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DataV
Advanced Skills

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Document conventions









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

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1. Configure VPC data source in DataV

DataV supports configuring a VPC-based database as a data source. For more information, see [VPC documents](#).

1. Log on to the [DataV console](#), select **Data Sources > Add Source**.
2. Select *RDS MySQL* from the Type drop-down list.
3. Click the secondary drop-down list and select *Intranet*.
4. Turn on the *VPC* button and enter the relevant information in the required fields.

The screenshot shows the 'Add Source' configuration window. The 'Type' dropdown is set to 'RDS for MySQL'. Below it, two dropdown menus are highlighted with a red box: the first is set to 'Intranet' and the second is set to 'north east'. A 'VPC' toggle switch is also highlighted with a red box and is turned on. Below these are input fields for 'Name', 'Host', 'VPC ID', 'Instance ID', 'Username', and 'Password'.

Add Source [X]

* Instance ID
[Input Field]

* Username
[Input Field]

* Password
[Input Field]

* Port
3306

* Database
[Database List] [Dropdown Arrow]

Before submitting, please ensure:

1. the database is accessible to Internet. (IP Whitelist is not supported. Check detail:
2. the domain of the database can be parsed.
3. the database has been enabled and not blocked by the firewall.

[OK]

In addition to conventional database configurations, you must configure the VPC ID and instance ID for the VPC database. Both IDs can be found in Alibaba Cloud console.

If all the parameters are configured, the system will test the data source connection automatically.

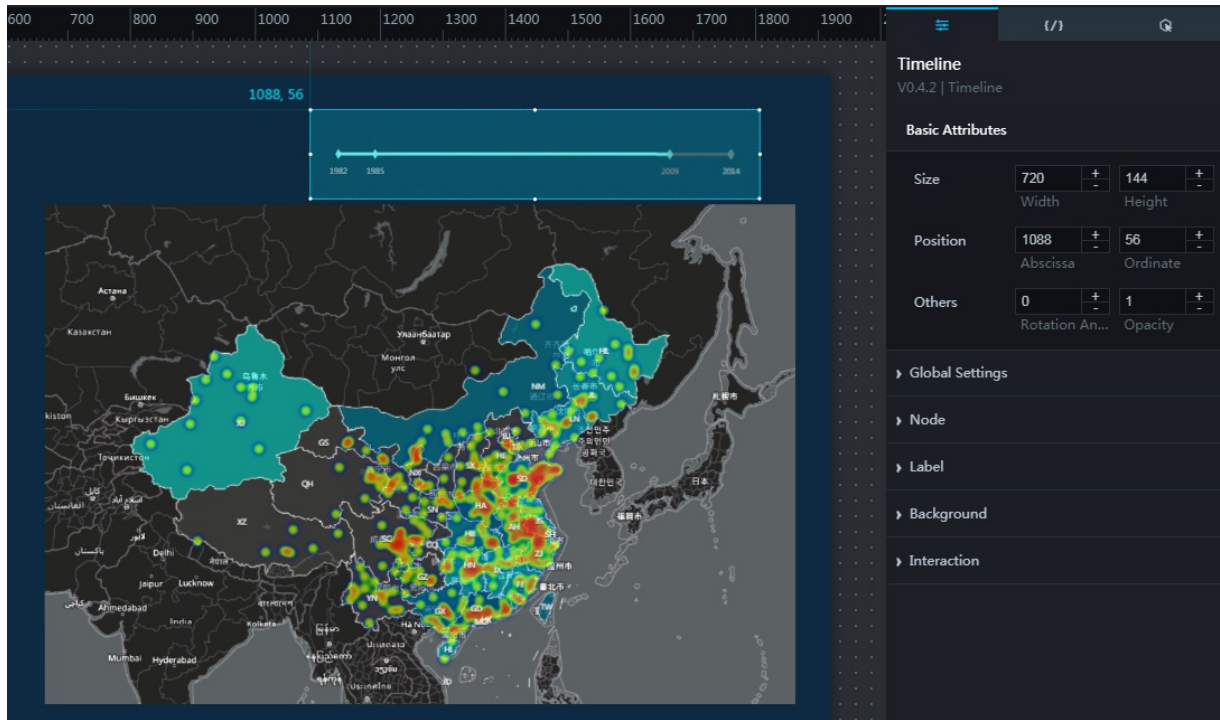
5. Click OK when the connection is verified.

You can now use the VPC database as a widget data source.

2.Widget interaction

Widgets can interact with each other through related callback IDs, see [Configure widget interaction](#). By using callback IDs, if you click a widget, data of a widget with the corresponding callback ID will change accordingly.

Using a timeline widget as an example, with a callback ID, after you click a timestamp the map widget displays detailed information of this timestamp, see [Configure widget interaction](#).

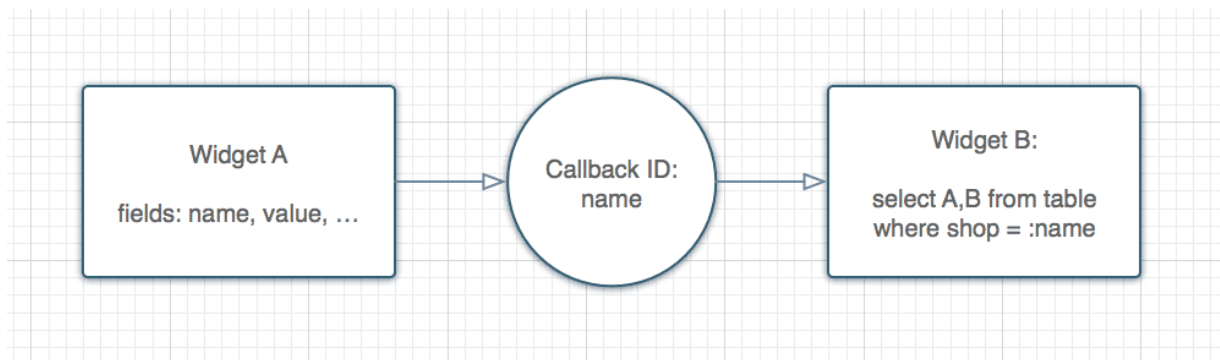


Set a callback ID

A callback ID can be considered as a parameter variable that is used to control the transmission of parameters between widgets, and realize interactions between them (that is, if data of one widget is updated, other widgets with the same callback ID are also updated).

Note Callback ID is not supported if the Data Source Type is *Static Data* or a *CSV file*.

For instance, if you click a scattered point in a map, click a row in a list, or select a time point on a time table, the system temporarily stores the designated callback ID, for example, name, into the *name* variable.



Set variable input

When the Data Source Type is SQL or API, you can directly input the variable.

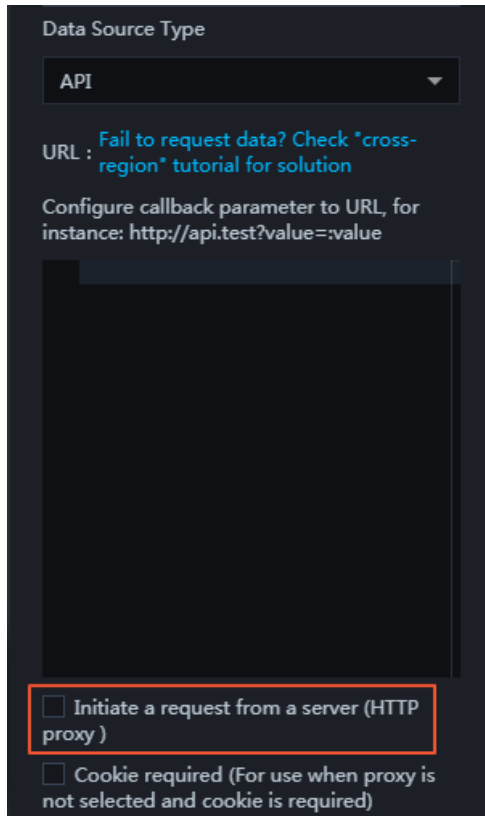
```
select :name as value  
select A from table where year = :name
```

If you are using an API data source, the system directly assigns value to the variable parameters with the same name.

3. Cross-origin data configuration

Background

If user A creates a visualization project in DataV, and selects *API* from the Data Source Type drop-down list (shown in the following figure), depending on where the API is hosted, the following situations may occur.



- If the API is on a remote server and has access to a public network, select **Initiate a request from a server (HTTP proxy)**. The DataV backend server initiates a request to the API at the same time. The request has a 10-second timeout and cannot be changed.
- If the API is on a local server, deselect **Initiate a request from a server (HTTP proxy)**, and the interface needs to be configured across origins. The API is accessed by a local browser and the timeout duration is also determined by the local browser.

What is an issue related to cross-origin data configuration

Assume that user A's website needs to include data from their own website and from user B's website. Data on user A's website can be accessed by the website interface <http://userA.com/page1>. The website interface for user B is <http://userB.com/page2>. If user A uses a Javascript AJAX request to gain access to user B's website, user A cannot retrieve data from userB.com.


If, for example, a Chrome browser is opened during the preceding request, the following is displayed:

```
XMLHttpRequest cannot load http://userB.com/page2. Because no 'Access-Control-Allow-Origin' header is present on the requested resource.Origin 'http://userA.com/' is not allowed access.
```

This means we encountered a cross-domain issue.

Reason

Because each website contains various interfaces, such as user interface, order interface and article interface, each user can put the data returned from those interfaces on their own website. This means the browsers have a **same-origin policy**, which restricts a script from one origin to obtain resources from another origin.

 **Note** Same origin: If two pages have the same protocol (HTTP), port (80) and host (userA.com), these two pages are considered to be from the same origin.

Solution

- **Cross-origin between A.x.com and B.x.com**

If the sub-origins for two sites are different, such as `http://xyz.userA.com/` and `http://123.userA.com/`, the cross-origin issue still exists.


To solve this issue, you must declare the page to a higher-level origin.

```
<script>
  document.domain = "x.com";
</script>
```

- **JSONP**

Although JSONP is a commonly applied solution, it is vulnerable to Cross-Site Scripting (XSS) attacks. Therefore, DataV does not support this method.

- **Cross-Origin Resource Sharing (CORS)**

 **Note** Cross-Origin Resource Sharing (CORS) was introduced to solve issues related to the sharing of restricted resources. Most new browsers are compatible with CORS.

Concept

Add the custom header information HTTP to user B's website (local API) so that its resources can be accessed by other websites.

Example

- Header information returned from a data server includes the following basic content:

```
Access-Control-Allow-Origin: http://www.example.com
```

- If user B's website interface data are used by many specified websites, the header information must be generated dynamically. The following example uses PHP:

```
<? php
if (is_my_bastard($_SERVER['HTTP_ORIGIN'])) {
header("Access-Control-Allow-Origin: {$_SERVER['HTTP_ORIGIN']}");
}
? >
```

- If user B's website interface data are used by all the other websites, use `"*"`.

```
Access-Control-Allow-Origin: *
```

Cookie

By default, CORS does not contain cookie information. If you want to add cookies, follow these steps:

- i. Add the `withCredentials` parameter, such as `jquery`:

```
$.ajax({
  url: "http://userB.com/isdad",
  xhrFields: {
    withCredentials: true
  }
});
```

- ii. Configure the server to allow headers with credentials and disallow the wildcard character `"*"`, as follows:

```
<? php
if (is_my_bastard($_SERVER['HTTP_ORIGIN'])) {
header("Access-Control-Allow-Origin: {$_SERVER['HTTP_ORIGIN']}"); // Disallow "*"
header("Access-Control-Allow-Credentials:true");
}
? >
```

For more information, see [HTTP access control \(CORS\)](#).

4. Use cookies to isolate data of a DataV project

If you use an API data source in a DataV project, you can configure cookies to allow different users to view their own data after they log on to the system. This ensures data security in the project.

How it works

1. If you embed a DataV project into the web page of your business system by using an iframe, the web page requests contain user logon information, for example, Session_Id in cookies when a user logs on.
2. If you use an API data source and select **Cookie Required (Applicable when Initiate Request from Server is not selected and cookies are required)**, DataV adds cookies in HTTP requests. The cookies contain user logon information.

Configure Datasource [X]

• Data Source

Data Source Type
API

Request method
GET

URL: [Important: solution to cross-origin access issues](#)
Configure callback parameter(s) into the URL, for example: http://api.test?value=:value


Headers (Optional)

1 {}

Initiate Request from Server (Applicable when cross-origin access fails)

Cookie Required (Applicable when Initiate Request from Server is not selected)

[Preview Data Response](#)

 **Note** If cross-origin requests are required, select Initiate Request from Server (Applicable when cross-origin access fails). For more information, see [Cross-origin data configuration](#).

3. When users log on and request the DataV project, the server verifies user information in the requests and returns data to users based on the information. Individual users can view only their own data.

5. Introduction to the DataV Proxy service

This topic describes how to start the DataV Proxy service and what are the features of this service. With the DataV Proxy service, you can configure data queries without the need for opening a database or building an API. The DataV Proxy service sends encrypted SQL strings and the ID of a database to an application. Then the application connects to the database, obtains the query results, and returns the results to DataV.

Startup

To start the DataV Proxy service, follow these steps:

- For Windows:
 - i. Click [Download DataV Proxy](#) to download the installation package.
 - ii. Decompress the installation package.
 - iii. Double-click the `datav_proxy_wins.exe` file.
- For Linux and Mac OS:
 - i. Run the following command to download the DataV Proxy application:

```
wget https://sh-conf.oss-cn-shanghai.aliyuncs.com/doc_files/datav_proxy.zip
```

- ii. Decompress the installation package and find the directory where the DataV Proxy service is located.
- iii. Run the following command to start the DataV Proxy service:

```
chmod 777 ./*  
sh exec.sh start
```

 **Note** By default, the DataV Proxy service is started on port 8001.

You can run the `sh exec.sh start -p [port number]` command to start the DataV Proxy service. In this command, you can set the port number as needed (for example, `sh exec.sh start -p 8080`).

You can also run the `sh exec.sh stop` command to stop the DataV Proxy service.

After the DataV Proxy service is started, you can paste `http://domain name:port` into a browser to access the service.

- `domain name` : The Internet IP address of the server to install the DataV Proxy service.
- `Port` : The port on which the DataV Proxy service is started.

 **Note** You must first register the DataV Proxy service before you can use it.

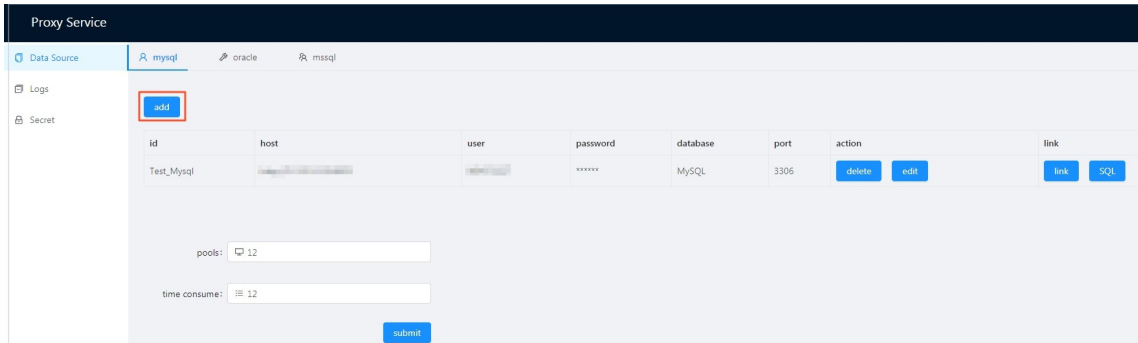
Features

- Customize the data source

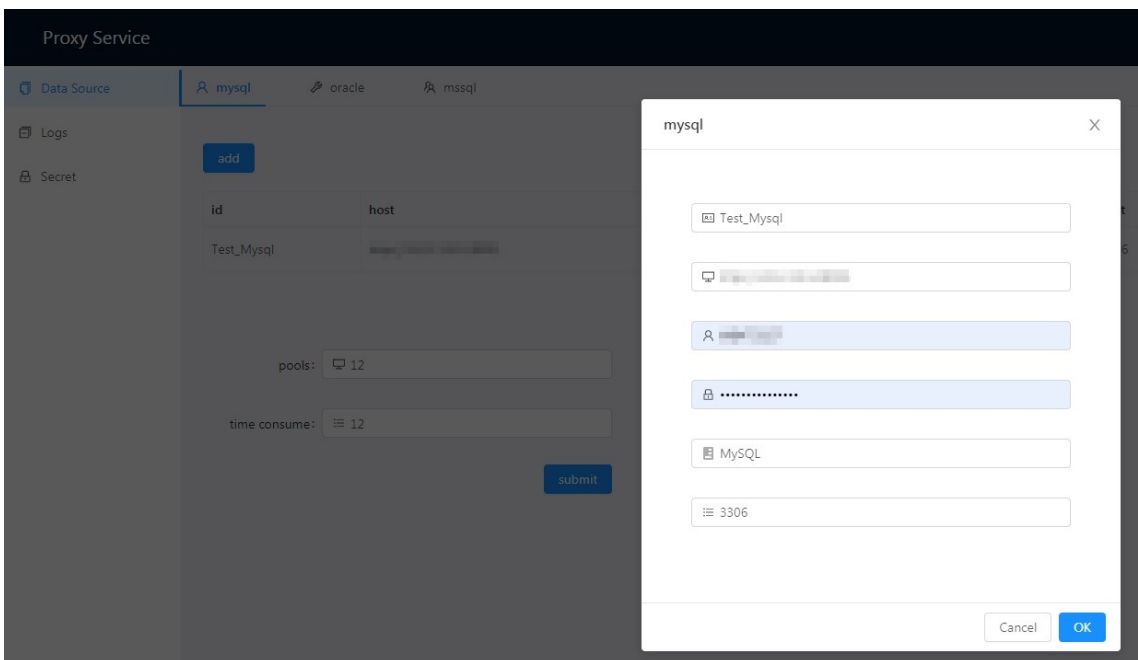
You can configure the basic information about a database, such as the data source. This information is used when you configure the database as a data source for DataV. After the basic information is configured, you can click **link** and **SQL** to test the reliability of the data source.

To configure a data source, follow these steps:

- i. In the left-side navigation pane, click **Data Source**, select the target data source, and click **Add**.



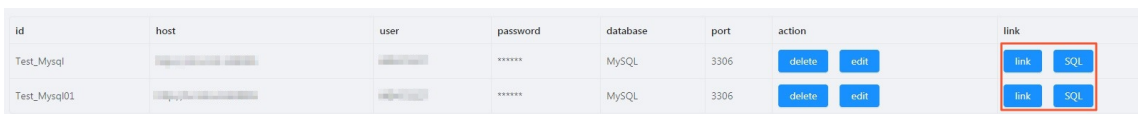
- ii. In the displayed dialog box, enter basic information about the data source.



- iii. Test the data source.

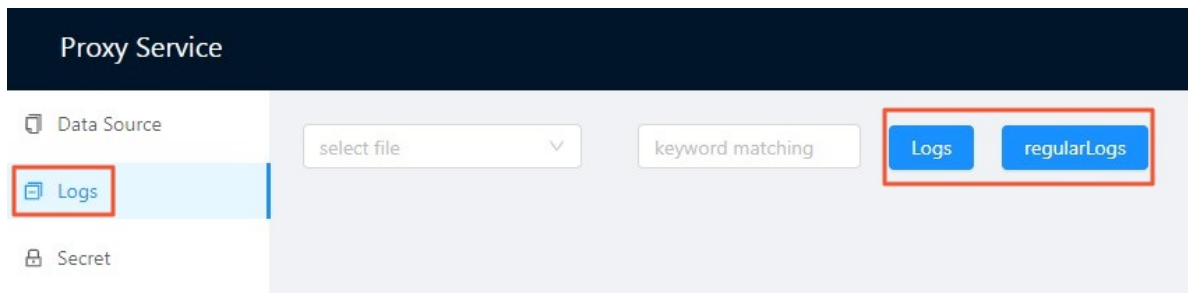
Click **link** to test the connectivity of the database.

Click **SQL** and enter a SQL statement to test whether data in the database meets the requirements.



- Query logs

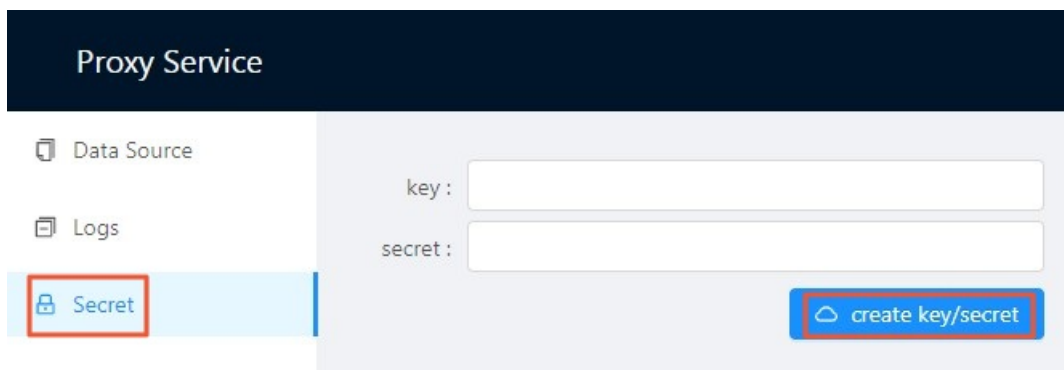
You can query logs by specifying the number of columns that contain keywords.



Notice You can only view logs on Windows and cannot query logs by specifying the number of columns that contain keywords.

- **Automatically generate keys and secrets**

You can click **create key/secret** to generate a pair of key and secret that can be used to configure DataV data sources. When you create a new pair, your existing key and secret automatically expire.

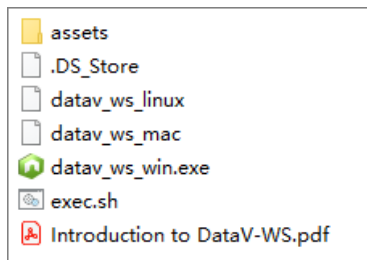


Notice By default, no key and secret are available. You need to click **create key/secret** to generate a pair of key and secret for subsequent use.

6. Use the DataV-WS service

DataV-WS integrates the static file service and WebSocket. The static file service is used to load local model addresses. WebSocket can be used in the blueprint editor to connect multiple projects in the same network range without additional development. This topic describes how to use DataV-WS.

DataV-WS document directories



 **Notice** Do not delete the `assets` directory.

Start and stop DataV-WS

- Windows:
 - i. Download the [DataV-WS installation package](#).
 - ii. Decompress the package and double-click the `datav_ws_win.exe` file.
 - iii. View the returned message. If the following information appears, DataV-WS is started:

```
Server listen on IP address:8181 (for example, 127.0.0.1:8181)
```

 **Notice** Do not close the command prompt after the start.

- iv. Develop and demonstrate WebSocket and the static file service after you start DataV-WS. For more information, see [Configure DataV-WS](#).
- Linux or macOS:
 - i. Run the following command to download the DataV-WS installation package:

```
wget http://sh-conf.oss-cn-shanghai.aliyuncs.com/doc_files/datav_ws.zip
```

- ii. Decompress the package, start the terminal, and enter the service directory, for example, `datav-ws`.
- iii. Run the following commands to start DataV-WS (port 8001 is used by default):

```
chmod 777 ./  
sh exec.sh start
```

You can run the `sh exec.sh stop` command to stop DataV-WS.

You can run the `sh exec.sh restart` command to restart DataV-WS.

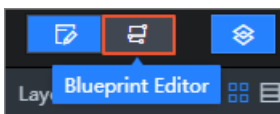
- iv. Develop and demonstrate WebSocket and static file service after you start DataV-WS. For

more information, see [Configure DataV-WS](#).

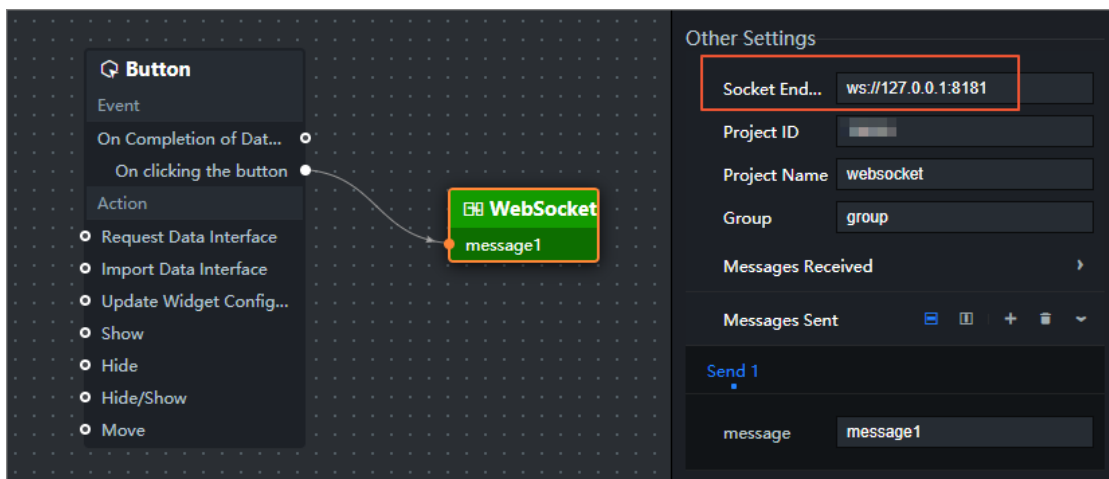
Configure DataV-WS

You can configure WebSocket and the static file service.

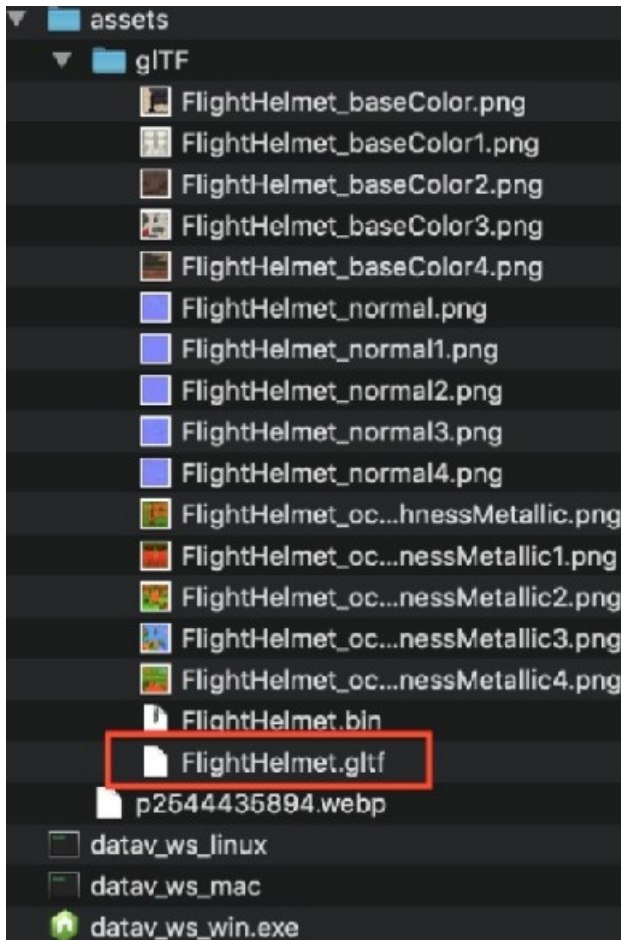
- Configure WebSocket.
 - Development:
 - a. Start DataV-WS on your local computer. For more information, see [Start and stop DataV-WS](#).
 - b. Log on to the [DataV console](#).
 - c. Create an empty [DataV project](#).
 - d. In the upper-left corner of the canvas editor, click the **Blueprint Editor** icon. The blueprint editor appears.



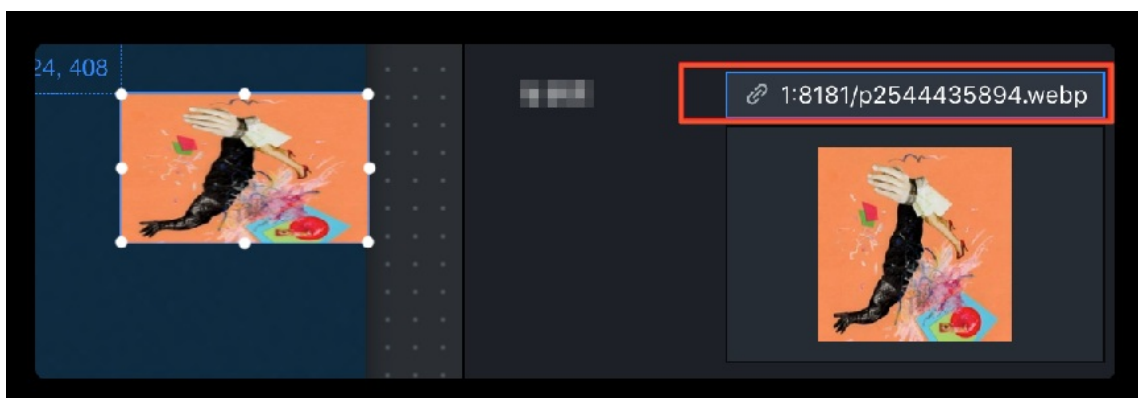
- e. In the blueprint editor, drag and drop the **WebSocket** node to the canvas.
- f. Click the **WebSocket** node in the blueprint editor and set **Socket Endpoint** to `ws://127.0.0.1:8181`.



- Demonstration:
 - a. Start DataV-WS on a demonstration server that is in the same network range as the development server. For more information, see [Start and stop DataV-WS](#).
 - b. Add a **WebSocket** node. Set **Socket Endpoint** of the **WebSocket** node to `ws://IP address of the demonstration server:8181`. The projects that use the two **WebSocket** nodes can communicate with each other.
- Configure the static file service.
 - i. Start DataV-WS on your local computer. For more information, see [Start and stop DataV-WS](#).
 - ii. Add static files (such as images) to the `assets` directory.



- iii. Log on to the [DataV console](#).
- iv. Create an empty [DataV project](#).
- v. In the canvas editor, add an image widget. For more information, see [添加组件](#).
- vi. Set **Background Image** to `http://IP address:8181/p2544435894.webp` so that the project can obtain the image from DataV-WS.



References

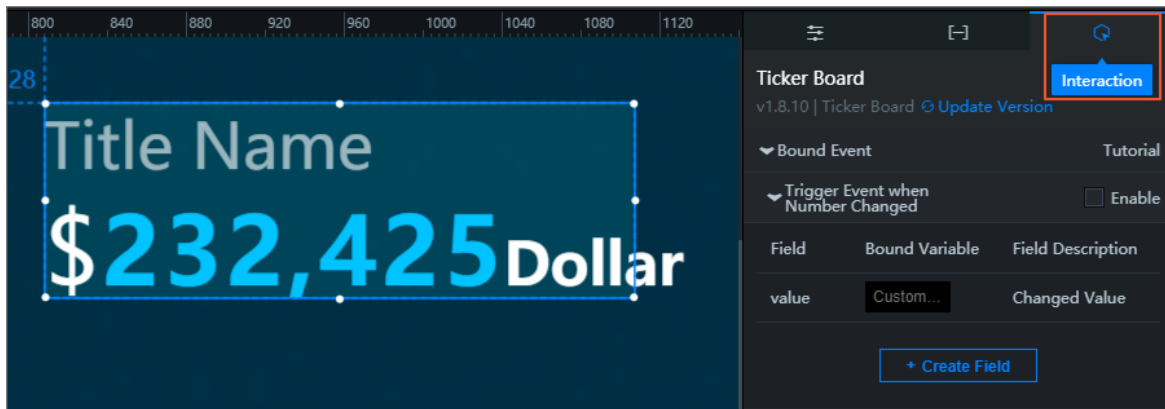
[User-created WebSocket node service](#)

7. Configure a callback ID for a ticker board

A callback ID in DataV is a parameter that a widget sends to another widget when the first widget responds to operations or when an update is automatically triggered. The parameter is a variable used to query data of one widget in another. This topic uses a ticker board widget as an example to demonstrate the use of callback IDs.

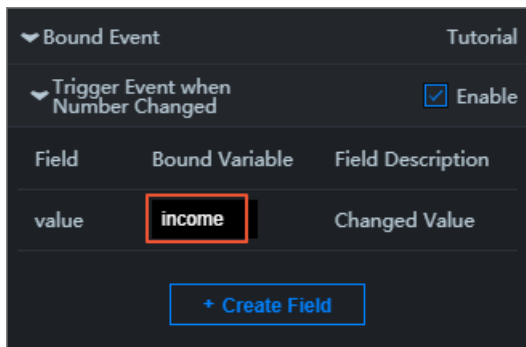
Procedure

1. Click the ticker board widget, and then click the Interaction tab on the right-side panel.



Note You can configure callback IDs on the Interaction tab on the right-side panel.

2. Select the Enable check box to the right of Trigger Event when Number Changed.
3. In the Bound Variable column, change the variable name from *value* to *income*.



Note

- After you change the variable name to *income*, you can use *income* to obtain the parameter value in another widget that calls the callback ID of this widget.
- You can configure different variable names in different widgets to differentiate parameters.

4. Click the ticker board widget. On the Data tab on the right-side panel, click Modify next to Data Source and use the callback ID that you have configured in the format of `:Variable name`

e , for example, :income .

Examples:

- SQL (Use one of the following two methods.)

```
select :income as value
```

```
select A from table where count = :income
```

income is the callback ID, value is the field you specified to receive the value of the callback ID, and count and A are the fields in your database.

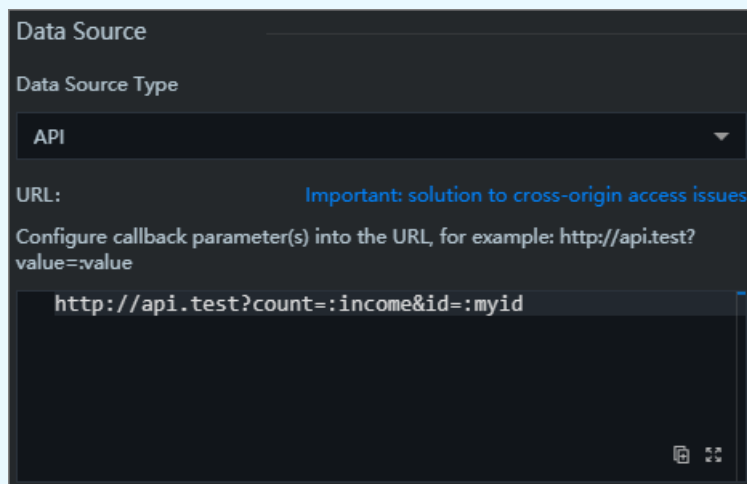
- API

```
http://api.test?count=:income&id=:myid
```

income and myid are the callback IDs, and count and id are the fields in your database.

ⓘ Note

- If the data source type of your widget is Static Data or CSV File, callback IDs are not supported.
- DataV automatically completes the callback IDs. When you configure the data source, enter : , and the editor lists callback IDs configured for the widget. You can use the up and down arrow keys to select a callback ID and then press Enter. This helps you quickly find a callback ID when there are a lot of interactive widgets in the project.



Advanced features

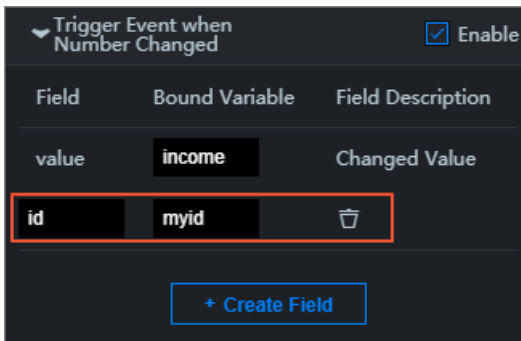
Configure a custom field

1. Click the ticker board widget, and then click the Data tab on the right-side panel.
2. Add an id field and set its value to 123.

```

1  [
2  {
3    "name": "",
4    "value": 232425
5    "id": 123
6  }
7  ]
    
```

3. Click the **Interaction** tab.
4. Click **Create Field**.
5. In the **Field** column, enter `id`. In the **Bound Variable** column, enter a variable name.



Note You must specify values in both the **Field** and **Bound Variable** columns so that the variable can take effect.

Set a default value for the callback ID

Specify a request parameter in the URL to set a default value for the callback ID. Example:

```
http://datav.aliyun.com/screen/000000?myid=123
```

000000 is the project ID.

When you access the project by using this URL, the callback ID *myid* is automatically set to 123.

Multiple callback IDs are separated with ampersands (&). The following example sets the default values for both the callback IDs *myid* and *income*:

```
http://datav.aliyun.com/screen/000000?myid=123&income=1000
```

000000 is the project ID.

FAQ

I have configured a callback ID in the project editor page. What do I do if data query fails because the system cannot obtain the callback value based on the callback ID?

This error occurs because the editor cannot trigger an event to obtain the callback value. You can view the callback value by using one of the following methods:

- Preview the project. View the callback value in the URL, or click the **Network** tab in the browser console and obtain the value in the response.
- Edit the project. Add the callback ID and value to the end of the URL:

```
https://datav.aliyun.com/admin/screen/99999?Callback ID=Callback value
```