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# Reference Guide

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# Keyword reference

You can use keywords when asking a question to help define your search. This reference lists the various keywords. You can also see this list of keywords and examples from within the help center.

## General

Keyword	Examples
top	<ul style="list-style-type: none"> <li>top sales rep by count sales for average revenue &gt;10000</li> <li>sales rep average revenue for each region top</li> </ul>
bottom	<ul style="list-style-type: none"> <li>bottom revenue average revenue by state</li> <li>customer by revenue for each sales rep bottom</li> </ul>
<i>n</i>	top 10 sales rep revenue
<i>n</i>	bottom 25 customer by revenue for each sales rep
sort by	<ul style="list-style-type: none"> <li>revenue by state sort by average revenue</li> <li>revenue by customer sort by region</li> </ul>

## Date

Keyword	Examples
after	order date after 10/31/2014
before	order date before 03/01/2014
between ... and ...	order date between 01/30/2012 and 01/30/2014
daily year-over-year	growth of revenue by order date daily year-over-year
daily	shipments by region daily
day	count monday restaurant
day of week	revenue by day of week last 6 months
day of week	count shipments Monday
<i>n</i> days for each month	sales last 2 days for each month
<i>n</i> days for each quarter	revenue last 15 days for each quarter

Keyword	Examples
<i>n</i> days for each week	total sold last 2 days for each week
<i>n</i> days for each year	revenue last 300 days for each year
growth of ... by ... daily	growth of sales by order date daily
growth of ... by ... monthly	growth of sales by date shipped monthly sales > 24000
growth of ... by ... quarterly	growth of sales by date shipped quarterly
growth of ... by ... weekly	growth of sales by receipt date weekly for proski2000
growth of ... by ... yearly	growth of sales by date closed yearly
growth of ... by ...	growth of sales by order date
<i>n</i> hours for each day	sales last 2 hours for each day
last day by	customers last day by referrer
last month by	customers last month by day
last <i>n</i> days	visitors last 7 days
last <i>n</i> quarters	visitors last 2 quarters by month by campaign
last <i>n</i> weeks	visitors last 10 weeks by day
last quarter	customers last quarter sale >300
last week	customers last week by store
last year	top 10 customers last year by sale by store for region west
month to date	sales by product month to date sales > 2400
month year	commission by sales rep February 2014
<i>month</i>	commission January
month	revenue by month last year
monthly year-over-year	growth of revenue by receipt date monthly year-over-year
monthly	commission > 10000 monthl y

Keyword	Examples
<i>n</i> months for each quarter	cost last 2 months for each quarter
<i>n</i> months for each year	last 8 months for each year
<i>n</i> days ago	sales 2 days ago
<i>n</i> months ago	sales 2 months ago by region
<i>n</i> months	visitors last 6 months for homepage visits > 30 by month
<i>n</i> quarters ago	sales 4 quarters ago by product name contains deluxe
<i>n</i> weeks ago	sales 4 weeks ago by store
<i>n</i> years ago	sales 5 years ago by store for region west
<i>n</i> years	opportunities next 5 years by revenue
<i>n</i> years	visitors last 5 years by revenue for sum revenue >5000
next day	shipments next day by order
next month	appointments next month by day
next <i>n</i> days	shipments next 7 days
next <i>n</i> months	openings next 6 months location
next <i>n</i> quarters	opportunities next 2 quarters by campaign
next <i>n</i> weeks	shipments next 10 weeks by day
next quarter	opportunities next quarter amount > 30000
next week	shipments next week by store
next year	opportunities next year by sales rep
quarter to date	sales by product quarter to date for top 10 products by sales
quarterly year-over-year	growth of revenue by date shipped quarterly year-over-year
quarterly	sales quarterly for each product
<i>n</i> quarters for each year	last 2 quarters for each year
today	sales today by store

Keyword	Examples
week to date	sales by order date week to date for pro-ski200
week	revenue by week last quarter
weekly year-over-year	growth of revenue by date shipped weekly year-over-year
weekly	revenue weekly
$n$ weeks for each month	sales last 3 weeks for each month
$n$ weeks for each quarter	last 2 weeks for each quarter
$n$ weeks for each year	last 3 weeks for each year
year to date	sales by product year to date
year	revenue by product 2014 product name contains snowboard
yearly	shipments by product yearly
yesterday	sales yesterday for pro -ski200 by store

## Time

Keyword	Examples
detailed	ship time detailed
last minute	count homepage views last minute
last hour	count unique visits last hour
$n$ minutes	count visitors last 30 minutes
$n$ hours	count visitors last 12 hours
hourly	visitors by page name hourly
$n$ minutes ago	sum inventory by product 10 minutes ago

Keyword	Examples
<i>n</i> hours ago	<code>sum inventory by product by store 2 hours ago</code>

## Text

Keyword	Examples
begins with	<code>product name begins with 'pro'</code>
contains	<code>product name contains "alpine" description contains "snow shoe"</code>
ends with	<code>product name ends with 'deluxe'</code>
not begins with	<code>product name not begins with "tom's"</code>
not contains	<code>product color not contains 'tan' product color not contains 'red'</code>
not ends with	<code>product name not ends with "trial"</code>
similar to	<code>course name similar to 'hand'</code>
not similar to	<code>course name not similar to 'hand'</code>

## Number

Function	Examples
sum	<code>sum revenue</code>
average	<code>average revenue by store</code>
count	<code>count visitors by site</code>
max	<code>max sales by visitor by site</code>
min	<code>min revenue by store by campaign for cost &gt; 5000</code>
standard deviation	<code>standard deviation revenue by product by month for date after 10/31/2010</code>
unique count	<code>unique count visitor by product page last week</code>
variance	<code>variance sale amount by visitor by product for last year</code>



## Comparative

Function	Examples
all	<code>all</code>
between... and	<code>revenue between 0 and 1000</code>
vs, versus	<code>revenue east vs west</code>
>	<code>sum sale amount by visitor by product for last year sale amount &gt; 2000</code>
<	<code>unique count visitor by product by store for sale amount &lt; 20</code>
>=	<code>count calls by employee lastname &gt;= m</code>
<=	<code>count shipments by city latitude &lt;= 0</code>
=	<code>unique count visitor by store purchased products = 3 for last 5 days</code>
!=	<code>sum sale amount region != canada region != mexico</code>

## Location

Keyword	Examples
near	<code>revenue store name county near san francisco</code>
near... within <i>n</i> miles km meters	<code>revenue store name county near alameda within 50 miles</code>
farther than <i>n</i> miles km meters from	<code>average hours worked branch farther than 80 km from scarborough</code>

Location keywords only work for searches where the data source includes latitude/longitude data.

## Period

Keyword	Example
---------	---------

quarter ( <i>date</i> )	quarter (commit date)
quarter of year ( <i>date</i> )	quarter of year (commit date)
month of quarter ( <i>date</i> )	month of quarter (commit date)
week of year ( <i>date</i> )	week of year (commit date)
week of quarter ( <i>date</i> )	week of quarter (commit date)
week of month ( <i>date</i> )	week of month (commit date)
day of year ( <i>date</i> )	day of year (commit date)
day of quarter ( <i>date</i> )	day of quarter (commit date)
day ( <i>date</i> )	day (order date)
day of month ( <i>date</i> )	day of monthy (order date)
day of week ( <i>date</i> )	day of week (order date)
hour ( <i>datetime</i> )	hour (timestamp)

## Help

Function	Examples
help	help keywords
how to	how to search

# TQL reference

TQL is the ThoughtSpot language for entering SQL commands. This reference lists TQL commands you can use to do things like creating a schema or verifying a data load.

## About using TQL

You can use TQL either [through the ThoughtSpot application's web interface](#) or the [command line interface](#) in the Linux shell.

Use `--query_results_apply_top_row_count <number>` flag to limit the number of result rows returned by a query. For example:

```
$ tql --query_results_apply_top_row_count 100
```

As a best practice, you should enclose object names (database, schema, table, and column) in double quotes, and column values in single quotes. When referring to objects using fully qualified object names, the syntax is:

```
"database"."schema"."table"
```

To get help on SQL when using TQL, enter `help` on the command line.

You can use TQL to view and modify schemas and data in tables. Remember to add a semicolon after each command. Commands are not case sensitive but are capitalized here for readability.

**Note:** Worksheets and pinboards in ThoughtSpot are dependent upon the data in the underlying tables. Use caution when modifying tables directly. If you change or remove a schema on which those objects rely, the objects could become invalid.

## View schemas and data

Syntax	Description
<code>SHOW DATABASES</code>	<p>Lists all available databases.</p> <p>Examples:</p> <pre>SHOW DATABASES;</pre>
<code>USE &lt;database&gt;</code>	<p>Switches the context to the specified database. This is required if queries do not use fully qualified names (database.schema.table) for specifying tables.</p> <p>Examples:</p> <pre>USE "fruit_database";</pre>

Syntax	Description
<code>SHOW SCHEMAS</code>	Lists all schemas within the current database. For example:  <code>SHOW SCHEMAS;</code>
<code>SHOW TABLES</code>	Lists all tables within the current database by schema. For example:  <code>SHOW TABLES;</code>
<code>SHOW TABLE &lt;table&gt;</code>	Lists all the columns for a table. For example:  <code>SHOW TABLE "locations";</code>
<code>SCRIPT SERVER</code>	Generates the TQL schema for all tables in all databases on the server. For example:  <code>SCRIPT SERVER;</code>
<code>SCRIPT DATABASE &lt;database&gt;</code>	Generates the TQL schema for all tables in a database. For example:  <code>SCRIPT DATABASE "fruit_database";</code>
<code>SCRIPT TABLE &lt;table&gt;</code>	Generates the TQL schema for a table. For example:  <code>SCRIPT TABLE "vendor";</code>

Syntax	Description
<pre> SELECT     &lt;cols_or_expr&gt; FROM &lt;table_list&gt; [WHERE &lt;predicates&gt;] [GROUP BY &lt;expr&gt;] [ORDER BY &lt;expr&gt;] </pre>	<p>Shows specified set of table data.</p> <p>If you do not specify the TOP number of rows to select, the top 50 rows will be returned by default. The number of rows to return can be set using the TQL command line flag:</p> <pre>--query_results apply_top_row_count</pre> <p>You can use the following aggregation functions:</p> <ul style="list-style-type: none"> <li>• <code>sum</code></li> <li>• <code>count</code></li> <li>• <code>count distinct</code></li> <li>• <code>stddev</code></li> <li>• <code>avg</code></li> <li>• <code>variance</code></li> <li>• <code>min</code></li> <li>• <code>max</code></li> </ul> <p>You can use the following date functions:</p> <ul style="list-style-type: none"> <li>• <code>absyear</code></li> <li>• <code>absmonth</code></li> <li>• <code>absday</code></li> <li>• <code>absquarter</code></li> <li>• <code>date</code></li> <li>• <code>time</code></li> </ul> <p>For example:</p> <pre> SELECT TOP 10 "quantity" FROM "sales_fact";  SELECT COUNT(*) FROM "vendor";  SELECT "vendor", SUM("quantity") FROM "sales_fact" GROUP BY "vendor";  SELECT "vendor", SUM("amount") FROM "vendor", "sales_fact" WHERE "sales_fact"."vendorid" = "vendor"."vendorid" AND "amount" &gt; 100 GROUP BY "vendor" ORDER BY "amount" DESC;  SELECT "vendor", SUM("quantity") FROM "sales_fact" GROUP BY "vendor" LIMIT 10; </pre>

## Schema creation

Syntax	Description
<pre> CREATE DATABASE &lt;database&gt; </pre>	<p>Creates a database. For example:</p> <pre>CREATE DATABASE "fruit_database";</pre>

Syntax	Description
<pre>CREATE SCHEMA &lt;schema&gt;</pre>	<p>Creates a schema within the current database. For example:</p> <pre>CREATE SCHEMA "fruit_schema";</pre>
<pre>CREATE TABLE &lt;table&gt; (&lt;column_definitions&gt; [&lt;constraints&gt;]) [PARTITION BY HASH (&lt;number&gt;) [KEY ("&lt;column&gt;")]]]</pre>	<p>Creates a table with the specified column definitions and constraints.</p> <p>Use <b>PARTITION BY HASH</b> to shard a table across all nodes. If no <b>KEY</b> is specified, the table will be randomly sharded.</p> <p>Do not specify relationship constraints ( <b>FOREIGN KEY</b> or <b>RELATIONSHIP</b> ) in the <b>CREATE TABLE</b> statement. Instead, define these using <b>ALTER TABLE</b> statements at the end of your TQL script, after creating your tables. This method guarantees that tables are created before they are referenced in the constraint definitions. For example:</p> <pre>CREATE TABLE "vendor" ("vendorid" int, "name" varchar(255));  CREATE TABLE "sales_fact" ("saleid" int, "locationid" int, "vendorid" int, "quantity" int, "sale_amount" double, "fruitid" int, CONSTRAINT PRIMARY KEY("saleid")) PARTITION BY HASH(96) KEY ("saleid");</pre>

## Schema modification

Syntax	Description
<pre>DROP DATABASE &lt;database&gt;</pre>	<p>Drops a database and all of its schemas and tables. For example:</p> <pre>DROP DATABASE "fruit_database";</pre>
<pre>DROP SCHEMA &lt;schema&gt;</pre>	<p>Drops a schema within the current database, and drops all of the tables in the schema. For example:</p> <pre>DROP SCHEMA "fruit_schema";</pre>
<pre>DROP TABLE &lt;table&gt;</pre>	<p>Drops a table. For example:</p> <pre>DROP TABLE "location";</pre>

Syntax	Description
<pre>TRUNCATE TABLE &lt;table&gt;</pre>	<p>Removes all data from a table, but preserves its metadata, including all GUIDs, relationships, etc. This can be used to force a new schema for a table without losing the metadata.</p> <p>However, this operation removes all existing data from the table and must be used with caution. You must reload the data following a <b>TRUNCATE</b> , or all dependent objects (worksheets and pinboards) in ThoughtSpot will become invalid. For example:</p> <pre>TRUNCATE TABLE "location";</pre>
<pre>ALTER TABLE &lt;table&gt; ADD   DROP   RENAME COLUMN &lt;column&gt;</pre>	<p>Alters a table to add, drop, or rename a column.</p> <p>When you add a column to an existing table, you must provide a default value to use for existing rows. For example:</p> <pre>ALTER TABLE "cart" ADD COLUMN "nickname" varchar(255) DEFAULT 'no nickname';  ALTER TABLE "cart" DROP COLUMN "nickname";  ALTER TABLE "cart" RENAME COLUMN "nickname" TO "shortname";</pre>
<pre>ALTER TABLE &lt;table&gt; DROP CONSTRAINT PRIMARY KEY;</pre>	<p>Drops the primary key from a table.</p> <p>Note that if you then add a new primary key, the same upsert behavior will be applied as with adding any primary key. This can result in data deletion, so make sure you understand how the upsert will affect your data ahead of time. For example:</p> <pre>ALTER TABLE "sales" DROP CONSTRAINT PRIMARY KEY;  ALTER TABLE "sales" ADD CONSTRAINT PRIMARY KEY ("PO_number");</pre>
<pre>ALTER TABLE &lt;table&gt; DROP [FOREIGN KEY   RELATIONSHIP] &lt;name&gt;;</pre>	<p>Drops the named foreign key or relationship between two tables. For example:</p> <pre>ALTER TABLE "sales_fact" DROP FOREIGN KEY "FK_PO_number";  ALTER TABLE "fruit_dim" DROP RELATIONSHIP "REL_dates";</pre>

Syntax	Description
<pre>ALTER TABLE &lt;table&gt; DROP [CONSTRAINT FOREIGN KEY  [&lt;table_name&gt;]   RELATIONSHIP [WITH &lt;table_name&gt;];</pre>	<p>You must use this syntax when dropping relationships between tables created before ThoughtSpot version 3.2. This is because relationships could not be named in older versions.</p> <p>Drops the foreign key or relationship between two tables where you cannot reference it by relationship name. If the relationship was created without a name, use:</p> <ul style="list-style-type: none"> <li>the name of the referenced table, for a foreign key.</li> <li>the name of the related table, for a relationship.</li> </ul> <p>If you drop a foreign key without specifying the referenced table, all foreign keys from the table you are altering will be dropped.</p> <p>Examples:</p> <pre>ALTER TABLE "shipments" DROP CONSTRAINT FOREIGN KEY "orders";  ALTER TABLE "wholesale_buys" DROP RELATIONSHIP WITH "retail_sales";</pre> <p>Drops all relationships that have wholesale_buys as a source.</p> <pre>ALTER TABLE "wholesale_buys" DROP RELATIONSHIP;</pre> <p>Drops all foreign keys from wholesale_buys.</p> <pre>ALTER TABLE "wholesale_buys" DROP CONSTRAINT FOREIGN KEY;</pre>
<pre>ALTER TABLE &lt;table&gt; [SET DIMENSION   SET FACT [PARTITION BY HASH [(&lt;shards&gt;)] [KEY(&lt;column&gt;)]]]</pre>	<p>Changes the partitioning on a table by doing one of:</p> <ul style="list-style-type: none"> <li>re-sharding a sharded table</li> <li>changing a replicated table to a sharded table</li> <li>changing a sharded table to a replicated (unsharded) table</li> </ul> <p>By default, ThoughtSpot does not shard dimension tables.</p> <p>To change the partitioning on a table, or to change a dimension table to a sharded table, use <code>ALTER TABLE...SET FACT PARTITION BY HASH...</code>;</p> <p>To make a sharded table into a dimension table (replicated on every node), use <code>ALTER TABLE...SET DIMENSION;</code> command.</p> <p>Examples of this statement:</p> <pre>ALTER TABLE "sales_fact" SET FACT PARTITION BY HASH (96) KEY ("PO_number"); ALTER TABLE "fruit_dim" SET DIMENSION;</pre>
<pre>ALTER TABLE &lt;table&gt; MODIFY COLUMN &lt;column&gt; &lt;new_data_type&gt;;</pre>	<p>Changes the data type of a column. This can have implications on sharding and primary key behavior. See <a href="#">About data type conversion</a>. For example:</p> <pre>ALTER TABLE fact100 MODIFY COLUMN product_id int;</pre>



## Modify data

Syntax	Description
<pre>INSERT INTO &lt;table&gt; VALUES ...</pre>	<p>Inserts values into a table. Only use this for testing. Do not use <b>INSERT</b> on a production system. For example:</p> <pre>INSERT INTO "vendor" VALUES 'helen rose', 'jacob norse', 'eileen ruff', 'manny gates';</pre>
<pre>ALTER TABLE &lt;table&gt; SET LOAD PRIORITY &lt;value&gt;  &lt;new_data_type&gt;;</pre>	<p>Sets the load priority for a table. Load priority determines the order in which a table is loaded on a cluster restart. You can set any value from <b>1-100</b> . The system default for all tables is <b>50</b> . For example:</p> <pre>ALTER TABLE 'sales_facts' SET LOAD PRIORITY 1</pre>
<pre>UPDATE &lt;table&gt; ... SET ... [WHERE ...]</pre>	<p>Updates rows in a table that match optionally provided predicates. Predicates have the form <b>column = value</b> connected by the <b>AND</b> keyword. Sets the column values to the specified values. For example:</p> <pre>UPDATE "location" SET "borough" = 'staten island', "city" = 'new york' WHERE "borough" = 'staten isl' AND city = 'NY';</pre>
<pre>DELETE FROM &lt;table&gt; [WHERE...]</pre>	<p>Deletes rows from a table that match optionally provided predicates. Predicates have the form <b>column = value</b> connected by the <b>AND</b> keyword. For example.</p> <pre>DELETE FROM "vendor" WHERE "name" = 'Joey Smith' AND "vendorid" = '19463';</pre>

## Constraints and relationships

Constraints and relationships in ThoughtSpot are used to define the relationships between tables (i.e. how they can be joined). However, constraints are not enforced, as they would be in a transactional database. You can define the following constraints when creating a table with **CREATE TABLE** , or add them to an existing table using the **ADD CONSTRAINT** syntax:

Syntax	Description
PRIMARY KEY	<p>Designates a unique, non-null value as the primary key for a table. This can be one column or a combination of columns. If values are not unique, an upsert will be performed if a row includes a primary key that is already present in the data. Some examples: &lt;/p&gt;</p> <pre> CREATE TABLE "schools" ( "schoolID" varchar(15), "schoolName" varchar(255), "schoolCity" varchar(55), "schoolState" varchar(55), "schoolNick" varchar(55), CONSTRAINT PRIMARY KEY ("schoolID") ) ;  ALTER TABLE "cart" ADD CONSTRAINT PRIMARY KEY ("cart_id");  ALTER TABLE "cart" DROP CONSTRAINT PRIMARY KEY "cart_id"; </pre>
FOREIGN KEY	<p>Defines a relationship where the value(s) in the table are used to join to a second table. Uses an equality operator. The foreign key must match the primary key of the table that is referenced in number, column type, and order of columns.</p> <p>When creating a foreign key, give it a name. You can reference the foreign key name later, if you want to remove it.</p> <p>Examples of this statement:</p> <pre> ALTER TABLE "batting" ADD CONSTRAINT "FK_player" FOREIGN KEY ("playerID") REFERENCES "players" ("playerID");  ALTER TABLE "batting" ADD CONSTRAINT "FK_lg_team" FOREIGN KEY ("lgID" ,"teamID") REFERENCES "teams" ("lgID" ,"teamID");  ALTER TABLE "shipment" ADD CONSTRAINT "FK_PO_vendor" FOREIGN KEY ("po_number", "vendor") REFERENCES "orders" ("po_number", "vendor");  ALTER TABLE "shipment" DROP CONSTRAINT "FK_PO_vendor"; </pre>

Syntax	Description
RELATIONSHIP	<p>Defines a relationship where the value(s) in the table can be used to join to a second table, using an equality condition (required) and one or more range conditions (optional). These conditions act like a WHERE clause when the two tables are joined. They are applied using AND logic, such that all conditions must be met for a row to be included.</p> <p>You may add multiple relationships between tables. When creating a relationship, give it a name. You can reference the relationship name later, if you want to remove it.</p> <p>Examples of this statement:</p> <pre>ALTER TABLE "wholesale_buys" ADD RELATIONSHIP "REL_fruit" WITH "retail_sales" AS "wholesale_buys"."fruit" = "retail_sales"."fruit" AND ("wholesale_buys"."date_order" &lt; "retail_sales"."date_sold" AND "retail_sales"."date_sold" &lt; "wholesale_buys"."expire_date");  ALTER TABLE "wholesale_buys" DROP RELATIONSHIP "REL_fruit";</pre>

## Data types

ThoughtSpot supports a simplified list of data types:

Syntax	Description	Examples
Character	<ul style="list-style-type: none"> <li>VARCHAR(<i>n</i>)</li> </ul>	Specify the maximum number of characters, as in VARCHAR(255). The size limit is 1GB for VARCHAR values.
Floating point	<ul style="list-style-type: none"> <li>DOUBLE</li> <li>FLOAT</li> </ul>	DOUBLE is recommended.
Boolean	<ul style="list-style-type: none"> <li>BOOL</li> </ul>	Can be <code>true</code> or <code>false</code> .
Integer	<ul style="list-style-type: none"> <li>INT</li> <li>BIGINT</li> </ul>	<p>INT holds 32 bits.</p> <p>BIGINT holds 64 bits.</p>

Syntax	Description	Examples
Date or time	<ul style="list-style-type: none"><li>• DATE</li><li>• DATETIME</li><li>• TIMESTAMP</li><li>• TIME</li></ul>	<p>DATETIME, TIMESTAMP, and TIME are stored at the granularity of seconds</p> <p>.</p> <p>TIMESTAMP is identical to DATETIME, but is included for syntax compatibility.</p>

# tsload flag reference

For recurring data loads and for scripting loads, use `tsload` (the ThoughtSpot Loader). This reference section lists all the flags that can be used to modify the behavior of `tsload`.

## General tsload flags

Flag	Description	Notes
<code>--target_database &lt;database&gt;</code>	Specifies the pre-existing target database into which tsload should load the data.	
<code>--target_schema &lt;schema&gt;</code>	Specifies the target schema.	Default is "falcon_default_schema".
<code>--target_table &lt;table&gt;</code>	Specifies the tables that you want to load into the database.	The tables must exist in the database specified by <code>--target_database</code> .
<code>--empty_target</code>	Specifies that any data in the target table is to be removed before the new data is loaded.	If supplied, any rows that exist in the table specified by <code>--target_database</code> and <code>--target_table</code> will be deleted before this data load. To perform an "upsert" on the existing data, omit this flag or specify <code>--noempty_target</code> .
<code>--max_ignored_rows &lt;number&gt;</code>	Specifies the maximum number of rows that can be ignored if they fail to load.	If the number of ignored rows exceeds this limit, the load will be aborted.
<code>--bad_records_file &lt;path_to_file&gt;/&lt;file_name&gt;</code>	Specifies the file to use for storing rows that failed to load.	Input rows that do not conform to the defined schema in ThoughtSpot will be ignored and inserted into this file.
<code>--date_format &lt;date_formatmask&gt;</code>	Specifies the format string for date values.	The default format is <code>yearmonthday</code> e.g. "Dec 30th, 2001" and is represented as <code>20011230</code> . Use the date format specifications supported in the <a href="#">strptime library function</a> .
<code>--date_time_format &lt;date_formatmask&gt; &lt;time_formatmask&gt;</code>	Specifies the format string for datetime values.	The default is <code>yearmonthday hour:minute:second</code> e.g. Dec 30th, 2001 1:15:12 and is represented as 20011230 01:15:12. Use the datetime format specifications supported in the <a href="#">strptime library function</a> .
<code>--time_format &lt;time_formatmask&gt;</code>	Specifies the format string for time values.	The default is <code>hour:minute:second</code> . Use the time format specifications supported in the <a href="#">strptime library function</a> .

Flag	Description	Notes
<code>--v=[0 1 2 3]</code>	Specifies the verbosity of log messages.	Provide a value for verbosity level. By default, verbosity is set to the minimum, which is 0. This value is similar to a volume control. At higher levels your log receives more messages and that log more frequently. This is used for debugging. You should not change this value unless instructed by ThoughtSpot Support.
<code>--skip_second_fraction</code>	Skips fractional seconds when loading data.	If supplied, the upserts logic may be affected, especially if the date time being loaded is a primary key, and the data has millisecond granularity. Load the data twice, once as a string with a primary key, and again with second granularity date time. There is no support to store fractional seconds in the ThoughtSpot system.

## File loading tsload flags

The following flags are used when loading data from an input file:

Flag	Description	Notes
<code>--source_file</code> <code>&lt;path_to_file&gt;/&lt;file_name&gt;</code>	Specifies the location of the file to be loaded.	
<code>--source_data_format</code> <code>[csv delimited]</code>	Specifies the data file format.	Optional. The default is csv.
<code>--field_separator</code> <code>"&lt;delimiter&gt;"</code>	Specifies the field delimiter used in the input file.	
<code>--trailing_field_separator</code>	Specifies that the field separator appears after every field, including the last field per row.	Example row with trailing field separator: a,b,c, The default is false.
<code>--null_value</code> <code>"&lt;null_representation&gt;"</code>	Specifies how null values are represented in the input file.	These values will be converted to NULL upon loading.
<code>--date_converted_to_epoch</code> <code>[true false]</code>	Specifies whether the "date" or "datetime" values in the input file are represented as epoch values.	
<code>--boolean_representation</code> <code>[true_false   1_0   T_F   Y_N]</code>	Specifies the format in which boolean values are represented in the input file.	The default is T_F. You can also use this flag to specify other values. For example, if your data used Y for true and NULL for false, you could specify: <code>--boolean_representation Y_NULL</code>

Flag	Description	Notes
<code>--has_header_row</code>	Indicates that the input file contains a header row.	If supplied, the first row of the file is ignored. If not supplied, the first row of the file is loaded as data.
<code>--escape_character</code> <code>"&lt;character&gt;"</code>	Specifies the escape character used in the input file.	If no value is specified, the default is "(double quotes)".
<code>--enclosing_character</code> <code>"&lt;character&gt;"</code>	Specifies the enclosing character used in the input file.	If the enclosing character is double quotes, you need to escape it, as in this example: <code>--enclosing_character "\""</code>
<code>--use_bit_boolean_values</code> <code>= [true   false]</code>	Specifies how boolean values are represented in the input file.	If supplied, the input CSV file uses a bit for boolean values, i.e. the false value is represented as 0x0 and true as 0x1. If omitted or set to false, boolean values are assumed to be T_F, unless you specify something else using the flag <code>--boolean_representation</code> <code>[true_false   1_0   T_F   Y_N] .</code>

# tscli command reference

The `tscli` command line interface is an administration interface for the ThoughtSpot instance. Use `tscli` to take snapshots (backups) of data, apply updates, stop and start the services, and view information about the system. This reference defines each subcommand and what you can accomplish with it.

The command returns 0 upon success and a non-zero exit code upon failure. Because the `tscli` command is typically running a command on multiple codes, an error may be called at different points. As much as possible, the command attempts to save errors to the `stderr` directory as configured on a node.

## How to use the tscli command

The `tscli` command has the following syntax:

```
tscli [-h] [--helpfull] [--verbose] [--noautoconfig]
      [--autoconfig] [--yes] [--cluster <cluster>]
      [--zoo <zookeeper>] [--username username] [--identity_file identity_file]
      {alert,backup,backup-policy,callhome,cluster,command,dr-mirror,etl,event,
      feature,fileservers,firewall,hdfs,ldap,logs,map-til
      es,monitoring,nas,node,
      os,saml,scheduled-pinboards,smtp,snapshot,snapsho
      t-policy,spot,ssl,storage,
      support}
```

The `tscli` command has several subcommands such as `alert`, `backup`, and so forth. You issue a subcommand using the following format:

```
tscli [subcommand ]
```

Subcommands have their own additional options and actions such as `tscli backup create` or `tscli backup delete` for example. To view help for a subcommand:

```
tscli [subcommand] -h
```

A subcommand itself may have several options.



## tscli subcommands

This section lists each subcommand and its syntax.

### alert subcommand

```
tscli alert [-h] {count,info,list,off,on,refresh,silence,status,unsilence}
```

Use this subcommand to do the following:

- `tscli alert info` Lists all alerts.
- `tscli alert list` Lists the generated alerts.
- `tscli alert off` Disables all alerts from the cluster in the cluster's timezone.
- `tscli alert on` Enables alerts from the cluster.
- `tscli alert silence --name <alert_name>`

Silences the alert with `alert_name`. For example, `DISK_ERROR`. Silenced alerts are still recorded in postgres, however emails are not sent out.

- `tscli alert status` Shows the status of cluster alerts.
- `tscli alert unsilence-name alert_name`

Unsilences the alert with `* alert_name *`. For example, `DISK_ERROR`.

### backup subcommand

```
tscli backup [-h] {create,delete,ls,restore}
```

Use this subcommand to do the following:

- `tscli backup create [-h] [--mode {full,light,dataless}] [--type {full,incremental}] [--base BASE] [--storage_type {local,nas}] [--remote] name out`

Pulls a snapshot and saves it as a backup where:

- `--mode {full,light,dataless}`

Mode of backups. To understand these different modes see [Understand backup modes](#).

- `--type {full,incremental}` Type of backup.(Incremental `incremental` is not implemented yet) (default: full)
- `--base BASE`

Based snapshot name for incremental backup. (Not Implemented yet) (default: None)

- `--storage_type {local,nas}`

Storage type of output directory. (default: local)

- `--remote`

Take backup through orion master. (default: True)

- `tscli backup delete * name *` Deletes the named backup.
- `tscli backup ls` List all backups taken by the system.
- `tscli backup restore` Restore cluster using backup.

## backup-policy

```
tscli backup-policy [-h] {create,delete,disable,enable,ls,show,status,update}
```

Use this subcommand to do the following:

- `tscli backup-policy create` Prompts an editor for you to edit the parameters of the backup policy.
- `tscli backup-policy delete name` Deletes the backup policy with `name`.
- `tscli backup-policy disable name` Disables the policy `name`.
- `tscli backup-policy enable name` Enables the policy `name`.
- `tscli backup-policy ls` List backup policies.
- `tscli backup-policy show name` Show the policy `name`.
- `tscli backup-policy status name` Enables the policy `name`.
- `tscli backup-policy update * name *` Prompts an editor for you to edit the policy `name`.

## callhome

```
tscli callhome [-h] {disable,enable,generate-bundle}
```

Use this subcommand to do the following:

- `tscli callhome disable` Turns off the periodic call home feature.
- `tscli callhome enable --customer_name customer_name``

Enables the “call home” feature, which sends usage statistics to ThoughtSpot This feature is enabled by default.

The parameter `customer_name` takes the form `Shared/*`customer_name`*/stats`.

- `tscli callhome generate-bundle -d directory --since DAYS`
  - `--d D` Dest folder where tar file will be created. (default: None)
  - `--since DAYS`

Grab callhome data from this time window in the past. Should be a human readable duration string, e.g. `4h` (4 hours), `30m` (30 minutes), `1d` (1 day). (default: None) Generates a tar file of the cluster metrics and writes it to the specified directory where `DAYS` is how far back you'd like to generate the tar file from in days. For example, `30`. If this parameter is not specified, the command will collect the stats from the last `7` days by default.

## cluster

```
tscli cluster [-h] {abort-reinstall-os,check,create,get-config,load,reinstall-os,report,restore,resume-reinstall-os,resume-update,set-config,set-min-resource-spec,show-resource-spec,start,status,stop,update,update-hadoop}
```

Use this subcommand to do the following:

- `tscli cluster abort-reinstall-os` Abort in-progress reinstall.
- `tscli cluster check --includes {all,disk,zookeeper,hdfs,orion-cgroups,orion-oreo}` check the status nodes in the cluster.

You must specify a component to check.

- `tscli cluster create release`

Creates a new cluster from the release file specified by `* release *`. This command is used by ThoughtSpot Support when installing a new cluster, for example, `tscli cluster create 2.0.4.tar.gz`

- `tscli cluster get-config` Get current cluster network and time configuration. Prints JSON configuration to stdout. If for some reason the system cannot be connected to all interfaces, the command returns an error but continues to function.
- `tscli cluster load` Load state from given backup onto existing cluster
- `tscli cluster reinstall-os` Reinstall OS on all nodes of the cluster.
- `tscli cluster report` Generate cluster report.
- `tscli cluster restore --release release_tarball backupdir``

Restores a cluster using the backup in the specified directory `backupdir`. If you're restoring from a dataless backup, you must supply the release tarball for the corresponding software release.

- `tscli cluster resume-reinstall-os` Resume in-progress reinstall.
- `tscli cluster resume-update` Resume in-progress updates.
- `tscli cluster set-config` Set cluster network and time configuration. Takes JSON configuration from stdin.
- `tscli cluster set-min-resource-spec` Sets min resource configuration of the cluster
- `tscli cluster show-resource-spec` Prints default or min.
- `tscli cluster start` Start cluster.
- `tscli cluster status` Gives the status of the cluster, including release number, date last updated, number of nodes, pending tables time, and services status.
- `tscli cluster stop` Pauses the cluster (but does not stop storage services).
- `tscli cluster update` Update existing cluster.
- `tscli cluster update-hadoop` Updates Hadoop/Zookeeper on the cluster.

## command

```
tscli command [-h] {run}
```

Command to run a command on all nodes.

```
tscli command run [-h] [--nodes NODES ] --dest_dir DEST_DIR [--copyfirst COPYFIRST ] [--timeout TIMEOUT ] command
```

- `--nodes NODES` Space separated IPs of nodes where you want to run the command. (default: `all` )
- `--dest_dir DEST_DIR` Directory to save the files containing output from each nodes. (default: `None` )
- `--copyfirst COPYFIRST` Copy the executable to required nodes first. (default: `False` )
- `--timeout TIMEOUT` Timeout waiting for the command to finish. (default: `60` )

## dr-mirror

```
tscli dr-mirror [-h] {start,status,stop}
```

- `tscli dr-mirror start` Starts a mirror cluster which will continuously recover from a primary cluster.
- `tscli dr-mirror status` Checks whether the current cluster is running in mirror mode.
- `tscli dr-mirror stop` Stops mirroring on the local cluster.

## etl

```
tscli etl [-h] {change-password,disable-lw,download-agent,enable-lw,show-lw}
```

- `tscli etl change-password --admin_username admin_user --username Informatica_user`

Changes the Informatica Cloud account password used by ThoughtSpot Data Connect. Required parameters are:

- `--admin_username admin_user` specifies the Administrator username for ThoughtSpot.
- `--username Informatica_user` specifies the username for the Informatica Cloud.
- `tscli etl disable-lw` Disables ThoughtSpot Data Connect.
- `tscli etl download-agent` Downloads the ThoughtSpot Data Connect agent to the cluster.

- `tscli etl enable-lw [-h] --username USERNAME --thoughtspot_url THOUGHTSPOT_URL --admin_username ADMIN_USERNAME [--groupname GROUPNAME ] --org_id ORG_ID [--pin_to PIN_TO ] [--proxy_host PROXY_HOST ] [--proxy_port PROXY_PORT ] [--proxy_username PROXY_USERNAME ] [--max_wait MAX_WAIT ]`

You should contact ThoughtSpot Support for assistance in setting this up. Required parameters are:

- `--username USERNAME` Username for Informatica Cloud (default: None)
  - `--thoughtspot_url THOUGHTSPOT_URL` URL to reach thoughtspot. (default: None)
  - `--admin_username ADMIN_USERNAME` Admin username for ThoughtSpot (default: None)
  - `--groupname GROUPNAME`
  - `--org_id ORG_ID` specifies the Informatica `id` of the organization (company). For ThoughtSpot, this is `001ZFA`. `org_id` shouldn't include the prefix `Org`. For example, if on Informatica cloud, the `orgid` is `Org003XYZ`, then use only
  - `--pin_to PIN_TO` specifies the IP address to pin to. If you specify an IP to pin to, that node becomes sticky to the Informatica agent, and will always be used. Defaults to the public IP address of the localhost where this command was run.
  - `--proxy_host PROXY_HOST` Proxy server host for network access (default: )
  - `--proxy_port PROXY_PORT` Proxy server port (default: )
  - `--proxy_username PROXY_USERNAME` Proxy server username (default: )
  - `--max_wait MAX_WAIT` Maximum time in seconds to wait for Data Connect agent to start (default: None)
- `tscli etl show-lw` Shows the status of ThoughtSpot Data Connect. It also returns the Informatica username and OrgId.

## event

```
tscli event [-h] {list}
```

This subcommand has the following actions:

```
tscli event list [-h] [--include INCLUDE ] [--since SINCE ] [--from FROM ] [--to TO ] [--limit LIMIT ] [--detail] [--summary_contains SUMMARY_CONTAINS ] [--detail_contains DETAIL_CONTAINS ] [--attributes ATTRIBUTES ]
```

- `--include INCLUDE` Options are all, config, notification. Default config. (default: config)
- `--since SINCE` Grab events from this time window in the past. Should be a human readable duration string, e.g. `4h` (4 hours), `30m` (30 minutes), `1d` (1 day). (default: None)
- `--from FROM` Begin timestamp, must be of the form: `yyyymmdd-HH:MM` (default: None)
- `--to TO` End timestamp, must be of the form: `yyyymmdd-HH:MM` (default: None)
- `--limit LIMIT` Max number of events to fetch. (default: 0)
- `--detail` Print events in detail format. This is not tabular. Default is a tabular summary. (default: False)
- `--summary_contains SUMMARY_CONTAINS` Summary of the event will be checked for this string. Multiple strings to check for can be specified by separating them with `|` (event returned if it matches ALL). Put single quotes around the param value to prevent undesired glob expansion (default: None)
- `--detail_contains DETAIL_CONTAINS` Details of the event will be checked for this string. Multiple strings to check for can be specified by separating them with `|` (event returned if it

matches ALL). Put single quotes around the param value to prevent undesired glob expansion (default: None)

- `--attributes` `ATTRIBUTES` Specify attributes to match as key=value. Multiple attributes to check for can be specified by separating them with `|` (event returned if it matches ALL). Put single quotes around the param value to prevent undesired glob expansion (default: None)

## feature

```
tscli feature [-h] {get-all-config}
```

This subcommand has the following actions:

`tscli feature get-all-config` Gets the configured features in a cluster. The command will return a list of features, such as custom branding, Data Connect, and call home, and tell you whether they are enabled or disabled.

## fileserver

```
tscli fileserver [-h] {configure,download-release,purge-config,show-config,upload}
```

This subcommand has the following actions:

- `tscli fileserver configure [-h] --user` `USER` `[--password` `PASSWORD` `]`  
Configures the secure file server username and password for file upload/download and the call home feature. You only need to issue this command once, to set up the connection to the secure file server. You only need to reissue this command if the password changes. The parameter `PASSWORD` is optional. If a password is not specified, you will be prompted to enter it.
- `tscli fileserver download-release [-h] [--user` `USER` `]` `[--password` `PASSWORD` `]` `release`  
Downloads the specified release file and its checksum. Specify the release by number, to the second decimal point (e.g. 3.1.0, 3.0.5, etc.). You may optionally specify the `--user` and `--password` to bypass the credentials that were specified when configuring the file server connection with `tscli fileserver configure`. Before using this command for the first time, you need to set up the file server connection using `tscli fileserver configure`.
- `tscli fileserver purge-config` Removes the file server configuration.
- `tscli fileserver show-config` Shows the file server configuration.
- `tscli fileserver upload [-h] [--user` `USER` `]` `[--password` `PASSWORD` `]` `--file_name` `FILE_NAME*` `--server_dir_path` `* SERVER_DIR_PATH`

Uploads the file specified to the directory specified on the secure file server. You may optionally specify the `--user` and `--password` to bypass the credentials that were specified when configuring the file server connection with `tscli fileserver configure`. Before using this command for the first time, you need to set up the file server connection using `tscli fileserver configure`.

Accepts these flags

- `--user` `USER` Username of fileserver (default: None)

- `--password` `PASSWORD` Password of fileserver (default: None). This is required and the command prompts you for it if you do not supply it.
- `--file_name` `FILE_NAME` Local file that needs to be uploaded (default: None)
- `--server_dir_path` `SERVER_DIR_PATH` Directory path on fileserver. (default: None) The `SERVER_DIR_PATH` parameter specifies the directory to which you want to upload the file. It is based on your customer name, and takes the form `/Shared/support/* customer_name *`.

## firewall

```
tscli firewall [-h] {close-ports,disable,enable,open-ports,status}
```

- `tscli firewall close-ports`

Closes given ports through firewall on all nodes. Takes a list of ports to close, comma separated. Only closes ports which were previously opened using “open-ports”. Ignores ports which were not previously opened with “open-ports” or were already closed.

- `tscli firewall disable` Disable firewall.
- `tscli firewall enable` Enable firewall.
- `tscli firewall open-ports * ports *`

Opens given ports through firewall on all nodes. Takes a list of ports to open, comma separated. Ignores ports which are already open. Some essential ports are always kept open (e.g. `ssh`), they are not affected by this command or by `close-ports`.

- `tscli firewall status` Shows whether firewall is currently enabled or disabled.

## hdfs

```
tscli hdfs [-h] {leave-safemode}
```

This subcommand has the following actions:

`tscli hdfs leave-safemode` Command to get HDFS namenodes out of safemode.

## ldap

```
tscli ldap [-h] {add-cert,configure,purge-configuration}
```

This subcommand has the following actions:

- `tscli ldap add-cert name certificate`

Adds an SSL certificate for LDAP. Use only if LDAP has been configured without SSL and you wish to add it. Use `* name *` to supply an alias for the certificate you are installing.

- `tscli ldap configure`

Configures LDAP using an interactive script. You can see detailed instructions for setting up LDAP in [About LDAP integration](#).

- `tscli ldap purge-configuration` Purges (removes) any existing LDAP configuration.

## logs

```
tscli logs [-h] {collect,runcmd}
```

This subcommand has the following actions:

- `tscli logs collect [-h] [--include INCLUDE] [--exclude EXCLUDE] [--since SINCE] [--from FROM] [--to TO] [--out OUT] [--maxsize MAXSIZE] [--sizeonly] [--nodes NODES]`

Extracts logs from the cluster. Does not include any logs that have been deleted due to log rotation.

These parameters have the following values:

- `--include INCLUDE`

Specifies a comma separated list of logs to include. Each entry is either a “selector” or a glob for matching files. Selectors must be among: `all`, `orion`, `system`, `ts`. Anything starting with `/` is assumed to be a glob pattern and interpreted via `find(1)`. Other entries are ignored. Put single quotes around the param value to prevent undesired glob expansion (default: `all`)

- `--exclude EXCLUDE`

Comma separated list of logs to exclude. Applies to the list selected by `--include`. Params are interpreted just like in `--include` (default: None)

- `--since SINCE`

Grab logs from this time window in the past. Should be a human readable duration string, e.g. 4h (4 hours), 30m (30 minutes), 1d (1 day). (default: None)

- `--from FROM` Timestamp where collection begins, must be of the form: `yyyymmdd-HH:MM` (default: None)

- `--to TO` Timestamp where collection ends, must be of the form: `yyyymmdd-HH:MM` (default: None)

- `--out OUT` Tarball path for dumping logs from each node (default: `/tmp/logs.tar.gz`)

- `--maxsize MAXSIZE` Only fetch logs if size is smaller than this value. Can be specified in megabytes/gigabytes, e.g. 100MB, 10GB. (default: None)

- `--sizeonly` Do not collect logs. Just report the size. (default: False)

- `--nodes NODES` Comma separated list of nodes from where to collect logs. Skip this to use all nodes. (default: None)

- `tscli logs runcmd [-h] --cmd CMD [--include INCLUDE] [--exclude EXCLUDE] [--since SINCE] [--from FROM] [--to TO] [--outfile OUTFILE] [--outdir OUTDIR] [--cmd_infmt CMD_INFMT] [--cmd_outfmt CMD_OUTFMT] [--nodes NODES]`



Runs a Unix command on logs in the cluster matching the given constraints. Results are reported as text dumped to standard out, the specified output file, or as tarballs dumped into the specified directory.

- `--cmd` `CMD`

Unix-Command to be run on the selected logs. Use single quotes to escape spaces etc. Language used to specify CMDSTR has following rules.

- A logfile and its corresponding result file can be referred by keywords `SRCFILE` & `DSTFILE` . eg. `cp SRCFILE DSTFILE`
- Without any reference to `DSTFILE` in `CMDSTR`, `> DSTFILE` will be appended to `CMDSTR` for output redirection. eg `du -sch SRCFILE` gets auto- transtalted to `du -sch SRCFILE > DSTFILE`
- Without any reference to `SRCFILE`, content of log is streamed to `CMDSTR` via pipe. eg. `tail -n100 | grep ERROR` gets auto- transtalted to `cat SRCFILE | tail -n100 | grep ERROR > DSTFILE` (default: None)

- `--include` `INCLUDE`

Comma separated list of logs to include,each entry is either a “selector” or a glob for matching files.Selectors must be among: `all` , `orion` , `system` , `ts` . Anything starting with `/` is assumed to be a glob pattern and interpreted via `find(1)` . Other entries are ignored. TIP: put single quotes around the param value to prevent undesired glob expansion (default: all)

- `--exclude` `EXCLUDE`

Comma separated list of logs to exclude. Applies to the list selected by `--include` . Params are interpreted just like in `--include` (default: None)

- `--since` `SINCE`

Grab logs from this time window in the past. Should be a human readable duration string, e.g. `4h` (4 hours), `30m` (30 minutes), `1d` (1 day). (default: None)

- `--from` `FROM` Timestamp where collection begins, must be of the form: `yyyymmdd-HH:MM` (default: None)

- `--to` `TO` Timestamp where collection ends, must be of the form: `yyyymmdd-HH:MM` (default: None)

- `--outfile` `OUTFILE` File path for printing all the results. By default printed to stdout (default: None)

- `--outdir` `OUTDIR` Directory path for dumping results with original dir structure from each node. Used as an alternative to printing output to outfile/stdout (default: None)

- `--cmd_infmt` `CMD_INFMT` Specify if the inputfile should be compressed/uncompressed before running `CMD` . `C` =compressed, `U` =uncompressed. Don't use this flag if `CMD` works on both (default: None)

- `--cmd_outfmt` `CMD_OUTFMT` Specify if `OUTFILE` generated by `CMD` will be compressed/uncompressed. `C` =compressed, `U` =uncompressed. Don't use this flag if output file will be of same format as input file (default: None)

- `--nodes` `NODES` Comma separated list of nodes where to run command. Skip this to use all nodes. (default: None)

## map-tiles

```
tscli map-tiles [-h] {disable,enable}
```

This subcommand supports the following actions:

- `tscli map-tiles enable [-h] [--online] [--offline] [--tar TAR] [--md5 MD5]`

Enables ThoughtSpot's map tiles, which are used when constructing geomap charts. If you don't have internet access, you must download the map tiles tar and md5 files. Then you must append the following to the `tscli` command.

- `--online` Download `maptiles` tar from internet. (default: True)
- `--offline` Using `maptiles` tar from local disk. (default: False)
- `--tar TAR` Specified tar file for map-tiles. (default: )
- `--md5 MD5` Specified md5 file for map-tiles. (default: )
- `tscli map-tiles disable` Disable map-tiles functionality.

## monitoring

```
tscli monitoring [-h] {set-config,show-config}
```

This subcommand has the following actions:

- `tscli monitoring set-config [-h] [--email EMAIL] [--clear_email] [--heartbeat_interval HEARTBEAT_INTERVAL] [--heartbeat_disable] [--report_interval REPORT_INTERVAL] [--report_disable]` Sets the monitoring configuration.
  - `--email EMAIL` Comma separated list (no spaces) of email addresses where the cluster will send monitoring information.
  - `--clear_email` Disable emails by clearing email configuration. (default: False)
  - `--heartbeat_interval HEARTBEAT_INTERVAL` Heartbeat email generation interval in seconds. Should be greater than 0.
  - `--heartbeat_disable` Disable heartbeat email generation. (default: False)
  - `--report_interval REPORT_INTERVAL` Cluster report email generation interval in seconds. Should be greater than 0.
  - `--report_disable` Disable cluster report email generation. (default: False)
- `tscli monitoring show-config` Shows the monitoring configuration.

## nas

```
tscli nas [-h] {ls,mount-cifs,mount-nfs,unmount}
```

This subcommand has the following actions:

- `tscli nas ls [-h]` List mounts managed by NAS mounter service.
- `tscli nas mount-cifs [-h] --server SERVER [--path_on_server PATH_ON_SERVER ] --mount_point MOUNT_POINT --username USERNAME --password PASSWORD [--uid UID ] [--gid GID ] [--options OPTIONS ]`

Mounts a CIFS device on all nodes.

- `--server SERVER` IP address or DNS name of CIFS service. For example, `10.20.30.40` (default: None)
- `--path_on_server PATH_ON_SERVER` Filesystem path on the CIFS server to mount (source). For example: `/a` (default: `/` )
- `--mount_point MOUNT_POINT`  
Directory on all cluster nodes where the NFS filesystem should be mounted (target). This directory does not need to already exist. If this directory already exists, a new directory is not created and the existing directory is used for mounting. For example: `/mnt/external` (default: None)
- `--username USERNAME` Username to connect to the CIFS filesystem as (default: None)
- `--password PASSWORD` CIFS password for `--username` (default: None)
- `--uid UID`  
`UID` that will own all files or directories on the mounted filesystem when the server does not provide ownership information. See `man mount.cifs` for more details. (default: `1001` )
- `--gid GID`  
Gid that will own all files or directories on the mounted filesystem when the server does not provide ownership information. See `man mount.cifs` for more details. (default: `1001` )
- `--options OPTIONS` Other command-line options to forward to `mount.cifs` command (default: `noexec` )
- `tscli nas mount-nfs [-h] --server SERVER [--protocol PROTO --path_on_server PATH_ON_SERVER] --mount_point MOUNT_POINT [--options OPTIONS]`

Mounts a NFS device on all nodes. Parameters are:

- `--server SERVER` IP address or DNS name of NFS service. For example, `10.20.30.40` (default: None)
- `--path_on_server PATH_ON_SERVER` Filesystem path on the NFS server to mount (source). For example: `/a/b/c/d` (default: `/` )
- `--mount_point MOUNT_POINT`  
Directory on all cluster nodes where the NFS filesystem should be mounted (target). This directory does not need to already exist. If this directory already exists, a new directory is not created and the existing directory is used for mounting. For example: `/mnt/external` (default: None)
- `--options OPTIONS` Command-line options to forward to mount command (default: `noexec` ).
- `--protocol PROTO` One of `nfs` or `nfs4` . The default is `nfs` .
- `tscli nas unmount [-h] --dir DIR`

Unmounts all devices from the specified `DIR` (directory) location. This command returns an error if nothing is currently mounted on this directory via `tscli nas mount` (default: None)

## node

```
tscli node [-h] {check,ls,reinstall-os,resume-reinstall-os,status} ...
```

This subcommand has the following actions:

- `tscli node check [-h] [--select {reinstall-preflight}] [--secondary SECONDARY ]`

Run checks per node. Takes the following parameters:

- `--select {reinstall-preflight}` Select the type of node check (default: `reinstall-preflight`)
- `--secondary SECONDARY` Secondary drive for `reinstall-preflight` (default: `sdd`)
- `tscli node ls [-h] [--type {all,healthy,not-healthy}]` Filter by node state (default: `all`)
- `tscli node reinstall-os [-h] [--secondary SECONDARY ] [--cluster]` Reinstall OS on a node. This takes the following parameters:
  - `--secondary SECONDARY` Secondary drive to be used to carry to reinstall (default: `sdd`)
  - `--cluster` Is the node part of a cluster (default: `False`)
- `tscli node resume-reinstall-os` Resume in-progress reinstall

## rpackage

```
tscli rpackage [-h] {add,delete,list} ...
```

Manages R packages available to SpotIQ.

- `tscli rpackage add [-h] [--repo REPO ] [--timeout TIMEOUT ] [--dest_dir DEST_DIR ] [--nodes NODES ] package_name` Command to add an R `package_name` to the cluster. This command has the following options:
  - `--repo REPO` Specify the url of a specific repo to download packages
  - `--timeout REPO` Timeout waiting for the R Package to be installed (default: 60)
  - `--dest_dir REPO` Directory where output of this command will be placed (default: None)
  - `--nodes NODES` Space separated IPs of nodes where you want to run the command. (default: all).

- `tscli rpackage add [-h] [--timeout TIMEOUT] [--dest_dir DEST_DIR] [--nodes NODES] package_name` Command to delete an installed R package from the cluster. This command has the following options:
  - `--timeout REPO` Timeout waiting for the R Package to be removed (default: 60)
  - `--dest_dir REPO` Directory where output of this command will be placed (default: None)
  - `--nodes NODES` Space separated IPs of nodes where you want to run the command. (default: all).
- `tscli rpackage list [-h] [--detailed]` List all R packages installed on the cluster.

## saml

```
tscli saml [-h] {configure,purge-configuration}
```

This subcommand has the following actions:

- `tscli saml configure [-h]` Configures SAML. To see a list of prerequisites refer to [Configure SAML](#).
- `tscli saml purge-configuration` Purges any existing SAML configuration.

## scheduled-pinboards

```
tscli scheduled-pinboards [-h] {disable,enable}
```

This subcommand has the following actions:

- `tscli scheduled-pinboards disable [-h]` Disable scheduled pinboards for this cluster.
- `tscli scheduled-pinboards enable [-h]` Enables scheduled pinboards, which is disabled in prod clusters by default.

**Note:** When you enable scheduled pinboards, you should also configure a whitelist of intended email domains. Contact ThoughtSpot Support for help configuring a whitelist.

## smtp

```
tscli smtp [-h] {reset-canonical-mapping,set-canonical-mapping,
set-mailfromname,set-mailname,set-relayhost,show-canonical-mapping,
show-mailfromname,show-mailname,show-relayhost}
```

This subcommand takes supports the following actions:

- `tscli smtp reset-canonical-mapping` Deletes the current postmap mapping.
- `tscli smtp set-canonical-mapping [-h] new_key new_value` Sets a new Postmap

mapping.

- `tscli smtp set-mailfromname mailfromname` Sets the name, an email address, from which email alerts are sent, for the cluster.
- `tscli smtp set-mailname mailname` Sets the mailname, a domain, where email alerts are sent, for the cluster.
- `tscli smtp set-relayhost [-h] [--force FORCE] relayhost` Sets the Relay Host for SMTP (email) sent from the cluster.
  - `--force FORCE` Set even if relay host is not accessible. (default: `False`)
- `tscli smtp show-canonical-mapping` Shows the current postmap mapping.
- `tscli smtp show-mailfromname` Shows the mailname, from which email alerts are sent, for the cluster.
- `tscli smtp show-mailname` Shows the mailname, where email alerts are sent, for the cluster.
- `tscli smtp show-relayhost` Shows the for SMTP (email) sent from the cluster. If there is no Relay Host configured, the command returns `NOT FOUND`.

## snapshot

```
tscli snapshot [-h] {backup,create,delete,ls,restore,update-ttl}
```

Learn more about snapshots and backups see the [Understand the backup strategies](#) documentation. This subcommand supports the following actions:

- `tscli snapshot backup [-h] [--mode {full,light,dataless}] [--type {full,incremental}] [--base BASE] [--storage_type {local,nas}] [--remote] name out`

Pull snapshot out as a backup. This takes the following parameters:

- `--mode {full,light,dataless}` Mode of backups. (default: `full`)
- `name` Name of snapshot to pull out as a backup. To list all snapshots, run `tscli snapshot ls`.
- `out` Directory where backup will be written, must not already exist.
- `--type {full,incremental}` Type of backup.(Incremental backup is not implemented yet) (default: `full`)
- `--base BASE` Based snapshot name for incremental backup. (Not Implemented yet) (default: `None`)
- `--storage_type {local,nas}` Storage type of output directory. (default: `local`)
- `--remote` Take backup through Orion master. (default: `True`)
- `tscli snapshot create [-h] name reason ttl`  
Creates a new snapshot with the `name` and `reason` provided. This command does not accept `.` (periods), but does accept `-` (dashes). The `ttl` parameters is the number of days after which this snapshot will be automatically deleted. A value of `-1` disables automatic deletion.
- `tscli snapshot delete [-h] name` Deletes the named snapshot.
- `tscli snapshot ls [-h]` List available snapshots.

- `tscli snapshot restore [-h] [--allow_release_change] [--only_service_state] name` Restore cluster to an existing snapshot. This takes the following parameters:
  - `--allow_release_change` Allow restoration to a snapshot at a different release. (default: `False`)
  - `--only_service_state` Restore only service state. (default: `False`)
- `tscli snapshot update-ttl [-h] [--disable DISABLE ] name ttl`

Updates manual snapshot garbage collection policy.

- `name` Specifies which snapshot to update.
- `ttl` Extends the manual snapshot `ttl` (time-to-live) value. Use a positive value to increase `ttl`. Use negative value to decrease it.
- `--disable DISABLE` Disable manual snapshot garbage collection. Setting this value to `True` will override any `ttl` value. (default: `False`)

## snapshot-policy

```
tscli snapshot-policy [-h] {disable,enable,show,update}
```

This subcommand supports the following actions:

- `tscli snapshot-policy disable [-h]` Disable snapshot policy.
- `tscli snapshot-policy enable -h` Enable specified snapshot policy.
- `tscli snapshot-policy show [-h]` Show snapshot policy.
- `tscli snapshot-policy update [-h] [--config CONFIG ]` Update periodic snapshot config. This takes the following parameter:
  - `--config CONFIG` Text format of periodic backup policy config (default: `None`)

## spot

```
tscli spot [-h] {enable}
```

Enables Spot integration. This subcommand supports the following actions:

```
tscli spot enable [-h] --token TOKEN --thoughtspot_url THOUGHTSPOT_URL [--cache_timeout CACHE_TIMEOUT ]
```

- `--token TOKEN` Slack authorization token for Spot bot. This is required. You receive this token when your Slack administrator adds the Spot application.
- `--thoughtspot_url THOUGHTSPOT_URL` URL for the ThoughtSpot application. This is required.
- `--cache_timeout CACHE_TIMEOUT` Internal cache timeout (default: `60000`)

## ssl

```
tscli ssl [-h] {add-cert,clear-min-tls-version,off,on,rm-cert,
set-min-tls-version,status,tls-status}
```

This subcommand supports the following actions:

- `tscli ssl add-cert [-h] key certificate` Adds an SSL certificate, key pair.
- `tscli ssl clear-min-tls-version [-h]` Clears any customizations for the minimum TLS version to support.
- `tscli ssl off`  
Disables SSL. Disabling SSL will stop users from seeing a security warning when accessing ThoughtSpot from a browser if there is no SSL certificate installed.
- `tscli ssl on [-h]` If SSL is enabled and there is no certificate, users will see a security warning when accessing ThoughtSpot from a browser.
- `tscli ssl rm-cert` Removes the existing SSL certificate, if any.
- `tscli ssl set-min-tls-version [-h] {1.0,1.1,1.2}` Sets the minimum supported TLS version. Sets the minimum SSL version to be supported by the ThoughtSpot application. Please ensure that client browsers are enabled for this version or newer.
- `tscli ssl status` Shows whether SSL authentication is enabled or disabled.
- `tscli ssl tls-status [-h]` Prints the status of TLS support.

## storage

```
tscli storage [-h] gc df
```

This subcommand supports the following actions:

- `tscli storage gc [-h] [--log_age LOG_AGE ] [--force] [--localhost_only]`  
Garbage collect unused storage. Before issuing this command, you must stop the cluster using `tscli cluster stop`. After garbage collection has completed, you can restart the cluster with `tscli cluster start`. The command frees space in these directories:
  - `/tmp`
  - `/usr/local/scaligent/logs/`
  - `/export/logs/orion`
  - `/export/logs/oreo`
  - `/export/logs/hadoop`
  - `/export/logs/zookeeper`
  - `cores`

Accepts these optional flags:

- `--log_age LOG_AGE`



Delete logs older than these many hours. Use a non-zero value ideally. A zero value will cause all temporary files to be deleted, including say those which are just temporarily closed while they are being passed from one component to the next. (default: 4 )

- `--force` Forces deletion of all logs and temporary files regardless of age. This must only be run on a stopped cluster. (default: False)
- `--localhost_only` If used, only the logs on the localhost will be removed. If not specified, the command acts on the entire cluster.
- `tscli storage df [--mode disk|hdfs]`

Checks the disk usage on the relevant mounts. Returns output similar to the Linux system command `df -h <directory>`.

## support

```
tscli support [-h]
{restart-remote,rm-admin-email, rm-admin-phone, rm-feedback-email, set-admin-email, set-admin-phone, set-feedback-email, set-remote, show-admin-email, show-admin-phone, show-feedback-email, show-remote, start-remote, stop-remote}
```

This subcommand supports the following actions:

- `tscli support bundle [-h] [--include INCLUDE] [--exclude EXCLUDE] [--list_selectors] [--since SINCE] [--from FROM] [--to TO] [--out OUT] [--nodes NODES]`
  - `--include INCLUDE` Comma separated list of selectors to include, each entry is either a “selector” or a glob for matching files. To see the list of valid selectors, run this command with `--list_selectors`. You may also specify: “all” to get all selectors and logs, and “basic” to get only the basic selectors. Selectors may also be selectors meant for logs collect: all, orion, system, ts, or the name of a service. Anything starting with / is assumed to be a glob pattern and interpreted via find(1). Other entries are ignored. TIP: put single quotes around the param value to prevent undesired glob expansion. Use “all” to collect all selectors and all logs (default: all\_but\_logs)
  - `--exclude EXCLUDE` Comma separated list of selectors to exclude. Applies to the list selected by `--include`. Params are interpreted just like in `--include`. Use the special keyword “logs” to exclude logs collection all together. (default: None)
  - `--list_selectors` List the selectors available for `--include` and `--exclude`, and then exit. (default: False)
  - `--since SINCE` Grab logs from this time window in the past. Should be a human readable duration string, e.g. 4h (4 hours), 30m (30 minutes), 1d (1 day). (default: None)
  - `--from FROM` Timestamp where collection begins, must be of the form: `yyyymmdd-HH:MM` (default: None)

- `--to TO` Timestamp where collection ends, must be of the form: `yyyymmdd-HH:MM` (default: None)
  - `--out OUT` Tarball path for dumping the support bundle (default: `/tmp/support_bundle.tar.gz`)
  - `--nodes NODES` Comma separated list of nodes from where to collect logs. Skip this to use all nodes. (default: None)
- 
- `tscli support restart-remote` Restarts remote support.
  - `tscli support rm-admin-email` Removes the email address for contacting the customer administrator. Replaces it with the default ThoughtSpot Support email address.
  - `tscli support rm-feedback-email` Removes the email address for product feedback. Replaces it with the default ThoughtSpot Support email address.
  - `tscli support rm-admin-phone` Removes the phone number for contacting the customer administrator. Replaces it with the default ThoughtSpot Support phone number.
  - `tscli support rm-feedback-email` Removes the email for sending feedback out of the system. If you would like to set a blank email address, issue the command `tscli support set-feedback-email ' '`.
  - `tscli support set-admin-email email` Sets the email address for contacting the customer administrator. If you would like to display a blank email address, issue the command `tscli support set-admin-email ' '`.
  - `tscli support set-feedback-email email` Sets the email address for sending feedback. If you would like to display a blank email address, issue the command `tscli support set-feedback-email ' '`.
  - `tscli support set-admin-phone phone_number` Sets the phone number for contacting the customer administrator. Specify a phone number using any value (e.g. `+1 800-508-7008 Ext. 1`). If you would like to display a blank phone number, issue the command `tscli support set-admin-phone`.
  - `tscli support set-remote [-h] [--addr ADDR] [--user USER]` Configures the cluster for remote support through SSH tunneling, where `ADDR` is the address of support, e.g. `tunnel.thoughtspot.com`, and `USER` is the support username.
  - `tscli support show-admin-email` Shows the email address for customer administrator, if set.
  - `tscli support show-feedback-email` Shows the email address for product feedback, if set.
  - `tscli support show-admin-phone` Shows the phone number for customer administrator, if set.
  - `tscli support show-remote` Shows the status and configuration of remote support.
  - `tscli support start-remote` Starts remote support.
  - `tscli support stop-remote` Stops remote support.

## tokenauthentication

```
tscli cli tokenauthentication [-h] {disable,enable}
```

- `tscli cli tokenauthentication enable` Generates a token.
- `tscli cli tokenauthentication disable` Purges token login configuration.

# Date and time formats reference

This is a references for the date and time contexts and formats you can use with ThoughtSpot. You define data formats in specific contexts and, depending on the context, your choices in data formatting differ. You must understand date and time when you load data in these contexts:

- using data upload from the browser
- through `tsload` command
- through data connect or another extract, transform, load (ETL) tool

Data loading formats do not change how data is displayed in tables and charts.

The context where you *can control* date and time formats is data modeling. Data modeling controls how data is displayed in search and their resulting answers.

## Data loading formats via tsload

When loading via the `tsload` command you must specify `date` and `timestamp` formats using the format specifications defined in the `strptime` library function. Data is imported based on the timezone of the node from which `tsload` is run.

For `date` data types, the default format is `%Y%m%d` which translates to `yearmonthday`. For example, `Dec 30th, 2001` is represented as `20011230`. For `time` and `datetime` data types, the default is `%Y%m%d %H:%M:%S` which translates to `yearmonthday hour:minute:second`, for example, `Dec 30th, 2001 1:15:12` is represented as `20011230 01:15:12`.

## Data modeling formats for browser data upload

These date and time formats are supported in a CSV file when uploading via the browser. You cannot specify the date format; ThoughtSpot will pick the format that fits your data best:

- 1/30/2014
- 2014-01-30
- 2014-1-30
- 30-Jan-2014
- 2014-Jan-30
- 2014-01-30 10:32 AM
- 2014-01-30 14:52
- 2014-01-30 10:32:22
- 2014-01-30 10:32:22 AM
- 2014-01-30 10:32:22.0
- 2014-01-30 10:32:22.0 AM
- 2014-01-30 10:32:22.000
- 2014-01-30 10:32:22.000 AM
- 1/30/2014
- 30-Jan-14
- 01-Mar-02 (assumes 2002)
- 30/1/2014 10:32 AM
- 30/1/2014 14:52
- 30/1/2014 10:32:22
- 30/1/2014 10:32:22 AM
- 30/1/2014 10:32:22.0

- 30/1/2014 10:32:22.0 AM
- 30/1/2014 10:32:22.000
- 30/1/2014 10:32:22.000 AM
- 30-Jan-14 10:32 AM
- 30-Jan-14 14:52
- 30-Jan-14 10:32:22
- 30-Jan-14 10:32:22 AM
- 30-Jan-14 10:32:22.0
- 30-Jan-14 10:32:22.0 AM
- 30-Jan-14 10:32:22.000
- 30-Jan-14 10:32:22.000 AM
- Fri Jan 30 2014 3:26 PM
- Fri Jan 30 2014 13:46
- Fri Jan 30 2014 10:32:22
- Fri Jan 30 2014 10:32:22 AM
- Fri Jan 30 2014 10:32:22.0
- Fri Jan 30 2014 10:32:22.0 AM
- Fri Jan 30 2014 10:32:22.000
- Fri Jan 30 2014 10:32:22.000 AM
- 14:52
- 10:32 AM
- 10:32:22
- 10:32:22 AM
- 10:32:22.0
- 10:32:22.000
- 10:32:22.0 AM
- 10:32:22.000 AM

## Data loading formats via data connect or another ETL tool

Data that is loaded via ETL arrives through ODBC or JDBC connection. After you extract the data from the source and before you load it into ThoughtSpot, you must transform any date or timestamp into a valid format for ThoughtSpot. Once transformed, no explicit data masking is required. See the data integration guide for more details of loading data via ODBC and JDBC.

## Data modeling formats

A user with administrative rights can configure data modeling for data on one or all files. You can set number, date, and currency display formats. These formats define how these value types display in tables and charts. See the Admin Guide for more information about data modeling settings. The following format strings are available for use:

Format mask	Description
YYYY or yyyy	four digit year such as 2017
YY or yy	last two digits of year such as 17
M	month with no leading zero 1 - 12
MM	Two digit month 01 - 12

Format mask	Description
MMM	Three letter month such as Jan
D	Day of year without a leading zero 0 - 365
DD	Day of year with up to one leading zero 01 - 365
DDD	Day of year with up to two leading zeroes 001 - 365
d	Day of month with no leading zero 1 - 31
dd	Two digit day of month 01 - 31
HH	Two digit 24 hour representation of hour 00 - 23
hh	Two digit 12 hour representation of hour 01 - 12
H	24 hour representation of hour with no leading zero 0 - 23
h	12 hour representation of hour with no leading zero 1 - 12
mm	Minutes 00 - 59
m	Minutes with no leading zero 0 - 59
ss	Seconds 00 - 59
s	Seconds with no leading zero 0 - 59
a	AM/PM indicator

Valid delimiters include most non-alphabet characters. This includes but is not limited to:

- \ (forward slash)
- / (backward slash)
- | (pipe symbol)
- : (colon)
- - (dash)
- \_ (underscore)
- = (equal sign)

Examples of valid format masks you can produce for display are as follows:

- MM/dd/yyyy
- MMM
- DD/MM/yyyy
- MM/dd/yyyy HH:mm
- DD/MM/yyyy HH:mm

# Row level security rules reference

ThoughtSpot allows you to create row level security rules using expressions. If an expression evaluates to “true” for a particular row and group combination, that group will be able to see that row. This reference lists the various operators and functions you can use to create rules.

For information on how to use the row level security functions and operators, see [About Rule-Based Row Level Security](#). There is a special variable called `ts_groups`, which you can use when creating row level security rules. It fetches a list of the groups that the currently logged in user belongs to. For each row, if the expression in the rule evaluates to ‘true’ for any one of these groups, that row will be shown to the user.

You can also see this list of operators and examples from within the Rule Builder by selecting **Rule Assistant**.

## Conversion functions

These functions can be used to convert data from one data type to another. Conversion to or from date data types is not supported.

Function	Description	Examples
<code>to_bool</code>	Returns the input as a boolean (true or false).	<code>to_bool (0) = false</code> <code>to_bool (married)</code>
<code>to_date</code>	Accepts a date represented as an integer or text string, and a second string parameter that can include strftime date formatting elements. Replaces all the valid strftime date formatting elements with their string counterparts and returns the result. Does not accept epoch formatted dates as input.	<code>to_date (date_sold, '%Y-%m-%d')</code>
<code>to_double</code>	Returns the input as a double.	<code>to_double ('3.14') = 3.14</code> <code>to_double (revenue * .01)</code>
<code>to_integer</code>	Returns the input as an integer.	<code>to_integer ('45') + 1 = 46</code> <code>to_integer (price + tax - cost)</code>
<code>to_string</code>	Returns the input as a text string.	<code>to_string (45 + 1) = '46'</code> <code>to_string (revenue - cost)</code>

## Date functions

Function	Description	Examples
<code>add_days</code>	Returns the result of adding the specified number of days to the given date.	<code>add_days (01/30/2015, 5) = 02/04/2015</code> <code>add_days (invoiced, 30)</code>
<code>date</code>	Returns the date portion of a given date.	<code>date (home visit)</code>
<code>day</code>	Returns the number (1-31) of the day for the given date.	<code>day (01/15/2014) = 15</code> <code>day (date ordered)</code>
<code>day_number_of_week</code>	Returns the number (1-7) of the day in a week for the given date with 1 being Monday and 7 being Sunday.	<code>day_number_of_week (01/30/2015) = 6</code> <code>day_number_of_week (shipped)</code>
<code>day_number_of_quarter</code>	Returns the number of the day in a quarter for a given date.	<code>day_number_of_quarter (01/30/2015)</code>
<code>day_number_of_week</code>	Returns the number of the day in a week for a given date.	<code>day_number_of_week(01/15/2014) &gt; 3</code>
<code>day_number_of_year</code>	Returns the number (1-366) of the day in a year for the given date.	<code>day_number_of_year (01/30/2015) = 30</code> <code>day_number_of_year (invoiced)</code>
<code>day_of_week</code>	Returns the day of the week for the given date.	<code>day_of week (01/30/2015) = Friday</code> <code>day_of_week (serviced)</code>
<code>diff_days</code>	Subtracts the second date from the first date and returns the result in number of days, rounded down if not exact.	<code>diff_days (01/15/2014, 01/17/2014) = -2</code> <code>diff_days (purchased, shipped)</code>

Function	Description	Examples
<code>diff_time</code>	Subtracts the second date from the first date and returns the result in number of seconds.	<code>diff_time (01/01/2014, 01/01/2014)</code> = -86,400 <code>diff_time (clicked, submitted)</code>
<code>hour_of_day</code>	Returns the hour of the day for the given date.	<code>hour_of_day (received)</code>
<code>is_weekend</code>	Returns true if the given date falls on a Saturday or Sunday.	<code>is_weekend (01/31/2015) = true</code> <code>is_weekend (emailed)</code>
<code>month</code>	Returns the month from the given date.	<code>month (01/15/2014) = January</code> <code>month (date ordered)</code>
<code>month_number</code>	Returns the number (1-12) of the month for the given date.	<code>month_number (09/20/2014) = 9</code> <code>month_number (purchased)</code>
<code>month_number_of_quarter</code>	Returns the month (1-12) number for the given date in a quarter.	<code>month_number_of_quarter (02/20/2018) &gt; 9</code>
<code>now</code>	Returns the current timestamp.	<code>now ()</code>
<code>start_of_month</code>	Returns <code>MMM yyyy</code> for the first day of the month. Your installation configuration can override this setting so that it returns a different format such as <code>MM/dd/yyyy</code> . Speak with your ThoughtSpot administrator for information on doing this.	<code>start_of_month ( 01/31/2015 ) = Jan FY 2015</code> <code>start_of_month (shipped)</code>
<code>start_of_quarter</code>	Returns the date for the first day of the quarter for the given date.	<code>start_of_quarter ( 09/18/2015 ) = Q3 FY 2015</code> <code>start_of_quarter (sold)</code>
<code>start_of_week</code>	Returns the date for the first day of the week for the given date.	<code>start_of_week ( 06/01/2015 ) = 05/30/2015 Week</code> <code>start_of_week (emailed)</code>



Function	Description	Examples
<code>start_of_year</code>	Returns the date for the first day of the year for the given date.	<code>start_of_year ( 02/15/2015 ) = FY 2015</code> <code>start_of_year (joined)</code>
<code>time</code>	Returns the time portion of a given date.	<code>time (3/1/2002 10:32) = 10:32</code> <code>time (call began)</code>
<code>week_number_of_month</code>	Returns the week number for the given date in a month.	<code>week_number_of_month(03/23/2017) = 3</code>
<code>week_number_of_quarter</code>	Returns the week number for the given date in a quarter.	<code>week_number_of_quarter(04/03/2017)&gt; 2</code>
<code>week_number_of_year</code>	Returns the week number for the given date in a year.	<code>week_number_of_year(04/03/2017) = 20</code>
<code>year</code>	Returns the year from the given date.	<code>year (01/15/2014) = 2014</code> <code>year (date ordered)</code>

## Mixed functions

These functions can be used with text and numeric data types.

Function	Description	Examples
<code>!=</code>	Returns true if the first value is not equal to the second value.	<code>3 != 2 = true</code> <code>revenue != 1000000</code>
<code>&lt;</code>	Returns true if the first value is less than the second value.	<code>3 &lt; 2 = false</code> <code>revenue &lt; 1000000</code>
<code>&lt;=</code>	Returns true if the first value is less than or equal to the second value.	<code>1 &lt;= 2 = true</code> <code>revenue &lt;= 1000000</code>
<code>=</code>	Returns true if the first value is equal to the second value.	<code>2 = 2 = true</code> <code>revenue = 1000000</code>
<code>&gt;</code>	Returns true if the first value is greater than the second value.	<code>3 &gt; 2 = true</code> <code>revenue &gt; 1000000</code>
<code>&gt;=</code>	Returns true if the first value is greater than or equal to the second value.	<code>3 &gt;= 2 = true</code> <code>revenue &gt;= 1000000</code>
<code>greatest</code>	Returns the larger of the values.	<code>greatest (20, 10) = 20</code> <code>greatest (q1 revenue, q2 revenue)</code>

Function	Description	Examples
<code>least</code>	Returns the smaller of the values.	<code>least (20, 10) = 10</code> <code>least (q1 revenue, q2 revenue)</code>

## Number functions

Function	Description	Examples
<code>?</code>	Returns the result of multiplying both numbers.	<code>3 * 2 = 6</code> <code>price * taxrate</code>
<code>+</code>	Returns the result of adding both numbers.	<code>1 + 2 = 3</code> <code>price + shipping</code>
<code>-</code>	Returns the result of subtracting the second number from the first.	<code>3 - 2 = 1</code> <code>revenue - tax</code>
<code>/</code>	Returns the result of dividing the first number by the second.	<code>6 / 3 = 2</code> <code>markup / retail price</code>
<code>^</code>	Returns the first number raised to the power of the second.	<code>3 ^ 2 = 9</code> <code>width ^ 2</code>
<code>abs</code>	Returns the absolute value.	<code>abs (-10) = 10</code> <code>abs (profit)</code>
<code>acos</code>	Returns the inverse cosine in degrees.	<code>acos (0.5) = 60</code> <code>acos (cos-satellite-angle)</code>
<code>asin</code>	Returns the inverse sine (specified in degrees).	<code>asin (0.5) = 30</code> <code>asin (sin-satellite-angle)</code>
<code>atan</code>	Returns the inverse tangent in degrees.	<code>atan (1) = 45</code> <code>atan (tan-satellite-angle)</code>
<code>atan2</code>	Returns the inverse tangent in degrees.	<code>atan2 (10, 10) = 45</code> <code>atan2 (longitude, latitude)</code>
<code>cbrt</code>	Returns the cube root of a number.	<code>cbrt (27) = 3</code> <code>cbrt (volume)</code>
<code>ceil</code>	Returns the smallest following integer.	<code>ceil (5.9) = 6</code> <code>ceil (growth rate)</code>
<code>cos</code>	Returns the cosine of an angle (specified in degrees).	<code>cos (63) = 0.45</code> <code>cos (beam angle)</code>
<code>cube</code>	Returns the cube of a number.	<code>cube (3) = 27</code> <code>cube (length)</code>

Function	Description	Examples
<code>exp</code>	Returns Euler's number (~2.718) raised to a power.	<code>exp (2) = 7.38905609893</code> <code>exp (growth)</code>
<code>exp2</code>	Returns 2 raised to a power.	<code>exp2 (3) = 8</code> <code>exp2 (growth)</code>
<code>floor</code>	Returns the largest previous integer.	<code>floor (5.1) = 5</code> <code>floor (growth rate)</code>
<code>ln</code>	Returns the natural logarithm.	<code>ln (7.38905609893) = 2</code> <code>ln (distance)</code>
<code>log10</code>	Returns the logarithm with base 10.	<code>log10 (100) = 2</code> <code>log10 (volume)</code>
<code>log2</code>	Returns the logarithm with base 2 (binary logarithm).	<code>log2 (32) = 5</code> <code>log2 (volume)</code>
<code>mod</code>	Returns the remainder of first number divided by the second number.	<code>mod (8, 3) = 2</code> <code>mod (revenue , quantity )</code>
<code>pow</code>	Returns the first number raised to the power of the second number.	<code>pow (5, 2) = 25</code> <code>pow (width, 2)</code>
<code>random</code>	Returns a random number between 0 and 1.	<code>random ( ) = .457718</code> <code>random ( )</code>
<code>round</code>	Returns the first number rounded to the second number (the default is 1).	<code>round (35.65, 10) = 40</code> <code>round (battingavg, 100)</code>
<code>safe_divide</code>	Returns the result of dividing the first number by the second. If the second number is 0, returns 0 instead of NaN (not a number).	<code>safe_divide (12, 0) = 0</code> <code>safe_divide (total_cost, units)</code>
<code>sign</code>	Returns +1 if the number is greater than zero, -1 if less than zero, 0 if zero.	<code>sign (-250) = -1</code> <code>sign (growth rate)</code>
<code>sin</code>	Returns the sine of an angle (specified in degrees).	<code>sin (35) = 0.57</code> <code>sin (beam angle)</code>
<code>spherical_distance</code>	Returns the distance in km between two points on Earth.	<code>spherical_distance (37.465191, -122.153617, 37.421962, -122.142174) = 4,961.96</code> <code>spherical_distance (start_latitude, start_longitude, start_latitude, start_longitude)</code>

Function	Description	Examples
<code>sq</code>	Returns the square of a numeric value.	<code>sq (9) = 81</code> <code>sq (width)</code>
<code>sqrt</code>	Returns the square root.	<code>sqrt (9) = 3</code> <code>sqrt (area)</code>
<code>tan</code>	Returns the tangent of an angle (specified in degrees).	<code>tan (35) = 0.7</code> <code>tan (beam angle)</code>

## Operators

Operator	Description	Examples
<code>and</code>	Returns true when both conditions are true, otherwise returns false.	<code>(1 = 1) and (3 &gt; 2) = true</code> <code>lastname = 'smith' and state = 'texas'</code>
<code>if...then...else</code>	Conditional operator.	<code>if (3 &gt; 2) then 'bigger' else 'not bigger'</code> <code>if (cost &gt; 500) then 'flag' else 'approve'</code>
<code>ifnull</code>	Returns the first value if it is not null, otherwise returns the second.	<code>ifnull (cost, 'unknown')</code>
<code>isnull</code>	Returns true if the value is null.	<code>isnull (phone)</code>
<code>not</code>	Returns true if the condition is false, otherwise returns false.	<code>not (3 &gt; 2) = false</code> <code>not (state = 'texas')</code>
<code>or</code>	Returns true when either condition is true, otherwise returns false.	<code>(1 = 5) or (3 &gt; 2) = true</code> <code>state = 'california' or state = 'oregon'</code>

## Text functions

Function	Description	Examples
<code>concat</code>	Returns the one or more values as a concatenated text string. Be sure to use single quotes instead of double quotes around each of the strings.	<code>concat ( 'hay' , 'stack' ) = 'haystack'</code> <code>concat (last_name , first_name )</code>

Function	Description	Examples
<code>contains</code>	Returns true if the first string contains the second string, otherwise returns false.	<pre>contains ('broomstick', 'room') = true contains (product, 'trial version')</pre>
<code>edit_distance</code>	Accepts two text strings. Returns the edit distance (minimum number of operations required to transform one string into the other) as an integer. Works with strings under 1023 characters.	<pre>edit_distance ('attorney', 'atty') = 4 edit_distance (color, 'red')</pre>
<code>edit_distance_with_cap</code>	Accepts two text strings and an integer to specify the upper limit cap for the edit distance (minimum number of operations required to transform one string into the other). If the edit distance is less than or equal to the specified cap, returns the edit distance. If it is higher than the cap, returns the cap plus 1. Works with strings under 1023 characters.	<pre>edit_distance_with_cap ('pokemon go', 'minecraft pixelmon', 3) = 4 edit_distance_with_cap (event, 'burning man', 3)</pre>
<code>similar_to</code>	Accepts a document text string and a search text string. Returns true if relevance score (0-100) of the search string with respect to the document is greater than or equal to 20. Relevance is based on edit distance, number of words in the query, and length of words in the query which are present in the document.	<pre>similar_to ('hello world', 'hello swirl') = true similar_to (current team, drafted by)</pre>
<code>similarity</code>	Accepts a document text string and a search text string. Returns the relevance score (0-100) of the search string with respect to the document. Relevance is based on edit distance, number of words in the query, and length of words in the query which are present in the document. If the two strings are an exact match, returns 100.	<pre>similarity ('where is the burning man concert', 'burning man') = 46 similarity (tweet1, tweet2)</pre>

Function	Description	Examples
<code>spells_like</code>	Accepts two text strings. Returns true if they are spelled similarly and false if they are not. Works with strings under 1023 characters.	<pre>spells_like ('thouhgtspot', 'thoughtspot') = true spells_like (studio, distributor)</pre>
<code>strlen</code>	Returns the length of the text.	<pre>strlen ('smith') = 5 strlen (lastname)</pre>
<code>strpos</code>	Returns the numeric position (starting from 0) of the first occurrence of the second string in the first string, or -1 if not found.	<pre>strpos ('haystack_with_needles', 'needle') = 14 strpos (complaint, 'lawyer')</pre>
<code>substr</code>	Returns the portion of the given string, beginning at the location specified (starting from 0), and of the given length.	<pre>substr ('persnickety', 3, 7) = snicket substr (lastname, 0, 5)</pre>

## Variables

These variables can be used in your expressions.

Function	Description	Examples
<code>ts_groups</code>	Returns a list of all the groups the current logged in user belongs to. For any row, if the expression evaluates to true for any of the groups, the user can see that row.	<pre>ts_groups = 'east'</pre>
<code>ts_username</code>	Returns the user with the matching neame.	<pre>ts_username != 'mark'</pre>

# Formula function reference

ThoughtSpot allows you to create derived columns in worksheets using formulas. You create these columns by building formulas using the **Formula Assistant**. An individual formula is constructed from  $n$  combination of operators and functions.

This reference lists the various operators and functions you can use to create formulas.

## Operators

Operator	Description	Examples
<code>and</code>	Returns true when both conditions are true, otherwise returns false.	<code>(1 = 1) and (3 &gt; 2) = true</code> <code>lastname = 'smith' and state = 'texas'</code>
<code>if...then...else</code>	Conditional operator.	<code>if (3 &gt; 2) then 'bigger' else 'not bigger'</code> <code>if (cost &gt; 500) then 'flag' else 'approve'</code>
<code>ifnull</code>	Returns the first value if it is not null, otherwise returns the second.	<code>ifnull (cost, 'unknown')</code>
<code>isnull</code>	Returns true if the value is null.	<code>isnull (phone)</code>
<code>not</code>	Returns true if the condition is false, otherwise returns false.	<code>not (3 &gt; 2) = false</code> <code>not (state = 'texas')</code>
<code>or</code>	Returns true when either condition is true, otherwise returns false.	<code>(1 = 5) or (3 &gt; 2) = true</code> <code>state = 'california' or state = 'oregon'</code>

## Aggregate functions

These functions can be used to aggregate data.

Function	Description	Examples
<code>average</code>	Returns the average of all the values of a column.	<code>average (revenue)</code>
<code>average_if</code>	Returns the average of all the columns that meet a given criteria.	<code>average_if(city = "San Francisco", revenue)</code>
<code>count</code>	Returns the number of rows in the table containing the column.	<code>count (product)</code>

Function	Description	Examples
<code>count_if</code>	Returns the number of rows in the table containing the column.	<code>count_if(region = 'west', region)</code>
<code>cumulative_average</code>	Takes a measure and one or more attributes. Returns the average of the measure, accumulated by the attribute(s) in the order specified.	<code>cumulative_average (revenue, order date, state)</code>
<code>cumulative_max</code>	Takes a measure and one or more attributes. Returns the maximum of the measure, accumulated by the attribute(s) in the order specified.	<code>cumulative_max (revenue, state)</code>
<code>cumulative_min</code>	Takes a measure and one or more attributes. Returns the minimum of the measure, accumulated by the attribute(s) in the order specified.	<code>cumulative_min (revenue, campaign)</code>
<code>cumulative_sum</code>	Takes a measure and one or more attributes. Returns the sum of the measure, accumulated by the attribute(s) in the order specified.	<code>cumulative_sum (revenue, order date)</code>
<code>group_average</code>	Takes a measure and one or more attributes. Returns the average of the measure grouped by the attribute(s).	<code>group_average (revenue, customer region, state)</code>
<code>group_count</code>	Takes a measure and one or more attributes. Returns the count of the measure grouped by the attribute(s).	<code>group_count (revenue, customer region)</code>
<code>group_max</code>	Takes a measure and one or more attributes. Returns the maximum of the measure grouped by the attribute(s).	<code>group_max (revenue, customer region)</code>
<code>group_min</code>	Takes a measure and one or more attributes. Returns the minimum of the measure grouped by the attribute(s).	<code>group_min (revenue, customer region)</code>
<code>group_stddev</code>	Takes a measure and one or more attributes. Returns the standard deviation of the measure grouped by the attribute(s).	<code>group_stddev (revenue, customer region)</code>
<code>group_sum</code>	Takes a measure and one or more attributes. Returns the sum of the measure grouped by the attribute(s).	<code>group_sum (revenue, customer region)</code>
<code>group_unique_count</code>	Takes a measure and one or more attributes. Returns the unique count of the measure grouped by the attribute(s).	<code>group_unique_count (product , supplier)</code>



Function	Description	Examples
<code>group_variance</code>	Takes a measure and one or more attributes. Returns the variance of the measure grouped by the attribute(s).	<code>group_variance (revenue, customer region)</code>
<code>max</code>	Returns the maximum value of a column.	<code>max (sales)</code>
<code>max_if</code>	Returns the maximum value among columns that meet a criteria.	<code>max_if( (revenue &gt; 10) , customer region )</code>
<code>min</code>	Returns the minimum value of a column.	<code>min (revenue)</code>
<code>min_if</code>	Returns the minimum value among columns that meet a criteria.	<code>min_if( (revenue &lt; 10) , customer region )</code>
<code>moving_average</code>	Takes a measure, two integers to define the window to aggregate over, and one or more attributes. The window is (current - Num1...Current + Num2) with both end points being included in the window. For example, "1,1" will have a window size of 3. To define a window that begins before Current, specify a negative number for Num2. Returns the average of the measure over the given window. The attributes are the ordering columns used to compute the moving average.	<code>moving_average (revenue, 2, 1, customer region)</code>
<code>moving_max</code>	Takes a measure, two integers to define the window to aggregate over, and one or more attributes. The window is (current - Num1...Current + Num2) with both end points being included in the window. For example, "1,1" will have a window size of 3. To define a window that begins before Current, specify a negative number for Num2. Returns the maximum of the measure over the given window. The attributes are the ordering columns used to compute the moving maximum.	<code>moving_max (complaints, 1, 2, store name)</code>

Function	Description	Examples
<code>moving_min</code>	Takes a measure, two integers to define the window to aggregate over, and one or more attributes. The window is (current - Num1...Current + Num2) with both end points being included in the window. For example, "1,1" will have a window size of 3. To define a window that begins before Current, specify a negative number for Num2. Returns the minimum of the measure over the given window. The attributes are the ordering columns used to compute the moving minimum.	<code>moving_min (defects, 3, 1, product)</code>
<code>moving_sum</code>	Takes a measure, two integers to define the window to aggregate over, and one or more attributes. The window is (current - Num1...Current + Num2) with both end points being included in the window. For example, "1,1" will have a window size of 3. To define a window that begins before Current, specify a negative number for Num2. Returns the sum of the measure over the given window. The attributes are the ordering columns used to compute the moving sum.	<code>moving_sum (revenue, 1, 1, order date)</code>
<code>stddev</code>	Returns the standard deviation of all values of a column.	<code>stddev (revenue)</code>
<code>stddev_if</code>	Returns a standard deviation values filtered to meet a specific criteria.	<code>stddev_if( (revenue &gt; 10) , (revenue/10.0) )</code>
<code>sum</code>	Returns the sum of all the values of a column.	<code>sum (revenue)</code>
<code>sum_if</code>	Returns sum values filtered by a specific criteria.	<code>sum_if(region='west', revenue)</code>
<code>unique_count</code>	Returns the number of unique values of a column.	<code>unique_count (customer)</code>
<code>unique_count_if</code>	Returns the number of unique values of a column provided it meets a criteria.	<code>unique_count_if( (revenue &gt; 10) , order date )</code>
<code>variance</code>	Returns the variance of all the values of a column.	<code>variance (revenue)</code>
<code>variance_if</code>	Returns the variance of all the values of a column provided it meets a criteria..	<code>variance_if( (revenue &gt; 10) , (revenue/10.0) )</code>

## Conversion functions

These functions can be used to convert data from one data type to another. Conversion to or from date data types is not supported.

Function	Description	Examples
<code>to_bool</code>	Returns the input as a boolean (true or false).	<code>to_bool (0) = false</code> <code>to_bool (married)</code>
<code>to_date</code>	Accepts a date represented as an integer or text string, and a second string parameter that can include strftime date formatting elements. Replaces all the valid strftime date formatting elements with their string counterparts and returns the result. Does not accept epoch formatted dates as input.	<code>to_date (date_sold, '%Y-%m-%d')</code>
<code>to_double</code>	Returns the input as a double.	<code>to_double ('3.14') = 3.14</code> <code>to_double (revenue * .01)</code>
<code>to_integer</code>	Returns the input as an integer.	<code>to_integer ('45') + 1 = 46</code> <code>to_integer (price + tax - cost)</code>
<code>to_string</code>	Returns the input as a text string.	<code>to_string (45 + 1) = '46'</code> <code>to_string (revenue - cost)</code>

## Date functions

Function	Description	Examples
<code>add_days</code>	Returns the result of adding the specified number of days to the given date.	<code>add_days (01/30/2015, 5) = 02/04/2015</code> <code>add_days (invoiced, 30)</code>
<code>date</code>	Returns the date portion of a given date.	<code>date (home visit)</code>
<code>day</code>	Returns the number (1-31) of the day for the given date.	<code>day (01/15/2014) = 15</code> <code>day (date ordered)</code>

Function	Description	Examples
<code>day_number_of_week</code>	Returns the number (1-7) of the day in a week for the given date with 1 being Monday and 7 being Sunday.	<code>day_number_of_week (01/30/2015) = 6</code> <code>day_number_of_week (shipped)</code>
<code>day_number_of_quarter</code>	Returns the number of the day in a quarter for a given date.	<code>day_number_of_quarter (01/30/2015)</code>
<code>day_number_of_week</code>	Returns the number of the day in a week for a given date.	<code>day_number_of_week(01/15/2014) &gt; 3</code>
<code>day_number_of_year</code>	Returns the number (1-366) of the day in a year for the given date.	<code>day_number_of_year (01/30/2015) = 30</code> <code>day_number_of_year (invoiced)</code>
<code>day_of_week</code>	Returns the day of the week for the given date.	<code>day_of_week (01/30/2015) = Friday</code> <code>day_of_week (serviced)</code>
<code>diff_days</code>	Subtracts the second date from the first date and returns the result in number of days, rounded down if not exact.	<code>diff_days (01/15/2014, 01/17/2014) = -2</code> <code>diff_days (purchased, shipped)</code>
<code>diff_time</code>	Subtracts the second date from the first date and returns the result in number of seconds.	<code>diff_time (01/01/2014, 01/01/2014) = -86,400</code> <code>diff_time (clicked, submitted)</code>
<code>hour_of_day</code>	Returns the hour of the day for the given date.	<code>hour_of_day (received)</code>
<code>is_weekend</code>	Returns true if the given date falls on a Saturday or Sunday.	<code>is_weekend (01/31/2015) = true</code> <code>is_weekend (emailed)</code>
<code>month</code>	Returns the month from the given date.	<code>month (01/15/2014) = January</code> <code>month (date ordered)</code>
<code>month_number</code>	Returns the number (1-12) of the month for the given date.	<code>month_number (09/20/2014) = 9</code> <code>month_number (purchased)</code>

Function	Description	Examples
<code>month_number_of_quarter</code>	Returns the month (1-12) number for the given date in a quarter.	<code>month_number_of_quarter (02/20/2018) &gt; 9</code>
<code>now</code>	Returns the current timestamp.	<code>now ()</code>
<code>start_of_month</code>	Returns <code>MMM yyyy</code> for the first day of the month. Your installation configuration can override this setting so that it returns a different format such as <code>MM/dd/yyyy</code> . Speak with your ThoughtSpot administrator for information on doing this.	<code>start_of_month ( 01/31/2015 ) = Jan FY 2015</code> <code>start_of_month (shipped)</code>
<code>start_of_quarter</code>	Returns the date for the first day of the quarter for the given date.	<code>start_of_quarter ( 09/18/2015 ) = Q3 FY 2015</code> <code>start_of_quarter (sold)</code>
<code>start_of_week</code>	Returns the date for the first day of the week for the given date.	<code>start_of_week ( 06/01/2015 ) = 05/30/2015 Week</code> <code>start_of_week (emailed)</code>
<code>start_of_year</code>	Returns the date for the first day of the year for the given date.	<code>start_of_year ( 02/15/2015 ) = FY 2015</code> <code>start_of_year (joined)</code>
<code>time</code>	Returns the time portion of a given date.	<code>time (3/1/2002 10:32) = 10:32</code> <code>time (call began)</code>
<code>week_number_of_month</code>	Returns the week number for the given date in a month.	<code>week_number_of_month(03/23/2017) = 3</code>
<code>week_number_of_quarter</code>	Returns the week number for the given date in a quarter.	<code>week_number_of_quarter(04/03/2017)&gt; 2</code>
<code>week_number_of_year</code>	Returns the week number for the given date in a year.	<code>week_number_of_year(04/03/2017) = 20</code>

Function	Description	Examples
<code>year</code>	Returns the year from the given date.	<code>year (01/15/2014) = 2014</code> <code>year (date ordered)</code>

## Mixed functions

These functions can be used with text and numeric data types.

Function	Description	Examples
<code>!=</code>	Returns true if the first value is not equal to the second value.	<code>3 != 2 = true</code> <code>revenue != 1000000</code>
<code>&lt;</code>	Returns true if the first value is less than the second value.	<code>3 &lt; 2 = false</code> <code>revenue &lt; 1000000</code>
<code>&lt;=</code>	Returns true if the first value is less than or equal to the second value.	<code>1 &lt;= 2 = true</code> <code>revenue &lt;= 1000000</code>
<code>=</code>	Returns true if the first value is equal to the second value.	<code>2 = 2 = true</code> <code>revenue = 1000000</code>
<code>&gt;</code>	Returns true if the first value is greater than the second value.	<code>3 &gt; 2 = true</code> <code>revenue &gt; 1000000</code>
<code>&gt;=</code>	Returns true if the first value is greater than or equal to the second value.	<code>3 &gt;= 2 = true</code> <code>revenue &gt;= 1000000</code>
<code>greatest</code>	Returns the larger of the values.	<code>greatest (20, 10) = 20</code> <code>greatest (q1 revenue, q2 revenue)</code>
<code>least</code>	Returns the smaller of the values.	<code>least (20, 10) = 10</code> <code>least (q1 revenue, q2 revenue)</code>

## Number functions

Function	Description	Examples
<code>?</code>	Returns the result of multiplying both numbers.	<code>3 * 2 = 6</code> <code>price * taxrate</code>
<code>+</code>	Returns the result of adding both numbers.	<code>1 + 2 = 3</code> <code>price + shipping</code>
<code>-</code>	Returns the result of subtracting the second number from the first.	<code>3 - 2 = 1</code> <code>revenue - tax</code>
<code>/</code>	Returns the result of dividing the first number by the second.	<code>6 / 3 = 2</code> <code>markup / retail price</code>

Function	Description	Examples
<b>^</b>	Returns the first number raised to the power of the second.	<code>3 ^ 2 = 9</code> <code>width ^ 2</code>
<b>abs</b>	Returns the absolute value.	<code>abs (-10) = 10</code> <code>abs (profit)</code>
<b>acos</b>	Returns the inverse cosine in degrees.	<code>acos (0.5) = 60</code> <code>acos (cos-satellite-angle)</code>
<b>asin</b>	Returns the inverse sine (specified in degrees).	<code>asin (0.5) = 30</code> <code>asin (sin-satellite-angle)</code>
<b>atan</b>	Returns the inverse tangent in degrees.	<code>atan (1) = 45</code> <code>atan (tan-satellite-angle)</code>
<b>atan2</b>	Returns the inverse tangent in degrees.	<code>atan2 (10, 10) = 45</code> <code>atan2 (longitude, latitude)</code>
<b>cbrt</b>	Returns the cube root of a number.	<code>cbrt (27) = 3</code> <code>cbrt (volume)</code>
<b>ceil</b>	Returns the smallest following integer.	<code>ceil (5.9) = 6</code> <code>ceil (growth rate)</code>
<b>cos</b>	Returns the cosine of an angle (specified in degrees).	<code>cos (63) = 0.45</code> <code>cos (beam angle)</code>
<b>cube</b>	Returns the cube of a number.	<code>cube (3) = 27</code> <code>cube (length)</code>
<b>exp</b>	Returns Euler's number (~2.718) raised to a power.	<code>exp (2) = 7.38905609893</code> <code>exp (growth)</code>
<b>exp2</b>	Returns 2 raised to a power.	<code>exp2 (3) = 8</code> <code>exp2 (growth)</code>
<b>floor</b>	Returns the largest previous integer.	<code>floor (5.1) = 5</code> <code>floor (growth rate)</code>
<b>ln</b>	Returns the natural logarithm.	<code>ln (7.38905609893) = 2</code> <code>ln (distance)</code>
<b>log10</b>	Returns the logarithm with base 10.	<code>log10 (100) = 2</code> <code>log10 (volume)</code>
<b>log2</b>	Returns the logarithm with base 2 (binary logarithm).	<code>log2 (32) = 5</code> <code>log2 (volume)</code>
<b>mod</b>	Returns the remainder of first number divided by the second number.	<code>mod (8, 3) = 2</code> <code>mod ( revenue , quantity )</code>

Function	Description	Examples
<code>pow</code>	Returns the first number raised to the power of the second number.	<code>pow (5, 2) = 25</code> <code>pow (width, 2)</code>
<code>random</code>	Returns a random number between 0 and 1.	<code>random ( ) = .457718</code> <code>random ( )</code>
<code>round</code>	Returns the first number rounded to the second number (the default is 1).	<code>round (35.65, 10) = 40</code> <code>round (battingavg, 100)</code>
<code>safe_divide</code>	Returns the result of dividing the first number by the second. If the second number is 0, returns 0 instead of NaN (not a number).	<code>safe_divide (12, 0) = 0</code> <code>safe_divide (total_cost, units)</code>
<code>sign</code>	Returns +1 if the number is greater than zero, -1 if less than zero, 0 if zero.	<code>sign (-250) = -1</code> <code>sign (growth rate)</code>
<code>sin</code>	Returns the sine of an angle (specified in degrees).	<code>sin (35) = 0.57</code> <code>sin (beam angle)</code>
<code>spherical_distance</code>	Returns the distance in km between two points on Earth.	<code>spherical_distance (37.465191, -122.153617, 37.421962, -122.142174) = 4,961.96</code> <code>spherical_distance (start_latitude, start_longitude, start_latitude, start_longitude)</code>
<code>sq</code>	Returns the square of a numeric value.	<code>sq (9) = 81</code> <code>sq (width)</code>
<code>sqrt</code>	Returns the square root.	<code>sqrt (9) = 3</code> <code>sqrt (area)</code>
<code>tan</code>	Returns the tangent of an angle (specified in degrees).	<code>tan (35) = 0.7</code> <code>tan (beam angle)</code>

## Text functions

Function	Description	Examples
<code>concat</code>	Returns the one or more values as a concatenated text string. Be sure to use single quotes instead of double quotes around each of the strings.	<code>concat ( 'hay' , 'stack' ) = 'haystack'</code> <code>concat (last_name , first_name )</code>



Function	Description	Examples
<code>contains</code>	Returns true if the first string contains the second string, otherwise returns false.	<pre>contains ('broomstick', 'room') = true contains (product, 'trial version')</pre>
<code>edit_distance</code>	Accepts two text strings. Returns the edit distance (minimum number of operations required to transform one string into the other) as an integer. Works with strings under 1023 characters.	<pre>edit_distance ('attorney', 'atty') = 4 edit_distance (color, 'red')</pre>
<code>edit_distance_with_cap</code>	Accepts two text strings and an integer to specify the upper limit cap for the edit distance (minimum number of operations required to transform one string into the other). If the edit distance is less than or equal to the specified cap, returns the edit distance. If it is higher than the cap, returns the cap plus 1. Works with strings under 1023 characters.	<pre>edit_distance_with_cap ('pokemon go', 'minecraft pixelmon', 3) = 4 edit_distance_with_cap (event, 'burning man', 3)</pre>
<code>similar_to</code>	Accepts a document text string and a search text string. Returns true if relevance score (0-100) of the search string with respect to the document is greater than or equal to 20. Relevance is based on edit distance, number of words in the query, and length of words in the query which are present in the document.	<pre>similar_to ('hello world', 'hello swirl') = true similar_to (current team, drafted by)</pre>
<code>similarity</code>	Accepts a document text string and a search text string. Returns the relevance score (0-100) of the search string with respect to the document. Relevance is based on edit distance, number of words in the query, and length of words in the query which are present in the document. If the two strings are an exact match, returns 100.	<pre>similarity ('where is the burning man concert', 'burning man') = 46 similarity (tweet1, tweet2)</pre>

Function	Description	Examples
<code>spells_like</code>	Accepts two text strings. Returns true if they are spelled similarly and false if they are not. Works with strings under 1023 characters.	<pre>spells_like ('thouhgtspot', 'thoughtspot') = true spells_like (studio, distributor)</pre>
<code>strlen</code>	Returns the length of the text.	<pre>strlen ('smith') = 5 strlen (lastname)</pre>
<code>strpos</code>	Returns the numeric position (starting from 0) of the first occurrence of the second string in the first string, or -1 if not found.	<pre>strpos ( 'haystack_with_needles', 'needle') = 14 strpos (complaint, 'lawyer')</pre>
<code>substr</code>	Returns the portion of the given string, beginning at the location specified (starting from 0), and of the given length.	<pre>substr ('persnickety', 3, 7) = snicket substr (lastname, 0, 5)</pre>

# Alerts code reference

This reference identifies the messages that can appear in the **System Health > Overview > Critical Alerts** and in the **Alerts** dashboard.

## Informational alerts

### TASK\_TERMINATED

**Msg:** Task `{{.Service}}.{{.Task}}` terminated on machine `{{.Machine}}`

**Type:** INFO

This alert is raised when a task terminates.

### DISK\_ERROR

**Msg:** Machine `{{.Machine}}` has disk errors

**Type:** INFO

Raised when a machine has disk errors.

### ZK\_AVG\_LATENCY

**Msg:** Average Zookeeper latency is more than `{{.Num}}` msec

**Type:** INFO

Raised when average Zookeeper latency is above a threshold.

### ZK\_MAX\_LATENCY

**Msg:** Max Zookeeper latency is more than `{{.Num}}` msec

**Type:** INFO

Raised when max Zookeeper latency is above a threshold.

### ZK\_MIN\_LATENCY

**Msg:** Min Zookeeper latency is more than `{{.Num}}` msec

**Type:** INFO

Raised when min Zookeeper latency is above a threshold.

### ZK\_OUTSTANDING\_REQUESTS

**Msg:** Number of outstanding Zookeeper requests exceeds `{{.Num}}`

**Type:** INFO

Raised when there are too many outstanding Zookeeper requests.

## ZK\_NUM\_WATCHERS

**Msg:** Number of Zookeeper watchers exceeds {{.Num}}

**Type:** INFO

Raised when there are too many Zookeeper watchers.

## MASTER\_ELECTION

**Msg:** {{.Machine}} elected as Orion Master

**Type:** INFO

Raised when a new Orion Master is elected.

## PERIODIC\_BACKUP

**Msg:** {{.Process}} periodic backup for policy {{.Name}} failed.

**Type:** INFO

Raised when periodic backup fails.

## PERIODIC\_SNAPSHOT

**Msg:** {{.Process}} periodic snapshot {{.Name}} failed.

**Type:** INFO

Raised when a periodic snapshot fails.

## HDFS\_CORRUPTION

**Msg:** HDFS root directory is in a corrupted state.

**Type:** INFO

Raised when HDFS root directory is corrupted.

## APPLICATION\_INVALID\_STATE

**Msg:** {{.Service}}.{{.Task}} on {{.Machine}} at location {{.Location}}

**Type:** INFO

Raised when Application raises invalid state alert.

## UPDATE\_START

**Msg:** Starting update of ThoughtSpot cluster {{.Cluster}}

**Type:** INFO

Raised when update starts.

## UPDATE\_END

**Msg:** Finished update of ThoughtSpot cluster {{.Cluster}} to release {{.Release}}

**Type:** INFO

Raised when update completes.

## Errors

### TIMELY\_JOB\_RUN\_ERROR

**Msg:** Job run {{.Message}}

**Type:** ERROR

Raised when a job run fails.

### TIMELY\_ERROR

**Msg:** Job manager {{.Message}}

**Type:** ERROR

Raised when a job manager runs into an inconsistent state.

## Warnings

### DISK\_SPACE

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% disk space free

**Type:** WARNING

Raised when a disk is low on available disk space. Valid only in the 3.2 version of ThoughtSpot.

### ROOT\_DISK\_SPACE

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% disk space free on root partition

**Type:** WARNING

Raised when a machine is low on available disk space on root partition.

### BOOT\_DISK\_SPACE

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% disk space free on boot partition

**Type:** WARNING

Raised when a machine is low on available disk space on boot partition.

## UPDATE\_DISK\_SPACE

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% disk space free on update partition

**Type:** WARNING

Raised when a machine is low on available disk space on update partition.

## EXPORT\_DISK\_SPACE

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% disk space free on export partition

**Type:** WARNING

Raised when a machine is low on available disk space on export partition.

## HDFS\_NAMENODE\_DISK\_SPACE

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% disk space free on HDFS namenode drive

**Type:** WARNING

Raised when a machine is low on available disk space on HDFS namenode drive.

## MEMORY

**Msg:** Machine {{.Machine}} has less than {{.Perc}}% memory free

**Type:** WARNING

Raised when a machine is low on free memory.

## OS\_USERS

**Msg:** Machine {{.Machine}} has more than {{.Num}} logged in users

**Type:** WARNING

Raised when a machine has too many users logged in.

## OS\_PROCS

**Msg:** Machine {{.Machine}} has more than {{.Num}} processes

**Type:** WARNING

Raised when a machine has more too many processes.

## SSH

**Msg:** Machine {{.Machine}} doesn't have an active SSH server

**Type:** WARNING

Raised when a machine has more than 600 processes.

## DISK\_ERROR\_EXTERNAL

**Msg:** Machine {{.Machine}} has disk errors

**Type:** WARNING

Raised when more than 2 disk errors happen in a day.

## ZK\_FD\_COUNT

**Msg:** Zookeeper has more than {{.Num}} open file descriptors

**Type:** WARNING

Raised when there are too many open Zookeeper files.

## ZK\_EPHEMERAL\_COUNT

**Msg:** Zookeeper has more than {{.Num}} ephemeral files

**Type:** WARNING

Raised when there are too many Zookeeper ephemeral files.

## HOST\_DOWN

**Msg:** {{.Machine}} is down

**Type:** WARNING

Raised when a host is down.

## TASK\_UNREACHABLE

**Msg:** {{.ServiceDesc}} on {{.Machine}} is unreachable over HTTP

**Type:** WARNING

Raised when a task is unreachable over HTTP.

## TASK\_NOT\_RUNNING

**Msg:** {{.ServiceDesc}} is not running

**Type:** WARNING

Raised when a service task is not running on any machine in the cluster.

## Critical alerts

### TASK\_FLAPPING

**Msg:** Task `{{.Service}}.{{.Task}}` terminated `{{._actual_num_occurrences}}` times in last `{{._earliest_duration_str}}`

**Type:** CRITICAL

This alert is raised when a task is crashing repeatedly. The service is evaluated across the whole cluster. So, if a service crashes 5 times in a day across all nodes in the cluster, this alert is generated.

### OREO\_TERMINATED

**Msg:** Oreo terminated on machine `{{.Machine}}`

**Type:** CRITICAL

This alert is raised when the Oreo daemon on a machine terminates due to an error. This typically happens due to an error accessing Zookeeper, HDFS, or a hardware issue.

### HDFS\_DISK\_SPACE

**Msg:** HDFS has less than `{{.Perc}}%` space free

**Type:** CRITICAL

Raised when a HDFS cluster is low on total available disk space.

### ZK\_INACCESSIBLE

**Msg:** Zookeeper is not accessible

**Type:** CRITICAL

Raised when Zookeeper is inaccessible.

### PERIODIC\_BACKUP\_FLAPPING

**Msg:** Periodic backup failed `{{._actual_num_occurrences}}` times in last `{{._earliest_duration_str}}`

**Type:** CRITICAL

This alert is raised when a periodic backup failed repeatedly.

### PERIODIC\_SNAPSHOT\_FLAPPING

**Msg:** Periodic snapshot failed `{{._actual_num_occurrences}}` times in last `{{._earliest_duration_str}}`

**Type:** CRITICAL



This alert is raised when periodic snapshot failed repeatedly.

### APPLICATION\_INVALID\_STATE\_EXTERNAL

**Msg:** `{{.Service}}.{{.Task}}` on `{{.Machine}}` at location `{{.Location}}`

**Type:** CRITICAL

Raised when Application raises invalid state alert.

# User action code reference

This reference identifies the user action codes that can appear in the **System Health** pages and in logs or other reports.

<code>answer_unsaved</code>	User makes a change to tokens in the search bar.
<code>answer_saved</code>	User opens an existing saved answer and makes changes to tokens in the search bar.
<code>answer_pinboard_context</code>	User opens an existing saved pinboard, edits a context viz and makes a change to tokens in the search bar.
<code>answer_aggregated_worksheet</code>	User opens an existing saved aggregated worksheet and makes changes to tokens in the search bar.
<code>answer_upgrade</code>	Requests made for the sole purpose of upgrade.
<code>pinboard_view</code>	User opens an existing saved pinboard.
<code>pinboard_filter</code>	User adds, removes or applies values to a pinboard filter.
<code>pinboard_ad_hoc</code>	User drills down in a pinboard viz.
<code>data_chart_config</code>	Request for new data being generated following a chart config change.
<code>data_show_underlying_row</code>	Request to show underlying data for a data row(s).
<code>data_export</code>	Request to export data.
<code>pinboard_tspublic_runtime_filter</code>	Request to TSPublic/pinboarddata with runtime filters.
<code>answer_aggregated_worksheet_save</code>	User updates aggregated worksheet.
<code>answer_add_new_filter</code>	User adds a filter using the UI.
<code>data_show_underlying_viz</code>	Request to show underlying data for a data row(s).
<code>answer_view</code>	User opens an existing, saved answer.
<code>answer_viz_context_view</code>	User opens an existing saved pinboard, edits a context viz.
<code>pinboard_insight_view</code>	User opens SpotIQ tab pinboards.
<code>pinboard_admin_view</code>	User opens admin tab pinboards.

<code>pinboard_embed_view</code>	User opens embed pinboard from a URL.
<code>pinboard_homepage_view</code>	On loading of homepage pinboard.
<code>pinboard_learn_view</code>	On loading learn pinboard.
<code>pinboard_tspublic_no_runtime_filter</code>	Request to TSPublic/pinboard data without run-time filters.

# Error code reference

**Summary:** List of error codes and messages.

This section lists error codes that can appear in ThoughtSpot, with summary information and actions to take. Error codes and messages are shown in ThoughtSpot when something goes wrong. These messages can appear in the application and in logs.

When you see an error code, you will also see a message with a brief summary of what has happened. If there is a remediation action you can take, it will be listed in this references. If there is no action listed, please contact ThoughtSpot Support.

**Tip:** Only the base code number is listed for each error. So keep this in mind when searching through these codes. For example, error code TS-00125 is simply listed as 125.

## Metadata Errors (100 - 499)

Code	Severity	Summary	Details	Action
TS-00100	INFO	Success. {1} has been added to {2}. \# {1} – name of visualization \# {2} – {name/link to pinboard}	None	None
TS-00101	ERROR	Failure adding {1} to {2}	Visualization could not be added to {2} \# {1} – name of visualization \# {2} – name/link to pinboard	None
TS-00102	ERROR	Failure adding {1} to {2} due to corruption	{1} could not be added to {2} as the pinboard has one or more invalid visualizations	Please try again after removing the invalid visualization(s) from {2} \# {1} – name of visualization \# {2} – name/link to pinboard
TS-00103	INFO	Success. Visualization has been deleted from {1}. 1 – name/link to pinboard	None	None

TS-00104	ERROR	Failure deleting visual from {1}	Visualization could not be deleted from the pinboard. 1 – name/link to pinboard	None
TS-00105	ERROR	Failure deleting visual from {1} due to corruption	Visualization could not be deleted from {1} as the pinboard has one or more invalid visualizations. 1 – name/link to pinboard	Please try again after removing the invalid visualization(s) from the pinboard
TS-00106	INFO	Success. {1} created successfully. 1 – name/link to pinboard	None	None
TS-00107	ERROR	Failure creating {1}. 1 – name/link to pinboard	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00108	INFO	Sticker created successfully.	None	None
TS-00109	ERROR	Failure creating the sticker.	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00110	INFO	Sticker deleted successfully.	None	None
TS-00111	ERROR	Failure deleting sticker.	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00112	INFO	Pinboards deleted successfully.	None	None
TS-00113	ERROR	Failure deleting pinboards	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00114	INFO	Answers deleted successfully.	None	None

TS-00115	ERROR	Failure deleting answers	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00116	INFO	Tables deleted successfully.	None	None
TS-00117	ERROR	Failure deleting tables	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00118	INFO	Relationship created successfully.	None	None
TS-00119	ERROR	Failure creating relationship	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00120	INFO	Relationship updated successfully.	None	None
TS-00121	ERROR	Failure updating the relationship	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00122	INFO	Relationship deleted successfully.	None	None
TS-00123	ERROR	Failure deleting the relationship	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00124	ERROR	Failure fetching details for table	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00125	ERROR	Failure fetching details for the tables	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None

TS-00126	ERROR	Failure fetching details for datasource	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00127	ERROR	Failure fetching details for datasources	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00128	ERROR	Failure fetching details for metadata items	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00129	ERROR	Failure opening the answer	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00130	ERROR	Failure opening the pinboard	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00131	ERROR	Failure opening the worksheet	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00132	INFO	Table saved successfully.	None	None
TS-00133	ERROR	There was a problem saving the table	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00134	INFO	Visualization update successful	None	None
TS-00135	ERROR	Visualization failed to update	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None

TS-00136	INFO	{1} saved 1 – name of answer	None	None
TS-00137	ERROR	{1} could not be saved 1 – name of answer	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00138	INFO	{1} saved 1 - name of pinboard / link	None	None
TS-00139	ERROR	{1} could not be saved 1 - name of pinboard / link	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00140	INFO	{1} saved 1 – name of worksheet	None	None
TS-00141	ERROR	{1} could not be saved 1 – name of worksheet	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00142	INFO	{1} saved 1 – name of answer	None	None
TS-00143	ERROR	{1} could not be saved	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}. 1 – name of answer	None
TS-00144	INFO	{1} saved 1 – name/ link to pinboard	None	None
TS-00145	ERROR	{1} could not be saved	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}. 1 – name of pinboard	None
TS-00146	INFO	Worksheet saved	None	None
TS-00147	ERROR	Worksheet could not be saved	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None



TS-00148	INFO	Sticker updated	None	None
TS-00149	ERROR	The sticker could not be updated	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00150	INFO	Successfully assigned sticker	None	None
TS-00151	ERROR	The sticker could not be assigned	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00152	INFO	Successfully unassigned sticker	None	None
TS-00153	ERROR	The sticker could not be unassigned	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00154	ERROR	Failed to fetch metadata list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00155	ERROR	Failed to fetch table list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00156	ERROR	Failed to fetch relationship list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00157	ERROR	Failed to fetch answer list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00158	ERROR	Failed to fetch pin-board list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None

TS-00159	ERROR	Failed to fetch worksheet list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00160	ERROR	Failed to fetch aggregated worksheet list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00161	ERROR	Failed to fetch imported data list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00162	ERROR	Failed to fetch system table list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00163	ERROR	Failed to DB view list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00164	ERROR	Failed to fetch data source list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00165	ERROR	Failed to fetch column list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00166	ERROR	Failed to label list	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00167	ERROR	Failed to fetch answer	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None

TS-00168	ERROR	Failed to fetch worksheet	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00169	INFO	Aggregated worksheet {1} created 1 – name of aggregated worksheet	None	None
TS-00170	ERROR	Failure creating Aggregated Worksheet.	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00171	INFO	{1} updated 1 – name of aggregated worksheet	None	None
TS-00172	ERROR	{1} failed to update 1 – name of aggregated worksheet	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00173	ERROR	{1} failed to update 1 – name of the formula	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00174	ERROR	Comments cannot be fetched	Failed to save client state	None
TS-00175	ERROR	Comment cannot be created	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00176	ERROR	Comment cannot be updated	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00177	ERROR	Comment cannot be deleted	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None

TS-00178	INFO	Rule saved successfully	None	None
TS-00179	ERROR	Rule could not be saved	We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00180	INFO	Rule deleted successfully	None	None
TS-00181	ERROR	Rule could not be deleted	We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00182	INFO	Item deleted successfully.	None	None
TS-00183	ERROR	Item could not be deleted.	We're not sure what happened. Please email the trace file to {adminEmail}.	None
TS-00184	INFO	Related link created successfully.	None	None
TS-00185	ERROR	Related link could not be created.	Uh oh. We're not sure what happened. Please click 'Report Problem' to email a report to your administrator, {adminEmail}.	None
TS-00186	INFO	Related link updated successfully.	None	None
TS-00187	ERROR	Related link could not be updated.	Uh oh. We're not sure what happened. Please click 'Report Problem' to email a report to your administrator, {adminEmail}.	None
TS-00188	INFO	Related link deleted successfully.	None	None

TS-00189	ERROR	Related link could not be deleted.	Uh oh. We're not sure what happened. Please click 'Report Problem' to email a report to your administrator, {adminEmail}.	None
TS-00190	INFO	Related link detail fetched successfully.	None	None
TS-00191	ERROR	Related link detail could not be fetched.	Uh oh. We're not sure what happened. Please click 'Report Problem' to email a report to your administrator, {adminEmail}.	None

## Data Service Errors (500 - 699)

Code	Severity	Summary	Details	Action
TS-00500	ERROR	Failed to fetch leaf level data	Failed to fetch leaf level data.	None
TS-00501	ERROR	Failed to fetch excel data	Failed to fetch excel data.	None
TS-00502	ERROR	Failed to fetch visualization data	Failed to fetch vizualiation data.	None
TS-00503	ERROR	Failed to fetch visualizations data	Failed to fetch data for visualizations.	None
TS-00504	ERROR	Failed to fetch chart data	Failed to fetch table data.	None
TS-00505	ERROR	Failed to fetch table data	Failed to fetch table data.	None
TS-00506	ERROR	Failed to fetch worksheet data	Failed to fetch worksheet data.	None
TS-00507	ERROR	Failed to fetch filter data	Failed to fetch filter data.	None
TS-00508	ERROR	Failed to fetch headline data	Failed to fetch filter data.	None

Code	Severity	Summary	Details	Action
TS-00509	ERROR	Failed to fetch natural query	Failed to fetch natural query.	None
TS-00510	INFO	File upload successful	None	None
TS-00511	ERROR	Failed to upload file	Failed to upload	None
TS-00512	ERROR	The pinboard data could not be exported to pdf.	Uh oh. We're not sure what happened. Please click 'Report Problem' to email a report to your administrator, {adminEmail}.	None

## Dependency Errors (700 - 799)

Code	Severity	Summary	Details	Action
TS-00700	ERROR	Failure fetching table dependents	Failed to fetch dependents for the table.	None
TS-00701	ERROR	Failure fetching column dependents	Failed to fetch dependents for the column.	None
TS-00702	ERROR	Failure fetching incomplete items	Failed to fetch incomplete items.	None

## Admin Service Errors (800 - 899)

Code	Severity	Summary	Details	Action
TS-00800	ERROR	Failure fetching MemCache stats	Failed to fetch MemCache stats.	None
TS-00801	ERROR	Failure MemCache Clear	Failed to clear MemCache.	None
TS-00802	ERROR	Failure searching from MemCache	Failed to search from MemCache.	None
TS-00803	ERROR	Failure fetching Loggers	Failed to fetch Loggers.	None
TS-00804	ERROR	Failure setting LogLevel	Failed to set Log Level.	None
TS-00805	ERROR	Failure getting debug info	Failed to get debug info.	None
TS-00806	INFO	Memcache cleared successfully	None	None

Code	Severity	Summary	Details	Action
TS-00807	INFO	Log level set successfully	None	None
TS-00808	ERROR	Failed to report problem	None	None
TS-00809	INFO	Problem reported successfully	None	None

## Permissions Errors (900 - 999)

Code	Severity	Summary	Details	Action
TS-00900	ERROR	Failure fetching table permissions	Failed to fetch table permissions.	None
TS-00901	ERROR	Failure fetching answer permissions	Failed to fetch answer permissions.	None
TS-00902	ERROR	Failure fetching pinboard permissions	Failed to fetch pinboard permissions.	None
TS-00903	ERROR	Failure getting metadata permissions	Failed to get metadata permissions.	None

## Import Data Errors (1000 - 1099)

Code	Severity	Summary	Details	Action
TS-01000	ERROR	Data caching failed	Data caching failed.	None
TS-01001	ERROR	Read Columns failed.	Failed to read columns.	None
TS-01002	ERROR	Failed to read keys.	Failed to read keys.	None
TS-01003	ERROR	Failed to read relationships.	Failed to read relationships.	None
TS-01004	ERROR	Failed to load data.	Failed to load data.	None
TS-01005	ERROR	Failed to create table.	Failed to create table.	None
TS-01006	ERROR	Failed to fetch data rows.	Failed to fetch data rows.	None
TS-01007	ERROR	Failed to delete files.	Failed to fetch data rows.	None
TS-01008	ERROR	Failed to abort create table.	Failed to abort create table.	None
TS-01009	ERROR	Failed to create schema.	Failed to create schema.	None
TS-01010	ERROR	Failed to fetch table models.	Failed to fetch table models.	None

Code	Severity	Summary	Details	Action
TS-01011	ERROR	Failed to fetch sample values.	Failed to fetch sample values.	None

## Scheduled Jobs Errors (1100 - 1199)

Code	Severity	Summary	Details	Action
TS-01100	INFO	The list of jobs.	None	Please click 'Report Problem' to email a report to your administrator.
TS-01110	INFO	Successfully created job.	None	None
TS-01111	ERROR	The job could not be created.	None	Please click 'Report Problem' to email a report to your administrator.
TS-01112	INFO	Successfully updated job.	None	None
TS-01113	ERROR	The job could not be updated.	None	Please click 'Report Problem' to email a report to your administrator.
TS-01114	INFO	Successfully deleted jobs.	None	None
TS-01115	ERROR	The job could not be deleted.	None	Please click 'Report Problem' to email a report to your administrator.
TS-01116	INFO	The job was paused.	None	None
TS-01117	ERROR	The job could not be paused.	None	Please click 'Report Problem' to email a report to your administrator.
TS-01118	INFO	The job was resumed	None	None
TS-01119	ERROR	The job could not be resumed.	None	Please click 'Report Problem' to email a report to your administrator.

## User Admin Service Errors (1200 - 1399)

Code	Severity	Summary	Details	Action
TS-01200	ERROR	Failed to fetch users list	Failed to fetch users list	None
TS-01201	ERROR	Failed to fetch groups list	Failed to fetch groups list	None



Code	Severity	Summary	Details	Action
TS-01202	ERROR	Failed to fetch users and groups list	Failed to fetch users and groups list	None
TS-01203	ERROR	Successfully created user	Successfully created user	None
TS-01204	ERROR	Failed to create user	Failed to create user	None
TS-01205	ERROR	Successfully created group	Successfully created group	None
TS-01206	ERROR	Failed to create group	Failed to create group	None
TS-01207	ERROR	Successfully updated user	Successfully updated user	None
TS-01208	ERROR	Failed to update user	Failed to update user	None
TS-01209	ERROR	Successfully updated users	Successfully updated users	None
TS-01210	ERROR	Failed to update users	Failed to update users	None
TS-01211	ERROR	Successfully updated group	Successfully updated group	None
TS-01212	ERROR	Failed to update group	Failed to update group	None
TS-01213	ERROR	Successfully updated password	Successfully updated password	None
TS-01214	ERROR	Failed to update password	Failed to update password	None
TS-01215	ERROR	Successfully deleted users	Successfully deleted users	None
TS-01216	ERROR	Failed to delete users	Failed to delete users	None
TS-01217	ERROR	Successfully deleted groups	Successfully deleted groups	None
TS-01218	ERROR	Failed to delete groups	Failed to delete groups	None
TS-01219	ERROR	Successfully assigned users to groups	Successfully assigned users to groups	None
TS-01220	ERROR	Failed to assign users to groups	Failed to assign users to groups	None
TS-01221	ERROR	Failed to fetch profile pic	Failed to fetch profile pic	None
TS-01222	INFO	Successfully uploaded profile pic	None	None
TS-01223	ERROR	Failed to upload profile pic	Failed to upload profile pic	None
TS-01224	ERROR	Successfully assigned groups to group	Failed to assign user to group	None
TS-01228	ERROR	Successfully created role	Successfully created role	None

Code	Severity	Summary	Details	Action
TS-01229	ERROR	Failed to create role	Failed to create role	None
TS-01230	ERROR	Successfully deleted role	Successfully deleted role	None
TS-01231	ERROR	Failed to delete role	Failed to delete role	None
TS-01232	ERROR	Successfully updated role	Successfully updated role	None
TS-01233	ERROR	Failed to update role	Failed to update role	None

## Session Service Errors (1400 - 1599)

Code	Severity	Summary	Details	Action
TS-01400	ERROR	Failed to fetch session info	Failed to fetch session info	None
TS-01401	ERROR	Failed to login	Uh oh. We're not sure what happened. Please email the trace file to {adminE-mail}.	None
TS-01402	ERROR	Failed to logout	Failed to logout	None
TS-01403	ERROR	Failed to save client state	Failed to save client state	None
TS-01404	ERROR	Failed to fetch login config	Failed to fetch login config	None
TS-01405	ERROR	Failed to fetch slack config	Failed to fetch slack config	None
TS-01406	ERROR	Health check failed	Health check failed	None
TS-01407	ERROR	Failed to fetch health portal token	Failed to fetch health portal token	None
TS-01408	ERROR	The health portal release name could not be retrieved	Uh oh. We're not sure what happened. Please email the trace file to {adminE-mail}.	None

## Data Management Service Errors (1600 - 1799)

Code	Severity	Summary	Details	Action
TS-01600	ERROR	Failed to fetch data source types	Failed to fetch data source types	None
TS-01601	ERROR	Failed to fetch data source sample values	Failed to fetch data source sample values	None
TS-01602	ERROR	Failed to delete data source	Failed to delete data source	None
TS-01603	ERROR	Failed to execute DDL	Failed to execute DDL	None
TS-01604	ERROR	Failed to update schedule	Failed to update schedule	None
TS-01605	ERROR	Failed to reload tasks	Failed to reload tasks	None
TS-01606	ERROR	Failed to stop tasks	Failed to stop tasks	None
TS-01607	ERROR	Failed to get creation DDL	Failed to get creation DDL	None
TS-01608	ERROR	Failed to load from data source	Failed to load from data source	None
TS-01609	ERROR	Failed to create connection to data source	Failed to create connection to data source	None
TS-01610	ERROR	Failed to create data source	Failed to create data source	None
TS-01611	ERROR	Failed to connect to data source	Failed to connect to data source	None
TS-01612	ERROR	Failed to get data source connection field info	Failed to get data source connection field info	None
TS-01613	ERROR	Failed to get connection list for data source	Failed to get connection list for data source	None
TS-01614	ERROR	Failed to get connection attributes for data source	Failed to get connection attributes for data source	None
TS-01615	ERROR	Failed to get connections to data source	Failed to get connections to data source	None

Code	Severity	Summary	Details	Action
TS-01616	ERROR	Failed to fetch data source config	Failed to fetch data source config	None
TS-01617	ERROR	Failed to parse sql.	Failed to parse sql.	None
TS-01618	ERROR	Failed to execute sql.	Failed to execute sql.	None
TS-01619	INFO	Successfully created connection to data source	None	None
TS-01620	INFO	Successfully updated data upload schedule	None	None
TS-01621	ERROR	Failed to execute sql.	Please check the failing command, executed {1} statements successfully.	None
TS-01622	ERROR	Lightweight data-cache disabled	Lightweight data-cache disabled	None
TS-01623	INFO	Selected tables were queued for loading.	Selected tables were queued for loading.	None
TS-01624	ERROR	DataType conversion error.	No mapping found for source datatype to ThoughtSpot datatype.	None
TS-01625	INFO	Successfully reload task started.	None	None
TS-01626	INFO	Successfully connected to data source.	None	None
TS-01627	INFO	Successfully created data source.	None	None
TS-01628	INFO	Successfully stopped the tasks.	None	None
TS-01629	INFO	Successfully deleted the connection.	None	None
TS-01630	ERROR	There was an error deleting this connection.	None	None
TS-01631	INFO	Successfully executed the DDL.	None	None

## Cluster Status Service Errors (1800 - 1899)

Code	Severity	Summary	Details	Action
TS-01800	WARNING	Failed to fetch cluster information from search service.	None	None
TS-01801	WARNING	Failed to fetch table detail information from search service.	None	None
TS-01802	WARNING	Failed to fetch cluster information from database service.	None	None
TS-01803	WARNING	Failed to fetch table detail information from database service.	None	None
TS-01804	WARNING	Failed to fetch cluster information from cluster management service.	None	None
TS-01805	WARNING	Failed to fetch detail information from cluster management service.	None	None
TS-01806	WARNING	Failed to fetch log from cluster management service.	None	None
TS-01807	WARNING	Failed to fetch snapshot list from cluster management service.	None	None
TS-01808	WARNING	Failed to fetch cluster information from alert management service.	None	None
TS-01809	WARNING	Failed to fetch cluster information from event service.	None	None
TS-01810	WARNING	Failed to fetch alerts information from alert management service.	None	None
TS-01811	WARNING	Failed to fetch events information from alert management service.	None	None
TS-01812	INFO	Thanks for your feedback!	None	None
TS-01813	WARNING	Sorry! Unable to submit the feedback at this moment!	None	None
TS-01814	INFO	Successfully exported objects. File can be found at {1}.	None	None
TS-01815	ERROR	Sorry! Unable to export objects at this moment!	What happened? {1}.	None

Code	Severity	Summary	Details	Action
TS-01816	INFO	Successfully imported objects	None	None
TS-01817	ERROR	Sorry! Unable to import objects at this moment!	What happened? {1}.	None
TS-01818	INFO	Successfully deleted data source object(s).	None	None

## Callosum API Errors (9000 - 9199)

Code	Severity	Summary	Details	Action
TS-09000	ERROR	The data you are trying to delete has some dependencies	Some objects depend on the data you are trying to delete	delete the dependencies before deleting this data.
TS-09001	ERROR	Uh oh. We're not sure what happened.	Please email the trace file to {adminEmail}.	None
TS-09002	ERROR	Could not authorize user	Try logging in again	None
TS-09003	ERROR	Uh oh. We're not sure what happened.	Please email the trace file to {adminEmail}.	None
TS-09004	WARNING	Still loading data, come back soon	None	None
TS-09005	ERROR	Uh oh. We're having trouble getting data for this request.	Please email the trace file to {adminEmail}.	None
TS-09006	ERROR	Uh oh. We're having trouble getting data for this request.	Please email the trace file to {adminEmail}.	None
TS-09007	ERROR	Uh oh. We're having trouble getting data for this request.	Please email the trace file to {adminEmail}.	None
TS-09008	ERROR	Something went wrong with your search	Uh oh. We're not sure what happened. Please email the trace file to {adminEmail}.	None

Code	Severity	Summary	Details	Action
TS-09009	ERROR	The calculation engine has timed out. Please try again.	Please email the trace file to {adminEmail}.	None
TS-09010	ERROR	Cannot open Object	Object cannot be opened due to errors in some of its dependencies	None
TS-0Blink Generated Errors (9500 - 9599)				
TS-09500	WARNING	Cannot connect to the calculation engine. Please try again soon.	None	None
TS-09501	WARNING	The calculation engine has timed out. Please try again.	None	None
TS-09502	WARNING	Cannot connect to the search engine. Please try again soon.	None	None
TS-09503	WARNING	The search engine has timed out. Please try again.	None	None
TS-09504	ERROR	Cannot open {1}	{1} cannot be opened due to errors in the following dependencies 1 - Type of the object Table/Answer/Pinboard etc.	None
TS-09505	WARNING	We're still indexing this data, try again soon	None	None
TS-09506	ERROR	Object is not present in the system	{1} is not present in the system 1 - Type of the object Table/Answer/Pinboard etc.	None
TS-09507	ERROR	ThoughtSpot is unreachable. Please try again soon	None	None

## Common Errors (10000 - 10099)

Code	Severity	Summary	Details	Action
TS-10000	ERROR	A system error has occurred	Uh oh. We're not sure what happened. Please contact your administrator.	None
TS-10001	ERROR	Connection failed	The metadata store is not reachable.	Please contact your administrator
TS-10002	ERROR	The input is invalid	Input from the client to the server is invalid.	Please contact your administrator
TS-10003	ERROR	Unfortunately, you can't do that	You are not authorized to perform {1}. # {1} – action user is not authorized for	Please request access from your administrator
TS-10004	ERROR	The user could not be authorized	User {0} is not authorized to perform {1}. # {0} – name of the user # {1} – action user is not authorized for	Please request access from your administrator
TS-10005	ERROR	The base object is missing	An underlying object referenced by this object is missing in store.	Please contact your administrator
TS-10006	ERROR	The connection to Zookeeper has failed	Zookeeper is not reachable.	Please contact your administrator
TS-10007	ERROR	There's invalid parameter(s)	Invalid parameter values: {0}.	Please contact your administrator
TS-10008	ERROR	The user cannot be found	User {0} not found in store. # {0} – name of the user	Please contact your administrator
TS-10009	ERROR	Cannot add group	This group already belongs to the group you are trying to add it to.	None



## Falcon Errors (10600 - 10699)

Code	Severity	Summary	Details	Action
TS-10603	ERROR	Falcon query cancelled	None	None

## Data Errors (11000 - 11099)

Code	Severity	Summary	Details	Action
TS-11001	ERROR	Invalid row	None	None
TS-11002	ERROR	Invalid table/query resultset	None	None
TS-11003	ERROR	Invalid column identifier	None	None
TS-11004	ERROR	Invalid visualization identifier	None	None
TS-11005	ERROR	No data	Query execution resulted in no data.	None
TS-11006	ERROR	Query execution failed	Error in query execution to Falcon.	None
TS-11007	ERROR	Answer data generation failed	Error in Answer data generation for Sage input.	None
TS-11008	ERROR	Data export failed	None	None
TS-11009	ERROR	Data generation failed	Error in data generation in Callosum.	None

## Report Generation Errors (12000 - 13000)

Code	Severity	Summary	Details	Action
TS-12700	ERROR	Error while exporting data file.	None	None
TS-12701	ERROR	Invalid input.	The definition of the job is invalid.	None
TS-12702	ERROR	No author provided.	None	None
TS-12703	ERROR	No pinboard provided.	None	None
TS-12704	ERROR	No recipients provided.	None	None

Code	Severity	Summary	Details	Action
TS-12705	ERROR	This format is not supported.	None	None
TS-12706	ERROR	No job name provided.	None	None
TS-12707	ERROR	No job description provided.	None	None
TS-12708	ERROR	Pinboard data export error.	None	None
TS-12709	ERROR	Visualization data export error.	None	None
TS-12710	ERROR	User data unavailable.	None	None
TS-12711	ERROR	Configuration information unavailable.	None	None
TS-12712	ERROR	There are too many recipients.	The max number of recipients is 1000.	None
TS-12713	ERROR	Attachment size limit exceeded.	None	None
TS-12714	ERROR	Recipient domain is not whitelisted.	None	None

## More Metadata Errors (13000 - 13099)

Code	Severity	Summary	Details	Action
TS-13001	ERROR	Schema creation failed	Error creating database schema.	None
TS-13002	ERROR	Views creation failed	Error creating view.	None
TS-13003	ERROR	The object cannot be found in store	Object with Id: {0} of type: {1} not found. # {0} – identity of the object # {1} – type of object	None
TS-13004	ERROR	The object is in an invalid state	Object with Id: {0} of type: {1} in invalid state. # {0} – identity of the object # {1} – type of object	None

Code	Severity	Summary	Details	Action
TS-13005	ERROR	Object already exists	Object with Id: {0} of type: {1} already exists. # {0} – identity of the object # {1} – type of object	None
TS-13006	ERROR	Invalid object type	Invalid type: {0} provided. # {1} – type of object	None
TS-13007	ERROR	Invalid Sage question	Insufficient or invalid input from Sage: {0}. # {0} – the invalid input	None
TS-13008	ERROR	Invalid Sage question	Input from from Sage – missing columns of type: {0}. # {0} – column type	None
TS-13009	ERROR	Invalid Sage question	Invalid input from Sage – invalid expression: {0}. # {0} – the invalid expression	None
TS-13010	ERROR	Sending logical metadata to Sage failed	Sending logical metadata to Sage failed due to: {0}. # {0} – reason for failure	None
TS-13011	ERROR	Answer generation failed	Answer generation failed due to: {0}. # {0} – reason for failure	None
TS-13012	ERROR	Worksheet generation failed	Worksheet generation failed due to: {0}. # {0} – reason for failure	None
TS-13013	ERROR	Service provider unavailable	Service provider unavailable: {0}. # {0} – provider details	None
TS-13015	ERROR	Physical model not loaded	None	None
TS-13016	ERROR	Invalid physical schema proto	Inconsistency in physical schema from Falcon: {0}. # {0} – error details	None
TS-13017	ERROR	Invalid duplicate columns	Duplicate columns: {0}. # {0} – List of duplicate column identities	None

Code	Severity	Summary	Details	Action
TS-13018	ERROR	Cyclic relationship	Detected cycles: {0}. # {0} – cycle details	None
TS-13019	WARNING	Older physical schema version received	Schema update for older version: {0} received and ignored. # {0} – received version number	None
TS-13020	ERROR	Invalid relationship	Attempted to create invalid relationship: {0}. # {0} – relationship details	None
TS-13022	ERROR	Invalid filter values: {values}	None	None
TS-13023	ERROR	Creating relationship failed.	None	None
TS-13024	ERROR	Deleting schema failed.	None	None
TS-13025	ERROR	Expression validation failed.	None	None
TS-13026	INFO	Load schedule successfully disabled.	None	None
TS-13027	ERROR	Load schedule could not be disabled.	None	None
TS-13028	ERROR	Objects fetched from the connection are invalid for editing datasource.	None	To proceed with editing the datasource, please edit the connection below to fetch valid source objects.
TS-13029	INFO	Successfully edited data source connection.	None	None
TS-13030	ERROR	Connection test failed.	None	Please verify connection attributes.

## Loading Errors (30000 - 30099)

Code	Severity	Summary	Details	Action
TS-30000	ERROR	Table is not ready (data loading in progress).	None	None

## Timely Errors (60000 - 64999)

Code	Severity	Summary	Details	Action
TS-60000	ERROR	Failed to initialize.	None	None

# Frequently asked questions

## Where can I find the version of ThoughtSpot I am using?

Users with administrative privileges can see this displayed on the **Admin > System Health > Overview** page.

## I'm not seeing certain columns/values in the drop-down, why?

It could be the index has not built with the latest data or something is causing the column to be dropped.

- Verify the the column is available using the **Data** page.
- View the table columns and check the **INDEX TYPE** value. If it is set to **DONT\_INDEX**, change it.
- Check the column's **INDEX PRIORITY** &mdash; make sure it is **1**.

To learn more about modeling data see [modeling data](#) in this documentation.

## How do I track progress of current index build?

If you are an administrator, you can use the **Admin > System Health > Overview** page to see the number of tables currently being indexed. You can also review the

## How do I display the features used in my cluster configuration?

1. Log into the ThoughtSpot cluster as the **admin** user.
2. Use the **tscli feature** subcommand to display your current configuration.

```
$ tscli feature get-all-config
```

NAME	STATUS	CONFIGURATION
Firewall	Disabled	
Saml	Disabled	
Ldap	Disabled	
CustomBranding	Disabled	
CustomBrandingFontCustomization	Disabled	
DataConnect	Disabled	
RLS	Enabled	
Callhome	Enabled	
SSHTunnel	Enabled	
Fileserver	Disabled	

### Is it possible to create a max(date) filed and set it to filter?

If you have a date field in my set of data and want to return the most recent set of data based on specific date. To do this:

1. Create a formula called **Max Date** , for example:

```
date = group_max ( date_to_filter_by )
```

2. In the search bar, filter your dates by this formula for example:

```
max date = true
```

This returns only those fields that pass the filter.