Data Transfer Service

Fix for Verification Failure

Product Documentation

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Fix for Verification Failure

Check Item Overview

Last updated：2021-11-16 18:14:36

This document lists the check items for database migration, sync, and subscription tasks. If an error is reported for a check item, fix it as instructed in the corresponding document.

MySQL/TDSQL-C

- Database connection check
- Peripheral check
- Version check
- Partial database parameter check
- Target database content conflict check
- Target database space check
- Binlog parameter check
- Foreign key dependency check
- View check
- Warning item check
- RDS check

TDSQL for MySQL

- Database connection check
- Peripheral check
- Version check
- Partial database parameter check
- Target database content conflict check
- Target database space check
- Binlog parameter check
- Foreign key dependency check
- Warning item check

PostgreSQL

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- Source database connectivity check
- Source database version check
- Target database connectivity check
- Account conflict check
- Parameter configuration conflict check
- Structure conflict check
- Extension/Plugin compatibility check
- Incremental migration precondition check

MongoDB

- MongoDB connection check
- Database/Table content conflict check
- Source database node role check
- Oplog check
- Database version check
- Database capacity check
- Target database load check
- Shardkey check
- Source database balancer check

SQL Server

- Migration parameter check
- Migration network check
- Source database connectivity check
- Target database connectivity check
- Disk space check
- Database version check
- Source database existence check
- Target database existence check

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Check Items of MySQL/MariaDB/Percona/TDSQL-C for MySQL/TDSQL for MySQL

Version Check

Last updated：2023-08-25 16:55:44

Check Details

Check requirements: The target database version must be later than or equal to the source database version, and all versions in migration and sync tasks must meet the version requirements.
Check description: Here, the versions are differentiated by the major version number; for example, v5.6.x supports migration or sync to v5.6.x, v5.7.x, and later versions. The last digit is the minor version number, which is not restricted; for example, v5.6.5 can be migrated or synced to v5.6.4, but there may be compatibility issues.

Troubleshooting

Check the source and target databases as instructed in Databases Supported for Data Migration and Databases Supported for Data Sync. If the source or target database version is not supported, upgrade the target database version or use a database instance on a higher version.

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Source Instance Permission Check

Last updated：2023-08-25 16:58:15

Check Details

Check whether you have the operation permissions of the database by referring to the following:

Permission requirements for data migration

Migration from MySQL to TencentDB for MySQL

Migration from TDSQL for MySQL to TDSQL for MySQL

Permission requirements for data sync

Sync from MySQL/MariaDB/Percona to TencentDB for MySQL

Sync from TDSQL for MySQL to TDSQL for MySQL

Permission requirements for data subscription

Creating MySQL or TDSQL for MySQL Data Subscription

Troubleshooting

If you don't have the operation permissions, get authorized based on the permission requirements in the check details, and run the verification task again.

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Partial Database Parameter Check

Last updated：2023-08-25 16:57:08

Check Details

`row_format` in the source database table cannot be `FIXED` .
The values of the `lower_case_table_names` variable in both the source and target databases must be the same.
The `max_allowed_packet` parameter of the target database must be set to 4 MB or above.
The `connect_timeout` variable of the source database must be above 10.
In migration from MySQL/TDSQL for MySQL/TDSQL-C to MySQL, if a time-consuming SQL statement is running on the source database, a warning will be reported, with the content being "A time-consuming SQL statement is running on the source database, which may cause table locks. Please try again later or process the SQL statement on the source database".

Troubleshooting

Modifying the `row_format` parameter in the source database

If the value of `row_format` in a database table is `FIXED` , an error will be reported when the storage length of each row of the table exceeds the limit. Therefore, you need to change the value of `row_format` to `DYNAMIC` so that the storage length of each row varies by the content length.
If a similar error occurs, fix it as follows:
1. Log in to the source database.
2. Set `row_format` to `DYNAMIC` .

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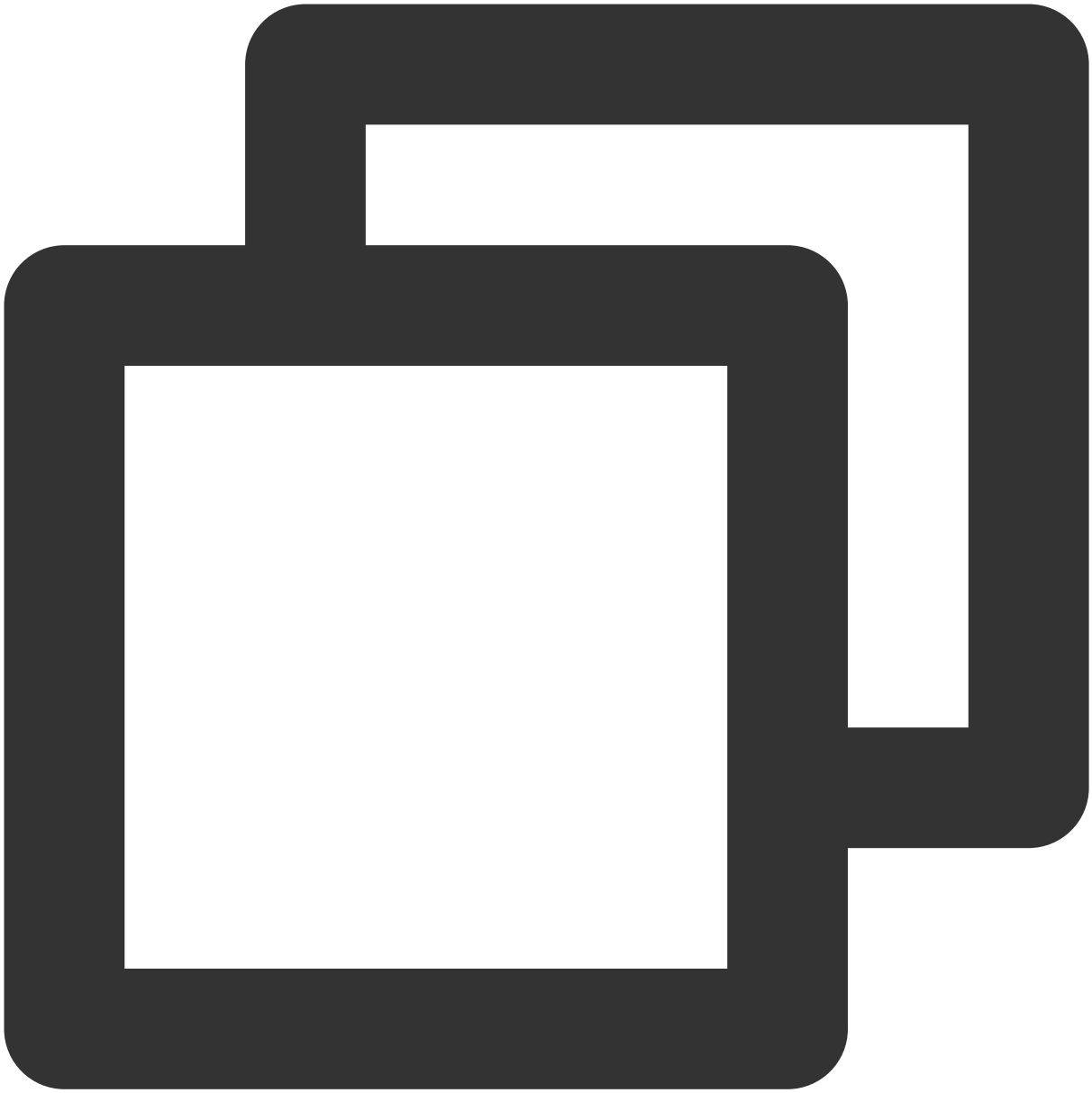

```
alter table table_name row_format = DYNAMIC;
```

3. Check whether the configuration takes effect.

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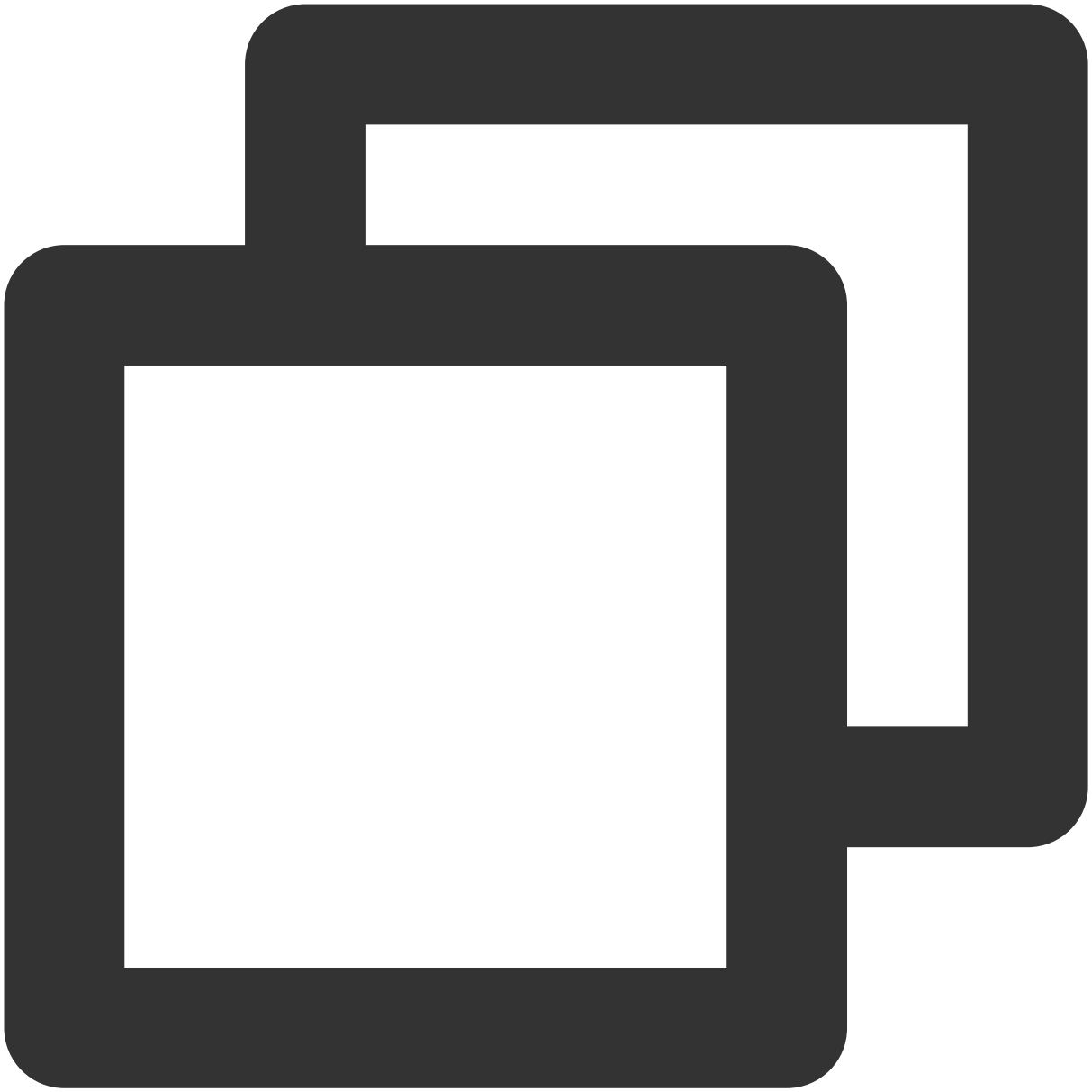

```
show table status like 'table_name'\\G;
```

The system will display a result similar to the following:

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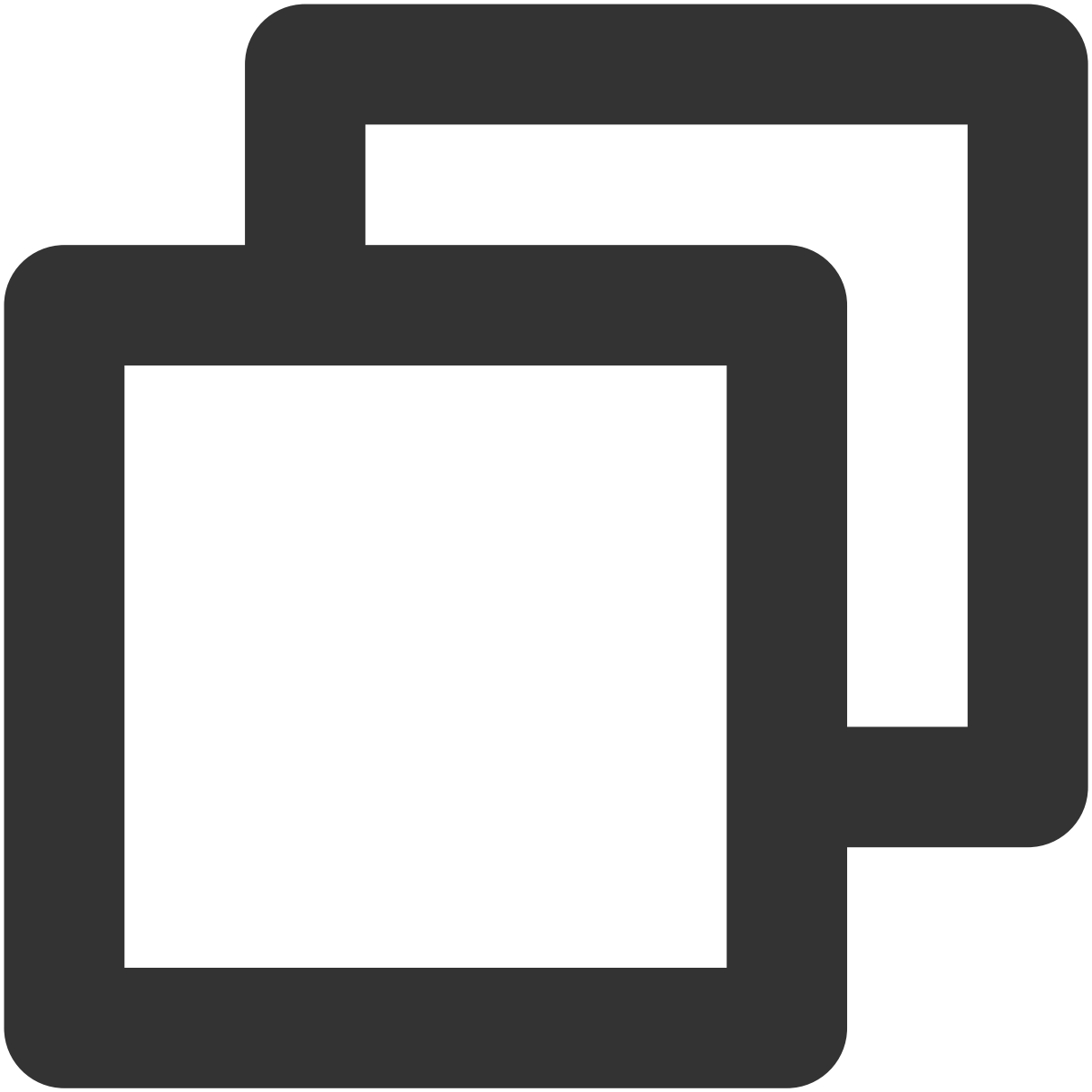

```
mysql> show table status like 'table_name'\\G;
*************************** 1. row ***************************
        Name: table_name
      Engine: InnoDB
     Version: 10
  Row_format: Dynamic
        Rows: 5
        ......
1 row in set (0.00 sec)
```

4. Run the verification task again.

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Making `lower_case_table_names` have the same value in source and target databases

`lower_case_table_names` sets the letter case sensitivity in MySQL. It has the following valid values: Windows and macOS environments are case-insensitive, but Linux environments are case-sensitive. To ensure the compatibility between different operating systems, you need to use the same letter case sensitivity rule.

`0` : The name of a stored table is in the specified letter case and is case-sensitive during comparison.

`1` : The name of a stored table is in lowercase on the disk and is case-insensitive during comparison.

`2` : The name of a stored table is in the specified letter case and is in lowercase during comparison.

If a similar error occurs, set the parameter in the source and target databases to the same value as follows:

1. Log in to the source database.
2. Check the values of `lower_case_table_names` in the source and target databases.

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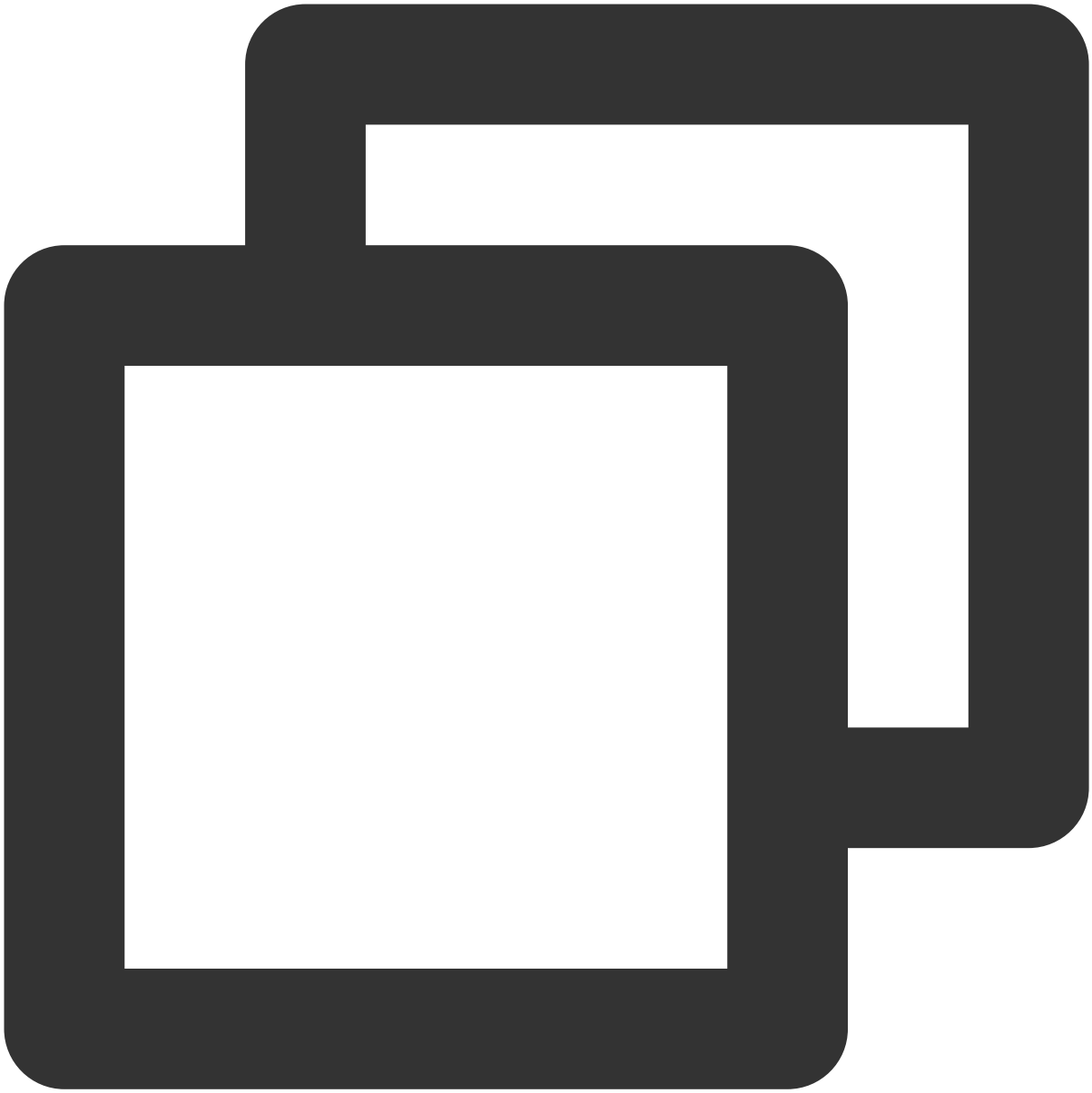

```
show variables like '%lower_case_table_names%';
```

3. Modify the `my.cnf` configuration file of the source database as follows:

Note

The default path of the `my.cnf` configuration file is `/etc/my.cnf` , subject to the actual conditions.

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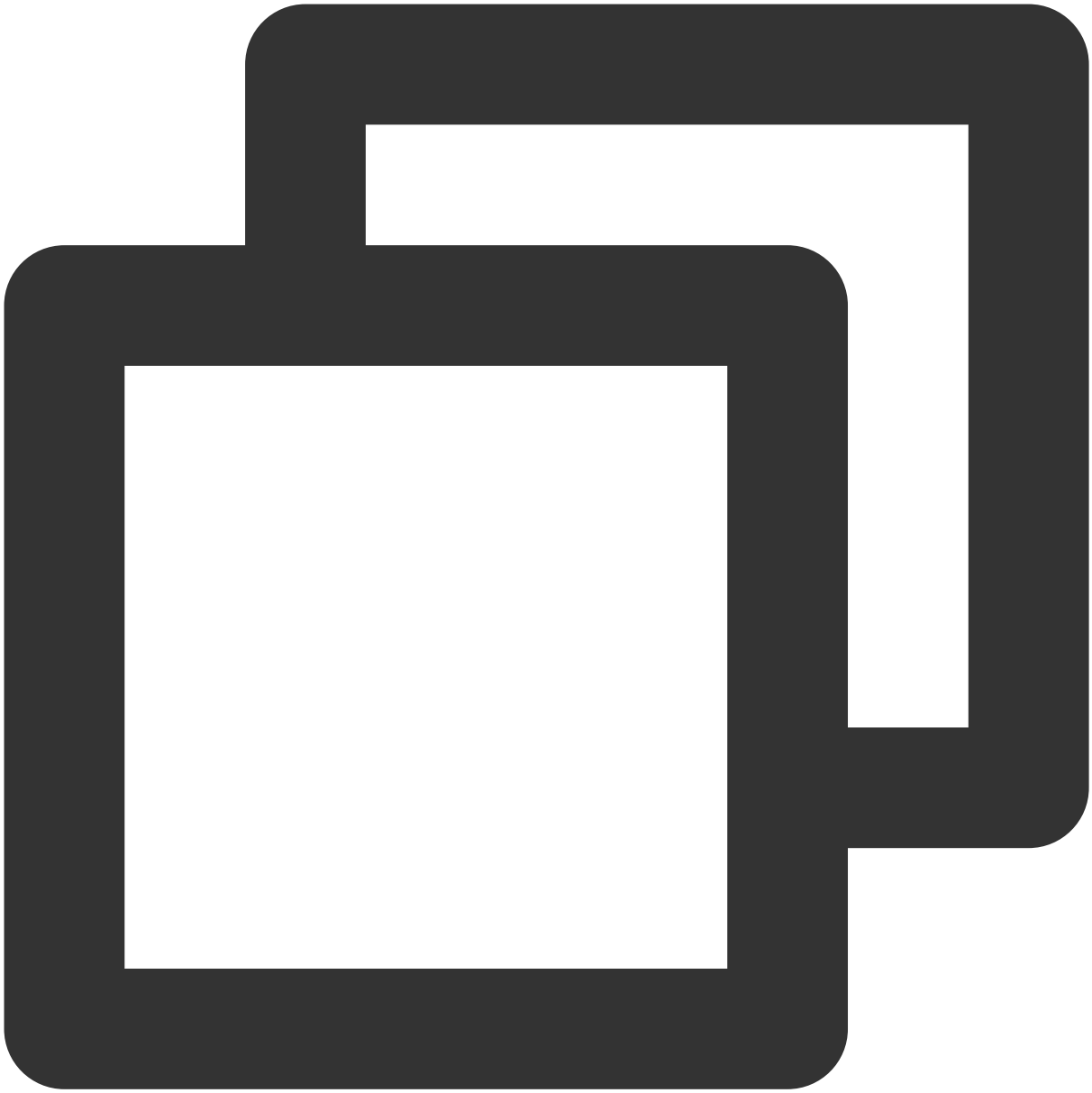

```
lower_case_table_names = 1
```

4. Run the following command to restart the database:

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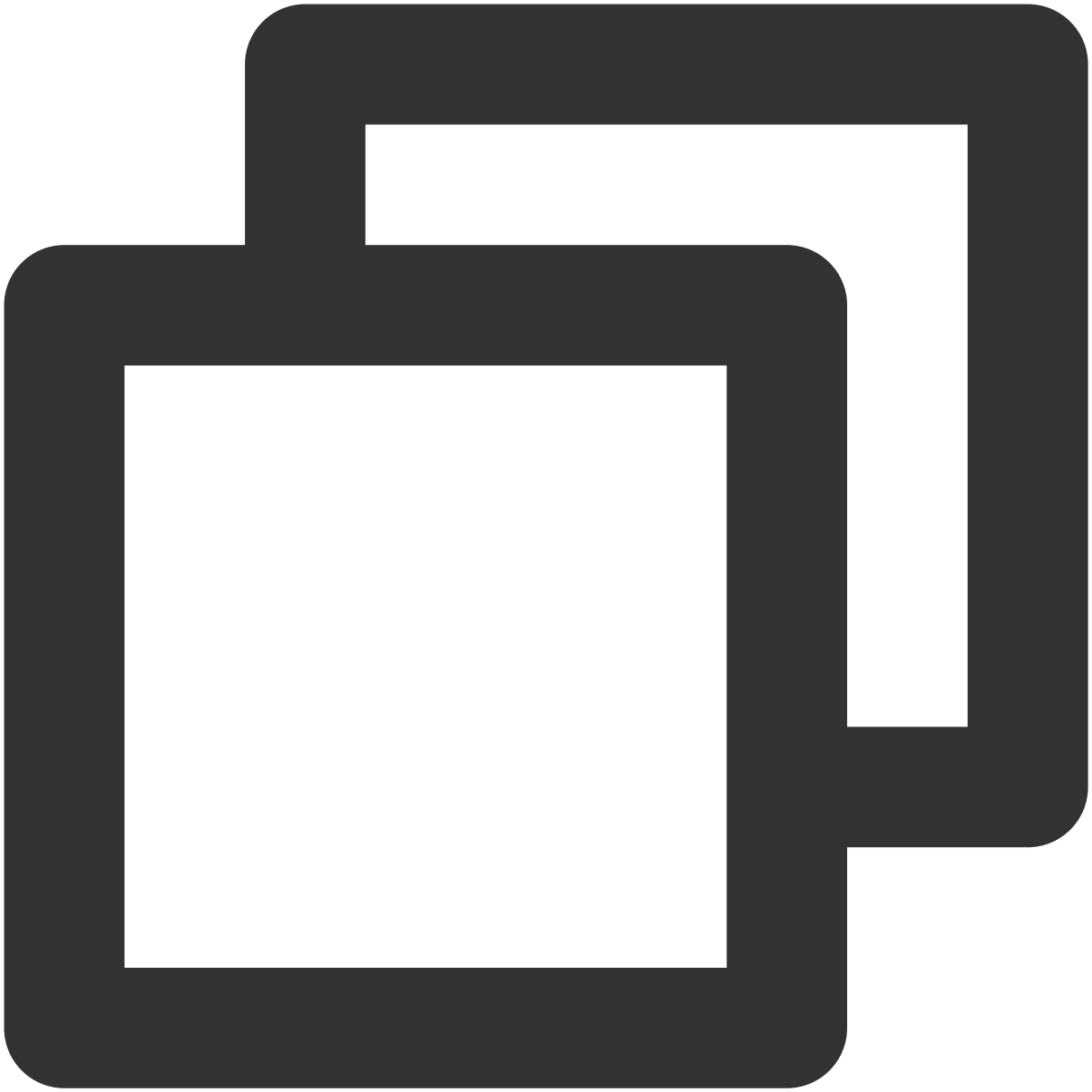

```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

5. Check whether the configuration takes effect.

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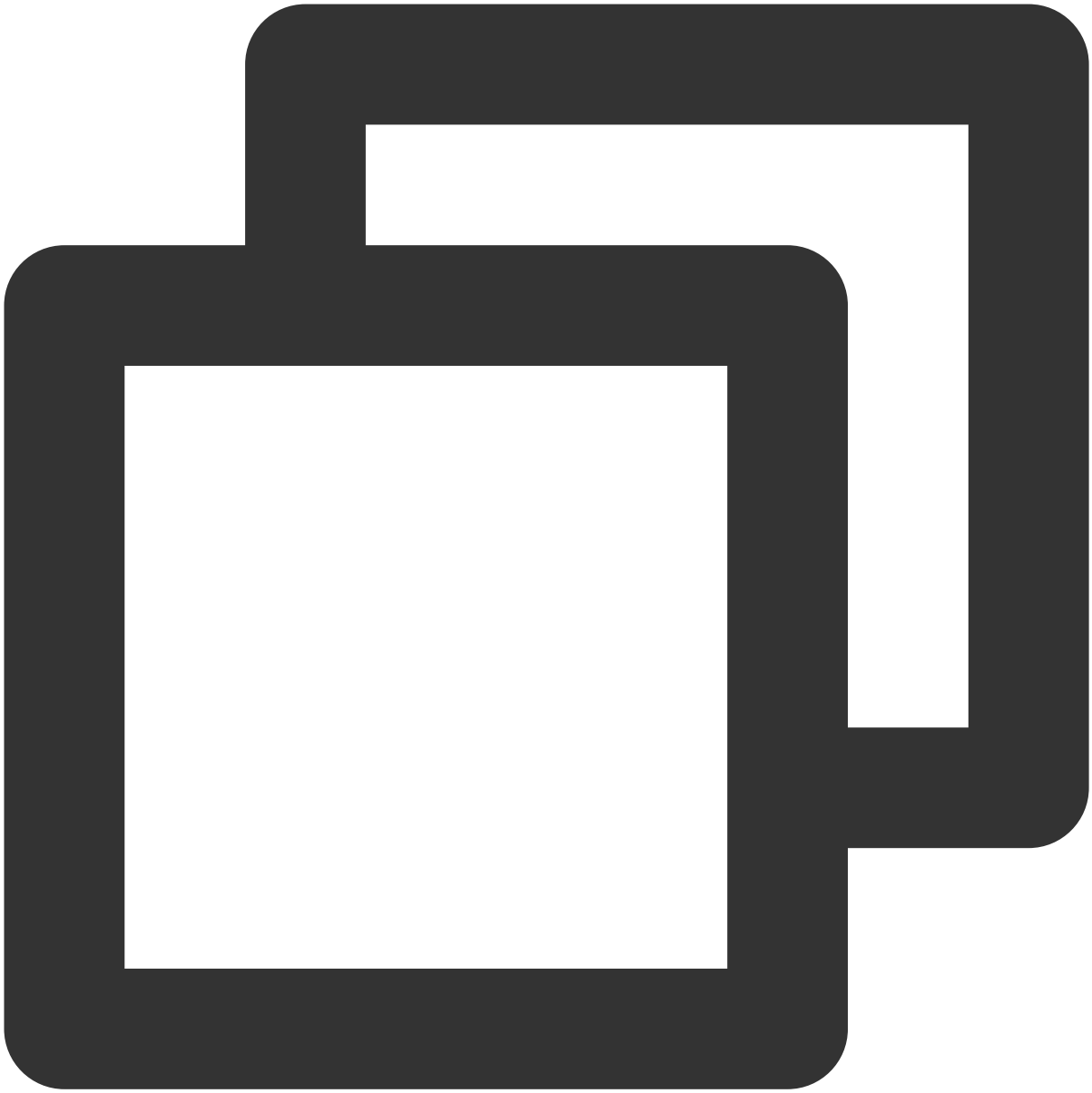

```
show variables like '%lower_case_table_names%';
```

The system will display a result similar to the following:

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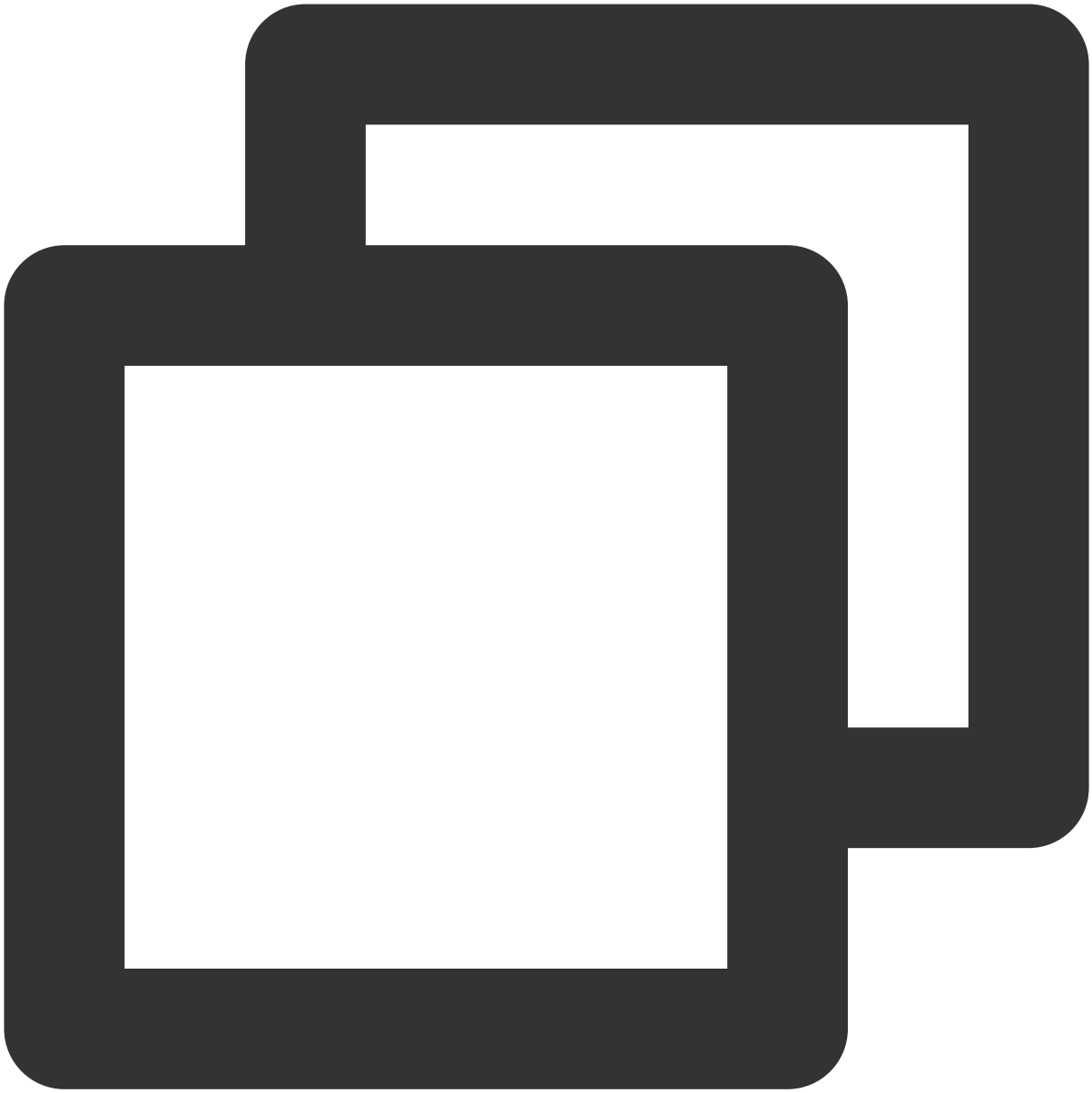

```
mysql> show variables like '%lower_case_table_names%';
+------------------------+-------+
| Variable_name          | Value |
+------------------------+-------+
| lower_case_table_names | 1     |
+------------------------+-------+
1 row in set (0.00 sec)
```

6. Run the verification task again.

Modifying the `max_allowed_packet` parameter in the target database

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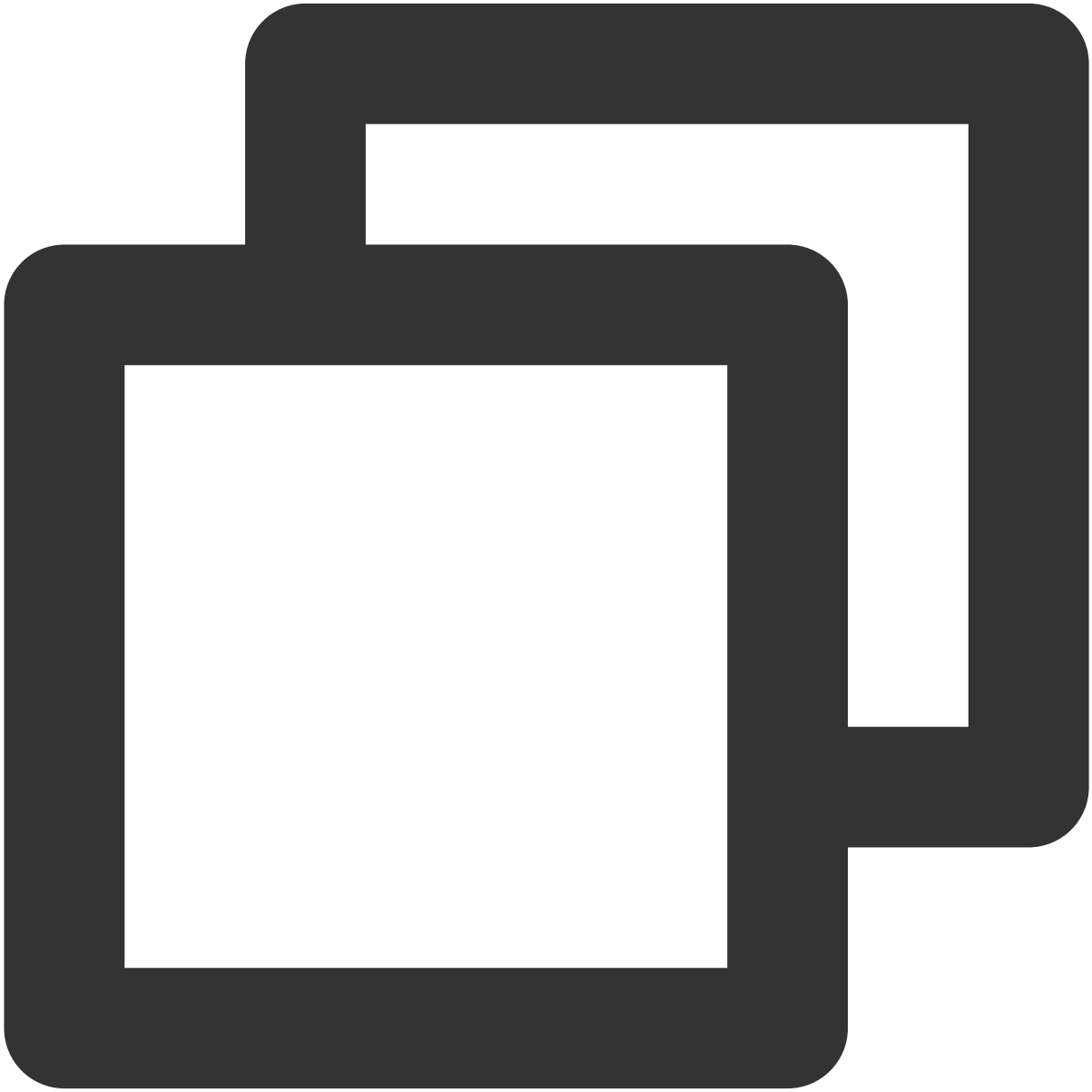
`max_allowed_packet` is the maximum size of a packet that can be transferred. If its value is too large, more memory will be used, causing packet losses and the inability to capture the SQL statements of large exception event packets. If its value is too small, program errors may occur, causing backup failures and frequent sending/receiving of network packets, which compromises the system performance.
If a similar error occurs, fix it as follows:
1. Log in to the target database.
2. Modify the `max_allowed_packet` parameter.



```
set global max_allowed_packet = 4*1024*1024;
```

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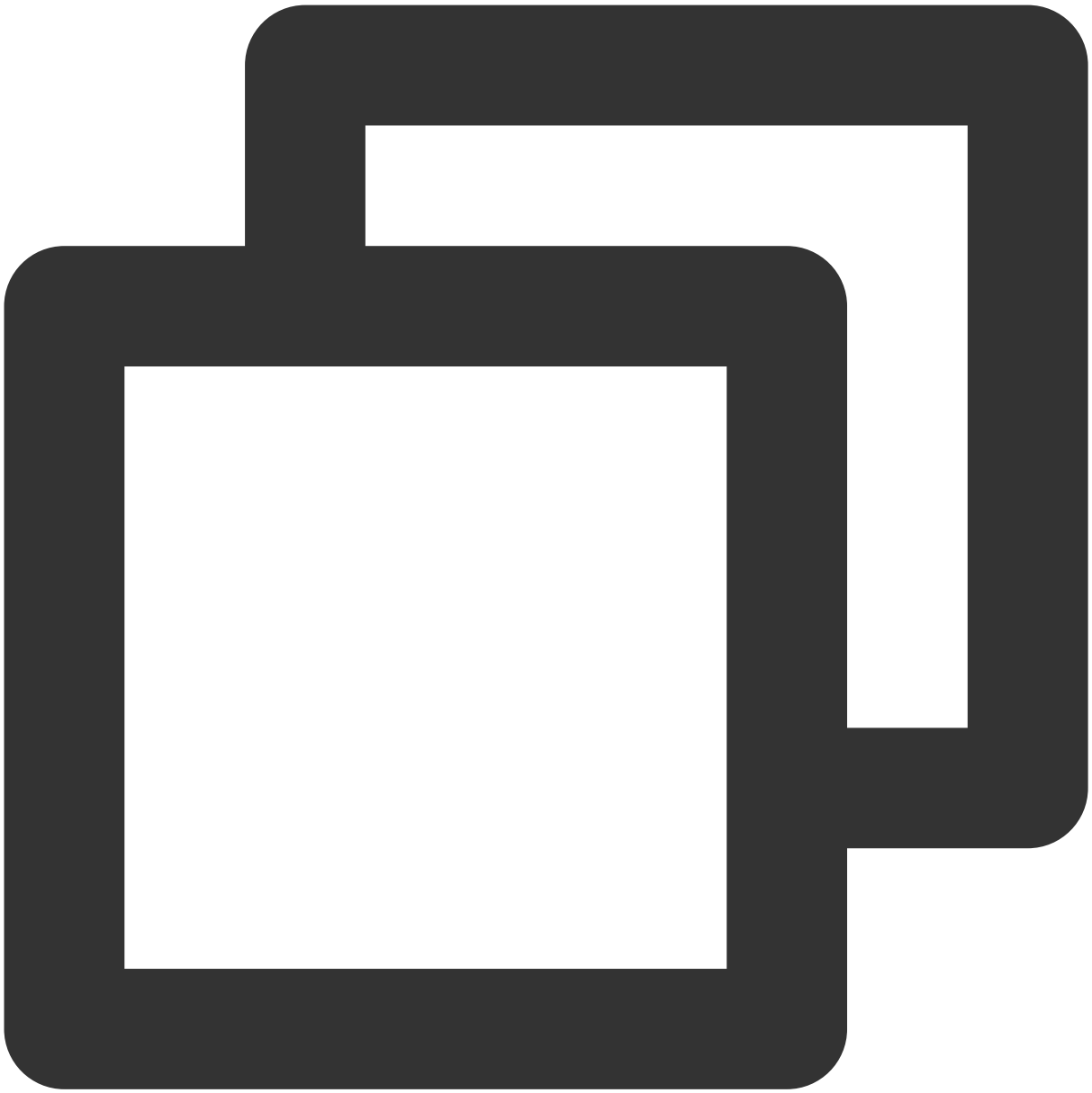
3. Check whether the configuration takes effect.



```
show global variables like '%max_allowed_packet%';
```

The system will display a result similar to the following:

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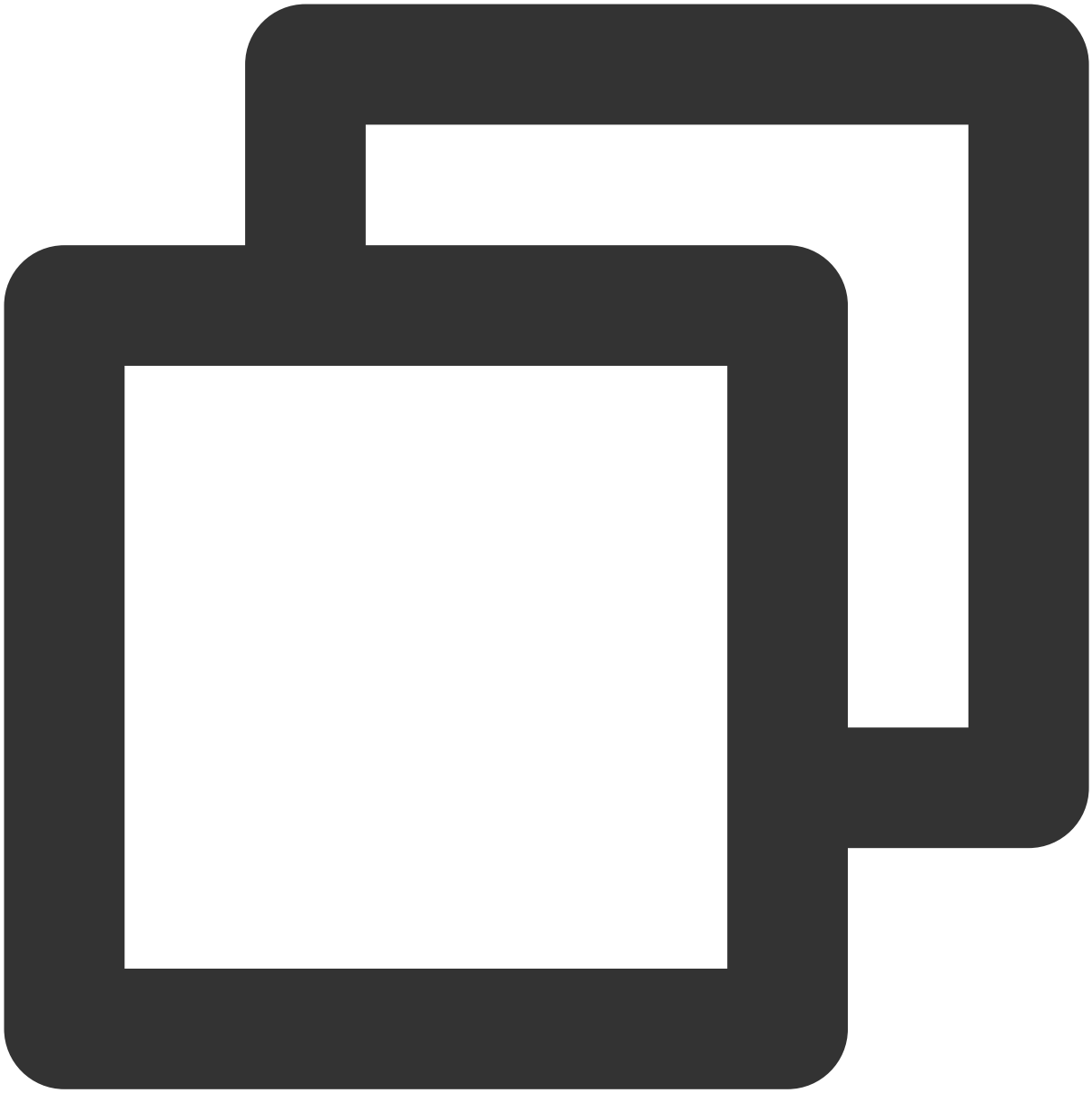

```
mysql> show global variables like '%max_allowed_packet%';
+--------------------------+---------+
| Variable_name            | Value   |
+--------------------------+---------+
| max_allowed_packet       | 4194304 |
+--------------------------+---------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Modifying the `connect_timeout` variable in the source database

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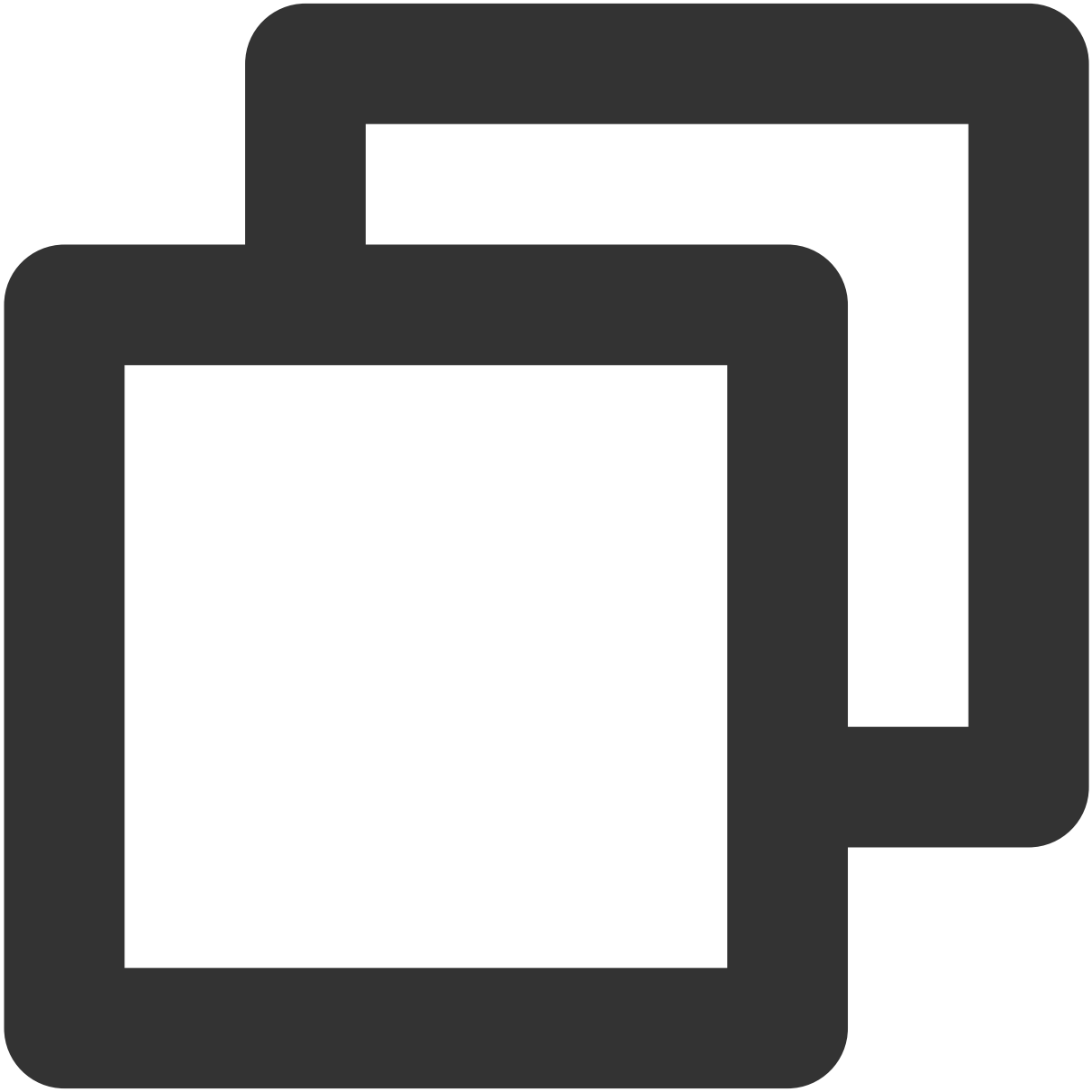
`connect_timeout` is the database connection timeout, and a connection request will be denied if the connection duration is greater than the value of `connect_timeout` . If the value of `connect_timeout` is too small, the database will be frequently disconnected, which will impact the database processing efficiency. Therefore, we recommend that you set a value greater than 10 for this parameter.

If a similar error occurs, fix it as follows:

1. Log in to the source database.
2. Modify the `connect_timeout` parameter.



```
set global connect_timeout = 10;
```

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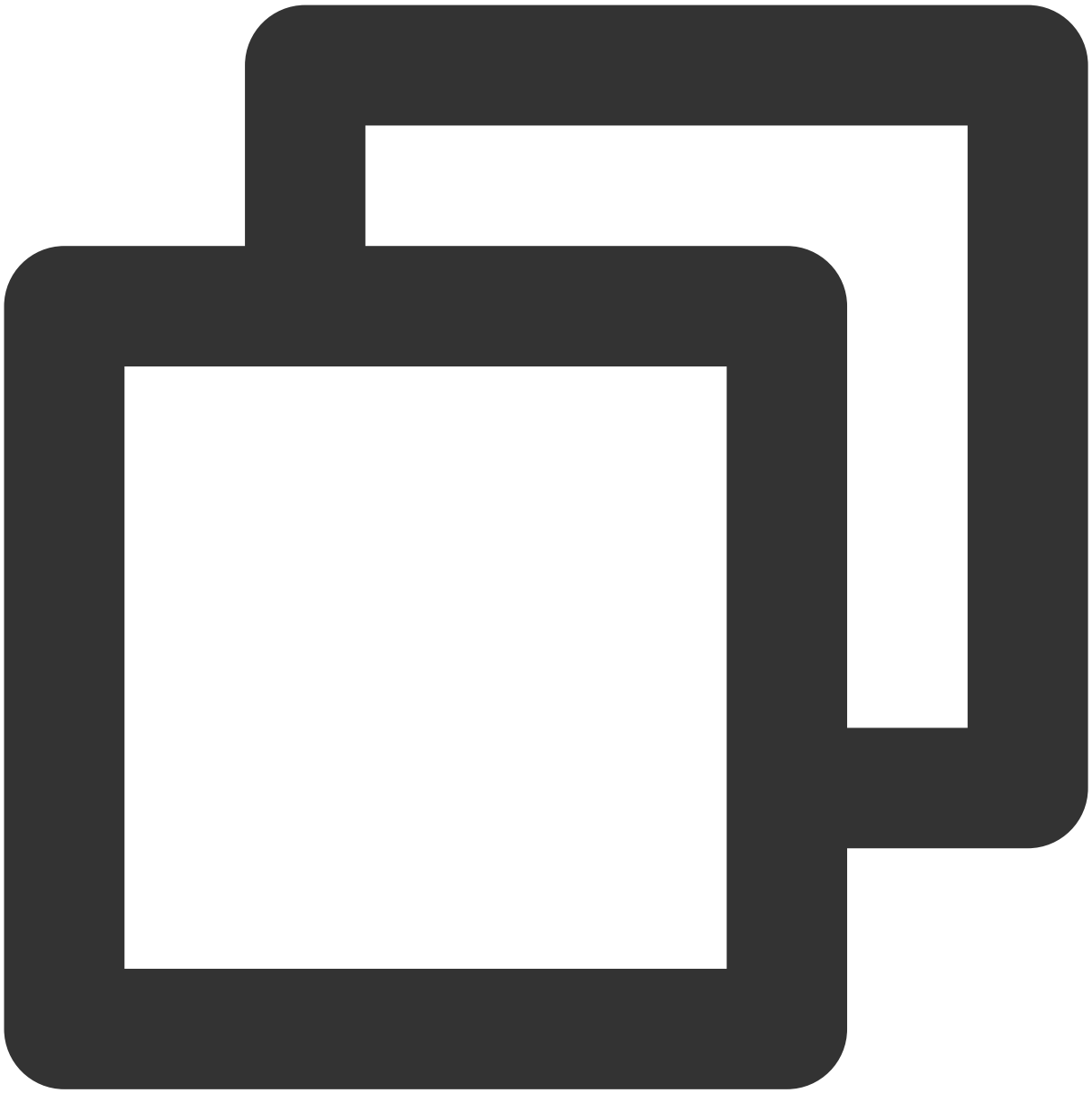
3. Check whether the configuration takes effect.



```
show global variables like '%connect_timeout%';
```

The system will display a result similar to the following:

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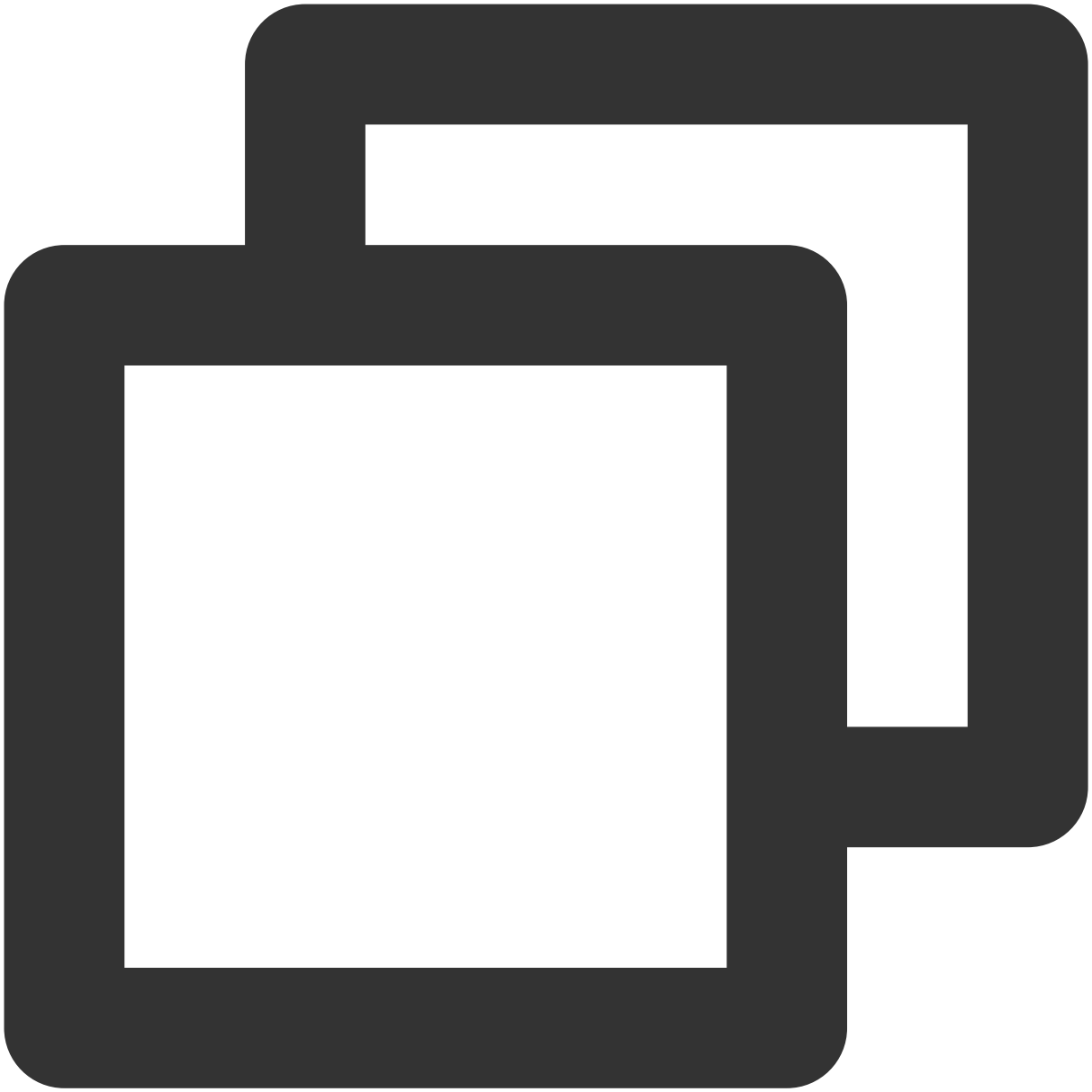

```
mysql> show global variables like '%connect_timeout%';
+-----------------------+---------+
| Variable_name         | Value   |
+-----------------------+---------+
| connect_timeout       | 10      |
+-----------------------+---------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

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Target Database Content Conflict Check

Last updated：2023-08-25 17:00:01

Check Details

The target instance cannot contain objects with the same name as those in the source database. If a conflict causes an error, troubleshoot by using any of the following methods.
Option 1: Use database/table mapping.
Option 2: Rename or delete objects with the same name in the target database.
Option 3: Remove objects with the same name from the migration objects.
If an entire instance is migrated, the target instance must be empty. If a conflict causes an error, you need to delete the instance content.
If advanced objects are selected, the target database cannot contain conflicted advanced objects. If a conflict causes an error, you need to delete the conflicted objects.

Troubleshooting

Using database/table mapping for MySQL/MariaDB/Percona/TDSQL-C for MySQL/TDSQL for MySQL only)

You can use the DTS table mapping feature to map the names of the objects to be migrated with the same name to other names in the target database.
1. Log in to the DTS console, select the migration task, and click **More** > **Modify** in the **Operation** column.
2. In **Selected Object** on the right, hover over an object to be modified, click the displayed **Edit** icon, and rename the object.
3. Run the verification task again.

Modifying objects with the same name in target database

Log in to the target database and rename or delete the objects with the same name as the migration objects.

Removing objects with the same name from migration objects

Modify the migration task configuration to remove the objects with the same name from the migration objects. The removed objects cannot be migrated.
1. Log in to the DTS console, select the migration task, and click **More** > **Modify** in the **Operation** column.
2. Remove the objects with the same name from the migration objects.
3. Run the verification task again.

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Deleting target database content

Log in to the target database, delete the objects with the same name as those in the source database or the entire database, and run the verification task again.

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Target Database Space Check

Last updated：2023-08-25 16:21:23

Check Details

The storage space of the target database must be at least 1.2 times the size of the tables to be migrated in the source database.
Full data migration will execute INSERT operations concurrently, generating data fragments in some tables of the target database. Therefore, after full migration is completed, the storage space of the tables in the target database may be larger than that in the source instance.

Troubleshooting

Delete some data from the target database to free up sufficient space.
Upgrade the storage specification of the target database to use an instance with a larger capacity for migration. For more information, see Adjusting Database Instance Specifications.

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Binlog Parameter Check

Last updated：2023-08-25 16:23:03

Check Details

You need to configure the source database's binlog parameters in compliance with the following requirements. If the verification fails, fix it as instructed in this document.
The `log_bin` variable must be set to `ON` .
The `binlog_format` variable must be set to `ROW` .
`binlog_row_image` must be set to `FULL` .
If the source database is MySQL 5.6 or later, `gtid_mode` can only be set to `ON` or `OFF` . We recommend that you set it to `ON` , because if it is set to `OFF` , an alarm will be triggered, and if it is set to `ON_PERMISSIVE` or `OFF_PERMISSIVE` , an error will be reported.
The `server_id` parameter must be set manually and cannot be `0` .
It is not allowed to set `do_db` and `ignore_db` .
If the source database is a replica database, the `log_slave_updates` variable must be set to `ON` .
We recommend that you retain the binlog of the source database for at least three days; otherwise, the task cannot be resumed from the checkpoint and will fail.

Troubleshooting

Enabling binlog

`log_bin` controls the binlog switch. You need to enable binlog to log all database table structure and data changes.
If a similar error occurs, fix it as follows:
1. Log in to the source database.
2. Modify the `my.cnf` configuration file of the source database as follows:
The modification of the `log_bin` parameter only takes effect after the database is restarted. Therefore, if errors are also reported for the `binlog_format` , `server_id` , binlog_row_image `and` expire_logs_days` parameters in the verification stage, we recommend that you modify all these parameters before restarting the database so that all the modifications can take effect.
Note
The default path of the `my.cnf` configuration file is `/etc/my.cnf` , subject to the actual conditions.

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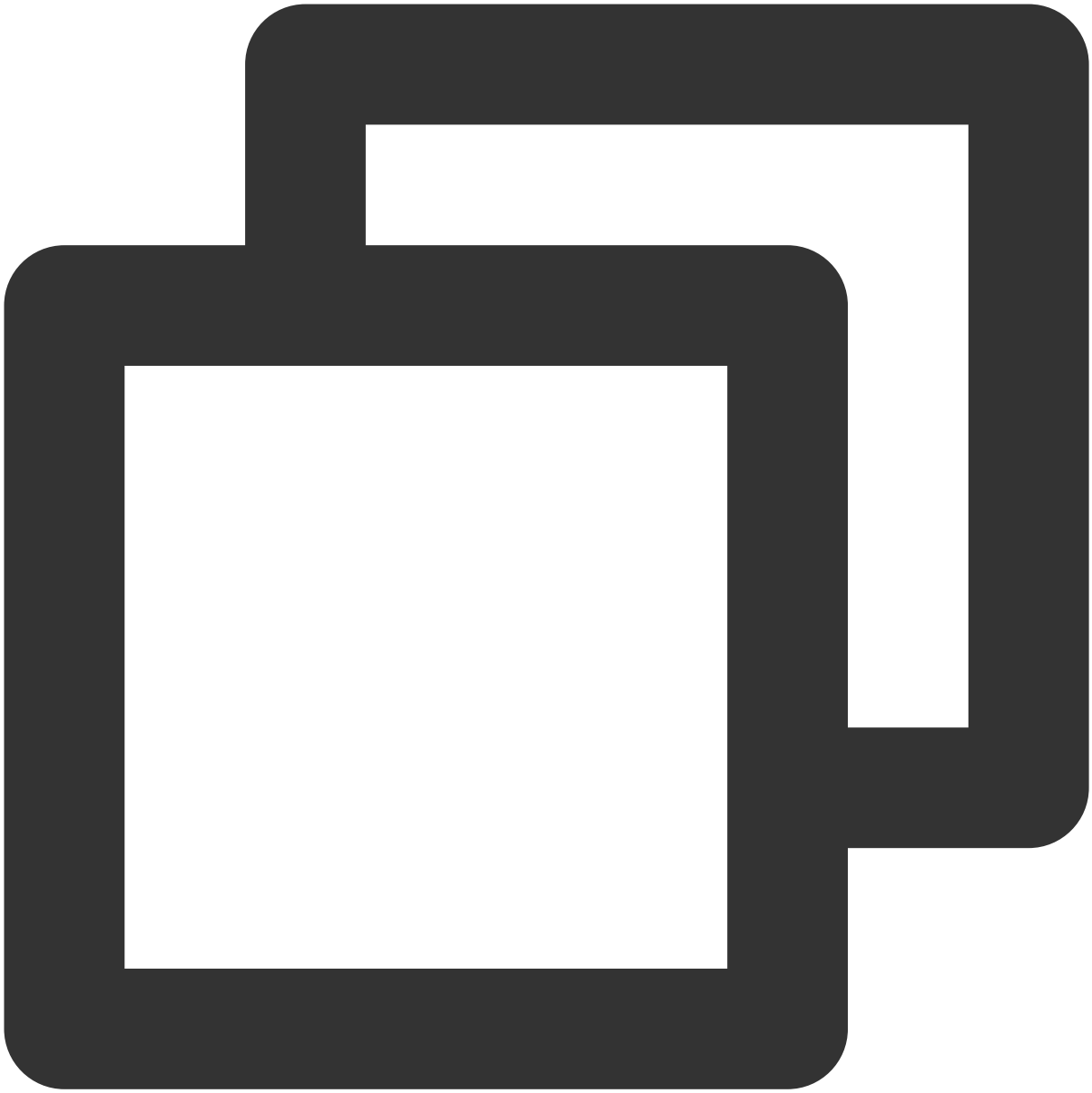

```
log_bin = MYSQL_BIN
binlog_format = ROW
server_id = 2     //We recommend that you set it to an integer above 1. The value h
binlog_row_image = FULL
expire_logs_days = 3     //Modify the binlog retention period (at least 3 days pref
```

3. Run the following command to restart the source database:

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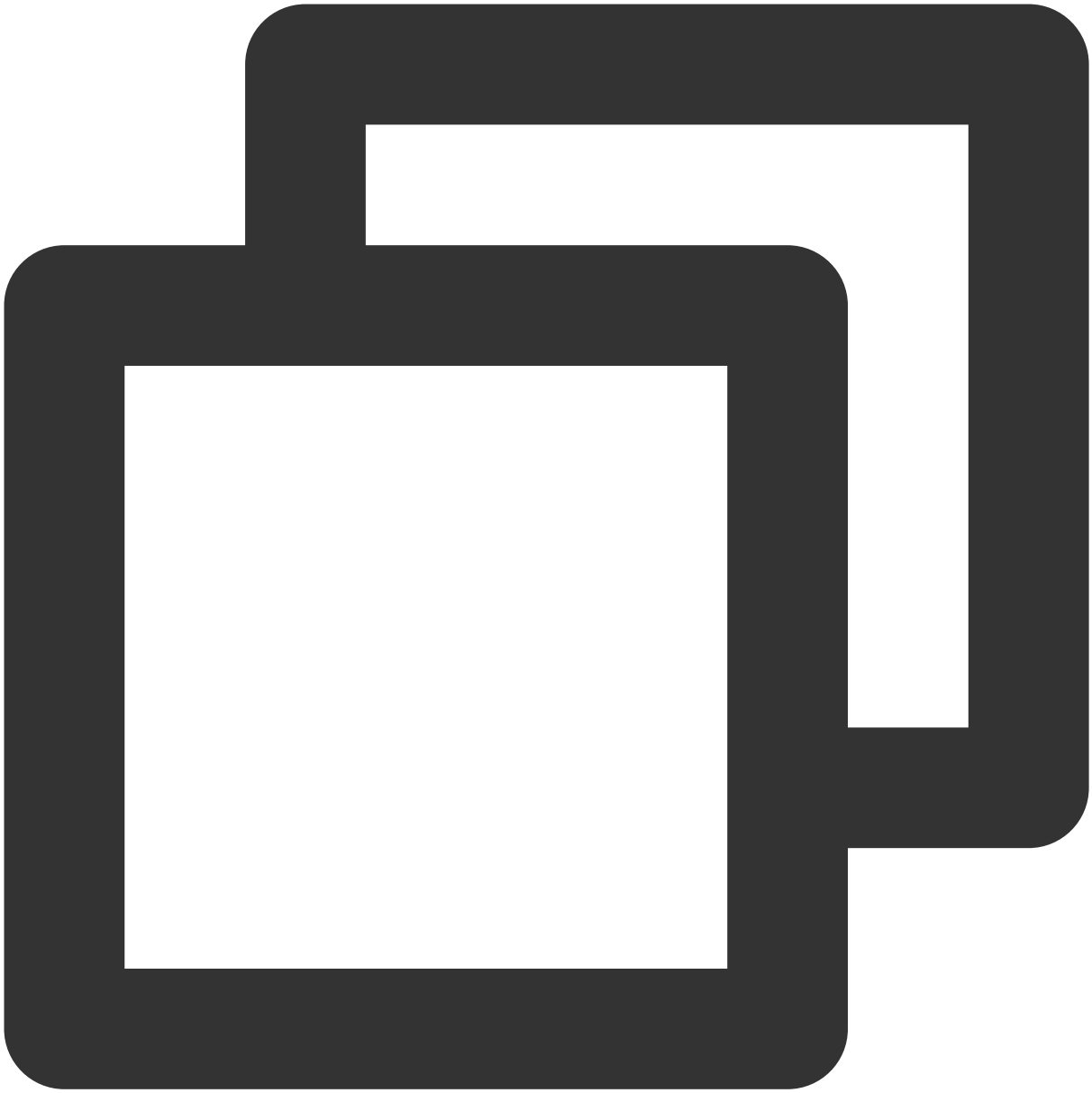

```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

Note

[$Mysql_Dir] is the installation path of the source database. Replace it with the actual path.

4. Check whether the binlog feature has been enabled.

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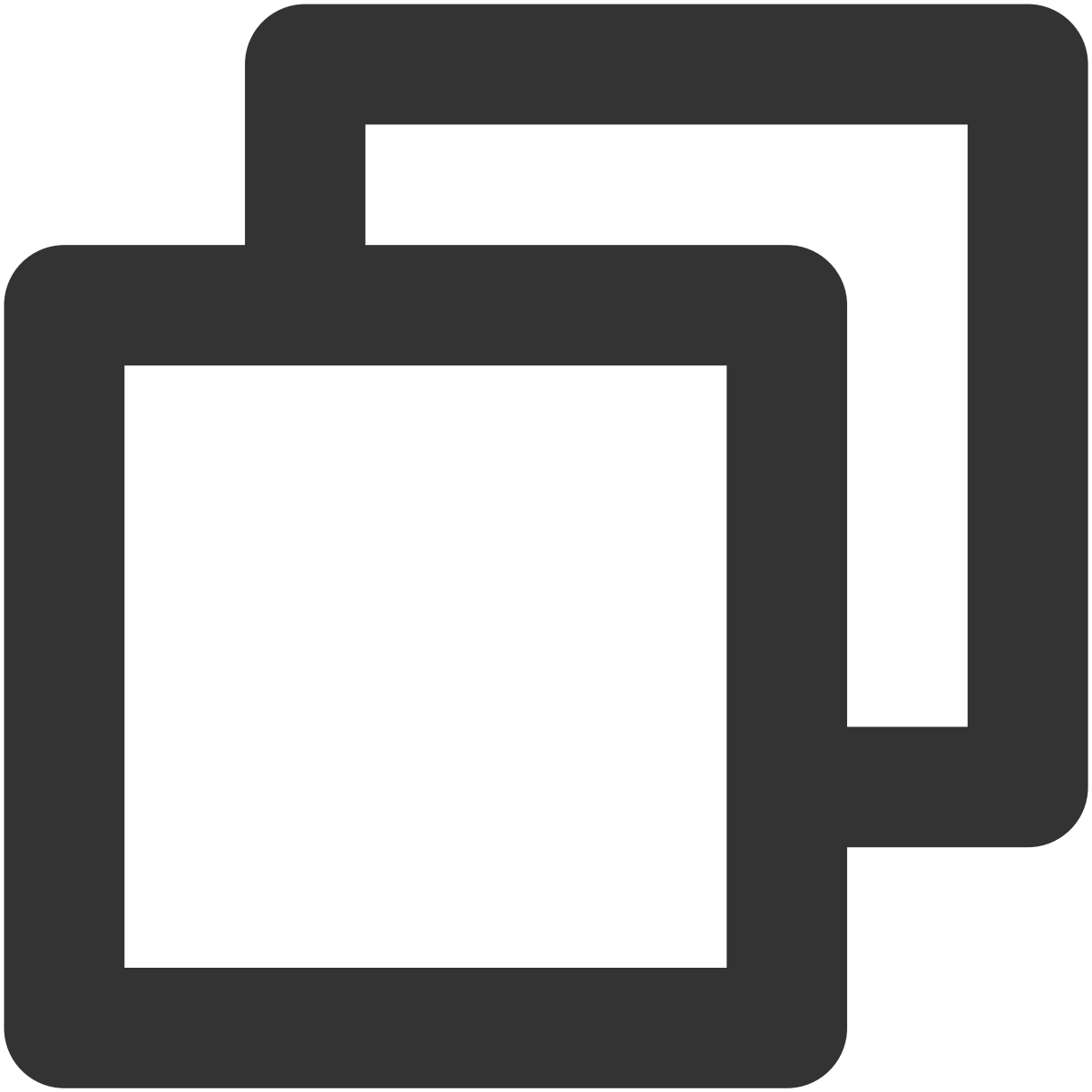

```
show variables like '%log_bin%';
```

The system will display a result similar to the following:

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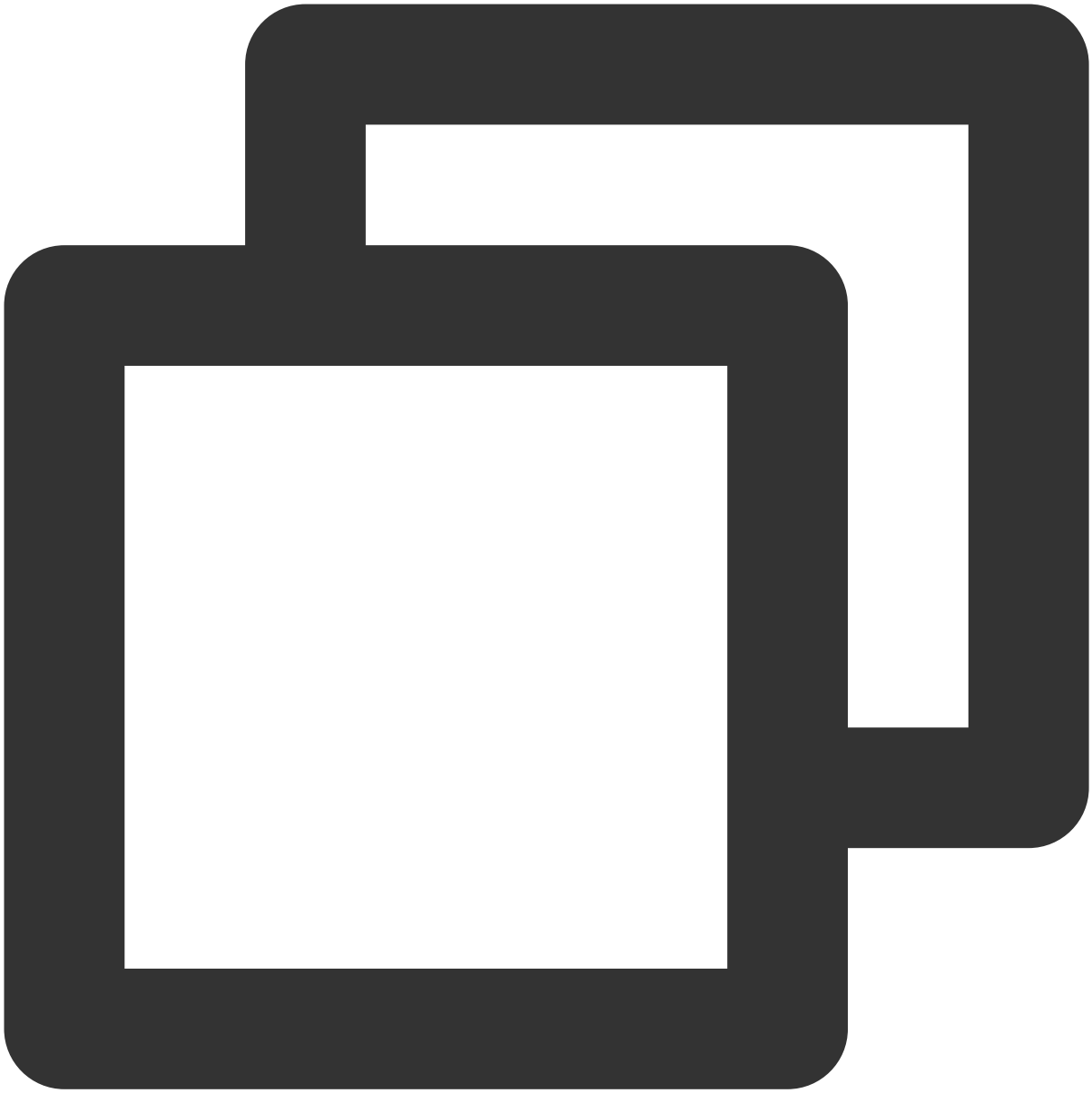

```
mysql> show variables like '%log_bin%';
+-----------------+-------+
| Variable_name   | Value |
+-----------------+-------+
| log_bin         | ON    |
+-----------------+-------+
| binlog_format   | ROW   |
+-----------------+-------+
| binlog_row_image | FULL  |
+-----------------+-------+
1 row in set (0.00 sec)
```

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5. Run the verification task again.

Modifying `binlog_format` parameter

`binlog_format` specifies one of the following three binlog formats:

`STATEMENT` : Each SQL statement that modifies the data will be logged into the binlog of the source/primary database. When replicating data, the replica/secondary database will run the same SQL statements as those in the source/primary database. This format can reduce the binlog size. However, the replica/secondary database may not be able to properly replicate certain functions.

`ROW` : The binlog will log the modification of each data row, and the replica/secondary database will modify the same data. This format guarantees the correct source-replica or primary-secondary replication, but the binlog size will increase.

`MIXED` : It is a combination of the above two formats. MySQL will automatically select `STATEMENT` or `ROW` format to log each executed SQL statement.

Therefore, to ensure the correct source-replica or primary-secondary replication, the `binlog_format` parameter should be set to `ROW` . If a similar error occurs, fix it as follows:

Note

Changes to this parameter can only take effect after all connections to the database are reset. If the source database is a replica/secondary database, you also need to restart the source-replica or primary-replica sync SQL thread to prevent current business connections from continuing writing data in the mode before modification.

1. Log in to the source database.
2. Run the following command to modify `binlog_format` .

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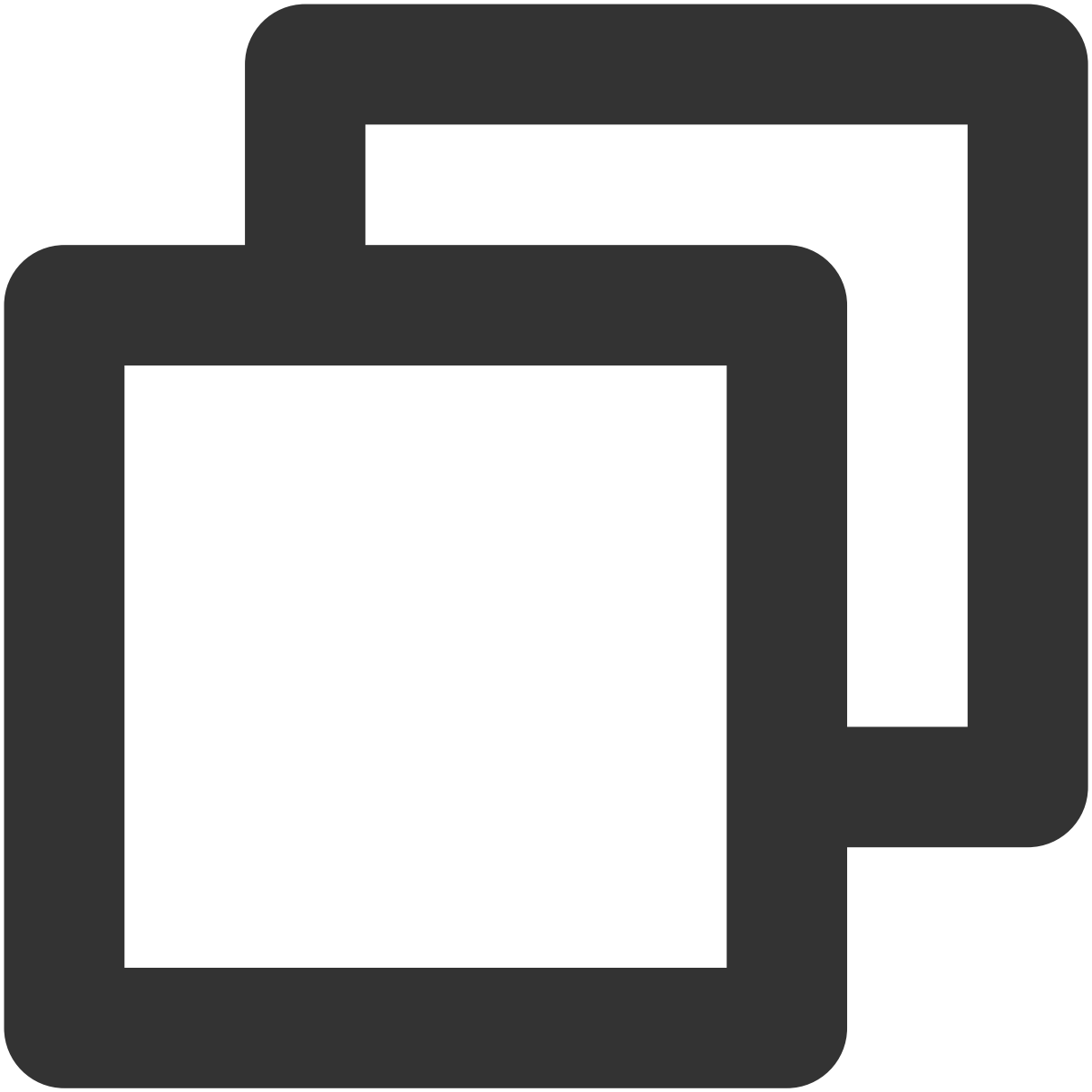

```
set global binlog_format = ROW;
```

3. Restart the thread for the configuration to take effect. Then, run the following command to check whether the parameter modification takes effect:

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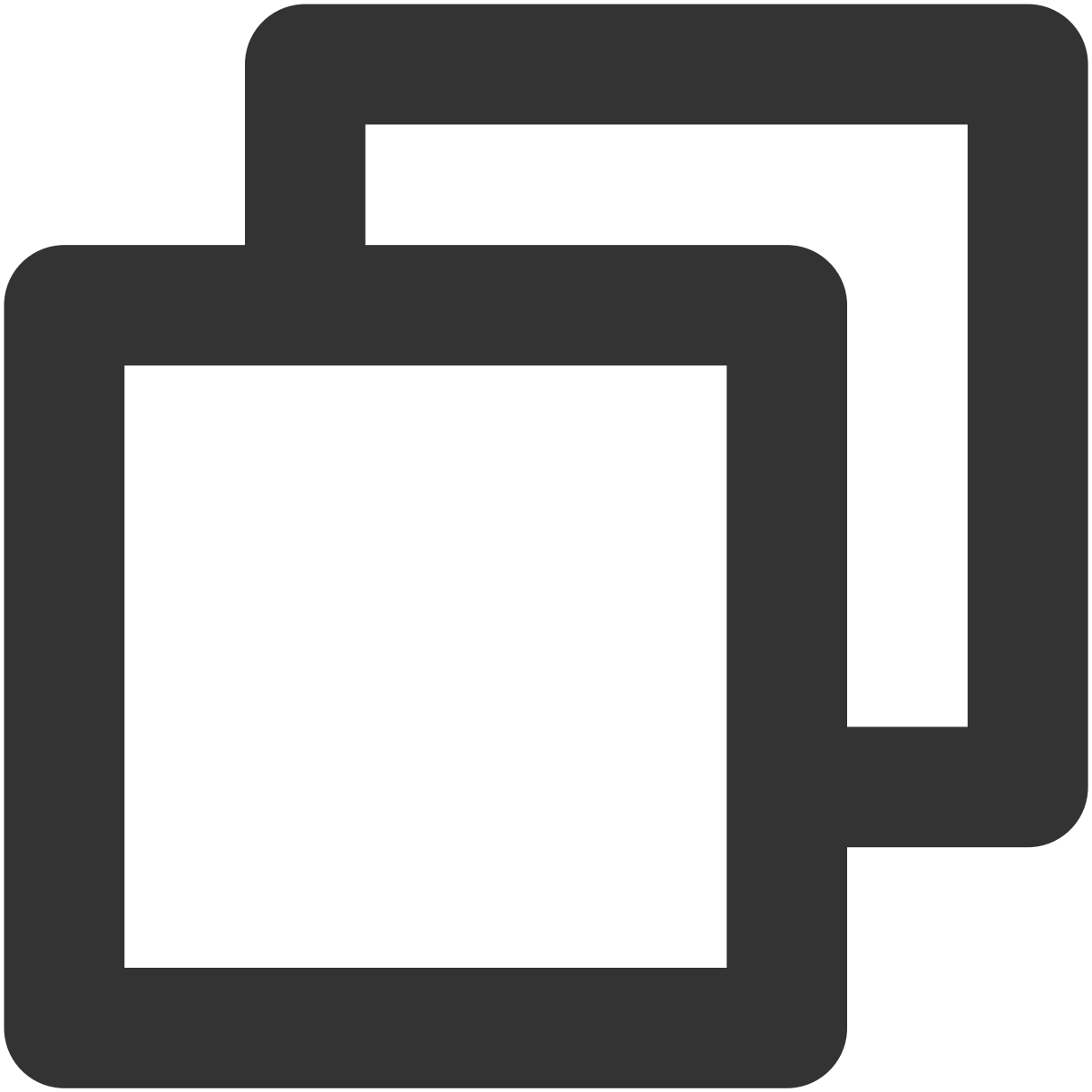

```
show variables like '%binlog_format%';
```

The system will display a result similar to the following:

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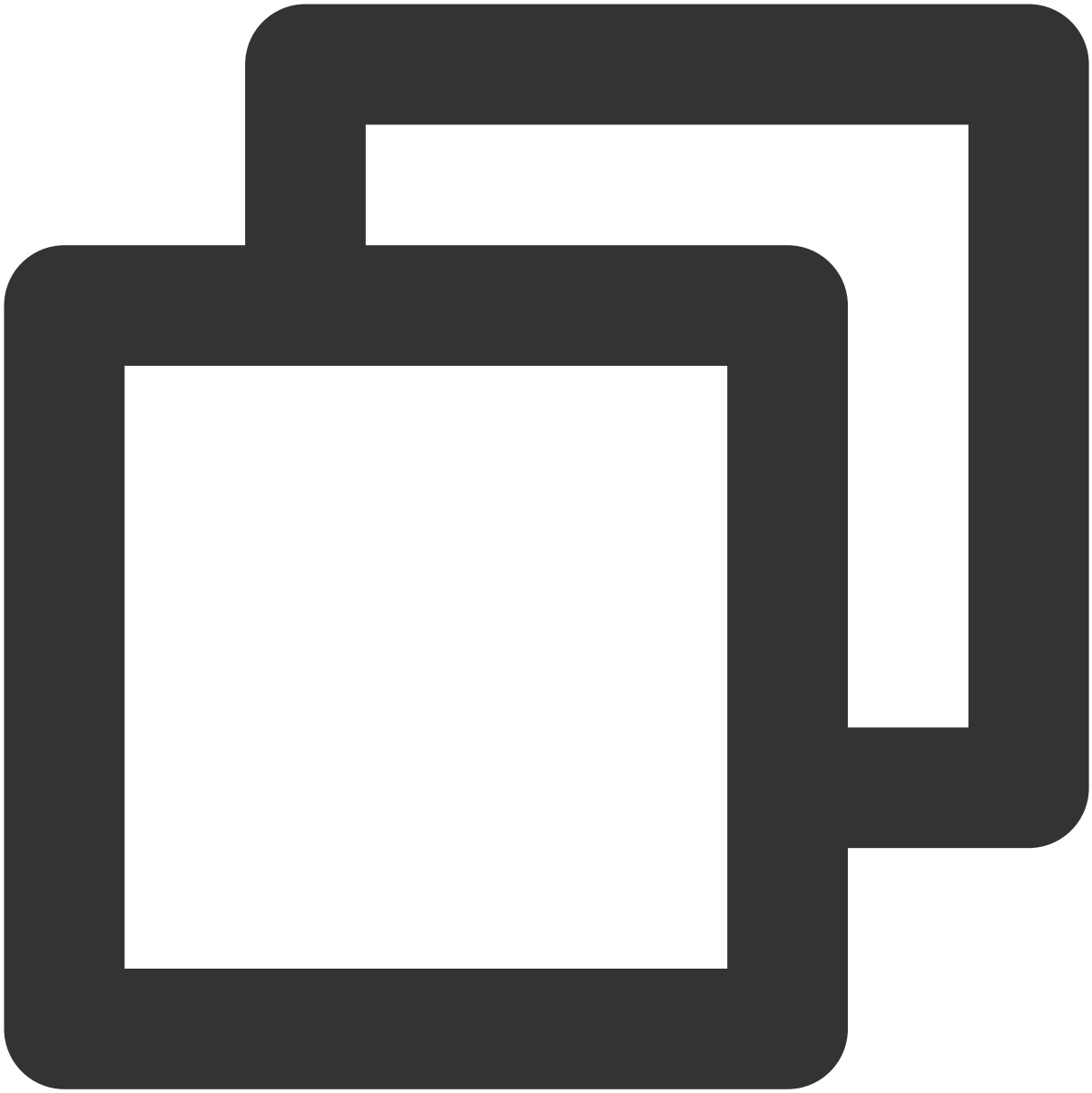

```
mysql> show variables like '%binlog_format%';
+---------------+-------+
| Variable_name | Value |
+---------------+-------+
| binlog_format | ROW   |
+---------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Modifying `binlog_row_image` parameter

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The `binlog_row_image` parameter determines how the binlog logs the pre-image (content before modification) and post-image (content after modification), which directly affects features such as data flashback and source-replica or primary-replica replication.

The `binlog_row_image` parameter takes effect only if `binlog_format` is set to `ROW`. The following describes the effects of specific values:

`FULL`: In `ROW` format, binlog will log all the pre-image and post-image column data information.

`MINIMAL`: In `ROW` format, if a table has no primary key or unique key, the pre-image will log all columns, and the post-image will log the modified columns. If it has a primary key or unique key, both the pre-image and post-image will only log the affected columns.

Therefore, you need to set `binlog_row_image` to `FULL` to make the source database binlog log the full image. If an error occurs, troubleshoot as follows:

Note

Changes to this parameter can only take effect after all connections to the database are reset. If the source database is a replica/secondary database, you also need to restart the source-replica or primary-replica sync SQL thread to prevent current business connections from continuing writing data in the mode before modification.

1. Log in to the source database.
2. Run the following command to modify `binlog_row_image`:

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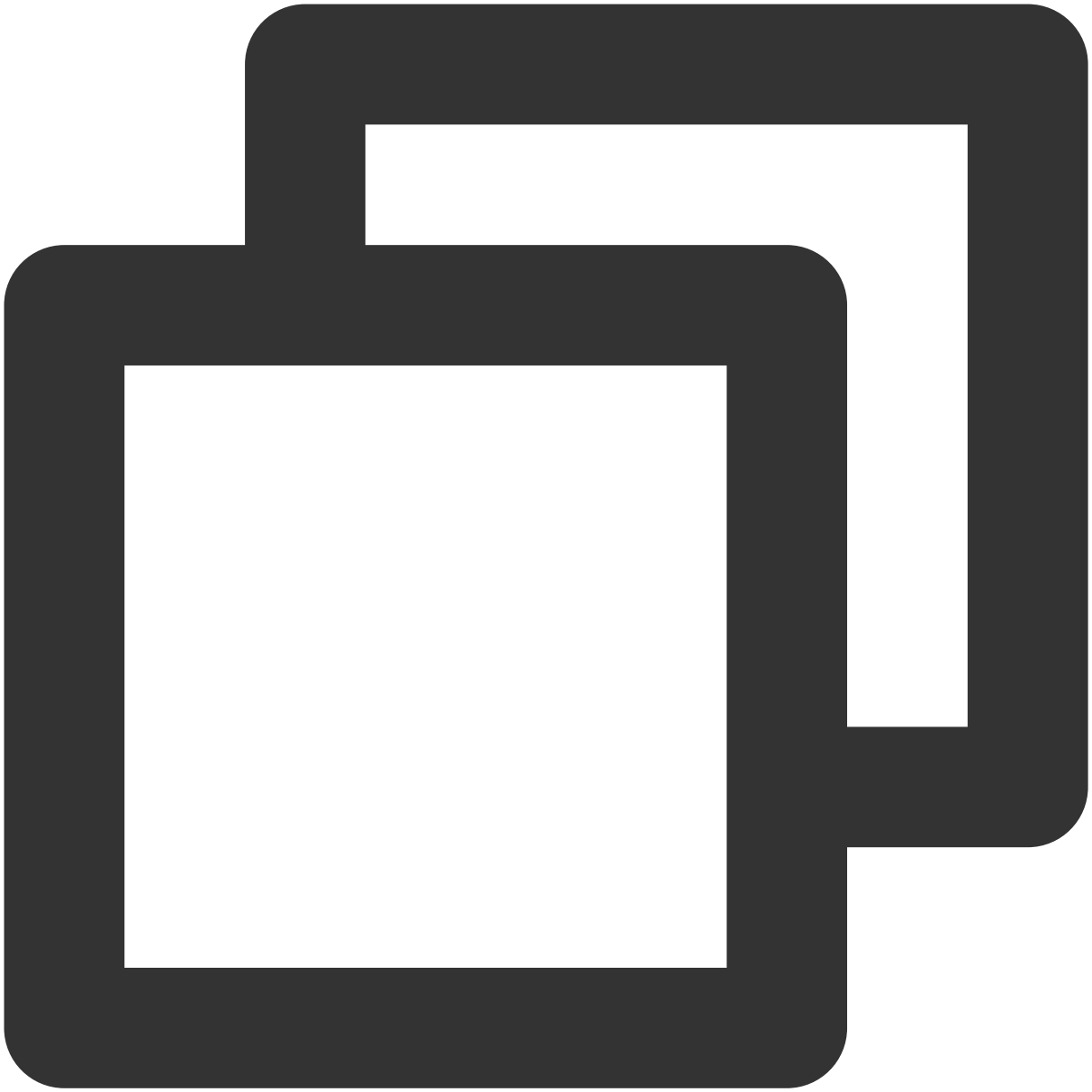

```
set global binlog_row_image = FULL;
```

3. Restart the thread for the configuration to take effect. Then, run the following command to check whether the parameter modification takes effect:

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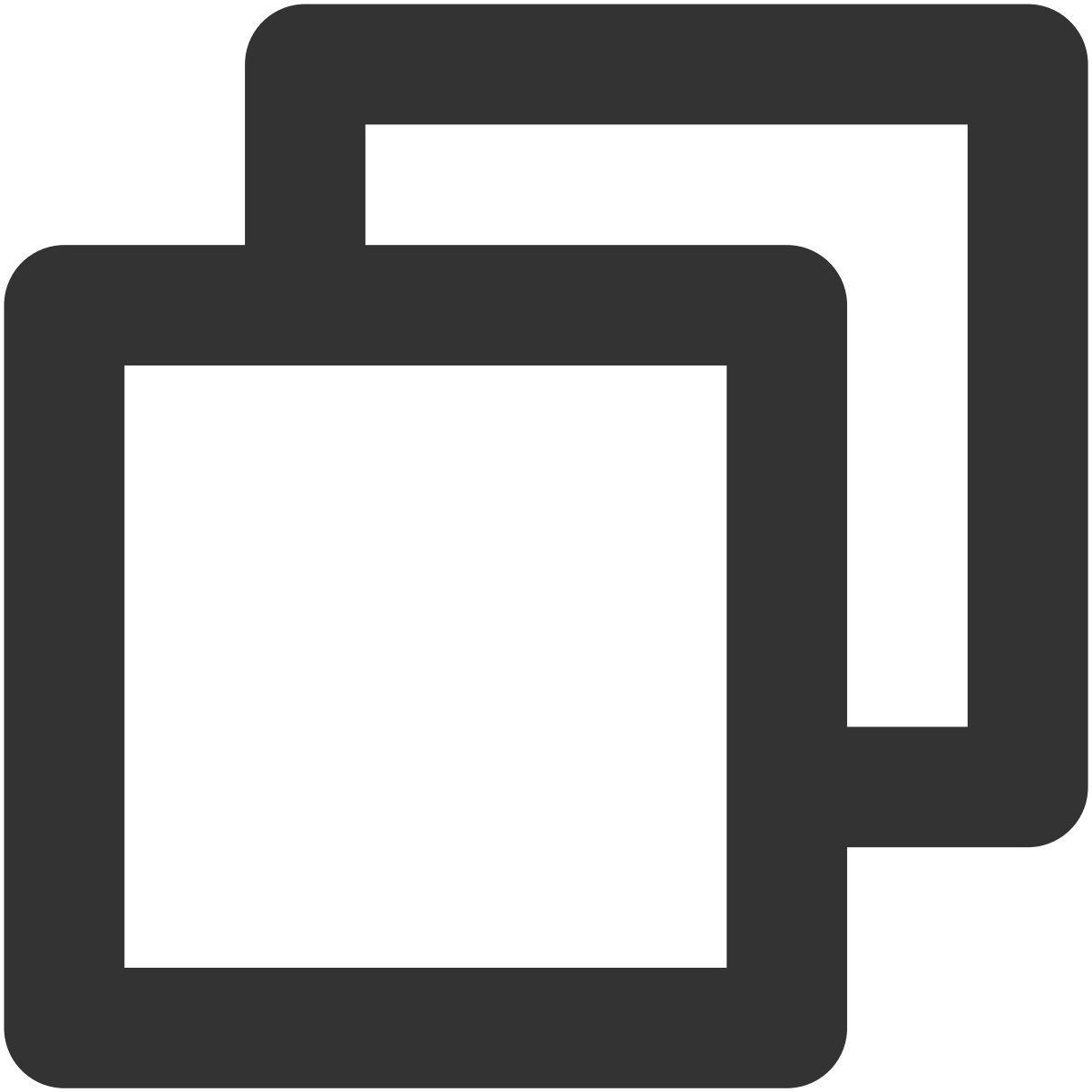

```
show variables like '%binlog_row_image%';
```

The system will display a result similar to the following:

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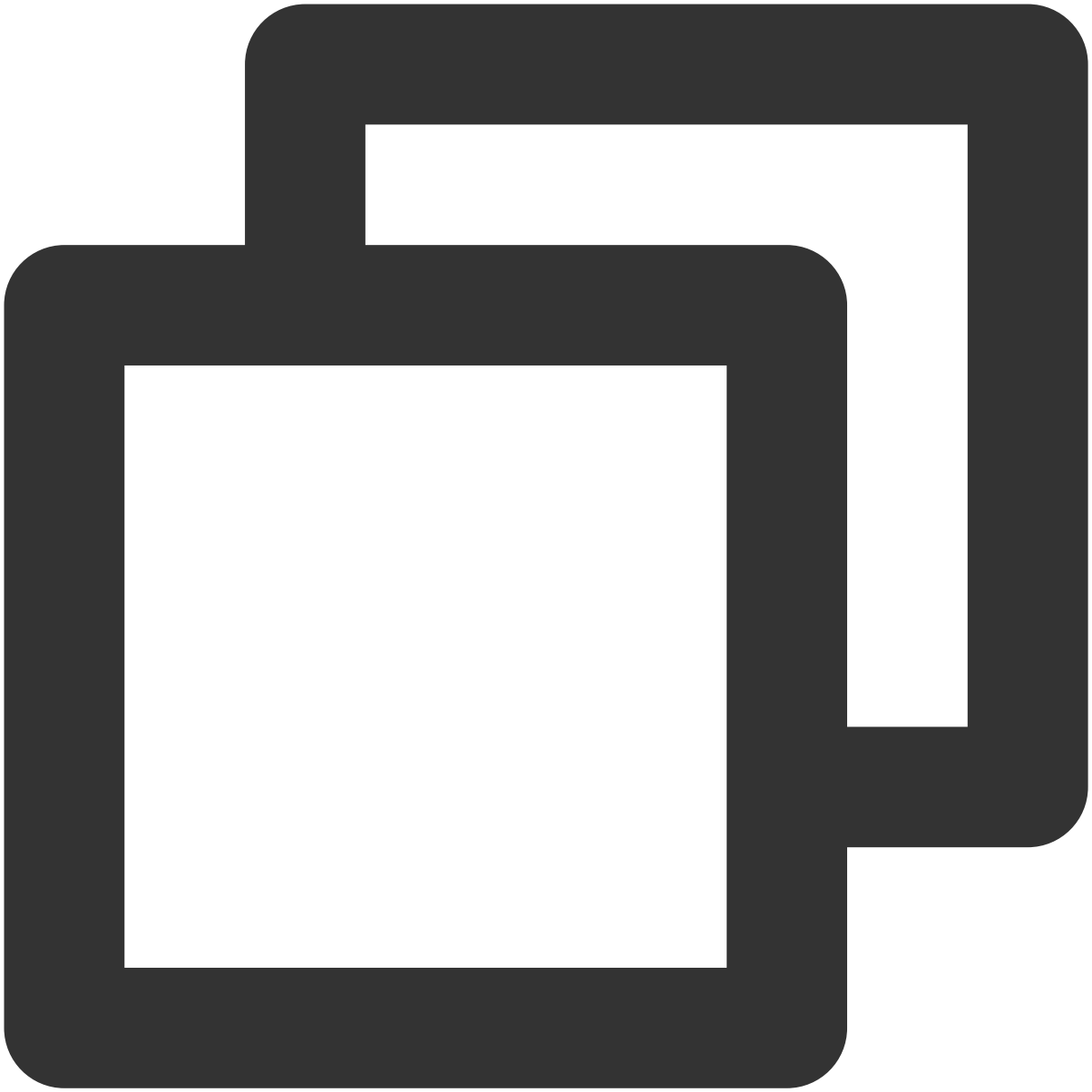

```
mysql> show variables like '%binlog_row_image%';
+------------------+-------+
| Variable_name    | Value |
+------------------+-------+
| binlog_row_image | FULL  |
+------------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Modifying `gtid_mode` parameter

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A global transaction identifier (GTID) uniquely identifies a transaction in the binlog. Using GTIDs can prevent disordered data or source-replica or primary-replica inconsistency due to repeated transaction executions.
GTID is a new feature on MySQL 5.6. Therefore, this problem may only occur on MySQL 5.6 or later versions. DTS only allows you to set `gtid_mode` to `ON` or `OFF` . We recommend that you set it to `ON` ; otherwise, an alarm will be triggered during verification.
The alarm does not affect the migration or sync task but affects the business. After GTID is set, if HA switch occurs in the source database during incremental data sync, DTS will be switched and restarted, which is almost imperceptible to the task; if GTID is not set, the task will fail after disconnection and cannot be resumed.
Below are the valid values of `gtid_mode` . When modifying the value, you can only do so in the specified sequence step by step; for example, if you want to change `OFF` to `ON` , you should modify the `gtid_mode` value in the following sequence: `OFF` <-> `OFF_PERMISSIVE` <-> `ON_PERMISSIVE` <-> `ON` .
`OFF` : All new transactions in the source/primary database and all transactions in the replica/secondary database must be anonymous.
`OFF_PERMISSIVE` : All new transactions in the source/primary database must be anonymous. Transactions in the replica/secondary database can be anonymous or GTID transactions but cannot only be GTID transactions.
`ON_PERMISSIVE` : All new transactions in the source/primary database must be GTID transactions, and transactions in the replica/secondary database can be anonymous or GTID transactions.
`ON` : All new transactions in the source/primary database and all transactions in the replica/secondary database must be GTID transactions.
If a similar alarm is triggered, fix it as follows:
1. Log in to the source database.
2. Set `gtid_mode = OFF_PERMISSIVE` on the source/primary and replica databases.
On MySQL versions earlier than v5.7.6, you need to modify the parameter in the `my.cnf` configuration file and restart the database to make the change take effect. On v5.7.6 and later, you can modify the parameter through global naming without restarting the database, but you must reset all business connections.

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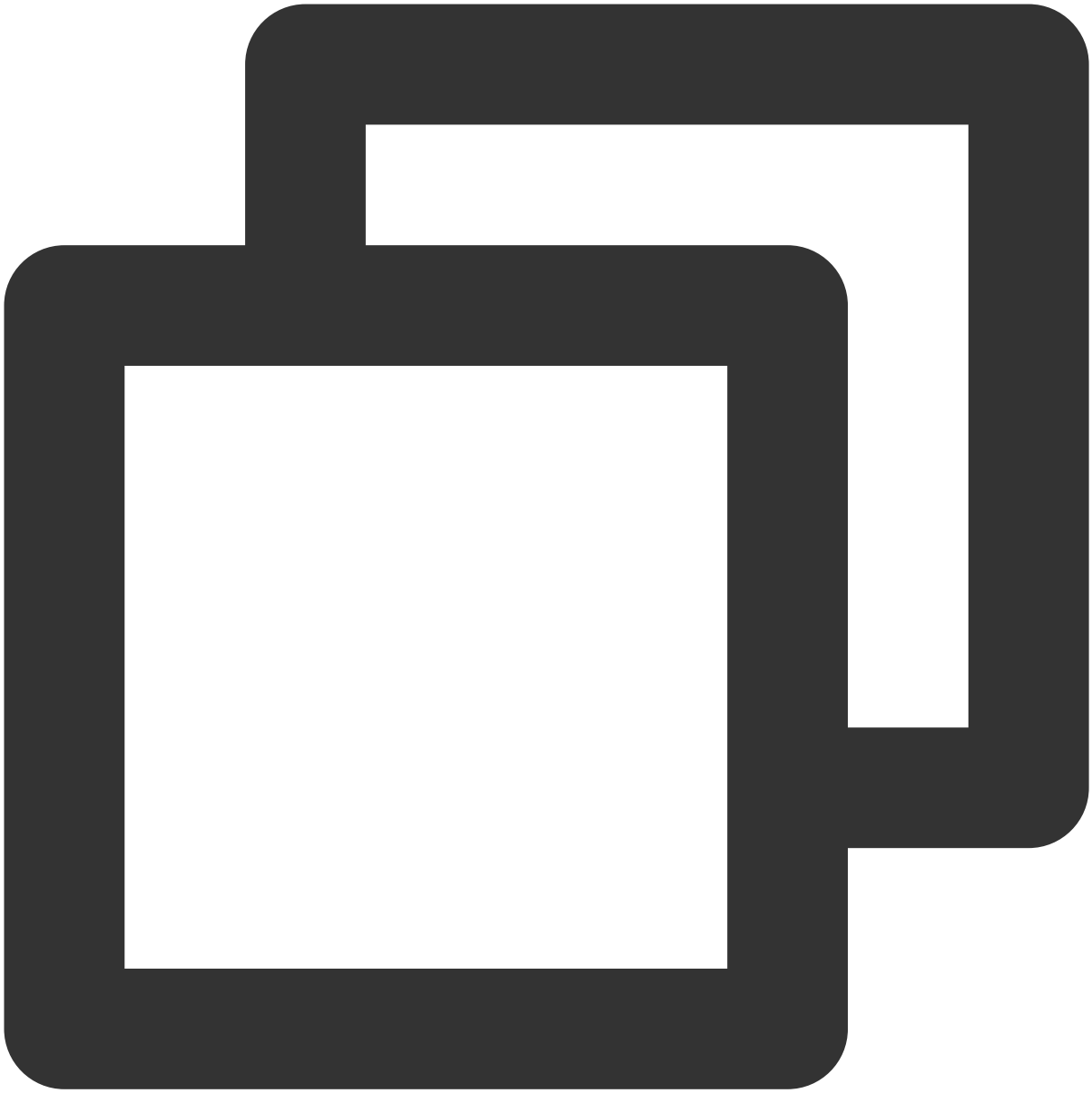

```
set global gtid_mode = OFF_PERMISSIVE;
```

3. Set `gtid_mode = ON_PERMISSIVE` on the source/primary and replica databases.

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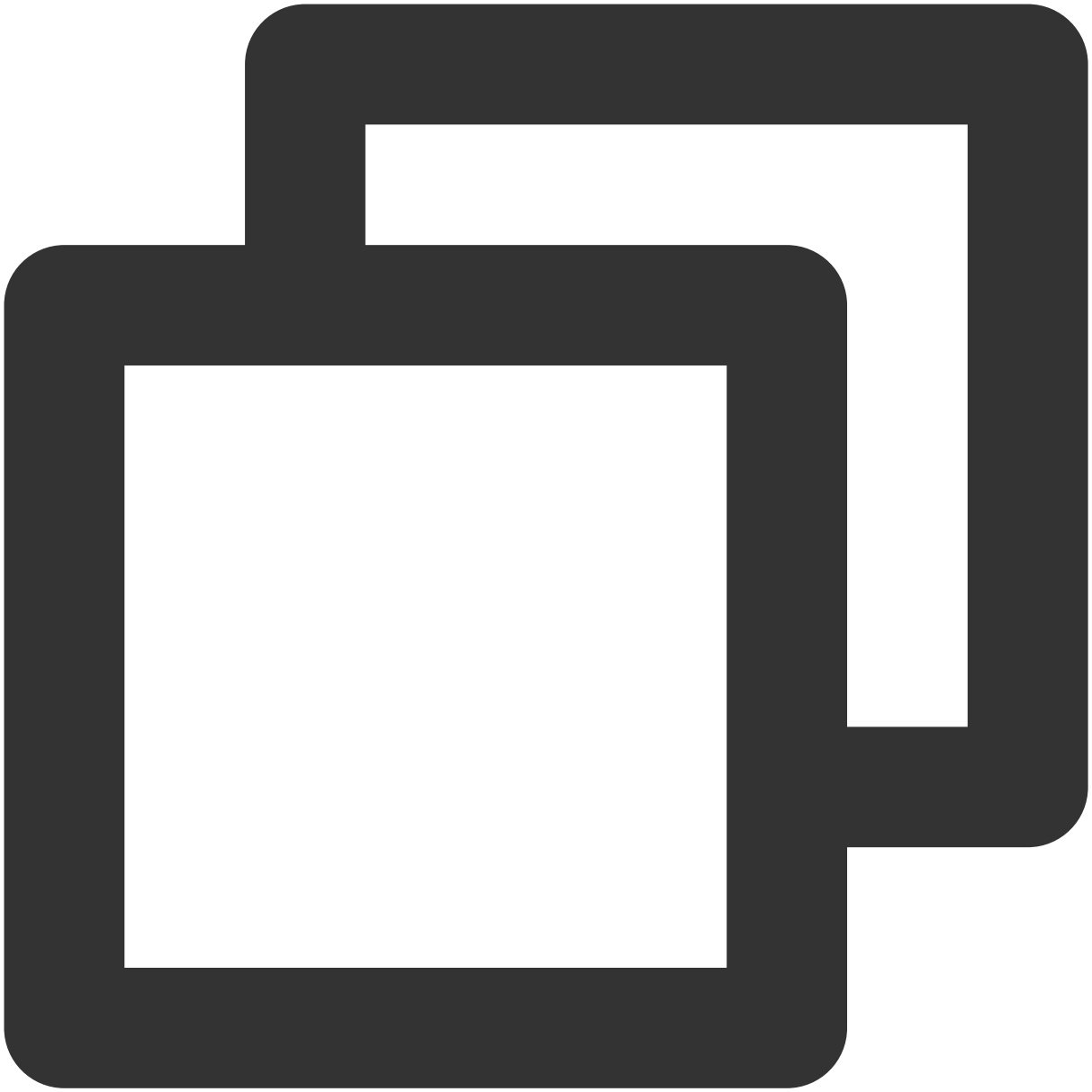

```
set global gtid_mode = ON_PERMISSIVE;
```

4. Run the following command on each instance node to check whether consumption of anonymous transactions is completed. If the parameter value is `0` , the consumption is completed.

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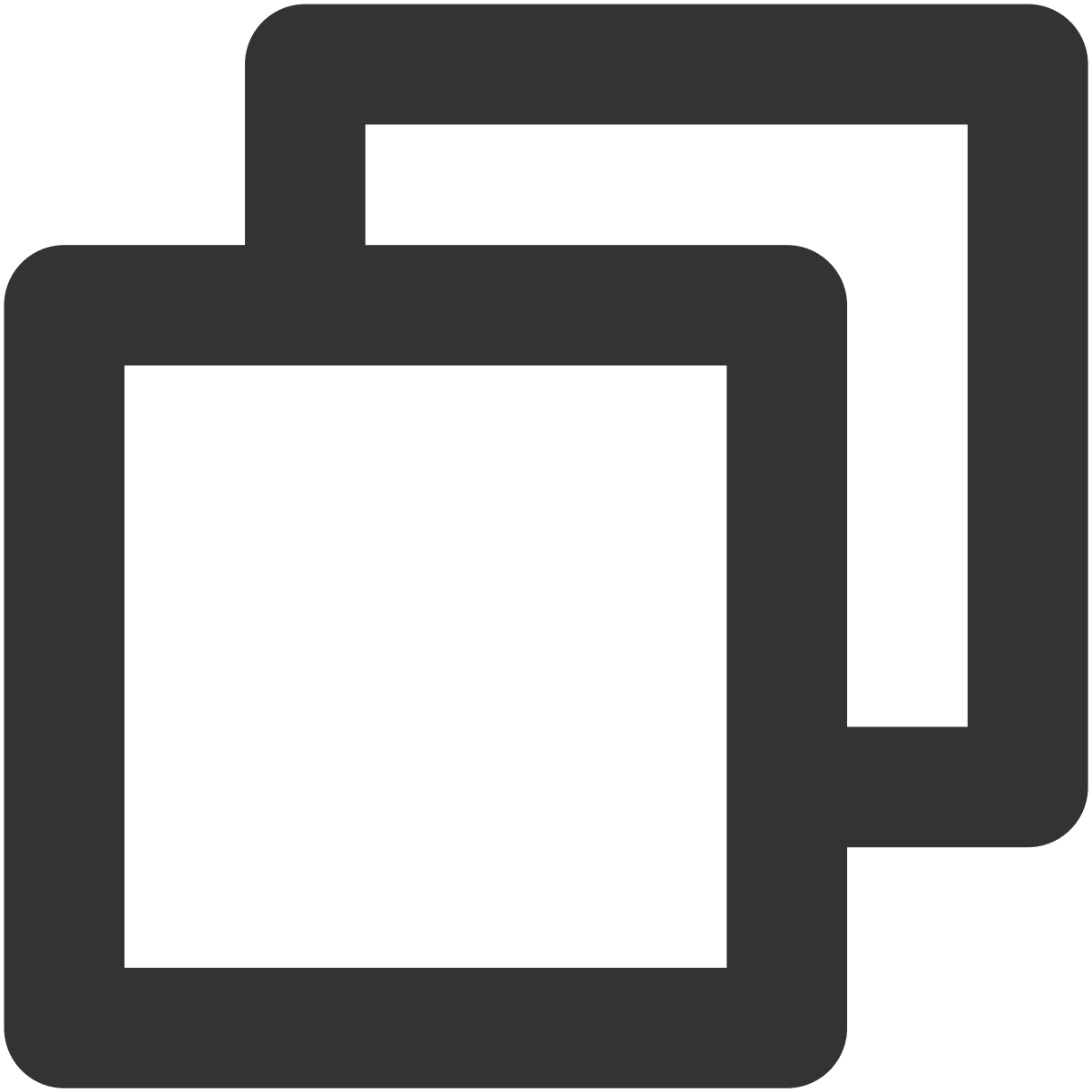

```
show variables like '%ONGOING_ANONYMOUS_TRANSACTION_COUNT%';
```

The system will display a result similar to the following:

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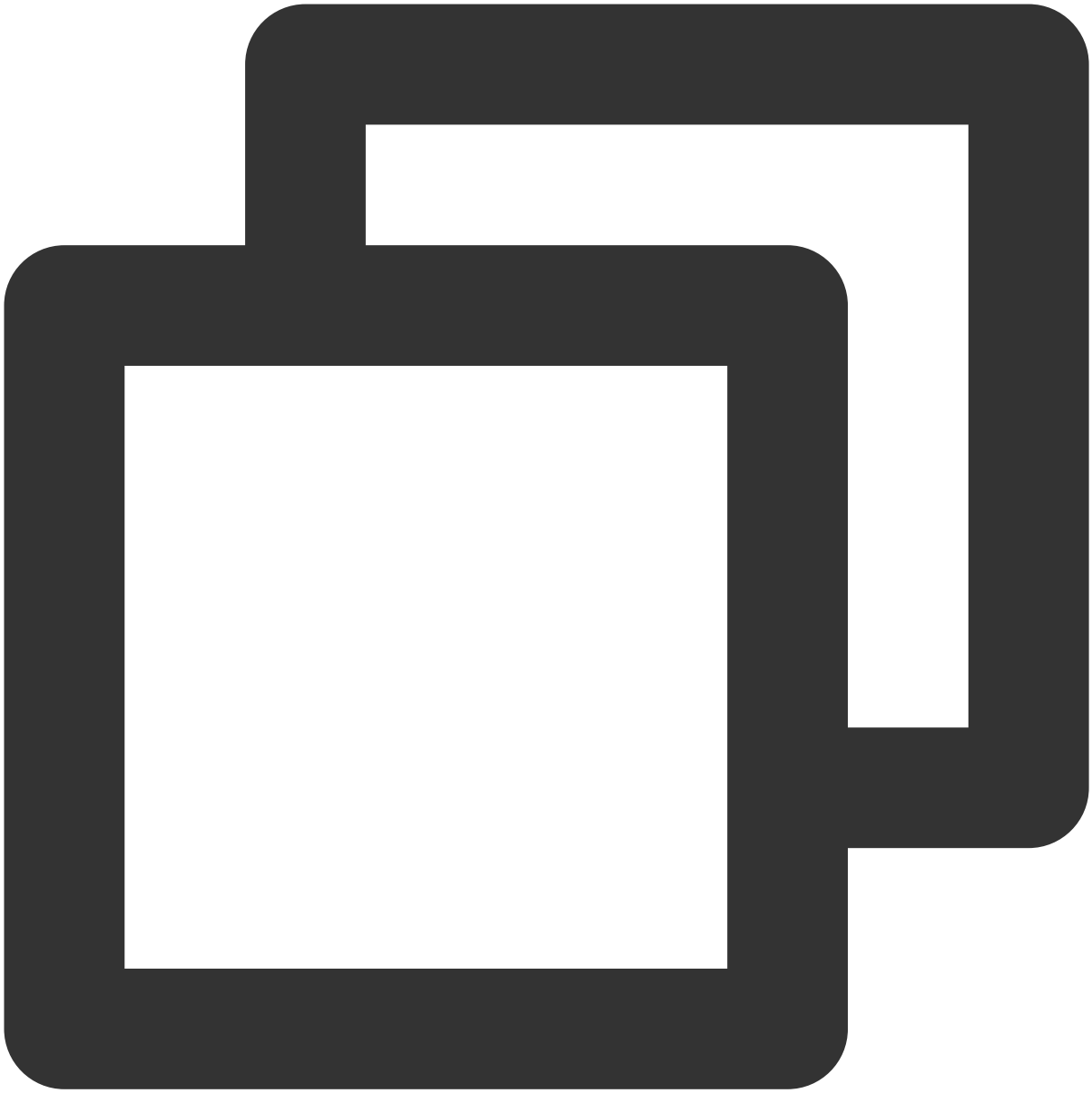

```
mysql> show variables like '%ONGOING_ANONYMOUS_TRANSACTION_COUNT%';
+-----------------------------------+-------+
| Variable_name                     | Value |
+-----------------------------------+-------+
| Ongoing_anonymous_transaction_count | 0     |
+-----------------------------------+-------+
1 row in set (0.00 sec)
```

5. Set `gtid_mode = ON` on the source/primary and replica databases.

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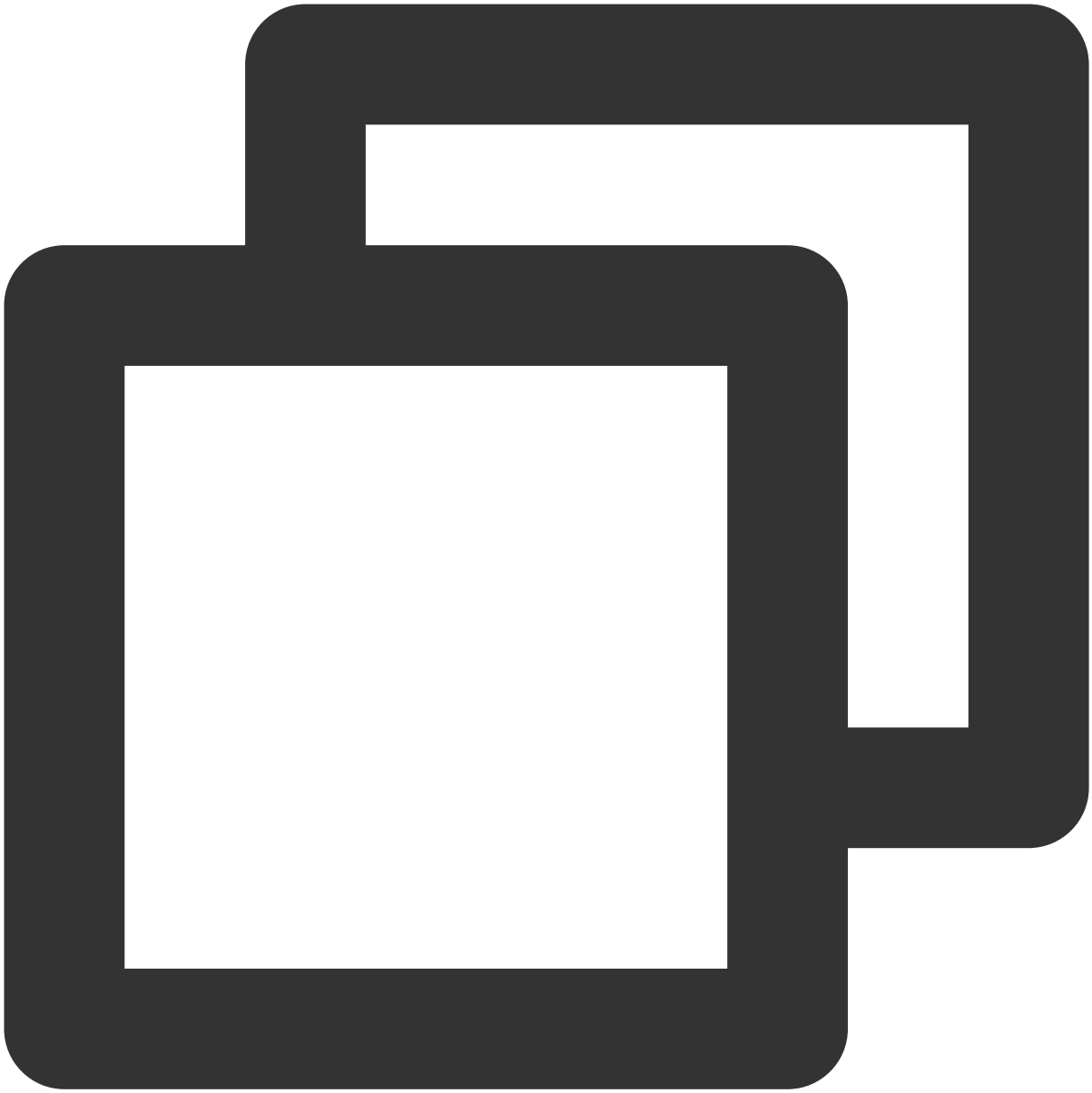

```
set global gtid_mode = ON;
```

6. Add the following content to the `my.cnf` file and restart the database to make the initial values take effect.

Note

The default path of the `my.cnf` configuration file is `/etc/my.cnf`, subject to the actual conditions.

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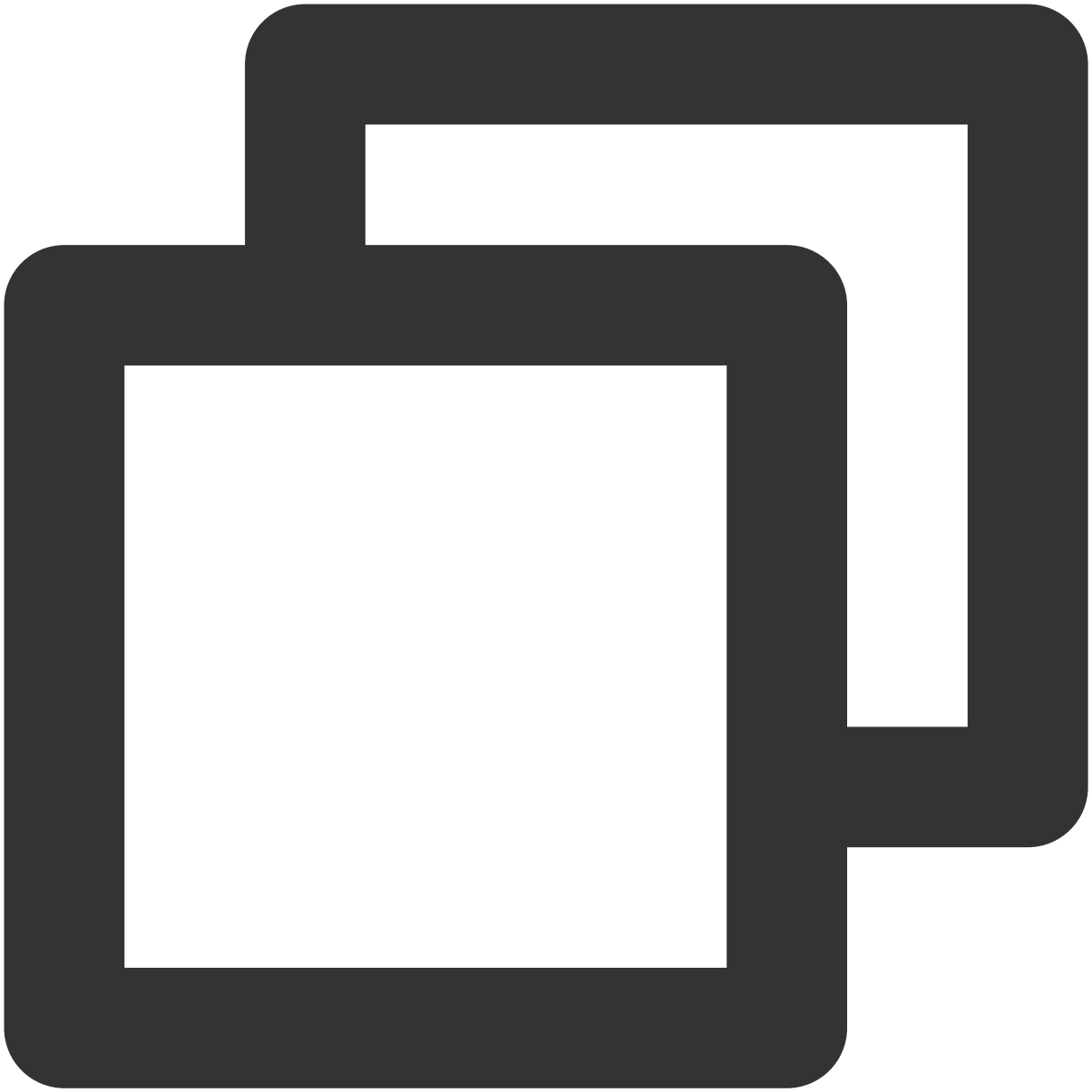

```
gtid_mode = on
enforce_gtid_consistency = on
```

7. Run the verification task again.

Modifying `server_id` parameter

The `server_id` parameter must be set manually and cannot be `0`. The default value of this parameter is `1`, but the configuration may not be correct even if the queried parameter value is `1`. You still need to set it manually.

1. Log in to the source database.

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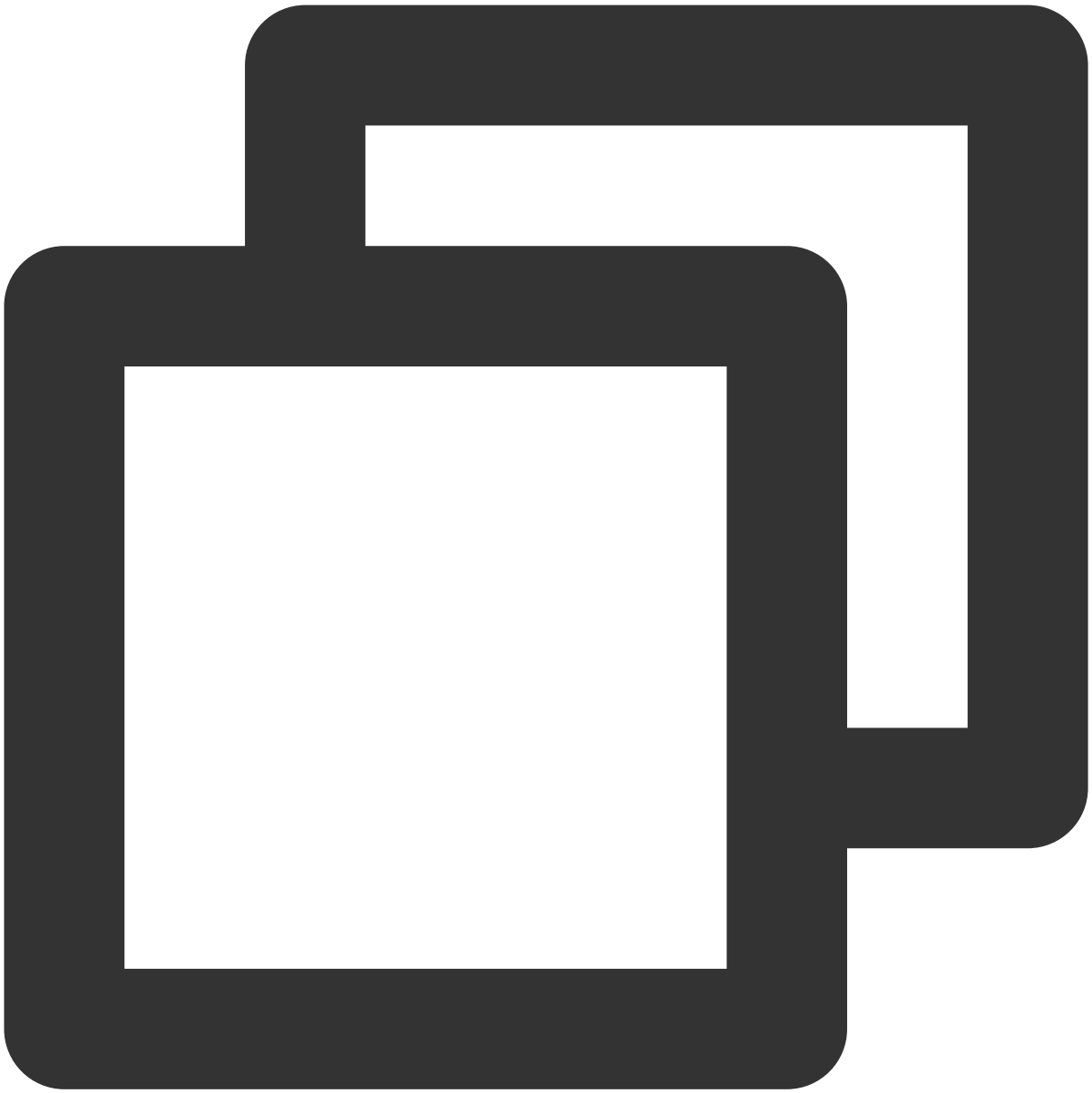
2. Run the following command to modify `server_id` :



```
set global server_id = 2;  // We recommend that you set it to an integer above 1. T
```

3. Run the following command to check whether the parameter modification takes effect:

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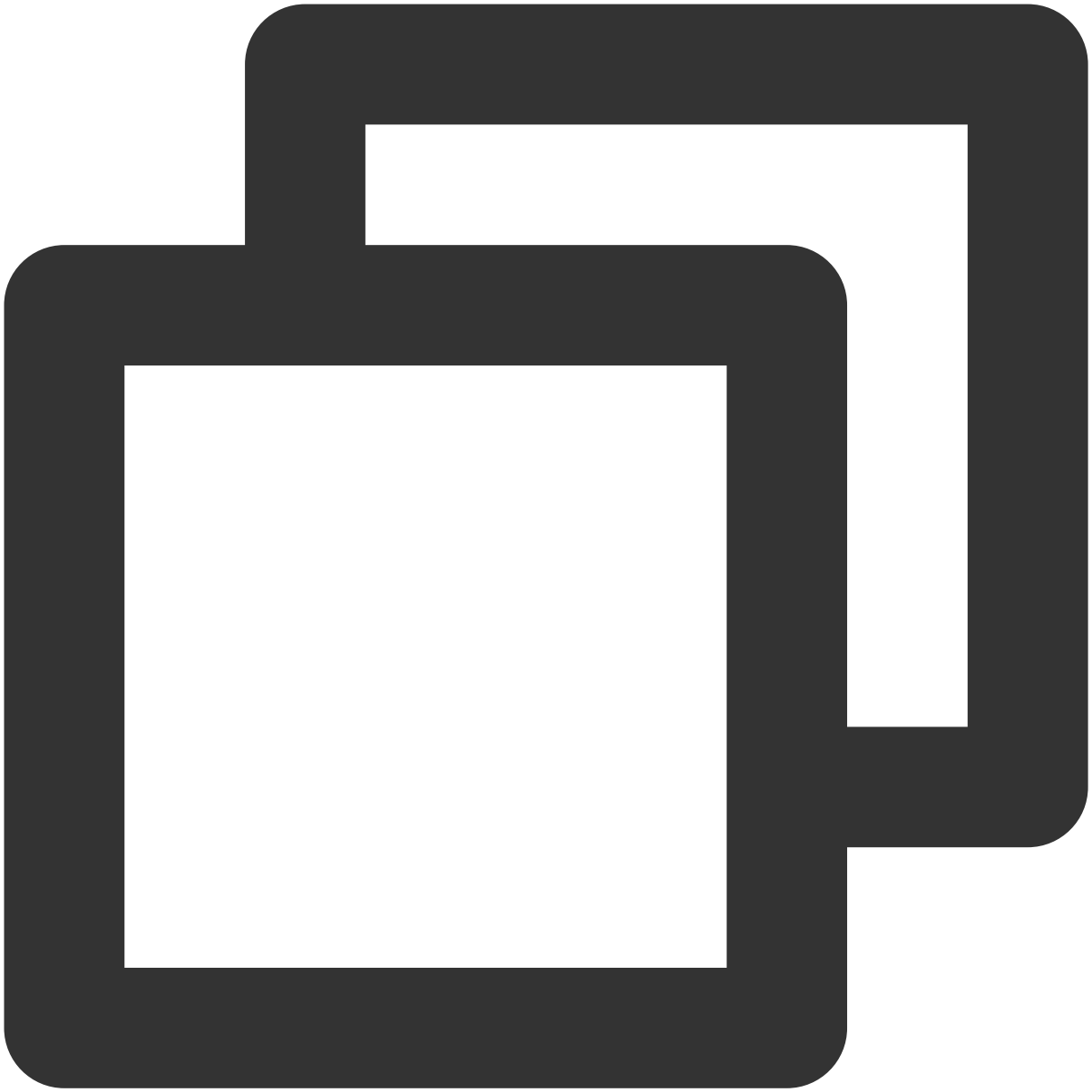

```
show global variables like '%server_id%';
```

The system will display a result similar to the following:

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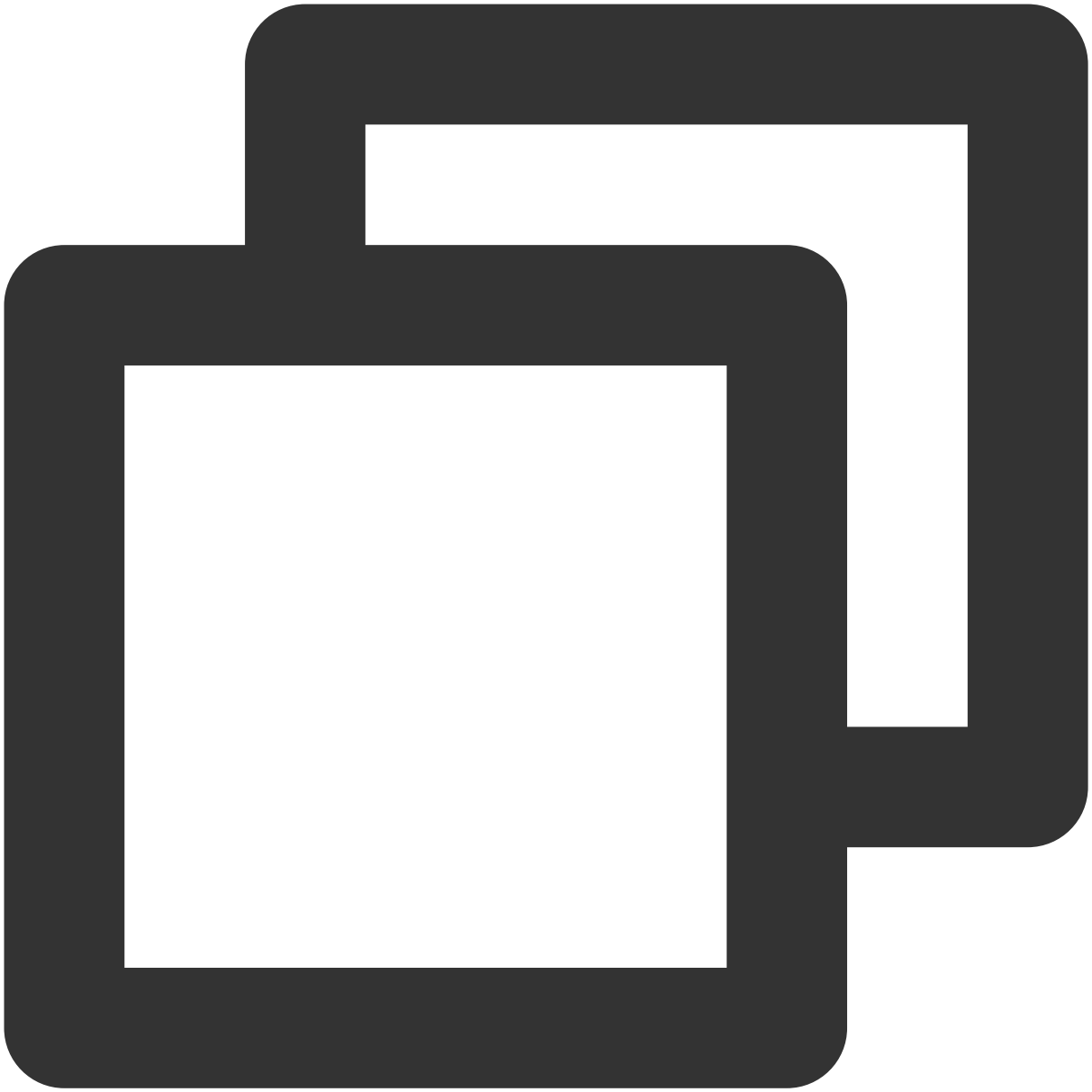

```
mysql> show global variables like '%server_id%';
+---------------+-------+
| Variable_name | Value |
+---------------+-------+
| server_id     | 2     |
+---------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Deleting `do_db` and `ignore_db` settings

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The binlog logs all executed DDL and DML statements in the database, while `do_db` and `ignore_db` are used to set the filter conditions for binlog.

`binlog_do_db` : Only the specified databases will be logged in the binlog (all databases will be logged by default).

`binlog_ignore_db` : The specified databases will not be logged in the binlog.

After `do_db` and `ignore_db` are set, some cross-database operations will not be logged in the binlog, and source-replica or primary-replica replication will be abnormal; therefore, this setting is not recommended. If a similar error occurs, fix it as follows:

1. Log in to the source database.

2. Modify the `my.cnf` configuration file in the source database to delete `do_db` and `ignore_db` settings.

Note

The default path of the `my.cnf` configuration file is `/etc/my.cnf` , subject to the actual conditions.

3. Run the following command to restart the source database:

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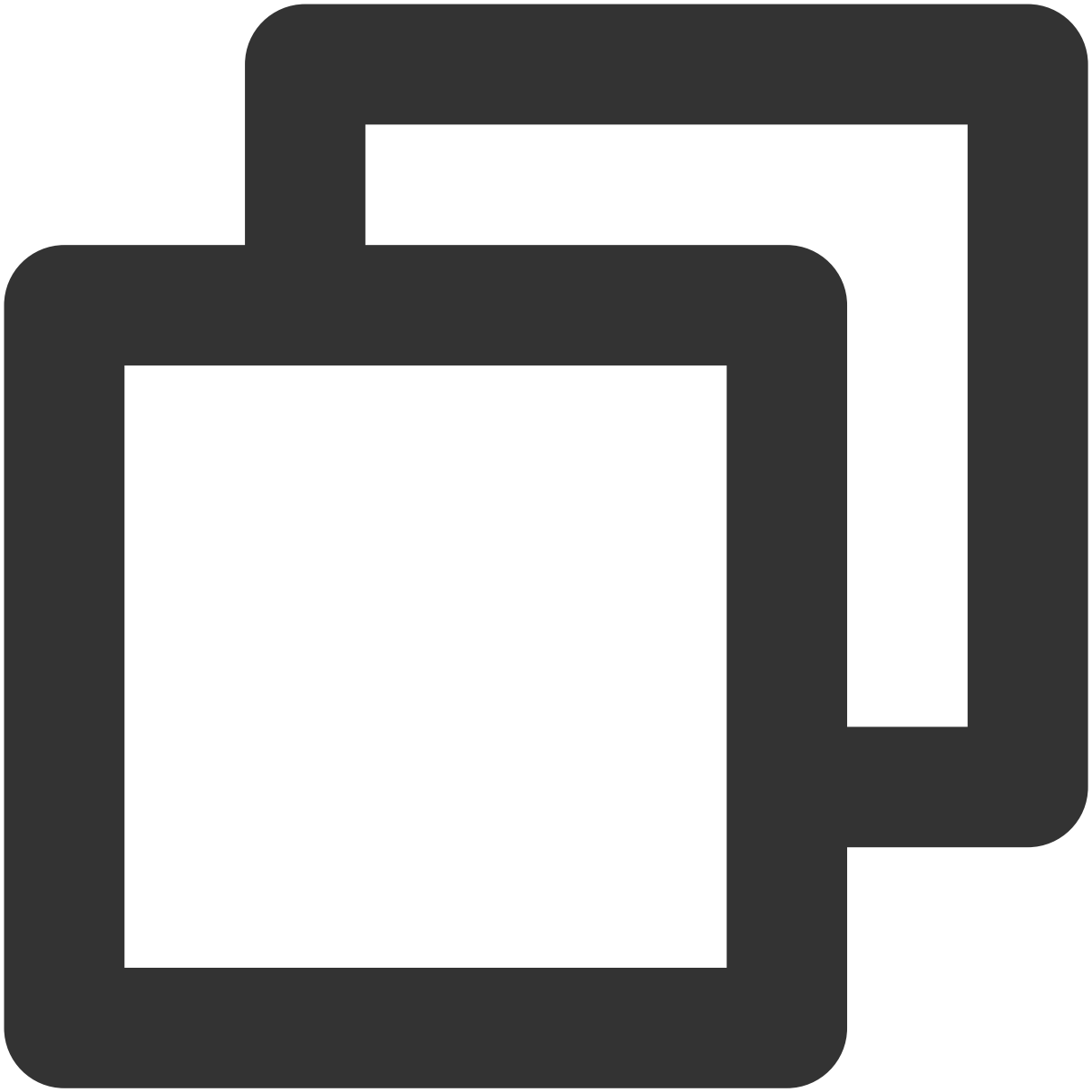

```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

Note

[$Mysql_Dir] is the installation path of the source database. Replace it with the actual path.

4. Check whether the parameter modification takes effect.

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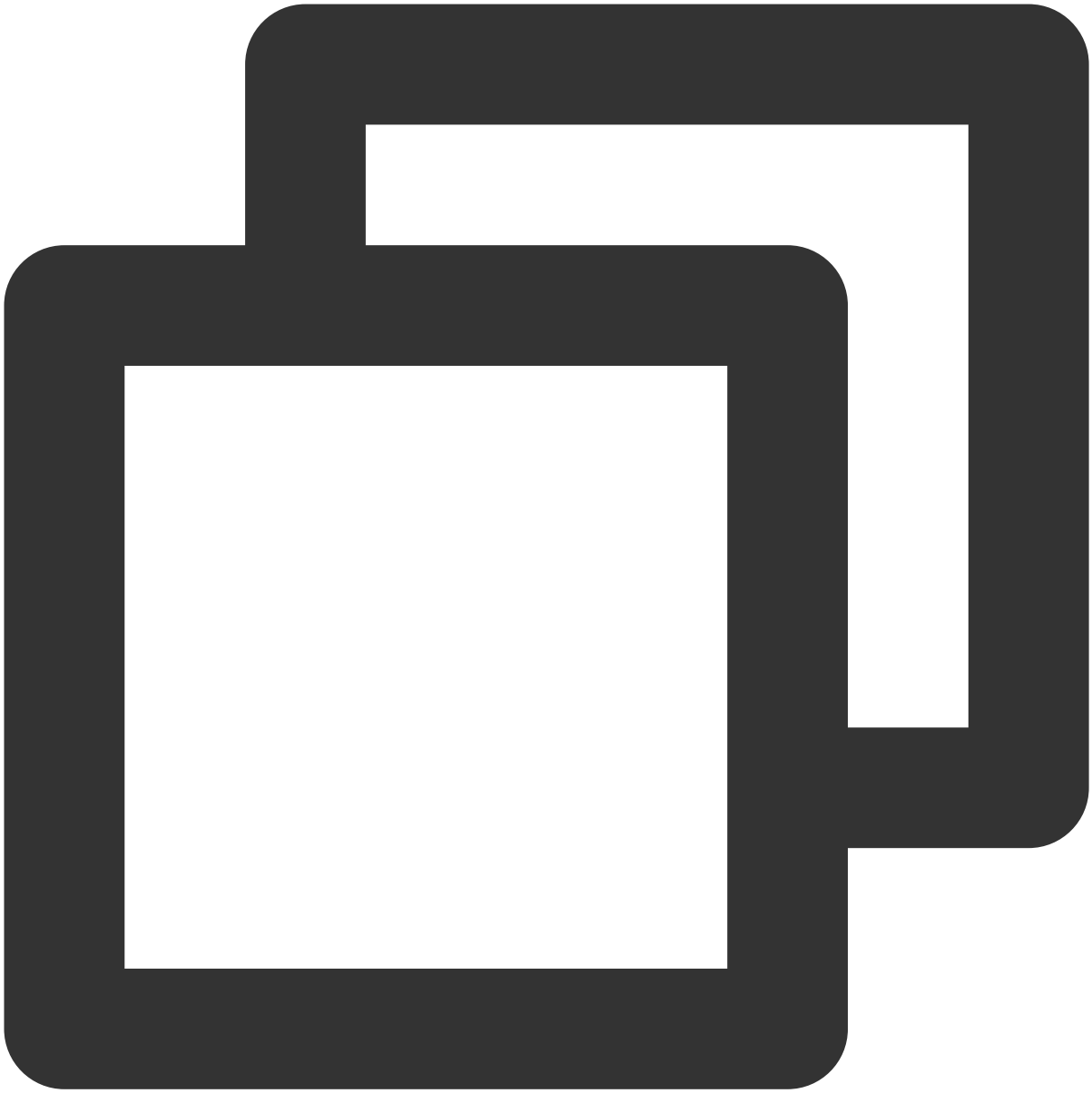

```
show master status;
```

The system will display a result similar to the following:

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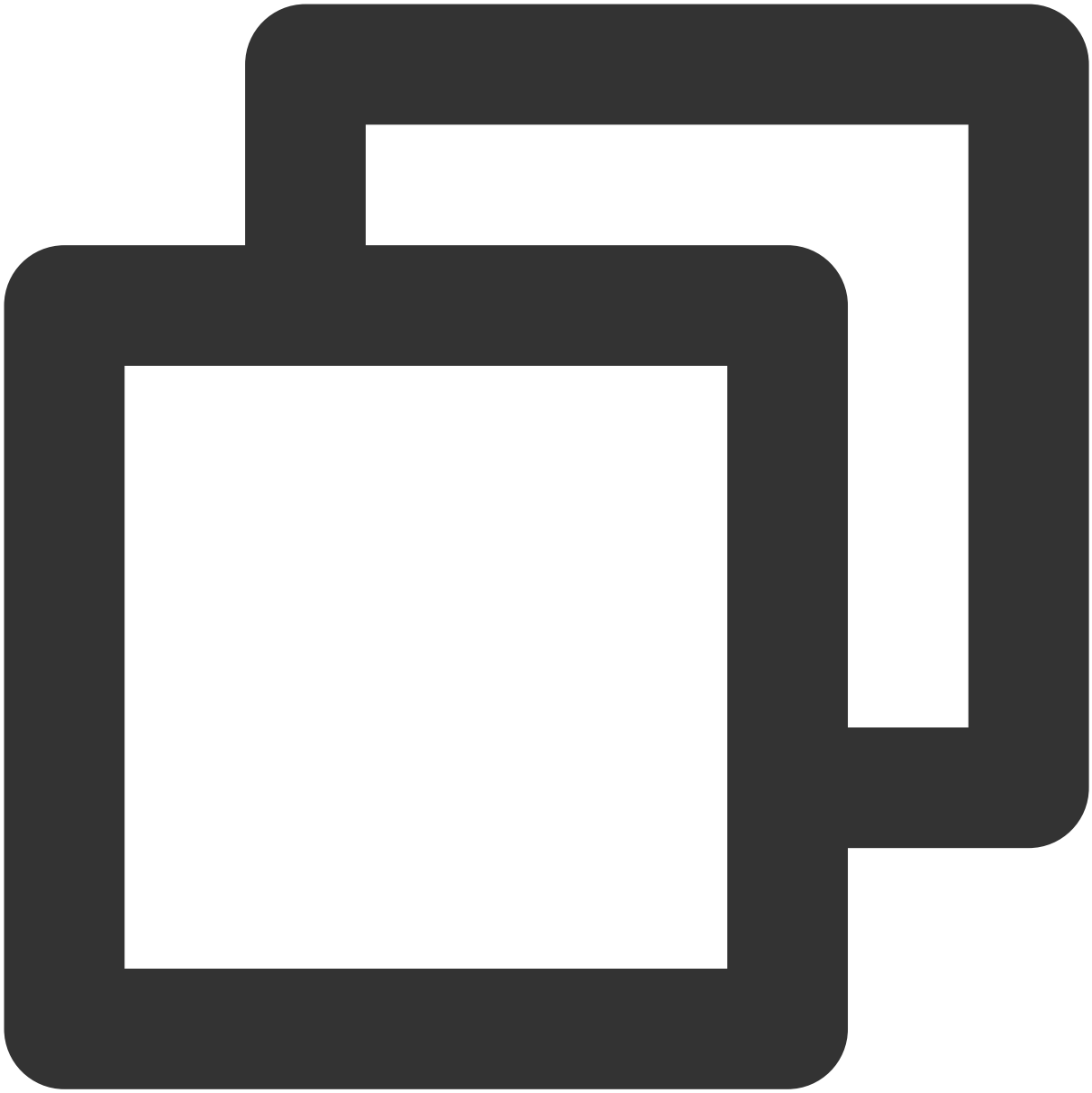

```
mysql> show master status;
+---------------+----------+--------------+------------------+-------------------+
| File          | Position | Binlog_Do_DB | Binlog_Ignore_DB | Executed_Gtid_Set |
+---------------+----------+--------------+------------------+-------------------+
| binlog.000011 | 154      |              |                  |                   |
+---------------+----------+--------------+------------------+-------------------+
```

5. Run the verification task again.

Modifying `log_slave_updates` parameter

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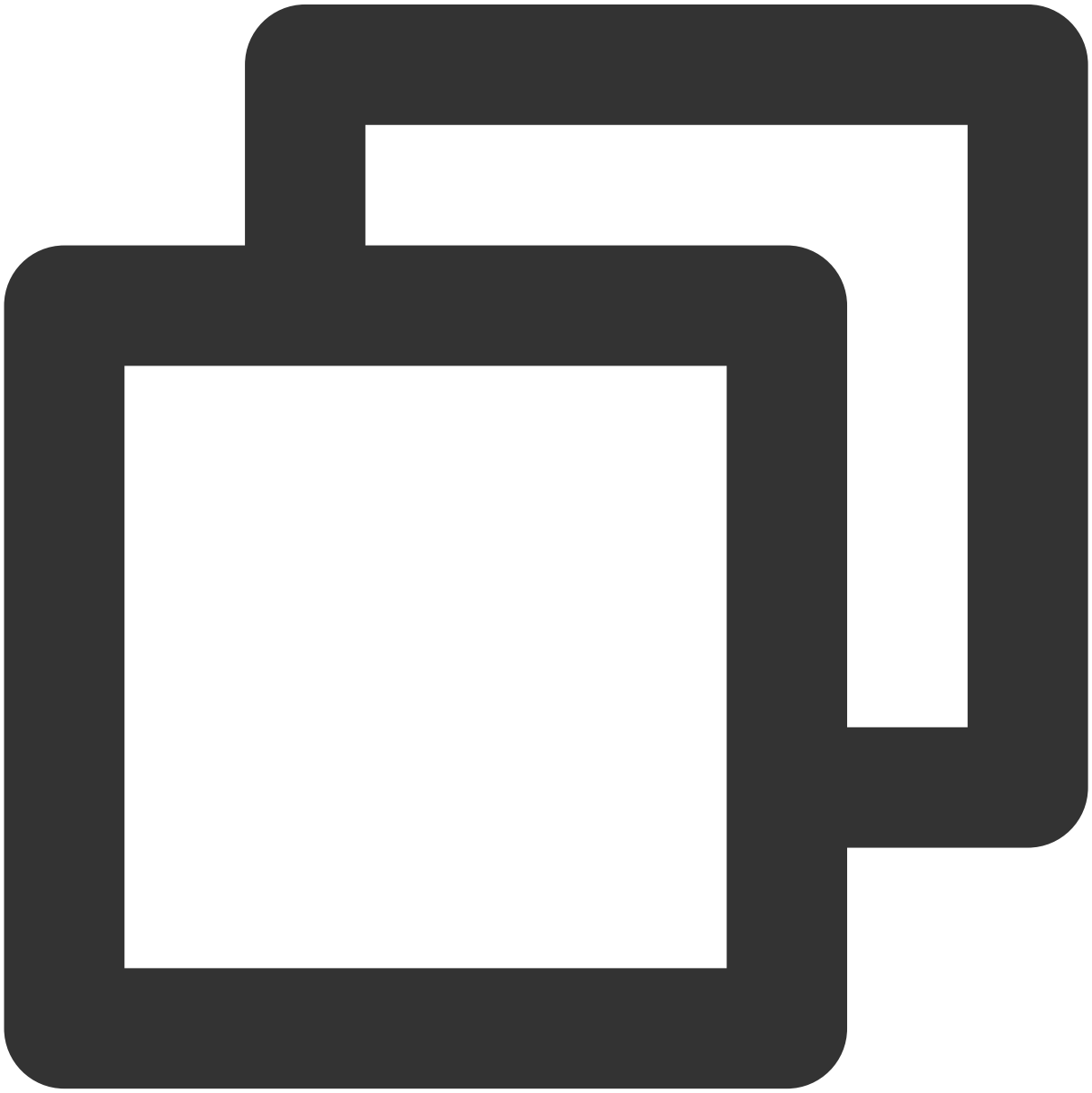
In the source-replica or primary-replica reuse structure, if the `log-bin` parameter is enabled in the replica/secondary database, data operations directly performed in this database can be logged in the binlog, but data replications from the source/primary database to the replica/secondary database cannot be logged. Therefore, if the replica/secondary database is to be used as the source/primary database of another database, the `log_slave_updates` parameter needs to be enabled.

1. Log in to the source database.
2. Add the following content to the `my.cnf` configuration file of the source database.

Note

The default path of the `my.cnf` configuration file is `/etc/my.cnf`, subject to the actual conditions.



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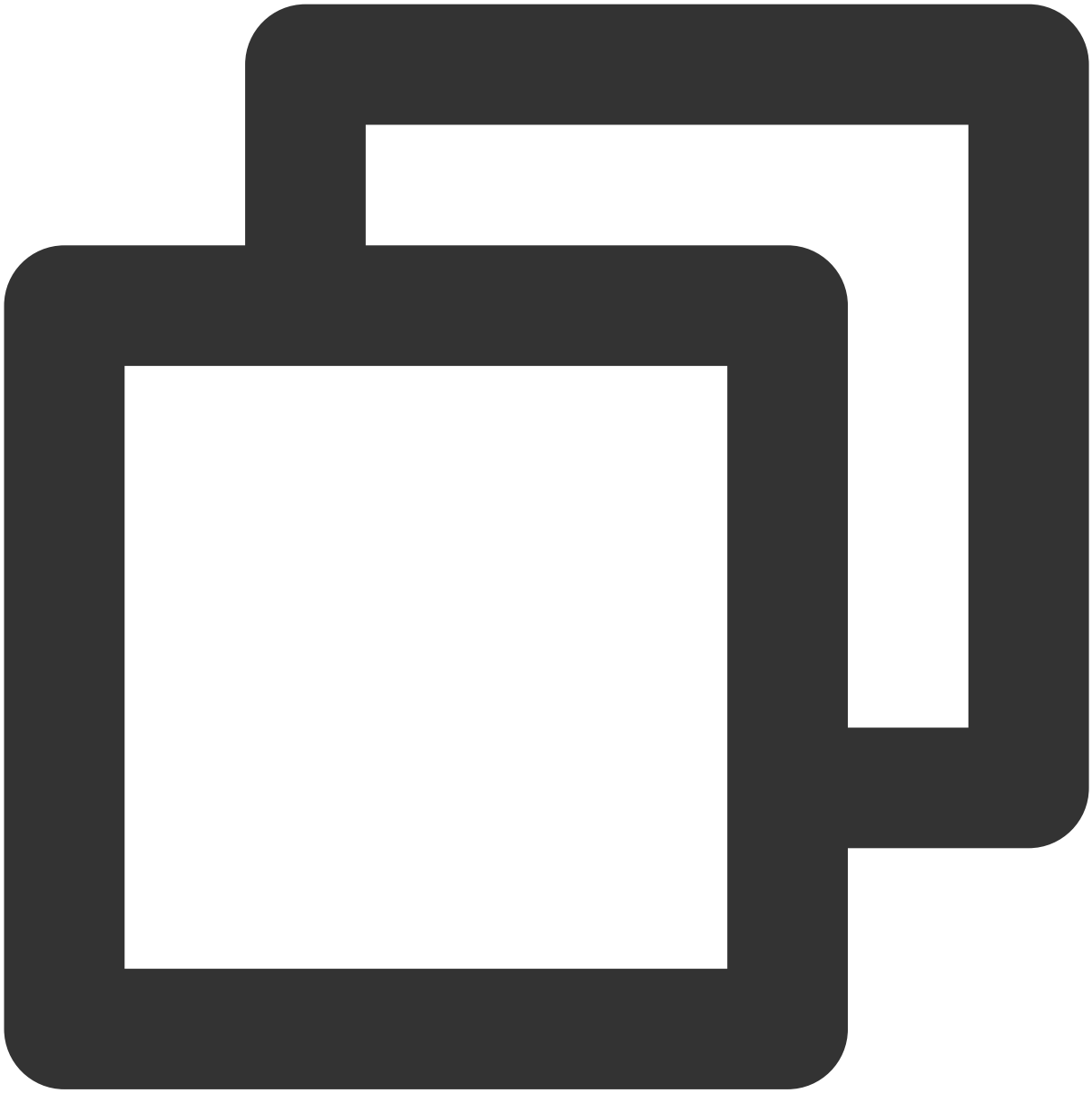
```
log_slave_updates = ON
```

3. Run the following command to restart the source database:



```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

Note

[$Mysql_Dir] is the installation path of the source database. Replace it with the actual path.

4. Check whether the configuration takes effect.

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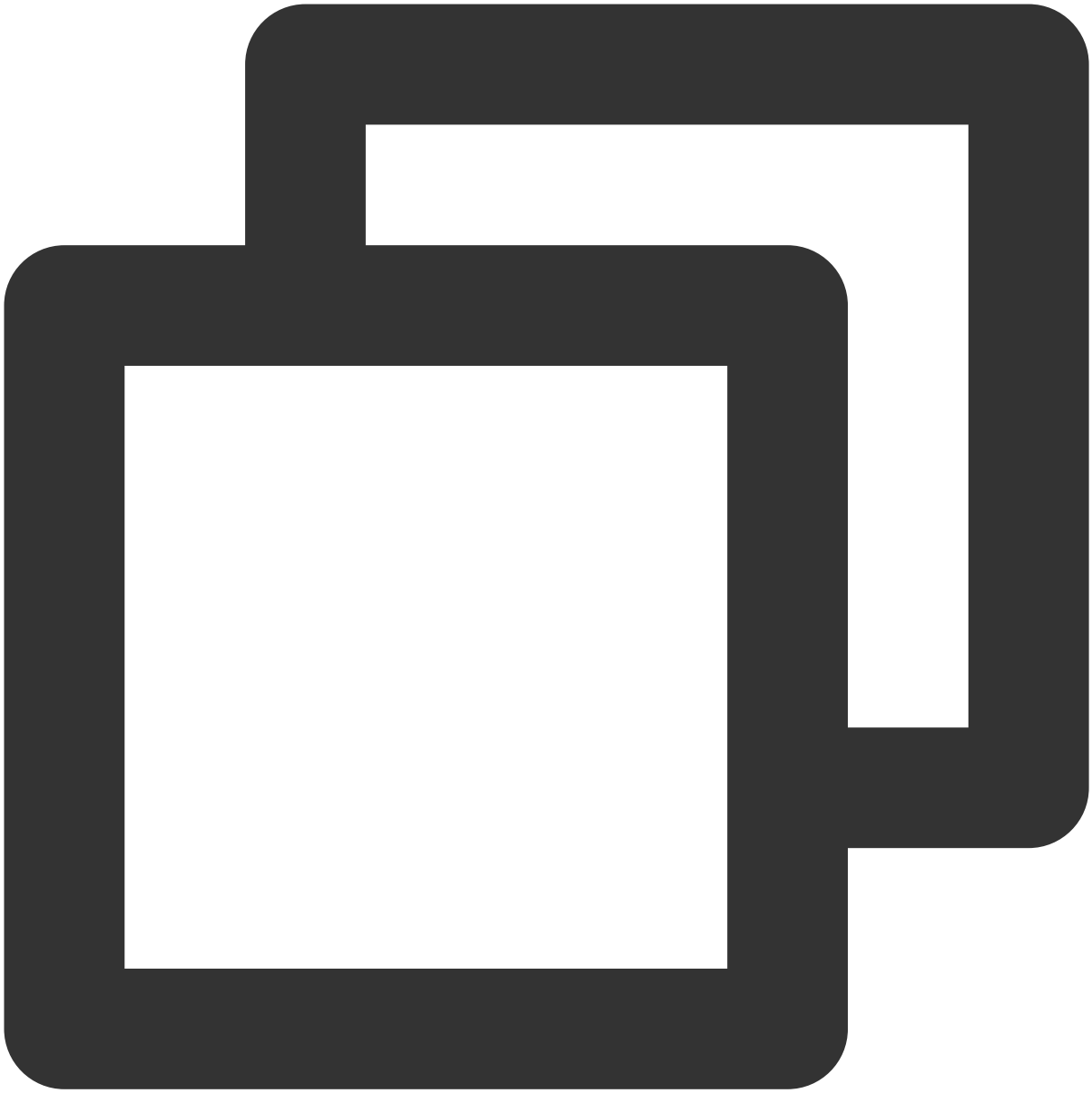

```
show variables like '%log_slave_updates%';
```

The system will display a result similar to the following:

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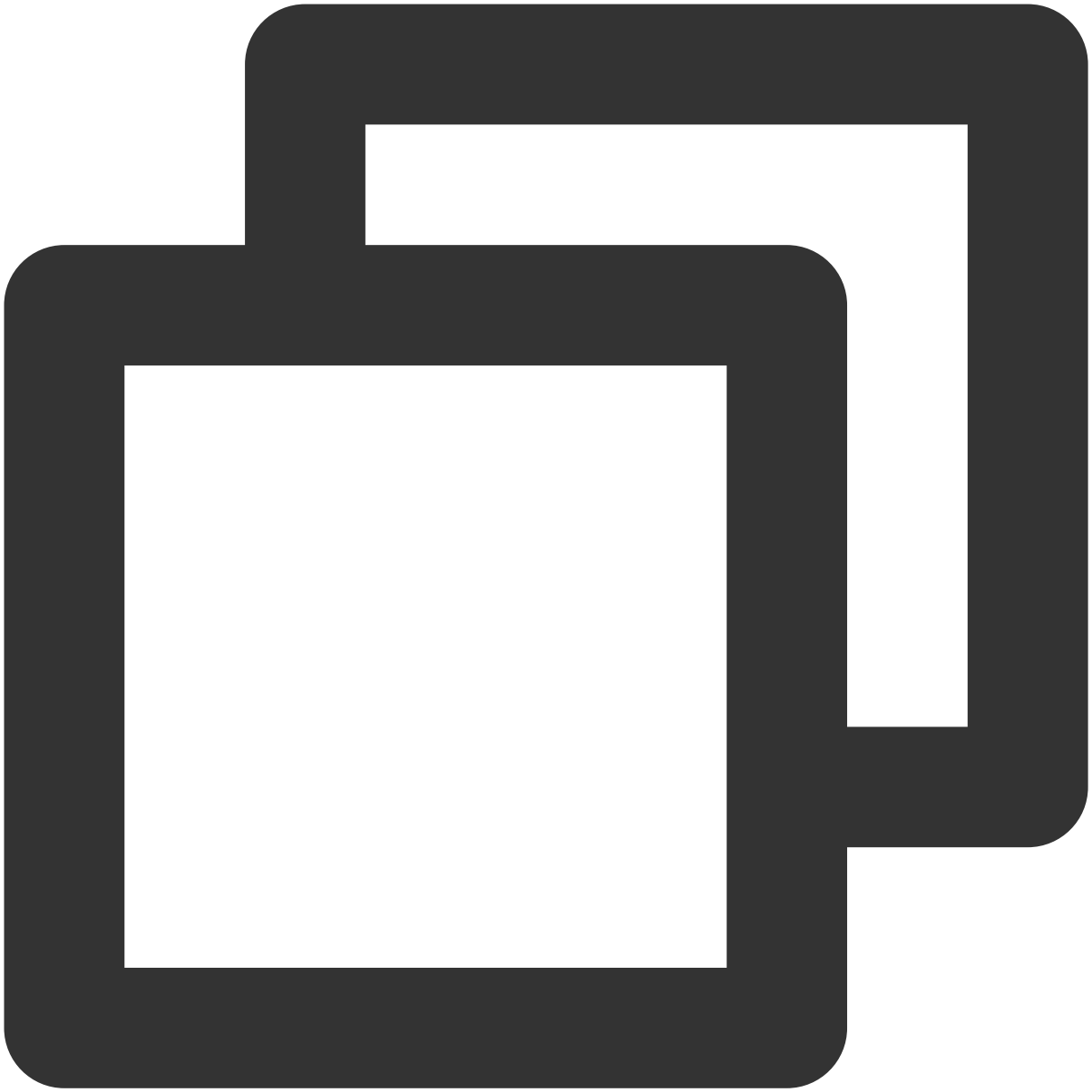

```
mysql> show variables like '%log_slave_updates%';
+-------------------+-------+
| Variable_name     | Value |
+-------------------+-------+
| log_slave_updates | ON    |
+-------------------+-------+
1 row in set (0.00 sec)
```

5. Run the verification task again.

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MongoDB Check Items
MongoDB Connection Check

Last updated：2023-08-25 16:26:32

Check Details

The source and target databases need to be normally connected, and if not, a connection failure will be reported.

Causes

The network or server where the source database resides has a security group or firewall configured. For more information, see Failed Connectivity Test > Security Group or Firewall Configured in Network or Server of Source Database.
The source IP addresses are blocked by the source database. For more information, see Failed Connectivity Test > Source IP Addresses Blocked in Source Database.
The network port is closed. For more information, see Failed Connectivity Test > Closed Network Port.
The database account or password is incorrect.

Troubleshooting

Refer to the causes above based on the actual scenario and troubleshoot as instructed.

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Database/Table Content Conflict Check

Last updated：2023-08-25 16:29:29

Check Details

In MongoDB data migration scenarios, the target database can contain collections with the same name as those in the source database, but the collections must be empty.

Troubleshooting

If a conflict causes an error, you can delete collections with the same name in the target database or clear their data.

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Source/Target Database Account Permission Check

Last updated：2023-08-25 16:28:36

Check Details

Check whether you have the operation permissions of the database as described below:
Permission requirements for data migration: Migration from MongoDB to TencentDB for MongoDB.

Troubleshooting

If you don't have the operation permissions, get authorized based on the permission requirements in the check details, and run the verification task again.

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Database Version Check

Last updated：2023-08-25 16:30:12

The source and target database versions must be supported by MongoDB.

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Database Capacity Check

Last updated：2023-08-25 16:25:05

Check Details

In MongoDB data migration scenarios, the storage space of the target database needs to be at least 1.3 times the size of the collections to be migrated in the source database.

Troubleshooting

Delete some data from the target database to free up space.

Upgrade the storage specification of the target database to use an instance with a larger capacity for migration.

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PostgreSQL Check Items
Source/Target Database Connectivity Check

Last updated：2023-08-25 16:33:48

Check Details

The source and target databases need to be normally connected, and if not, a connection failure will be reported.

Causes

The network or server where the source database resides has a security group or firewall configured. For more information, see Failed Connectivity Test > Security Group or Firewall Configured in Network or Server of Source Database.
The source IP addresses are blocked by the source database. For more information, see Failed Connectivity Test > Source IP Addresses Blocked in Source Database.
The network port is closed. For more information, see Failed Connectivity Test > Closed Network Port.
The database account or password is incorrect.

Troubleshooting

Refer to the causes above based on the actual scenario and troubleshoot as instructed.

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Source Instance Version Check

Last updated：2023-08-25 16:34:36

Check Details

Migration scenario

Source database versions earlier than PostgreSQL 10.x (such as 9.x) do not support full + incremental migration. If an incremental migration task is configured for the source database, the verification will fail.

If the source and target database versions are inconsistent, there may be some compatibility issues and the task will report a warning. You need to read the compatibility report of each version to check whether your business has used incompatible features.

Sync scenario

Source database versions earlier than PostgreSQL 10 do not support data sync. A data sync task requires that the target instance version be later than or the same as the source instance version.

If the source and target database versions are inconsistent, there may be some compatibility issues and the task will report a warning. You need to read the compatibility report of each version to check whether your business has used incompatible features.

Troubleshooting

Check the source and target databases as instructed in Databases Supported for Data Migration and Databases Supported for Data Sync. If the source or target database version is not supported, upgrade the target database version or use a database instance on a higher version.

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Structure Conflict Check

Last updated：2023-08-25 16:40:54

Check Details

In PostgreSQL data migration scenarios, the target instance cannot contain objects with the same name as those in the source database.
If an entire PostgreSQL instance is migrated, the target instance must be empty. If a conflict causes an error, you need to delete the instance content.

Troubleshooting

If a conflict is detected, you need to delete the conflicted content and verify again.

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Target Database Existence Check

Last updated：2023-08-25 16:37:41

Check Details

Check whether there is a target database, and if not, an error will be reported.

Troubleshooting

Do not delete the target database during migration; otherwise, you need to create a migration task again.

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Primary Key Dependency Check

Last updated：2023-08-25 16:38:25

Check Details

In PostgreSQL data sync scenarios, you need to check whether the table to be synced has the primary key, and if not, the task verification will report a warning and automatically set `ALTER TABLE XXXREPLICA IDENTITY` .

Troubleshooting

Set a primary key as prompted and execute the verification task again.

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Key Instance Parameter Check

Last updated：2023-08-25 16:39:14

Check Details

In PostgreSQL data sync scenarios, the sync task will check whether the replication parameter `wal_level` is set to `logical`. At the same time, the sum of the number of selected databases for sync and the value of `replication_slots` must be smaller than or equal to the value of `max_wal_senders`.

Troubleshooting

Set the value of `wal_level` to `logical`.
Reduce the number of databases to be synced.

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Read-Only Database Check for Target Instance

Last updated：2023-08-25 16:39:58

Check Details

When configuring a PostgreSQL sync task, you need to check whether the target instance is read-only, and if so, data cannot be synced and the task will report an error.

Troubleshooting

Do not select a read-only instance as the target instance when configuring a sync task.

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Multi-Task Conflict Check

Last updated：2023-08-25 16:41:29

Check Details

PostgreSQL does not support rings in data sync. A ring will cause the task verification to report an error. If there is a ring in a data sync task, in which case the sync objects in the source database have been involved in multiple tasks, a warning will be reported. You need to check your task configurations.

Troubleshooting

Cancel the tasks with rings or duplicate sync configurations as prompted and execute the verification task again.

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TDSQL for PostgreSQL Database Connection Check

Last updated：2023-08-25 16:51:50

Check Details

The source and target databases need to be normally connected, and if not, a connection failure will be reported.

Causes

The network or server where the source database resides has a security group or firewall configured. For more information, see Failed Connectivity Test > Security Group or Firewall Configured in Network or Server of Source Database.
The source IP addresses are blocked by the source database. For more information, see Failed Connectivity Test > Source IP Addresses Blocked in Source Database.
The network port is closed. For more information, see Failed Connectivity Test > Closed Network Port.
The database account or password is incorrect.

Troubleshooting

Refer to the causes above based on the actual scenario and troubleshoot as instructed.

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Version Check

Last updated：2023-08-25 16:53:12

Check Details

Log in to the database, run `select tbase_version();` , and `Tbase_V2.xx` must be returned.

Troubleshooting

Select the ID of the TDSQL for PostgreSQL instance on the supported version.

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Peripheral Check

Last updated：2023-08-25 16:45:59

Check Details

The `wal_level` of the DN node must be `logical`.

Troubleshooting

1. Log in to the source database.
2. Open the `postgresql.conf` file and modify `wal_level`.

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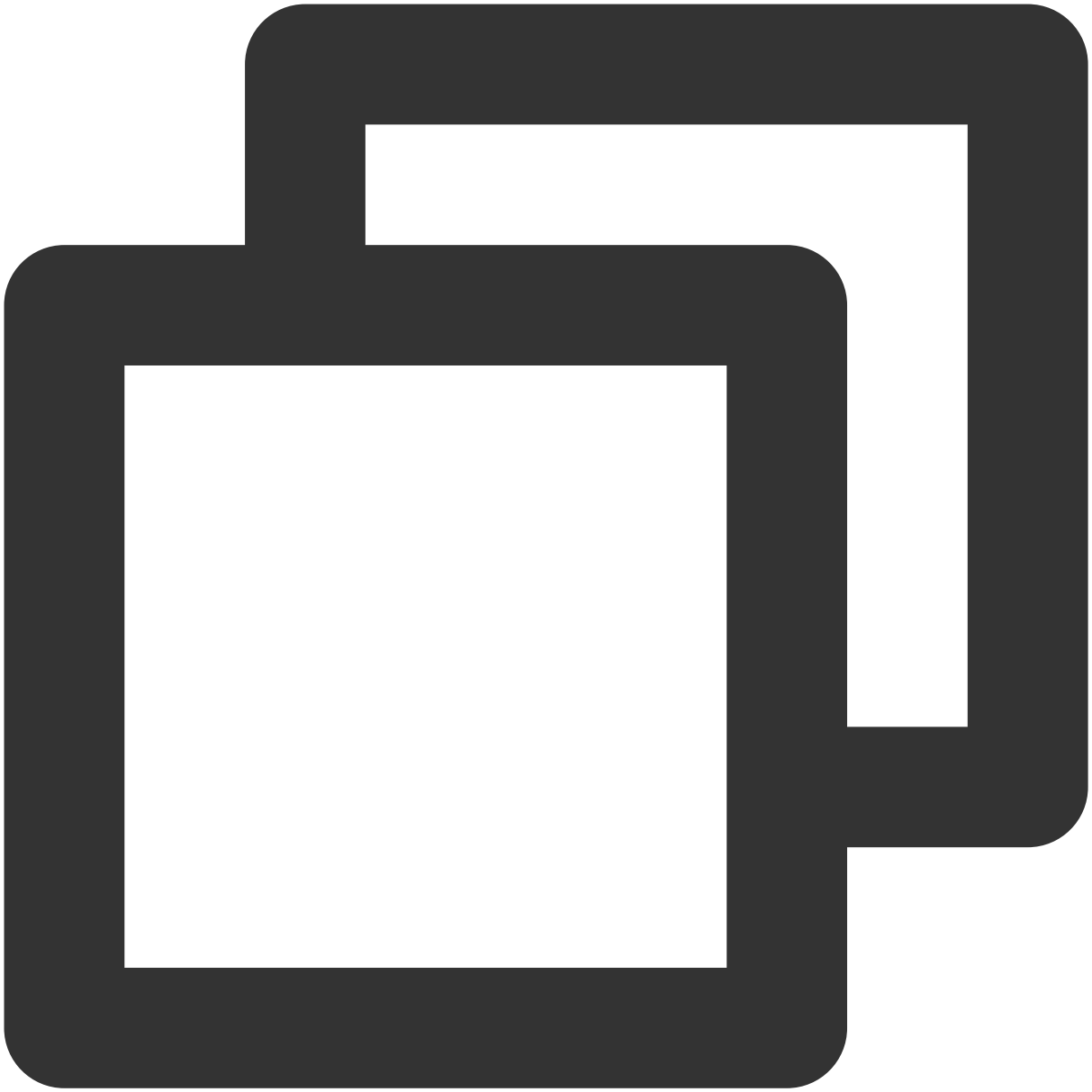

```
`wal_level` = `logical`
```

3. After the modification is completed, restart the database.

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Source Instance Permission Check

Last updated：2023-07-19 17:04:58

Check Details

You must have the REPLICATION permission, that is, `pg_roles.rolreplication`.
You must have the SELECT permission of the subscribed table. For entire database subscription, you must have the SELECT permission of all the tables under the schema.
For more information, see Creating TDSQL for PostgreSQL Data Subscription.

Troubleshooting

If you don't have the operation permissions, get authorized based on the permission requirements in the check details and run the verification task again.

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Constraint Check

Last updated：2023-08-25 16:46:52

Check Details

The subscribed table must have a primary key or have REPLICA IDENTITY as FULL.

Troubleshooting

If the verification fails, modify the corresponding table.

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Redis/Tendis Network Connectivity

Last updated：2023-07-06 15:42:34

Check Details

The source and target databases need to be normally connected, and if not, a connection failure will be reported.

Causes

The network or server where the source database resides has a security group or firewall configured. For more information, see Failed Connectivity Test > Security Group or Firewall Configured in Network or Server of Source Database.
The source IP addresses are blocked by the source database. For more information, see Failed Connectivity Test > Source IP Addresses Blocked in Source Database.
The network port is closed. For more information, see Failed Connectivity Test > Closed Network Port.
The database account or password is incorrect.

Troubleshooting

Refer to the causes above based on the actual scenario and troubleshoot as instructed.

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Source-Target Instance Version Compatibility

Last updated：2023-07-06 15:41:28

Check Details

The migration from Redis to TencentDB for Redis is supported for source Redis 2.2.6 or later. The migration from Redis to TencentDB for KeeWiDB is supported for source Redis 4.0. To migrate to other versions, submit a ticket for application.
The target database version must be later than or equal to the source database version; otherwise, an alarm will be triggered for compatibility problems during verification.
The target database must have the latest proxy.

Troubleshooting

Check the source and target databases as instructed in Databases Supported for Data Migration and Databases Supported for Data Sync. If the source or target database version is not supported, upgrade the target database version or use a database instance on a higher version.

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Source Instance Parameter Check

Last updated：2023-08-25 16:54:11

Check Details

In Redis migration scenarios, if the target database is TencentDB for Redis, the number of databases in the source instance must be not greater than that in the target instance.
Check whether the status of the source instance is normal.

Troubleshooting

Modify the number of databases of the source and target instances and restart the verification task.
Confirm the status of the source instance.

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Target Instance Capacity Check

Last updated：2023-07-06 15:39:54

Check Details

For migration from Redis to TencentDB for Redis/KeeWiDB, the space of the target database must be at least 1.5 or 2 times the volume of the data to be migrated in the source database, respectively.

Troubleshooting

Delete some data from the target database to free up space.
Upgrade the storage specification of the target database to use an instance with a larger capacity for migration.

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Whether Target Instance Is Empty

Last updated：2023-07-06 15:39:01

Check Details

For Redis migration, the target instance must be empty; otherwise, an error will be reported.

Troubleshooting

If an error is reported, delete the content in the target instance and restart the verification task.

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Target Instance Status Check

Last updated：2023-07-06 15:38:05

Check Details

Check whether the target database exists, and if not, an error will be reported.

Troubleshooting

Do not delete the target database during migration; otherwise, you need to create a migration task again.

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SQL Server
Migration Parameter Check

Last updated：2023-08-25 16:42:46

Check Details

The target instance cannot have databases with the same name as those in the source database; otherwise, an error will be reported.

Troubleshooting

If an error is reported, you need to delete the database with the same name from the target instance or rename it.

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Source/Target Database Connectivity Check

Last updated：2023-07-06 15:32:33

Check Details

The source and target databases need to be normally connected, and if not, a connection failure will be reported.

Causes

The network or server where the source database resides has a security group or firewall configured. For more information, see Failed Connectivity Test > Security Group or Firewall Configured in Network or Server of Source Database
The source IP addresses are blocked by the source database. For more information, see Failed Connectivity Test > Source IP Addresses Blocked in Source Database.
The network port is closed. For more information, see Failed Connectivity Test > Closed Network Port.
The database account or password is incorrect.

Troubleshooting

Refer to the causes above based on the actual scenario and troubleshoot as instructed.

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Database Version Check

Last updated：2023-07-06 15:33:15

Only migration from Basic Edition to High Availability Edition (including Dual-Server High Availability Edition and Cluster Edition) is supported, and the version number of the target database must be later than that of the source database. Cross-major version migration is not supported.

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User Permission Check

Last updated：2023-07-06 15:32:00

Check Details

Check whether you have the operation permissions of the database as instructed in Migration from SQL Server to TencentDB for SQL Server.

Troubleshooting

If you don't have the operation permissions, get authorized based on the permission requirements in the check details and run the verification task again.

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Database Connection Check

Last updated：2021-11-15 15:02:07

Check Details

The source and target databases need to be normally connected, and if not, the error message "Failed to connect to the source database" will be displayed.

Causes

- The network or server where the source database resides has a security group or firewall configured.
- The source IP addresses are blocked in the source database.
- The network port is closed.
- The database account or password is incorrect.

Security Group or Firewall Configured in Network or Server of Source Database

Check method

A security group is similar to a firewall. It is a group of network security settings for databases in the cloud.

Check as follows based on the actual conditions:

- Check whether the server where the source database resides is configured with firewall policies.
  - Windows: open Control Panel and find the Windows Defender Firewall and check whether firewall policies are configured.
  - Linux: run the `iptables -L` command to check whether the server is configured with firewall policies.
- Check whether DTS IP range is blocked in the security group of the database.
  i. Log in to the corresponding database and click an instance ID in the instance list to enter the instance management page.
  ii. On the instance management page, select the **Security Group** tab and check whether there are policies blocking the SNAT IP range of DTS.

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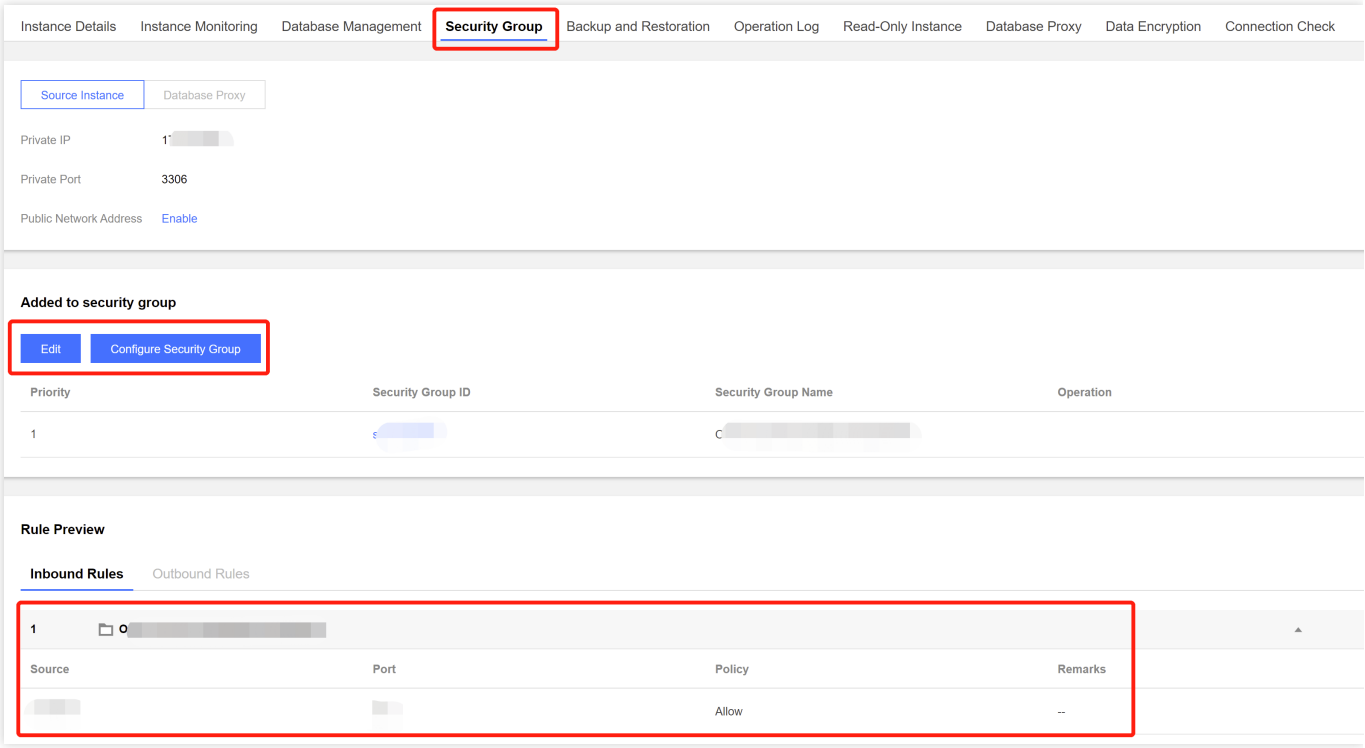

Fix

Fix it as follows based on the actual conditions:

- The firewall is enabled on the server:

  i. Disable the server firewall, log in to DTS, and run the verification task again.

  > Note：
  > This method is applicable to both Windows and Linux.

  ii. Set the DTS IP range policy to **Allow**.

- The SNAT IP range of DTS is blocked in the security group:

  i. Click the corresponding security group ID on the **Security Group** tab.

2. Set the DTS IP range policy to **Allow**.

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Source IP Addresses Blocked in Source Database

Check method

MySQL

- On the server where the source database is deployed, use the database account and password entered in the data migration task to connect to the source database. If the database can be normally connected, the source IP address may be blocked in the source database.
- For self-built database, you need to check the `bind-address` configuration in the database. If it is not `0.0.0.0`, the IP is blocked.
- If the source database is MySQL, you can use the MySQL client to connect to it, run the following SQL statement, and check whether the list of authorized IP addresses contains the SNAT IP addresses of DTS in the output result. When granting database permissions to users, the authorized IPs must include the SNAT IPs; otherwise, they may be blocked; for example:

```
root@10.0.0.0/8 // Authorize users to access through `10.0.0.0/8`, and other IP
s will be blocked (incorrect configuration)
root@% // Authorize users to access all IPs, which should include the SNAT IPs
(correct configuration)
```

You can verify as follows:

```
select host,user,authentication_string,password_expired,account_locked from
mysql.user WHERE user='[\$Username]'; // `[\$Username]` is the database account
entered in the data migration task
```

SQL Server

Check whether there is an endpoint or trigger that blocks the access source IP address in the source database.

PostgreSQL

- If the source database is another database in the cloud, check whether the secure access policies in the source database have restrictions. Check as follows according to the specific cloud vendor:
- If the source database is a self-built PostgreSQL database, enter the `data` directory in the `$PGDATA` directory, find the `pg_hba.conf` file, and check whether the file contains a `deny` policy or only allows access from certain IP addresses over the network.

```
# cat pg_hba.conf
local replication all trust
host replication all 127.x.x.1/32 trust
host replication all ::1/128 trust
```

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```
host all all 0.0.0.0/0 md5
host all all 172.x.x.0/20 md5
```

MongoDB

For self-built database, you need to check the `bind-address` configuration in the database. If it is not `0.0.0.0`, the IP is blocked.

Fix

MySQL

1. If the source database is MySQL, run the following SQL statement in it to authorize the user configured in the data migration task.

```
mysql> grant all privileges on . to '[\$UserName]'@'%'; // `[\$Username]` is th
e database account entered in the data migration task
mysql> flush privileges;
```

2. For a self-built database, if the `bind-address` configuration is incorrect, modify it as instructed below.

   2.1. Add the following content to the `/etc/my.cnf` file:

> Note：
> The default path of the `my.cnf` configuration file is `/etc/my.cnf`, subject to the actual conditions.

```
bind-address=0.0.0.0 # All IP addresses or specified addresses
```

   2.2. Restart the database.

```
service mysqld restart
```

   2.3. Check whether the configuration takes effect.

```
netstat -tln
```

3. Run the verification task again.

SQL Server

Disable the firewall or trigger.

PostgreSQL

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1. Add an access policy allowing the DTS IP range to the `pg_hba.conf` file or temporarily open all IP ranges in the access policy during migration. For example, add the following line to the `pg_hba.conf` file:

```
host all all 0.0.0.0/0 md5
```

2. After the modification is completed, you can restart the database to make the configuration take effect:

```
pg_ctl -D $PGDATA restart
```

3. Run the verification task again.

MongoDB

Configure `bind-address` as instructed in MySQL.

Closed Network Port

Check method

Below are the default ports for common databases. You need to check whether they are opened, and if not, open them based on the actual conditions:

- MySQL: 3306
- SQL Server: 1433
- PostgreSQL: 5432
- MongoDB: 27017
- Redis: 6379

Fix

Open the corresponding database port.

If the source database is SQL Server, you need to open the file sharing service port 445 at the same time.

Incorrect Database Account or Password

Check method

Log in to the source database to check whether the account and password are correct.

Fix

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Modify the data migration task in the DTS console, enter the correct database account and password, and run the verification task again.

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Source Database Existence Check

Last updated：2021-11-15 16:08:05

Check Details

Check whether the source database to be migrated exists, and if not, an error will be reported.

Fix

Do not delete the source database during migration; otherwise, you need to create a migration task again.

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Target Database Existence Check

Last updated：2021-11-15 16:08:05

Check Details

Check whether the target database exists, and if not, an error will be reported.

Fix

Do not delete the target database during migration; otherwise, you need to create a migration task again.

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Peripheral Check

Last updated：2022-08-24 16:28:42

MySQL/TDSQL for MySQL/TDSQL-C check details

- Check requirements: The `innodb_stats_on_metadata` environment variable in the source database must be set to `OFF` .
- ◦ Check description:
  - If the `innodb_stats_on_metadata` parameter is enabled, every time tables in the `information_schema` metadatabase are queried, InnoDB will update the `information_schema.statistics` table, causing slower access. After this parameter is disabled, access to the schema table can be faster.
  - On MySQL versions earlier than 5.6.6, the default value of the `innodb_stats_on_metadata` parameter is `ON` , and you need to change it to `OFF` . On MySQL 5.6.6 or later, the default value is `OFF` , which has no problem.

TDSQL for PostgreSQL check details

The `wal_level` of the DN node must be logical.

Troubleshooting

1. Log in to the source database.
2. Change the value of `innodb_stats_on_metadata` to `OFF` .

```
set global innodb_stats_on_metadata = OFF;
```

3. Check whether the configuration takes effect.

```
show global variables like '%innodb_stats_on_metadata%';
```

The system should display a result similar to the following:

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```
mysql> show global variables like '%innodb_stats_on_metadata%';
+--------------------------+-------+
| Variable_name | Value |
+--------------------------+-------+
| innodb_stats_on_metadata | OFF |
+--------------------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

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Migration Network Check

Last updated：2021-11-15 16:08:05

Check Details

Check whether the internal migration network is connected.

Fix

If an error is reported during the migration network check, submit a ticket for assistance.

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Version Check

Last updated：2023-02-13 10:44:39

MySQL/TDSQL for MySQL check details

- Check requirements: The target database version must be later than or equal to the source database version, and all versions in migration and sync tasks must meet the version requirements.
- Check description: Here, the versions are differentiated by the major version number; for example, v5.6.x supports migration or sync to v5.6.x, v5.7.x, and later. The last digit is the minor version number, which is not restricted; for example, v5.6.5 can be migrated or synced to v5.6.4, but there may be compatibility issues.

PostgreSQL check details

- Versions earlier than PostgreSQL 10.x (such as 9.x) do not support full + incremental migration. If an incremental migration task is configured for the source database, the verification will fail.
- If the versions are different, some special compatibility issues may arise, and a warning will appear during migration. Read the compatibility report for each version to check whether your business is using any incompatible features.

TDSQL for PostgreSQL check details

Log in to the database, run `select tbase_version();` , and `Tbase_V2.xx` must be returned.

MongoDB check details

The source and target database versions must be supported by MongoDB.

SQL Server check details

Only migration from Basic Edition to High Availability Edition (including Dual-Server High Availability Edition and Cluster Edition) is supported, and the version number of the target instance must be later than that of the source instance.

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Redis check details

- The source Redis instance must be on v2.2.6 or later. Earlier versions don't support migration through DTS.
- The target database version must be later than or equal to the source database version; otherwise, an alarm will be triggered for compatibility problems during verification.
- The proxy of the target Redis database must be on the latest version.

Troubleshooting

Check the source and target databases as instructed in Databases Supported for Data Migration and Databases Supported for Data Sync. If the source or target database version is not supported, upgrade the target instance version or use a database instance on a later version.

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Source Instance Permission Check

Last updated：2022-09-16 10:07:13

Check details

Check whether you have the operation permissions of the database by referring to the following documents:

- Permission requirements for data migration
  - Migration from MySQL to TencentDB for MySQL
  - Migration from PostgreSQL to TencentDB for PostgreSQL
  - Migration from MongoDB to TencentDB for MongoDB
  - Migration from SQL Server to TencentDB for SQL Server
- Permission requirements for data sync
  - Sync from TDSQL for MySQL to TDSQL for MySQL

TDSQL for PostgreSQL check details

You must have the REPLICATION permission, i.e., `pg_roles.rolreplication` .

You must have the SELECT permission of the subscribed table. For entire database subscription, you must have the SELECT permission of all the tables under the schema.

Troubleshooting

If you don't have the operation permissions, get authorized based on the permission requirements in the check details and run the verification task again.

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Account Conflict Check

Last updated：2021-11-15 15:55:34

Check Details

Check whether the target database user conflicts with the source database user.

Fix

In full database migration, if the target database has the same account as that in the source database, you need to delete it.

- If the account in the target database is the initial account, use it to log in to the database and run the following statements:

```
create user new user with password 'password';
grant pg_tencentdb_superuser to new username;
alter user new user with CREATEDB;
alter user new user with CREATEROLE;
```

- If the account in the target database is a new user, use it to log in to the database and delete the conflicting user.

```
drop user conflicting user;
# If the conflicting user has resource dependencies, run the following statemen
t to modify the owner of the resources first (with a table as an example belo
w):
alter table table name owner to new user;
```

After the conflicting user is deleted, run the verification task again.

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Partial Database Parameter Check

Last updated：2021-11-15 15:15:23

MySQL/TDSQL for MySQL/TDSQL-C/MariaDB/Percona Check Details

- `row_format` in the source database table cannot be `FIXED` .
- The `lower_case_table_names` variable in the source and target databases must be the same.
- The `max_allowed_packet` parameter of the target database must be set to 4 MB or above.
- The `connect_timeout` variable of the source database must be above 10.
- In migration from MySQL/TDSQL for MySQL/TDSQL-C to MySQL, if a time-consuming SQL statement is running on the source database, the warning "A time-consuming SQL statement is running on the source database, which may cause table locks. Please try again later or process the SQL statement on the source database" will be reported.

Fix

Modifying `row_format` parameter in source database

If the value of `row_format` in the database table is `FIXED` , data overflow will occur if the storage length of each row in the table exceeds the limit, and an error will be reported. Therefore, you need to modify it to another format such as `DYNAMIC` to make the storage length of each row vary by content length.

If a similar error occurs, fix it as follows:

1. Log in to the source database.
2. Set `row_format` to `DYNAMIC` .

```
alter table table_name row_format = DYNAMIC
```

3. Check whether the configuration takes effect.

```
show table status like '%row_format%';
```

The system should display a result similar to the following:

```
mysql> show table status like '%row_format%';
+---------------+----------+
```

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```
| Variable_name | Value |
+---------------+----------+
| row_format | DYNAMIC |
+---------------+----------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Making `lower_case_table_names` have the same value in source and target databases

`lower_case_table_names` sets the letter case sensitivity in MySQL. It has the following valid values: Windows and macOS environments are case-insensitive, but Linux environments are case-sensitive. To ensure the compatibility between different operating systems, you need to use the same letter case sensitivity rule.

- 0: the name of a stored table is in the specified letter case and is case-sensitive during comparison.
- 1: the name of a stored table is in lowercase on the disk and is case-insensitive during comparison.
- 2: the name of a stored table is in the specified letter case and is in lowercase during comparison.

If a similar error occurs, set the parameter in the source and target databases to the same value as follows:

1. Log in to the source database.
2. Check the values of `lower_case_table_names` in the source and target databases.

```
show variables like '%lower_case_table_names%';
```

3. Modify the `lower_case_table_names` parameter.

```
alter global lower_case_table_names = 1
```

4. Run the following command to restart the databases:

```
[\$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[\$Mysql_Dir]/bin/safe_mysqld &
```

5. Check whether the configuration takes effect.

```
show variables like '%lower_case_table_names%';
```

The system should display a result similar to the following:

```
mysql> show variables like '%lower_case_table_names%';
+------------------------+-------+
| Variable_name | Value |
+------------------------+-------+
| lower_case_table_names | 1 |
```

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```
+-----------------------+-------+
1 row in set (0.00 sec)
```

6. Run the verification task again.

Modifying `max_allowed_packet` parameter in target database

`max_allowed_packet` is the maximum size of a packet that can be transferred. If its value is too large, more memory will be used, causing packet losses and inability to capture the SQL statements of large exception event packets. If its value is too small, program errors mat occur, causing backup failure and frequent sending/receiving of network packets, which compromises the system performance.

If a similar error occurs, fix it as follows:

1. Log in to the target database.
2. Modify the `max_allowed_packet` parameter.

```
set global max_allowed_packet = 4M
```

3. Check whether the configuration takes effect.

```
show global variables like '%max_allowed_packet%';
```

The system should display a result similar to the following:

```
mysql> show global variables like '%max_allowed_packet%';
+-----------------------+---------+
| Variable_name | Value |
+-----------------------+---------+
| max_allowed_packet | 4194304 |
+-----------------------+---------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Modifying `connect_timeout` variable in source database

`connect_timeout` is the database connection time. Connection requests after `connect_timeout` elapses will be rejected. If this value is too small, database connections will be closed frequently, affecting the processing efficiency. Therefore, we recommend you set a value above 10.

If a similar error occurs, fix it as follows:

1. Log in to the source database.
2. Modify the `connect_timeout` parameter.

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```
set global connect_timeout = 10
```

3. Check whether the parameter is successfully modified.

```
show global variables like '%connect_timeout%';
```

The system should display a result similar to the following:

```
mysql> show global variables like '%connect_timeout%';
+-----------------------+-------+
| Variable_name | Value |
+-----------------------+-------+
| connect_timeout | 10 |
+-----------------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

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Source Instance Parameter Check

Last updated：2022-10-17 18:15:04

Check details

- In Redis migration scenarios, if the target database is TencentDB for Redis, the number of databases in the source instance must be not greater than or equal to that in the target instance.
- Check whether the status of the source instance is normal.

Troubleshooting

- Modify the number of databases of the source and target instances and restart the verification task.
- Confirm the status of the source instance.

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Source Instance Type (Master or Replica)

Last updated：2023-07-06 15:34:37

Check Details

The source database must be a replica node; otherwise, an alarm will be triggered. The alarm will not stop the task and can be ignored, but you should assess the impact of ignoring it.
During migration, DTS will perform a `BGSAVE` operation on the source database, which will use the database memory and resources. If the source database is a master node, business writes will be greatly affected.
If the source database is a TencentDB for Redis database, a replica node will be used for migration by default.
If the source database is a local self-built Redis database, the master node may be used for migration. If an alarm is triggered during the check, we recommend that you change the source database to a replica node.

Troubleshooting

Reconfigure the migration task by changing the parameters of the source database to the information of a replica node.

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Parameter Configuration Conflict Check

Last updated：2021-11-15 15:55:33

Check Details

- Check requirements: check the following parameter values of the source and target databases. If a parameter has different values in the source database and target database, a verification warning will be reported, which will not block the migration task but will affect the business. You need to assess and determine whether to modify the parameter.
  TimeZone, lc_monetary, lc_numeric, array_nulls, server_encoding, DateStyle, extra_float_digits, gin_fuzzy_search_limit, xmlbinary, and constraint_exclusion.

- Impact on the business: if the parameter values are different, data inconsistency between the source and target databases may be caused. Below is the specific impact:
  - TimeZone: sets the instance time zone. If this parameter has different values, data may be incorrect after migration.
  - lc_monetary: sets the instance currency mode. If this parameter has different values, currency numbers may be incorrect after migration.
  - lc_numeric: sets the instance numeric mode. If this parameter has different values, data may be incorrect after migration.
  - array_nulls: sets whether arrays can be empty. If this parameter has different values, data inconsistency may occur, and certain data may fail to be migrated.
  - server_encoding: sets the instance character set. If this parameter has different values, garbled characters may be present in the stored data.
  - DateStyle: sets the date format. If this parameter has different values, data migration may fail.
  - extra_float_digits: sets the floating-point value output precision. If this parameter has values, data precision will be affected. In high-precision database use cases, data inconsistency will occur after migration.
  - gin_fuzzy_search_limit: sets the upper limit of the size of the set returned by the GIN index. If this parameter has different values, data display inconsistency will occur after migration.
  - xmlbinary: sets the XML function conversion result. If this parameter has different values, function execution in the target database may be different from that in the source database.
  - constraint_exclusion: sets whether the restraints take effect. If this parameter has different values, data inconsistency may occur after migration.

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Fix

1. Log in to the source database with the `superuser` account.
2. Run the following sample statements to modify the corresponding parameters:
   - You can choose to first modify the parameters in the source database. If such parameters cannot be modified, you need to modify them in the target database by submitting a ticket.
   - The `server_encoding` parameter cannot be modified in the source database. If it is exceptional, check whether it has been created in the target database, and if so and it is different from that in the source database, you need to apply for a new instance; and if not, modify it as follows (currently, TencentDB instances only support two character sets: UTF-8 and LATIN):

```
alter system set timezone='parameter value';
alter system set lc_monetary='parameter value';
alter system set lc_numeric='parameter value';
```

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Target Database Content Conflict Check

Last updated：2022-09-21 18:04:04

Check Details

MySQL/MariaDB/Percona/TDSQL-C for MySQL/TDSQL for MySQL check requirements

- The target instance cannot have objects with the same name as those in the source database. If a conflict causes an error, you can fix it in one of the following methods:
  - Option 1: Use database/table mapping.
  - Option 2: Rename or delete objects with the same name in the target database.
  - Option 3: Remove objects with the same name from the migration objects.
- During entire instance migration, the target instance must be empty. If a conflict causes an error, you need to delete the instance content.
- If advanced objects are selected, the target database cannot have conflicting advanced objects. If a conflict causes an error, you need to delete the conflicting objects.

PostgreSQL check requirements

- The target instance cannot have objects with the same name as those in the source database.
- During entire instance migration, the target instance must be empty. If a conflict causes an error, you need to delete the instance content.

MongoDB check requirements

The target instance can have tables with the same name as those in the source database, but they must be empty tables. If a conflict causes an error, you can fix it in one of the following methods:

- Option 1: Delete tables with the same name in the target database or clear their data.
- Option 2: Remove objects with the same name from the migration objects.

SQL Server check requirements

The target instance cannot have databases with the same name as those in the source database; otherwise, an error will be reported.

If an error is reported, you need to delete or rename databases with the same name from the target database.

Redis check requirements

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The target instance must be empty; otherwise, an error will be reported.

If an error is reported, delete the content in the target instance and restart the verification task.

Troubleshooting

Using table mapping (for MySQL/MariaDB/Percona/TDSQL-C for MySQL/TDSQL for MySQL only)

You can use the DTS table mapping feature to map the names of the objects to be migrated with the same name to other names in the target database.

1. Log in to the DTS console, select the corresponding migration task, and click **More** > **Modify** in the **Operation** column.
2. In **Selected Object** on the right, hover over an object to be modified, click the displayed **Edit** icon, and rename the object.

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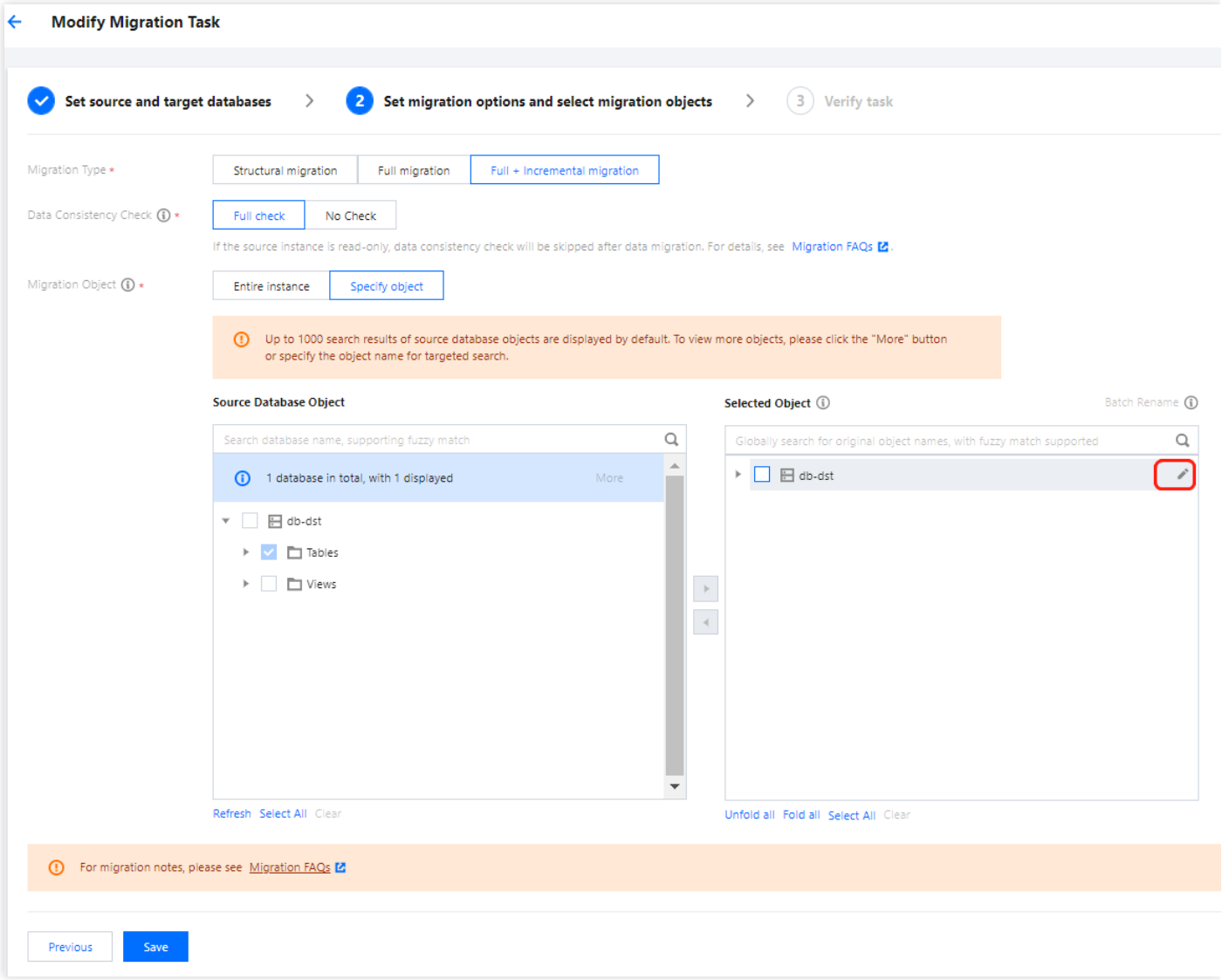

3. Run the verification task again.

Modifying objects with the same name in target database

Log in to the target database, rename or delete the objects with the same name as the migration objects.

Removing objects with the same name from migration objects

Modify the migration task configuration to remove the objects with the same name from the migration objects. The removed objects cannot be migrated.

1. Log in to the DTS console, select the corresponding migration task, and click **More** > **Modify** in the **Operation** column.
2. Remove the objects with the same name from the migration objects.
3. Run the verification task again.

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Deleting the target database content

Log in to the target database, delete the objects with the same name as those in the source database or the entire database, and run the verification task again.

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Target Database Space Check

Last updated：2022-09-21 18:04:04

Check Details

MySQL/TDSQL-C for MySQL/TDSQL for MySQL/PostgreSQL check requirements

The storage space of the target database must be at least 1.2 times the size of the tables to be migrated in the source database.
Full data migration will execute INSERT operations concurrently, generating data fragments in some tables of the target database. Therefore, after full migration is completed, the size of the tables in the target database may be larger than that in the source instance.

MongoDB check requirements

The storage space of the target database must be at least 1.3 times the size of the tables to be migrated in the source database.

Redis check requirements

The storage space of the target database must be at least 1.5 times that of the source database.

Troubleshooting

- Delete some data from the target database to free up sufficient space.
- Upgrade the storage specification of the target database as instructed in Adjusting Database Instance Specification to use an instance with a larger capacity for migration.

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Target Database Load Check

Last updated：2021-11-15 16:02:04

Check Details

- Check requirements: DTS migration will increase the load in the target database. If there is a business running in the target database during migration, a verification warning will be triggered. It will not block the task but will affect the business. You need to assess and determine whether to ignore the warning.
- Impact on business: MongoDB DTS uses logical sync for data migration, which will cause certain pressure on the CPU load of the target database. If there is a business running in the target database, you need to assess and initiate the migration task with caution.

Fix

Stop any business running in the target database and run the verification task again.

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Local Disk Space Check

Last updated：2021-11-15 16:02:04

Check Details

Check whether the disk space on the server of the source database is sufficient. During migration of a self-built source database, at least 50 GB disk space should be reserved on the server of the source database. We recommend you reserve a space at least 1.5 times the size of the migration data to avoid errors during migration.

Fix

Delete some data from the server of the source database to free up sufficient space.

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Binlog Parameter Check

Last updated：2022-09-27 14:27:59

MySQL/TDSQL for MySQL/TDSQL-C Check Details

You need to configure the source database's binlog parameters in compliance with the following requirements. If the verification fails, fix it as instructed in this document.

- The `log_bin` variable must be set to `ON` .
- The `binlog_format` variable must be set to `ROW` .
- `binlog_row_image` must be set to `FULL` .
- If the source database is MySQL 5.6 or later, `gtid_mode` can be set to only `ON` or `OFF` . We recommend you set it to `ON` , because if it is set to `OFF` , an alarm will be triggered, and if it is set to `ON_PERMISSIVE` or `OFF_PERMISSIVE` , an error will be reported.
- The `server_id` parameter must be set manually and cannot be `0` .
- It is not allowed to set `do_db` and `ignore_db` .
- If the source database is a replica instance, the `log_slave_updates` variable must be set to `ON` .
- We recommend you retain the binlog of the source database for at least three days; otherwise, the task cannot be resumed from the checkpoint and will fail.

Troubleshooting

Enabling binlog

`log_bin` controls the binlog switch. You need to enable binlog to log all database table structure and data changes.

If a similar error occurs, fix it as follows:

1. Log in to the source database.

2. Modify the `my.cnf` configuration file of the source database as follows. As the database needs to be restarted after the `log_bin` parameter is modified, we recommend you also modify the `binlog_format` and `binlog_row_image` parameters based on the verification requirements.

   Note：

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The default path of the `my.cnf` configuration file is `/etc/my.cnf`, subject to the actual conditions.

```
log_bin = MYSQL_BIN
binlog_format = ROW
binlog_row_image = FULL
```

3. Run the following command to restart the source database:

```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

Note：
`[\$Mysql_Dir]` is the installation path of the source database. Replace it with the actual path.
4. Check whether the binlog feature has been enabled.

```
show variables like '%log_bin%';
```

The system should display a result similar to the following:

```
mysql> show variables like '%log_bin%';
+-----------------+-------+
| Variable_name | Value |
+-----------------+-------+
| log_bin | ON |
+-----------------+-------+
| binlog_format | ROW |
+-----------------+-------+
| binlog_row_image | FULL |
+-----------------+-------+
1 row in set (0.00 sec)
```

5. Run the verification task again.

Modifying `binlog_format` parameter

`binlog_format` specifies one of the following three binlog formats:

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- `STATEMENT` : Each SQL statement that modifies the data will be logged into the binlog of the master. When replicating data, the replica will run the same SQL statements as those in the master. This format can reduce the binlog size. However, the replica may not be able to properly replicate certain functions.
- `ROW` : The binlog will log the modifications of each data row, and the replica will modify the same data. This format guarantees the correct source-replica replication, but the binlog size will increase.
- `MIXED` : It is a combination of the above two formats. MySQL will automatically select `STATEMENT` or `ROW` format to log each executed SQL statement.

Therefore, to ensure the correct source-replica replication, the `binlog_format` parameter should be set to `ROW` . If a similar error occurs, fix it as follows:

> Note：
> Changes to this parameter can take effect only after all connections to the database are reset. If the source database is a replica, you also need to restart the source/replica sync SQL thread to prevent current business connections from continuing writing data in the mode before modification.

1. Log in to the source database.

2. Run the following command to modify `binlog_format` .

```
set global binlog_format = ROW;
```

3. Restart the thread to make the configuration take effect. Then, run the following command to check whether the parameter modification takes effect:

```
show variables like '%binlog_format%';
```

The system should display a result similar to the following:

```
mysql> show variables like '%binlog_format%';
+---------------+-------+
| Variable_name | Value |
+---------------+-------+
| binlog_format | ROW |
+---------------+-------+
1 row in set (0.00 sec)
```

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5. Run the verification task again.

Modifying `binlog_row_image` parameter

The `binlog_row_image` parameter determines how the binlog logs the pre-image (content before modification) and post-image (content after modification), which directly affects features such as data flashback and source-replica replication.
The `binlog_row_image` parameter takes effect only if `binlog_format` is set to `ROW`. The following describes the effects of specific values:

- `FULL`: In `ROW` format, binlog will log all column data information of the pre-image and post-image.
- `MINIMAL`: In `ROW` format, if a table has no primary key or unique key, the pre-image will log all columns, and the post-image will log the modified columns. If it has a primary key or unique key, both the pre-image and post-image will only log the affected columns.

Therefore, you need to set `binlog_row_image` to `FULL` to make the source database binlog log the full image. If an error occurs, fix it as follows:

> Note：
> Changes to this parameter can take effect only after all connections to the database are reset. If the source database is a replica, you also need to restart the source/replica sync SQL thread to prevent current business connections from continuing writing data in the mode before modification.

1. Log in to the source database.

2. Run the following command to modify `binlog_row_image`:

```
set global binlog_row_image = FULL;
```

3. Restart the thread to make the configuration take effect. Then, run the following command to check whether the parameter modification takes effect:

```
show variables like '%binlog_row_image%';
```

The system should display a result similar to the following:

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```
mysql> show variables like '%binlog_row_image%';
+------------------+-------+
| Variable_name | Value |
+------------------+-------+
| binlog_row_image | FULL |
+------------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Modifying `gtid_mode` parameter

A global transaction identifier (GTID) uniquely identifies a transaction in the binlog. Using GTIDs can prevent disordered data or source-replica inconsistency due to repeated transaction executions.
GTID is a new feature on MySQL 5.6. Therefore, this problem may only occur on MySQL 5.6 or later. DTS only allows you to set `gtid_mode` to `ON` or `OFF`. We recommend you set it to `ON`; otherwise, an alarm will be triggered during verification.

The alarm does not affect the migration or sync task but affects the business: after GTID is set, during incremental data sync, if HA switch occurs in the source instance, DTS will be switched and restarted, which is almost imperceptible to the task; if GTID is not set, the task will fail after disconnection and cannot be recovered.

Below are the valid values of `gtid_mode`. When modifying the value, you can only do so in the specified sequence step by step; for example, if you want to change `OFF` to `ON`, you should modify the `gtid_mode` value in the following sequence: `OFF` > `OFF_PERMISSIVE` > `ON_PERMISSIVE` > `ON`.

- `OFF`: All new transactions in the master database and all transactions in the replica database must be anonymous.
- `OFF_PERMISSIVE`: All new transactions in the master database must be anonymous. Transactions in the replica database can be anonymous or GTID transactions but cannot be only GTID transactions.
- `ON_PERMISSIVE`: All new transactions in the master database must be GTID transactions, and transactions in the replica database can be anonymous or GTID transactions.
- `ON`: All new transactions in the master database and all transactions in the replica database must be GTID transactions.

If a similar alarm is triggered, fix it as follows:

1. Log in to the source database.

2. Set `gtid_mode = OFF_PERMISSIVE` on both the source and replica databases.
   On MySQL versions earlier than v5.7.6, you need to modify the parameter in the `my.cnf` configuration file and

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restart the database to make the change take effect. On v5.7.6 and later, you can modify the parameter through global naming with no need to restart the database, but you must reset all business connections.

```
set global gtid_mode = OFF_PERMISSIVE;
```

3. Set `gtid_mode = ON_PERMISSIVE` on both the source and replica databases.

```
set global gtid_mode = ON_PERMISSIVE;
```

4. Run the following command on each instance node to check whether consumption of anonymous transactions is completed. If the parameter value is `0` , the consumption is completed.

```
show variables like '%ONGOING_ANONYMOUS_TRANSACTION_COUNT%';
```

The system should display a result similar to the following:

```
mysql> show variables like '%ONGOING_ANONYMOUS_TRANSACTION_COUNT%';
+----------------------------------------+-------+
| Variable_name | Value |
+----------------------------------------+-------+
| Ongoing_anonymous_transaction_count | 0 |
+----------------------------------------+-------+
1 row in set (0.00 sec)
```

5. Set `gtid_mode = ON` on both the source and replica databases.

```
set global gtid_mode = ON;
```

6. Add the following content to the `my.cnf` file and restart the database to make the initial values take effect.

> Note：
> The default path of the `my.cnf` configuration file is `/etc/my.cnf` , subject to the actual conditions.

```
gtid_mode = on
enforce_gtid_consistency = on
```

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7. Run the verification task again.

Modifying `server_id` parameter

The `server_id` parameter must be set manually and cannot be set to `0`. The system default value of this parameter is `1`, but the configuration isn't necessarily correct even if the queried parameter value is `1`. You still need to manually set it.

1. Log in to the source database.

2. Run the following command to modify `server_id`:

```
set global server_id = 2; // We recommend you set it to an integer above 1. The value here is only an example.
```

3. Run the following command to check whether the parameter modification takes effect:

```
show global variables like '%server_id%';
```

The system should display a result similar to the following:

```
mysql> show global variables like '%server_id%';
+---------------+-------+
| Variable_name | Value |
+---------------+-------+
| server_id | 2 |
+---------------+-------+
1 row in set (0.00 sec)
```

4. Run the verification task again.

Deleting `do_db` and `ignore_db` settings

The binlog logs all executed DDL and DML statements in the database, while `do_db` and `ignore_db` are used to set the filter conditions for binlog.

- `binlog_do_db`: Only the specified databases will be logged in the binlog (all databases will be logged by default).
- `binlog_ignore_db`: The specified databases will not be logged in the binlog.

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After `do_db` and `ignore_db` are set, some cross-database operations will not be logged in the binlog, and source-replica replication will be abnormal; therefore, we recommend you not set them. If a similar error occurs, fix it as follows:

1. Log in to the source database.
2. Modify the `my.cnf` configuration file in the source database to delete `do_db` and `ignore_db` settings.

> Note：
> The default path of the `my.cnf` configuration file is `/etc/my.cnf`, subject to the actual conditions.

3. Run the following command to restart the source database:

```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

> Note：
> `[\$Mysql_Dir]` is the installation path of the source database. Replace it with the actual path.
> 4. Check whether the parameter modification takes effect.

```
show master status;
```

The system should display a result similar to the following:

```
mysql> show master status;
+--------------+----------+--------------+------------------+-------------------
+
| File | Position | Binlog_Do_DB | Binlog_Ignore_DB | Executed_Gtid_Set |
+--------------+----------+--------------+------------------+-------------------
+
| binlog.000011 | 154 | | | |
+--------------+----------+--------------+------------------+-------------------
+
```

5. Run the verification task again.

Modifying `log_slave_updates` parameter

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In the source-replica reuse structure, if the `log-bin` parameter is enabled in the replica database, data operations directly performed in the replica database can be logged in the binlog, but data replications from the source database to the replica database cannot be logged. Therefore, if the replica database is to be used as the source database of another replica database, the `log_slave_updates` parameter needs to be enabled.

1. Log in to the source database.

2. Add the following content to the `my.cnf` configuration file of the source database.

> Note：
> The default path of the `my.cnf` configuration file is `/etc/my.cnf`, subject to the actual conditions.

```
log_slave_updates = ON
```

3. Run the following command to restart the source database:

```
[$Mysql_Dir]/bin/mysqladmin -u root -p shutdown
[$Mysql_Dir]/bin/safe_mysqld &
```

> Note：
> `[\$Mysql_Dir]` is the installation path of the source database. Replace it with the actual path.
> 4. Check whether the configuration takes effect.

```
show variables like '%log_slave_updates%';
```

The system should display a result similar to the following:

```
mysql> show variables like '%log_slave_updates%';
+-------------------+-------+
| Variable_name | Value |
+-------------------+-------+
| log_slave_updates | ON |
+-------------------+-------+
1 row in set (0.00 sec)
```

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5. Run the verification task again.

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Oplog Check

Last updated：2021-11-15 15:55:34

Check Details

- Check requirements: oplogs can be obtained from the source database during full + incremental migration.
- Check description: incremental migration requires oplogs for replay. If the `oplog.rs` or `oplog.$main` table does not exist in the source `local` database, oplogs cannot be obtained.

Fix

Start the source database as a replica set or in primary/secondary mode to ensure that oplogs can be generated for operations and recorded in the source `local` database.

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Foreign Key Dependency Check

Last updated：2022-09-02 15:04:25

MySQL/MariaDB/Percona/TDSQL-C/TDSQL for MySQL Check Details

- Foreign key dependency can only be set to only `NO ACTION` or `RESTRICT` .
- During partial table migration, tables with foreign key dependency must be migrated.

TDSQL for MySQL (TDStore Edition) Check Details

Foreign key-dependent data is not supported. If the source database has such data, the task verification will report an error.

Troubleshooting

- MySQL/MariaDB/Percona/TDSQL-C/TDSQL for MySQL: Modify the foreign key parameter to a value type supported by DTS.
- TDSQL for MySQL (TDStore Edition): Delete the foreign key parameter content.

Modifying the foreign key rule

When you set a foreign key in MySQL, there are four values that can be selected:

- `CASCADE` : When a record is deleted or updated in the parent table, its associated records will also be deleted or updated in the child table.
- `SET NULL` : When a record is deleted or updated in the parent table, the column of the foreign key field of its associated records will be set to `null` in the child table (child table foreign keys cannot be set to `not null`).
- `RESTRICT` : When a record is deleted or updated in the parent table, if it is associated with records in the child table, the deletion request in the parent table will be denied.
- `NO ACTION` : Similar to `RESTRICT` , the foreign key will be checked first.

If an error occurs, fix it as follows:

Windows

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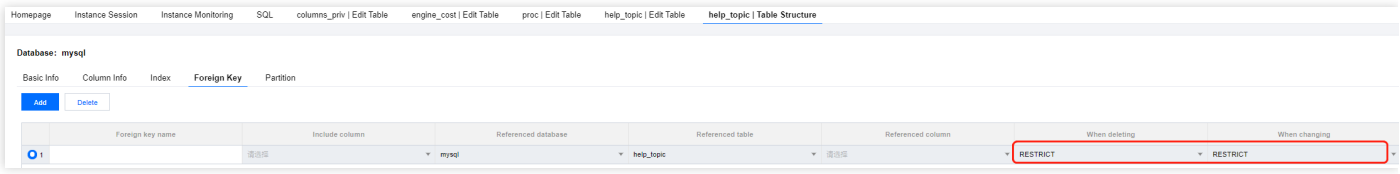
1. Log in to the DMC platform in the source database as instructed in DMC Management.
2. Select the table to be modified in the target tree on the left and click the **Foreign Key** tab on the opened table editing page to modify the foreign key parameter.



3. After completing the modification, click **Save**.
4. Run the verification task again.

Linux

1. Log in to the source database as instructed in Connecting to MySQL Instance.

2. Delete the original foreign key settings.

```
alter table `table name 1` drop foreign key `foreign key name 1`;
```

3. Add the foreign key settings again.

```
alter table `table name 1` add constraint `foreign key name 2` foreign key `tab
le name 1`(`column name 1`) references `table name 2`(`column name 1`)
on delete cascade on update cascade;
```

4. Run the verification task again.

Completing migration objects

When modifying the migration task configuration, include objects with associations in **Migration Object**.

1. Log in to the DTS console, select the target migration task, and click **More** > **Modify** in the **Operation** column.
2. Select the objects with associations in **Migration Object**.
3. Run the verification task again.

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View Check

Last updated：2021-11-15 15:52:25

MySQL/TDSQL-C Check Details

- Check requirements: when exporting a view structure, DTS will check whether `user1` corresponding to `DEFINER` (`[DEFINER = user1]`) in the source database is the same as `user2` in the migration target.
  - If they are the same, do not modify the settings after migration.
  - If they are different, change the `SQL SECURITY` attribute of `user1` in the target database after migration from `DEFINER` to `INVOKER` (`[INVOKER = user1]`), and set the `DEFINER` in the target database to `user2` of the migration target (`[DEFINER = migration target user2]`).

- Check description: the `SQL SECURITY` parameter indicates according to whose permissions the system runs the command when a user accesses the specified view.
  - `DEFINER` : only the definer can run the command.
  - `INVOKER` : only invokers with the invocation permissions can run the command.
    By default, `DEFINER` is specified by the system.

TDSQL for MySQL Check Details

Only a definer that is the same as the migration target's `user@host` is allowed; that is, when a view structure is exported, DTS will check whether the `user1` corresponding to the definer in the source database (`[DEFINER = user1]`) is the same with the `user2` in the migration target's `user@host` , and if yes, the view can be migrated; otherwise, it cannot.

For a definer different from that of the migration target's `user@host` , if you want to migrate it, you need to modify the definer in the source database view to the migration target's user, or do not select it during the migration/sync task and then manually sync the view after the task is completed.

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Advanced Object Check

Last updated：2022-09-21 17:24:22

MySQL/MariaDB/Percona check details

If you select to migrate/sync advanced objects, DTS will verify the following content. You must fix errors to continue the task. For warnings, you can ignore them based on business risk assessment and continue the task.

- Error: The target instance parameter `log_bin_trust_function_creators` must be `ON`.
- Warnings:
  - The advanced object migration/sync feature conflicts with the database/table renaming feature. After selecting advanced objects, you must cancel database/table renaming.
  - If you select functions or stored procedures as advanced objects, DTS will check whether `user1` corresponding to `DEFINER` (`[DEFINER = user1]`) in the source database is the same as the task execution account `user2`.
    - If they are the same, do not modify the settings after migration/sync.
    - If they are different, change the `SQL SECURITY` attribute of `user1` in the target database after migration/sync from `DEFINER` to `INVOKER` (`[INVOKER = user1]`), and set the `DEFINER` in the target database to the task execution account `user2` (`[DEFINER = task execution account user2]`).
  - Migration/Sync time of advanced objects:
    - Stored procedures and functions: They will be migrated/synced during **source database export**.
    - Triggers and events: If there are no incremental migration/sync tasks, they will be migrated/synced when the task stops; otherwise, they will be migrated/synced after you click **Done**, in which case the transition will take a longer time.

Troubleshooting

Modify the `log_bin_trust_function_creators` parameter.

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`log_bin_trust_function_creators` controls whether to allow users to write stored functions to the binlog. If it is set to `OFF`, only users with `SUPER` permissions can write stored function creation operations to the binlog. If it is set to `ON`, users with no `SUPER` permissions can also do this.

If an error occurs, troubleshoot as follows:

1. Log in to the source database.
2. Run the following command to modify the `log_bin_trust_function_creators` parameter:

```
set global log_bin_trust_function_creators = ON;
```

3. Run the following command to check whether the parameter modification takes effect:

```
show variables like '%log_bin_trust_function_creators%';
```

The system should display a result similar to the following:

```
mysql> show variables like '%log_bin_trust_function_creators%';
+---------------------------------+-------+
| Variable_name | Value |
+---------------------------------+-------+
| log_bin_trust_function_creators | ON |
```

4. Run the verification task again.

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Incremental Migration Precondition Check

Last updated：2021-11-15 15:55:33

Check Details

If you select incremental migration as the migration type, you need to check the following conditions; otherwise, the verification will fail.

- The major version of the source and target databases need to be below PostgreSQL 10.x.
- `wal_level` in the source database must be set to `logical` .
- The `max_replication_slots` and `max_wal_senders` values in the target database must be greater than the total number of databases to be migrated.
- The `max_worker_processes` value in the target database must be greater than the `max_logical_replication_workers` value.
- The tables to be migrated should not include unlogged tables; otherwise, they cannot be migrated.

Fix

If the version does not meet the requirements, you need to upgrade it. You can change the values of the `wal_level` , `max_replication_slots` , `max_worker_processes` , and `max_wal_senders` as follows:

1. Log in to the source database.

   Note：

   - If the source database is self-built, you need to log in to the server where the database runs and enter the main data directory of the database, which is usually `$PGDATA` .
   - If the source database is in another cloud, modify the parameters as requested by the corresponding cloud vendor.
   - If you need to modify the parameters in the target database, submit a ticket for assistance.

2. Open the `postgresql.conf` file and modify `wal_level` .

```
wal_level = logical
```

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3. After the modification is completed, restart the database.
4. Log in to the database and run the following command to check whether the parameters are correctly set:

```
postgres=> select name,setting from pg_settings where name='wal_level';
name | setting
-----------+---------
wal_level | logical
(1 row)
postgres=> select name,setting from pg_settings where name='max_replication_slo
ts';
name | setting
----------------------+---------
max_replication_slots | 10
(1 row)
postgres=> select name,setting from pg_settings where name='max_wal_senders';
name | setting
-----------------+---------
max_wal_senders | 10
(1 row)
```

5. Run the verification task again.

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Extension/Plugin Compatibility Check

Last updated：2021-11-15 15:55:33

Check Details

- Check requirements: check whether extensions/plugins in the source database also exist in the target database. Before migration, you don't need to create extensions/plugins in the target database since DTS will create them for you. If an extension/plugin cannot be created in it, or the extension/plugin version in it differs from that in the source database, a verification warning will be reported. The warning will not block the migration task but will affect the business.

- Impact on the business: PostgreSQL has many extensions. Most extension compatibility issues don't affect data migration, but those related to the storage engine (such as TimescaleDB, PipelineDB, and PostGIS) will cause the migration task to fail.

Fix

- For extension/plugin compatibility issues not related to the engine (such as pg_hint_plan, pg_prewarm, tsearch2, hll, rum, and zhparser), you generally can ignore them and fix them by yourself based on your business conditions.
- For extension compatibility issues related to the engine (such as TimescaleDB, PipelineDB, and PostGIS), we recommend you submit a ticket for assistance.

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Source Database Balancer Check

Last updated：2021-11-15 16:02:04

Check Details

- Check requirements: if the source database is a sharded instance, you need to disable the balancer in it before you can start migration.
- Check description: an incremental migration task will get the oplog. If the balancer is enabled, `moveChunk` in the source database may cause data inconsistency in the target database.

Fix

1. Log in to the source database.
2. Run the following command to disable the source database balancer:

```
sh.stopBalancer()
sh.getBalancerState()
```

3. Run the verification task again.

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Source Database Node Role Check

Last updated：2021-11-15 16:02:04

Check Details

- Check requirements: in a MongoDB migration task, if the source database is a sharded database, you need to enter the `mongos` , `config server` , and `mongod` node information.
- Check description: the information of the `mongos` , `config server` , and `mongod` nodes cannot be disordered; otherwise, data migration will also be disordered; for example, the `mongos` node information should not be entered in the box for the `mongod` node. Note that you only need to enter the information of one `mongod` node for each shard.

Fix

- Enter the correct node information in the DTS task configuration items.
- Enter only one `mongod` for each shard.

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ShardKey Check

Last updated：2021-11-15 16:02:04

Check Details

- Check requirement: if the target database is a sharded instance, you can preset the shardkey in it. If the table shardkeys in the source and target databases are different, an warning will be triggered. It will not block the task but will affect the business. You need to assess and determine whether to ignore the warning.
- Impact on the business: if some shardkeys are different, the migration or sync task will fail.

Fix

If the target database has preset shardkeys, run the following command to shard the source database:

```
sh.shardCollection("<database>.<collection>", { <shard key> : "hashed" } , false,
{numInitialChunks: number of preset chunks})
```

Run the verification task again.

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Warning Item Check

Last updated：2021-11-15 15:52:36

MySQL/TDSQL-C Check Details

You need to configure the following parameter as required; otherwise, the system will report warnings during verification, which will not affect the migration task progress but will affect the business. You need to assess and determine whether to modify the parameters.

- We recommend you set `max_allowed_packet` in the target database to a value greater than that in the source database.
  - Impact on the business: if the `max_allowed_packet` parameter in the target database is smaller than that in the source database, it may cause failures in writing data to the target database and lead to full migration failures.
  - Fix: change the value of the `max_allowed_packet` parameter in the target database to a value greater than that in the source database.
- We recommend you set `max_allowed_packet` in the target database to a value greater than 1 GB.
  - Impact on the business: if the value of `max_allowed_packet` is too large, more memory will be used, causing packet losses and inability to capture the SQL statements of large exception event packets. If its value is too small, program errors mat occur, causing backup failure and frequent sending/receiving of network packets, which compromises the system performance.
  - Fix: run the following command to modify the `max_allowed_packet` parameter:

    ```
    set global max_allowed_packet = 1GB
    ```
- We recommend you use the same character set for the source and target databases.
  - Impact on the business: if the character sets of the source and target databases are different, there may be garbled characters.
  - Fix: run the following command to change the character sets of the source and target databases to the same one:

    ```
    set character_set_server = 'utf8';
    ```
- We recommend you use a database with a specification above 2-core CPU and 4 GB memory.

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- If you only perform full data migration, do not write new data into the source database during migration; otherwise, the data in the source and target databases will be inconsistent. In scenarios with data writes, to ensure the data consistency in real time, we recommend you select full + incremental data migration.

- For data export with locks: you need to use `Flush Table With Read Lock` to temporarily lock tables in the source database, and the `MyISAM` table will be locked until the full data is exported. Currently, the lock wait timeout period is 60s, and if locks cannot be obtained before it elapses, the task will fail.

- For data export without locks: read locks will be added to tables without a primary key or non-null unique key.

TDSQL for MySQL Check Details

You need to configure the following parameter as required; otherwise, the system will report warnings during verification, which will not affect the migration task progress but will affect the business. You need to assess and determine whether to modify the parameters.

- We recommend you set `max_allowed_packet` in the target database to a value greater than that in the source database.
  - Impact on the business: if the `max_allowed_packet` parameter in the target database is smaller than that in the source database, it may cause failures in writing data to the target database and lead to full migration failures.
  - Fix: change the value of the `max_allowed_packet` parameter in the target database to a value greater than that in the source database.

- We recommend you set `max_allowed_packet` in the target database to a value greater than 1 GB.
  - Impact on the business: if the value of `max_allowed_packet` is too large, more memory will be used, causing packet losses and inability to capture the SQL statements of large exception event packets. If its value is too small, program errors mat occur, causing backup failure and frequent sending/receiving of network packets, which compromises the system performance.
  - Fix: run the following command to modify the `max_allowed_packet` parameter:

```
set global max_allowed_packet = 1GB
```

- We recommend you use the same character set for the source and target databases.
  - Impact on the business: if the character sets of the source and target databases are different, there may be garbled characters.

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  - Fix: run the following command to change the character sets of the source and target databases to the same one:

```
set character_set_server = 'utf8';
```

- We recommend you use a database with a specification above 2-core CPU and 4 GB memory.
- If you only perform full data migration, do not write new data into the source database during migration; otherwise, the data in the source and target databases will be inconsistent. In scenarios with data writes, to ensure the data consistency in real time, we recommend you select full + incremental data migration.
- For data export with locks: you need to use `Flush Table With Read Lock` to temporarily lock tables in the source database, and the `MyISAM` table will be locked until the full data is exported. Currently, the lock wait timeout period is 60s, and if locks cannot be obtained before it elapses, the task will fail.
- For data export without locks: read locks will be added to tables without a primary key or non-null unique key.
- If the source database instance is a distributed database, you need to create sharded tables in the target database in advance; otherwise, the tables will become non-sharded tables after being migrated.

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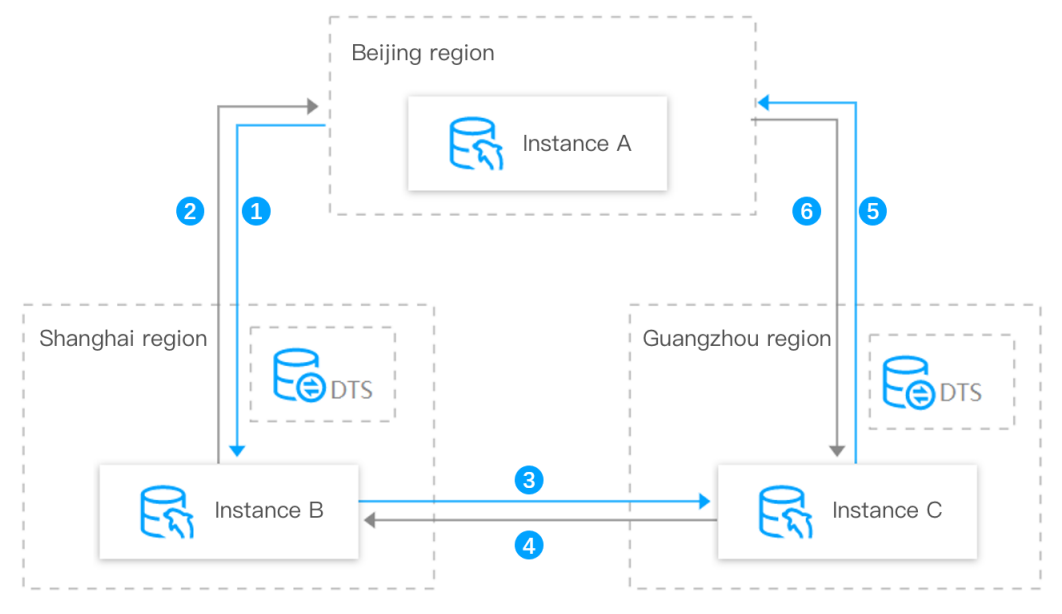
DLL Ring Sync Check for Single Database/Table Object

Last updated：2021-11-16 16:14:00

Check Details

In scenarios where multiple sync tasks need to be configured, such as two-way sync, many-to-one sync, and active-active sync, DDL configuration should not form a ring; otherwise, DDL statements will loop in the system, causing errors.

For example, among the three sync tasks (1, 3, and 5) marked by blue lines in the following figure, you can select DDL in up to two of them, and if you select three, a ring will be formed.



Fix

Modify the sync task configuration. In **Set sync options and objects** > **Data Sync Option** > **SQL Type**, modify the DDL parameter configuration to avoid rings.

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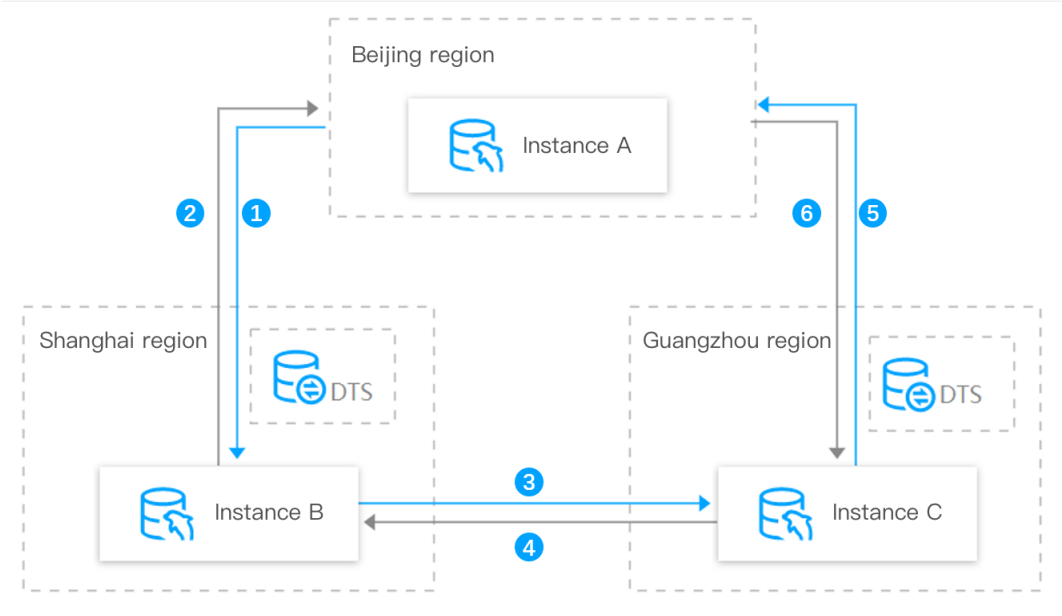
DLL Sync Conflict Check for Single Database/Table Object in the Same Target

Last updated：2021-11-16 16:14:23

Check Details

In scenarios where multiple sync tasks need to be configured, such as many-to-one sync and active-active sync, the same table object cannot receive DDL sync from multiple IDCs; otherwise, such DDL statements may conflict with each other in the target database, causing errors.

For example, as shown below, databases A and C have tables with the same name to be synced to database B. Then, you can select DDL in only one task between tasks 1 and 4.



Fix

Modify the sync task configuration. In **Set sync options and objects** > **Data Sync Option** > **SQL Type**, modify the DDL parameter configuration to avoid the situation where the same table object receives DDL sync from multiple IDCs.

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Level-2 Subpartitioned Table Check

Last updated：2022-11-24 10:38:58

TDSQL for MySQL Check Details

- If the source database is TDSQL for MySQL, the migration task will report a warning if there are level-2 subpartitioned tables. You can ignore the warning and continue with the task, in which case the level-2 subpartitioned tables will be skipped for migration. If there are such tables in a data sync task, the verification will fail, and you need to remove these tables. For more information, see Subpartitioning.
- As the underlying logic of level-2 subpartitioned tables is implemented based on subtables, the target database will report an exception when level-2 subpartitioned tables are migrated or synced.

Troubleshooting

Remove the level-2 subpartitioned tables from the list of tables to be migrated or synced.

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Primary Key Check

Last updated：2022-11-24 10:38:58

TDSQL for MySQL Check Details

If the target database is TDSQL for MySQL, the source database table must have a primary key. Currently, tables without primary key cannot be migrated.

Troubleshooting

Modify the tables without primary key as prompted and execute the verification task again.

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DDL Check for Tables to Be Migrated

Last updated：2022-11-24 10:38:58

TDSQL for MySQL/MariaDB Check Details

- If the target database is TDSQL for MySQL or TencentDB for MariaDB, the verification will fail if a table to be migrated contains any characters other than digits, underscores, or letters in its name or column name.
- Note: TDSQL for MySQL or TencentDB for MariaDB database/table/column names can only contain digits, underscores, or letters.

Troubleshooting

Remove tables that contain invalid characters as prompted and execute the verification task again.

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System Database Conflict Check

Last updated：2022-11-24 10:38:58

TDSQL for MySQL Check Details

- If the target database is TDSQL for MySQL and the database named `sysdb` is included in the databases to be migrated, it won't be migrated.
- Note: `sysdb` is the system database in TDSQL for MySQL. If a database to be migrated is named `sysdb`, the migration task will report a warning but continue to run normally.

Troubleshooting

Remove `sysdb` from the list of databases to be migrated.

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Table Structure Check for Source and Target Instances

Last updated：2022-11-24 10:38:58

TDSQL for MySQL Check Details

- If the target database is TDSQL for MySQL, we recommend you create a partitioned table and specify a shardkey in the target database in advance; otherwise, the task will report a warning. You can ignore the warning and continue with the task. After the warning is ignored, DTS will create a table in the target database based on the source database table paradigm. If the source database is a standalone instance, DTS will create a single table.
- If you have already created a partitioned table in the target database or don’t need one, DTS will check whether the source and target database table structures are consistent. The verification will fail if the field types, field names, or encoding methods are inconsistent.

Troubleshooting

When the verification fails, DTS will display the list of tables with inconsistent table structures. You can modify the target table structure based on the inconsistencies.

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InnoDB Table Check

Last updated：2022-11-24 10:38:58

TDSQL for MySQL/MariaDB Check Details

If the target database is TDSQL for MySQL or TencentDB for MariaDB, only InnoDB tables can be migrated or synced. If the objects to be migrated or synced include non-InnoDB tables, the verification will fail.

Troubleshooting

Remove non-InnoDB tables as prompted and execute the verification task again.

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Migration Object Dependency Check

Last updated：2022-11-24 10:38:58

TencentDB for MariaDB Check Details

If the target database is TencentDB for MariaDB, the views to be migrated are not migrated together with their referenced tables or views, the verification will fail.

Troubleshooting

Select other objects that are referenced with the views to be migrated and migrate them together as prompted, and execute the verification task again.

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Constraint Check

Last updated：2022-08-24 16:28:42

TDSQL for PostgreSQL check details

The subscribed table must have a primary key or have REPLICA IDENTITY as FULL.

Troubleshooting

If the verification fails, modify the corresponding table.

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