huawei Cloud databases easily and smoothly.

Intended Audience

This document is intended for O&M personnel, who should be familiar with:

- UGO, including its software architecture and operation mechanism
- Computer principles
- Linux operating system
- Windows operating system
- Network communications

Symbol Convention

The symbols that may be found in this document are defined as follows:

Symbol	Description
 DANGER	Indicates an urgent hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury.

Symbol	Description
 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potential hazard which, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or other unanticipated results. This symbol does not indicate human body injuries.
 NOTE	Calls attention to important information, best practices, and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

The latest document issue contains all the changes in earlier issues.

Issue	Release Date	Description
01	2021-9-30	This issue is the first official release.

6.2 Overview

Security hardening aims to improve the system defense capability and ensure system and network security.

This document describes how to harden the operating system, Tomcat server, and UGO service to provide a secure and stable environment for UGO. Security hardening can be performed after UGO is installed.

Before performing security hardening, you need to be familiar with the following information:

- You need to understand the impact of security hardening on the OS or services and determine whether to perform security hardening based on the impact. For example, after the security hardening, the **root** user may be forbidden to log in to the OS in SSH mode.
- The corresponding hardening steps or commands are manually executed.
- The OS security can be hardened only after the UGO service is successfully installed.
- This document provides guidance only for installation scenarios. To harden the security of a running service system, confirm a security hardening plan with Huawei engineers.

6.3 OS Hardening

Type	No.	Hardening Item	Hardening Method	Effective Method
SSH service	1	Set SSH idle connection timeout	Configure the following parameters in the /etc/ssh/sshd_config file: <ul style="list-style-type: none"> • ClientAliveInterval 300 • ClientAliveCountMax 0 	Restart the SSH service. systemctl restart sshd.service CAUTION Ensure that the service is restarted successfully. Otherwise, the SSH remote login may fail.
	2	Disable SSH TCP forwarding	Configure the following parameter in the /etc/ssh/sshd_config file: AllowTcpForwarding no	
	3	Disable the connection to the server port	Configure the following parameter in the /etc/ssh/sshd_config file: GatewayPorts no	
	4	Disable SSH X11 forwarding	Configure the following parameter in the /etc/ssh/sshd_config file: X11Forwarding no	
	5	Disable SSH Agent forwarding	Configure the following parameter in the /etc/ssh/sshd_config file: AllowAgentForwarding no	
	6	Disable SSH tunnel	Configure the following parameter in the /etc/ssh/sshd_config file: PermitTunnel no	

Type	No.	Hardening Item	Hardening Method	Effective Method
	7	Set the MAC algorithms available for SSH	<ol style="list-style-type: none"> 1. Query the MAC algorithm set supported by the current SSH version: sshd -T grep macs 2. Compare the query result with the secure MAC algorithm set. The secure MAC algorithm set contains the following items: <ul style="list-style-type: none"> • hmac-sha2-256- etm@openssh.com • hmac-sha2-512- etm@openssh.com • hmac-sha2-256 • hmac-sha2-512 3. Add the secure MAC algorithms configured in the query result to the /etc/ssh/sshd_config file. <p>Example:</p> <ul style="list-style-type: none"> • The query result is MACs hmac-sha2-512- etm@openssh.com. • This algorithm belongs to the secure MAC algorithm set. Therefore, add this algorithm to the /etc/ssh/sshd_config file. 	

Type	No.	Hardening Item	Hardening Method	Effective Method
	8	Set algorithms to support Ciphers protocol version 2	<ol style="list-style-type: none"> 1. Query the encryption algorithm set supported by the current SSH version. sshd -T grep ciphers 2. Compare the query result with the security password set. 3. The security cryptographic algorithm set contains the following information: <ul style="list-style-type: none"> • aes128-ctr • aes192-ctr • aes256-ctr 4. Add the security cryptographic algorithms configured in the query result to the /etc/ssh/sshd_config file. <p>Example:</p> <ul style="list-style-type: none"> • The query result is Ciphers aes128-ctr. • This algorithm belongs to the secure cryptographic algorithm set. Therefore, add this algorithm to the /etc/ssh/sshd_config file. 	
	9	Set the number of retries upon an authentication failure to prevent brute force cracking.	Configure the following parameter in the /etc/ssh/sshd_config file: MaxAuthTries 5	
	10	Prohibit users to log in to the system using accounts without passwords in remote shell mode.	Configure the following parameter in the /etc/ssh/sshd_config file: PermitEmptyPasswords no	
	11	Set users who are allowed to access SSH services.	Configure the following parameter in the /etc/ssh/sshd_config file: (The user ugo is an example. Set it based on the site requirements.) AllowUsers ugo	

Type	No.	Hardening Item	Hardening Method	Effective Method
	12	Prohibit the user root to log in to the OS in SSH mode by default	Configure the following parameter in the /etc/ssh/sshd_config file: PermitRootLogin no	
	13	Set the KEX algorithm on the SSH server	<ol style="list-style-type: none"> 1. Query the KEX algorithm set supported by the current SSH version: sshd -T grep kexalgorithms 2. Compare the query result with the secure KEX set. 3. The secure KEX algorithm set contains the following information: <ul style="list-style-type: none"> • curve25519-sha256 • curve25519-sha256@libssh.org • diffie-hellman-group-exchange-sha256 4. Add the secure KEX algorithms configured in the query result to the /etc/ssh/sshd_config file. <p>Example:</p> <ul style="list-style-type: none"> • The query result is KexAlgorithms curve 25519-sha256. • This algorithm belongs to the secure KEX algorithm set. Therefore, add this algorithm to the /etc/ssh/sshd_config file. 	
	14	Log in logs using SSH	Configure the following parameter in the /etc/ssh/sshd_config file: LogLevel VERBOSE	
File permissions	1	Set the configuration file permissions on the SSH server	Run the following command as the root user: chmod 600 /etc/ssh/sshd_config	Take effect immediately

Type	No.	Hardening Item	Hardening Method	Effective Method
Ke rn el se cu rit y	1	Prevent IP spoofing attacks on servers	<ol style="list-style-type: none"> 1. Modify parameters in the /etc/sysctl.config file. net.ipv4.conf.all.rp_filter = 1 net.ipv4.conf.default.rp_filter = 1 2. Save the configurations. <code>#sysctl -p</code> <p>NOTICE The name and location of the sysctl.config file may vary according to the operating system. For example, in CentOS, the file is /etc/sysctl.conf.</p>	Reload the configurations. sysctl -p
	2	Disable tcp_timestamps to reduce the possibility of DoS attacks.	Configure the following parameter in the /etc/sysctl.config file: <code>net.ipv4.tcp_timestamps=0</code>	Reload the configurations. sysctl -p
Ac co un t pa ss wo rd	1	Set the password validity period of the OS account to 90 days.	Configure the following parameter in the /etc/login.defs file: <code>PASS_MAX_DAYS 90</code>	Take effect for new accounts
	2	Notify users that their password will expire in 28 days	Configure the following parameter in the /etc/login.defs file: <code>PASS_WARN_AGE 28</code>	Take effect for new accounts
	3	Configure that if an account fails to log in to the system for five consecutive times, the account will be locked for 5 minutes.	Configure the following parameters in the /etc/pam.d/system-auth file (Red Hat and CentOS): <code>auth required pam_tally2.so deny=5 unlock_time=300 even_deny_root root_unlock_time=300</code>	Take effect immediately

6.4 Tomcat Server Hardening

Configure BouncyCastle for Tomcat.

Procedure

Step 1 Use any editor to edit the **java-home/jre/lib/security/java.security** properties file. Add the downloaded JCE provider to this file and set Bouncy Castle JCE provider.

security.provider.2=org.bouncycastle.jce.provider.BouncyCastleProvider



- Ensure that the Sun security provider is at position 1.
- For details, click [here](#).

Step 2 Copy the JCE provider JAR file to the **java-home/jre/lib/ext/** directory.

bcpkix-jdk15on-*.jar**

bcprov-jdk15on-*.jar**

Step 3 Restart the UGO service.

python3 ugoserver.py restart

If the command output similar to the following is displayed, the restart is successful.

```
[ 6 bin]$ python3 ugoserver.py restart
-----
Service Name | Operation Details
-----
DB           | Service stopped successfully.
WebUI        | Service stopped successfully.
UGO_IAMService | Service stopped successfully.
DB           | Service started successfully.
WebUI        | Service started successfully.
UGO_IAMService | Service started successfully.
-----
Note : Started WebUI Services in Backend. Please wait for sometime before accessing WebURL.
Send => Audit Log | OK | Audit log sent Successfully.
```

----End

6.5 UGO Service Hardening

Hardening Item	Description
Log hardening	After the debug or trace log function is enabled, requests, responses, and other sensitive information in open-source libraries (such as the Spring framework) can be recorded. You can disable the corresponding log recording in the log4j2.xml file. The function is disabled by default.

7 UGO Glossary

The following table lists the common terms in UGO documents.

Table 7-1 UGO glossary

Term	Description
B	
table	A table consists of columns and rows. Rows contain different values of the same columns.
expression	An expression is an SQL statement that returns a value.
encoding	In information processing, encoding is the process of converting one form of information (such as letters, words, sounds, images, or gestures) into another. Sometimes, it is in shortened or secret form for communication through a channel or storage in a medium.
compile	Compilation of PL/SQL functions.
C	
operating system	An operating system (OS) is a program that manages other programs in a computer after being initially loaded to the computer by a boot program.
D	
port	A port is a network portal through which two computing processes can communicate with each other.
object migration	When creating an object migration project, users need to set migration objects, configure the mapping between the source and target databases, edit the migration scripts, and create schemas in the target database.
F	

Term	Description
analysis	Analysis is a process of checking, cleaning, transforming, and modeling data. It helps users extract useful information, draw conclusions, and make decisions.
G	
procedure	A procedure is known as a routine, subroutine, method, or function (not a mathematical function, but is similar to a function used in function programming). It includes a series of computational steps that need to be performed.
H	
Huawei Cloud database	Huawei Cloud databases use the cache mode or local mode for data synchronization. Data is synchronized by cloud database region. During application development, users can select a data synchronization mode for each storage area based on application requirements. The cache mode and local mode can be used together or separately.
I	
column constraint	Column constraints are restrictions on the data that can be inserted into a given column.
J	
validation	Validation is to ensure that the data inserted into an application complies with the defined format and other input standards.
K	
client	A client is a computer or program used to connect to or send requests to another computer or program.
M	
default value	A default value is the pre-defined configuration of a system or an application. In most programs, the default value can be changed as required.
schema	A schema is a collection of logical structures of data or schema objects.
P	
evaluation project	An evaluation project is used to evaluate the source database so that users can migrate the database schemas to the selected target database.
procedural language/ PostgreSQL (PL/ pgSQL)	Procedural language/PostgreSQL (PL/pgSQL) is a procedural programming language which is supported by object-relational database management system (ORDBMS) of PostgreSQL.

Term	Description
PL/SQL	PL/SQL is an extension of SQL statements. PL/SQL is a combination of SQL statements with the procedural features of programming languages. It is developed to enhance the capabilities of SQL statements.
PL/SQL function	A function is a PL/SQL block which is similar to a procedure. The major difference between a procedure and a function is that a function must always return a value, but a procedure may not return a value.
Postgres/ PostgreSQL	<p>PostgreSQL (Postgres for short) is an object-relational database management system (ORDBMS) with an emphasis on extensibility and standards compliance.</p> <p>It is used to store data securely, support best practices, and retrieve data as requested by other software applications. The software applications can run on the same computer as PostgreSQL or on another computer over a network, including the Internet.</p> <p>PostgreSQL is free and open-source software released under the PostgreSQL license terms.</p>
Q	
migration	Migration is a process of migrating scripts, queries, schemas, and data from the source database (for example, Oracle) to the target database (for example, RDS for MySQL)
S	
schema	A schema is a collection of database objects. Generally, a user corresponds to a schema. The schema name of the user is the same as the user name by default.
database	<p>A database (DB) is a collection of related information, making public retrieval simple and efficient.</p> <p>database properties:</p> <ul style="list-style-type: none"> • Database name • Endian file format (BIG_ENDIAN or LITTLE_ENDIAN) • relationship • There must be a relationship between database data.
database administrator	<p>A database administrator (DBA) is responsible for installing, configuring, upgrading, managing, monitoring, and maintaining databases.</p> <p>This role focuses on database policy development and design, database performance and capacity monitoring and improvement, and future expansion requirement planning. The DBA may also plan, co-ordinate and implement security measures to safeguard the database.</p>

Term	Description
database management system	A database management system (DBMS) is a software package with computer programs. It controls the creation, maintenance, and usage of databases. It allows organizations to conveniently develop databases for various applications.
index	An index is an ordered data structure in a database management system to speed up table data query and update.
database evaluation	Database evaluation covers the object compatibility analysis of the source database, target database recommendation, workload evaluation, and migration risk identification to identify the feasibility and risks of migrating data from the source database to the target database.
SQL conversion	The function for SQL conversion is a single-row function whose parameter type can be a column name, text, or expression. TO_CHAR, TO_NUMBER, and TO_DATE can be used to convert data types.
structured query language	Structured query language (SQL) is used to manage relational databases.
view	Views restrict access to specific rows or columns of a table. A view is a virtual table exported from one or more tables. Its contents are defined by a query.
T	
graphical user interface	<p>A graphical user interface (GUI) is a working environment in which a computer user is presented with a screen. There are pictures or icons representing programs, actions or files on the screen. The user can use a mouse cursor (or similar pointing device) to select an appropriate icon, or use arrow keys or other keys on the keyboard to move and select an appropriate icon on the screen. There are often drop-down menus available when the mouse is placed over certain parts of the screen.</p> <p>A GUI typically uses object-oriented or event-driven programming, rather than a sequence of pre-determined actions. An application waits for an event such as a mouse click over a particular icon, to determine what action is required and execute the appropriate piece of code. The application then goes back to the "wait" state until another event occurs, such as a mouse click over a different icon.</p>

Term	Description
uniform resource locator	A uniform resource locator (URL) is a unique identifier used to locate a resource on the Internet. It is also referred to as a web address.
Y	
metadata	Metadata is defined as the data providing information about one or more aspects of the data. Metadata defines data properties and is used to specify data storage locations, record historical data, retrieve resource data, and record information.
consistency	The database must remain in a consistent state. The effects of a transaction are invisible to other concurrent transactions until that transaction is committed.
Z	
field	A database field is a set of data values, of the same data type, in a table. It is also referred to as a column or an attribute. Field attributes: <ul style="list-style-type: none">• Field name• Field type• Field size• Wildcard value: default value (Only the following field types have default values: UINT8, UINT16, UINT32, STRING, VSTRING, and IP_ADDRESS.)
primary key	A primary key uniquely specifies a tuple in a table. There is only one primary key in a table. Natural attributes (attributes used to describe data being entered) can also be used as primary keys. Surrogate keys are usually used as primary keys.
dashboard	A dashboard is a graphical user interface that typically provides at-a-glance views of key performance metrics (KPIs) related to a specific objective or business process.
execute	Refers to executing an instruction.