Data Transmission Service

Operation Guide

Product Introduction

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MySQL Data Online Import

Last updated：2018-07-30 15:19:15

TencentDB Service for Transmission (DTS) provides data migration and continuous data replication from self-built MySQL databases to TencentDB, allowing users to migrate hot data without interrupting their services. Data migration is supported for local IDCs with public IP/Port or access to Tencent Cloud via direct connection, or MySQL databases in Tencent Cloud CVMs. **MySQL 5.7 does not support DTS, and you can import your data by downloading cold backup files.**

Preparations

Note

- A DTS data migration task involves two steps: cold backup data export and incremental data synchronization. **Cold backup data export and migrated data comparison have certain effect on the load of the source database**, so it is recommended to perform database migration during off-peak hours or in the standby database.
- **Specified Database Table Migration**
  - If, for example, lower_case_table_name is specified for migration, a migration verification task will be performed to check if the configuration is consistent between the source/destination instances. If not, an error message will display, which helps prevent any restart issue due to lower_case_table_name.
- **Whole Instance Migration**
  - To migrate configurations where the source instance has different restart-requiring parameters, such as lower_case_table_name, from the destination instance, configure to require restarting the destination instance.
  - To import cold backup files and rebuild master/slave instances for migration from Alibaba Cloud, restarting the destination instance is required.
- **Super permission for the source instance is required**

Super permission for source instance

For accounts to be used for migration, it is recommended to acquire the Super permission for the source instance. The Super permission is required in the following scenarios:

- Before data migration is completed, DTS will check data consistency, which requires the Super permission to change the "session" parameter and "binlog_format".
- **If, during binlog synchronization, a user creates an Event in the source instance and an account that is not used for DTS data migration is specified as DEFINER for this event, an error will occur if the Super permission is unavailable.**

Databases supported for migration

- Data migration from self-built CVM MySQL databases in basic and VPC networks to TencentDB instances.
- Data migration from MySQL databases with public network IP/Port to TencentDB instances.
- Data migration from MySQL databases with access to Tencent Cloud via VPN or direct connection to TencentDB instances.

Check the following in advance

1. Check if any database table with the same name as the target TencentDB instance exists, to avoid conflict;
2. Check database version. Cloud migration is supported for MySQL 5.1/5.5/5.6. As MySQL 5.1 is no longer supported by Tencent Cloud TencentDB, it is recommended that you update MySQL 5.1 to MySQL 5.5 first, then migrate data to TencentDB for MySQL 5.5. You can also use the DTS data migration tool to directly migrate data from local MySQL 5.1 to Tencent Cloud TencentDB for MySQL 5.5.
3. Check the capacity of the destination TencentDB instance, which must be larger than that of the source instance;

4. Create a migration account in the source MySQL database (this is not required if you already have an authorized account for data migration);

```
GRANT ALL PRIVILEGES ON *.* TO "migration account"@"%" IDENTIFIED BY "migration password";

FLUSH PRIVILEGES;
```

5. Confirm source database MySQL variables
   Use `SHOW GLOBAL VARIABLES LIKE 'XXX'` ;

   Check MySQL global variables to confirm whether migration can be performed under the current status:

server_id > 1

log_bin = ON;

binlog_format = ROW/MIXED

binlog_row_image = FULL

innodb_stats_on_metadata = 0

It **is** recommended that wait_timeout **is** higher than **or** equal to 3,600 seconds, **and** it must be lowe r than 7,200 seconds.

The same time length **is** configured **for** interactive_timeout **and** wait_timeout.

If the source instance **is** slave, confirm the following parameters **in** the source instance:

log_slave_updates = 1

6. Change variable value:

a. Change the source database MySQL configuration file `my.cnf` , and restart:

log-bin=[custom binlog file name]

b. Modify configuration dynamically:

set global server_id = 99;

set global binlog_format=**ROW**;

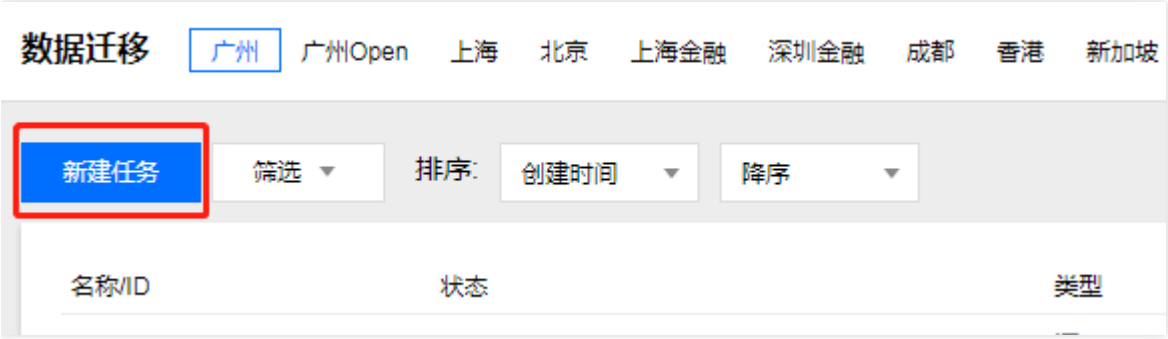
set global binlog_row_image=**FULL**;

set global innodb_stats_on_metadata = 0;

Procedure

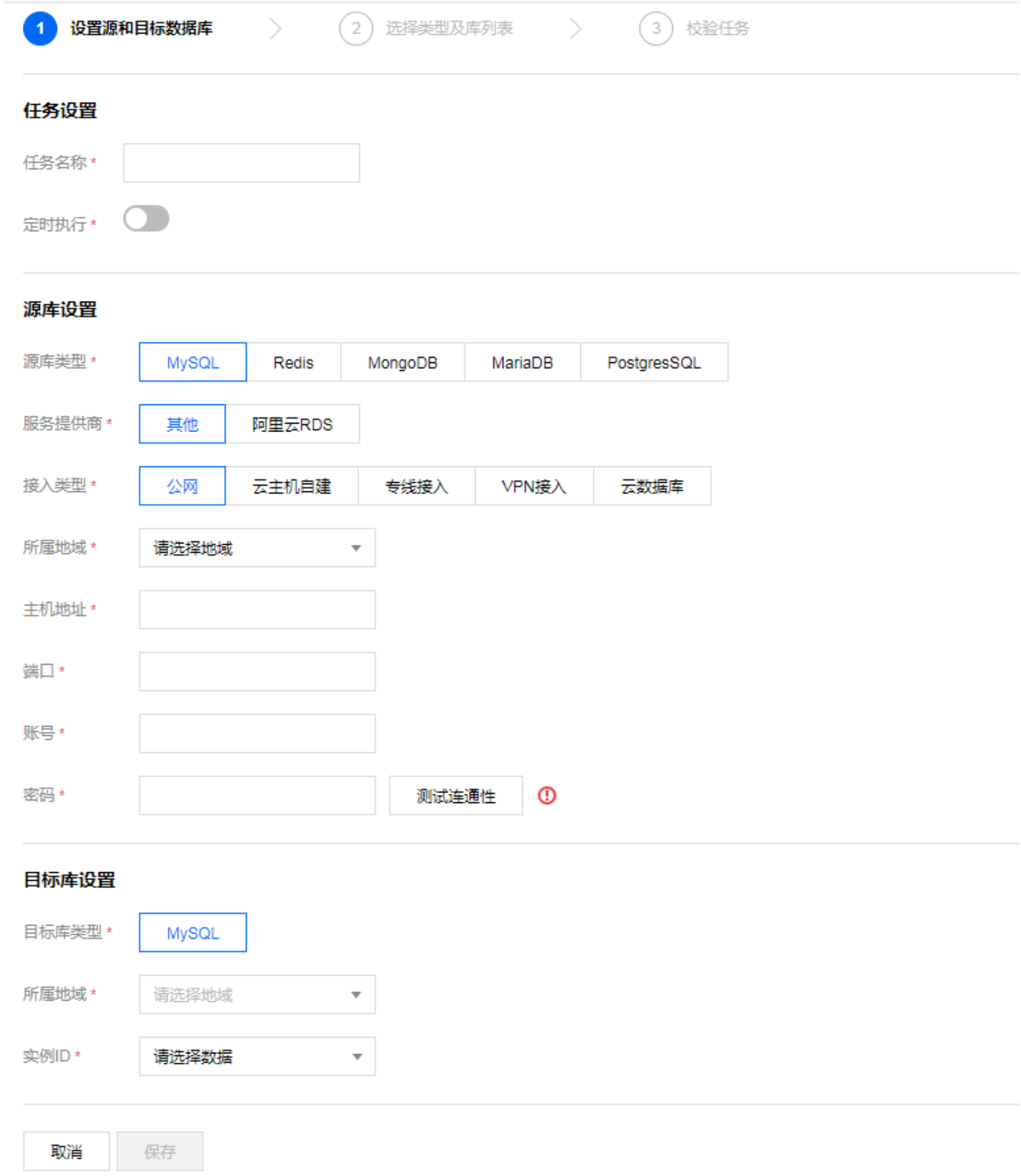
Create DTS data migration service

Log into the console, go to the Data Migration page and click **New Task**.



Modify configuration

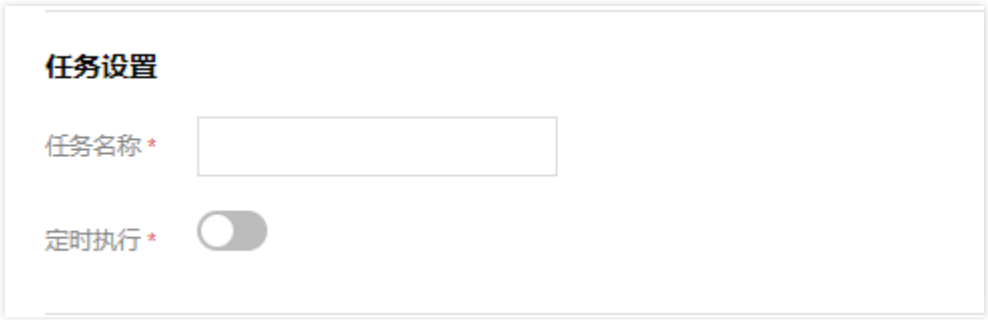
On the page you are redirected to, complete task configuration, source database configuration, and destination database configuration. Details:



Task configuration

- Task Name: Specify a name for the task.

- Execution schedule: Specify a start time for your migration task.



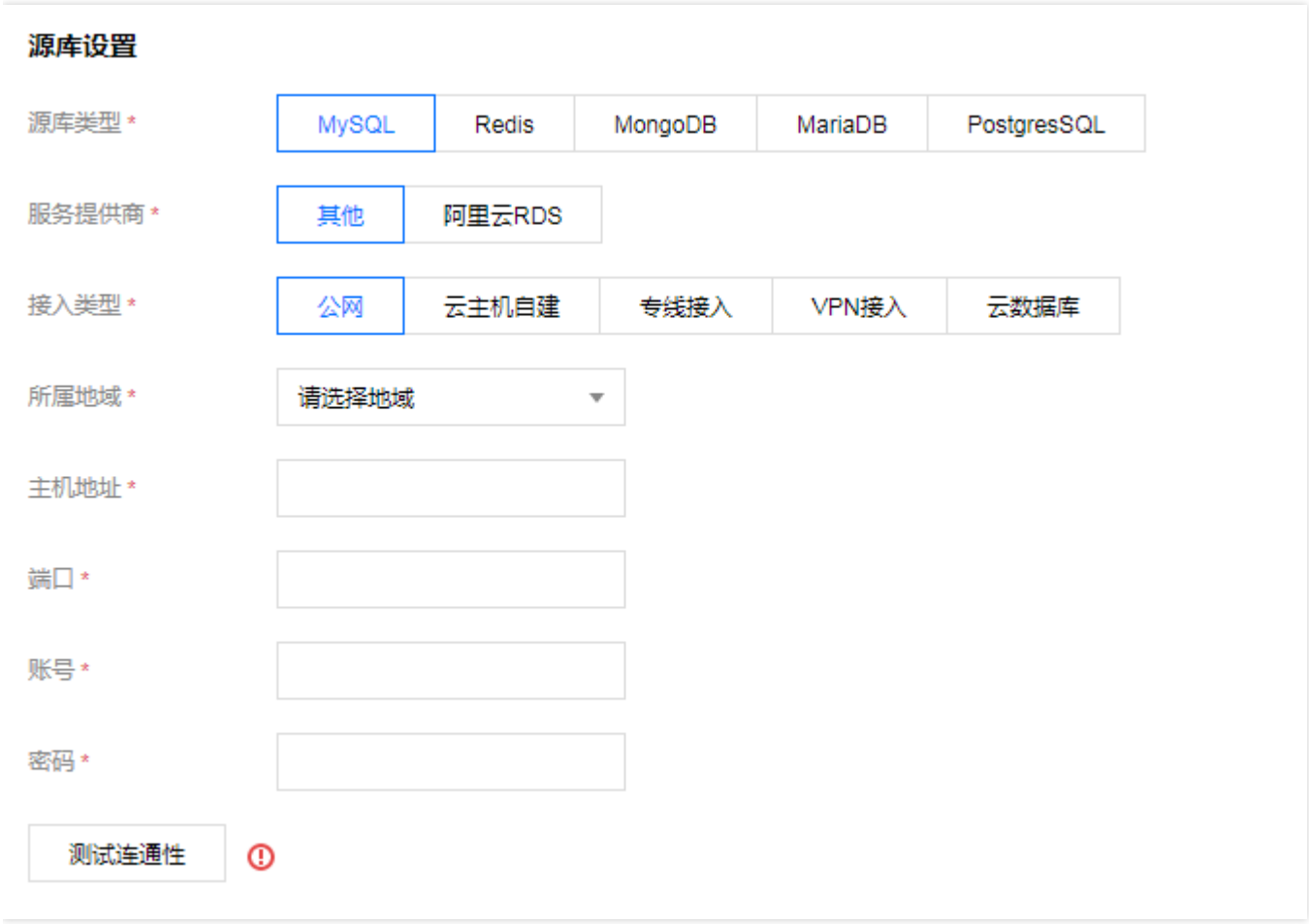
Source database information

- Source database type: Four types of source databases are supported for now: MySQL with public IP, self-built MySQL on CVM, MySQL with access to Tencent Cloud via direct connection, and MySQL with access via VPN.

  MySQL with public IP: MySQL databases accessible via public IP.

  Required information:

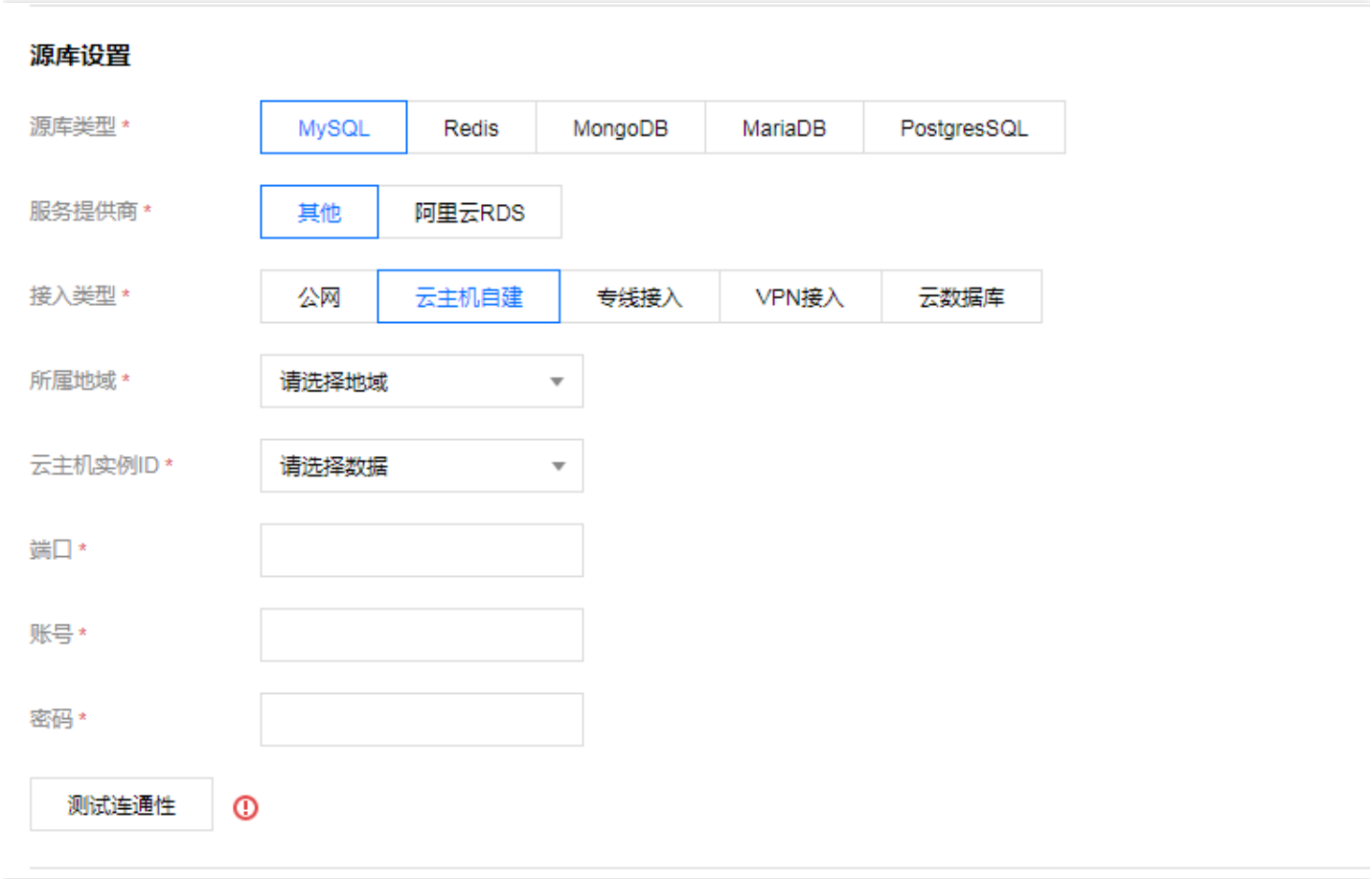
- CVM address of MySQL
- Port of MySQL
- Account of MySQL
- Password of MySQL



Self-built MySQL on CVM: CVM-based self-built MySQL databases in basic network and those in VPCs are all supported. You need to specify the ID of the CVM instance and the network environment where it is located.

Required information:

- Region: Data migration is only supported when the CVM-based self-built MySQL and the destination TencentDB are in the same region. If the CVM and TencentDB are located in different regions, select **MySQL with Public IP** and perform migration using CVM public network.
- CVM network: Both basic networks and VPCs are supported.
- VPC: If you select VPC, select the VPC and subnet where the instance belongs to.
- CVM instance ID
- Port of MySQL
- Account of MySQL
- Password of MySQL



MySQL connected via Direct Connect: You can migrate data to Tencent Cloud using DTS for local IDC self-built MySQL databases connected to Tencent Cloud through the Direct Connect (DC) service. Required information:

- Direct Connect Gateway: The direct connect gateway used by the database server to connect to Tencent Cloud. About Direct Connect Gateway
- VPC: The VPC where the direct connect gateway belongs to.
- CVM address of MySQL: The CVM address of MySQL in the IDC. DTS accesses the CVM by mapping with the IP through the direct connect gateway.
- Port of MySQL
- Account of MySQL
- Password of MySQL

MySQL with access via VPN: You can migrate data to Tencent Cloud using DTS for local IDC self-built MySQL databases connected to Tencent Cloud through VPN Connection or a self-built VPN service in CVM.

Required information:

- Region: VPN services are only supported if they are in the same region.
- VPN type: Cloud VPN Service or self-built VPN on CVM.
- VPN gateway: This information is only required for Cloud VPN Service. About VPN
- VPC: The VPC where the VPN service belongs to.
- CVM address of MySQL: The CVM address of MySQL in the IDC. DTS accesses the CVM by mapping with the IP through the direct connect gateway.
- Port of MySQL
- Account of MySQL
- Password of MySQL

Select the database to migrate

Select the database to migrate (you can choose to migrate the entire database or only certain tables), create migration task and check task information.

Notes:

1. The character_set_server and lower_case_table_names configuration items are migrated only when the whole instance is migrated.
2. If the character set configuration of migrated tables for the source instance is different from that of the destination instance, the character set configuration of the source instance is retained.

Data migration: Export data in the selected database and import it into TencentDB for MySQL.
Incremental synchronization: After performing data export and import, configure TencentDB for MySQL as the slave database for source database to achieve incremental synchronization between master and slave.
Overwrite root account: Since the root account is used for security verification for cloud databases, subsequent TencentDB operations will be affected if no root account exists in the source database. Therefore, if the entire instance is migrated, you should specify whether to overwrite the destination database root account with the source database root account. Choose **Yes** if you want to use the root account of the source database or if no root account is configured for the destination database. Choose **No** if you want to retain the root account for the destination database.

Data consistency test

Select a data test type. (Choose from whole test, partial test, or no test.)

Note:
The test ratio fields are required for certain test items.

Verify migration task information

After a migration task is created, verify the task information. Click **Next Step: Verification Task** to verify it. You cannot start the task until all the verification items pass. Click **Start** to complete the process.

There are 3 statuses for task verification:

- Pass: This means verification is fully passed.
- Warning: This means that the verification did not pass. Database operation may be affected during or after data migration, but the migration task can still be executed.
- Failed: This means that the verification did not pass, and the migration task cannot be executed. If the verification fails, check and modify the migration task information according to the error entries and then retry the verification. To view the cause of failure, please see "Verification Failure Description".

Start migration

Once the verification passes, you can click **Start Migration** to start the migration right away. Note that if you have set a specified time for a migration task, the task will be queued and executed at the specified time. Otherwise, it will be executed immediately.
When the migration is started, you can see the corresponding migration progress information under the migration task. Required migration steps and the current stage will be displayed if you move your cursor over the exclamation mark following the steps.

> **Note:**
> Due to system design limitations, multiple migration tasks submitted or queued at the same time will be performed serially based on the queuing time.

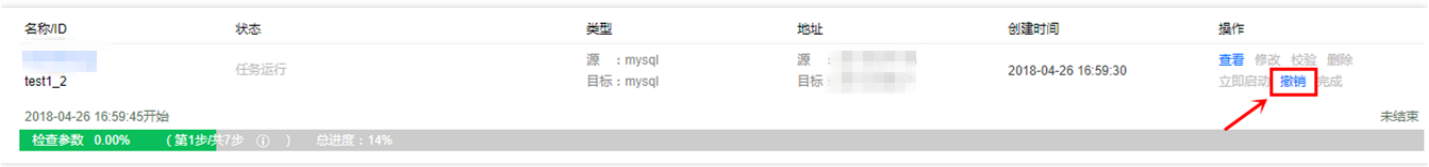
Incremental synchronization

When creating a migration task, the incremental synchronization option is selected by default. When data migration is completed, the target TencentDB for MySQL will be set as the slave database for the source database, and new data of the source database during migration will be synchronized to the destination TencentDB for MySQL via master/slave synchronization. In this case, any changes made to the source database will be synchronized to the destination TencentDB for MySQL.
After migration, click the **Finish** button to terminate the synchronization relationship between source and destination databases, then switch the service to the destination the TencentDB for MySQL instance to complete migration.

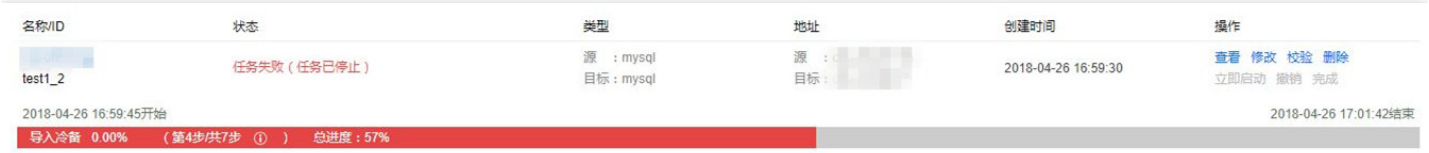
> **Note:**
> Before terminating synchronization, do not write data into the destination database instance as this may cause data inconsistency between the source and destination databases, which will cause data comparison to fail, resulting in a failed migration.

Cancel migration

To cancel an in-progress migration task, click the **Cancel** button.



The following displays upon cancellation:



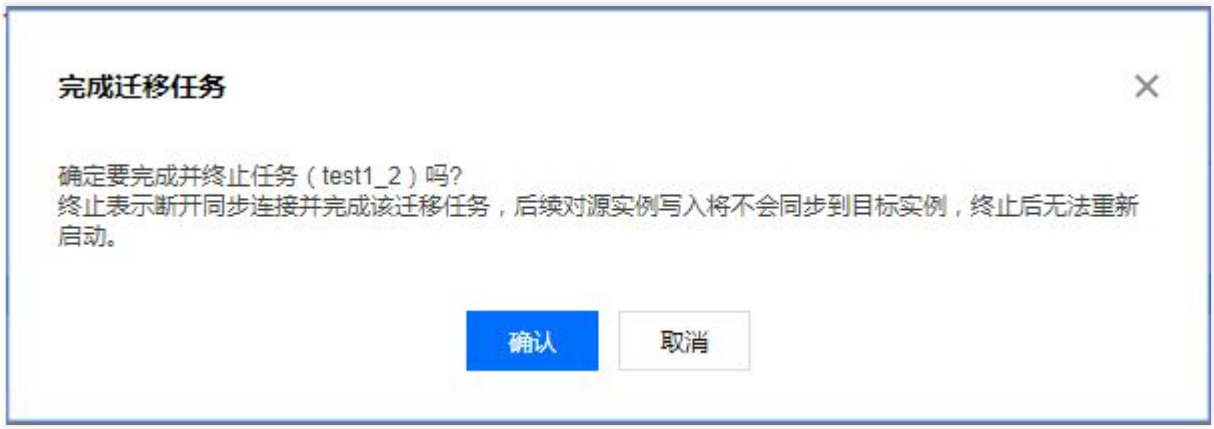
Notes:

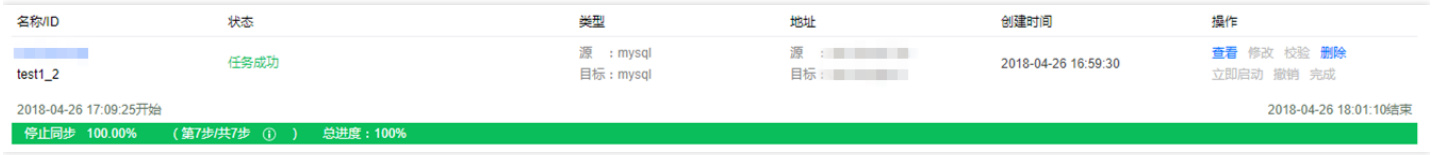
1. Clicking the Cancel button does not clear any data synchronized to the destination instance.
2. Restarting the task may cause the verification or task to fail. You may need to manually clear all conflicting databases or tables in the destination database to start the migration task again.
3. When migrating a single table, make sure that tables relied on by foreign keys of all tables are migrated.

Complete migration

When the migration is 100% complete, click the **Finish** button on the right to complete the migration.

The following displays after you click **Finish**:





Note:

While the migration is in a status of **Unfinished**, the migration task will continue, so will data synchronization.

MySQL Offline Data Migration

Last updated：2018-08-24 17:12:14

Migrating Data via Console

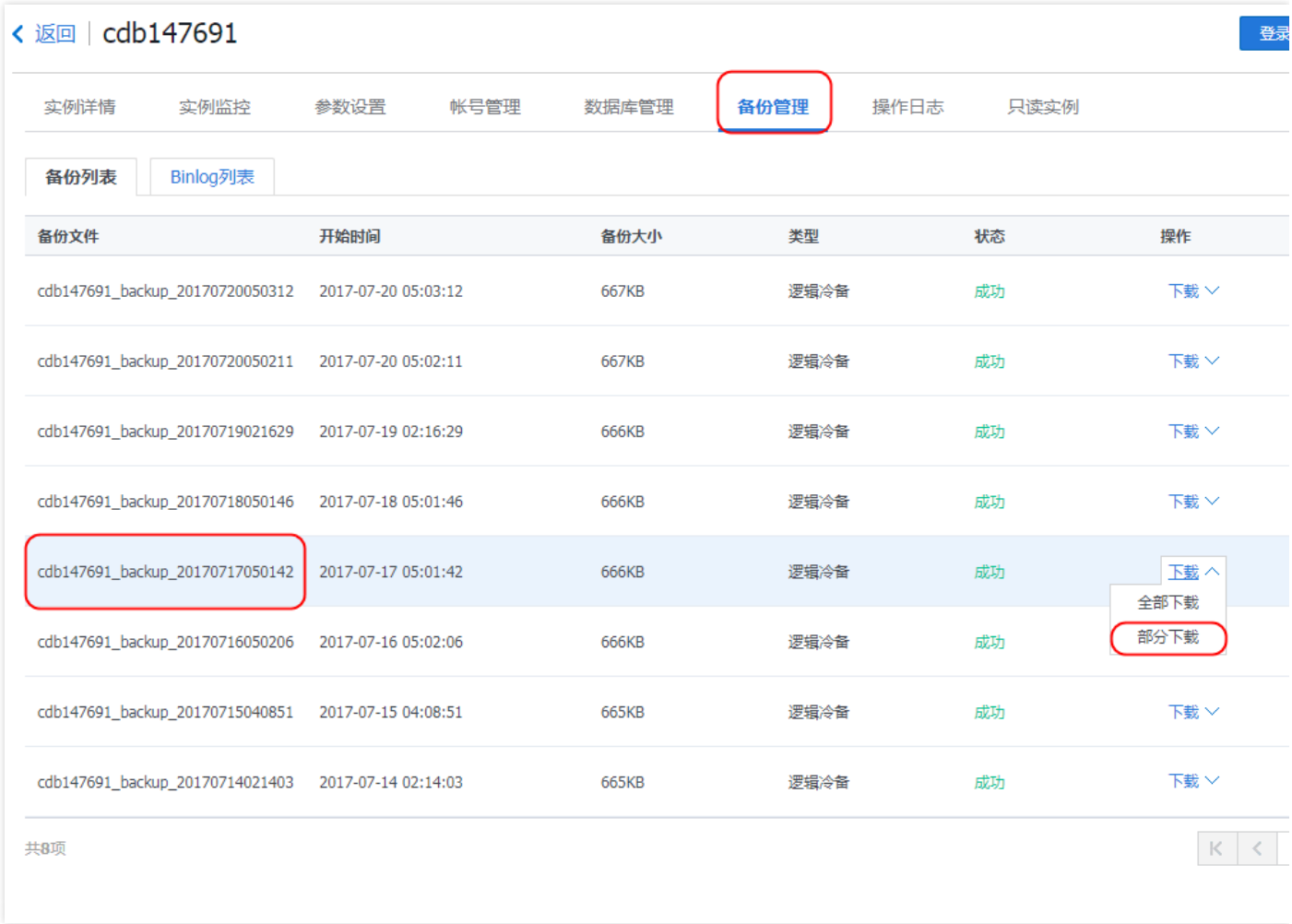
1. Log in to the Cloud Database console to download backup files. (For more information, please see Downloading Backup Files)
2. A database can be recovered with MySQL command line tool, as shown below:

   ```
   shell > mysql -h hostname -P port -u username -p < bak_pathname
   ```

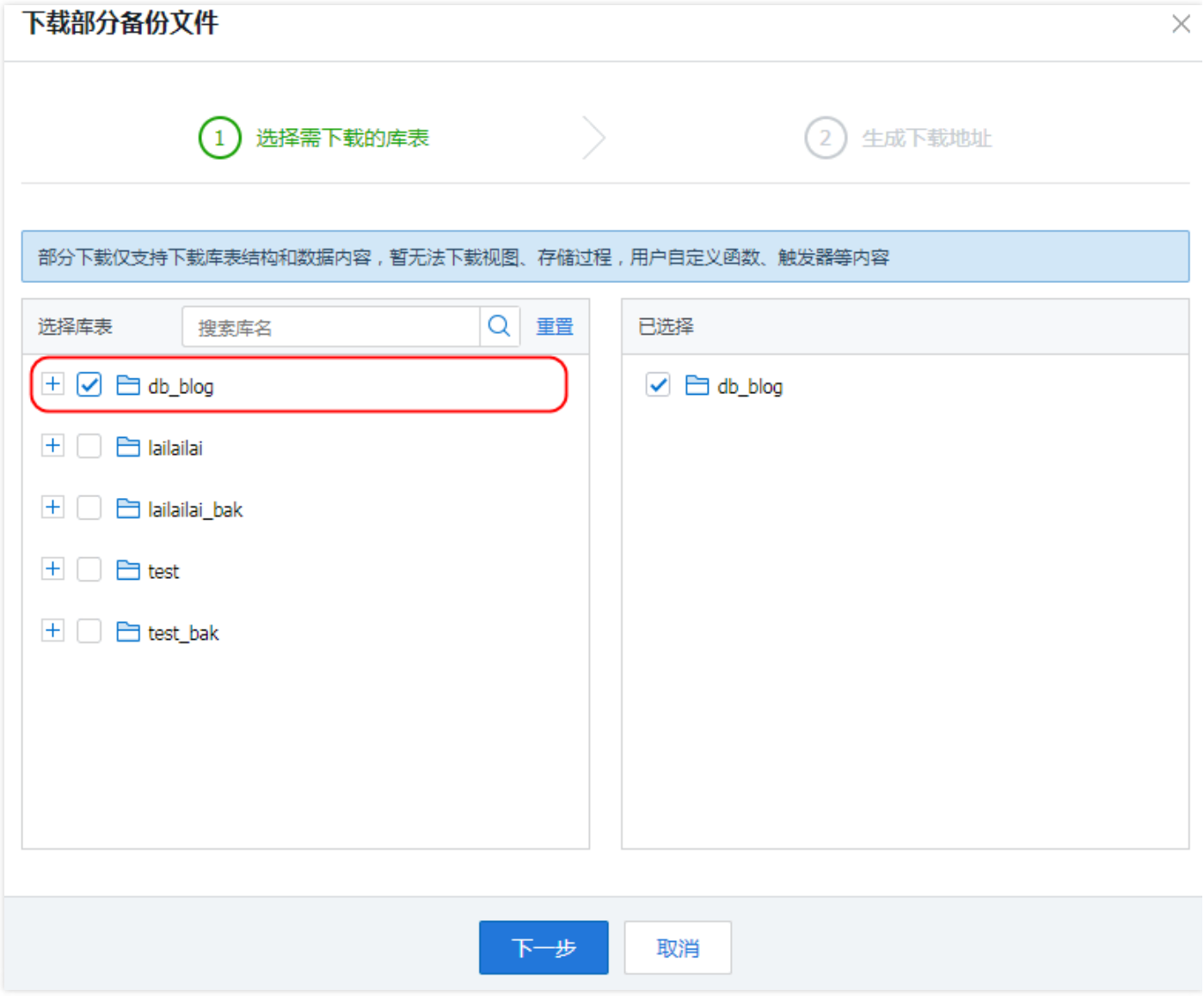
   The "hostname" is the destination server to be recovered. The "port" is the port of destination server. The "username" is the user name for the database on the destination server. The "bak_pathname" is the full path for backup files.
3. Log in to the MySQL database to recover the database table with `shell > source bak_pathname` . The "bak_pathname" is the full path for backup files.

Migrate data on Windows

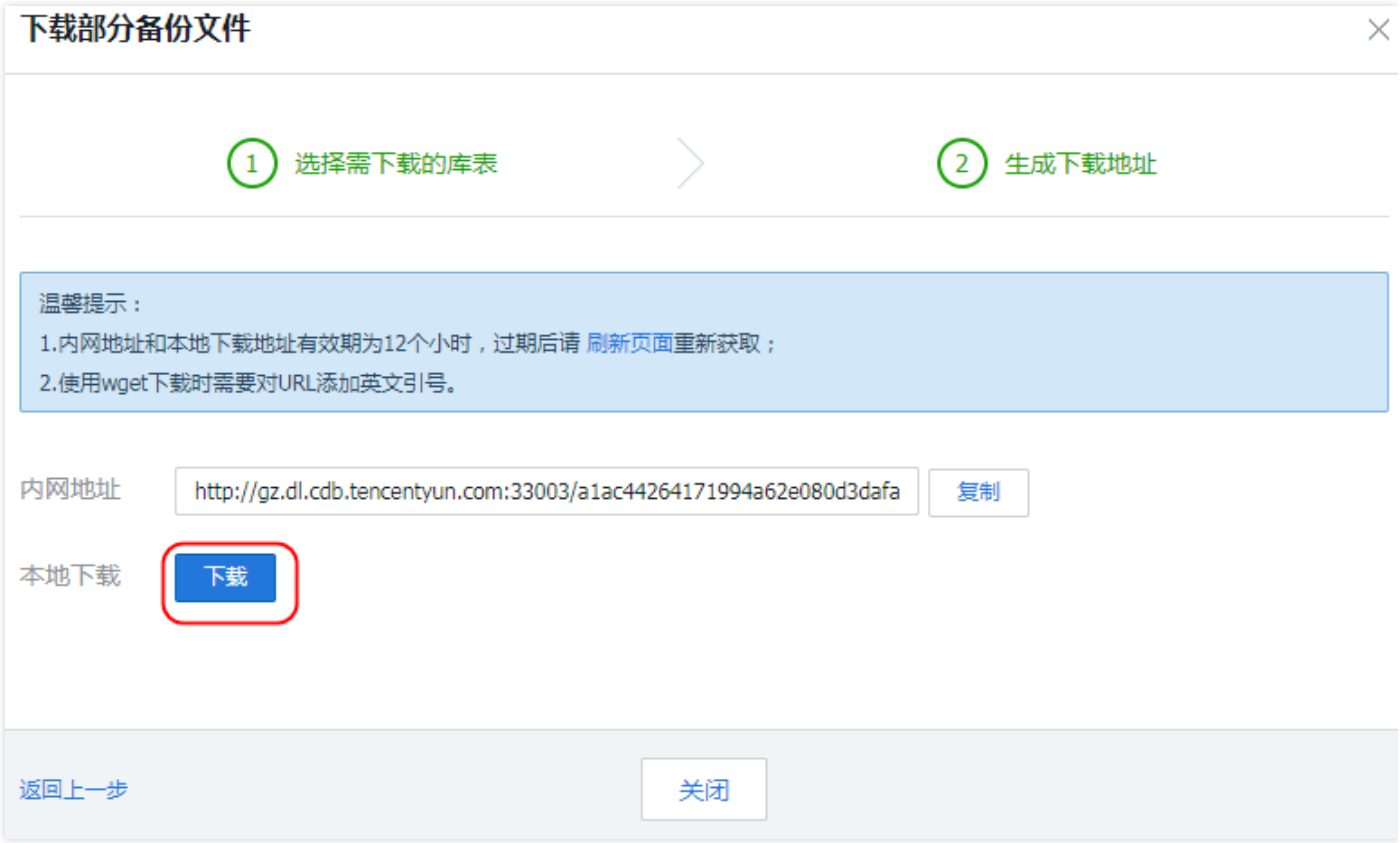
1. Take the database "db_blog" as an example. Log in to the Cloud Database console and locate the instance of which you need to export data. Click **Management** -> **Backup Management** to enter the backup management page. Find the backup files to be downloaded and click **Download** -> **Partial Download**.



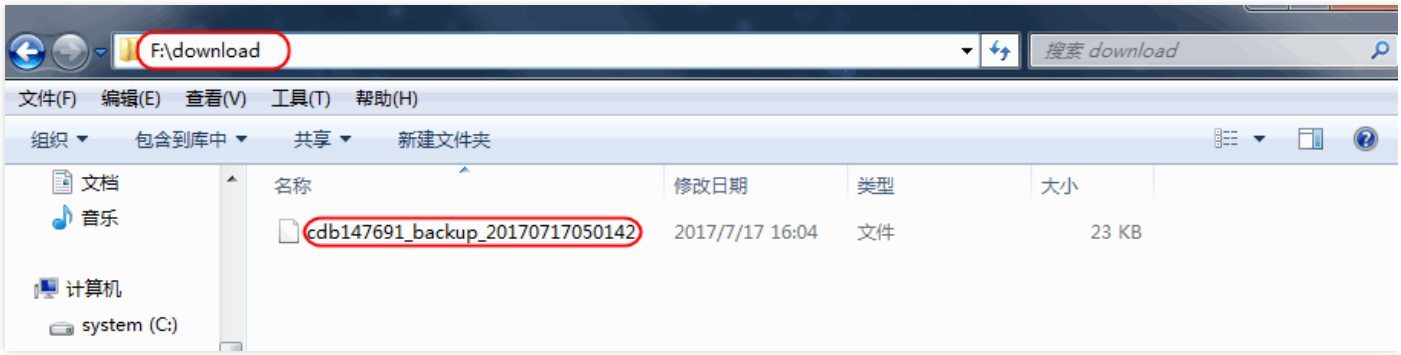
2. Select the database to be exported and click **Next**.



3. Click **Download** in **Download Locally** to download backup files to the local computer.

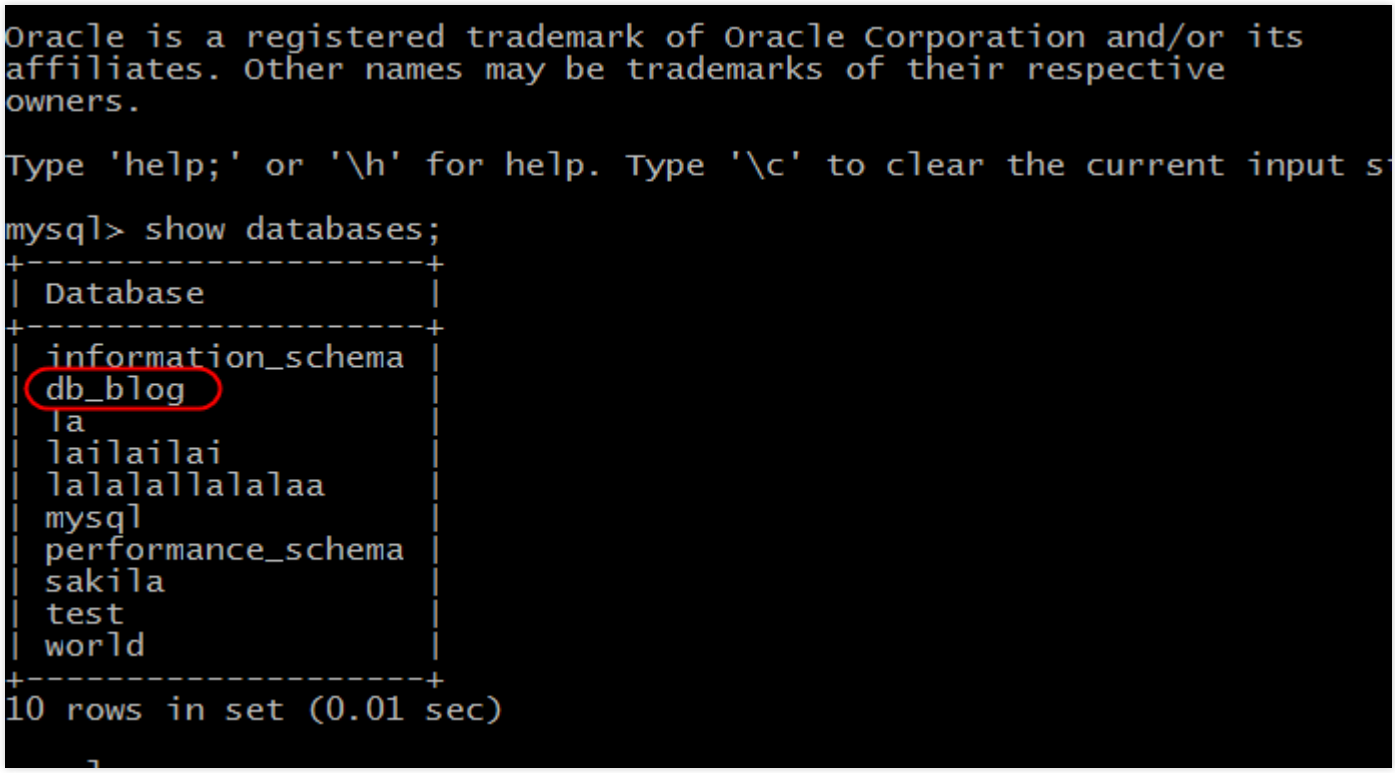


4. Record the full path.
   The full path for this example is as follows: F:\download\cdb147691_backup_20170717050142



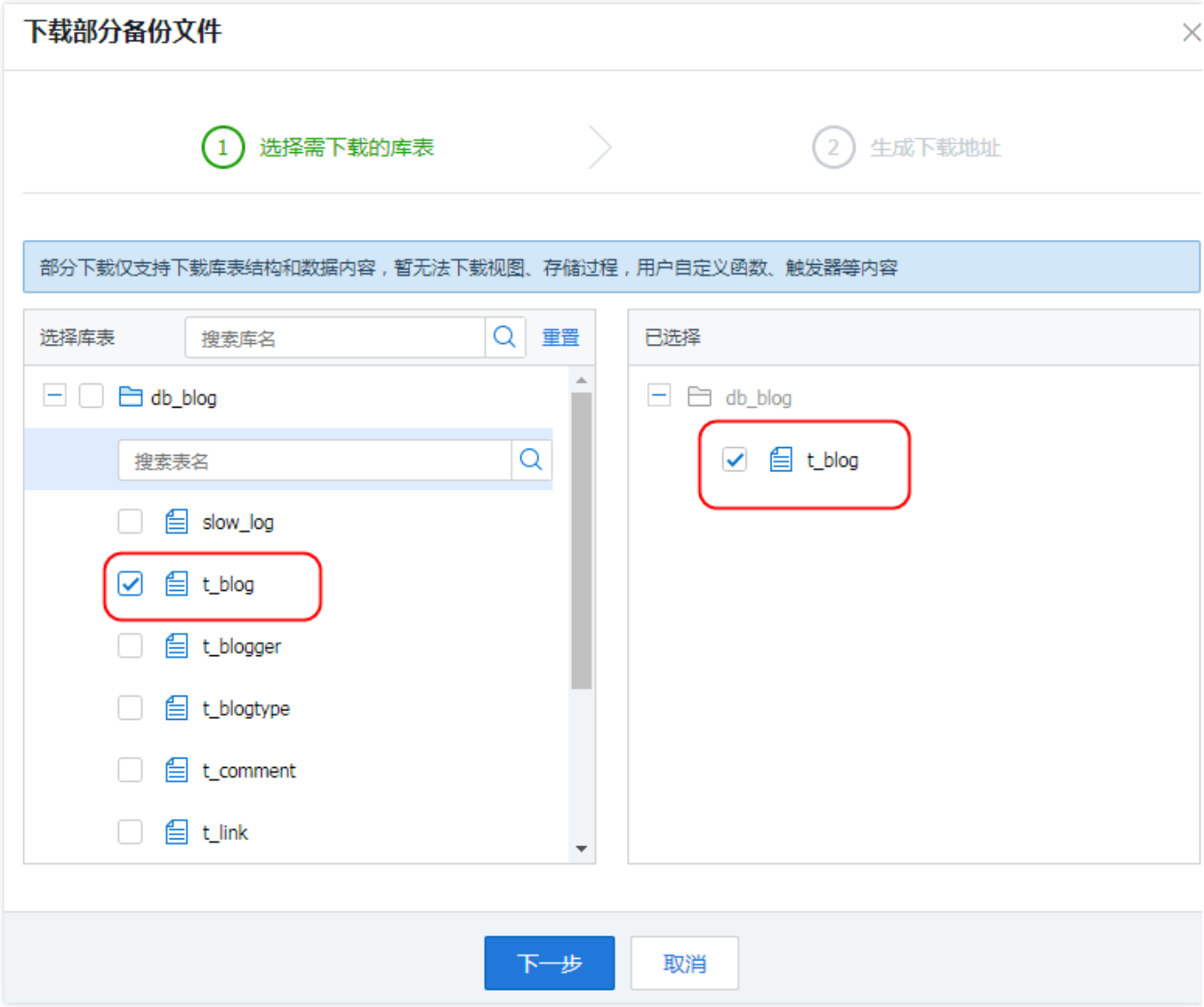
5. Enter the command prompt to recover the database with MySQL command line tool.

6. Log in to the MySQL database, and you can find that the backup database has already been recovered to the server.

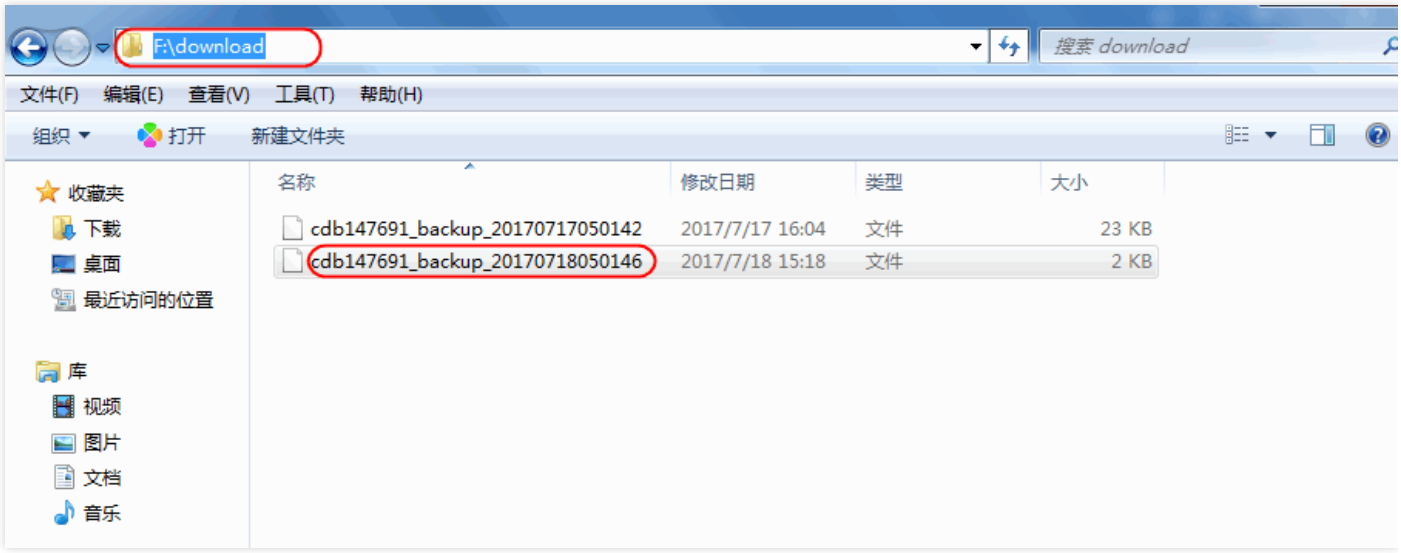


Migrate database table on Windows

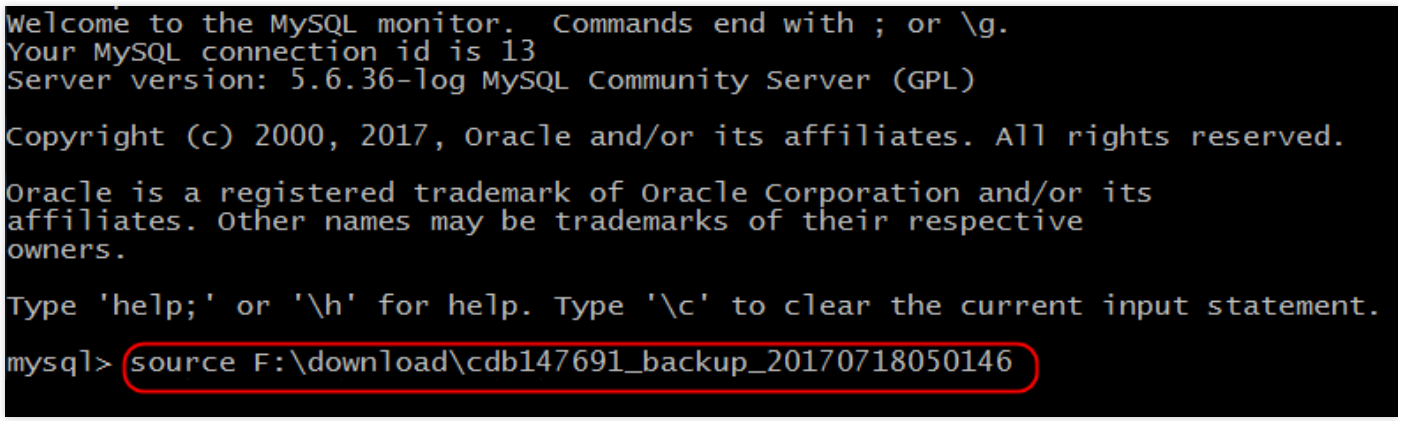
1. Take the database table "t_blog" under "db_blog" as an example. Download backup files from the Cloud Database console.



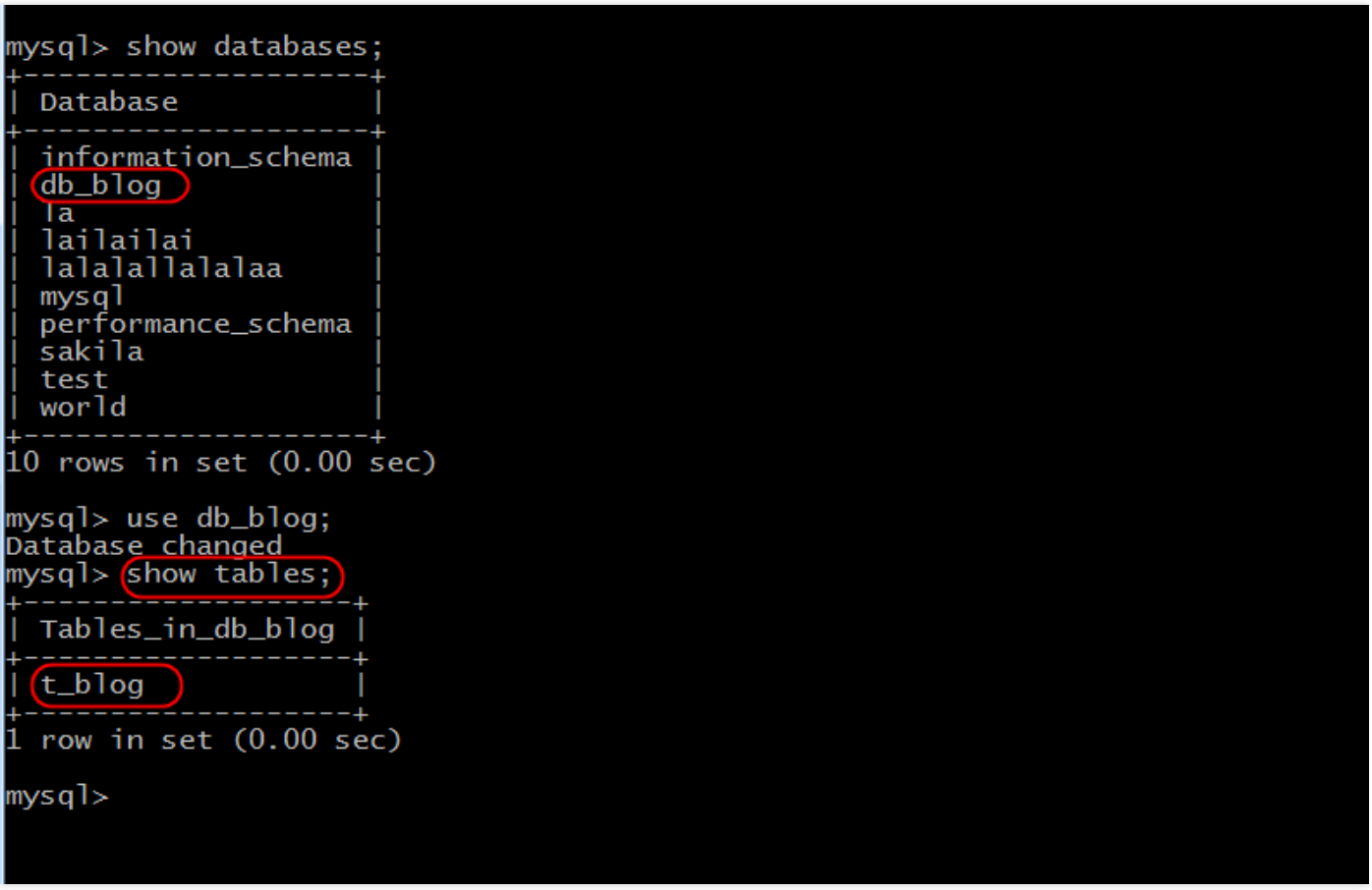
2. Download backup files from the Cloud Database console and record the full path.
   The full path for this example is F:\download\cdb147691_backup_20170718050146.



3. Enter the command prompt to recover the database with MySQL command line tool.



4. Log in to the MySQL database, and you can find that the backup database table has already been recovered to the server.



Migrating Data with Command Line Tool

1. Generate the SQL files to be imported using MySQL command line tool mysqldump, as shown below:

Note:
The data files exported by mysqldump must be compatible with the SQL standard of the purchased cloud database's MySQL version. You can log in to the cloud database via `select version ();` to obtain corresponding MySQL version information. The generated SQL file name can contain English letters/numbers/underscores, but cannot contain "test" characters.

```
shell > mysqldump [options] db_name [tbl_name ...] > bak_pathname
```

The "options" is the export option. The "db_name" is the database name. The "tbl_name" is the table name, and the "bak_pathname" is the export path.
For more information on how to export data with mysqldump, please see official MySQL manual.

2. A database can be recovered with MySQL command line tool, as shown below:

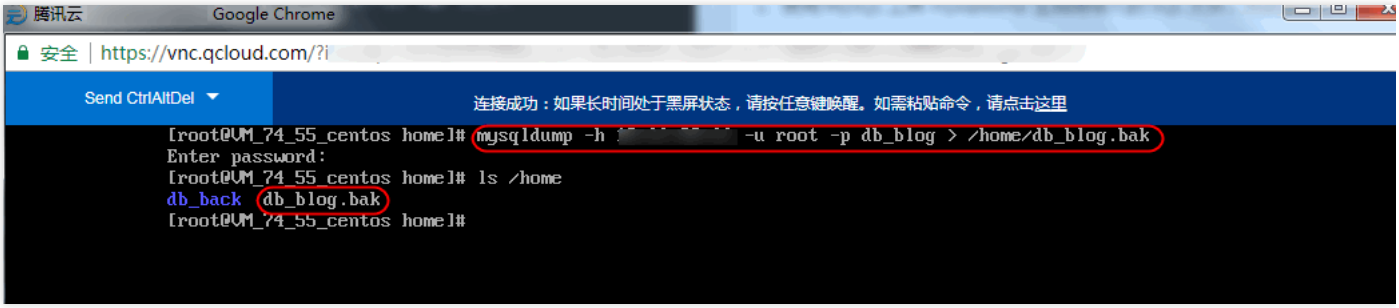
```
shell > mysql -h hostname -P port -u username -p < bak_pathname
```

The "hostname" is the destination server to be recovered. The "port" is the port of destination server. The "username" is the user name for the database on the destination server. The "bak_pathname" is the full path for backup files.

Migrate data on CVM Linux system

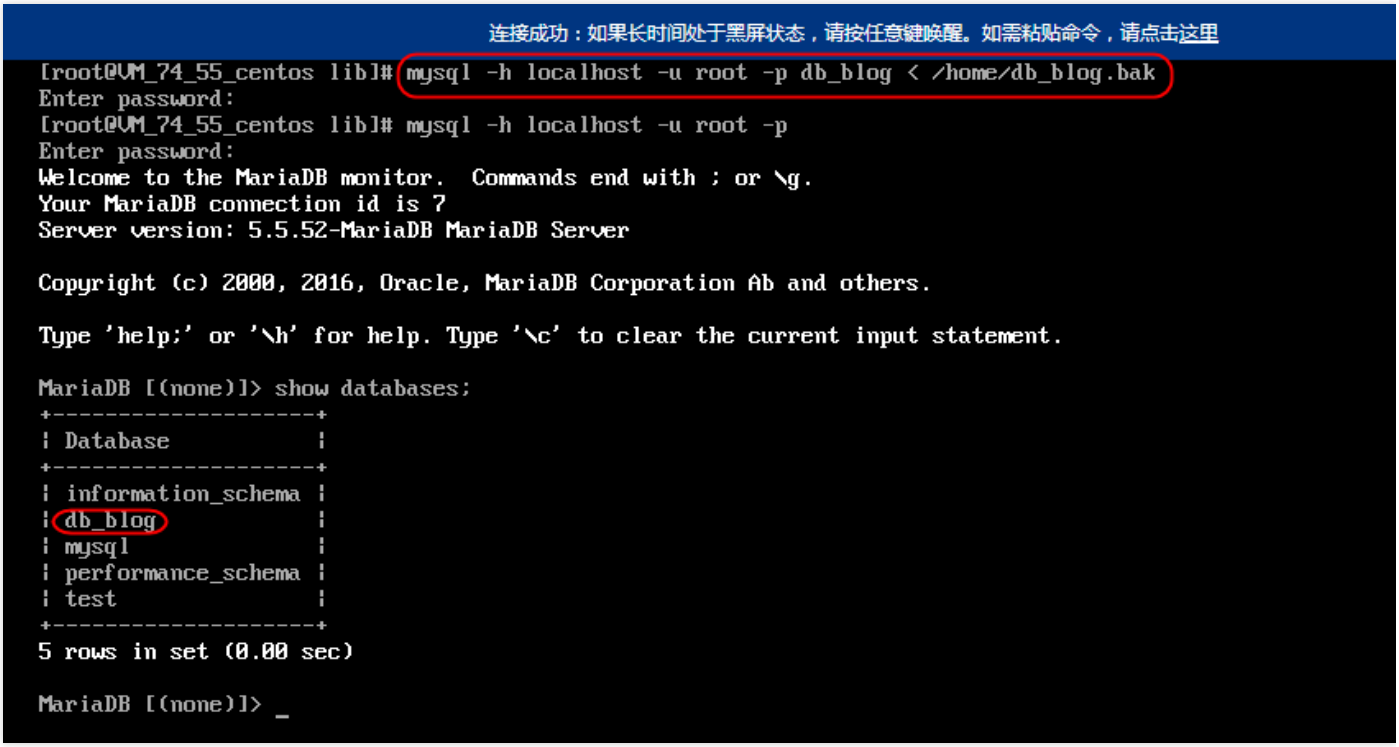
For more information on accessing the database on CVMs, please see Assess MySQL Database.

1. Take the db_blog database on Cloud Database as an example. Log in to the CVM and generate the SQL files to be imported using MySQL command line tool mysqldump, as shown below:



2. Recover the data with MySQL command line tool. In this example, the data is recovered to a CVM. You can find that the backup database has already been recovered to the corresponding database on the

destination server.



Character Set Encoding Issues of Imported Data Files

1. If the imported data files do not specify a character set encoding, the one set by the cloud database will be executed.
2. If the imported data files have specified a character set encoding, the specified one will be executed.
3. If the character set encoding of imported data files is different from those of the cloud database, it will display unreadable codes.

For more information on character set encoding, please see Character Set in Use limits

Migration from Ali RDS to CDB

Last updated：2018-08-15 16:45:04

This document describes how to migrate data from Alibaba Cloud Database (RDS) to Tencent Cloud's TencentDB using the data migration tool DTS provided by Tencent Cloud.

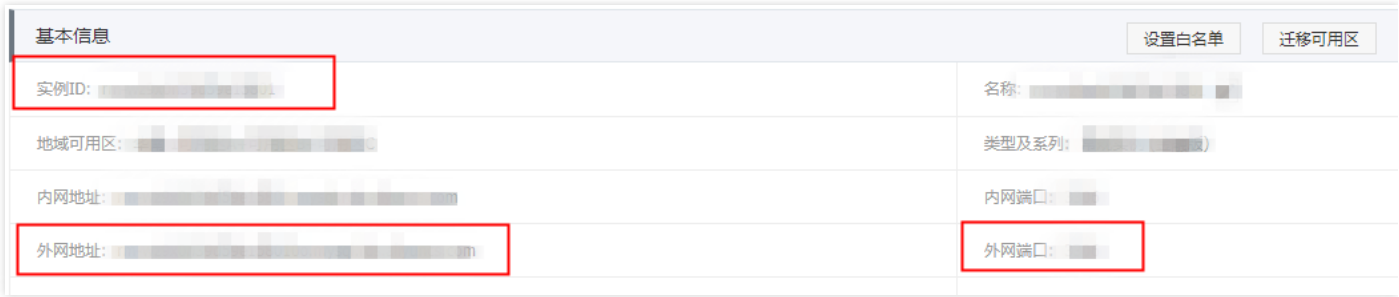
Environment Requirements

Alibaba Cloud CVM MySQL 5.6 or earlier version.
Tencent Cloud TencentDB MySQL 5.6 instance.

Procedure

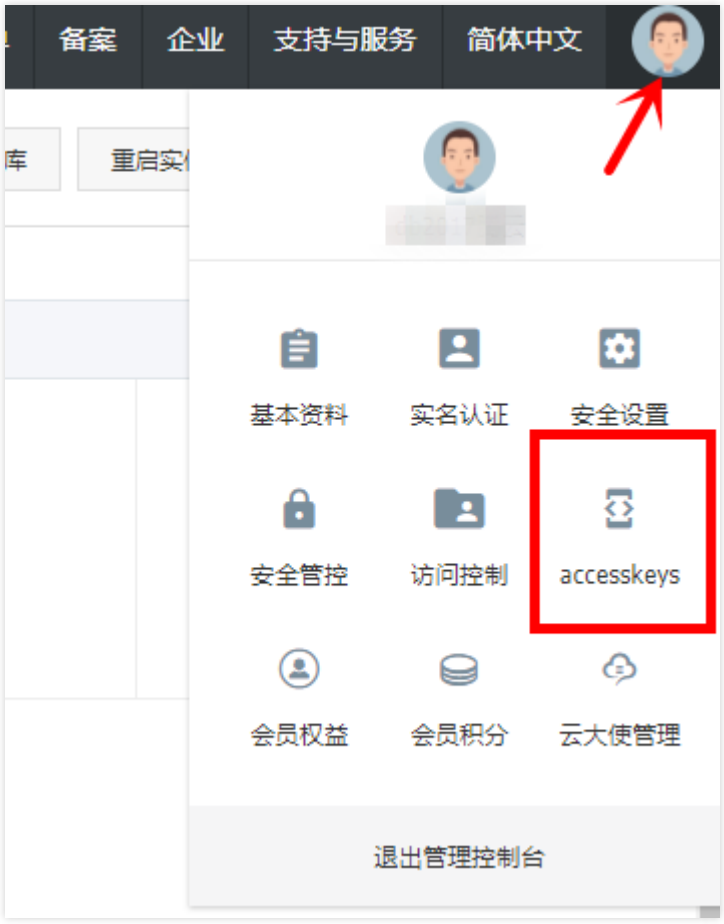
Obtain the basic information and AccessKey of source database

1. Log in to the RDS Management console and select the destination instance.
2. You can obtain necessary information on the basic information page of the destination instance, as shown below:



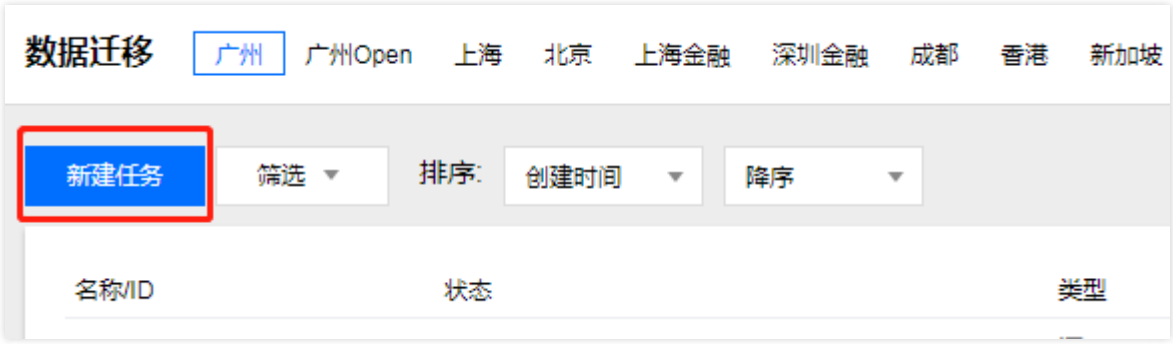
> **Note:**
> Public network addresses provided by Alibaba Cloud need to be converted to IP addresses. Here is an address for querying IP/server address.

3. Hover the cursor over the profile photo in the upper right corner and choose **accesskeys** in the drop-down box. You can obtain the AccessKey in the page.

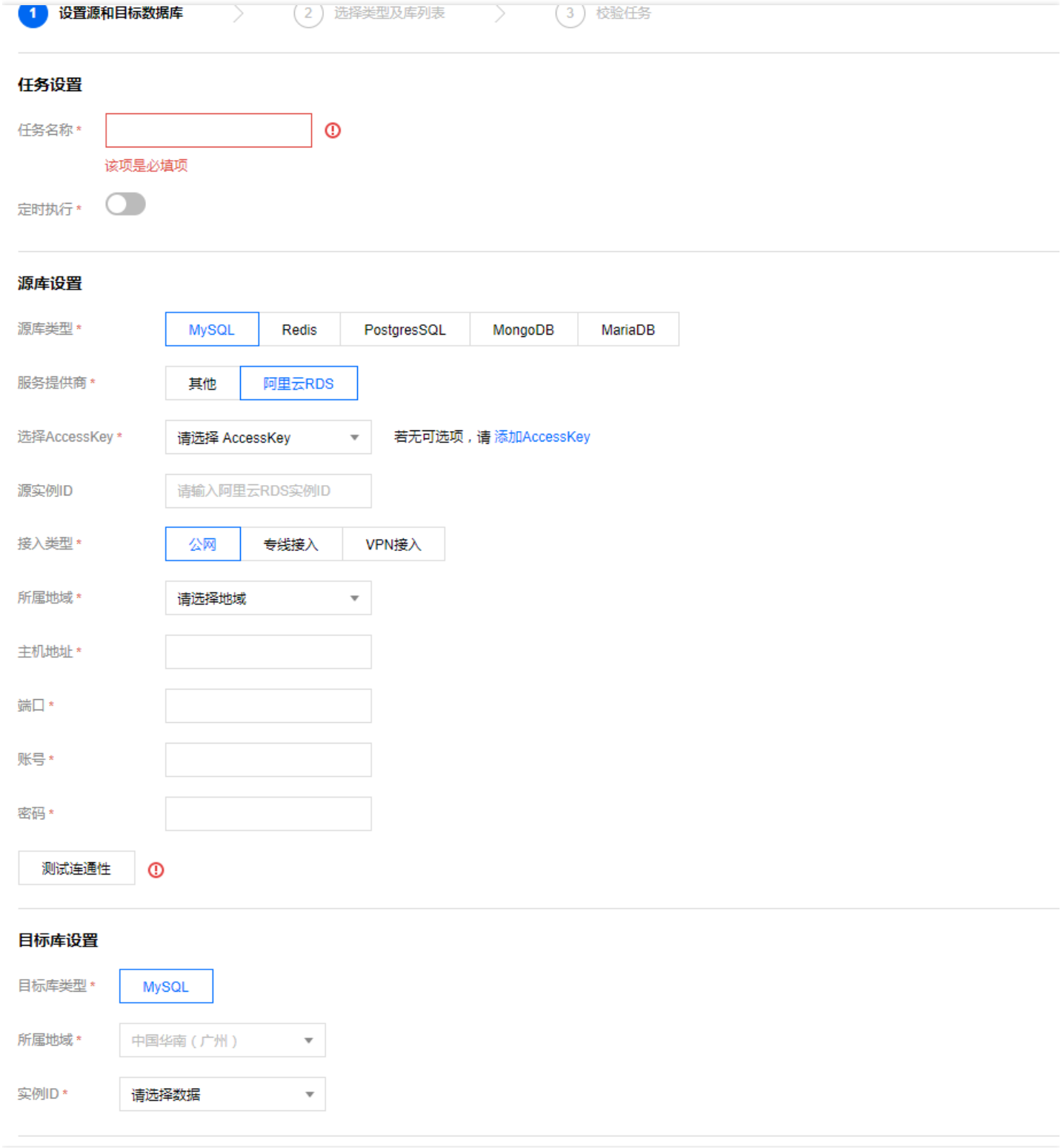


Create DTS tasks of Tencent Cloud TencentDB

1. Log in to the console, go to the Data Migration page and click **New Task**.



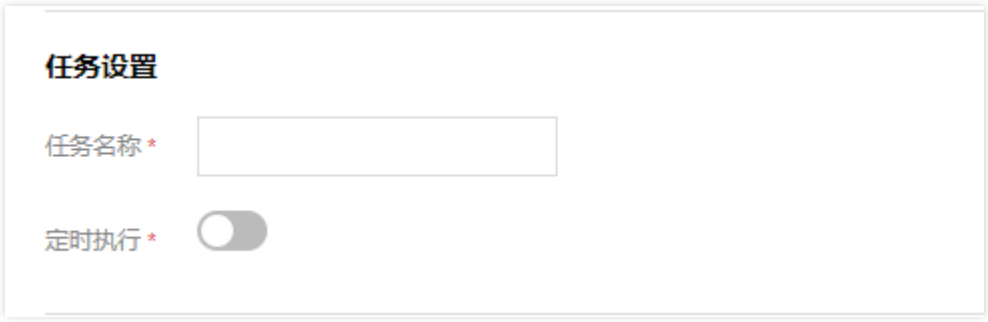
2. On the page you are redirected to, complete task configuration, source database configuration, and destination database configuration. Details:



Task configuration

- Task name: Specify a name for the task.

- Execution schedule: Specify a start time for your migration task.



Source database information

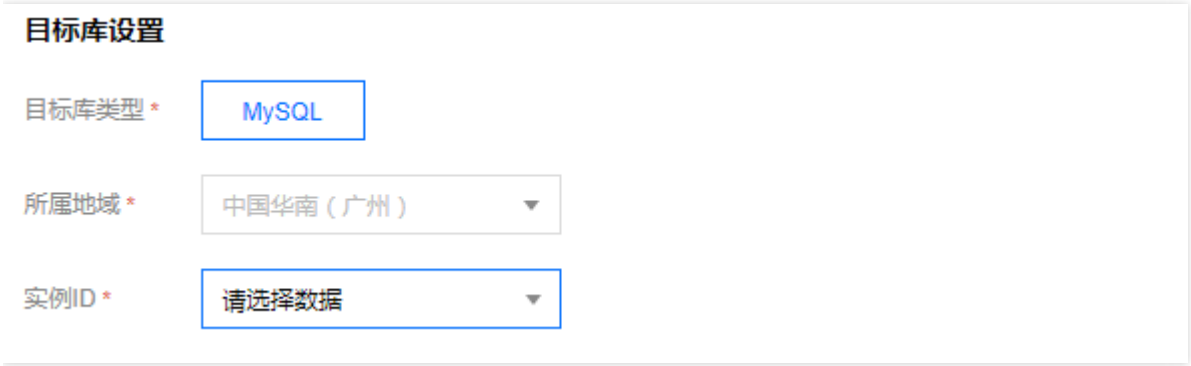
Select the connection type as needed. Enter the connection information of the corresponding source database.

Note:
You need to activate a IP whitelist for external mapping by TencentDB in Alibaba Cloud. Otherwise, the connectivity test fails.
For example:

i. For the mapping of Tencent Cloud's MySQL with public IP, you need to add the corresponding public IP to Alibaba Cloud's whitelist.
ii. For "direct connect" or "VPN" database configured in DTS configuration, an IP for external mapping will appear after the task is generated. You must add the IP to Alibaba Cloud's whitelist.

Destination database information

Select TencentDB instance for the destination instance type and enter the link information of the destination database.



Select the database to migrate

Select the database to be migrated, and then create and check migration task information.

Data consistency test

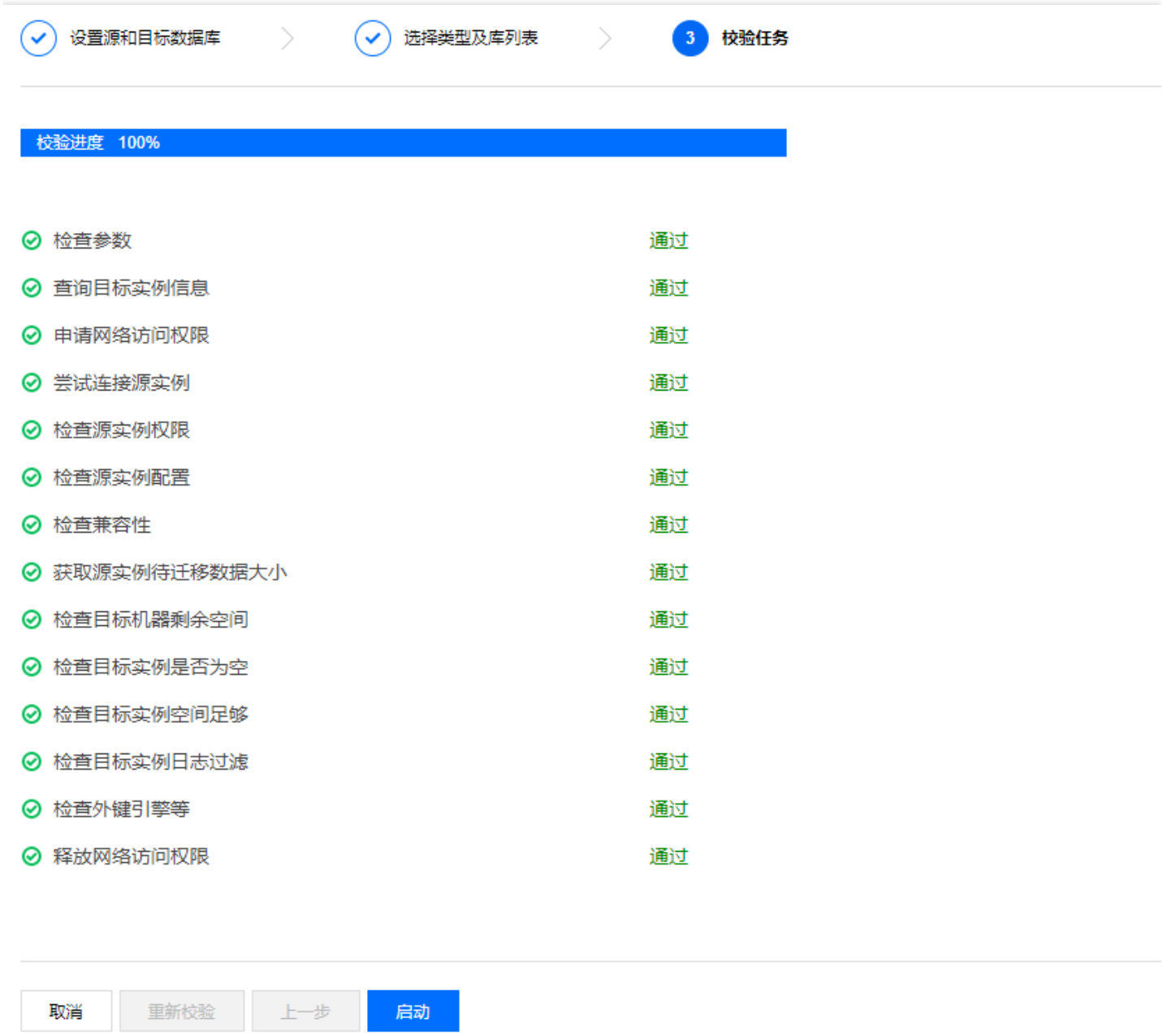
Select a data test type. (Choose from whole test or no test.)

Note:

The test ratio fields are required for certain test items.

Verify migration task information

After a migration task is created, verify the task information. Click **Next Step: Verification Task** to verify it. You cannot start the task until all the verification items pass. Click **Start** to complete the process.



There are three statuses for task verification:

- Pass: This means verification is fully passed.
- Warning: This means that the verification fails. Database operation may be affected during or after data migration, but the migration task can still be executed.
- Failed: This means that the verification fails, and the migration task cannot be executed. If the verification fails, check and modify the migration task information according to the error entries and then retry the verification.

Start migration

Once the verification passes, you can click **Start Migration** to start the migration right away. Note that if you have set a specified time for a migration task, the task will be queued and executed at the specified time. Otherwise, it will be executed immediately.
When the migration is started, you can see the corresponding migration progress information under the migration task. Required migration steps and the current stage will be displayed if you move your cursor over the exclamation mark following the steps.

> **Note:**
> Due to system design limitations, multiple migration tasks submitted or queued at the same time will be performed serially based on the queuing time.

Cancel migration

To cancel an in-progress migration task, click the **Cancel** button.

Complete migration

When the migration is 100% complete, click the **Finish** button on the right to complete the migration.

> **Note:**
> While the migration is in a status of **Unfinished**, the migration task will continue, so will the database data synchronization.

Redis Data Migration
Online Migration

Last updated：2018-07-30 15:30:59

How to Use Redis Migration Tool

Overview of Self-built Instance Migration

The online migration tool does not support migration between Master/Slave, Cluster, and new-generation CRS instances.

Glossary

Term	Description
Source Instance	Source instance of the migration
Destination Instance	Destination instance of the migration, i.e. Tencent CRS instance purchased by the user
Self-built CVM instance migration	Migrate the Redis service deployed on Tencent CVM to Tencent CRS
Public network instance migration	Migrate the Redis service deployed in public network environment to Tencent CRS

Notes on migration

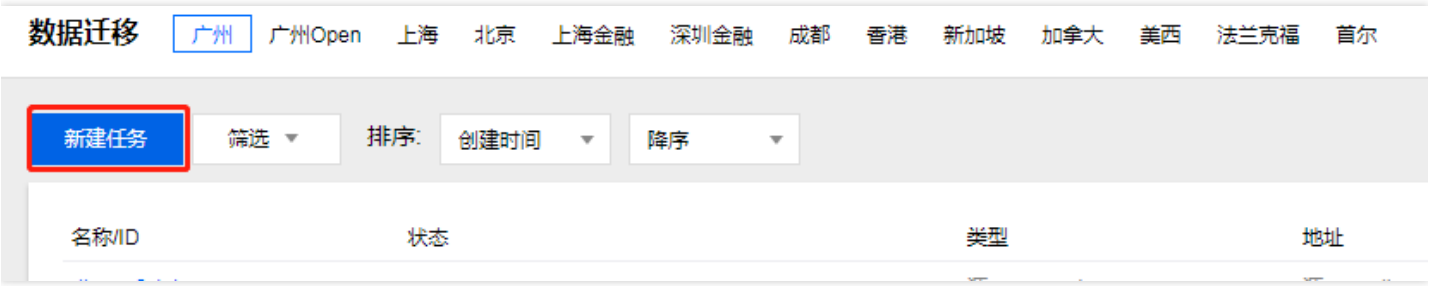
1. You can only migrate instances to Tencent CRS master/slave edition.
2. To ensure efficient migration, cross-region migration is not supported for self-built CVM instances.
3. Migration of self-built CRS 3.2 instances is not allowed by the RDB protocol.
4. For the migration of public network instances, make sure the source instance service is accessible in public network environments.
5. Only migrate instances that are running normally. Instances with an uninitialized password or another task going on cannot be migrated.
6. The destination instance must be an empty instance without any data. Instances in migration will be locked, so no data can be written into them.

7. When the migration succeeds, you can disconnect from the source instance and switch the connection to the destination instance after the data is verified at the business side.

Migration Process

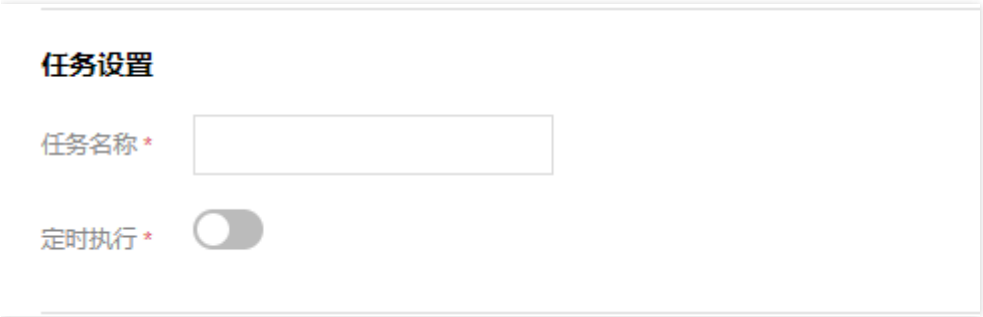
Create a migration task

Enter the migration task list page and click **New Task** to enter the migration task creation page.



Migration task configuration

Task name: Specify a name for the task.
Execution schedule: Specify a start time for your migration task.



Note:

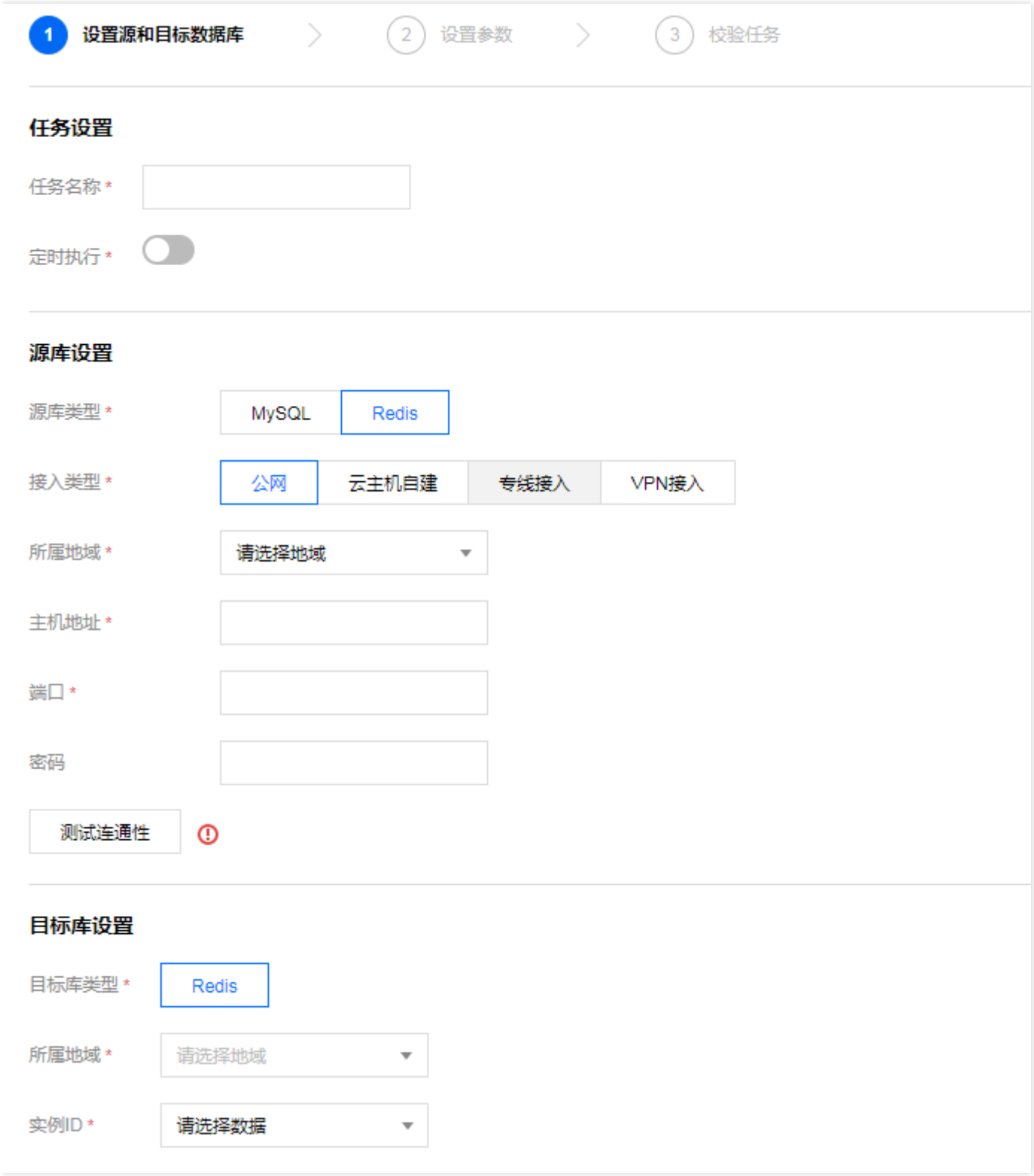
1. To start a scheduled task that has been modified, you need to click **Scheduled Start** again after the verification passes.
2. If the start time is set at a time earlier than the current time, the scheduled start is converted to an immediate start. Click **Start Now** to start the task immediately.

Enter basic information

The following description is based on Redis instance on CVM. The same is applicable to the public network instance migration.

Field	Description	Use	Required
Task name	Name of the migration task	Used by users for their management of tasks	Yes
CVM instance ID	ID of the Tencent CVM in which the source Redis instance resides	The migration task will check the operation status of the CVM with this ID	Yes
CVM private network IP	Private IP of the Tencent CVM in which the source Redis instance resides	The migration task will check the private IP of CVM	Yes
Port	Port number of source instance	The migration task will access the source instance service.	Yes
Password	Source instance password	The password is used for the authentication for accessing the source instance	No
Instance ID	Destination instance ID	Data is synchronized to the destination instance	Yes

Note: Currently, the migration of a source instance without the password is supported.



Parameter settings

The system sets the parameters when the migration starts and recovers them to the history values after migration. Click **Next Step: Verification Task** to verify the parameters (Use default value for migration

efficiency).

Then, the parameters are under verification. Click **Start** after the verification passes.

Note:

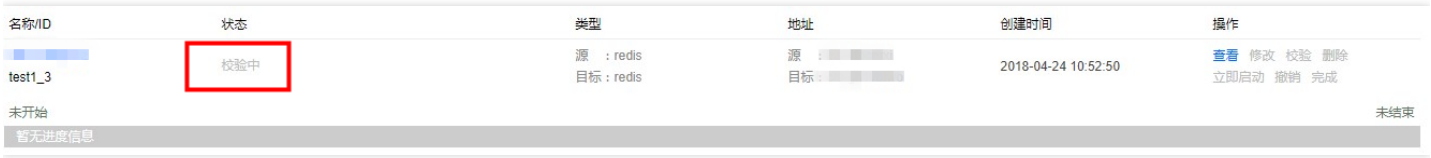
1. A migration can be executed even if an alarm occurs. But you need to check whether the alarm may affect the data.
2. Special note: If the network is inaccessible, please check the security group of the service to which the source instance belongs. All ports for the security group should be allowed.

Start the migration task

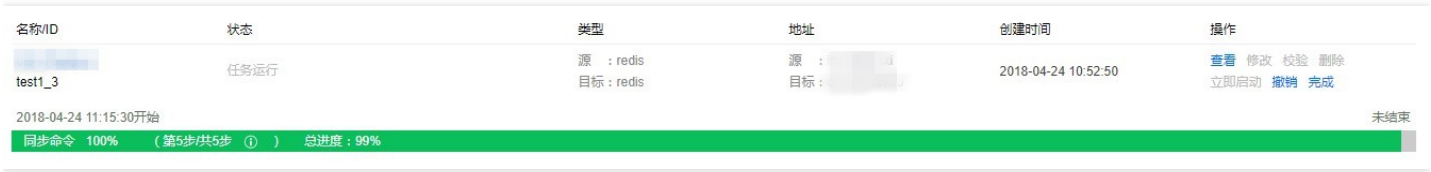
The migration task is still in "Not Started" status after the parameter verification passes. Click **Start Now** on the right. Another parameter verification is launched after the task is started. In this case, you can only

cancel the task, view the task and view verification details.

Another parameter verification is launched after the task is started. The task status is "Verifying".



The data migration starts after the parameter verification passes.



During data synchronization, data offset and the changes in the keys of source/destination instances will be displayed.

Complete the migration task

When the keys of source/destination instances are consistent with each other, click **Finish** on the right and then **OK** to complete the data synchronization.
You can verify the data on the destination instance. If the verification is passed, the synchronization can be finished.

Offline Migration

Last updated：2018-06-07 10:27:21

CRS Import Tool crs-port

About crs-port

"crs-port" is a tool provided by Tencent Cloud Redis Storage (CRS) for importing and exporting CRS instance data through command lines and offers the following features:
• You can only import/export RDB files from instances of Tencent CRS master/slave edition.
• You cannot import/export RDB files from cluster or new-generation CRS instances.

Download "crs-port" tool

You can download "crs-port" tool (support 32-bit and 64-bit) by clicking here.
Updated On: March, 16, 2017

Import RDB files

Command:

```
crs-port restore -n 16 -i /data/dump.rdb -t 192.168.0.1:6379 -A pwd
```

Parameter description

n [concurrent level]: A value equaling 2 times to 4 times the total core count of CPU is recommended.

i: Specify the path where the file to be imported is located.

t: IP and port of the destination CRS instance to which the file will be imported.

A: URL password of the destination CRS instance.

setdb=N: Specify a database to be imported to in the destination instance. The value range for N is [0,15]

filterdb=N: Specify a database of which the data is to be imported to the destination instance. The value range for N is [0, 15]

Notes

The message " [ERROR] restore error: ERR Target key name is busy. for key: xxx" indicates that the key already exists in the database. This error can be solved as follows:

A. You need to clear the destination CRS instance before using the tool, otherwise an error will occur. You can clear the instance via the console.
B. Check if there is any other writing to the destination instance by checking the QPS after clearing the instance. Stop the writing.
It is necessary to ensure that the machine time when the script is executed is correct, otherwise data inconsistencies may occur.

Dump RDB files

Command:

```
crs-port dump -n 16 -f 192.168.0.1:6379 -P pwd -o /data/dump.rdb
```

Parameter description
n [concurrent level]: A value equaling 2 times to 4 times the total core count of CPU is recommended.
f: IP and port of source Redis service.
P: Password of source Redis service. If no password exists, this parameter can be left empty.
o: Specify the output path of file.
(Only support master/slave CRS instances. Cluster instances are not supported.)

PostgreSQL Data Migration

Last updated：2018-09-07 11:06:16

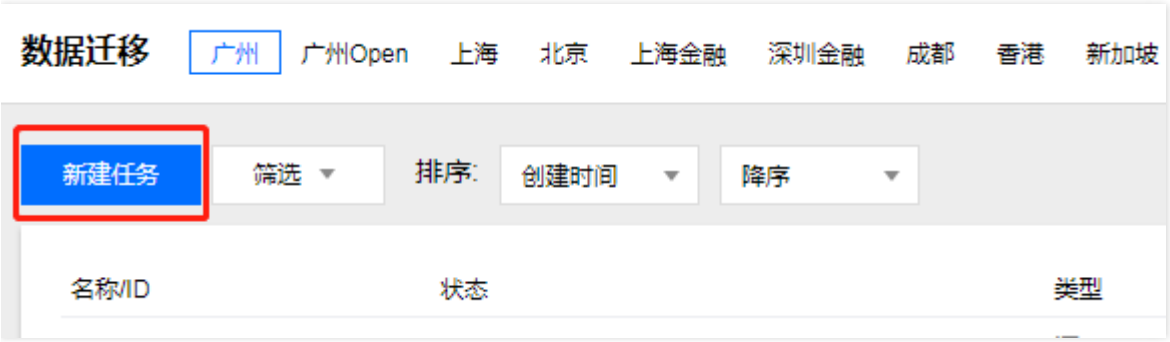
TencentDB Service for Transmission (DTS) supports data migration and provides continuous data replication from self-built MySQL databases to TencentDB, allowing users to migrate hot data without interrupting their services. Data migration is supported for local IDCs with public IP/Port or access to Tencent Cloud via direct connect, or MySQL databases in Tencent Cloud CVMs.

Note:
Data migration is only supported for 9.3.x and 9.5.x PostgreSQL databases. Incremental synchronization is not supported for the 9.3.x versions, and is supported for the 9.5.x versions only if an online sync plug-in is available. For more information on specific configuration, please see Sync Plug-in Configuration.

Procedure

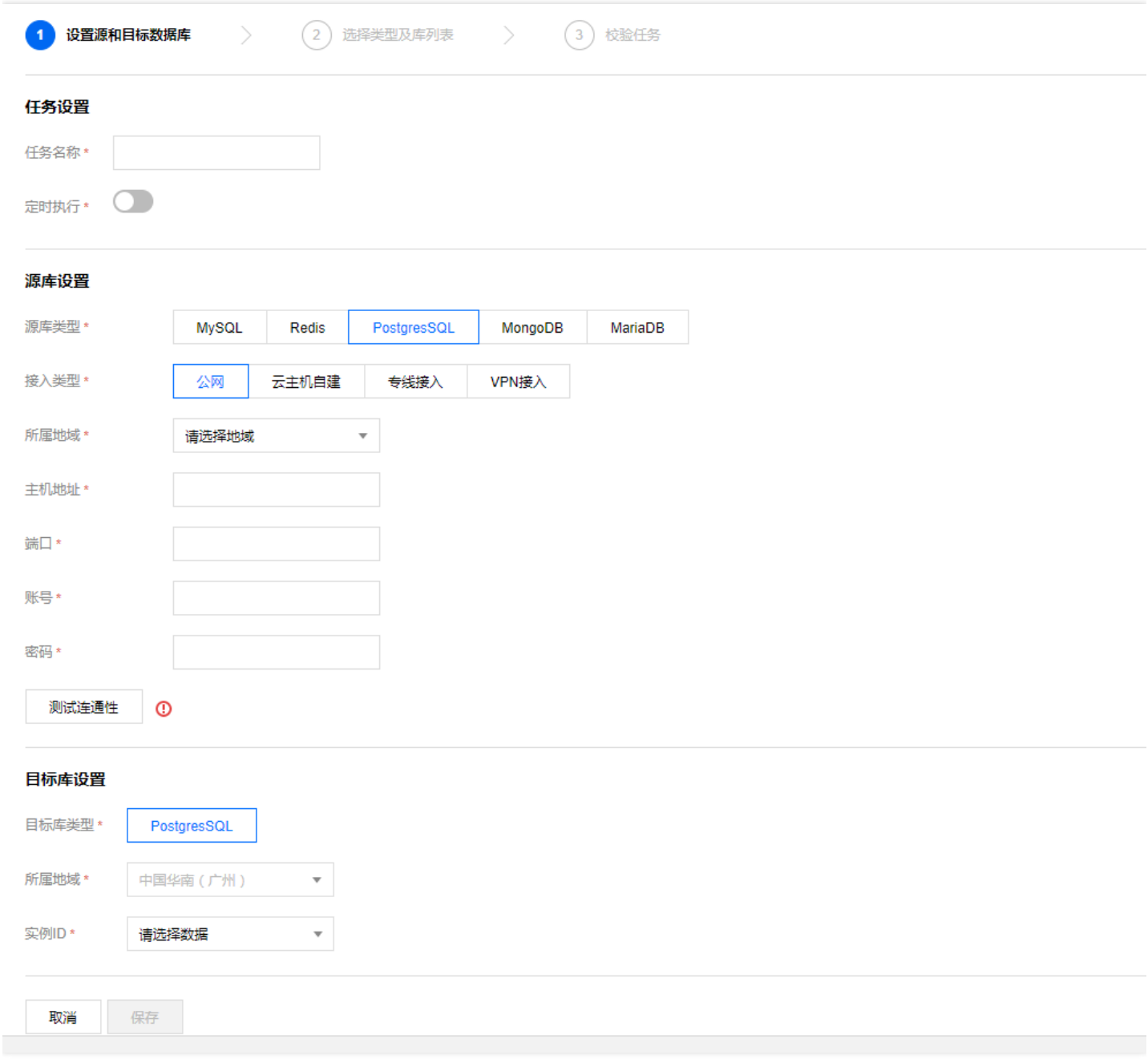
Create DTS data migration service

Log in to the console, go to the Data Migration page and click **New Task**.



Enter configuration

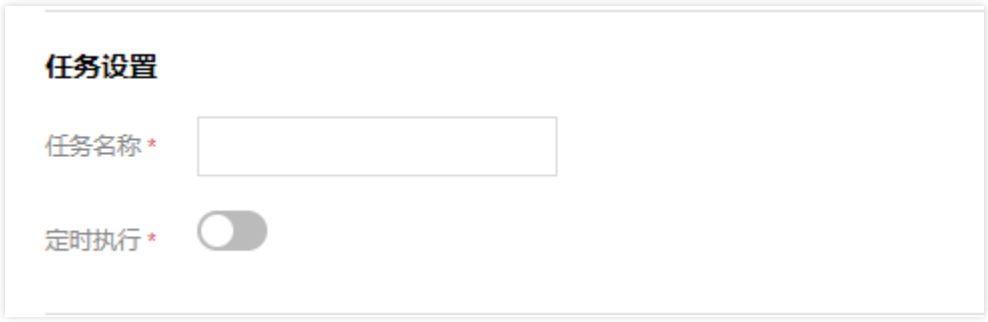
On the page you are redirected to, complete task configuration, source database configuration, and destination database configuration. Details:



Task configuration

- Task name: Specify a name for the task.

- Execution schedule: Specify a start time for your migration task.



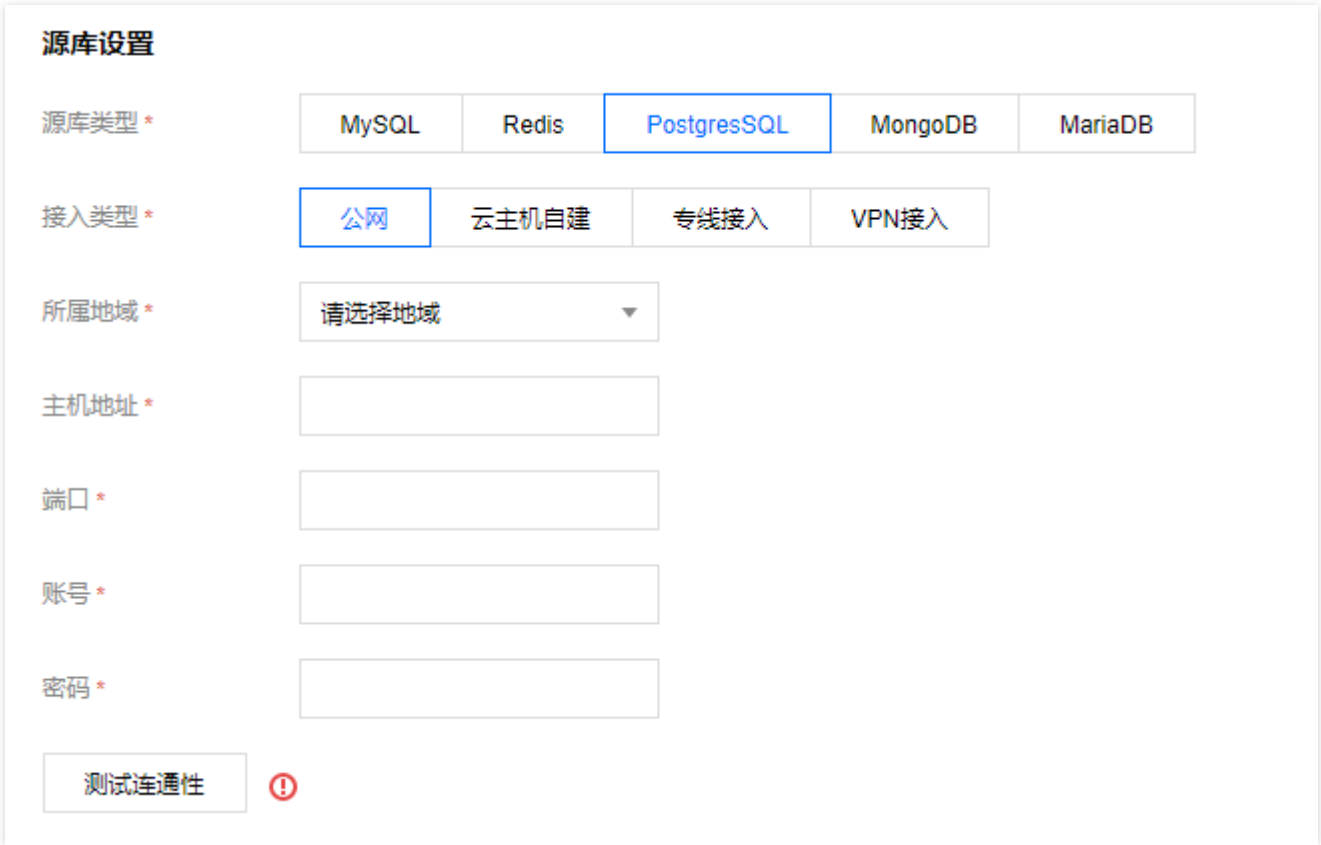
Source database information

- Source database type: PostgreSQL with public IP, Self-built PostgreSQL on CVM, PostgreSQL with access to Tencent Cloud via direct connect and PostgreSQL with access via VPN are supported.

PostgreSQL with public IP: PostgreSQL databases that can be accessed via public IP.

Required information:

- CVM address of PostgreSQL
- Port of PostgreSQL
- Account of PostgreSQL
- Password of PostgreSQL



Self-built PostgreSQL on CVM: CVM-based self-built PostgreSQL databases in both basic networks and VPCs. You need to specify the ID of the CVM instance and the network environment where it is located.

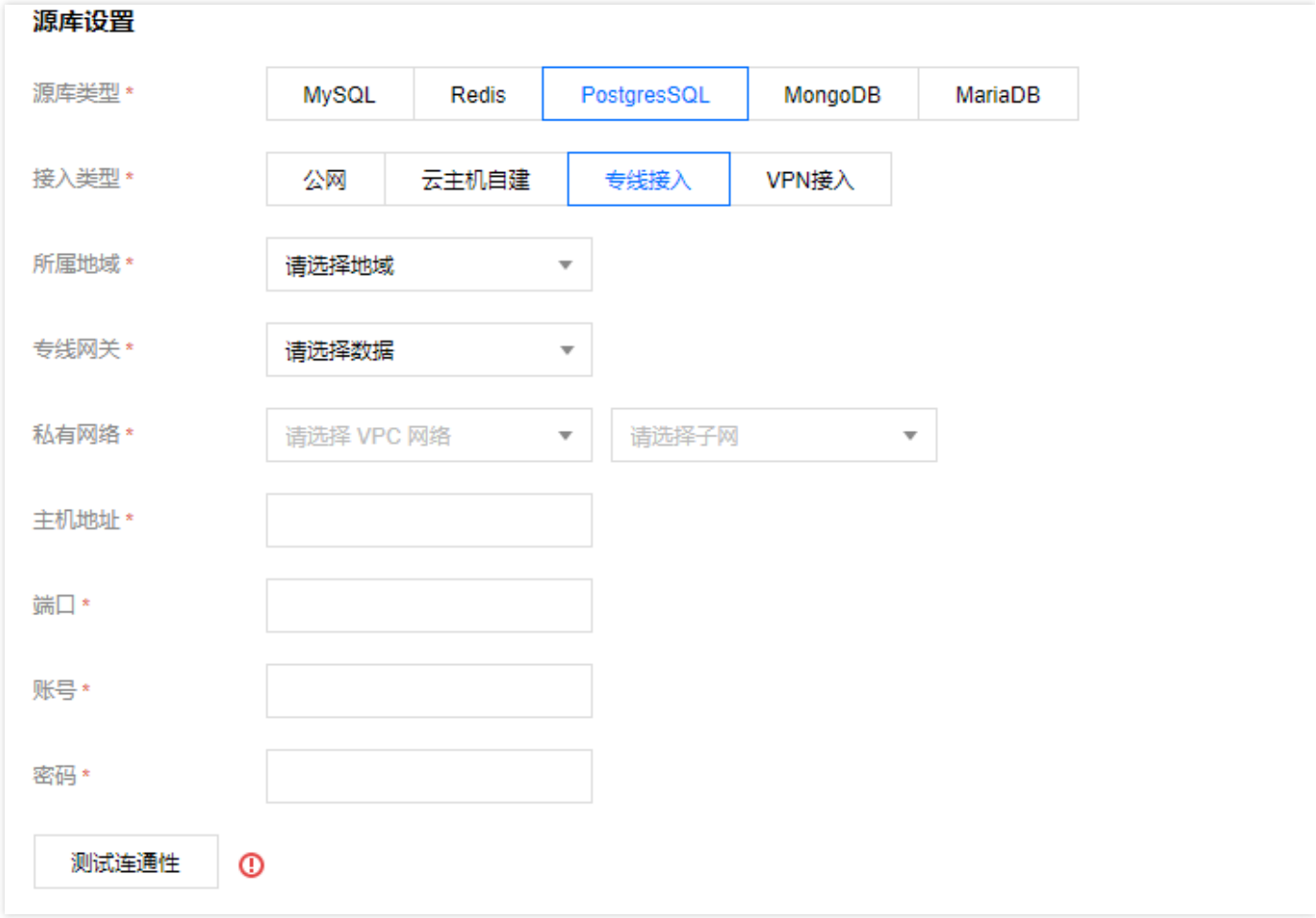
Required information:

- Region: Data migration is only supported when the CVM-based self-built PostgreSQL and the destination TencentDB are in the same region. If the CVM and TencentDB are located in different regions, you need to choose **PostgreSQL with Public IP** and perform migration using CVM public network.
- CVM network: Both basic networks and VPCs are supported.
- VPC: If you select a VPC, you need to select the VPC and subnet to which the instance belongs.
- CVM instance ID
- Port of PostgreSQL
- Account of PostgreSQL
- Password of PostgreSQL

PostgreSQL via direct connection: You can migrate data to Tencent Cloud using DTS for local IDC self-built PostgreSQL databases connected to Tencent Cloud through the Direct Connect (DC) service. Required information:

- Direct Connect Gateway: The direct connect gateway used by the database server to connect to Tencent Cloud. About Direct Connect Gateway
- VPC: The VPC where the direct connect gateway belongs to.
- CVM address of PostgreSQL: The CVM address of PostgreSQL in the IDC. DTS accesses the CVM by mapping with the IP through the direct connect gateway.

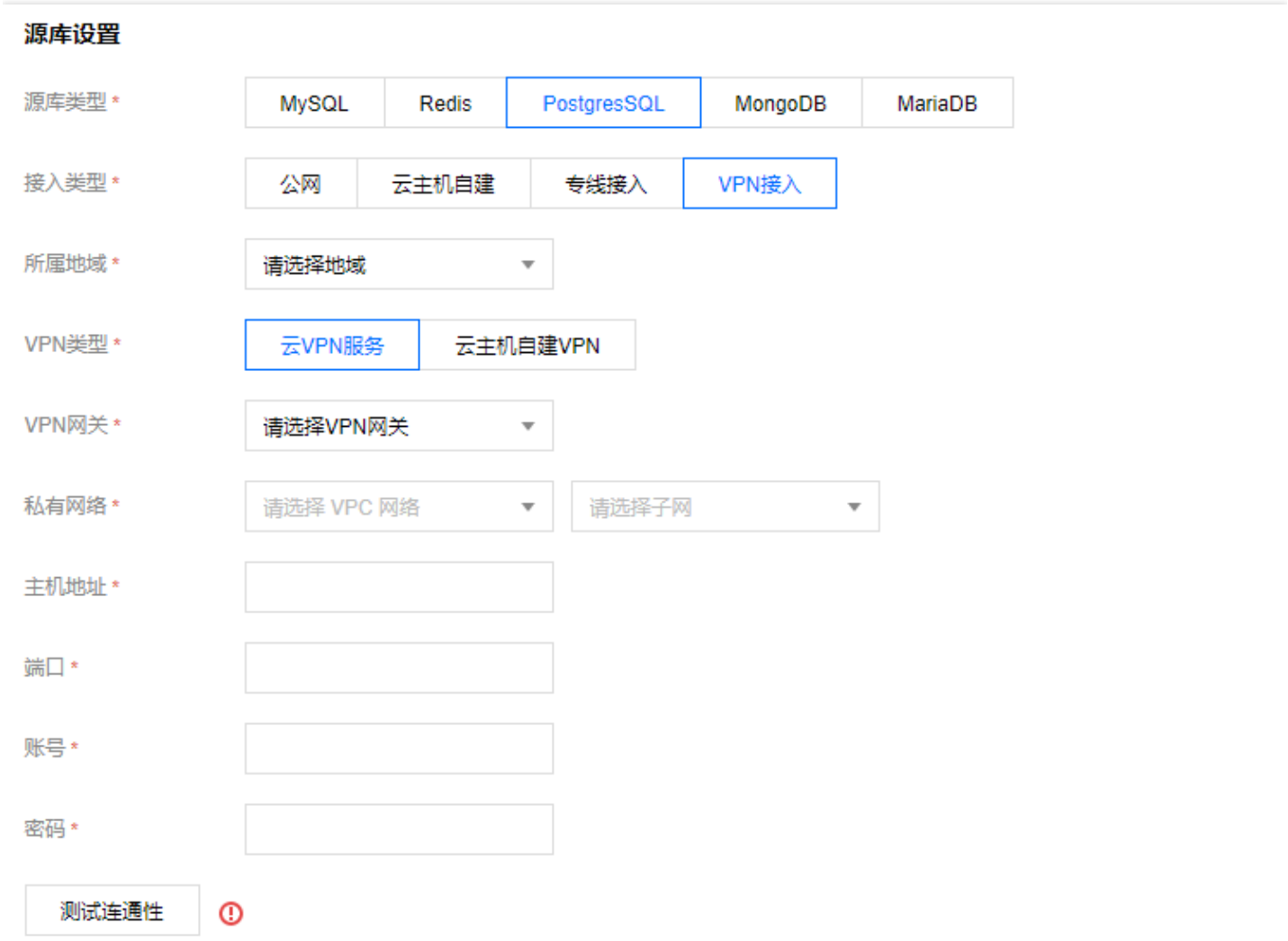
- Port of PostgreSQL
- Account of PostgreSQL
- Password of PostgreSQL



MySQL with access via VPN: You can migrate data to Tencent Cloud using DTS for local IDC self-built PostgreSQL databases connected to Tencent Cloud through VPN Connection or a self-built VPN service in CVM.

Required information:

- Region: VPN services are only supported if they are in the same region.
- VPN type: Cloud VPN Service or self-built VPN on CVM.
- VPN gateway: This information is only required for Cloud VPN Service. About VPN
- VPC: The VPC where the VPN service belongs.
- CVM address of PostgreSQL: The CVM address of PostgreSQL in the IDC. DTS accesses the CVM by mapping with the IP through the direct connect gateway.
- Port of PostgreSQL
- Account of PostgreSQL
- Password of PostgreSQL



Select the database to migrate

Select the database to migrate (you can choose to migrate the entire database or only certain tables), create migration task and check task information.

Verify migration task information

After a migration task is created, verify the task information. Click **Next Step: Verification Task** to verify it. You cannot start the task until all the verification items pass. Click **Start** to complete the process.

There are 3 statuses for task verification:

- Pass: This means verification is fully passed.
- Warning: This means that the verification fails. Database operation may be affected during or after data migration, but the migration task can still be executed.
- Failed: This means that the verification fails, and the migration task cannot be executed. If the verification fails, check and modify the migration task information according to the error entries and then retry the verification.

Start migration

Once the verification passes, you can click **Start** to start the migration right away. Note that if you have set a specified time for a migration task, the task will be queued and executed at the specified time. Otherwise, it will be executed immediately.

When the migration is started, you can see the corresponding migration progress information under the migration task. Required migration steps and the current stage will be displayed if you move your cursor over the exclamation mark following the steps.

Note:
Due to system design limitations, multiple migration tasks submitted or queued at the same time will be performed serially based on the queuing time.

Incremental synchronization

When creating a migration task, the incremental synchronization option is selected by default. When data migration is completed, the target TencentDB for PostgreSQL will be set as the slave database for the source database, and new data of the source database during migration will be synced to the target TencentDB for PostgreSQL via master/slave synchronization. In this case, any changes made to the source database will be synced to the destination TencentDB for PostgreSQL.
After migration, click the **Finish** button to terminate the synchronization relationship between source and destination databases to complete migration.

Note:
Before terminating synchronization, do not write data into the destination database instance as this may cause data inconsistency between the source and destination databases, which will cause data comparison to fail, resulting in a failed migration.

Stop migration

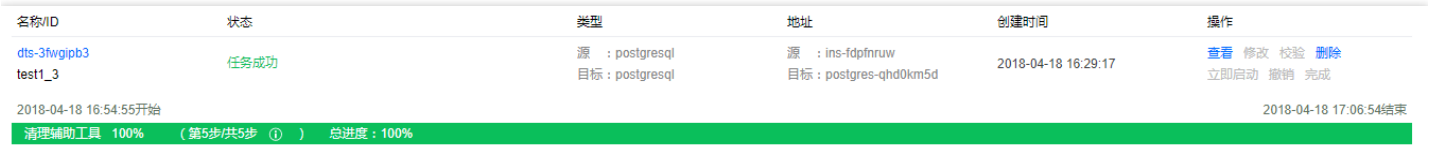
To cancel an in-progress migration task, click the **Cancel** button.

Note:

1. Restarting the task may cause the verification or task to fail. You may need to manually clear all conflicting databases or tables in the destination database to start the migration task again.

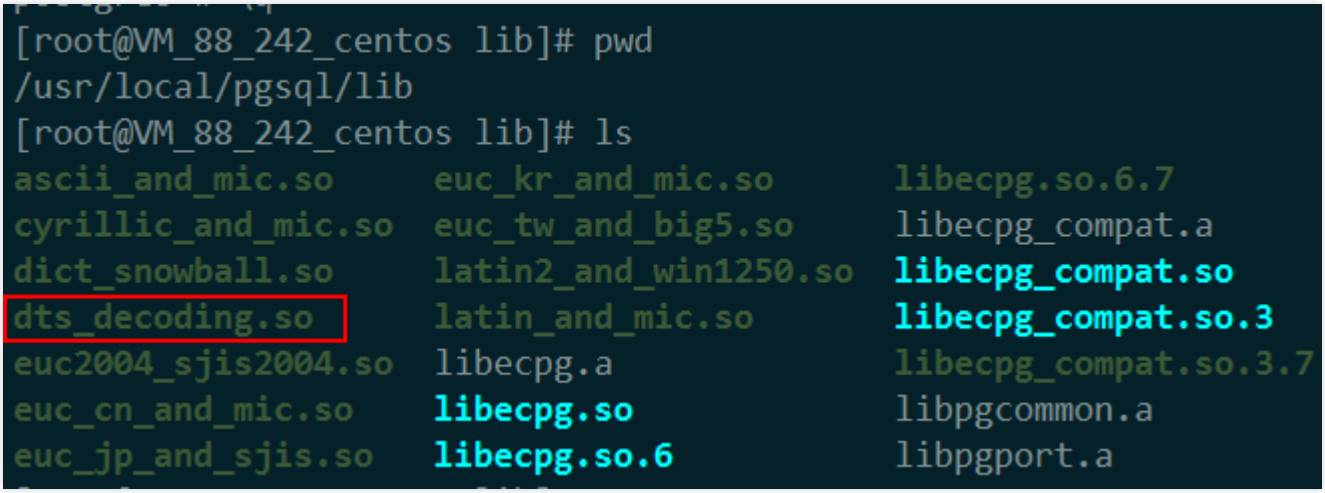
2. When migrating a single table, make sure that tables relied on by foreign keys of all tables are migrated.

Complete migration



Sync Plug-in Configuration

1. Download and copy dts_decoding to the lib directory in PostgreSQL installation path.



2. Modify the configuration file "postgresql.conf" under the data directory.

wal_level >= logical
Available max_replication_slots >= The number **of** databases to be migrated
Available max_wal_senders >= The number **of** databases to be migrated

```
# - Settings -

wal_level = logical                     # minimal, archive, hot_standby, or logical
```

```
# Set these on the master and on any standby that will send replication data.

max_wal_senders = 10            # max number of walsender processes
                                # (change requires restart)
#wal_keep_segments = 0          # in logfile segments, 16MB each; 0 disables
#wal_sender_timeout = 60s       # in milliseconds; 0 disables

max_replication_slots = 10      # max number of replication slots
```

3. Modify the configuration file "pg_hba.conf" under the data directory.
replication connection needs to be configured.

```
# "local" is for Unix domain socket connections only
local   all             all                                     trust
# IPv4 local connections:
host    all             all             127.0.0.1/32            trust
host    all             all             0.0.0.0/0               md5
host    replication     all             0.0.0.0/0               md5
# IPv6 local connections:
host    all             all             ::1/128                 trust
```

4. Restart the source instance.

Note:
When specified database table features are used, such as tables using rules or being associated with other tables, inserting data during incremental migration may fail, because some SQL operations are not supported by migration features. If this problem occurs, use schema migration or whole instance migration feature.