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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.

## Keywords in Other Languages

Currently, we offer the following keyword translations.

日本語	中文 (简体)	Deutsche	Español (latín)	Español (España)
Français (Canada)	Français (France)	Português (Brasil)	Português (Portugal)	Italiano
Dansk	Suomi	Svenska	Norsk	Nederland

Also, see the topic on how to set [locale preferences in your user profile](#) to control language, date, and number formats on the ThoughtSpot UI.

## General

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

## Date

Keyword	Examples
after	<code>order date after 10/31/2014</code>

Keyword	Examples
before	order date <b>before</b> 03/01/2014
between ... and ...	order date <b>between</b> 01/30/2012 and 01/30/2014
daily year-over-year	growth of revenue by order date <b>daily year-over-year</b>
daily	shipments by region <b>daily</b>
day	count <b>monday</b> restaurant
day of week	revenue by <b>day of week</b> last 6 months
day of week	count shipments <b>Monday</b>
n days for each month	<b>sales last 2 days for each month</b>
n days for each quarter	revenue <b>last 15 days for each quarter</b>
n days for each week	<b>total sold last 2 days for each week</b>
n days for each year	revenue <b>last 300 days for each year</b>
growth of ... by ... daily	<b>growth of sales by order date daily</b>
growth of ... by ... monthly	<b>growth of sales by date shipped monthly</b> sales > 24000
growth of ... by ... quarterly	<b>growth of sales by date shipped quarterly</b>
growth of ... by ... weekly	<b>growth of sales by receipt date weekly</b> for pro-ski2000
growth of ... by ... yearly	<b>growth of sales by date closed yearly</b>
growth of ... by ...	<b>growth of sales by order date</b>
n hours for each day	<b>sales last 2 hours for each day</b>
last day by	customers <b>last day by</b> referrer
last month by	customers <b>last month by</b> day
last n days	visitors <b>last 7 days</b>
last n quarters	visitors <b>last 2 quarters</b> by month by campaign
last n weeks	visitors <b>last 10 weeks</b> by day

Keyword	Examples
last quarter	customers <b>last quarter</b> sale > 300
last week	customers <b>last week</b> by store
last year	top 10 customers <b>last year</b> by sale by store for region west
last <i>n</i> years	visitors <b>last 5 years</b> by revenue for sum revenue > 5000
month to date	sales by product <b>month to date</b> sales > 2400
<i>month</i> year	commission by sales rep <b>February 2014</b>
<i>month</i>	commission <b>January</b>
month	revenue by <b>month</b> last year
monthly year-over-year	growth of revenue by receipt date <b>monthly year-over-year</b>
monthly	commission > 10000 <b>monthly</b>
<i>n</i> months for each quarter	cost <b>last 2 months for each quarter</b>
<i>n</i> months for each year	<b>last 8 months for each year</b>
<i>n</i> days ago	<b>sales 2 days ago</b>
<i>n</i> months ago	<b>sales 2 months ago</b> by region
<i>n</i> months	visitors <b>last 6 months</b> for homepage visits > 30 by month
<i>n</i> quarters ago	<b>sales 4 quarters ago</b> by product name contains deluxe
<i>n</i> weeks ago	<b>sales 4 weeks ago</b> by store
<i>n</i> years ago	<b>sales 5 years ago</b> by store for region west
<i>n</i> years	opportunities <b>next 5 years</b> by revenue
next day	shipments <b>next day</b> by order
next month	appointments <b>next month</b> by day
next <i>n</i> days	shipments <b>next 7 days</b>
next <i>n</i> months	<b>openings next 6 months</b> location
next <i>n</i> quarters	opportunities <b>next 2 quarters</b> by campaign
next <i>n</i> weeks	shipments <b>next 10 weeks</b> by day

Keyword	Examples
next quarter	opportunities <b>next quarter</b> amount > 30000
next week	shipments <b>next week</b> by store
next year	opportunities <b>next year</b> by sales rep
quarter to date	sales by product <b>quarter to date</b> for top 10 products by sales
quarterly year-over-year	growth of revenue by date shipped <b>quarterly year-over-year</b>
quarterly	sales <b>quarterly</b> for each product
<i>n</i> quarters for each year	<b>last 2 quarters</b> for each year
today	sales <b>today</b> by store
week to date	sales by order date <b>week to date</b> for pro-ski200
week	revenue by <b>week</b> last quarter
weekly year-over-year	growth of revenue by date shipped <b>weekly year-over-year</b>
weekly	revenue <b>weekly</b>
<i>n</i> weeks for each month	sales <b>last 3 weeks for each month</b>
<i>n</i> weeks for each quarter	<b>last 2 weeks for each quarter</b>
<i>n</i> weeks for each year	<b>last 3 weeks for each year</b>
year to date	sales by product <b>year to date</b>
year	revenue by product <b>2014</b> product name contains snowboard
yearly	shipments by product <b>yearly</b>
yesterday	sales <b>yesterday</b> for pro-ski200 by store

## Time

Keyword	Examples
detailed	<b>ship time detailed</b>

Keyword	Examples
last minute	count homepage views <b>last minute</b>
last hour	count unique visits <b>last hour</b>
<i>n</i> minutes	count visitors last <b>30 minutes</b>
<i>n</i> hours	count visitors last <b>12 hours</b>
hourly	visitors by page name <b>hourly</b>
<i>n</i> minutes ago	sum inventory by product <b>10 minutes ago</b>
<i>n</i> hours ago	sum inventory by product by store <b>2 hours ago</b>

## Text

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

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

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

## Period

Keyword	Example
quarter ( <i>date</i> )	<b>quarter</b> ( <i>purchase date</i> )
quarter of year ( <i>date</i> )	<b>quarter of year</b> ( <i>purchase date</i> )
month of quarter ( <i>date</i> )	<b>month of quarter</b> ( <i>purchase date</i> )
week of year ( <i>date</i> )	<b>week of year</b> ( <i>ship date</i> )
week of quarter ( <i>date</i> )	<b>week of quarter</b> ( <i>ship date</i> )
week of month ( <i>date</i> )	<b>week of month</b> ( <i>ship date</i> )
day of year ( <i>date</i> )	<b>day of year</b> ( <i>ship date</i> )
day of quarter ( <i>date</i> )	<b>day of quarter</b> ( <i>ship date</i> )
day ( <i>date</i> )	<b>day</b> ( <i>ship date</i> )
day of month ( <i>date</i> )	<b>day of month</b> ( <i>order date</i> )
day of week ( <i>date</i> )	<b>day of week</b> ( <i>order date</i> )
hour ( <i>datetime</i> )	<b>hour</b> ( <i>timestamp</i> )

## In

Keyword	Example
in ( <i>subsearch</i> )	<code>in (top 10 store name by sales footwear)</code>

# 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.

**❶ 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>	Lists all available databases.  Examples:  <code>SHOW DATABASES;</code>

Syntax	Description
<code>USE &lt;database&gt;</code>	Switches the context to the specified database. This is required if queries do not use fully qualified names (database.schema.table) for specifying tables.  Examples:  <code>USE "fruit_database";</code>
<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>• sum</li> <li>• count</li> <li>• count distinct</li> <li>• stddev</li> <li>• avg</li> <li>• variance</li> <li>• min</li> <li>• max</li> </ul> <p>You can use the following date functions:</p> <ul style="list-style-type: none"> <li>• absyear</li> <li>• absmonth</li> <li>• absday</li> <li>• absquarter</li> <li>• date</li> <li>• time</li> </ul> <p>For example:</p> <pre>SELECT TOP 10 "quantity" FROM "sales_fact";</pre> <pre>SELECT COUNT(*) FROM "vendor";</pre> <pre>SELECT "vendor", SUM("quantity") FROM "sales_fact" GROUP BY "vendor";</pre> <pre>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;</pre> <pre>SELECT "vendor", SUM("quantity") FROM "sales_fact" GROUP BY "vendor" LIMIT 10;</pre>

## Schema creation

Syntax	Description
<code>CREATE DATABASE     &lt;data- base&gt;</code>	Creates a database. For example:  <code>CREATE DATABASE "fruit_database";</code>
<code>CREATE SCHEMA     &lt;schema&gt;</code>	Creates a schema within the current database. For example:  <code>CREATE SCHEMA "fruit_schema";</code>
<code>CREATE TABLE     &lt;table&gt; (&lt;column_def-     itions&gt;         [&lt;con-         straints&gt;]) [PARTI-         TION BY HASH (&lt;num-         ber&gt;) [KEY             ("&lt;col-         umn&gt;")]]</code>	Creates a table with the specified column definitions and constraints.  Use <code>PARTITION BY HASH</code> to shard a table across all nodes. If no <code>KEY</code> is specified, the table will be randomly sharded.  Do not specify relationship constraints ( <code>FOREIGN KEY</code> or <code>RELATION- SHIP</code> ) in the <code>CREATE TABLE</code> statement. Instead, define these using <code>AL- TER TABLE</code> 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:  <code>CREATE TABLE "vendor" ("vendorid" int, "name" var- char(255));</code>  <code>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");</code>

## Schema modification

Syntax	Description
<code>DROP DATABASE     &lt;data- base&gt;</code>	Drops a database and all of its schemas and tables. For example:  <code>DROP DATABASE "fruit_database";</code>

Syntax	Description
<code>DROP SCHEMA &lt;schema&gt;</code>	Drops a schema within the current database, and drops all of the tables in the schema. For example:  <code>DROP SCHEMA "fruit_schema";</code>
<code>DROP TABLE &lt;table&gt;</code>	Drops a table. For example:  <code>DROP TABLE "location";</code>
<code>TRUNCATE TABLE &lt;table&gt;</code>	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.  However, this operation removes all existing data from the table and must be used with caution. You must reload the data following a <code>TRUNCATE</code> , or all dependent objects (worksheets and pinboards) in ThoughtSpot will become invalid. For example:  <code>TRUNCATE TABLE "location";</code>
<code>ALTER TABLE &lt;table&gt; ADD   DROP   RENAME COLUMN &lt;column&gt;</code>	Alters a table to add, drop, or rename a column.  When you add a column to an existing table, you must provide a default value to use for existing rows. For example:  <code>ALTER TABLE "cart" ADD COLUMN "nickname" varchar(255) DEF- FAULT 'no nickname';</code>  <code>ALTER TABLE "cart" DROP COLUMN "nickname";</code>  <code>ALTER TABLE "cart" RENAME COLUMN "nickname" TO "shortname";</code>
<code>ALTER TABLE &lt;table&gt; DROP CON- STRAINT PRIMARY KEY;</code>	Drops the primary key from a table.  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:  <code>ALTER TABLE "sales" DROP CONSTRAINT PRIMARY KEY;</code>  <code>ALTER TABLE "sales" ADD CONSTRAINT PRIMARY KEY ("PO_number");</code>

Syntax	Description
<pre>ALTER TABLE &lt;table&gt; DROP [FOR- EIGN KEY  RELA- TIONSHIP] &lt;name&gt;;</pre>	<p>Drops the named foreign key or relationship between two tables. For example:</p> <pre>ALTER TABLE "sales_fact" DROP CONSTRAINT FOREIGN KEY "FK_P0_number";</pre> <pre>ALTER TABLE "fruit_dim" DROP RELATIONSHIP "REL_dates";</pre>
<pre>ALTER TABLE &lt;table&gt; DROP [CON- STRAINT 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 "or- ders";</pre> <pre>ALTER TABLE "wholesale_buys" DROP RELATIONSHIP WITH "re- tail_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>

Syntax	Description
<pre>ALTER TABLE &lt;table&gt; [SET DI- MENSION   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 <code>INSERT</code> 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_da- ta_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 <code>1-100</code>. The system default for all tables is <code>50</code>. For example:</p> <pre>ALTER TABLE 'sales_facts' SET LOAD PRIORITY 1;</pre>
---	--

Syntax	Description
<pre>UPDATE &lt;table&gt; ... SET ... [WHERE ...]</pre>	<p>Updates rows in a table that match optionally provided predicates. Predicates have the form <code>column = value</code> connected by the <code>AND</code> keyword.</p> <p>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 <code>column = value</code> connected by the <code>AND</code> keyword.</p> <p>For example:</p> <pre>DELETE FROM "vendor" WHERE "name" = 'Joey Smith' AND "ven- dorid" = '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
<pre>PRIMARY KEY</pre>	<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:</p> <pre>CREATE TABLE "schools" ( "schoolID" varchar(15), "schoolName" varchar(255), "schoolCity" varchar(55), "schoolState" var- char(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>

Syntax	Description
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>
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" = "re- tail_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>	INT holds 32 bits. BIGINT holds 64 bits.
Date or time	<ul style="list-style-type: none"><li>DATE</li><li>DATETIME</li><li>TIMESTAMP</li><li>TIME</li></ul>	DATETIME, TIMESTAMP, and TIME are stored at the granularity of seconds  TIMESTAMP is identical to DATETIME, but is included for syntax compatibility.

# 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="#">strftime 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 <code>20011230 01:15:12</code> . Use the datetime format specifications supported in the <a href="#">strftime 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="#">strftime library function</a> .	

Flag	Description	Notes
--v=[0 1 2 3]	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.
--skip_second_fraction	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
--source_file <path_to_file>/<file_name>	Specifies the location of the file to be loaded.	
--source_data_format [csv delimited]	Specifies the data file format.	Optional. The default is csv.
--field_separator "<delimiter>"	Specifies the field delimiter used in the input file.	
--trailing_field_separator	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.
--null_value "<null_representation>"	Specifies how null values are represented in the input file.	These values will be converted to NULL upon loading.
--date_converted_to_epoch [true false]	Specifies whether the “date” or “datetime” values in the input file are represented as epoch values.	
--boolean_representation [true_false   1_0   T_F   Y_N]	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: --boolean_representation Y_NULL

Flag	Description	Notes
<code>--has_header_row</code>	Indicates that the input file contains a header row.	If supplied, column names in the header row are used to match column names in the target table in ThoughtSpot. If not supplied, the first row of the file is loaded as data, the same as all subsequent rows.
<code>--escape_character "&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 "&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 = [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 [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 nodes, 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]
      {access,alert,ansible, backup,backup-policy,callhome,cassandra,cluster,command,dr-mirror,etl,event,feature,fileserver,firewall,hdfs,ipsec,ldap,logs,map-tiles,monitoring,nas,node,patch,rpackage,saml,scheduled-pinboards,smtp,snapshot,snapshot-policy,spot,sssd,ssl,storage,support,tokenuauthentication}
```

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.

## access

```
tscli access [-h] {list} ...
```

Use this subcommand to do the following:

- `tscli access list` Lists objects by last access time.

## alert

```
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`.

## ansible

```
tscli ansible [-h] {checkout,commit} [--local] ...
```

Use this subcommand to install and configure third party software on the ThoughtSpot cluster.

For details, see:

- [About third party security and monitoring software](#)
- [Installing third party security and monitoring software](#)

## backup

```
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.

## cassandra

```
tscli cassandra [-h] {backup,restore} ...
```

Use this subcommand to do the following:

- `tscli cassandra backup` Take a backup of cassandra
- `tscli cassandra restore` Restore cassandra from a backup

## 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,enabl e-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 `org_id` 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: `0`)
- `--proxy_username PROXY_USERNAME` Proxy server username (default: `None`)
- `--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 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.

## ipsec

```
tscli ipsec [-h] {disable,enable,status} ...
```

This subcommand has the following actions:

`tscli ipsec disable` Disable IPSec `tscli ipsec enable` Enable IPSec `tscli ipsec status`  
Show IPSec status on all nodes

## 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-translated 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-translated 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,status} ...
```

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 interest 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.
- `tscli map-tiles status` Check whether map-tiles is enabled.

## 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 umount [-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

## patch

```
tscli patch [-h] {apply,ls,resume-apply,resume-rollback,rollbac
k} ...
```

This subcommand has the following actions:

- `tscli patch apply [-h] [ release ]`

Apply the patch on an existing cluster. Takes the following parameters:

- `release` The relative path to the patch tar ball

- `tscli patch ls [-h] [--applied] [--rolled_back] [--service SERVICE] [--md5 MD5] [--history]` Lists the patches currently applied. This takes the following parameters:

- `--applied` Show only the patches applied since last full release (default: `False`)
- `--rolled_back` Show only the patches rolled back since last full release (default: `False`)
- `--service SERVICE` Show patches filtered by service (default: `None`)
- `--md5 MD5` Shows the details of the patch specified (default: `None`)
- `--history` Shows the history of all patch apply/rollback release (default: `False`)

- `tscli patch resume-apply [-h]`

Resume patch apply

- `tscli patch resume-rollback [-h]`

Resume patch roll-backup

- `tscli patch rollback [-h]`

Rollback the patch from an existing cluster

## 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] {remove-mailfromname,remove-mailname,remove-relayhost,remove-saslcredentials,reset-canonical-mapping,set-canonical-mapping,set-mailfromname,set-mailname,set-relayhost,set-saslcredentials,show-canonical-mapping,show-mailfromname,show-mailname,show-relayhost}
```

This subcommand takes supports the following actions:

- `tscli smtp remove-mailfromname` Removes current cluster mailfromname
- `tscli smtp remove-mailname` Removes current cluster mailname
- `tscli smtp remove-relayhost` Removes current cluster relayhost
- `tscli smtp remove-saslcredentials` Clears SASL credentials and disables SMTP AUTH
- `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 set-saslcredentials` Sets SASL credentials and enables SMTP AUTH
- `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,pin,restore,unpin,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` parameter is the number of days after which this snapshot will be automatically deleted. A value of `-1` disables automatic deletion.

- `tscli snapshot pin [-h] name` Pins a snapshot so it cannot be deleted or garbage collected.
- `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 unpin [-h] name` Unpin a snapshot so it can be deleted or garbage collected.

- `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 authroization 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.

## sssd

```
tscli sssd {enable, disable, set-sudo-group, clear-sudo-group}  
...
```

This subcommand uses system security services daemon (SSSD), and has the following actions:

- `tscli sssd enable --user USER --domain DOMAIN`  
Enables system Active Directory (AD) user access on a single node. You will be prompted for password credentials. The user must have permission to join a computer or VM to the domain.
- `tscli sssd disable`  
Disables system AD based access on a local node. Running this command will also remove the AD group from sudoers list.
- `tscli sssd set-sudo-group ACTIVE_DIRECTORY_GROUP_NAME`  
Allows `sudo` permissions for AD group.
- `tscli sssd clear-sudo-group ACTIVE_DIRECTORY_GROUP_NAME`  
Clears any set AD sudo group.

For more about setting up Active Directory access, see [Enable Active Directory based access](#).

## 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]
{bundle,restart-remote,rm-admin-email,rm-admin-phone,rm-feedback-email,
set-admin-email,set-admin-phone,set-debug-ui-password,
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 `strftime` 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 10:32:22.000
- 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  |

| Format mask | Description                                                |
|-------------|------------------------------------------------------------|
| MM          | Two digit month 01 - 12                                    |
| 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><br><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><br><code>to_double (revenue * .01)</code>                                                 |
| <code>to_integer</code> | Returns the input as an integer.                                                                                                                                                                                                                                                                           | <code>to_integer ('45') + 1 = 46</code><br><code>to_integer (price + tax - cost)</code>                                          |
| <code>to_string</code>  | Returns the input as a text string. To convert a date to a string, specify the date format you want to use.                                                                                                                                                                                                | <code>to_string (45 + 1) = '46'</code><br><code>to_string (revenue - cost)</code><br><code>to_string (date, ('%m/%d/%y'))</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><br><code>add_days (invoiced, 30)</code>                               |
| <code>add_minutes</code>           | Returns the result of adding the specified number of minutes to input date/date-time/time.                                                                                                                                                                   | <code>add_minutes ( 01/30/2015 00:10:20 , 5 ) = 01/30/2015 00:11:20</code><br><code>add_minutes ( 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><br><code>day (date ordered)</code>                                                    |
| <code>day_number_of_quarter</code> | Returns the number of the day in a quarter for a given date. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.) | <code>day_number_of_quarter (01/30/2015) = 30</code><br><code>day_number_of_quarter (01/30/2015, 'fiscal') = 91</code>   |
| <code>day_number_of_week</code>    | Returns the number (1-7) of the day in a week for a given date with 1 being Monday and 7 being Sunday.                                                                                                                                                       | <code>day_number_of_week(01/15/2014) = 3</code><br><code>day_number_of_week (shipped)</code>                             |

| Function                        | Description                                                                                                                                                                                                                                                        | Examples                                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>day_number_of_year</code> | Returns the number (1-366) of the day in a year from a given date. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.) | <code>day_number_of_year (01/30/2015) = 30</code><br><code>day_number_of_year ( 01/30/2015, 'fiscal' ) = 275</code><br><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><br><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><br><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><br><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><br><code>is_weekend (emailed)</code>                                                                                  |
| <code>month</code>              | Returns the month from the given date.                                                                                                                                                                                                                             | <code>month (01/15/2014) = January</code><br><code>month (date ordered)</code>                                                                                    |

| Function                             | Description                                                                                                                                                                                                                                                     | Examples                                                                                                                                              |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>month_number</code>            | Returns the number (1-12) of the month from a given date. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)       | <code>month_number (09/20/2014) = 9</code><br><code>month_number ( 09/20/2014, 'fiscal' ) = 5</code><br><code>month_number (purchased)</code>         |
| <code>month_number_of_quarter</code> | Returns the month (1-3) number for the given date in a quarter. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.) | <code>month_number_of_quarter (02/20/2018) = 2</code><br><code>month_number_of_quarter (02/20/2018, 'fiscal') = 1</code>                              |
| <code>now</code>                     | Returns the current timestamp.                                                                                                                                                                                                                                  | <code>now ()</code>                                                                                                                                   |
| <code>quarter_number</code>          | Returns the number (1-4) of the quarter associated with the given date. Add an optional second parameter to specify 'fiscal' or 'calendar' dates. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)                                  | <code>quarter_number ( 04/14/2014 ) = 2</code><br><code>quarter_number ( 04/14/2014, 'fiscal' ) = 4</code><br><code>quarter_number ( shipped )</code> |

| Function                      | Description                                                                                                                                                                                                                                                              | Examples                                                                                                                                                              |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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><br><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. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)    | <code>start_of_quarter ( 04/01/2014 ) = Apr 2014</code><br><code>start_of_quarter ( 04/01/2014, 'fiscal' ) = Feb 2014</code><br><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><br><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. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)       | <code>start_of_year (04/01/2014) returns Jan 2014</code><br><code>start_of_year (04/01/2014, 'fiscal') returns May 2013</code><br><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><br><code>time (call began)</code>                                                                                          |

| Function                            | Description                                                                                                                                                                                                                                                                                                            | Examples                                                                                                                      |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <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.<br>Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result.<br>Default is 'calendar'.<br>(In examples, start of fiscal year is set to May 01.)                                                      | <code>week_number_of_quarter (04/03/2017) = 1</code><br><code>week_number_of_quarter (04/03/2017, 'fiscal') = 10</code>       |
| <code>week_number_of_year</code>    | Returns the week number for the given date in a year. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)                                                                  | <code>week_number_of_year (01/17/2014) = 3</code><br><code>week_number_of_year ( 01/17/2014, 'fiscal') = 38</code>            |
| <code>year</code>                   | Returns the year from a given date.<br>Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result.<br>Default is 'calendar'.<br>(In examples, start of fiscal year is set to May 01. Per standard convention, the fiscal year is defined by the year-end date.) | <code>year (01/15/2014) = 2014</code><br><code>year (12/15/2013, 'fiscal' ) = 2014</code><br><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><br><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><br><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><br><code>revenue &lt;= 1000000</code>                   |
| <code>=</code>        | Returns true if the first value is equal to the second value.                 | <code>2 = 2 = true</code><br><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><br><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><br><code>revenue &gt;= 1000000</code>                   |
| <code>greatest</code> | Returns the larger of the values.                                             | <code>greatest (20, 10) = 20</code><br><code>greatest (q1 revenue, q2 revenue)</code> |
| <code>least</code>    | Returns the smaller of the values.                                            | <code>least (20, 10) = 10</code><br><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><br><code>price * taxrate</code>       |
| <code>+</code> | Returns the result of adding both numbers.                          | <code>1 + 2 = 3</code><br><code>price + shipping</code>      |
| <code>-</code> | Returns the result of subtracting the second number from the first. | <code>3 - 2 = 1</code><br><code>revenue - tax</code>         |
| <code>/</code> | Returns the result of dividing the first number by the second.      | <code>6 / 3 = 2</code><br><code>markup / retail price</code> |

| Function           | Description                                                         | Examples                                                                     |
|--------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------|
| <code>^</code>     | Returns the first number raised to the power of the second.         | <code>3 ^ 2 = 9</code><br><code>width ^ 2</code>                             |
| <code>abs</code>   | Returns the absolute value.                                         | <code>abs (-10) = 10</code><br><code>abs (profit)</code>                     |
| <code>acos</code>  | Returns the inverse cosine in degrees.                              | <code>acos (0.5) = 60</code><br><code>acos (cos-satellite-angle)</code>      |
| <code>asin</code>  | Returns the inverse sine (specified in degrees).                    | <code>asin (0.5) = 30</code><br><code>asin (sin-satellite-angle)</code>      |
| <code>atan</code>  | Returns the inverse tangent in degrees.                             | <code>atan (1) = 45</code><br><code>atan (tan-satellite-angle)</code>        |
| <code>atan2</code> | Returns the inverse tangent in degrees.                             | <code>atan2 (10, 10) = 45</code><br><code>atan2 (longitude, latitude)</code> |
| <code>cbrt</code>  | Returns the cube root of a number.                                  | <code>cbrt (27) = 3</code><br><code>cbrt (volume)</code>                     |
| <code>ceil</code>  | Returns the smallest following integer.                             | <code>ceil (5.9) = 6</code><br><code>ceil (growth rate)</code>               |
| <code>cos</code>   | Returns the cosine of an angle (specified in degrees).              | <code>cos (63) = 0.45</code><br><code>cos (beam angle)</code>                |
| <code>cube</code>  | Returns the cube of a number.                                       | <code>cube (3) = 27</code><br><code>cube (length)</code>                     |
| <code>exp</code>   | Returns Euler's number (~2.718) raised to a power.                  | <code>exp (2) = 7.38905609893</code><br><code>exp (growth)</code>            |
| <code>exp2</code>  | Returns 2 raised to a power.                                        | <code>exp2 (3) = 8</code><br><code>exp2 (growth)</code>                      |
| <code>floor</code> | Returns the largest previous integer.                               | <code>floor (5.1) = 5</code><br><code>floor (growth rate)</code>             |
| <code>ln</code>    | Returns the natural logarithm.                                      | <code>ln (7.38905609893) = 2</code><br><code>ln (distance)</code>            |
| <code>log10</code> | Returns the logarithm with base 10.                                 | <code>log10 (100) = 2</code><br><code>log10 (volume)</code>                  |
| <code>log2</code>  | Returns the logarithm with base 2 (binary logarithm).               | <code>log2 (32) = 5</code><br><code>log2 (volume)</code>                     |
| <code>mod</code>   | Returns the remainder of first number divided by the second number. | <code>mod (8, 3) = 2</code><br><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><br><code>pow (width, 2)</code>                                                                                                                                       |
| <code>random</code>             | Returns a random number between 0 and 1.                                                                                           | <code>random () = .457718</code><br><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><br><code>round (battingavg, 100)</code><br><code>round (48.67, .1) = 48.7</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><br><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><br><code>sign (growth_rate)</code>                                                                                                                                  |
| <code>sin</code>                | Returns the sine of an angle (specified in degrees).                                                                               | <code>sin (35) = 0.57</code><br><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><br><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><br><code>sq (width)</code>                                                                                                                                               |
| <code>sqrt</code>               | Returns the square root.                                                                                                           | <code>sqrt (9) = 3</code><br><code>sqrt (area)</code>                                                                                                                                             |
| <code>tan</code>                | Returns the tangent of an angle (specified in degrees).                                                                            | <code>tan (35) = 0.7</code><br><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><br><code>lastname = 'smith' and state = 'texas'</code>                        |
|                               |                                                                          | <b>Note:</b> Not available for row level security (RLS) formulas.                                                        |
| <code>if...then...else</code> | Conditional operator.                                                    | <code>if (3 &gt; 2) then 'bigger' else 'not bigger'</code><br><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><br><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><br><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><br><code>concat (last_name , first_name )</code>   |
| <code>contains</code> | Returns true if the first string contains the second string, otherwise returns false.                                                           | <code>contains ('broomstick', 'room') = true</code><br><code>contains (product, 'trial version')</code> |

| Function                            | Description                                                                                                                                                                                                                                                                                                                                                              | Examples                                                                                                                                         |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <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.                                                                                                                                                                              | <code>edit_distance ('attorney', 'atty') = 4</code><br><code>edit_distance (color, 'red')</code>                                                 |
| <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. | <code>edit_distance_with_cap ('pokemon go', 'minecraft pixelmon', 3) = 4</code><br><code>edit_distance_with_cap (event, 'burning man', 3)</code> |
| <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.                                                | <code>similar_to ('hello world', 'hello swirl') = true</code><br><code>similar_to (current team, drafted by)</code>                              |
| <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.                               | <code>similarity ('where is the burning man concert', 'burning man') = 46</code><br><code>similarity (tweet1, tweet2)</code>                     |
| <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.                                                                                                                                                                                                                                | <code>spells_like ('thouhgspot', 'thoughtspot') = true</code><br><code>spells_like (studio, distributor)</code>                                  |

| Function            | Description                                                                                                                          | Examples                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <code>strlen</code> | Returns the length of the text.                                                                                                      | <code>strlen ('smith') = 5</code><br><code>strlen (lastname)</code>                                       |
| <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. | <code>strpos ('haystack_with_needles', 'needle') = 14</code><br><code>strpos (complaint, 'lawyer')</code> |
| <code>substr</code> | Returns the portion of the given string, beginning at the location specified (starting from 0), and of the given length.             | <code>substr ('persnickety', 3, 7) = snicket</code><br><code>substr (lastname, 0, 5)</code>               |

## 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. | <code>ts_groups = 'east'</code>    |
| <code>ts_username</code> | Returns the user with the matching neame.                                                                                                                                  | <code>ts_username != 'mark'</code> |

# 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><br><code>lastname = 'smith' and state = 'texas'</code>                        |
|                               |                                                                          | <b>Note:</b> Not available for row level security (RLS) formulas.                                                        |
| <code>if...then...else</code> | Conditional operator.                                                    | <code>if (3 &gt; 2) then 'bigger' else 'not bigger'</code><br><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><br><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><br><code>state = 'california' or state = 'oregon'</code>                       |

## Aggregate functions (group aggregate)

These functions can be used to aggregate data.

</tbody> </table> ## 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>average</code> | Returns the average of all the values of a column. | <code>average (revenue)</code> |

| Function                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Examples                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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>                                                                                                                                                                                                                                                                                                                  |
| <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_aggregate</code>    | <p>Takes a measure and, optionally, attributes and filters. These can be used to aggregate measures with granularities and filters different from the terms/columns used in the search. Especially useful for comparison analysis.</p> <p>This formula takes the form: <code>group_aggregate (&lt; aggregation (measure) &gt;, &lt; groupings &gt;, &lt; filters &gt;)</code></p> <p>Lists can be defined with {} and optional list functions <code>query_groups</code> or <code>query_filters</code>, which by default specify the lists or filters used in the original search. Plus (+) or (-) can be used to add or exclude specific columns for query groups.</p> | <pre>group_aggregate (sum (revenue) , {ship mode, date} , {} )</pre> <pre>group_aggregate (sum (revenue) , {ship mode , date}, {day_of_week (date) = 'friday'} )</pre> <pre>group_aggregate (sum (revenue) , query_groups() , query_filters() )</pre> <pre>group_aggregate (sum (revenue) , query_groups() + {date} , query_filters() )</pre> |

| Function                        | Description                                                                                                            | Examples                                                     |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <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>         |
| <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>   |

| Function                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Examples                                                     |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <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>       |
| <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>          |

| Function                     | Description                                                                                                                                                                                                                                                 | Examples                                                                                                        |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <code>rank</code>            | Returns the rank for the current row. Identical values are assigned an identical rank. Takes an aggregate as input for the first argument. Use the second argument as either 'asc'   'desc' to specify ascending or descending order.                       | <code>rank (sum (revenue) , 'asc' )</code><br><code>rank (sum (revenue) , 'desc'</code>                         |
| <code>rank_percentile</code> | Returns the percentile rank for the current row. Identical values are assigned an identical percentile rank. Taken an aggregate as input for the first argument. Use the second argument as either 'asc'   'desc' to specify ascending or descending order. | <code>rank_percentile (sum (revenue) , 'asc' )</code><br><code>rank_percentile (sum (revenue) , 'desc' )</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>                                                  |

| Function             | Description                                     | Examples                                                           |
|----------------------|-------------------------------------------------|--------------------------------------------------------------------|
| <code>to_bool</code> | Returns the input as a boolean (true or false). | <code>to_bool (0) = false</code><br><code>to_bool (married)</code> |

| Function                | Description                                                                                                                                                                                                                                                                                                | Examples                                                                                                                         |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <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><br><code>to_double (revenue * .01)</code>                                                 |
| <code>to_integer</code> | Returns the input as an integer.                                                                                                                                                                                                                                                                           | <code>to_integer ('45') + 1 = 46</code><br><code>to_integer (price + tax - cost)</code>                                          |
| <code>to_string</code>  | Returns the input as a text string. To convert a date to a string, specify the date format you want to use.                                                                                                                                                                                                | <code>to_string (45 + 1) = '46'</code><br><code>to_string (revenue - cost)</code><br><code>to_string (date, ('%m/%d/%y'))</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><br><code>add_days (invoiced, 30)</code>                               |
| <code>add_minutes</code> | Returns the result of adding the specified number of minutes to input date/date-time/time. | <code>add_minutes ( 01/30/2015 00:10:20 , 5 ) = 01/30/2015 00:11:20</code><br><code>add_minutes ( 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><br><code>day (date ordered)</code>                                                    |

| Function                           | Description                                                                                                                                                                                                                                                        | Examples                                                                                                                                                          |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>day_number_of_quarter</code> | Returns the number of the day in a quarter for a given date. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)       | <code>day_number_of_quarter (01/30/2015) = 30</code><br><code>day_number_of_quarter (01/30/2015, 'fiscal') = 91</code>                                            |
| <code>day_number_of_week</code>    | Returns the number (1-7) of the day in a week for a given date with 1 being Monday and 7 being Sunday.                                                                                                                                                             | <code>day_number_of_week(01/15/2014) = 3</code><br><code>day_number_of_week (shipped)</code>                                                                      |
| <code>day_number_of_year</code>    | Returns the number (1-366) of the day in a year from a given date. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.) | <code>day_number_of_year (01/30/2015) = 30</code><br><code>day_number_of_year ( 01/30/2015, 'fiscal' ) = 275</code><br><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><br><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><br><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><br><code>diff_time (clicked, submitted)</code>                                                          |

| Function                             | Description                                                                                                                                                                                                                                                           | Examples                                                                                                                                      |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <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><br><code>is_weekend (emailed)</code>                                                              |
| <code>month</code>                   | Returns the month from the given date.                                                                                                                                                                                                                                | <code>month (01/15/2014) = January</code><br><code>month (date ordered)</code>                                                                |
| <code>month_number</code>            | Returns the number (1-12) of the month from a given date.<br>Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result.<br>Default is 'calendar'.<br>(In examples, start of fiscal year is set to May 01.)    | <code>month_number (09/20/2014) = 9</code><br><code>month_number ( 09/20/2014, 'fiscal' ) = 5</code><br><code>month_number (purchased)</code> |
| <code>month_number_of_quarter</code> | Returns the month (1-3) number for the given date in a quarter. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result.<br>Default is 'calendar'.<br>(In examples, start of fiscal year is set to May 01.) | <code>month_number_of_quarter (02/20/2018) = 2</code><br><code>month_number_of_quarter (02/20/2018, 'fiscal' ) = 1</code>                     |
| <code>now</code>                     | Returns the current timestamp.                                                                                                                                                                                                                                        | <code>now ()</code>                                                                                                                           |

| Function                      | Description                                                                                                                                                                                                                                                              | Examples                                                                                                                                                               |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>quarter_number</code>   | Returns the number (1-4) of the quarter associated with the given date. Add an optional second parameter to specify 'fiscal' or 'calendar' dates. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)                                           | <code>quarter_number ( 04/14/2014 ) = 2</code><br><code>quarter_number ( 04/14/2014, 'fiscal' ) = 4</code><br><code>quarter_number ( shipped )</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><br><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. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)    | <code>start_of_quarter ( 04/01/2014 ) = Apr 2014</code><br><code>start_of_quarter ( 04/01/2014, 'fiscal' ) = Feb 2014</code><br><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><br><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. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.) | <code>start_of_year (04/01/2014) returns Jan 2014</code><br><code>start_of_year (04/01/2014, 'fiscal') returns May 2013</code><br><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><br><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. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)           | <code>week_number_of_quarter (04/03/2017) = 1</code><br><code>week_number_of_quarter (04/03/2017, 'fiscal') = 10</code>                                               |
| <code>week_number_of_year</code>    | Returns the week number for the given date in a year. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01.)              | <code>week_number_of_year (01/17/2014) = 3</code><br><code>week_number_of_year ( 01/17/2014, 'fiscal') = 38</code>                                                    |

| Function          | Description                                                                                                                                                                                                                                                                                                   | Examples                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <code>year</code> | Returns the year from a given date. Add an optional second parameter to specify whether a 'fiscal' or 'calendar' year is used to calculate the result. Default is 'calendar'. (In examples, start of fiscal year is set to May 01. Per standard convention, the fiscal year is defined by the year-end date.) | <code>year (01/15/2014) = 2014</code><br><code>year (12/15/2013, 'fiscal') = 2014</code><br><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><br><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><br><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><br><code>revenue &lt;= 1000000</code>                   |
| <code>=</code>        | Returns true if the first value is equal to the second value.                 | <code>2 = 2 = true</code><br><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><br><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><br><code>revenue &gt;= 1000000</code>                   |
| <code>greatest</code> | Returns the larger of the values.                                             | <code>greatest (20, 10) = 20</code><br><code>greatest (q1 revenue, q2 revenue)</code> |
| <code>least</code>    | Returns the smaller of the values.                                            | <code>least (20, 10) = 10</code><br><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><br><code>price * taxrate</code> |

| Function           | Description                                                         | Examples                                                                     |
|--------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------|
| <code>+</code>     | Returns the result of adding both numbers.                          | <code>1 + 2 = 3</code><br><code>price + shipping</code>                      |
| <code>-</code>     | Returns the result of subtracting the second number from the first. | <code>3 - 2 = 1</code><br><code>revenue - tax</code>                         |
| <code>/</code>     | Returns the result of dividing the first number by the second.      | <code>6 / 3 = 2</code><br><code>markup / retail price</code>                 |
| <code>^</code>     | Returns the first number raised to the power of the second.         | <code>3 ^ 2 = 9</code><br><code>width ^ 2</code>                             |
| <code>abs</code>   | Returns the absolute value.                                         | <code>abs (-10) = 10</code><br><code>abs (profit)</code>                     |
| <code>acos</code>  | Returns the inverse cosine in degrees.                              | <code>acos (0.5) = 60</code><br><code>acos (cos-satellite-angle)</code>      |
| <code>asin</code>  | Returns the inverse sine (specified in degrees).                    | <code>asin (0.5) = 30</code><br><code>asin (sin-satellite-angle)</code>      |
| <code>atan</code>  | Returns the inverse tangent in degrees.                             | <code>atan (1) = 45</code><br><code>atan (tan-satellite-angle)</code>        |
| <code>atan2</code> | Returns the inverse tangent in degrees.                             | <code>atan2 (10, 10) = 45</code><br><code>atan2 (longitude, latitude)</code> |
| <code>cbrt</code>  | Returns the cube root of a number.                                  | <code>cbrt (27) = 3</code><br><code>cbrt (volume)</code>                     |
| <code>ceil</code>  | Returns the smallest following integer.                             | <code>ceil (5.9) = 6</code><br><code>ceil (growth rate)</code>               |
| <code>cos</code>   | Returns the cosine of an angle (specified in degrees).              | <code>cos (63) = 0.45</code><br><code>cos (beam angle)</code>                |
| <code>cube</code>  | Returns the cube of a number.                                       | <code>cube (3) = 27</code><br><code>cube (length)</code>                     |
| <code>exp</code>   | Returns Euler's number (~2.718) raised to a power.                  | <code>exp (2) = 7.38905609893</code><br><code>exp (growth)</code>            |
| <code>exp2</code>  | Returns 2 raised to a power.                                        | <code>exp2 (3) = 8</code><br><code>exp2 (growth)</code>                      |
| <code>floor</code> | Returns the largest previous integer.                               | <code>floor (5.1) = 5</code><br><code>floor (growth rate)</code>             |
| <code>ln</code>    | Returns the natural logarithm.                                      | <code>ln (7.38905609893) = 2</code><br><code>ln (distance)</code>            |

| Function                        | Description                                                                                                                        | Examples                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>log10</code>              | Returns the logarithm with base 10.                                                                                                | <code>log10 (100) = 2</code><br><code>log10 (volume)</code>                                                                                                                                       |
| <code>log2</code>               | Returns the logarithm with base 2 (binary logarithm).                                                                              | <code>log2 (32) = 5</code><br><code>log2 (volume)</code>                                                                                                                                          |
| <code>mod</code>                | Returns the remainder of first number divided by the second number.                                                                | <code>mod (8, 3) = 2</code><br><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><br><code>pow (width, 2)</code>                                                                                                                                       |
| <code>random</code>             | Returns a random number between 0 and 1.                                                                                           | <code>random () = .457718</code><br><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><br><code>round (battingavg, 100)</code><br><code>round (48.67, .1) = 48.7</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><br><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><br><code>sign (growth_rate)</code>                                                                                                                                  |
| <code>sin</code>                | Returns the sine of an angle (specified in degrees).                                                                               | <code>sin (35) = 0.57</code><br><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><br><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><br><code>sq (width)</code>                                                                                                                                               |
| <code>sqrt</code>               | Returns the square root.                                                                                                           | <code>sqrt (9) = 3</code><br><code>sqrt (area)</code>                                                                                                                                             |
| <code>tan</code>                | Returns the tangent of an angle (specified in degrees).                                                                            | <code>tan (35) = 0.7</code><br><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><br><code>concat (last_name , first_name )</code>                                            |
| <code>contains</code>               | Returns true if the first string contains the second string, otherwise returns false.                                                                                                                                                                                                                                                                                    | <code>contains ('broomstick', 'room') = true</code><br><code>contains (product, 'trial version')</code>                                          |
| <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.                                                                                                                                                                              | <code>edit_distance ('attorney', 'atty') = 4</code><br><code>edit_distance (color, 'red')</code>                                                 |
| <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. | <code>edit_distance_with_cap ('pokemon go', 'minecraft pixelmon', 3) = 4</code><br><code>edit_distance_with_cap (event, 'burning man', 3)</code> |
| <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.                                                | <code>similar_to ('hello world', 'hello swirl') = true</code><br><code>similar_to (current team, drafted by)</code>                              |

| Function                 | Description                                                                                                                                                                                                                                                                                                                                | Examples                                                                                                                     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <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. | <code>similarity ('where is the burning man concert', 'burning man') = 46</code><br><code>similarity (tweet1, tweet2)</code> |
| <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.                                                                                                                                                                                                  | <code>spells_like ('thouhgtspot', 'thoughtspot') = true</code><br><code>spells_like (studio, distributor)</code>             |
| <code>strlen</code>      | Returns the length of the text.                                                                                                                                                                                                                                                                                                            | <code>strlen ('smith') = 5</code><br><code>strlen (lastname)</code>                                                          |
| <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.                                                                                                                                                                                                       | <code>strpos ('haystack_with_needles', 'needle') = 14</code><br><code>strpos (complaint, 'lawyer')</code>                    |
| <code>substr</code>      | Returns the portion of the given string, beginning at the location specified (starting from 0), and of the given length.                                                                                                                                                                                                                   | <code>substr ('persnickety', 3, 7) = snicket</code><br><code>substr (lastname, 0, 5)</code>                                  |

# 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 visuzliation 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   |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                                  | <b>Details</b>                                                                                                            | <b>Action</b> |
|-------------|-----------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------|
| TS-00508    | ERROR           | Failed to fetch headline data                   | Failed to fetch filter data.                                                                                              | None          |
| 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)

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                     | <b>Details</b>                             | <b>Action</b> |
|-------------|-----------------|------------------------------------|--------------------------------------------|---------------|
| 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)

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                  | <b>Details</b>                  | <b>Action</b> |
|-------------|-----------------|---------------------------------|---------------------------------|---------------|
| 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          |

| Code     | Severity | Summary                       | Details                   | Action |
|----------|----------|-------------------------------|---------------------------|--------|
| TS-00805 | ERROR    | Failure getting debug info    | Failed to get debug info. | None   |
| TS-00806 | INFO     | Memcache cleared successfully | None                      | None   |
| 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   |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                 | <b>Details</b>                 | <b>Action</b> |
|-------------|-----------------|--------------------------------|--------------------------------|---------------|
| 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          |
| TS-01011    | ERROR           | Failed to fetch sample values. | Failed to fetch sample values. | None          |

## Scheduled Jobs Errors (1100 - 1199)

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                | <b>Details</b> | <b>Action</b>                                                          |
|-------------|-----------------|-------------------------------|----------------|------------------------------------------------------------------------|
| 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   |
| 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   |

| Code     | Severity | Summary                               | Details                        | Action |
|----------|----------|---------------------------------------|--------------------------------|--------|
| 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   |
| 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.<br>Please email the trace file to {adminEmail}. | 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   |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                                        | <b>Details</b>                                                                    | <b>Action</b> |
|-------------|-----------------|-------------------------------------------------------|-----------------------------------------------------------------------------------|---------------|
| 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 {adminEmail}. | None          |

## Data Management Service Errors (1600 - 1799)

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                                  | <b>Details</b>                                  | <b>Action</b> |
|-------------|-----------------|-------------------------------------------------|-------------------------------------------------|---------------|
| 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          |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                                      | <b>Details</b>                                                          | <b>Action</b> |
|-------------|-----------------|-----------------------------------------------------|-------------------------------------------------------------------------|---------------|
| 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          |
| 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           | Data Type 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 databse 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 man-agement 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 mo-ment!                     | What hap-pened? {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<br>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<br>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   |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                         | <b>Details</b>                        | <b>Action</b> |
|-------------|-----------------|----------------------------------------|---------------------------------------|---------------|
| TS-12704    | ERROR           | No recipients provided.                | None                                  | None          |
| 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)

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                      | <b>Details</b>                                                                                           | <b>Action</b> |
|-------------|-----------------|-------------------------------------|----------------------------------------------------------------------------------------------------------|---------------|
| 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          |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                          | <b>Details</b>                                                                                            | <b>Action</b> |
|-------------|-----------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------|
| TS-13005    | ERROR           | Object already exists                   | Object with Id: {0} of type: {1} already exists.<br># {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 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          |

| <b>Code</b> | <b>Severity</b> | <b>Summary</b>                                                           | <b>Details</b>                                                                             | <b>Action</b>                                                                                           |
|-------------|-----------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 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 data-source. | 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** &emdash; 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 | CONFIGUR
ATION |
+-----+
| 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) field 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.