

# Data Transfer Service Practical Tutorial Product Documentation





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# Practical Tutorial Synchronizing Local Database to the Cloud

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## Overviews

This article provides instructions for using DTS to synchronize local IDC self-built database services to Tencent Cloud. In the scenario of service migration, after the local database is synchronized to the cloud, a cutover must be performed. To prevent abnormalities in the cloud database after the service cutover, it is recommended to use the DTS data synchronization module to configure a reverse escape link, so that when the database on the cloud is synchronized abnormally, the service can switch back to the local database.



## Preparations

#### 1. Preparation for Network Connection Establishment

Using DTS for database synchronization requires opening up connectivity between the source/target database and Tencent Cloud VPC, so that DTS can connect to the source/target database.

In this example, the source database is a self-build IDC database. DTS can connect through Public Network/VPN Access/Driect Connet/CCN Methods. We will use VPN Access as an example. The target database is a Tencent Cloud database instance.

1. Connect the local IDC **nearby access** to Tencent Cloud VPC.

For specific network connection operations of VPN Access, see Interworking Between local IDC and Tencent Cloud. If you wish to use other access methods, you can also see Interworking Between local IDC and Tencent Cloud to view network connection configuration principles.

2. When a DTS task is purchased later, **Source Instance Region** needs to select the region where the source library's Tencent Cloud VPC is located, which is VPC1's region Beijing. **Target Instance Region** needs to select the region where the target database is located, which is Guangzhou.

3. In the subsequent DTS task configuration, in the source library settings, **Access Type** choose VPN Access, for **VPC** and **Subnet**, select VPC1 and choose one of its subnets, subnet1; in the target library settings, **Access Type** choose Database.

#### 2. Preparation for Account and Permission

Create an account for executing DTS tasks and grant it permissions. The following is an introduction using MySQL as an example.

Authorization for the source database is as follows:





#Creating Execution Task Account CREATE USER 'account'@'%' IDENTIFIED BY 'password'; #Grant Permissions GRANT RELOAD, LOCK TABLES, REPLICATION CLIENT, REPLICATION SLAVE, SHOW VIEW, PROCES GRANT ALL PRIVILEGES ON `\_\_tencentdb\_\_`.\* TO 'account'@'%'; FLUSH PRIVILEGES;

Authorization for the target database is as follows:









#Creating Execution Task Account CREATE USER 'account'@'%' IDENTIFIED BY 'password'; #Grant Permissions GRANT ALTER, ALTER ROUTINE, CREATE, CREATE ROUTINE, CREATE TEMPORARY TABLES, CREATE FLUSH PRIVILEGES;

## Notes

Forward synchronization and reverse synchronization are two independent unidirectional sync tasks. Each independent task's constraints, operational limits, etc., need to meet the basic requirements of the sync tasks, see Data Synchronization" section for corresponding sync links.

DBbridge, when executing full data synchronization, will occupy certain source database resources, which may lead to an increase in the load on the source database, adding to the database's own pressure. If your database configuration is too low, it's recommended to proceed during the business off-peak period.

## Summary of Directions

In scenarios where DTS is used for database migration, to prevent data anomalies in the target database after cutover, it is recommended to use data synchronization configuration to establish a reverse escape route. This allows for a business switchback to the source database if an anomaly occurs in the target database.



1. Configure and initiate the forward synchronization task, opting for full + incremental synchronization.

Key configurations in the forward task: For **Initialization Type**, select Structure Initialization + Full Data Initialization; for **Existing Table with Same Name**, choose Pre-validate and report error.

2. Configure the reverse task for incremental synchronization only. After configuration, do not start it immediately.

Key configurations in the reverse task: For Initialization Type , do not select any; for Existing Table with Same

Name , choose Ignore and Continue Execution.

3. Forward synchronization is completed, stop the forward task, perform manual cutover, and connect the service to the target database.

4. Start the reverse synchronization task to synchronize the incremental data from the target database back to the source database.

5. (Optional) If the data in the target database is abnormal after cutover, stop the reverse synchronization and switch the service back to the source database.

## **Detailed Operation Information**

#### Note:

The overviews for different database links are similar. The following introduces syncing from MySQL to MySQL as an example. For more information, see Data Synchronization section under Link Configuration Guide.

#### Step One: Purchasing DTS

Log in to the data synchronization purchase page, select the appropriate configuration, and click **Buy Now**. 1. Forward task.

**Source Instance Region** is to choose the region associated with the source library's Tencent Cloud VPC, which is Beijing for VPC1. **Target Instance Region** is to choose the region where the target database is located, which is Guangzhou.

2. Reverse task.

The database type and region selection of the source and target instances are opposite.

#### Step Two: Creating and Starting Forward Synchronization

1. After successful purchase, return to the data sync list, and you can see the newly created data sync task, click **Configure** in the **Operation** column to enter the sync task configuration page.

2. On the sync task configuration page, configure the source and target instances and their accounts and passwords, test the connectivity, and click **Next**.

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Task Configur	ation						
Task Name <b>*</b>	sync-						
Running Mode *	Immediate exect	ution Scheduled execu	tion				
Source Instan	ce Settings						
Source Instance 1	Type * MySQL						
Source Instance F	Region South China(Guangz	:hou)					
Service Provider •	• Others A	WS Alibaba Cloud					
Access Type <b>*</b>	Public Network	Self-Build on CVM	Direct Connect	VPN Access	Database	CCN	
Cross-/Intra-Acco	ount * Intra-account	Cross-account					
Instance ID *	cdb-		т Ф				
Account *	root						
Password *							
	Test Connectivity	/ 🕑 Test passed					
Target Instand	ce Settings						
Target Instance T	ype * MySQL						
Target Instance R	egion South China(Guangz	:hou)					
Access Type <b>*</b>	Public Network	Self-Build on CVM	Direct Connect	VPN Access	Database	CCN	
Instance ID *	cdb-		<b>~</b>				
Account *	root						
Password *	••••••						
	Test Connectivity	Y Stest passed					
ory	Parameter	Description					
	Task Name	DTS will automat	icallv generate	a task name	, which is cı	ustomizable	
		s will automatically generate a task name, which is customizable.					



Source Instance	Source Instance Type	Select the source instance type selected during purchase, which cannot be changed once configured.
Settings	Source Instance Region	Select the source instance region selected during purchase, which cannot be changed once configured.
	Service Provider	For a self-built database (such as a CVM-based one) or TencentDB database, select <b>Others</b> . For a third-party cloud database, select the corresponding service provider. In this scenario, select <b>Others</b> .
	Access Type	<ul> <li>Select a type based on your scenario. In this scenario, select Direct</li> <li>Connect or VPN Access</li> <li>, and you need to configure VPN-IDC interconnection as instructed in</li> <li>Direct Connect or VPN Access: Configuring VPN-IDC Interconnection.</li> <li>For the preparations for different access types, see Overview.</li> <li>Public Network: The source database can be accessed through a public IP.</li> <li>Self-Build on CVM: The source database is deployed in a CVM instance.</li> <li>Direct Connect: The source database can be interconnected with VPCs through Direct Connect.</li> <li>VPN Access: The source database can be interconnected with VPCs through VPN Connections.</li> <li>Database: The source database is a TencentDB instance.</li> <li>CCN: The source and target databases are both deployed in Tencent Cloud VPCs. To use the VPC access type, submit a ticket for application.</li> </ul>
	VPC-based Direct Connect Gateway/VPN Gateway	Only VPC-based Direct Connect gateway is supported. You need to confirm the network type associated with the gateway. VPN Gateway: Select a VPN Gateway instance.
	VPC	Select a VPC and subnet associated with the VPC-based Direct Connect Gateway or VPN Gateway.
	Host Address	IP address or domain name for accessing the source MySQL instance.
	Port	Port for accessing the source MySQL instance.
	Account	Account of the source instance, which must have the required permissions.
	Password	Password of the source instance account.

Target Instance	Target Instance Type	The target instance type selected during purchase, which cannot be changed.
Settings	Target Instance Region	The target instance region selected during purchase, which cannot be changed.
	Access Type	Select a type based on your scenario. In this scenario, select <b>Database</b> .
	Instance ID	Target instance ID.
	Account	Account of the target instance, which must have the required permissions.
	Password	Password of the target instance account.

3. On the **Set sync options and objects** page, set the data initialization, data sync, and sync object options and click **Save and Go Next**.

#### Note:

If you only select **Full data initialization** for **Initialization Type**, the system will assume by default that you have created the table structures in the target database and will neither sync table structures nor check whether the source and target databases have tables with the same name. Therefore, if you select **Precheck and report error** for **If Target Already Exists**, the precheck and error reporting feature won't take effect.

If you select **Full data initialization** only, you need to create the table structures in the target database in advance. If you want to rename a table (for example, rename table A table B) during sync, you must select the entire database (or entire instance) where table A resides rather than only table A as the **sync object**; otherwise, the system will report an error.

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Data Initializa	ation Option								
Initialization Typ	e	Structure	Initialization	Full da	ta initializatio	in			
If Target Already	r Exists ★	Precheck	and report erro	or Ig	nore and exec	ute			
Data Sync Op	otion								
Primary Key Con	flict Resolution *	Report	Ignore	Overwr	ite				
SQL Type	[	Insert	Update	Delete					
DDL	[	DDL							
Custom DDL *	(								
Database		Create	Drop	Alter					
Table		Create	Drop	Alter	Truncate	Rename			
View		Create	Drop						
Index		Create	Drop						
Advanced Migra	Dption	Procedure Advanced ob	e <b>V</b> Function ojects can only b to 200 results o	on be copied or can be displ	nce, which me ayed. If the ol	ans you cannot ojects you need a	copy new obje are not shown	in the result	task is started. list, you can search them by object name.
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Advanced Migra	Dption Ubject ()	Procedure Advanced ob Up Up Source Data	e V Function ijects can only b to 200 results of base Object abase name, su	on be copied or can be displ	ayed. If the ol	ans you cannot ojects you need a	copy new obje are not shown	in the result	task is started. list, you can search them by object name. Selected Object ① Globally search for original object names, with fuzzy match
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Advanced Migra	Dption (i)	Procedure Advanced ob Up Source Datal Search data	e V Function ojects can only b to 200 results of base Object abase name, su database in tota	on can be displ pporting fu: Il, with 1 disp	ayed. If the ol tzy match	ans you cannot	copy new obje are not shown More	cts once the in the result Q	task is started. list, you can search them by object name. Selected Object ③ Globally search for original object names, with fuzzy match db-dst (Entire database selected)
Advanced Migra	Dption	Procedur Advanced ob Up Up Source Data Search data	e Function ijects can only b to 200 results of base Object abase name, su database in tota db-dst	on be copied or can be displ pporting fur I, with 1 disp	ayed. If the ol	ans you cannot	copy new obje are not shown More	cts once the in the result	task is started. list, you can search them by object name. Selected Object ③ Globally search for original object names, with fuzzy match Def db-dst (Entire database selected)
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	If Target Already Exists	Precheck and report error: If a table with the same name exists in both the source and target databases, an error will be reported, and the task will stop. Ignore and execute: Full and incremental data will be directly added to tables in the target instance.
Data Sync Option	Conflict Resolution Method	Report: If a primary key conflict is found during data sync, an error will be reported, and the data sync task will be paused. Ignore: If a primary key conflict is found during data sync, the primary key record in the target database will be retained. Overwrite: If a primary key conflict is found during data sync, the primary key record in the source database will overwrite that in the target database.
	SQL Type	Supported operations include INSERT, UPDATE, DELETE, and DDL. If you select Custom DDL, you can select different DDL statement sync policies as needed. For more information, see Setting SQL Filter Policy.
Sumo	Database and Table Objects of Source Instance	Select the objects to be synced. You can select basic databases, tables, views, procedures, and functions. The sync of advanced objects is a one-time operation: only advanced objects already in the source database before the task start can be synced, while those added to the source database after the task start will not be synced to the target database. For more information, see Syncing Advanced Object.
Object Option	Selected Object	Database/Table mapping (renaming) is supported. Hover over a database or table name, click the displayed Edit icon, and enter a new name in the pop-up window. When advanced objects are selected for sync, we recommend you not rename databases/tables; otherwise, sync of the advanced objects may fail. Online DDL temp tables can be synced (through tools such as gh-ost or pt- online-schema-change). Click Edit of a table and select a temp table name in the pop-up window. For more information, see Syncing Online DDL Temp Table.

4. On the Verify task page, complete the verification. After all check items are passed, click Start Task.

If the verification fails, fix the problem as instructed in Check Item Overview and initiate the verification again. Failed: It indicates that a check item fails and the task is blocked. You need to fix the problem and run the verification

task again.

Alarm: It indicates that a check item doesn't completely meet the requirements, and the task can be continued, but the business will be affected. You need to assess whether to ignore the alarm or fix the problem and continue the task based on the alarm message.



Create Verification Task	
Query Verification Result	
⊘ connect db check	Passe
⊘ necessary check	Passe
Ø version check	Passe
① source instance privilege check	Alam
Simple instance param check	Passe
Ø target instance privilege check	Passe
	Passe
𝔗 check if there's enough space in target instance	Passe
Source instance binlog param check	Passe
✓ foreign key constraint check	Passe
Ø partial table foreign key constraint check	Pass
Ø view check	Pass
0 warning param check	Alarr

5. Return to the data sync task list, and you can see that the task has entered the **Running** status.

#### Note:

You can click **More** > **Stop** in the Operation column to stop a sync task. You need to ensure that data sync has been completed before stopping the task.

replicate- replicate- → → → → → → → → → → → → → → → → → → →	Immediate execution	Medium	Monthly subscription () Expire at 2022-05- 12 11:00:01	MySQL -> MySQL	MySQL	MySQL	Database	Database	
---	------------------------	--------	---	----------------	-------	-------	----------	----------	--

6. (Optional) You can click a task name to enter the task details page and view the task initialization status and monitoring data.

#### Step Three: Configuring Reverse Synchronization

The operations for reverse synchronization are basically the same as those for forward synchronization; only the differences are described below.

1. Set the synchronization source and target database.

In this step, the source and target databases are swapped compared to the forward task.

2. Set synchronization options and synchronization objects.

Initialization Type: Do not select any.

Existing Table with Same Name: Choose Ignore and Continue Execution.

Primary Key Conflict Resolution Mechanism: Choose based on the business scenario.

Synchronization Operation Type: Keep consistent with the forward task.

3. On the validation task page, perform the validation. After passing the validation, start the task.

#### **Step Four: Service Cutover**

Wait until both the data gap and latency gap in the forward synchronization task are 0, then you can start the cutover.

- 1. After the data validation is correct, proceed with the business cutover. For data validation here, you can use Creating Data Consistency Check Task (MySQL) for auxiliary verification.
- 2. Terminate the forward synchronization task.
- 3. Manually connect the source database business to the target database.

#### Step Five: Starting Reverse Synchronization

Start the reverse task.

#### Step Six (Optional): Reverse Cutover

If data exception of target database is detected, stop reverse synchronization and switch the service back to the source database.

# Creating Two-Way Sync Data Structure

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## Overview

DTS supports two-way data sync between two databases, which can be applied to multi-site active-active scenarios. In a two-way sync task, two one-way sync tasks are created to establish a two-way topology, and data can be written into both database instances at the same time during sync.

Two-way data sync must follow restrictions on one-way sync and relevant operations. For more information, see the appropriate sync scenario in Databases Supported by Data Sync.

## Notes

During full data sync, DTS consumes certain source instance resources, which may increase the load and pressure of the source database. If your database configuration is low, we recommend you sync the data during off-peak hours. To avoid duplicate data, make sure that the tables to be synced have a primary key or non-null unique key. You should plan the data in advance. The two source databases are responsible for updating (adding, deleting, and modifying) data with different primary keys so as to avoid problems such as primary key conflict and mutual overwriting of data with the same primary key (for example, data records with primary keys **1**, **3**, and **5** are updated in database A, while data records with primary keys **2**, **4**, and **6** are updated in database B). If there are duplicate primary keys in the two source databases for business reasons, select an appropriate conflict resolution policy as instructed in Recommended Configurations for Typical Use Cases to make the sync behavior and data meet the expectations.

Prepare the target database and grant the account executing the sync task the permissions of the source and target databases.

## **Use Limits**

DDL statements can be executed in at most one direction during two-way sync, as the sync linkage should not form a ring (you can run DDL statements in either the forward or reverse direction).

All sync links between MySQL, TDSQL-C for MySQL, MariaDB, Percona, and TDSQL for MySQL support two-way sync except when a TDSQL for MySQL instance with the MariaDB kernel is used as the source or target database.

## Recommended Configurations for Typical Use Cases

A two-way sync task consists of two one-way sync tasks to establish a two-way topology. The creation steps for each one-way sync task are similar to those for a general one-way sync task. They differ only in the following sync option settings:

#### Sync Option Settings Difference

The following configurations are recommended for typical use cases for your reference.

Scenario	Time Requirements	Sync Task	Initialization Type	lf Target Already Exists	Conflict Resolution Method	SQL Type
Scenario 1: Instance A has database/table	Task 2 can be created only after task	Task 1: Forward sync (A < B)	Structure initialization/full data initialization	Precheck and report error	Select an option as needed.	
data, and instance B is empty	1 enters the "incremental sync" phase	Task 2: Reverse sync (B > A)	Do not select	Ignore and execute	Example: If a primary key conflict occurs, and you want the	Select DDL in at
Scenario 2: Instance A has database/table structures and data, and	Nono	Task 1: Forward sync (A > B)	Full data initialization	Ignore and execute	content of database A to prevail, you need to select	most one task. For operation types other than
instance B has only database/table structures but no data	None	Task 2: Reverse sync (B > A)	Do not select	Ignore and execute	for task 1 and **Ignore** or **Report** for task 2.	DDL, keep them consistent between
Scenario 3: Both instances A and B have	None	Task 1: Forward sync (A > B)	Full data initialization	lgnore and execute	The conflict resolution method takes effect only for the	the two tasks.
database/table structures and data		Task 2: Reverse sync (B > A)	Full data initialization	Ignore and execute	data with primary key conflict.	



## Directions

This document takes creating two-way sync between self-built MySQL database A in Shanghai region and TencentDB for MySQL database B in Beijing region as an example. Initially, A has database/table structures and data, while B is empty. When a primary key conflict occurs, data updates in A shall prevail. For A > B sync, the primary key conflict resolution policy is **Overwrite**, and DDL and DML statements are synced. For B > A sync, the policy is **Ignore**, and only DML statements are synced.



#### Creating a sync task 1: Reverse sync (A > B)

1. Log in to the data sync purchase page, select appropriate configuration items, and click **Buy Now**.

2. After successful purchase, return to the data sync list, and you can see the newly created data sync task. You need to configure it before you can use it.

3. In the data sync list, click **Configure** in the **Operation** column to enter the sync task configuration page.

4. On the sync task configuration page, configure the source and target instances and their accounts and passwords, test the connectivity, and click **Next**.

Task Configuration							
Task Name *	sync-						
Running Mode *	Immediate execution Sche	eduled execution					
Source Instance Settin	gs						
Source Instance Type *	MySQL						
Source Instance Region	South China(Guangzhou)						
Service Provider *	Others AWS Alibab	a Cloud					
Access Type *	Public Network Self-Build	on CVM Direc	t Connect	VPN Access	Database	CCN	
Cross-/Intra-Account *	Intra-account Cross-accou	int	_				
Instance ID *	cdb-	Ψ	φ				
Account *	root		Da	itabase A	A		
Password *	Please enter password						
	Test Connectivity		-				
Target Instance Setting	js						
Target Instance Type *	MySQL						
Target Instance Region							
	South China(Guangzhou)						
Access Type *	South China(Guangzhou) Public Network Self-Build	on CVM Direc	t Connect	VPN Access	Database	CCN	
Access Type *	South China(Guangzhou) Public Network Self-Build cdb-	on CVM Direc	t Connect	VPN Access	Database	CCN	
Access Type *	South China(Guangzhou) Public Network Self-Build cdb- root	on CVM Direc	tt Connect		Database	CCN	
Access Type * Instance ID * Account * Password *	South China(Guangzhou)           Public Network         Self-Build           cdb-	on CVM Direc	tt Connect	VPN Access	Database	CCN	
Access Type * Instance ID * Account * Password *	South China(Guangzhou)       Public Network     Self-Build       cdb-	on CVM Direc	Data	VPN Access	Database	CCN	
Access Type * Instance ID * Account * Password *	South China(Guangzhou)       Public Network     Self-Build       cdb-	on CVM Direc	Data	VPN Access	Database	CCN	
Access Type * Instance ID * Account * Password *	South China(Guangzhou)       Public Network     Self-Build       cdb-	on CVM Direc	Data	VPN Access	Database	CCN	
Access Type * Instance ID * Account * Password * eggory	South China(Guangzhou)       Public Network     Self-Build       cdb-	on CVM Direct Telescrip DESCRIP DTS wi custom	Data	VPN Access	Database	ccn sk nam	ne, which is
Access Type * Instance ID * Account * Password * eggory k Configuration	South China(Guangzhou)       Public Network     Self-Build       cdb-	on CVM Direct The second seco	Data Data Data Data Data Data Data	VPN Access	Database erate a ta	ccN sk nam execut	ie, which is tion are supported
Access Type * Instance ID * Account * Password * eggory k Configuration rce Instance ings	South China(Guangzhou)       Public Network     Self-Build       cdb-	on CVM Direct Direct Descrip DTS wi custom Immedi The dat change	tt Connect Data Data Data Data Data Data Data Da	VPN Access abase B atically gen cution and s A type select	Database erate a ta scheduled	sk nam execut	ne, which is tion are supported ase, which canno



	Service Provider	Select **Others**.
	Access Type	For a third-party cloud database, you can select **Public Network** generally or select **VPN Access**, **Direct Connect**, or **CCN** based on your actual network conditions. In this scenario, **Public Network** is selected as an example. For the preparations for different access types, see Overview.
	Target Instance Type	The target database B type selected during purchase, which cannot be changed.
	Target Instance Region	The target database B region selected during purchase, which cannot be changed.
Target Instance	Access Type	In this scenario, select **Database**.
Settings	Instance ID	Instance ID of database B.
	Account	Account of database B, which must have the required permissions.
	Password	Password of database B.

5. On the **Set sync options and objects** page, set the data initialization, data sync, and sync object options and click **Save and Go Next**.

Data Initialization Option			
Initialization Type	Structure Initialization Full data initializat	tion	
If Target Already Exists *	Precheck and report error Ignore and ex	ecute	
Data Sync Option			
Primary Key Conflict Resolution	* Report Ignore Overwrite		
SQL Type			
DML	Insert Update Delete		
DDL	DDL		
Custom DDL *			
Sync Object Option			
Advanced Migration Object 🕄	Procedure V Function Advanced objects can only be copied once, which n	neans you cannot copy new objects on	ce the task is started.
	Up to 200 results can be displayed. If the	objects you need are not shown in the	result list, you can search them by object name.
	Source Database Object		Selected Object 🚯
	Search database name, supporting fuzzy match	Q	Globally search for original object names, w
	i 1 database in total, with 1 displayed	More	db-dst (Entire database selecte
	🕨 🔽 🔚 db-dst		
			>
			<
	Refresh Select all Clear		Unfold all Fold all Select all Clear Revert to
gory	Parameter	Description	
Initialization on	Initialization Type	In this scenario, select data initialization**. Structure initialization	t **Structure initialization/Full

Full data initialization: Data in the source instance will be initialized into the target database before the



		sync task runs.
	If Target Already Exists	In this scenario, select **Precheck and report error**. Precheck and report error: If a table with the same name exists in both the source and target databases, an error will be reported, and the task will stop. Ignore and execute: Full and incremental data will be directly added to tables in the target instance.
Data Sync Option	Conflict Resolution Method	Select a conflict resolution policy based on the business conditions. In this scenario, select **Overwrite**. Report: If a primary key conflict is found during data sync, an error will be reported, and the data sync task will be paused. Ignore: If a primary key conflict is found during data sync, the primary key record in the target database will be retained. Overwrite: If a primary key conflict is found during data sync, the primary key record in the source database will overwrite that in the target database.
	SQL Type	Supported operations include INSERT, UPDATE, DELETE, and DDL. If you select **Custom DDL**, you can select different DDL statement sync policies as needed. For more information, see Setting SQL Filter Policy.In two-way sync, you can select **DDL** in at most one task. In this scenario, select **DDL** in task 1 but not task 2.
	Database and Table Objects of Source Instance	Select the objects to be synced.
Sync Object Option	Selected Object	Database/Table mapping (renaming) is supported. Hover over a database or table name, click the displayed **Edit** icon, and enter a new name in the pop-up window.

6. In an A > B forward sync task, DTS will check the source and target database parameters. After all check items are passed, click **Start Task**. In a B > A reverse sync task, DTS will also check the DDL configuration.

#### Note:

If the verification failed, fix the problem as instructed in Database Connection Check and initiate the verification task again.

If an alarm is displayed in the verification result, it will not affect the task start, but we recommend you click View

**Details** to get the suggestions for adjustment.

DDL check

Source and target database parameter check

Create Verification Task	
Query Verification Result	
⊘ connect db check	Passed
⊘ necessary check	Passed
⊘ version check	Passed
O source instance privilege check	Alarm View
⊘ simple instance param check	Passed
⊘ target instance privilege check	Passed
⊘ check if target instance has conflict content	Passed
⊘ check if there's enough space in target instance	Passed
⊘ source instance binlog param check	Passed
⊘ foreign key constraint check	Passed
⊘ partial table foreign key constraint check	Passed
Ø view check	Passed
O warning param check	Alarm View
Previous Stant Task	

7. Return to the data sync task list, and you can see that the task has entered the **Running** status.

#### Creating a sync task 2: Reverse sync (B > A)

The operations of forward and reverse sync tasks are basically the same. The following only describes their differences:

1. Confirm the status of task 1. When task 1 enters the "incremental sync" phase, start configuring task 2.

This task configuration timing is required only when database B is empty. In other scenarios, there is no need to wait.

2. Set source and target databases.

Swap the data in source and target databases in task 1.

1 Set source and ta	rrget databases > 2 Set sync options and objects > 3 Verify task
Task Configuration	
Task Name *	sync-
Running Mode *	Immediate execution Scheduled execution
Source Instance Setting	gs
Source Instance Type *	MySQL
Source Instance Region	South China(Guangzhou)
Service Provider *	Others AWS Alibaba Cloud
Access Type *	Public Network         Self-Build on CVM         Direct Connect         VPN Access         Database         CCN
Cross-/Intra-Account *	Intra-account Cross-account
Instance ID *	cdb- 💌 🗘
Account *	root Database B
Password *	Please enter password
Password *	Please enter password Test Connectivity
Password * Target Instance Setting	Please enter password Test Connectivity
Password * Target Instance Setting Target Instance Type *	Please enter password       Test Connectivity       Js       MySQL
Password * Target Instance Setting Target Instance Type * Target Instance Region	Please enter password       Test Connectivity       J5       MySQL       South China(Guangzhou)
Password * Target Instance Setting Target Instance Type * Target Instance Region Access Type *	Please enter password         Test Connectivity         JS         MySQL         South China(Guangzhou)         Public Network       Self-Build on CVM         Direct Connect       VPN Access       Database       CCN
Password * Target Instance Setting Target Instance Type * Target Instance Region Access Type * Instance ID *	Please enter password         Test Connectivity         JS         MySQL         South China(Guangzhou)         Public Network       Self-Build on CVM         Direct Connect       VPN Access       Database       CCN         cdb-
Password * Target Instance Setting Target Instance Type * Target Instance Region Access Type * Instance ID * Account *	Please enter password         Test Connectivity         JS         MySQL         South China(Guangzhou)         Public Network       Self-Build on CVM         Direct Connect       VPN Access         Cdb-         root       Database A
Password * Target Instance Setting Target Instance Type * Target Instance Region Access Type * Instance ID * Account * Password *	Please enter password         Test Connectivity         JS         MySQL         South China(Guangzhou)         Public Network       Self-Build on CVM         Direct Connect       VPN Access         Cdb-           root           Please enter password

3. Set sync options and objects.

Initialization Type: Do not select.

If Target Already Exists: Select Ignore and execute.

Primary Key Conflict Resolution: Select an option based on your business conditions. In this scenario, select **Ignore**. SQL Type: In two-way sync, you can select DDL in at most one task. In this scenario, select DDL in task 1 but not task 2.

ta Initialization Option				
ialization Type	Structure Initialization	Full data initialization		
arget Already Exists *	Precheck and report error	Ignore and execute	]	
ta Sync Option				
nary Key Conflict Resolution *	Report Ignore	Overwrite		
L Type				
L	Insert Update	Delete		
L	DDL			
nc Object Ontion				
Up to 200 results can l	be displayed. If the objects you	uneed are not shown in the r	sult list, you can search them by object name.	
Up to 200 results can l	be displayed. If the objects you	u need are not shown in the re	sult list, you can search them by object name.	
Up to 200 results can l Source Database Object	be displayed. If the objects you	u need are not shown in the re	esult list, you can search them by object name.	Batch Rename
Up to 200 results can I Source Database Object Search database name, suppo	be displayed. If the objects you rting fuzzy match	u need are not shown in the r	esult list, you can search them by object name. Selected Object ① Globally search for original object names, with fuzzy match suppo	Batch Renam
Up to 200 results can l     Source Database Object     Search database name, suppo     1 database in total, wi	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	sult list, you can search them by object name.  Selected Object ③  Globally search for original object names, with fuzzy match support  db-dst (Entire database selected)	Batch Renam
Up to 200 results can l Source Database Object Search database name, suppo 1 database in total, wi db-dst	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	esult list, you can search them by object name.  Selected Object ③  Globally search for original object names, with fuzzy match support  d b-dst (Entire database selected)	Batch Renam
Up to 200 results can l Cource Database Object Search database name, suppo I database in total, wi M Cource Database db-dst	be displayed. If the objects you rting fuzzy match ith 1 displayed	a need are not shown in the read are not sho	esult list, you can search them by object name.  Selected Object ③  Globally search for original object names, with fuzzy match support  d to db-dst (Entire database selected)	Batch Renam
Up to 200 results can l Cource Database Object Search database name, suppo 1 database in total, wi Cource Database db-dst	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	esult list, you can search them by object name.  Selected Object ③  Globally search for original object names, with fuzzy match support  d b db-dst (Entire database selected)	Batch Renam
Up to 200 results can l Up to 200 results can l Source Database Object Search database name, suppo 1 database in total, wi I database in total, wi D db-dst	be displayed. If the objects you irting fuzzy match ith 1 displayed	u need are not shown in the m	sult list, you can search them by object name.  Selected Object ③  Globally search for original object names, with fuzzy match support  d to db-dst (Entire database selected)	Batch Renam
Up to 200 results can l Cource Database Object Search database name, suppo 1 database in total, wi  Curce Database and the suppo temperature of the support	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	sult list, you can search them by object name.     Selected Object ③     Globally search for original object names, with fuzzy match support     Image: Ima	Batch Renam
Up to 200 results can l Up to 200 results can l Source Database Object Search database name, suppo 1 database in total, wi  Call I database in total, wi Call I database in total, wi	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	esult list, you can search them by object name.  Selected Object ③ Globally search for original object names, with fuzzy match support d db-dst (Entire database selected)	Batch Renam
Up to 200 results can l Source Database Object Search database name, suppo 1 database in total, wi	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	esult list, you can search them by object name.  Selected Object ③  Globally search for original object names, with fuzzy match support  d b db-dst (Entire database selected)	Batch Renam
Up to 200 results can I Source Database Object Search database name, suppo I database in total, wi I database in total, wi I db-dst	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the m	esult list, you can search them by object name.  Selected Object ③ Globally search for original object names, with fuzzy match support d db-dst (Entire database selected)	Batch Renam
Up to 200 results can i Source Database Object Search database name, suppo 1 database in total, wi	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the magnetic structure of the magnetic structu	esult list, you can search them by object name.	Batch Renam
<ul> <li>Up to 200 results can I</li> <li>Source Database Object</li> <li>Search database name, suppo</li> <li>1 database in total, wi</li> <li>I database in total, wi</li> <li>I db-dst</li> </ul>	be displayed. If the objects you rting fuzzy match ith 1 displayed	u need are not shown in the magnetic structure of the magnetic structu	sult list, you can search them by object name.  Selected Object ③ Globally search for original object names, with fuzzy match suppo d db-dst (Entire database selected)  Unfold all Fold all Select all Clear Revert to Original Name	Batch Renam

4. On the Verify task page, check the DDL configuration.

#### Stopping a sync task

If you no longer need a sync task, you can select **More > Stop** in the **Operation** column to stop it.

# Creating Many-to-One Sync Data Structure

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## Overview

Many-to-One sync is to sync the content in multiple source databases to one target database. If you use a single database, you may often need to shard the data due to high load or region issues, but storing the databases/tables of the same type in many databases makes data query inconvenient. The many-to-one sync feature can easily solve this problem.

As a many-to-one sync task consists of multiple one-way sync tasks to establish a many-to-one topology, restrictions on one-way sync and relevant operations must be followed. For more information, see the appropriate sync scenario in Data Sync.

## Notes

During full data sync, DTS consumes certain source database resources, which may increase the load and pressure of the source database. If your database configuration is low, we recommend you sync the data during off-peak hours. To avoid duplicate data, make sure that the tables to be synced have a primary key or non-null unique key. You should plan the data in advance. Each source database is responsible for updating (adding, deleting, and modifying) data with different primary keys so as to avoid problems such as primary key conflict and mutual overwriting of data with the same primary key. If there are duplicate primary keys in multiple source databases for business reasons, select an appropriate conflict resolution method as instructed in Recommended Configuration for Typical Use Case to make the sync behavior and data meet the expectations.

## **Application Restrictions**

DDL statements in the configurations of multiple sync tasks should not form a ring.

## **DDL Configuration Principles**

DDL statements in the configurations of multiple sync tasks should not form a ring; otherwise, they will loop in the system, causing errors.

The same table object in the target database cannot receive DDL sync from multiple source databases; otherwise, such DDL statements may conflict with each other in the target database, causing errors.

In many-to-one sync that combines multiple tables with the same name into one, you can select DDL in only one sync task.

In other types of many-to-one sync tasks (such as a task that combines multiple tables with different names into one database), you can select DDL in each task. In this case, select an appropriate DDL sync policy based on the actual conditions.

During verification, the sync system will judge whether the sync task being created will cause a DDL loop or conflict based on all your other sync tasks and provide prompts for your reference.

## Recommended Configurations for Typical Use Cases

A many-to-one sync task consists of multiple one-way sync tasks to establish a many-to-one topology. The creation steps for each one-way sync task are similar to those for a general one-way sync task. They differ only in the following sync option settings:

The following configurations are recommended for typical use cases for your reference.

Example: a sync task among databases A, B, and C needs to be created, where databases A and B have tables with the same name that need to be synced to database C, task 1 is sync from A to C, and task 2 is sync from B to C. To sync data from more source databases to the target database, simply add sync tasks by referring to task 2.

Scenario	Time Requirements	Sync Task	Initialization Type	lf Target Already Exists	Conflict Resolution Method	SQL Type
Scenario 1: databases A and B have database/table	Task 2 can be started only after task	Task 1	Structure initialization/full data initialization	lgnore and execute	Select an option as needed. Example: if a	Select DDL in at most one task.
structures and data, and database C is empty	1 enters the "incremental sync" phase	Task 2	Full data initialization	Ignore and execute	conflict occurs, and you want the	For operation types other than
Scenario 2: databases A and B have		Task 1	Full data initialization	Ignore and execute	content of database A to prevail, you need to select	DDL, keep them consistent
structures and data, and database C has only database/table structures but no data	None	Task 2	Same as task 1	Same as task 1	**Overwrite** for task 1 and **Ignore** or **Report** for task 2. The conflict resolution	between the other multiple tasks.



Scenario 3: databases A, B, and C all have	None	Task 1	Full data initialization	Ignore and execute	method takes effect only for the data with primary key
database/table structures and data		Task 2	Same as task 1	Same as task 1	conflict.

## Directions

The following uses MySQL two-to-one sync (databases A and B have database/table structures and data, and database C is empty) as an example. The many-to-one sync operations for other databases are similar.

#### Creating sync task 1 (database A > database C)

1. Log in to the data sync purchase page, select appropriate configuration items, and click **Buy Now**.

2. After successful purchase, return to the data sync list, and you can see the newly created data sync task. You need to configure it before you can use it.

3. In the data sync list, click **Configure** in the **Operation** column to enter the sync task configuration page.

4. On the sync task configuration page, configure the source and target databases and their accounts and passwords, test the connectivity, and click **Next**.

Category	Parameter	Description
Task Configuration	Task Name	DTS will automatically generate a task name, which is customizable.
	Running Mode	Immediate execution and scheduled execution are supported.
Source Database Settings	Source Database Type	Select the TencentDB instance type selected during purchase, which cannot be changed once configured.
	Source Database Region	Select the TencentDB instance A region selected during purchase, which cannot be changed once configured.
	Service Provider	Others (including TencentDB for MySQL and self-built MySQL), AWS, and Alibaba Cloud are supported.
	Access Type	If **Other Cloud Vendors** is selected as **Service Provider**, the access type can be public network; if **Others** is selected as **Service Provider**, you need to select an access type according to the database deployment conditions.



		Public Network: self-built database connected through a public IP.
		Self-Build on CVM: self-built database on CVM.
		Direct Connect/VPN Access: self-built database connected through a Direct Connect/VPN gateway.
		VPC: self-built database connected through a VPC.
		Database: TencentDB database.
		CCN: self-built database connected through CCN.
	Target Database Type	Select the target database type, which cannot be changed once configured.
Target Database Settings	Target Database Region	Select the target database C region, which cannot be changed once configured.
	Access Type	Select the access type of the target database C.

5. On the **Set sync options and objects** page, set the data initialization, data sync, and sync object options and click **Save and Go Next**.

Category	Parameter	Description
Data Initialization Option	Initialization Type	Structure initialization: table structures in the source database will be initialized into the target database before the sync task runs. Full data initialization: data in the source database will be initialized into the target database before the sync task runs. In this document, select **Structure initialization/Full data initialization**.
	If Target Already Exists	Precheck and report error: if a table with the same name exists in both the source and target databases, an error will be reported, and the task will stop. Ignore and execute: full and incremental data will be directly added to tables in the target database. In this document, select **Ignore and execute**.
Data Sync Option	Conflict Resolution Method	Report: if a primary key conflict is found during data sync, an error will be reported, and the data sync task will be



		<ul> <li>paused.</li> <li>Ignore: if a primary key conflict is found during data sync, the primary key record in the target database will be retained.</li> <li>Overwrite: if a primary key conflict is found during data sync, the primary key record in the source database will overwrite that in the target database.</li> <li>Select an option as needed.</li> </ul>
	SQL Type	Supported operations: INSERT, UPDATE, DELETE, and DDL.In many-to-one sync, you can select DDL in at most one task. In this document, select DDL in task 1 but not other tasks.
Sync Object Option	Database and Table Objects of Source Database	Select the objects to be synced. You can select databases, tables, and views.
	Selected Object	It displays the selected sync objects, and database/table mapping is supported.

6. On the task verification page, the system will check the DDL configuration first and then check the source and target database parameters. After all check items are passed, click **Start Task**.

Note:

If the verification failed, fix the problem as instructed in Fix for Verification Failure and initiate the verification task again.

If an alarm is displayed in the verification result, it will not affect the task start, but we recommend you click View

**Details** to get the suggestions for adjustment.

DDL check

Source and target database parameter check

7. Return to the data sync task list, and you can see that the task has entered the **Running** status.

#### Creating sync task 2 (database B > database C)

Configure sync task 2 after the previous sync task enters the **incremental sync** phase.

The operations of tasks 1 and 2 are basically the same. The following only describes their differences:

1. Set the sync source and target databases.

Enter the information of databases A and B in the source and target database settings respectively.

2. Set the sync options and objects.

Initialization Type: select Full data initialization only but not Structure Initialization.

If Target Already Exists: select Ignore and execute.

Conflict Resolution Method: select an option as needed.

SQL Type: do not select DDL. In many-to-one sync, you can select DDL in at most one task. In this document, select DDL in task 1 but not other tasks.

#### Stopping sync task

If you no longer need a sync task, you can select **More** > **Stop** in the **Operation** column to stop it.

# Creating Multi-Site Active-Active IDC Architecture

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## Overview

The multi-site active-active IDC architecture refers to multiple IDCs that are deployed in different regions and provide service concurrently. Data can be synced among them in real time. If a disaster occurs in an IDC, its traffic can be routed to other IDCs to implement quick cross-region failover and guarantee business continuity. The multi-site active-active IDC architecture is implemented by creating multiple two-way sync tasks, each of which consists of two one-way sync tasks. Therefore, restrictions on one-way sync and relevant operations must be followed. For more information, see the appropriate sync scenario in Data Sync.

## Notes

During full data sync, DTS consumes certain source database resources, which may increase the load and pressure of the source database. If your database configuration is low, we recommend you sync the data during off-peak hours. To avoid duplicate data, make sure that the tables to be synced have a primary key or non-null unique key. You should plan the data in advance. Each IDC is responsible for updating (adding, deleting, and modifying) data with different primary keys so as to avoid problems such as primary key conflict and mutual overwriting of data with the same primary key. If there are duplicate primary keys in multiple source databases for business reasons, select an appropriate conflict resolution method to make the sync behavior and data meet the expectations.

## **Application Restrictions**

DDL statements in the configurations of multiple sync tasks should not form a ring. Currently, a two-way sync task can be created between two MySQL databases, two TDSQL-C for MySQL databases, or one MySQL database and one TDSQL-C for MySQL database.

## **DDL Configuration Principles**

This document uses a specific scenario to describe how to configure DDL statements for easier understanding. For example, in a multi-site active-active-active IDC architecture, three two-way sync tasks are created among databases



A (Beijing region), B (Shanghai region), and C (Guangzhou region): A <-> B, B <-> C, and C <-> A.

DDL statements in the configurations of multiple sync tasks should not form a ring; otherwise, they 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.

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, 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.

During verification, the sync system will judge whether the sync task being created will cause a DDL loop or conflict based on all your other sync tasks and provide prompts for your reference.

## Recommended Configurations for Typical Use Cases

The multi-site active-active IDC architecture is implemented by creating multiple two-way sync tasks, each of which consists of two one-way sync tasks. Therefore, the operation steps for each sync task in such architecture are basically the same as those for a general one-way sync task. They differ only in the following configurations:

### Sync Option Settings Difference

Set source and target	databases	> 2	Set sync o	ptions and	objects	>	3 Verify task
Data Initialization Option							
Initialization Type	Structure	Initialization	Full data in	itialization			
If Target Already Exists *	Precheck	and report erro	r Ignore	Ignore and execute			
Data Sync Option	Report	lanore	Overwrite				
SQL Type							
DML *	Insert	Update	Delete				
DDL	DDL						
Custom DDL *							

This document recommends the following configuration for a typical multi-site active-active IDC architecture for your reference.

For example, in a multi-site active-active IDC architecture, three two-way sync tasks are created among databases A (Beijing region), B (Shanghai region), and C (Guangzhou region): A <-> B (tasks 1 and 2), B <-> C (tasks 3 and 4), and C <-> A (tasks 5 and 6).

Scenario	Time Requirements	Sync Task	Initialization Type	If Target Already Exists	Conflict Resolution Method	SQL Type
Scenario 1: database A has database/table structures and data, and databases B and C are empty	Task 2 can be created only after task	Task 1	Structure initialization/full data initialization	Precheck and report error	Select an option as needed. The	Select DDL statements according to the configuration principles. For other operation types, we recommend you keep them consistent among all sync tasks.
	"incremental sync" phase	Task 2	Do not select	Ignore and execute	resolution method takes	
	Task 4 can be created only after task 3 enters the "incremental sync" phase	Task 3	Structure initialization/full data initialization	Precheck and report error	effect only for the data with primary key conflict.	
		Task 4	Do not select	lgnore and execute		

	Task 6 can be created only after task 5 enters the "incremental sync" phase	Task 5	Structure initialization/full data initialization	Precheck and report error
		Task 6	Do not select	Ignore and execute
Scenario 2: databases A, B, and C all have database/table structures and data	None	Tasks 1-6	Full data initialization	Ignore and execute

## Directions

Creating a multi-site active-active IDC architecture is to create multiple two-way sync tasks. For detailed directions, see Creating Two-Way Sync Data Structure.

# Selecting Data Sync Conflict Resolution Policy

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## Overview

DTS supports complex topology structures, including many-to-one, one-to-many, cascading one-way, two-way, and cascading two-way sync. In such a structure, data is written to multiple nodes at the same time, so primary key conflicts may occur. To address this issue, DTS detects primary key conflicts and provides the following resolution policies:

Primary Key Conflict Resolution Policy	Description	SQL Statement Rewrite During Conflict Resolution
Report	During a sync task, if an INSERT statement in the source database has a primary key conflict with the data in the target database, the task will report an error and pause. You need to handle the conflict manually first before proceeding.	The task reports an error, and the SQL statement isn't rewritten.
Ignore	During a sync task, if an INSERT statement in the source database has a primary key conflict with the data in the target database, the data inserted into the source database will be ignored, and the data in the target database will prevail.	If an INSERT statement has a primary key conflict, INSERT will be rewritten to INSERT IGNORE.
Overwrite	During a sync task, if an INSERT or UPDATE statement has a primary key conflict with the data in the target database, the data in the target database will be overwritten by the inserted or updated data in the source database.	If an INSERT or UPDATE statement has a primary key conflict, INSERT or UPDATE will be rewritten to REPLACE INTO or DELETE + REPLACE INTO respectively.

## Examples

Primary key conflict resolution policies take effect only for INSERT and UPDATE primary key conflicts but not in nonconflict scenarios. After a policy is applied, the task can report an error or proceed once a conflict occurs. Below are examples of two primary key conflict scenarios with results under different policies.



#### **INSERT** primary key conflict

An A > B one-way sync with ID as the primary key is created. When an INSERT statement in A has a primary key conflict with the data in B during data sync, DTS will handle the conflict according to the configured conflict resolution policy.



The respective sync results in B under different policies are as detailed below:

Report: The task reports an error, and the data in B remains unchanged (ID=1, Price=10).

Ignore: The task ignores the data with the same primary key in A, and the data in B remains unchanged (ID=1, Price=10).

Overwrite: The task overwrites the data in B with the data with the same primary key in A, and the data in B becomes ID=1, Price=20.

#### **UPDATE** primary key conflict

In some scenarios, you may modify the primary key, leading to a primary key conflict. For example, the primary key in A is updated (ID=1 > ID=2), which will conflict with the data with primary key ID being 2 in B.





The respective sync results in B under different policies are as detailed below:

Report: The task reports an error, and the data in B remains unchanged.

Ignore: The task reports an error, and the data in B remains unchanged. Note that DTS ignores the conflict in this case.

Overwrite: The task overwrites the data in B with the data with the same primary key in A, and only the data with primary key 2 exists in B (ID=2, Price=10).

## Conflict Resolution Policy and Data Consistency

In complex data architectures such as 2-region-3-DC and multi-site active-active architectures, data may need to be written to three or more nodes at the same time, and it is crucial to guarantee the data consistency across multiple nodes. Many users believe that they can use a primary key conflict resolution policy to sync the data on the specified node to other nodes, but this actually doesn't work.

In the following two-way sync scenario, the **Overwrite** policy is set for both A > B and B > A sync. If different data records with the primary key 1 are inserted into nodes A and B at the same time, they will be swapped with each other between A and B eventually.





In real-world scenarios, to implement data consistency across nodes, you generally need to partition the database by primary key, introduce additional coordination mechanisms such as data overwriting by version number, and use other methods in addition to a conflict resolution policy.

# Using CLB as Proxy for Cross-Account Database Migration

Last updated : 2024-07-08 15:54:46

## Overview

This document describes how to use CLB as a proxy service to establish a network connection between the source database and DTS. This is suitable for migrating/syncing IDC-based self-built databases or databases in another cloud associated with another Tencent Cloud account to the current account and running various tasks. Below is an example:

VPCs A and B are group company networks, VPC C is a subsidiary network, and account C has no permission to manipulate resources of A and B.

A Direct Connect line is established under account A to connect to the self-built IDC network or third-party cloud vendor network, and account B is connected to VPCs A, B, and C through CCN. Therefore, networks in the dotted box have been interconnected, and account C can access the source database.

Use account C for migration/sync through DTS.

For this scenario, you can associate the source database with a CLB instance. Because CLB can interconnect networks across accounts, you can use the CLB instance as a DTS proxy service for routing and forwarding. Key configuration principles are as follows:

1. Use account C to create a CLB instance.

2. Configure the real server in the CLB instance and bind the source database IP to the real server.

3. Create a migration/sync task and enter the CLB address and port as the IP address and port of the source database.

### Directions

#### Creating a CLB instance with account C

1. Log in to the CLB purchase page with account C.

2. Configure CLB instance parameters and select the Pay as You Go billing mode and the Private Network type.

3. Return to the **Instance Management** page to view the VIP, which will be used in the subsequent DTS configuration.



ID/Name †	Monitor	Status	VIP	Network Y	Network	Health !
R clb-test	dı	Normal	1	Public Network		Health c d(Config

#### Binding the source database IP to the CLB real server

#### Note:

The CLB operations in the following steps are for reference only, subject to the descriptions in Hybrid Cloud Deployment.

1. On the **Instance Management** page in the CLB console, click the ID of the CLB instance just purchased.

2. On the **Basic Info** page, click **Configure** for enabling the feature of binding IPs in another VPC in the **Real Server** section.

asic Info	Listener Management	Redirection Configurations	Monitoring	Security Group	
Basic Info				Access Log	
Name D	16	. ( <i>p</i> *		The "Store Logs in feature will be dead more information, p	COS" feature ha tivated in all reg lease see Deac
Status	Normal			Cloud Log Service	Not Enabled
/IP	310			Store Logs in COS(i)	The "Store L
nstance Type	Public Network				store your ac
Region	Guangzhou				
Availability Zone	Guangzhou Zone	4		Real Server	
SP	BGP			Tencent Cloud CLB hel	p you achieve c
Network				- Cross-region Binding: - Binding IPs of other V	A CLB instanc PCs: A CLB ins

#### 3. In the pop-up window, click **Submit**.

Enable Binding IP of Other VPCs						
After enabling it, a CLB instance can be bound with private IPs of other VPCs.						
Submit	Close					

4. After enabling the feature, click Add SNAT IP newly displayed in the Real Server section.

Real Server							
Tencent Cloud CLB help you achieve cross-region connection. Only one policy can be selected: - Cross-region Binding: A CLB instance can be bound with CVMs of a VPC across regions.Configure - Binding IPs of other VPCs: A CLB instance can be bound with IPs of multiple VPCs and IDCs (Configured)							
Binding IP of Other VPCs							
Add SNAT IP							

- 5. In the pop-up window, select a subnet, click **Add** to assign an IP, and click **Save**.
- 6. After the SNAT IP is configured.

7. On the instance details page, click the Listener Management tab and click Create in the TCP/UDP/TCP SSL/QUIC Listeners section.

Basic Info Listener Management		Redirection Config	urations	Monitoring S	
Note	: When custom redirection policies are conf	igured, the original forwa	rding rules are mo	odified, the redirecti	on policies v
нттр/н	TTPS Listener		-		
Creat	e				
	You've not created any listeners. C	Create Now	Click to dis	splay details	
TCP/UDF Creat	P/TCP SSL Listener				
test1(	TCP:10002)		Click to dis	splay details	

8. Configure a TCP listener in the pop-up window. You can choose whether to enable health check and session persistence as needed.

9. After configuring the listener, select it and click **Bind** on the right to bind the source database IP address.

Basic Info	Listener Management	Redirection Configurations	Monitoring	Security Gro	up			
Note: Whe	n custom redirection policies are con	figured, the original forwarding rule:	are modified, the redirect	on policies will be i	emoved automatica	ally. You need to	configure it again. See detai	IS 🖸
HTTP/HTTPS	Listener							
Create								
Y	ou've not created any listeners.	Create Now Click	to display details					
TCP/UDP/TCF	SSL Listener							
Create								
test-tcp(TCF	2:3306)	Listen	er Details Expand 👻					
		Bound	Real Server					
		Bin	d Modify Port	Modify Weig	Unbind			
			CVM ID/Name				Port Health Status	IP Address
							Listener create	d. PleaseBound real s

10. In the pop-up window, select **Another private IP**, enter the source database IP address and port to be bound, set the weight, and click **OK**.

Bind with backend service								
Target type 🛈 🛛 Instance 🔘 Other Private IP								
Default Port Default Weight								
IP	Port	Weight (j)						
Source Database IP	1-65535	- 10 -						

11. Return to the Real Servers Bound section to view the bound source database IP.

#### Configuring a DTS task

The configuration steps for a DTS task with CLB as an proxy are basically the same as those described in Migration from MySQL to TencentDB for MySQL or sync from MySQL/MariaDB/Percona to MySQL, with only the following difference:

After purchasing a data migration/sync task with account C, in the **Set source and target databases** step, select **VPC** as the access method (you need to submit a ticket to enable this option), select the VPC and subnet of account C, and enter the VIP address of the CLB instance as the host address.

1 Set source and t	arget databases	> 2 Set migra	ation options	and select migration	n objects	> (
Task Configuration						
Task Name <b>*</b>	٤					
Running Mode *	Immediate executio	Scheduled exec	ution			
Source Database Setti	ngs					
Source Database Type *	MySQL					
Service Provider <b>*</b>	Others AWS	Alibaba Cloud				
Access Type *	Public Network	Self-Build on CVM	Direct Conne	VPN Access	Database	CCN
	Please add the DTS IP a	ddresses to the security g	roup allowlist in	advance so that the con	nectivity test can b	e quickly
Region	South China(Guangzho	u)				
VPC *	vpc- (Defau	It-VPC)	▼ subn	et (Default-Su	ibnet)	•
Host Address *	Please enter IP addre	SS	CLE	3 VIP		
Port *	Enter the port					
Account *	root					
Password *	Please enter passwor	d				
	Test Connectivity					

# Migrating Self-built Databases to Tencent Cloud Databases via CCN

Last updated : 2024-08-13 14:59:45

## Overview

This document describes how to use the data migration feature of DTS to migrate data from a self-built database to a TencentDB database through CCN.

CCN can interconnect a VPC with another VPC or a local IDC. To use CCN access, you must establish cross-VPC and VPC-IDC interconnections through CCN in advance.

In this scenario, you have used CCN to interconnect the three networks of VPC-Guangzhou, VPC-Chengdu, and VPC-Shanghai, have a self-built database in Guangzhou, and plan to migrate the data in the source database in Guangzhou to the target database in Nanjing. VPC-Chengdu is selected as the **Accessed VPC**.

## **Configuration Principles**

When selecting CCN access, you need to connect the source database to the source of the DTS migration/sync linkage over CCN as follows: source database > accessed VPC > source of the migration/sync linkage, as shown in orange below.



The accessed VPC and the source of the migration/sync linkage are interconnected as follows in the entire DTS task: The source of the migration/sync linkage is the network in the region of the source database selected during the task purchase, as shown below:

The region of the source database selected during task purchase must be the same as the region of the accessed VPC; otherwise, the networks cannot be interconnected, and DTS will change the former to the latter.





Accessed VPC: The accessed VPC refers to the VPC in CCN over which the migration/sync linkage is connected. It can be configured when you set the source and target databases as shown below: The accessed VPC and the VPC of the source database are interconnected over CCN.

## Notes

When DTS performs full data migration, it will occupy certain source instance resources, which may increase the load of the source instance and the database pressure. If your database has low configurations, we recommend that you migrate data during off-peak hours.

Migration is implemented without locks by default, during which no global lock (the FTWRL lock) is added to the source database, and only tables without a primary key are locked.

## Prerequisites

You have created a TencentDB for MySQL instance as instructed in Creating MySQL Instance.

The source and target databases must meet the requirements for the migration feature and version as instructed in Databases Supported by Data Migration.

You have completed all preparations as instructed in Overview.

The source database must have the following permissions:

Migration of the entire instance:





CREATE USER 'migration account'@'%' IDENTIFIED BY 'migration password'; GRANT RELOAD,LOCK TABLES,REPLICATION CLIENT,REPLICATION SLAVE,SHOW DATABASES,SHOW V GRANT ALL PRIVILEGES ON `\_\_tencentdb\_\_`.\* TO 'migration account'@'%'; GRANT SELECT ON \*.\* TO 'migration account';

Migration of specified objects:





CREATE USER 'migration account'@'%' IDENTIFIED BY 'migration password'; GRANT RELOAD,LOCK TABLES,REPLICATION CLIENT,REPLICATION SLAVE,SHOW DATABASES,SHOW V GRANT ALL PRIVILEGES ON `\_\_tencentdb\_\_`.\* TO 'migration account'@'%'; GRANT SELECT ON `mysql`.\* TO 'migration account'@'%'; GRANT SELECT ON database to be migrated.\* TO 'migration account';

Permissions required of the target database: ALTER, ALTER ROUTINE, CREATE, CREATE ROUTINE, CREATE TEMPORARY TABLES, CREATE USER, CREATE VIEW, DELETE, DROP, EVENT, EXECUTE, INDEX, INSERT, LOCK TABLES, PROCESS, REFERENCES, RELOAD, SELECT, SHOW DATABASES, SHOW VIEW, TRIGGER, and UPDATE.

## **Application Restrictions**

Basic tables, views, functions, triggers, stored procedures, and events can be migrated, while system tables such as information\_schema , sys , performance\_schema , \_\_\_cdb\_recycle\_bin\_\_ ,

\_\_recycle\_bin\_\_, \_\_tencentdb\_\_, and mysql cannot.

When views, stored procedures, and functions are migrated, DTS will check whether <code>user1</code> corresponding to <code>DEFINER ( [DEFINER = user1] )</code> in the source database is the same as the migration account <code>user2</code>, and if not, DTS will change the <code>SQL SECURITY</code> attribute of <code>user1</code> in the target database from <code>DEFINER</code> to <code>INVOKER ( [INVOKER = user1] )</code> after the migration, and set the <code>DEFINER</code> in the target database to the migration account <code>user2 ( [DEFINER = migration account user2] )</code>. If the view definition in the source database is too complex, the task may fail.

If the source MySQL database is a non-GTID database, DTS doesn't support HA switch for it. If it is switched, DTS incremental sync may be interrupted.

Only data with the following three database engines can be migrated: InnoDB, MyISAM, and TokuDB. Tables with other engines will be skipped during migration by default.

Correlated data objects must be migrated together; otherwise, migration will fail. Common correlations include table reference by views, view reference by views, and tables correlated through primary/foreign keys.

During incremental migration, if the source database has distributed transactions or generates binlog statements in the STATEMENT format, the migration will fail.

In migration without locks (the source database is Alibaba Cloud ApsaraDB RDS for MySQL 5.6, Alibaba Cloud PolarDB for MySQL 5.6, or Amazon RDS for MySQL, and the target database is TencentDB for MySQL), DDL operations are not supported during full migration.

## **Operation Limits**

During migration, do not perform the following operations; otherwise, the migration task will fail:

Do not modify or delete user information (including username, password, and permissions) in the source and target databases and port numbers.

Do not run distributed transactions in the source database.

Do not write binlog data in the **STATEMENT** format into the source database.

Do not clear binlogs in the source database.

Do not run DDL operations of changing the database/table structure during database/table structure migration or full migration.

Do not delete the system table \_\_tencentdb\_\_ during incremental migration.

If you only perform full data migration, do not write new data into the source instance 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.

## Supported SQL Operations

Operation Type	Supported SQL Operations
DML	INSERT, UPDATE, DELETE, and REPLACE
DDL	TABLE: CREATE TABLE, ALTER TABLE, DROP TABLE, TRUNCATE TABLE, and RENAME TABLE VIEW: CREATE VIEW and DROP VIEW INDEX: CREATE INDEX and DROP INDEX DATABASE: CREATE DATABASE, ALTER DATABASE, and DROP DATABASE

## **Environment Requirements**

#### Note:

The system will automatically check the following environment requirements before starting a migration task and report an error if a requirement is not met. If you can identify the failed check item, fix it as instructed in Database Connection Check; otherwise, wait for the system verification to complete and fix the problem according to the error message.

Туре	Environment Requirement
Requirements for source database	The source and target databases can be connected. The server where the source database resides must have enough outbound bandwidth; otherwise, the migration speed will be affected. Requirements for the database parameters: The `server_id` parameter in the source database must be set manually and cannot be 0. `row_format` for the source databases/tables cannot be set to `FIXED`. The values of the `lower_case_table_names` variable in both the source and target databases must be the same. The `connect_timeout` variable in the source database must be greater than or equal to 10. We recommend you enable `skip-name-resolve` to reduce the possibility of connection timeout. Requirements for binlog parameters: The `log_bin` variable in the source database must be set to `ON`. The `binlog_format` variable in the source database must be set to `ROW`.

	The `binlog_row_image` variable in the source database must be set to `FULL`. On MySQL 5.6 or later, if the `gtid_mode` variable is not `ON`, an alarm will be triggered. We recommend you enable `gtid_mode`. You cannot set filter conditions with `do_db` and `ignore_db`. If the source database is a slave database, the `log_slave_updates` variable must be set to `ON`. Foreign key dependency: Foreign key dependency can be set to only one of the following three types: `NO ACTION`, `RESTRICT`, and `CASCADE`. During partial table migration, tables with foreign key dependency must be migrated. The migration precision of DTS for data in `FLOAT` type is 38 digits, and for data in `DOUBLE` type is 308 digits. You should check whether this meets your requirements.
Requirements for the target database	The target database version must be equal to or later than the source database version. The size of the target database space must be at least 1.2 times that of the databases/tables to be migrated in the source database. (Full data migration will execute INSERT operations concurrently, causing some tables in the target database to generate data fragments. Therefore, after full migration is completed, the size of the tables in the target database may be larger than that in the source database.) The target database cannot have migration objects such as tables and views with the same name as those in the source database. The `max_allowed_packet` parameter of the target database must be set to 4 MB or above.
Other requirements	The environment variable `innodb_stats_on_metadata` must be set to `OFF`.

## Directions

#### Configuring the network interconnection through CCN

Establish interconnections as instructed in Connecting Network Instances Under the Same Account.

#### Note:

CCN only provides bandwidth below 10 Kbps between all regions free of charge. However, DTS requires a higher bandwidth. Therefore, bandwidth configuration in the link is required.

#### Configuring a DTS migration task

1. Log in to the DTS console, select **Data Migration** on the left sidebar, and click **Create Migration Task** to enter the **Create Migration Task** page.



2. On the **Create Migration Task** page, select the types, regions, and specifications of the source and target instances and click **Buy Now**.

3. On the **Set source and target databases** page, configure the task, source database, and target database settings. After the source and target databases pass the connectivity test, click **Create**.

#### Note:

If the connectivity test fails, troubleshoot and fix the problem as prompted and as instructed in Database Connection Check and try again.

Setting Type	Configuration Item	Description
	Task Name	Set a meaningful name for easy task identification.
Task Configuration	Running Mode	Immediate execution: The task will be started immediately after the task verification is passed. Scheduled execution: You need to configure a task execution time and the task will be started automatically then.
	Tag	Tags are used to manage resources by category in different dimensions. If the existing tags do not meet your requirements, go to the console to create more.
Source Database Settings	Source Database Type	The source database type selected during purchase, which cannot be changed.
	Service Provider	Select Others.
	Region	The source database region selected during purchase, which cannot be changed.
	Access Type	Select CCN. For more information on access types, see Overview.
	Host Address	IP address or domain name for accessing the source MySQL database.
	Port	Port for accessing the source MySQL database.
	Account	Account of the source MySQL database, which must have the required permissions.
	Password	Password of the source MySQL database.
	VPC-based CCN Instance	Only VPC-based CCN instance is supported. You need to confirm the network type associated with CCN.
	Accessed VPC	The accessed VPC refers to the VPC in CCN over which the migration/sync linkage is connected. You need to select a CCN-

		associated VPC other than the VPC where the source database resides.
		To ensure the network connectivity, you must check whether the following key requirements are met: The selected CCN-associated VPC cannot be in the same region as the host address of the source database. If the source database is MySQL in a self-built IDC, this restriction can be ignored. The selected CCN-associated VPC cannot be in the same VPC as the host address of the source database. If the source database is MySQL in a self-built IDC, the selected VPC cannot be the VPC of the Direct Connect gateway associated with the self-built IDC.
	Subnet	Name of the subnet of the selected VPC.If you cannot pull the subnet, there may be a problem with your account. The account of the accessed VPC must be the same as the migration account.For example, to migrate a database under account A to account B, you should use account B to create a task. Therefore, the accessed VPC must be under account B.
	Region of Accessed VPC	The region of the source database selected during task purchase must be the same as the region of the accessed VPC; otherwise, DTS will change the former to the latter.
	Target Database Type	The target database type selected during purchase, which cannot be changed.
Target Database Settings	Region	The target database region selected during purchase, which cannot be changed.
	Access Type	Select Database.
	Database Instance	Select the instance ID of the target TencentDB database.
	Account	The account of the target TencentDB database, which needs to have required permissions.
	Password	Password of the target TencentDB database.

# 4. On the **Set migration options and select migration objects** page, configure the migration type and objects and click **Save**.

Configuration Item	Description	
--------------------	-------------	--



Migration Type	Select a type based on your scenario. Structural migration: Structured data such as databases and tables in the database will be migrated. Full migration: The entire database will be migrated. Full + incremental migration: The entire database and subsequent incremental data will be migrated. If there are data writes during migration, and you want to smoothly migrate the data in a non-stop manner, select this option.
Migration Object	Entire instance: Migrate the entire database instance excluding the system databases such as `information_schema`, `mysql`, `performance_schema`, and `sys`. Specified objects: Migrate specified objects.
Specified objects	Select the objects to be migrated in Source Database Object and move them to the Selected Object box.

5. On the task verification page, verify the task. After the verification is passed, click **Start Task**.

If the verification failed, fix the problem as instructed in Database Connection Check and initiate the verification task again.

Failed: It indicates that a check item fails and the task is blocked. You need to fix the problem and run the verification task again.

Alarm: It indicates that a check item doesn't completely meet the requirements, and the task can be continued, but the business will be affected. You need to assess whether to ignore the alarm or fix the problem and continue the task based on the alarm message.

6. Return to the data migration task list, and you can see that the task has entered the **Creating** status. After 1–2 minutes, the data migration task will be started.

Select Structural migration or Full migration: once completed, the task will be stopped automatically.

Select **Full + Incremental migration**: After full migration is completed, the migration task will automatically enter the incremental data sync stage, which will not stop automatically. You need to click **Complete** to manually stop the incremental data sync.

Manually complete incremental data sync and business switchover at appropriate time.

Observe whether the migration task is in the incremental sync stage and is not in the lag status. If so, stop writing data to the source database for a few minutes.

Manually complete incremental sync when the data gap between the target and the source databases is 0 MB and the time lag between them is 0 seconds.

7. (Optional) If you want to view, delete, or perform other operations on a task, click the task and select the target operation in the **Operation** column. For more information, see Viewing Task.

#### **Business cutover**



After the migration task status becomes **Task successful**, you can formally cut over the business. For more information, see Cutover Description.