THOUGHTSPOT

Application Integration Guide

Version 5.0 January 11, 2019

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Introduction

This guide explains how to integrate ThoughtSpot with other applications, including authentication, embedding, and APIs. For information on how to integrate with other data sources for loading data, refer to the Data Integration Guide.

Here are the top level topics on application integration:

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- Login credentials
- Using the JavaScript API
- SAML
- REST API
- Emdbed ThoughtSpot
- Runtime Filters
- Style Customization
- API Reference

Log in to the Linux shell using SSH

To perform basic administration such as checking network connectivity, starting and stopping services, and setting up email, log in remotely as the Linux administrator user “admin”. To log in with SSH from a client machine, you can use the command shell or a utility like Putty.

In the following procedure, replace `<hostname_or_IP>` with the hostname or IP address of a node in ThoughtSpot. The default SSH port (22) will be used.

1. Log in to a client machine and open a command prompt.
2. Issue the SSH command, specifying the IP address or hostname of the ThoughtSpot instance:

```
ssh admin@<hostname_or_IP>
```

3. Enter the password for the admin user.

Log in credentials

You can access ThoughtSpot via SSH at the command prompt and from a Web browser.

Administrative access

Each ThoughtSpot appliance comes pre-built with three default users. You should talk with a ThoughtSpot Customer Success Engineer or ThoughtSpot support, to get the password for each user. The default users are:

Type	Username	Description
Shell user	`admin`	Used for work that requires sudo or root privileges. Does not exist for application login. Logs for this user are found in `/usr/local/scaligent/logs` logs
Shell user	`thoughtspot`	Used for command line work that does not require sudo or root privileges. For example, these users can use `tsload` , `tql` , and check the cluster status. This user cannot login to the application. Logs for this user are found under `/tmp` .
Application user	`tsadmin`	Access through a Web browser.

Both the `admin` and `thoughtspot` user can SSH into the appliance. Once on the appliance, either user can do any of the following:

- tscli
- tsload
- tql

The `thoughtspot` user is restricted to `tscli` commands that do not require `sudo` or root privileges.

SSH to the appliance

To perform basic administration such as checking network connectivity, starting and stopping services, and setting up email, log in remotely as the Linux administrator user “admin”. To log in with SSH from any machine, you can use the command shell or a utility like Putty.

In the following procedure, replace `<hostname_or_IP>` with the hostname or IP address of a node in ThoughtSpot. The default SSH port (22) will be used.

1. Log in to a client machine and open a command prompt.
2. Issue the SSH command, specifying the IP address or hostname of the ThoughtSpot instance:

```
ssh admin@<hostname_or_IP>
```

3. Enter the password for the admin user.

Log in to the ThoughtSpot application

To set up and explore your data, access the ThoughtSpot application from a standard Web browser using a username and password.

Before accessing ThoughtSpot, you need:

- The Web address (IP address or server name) for ThoughtSpot.
- A network connection.
- A Web browser.
- A username and password for ThoughtSpot.

  Supported Web browsers include:

Browser	Version	Operating System
Google Chrome	20 and above	Windows 7 or greater, Linux, MacOS
Mozilla Firefox	14 and above	Windows 7 or greater, Linux, MacOS
Internet Explorer	11	Windows 7 or greater

> **Tip:** While Internet Explorer is supported, using it is not recommended. Depending on your environment, you can experience performance or UI issues when using IE.

To log in to ThoughtSpot from a browser:

1. Open the browser and type in the Web address for ThoughtSpot: `http://<hostname_or_IP>`
2. Enter your username and password and click **Enter Now**.

Using the JavaScript API

The ThoughtSpot JavaScript API (JS API) allows you to use your ThoughtSpot instance within your own Web application. The JS API has methods that allow you to:

- Authenticate to ThoughtSpot.
- Embed visualizations from ThoughtSpot in your Web page using iframes.
- Use the ThoughtSpot REST API to get data from ThoughtSpot and use it in your Web page.

You can download the ThoughtSpot JavaScript library from our secure storage server.

> **Note:** To use the JS API in your Web page, you must have the access and permissions to update the code of the web page or application.

Browser Support

The JS API works in the following browsers:

Browser	Versions
Internet Explorer	11
Firefox	38 or later
Google Chrome	47 or later
Safari	9 or later

Internet Explorer 10

Microsoft introduced a compatibility mode in Internet Explorer 10, which displays your page using the version of Internet Explorer that is most compatible with the current page. Since we do not support any version below 11, this feature can sometimes break the code. There are two ways to force the emulation of Internet Explorer to the most up to date version:

- Add a Custom Response Header

  This is the recommended approach since it is more robust, offers more control, and has a lower risk of introducing a bug to your code. The header name should be set to “X-UA-Compatible” and the value should be set to “IE=Edge”. The response header should be based on the server it is set on and the technology being used.

- Add a Meta Tag

  The following meta tag should be added to your header: `<meta http-equiv="X-UA-Compatible" content="IE=Edge" \>`. This tag must be the first tag in the header section of the page.

Cross-Origin HTTP Requests (CORS)

Collecting user credentials from one application (domain) and sending them to another (such as ThoughtSpot) can present security vulnerabilities such as a phishing attack. Cross-origin or cross-domain verification closes this vulnerability.

When you use the JavaScript API, your client makes a call from your own Web page, portal, or application to ThoughtSpot. The domains of your client and ThoughtSpot will be different. So, you'll need to enable cross-origin HTTP requests from your client application to the ThoughtSpot application. This protects your data, so that another actor cannot use the same URL to embed the visualization in its own Web pages.

Your cluster's CORS configuration controls which domains are allowed to use your client code to authorize users. It also prevents other people from copying your code and running it on their site. For example, if your Web site is hosted on the domain `example.com`, you would enable CORS for that domain. Similarly, if you want to test your code locally, you'll also need to add the origin for your local server as well, for example: `http://localhost:8080.` Though, it is a good idea to disable the `localhost` access after your testing is complete.

To enable CORS between your client applications and your ThoughtSpot instance. , you must work with ThoughtSpot Support.

About SAML

ThoughtSpot can be set up with Security Assertion Markup Language (SAML) to enable Single Sign On (SSO). SAML can be configured in several ways, including with CA SiteMinder.

For basic instructions on configuring SAML, use one of these procedures:

- Configure SAML, for instructions to configure SAML in ThoughtSpot.
- Configure SAML with CA SiteMinder, for configuring SAML specifically with CA SiteMinder.

Configure SAML

ThoughtSpot can use Security Assertion Markup Language (SAML) to authenticate users. You can set up SAML through the shell on the ThoughtSpot instance using a `tscli` based configurator.

Before configuring SAML, you will need this information:

- IP of the server where your ThoughtSpot instance is running.
- Port of the server where your ThoughtSpot instance is running.
- Protocol, or the authentication mechanism for ThoughtSpot.
- Unique service name that is used as the unique key by IDP to identify the client.

  It should be in the following format: `urn:thoughtspot:callosum:saml`
- Allowed skew time, which is the time after authentication response is rejected and sent back from the IDP. It is usually set to 86400.
- The absolute path to the `idp-meta.xml` file. This is needed so that the configuration persists over upgrades.
- This configurator also checks with the user if internal authentication needs to be set or not. This internal authentication mechanism is used to authenticate `tsadmin`, so set it to true if you do not know what it does.

Use this procedure to set up SAML on ThoughtSpot for user authentication. Note that this configuration persists across software updates, so you do not need to reapply it if you update to a newer release of ThoughtSpot.

1. Log in to the Linux shell using SSH.
2. Execute the command to launch the interactive SAML configuration:

   ```
   tscli saml configure
   ```

3. Complete the configurator prompts with the information you gathered above.
4. When the configuration is complete, open a Web browser and go to the ThoughtSpot login page. It should now show the Single Sign On option.

Configure CA SiteMinder

Summary: CA SiteMinder can be used as an Identity Provider for single sign on to ThoughtSpot.

Before configuring CA SiteMinder, you must configure SAML in ThoughtSpot. Use this procedure to set up CA SiteMinder for use with ThoughtSpot:

1. Configure the Local Identity Provider Entity as follows:

Section	Entry
Entity Location	Local
Entity Type	SAML2 IDP
Entity ID	Any (Relevant ID)
Entity Name	Any (Relevant name)
Description	Any (Relevant description)
Base URL	https://<FWS_FQDN> where FWS_FQDN is the fully-qualified domain name for the host serving SiteMinder Federation Web Services
Signing Private Key Alias	Select the correct private key alias or import one if not done already
Signed Authentication Requests Required	No
Supported NameID format	Optional

2. Create the Remote SP Entity, either via a metadata import or manually. To configure the Remote SP entity manually, select **Create Entity**. Create ThoughtSpot as a Remote Entity with following details:

Section	Entry
Entity Location	Remote
New Entity Type	SAML2 SP
Entity ID	Your cluster
Entity Name	Any (relevant name)

Section	Entry
Description	Any (relevant description)
Assertion Consumer Service URL	(Relevant URL)
Verification Certificate Alias	Select the correct certificate or import one if not done already. This is used to verify the signature in incoming requests
Supported NameID Format	Optional

3. You will now configure the Federation Partnership between CA SiteMinder (the IDP) and ThoughtSpot (the Remote SP) in CA SiteMinder. Log in to CA SiteMinder.
4. Navigate to **Federation** -> **Partnership Federation** -> **Create Partnership** (**SAML 2 IDP -> SP**).
5. Click **Configure Partnership** and fill in the following values:

Section	Entry
Add Partnership Name	Any (relevant name)
Description	Any (relevant description)
Local IDP ID	Select Local IDP ID
Remote SP ID	Select Remote SP ID
Base URL	Will be pre-populated
Skew Time	Any per environment requirement
User Directories and Search Order	Select required Directories in required search order

6. Click **Configure Assertion** and fill in the following values:

Section	Entry
Name ID Format	Optional
Name ID Type	User Attribute
Value	Should be the name of the user attribute containing the email address or user identifier. For example, ‘mail’

7. Click **Configure SSO and SLO** and fill in the following values:

Section	Entry
Add Authentication URL	This should be the URL that is protected by SiteMinder
SSO Binding	Select SSO Binding supported by the SP, typically the HTTP-Post
Audience	(Relevant audience)
Transaction Allowed	Optional
Assertion Consumer Ser-vice URL	This should be pre-populated using the information from the SP entity

8. Continue to Partnership Activation and select Activate.

Configure Active Directory Federated Services

You can configure Active Directory Federated Services (AD FS) to work with ThoughtSpot. This procedure outlines the basic prerequisites and steps to set up AD FS.

- Configure SAML in ThoughtSpot.
- Install AD FS 2.0.
- Make sure you can run AD FS 2.0 Federation Server Configuration Wizard from the AD FS 2.0 Management Console.
- Make sure that DNS name of your Windows Server is available at your service provider (SP) and vice versa. You can do this by running the command `nslookup` on both machines, supplying the DNS of the other server.

AD FS 2.0 supports SAML 2.0 in IdP (Identity Provider) mode and can be easily integrated with the SAML Extension for both SSO (Single Sign-On) and SLO (Single Log Out).

After completing the prerequisites, use these procedures to configure AD FS for use with ThoughtSpot.

1. Initialize IdP metadata.
2. Initialize the Service Provider metadata.
3. Test your ADFS integration.

Initialize the Identity Provider Metadata

Summary: This procedure shows how to initialize the Identity Provider (IdP) metadata for AD FS.

This is one part of the configuration procedure for setting up ThoughtSpot to work with AD FS for authentication. You should also refer to the overview of the entire process of integrating with AD FS.

To initialize the IdP metadata on AD FS:

1. Download the AD FS 2.0 IdP metadata from the AD FS server. You can reference this file by its URL, which looks like:

   ```
   https://<adfsserver>/FederationMetadata/2007-06/FederationMetadata.xml
   ```

2. Log in to the Linux shell using SSH.
3. Change directories to the SAML directory:

   ```
   $ cd /usr/local/scaligent/release/production/orion/tomcat/callosum/saml
   ```

4. Replace the contents of the file `idp-meta.xml` with the metadata of the IdP that you downloaded. Do not change the name of the file.
5. Contact ThoughtSpot support for help restarting ThoughtSpot's Tomcat instance.
6. Next, Initialize the Service Provider Metadata.

Initialize the Service Provider Metadata

Summary: This procedure shows how to initialize the Service Provider (SP) metadata for AD FS.

This is the second part of the configuration procedure for setting up ThoughtSpot to work with AD FS for authentication. You should also refer to the overview of the entire process of integrating with AD FS.

To initialize the Service Provider metadata on AD FS:

1. Open the AD FS 2.0 Management Console.
2. Select **Add Relying Party Trust**.
3. Select **Import data about the relying party from a file**.
4. Upload the metadata.xml file that you downloaded from ThoughtSpot earlier.
5. Select **Next.** The wizard may complain that some of the content of the metadata is not supported. You can safely ignore this warning.
6. In the **Ready to Add Trust** section, make sure that the tab endpoints contains multiple endpoint values. If not, verify that your metadata was generated with the HTTPS protocol URLs.
7. Leave the **Open the Edit Claim Rules dialog** checkbox checked. Click **Next**.
8. Select **Add Rule.**
9. Choose **Send LDAP Attributes as Claims** and click **Next.**
10. For **NameID** enter “Claim rule name”
11. For **Attribute store**, choose “Active Directory”.
12. For **LDAP Attribute** choose “SAM-Account-Name”.
13. For **Outgoing claim type**, choose “Name ID”.
    a. If you are using ADFS 3.0, you might need to configure the Name ID as a Pass Through claim.

14. Finish the wizard and confirm the claim rules window.
15. Open the provider by double-clicking it.
16. Select the **Advanced** tab and change **Secure hash algorithm** to “SHA-1”.
17. Your Service Provider is now registered.
18. Test the ADFS Integration.

Test the ADFS Integration

After setting up the AD FS integration, test to make sure it is working properly. To test your AD FS integration, go to ThoughtSpot login page using a Web browser and try to login with SAML.

About the REST API

Summary: The purpose of the REST API is to get data out of ThoughtSpot so you can use it in a Web page, portal, or application.

When using the REST API, authentication is achieved through SAML. After authentication, use the POST method to call a URL for the desired visualization or pinboard. A JSON (JavaScript Object Notation) representation of the data will be returned.

Authentication

Before you can use the REST API, you must authenticate to ThoughtSpot using SAML with the JavaScript API.

Cross Domain Verification

You'll need to enable cross domain verification when using the REST API. This protects your data, so that another website cannot use a URL to get data from ThoughtSpot. The procedure for enabling the JavaScript API includes information on how to enable this.

REST API capabilities

Use a POST method to access the URL, which calls the REST API. The data is returned as a JSON string. When using this method, you'll need to extract the data from the JSON file and render it on your Web page, portal, or application.

You can use the REST API to do things like:

- Generate dynamic picklists on your Web page.
- Display a single value.
- Retrieve the data to populate a visualization drawn by your own renderer.
- Pull data directly from ThoughtSpot

Remember that the data you retrieve from ThoughtSpot is live data, so whenever the Web page is rendered, the current value(s) will be shown.

Direct Search-to-Embed API

The Direct Search-to-Embed API enables searching directly from an external application or web page to pull data from ThoughtSpot. This feature was introduced in ThoughtSpot 5.0. When using it, you can access data stored in ThoughtSpot directly. You do not need to save a search result to a pinboard and then reference it using the visualization's URL.

Public API reference

You can find more information on our public APIs in the Reference guide.

Related information

- API Reference guide.
- Direct Search-to-Embed API.

Calling the REST API

To call the REST API, you'll specify a URL using the POST method, passing the ID numbers of the objects from which you want to obtain data.

Specify the pinboard or visualization example

For a pinboard, you'll append the ID of your pinboard as a parameter, like this example:

```
https://<thoughtspot_server>/callosum/v1/tspublic/v1/pinboardda
ta?id=7752fa9e-db22-415e-bf34-e082c4bc41c3
```

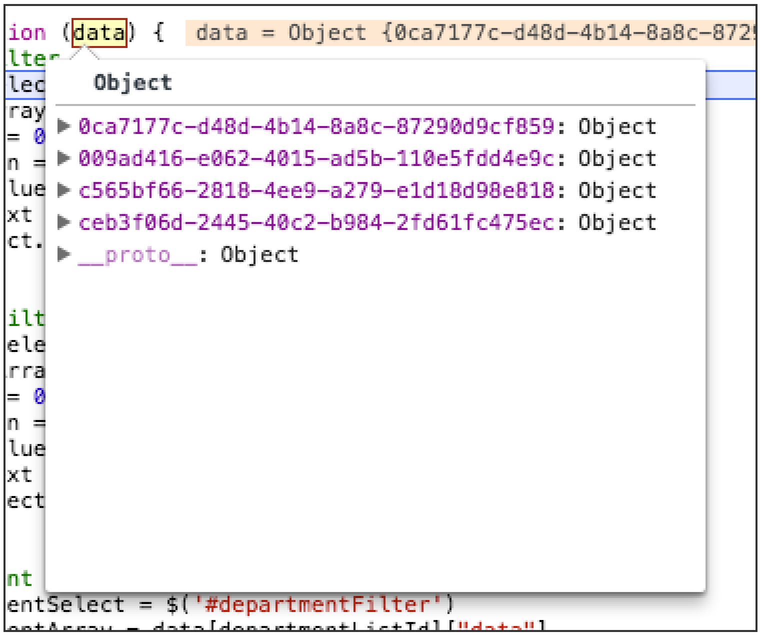
To retrieve data from a specific visualization within a pinboard, you would append the ID number of the visualization using the vizid parameter:

```
https://<thoughtspot_server>/callosum/v1/tspublic/v1/pinboardda
ta?id=7752fa9e-db22-415e-bf34-e082c4bc41c3&vizid=%5B1e99d70f-c1
dc-4a52-9980-cfd4d14ba6d6%5D
```

Remember: You must add brackets around the vizid parameter. The URL encoding for open bracket is `%5B`, and the URL encoding for close bracket is `%5D`.

Object Format for Returned Data

When you parse the returned JSON data you can see that there is one object for every viz on the pinboard. The objects are named according to the corresponding vizid.



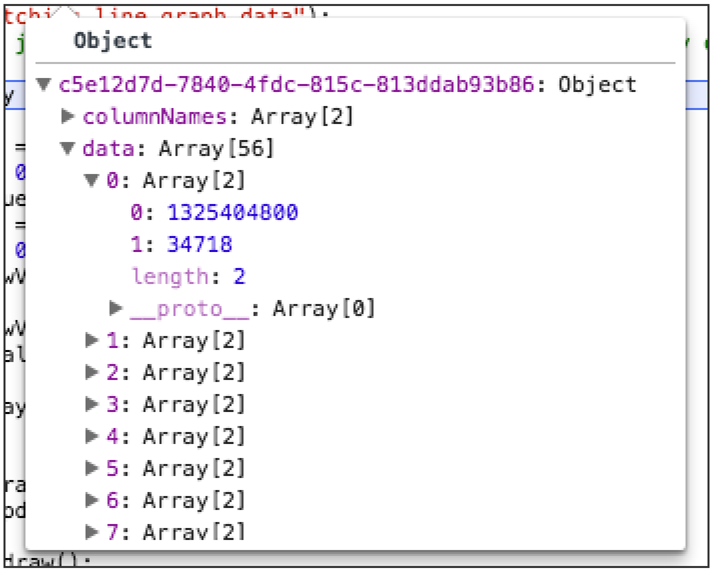
If you make a call to a specific viz on a pinboard, it will return just one object. The JSON object format for the data that is returned from ThoughtSpot is:

```
{
vizId1 : {
          name: “Viz name”,
          :[[2-d array of data values], [], [] …..[]],
          columnNames:[col1, col2, …. ],
          samplingRatio: n
          },
vizId2 : {
          .
          }
}
```

Each object contains four components:

1. An array of column headers.
2. An array of data.
3. The name given to the specific viz.
4. And a sampling ratio. The sampling ratio tells you the percentage of total data returned. `1` would mean all data in the viz was returned in the API call.

The `columnNames` array contains a list of all column headers. And the `data` array contains a list of other arrays. Each sub array represents a new row of data.



The REST API supports filtering the data returned via parameters that you pass within the URL. These are called Runtime Filters.

Example

The following example shows a JavaScript function that calls the REST API, gets the results back, and retrieves a single value from the JSON results:

```
/**
 * Generates headline by making a data API call.
 *
 * @param void
 * @return void
 */
function generateHeadline(filters) {
    var pinboardId = "0aa0839f-5d36-419d-b0db-10102131dc37";
    var vizId = "67db30e8-06b0-4159-a748-680811d77ceb";
    var myURL = "";

    if (filters === void 0) {
        myURL = "http://192.168.2.55:443/callosum/v1/tspublic/v
1/" +
                "pinboarddata?id=" + pinboardId + "&" +
                "vizid=%5B" + vizId + "%5D";
    } else {
        var query = getQueryString(filters);
        myURL = "http://192.168.2.55:443/callosum/v1/tspublic/v
1/" +
                "pinboarddata?id=" + pinboardId + "&" + +
                "vizid=%5B" + vizId + "%5D&" + query;
    }

    var jsonData = null;
    var xhr = new XMLHttpRequest();
    xhr.open("POST", myURL, true);
    xhr.withCredentials = true;
    xhr.onreadystatechange = function() {
        var headline = document.getElementById("embeded-headlin
e");
        if (xhr.readyState == 4 && xhr.status == 200) {
            jsonData = JSON.parse(xhr.responseText);
            headline.innerHTML = jsonData[vizId].data[0][0];
        } else {
            headline.innerHTML = "Error in getting data !!!";
        }
    };
    xhr.send();
}
```

REST API pagination

Summary: You can paginate the JSON response that is called from the REST API. The order of the data is retained from page to page.

Given the ability to paginate, you can quickly populate tables and make new REST calls every time you go to the next page of the data on the table. There is significant load time if you want to populate the data table with many rows (greater than 1000) from the REST API.

To paginate results in your API response, you'll need to add new parameters to the query:

`PageSize` determines the number of rows to be included.

```
{
    "name": "pagesize",
    "description": PageSize: The number of rows.",
    "defaultValue": "-1",
    "type": "integer"
}
```

`Offset` determines the starting point.

```
{
    "name": "offset",
    "description": Offset: The starting point",
    "defaultValue": "-1",
    "type": "integer"
}
```

`PageNumber` is an alternate way to determine the offset. You must make a call with `pageNumber = 1` first. Then you can access any page. Calling with `pageNumber != 1` as the initial call will fail. `pageNumber = 0` is not a valid value.

```
{
    "name": "pagenumber",
    "description": PageNumber: This is an alternate way to set
offset. This is 1-based
                   indexing. Offset = (pageNumber - 1) * pageSi
ze.
    "defaultValue": "-1",
    "type": "integer"
}
```

`FormatType` is the JSON format type.

```
{
    "name": "formattype",
    "description": FormatType: This sets the JSON format type.
Values that are allowed are
                   FULL and COMPACT.
    "defaultValue": "COMPACT",
    "type": "string"
}
```

`COMPACT` is the default type, and is formatted as follows: `['col1', 'col2'] [1, 'a']`. While `FULL` is formatted like this: `{'col1': 1 'col2': 'a'}`

Example

The following example shows ThoughtSpot data that is being populated in a table:

```
 /**
 * Sample response for Page-1.
 */
{
    "totalRowCount": 1500,
    "pageSize": 100,
    "pageNumber": 1
        "data":
    [
       {
            "key1": "value1",
            "key2": "value2",
        },
        {
            "key1": "value1",
            "key2": "value2",
        },
    ]
}
```

Use the REST API to get data

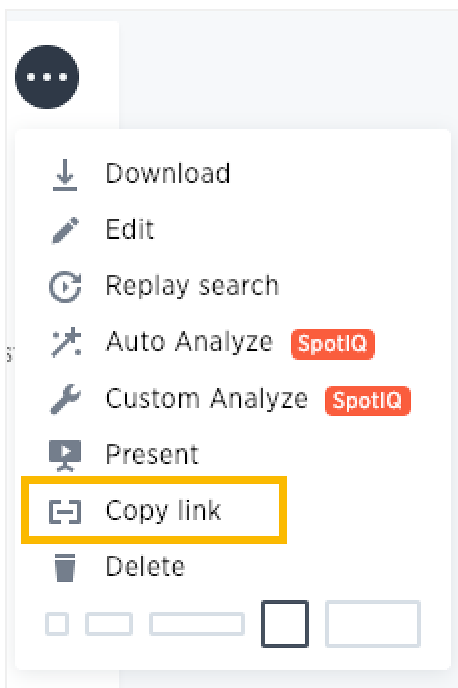
Summary: This procedure shows how to use the REST API to get data out of ThoughtSpot, so you can use it in a Web page, portal, or application.

Data retrieved using the REST API is returned as JSON (JavaScript Object Notation).

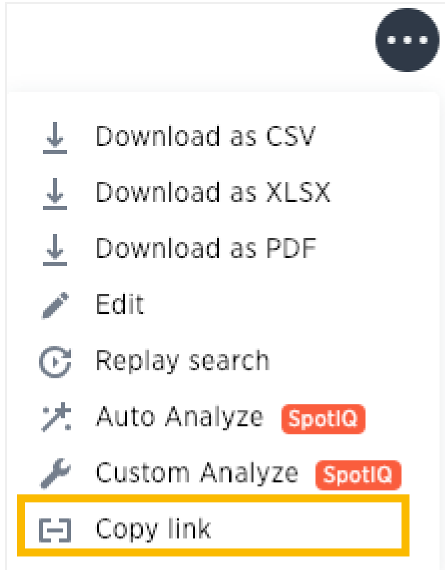
Before you can use the REST API, you need to enable the JavaScript API (JS API) and authenticate to ThoughtSpot.

Use this procedure to construct the URL you will use to call the REST API:

1. Log in to ThoughtSpot from a browser.
2. Navigate to the pinboard from which you want to get data. If it doesn't exist yet, create it now.
3. Find the ID number of the object you want to get the data from. If the object is:
    - A pinboard, click ellipses icon (3 dots) the and select **Copy Link**.

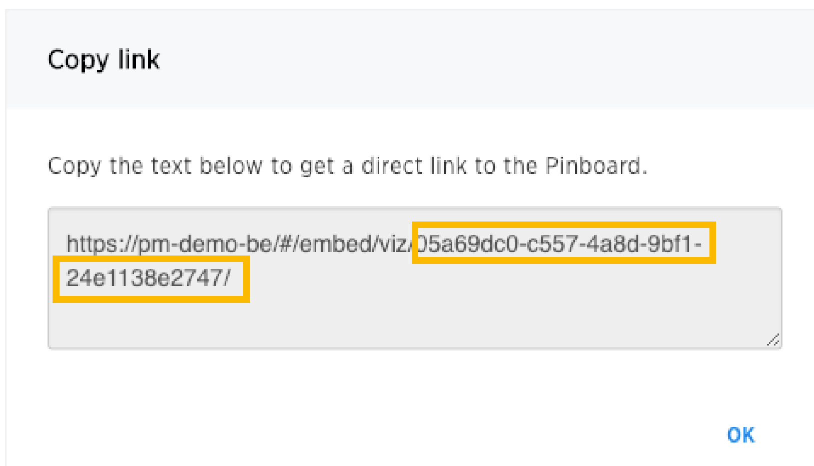
    - A visualization, click the **Copy Link** icon in the upper right corner of the table or chart.



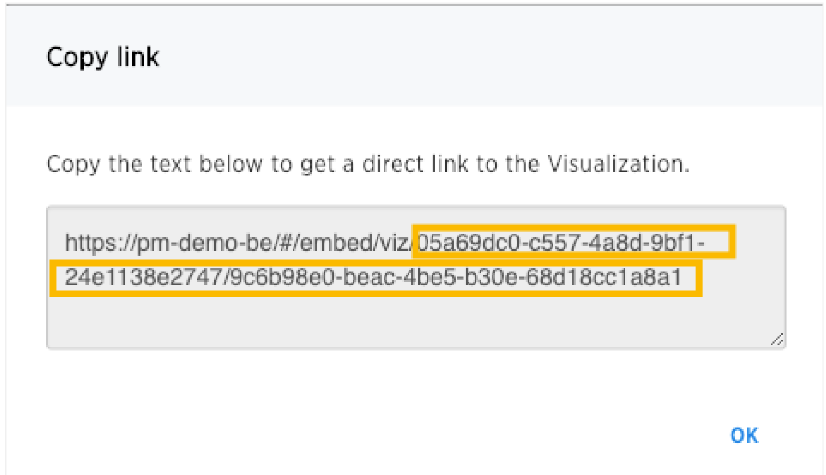
4. Copy the ID number from the link shown. Paste it somewhere so that you can use it later to construct the URL to use when calling the REST API.

   If the object is:

   - A pinboard, copy the identifier that appears after "viz/". Omit the trailing "/".



   - A visualization (table or chart), copy the identifier that appears after "viz/". This is the visualization ID.



5. Construct the URL as follows: For a pinboard, the URL takes the form:

```
https://<thoughtspot_server>/callosum/v1/tspublic/v1/pi
nboarddata?id=<pinboard_id>
```

For a visualization, the URL takes the form:

```
https://<thoughtspot_server>/callosum/v1/tspublic/v1/pi
nboarddata?id=<pinboard_id>&vizid=%5B<visualization_i
d>%5D
```

6. If you want to apply any filters to the data that will be returned, apply Runtime Filters.
7. Now your URL is complete, and you can use it to access the data directly via the HTTP POST method. The REST API returns the data formatted as JSON.
8. Retrieve the data from the JSON and display it in your Web page, Web portal, or application.

Use the Embedded Search API to pull data from ThoughtSpot

Summary: This procedure shows how to use the Embedded Search API to get data from ThoughtSpot

The Embedded Search API enables searching directly from an external application or web page to pull data from ThoughtSpot. This feature was introduced in ThoughtSpot 5.0. When using it, you can access data stored in ThoughtSpot directly. You do not need to save a search result to a pinboard and then reference it using the visualization's URL.

This embedded search is useful when you want to allow an application to pull data directly from ThoughtSpot in an ad hoc fashion.

To have the Embedded Search API functionality turned on, contact ThoughtSpot Support.

Data retrieved using the Embedded Search API is returned as JSON (JavaScript Object Notation). You will need to parse the JSON to get the data values you need, generally using JavaScript in the receiving application.

Use this procedure to construct the call to the Embedded Search API:

1. Enable the JavaScript API (JS API) on the receiving page of the target application.
2. Authenticate to ThoughtSpot on the receiving page of the target application.
3. Embed the ThoughtSpot application in your own web page or application.
4. To subscribe to results for all the searches the user does in the embedded ThoughtSpot application, use the API JavaScript function subscribeToData( ). This will allow your page to listen for data coming from ThoughtSpot.

   Now when a user searches, the iFrame will send data to the subscription. The parent web page or application receives the data as JSON, and can do whatever you want with it.
5. You can set up your web page or application to display or otherwise act on the data it receives from the subscription.
6. To test it out, do a search in the embedded ThoughtSpot application to retrieve the data. Your application should act on the data in the way you set it up to do so.

Use the Data Push API

Summary: This procedure shows how to use the Data Push API to send data from ThoughtSpot to another application

The Data Push API allows you to open a web page in the context of the ThoughtSpot application. This third party web page will then have access to the results of the ThoughtSpot search from which it was invoked. This is useful when you want to initiate an action in another application based on the result of a search in ThoughtSpot. The Data Push API was introduced in ThoughtSpot 5.0.

An example of pushing data to another system to trigger an action would be where you do a search to find customers who are coming due for renewal of their contract in the next month. You could then trigger an action that brings up a web page from an external billing system. The billing system could be set up to read the data (list of names, emails, products, and renewal dates) from ThoughtSpot. The billing system might then add the price, generate an invoice for each customer, and send it out via email.

To have the Data Push API functionality turned on, contact ThoughtSpot Support.

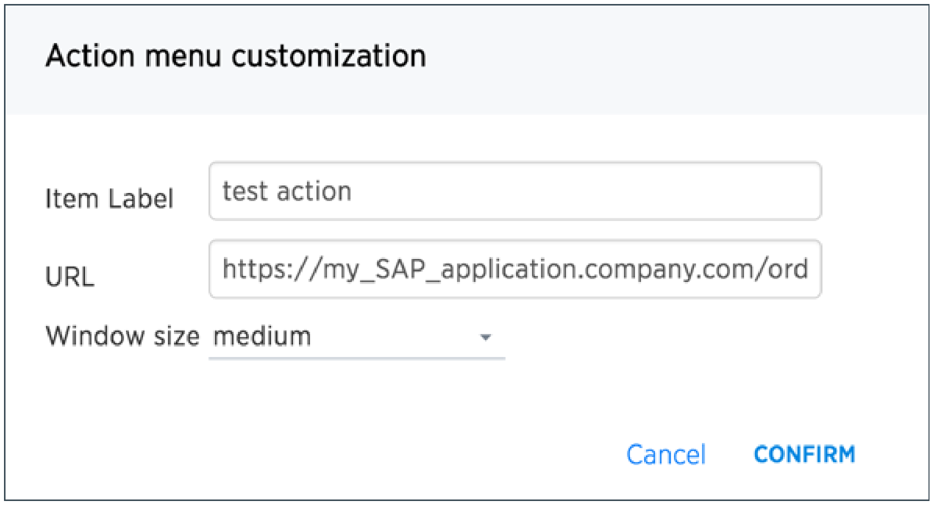
The DataPush API makes the data available to the external application formatted as JSON (JavaScript Object Notation). You will need to parse the JSON to get the data values you need using JavaScript in the receiving application.

Create an Custom Action

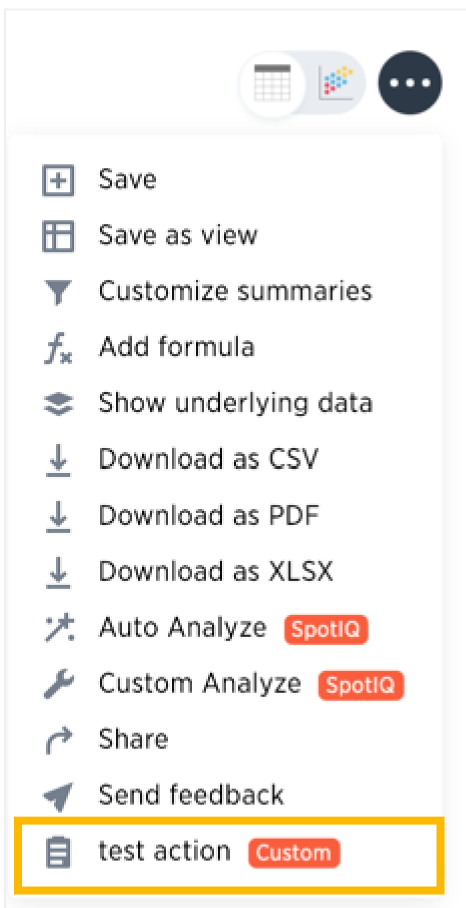
To create a Custom Action, you must have the Can administrator ThoughtSpot privilege.

Use this procedure to create an Custom Action in ThoughtSpot:

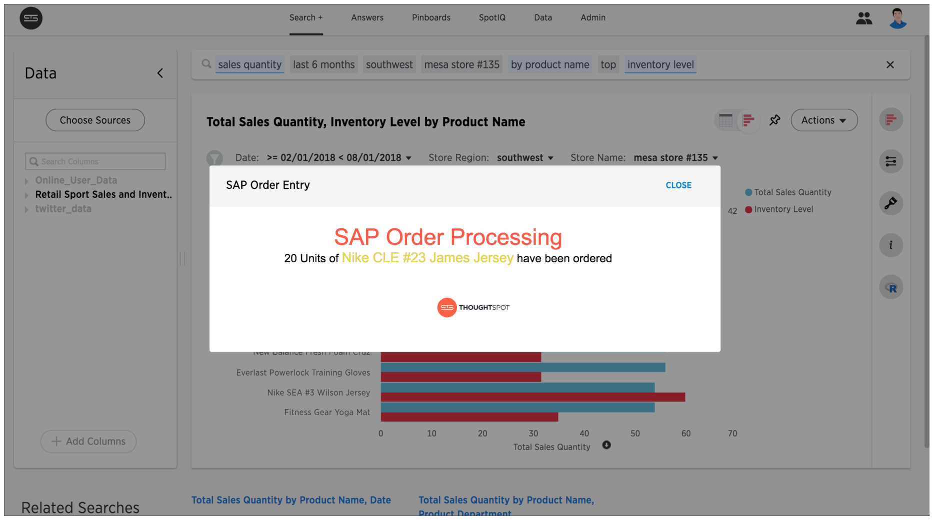
1. Log in to ThoughtSpot from a browser.
2. Choose **Admin** and then **Action Customization**.
3. Click the **Add custom action item** button.
4. Fill in the details for your custom action:
    - Item Label: Clicking the menu item with the name you provide here will initiate the data push to the other system. This menu item will appear under the three dot menu of a search result.
    - URL: The URL of the target page in the external web page or application.
    - Window size: The size of the window that will display the external web page or application in ThoughtSpot.



5. Now when a user is viewing a search result, they'll have the option to use the Custom Action you created. To initiate the action, they'll click the ellipses icon (3 dots) , and select **Your Action Name**. You'll notice a **Custom** tag next to your action name to indicate that this is something custom built, and not a ThoughtSpot action.



6. When a user clicks your action, they'll see the web page you entered as the URL for your custom action.



Note: In order for your action to work correctly, the answer from which the user selected the action needs to have the correct search terms which your application or web page is expecting to receive. There is no way to guarantee this, other to train your users on the purpose of your action, and what's required for it to run.

Sample application

Here is a sample application you can use to try out the Data Push API:

```
<!doctype html>
<html lang="en">
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/
1.6.9/angular.min.js"></script>
<script type="text/javascript" src="api/api.js"></script>
<body>
    <script>

        var app = angular.module("latestData", []);
        app.controller("dataCtrl", ['$scope', '$window', functi
on($scope, $window) {

            $scope.currentData=undefined;
            $scope.showData=false;
            $scope.displayData = function() {
                $scope.showData = true;
            };
            function currentDataCallback(event) {
                $scope.currentData = event;
            }
            $window.onload = function(){
                $window.thoughtspot.getCurrentData(currentDataC
allback);
            };

        }]);
    </script>
    <div ng-app ="latestData" ng-controller="dataCtrl">
        <button class="get-data" ng-click="displayData()">Clic
k here for latest exported data</button>
        <div class="display-data" ng-if="showData"> </div>
    </div>
</body>
</html>
```

Understand embedding

Embedding allows you to embed all or part of ThoughtSpot in another client application. This page provides an explanation of what you must consider when embedding ThoughtSpot

Decide what to embed and where

The type of embedding your company requires can help you determine what type of embedding to use. For example, you may simply need a single chart displayed as a wallboard or you may want your customers to access reports on their own data. The first example could require modifying a single HTML page while the later example may require working with a development team and several different workflows in a browser application.

Regardless of the simplicity or complexity of your client application, its infrastructure must allow for loading and calling the ThoughtSpot JS library. This library allows you to authenticate to ThoughtSpot and load specific objects.

There are different methods for embedding ThoughtSpot into a client application:

Type	Description
Full	Embeds the entire ThoughtSpot application including menu bars. Full navigation is supported.
Page-level	Embeds pages without the menus bars or page-level navigation. This is useful where you want to limit the inclusion to a portion of ThoughtSpot. For example, you may only embed the **Search** or the **Answers** page.
Object-level	Embed a single visualization in your application. Content is created in ThoughtSpot and then that content is embedded. The content is rendered within an `iframe` . This returns a JSON object that includes the underlying data.

You can also use the ThoughtSpot data APIs to request data from ThoughtSpot.

Configuration requirements for embedding

Only Extended Enterprise installation can use ThoughtSpot's embed functionality. ThoughtSpot Enterprise installations must also work with ThoughtSpot Support to enable embed before using this functionality.

Optional settings for embedding

There are some settings that apply to embedding which ThoughtSpot Support or your other ThoughtSpot technical contact can make for you.

One of these involves what happens when a user clicks on a link within the data. When your data includes URLs, they display as clickable links in ThoughtSpot tables. By default, clicking on a link opens the URL in a separate tab. But there is a system-wide setting that can be changed to open the links within the context in which they appear.

Changing this setting opens the links:

Link type	Opens in
Link in search result table in ThoughtSpot	Same browser tab as ThoughtSpot application
Link in table embedded in an iFrame	Same iFrame that contains the table
Link in full ThoughtSpot application embedded in an iFrame	Same iFrame that contains the application

Choose an authentication methodology

You can control which type of authentication you use between your client application and ThoughtSpot.

No Authentication

You can simply not set up authentication. This would require the user to *already be logged into ThoughtSpot* before interacting with your client application. This is typically only useful when testing your client. You would not use this in your production environment.

SAML

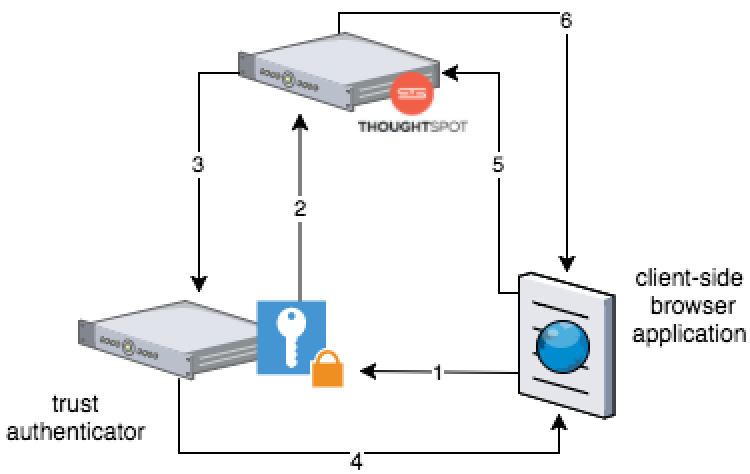
Before you can embed all or part of ThoughtSpot, you must authenticate to ThoughtSpot using SAML with the the public REST API call. After authentication, a URL is provided to call the desired visualization and populate it into an `iframe`.

You must configure SAML on your ThoughtSpot instance before using this method.

Trusted authentication service

A ThoughtSpot installation can enable support for token-based authentication service. This allows an installation to use a central authentication service rather than using ThoughtSpot to authenticate. In this architecture, ThoughtSpot provides the service with a token that allows it to authenticate on behalf of users.

A trusted authenticator application or service obtains a token from ThoughtSpot. This token is used to obtain trust from other, third-party client applications that need access to ThoughtSpot. In the scenario below, the trust authenticator forwards requests for ThoughtSpot data from client applications to ThoughtSpot.



A user already logged into client-application interacts with a ThoughtSpot embed point which causes the following processes:

1. The client-side application requests a user token from the trusted authenticator.
2. The trusted authenticator requests user token from ThoughtSpot.
3. ThoughtSpot verifies the authenticator and returns a user token.
4. The authenticator returns the user token to the client.
5. The client forwards the user token to ThoughtSpot.
6. ThoughtSpot validates the token and returns information commensurate with that authenticated user's authorization.

Plan for Cross-Origin HTTP Requests (CORS)

Collecting user credentials from one application (domain) and sending them to another (such as ThoughtSpot) can present security vulnerabilities such as a phishing attack. Cross-origin or cross-domain verification closes this vulnerability.

When embedding, you must enable CORS between your client application domain and the ThoughtSpot domain. This protects your data, so that another actor cannot use the same URL to embed the visualization in its own Web pages.

Decide if you need to change the feedback email

ThoughtSpot has an automated feature that collects feedback from users and sends it to `support@thoughtspot.com`. Depending on what and how you embed, user actions with your embedded application can trigger feedback. You can continue to forward feedback in this manner or direct the feedback to another email. To learn how to change the feedback email, see Manage the feedback contact.

Remove the ThoughtSpot branded footer

The ThoughtSpot footer appears by default in the ThoughtSpot application. It also appears with an embed application that encompasses an individual pinboard or a full application. In embed applications that are have a single visualization, you can ask your ThoughtSpot support engineer to disable the footer.

Embed pinboard or visualization

The page explains, through an example, how to embed a visualization (table or chart) or pinboard from ThoughtSpot in your own static Web page, portal, or application.

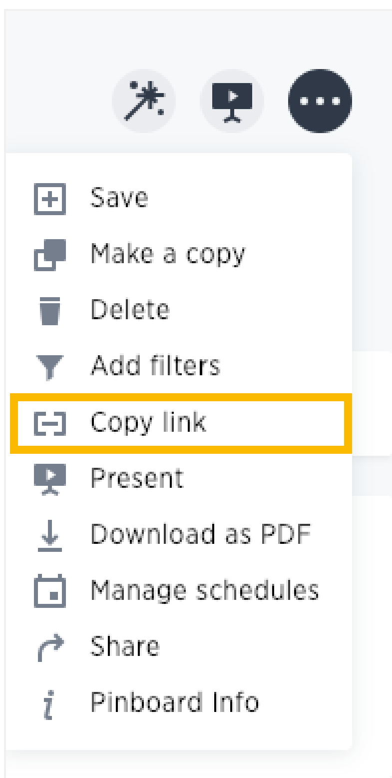
To build this sample, you need to have access to a text editor and a ThoughtSpot instance with a visualization. You should also have some experience working with Javascript.

Get the link for an entire pinboard or single visualization

This procedure assumes the pinboard with the visualization you want to embed already exists. If the pinboard or visualization doesn't exist, create it now before continuing.

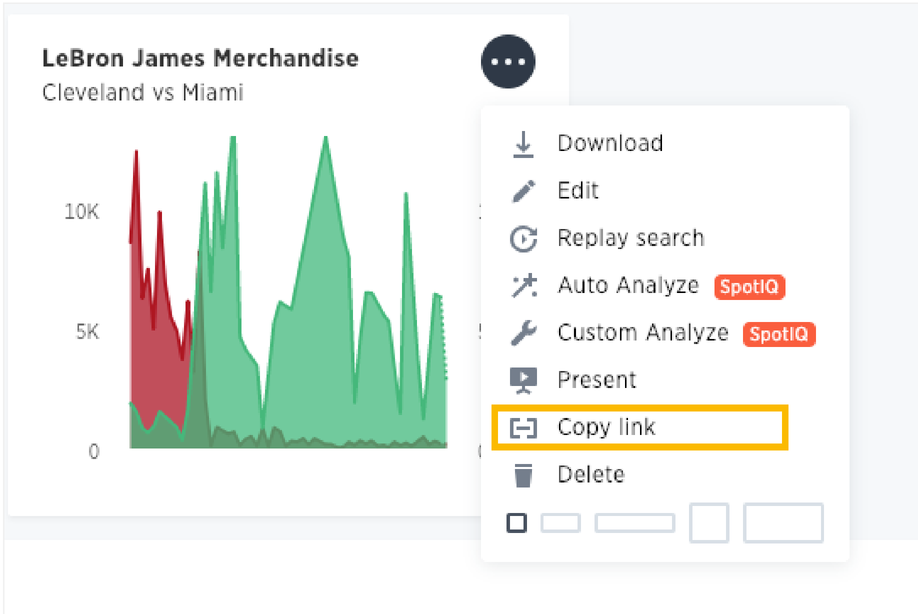
1. Log in to ThoughtSpot from a browser.
2. Navigate to a visualization on the **Pinboard** tab.
3. Open a pinboard.
4. Copy the URL for the entire pinboard and for a single visualization.

   If the object is a pinboard, click the ellipses icon (3 dots) > **Copy Link**.

   The format for the link is: `<protocol>:<host>:<port>/#/embed/viz/<pinboardID>`

For a vizualization in a pinboard, click the ellipses icon (3 dots) > Copy Link.



The format for the link is: `<protocol>:<host>:<port>/#/embed/viz/<pinboardID>/<vizualizationId>`

Edit the test.html

You need to edit the page in your application or web page where you want to embed a ThoughtSpot pinboard or visualization. For this example, you'll get a copy of the `test.html` file.

1. Create an empty directory called `test`.
2. Save the `test.html` file to the `test` directory.
3. Download the ThoughtSpot JavaScript library.
4. Place the Javascript library in an `api` directory co-located with the `test.html` file.
5. Edit the `test.html` file in your favorite editor.
6. Scroll down to the `Variables` section (about line 37).

   Here are the fields in the `test.html` file you need to edit.

```
var protocol = "THOUGHSPOT_PROTOCOL";
var hostPort = "HOST_PORT";

var pinboardId = "PINBOARD_ID";
var vizualizationId = "VIZUALIZATON_ID";
```

7. Edit each variable in the section and replace it with the IDs you copied from the pinboard.

   For example, your URL may look similar to the following:

`http://172.18.202.35:8088/#/embed/viz/061457a2-27bc-43a9-9754-0cd873691bf0/9985fccf-b28d-4262-b54b-29619a38348e`

This is a link copied from an individual visualization, the result in the file is:

```
var protocol = "http";
var hostPort = "172.18.202.35:8088";

var pinboardId = "061457a2-27bc-43a9-9754-0cd873691bf0";
var vizualizationId = "9985fccf-b28d-4262-b54b-29619a38348e";
```

The protocol (`http` or `https`) of your client and your ThoughtSpot instance should match. You'll use this identifier in the next part.

8. Save your changes and close the `test.html` file.

Enable CORS for your client domain

You must work with ThoughtSpot support to enable CORS between your client application domain and the ThoughtSpot domain. If you don't do this, you will receive an error message when `test.html` attempts to load the embedded objects.

The test infrastructure uses Python's `simplehttpserver` which runs, by default as `localhost:8000` , this is information ThoughtSpot support will need. You can also just copy the `test` directory to an existing web server. If you do this, you'll need to DNS for the server when you contact Support.

Test the example page

You are almost ready to view your embedded pinboard and visualization. The fastest way to run a webserver and test the code is using Python's `simplehttpserver`. If you have Python on your system you already have the `simplehttpserver`.

1. Log into ThoughtSpot.

   In production, you would have added authentication code to your client. You haven't done that with this system. So, before you test, you'll login to the ThoughtSpot. Successfully logging in causes the system to create a session and an authentication key. Your browser has this information and so when you load the `test.html` page in another tab, you won't need to authenticate again.

2. Change to your `test` directory.
3. Start the `simplehttpserver` web server.

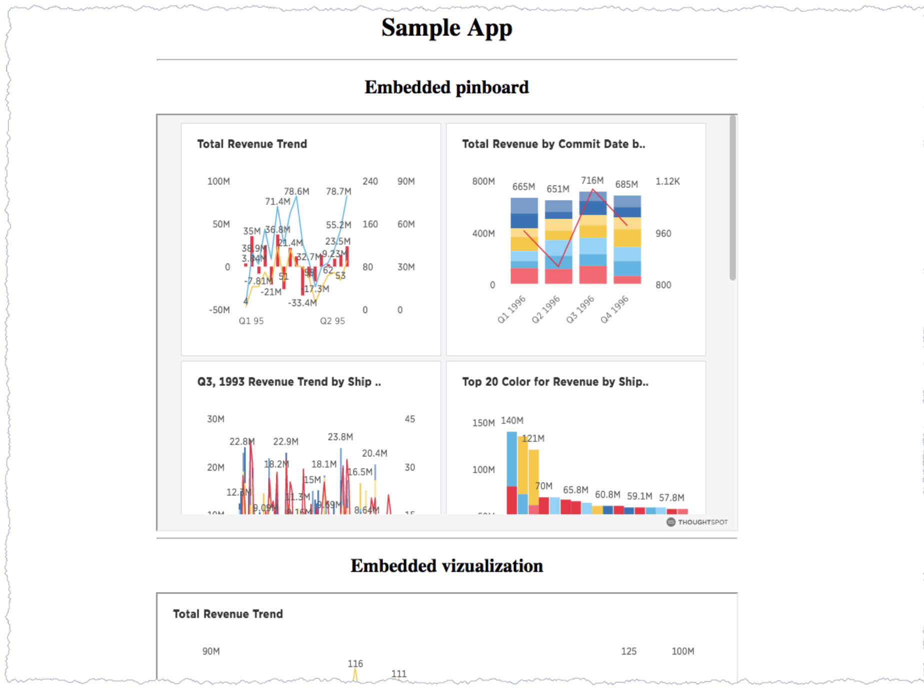
```
python -m SimpleHTTPServer 8000
```

4. Open your browser's **Developer** tools.

5. Navigate to the test page in your browser.

   `http://localhost:8000/test.html`

   You should see something similar to the following:



6. Check the browser console.

   Success is appears in the console with a message similar to this:

```
test.html:60 Initialization successful.
test.html:113 http://172.18.202.35:8088/#/embed/viz/061457a2-27bc-43a9-9754-0cd873691bf0
test.html:129 http://172.18.202.35:8088/#/embed/viz/061457a2-27bc-43a9-9754-0cd873691bf0/9985fccf-b28d-4262-b54b-29619a38348e
```

Troubleshooting embeds

If your embeds don't load, open the developer tools on your browser. Look for errors in the page loading, usually on the Console tab. If you see an error similar to:

```
No 'Access-Control-Allow-Origin' header is present on the requested resource.
```

Typically you see this if the cross domain (CORS) setting was not completed correctly on your ThoughtSpot cluster. Contact support@thoughtspot.com for more help.

Authentication flow with embed

If your ThoughtSpot system is configured for Security Assertion Markup Language (SAML) you can enable Single Sign On (SSO) for your embed application.

Place the JS API library in the `<head>` section of the HTML on your Web page. Ensure that the JS API script tag is the first script loaded in the page. You can see examples of this

Authenticate when the window is initialized

Your web page needs to authenticate by calling `window.thoughtspot.initialize` and waiting for the `onInitializationCallback` to be called before embedding any ThoughtSpot visualizations or making any ThoughtSpot REST API calls.

The JS API call `window.thoughtspot.initialize` can cause the entire Web page to be re-directed to your Identity Provider (IDP). This order implies that you may not execute any of your application logic before `window.thoughtspot.initialize` has called your callback.

Any redirection could interfere with your application logic. So, don't embed any static ThoughtSpot visualizations in your HTML. In other words, you should generate the ThoughtSpot visualizations dynamically after `window.thoughtspot.initialize` has called your callback.

The `onAuthExpiration` is only available if you have at least one ThoughtSpot visualization iframe in your web page.

Example of code flow

To authenticate with SSO.

1. Download the ThoughtSpot JavaScript library.
2. Include the library file into your web page's `<head>` section:

```
<head>
<script type="text/javascript" src="<protocol><your.thoughtspot.domain>/js/api/api.min.js">
...
</head>
```

3. From your application code, authenticate to ThoughtSpot by calling to the `window.thoughtspot.initialize` method.

   For example:

```
 <script type="text/javascript">
     thoughtspotHost = <hostname_or_ip_w/o_http>
     function setUpThoughtSpotAPI() {
         window.thoughtspot.initialize(
             function(isUserAuthenticatedToThoughtSpot)
{
                    if (isUserAuthenticatedToThoughtSpo
t) {
                        // load an embedded ThoughtSpot
visualization or
                        // make a ThoughtSpot data API c
all
                    } else {
                        // the current user into your sy
stem is not authenticated
                        // into your ThoughtSpot instanc
e, case in any other way suitable
                        // to your application logic. D
o NOT call setUpThoughtSpotAPI again
                        // here as that could create an
infinite cycle.
                    }
             },
             function() {
                 // the user got logged out from Thought
Spot, possibly because
                 // their session with ThoughtSpot expir
ed, you can call setUpThoughtSpotAPI()
                 // again to re-authenticate the user o
r handle this case in any other way
                 // suitable to your application logic.
             },
             thoughtspotHost
         );
     }
 </script>
```

4. Work with ThoughtSpot support to enable CORS between your client application domain and the ThoughtSpot domain.

   When this value is changed, the `nginx` service is restarted automatically to reflect the change.

Now, you're ready to either embed a visualization or use the REST API to get data from ThoughtSpot and display it within your Web page or application.

Full application embedding

Summary: Full embedding allows users to create ThoughtSpot content in an embedded environment.

Fully embedding ThoughtSpot content gives your users the ability to:

- create answers and pinboards
- share objects with users
- upload data and refresh uploaded data
- relate uploaded data with existing worksheets

This is useful for supplying the full search experience into an iframe with different navigation views and toggle options. However, there are limitations. Users won't be able to:

- create worksheets or views.
- modify profiles.
- view the Help Center.

Before you try the technique, make sure you have read, Understand embedding in this section.

A single page with the full application embedded

The following sample `embed.html` demonstrates how you might full embed app the application.

```
<!doctype html>
<html lang="en" style="height: 100%; width: 100%">
   <head>
      <meta http-equiv="X-UA-Compatible" content="IE=edge"/>
      <meta name="viewport" content="width=device-width">
      <meta charset="utf-8">
      <title>ThoughtSpot Embed App</title>
      <script type="text/javascript" src="api/api.min.js"></script>
      <script type="text/javascript">
         function updateIframeUrl(id) {
         var iframeUrl = "/?embedApp=true#/";
         if (id === 'homepage') {
         iframeUrl = "/?embedApp=true#/";
         } else if (id === 'search') {
         iframeUrl = "/?embedApp=true#/answer";
         } else if (id === 'answerList') {
         iframeUrl = "/?embedApp=true#/answers";
         } else if (id === 'pinboardList') {
         iframeUrl = "/?embedApp=true#/pinboards";
         } else if (id === 'data') {
         iframeUrl = "/?embedApp=true#/data/tables";
         }
         document.getElementById('ts-embed').setAttribute('src', iframeUrl);
         }

         function onCallback(event) {
         console.log(event.data);
         }
         window.thoughtspot.subscribeToAlerts("http://localhost:8000", onCallback);

      </script>
   </head>
   <body style="height: 100%; width: 100%">
      <button onclick="updateIframeUrl('homepage')">Homepage</button>
      <button onclick="updateIframeUrl('search')">Search</button>
      <button onclick="updateIframeUrl('answerList')">Answer list</button>
      <button onclick="updateIframeUrl('pinboardList')">Pinboard list</button>
      <button onclick="updateIframeUrl('data')">Data</button>
```

```
      <iframe id="ts-embed" src="/?embedApp=true#/" height="8
0%" width="80%"></iframe>
   </body>
</html>
```

The function `updateIframeUrl(id)` reflects the logic to change the src URL of the `iframe` when your users clicks on different navigation buttons.

Hide the ThoughtSpot navigation bar

To hide the primary navigation, configure this:

- Make sure the app is in an `<iframe/>` .
- Set the `embedApp` flag as true. This flag determines if the application is embedded.
- Set the `primaryNavHidden` flag as true (the default). This flag determines navigation visibility.

If either flag is `false` , the primary navigation will appear.

Error messages and full embed

ThoughtSpot can disable error messages within the ThoughtSpot iFrame and provide APIs to you to access those messages, and display them in your UI appropriately. This is done by suppressing error messages in the UI, and passing their details along to window.postMessage function, which your parent app can listen to. Hidden messages can be viewed in the console logs. Contact ThoughtSpot Support if you would like to enable this feature.

Additional notes

Here are some additional notes about the full embed feature:

- Call `thoughtspot.<customerURL>.com/#/answer` and use that to access the search functionality.
- Call `thoughtspot.<customerURL>.com/#/pinboards` and use that to access saved pinboards.
- Use SAML for authentication against ThoughtSpot within the iFrame.

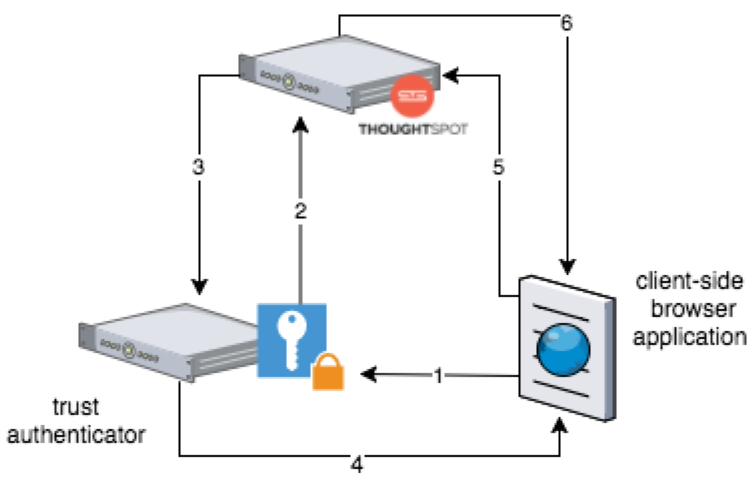
Finally, to hide the top navigation or the expandable left panel that shows data sources and fields within the current data source, contact ThoughtSpot Support.

Configure trusted authentication

If your organization has a trusted authentication server, you can use this server to authenticate users of the embedded ThoughtSpot application. After authenticating a user, the trusted authenticator server or service obtains an authentication token from ThoughtSpot on the user's behalf. In this way, the user need only authenticate once, with the trusted authentication server.

How users are authenticated

In the scenario below, the trust authenticator forwards requests for ThoughtSpot data from client applications to ThoughtSpot.



A user already logged into client-application interacts with a ThoughtSpot embed point which launches the following sequence:

1. The client-side application requests a user token from the trusted authenticator.

   This trusted authenticator server was previously configured as an authenticated server.

2. The trusted server authenticates the user and requests a token from ThoughtSpot on the user's behalf.
3. ThoughtSpot verifies the authenticator server's request and returns a user token.
4. The authenticator returns the user token to the client which it uses to complete the user request.
5. The client forwards the request together with the user token to ThoughtSpot.
6. ThoughtSpot validates the token and returns information commensurate with that authenticated user's authorization.

Enable trusted authentication and get a token

1. Log into the ThoughtSpot server.
2. Enable trusted authentication and generate an authenticate token. (service secret) – used to identify the server to ThoughtSpot.

```
 [admin@ourthoughtspot ~]$ tscli tokenauthentication ena
ble

 Token generated. Copy the GUID in the box.

 ########################################
 # b0cb26a0-351e-40b4-9e42-00fa2265d50c #
 ########################################

 Override added successfully
```

Tokens are like any other password, you should store them securely and protect knowledge of them. At any point in time, your installation can have a single authentication token. Repeated calls to enable overwrite the existing token and return a new one. To disable a token and not overwrite it:

```
tscli tokenauthentication disable
```

Once generated, tokens do not expire.

Trusted authentication call

1. User in another application or web page requests access to embedded ThoughtSpot.

   This is a REST request for an embedded ThoughtSpot Eobject, page, or the entire application. Your trusted authenticator server intercepts the request. Your server application must determine at minimum:

   - if the requestor is itself authenticated with your server
   - which user (`username`) is making the request
   - what is being requested, an object, page, or the entire ThoughtSpot application

   It is also important the the `username` is a match for a `username` on the ThoughtSpot application.

2. The trusted web server requests a authentication token on the user's behalf from ThoughtSpot.

   `POST https://<thoughtspot>/callosum/v1/session/auth/token`

   This post takes the following parameters:

Parameter	Description
`secret_key`	A required `formData` parameter containing a string which is the authentication token provide by the ThoughtSpot server.
`username`	A required `formData` parameter containing a string which is the user's `username` on ThoughtSpot.

`access_level`	A required `formData` parameter containing one of `FULL` or `REPORT_BOOK_VIEW`.
`id`	An optional `formData` parameter containing a ThoughtSpot object identifier. This is only required if you specified `REPORT_BOOK_VIEW` for the `access_level` parameter.

3. The trusted authenticator server is responsible for managing this token.

   The token can be managed in any way you see fit. Tokens expire in XXX minutes/hours/day.

4. The trusted authenticator server returns token to the original requestor.
5. Client completes the user's request providing the token along with the request.

   For example, if the customer was requesting a specific object:

   `https://THOUGHTSPOT_URL/?authtoken=TOKEN_VALUE/#/embed/viz/REPORTBOOK_ID/ID`

   If you are using ThoughtSpot embed with objects or pages, you must request reauthenticate requests for each new object.

About Runtime Filters

Runtime filters allow you to filter an answer or pinboard through parameters you pass in the URL to filter the data that is returned. You can use them with the data API or with embedding of answers or pinboards.

Capabilities of Runtime Filters

Runtime Filters provide ability to filter data at the time of retrieval using Embedding or the REST API. This is done by providing filter information through the URL query parameters.

This example shows the URL to access a pinboard with a filter. Here the Runtime Filter is operating on the column "Color" and will only return values that are equal (EQ) to "red".

```
http://10.77.144.40:8088/?col1=Color&op1=EQ&val1=red#
/pinboard/e36ee65e-64be-436b-a29a-22d8998c4fae
```

This example shows the URL for a REST API call with a filter. Here the Runtime Filter is operating on the column `Category` and returning values that are equal to `mfgr%2324`.

```
http://10.77.144.40:8088/callosum/v1/tspublic/v1/pinboarddata?
id=e36ee65e-64be-436b-a29a-22d8998c4fae&col1=Category
&op1=EQ&val1=mfgr%2324
```

ThoughtSpot will try to find a matching column from the pinboard or visualization being accessed, using the `col` field as `name`. You can add any number of filter sets by incrementing the parameters (e.g. `col2`, `op2`, and `val2`, etc.) For operators that support more than one value you can pass `val1=foo&val1=bar`, etc.

If the pinboard or answer you're filtering already has one or more filters applied, the Runtime Filter(s) will act as an `AND` condition. This means that the data returned must meet the conditions of all filters - those supplied in the runtime filter, and those included in the pinboard or visualization itself.

Supported Data Types

You can use runtime filters on these data types:

- `VARCHAR`
- `INT64`
- `INT32`
- `FLOAT`
- `DOUBLE`
- `BOOLEAN`
- `DATE`
- `DATE_TIME`
- `TIME`

Note that for `DATE` and `DATE_TIME` values, you must specify the date in epoch time (also known as POSIX or Unix time).

Example Uses

You can use Runtime Filters alongside the REST API and Embedding to create dynamic controls in your Web portal. For example, you could use the REST API to get a list of possible filters for a visualization. Then use that data to populate a select list on your Web portal. When a user makes a selection, you would then pass it as a Runtime Filter, and the result returned will apply the filter.

Limitations of runtime filters

Runtime Filters do not work directly on top of tables. You need to create a worksheet if you want to use Runtime Filters. This means that the pinboard or visualization on which you apply a runtime filter must be created on top of a worksheet.

If the worksheet was created from an answer (i.e. it is an aggregated worksheet), Runtime Filters will only work if the answer was formed using a single worksheet. If the answer from which the worksheet was created includes raw tables or joins multiple worksheets, you won't be able to use Runtime Filters on it. This is because of the join path ambiguity that could result.

Runtime Filters do not allow you to apply "having" filters using a URL.

You cannot apply a Runtime Filter on a pinboard or visualization built on tables whose schema includes a chasm trap. See the ThoughtSpot Administrator Guide for details on chasm traps and how ThoughtSpot handles them.

Apply a Runtime Filter

Runtime filters allow you to apply filters to the data returned by the APIs or the visualization or pinboard you're embedding. Before you apply a filter, make sure understand their limitations.

The filters are specified in the called URL as parameters. Before you can use runtime filter(s), you need to do these procedures:

1. Enable the JavaScript API (JS API) and authenticate to ThoughtSpot.
2. Use the Data API or Visualization Embedding to retrieve the answer or pinboard you want to use.

Now you are ready to add a runtime filter to your Data API call or Embedded object:

1. Obtain the URL you are using to embed the visualization or call the REST API.
2. Paste the URL it into a text editor.
3. Append the runtime filter to the URL, using the runtime filter operators to get the data you want. The format for the runtime filter is:
   - For Embedding a pinboard:

     ```
     http://<thoughtspot_server>:<port>/
     ?**col1=<column_name\>&op1=<operator\>&val1=<valu
     e\>**
     #/pinboard/<pinboard_id>
     ```

   - For Embedding a visualization:

     ```
     http://<thoughtspot_server>:<port>/
     ?**col1=<column_name\>&op1=<operator\>&val1=<valu
     e\>**
     #/pinboard/<pinboard_id>/<visualization_id>
     ```

   - For the REST API with a pinboard:

     ```
     http://<thoughtspot_server>:<port>
     /callosum/v1/tspublic/v1/pinboarddata
     ?id=<pinboard_id>
     &**col1=<column_name\>&op1=<operator\>&val1=<valu
     e\>**
     ```

   - For the REST API with a visualization:

```
http://<thoughtspot_server>:<port>
/callosum/v1/tspublic/v1/pinboarddata
?id=<pinboard_id>&vizid=%5B<visualization_id>%5D
&**col1=<column_name\>&op1=<operator\>&val1=<valu
e\>**
```

4. To add additional filters on a particular column, you can specify multiple values by separating them with `&` (ampersand) as in the example:

   ```
   val1=foo&val1=bar
   ```

   You can also use the `IN` operator for multiple values, as shown in this example:

   ```
   col1=<column_name>&op1=IN&val1=<value>&val1=<value>
   ```

5. Add additional filters by incrementing the number at the end of each parameter in the **Runtime Filter** for each filter you want to add, for example, `col2`, `op2`, `val2` and so on.

This example passes multiple variables to a single column as well as multiple columns. It shows that data values are returned as epoch.

```
col1=region&op1=IN&val1=midwest&val1=south&val1=northeast
&col2=date&op2=BET&val2=<epoch_start>&val2=<epoch_end>
```

Runtime Filter Operators

This list contains all the filter operators you can use with Runtime Filters.

Operator	Description	Number of Values
`EQ`	equals	1
`NE`	does not equal	1
`LT`	less than	1
`LE`	less than or equal to	1
`GT`	greater than	1
`GE`	greater than or equal to	1
`CONTAINS`	contains	1
`BEGINS_WITH`	begins with	1
`ENDS_WITH`	ends with	1
`BW_INC_MAX`	between inclusive of the higher value	2
`BW_INC_MIN`	between inclusive of the lower value	2
`BW_INC`	between inclusive	2
`BW`	between non-inclusive	2
`IN`	is included in this list of values	multiple

Customize the application style

Summary: Style Customization allows you to change the overall style of your ThoughtSpot interface.

Using style customization you can create a uniform ThoughtSpot experience that matches with your company's look and feel. To re-brand the interface, you can use the style customization option found on the Admin section in the ThoughtSpot web application. It lets you change the logo, application background color, chart color palettes, and footer text. For help with chart and table visualization fonts, contact ThoughtSpot support.

This is especially useful if you're using the ThoughtSpot APIs for embedding visualizations from ThoughtSpot in your own web portal or application. You can make the visualizations match the look and feel of the portal or application in which they are embedded. For more information on using the APIs, see the ThoughtSpot Application Integration Guide.

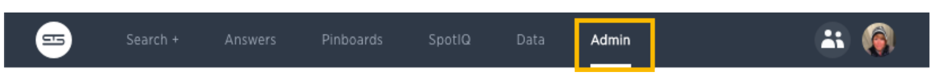
Style customization is enabled by default beginning in ThoughtSpot version 5.0. To disable style customization, contact ThoughtSpot Support. The ThoughtSpot logo in the middle of the page is automatically removed when Style Customization is enabled.

Change style customization

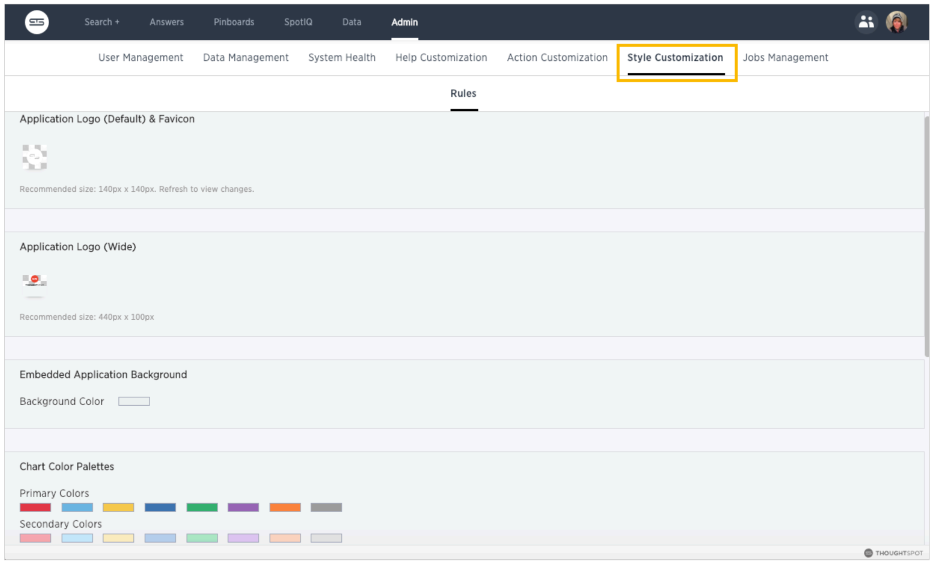
Make changes to the style of your ThoughtSpot interface in the **Style Customization** page. This option gives you defined, yet impactful capabilities for re-branding the interface, so having some understanding of typography and color schemes would be helpful.

To re-brand the interface:

1. Log in to ThoughtSpot from a browser.
2. Click on the **Admin** icon, on the top navigation bar.



3. In the **Admin** panel, click on **Style Customization**.



Once in the menu page, you can:

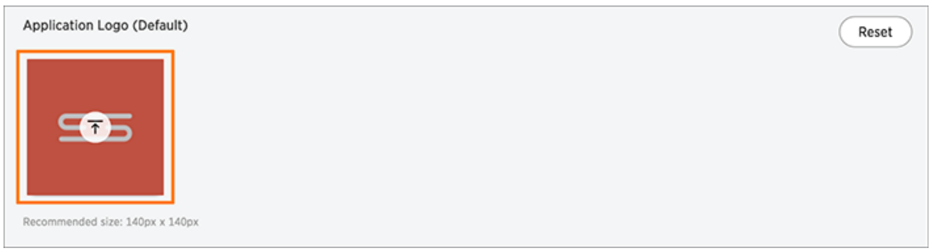
- Upload application logos
- Set chart and table visualization fonts
- Choose a background color
- Select chart color palettes
- Change the footer text.

Upload application logos

Summary: You can replace the ThoughtSpot logo, wherever it appears in the ThoughtSpot web application, with your own company logo.

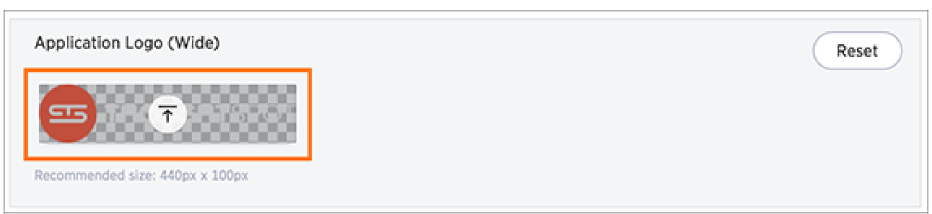
To upload your own default and wide application logos:

1. Click on the default icon under **Application Logo (Default)** to browse for and select your own default logo.

   Your icon image should be a square, and the recommended size is 140px by 140px. The accepted file formats are jpg, jpeg, and png. This logo will appear on the top left of the interface.

2. Next click on the wide icon under **Application Logo (Wide)** to browse for and select your own wide logo.

   The recommended size is 440px by 100px. The accepted file formats are jpg, jpeg, and png. This logo will appear on the login screen. You may need to test a few versions to make sure it appears correctly.

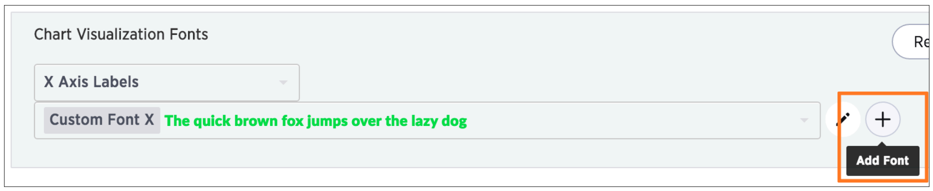
3. Click the **Reset** button on the upper right hand side of the sections if you would like to bring back the default logos.

Set chart and table visualization fonts

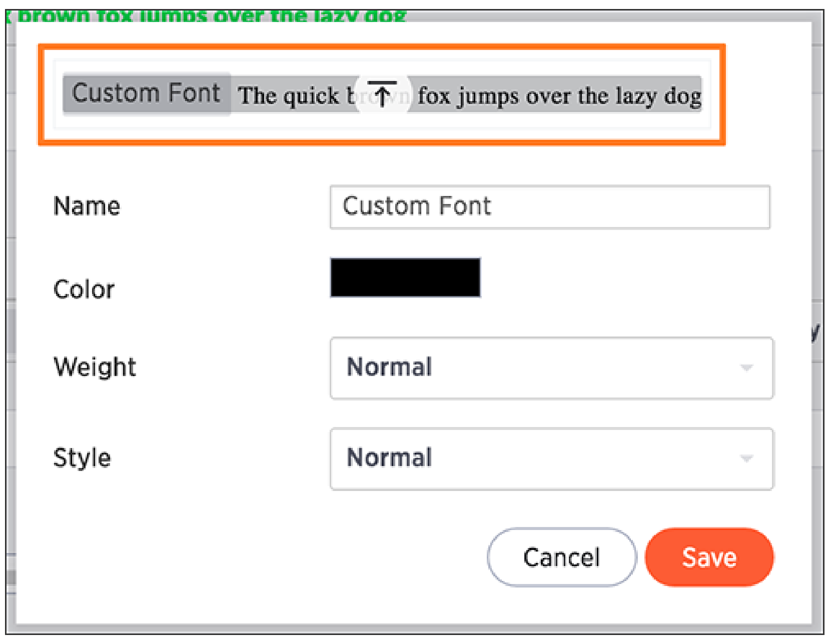
You can add and edit fonts to customize the appearance of your charts and tables. Be careful though, since the interface may become unreadable depending on how you change the default font, font weight, or font style. It is therefore suggested that you use the default font settings.

If you are confident in your knowledge of font visualizations, you can set your chart and table visualization fonts by following the steps below:

1. Click on the **Add New** button under **Chart Visualization Fonts**.

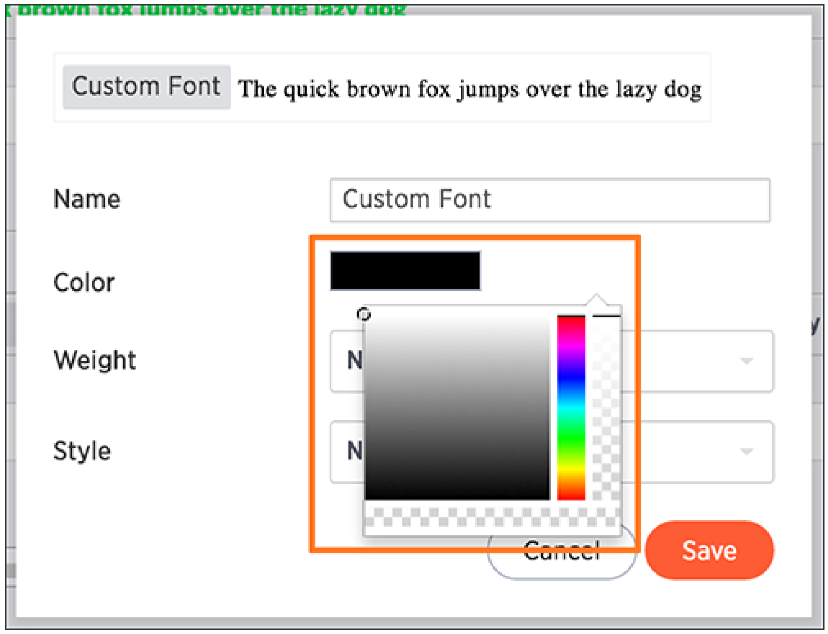


2. In the add new font menu, select the details for the font:
    a. Upload your custom font.

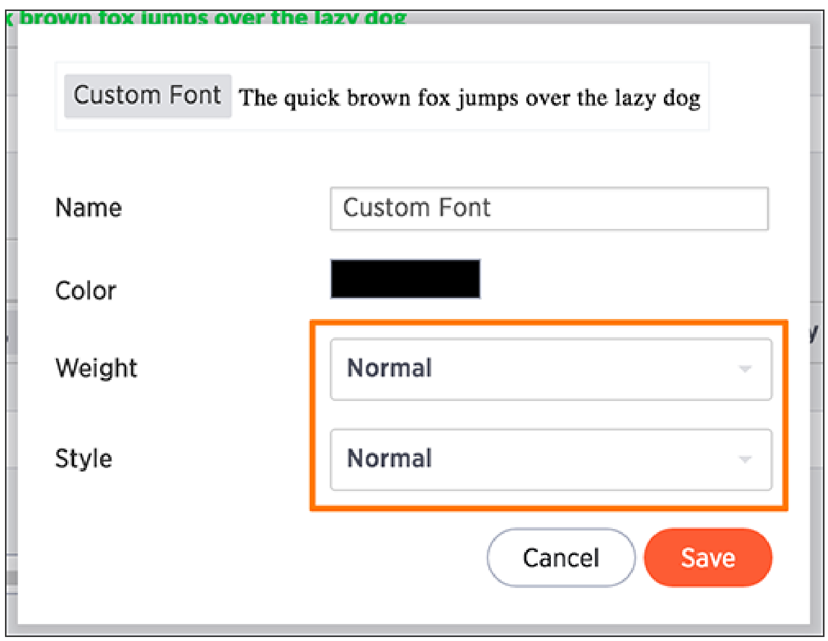


Only WOFF font types are supported.

    b. Use the color menu to choose the font color.



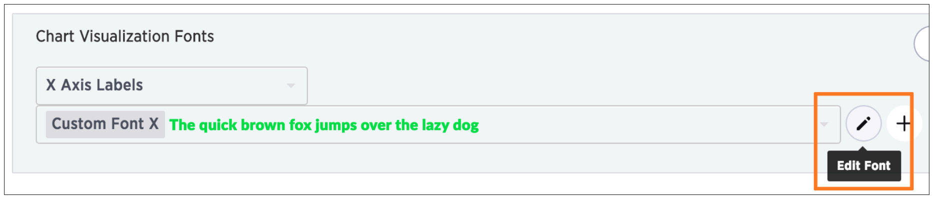
c. Choose the font weight and style from the drop down menus.



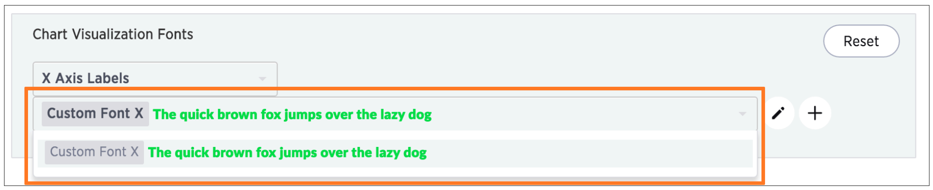
The font weight choices are normal, bold, and light. The style choices are normal, italic, and oblique.

d. Click **Save**.

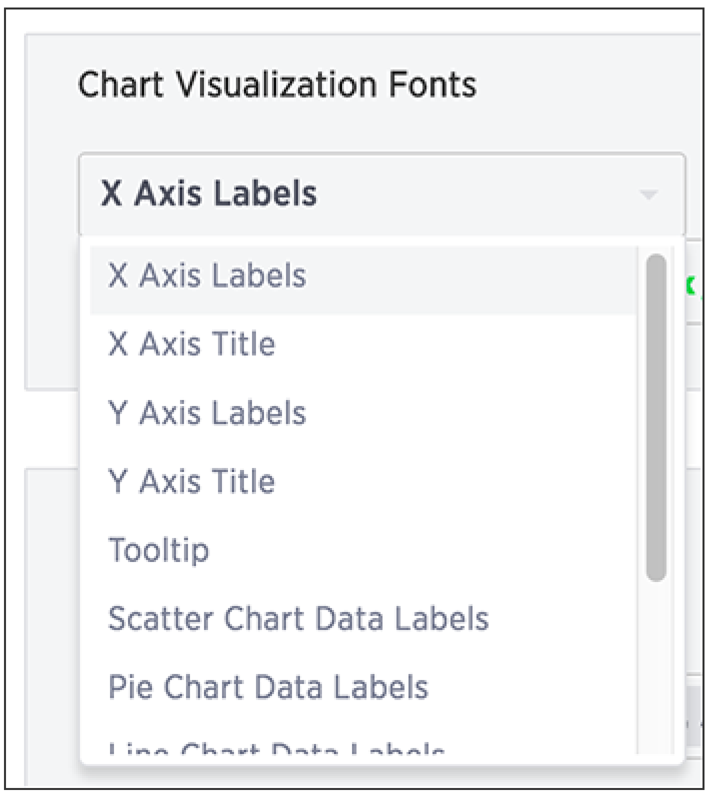
3. Click on the **Edit Font** icon  to make changes to the font you just uploaded or to a pre-existing font.



4. Make any changes to the details of the font in the edit menu and click **Save**.
5. Click the custom font drop down to choose your custom font.



6. Click the chart label drop down to choose where you would like to apply your custom font.



7. The same steps can be followed to set your **Table Visualization Fonts**.

8. Click the **Reset** button on the upper right hand side of the sections if you would like to bring back the default fonts.

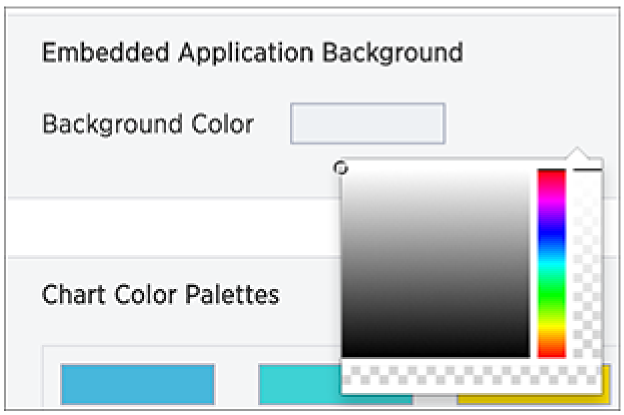
Choose a background color

You can change the background color to match with your company's theme. The custom background color is in effect when using the API to embed visualizations and pinboards.

This feature is only applicable when embedding ThoughtSpot in an external web portal or application. To choose a background color:

1. Click the background color box under **Application Background**.

2. Use the color menu to choose your new background color.



3. Click the **Reset** button on the upper right hand side of the section if you would like to bring back the default color.

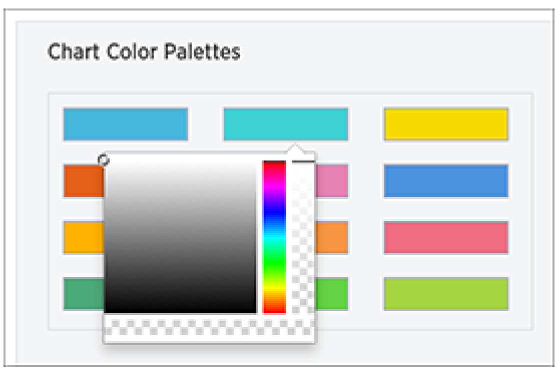
Select chart color palettes

You can change the color palettes that are used to create your charts. Although it is suggested that you stick with the default settings, it is possible to create your own appealing color palettes if done correctly.

To select the chart color palettes:

1. Navigate to the Chart Color Palettes section at the bottom of the Style Customization page.

2. Click on the color you would like to change in the primary color palette, and use the color menu to choose your new color.



   All of the colors in the primary color palette are used in a chart before any from the secondary palette are used. Therefore, the primary palette usually consists of primary colors.

3. Click on the color you would like to change in the secondary color palette, and use the color menu to choose your new color.

The colors from the secondary color palette are used once all of the colors have been exhausted from the primary palette. Therefore, the secondary palette usually consists of secondary colors.

4. Click the **Reset** button on the upper right hand side of the section if you would like to bring back the default color palettes.

Change the footer text

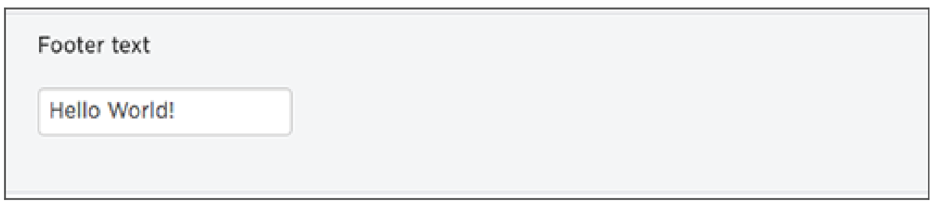
The ThoughtSpot footer appears by default in the ThoughtSpot application. It also appears with an embed application that encompasses an individual pinboard or a full application. In embed applications that are have a single visualization, you can ask your ThoughtSpot support engineer to disable the footer.

While you cannot remove the footer, you can customize it by adding a company-specific message.

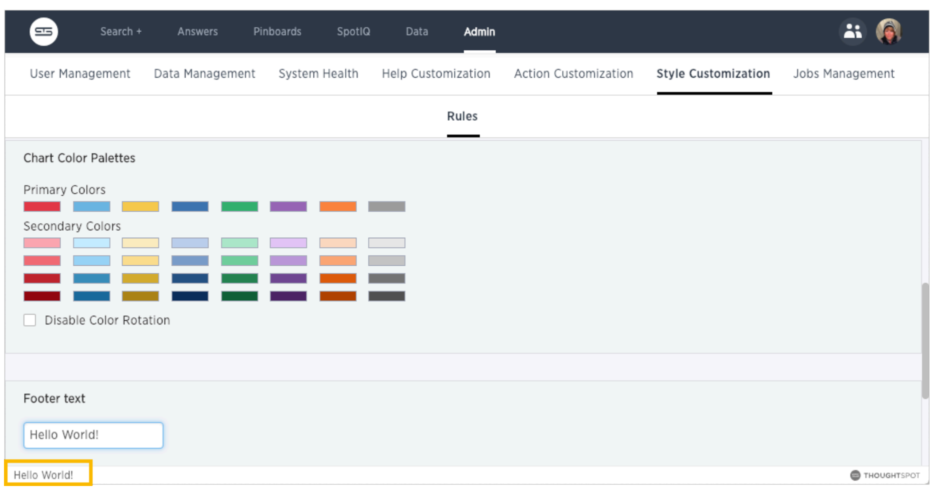
Add a message to the application footer

You can change the footer text to reflect your company's message. To change the footer text:

1. Click the text box under **Footer text**.
2. Enter your new text message.



Your new text message will automatically be displayed in the footer.



3. Click the **Reset** button on the upper right hand side of the section if you would like to bring back the default footer text.

Public API reference

This reference details all the public ThoughtSpot APIs. The descriptions are aimed to help you solve specific use cases, such as syncing users and groups, or fetching visualization headers. The following public APIs are available:

- pinboarddata API
- metadata API
- session API
- user API
- group API

See About the REST API for information on how to call and use the REST APIs.

pinboarddata API

Gets the pinboard data from the ThoughtSpot system. Returns one object if you make a call to a specific visualization on a pinboard.

- Public namespace: Data
- Current URL path: `/tspublic/v1/pinboarddata`

Parameters

Parameter	Description
`id`	GUID id of the pinboard query string.
`vizid`	Optional GUID ids of the visualizations query string.
`batchsize`	An integer defining the query batch size. The system default is `-1` .
`pagenumber`	An integer providing another way to specify an offset. The system default is `-1` . Alternate way to set offset. This is: `1-based indexingOffset = (pageNumber - 1) * batchSize query integer`
`offset`	An integer specifying the query offset. The system default is `-1` .
`formattype`	A string specifying the format type. Valid values are `COMPACT` or `FULL` JSON. The system default is `COMPACT` .

HTTP Status Codes

- 200 Gets the data of a pinboard/visualization.
- 400 Invalid pinboard id.

Response example:

Curl

```
curl -X POST --header 'Content-Type: application/json' --header 'Accept: application/json' 'https://<instance>/callosum/v1/tspublic/v1/pinboarddata?batchsize=-1&pagenumber=-1&offset=-1&formattype=COMPACT'
```

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/pinboarddata?batchsize=-1&pagenumber=-1&offset=-1&formattype=COMPACT
```

Response Body

```
no content
```

Response Code

```
400
```

Response Headers


```
{
  "x-callosum-incident-id": "2ff9d2e4-c928-4192-8250-8450de264a
b7",
  "x-callosum-trace-id": "2e551b8d-d3f4-4cf1-af90-a49bb246ad9
2",
  "date": "Sun, 19 Feb 2017 03:39:41 GMT",
  "x-callosum-request-time-us": "11536",
  "server": "nginx",
  "pragma": "no-cache",
  "cache-control": "no-store, no-cache, must-revalidate, max-ag
e=0, post-check=0, pre-check=0",
  "content-security-policy": "script-src 'self'",
  "connection": "keep-alive",
  "content-length": "0",
  "x-callosum-ip": "192.168.2.247",
  "content-type": null
}
```

metadata API

These two APIs work with metadata for objects in the system.

GET /tspublic/v1/metadata/listobjectheaders

Lists the metadata object headers in the repository

Parameters

Parameter	Description
`type`	A string specifying the metadata object type. Valid values for this field are: • `REPORT_BOOK` • `QUESTION_ANSWER_BOOKPINBOARD_ANSWER_BOOK` • `QUESTION_ANSWER_SHEET` • `PINBOARD_ANSWER_SHEET` • `LOGICAL_COLUMN` • `LOGICAL_TABLE` • `LOGICAL_RELATIONSHIP` • `TAG` • `DATA_SOURCE`
`subtypes`	List of sub-types of metadata object. This setting applies to the `LOGICAL_TABLE` type. Valid values are: • `ONE_TO_ONE_LOGICAL` • `WORKSHEET` • `PRIVATE_WORKSHEET` • `USER_DEFINED` • `AGGR_WORKSHEET`
`category`	A string specifying the metadata object category. Valid values are `ALL` or `MY` .
`sort`	Sort order of returned headers. Valid values - DEFAULT • `NAME` • `DISPLAY_NAME` • `AUTHOR` • `CREATED` • `MODIFIED`
`sortascending`	A boolean flag specifying sort order. A null value defines default order. True signifies ascending order. False signifies descending order.
`offset`	An integer specifying the batch offset to fetch page of headers. A value of `-1` implies first page.

Parameter	Description
`batchsize`	An integer specifying the batch size. The system default is unspecified, a value of `-1` implies no pagination.
`tagname`	A JSON string array containing a set of tag names to filter headers by.
`pattern`	A string specifying a object name pattern to match. Use `%` for wildcard match.
`skipids`	A string identifying the object metadata GUIDs to exclude.
`fetchids`	A string identifying the object metadata GUIDs to fetch.
`auto_created`	A boolean specifying whether to list auto created objects only. A value of null signifies return all.

HTTP Status Code

- `200` Gets the visualization headers.

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/metadata/listobjectheaders
```

For example:

```
curl -X GET --header 'Accept: application/json' --header 'X-Requested-By: ThoughtSpot'
    'https://<instance>/callosum/v1/tspublic/v1/metadata/listobjectheaders?category=ALL&sort=DEFAULT&offset=-1'
```

For example:

```
[
  {
    "id": "6715f768-8930-4180-9a3d-1efdbfaa8e7f",
    "name": "Headline Pinboard",
    "author": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "created": 1519940021267,
    "modified": 1519945210514,
    "modifiedBy": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "owner": "6715f768-8930-4180-9a3d-1efdbfaa8e7f",
    "isAutoCreated": false,
    "isAutoDelete": false
  },
  {
    "id": "262abdac-b00f-4f5f-ad33-fcf10154184f",
    "name": "Empty Pinboard",
    "author": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "created": 1519945152030,
    "modified": 1519945152030,
    "modifiedBy": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "owner": "262abdac-b00f-4f5f-ad33-fcf10154184f",
    "isAutoCreated": false,
    "isAutoDelete": false
  },
  {
    "id": "327f4d60-c502-43b0-b1d4-c73df5031a2e",
    "name": "Charts Pinboard",
    "author": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "created": 1519880454269,
    "modified": 1519945014529,
    "modifiedBy": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "owner": "327f4d60-c502-43b0-b1d4-c73df5031a2e",
    "isAutoCreated": false,
    "isAutoDelete": false
  },
  ...snip...,
  {
    "id": "e82fe65a-7ac0-4282-a783-7a35c01b8dbd",
    "name": "Broken Pinboard",
    "author": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "created": 1455598191207,
    "modified": 1455598218094,
    "modifiedBy": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "owner": "e82fe65a-7ac0-4282-a783-7a35c01b8dbd",
    "isAutoCreated": false,
    "isAutoDelete": false
```

```
  }
]
```

Response Code

```
200
```

Response Headers


```
{
  "x-callosum-trace-id": "c8008291-c074-45cf-b88a-371253166b5
b",
  "date": "Tue, 27 Mar 2018 17:38:54 GMT",
  "content-encoding": "gzip",
  "x-callosum-request-time-us": "11694",
  "transfer-encoding": "chunked",
  "x-nginx-localhost": "172.18.231.12",
  "x-callosum-ip": "172.18.231.12",
  "connection": "keep-alive",
  "x-ua-compatible": "IE=edge",
  "x-callosum-incident-id": "791eb139-5fd1-478a-9002-35a81b0dd4
aa",
  "pragma": "no-cache",
  "server": "ThoughtSpot",
  "vary": "Accept-Encoding",
  "content-type": "application/json",
  "cache-control": "no-store, no-cache, must-revalidate, max-ag
e=0, post-check=0, pre-check=0",
  "content-security-policy": "script-src 'self'"
}
```


GET /tspublic/v1/metadata/listvizheaders

Gets the visualization headers from the ThoughtSpot system. The expected output includes a list of objects, each with information about the visualizations of the given pinboard.

Parameters

Parameter	Description
`id`	A string specifying the GUID of a particular answer (reportbook).

HTTP Status Code

- `200` Gets the visualization headers.
- `400` Invalid pinboard GUID.

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/metadata/listvizhead
ers
```

For example:

```
curl -X GET --header 'Accept: application/json' --header 'X-Req
uested-By: ThoughtSpot' 'http://172.18.231.12:8088/callosum/v1/
tspublic/v1/metadata/listvizheaders?id=327f4d60-c502-43b0-b1d
4-c73df5031a2e'
```

Response Body

An array where each response has these first class citizens:

- `size` (String enumeration)
- `vizType` (String enumeration)
- `id` (GUID)
- `name` (String)
- `author` (GUID)
- `created` (Epoch)
- `modified` (Epoch)
- `modifiedBy` (GUID)
- `owner` (GUID)

For example:

```
[
  {
    "size": "m",
    "vizType": "CHART",
    "title": {
      "value": {
        "text": "Line chart- horizontal 900-1200 - data labels"
      }
    },
    "id": "8fbf93e6-54ba-4a20-b2bb-4afe8dca5321",
    "name": "1177d886-27fd-4dff-a617-8defadd27a6b::6e87081a-fc4
c-4bd9-b1e0-cfe145868498 Pinboard Ref",
    "author": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "created": 1519880461956,
    "modified": 1519945014529,
    "modifiedBy": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "owner": "6f403a20-fe68-43e7-a0bf-a4e706740361"
  },
...snip...
  {
    "size": "ls",
    "vizType": "CHART",
    "title": {
      "value": {
        "text": "Percent as chart"
      }
    },
    "id": "eb59aa25-1d2b-44f4-b5b4-b390105d56a8",
    "name": "b8c26ea1-b341-4a18-871b-cc67a6bb237f::80cd5837-d5a
7-491d-a3dc-490dfb3dbb0f Pinboard Ref",
    "author": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "created": 1519932657762,
    "modified": 1519945014529,
    "modifiedBy": "59481331-ee53-42be-a548-bd87be6ddd4a",
    "owner": "6f403a20-fe68-43e7-a0bf-a4e706740361"
  }
]
```


Response Code

```
200
```

Response Headers


```
{
  "x-callosum-trace-id": "c0c84945-be03-414c-80c3-47b1b094980
3",
  "date": "Tue, 27 Mar 2018 17:46:47 GMT",
  "content-encoding": "gzip",
  "x-callosum-request-time-us": "35402",
  "transfer-encoding": "chunked",
  "x-nginx-localhost": "172.18.231.12",
  "x-callosum-ip": "172.18.231.12",
  "connection": "keep-alive",
  "x-ua-compatible": "IE=edge",
  "x-callosum-incident-id": "4ed1364c-b018-43a8-8486-ee954cd3da
e3",
  "pragma": "no-cache",
  "server": "ThoughtSpot",
  "vary": "Accept-Encoding",
  "content-type": "application/json",
  "cache-control": "no-store, no-cache, must-revalidate, max-ag
e=0, post-check=0, pre-check=0",
  "content-security-policy": "script-src 'self'"
}
```

Public API reference

This object has two POST calls, one for `login` and one for `logout`.

POST /tspublic/v1/session/login

This call takes a `APPLICATION_FORM_URLENCODED` payload containing a `username`, a `password`, and an optional `rememberme` flag. If you do not supply the optional flag, the system uses the default `false` value.

Inputs

Parameter	Description
`username`	Username of the user to log in as.
`password`	Password of the user to log in as.
`rememberme`	A flag indicating if the user session needs to be remembered. Defaults to `false`.

Returns

No object is returned.

Status Codes

Code	Description
`204`	On successful login.
`401`	On failure to login

POST /tspublic/v1/session/logout

This call logs a user out of an existing session.

Returns

No object is returned.

Status Codes

Code	Description
`204`	On successful logout.
`401`	On failure or when unauthorized to call.

user API

- Public namespace: Configuration

POST /tspublic/v1/user/ownership

Transfers ownership of *all* objects from one user to another. You cannot transfer objects to or from the system user or the administrative user.

Parameters

Parameter	Description
`fromUserName`	Username to transfer from. You cannot specify the system user or an administrative user.
`toUserName`	Username to transfer to. You cannot specify the system user or an administrative user.

HTTP Status Code

- 200
- 400

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/user/transfer/ownership
```

Curl example:

```
ccurl -X POST --header 'Content-Type: application/json' --header 'Accept: application/json' --header 'X-Requested-By: ThoughtSpot' 'https://<instance>/callosum/v1/tspublic/v1/user/transfer/ownership?fromUserName=Auser&toUserName=Buser'
```

Response Object Format

```
no content
```

Response Code

```
200
```

Response Headers


```
{
  "x-callosum-incident-id": "d28fd603-bd7e-414f-882b-794d74c4b4
69",
  "x-callosum-trace-id": "55453051-5fb5-4139-8d24-adcc0b1b24f
2",
  "date": "Thu, 15 Mar 2018 22:21:47 GMT",
  "x-callosum-request-time-us": "970213",
  "server": "ThoughtSpot",
  "status": "204",
  "strict-transport-security": "max-age=31536000; includeSubDom
ains",
  "pragma": "no-cache",
  "cache-control": "no-store, no-cache, must-revalidate, max-ag
e=0, post-check=0, pre-check=0",
  "content-security-policy": "script-src 'self'",
  "x-ua-compatible": "IE=edge",
  "content-type": null
}
```


POST /tspublic/v1/user/sync

API to synchronize principal from external system with ThoughtSpot system. This API is for users and groups. It should help to keep ThoughtSpot users and groups automatically synchronized with your external database.

Specifically, you will have to make a call to `/tspublic/v1/user/sync` containing all users and groups present in the external database. If the call succeeds, then it is guaranteed that the users and groups in ThoughtSpot match those specified in the list of objects passed to `/tspublic/v1/user/sync`. This means that:

- Objects (users or groups) present in ThoughtSpot, but not present in the list passed to a sync call will be deleted.
- Objects present in ThoughtSpot, and present in the list passed to a sync call will be updated such that the object attributes in ThoughtSpot match those present in the list. This includes group membership.
- Objects not present in ThoughtSpot, and present in the list will be created in ThoughtSpot. The returned object represents the changes that were made in ThoughtSpot.

Parameter	Description
`applyChanges`	A boolean flag to indicate whether to sync the users and groups to the system, and apply the difference evaluated. You can use this API to validate a difference before applying changes.
`password`	A string specifying a password.
`principals`	A string specifying a list of principal objects.
`remoteDeleted`	This is boolean flag that indicates whether to remove deleted users/groups. When true, this flag removes any deleted users or groups.boolean

HTTP Status Code

- 200

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/user/sync
```

Curl example:

```
curl -X POST --header 'Content-Type: application/x-www-form-urlencoded' --header 'Accept: application/json' -d 'applyChanges=false' 'https://<instance>/callosum/v1/tspublic/v1/user/sync'
```

Response Object Format


```
{
  'usersAdded': ['username1','username2'],
  'usersDeleted': ['username3'],
  'usersUpdated': ['username4'],
  'groupsAdded': ['groupname1'],
  'groupsDeleted': ['groupname2','groupname3'],
  'groupsUpdated': ['groupname4']
}
```


Response Code

```
415
```

Response Headers


```
{
  "x-callosum-incident-id": "645499d1-d0cf-4b3b-bbdc-4296abb9a3
26",
  "x-callosum-trace-id": "19f7ad7d-226a-4e88-a301-405f8512595
9",
  "date": "Sun, 19 Feb 2017 03:55:52 GMT",
  "x-callosum-request-time-us": "4545",
  "server": "nginx",
  "pragma": "no-cache",
  "cache-control": "no-store, no-cache, must-revalidate, max-ag
e=0, post-check=0, pre-check=0",
  "content-security-policy": "script-src 'self'",
  "connection": "keep-alive",
  "content-length": "0",
  "x-callosum-ip": "192.168.2.247",
  "content-type": null
}
```

POST /tspublic/v1/user/updatepassword

Changes the password of a user

Parameters

Parameter	Description
`name`	Name of the user .
`password`	String to represent the new user password.
`currentpassword`	String to represent the current user password.

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/user/updatepassword
```

Curl example:

```
curl -X POST --header 'Content-Type: application/x-www-form-url
encoded' --header 'Accept: application/json' --header 'X-Reques
ted-By: ThoughtSpot' -d 'name=guest¤tpassword=test&password=foo
barfoobar' 'https://<instance>/callosum/v1/tspublic/v1/user/upd
atepassword'
```

GET /tspublic/v1/user/list

API to get a list of all users, groups, and their inter-dependencies in the form of principal objects. This API is for users and groups.

One principal object contains the following properties (* denotes required properties):

Property	Description
`name`	String to represent the name of the principal. This field, in conjunction with whether the object is a user or group, is used to identify a user/group. Consequently, this field is required to be unique (unique for users and groups separately. I.e. you can have user "x" and group "x").
`displayName`	String to represent the display name of the principal.
`description`	String to describe the principal.
`mail`	String to represent the email address of the user. This field should be populated only in case of user not group. It is ignored in the case of groups.
`principalTypeEnum`	The value of this field should be one of the following: • `LOCAL_USER` User created in the ThoughtSpot system and the validation of the user is done through password saved in the ThoughtSpot database. • `LOCAL_GROUP` Groups created in the ThoughtSpot system.
`password`	String to represent the password of the user. This field should be only populated in case of user not group. It is ignored in the case of groups. Also password is only required if the user is of LOCAL_USER type. Password is only required when the user is created for the first time. In subsequent update of the user password is not updated even if it changes in the source system.
`groupNames`	List of group names that a principal belongs to directly. Groups and users can belong to other groups.

HTTP Status Code

- 200

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/user/list
```

Curl example:

```
curl -X GET --header 'Accept: application/json' 'https://<insta
nce>/callosum/v1/tspublic/v1/user/list'
```

Response Body format

```
[
  {
    "name": "Group 1",
    "displayName": "Group Display Name 1",
    "description": "Group Description 1",
    "principalTypeEnum": "LOCAL_GROUP",
    "groupNames": []
  },
  {
    "name": "Test Name",
    "displayName": "Test DisplayName",
    "principalTypeEnum": "LOCAL_USER"
    "password": "password_123",
    "groupNames": ["Group 1"]
  }
]
```

Response Body example

```
[
  {
    "name": "Sales Executives",
    "displayName": "Sales Executives",
    "description": "",
    "created": 1481827712854,
    "modified": 1481827713052,
    "principalTypeEnum": "LOCAL_GROUP",
    "groupNames": []
  },
  {
    "name": "Operations Demo",
    "displayName": "Operations Demo",
    "description": "",
    "created": 1436491036553,
    "modified": 1436498598655,
    "principalTypeEnum": "LOCAL_GROUP",
    "groupNames": []
  },
  {
    "name": "Sales Directors",
    "displayName": "Sales Directors",
    "description": "",
    "created": 1481827747555,
    "modified": 1485805361837,
    "principalTypeEnum": "LOCAL_GROUP",
    "groupNames": []
  },
  {
    "name": "Product",
    "displayName": "Product",
    "description": "",
    "created": 1409250574242,
    "modified": 1477525172084,
    "principalTypeEnum": "LOCAL_GROUP",
    "groupNames": []
  },
  {
    "name": "Sales Development",
    "displayName": "Sales Development",
    "description": "",
    "created": 1481831987186,
    "modified": 1481831987382,
    "principalTypeEnum": "LOCAL_GROUP",
    "groupNames": [
```

```
      "Sales"
    ]
  }
]
```

Response Code

```
200
```

Response Headers


```
{
  "x-callosum-incident-id": "1be6e07b-b7aa-4531-8597-8852760757
f0",
  "x-callosum-trace-id": "e92c54ca-d5f1-44a6-ab8e-f6871bb0da8
b",
  "date": "Sun, 19 Feb 2017 04:14:13 GMT",
  "content-encoding": "gzip",
  "x-callosum-request-time-us": "19720",
  "server": "nginx",
  "vary": "Accept-Encoding",
  "content-type": "application/json",
  "pragma": "no-cache",
  "cache-control": "no-store, no-cache, must-revalidate, max-ag
e=0, post-check=0, pre-check=0",
  "transfer-encoding": "chunked",
  "content-security-policy": "script-src 'self'",
  "connection": "keep-alive",
  "x-callosum-ip": "192.168.2.247",
  "x-ua-compatible": "IE=edge"
}
```

group API

POST v1/group/addprivilege

Adds a `DATADOWNLOADING` or `USERDATAUPLOADING` privilege to the system default `ALL_GROUP`. All users in the system are always part of `ALL` group. By default, this group does not have either permission.

All the data sources which the `ALL_GROUP` has permissions to are downloadable when `DATADOWNLOADING` is set.

Parameters

Parameter	Description
`privilege`	A string representing the privilege to add. You can set `DATADOWNLOADING` or `USERDATAUPLOADING` privilege.
`groupNames`	A string representing the name of the group to add the privilege to. Only `ALL_GROUP` is accepted.

Return codes

- 200
- 204 Success
- 401 Failure/unauthorized

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/group/addprivilege
```

POST v1/group/removeprivilege

Removes a privilege from a group.

Parameters

Parameter	Description
`privilege`	A string representing the privilege to remove. You can set `DATADOWNLOADING` or `USERDATAUPLOADING` privilege.

Parameter	Description
`groupNames`	A string representing the name of the group to remove the privilege from. Only `ALL_GROUP` is accepted.

Return codes

- 200
- 204 Success
- 401 Failure/unauthorized

Request URL

```
https://<instance>/callosum/v1/tspublic/v1/group/addprivilege
```