

Alibaba Cloud Data Transmission Service

Change tracking

Issue: 20200220

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Document conventions

Style	Description	Example
	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 Danger: Resetting will result in the loss of user configuration data.
	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 Warning: Restarting will cause business interruption. About 10 minutes are required to restart an instance.
	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	 Notice: If the weight is set to 0, the server no longer receives new requests.
	A note indicates supplemental instructions, best practices, tips, and other content.	 Note: You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click Settings > Network > Set network type.
Bold	Bold formatting is used for buttons, menus, page names, and other UI elements.	Click OK.
Courier font	Courier font is used for commands.	Run the <code>cd /d C:/window</code> command to enter the Windows system folder.
<i>Italic</i>	Italic formatting is used for parameters and variables.	<code>bae log list --instanceid Instance_ID</code>
[] or [a b]	This format is used for an optional value, where only one item can be selected.	<code>ipconfig [-all -t]</code>

Style	Description	Example
{{ or {a b}}	This format is used for a required value, where only one item can be selected.	switch { <i>active</i> <i>stand</i> }

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1 Overview of change tracking scenarios

You can use the change tracking feature of DTS to retrieve incremental data from databases in real time. This topic lists the change tracking scenarios for different types of source databases.

**Note:**

For more information about the previous and new versions of the change tracking feature, see [#unique_4](#) and [#unique_5](#).

Change tracking version	Topic
Previous	#unique_6
New	Track data changes from ApsaraDB RDS for MySQL (new)

2 Change tracking (new)

2.1 Track data changes from ApsaraDB RDS for MySQL (new)

The change tracking feature allows you to track data changes in real time. It helps you achieve lightweight cache updates, business decoupling, asynchronous data processing, and real-time data synchronization of ETL operations. This topic describes how to track data changes from ApsaraDB RDS for MySQL.

Prerequisites

The database version of ApsaraDB RDS for MySQL is 5.1, 5.5, 5.6, 5.7, or 8.0.

Supported instance types

The change tracking feature supports MySQL databases of the following instance types:

- ApsaraDB RDS for MySQL
- User-created MySQL database with a public IP address
- User-created MySQL database hosted on ECS
- User-created MySQL database connected over Express Connect, VPN Gateway, or Smart Access Gateway

This topic uses ApsaraDB RDS for MySQL as an example to show how to configure a change tracking task. The configuration procedures are similar for other instance types.



Note:

If your source database is a user-created MySQL database, you must create a database account and configure binary logging. For more information, see [#unique_9](#).



Procedure


1. Create a change tracking instance. For more information, see [#unique_10/unique_10_Connect_42_section_sek_ra8_w7j](#).
2. Log on to the [DTS console](#).
3. In the left-side navigation pane, click Change Tracking.

4. At the top of the Change Tracking Tasks page, select the region where your change tracking instance resides.

5. Find the created change tracking instance and click **Configure Channel** in the **Actions** column.
6. Configure the source database information and network type for the change tracking task.

Category	Parameter	Description
Task Name	N/A	Modify the default name for the change tracking task. We recommend that you use an informative name for easy identification. The task name is not required to be unique.
Source Database	Version	Select New.
	Instance Type	Select RDS Instance.
	Database Type	This parameter is set to MySQL and cannot be modified.

Category	Parameter	Description
	Instance Region	The region that you select when purchasing the change tracking instance. You cannot change the value of this parameter.
	RDS Instance ID	Select the ID of the RDS instance from which you want to track data changes.  Note: A read-only instance or temporary instance cannot be used as the source instance for change tracking.
	Database Account	Enter the account of the source RDS database.  Note: <ul style="list-style-type: none">• The account must have the following permissions : REPLICATION SLAVE, REPLICATION CLIENT, and SELECT for the required objects.• If the database type of the source RDS instance is MySQL 5.5 or MySQL 5.6, you do not need to configure the database account and database password.
	Database Password	Enter the password for the account of the source RDS database.

Category	Parameter	Description
Network Type	N/A	<p>Select the network type of the change tracking task.</p> <div>  Note: <ul style="list-style-type: none"> We recommend that you select the same network type as the <code>~25367~</code> instance where the change tracking client is installed. For example, if the ECS instance is deployed in a VPC, select VPC as the network type and specify the VPC and VSwitch. Network latency is minimized if you track data changes over internal networks. Classic network <p>If you select Classic, no other configurations are required. For more information about the classic network, see Classic network.</p> VPC <p>If you select VPC, you must specify the VPC and VSwitch. For more information about VPC, see VPC.</p> </div>

7. Click Set Whitelist and Next. The following table describes the details about whitelist settings.

Instance type of the source database	Description
ApsaraDB RDS for MySQL	The IP addresses of DTS servers are automatically added to the whitelist of the ApsaraDB RDS for MySQL instance . This ensures that DTS servers can connect to the source instance.
User-created MySQL database hosted on ECS	The IP addresses of DTS servers are automatically added to an inbound rule of the ECS instance. This ensures that DTS servers can connect to the source instance.

Instance type of the source database	Description
<ul style="list-style-type: none">• User-created MySQL database with a public IP address• User-created MySQL database connected over Express Connect , VPN Gateway, or Smart Access Gateway	If a whitelist is configured for the user-created database, you must add the IP addresses of DTS servers to the whitelist of the database. For more information, see #unique_11 .

8. In the Create Change Tracking Account message that appears, click Next after the account is created.

**Note:**

This step is required only when the database type of the source RDS instance is MySQL 5.5 or MySQL 5.6. In this step, DTS creates a database account for change tracking in the source instance.

9. Select the data change types and objects.

1.Select Instance

2.Select Required Objects

3.Precheck

Information: If you select an entire database, DTS tracks all the data added to the database. If you only select some tables, you must modify the objects in the Available section to include other required objects in the task.

* Required Data Types: ☒ Data Updates ☒ Schema Updates ?

Required Objects

If you search globally, please expand the

dtstestdata

dtstestdata0925

dtstestdatanew

sys

Select All

Selected

dtstestdata(2Objects)

customer

order

Select All




>

<

Cancel

Previous


Save and Precheck

Parameter	Description
Required Data Types	<ul style="list-style-type: none"> • Data Updates If you select Data Updates, DTS tracks data updates of the selected objects, including INSERT, DELETE, and UPDATE operations. • Schema Updates If you select Schema Updates, DTS tracks the create, delete, and modify operations that are performed on all object schemas of the source instance. You need to use the change tracking client to filter the required data. <div>  Note: <ul style="list-style-type: none"> • If you select a database as the object, DTS tracks data changes of all objects, including new objects in the database. • If you select a table as the object, DTS only tracks data changes in this table. In this case, if you want to track data changes of a new table, you must add the table to the objects for change tracking. For more information, see Modify objects for change tracking. </div>
Required Objects	<p>In the Required Objects section, select the required objects and click the  button to add the objects to the Selected section.</p> <div>  Note: The objects for change tracking include databases and tables. </div>

10. In the lower-right corner of the page, click Save and Precheck.



Note:

- A precheck is performed before you can start the change tracking task. You can start the change tracking task only after the task passes the precheck.
- If the task fails the precheck, click the  icon next to each failed item to view details. Fix the issues based on the instructions and run the precheck again.

11. Close the Precheck dialog box after the following message is displayed: The precheck is passed.

After the change tracking task is created, DTS performs initial change tracking, which requires about one minute to complete. After the initial change tracking is complete, you can create a consumer group or consume the tracked data.

Subsequent operations

- [Create consumer groups](#)
- [Use a Kafka client to consume tracked data](#)

2.2 Create consumer groups

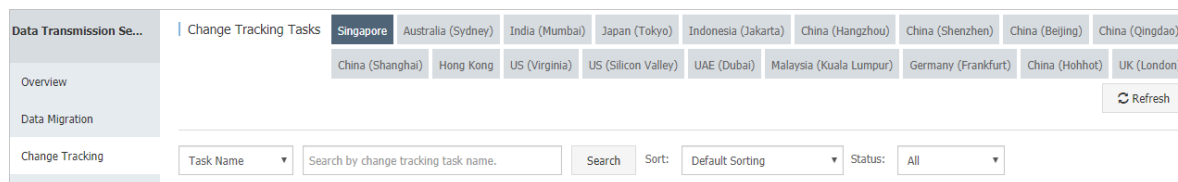
The change tracking feature allows you to create multiple consumer groups. Consumers in different consumer groups can track data changes from the same data source. Consumer groups help you reduce the cost for tracking data changes and improve the efficiency of data consumption.

Note

- You can create multiple consumer groups in a change tracking instance to repeatedly consume data.
- A consumer group consumes each message only once, and consumers in the consumer group serve as a backup for each other.
- In a consumer group, only one consumer can consume data at a time, while other consumers serve as disaster recovery nodes.

Procedure

1. Log on to the [DTS console](#).
2. In the left-side navigation pane, click Change Tracking.
3. At the top of the Change Tracking Tasks page, select the region where your change tracking instance resides.



4. Find the change tracking instance and click the instance ID.

<input type="checkbox"/>	Task ID/Name	Status	Consumption Checkpoint	Data Range	Billing Method	Actions
<input type="checkbox"/>	dtstest RDS Tracking Task_new	New Subsc: Normal		2019-09-26 10:59:04 2019-09-26 11:25:51	Pay-As- You-Go	Switch to Subscription View Tracked Data Modify Required Objects Add consumer group More
<input type="checkbox"/>	Delete	Total: 1 item(s), Per Page: 20 item(s) « < 1 > » <input type="text"/> GO				

5. In the left-side navigation pane, click Consume Data.

6. On the Consume Data page, click Add Consumer Group in the upper-right corner.

<	RDS Tracking Task_new
View Task Settings	Data Consume Refresh Add consumer group
Track Data Changes	
Configure Monitori...	
Data Consume	
	Could not find any record that met the condition.

7. In the Create Consumer Group dialog box that appears, configure the parameters for the consumer group.

Create consumer group

Subscribe instance

ID:

Subscribe instance

name: RDS Tracking Task_new

* Consumer group

name:

* Username:

* Password:

* Confirm password:

Create

Close

Parameter	Description
Consumer Group Name	Enter a new name for the consumer group. We recommend that you use an informative name for easy identification.

Parameter	Description
Username	<p>Enter the username of the consumer group.</p> <ul style="list-style-type: none"> A username must contain one or more of the following character types: uppercase letters, lowercase letters, digits, and underscores (_). The username must be 1 to 16 characters in length.
Password	<p>Enter the password that corresponds to the username of the consumer group.</p> <ul style="list-style-type: none"> A password must contain two or more of the following character types: uppercase letters, lowercase letters, digits, and special characters. The password must be 8 to 32 characters in length.
Confirm Password	Enter the new password again.

8. Click Create.

Subsequent operations

Use a Kafka client to consume tracked data

2.3 Manage consumer groups

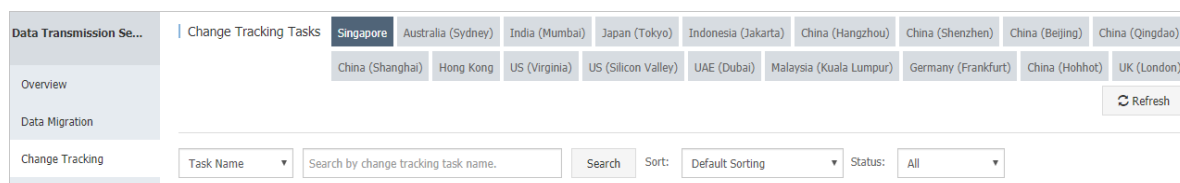
You can manage consumer groups of a change tracking instance in the DTS console. This topic describes how to modify the password of a consumer group and how to delete a consumer group.

Context

For more information about consumer groups, see [Change tracking \(new\)](#).

Procedure

1. Log on to the [DTS console](#).
2. In the left-side navigation pane, click Change Tracking.
3. At the top of the Change Tracking Tasks page, select the region where your change tracking instance resides.



4. Find the change tracking instance and click the instance ID.

<input type="checkbox"/>	Task ID/Name	Status	Consumption Checkpoint	Data Range	Billing Method	Actions
<input type="checkbox"/>	dts-xxxxxx New Subsc RDS Tracking Task_new	Normal		2019-09-26 10:59:04 2019-09-26 11:25:51	Pay-As-You-Go	Switch to Subscription View Tracked Data Modify Required Objects Add consumer group More
<input type="checkbox"/>	Delete	Total: 1 item(s), Per Page: 20 item(s)				

5. In the left-side navigation pane, click Consume Data.

6. Modify the password of a consumer group or delete a consumer group.

Modify the password of a consumer group

- a) On the Consume Data page, find the target consumer group and click **Modify Password** in the Actions column.

View Task Settings Track Data Changes Configure Monitori... Data Consume	RDS Tracking Task_new					
	Data Consume					Refresh Add consumer group
	Consumer group ID/Name	Consume timestamp	Remaining message	Delay(s)	Username	Operation
	userinf-group		-	-	dtstest	Modify password Delete

- b) In the **Modify Password** dialog box that appears, enter the old password and new password, and enter the new password again in the **Confirm Password** field.



Note:

- A password must contain two or more of the following character types: uppercase letters, lowercase letters, digits, and special characters.
- The password must be 8 to 32 characters in length.

- c) Click **Modify**.

Delete a consumer group



Note:

After a consumer group is deleted, the data in the group will be cleared and cannot be recovered. We recommend that you use caution when performing this operation.

- a) On the **Consume Data** page, find the target consumer group and click **Delete** in the Actions column.
- b) In the **Delete Consumer Group** message that appears, click **OK**.

2.4 Modify objects for change tracking

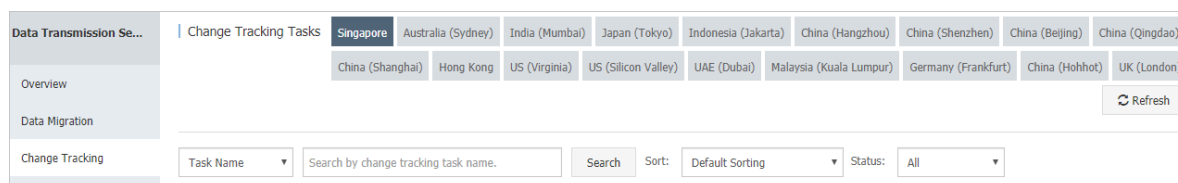
DTS allows you to add or remove objects for change tracking in the consumption process. This topic describes how to modify objects for change tracking.

Note

- After you add an object, the change tracking task pulls the incremental data of the new object from the time when the modification takes effect.
- After you remove an object, the change tracking client no longer tracks data changes of the removed object.

Procedure


1. Log on to the [DTS console](#).
2. In the left-side navigation pane, click Change Tracking.
3. At the top of the Change Tracking Tasks page, select the region where your change tracking instance resides.




4. Find the target instance and click Modify Required Objects in the Actions column.

5. In the Select Required Objects step, you can add and remove objects for change tracking.

- **Add objects for change tracking**

In the Required Objects section, select the required objects and click the  button to add the objects to the Selected section.

- **Remove objects for change tracking**


In the Selected section, select the objects to be removed and click the  button to move the objects to the Required Objects section.

6. In the lower-right corner of the page, click Save and Precheck.



Note:

- A precheck is performed before you can start the change tracking task. You can start the change tracking task only after the task passes the precheck.

- If the task fails the precheck, click the  icon next to each failed item to view details. Fix the issues based on the instructions and run the precheck again.

7. Close the Precheck dialog box after the following message is displayed: The precheck is passed.

After the change tracking task is created, DTS performs initial change tracking, which requires about one minute to complete. After the initial change tracking is complete, you can use the tracked data for subsequent operations. For more information, see [Use a Kafka client to consume tracked data](#).

2.5 View tracked data changes

This topic describes how to view the incremental data from a change tracking task in the DTS console. This topic provides the definition of each field in the tracked data changes.



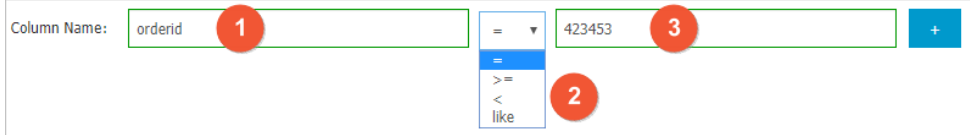
Prerequisites

- A change tracking task is created. For more information, see [Track data changes from ApsaraDB RDS for MySQL \(new\)](#).
- The change tracking task is in the Normal or Error state.

Procedure

1. Find the target instance and click View Tracked Data in the Actions column.

2. On the Track Data Changes page, 20 data entries that are tracked in the last minute are displayed by default. You can filter tracked data by using the filter criteria.

Filter	Description
Database Name	Enter the name of the database that you want to query. If you do not specify this filter, all databases are queried.
Table Name	Enter the name of the table that you want to query. If you do not specify this filter, all tables are queried.
Column Name	<p>Enter the name of the column that you want to query, select an operator, and then enter the column value. If you do not specify this filter, all columns are queried.</p> <p> Note: You can click the plus sign () to add more column filters.</p> 
SQL Type	Select the types of SQL operations that you want to query. INSERT, UPDATE, DELETE, and DDL operations are queried by default.

Filter	Description
Time	<p>Select a time range.</p> <p>The selected time range must be within the time range of all tracked data changes. For more information, see the prompt at the top of the page.</p> <div> <div>Track Data Changes</div> <div> Information: Data Range of Channel : 2019-07-25 09:34:33 ~ 2019-07-26 11:00:41 </div> <div> Database Name: <input type="text" value="Do not fill in, query all databases"/> Table Name: <input type="text" value="Do not fill in, query all tables"/> </div> <div> Column Name: <input type="text" value="Do not fill in, query all columns"/> = <input type="text"/> <input type="button" value="+"/> </div> <div> SQL Type: <input type="text" value="INSERT UPDATE DELETE DDL"/> </div> <div> Time: <input type="text" value="2019-11-11"/> <input type="text" value="19"/> : <input type="text" value="21"/> : <input type="text" value="26"/> To <input type="text" value="2019-11-11"/> <input type="text" value="19"/> : <input type="text" value="22"/> : <input type="text" value="26"/> <input type="button" value="Search"/> </div> </div>

3. Click Search to retrieve specific data entries.

Database Name:
Table Name:

Column Name:
=

SQL Type:

Time: : : To : :

Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions
dtstestdata	order	orderid:123456	INSERT	102420@188	2019-07-26 13:23:46	View Details

Table 2-1: Consumption checkpoint and timestamp

Database type	Consumption checkpoint	Timestamp
ApsaraDB RDS for MySQL	The location and time of an incremental data entry in the binary log.	The timestamp when an incremental data entry is written to the binary log file.
Oracle	The location and time of an incremental data entry in the redo or archive log.	The timestamp when an incremental data entry is written to the redo or archive log.

4. Click View Details in the Actions column of a data entry to view the details.

Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions
dtstestdata	order	orderid:888888	UPDATE	612343@187	2019-07-26 11:21:40	View Details
Field Details						
Field Name	Field Type	Character Encoding	Pre-image	Post-image		
address	STRING	utf8	杭州市	杭州市		
commodity	STRING	utf8	手机	手机		
orderid	INT32		888888	888888		
ordertime	DATETIME		2019-07-18 15:20:35	2019-07-18 15:20:35		
phonenumber	INT32		2147483647	2147483647		
username	STRING	utf8	user1	user2		

Field	Description
Field Name	The name of the field or column.
Field Type	The type of the field.
Character Encoding	The character encoding of the field, such as UTF-8, GBK, Latin 1, or UTF-8 (MB4).
Pre-image	The value of each field before the data entry is updated.
Post-image	The value of each field after the data entry is updated. The updated values are displayed in red.

Additional information about the pre-image and post-image

Operation type	Value description																																																															
INSERT	<table><tr><th>Database Name</th><th>Table Name</th><th>Primary Key Column:Value</th><th>Change Type</th><th>Checkpoint</th><th>Timestamp</th><th>Actions</th></tr><tr><td>dtstestdata</td><td>order</td><td>orderid:123456</td><td>INSERT</td><td>102420@188</td><td>2019-07-26 13:23:46</td><td>View Details</td></tr><tr><th colspan="7">Field Details</th></tr><tr><th>Field Name</th><th>Field Type</th><th>Character Encoding</th><th>Pre-image</th><th colspan="3">Post-image</th></tr><tr><td>address</td><td>STRING</td><td>utf8</td><td></td><td colspan="3">杭州</td></tr><tr><td>commodity</td><td>STRING</td><td>utf8</td><td></td><td colspan="3">PC</td></tr><tr><td>orderid</td><td>INT32</td><td></td><td></td><td colspan="3">123456</td></tr><tr><td>ordertime</td><td>DATETIME</td><td></td><td></td><td colspan="3">2019-07-26 13:23:21</td></tr><tr><td>username</td><td>STRING</td><td>utf8</td><td></td><td colspan="3">usernew</td></tr></table>	Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions	dtstestdata	order	orderid:123456	INSERT	102420@188	2019-07-26 13:23:46	View Details	Field Details							Field Name	Field Type	Character Encoding	Pre-image	Post-image			address	STRING	utf8		杭州			commodity	STRING	utf8		PC			orderid	INT32			123456			ordertime	DATETIME			2019-07-26 13:23:21			username	STRING	utf8		usernew		
	Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions																																																									
	dtstestdata	order	orderid:123456	INSERT	102420@188	2019-07-26 13:23:46	View Details																																																									
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	commodity	STRING	utf8		PC																																																											
	orderid	INT32			123456																																																											
	ordertime	DATETIME			2019-07-26 13:23:21																																																											
	username	STRING	utf8		usernew																																																											
	<p>The value of the pre-image is empty.</p> <p>The value of the post-image is the data written by the INSERT operation.</p>																																																															
DELETE	<table><tr><th>Database Name</th><th>Table Name</th><th>Primary Key Column:Value</th><th>Change Type</th><th>Checkpoint</th><th>Timestamp</th><th>Actions</th></tr><tr><td>dtstestdata</td><td>order</td><td>orderid:123456</td><td>DELETE</td><td>107682@188</td><td>2019-07-26 13:26:04</td><td>View Details</td></tr><tr><th colspan="7">Field Details</th></tr><tr><th>Field Name</th><th>Field Type</th><th>Character Encoding</th><th>Pre-image</th><th colspan="3">Post-image</th></tr><tr><td>address</td><td>STRING</td><td>utf8</td><td>杭州</td><td colspan="3"></td></tr><tr><td>commodity</td><td>STRING</td><td>utf8</td><td>PC</td><td colspan="3"></td></tr><tr><td>orderid</td><td>INT32</td><td></td><td>123456</td><td colspan="3"></td></tr><tr><td>ordertime</td><td>DATETIME</td><td></td><td>2019-07-26 13:23:21</td><td colspan="3"></td></tr><tr><td>username</td><td>STRING</td><td>utf8</td><td>usernew</td><td colspan="3"></td></tr></table>	Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions	dtstestdata	order	orderid:123456	DELETE	107682@188	2019-07-26 13:26:04	View Details	Field Details							Field Name	Field Type	Character Encoding	Pre-image	Post-image			address	STRING	utf8	杭州				commodity	STRING	utf8	PC				orderid	INT32		123456				ordertime	DATETIME		2019-07-26 13:23:21				username	STRING	utf8	usernew			
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	Field Details																																																															
	Field Name	Field Type	Character Encoding	Pre-image	Post-image																																																											
	address	STRING	utf8	杭州																																																												
	commodity	STRING	utf8	PC																																																												
	orderid	INT32		123456																																																												
	ordertime	DATETIME		2019-07-26 13:23:21																																																												
	username	STRING	utf8	usernew																																																												
	<p>The value of the pre-image is the data deleted by the DELETE operation.</p> <p>The value of the post-image is empty.</p>																																																															

Operation type


UPDATE

Value description

Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions
dtstestdata	order	orderid:888888	UPDATE	612343@187	2019-07-26 11:21:40	View Details
Field Details						
Field Name	Field Type	Character Encoding	Pre-image	Post-image		
address	STRING	utf8	杭州市	杭州市		
commodity	STRING	utf8	手机	手机		
orderid	INT32		888888	888888		
ordertime	DATETIME		2019-07-18 15:20:35	2019-07-18 15:20:35		
phonenumber	INT32		2147483647	2147483647		
username	STRING	utf8	user1	user2		

The value of the pre-image is the data before update.

The value of the post-image is the data after update.



Note:

The updated values are displayed in red.

DDL or DML

Database Name	Table Name	Primary Key Column:Value	Change Type	Checkpoint	Timestamp	Actions
dtstestdata			DDL	75069@188	2019-07-26 13:11:03	View Details
Field Details						
DDL Definition						
ALTER TABLE `order` DROP COLUMN `phonenumber`						
SET TIMESTAMP=1564117863;SET @@session.sql_mode=0;SET names utf8mb4;						

The details only contain DDL or DML statements.

2.6 Use a Kafka client to consume tracked data

The change tracking feature allows you to consume tracked data by using a Kafka client from V0.11 to V1.1. This topic describes how to use the demo code of a Kafka client.

Prerequisites

- A change tracking task is created. For more information, see [Track data changes from ApsaraDB RDS for MySQL \(new\)](#).
- One or more consumer groups are created. For more information, see [Create consumer groups](#).

Download the demo code of the Kafka client

Click [here](#) to download the demo code of the Kafka client. For more information about code usage, see [Readme](#).

Data format

Data is serialized and stored in the Avro format. For more information, see [Record.avsc](#). You must parse the tracked data based on the Avro schema.

Demo code of the Kafka client

- Parameters



Note:

You can use the DTS console to obtain the values of the following parameters. For more information, see [Obtain information for change tracking](#).

Parameter	Description
dtsConnectIp	The address of the change tracking task.
dtsConnectPort	The port number of the change tracking task.
topic	The topic of the change tracking task.
sid	The ID of a consumer group.
username	The username of the consumer group.
password	The password that corresponds to the username of the consumer group.
startTimeStamp	The consumption checkpoint. You must save the consumption checkpoint of consumed data. If the business program is interrupted, you can specify the consumption checkpoint on the change tracking client to resume data consumption. The consumption checkpoint helps you prevent data loss. When you start the change tracking client, you can specify the consumption point to consume data on demand.

- **Key code**

- **makeProps**

Configures parameters for the change tracking task.

- **assignOffsetToConsumer**

Specifies the consumption checkpoint where data consumption resumes.



Note:

You must save the consumption checkpoint of consumed data to ensure that you can specify the consumption checkpoint if the business program is interrupted. This helps you prevent data loss.

- **consume**

Converts data types for message processing.

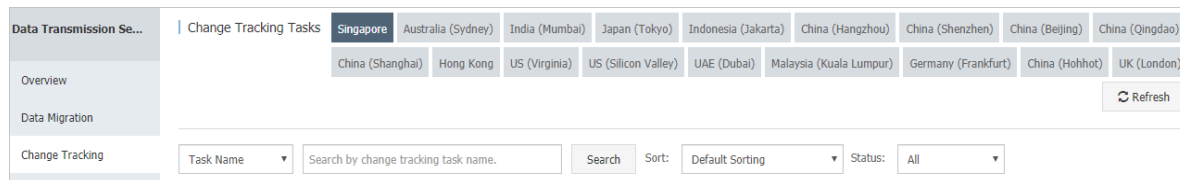
- **Mapping between the Avro data format and MySQL data types**

Parses and uses data by type. The data in the Avro format contains the `dataTypeNumber` field. Different values of this field correspond to different MySQL data types. For more information, see [Mappings between MySQL data types and `dataTypeNumber` values](#).

Obtain information for change tracking

The following example shows how to obtain the information that is required for tracking data changes from ApsaraDB RDS for MySQL.

1. Log on to the [DTS console](#).
2. In the left-side navigation pane, click Change Tracking.
3. At the top of the Change Tracking Tasks page, select the region where your change tracking instance resides.



4. Find the change tracking instance and click the instance ID.

5. On the View Task Settings page, obtain the topic and network information.

The screenshot shows the 'View Task Settings' page for 'RDS Tracking Task_new'. The left sidebar contains navigation links: 'View Task Settings', 'Track Data Changes', 'Configure Monitori...', and 'Data Consume'. The main content area is divided into three sections: 'Basic Information', 'Billing Information', and 'Network'. In the 'Basic Information' section, the 'Subscribe topic' field is highlighted with a red box and contains the value 'cn_hangzhou_rm_..._dtstest'. In the 'Network' section, the 'Public' and 'VPC' fields are highlighted with a red box, showing values like '...aliyuncs.com:18001' and '...aliyuncs.com:18003' respectively.



Note:

- The Network section shows the endpoint and port number.
- Network latency is minimized if you track data changes over internal networks. This is applicable if the ECS instance where you deploy the Kafka client and change tracking instance belong to the same VPC or classic network.

6. In the left-side navigation pane, click Consume Data. On the Consume Data page, obtain the consumer group ID and username.

The screenshot shows the 'Consume Data' page for 'RDS Tracking Task_new'. The left sidebar contains navigation links: 'View Task Settings', 'Track Data Changes', 'Configure Monitori...', and 'Data Consume'. The main content area shows a table with the following columns: 'Consumer group ID/Name', 'Consume timestamp', 'Remaining message', 'Delay(s)', 'Username', and 'Operation'. The 'Consumer group ID/Name' and 'Username' fields in the first row are highlighted with red boxes, showing values like 'dtst...' and 'dtstest' respectively. The table also includes a 'Total: 1 item(s)' and 'Per Page: 20 item(s)' summary at the bottom.

Mappings between MySQL data types and dataTypeNumber values

MySQL data type	Value of dataTypeNumber
MYSQL_TYPE_DECIMAL	0
MYSQL_TYPE_INT8	1
MYSQL_TYPE_INT16	2
MYSQL_TYPE_INT32	3
MYSQL_TYPE_FLOAT	4
MYSQL_TYPE_DOUBLE	5

MySQL data type	Value of dataTypeNumber
MYSQL_TYPE_NULL	6
MYSQL_TYPE_TIMESTAMP	7
MYSQL_TYPE_INT64	8
MYSQL_TYPE_INT24	9
MYSQL_TYPE_DATE	10
MYSQL_TYPE_TIME	11
MYSQL_TYPE_DATETIME	12
MYSQL_TYPE_YEAR	13
MYSQL_TYPE_DATE_NEW	14
MYSQL_TYPE_VARCHAR	15
MYSQL_TYPE_BIT	16
MYSQL_TYPE_TIMESTAMP_NEW	17
MYSQL_TYPE_DATETIME_NEW	18
MYSQL_TYPE_TIME_NEW	19
MYSQL_TYPE_JSON	245
MYSQL_TYPE_DECIMAL_NEW	246
MYSQL_TYPE_ENUM	247
MYSQL_TYPE_SET	248
MYSQL_TYPE_TINY_BLOB	249
MYSQL_TYPE_MEDIUM_BLOB	250
MYSQL_TYPE_LONG_BLOB	251
MYSQL_TYPE_BLOB	252
MYSQL_TYPE_VAR_STRING	253
MYSQL_TYPE_STRING	254
MYSQL_TYPE_GEOMETRY	255