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# ThoughtSpot Embrace

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# Table of Contents

<b>Overview.....</b>	<b>2</b>
Snowflake	
<b>Add a connection .....</b>	<b>6</b>
<b>Modify a connection.....</b>	<b>9</b>
<b>Best practices.....</b>	<b>16</b>
<b>Reference.....</b>	<b>25</b>
Redshift	
<b>Add a connection .....</b>	<b>26</b>
<b>Modify a connection.....</b>	<b>29</b>
<b>Reference .....</b>	<b>36</b>
BigQuery	
<b>Add a connection .....</b>	<b>37</b>
<b>Modify a connection.....</b>	<b>40</b>
<b>Reference .....</b>	<b>47</b>
Synapse	
<b>Add a connection .....</b>	<b>50</b>
<b>Modify a connection.....</b>	<b>53</b>
<b>Reference .....</b>	<b>60</b>

# Embrace overview

**Summary:** Using Embrace, you can perform live queries on external databases.

If your company stores source data externally in data warehouses, you can use ThoughtSpot Embrace to directly query that data and use ThoughtSpot's analysis and visualization features, without moving the data into ThoughtSpot.

Embrace supports the following external databases:

- Snowflake
- Amazon Redshift
- Google BigQuery
- Microsoft Azure Synapse

To enable Embrace, contact ThoughtSpot support.

## How it works

You create a connection to the external database, choosing the columns from each table that you want to explore in your live query. Primary key and foreign key relationships are imported along with the primary and foreign key tables. If there are any joins in the tables of your connection, they are also imported. After your connection is complete, it becomes a **linked** data source in ThoughtSpot that allows you to query the external database directly. It's easy to apply transformations and filter the data also.

## Key benefits

- Set up and deploy ThoughtSpot faster by connecting directly to the external database.
- Eliminate the need to move data into ThoughtSpot for analysis.
- Centralize data management and governance in the external database.
- Save significant time and money by avoiding ETL pipelines.
- Connect to multiple external databases.

## Limitations

### Feature availability in Embrace

The following matrix compares the features that are available in our internal high-performance database, Falcon, and the ones available in Embrace:

Feature Name	Falcon	Embrace
Simple Search and Complex searches: Versus, Inline Subquerying, Growth	✓	✓
Search Suggestions for column names and values	✓	✓
Headlines that summarize tables	✓	✓
All chart types and configurations	✓	✓
Spot IQ: Instant insights, Did you know?, Pinboard insights, Analyze	✓	✗
Monitor	✓	✗
Table and Column remapping through Scriptability	✗	✓
Custom calendar	✓	✗
Materialized view	✓	✗

### Function availability in Embrace

The following matrix compares the specific function support across the different databases of Embrace. Functions not listed here have full support.

Function	Snowflake	Amazon Redshift	Google BigQuery	Azure Synapse
SOUNDS_LIKE	✗	✗	✗	✗
STRING_MATCH_SCORE	✗	✗	✗	✗

Function	Snowflake	Amazon Redshift	Google BigQuery	Azure Synapse
EDIT_DISTANCE_WITH_CAP	X	X	X	X
APPROX_SET_CARDINALITY	X	X	X	X
COUNT_NOT_NULL	X	X	X	X
SPELLS_LIKE	✓	X	X	X
EDIT_DISTANCE	✓	X	X	X
MEDIAN	✓	✓	X	✓
PERCENTILE	✓	✓	X	✓

## Data type availability in Embrace

The following matrix captures the specific data type support limitations across the different databases of Embrace. Data types not listed here have full support.

Data Type	Snowflake	Amazon Redshift	Google BigQuery	Azure Synapse
BINARY	X	✓	✓	X
VARBINARY	X	✓	✓	X
TIMESTAMPTZ	✓	X	✓	✓
GEOMETRY	✓	X	✓	✓
BYTES	✓	✓	X	✓
DATETIMEOFFSET	✓	✓	✓	X

## Additional specific exceptions

The following list captures the specific limitations across the different databases of Embrace. Databases not listed here have full support.

## General: all databases

### Sample values

Embrace does not internationalize sample values in tables.

### Delayed UI rendering

For connections with a very large number of tables (on the order of 1000's of tables), UI rendering may take a very long time. These connections may time out.

### Deleting columns

After specifying a connection, columns cannot be deleted from the table. Editing a connection makes it possible to add additional columns, but not to remove them.

## Google BigQuery

### Join support

Google BigQuery does not support PK-FK joins. Therefore, when using Embrace, you must create joins explicitly in ThoughtSpot.

### Partitioned tables

When running a query on a partitioned table with **Require partition filter option** enabled, you must specify the `WHERE` clause. Omitting the `WHERE` clause throws an error.

To ensure that the query on such tables honors the partition condition, you must create a worksheet filter in ThoughtSpot.

## Azure Synapse

Azure Synapse supports at most 10 `IF THEN ELSE` statements in a single query.

## Next steps

- [Add a Snowflake connection \[See page 6\]](#)

Create the connection between ThoughtSpot and tables in an external Snowflake database.

- [Add a Redshift connection \[See page 26\]](#)

Create the connection between ThoughtSpot and tables in an external Amazon RedShift database.

- [Add a BigQuery connection \[See page 37\]](#)

Create the connection between ThoughtSpot and tables in an external Google BigQuery database.

- [Add a Synapse connection \[See page 50\]](#)

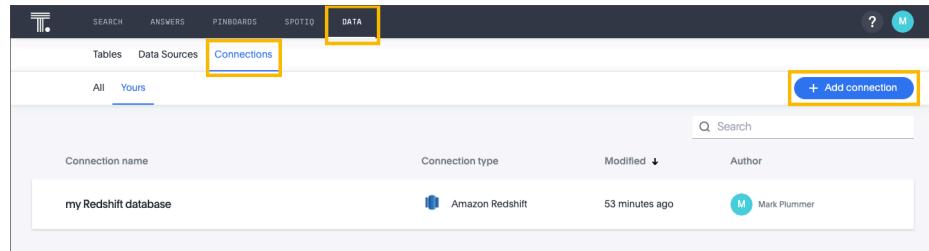
Create the connection between ThoughtSpot and tables in an external Azure Synapse database.

# Add a Snowflake connection

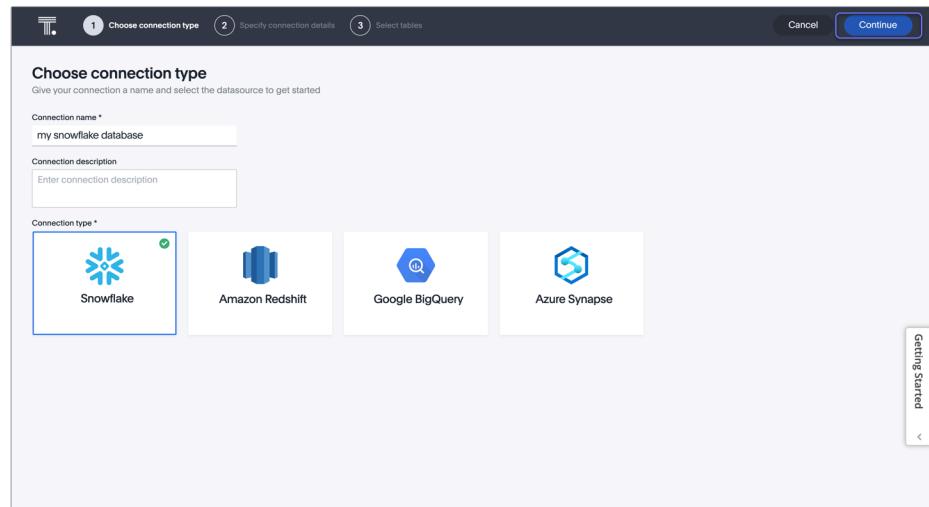
Once ThoughtSpot Embrace is enabled, you can add a connection to a Snowflake database. This allows you to perform a live query of the external database to create answers and pinboards, without having to bring the data into ThoughtSpot.

To add a new connection to Snowflake:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page, and click **+ Add connection** at the upper-right-hand side of the page.



3. Create a name for your connection, a description (optional), then select the Snowflake connection type, and click **Continue**.



4. Enter the connection details for your Snowflake data source, and click **Continue**.

**Snowflake connection details**  
Add your account details and credentials to retrieve the list of tables. [View details](#)

Account name \*

User \*

Password \*

Role \*

Warehouse \*

Database

Schema

Cancel Continue

Getting Started

Refer to the [Snowflake connection reference \[See page 25\]](#) for more information on each of the specific attributes you must enter for your connection.

5. Select tables (on the left) and the columns from each table (on the right), and then click **Create connection**.

**Select tables**  
Choose tables from the list on the left

All Selected (1)

Search tables

PUBLIC

- NewRetail\_Baskets\_Fact
- NewRetail\_Baskets\_Fact\_L...
- NewRetail\_Customer\_Dim...
- NewRetail\_Product\_Cost\_L...
- NewRetail\_Product\_Dime...
- NewRetail\_Product\_Dime...**

Tables

Column name (10/14 selected)

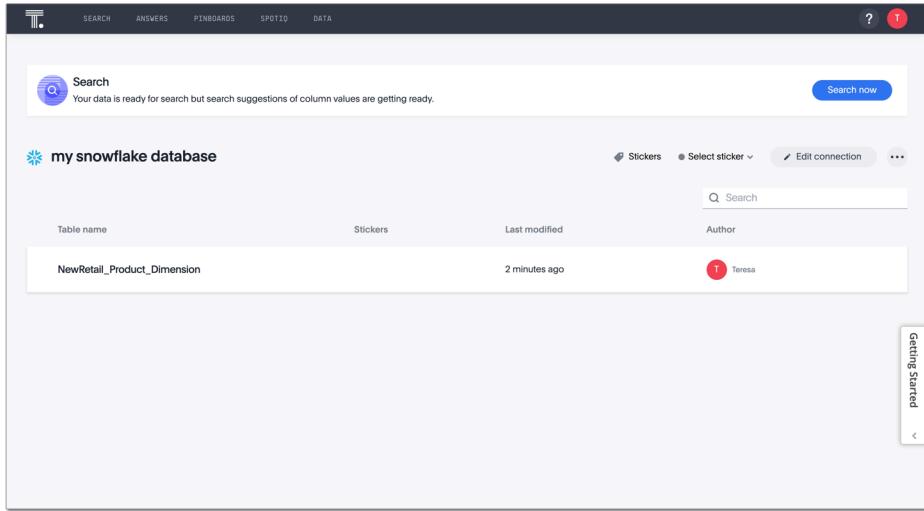
Column name (10/14 selected)	Data type	Sample data
Product_Key	VARCHAR	1
Category	VARCHAR	Food
Department_Key	VARCHAR	Canned Goods
Product_Name	VARCHAR	Pam's Club Chicken Noodle Soup
SKU_Number	VARCHAR	PC26182784343090822
Price	DOUBLE	2.09
Markup	DOUBLE	0.32

Columns from selected tables

Cancel Create connection

Getting Started

Once the connection is added, you can search your Snowflake database right away by clicking **Search now**.



Your new connection appears on the **Data > Connections** page. You can click the name of your connection to view the tables and columns in your connection.

The connection you just created is a link to the external data source. If there are any joins in the selected tables of the external data source, those are imported into ThoughtSpot.

You can now perform a live query on the selected tables and columns of your connection. Because the selected tables and columns in your connection are linked, it may take a while to initially render the search results. This is because ThoughtSpot does not cache linked data. With linked data, ThoughtSpot queries the external database directly, which is slower than querying data that is stored in ThoughtSpot's database.

## Related information

- [Modify a Snowflake connection \[See page 9\]](#)
- [Snowflake connection reference \[See page 25\]](#)
- [Load and manage data \[See page 0\]](#)
- [Data and object security \[See page 0\]](#)

# Modify a Snowflake connection

**Summary:** Learn how to modify a Snowflake connection and its tables.

You can modify an Embrace Snowflake connection in the following ways:

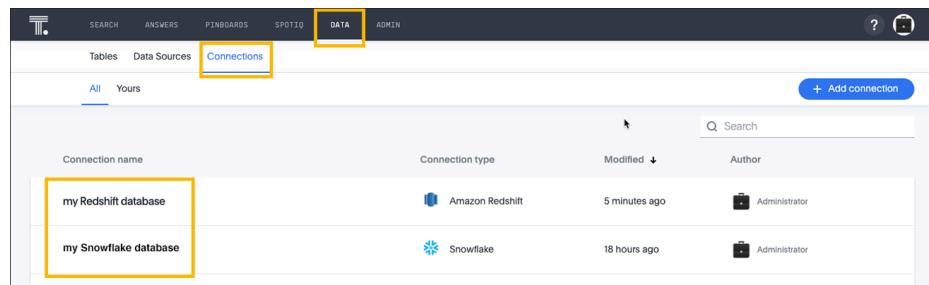
- Edit a connection: to add or remove tables and columns
- Remap a connection: to map a table or column to a different table or column
- Delete a table
- Delete a connection

## Editing a Snowflake connection

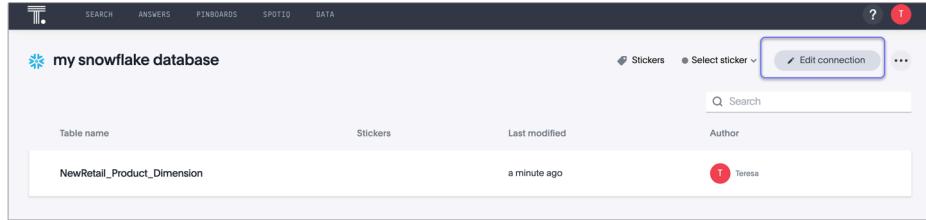
You can edit a Snowflake connection to add tables and columns.

To edit a connection:

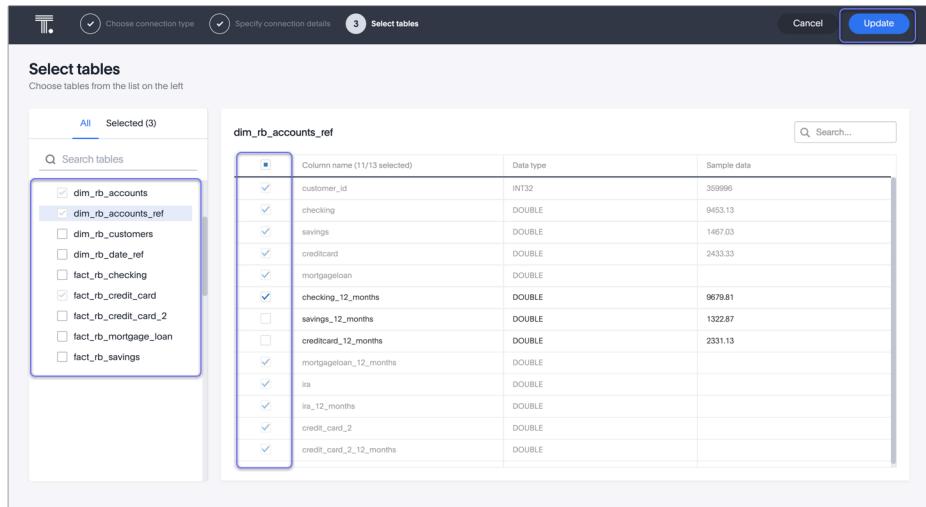
1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to edit.



4. Click **Edit connection** at the upper-right-hand side of the page.



5. On the Choose connection type page, change the connection name or description (if needed), and then click **Continue**.
6. On the Snowflake connection details page, make any changes needed, and then click **Continue**.
7. Expand the database table drop-down menu, and select the tables and columns you want to add.



8. Click **Update**, and then click **Confirm** to save the updated connection detail.

To remove a table from a connection, delete it from the connection details page. For more information, see [Deleting a table \[See page 13\]](#).

## Remapping a Snowflake connection

Modify the connection parameters by editing the source mapping `yml` file that was created when you added the connection. For example, you can remap the existing table or column to a different table or column in an existing database connection. ThoughtSpot recommends that you check the dependencies before and after you remap a table or column in a connection to ensure they display as intended.

To remap a connection:

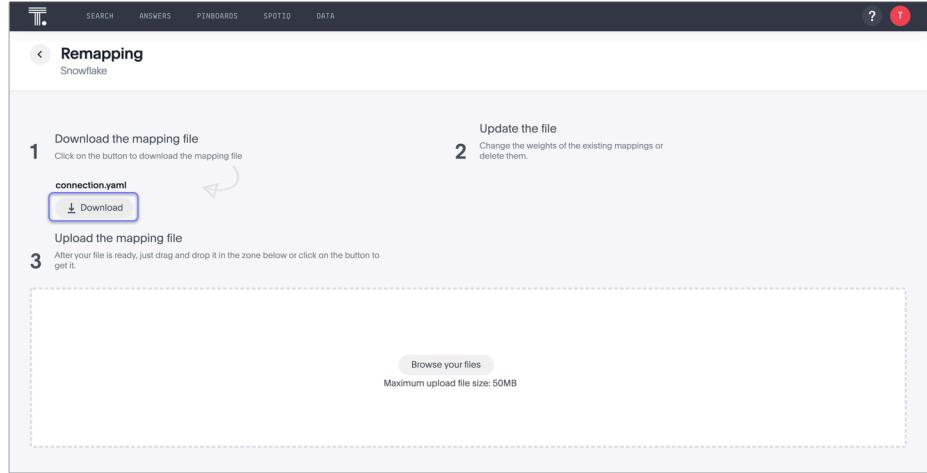
1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to remap.

The screenshot shows the ThoughtSpot Data interface. At the top, there is a navigation bar with tabs: SEARCH, ANSWERS, PINBOARDS, SPOTIO, DATA (which is highlighted with a yellow box), and ADMIN. Below the navigation bar, there are three main tabs: Tables, Data Sources, and Connections (also highlighted with a yellow box). Underneath these tabs, there are two buttons: All and Yours. On the right side of the screen, there is a search bar labeled "Search". The main content area displays a table of connections. The columns are Connection name, Connection type, Modified, and Author. There are two rows visible: one for "my Redshift database" (Amazon Redshift, 5 minutes ago, Administrator) and one for "my Snowflake database" (Snowflake, 18 hours ago, Administrator). Both rows have their names highlighted with yellow boxes.

4. Click the More Info icon  and select **Remapping** on the upper-right-hand side of the page.

The screenshot shows the ThoughtSpot connection details page for "my snowflake database". At the top, there is a header with the connection name "my snowflake database", a "Stickers" section, a "Select sticker" dropdown, an "Edit connection" button, and a "More" button. Below the header, there is a search bar labeled "Search" and a "Remapping" button, which is highlighted with a blue box. The main content area displays a table with one row: "NewRetail\_Product\_Dimension". The columns are Table name, Stickers, Last modified, and Author. The "Table name" cell contains "NewRetail\_Product\_Dimension", the "Last modified" cell contains "a minute ago", and the "Author" cell contains "T Teresa".

5. Click **Download** to download the source mapping file.



6. Edit the file, as required, and save it.

```
name: "Snowflake"
type: "RDBMS_SNOWFLAKE"
properties:
- key: "accountName"
  value: "thoughtspot_partner"
- key: "user"
  value: "abc"
- key: "password"
  value: ""
- key: "role"
  value: "SYSADMIN"
- key: "warehouse"
  value: "DEMO_WH"
- key: "database"
  value: "LIVEQUERY"
- key: "schema"
  value: ""
table:
- name: "PART"
  id: "65c4fec1-2773d-4c66-b308-5682cd182071"
  external_table:
    db_name: "LIVEQUERY"
    schema_name: "FALCON_DEFAULT_SCHEMA"
    table_name: "PART"
  column:
- name: "PARTKEY"
  id: "4bba5880-ae3f-475f-9292-b5986cb84610"
```

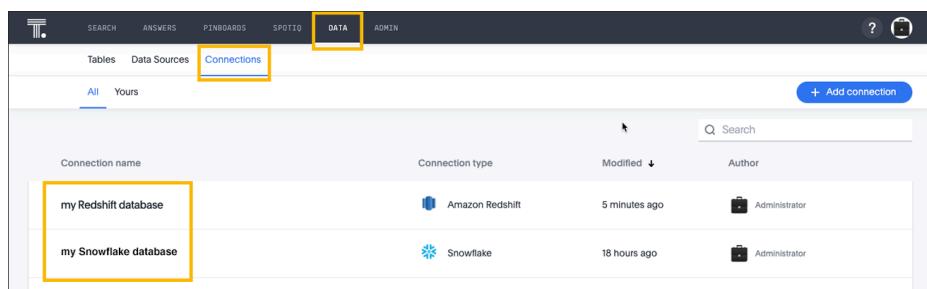
7. Finally, click **Browse your files**, and upload your edited mapping file to update the mapping of your connection.

## Deleting a table from a Snowflake connection

ThoughtSpot checks for dependencies whenever you try to remove a table in a connection. ThoughtSpot shows a list of dependent objects, and you can click them to delete them or remove the dependency. Then you can remove the table.

To delete a table:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection that contains the table you want to delete.



Connection name	Connection type	Modified	Author
my Redshift database	Amazon Redshift	5 minutes ago	Administrator
my Snowflake database	Snowflake	18 hours ago	Administrator

4. Find the table you want to delete in the list, and check the box next to its name.
5. Click **Delete**, and then click **Delete** again to confirm.

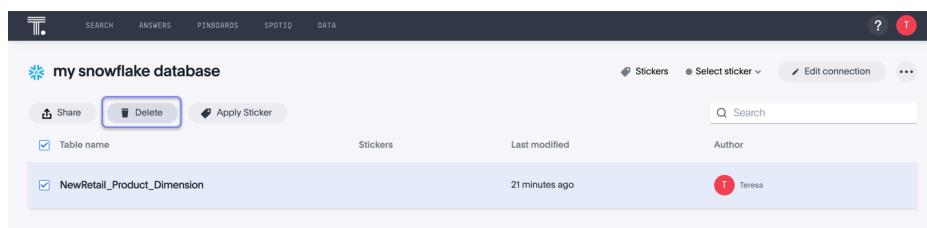


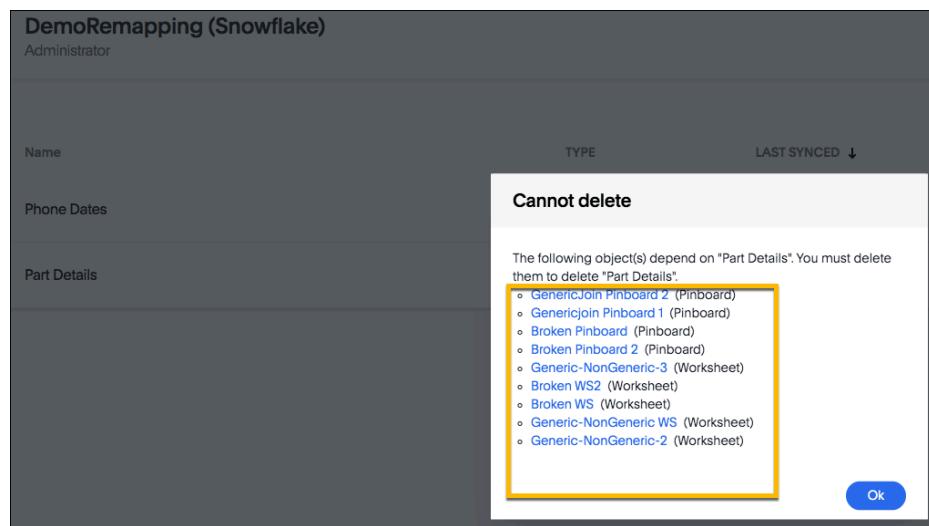
Table name	Last modified	Author
NewRetail_Product_Dimension	21 minutes ago	Teresa

If you attempt to delete a table with dependent objects, the operation is blocked. A *Cannot delete* window appears, with a list of links to dependent objects. See [Deleting a table with dependent objects \[See page 14\]](#)

## Deleting a table with dependent objects

- In the *Cannot delete* window, click the link for each object to modify or delete it.

When all dependencies are removed, you can delete the table.



You can also click the name of a table and then click the linked objects to see a list of dependent objects with links. The list shows the names of the dependent objects (worksheets, pinboards or answers), and the columns they use from that table. You can use this information to determine the impact of changing the structure of the data source or to see how widely used it is. Click a dependent object to modify or delete it.

## Deleting a Snowflake connection

A connection can be used in multiple data sources or visualizations. Because of this, you must delete all of the sources and tasks that use that connection, before you can delete the connection.

To delete a connection:

- Click **Data** in the top navigation bar.
- Click the **Connections** tab at the top of the page.

3. Check the box next to the connection you want to delete.
4. Click **Delete**, and then click **Delete** again to confirm.

Connection name	Connection type	Modified	Author
<input checked="" type="checkbox"/> my Redshift database	Amazon Redshift	2 hours ago	Administrator
<input type="checkbox"/> demo	Snowflake	20 hours ago	Administrator
<input type="checkbox"/> test	Snowflake	a day ago	Administrator

If you attempt to delete a connection with dependent objects, the operation is blocked, and a “Cannot delete” warning appears with a list of dependent objects with links.

**Cannot delete**

The following object(s) depend on "DemoRemapping". You must delete them to delete "DemoRemapping".

- GenericJoin Pinboard 2 (Pinboard)
- Genericjoin Pinboard 1 (Pinboard)
- Broken Pinboard (Pinboard)
- Broken Pinboard 2 (Pinboard)
- Generic-NonGeneric-3 (Worksheet)
- Broken WS2 (Worksheet)
- Broken WS (Worksheet)
- Phone Chasmtrap (Worksheet)
- Generic-NonGeneric WS (Worksheet)
- Generic-NonGeneric-2 (Worksheet)

Ok

5. If the “Cannot delete” warning appears, click the link for each object to delete it, and then click **Ok**. Otherwise, go to the next step.
6. When all its dependencies are removed, delete the connection by clicking **Delete**, and then click again **Delete** to confirm.

# Best practices for Embrace with Snowflake

**Summary:** You can connect to Snowflake using ThoughtSpot Embrace, and start searching your data. This article contains helpful pointers on data modeling.

After connecting to Snowflake through ThoughtSpot Embrace, you may notice that some things don't work as you expect. This article lists best practices for improving the user experience by making small changes to the Snowflake schema in Snowflake, to optimize it for ThoughtSpot.

## Change JSON to a relational schema in Snowflake

ThoughtSpot works with relational data, where data must be in the form of a table, with rows and columns. Relational data is commonly stored as comma separated values, in CSV format, or in tables in a database.

The Snowflake warehouse uses more flexible requirements for storing data, such as the `VARIANT` data type to store JSON. However, the user experience when searching directly on JSON data in ThoughtSpot is not as good as searching over relational data.

For example, if you connect to the Snowflake Free Trail sample WEATHER dataset, and search it in ThoughtSpot, the `DAILY_14_TOTAL` table features JSON data.

The screenshot shows the Snowflake 'Select tables' interface. On the left, there's a sidebar with a search bar and a list of tables under categories like TPCH\_SF100, TPCH\_SF1000, WEATHER, SOCIAL\_MEDIA\_FLOODG..., SPOTFLIX, SUPPLYCHAIN, and SUPPLYCHAIN\_MAIN. The 'DAILY\_14\_TOTAL' table is selected. The main area shows the table structure with columns T and DATE\_TIME. A single row is displayed in the preview pane, containing JSON data for a weather record on November 21, 2016, at 10:20:47.

	Column name (2/2 selected)	Data type	Sample data
<input checked="" type="checkbox"/>	T	DATE_TIME	<pre>[{"date": "2016-11-21T10:20:47Z", "time": "10:20:47", "weather": [{"id": 800, "main": "Clear", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 7}, {"id": 801, "main": "Clouds", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 7}, {"id": 802, "main": "Overcast", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 100}, {"id": 803, "main": "Rain", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 100}, {"id": 804, "main": "Thunderstorm", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 100}, {"id": 805, "main": "Snow", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 100}, {"id": 806, "main": "Mist", "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 100}], "sky": "clear", "icon": "01d", "id": 800, "minTemp": 286.98, "maxTemp": 296.98, "temp": 293.43, "feelsLike": 293.72, "humidity": 0, "pressure": 1003.22, "windDeg": 3, "windSpeed": 1.16, "clouds": 100}, {"date": "2016-11-21T10:20:47Z", "time": "10:20:47"}]</pre>

To make this data searchable in ThoughtSpot, you must first create a view in Snowflake, which effectively makes the JSON data into relational (table) data. You can then search this data in ThoughtSpot, and generate chart and table results from your searches. This process is called “schema on read”.

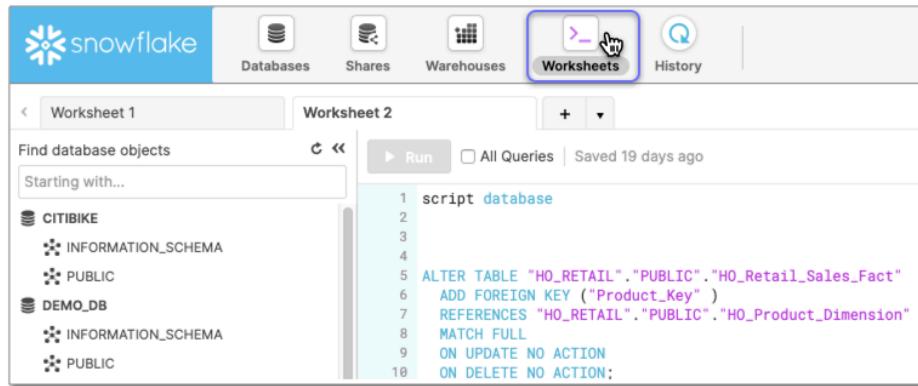
## Create a view in snowflake

To create a view from a Snowflake table that contains JSON, follow these steps:

1. Log in to your Snowflake instance.
2. If necessary, change your role so you can issue `CREATE VIEW` DDL statement in the target schema. See [CREATE VIEW \[See page 0\]](#) in Snowflake.

The screenshot shows the ThoughtSpot user interface. At the top, there are icons for Partner Connect and Help, and a user profile labeled 'AAAAAA SYSADMIN'. Below this is a navigation bar with a search bar and links for ACCOUNTADMIN, SYSADMIN (Default), PC\_PERISCOPE\_ROLE, PUBLIC, and SECURITYADMIN. On the right, there's a dropdown menu with options for Change Password, Switch Role (which is highlighted with a blue box), Preferences, and Log Out.

3. Click **Worksheets**.



4. Issue the `CREATE VIEW` statement.

See [CREATE VIEW Syntax \[See page 0\]](#).

The following example uses the sample `WEATHER` data from the **Snowflake Free Trial** sample data:

```
CREATE <strong>json_weather_data_view</strong> as
SELECT
    v:time::timestamp as observation_time,
    v:city.id::int as city_id,
    v:city.name::string as city_name,
    v:city.country::string as country,
    v:city.coord.lat::float as city_lat,
    v:city.coord.lon::float as city_lon,
    v:clouds.all::int as clouds,
    (v:main.temp::float)-273.15 as temp_avg,
    (v:main.temp_min::float)-273.15 as temp_min,
    (v:main.temp_max::float)-273.15 as temp_max,
    v:weather[0].main::string as weather,
    v:weather[0].description::string as weather_desc,
    v:weather[0].icon::string as weather_icon,
    v:wind.deg::float as wind_dir,
    v:wind.speed::float as wind_speed
FROM json_weather_data
WHERE city_id = 5128638;
```

5. Query the new view in Snowflake.

The following example demonstrates how you can query the view

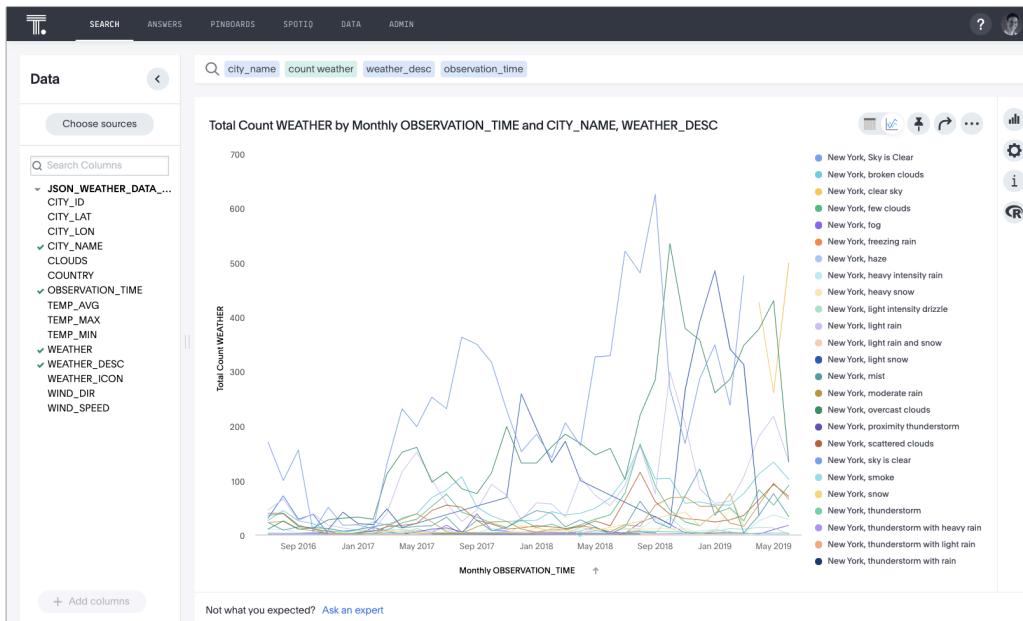
`json_weather_data_view` created in the previous step:

```
SELECT * FROM json_weather_data_view  
WHERE date_trunc('month',observation_time) = '2018-01-0  
1'  
LIMIT 20;
```

6. In ThoughtSpot Embrace, add a connection to Snowflake, specifically to the view you created.

See [Connect to Snowflake through Embrace \[See page 23\]](#).

When you subsequently search in ThoughtSpot against the Snowflake view, you can easily create charts and graphs, as expected.



## Add joins between tables

To search more than one table at the same time in ThoughtSpot, you must define joins between these tables by specifying the columns that contain matching data across two tables. These columns represent the 'primary key' and 'foreign key' of the join.

In Snowflake, you can query the schema to get a list of its existing foreign key constraints with referenced constraints.

To determine which foreign keys already exist in your Snowflake schema, issue the following `SELECT ... AS statement:`

```
select
    fk_tco.table_schema as foreign_schema,
    fk_tco.table_name as foreign_table,
    fk_tco.constraint_name as foreign_constraint,
    '>-' as rel,
    pk_tco.table_schema as referenced_schema,
    pk_tco.table_name as referenced_table,
    pk_tco.constraint_name as referenced_constraint
from
    information_schema.referential_constraints rco
join
    information_schema.table_constraints fk_tco
    on fk_tco.constraint_name = rco.constraint_name
    and fk_tco.constraint_schema = rco.constraint_schema
join
    information_schema.table_constraints pk_tco
    on pk_tco.constraint_name = rco.unique_constraint_name
    and pk_tco.constraint_schema = rco.unique_constraint_schema
order by
    fk_tco.table_schema,
    fk_tco.table_name;
```

The system returns the results of this query as a table that represents all foreign keys in the database, ordered by schema name and by name of the foreign table. The table has the following columns:

**foreign\_schema**

The name of the foreign schema

**foreign\_table**

The name of the foreign table

**foreign\_constraint**

The name of the foreign key constraint

**rel**

The relationship symbol that indicates the direction of the join

#### **referenced\_schema**

The name of the referenced schema

#### **referenced\_schema**

The name of the referenced schema

#### **referenced\_schema**

The name of the referenced schema

To search multi-table Snowflake data in ThoughtSpot, you must explicitly create joins.

There are two ways to do this:

1. ThoughtSpot recommends that you add the necessary foreign key constraints by creating a join in Snowflake. We demonstrate how you can do in [Create joins in Snowflake \[See page 21\]](#).

For in-depth information from Snowflake, see [CREATE or ALTER TABLE ... CONSTRAINT \[See page 0\]](#).

2. Alternatively, if you don't have the necessary permissions, you can create these relationships in ThoughtSpot.

See [Join a table or view to another data source \[See page 0\]](#) and [Constraints \[See page 0\]](#).

### Create joins in Snowflake

To add a foreign key constraint in Snowflake, you must issue the following `ALTER TABLE` statement:

```
ALTER TABLE <table_name> ADD { outoflineUniquePK | outoflineFK }
```

#### **outoflineUniquePK**

The primary key in the relationship, with the following definition:

```
outoflineUniquePK ::=  
    [ CONSTRAINT <constraint_name> ]  
    { UNIQUE | PRIMARY KEY } ( <col_name> [ , <col_name> ,  
    ... ] )  
    [ [ NOT ] ENFORCED ]  
    [ [ NOT ] DEFERRABLE ]  
    [ INITIALLY { DEFERRED | IMMEDIATE } ]  
    [ ENABLE | DISABLE ]  
    [ VALIDATE | NOVALIDATE ]  
    [ RELY | NORELY ]
```

#### **outoflineFK**

The foreign key in the relationship, with the following definition:

```
outoflineFK ::=  
    [ CONSTRAINT <constraint_name> ]  
    FOREIGN KEY ( <col_name> [ , <col_name> , ... ] )  
        REFERENCES <ref_table_name> [ ( <ref_col_name> [ , <re  
f_col_name> , ... ] ) ]  
        [ MATCH { FULL | SIMPLE | PARTIAL } ]  
        [ ON [ UPDATE { CASCADE | SET NULL | SET DEFAULT | RESTR  
ICT | NO ACTION } ]  
            [ DELETE { CASCADE | SET NULL | SET DEFAULT | RESTR  
ICT | NO ACTION } ] ]  
        [ [ NOT ] ENFORCED ]  
        [ [ NOT ] DEFERRABLE ]  
        [ INITIALLY { DEFERRED | IMMEDIATE } ]  
        [ ENABLE | DISABLE ]  
        [ VALIDATE | NOVALIDATE ]  
        [ RELY | NORELY ]
```

#### **Example 1: adding a foreign key in Snowflake**

For example, you can add a foreign key to Retail Sales schema in Snowflake by running the following

`ALTER TABLE` statement. Also, contrast it with [Example 2 \[See page 23\]](#):

```
ALTER TABLE "HO_RETAIL"."PUBLIC"."HO_Retail_Sales_Fact"
ADD FOREIGN KEY ("Date_Key" )
REFERENCES "HO_RETAIL"."PUBLIC"."HO_Date_Dimension"
MATCH FULL
ON UPDATE NO ACTION
ON DELETE NO ACTION;
```

#### Example 2: adding a foreign key in ThoughtSpot

To add the foreign key in ThoughtSpot (an alternative to the process outlined in [Example 1 \[See page 22\]](#)), you can issue the following TSQL `ALTER TABLE` statement:

```
TSQL> ALTER TABLE "HO_Retail_Sales_Fact"
ADD CONSTRAINT FOREIGN KEY ("Date_Key")
REFERENCES "HO_Date_Dimension" ("Date_Key");
```

## Connect to Snowflake through Embrace

Follow the general steps in [Add a Snowflake connection \[See page 6\]](#).

In the following screen, the **Account name** is the first part of the URL that you use to access Snowflake.

The screenshot shows the 'Specify connection details' step of the Embrace connection wizard. The title bar indicates the step number: 2. Specify connection details. The main form is titled 'Snowflake connection details' and contains fields for Account name, User, Password, Role, Warehouse, Database, and Schema. A progress bar at the top shows Step 2 completed. On the right side, a vertical status bar displays 'Getting Started'.

If you cannot find your **Full account name** in Snowflake, see the following examples for determining your account based on the account name, cloud platform, and region. Assume that the **account name** is `xy12345`.

Cloud platform	Region	Full account name
<b>AWS</b>	US East (N. Virginia)	xy12345.us-east-1
	US East (Ohio)	xy12345.us-east-2.aws
	US West (Oregon)	xy12345
	Canada (Central)	xy12345.ca-central-1.aws
	EU (Ireland)	xy12345.eu-west-1
	EU (Frankfurt)	xy12345.eu-central-1
	Asia Pacific (Singapore)	xy12345.ap-southeast-1
	Asia Pacific (Sydney)	xy12345.ap-southeast-2
<b>GCP - Preview</b>	us-central1 (Iowa)	xy12345.us-central1.gcp
<b>Azure</b>	East US 2	xy12345.east-us-2.azure
	US Gov Virginia	xy12345.us-gov-virginia.azure
	Canada Central	xy12345.canada-central.azure
	West Europe	xy12345.west-europe.azure
	Australia East	xy12345.australia-east.azure
	Southeast Asia	xy12345.southeast-asia.azure

# Snowflake connection reference

**Summary:** Learn about the fields used to create a Snowflake connection with ThoughtSpot Embrace.

Here is a list of the fields of a Snowflake connection in ThoughtSpot Embrace. You need specific information to establish a seamless and secure connection.

- **Connection name:** Mandatory. Enter a new Snowflake connection name.
- **Connection description:** Optional. Provide a short description about the connection.
- **Account name:** Mandatory. Enter the account name associated with the Snowflake connection.
- **User:** Mandatory. Enter the Snowflake account username.
- **Password:** Mandatory. Enter the Snowflake account password.
- **Role:** Mandatory. Specify the privilege of the user.
- **Warehouse:** Mandatory. Specify the warehouse associated with the connection.
- **Database:** Optional. Specify the database associated with the account.
- **Schema:** Optional. Specify the schema associated with the database.

# Add a Redshift connection

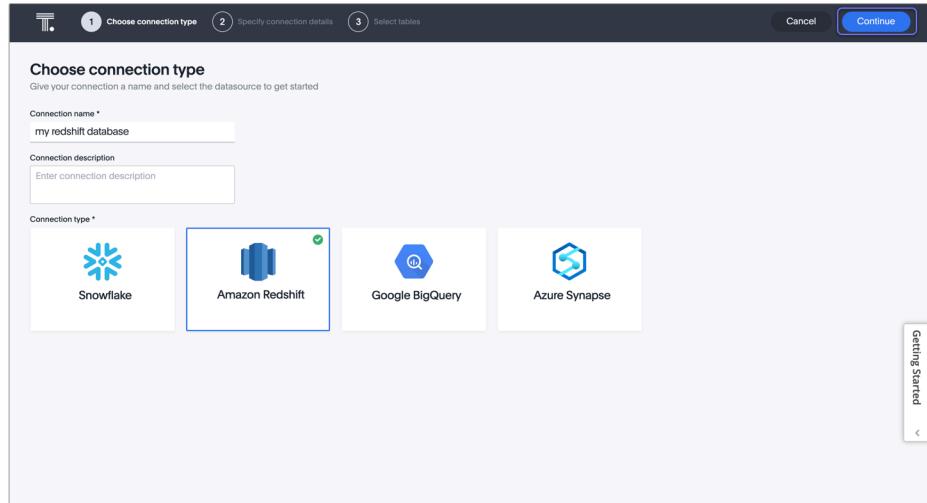
Once ThoughtSpot Embrace is enabled, you can add a connection to a Redshift database. This allows you to perform a live query of the external database to create answers and pinboards, without having to bring the data into ThoughtSpot.

To add a new connection to Redshift:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page, and click **+ Add connection** at the upper-right-hand side of the page.



3. Create a name for your connection, a description (optional), then select the Redshift connection type, and click **Continue**.



4. Enter the connection details for your external data source, and click **Continue**.

Amazon Redshift connection details  
Add your account details and credentials to retrieve the list of tables [View details](#)

Host \*

Port \*

User \*

Password \*

Database \*

Getting Started

Refer to the [Redshift connection reference \[See page 36\]](#) for more information on each of the specific attributes you must enter for your connection.

5. Select tables (on the left) and the columns from each table (on the right), and then click **Create connection**.

Select tables  
Choose tables from the list on the left

All Selected (1)

Search tables

PUBLIC

- NewRetail\_Baskets\_Fact
- NewRetail\_Baskets\_Fact\_...
- NewRetail\_Customer\_Dim...
- NewRetail\_Product\_Cost\_...
- NewRetail\_Product\_Dime...
- NewRetail\_Product\_Dime...

Tables

NewRetail\_Product\_Dimension

Column name (10/14 selected)	Data type	Sample data
Product_Key	VARCHAR	1
Category	VARCHAR	Food
Department_Key	VARCHAR	Canned Goods
Product_Name	VARCHAR	Pam's Club Chicken Noodle Soup
SKU_Number	VARCHAR	PC26182784343090822
Price	DOUBLE	2.09
Markup	DOUBLE	0.32

Columns from selected tables

Getting Started

Once the connection is added, you can search your Redshift database right away by clicking **Search now**.

The screenshot shows the ThoughtSpot interface with a search bar at the top. Below it, a section titled "my redshift database" displays a list of tables. The columns are "Table name", "Stickers", "Last modified", and "Author". The data is as follows:

Table name	Stickers	Last modified	Author
fact_rb_credit_card		a minute ago	T Teresa
dim_rb_accounts		a minute ago	T Teresa
dim_rb_accounts_ref		a minute ago	T Teresa

Your new connection appears on the **Data > Connections** page. You can click the name of your connection to view the tables and columns in your connection.

The connection you just created is a link to the external data source. If there are any joins in the selected tables of the external data source, those are imported into ThoughtSpot.

You can now perform a live query on the selected tables and columns of your connection. Because the selected tables and columns in your connection are linked, it may take a while to initially render the search results. This is because ThoughtSpot does not cache linked data. With linked data, ThoughtSpot queries the external database directly, which is slower than querying data that is stored in ThoughtSpot's database.

## Related information

- [Modify a Redshift connection \[See page 29\]](#)
- [Redshift connection reference \[See page 36\]](#)
- [Load and manage data \[See page 0\]](#)
- [Data and object security \[See page 0\]](#)

# Modify a Redshift connection

**Summary:** Learn how to modify a Redshift connection and its tables.

You can modify an Embrace Redshift connection in the following ways:

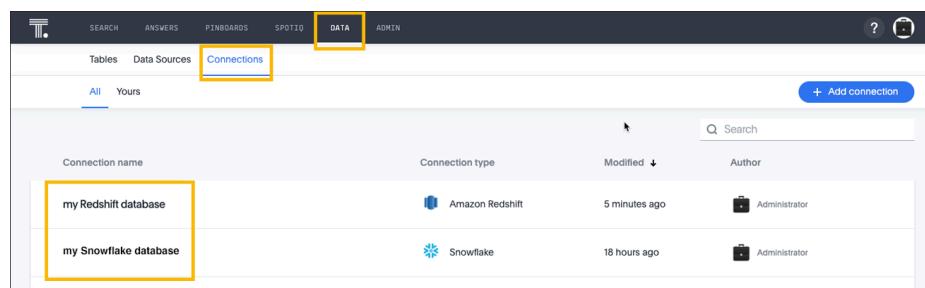
- Edit a connection: to add or remove tables and columns
- Remap a connection: to map a table or column to a different table or column
- Delete a table
- Delete a connection

## Editing a Redshift connection

You can edit a Redshift connection to add tables and columns.

To edit a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to edit.



The screenshot shows the ThoughtSpot Embrace interface with the 'DATA' tab selected in the top navigation bar. Below it, the 'Connections' tab is also highlighted with a yellow box. The main area displays a table of connections. The first connection, 'my Redshift database', has its entire row highlighted with a yellow box. The second connection, 'my Snowflake database', is also visible below it. The table includes columns for Connection name, Connection type, Modified, and Author.

Connection name	Connection type	Modified	Author
my Redshift database	Amazon Redshift	5 minutes ago	Administrator
my Snowflake database	Snowflake	18 hours ago	Administrator

4. Click **Edit connection** at the upper-right-hand side of the page.

The screenshot shows a list of tables in a Redshift database. The tables listed are customer, product, and date. Each table has columns for Type (Linked), Last synced (Never), and Author (Administrator). There are edit and delete icons next to each table entry. A yellow box highlights the 'Edit connection' button at the top right of the page.

5. On the Choose connection type page, change the connection name or description (if needed), and then click **Continue**.
6. On the Redshift connection details page, make any changes needed, and then click **Continue**.
7. Expand the database table drop-down menu, and select the tables and columns you want to add.

The screenshot shows the 'Select tables' dialog. On the left, there is a list of tables: dim\_rb\_accounts, dim\_rb\_accounts\_ref, dim\_rb\_customers, dim\_rb\_date\_ref, fact\_rb\_checking, fact\_rb\_credit\_card, fact\_rb\_credit\_card\_2, fact\_rb\_mortgage\_loan, and fact\_rb\_savings. The 'dim\_rb\_accounts\_ref' table is selected and shown in detail on the right. The table has 11 selected columns: customer\_id, checking, savings, creditcard, mortgageloan, checking\_12\_months, savings\_12\_months, creditcard\_12\_months, mortgageloan\_12\_months, ia, and ia\_12\_months. The data types for these columns are INT32, DOUBLE, DOUBLE, DOUBLE, DOUBLE, DOUBLE, DOUBLE, DOUBLE, DOUBLE, DOUBLE, and DOUBLE respectively. Sample data values are also provided for each column.

8. Click **Update**, and then click **Confirm** to save the updated connection detail.

To remove a table from a connection, delete it from the connection details page. For more information, see [Deleting a table \[See page 33\]](#).

## Remapping a Redshift connection

Modify the connection parameters by editing the source mapping `yml` file that was created when you added the connection. For example, you can remap the existing table or column to a different table or column in an existing database connection. ThoughtSpot recommends that you check the dependencies before and after you remap a table or column in a connection to ensure they display as intended.

To remap a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to remap.

The screenshot shows the ThoughtSpot interface with the 'DATA' tab selected in the top navigation bar. Below it, the 'Connections' tab is also highlighted with a yellow box. The main area displays a list of connections. Two specific connections are highlighted with yellow boxes: 'my Redshift database' and 'my Snowflake database'. The columns in the table include Connection name, Connection type, Modified, and Author.

Connection name	Connection type	Modified	Author
my Redshift database	Amazon Redshift	5 minutes ago	Administrator
my Snowflake database	Snowflake	18 hours ago	Administrator

4. Click the More Info icon  and select **Remapping** on the upper-right-hand side of the page.

The screenshot shows the 'my redshift database' connection details page. At the top right, there is a 'Remapping' button. The main area lists tables with their last modified times and authors.

Table name	Last modified	Author
fact_rb_credit_card	19 minutes ago	Teresa
dim_rb_accounts	19 minutes ago	Teresa
dim_rb_accounts_ref	2 minutes ago	Teresa

5. Click **Download** to download the source mapping file.

The screenshot shows the ThoughtSpot interface for remapping a connection. At the top, there are navigation links: SEARCH, ANSWERS, PINBOARDS, SPOTIQ, DATA, and ADMIN. On the right, there are help and settings icons. The main title is "Remapping" under "Amazon Redshift".  
Step 1: "Download the mapping file". It says "Click on the button to download the mapping file" and shows a file named "connection.yaml". A yellow box surrounds the "Download" button.  
Step 2: "Update the file". It says "Change the weights of the existing mappings or delete them."  
Step 3: "Upload the mapping file". It says "After your file is ready, just drag and drop it in the zone below or click on the button to get it." Below this is a dashed rectangular area for file upload, with a "Browse your files" button and a note "Maximum upload file size: 50MB".

6. Edit the file, as required, and save it.

```
name: my_redshift_database
type: RDBMS_REDSHIFT
properties:
- key: host
  value: embrace-uat.chzketlcaeem.us-west-2.redshift.amazonaws.com
- key: port
  value: "5439"
- key: user
  value: tsadmin
- key: password
  value: ""
- key: database
  value: champagne
```

7. Finally, click **Browse your files**, and upload your edited mapping file to update the mapping of your connection.

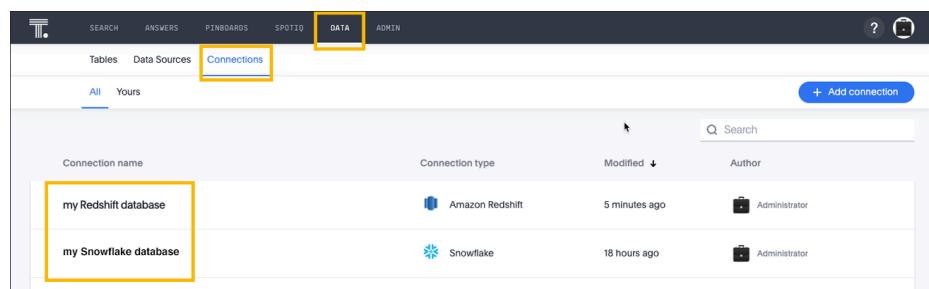
## Deleting a table from a Redshift connection

ThoughtSpot checks for dependencies whenever you try to remove a table in a connection. ThoughtSpot shows a list of dependent objects, and you can click them to delete them or remove the dependency.

Then you can remove the table.

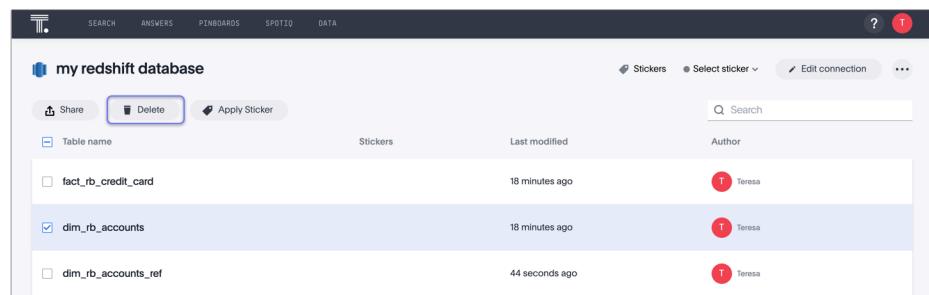
To delete a table:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection that contains the table you want to delete.



The screenshot shows the ThoughtSpot Data interface. The top navigation bar has tabs for SEARCH, ANSWERS, PINBOARDS, SPOTIQ, DATA (which is highlighted with a yellow box), and ADMIN. Below the navigation bar, there are three main sections: Tables, Data Sources, and Connections. The Connections section is currently active, indicated by a blue background and the word 'Connections' in white. Under 'Connections', there are two entries: 'my Redshift database' and 'my Snowflake database'. Both entries have a yellow box around them. A search bar labeled 'Search' is located above the connection list. To the right of the search bar is a button labeled '+ Add connection'.

4. Find the table you want to delete in the list, and check the box next to its name.
5. Click **Delete**, and then click **Delete** again to confirm.



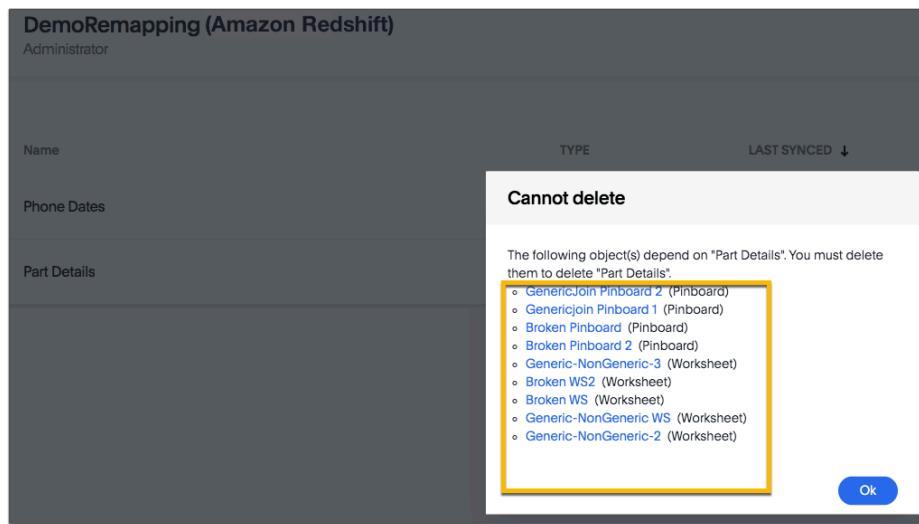
The screenshot shows the ThoughtSpot interface for the 'my redshift database'. At the top, there are buttons for Share, Delete (which is highlighted with a blue box), and Apply Sticker. Below these are sections for Table name, Stickers, Last modified, and Author. There are three tables listed: 'fact\_rb\_credit\_card', 'dim\_rb\_accounts' (which has a checked checkbox next to it), and 'dim\_rb\_accounts\_ref'. The 'dim\_rb\_accounts' row is highlighted with a blue background. A search bar labeled 'Search' is located at the top right. A red notification badge with the number '1' is visible in the top right corner of the interface.

If you attempt to delete a table with dependent objects, the operation is blocked. A *Cannot delete* window appears, with a list of links to dependent objects. See [Deleting a table with dependent objects \[See page 34\]](#)

### Deleting a table with dependent objects

- In the *Cannot delete* window, click the link for each object to modify or delete it.

When all dependencies are removed, you can delete the table.



You can also click the name of a table and then click the linked objects to see a list of dependent objects with links. The list shows the names of the dependent objects (worksheets, pinboards or answers), and the columns they use from that table. You can use this information to determine the impact of changing the structure of the data source or to see how widely used it is. Click a dependent object to modify or delete it.

## Deleting a Redshift connection

A connection can be used in multiple data sources or visualizations. Because of this, you must delete all of the sources and tasks that use that connection, before you can delete the connection.

To delete a connection:

- Click **Data** in the top navigation bar.

## Modify a Redshift connection

2. Click the **Connections** tab at the top of the page.
3. Check the box next to the connection you want to delete.
4. Click **Delete**, and then click **Delete** again to confirm.

The screenshot shows the ThoughtSpot interface with the 'Connections' tab selected. The toolbar has a 'Delete' button highlighted with a yellow box. Below the toolbar, there are two tabs: 'All' and 'Yours', with 'All' selected. A search bar and a '+ Add connection' button are also visible. The main area displays a list of connections with columns for Connection name, Connection type, Modified, and Author. The first connection, 'my Redshift database', has its checkbox checked and is highlighted with a yellow box.

Connection name	Connection type	Modified	Author
my Redshift database	Amazon Redshift	2 hours ago	Administrator
demo	Snowflake	20 hours ago	Administrator
test	Snowflake	a day ago	Administrator

If you attempt to delete a connection with dependent objects, the operation is blocked, and a “Cannot delete” warning appears with a list of dependent objects with links.

The screenshot shows a 'Cannot delete' dialog box. It contains a list of objects that depend on the connection being deleted. The objects listed are: GenericJoin Pinboard 2 (Pinboard), Genericjoin Pinboard 1 (Pinboard), Broken Pinboard (Pinboard), Broken Pinboard 2 (Pinboard), Generic-NonGeneric-3 (Worksheet), Broken WS (Worksheet), Phone Chasmtrap (Worksheet), Generic-NonGeneric WS (Worksheet), and Generic-NonGeneric-2 (Worksheet). A yellow box highlights the list of dependent objects. At the bottom right of the dialog is an 'Ok' button.

5. If the “Cannot delete” warning appears, click the link for each object to delete it, and then click **Ok**. Otherwise, go to the next step.
6. When all its dependencies are removed, delete the connection by clicking **Delete**, and then click again **Delete** to confirm.

# Redshift connection reference

**Summary:** Learn about the fields used to create a Redshift connection using ThoughtSpot Embrace.

Here is a list of the fields of a Redshift connection in ThoughtSpot Embrace. You need specific information to establish a seamless and secure connection.

- **Connection name:** Mandatory. Enter a name for your Redshift connection.
- **Connection description:** Optional. Provide a short description about the connection.
- **Host:** Mandatory. Enter the host name associated with the Redshift database.
- **Port:** Mandatory. Enter the port number associated with the Redshift database.
- **User:** Mandatory. Enter the Redshift account username.
- **Password:** Mandatory. Enter the Redshift account password.
- **Database:** Mandatory. Specify the database associated with the account.

# Add a BigQuery connection

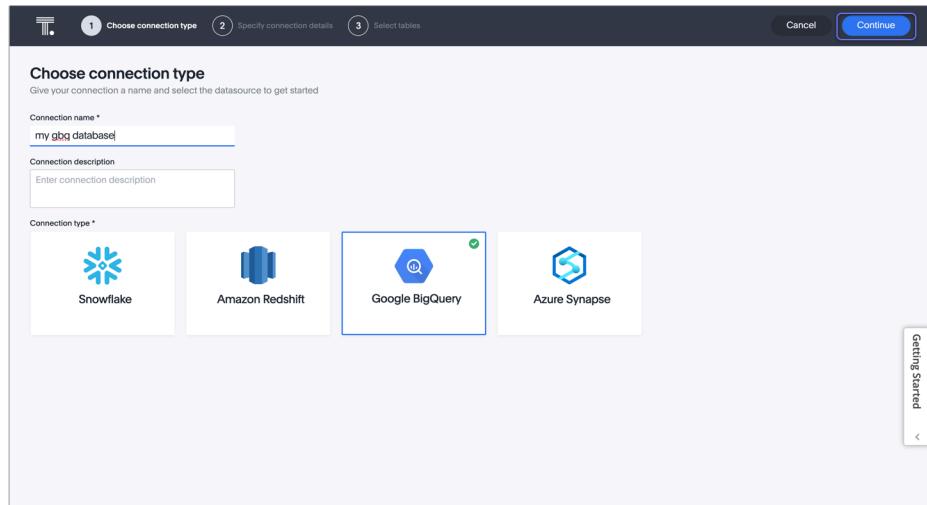
Once ThoughtSpot Embrace is enabled, you can add a connection to a BigQuery database. This allows you to perform a live query of the external database to create answers and pinboards, without having to bring the data into ThoughtSpot.

To add a new connection to BigQuery:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page, and click **+ Add connection** at the upper-right-hand side of the page.



3. Create a name for your connection, a description (optional), then select the BigQuery connection type, and click **Continue**.



4. Enter the connection details for your BigQuery data source, and click **Continue**.

**Google BigQuery connection details**

Add your account details and credentials to retrieve the list of tables. [View details](#)

Project id \*

Service account \*

Cancel Continue

Getting Started

Refer to the [BigQuery connection reference \[See page 47\]](#) for more information on each of the specific attributes you must enter for your connection.

5. Select tables (on the left) and the columns from each table (on the right), and then click **Create connection**.

**Select tables**

Choose tables from the list on the left

All Selected (1)

Search tables

PUBLIC

- NewRetail\_Baskets\_Fact
- NewRetail\_Baskets\_Fact...
- NewRetail\_Customer\_Dim...
- NewRetail\_Product\_Cost...
- NewRetail\_Product\_Dim...
- NewRetail\_Product\_Dime...

Tables

**NewRetail\_Product\_Dimension**

Column name (10/14 selected)	Data type	Sample data
Product_Key	VARCHAR	1
Category	VARCHAR	Food
Department_Key	VARCHAR	Canned Goods
Product_Name	VARCHAR	Parm's Club Chicken Noodle Soup
SKU_Number	VARCHAR	PC26182784343090822
Price	DOUBLE	2.09
Markup	DOUBLE	0.32

Columns from selected tables

Cancel Create connection

Getting Started

Once the connection is added, you can search your BigQuery database right away by clicking **Search now.**

Your new connection appears on the **Data > Connections** page. You can click the name of your connection to view the tables and columns in your connection.

The connection you just created is a link to the external data source. If there are any joins in the selected tables of the external data source, those are imported into ThoughtSpot.

You can now perform a live query on the selected tables and columns of your connection. Because the selected tables and columns in your connection are linked, it may take a while to initially render the search results. This is because ThoughtSpot does not cache linked data. With linked data, ThoughtSpot queries the external database directly, which is slower than querying data that is stored in ThoughtSpot's database.

## Related information

- [Modify a BigQuery connection \[See page 40\]](#)
- [BigQuery connection reference \[See page 47\]](#)
- [Load and manage data \[See page 0\]](#)
- [Data and object security \[See page 0\]](#)

# Modify a BigQuery connection

**Summary:** Learn how to modify a BigQuery connection and its tables.

You can modify an Embrace BigQuery connection in the following ways:

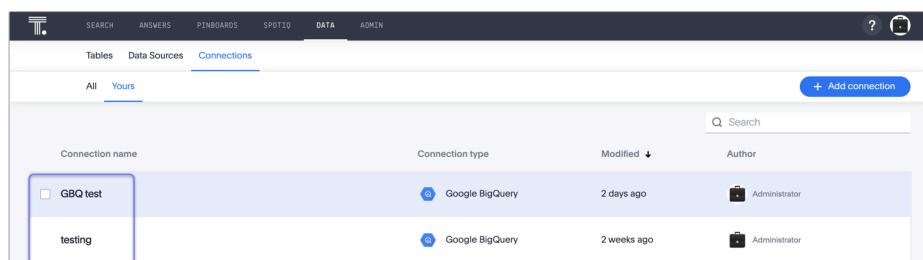
- Edit a connection: to add or remove tables and columns
- Remap a connection: to map a table or column to a different table or column
- Delete a table
- Delete a connection

## Editing a BigQuery connection

You can edit a BigQuery connection to add tables and columns.

To edit a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to edit.



4. Click **Edit connection** at the upper-right-hand side of the page.

Table name	Stickers	Last modified	Author
fact_rb_mortgage_loan		2 days ago	Administrator
fact_rb_checking		2 days ago	Administrator
dim_rb_date_ref		2 days ago	Administrator

5. On the Choose connection type page, change the connection name or description (if needed), and then click **Continue**.
6. On the BigQuery connection details page, make any changes needed, and then click **Continue**.
7. Expand the database table drop-down menu, and select the tables and columns you want to add.

Column name (11/13 selected)	Data type	Sample data
customer_id	INT32	359996
checking	DOUBLE	9453.13
savings	DOUBLE	1467.03
creditcard	DOUBLE	2433.33
mortgageloan	DOUBLE	
checking_12_months	DOUBLE	9679.81
savings_12_months	DOUBLE	1322.87
creditcard_12_months	DOUBLE	2331.13
mortgageloan_12_months	DOUBLE	
ira	DOUBLE	
ira_12_months	DOUBLE	
credit_card_2	DOUBLE	
credit_card_2_12_months	DOUBLE	

8. Click **Update**, and then click **Confirm** to save the updated connection detail.

To remove a table from a connection, delete it from the connection details page. For more information, see [Deleting a table \[See page 43\]](#).

## Remapping a BigQuery connection

Modify the connection parameters by editing the source mapping `yml` file that was created when you added the connection. For example, you can remap the existing table or column to a different table or column in an existing database connection. ThoughtSpot recommends that you check the dependencies before and after you remap a table or column in a connection to ensure they display as intended.

To remap a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to remap.

The screenshot shows the ThoughtSpot Data interface with the 'Connections' tab selected. A connection named 'GBQ test' is highlighted with a blue border. The table below lists connections with columns: Connection name, Connection type, Modified, and Author. The 'GBQ test' connection is listed under 'Google BigQuery' and was modified 2 days ago by 'Administrator'.

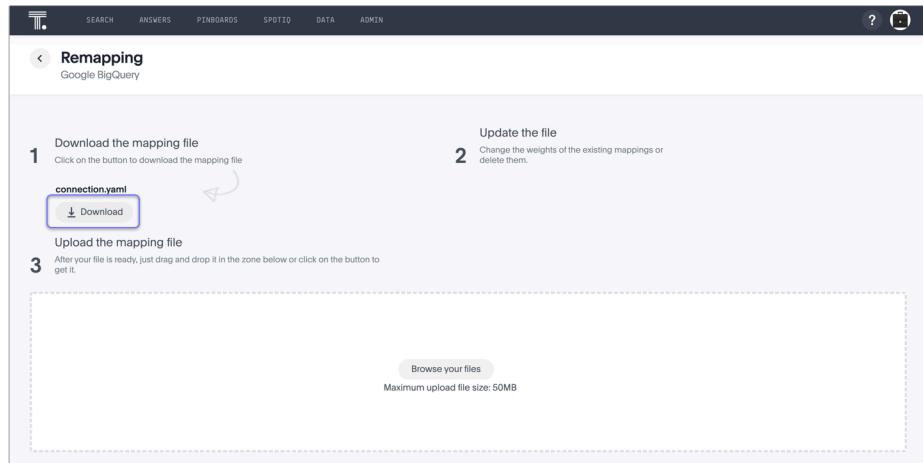
Connection name	Connection type	Modified	Author
GBQ test	Google BigQuery	2 days ago	Administrator
testing	Google BigQuery	2 weeks ago	Administrator

4. Click the More Info icon and select **Remapping** on the upper-right-hand side of the page.

The screenshot shows the 'GBQ test' connection details page. At the top right, there is a 'More Info' icon followed by a 'Remapping' button, which is highlighted with a blue border. The main table lists tables with columns: Table name, Stickers, Last modified, and Author. Three tables are listed: 'Grocery' (modified 2 minutes ago by 'Administrator'), 'fact\_rb\_mortgage\_loan' (modified 2 days ago by 'Administrator'), and 'fact\_rb\_checking' (modified 2 days ago by 'Administrator').

Table name	Stickers	Last modified	Author
Grocery		2 minutes ago	Administrator
fact_rb_mortgage_loan		2 days ago	Administrator
fact_rb_checking		2 days ago	Administrator

5. Click **Download** to download the source mapping file.



6. Edit the file, as required, and save it.

```
name: GBQ test
type: RDBMS_GCP_BIGQUERY
properties:
- key: project_id
  value: thoughtspot-eng
- key: oauth_pvt_key
  value: ""
table:
- name: fact_rb_mortgage_loan
  id: d3c3b2d2-f869-44ab-885f-d657c70d841a
  external_table:
    db_name: thoughtspot-eng
    schema_name: demo_be
    table_name: fact_rb_mortgage_loan
```

7. Finally, click **Browse your files**, and upload your edited mapping file to update the mapping of your connection.

## Deleting a table from a BigQuery connection

ThoughtSpot checks for dependencies whenever you try to remove a table in a connection. ThoughtSpot shows a list of dependent objects, and you can click them to delete them or remove the dependency. Then you can remove the table.

To delete a table:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection that contains the table you want to delete.

The screenshot shows the ThoughtSpot interface with the 'Connections' tab selected. A table named 'GBQ test' is highlighted with a blue border. The table has two rows: 'Grocery' and 'fact\_rb\_mortgage\_loan'. The 'Grocery' row is selected, indicated by a checked checkbox in the first column. The table columns are 'Connection name', 'Connection type', 'Modified', and 'Author'. The 'Grocery' row shows 'Google BigQuery', '2 days ago', and 'Administrator'. The 'fact\_rb\_mortgage\_loan' row shows 'Google BigQuery', '2 weeks ago', and 'Administrator'.

4. Find the table you want to delete in the list, and check the box next to its name.
5. Click **Delete**, and then click **Delete** again to confirm.

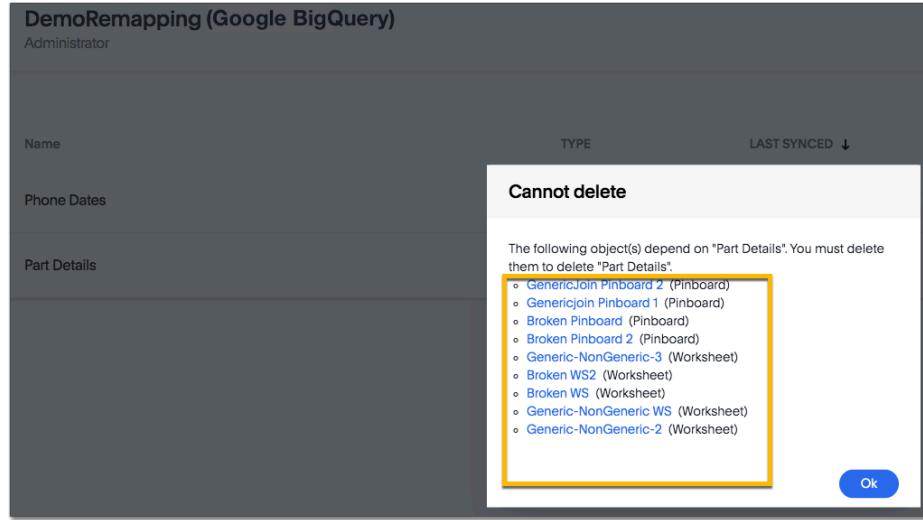
The screenshot shows the ThoughtSpot interface with the 'GBQ test' connection selected. The 'Delete' button is highlighted with a blue border. The table 'Grocery' is selected, indicated by a checked checkbox in the first column. The table columns are 'Table name', 'Stickers', 'Last modified', and 'Author'. The 'Grocery' row shows '10 minutes ago' and 'Administrator'. The 'fact\_rb\_mortgage\_loan' row shows '2 days ago' and 'Administrator'.

If you attempt to delete a table with dependent objects, the operation is blocked. A *Cannot delete* window appears, with a list of links to dependent objects. See [Deleting a table with dependent objects \[See page 44\]](#).

## Deleting a table with dependent objects

- In the *Cannot delete* window, click the link for each object to modify or delete it.

When all dependencies are removed, you can delete the table.



You can also click the name of a table and then click the linked objects to see a list of dependent objects with links. The list shows the names of the dependent objects (worksheets, pinboards or answers), and the columns they use from that table. You can use this information to determine the impact of changing the structure of the data source or to see how widely used it is. Click a dependent object to modify or delete it.

## Deleting a BigQuery connection

A connection can be used in multiple data sources or visualizations. Because of this, you must delete all of the sources and tasks that use that connection, before you can delete the connection.

To delete a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Check the box next to the connection you want to delete.
4. Click **Delete**, and then click **Delete** again to confirm.

The screenshot shows the ThoughtSpot interface with the 'Connections' tab selected. There are two connections listed:

- GBQ test**: Selected (indicated by a checked checkbox). Connection type: Google BigQuery. Modified: 2 days ago. Author: Administrator.
- testing**: Not selected. Connection type: Google BigQuery. Modified: 2 weeks ago. Author: Administrator.

A blue box highlights the 'Delete' button at the top left of the list.

If you attempt to delete a connection with dependent objects, the operation is blocked, and a “Cannot delete” warning appears with a list of dependent objects with links.

The screenshot shows the ThoughtSpot interface with a 'Cannot delete' dialog box open. The dialog contains the following text:

The following object(s) depend on "DemoRemapping". You must delete them to delete "DemoRemapping".

- GenericJoin Pinboard 2 (Pinboard)
- Genericjoin Pinboard 1 (Pinboard)
- Broken Pinboard (Pinboard)
- Broken Pinboard 2 (Pinboard)
- Generic-NonGeneric-3 (Worksheet)
- Broken WS2 (Worksheet)
- Broken WS (Worksheet)
- Phone Chasmtrap (Worksheet)
- Generic-NonGeneric WS (Worksheet)
- Generic-NonGeneric-2 (Worksheet)

An orange box highlights the list of dependent objects. A blue 'Ok' button is visible at the bottom right of the dialog.

5. If the “Cannot delete” warning appears, click the link for each object to delete it, and then click **Ok**. Otherwise, go to the next step.
6. When all its dependencies are removed, delete the connection by clicking **Delete**, and then click **Delete** again to confirm.

# BigQuery connection reference

**Summary:** Learn about the fields used to create a BigQuery connection using ThoughtSpot Embrace.

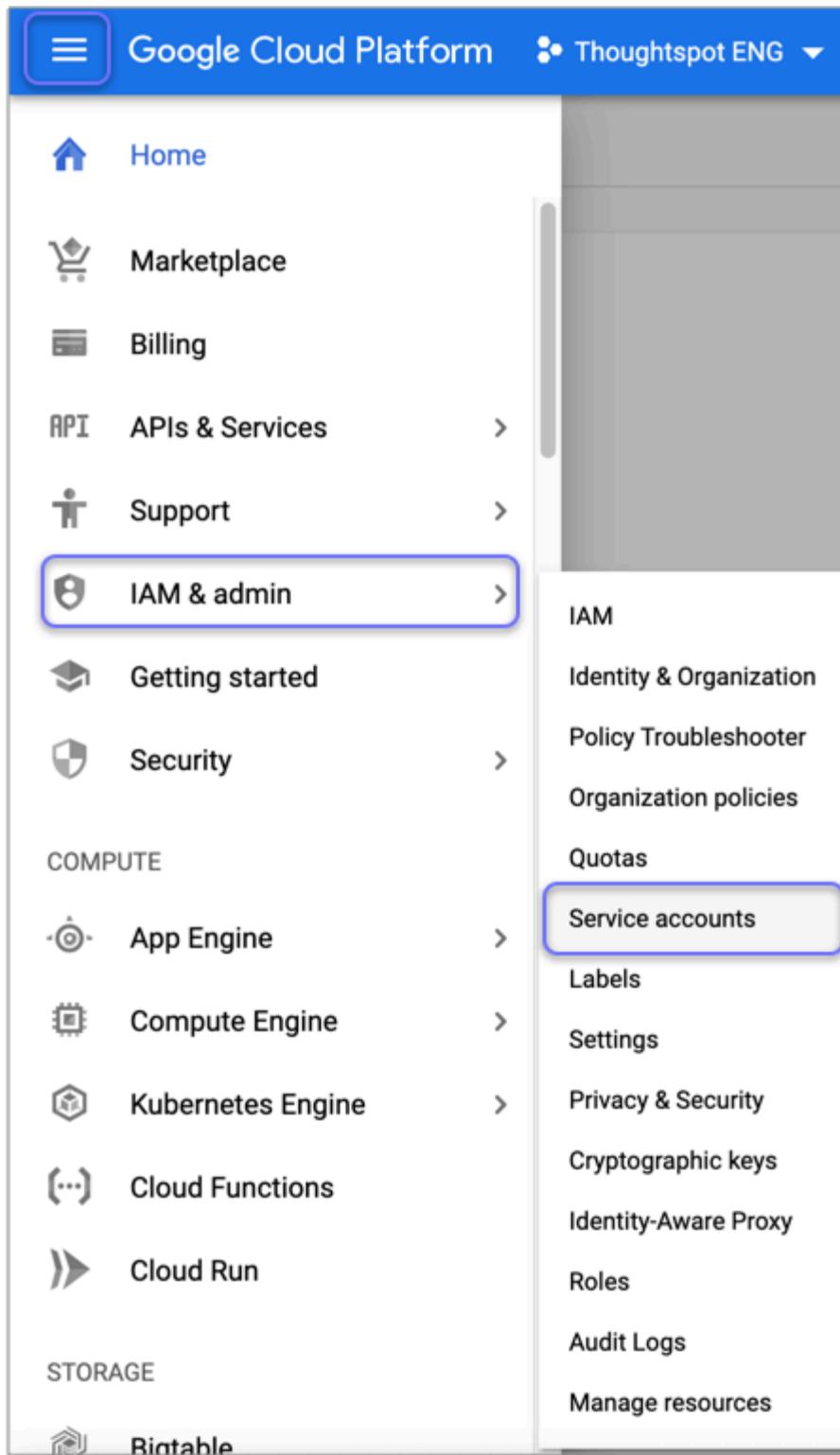
Here is a list of the fields of a BigQuery connection in ThoughtSpot Embrace. You need specific information to establish a seamless and secure connection.

- **Connection name:** Mandatory. Enter a name for your BigQuery connection.
- **Connection description:** Optional. Provide a short description about the connection.
- **Project id:** Mandatory. Enter the project ID associated with the BigQuery database.
- **Service account:** Mandatory. Enter the service account associated with the BigQuery database. See [set up service account \[See page 47\]](#).

## Set up service account

You may already have a service account for GBQ with the proper permissions in place. If not, follow these steps to create a service account.

1. Navigate to [console.cloud.google.com \[See page 0\]](#), and sign in.
2. Click the left menu button, if the menu is not already open.
3. Hover over **IAM & admin**.
4. Click on **Service accounts**.



5. Click + **CREATE SERVICE ACCOUNT** from the top menu.
6. Specify a name, and add an optional description.

7. Click **Create**.

The screenshot shows the 'Create service account' dialog. At the top, there are three tabs: ① Service account details (selected), ② Grant this service account access to project (optional), and ③ Grant users access to this service account (optional). The 'Service account details' tab is active, displaying fields for 'Service account name' (placeholder: Display name for this service account), 'Service account ID' (placeholder: Service account ID), and 'Service account description' (placeholder: Describe what this service account will do). At the bottom are 'CREATE' and 'CANCEL' buttons, with 'CREATE' being highlighted.

8. Specify permissions. Under **Select a role**, choose **BigQuery > BigQuery Data Viewer**.

The screenshot shows the 'Create service account' dialog with the 'Grant this service account access to project (optional)' tab selected. Under 'Service account permissions (optional)', it says 'Grant this service account access to Thoughtspot ENG so that it has permission to complete specific actions on the resources in your project.' A tooltip for 'BigQuery Data Viewer' is shown, stating 'Access to view datasets and all of their contents'. On the left, a sidebar titled 'Select a role' lists various Google Cloud roles, with 'BigQuery' and 'BigQuery Data Viewer' highlighted. At the bottom are 'MANAGE ROLES' and 'CREATE KEY' buttons.

9. On the next screen, click + **CREATE KEY**.

10. For **Key type**, choose **JSON**.

11. Click **Create**. The key downloads to your computer.

Copy and paste this key under **Service account** when connecting to Google BigQuery in ThoughtSpot.

# Add a Synapse connection

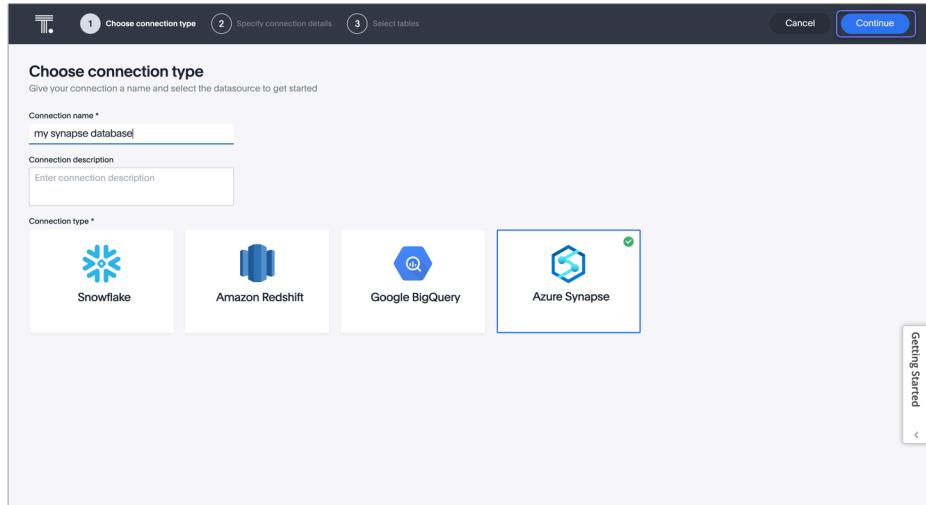
Once ThoughtSpot Embrace is enabled, you can add a connection to a Synapse database. This allows you to perform a live query of the external database to create answers and pinboards, without having to bring the data into ThoughtSpot.

To add a new connection to Synapse:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page, and click **+ Add connection** at the upper-right-hand side of the page.



3. Create a name for your connection, a description (optional), then select the Synapse connection type, and click **Continue**.



4. Enter the connection details for your Synapse data source, and click **Continue**.

## Add a Synapse connection

The screenshot shows the 'Specify connection details' step of the connection setup process. It includes fields for Host, Port, User, Password, and Database, each with a required asterisk. A 'View details' link is present above the password field. A 'Getting Started' sidebar is visible on the right.

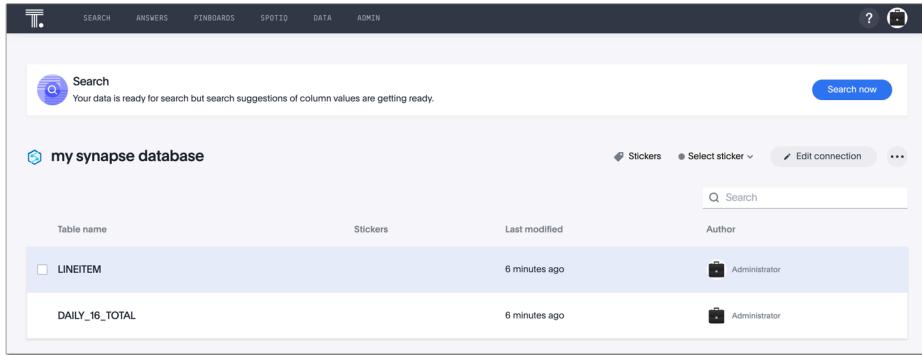
Refer to the [Synapse connection reference \[See page 60\]](#) for more information on each of the specific attributes you must enter for your connection.

5. Select tables (on the left) and the columns from each table (on the right), and then click **Create connection**.

The screenshot shows the 'Select tables' step. On the left, under 'PUBLIC', the 'NewRetail\_Product\_Dimension' table is selected. On the right, its columns are listed with checkboxes for selection. The 'Create connection' button is at the top right. A 'Getting Started' sidebar is on the right.

Column name (10/14 selected)	Data type	Sample data
Product_Key	VARCHAR	1
Category	VARCHAR	Food
Department_Key	VARCHAR	Canned Goods
Product_Name	VARCHAR	Pam's Club Chicken Noodle Soup
SKU_Number	VARCHAR	PC26182784343090822
Price	DOUBLE	2.09
Markup	DOUBLE	0.32

Once the connection is added, you can search your Synapse database right away by clicking **Search now**.



Your new connection appears on the **Data > Connections** page. You can click the name of your connection to view the tables and columns in your connection.

The connection you just created is a link to the external data source. If there are any joins in the selected tables of the external data source, those are imported into ThoughtSpot.

You can now perform a live query on the selected tables and columns of your connection. Because the selected tables and columns in your connection are linked, it may take a while to initially render the search results. This is because ThoughtSpot does not cache linked data. With linked data, ThoughtSpot queries the external database directly, which is slower than querying data that is stored in ThoughtSpot's database.

## Related information

- [Modify a Synapse connection \[See page 53\]](#)
- [Synapse connection reference \[See page 60\]](#)
- [Load and manage data \[See page 0\]](#)
- [Data and object security \[See page 0\]](#)

# Modify a Synapse connection

**Summary:** Learn how to modify a Synapse connection and its tables.

You can modify an Embrace Synapse connection in the following ways:

- Edit a connection: to add or remove tables and columns
- Remap a connection: to map a table or column to a different table or column
- Delete a table
- Delete a connection

## Editing a Synapse connection

You can edit a Synapse connection to add tables and columns.

To edit a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to edit.

Connection name	Connection type	Modified	Author
test	Azure Synapse	20 hours ago	Administrator
test2	Azure Synapse	20 hours ago	Administrator
test	Azure Synapse	1 week ago	Administrator

4. Click **Edit connection** at the upper-right-hand side of the page.

Table name	Stickers	Last modified	Author
service_nps_post_launch		20 hours ago	Administrator
training_nps_survey		20 hours ago	Administrator

5. On the Choose connection type page, change the connection name or description (if needed), and then click **Continue**.
6. On the Synapse connection details page, make any changes needed, and then click **Continue**.
7. Expand the database table drop-down menu, and select the tables and columns you want to add.

Column name (11/13 selected)	Data type	Sample data
customer_id	INT32	359996
checking	DOUBLE	9453.13
savings	DOUBLE	1467.03
creditcard	DOUBLE	2433.33
mortgageloan	DOUBLE	
checking_12_months	DOUBLE	9679.81
savings_12_months	DOUBLE	1322.87
creditcard_12_months	DOUBLE	2331.13
mortgageloan_12_months	DOUBLE	
ira	DOUBLE	
ira_12_months	DOUBLE	
credit_card_2	DOUBLE	
credit_card_2_12_months	DOUBLE	

8. Click **Update**, and then click **Confirm** to save the updated connection detail.

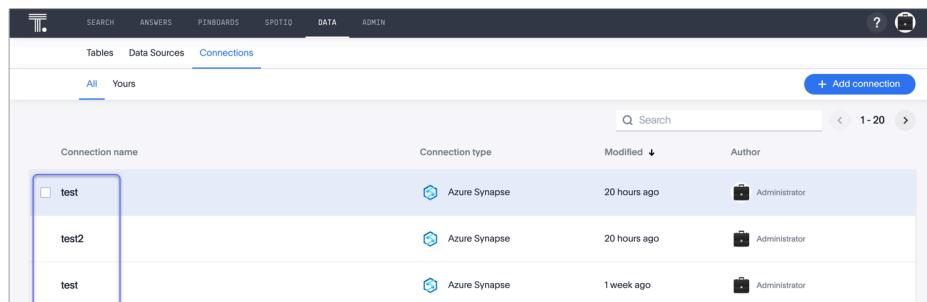
To remove a table from a connection, delete it from the connection details page. For more information, see [Deleting a table \[See page 56\]](#).

## Remapping a Synapse connection

Modify the connection parameters by editing the source mapping `yaml` file that was created when you added the connection. For example, you can remap the existing table or column to a different table or column in an existing database connection. ThoughtSpot recommends that you check the dependencies before and after you remap a table or column in a connection to ensure they display as intended.

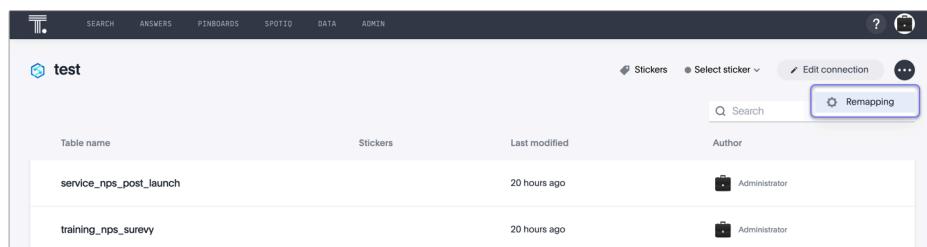
To remap a connection:

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection you want to remap.



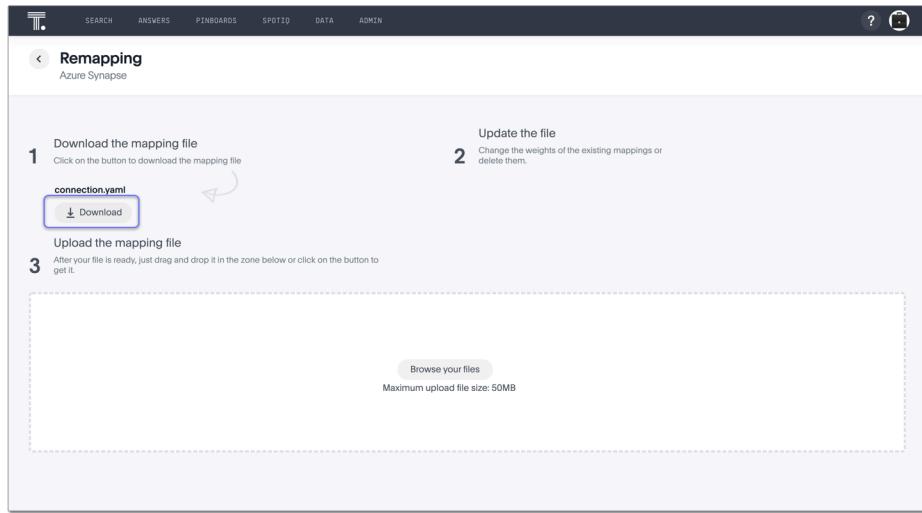
The screenshot shows the ThoughtSpot interface with the 'DATA' tab selected. Under the 'DATA' tab, the 'Connections' tab is active. The page displays a list of connections with columns for 'Connection name', 'Connection type', 'Modified', and 'Author'. There are three connections listed: 'test' (Azure Synapse, 20 hours ago, Administrator), 'test2' (Azure Synapse, 20 hours ago, Administrator), and 'test' (Azure Synapse, 1 week ago, Administrator). The first 'test' connection is highlighted with a blue border.

4. Click the More Info icon  and select **Remapping** on the upper-right-hand side of the page.



The screenshot shows the 'test' connection details page. At the top right, there are buttons for 'Stickers', 'Select sticker', 'Edit connection', and a 'More Info' icon. Below these buttons, a 'Remapping' button is highlighted with a blue border. The main area of the page lists tables with columns for 'Table name', 'Stickers', 'Last modified', and 'Author'. Two tables are listed: 'service\_nps\_post\_launch' (last modified 20 hours ago, Administrator) and 'training\_nps\_surevy' (last modified 20 hours ago, Administrator).

5. Click **Download** to download the source mapping file.



6. Edit the file, as required, and save it.

```
name: test
type: RDBMS_AZURE_SQL_DATAWAREHOUSE
properties:
- key: host
  value: embraceserver.database.windows.net
- key: port
  value: "1433"
- key: user
  value: tsadmin@embraceserver
- key: password
  value: ""
- key: database
  value: Champagne_UAT
table:
```

7. Finally, click **Browse your files**, and upload your edited mapping file to update the mapping of your connection.

## Deleting a table from a Synapse connection

ThoughtSpot checks for dependencies whenever you try to remove a table in a connection. ThoughtSpot shows a list of dependent objects, and you can click them to delete them or remove the dependency. Then you can remove the table.

To delete a table:

## Modify a Synapse connection

1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Click the name of the connection that contains the table you want to delete.

The screenshot shows the ThoughtSpot interface with the 'Connections' tab selected. A table named 'test' is highlighted with a blue border. The table has three rows:

Connection name	Connection type	Modified	Author
test	Azure Synapse	20 hours ago	Administrator
test2	Azure Synapse	20 hours ago	Administrator
test	Azure Synapse	1 week ago	Administrator

4. Find the table you want to delete in the list, and check the box next to its name.
5. Click **Delete**, and then click **Delete** again to confirm.

The screenshot shows the 'test' connection details. The 'service\_nps\_post\_launch' table is selected for deletion, indicated by a checked checkbox. The table has two rows:

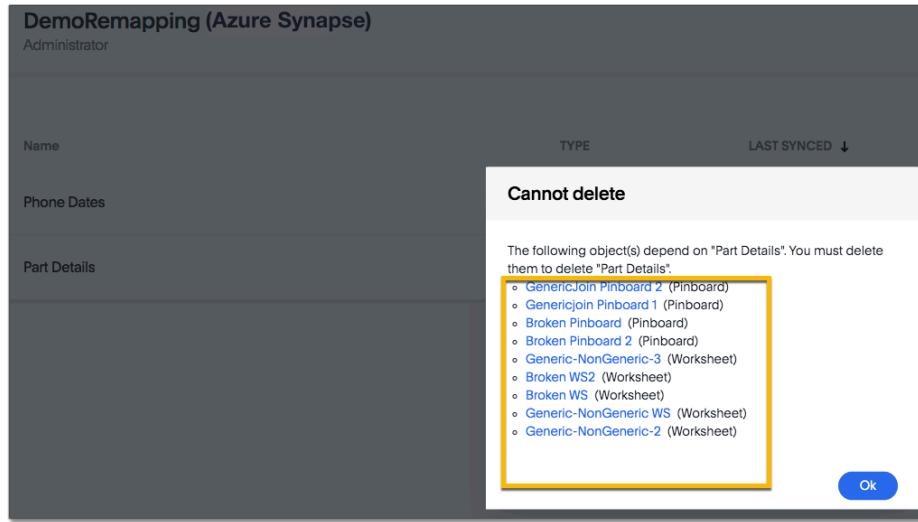
Table name	Last modified	Author
service_nps_post_launch	20 hours ago	Administrator
training_nps_survey	20 hours ago	Administrator

If you attempt to delete a table with dependent objects, the operation is blocked. A *Cannot delete* window appears, with a list of links to dependent objects. See [Deleting a table with dependent objects \[See page 57\]](#).

### Deleting a table with dependent objects

- In the *Cannot delete* window, click the link for each object to modify or delete it.

When all dependencies are removed, you can delete the table.



You can also click the name of a table and then click the linked objects to see a list of dependent objects with links. The list shows the names of the dependent objects (worksheets, pinboards or answers), and the columns they use from that table. You can use this information to determine the impact of changing the structure of the data source or to see how widely used it is. Click a dependent object to modify or delete it.

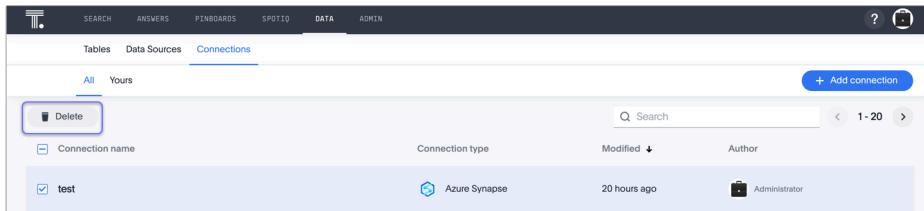
## Deleting a Synapse connection

A connection can be used in multiple data sources or visualizations. Because of this, you must delete all of the sources and tasks that use that connection, before you can delete the connection.

To delete a connection:

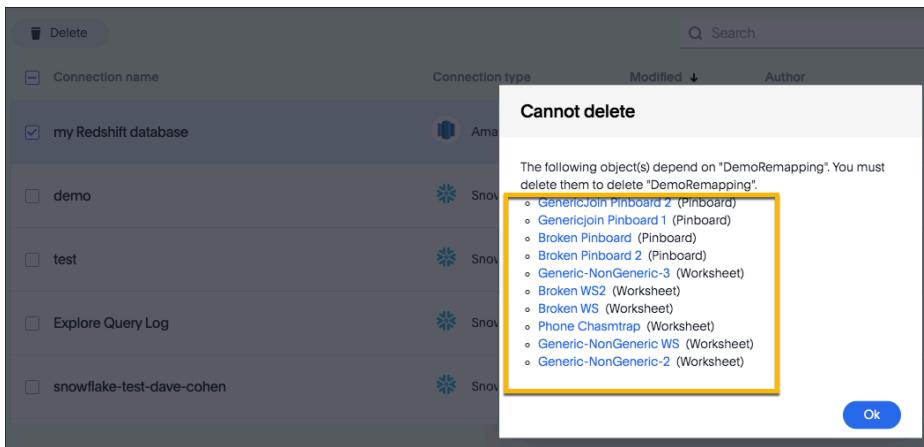
1. Click **Data** in the top navigation bar.
2. Click the **Connections** tab at the top of the page.
3. Check the box next to the connection you want to delete.
4. Click **Delete**, and then click **Delete** again to confirm.

## Modify a Synapse connection



->

If you attempt to delete a connection with dependent objects, the operation is blocked, and a “Cannot delete” warning appears with a list of dependent objects with links.



5. If the “Cannot delete” warning appears, click the link for each object to delete it, and then click **Ok**. Otherwise, go to the next step.
  
6. When all its dependencies are removed, delete the connection by clicking **Delete**, and then click again **Delete** to confirm.

# Synapse connection reference

**Summary:** Learn about the fields used to create a Synapse connection with ThoughtSpot Embrace.

Here is a list of the fields of a Synapse connection in ThoughtSpot Embrace. You need specific information to establish a seamless and secure connection.

- **Connection name:** Mandatory. Enter a new Synapse connection name.
- **Connection description:** Optional. Provide a short description about the connection.
- **Host:** Mandatory. Enter the host name associated with the Synapse database.
- **Port:** Mandatory. Enter the port number associated with the Synapse database.
- **User:** Mandatory. Enter the Synapse account username.
- **Password:** Mandatory. Enter the Synapse account password.
- **Database:** Mandatory. Specify the database associated with the account.