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# **Casne CloudStream User Guide**

## **Version 1.4**

## Introduction

This user guide contains instructions for operating the **CloudStream System Control** application, the web-based interface for controlling **Casne CloudStream**.

CloudStream is a modular data pipeline for the Industrial Internet of Things (IIoT). Our customers use CloudStream's custom data connectors to bridge data between their sensors, industrial data systems, and cloud platforms.

When used as a Software as a Service (SaaS) application, our connectors enabled niche applications that no other turnkey solutions offer – such as connecting AVEVA PI historians directly to ESRI ArcGIS systems, or data concentration between AVEVA PI historians and AVEVA Data Hub. Our customers find that these applications significantly reduce the complexity and cost of their IIoT infrastructure.

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## 1. CloudStream Roles

CloudStream contains three levels of user provisioning. Each user is assigned one of the following roles and has varying access to the **CloudStream System Control**:

Role	Description	Created By
<b>System</b>	<p>The System user is only used during the initial installation and provisioning of CloudStream. Only certified CloudStream installers may access this account. Once initial installation and configuration is complete, access to this account is revoked.</p> <p>The system account is capable of creating new CloudStream nodes and removing CloudStream nodes.</p>	CloudStream Installer
<b>Admin</b>	<p>Admin users can perform all levels of CloudStream operations within the <b>CloudStream System Control</b> including:</p> <ul style="list-style-type: none"><li>• Create/Remove other users/admins</li><li>• Change the role of other users/admins</li><li>• Update the password of other users/admins</li><li>• Deploy Cloudstream to a node (Updating the node version)</li><li>• Pause/Resume operations on a Node</li><li>• Create/Delete/Edit CloudStream Sources</li><li>• Create/Delete/Edit CloudStream Destination</li><li>• Create/Delete/Edit CloudStream Services</li><li>• View Logs</li></ul>	CloudStream Installer
<b>User</b>	<p>Users can perform all basic CloudStream operations and have limited user administration capabilities within the <b>CloudStream System Control</b> including:</p> <ul style="list-style-type: none"><li>• Update password</li><li>• Pause/Resume operations on a Node</li><li>• Create/Delete/Edit CloudStream Sources</li><li>• Create/Delete/Edit CloudStream Destination</li><li>• Create/Delete/Edit CloudStream Services</li><li>• View Logs</li></ul>	CloudStream Installer

After installation, your certified installer will provide you with an initial Admin account. Depending on your installation type, you will either receive a username/password (Edge Only: typically "admin"/"admin"), or you will receive an email invite to join CloudStream Cloud.

For additional details on user creation and administration, see **2.5 User Management**.

## 2. CloudStream System Control

All user operations of CloudStream take place within the **CloudStream System Control** web application. Depending on your installation, the web application will be hosted in the cloud or locally at the edge.

### 2.1. Installation

**Note:** Installation of CloudStream must be performed by a certified installer and the type of installation is determined during licensing. Future versions of CloudStream will allow for self-performed installs.

A CloudStream installation consists of at least 1 CloudStream Controller and 1 CloudStream Node. CloudStream is a fully distributed system, comprised of a 1 controller: n node model. A Controller can control any number of Nodes. Controllers and Nodes can be installed in any combination of Edge and Cloud. Your installer will work with you to determine the optimal installation for your use case.

The following environments are supported for installation:

**Cloud:** Casne Hosted Cloud

**Edge Containerized (Docker):** Linux, Windows 10, Windows 11, Windows Server 2022

**Edge Non-Containerized:** Windows 10, Windows 11, Windows Server 2016, Windows Server 2019, Windows Server 2022.

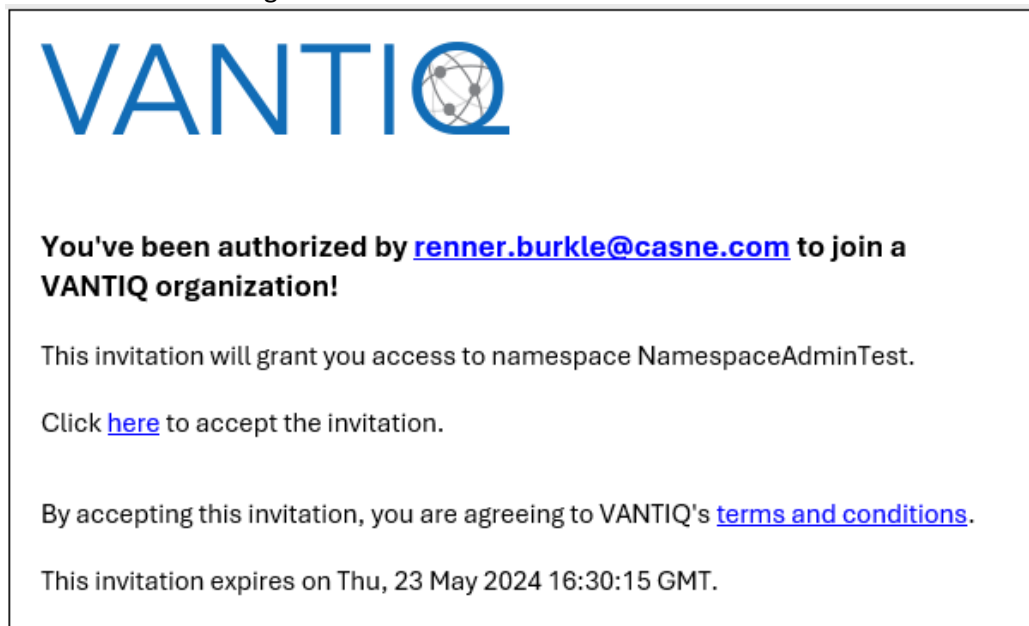
For Edge systems the minimum recommended resources are 8GB of RAM and 4CPU cores.  
*Depending on data transfer rates, additional resources may be required.*

## 2.2. System Control Access

Access to the CloudStream System Control web application is dependent on the type of installation. CloudStream System Control is bundled with every CloudStream Controller instance.

### Cloud Hosted Controllers

You will receive an email invite from [operations@vantiq.com](mailto:operations@vantiq.com) containing a link to your CloudStream cloud organization.



### Edge Hosted Controllers

Your CloudStream installer will provide you with a URL (typically localhost:8080 or [hostname]:8080) after installation, along with an initial admin account (typically "admin"/"admin"). Navigate to the URL to access CloudStream System Control.

## 2.3. Node Management

The “Nodes” page is the initial page all users are directed to upon logging in to CloudStream system control. Management of CloudStream nodes (including creating/deleting nodes, deploying/updating CloudStream versions, and updating the data services running on a node) is performed on this page. All other pages are locked until a node has been selected to manage.

The screenshot displays the CASNE CloudStream System Control interface. The top header shows the CASNE logo, the title "CloudStream System Control", and the version "Version 1.4". A left sidebar contains navigation links: Nodes, Config, Logs, System, Users, and Logout. The main content area is titled "Nodes" and includes buttons for "Create Node", "Deploy CloudStream", and "Refresh". Below these buttons is a table with the following columns: Name, Node Version, Creation Time, Deployed?, Latency (ms), Config, and Delete. The table contains one entry: "DemoNode" with Node Version "1.4", Creation Time "2024-05-22 13:07:05", Deployed? "true", Latency (ms) "2", and links for "Manage" and "Delete". At the bottom right of the table, there are "Back", "1", and "Next" buttons.

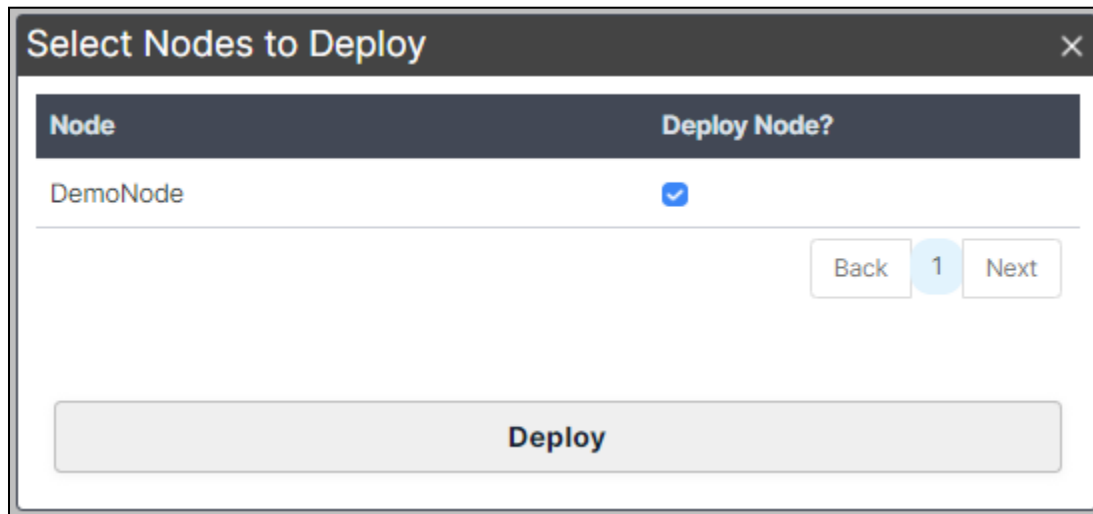
Name	Node Version	Creation Time	Deployed?	Latency (ms)	Config	Delete
DemoNode	1.4	2024-05-22 13:07:05	true	2	<a href="#">Manage</a>	<a href="#">Delete</a>

### Node Creation

Node creation activities are restricted to the System (installation) user, and all nodes are created during the installation process. New nodes are created by clicking the “Create Node” button. This button is disabled for admin and user leveled users.

### Deploy CloudStream

The “Deploy CloudStream” button is used to initially deploy CloudStream to a node, or to upgrade a node with the latest version of the CloudStream software. The CloudStream software is contained with the CloudStream Controller instance and can be remotely deployed to any connected nodes. Clicking this button opens the node deployment popup and users may select which nodes to deploy to:



The dialog box titled "Select Nodes to Deploy" contains a table with two columns: "Node" and "Deploy Node?". The table has one row with "DemoNode" and a checked checkbox. Below the table are "Back", "1", and "Next" buttons. At the bottom is a large "Deploy" button.

Node	Deploy Node?
DemoNode	<input checked="" type="checkbox"/>

Back 1 Next

Deploy

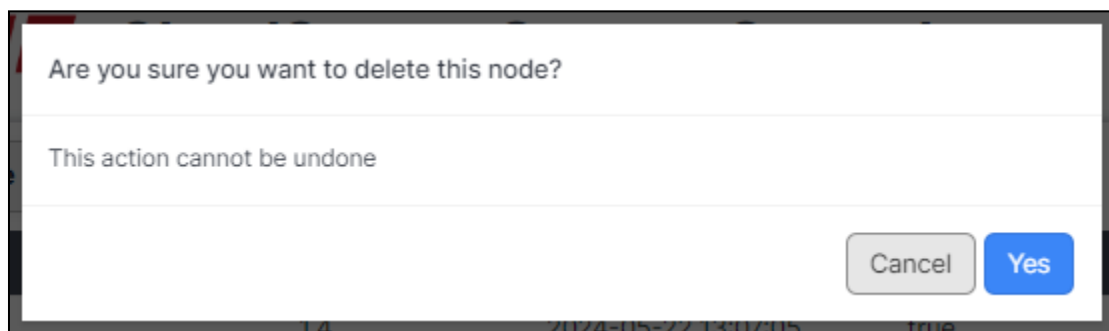
Depending upon connection speeds, deployment of the CloudStream software may take up to 10 minutes. Deployment status can be checked at any time by pressing the "Refresh" button. Once the deployment status of a node is "true", a node may be managed. The "Deploy CloudStream" button is disabled for user leveled users.

## Node Config

Clicking the "Manage" button for a node will navigate users to the Config page ([see section 2.4](#)). Once a node has been selected, Config, Logs, and System pages are unlocked.

## Node Deletion

Clicking the "Delete" button will permanently delete a node. This button is disabled for admin and user leveled users. Users are asked to confirm their selection prior to deleting a node:



The dialog box asks "Are you sure you want to delete this node?" and states "This action cannot be undone". It has "Cancel" and "Yes" buttons. At the bottom, there is a status bar showing "14", "2024-05-22 13:07:05", and "true".

Are you sure you want to delete this node?

This action cannot be undone

Cancel Yes

14 2024-05-22 13:07:05 true



## 2.4. Node Configuration (“Config”)

All node configuration activities take place within the Config page. From this page, users can create [Data Sources](#), [Data Destinations](#), and [CloudStream Services](#).

The modular building blocks of data operations in CloudStream are Data Sources, Data Destinations, and CloudStream service. Once sources and destinations have been defined, data is routed between them via CloudStream services.

**CASNE CloudStream System Control DemoNode**

**Data Sources** [New Source](#)

Name	Type	Rate (sec)	Data Format	Status
PIServer-Casne	PI Web API	10	JSON Array	Active

[Back](#) [1](#) [Next](#)

**Data Destinations** [New Destination](#)

Name	Type	Data Format	Status
GeoEvent-Casne	GeoEvent	JSON Array	Active

[Back](#) [1](#) [Next](#)

**CloudStream Services** [New Service](#) [Columns](#)

Name	Source	Destination	Status	Trend
PI->ESRI	PIServer-Casne	GeoEvent-Casne	Active	

[Back](#) [1](#) [Next](#)

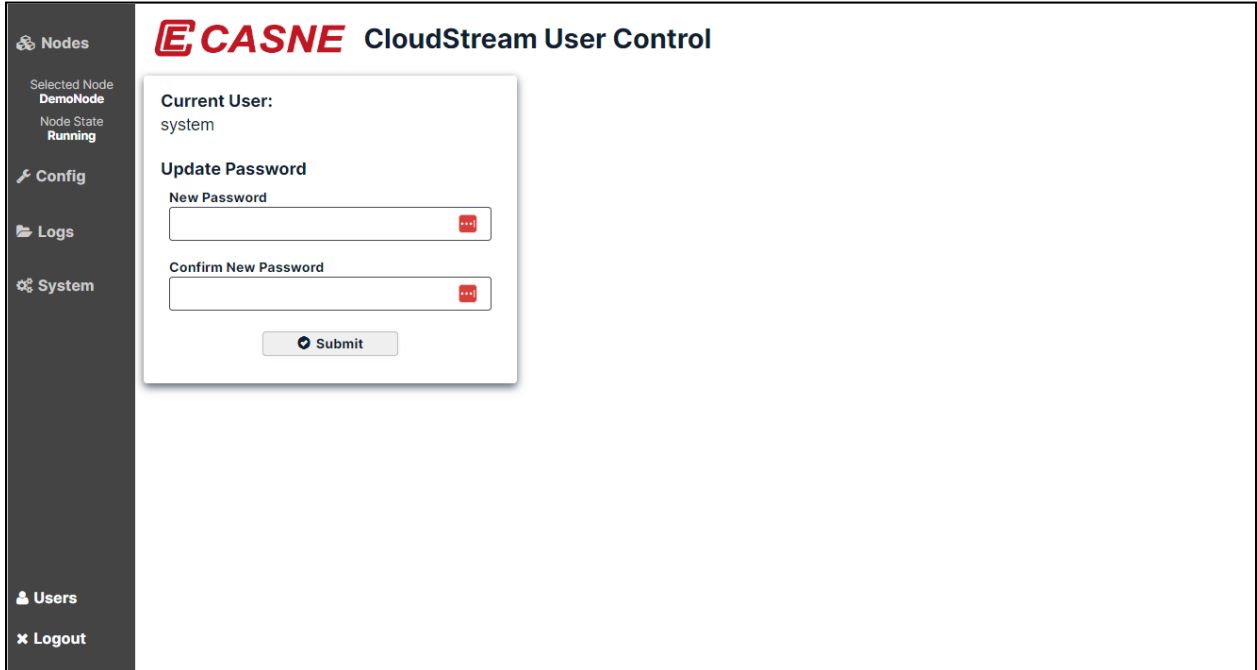
**Event Counts** [Chart Type](#) [Live Data](#)

**No Data Displayed**  
Select a service on the left to display on the graph.

## 2.5. User Management (“Users”)

**Note:** Future versions of CloudStream will allow admin users to onboard additional users. To add additional users in CloudStream v1.4, please contact your CloudStream installer.

Users may change their password at any time by clicking on the Users page.



The screenshot displays the CASNE CloudStream User Control web interface. On the left is a dark sidebar with navigation links: Nodes, Config, Logs, System, Users, and Logout. The main content area has the title 'CASNE CloudStream User Control'. A modal form is centered, showing 'Current User: system' and an 'Update Password' section with two password input fields and a 'Submit' button.

**CASNE CloudStream User Control**

**Current User:**  
system

**Update Password**

New Password

Confirm New Password

## 2.6. CloudStream System Control (“System”)

The System page contains CloudStream controls for the selected node. This includes starting/stopping the CloudStream clock or resetting CloudStream’s internal memory.

The screenshot shows the CASNE CloudStream System Control interface for a node named 'DemoNode'. The interface has a dark sidebar on the left with navigation links: Nodes, Config, Logs, System (selected), Users, and Logout. The main content area is titled 'CASNE CloudStream System Control' and 'DemoNode'. It features three buttons: 'Start Clock' (Resume Services), 'Stop Clock' (Pause All Services), and 'Reset Memory' (Clear Internal Memory). Below these buttons is a table showing the clock status.

Clock Active	Last Modified
true	2024-07-11 15:58:41

### Start Clock

Many operations within CloudStream are clock driven, such as polling from Data Sources. These operations will be paused when the Clock is stopped. However, some data sources (for example: MQTT), push data directly to CloudStream and are unaffected by the system clock status. The clock starts in a stopped state for new CloudStream nodes and must be started here prior to node operation. The clock status is also displayed as the “Node State” in the navigation bar once a node has been selected.

### Stop Clock

Clicking this button will stop the CloudStream clock, which will pause any CloudStream services that utilize the system clock.

### Reset Memory

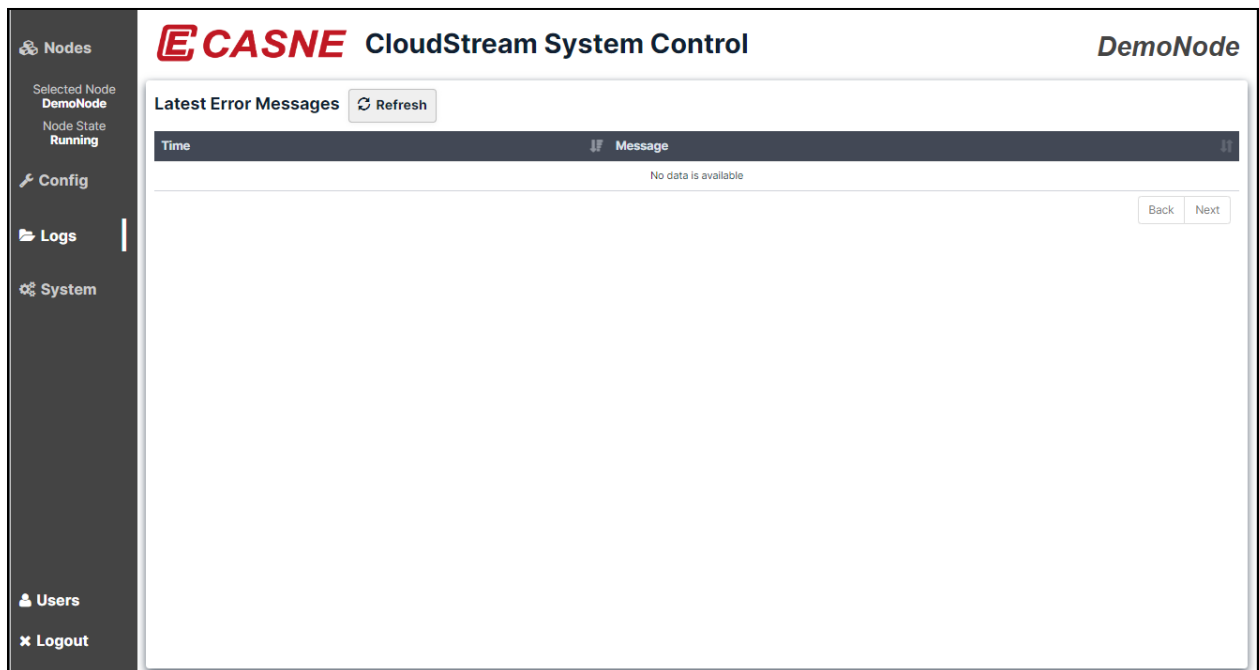
Clicking this button will reset the internal memory utilized by CloudStream. CloudStream caches certain data (such as PI Web API WebIds and schemas for AF Elements) in order to optimize latency and remote data calls. Resetting the internal memory will force CloudStream to re-cache this data, and may be used to immediately pick up changes made against external data systems.

## 2.7. Logging (“Logs”)

The Logs page contains all error messages generated during CloudStream node operation. These may include errors from accessing source systems, destination systems, or internal CloudStream errors.

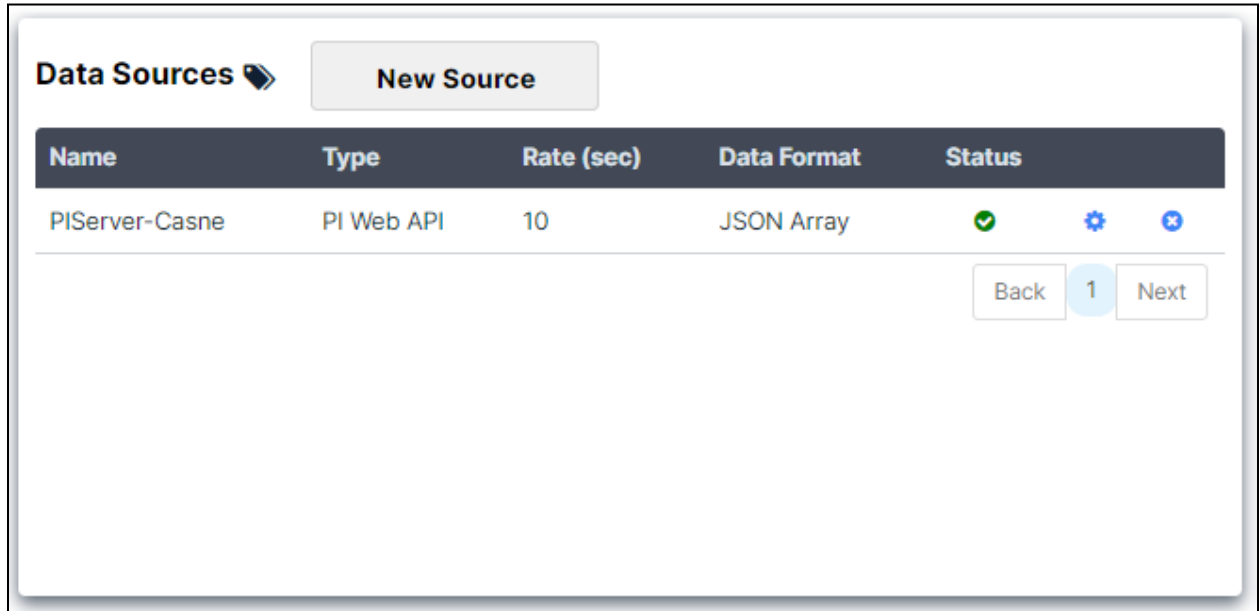
The logs refresh automatically upon loading the page and may be refreshed at any time by pressing the “Refresh” button.

**Note:** A maximum of 1,000 log messages are kept at any given time. Logs do not have an expiration date.

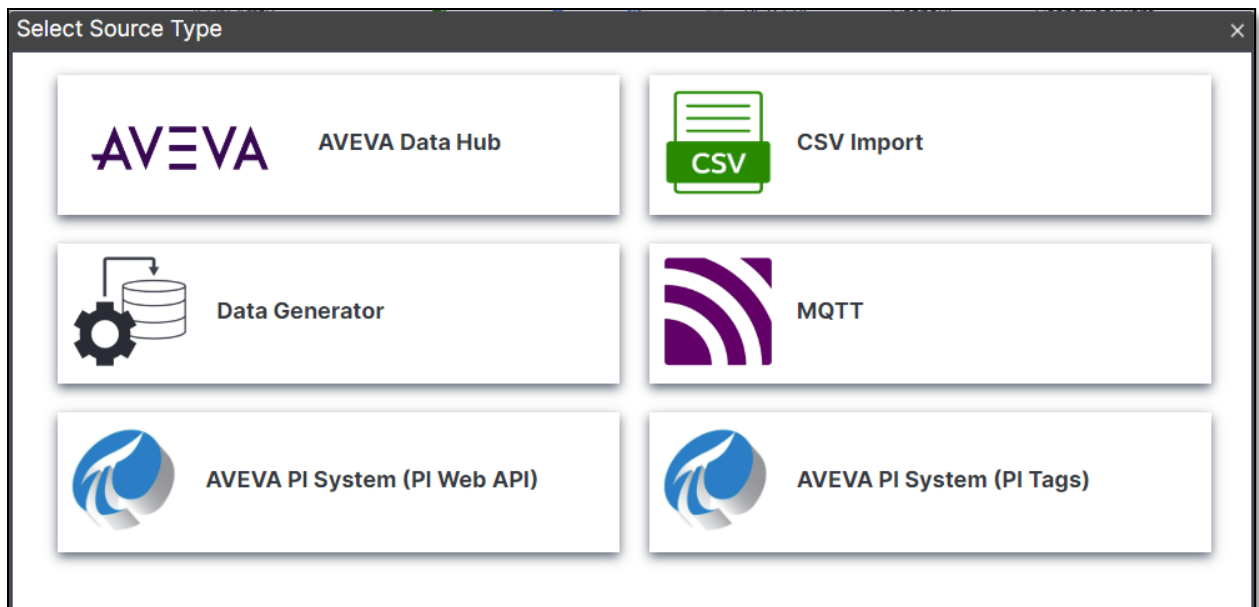


### 3. CloudStream Source Creation

To create a new CloudStream source, click on the **“New Source”** button from the Config page. Existing sources may be edited by pressing the gear button. Sources may be deleted by pressing the delete button (Note: a Source cannot be deleted if it is part of a Service).



This will open the Source Selection pop-up:



Click on any source to open up the corresponding Source Configuration window.

## 3.1. AVEVA Data Hub

The AVEVA Data Hub Source polls data from AVEVA Data Hub SDS Streams.

**Tab 1: Connection Info**

The screenshot shows a window titled "Configure New Data Source" with a close button (X) in the top right corner. The window has two tabs: "Connection Info" (selected) and "Data Preview".

**Connection Info Tab:**

- A grey instruction bar at the top says: "Enter Name, Connection Info & Validate to Continue."
- CloudStream Data Source Name:** A text input field containing "Ex: AVEVA Data Hub 1" with a red "x" icon and a "Show" icon on the right.
- Client ID:** A text input field with the placeholder text "Please enter your AVEVA Data Hub Client ID" and a "Show" icon on the right.
- Client Secret:** A text input field with the placeholder text "Please enter your AVEVA Data Hub Client Secret" with a red "x" icon and a "Show" icon on the right.
- Select Region:** A dropdown menu with the text "Select Region" and a downward arrow.
- A "Validate Connection" button at the bottom left.

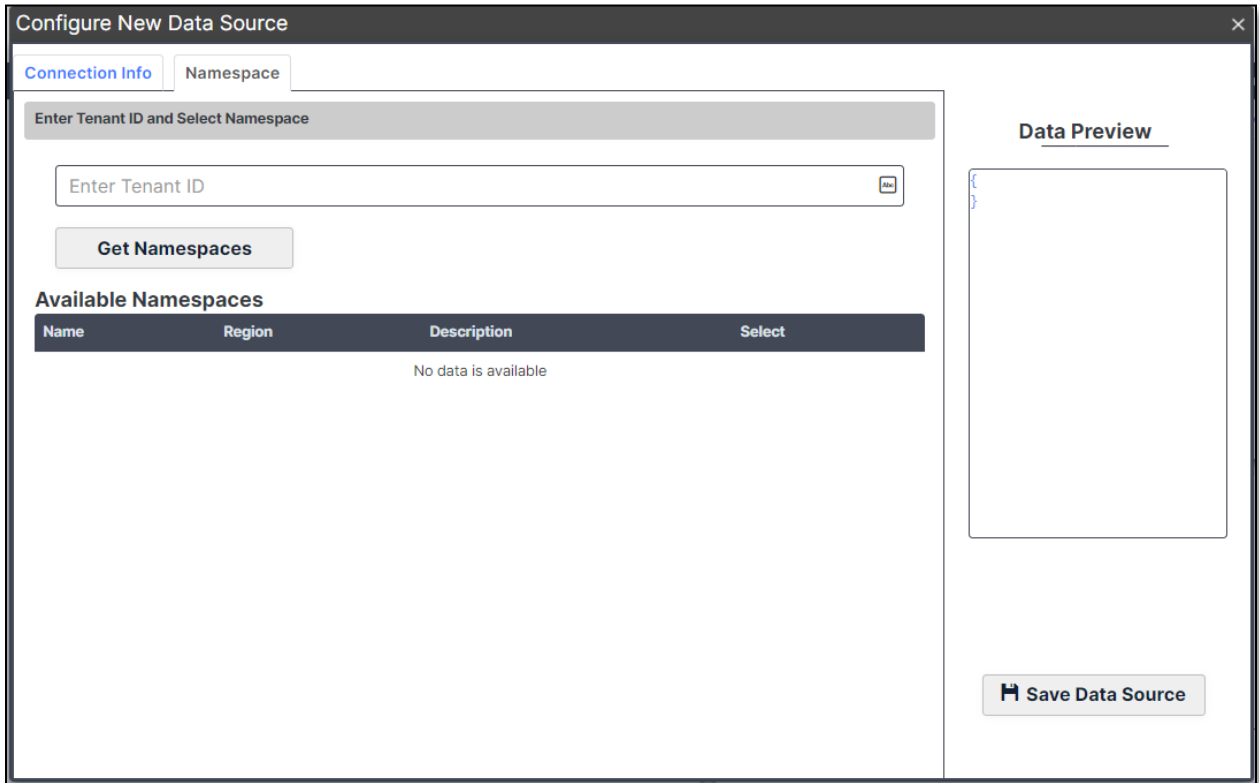
**Data Preview Tab:**

- A large empty box with a curly brace "{" at the top left, intended for data preview.
- A "Save Data Source" button at the bottom right.

### Instructions for this tab:

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter your AVEVA Data Hub **Client ID** and **Client Secret**.
3. Select your Data Hub Region (Currently supported: **US-West**)
4. Click "Validate Connection".
  - a. If successful, you will automatically move to the next configuration step ("**Namespace**" Tab).
  - b. In unsuccessful, you will be given an error message. Please correct the **Client ID**, **Client Secret**, or **Region**.
  - c. A Data Source may be saved at any time once Validation is complete.

## Tab 2: Namespace



Configure New Data Source

Connection Info Namespace

Enter Tenant ID and Select Namespace

Enter Tenant ID

Get Namespaces

Available Namespaces

Name	Region	Description	Select
No data is available			

Data Preview

{ }

Save Data Source

### Instructions for this tab:

1. Enter your Tenant ID and click **“Get Namespaces”**.
2. Select the Namespace containing the Streams you want to poll data from.
  - a. Only 1 Namespace can be selected per CloudStream AVEVA Data Hub Source
  - b. Once you select a **Namespace** you will automatically navigate to the **“Streams”** tab.

## Tab 3: Streams

Configure New Data Source

Connection Info

Namespace

Streams

Select Streams to Query

CloudStream will poll from all selected streams based on the chosen Rate:

Data Re-Check Rate (seconds):  
10

Available Streams

Name	Typeld	Select
Test1	TEST	▶

Selected Streams

Name	Typeld	Remove
No data is available		

Data Preview

{  
}

Save Data Source

### Instructions for this tab:

1. Enter your desired **Data Re-Check Rate**.
  - a. The minimum re-check rate is 1 second.
  - b. This is the rate at which CloudStream checks for new data.
  - c. For data that updates faster than your re-check rate, CloudStream will receive all updated values since the last check. No data is lost for faster updating data streams.
2. Select Streams you want to poll data from by pressing the button under the “**Select**” tab.
  - a. You may select multiple streams, but they must have the same **Typeld**.
  - b. An error will be generated if Streams with different **Typelds** are selected.
  - c. Upon selecting a Stream, the Data Preview will automatically update with the selected **Typeld**.
3. You may de-select a stream by pressing the button under the “**Remove**” column.
4. Once at least one Stream is selected, you may move to the “**Transforms**” tab.



**Tab 4: Transforms**

**Configure New Data Source**

Connection Info | Namespace | Streams | **Transforms**

(Optional) Alter the outgoing Data Object from AVEVA Data Hub  
Preview and confirm the outgoing Data Object before saving.

**Add or Remove Properties from the Data Object**

You may add additional properties with static values, or remove properties.

{"timestamp":16," } Click to expand

**Override Property Names**

Enter overrides in the form of:  
{"[Original Property]": "[New Name]"}  
For example: {"Value": "Pressure01"}

You can dynamically assign the name of the Stream to a property using @StreamName. For example: {"Value": "@StreamName"}

{"Value":"Value"} Click to expand

**Data Preview**

```
{
  timestamp: 16,
  value: 14
}
```

**Instructions for this tab:**

1. (Optional) Add or Remove Properties from the Data Object:
  - a. Click on the object symbol { } to open the object editor.
  - b. Unwanted properties can be deleted. CloudStream will not send deleted properties.
  - c. Additional, static properties can be added. Enter a new property name and the static value for that property.
2. (Optional) Override Property Names
  - a. Click on the object symbol { } to open the object editor.
  - b. Override property names by entering the old property name on the left, and the new property name on the right.
    - i. For example, "timestamp":"Time" will rename the "timestamp" property to "Time" in the outgoing data message.
    - ii. Entering the value of "@StreamName" on the right will dynamically rename the property to the name of the SDS stream from AVEVA Data Hub.
      1. This is useful when polling data from multiple streams from the same CloudStream Source.
      2. Note: If the SDS Stream Name is not a valid JSON property name, this transform will fail.
3. When complete, **Save** the Data Source and exit the configuration pop-up.

## 3.2. CSV

The CSV Source reads and sends data from an uploaded CSV file.

Note: CSV Source sends data all at once.

**Tab 1: CSV Upload**

Configure New Data Source

CSV Upload

Upload CSV & Validate Data Preview.  
For best results, do not exceed 10,000 records per CSV.

CloudStream Data Source Name

Ex: CSV Data

Upload CSV

Uploaded Document Name

Data Preview

Save Data Source

### Instructions for this tab:

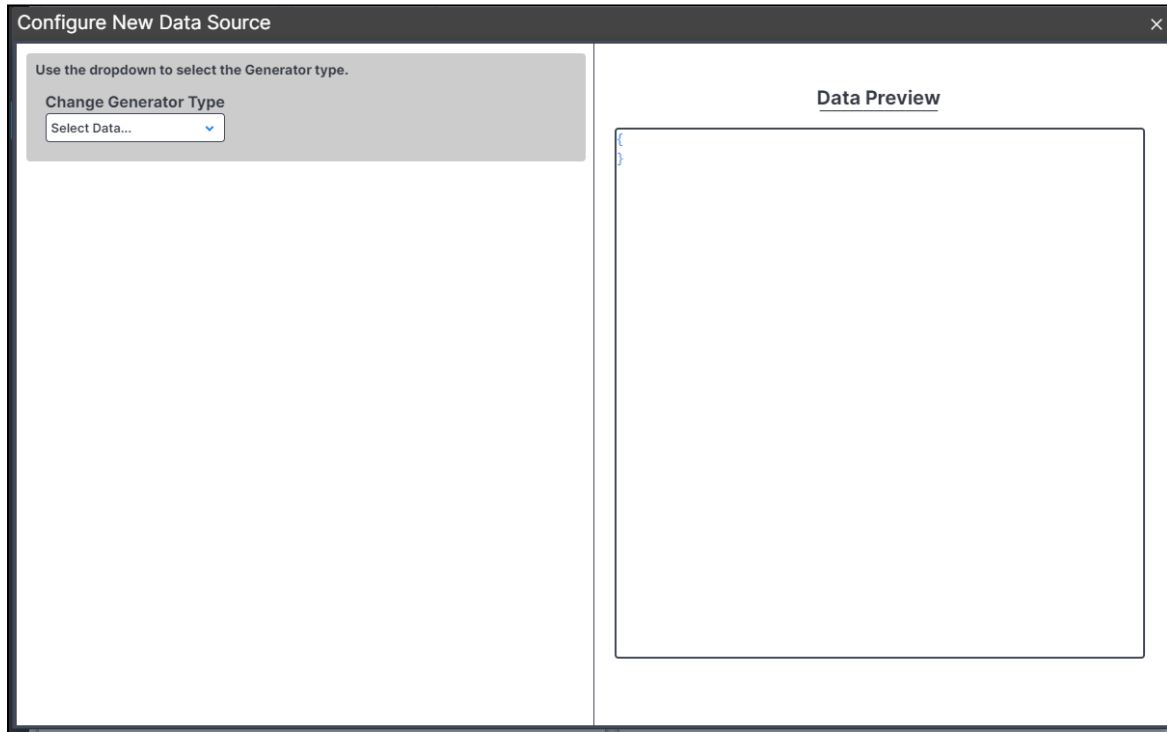
1. Enter a name for the CloudStream Data Source into the top input box.
2. Click "Upload CSV"
  - a. Select a CSV file that you would like to make as a data source
  - b. If successful, you will be given a message "File has been uploaded to document 'XXXX'"
  - c. If unsuccessful, you will be given an error message.

Note: Users will see a preview of the Data in the Data Preview section

3. When complete, **Save** the Data Source and exit the configuration pop-up.

### 3.3. Data Generator

The Data Generator Source simulates data using a variety of methods, including CSV playback, Sinusoid, Random and Totalizer algorithms.



#### Instructions for this Data Source:

1. Select a **Generator Type** from the dropdown, then enter configuration items for the selected algorithm.

## Generator Type: CSV File

The CSV File generator continuously plays back data from an uploaded CSV file. When the final record from the CSV is sent, playback restarts from the first record.

The screenshot shows a 'Configure New Data Source' window. On the left, there's a section for 'Upload CSV & Validate Data Preview' with instructions: 'For best results, do not exceed 10,000 records per CSV. Use the dropdown to change Generator type.' Below this is a 'Change Generator Type' dropdown menu set to 'CSV File'. Further down are input fields for 'Data Source Name' (with example 'Ex: CSV Data') and 'Data Playback Rate (Sec)' (with example 'Ex: 30'). At the bottom left are 'Upload CSV' and 'Save Data Source' buttons. To the right of the 'Upload CSV' button is an 'Uploaded Document Name' input field. On the right side of the dialog is a 'Data Preview' section with a large empty box for displaying data.

### Instructions for this Data Source:

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter the speed at which data is replayed "Data Playback Rate". A single record will be sent from the CSV every time the interval has been met.
3. Click "Upload CSV"
  - a. Select a CSV file using the file browser popup.
  - b. If successful, users will receive the message "File has been uploaded to document 'XXXX'"
  - c. If unsuccessful, users will be given an error message.

Note: After uploading the file users will see a preview of the Data in the Data Preview section

When complete, **Save** the Data Source and exit the configuration pop-up.

## Generator Type: **Sinusoid**

The sinusoid generator generates data using the following sinusoid algorithm:

```
value = Amplitude*(Math.sin(((Rate*i)*2*Math.PI()/Period)))
```

Where:

**Amplitude:** The maximum value for the sine function

**Rate:** The rate in which data is generated

**Period:** The duration of time for 1 complete sine wave.

**i:** A counter for the instance in which rate has been met. Starts at 0 and increments by 1 each time data is generated and resets when (rate \* i) exceeds the period.

Every message is sent in the format of:

```
{
  "value": [generated value],
  "timestamp": [timestamp with time zone (UTC) when CloudStream generated the event]
}
```

**Configure New Data Source**

Choose Amplitude, Period, & Rate  
Use the dropdown to change Generator type.

**Change Generator Type**  
Sinusoid

**Data Source Name**  
mySin

**Amplitude**  
100

**Period (seconds)**  
120

**Rate (seconds)**  
10

**Save Data Source**

**Data Preview**

```
{
  0: {
    Timestamp: 1,
    Value: 0
  },
  1: {
    Timestamp: 2,
    Value: 50
  },
  2: {
    Timestamp: 3,
    Value: 86.6025
  },
  3: {
    Timestamp: 4,
    Value: 100
  },
  4: {
    Timestamp: 5,
    Value: 86.6025
  },
  5: {
    Timestamp: 6,
    Value: 50
  },
  6: {
    Timestamp: 7,
    Value: 0
  }
}
```

### Instructions for this Data Source:

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter a number for the **Amplitude** into the input box.
3. Enter a number for the **Period** into the input box.
4. Enter a number for the **Rate** into the input box.
5. When complete, Save the Data Source and exit the configuration pop-up.

## Generator Type: **Random**

The Random generator generates data using the following algorithm:

```
value = Math.random(LowerBound, UpperBound)
```

Where:

**UpperBound**: The maximum value for the random function

**LowerBound**: The minimum value for the random function

Every message is sent in the format of:

```
{
  "value": [generated value],
  "timestamp": [timestamp with time zone (UTC) when CloudStream generated the event]
}
```

The screenshot shows a 'Configure New Data Source' window. On the left, under 'Choose Upper and Lower Bounds & Rate', there is a 'Change Generator Type' dropdown set to 'Random'. Below this, the 'Data Source Name' field contains 'myRandom'. Further down, 'Upper Bound' is set to 100, 'Lower Bound' is set to 100, and 'Rate (seconds)' is set to 10. A 'Save Data Source' button is at the bottom left. On the right, the 'Data Preview' section shows a JSON array of seven objects, each with a 'Timestamp' and a 'Value' of 100, indexed from 0 to 6.

### Instructions for this Data Source:

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter a number for the **Upper Bound** into the input box.
3. Enter a number for the **Lower Bound** into the input box.
4. Enter a number for the **Rate** into the input box. (A message will be sent every X seconds, where X is the Rate).
5. When complete, Save the Data Source and exit the configuration pop-up.

## Generator Type: **Totalizer**

The Totalizer generator generates data using the following sinusoid algorithm:

```
value = Peak*[i*(rate/frequency) - math.floor(i*(rate/period))]
```

Where:

**Peak:** The maximum value for the totalizer

**Rate:** The rate (seconds) in which data is generated

**Frequency:** The frequency (seconds) in which the totalizer resets

**i:** A counter for the instance in which rate has been met. Starts at 0 and increments by 1 each time data is generated and resets when (rate \* i) exceeds the frequency.

Every message is sent in the format of:

```
{
  "value": [generated value],
  "timestamp": [timestamp with time zone (UTC) when CloudStream generated the event]
}
```

Note that whenever the totalizer resets, 2 data points are set with an offset of 1ms: the final point (value = peak), and the reset point (value = 0).

The screenshot shows a 'Configure New Data Source' window. On the left, under 'Choose Peak, Frequency & Rate', there is a 'Change Generator Type' dropdown set to 'Totalizer'. Below this is a 'Data Source Name' input field containing 'myTotalizer'. Further down are input fields for 'Peak' (100), 'Frequency (seconds)' (120), and 'Rate (seconds)' (10). A 'Save Data Source' button is at the bottom left. On the right, the 'Data Preview' section shows a JSON array of data points. The array contains 7 elements, each with a 'Timestamp' and a 'Value'. The values are 0, 8.3333, 16.6667, 25, 33.3333, 41.6667, and 50, representing a linear increase over time.

Index	Timestamp	Value
0	1	0
1	2	8.3333
2	3	16.6667
3	4	25
4	5	33.3333
5	6	41.6667
6	7	50

### Instructions for this Data Source:

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter a number for the **Peak** into the input box.
3. Enter a number for the **Frequency** into the input box.

4. Enter a number for the **Rate** into the input box.
5. When complete, Save the Data Source and exit the configuration pop-up.



## 3.4. MQTT

The MQTT source subscribes to MQTT topics and receives incoming data into CloudStream. This source does not utilize the CloudStream clock, and messages are received in real time as they are sent to the broker.

**Tab 1: Connection Info**

Configure New Data Source

Connection Info

Enter Name, Connection Info & Validate to Continue.

CloudStream Data Source Name

Ex: MQTT Local 1

MQTT Broker: Server Name

Ex: localhost, mqtt.dev

MQTT Broker: Port

Ex: 1883

MQTT Broker: Security

☒ Unencrypted (tcp)

☐ Encrypted (tcps)

Data Preview

Not Available

### Instructions for this tab (Part 1):

1. Enter the name for the CloudStream Data Source into the top input box.
2. Enter the server name and port for the MQTT broker.
3. Choose encryption mode for the broker (TCP or TCPS)

Basic Auth Username (Optional)

username

Basic Auth Password (Optional)

MQTT Topics

Add Topic:

+ Subscribe

Topic

No data is available

Back Next

Validate Connection

Save Data Source

### Instructions for this tab (Part 2):

4. Enter your **Basic Auth** username and password (Optional – for brokers that support basic auth only).
5. Any number of topics may be subscribed to. To subscribe to a new topic, enter the name of the topic in the field above the data table and press the **Subscribe** button.
6. When complete, press **Validate Connection**. If the connection info is correct, you will now be able to get access to the Transforms Tab.

**Tab 2: Transforms**

Configure New Data Source

Connection Info Transforms

(Optional) Alter the outgoing Data Object from the PI Web API  
Preview and confirm the outgoing Data Object before saving.

Override Property Names

Enter overrides in the form of:  
{"[Original Property]" : "[New Name]}"  
For example: {"Value" : "Pressure01"}

Reset {"Value":"Value"} { } Click to expand

Data Preview

Not Available

Save Data Source

**Instructions for this tab:**

1. (Optional) Override Property Names
  - a. Click on the object symbol { } to open the object editor.
  - b. Override property names by entering the old property name on the left, and the new property name on the right.
    - i. For example, "timestamp":"Time" will rename the "timestamp" property to "Time" in the outgoing data message.
2. When complete, Save the Data Source and exit the configuration pop-up.

## 3.5. AVEVA PI Web API (Attributes & Elements)

The AVEVA PI Web API data source subscribes to data from individual PI Asset Framework attributes or PI Asset Framework elements (via Asset Framework templates) via the PI Web API.

**Tab 1: Connection Info**

Configure New Data Source

Connection Info

Enter Name, Connection Info & Validate to Continue.

**Data Source Name**

Ex: PI Server 1

**PI Web API URL**

Please enter in the form https://PISERVER.DOMAIN/piwebapi

**Basic Auth Username**

username

**Basic Auth Password**

password

Validate Connection

**Data Preview**

Save Data Source

**Instructions for this tab:**

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter the **PI Web API URL**.
3. Enter your **Basic Auth** username and password.
4. When complete, press **Validate Connection**. If the connection info is correct, you will now be able to get access to the *AF Server & Database* tab.

Tab 2: AF Server & Database

**Configure New Data Source**

**Connection Info** | **AF Server & Database**

Select Data Acquisition Mode, AF Server and Database  
A maximum of 1 Server and 1 Database may be selected per PI Web API data source.

**Data Acquisition Mode:**  
☒ Attributes ☐ Templates

**AF Server**

Name	Connected	Select
BRANDLP101	false	<input type="checkbox"/>

**Asset Database**

Name	Path	Select
No data is available		

**Data Preview**

```
{  
  Message: "Move to Transforms t  
}
```

**Save Data Source**

**Instructions for this tab:**

1. Select a Data Acquisition Mode
  - a. **Attributes:** Users can choose individual attributes and create data subscriptions.
  - b. **Template:** Users can choose Asset Framework templates and sync data from every Element using the template
2. Select the desired **AF Server** by clicking on the check box on the right side of the table under the Select column. All Asset Databases in the selected Server will be populated into the Asset Database table.
3. Select the desired **Asset Database** by clicking on the check box on the right side of the table under the Select column. You will now be able to get access to the Choose Attributes Tab or Templates tab.

**Tab 3a: Choose Attributes**

The screenshot shows the 'Configure New Data Source' dialog with the 'Choose Attributes' tab selected. The dialog has four tabs: 'Connection Info', 'AF Server & Database', 'Choose Attributes', and 'Transforms'. A grey box at the top left contains the text: 'Subscribe to Value Changes for AF Attributes. By default, a unique data subscription is created for each selected Attribute, even if they are in the same Element. Combine data from multiple Attributes within the same Element using "Reference Attributes" in the Transforms tab.'

The 'Choose Attributes' tab is divided into two main sections. On the left is the 'Asset Framework Hierarchy' with a tree view showing 'Elements' and 'Buildings'. On the right is the 'Select Attributes' section, which includes a 'Data Re-Check Rate (seconds):' input field with the value '10'. Below this are two tabs: 'Current Attributes' and 'Selected Attributes'. The 'Current Attributes' tab is active, showing a table with columns 'Attribute' and 'Element'. The table is currently empty, displaying 'No data is available'. On the right side of the dialog is a 'Data Preview' section showing a JSON message: '{ Message: "Move to Transforms t... }'. At the bottom right is a 'Save Data Source' button.

**Note:** Users can navigate to this tab only if "Attribute" mode was selected.

**Instructions for this tab:**

1. Select an Asset by clicking on the Asset name in the Asset Framework Hierarchy section.
  - a. After selecting an asset, the Current Attributes table will get populated, if the Asset contains any attributes.
2. Subscribe to the desired Attributes by pressing the blue arrow on the right side of the table in the Current Attributes table.
  - a. You will be able to see the selected attributes in the Selected Attributes table.
  - b. You unselect the attributes by pressing the blue arrow on the right side of the table in the Selected Attributes table.
  - c. You may select multiple attributes and each will be sent as individual messages.
3. Enter a rate for the Data Re-Check Rate into the input box.
  - a. This is the rate at which CloudStream will check for new data from the data subscription to the selected attributes. Note that data updating faster than the re-check rate will still be captured by CloudStream. All changes to the subscribed attributes will be captured regardless of the re-check rate.

## Tab 3b: Choose Templates

**Edit Data Source**

Connection Info AF Server & Database **Choose Template** Transforms

**Subscribe to Data from Elements using an AF Template**  
Data from each individual AF Element using the selected Template will be polled based on the chosen Rate.  
CloudStream will send an update if the value for any Attribute in an Element has updated since the previous poll.

**Data Re-Check Rate (seconds):**  
10

**Available Templates** Refresh Templates

Template	Database
RemoteAssets	CloudStream Demos >
RemoteAssets-Test	CloudStream Demos >

**Selected Template**

Template	Database
RemoteAssets	CloudStream Demos

**Data Preview**

```
{
  Name: "default",
  Humidity: "default",
  Lat: "default",
  Lon: "default",
  Pressure: "default",
  Level: "default",
  timestamp: "default",
  Temperature: "[Renamed from Temperature]"
}
```

Save Data Source

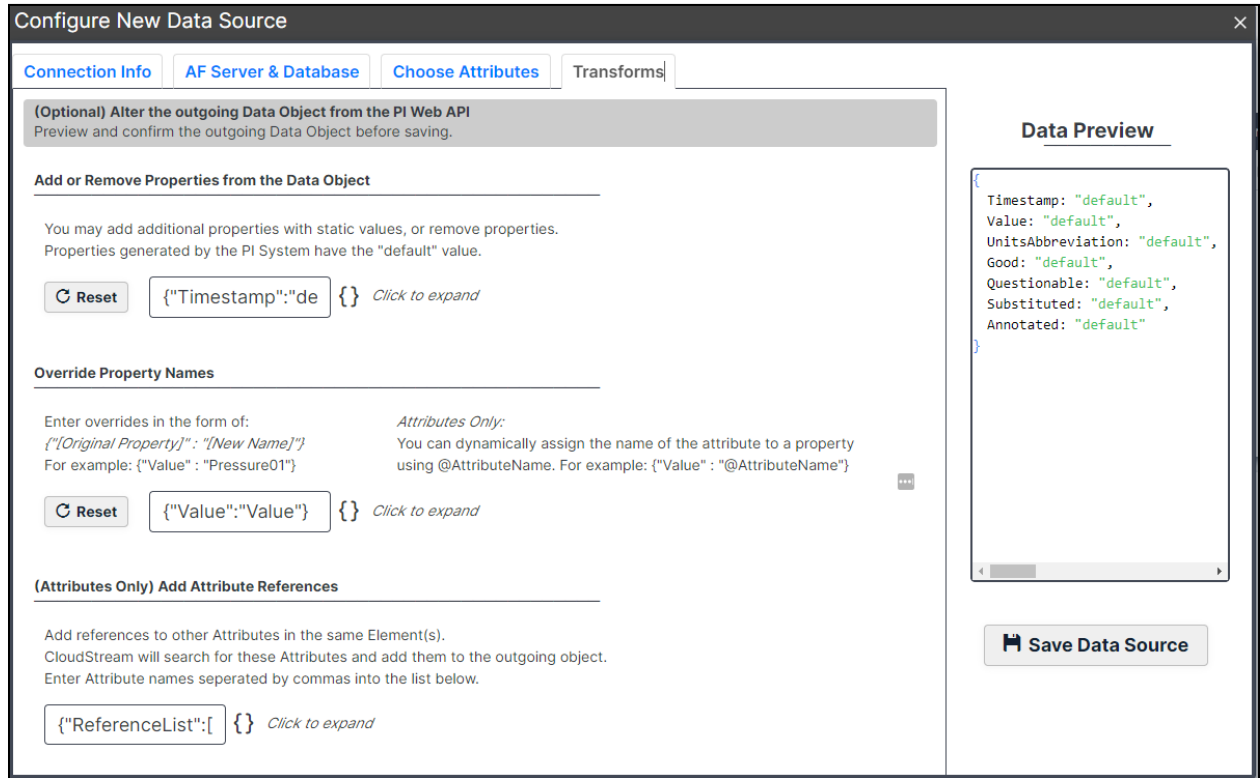
**Note:** Users can navigate to this tab only if “Element” mode was selected.

### Instructions for this tab:

1. Select a Template from the Available Templates table.
  - a. You may only select 1 Template at a time.
2. Enter a rate for the Data Re-Check Rate into the input box.
  - a. This is the rate at which CloudStream will check for new data from each element using the selected Template. When the rate is met, CloudStream will collect data from all attributes within each element and compare the values and timestamps to any previously collected data. If a single timestamp or attribute value within the Element has changed since the last time CloudStream polled for data, a new message will be sent.

## Tab 4: Transforms

The transforms tab is used to modify the outgoing data messages captured by CloudStream. The Data Preview viewer is updated automatically upon navigating to this tab.



**Configure New Data Source**

Connection Info | AF Server & Database | Choose Attributes | **Transforms**

(Optional) Alter the outgoing Data Object from the PI Web API  
Preview and confirm the outgoing Data Object before saving.

**Add or Remove Properties from the Data Object**

You may add additional properties with static values, or remove properties. Properties generated by the PI System have the "default" value.

{"Timestamp":"de"}

**Override Property Names**

Enter overrides in the form of: *Attributes Only:*  
{"Original Property"}: {"New Name"}  
For example: {"Value": "Pressure01"}  
You can dynamically assign the name of the attribute to a property using @AttributeName. For example: {"Value": "@AttributeName"}

{"Value":"Value"}

**(Attributes Only) Add Attribute References**

Add references to other Attributes in the same Element(s).  
CloudStream will search for these Attributes and add them to the outgoing object.  
Enter Attribute names separated by commas into the list below.

{"ReferenceList":[]}

**Data Preview**

```
{
  Timestamp: "default",
  Value: "default",
  UnitsAbbreviation: "default",
  Good: "default",
  Questionable: "default",
  Substituted: "default",
  Annotated: "default"
}
```

### Instructions for this tab:

1. **(Optional) Add or Remove Properties from the Data Object:**
  - a. Click on the object symbol { } to open the object editor.
  - b. Unwanted properties can be deleted. CloudStream will not send deleted properties.
  - c. Additional, static properties can be added. Enter a new property name and the static value for that property.
2. **(Optional) Override Property Names**
  - a. Click on the object symbol { } to open the object editor.
  - b. Override property names by entering the old property name on the left, and the new property name on the right.
    - i. For example, "timestamp":"Time" will rename the "timestamp" property to "Time" in the outgoing data message.
    - ii. Entering the value of "@AttributeName" on the right will dynamically rename the property "Value" to the name of the attribute from PI.
3. **(Optional) Add Attribute References**
  - a. Click on the object symbol { } to open the object editor.
  - b. Add references to other Attributes in the same Element.

- i. Whenever a change of value is received for the subscribed Attribute, CloudStream will search for the value of the reference attribute at the same timestamp as the updated Attribute value, within the same Element of the subscribed Attribute.
- ii. You may enter multiple reference attributes for a single subscribed Attribute.
- iii. If the reference is not found within the AF Element, the reference will be ignored.

When complete, **Save** the Data Source and exit the configuration pop-up.



## 3.6. AVEVA PI Web API (Tags)

The AVEVA PI Web API (Tags) data source subscribes to data updates from PI Tags.

**Tab 1: Connection Info**

**Configure New Data Source**

**Connection Info**

Enter Name, Connection Info & Validate to Continue.

**Data Source Name**

Ex: PI Server 1

**PI Web API URL**

Please enter in the form https://PISERVER.DOMAIN/piwebapi

**Basic Auth Username**

username

**Basic Auth Password**

password

**Validate Connection**

**Data Preview**

```
{
  Timestamp: "default",
  Value: "default",
  UnitsAbbreviation: "default",
  Good: "default",
  Questionable: "default",
  Substituted: "default",
  Annotated: "default"
}
```

**Save Data Source**

### Instructions for this tab:

1. Enter a name for the CloudStream Data Source into the top input box.
2. Enter the **PI Web API URL**.
3. Enter your **Basic Auth** username and password.
4. When complete, press **Validate Connection**. If the connection info is correct, you will now be able to access the *Data Server* tab.

Tab 2: Data Server

Configure New Data Source

Connection Info

Data Server

Select Data Acquisition Mode, AF Server and Database

A maximum of 1 Server and 1 Database may be selected per PI Web API data source.

Subscribe to Data

Data from each individual Tag will be polled based on the chosen Rate.  
CloudStream will send an update if the value for any Tag has updated since the previous poll.

Data Re-Check Rate (seconds):

10

AF Server

Name	IsConnected	
BRANDLPI01	false	▶
ESD-PIserver-01	false	▶

Data Preview

```
{
  Timestamp: "default",
  Value: "default",
  UnitsAbbreviation: "default",
  Good: "default",
  Questionable: "default",
  Substituted: "default",
  Annotated: "default"
}
```

Save Data Source

Instructions for this tab:

1. Enter a rate for the **Data Re-Check Rate** into the input box.
  - a. This is the rate at which CloudStream will check for new data from the data subscription to the selected tags. Note that data updating faster than the re-check rate will still be captured by CloudStream. All changes to the subscribed tags will be captured regardless of the re-check rate.
2. Select the desired PI Data Archive by pressing the blue arrow on the right side of the table. You will be moved to the next tab (Tags tab).

## Tab 3: Tags

Configure New Data Source

Connection Info

Data Server

Tags

Select PI Tags to Poll

Enter a valid filter below to see a list of tags by name.

tag

Find Tags

Results

Add all

Name	Description
composition.DynamicTag_ThatDied	
composition.StaticTag	
fast_tag	
test1.DynamicTag_ThatDied	
test1.StaticTag	

Back12345...51Next

Selected

Clear

Name	Description
No data is available	

BackNext

Data Preview

```
{
  Timestamp: "default",
  Value: "default",
  UnitsAbbreviation: "default",
  Good: "default",
  Questionable: "default",
  Substituted: "default",
  Annotated: "default"
}
```

Save Data Source

### Instructions for this tab:

1. Enter a tags name into the top input box and select the Find Tags button.
  - a. Standard PI Tag masks are supported by the search.
  - b. All the results will populate the Results table.
2. Select the desired Tags by pressing the blue arrow on the right side of the Results table.
  - a. You will gain access to the Transforms tab, and you will be able to see all the selected tags in the Selected table.
  - b. You can unselect a tag by clicking the blue cross on the right side of the Selected table.

## Tab 4: Transforms

**Configure New Data Source**

Connection Info Data Server Tags **Transforms**

(Optional) Alter the outgoing Data Object from the PI Web API  
Preview and confirm the outgoing Data Object before saving.

**Add or Remove Properties from the Data Object**

You may add additional properties with static values, or remove properties.  
Properties generated by the PI System have the "default" value.

{"Timestamp": "de"  Click to expand

**Override Property Names**

Enter overrides in the form of:  
{"[Original Property]": "[New Name]"}  
For example: {"Value": "Pressure01"}

You can dynamically assign the name of the tag to a property  
using @TagName. For example: {"Value": "@TagName"}

<null>  Click to expand

**Data Preview**

```
{
  Timestamp: "default",
  Value: "default",
  UnitsAbbreviation: "default",
  Good: "default",
  Questionable: "default",
  Substituted: "default",
  Annotated: "default"
}
```

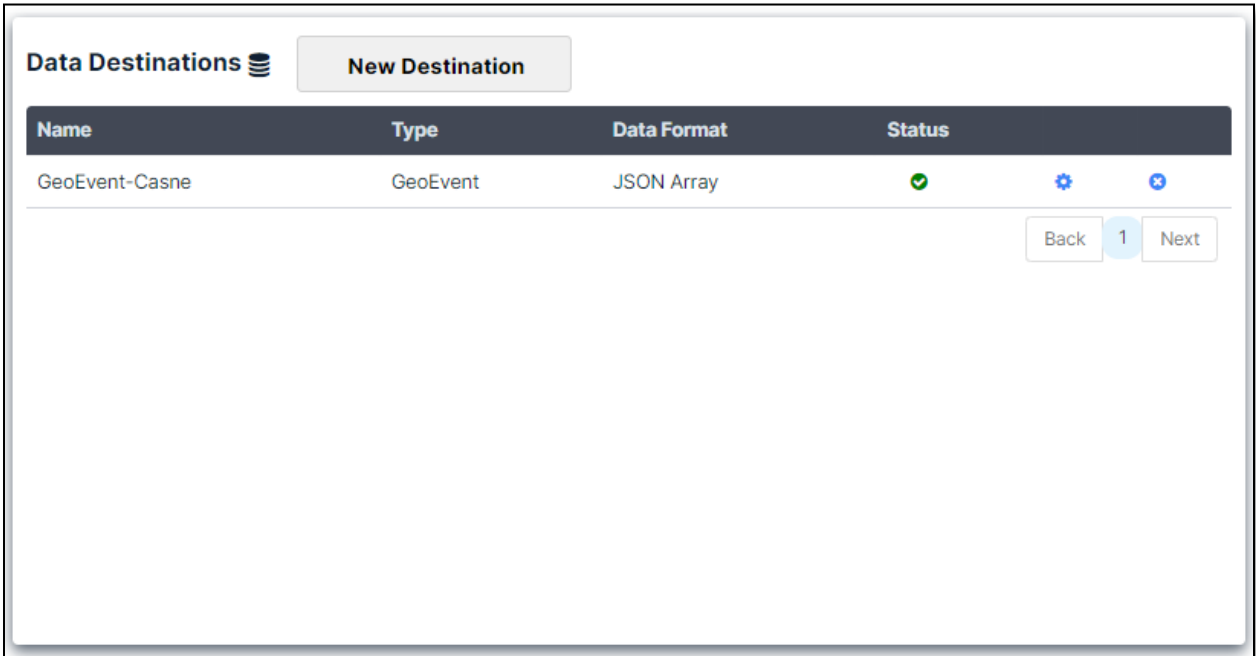
### Instructions for this tab:

1. **(Optional)** Add or Remove Properties from the Data Object:
  - d. Click on the object symbol { } to open the object editor.
  - e. Unwanted properties can be deleted. CloudStream will not send deleted properties.
  - f. Additional, static properties can be added. Enter a new property name and the static value for that property.
2. **(Optional)** Override Property Names
  - c. Click on the object symbol { } to open the object editor.
  - d. Override property names by entering the old property name on the left, and the new property name on the right.
    - iii. For example, "timestamp": "Time" will rename the "timestamp" property to "Time" in the outgoing data message.
    - iv. Entering the value of "@TagName" on the right will dynamically rename the property "Value" to the name of the Tag from PI.

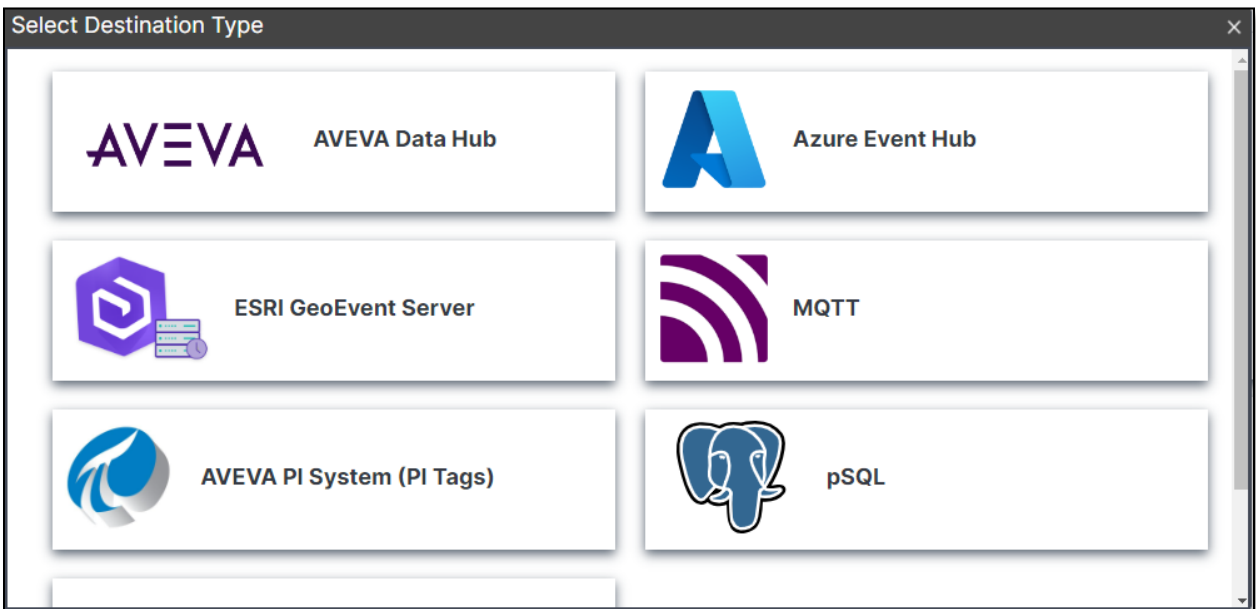
When complete, **Save** the Data Source and exit the configuration pop-up.

## 4. CloudStream Destination Creation

To create a new CloudStream Destination, click on the “**New Destination**” button from the Config page. Existing destinations may be edited by pressing the gear button. Destinations may be deleted by pressing the delete button (Note: a Destination cannot be deleted if it is part of a Service).



This will open the Destination Selection pop-up:



Click on any destination to open up the corresponding Destination Configuration window.

## 4.1. AVEVA Data Hub

## 4.2. Azure Event Hub

The Azure Event Hub Destination sends data to resources in an Azure Event Hub namespace.

Configure New Data Destination

Enter Destination Name & Policy Info

CloudStream DestinationName

Ex: Azure Event Hubs 1

Azure Instance Information

Event Hubs Namespace

Please enter the name of your Event Hub Namespace

Resource Name

<instance\_name>, <queue\_name>, or <topic\_name>/Subscription/<subscription\_name>

Authentication

SAS Policy Name

Please enter your SAS Policy name

SAS Policy Primary Key

Please enter your SAS Policy primary key

Save

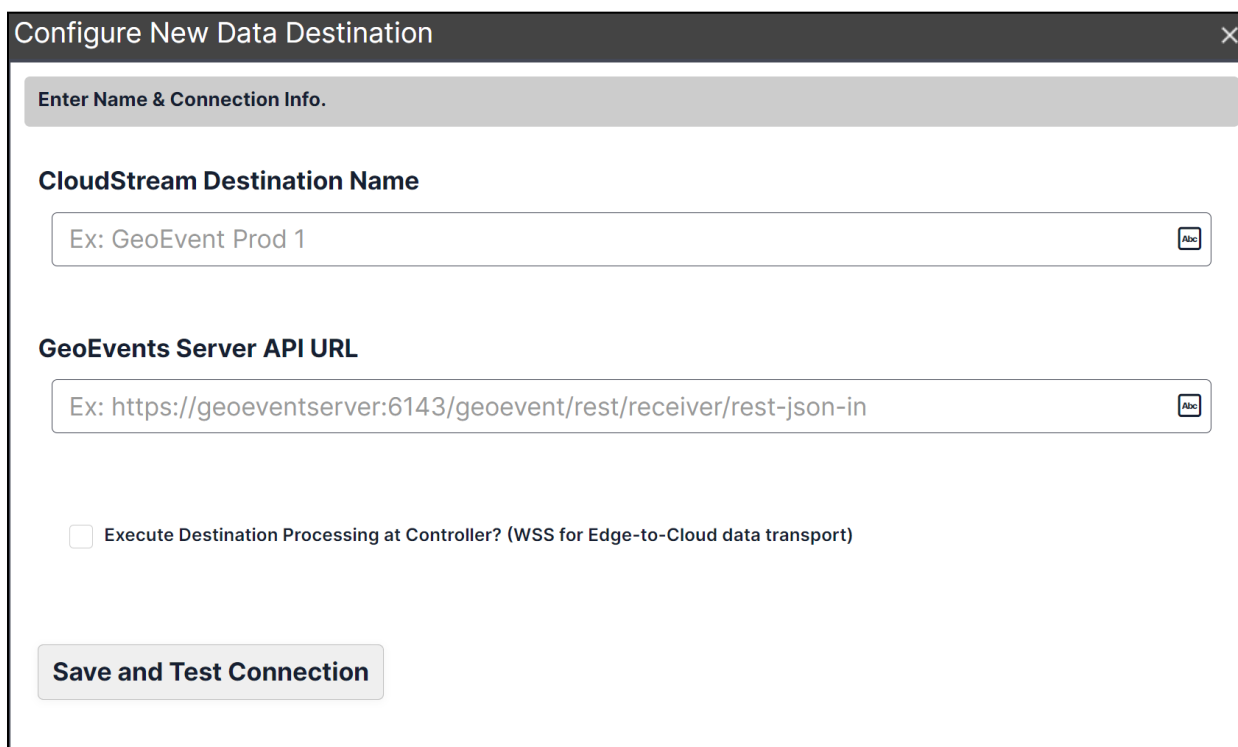
### Instructions for this Destination:

1. Enter the name for the Data Destination into the top input box.
2. Under **Azure Instance Information**, enter your **Azure Event Hubs** Namespace and the resource that data should be published to.
3. Under **Authentication**, enter the name of a valid **Shared Access Policy** and the primary key associated with that policy
4. When complete, **Save** the Data Destination and exit the configuration pop-up.



## 4.3. ESRI GeoEvent Server

The ESRI GeoEvent Server Destination sends data to an ESRI GeoEvent Server.



The screenshot shows a 'Configure New Data Destination' dialog box with a close button (X) in the top right corner. The dialog has a title bar and a main content area. At the top, there is a grey header bar with the text 'Enter Name & Connection Info.'. Below this, the 'CloudStream Destination Name' section has a text input field with the placeholder text 'Ex: GeoEvent Prod 1' and a small 'ABC' icon button on the right. The 'GeoEvents Server API URL' section has a text input field with the placeholder text 'Ex: https://geoeventserver:6143/geoevent/rest/receiver/rest-json-in' and a small 'ABC' icon button on the right. Below these fields is a checkbox labeled 'Execute Destination Processing at Controller? (WSS for Edge-to-Cloud data transport)'. At the bottom left of the dialog is a 'Save and Test Connection' button.

### Instructions for this Destination:

1. Enter the name for the Data Destination into the top input box.
2. Enter the URL for the desired **GeoEvents Server API** into the next input box.
3. If desired, enable processing at the controller by ticking the checkbox.
4. When complete, **Save** the Data Destination and exit the configuration pop-up.



## 4.4. MQTT

The MQTT destination connects to a MQTT broker and publishes messages to any number of MQTT topics.

### Tab 1: Connection Info

Configure New Data Source

Connection Info

Enter Name, Connection Info & Validate to Continue.

CloudStream Data Source Name

Ex: MQTT Local 1

MQTT Broker: Server Name

Ex: localhost, mqtt.dev

MQTT Broker: Port

Ex: 1883

MQTT Broker: Security

☒ Unencrypted (tcp)

☐ Encrypted (tcps)

Data Preview

Not Available

### Instructions for this tab (Part 1):

4. Enter the name for the CloudStream Data Source into the top input box.
5. Enter the server name and port for the MQTT broker.
6. Choose encryption mode for the broker (TCP or TCPS)

Basic Auth Username (Optional)

username

Basic Auth Password (Optional)

.....

MQTT Topics

Add Topic:

+ Subscribe

Topic
No data is available

Back Next

Validate Connection

Save Data Source

### Instructions for this tab (Part 2):

7. Enter your **Basic Auth** username and password (Optional – for brokers that support basic auth only).
8. Any number of topics may be subscribed to. To subscribe to a new topic, enter the name of the topic in the field above the data table and press the **Subscribe** button.

When complete, press **Validate Connection**. If the connection info is correct, you will now be able to save the destination.

## 4.5. PI Web API (Tags)

The PI Web API (Tags) destination publishes data directly to PI Tags. This data contains considerable data mapping to ensure that the PI Data Archive can receive the incoming data.

**Tab 1: Connection Info**

The screenshot shows a dialog box titled "Configure New Data Destination" with a close button (X) in the top right corner. The "Connection Info" tab is selected. Below the tab name is a grey instruction bar that says "Enter Name, Connection Info & Validate to Continue." The form contains four input fields: "Data Source Name" with a placeholder "Ex: PI Server 1", "PI Web API URL" with a placeholder "Please enter in the form https://PISERVER.DOMAIN/piwebapi", "Basic Auth Username" with a placeholder "username", and "Basic Auth Password" with a placeholder "password". Each of the last three fields has a red eye icon on the right side to toggle visibility. At the bottom left of the dialog is a "Validate Connection" button.

**Instructions for this tab:**

1. Enter the name for the CloudStream Data Destination into the top input box.
2. Enter the **PI Web API URL**.
3. Enter your **Basic Auth** username and password.
4. When complete, press **Validate Connection**. If the connection info is correct, you will now be able to save the Data Destination.

Tab 2: Data Server

Configure New Data Destination

Connection Info

Data Server

Data Mapping

Select Data Acquisition Mode, AF Server and Database

A maximum of 1 Server and 1 Database may be selected per PI Web API data source.

AF Server

Name	IsConnected	
BRANDLPI01	false	▶
ESD-PIserver-01	false	▶

Instructions for this tab:

1. Select the desired **Data Server** by pressing the blue arrow on the right side of the table. You will be moved to the next tab.

**Tab 3: Data Mapping**

Configure New Data Destination

Connection Info

Data Server

Data Mapping

Map incoming properties to PI Tag properties

Tag Name:

☒ From JSON Property ☐ From PI System

Name	Description
No data is available	

BackNext

Value:

☒ From JSON Property ☐ Static Value

Units Abbreviation

☒ From JSON Property ☐ Static Unit Abbreviations

**Instructions for this tab (Part 1):**

1. Under **Tag Name**, either search the **Data Server** for the desired tag by entering a search mask and pressing **Search for Tags** or by entering a JSON property of the incoming message containing the **Tag** name.
  - a. If the Tag name is contained within an incoming JSON property, then the tag name will be dynamic based on the incoming message. Otherwise, data will only be sent to the tag specified from the PI Data Archive.

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### Configure New Data Destination

Connection Info

Data Server

Data Mapping

Map incoming properties to PI Tag properties

Timestamp:

☒ From JSON Property ☐ Use Send Time

Enter the property name containing the timestamp from the incoming message

Questionable:

☒ From JSON Property ☐ True ☐ False

Enter the property containing the Questionable boolean from the incoming message

Good:

☒ From JSON Property ☐ True ☐ False

Enter the property containing the Good boolean from the incoming message

Save Data Destination

## Instructions for this tab (Part 2): Data Mapping

2. For each of the following **PI Tag Properties**, either enter a JSON property of the incoming object containing the respective **PI Tag Property** or enter a specific value:
  - a. **Value**
  - b. **Units Abbreviation**
  - c. **Timestamp**
  - d. **Questionable**
  - e. **Good**

## 4.6. pSQL

The pSQL Destination sends data to a pSQL database.

**Note:** This connector uses a pSQL driver subservice that must be initialized alongside the CloudStream node. Please contact your CloudStream installer for additional information.

**Tab 1: Connection Info**

Configure New Data Destination

Connection Info

Enter Name, Connection Info & Validate to Continue.

**CloudStream Destination Name**

Ex: pSQL DB 1

**Connection**

**Host URL**

Ex: http://sqlhost.com

**Database Port**

Ex: 5432

**Database Name**

Ex: SQL\_DB

**Authentication**

**Username**

**Password**

Show Token

Validate Connection

**Data Table Preview**

Save Data Source

**Instructions for this tab:**

1. Enter the name for the CloudStream Data Destination into the top input box.
2. Under **Connection**, enter your database host's URL and port, as well as the name of the database to insert into.
3. Under **Authentication**, enter a username and password for a user with sufficient permission.
4. When complete, press **Validate Connection**. If connection info is correct, you will be moved to the next tab.

**Note:** The "Show Token" button generated an authentication token for the pSQL driver subservice to securely connect to the CloudStream Node. This token is only used by CloudStream installers during subservice configuration.

## Tab 2: Tables

Configure New Data Destination

Connection Info

Tables

Select a table to insert into

Selected Table

test

Available Tables

Table Name	
test	▶

Data Table Preview

```
{  
  id: "integer"  
}
```

Save Data Source

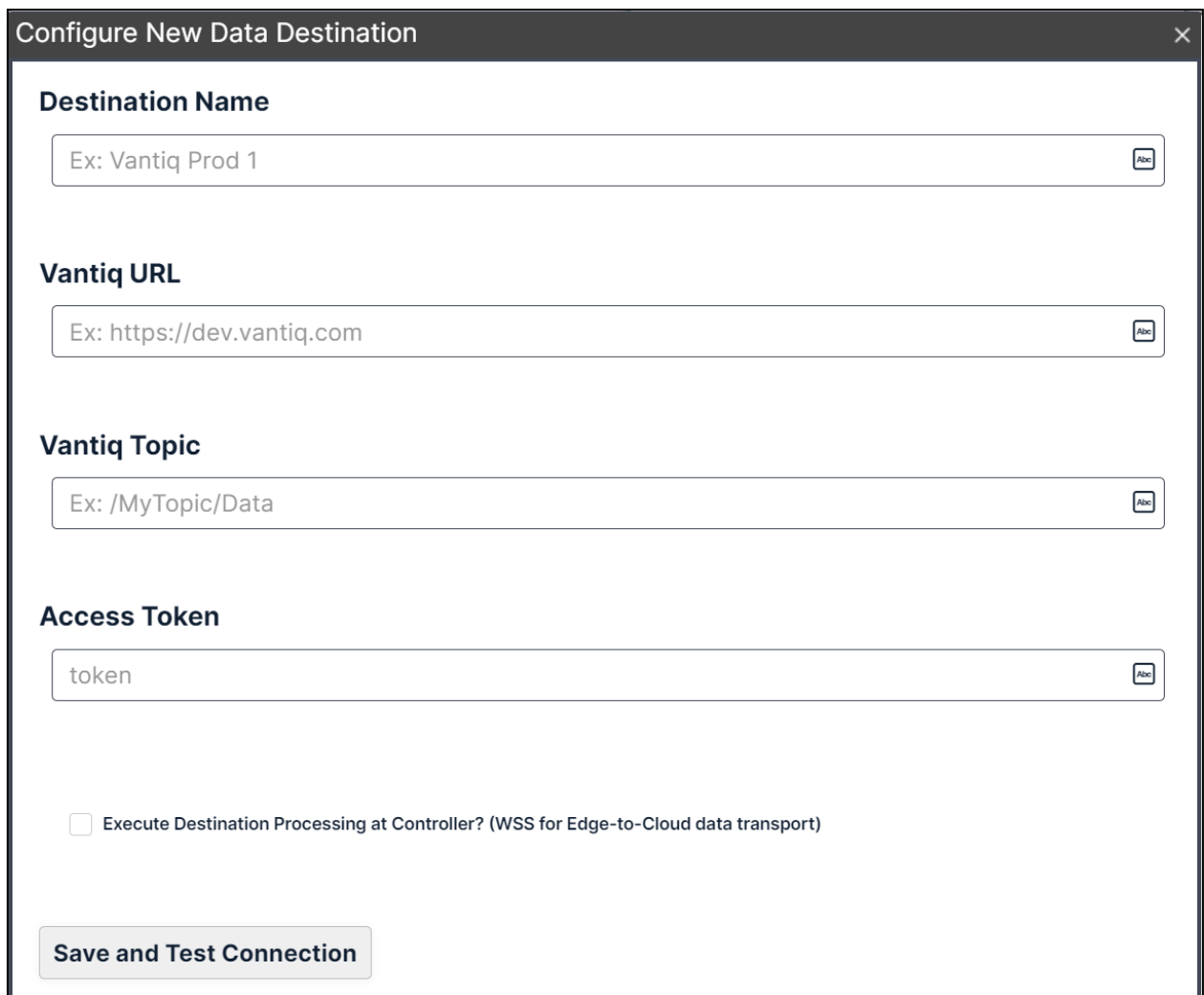
### Instructions for this tab:

1. Select a table from the list of tables. The columns of the selected table and their respective types are now visible in the **Data Table Preview**. Each pSQL Destination can only have one table.
2. When complete, **Save** the Data Destination and exit the configuration pop-up.



## 4.7. Vantiq

The Vantiq destination publishes JSON object data directly to a Vantiq topic.



The screenshot shows a 'Configure New Data Destination' dialog box with a dark title bar and a close button (X) in the top right corner. The dialog contains four text input fields, each with a placeholder example and a small 'Abc' icon on the right. The fields are labeled 'Destination Name', 'Vantiq URL', 'Vantiq Topic', and 'Access Token'. Below these fields is a checkbox labeled 'Execute Destination Processing at Controller? (WSS for Edge-to-Cloud data transport)'. At the bottom left is a button labeled 'Save and Test Connection'.

**Configure New Data Destination**

**Destination Name**  
Ex: Vantiq Prod 1

**Vantiq URL**  
Ex: https://dev.vantiq.com

**Vantiq Topic**  
Ex: /MyTopic/Data

**Access Token**  
token

☐ Execute Destination Processing at Controller? (WSS for Edge-to-Cloud data transport)

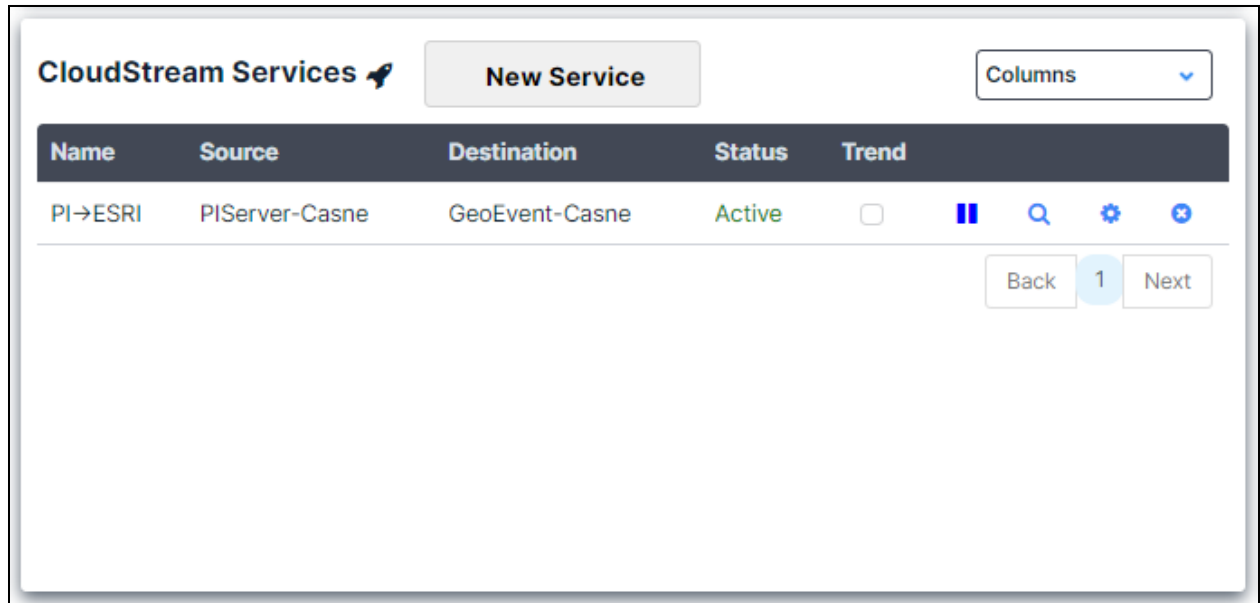
**Save and Test Connection**

### Instructions for this Destination:

1. Enter the name for the Data Destination into the top input box.
2. Enter the URL where **Vantiq** is located.
3. Enter the access token corresponding to the appropriate **Vantiq** namespace.
4. If desired, enable processing at the controller by ticking the checkbox.
  - a. This causes the data to first be routed to the controller before submitting to the remote Vantiq instance. This ensures that data is kept within WSS encryption and may be useful for edge nodes without certificates.
5. When complete, **Save** the Data Destination and exit the configuration pop-up.

## 5. CloudStream Service Creation

To create a CloudStream Service, click on the “New Service” button in the CloudStream Services table in the CloudStream System Control page.



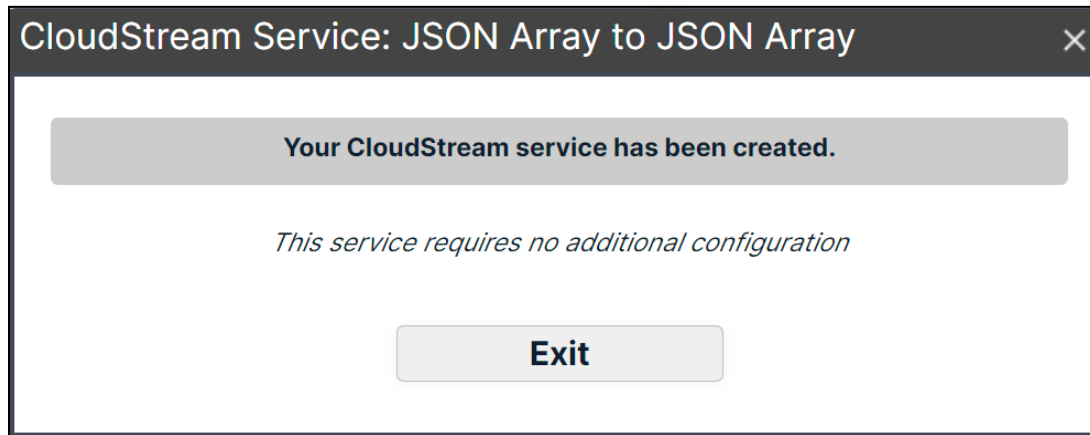
This will open the Service Creation pop-up:

The screenshot shows the 'Configure CloudStream Service' pop-up window. It has a title bar with a close button (X). The form contains the following fields: 'Service Name:' with a text input field; 'Select Source:' with a dropdown menu showing '--- No Source Selected ---'; 'Select Destination:' with a dropdown menu showing '--- No Destination Selected ---'; and a 'Create New Service' button at the bottom.

## Instructions for creating a CloudStream Service:

1. Enter the name for the CloudStream Service into the top input box.
2. Select a Source from the dropdown.
3. Select a Destination from the dropdown.
4. When complete, press **Create New Service**.

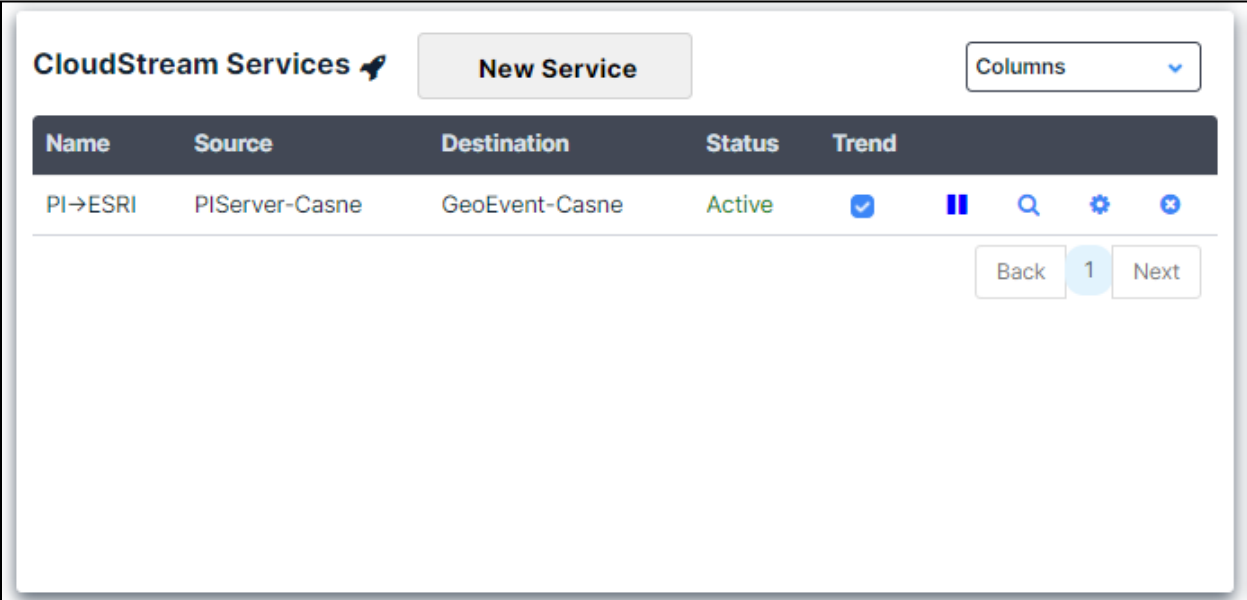
Upon successful completion, the following service pop-up will appear:



**Note:** As of CloudStream Version 1.4, no services require additional configuration, as all data is in the JSON Array format. Press the Exit button to close the popup.

## 5.1 Service Monitoring

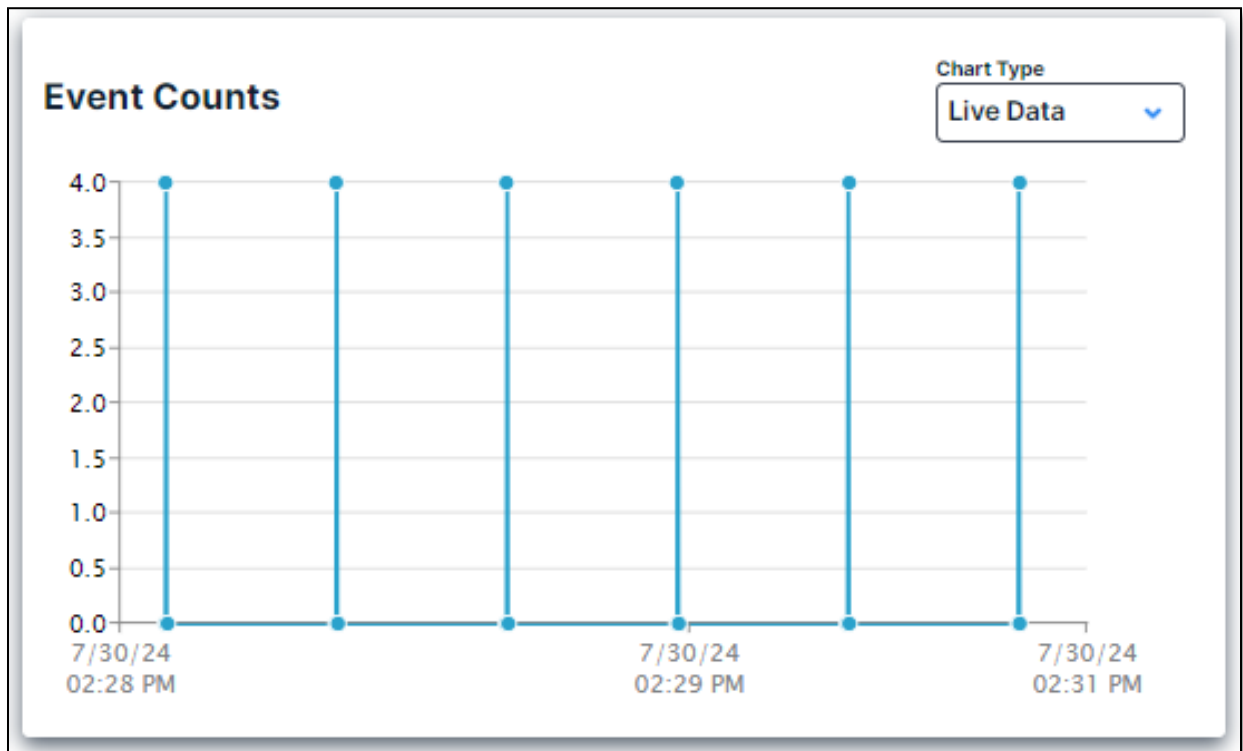
Live event counts for any service can be monitored by selecting the “Trend” option in the service table.



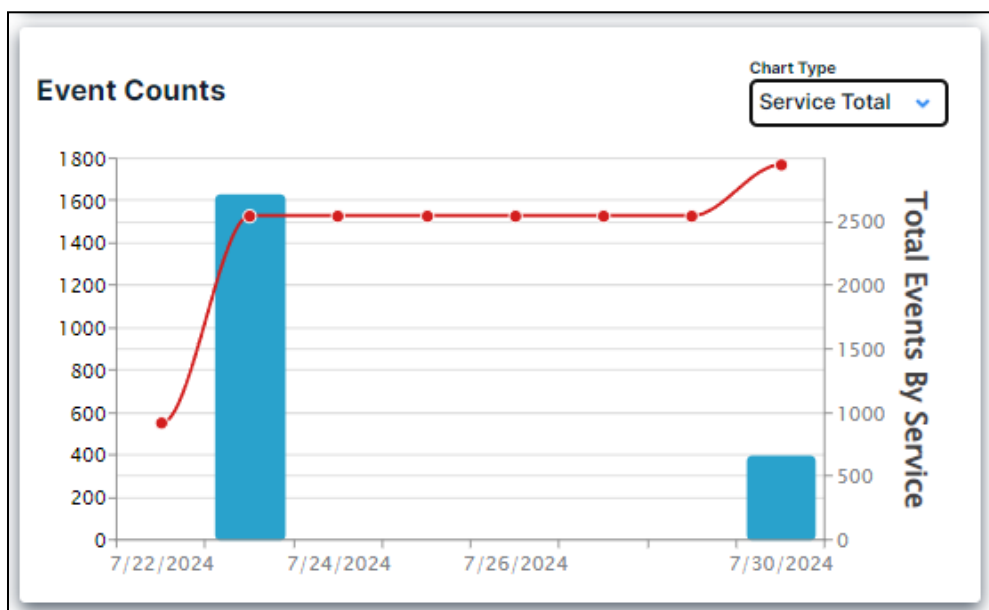
The screenshot shows the 'CloudStream Services' interface. At the top, there is a 'New Service' button and a 'Columns' dropdown menu. Below this is a table with the following columns: Name, Source, Destination, Status, and Trend. The table contains one row with the following data: Name: PI→ESRI, Source: PIServer-Casne, Destination: GeoEvent-Casne, Status: Active, and Trend: [checked checkbox]. To the right of the table, there are several icons: a pause button, a search icon, a settings icon, and a refresh icon. Below the table, there are 'Back', '1', and 'Next' buttons.

Name	Source	Destination	Status	Trend
PI→ESRI	PIServer-Casne	GeoEvent-Casne	Active	<input checked="" type="checkbox"/>

The Event Counts plot will automatically update whenever data is sent to the CloudStream destination within the selected service:



Changing the Chart Type from “Live Data” to “Service Total” will display the total data points sent per day and life total for the selected CloudStream Service. Up to 1 week of data is saved:



Clicking the magnifying glass icon in the service table will open the Live Data Viewer for the service. This will allow you to see the contents of each data message sent to the Destination:

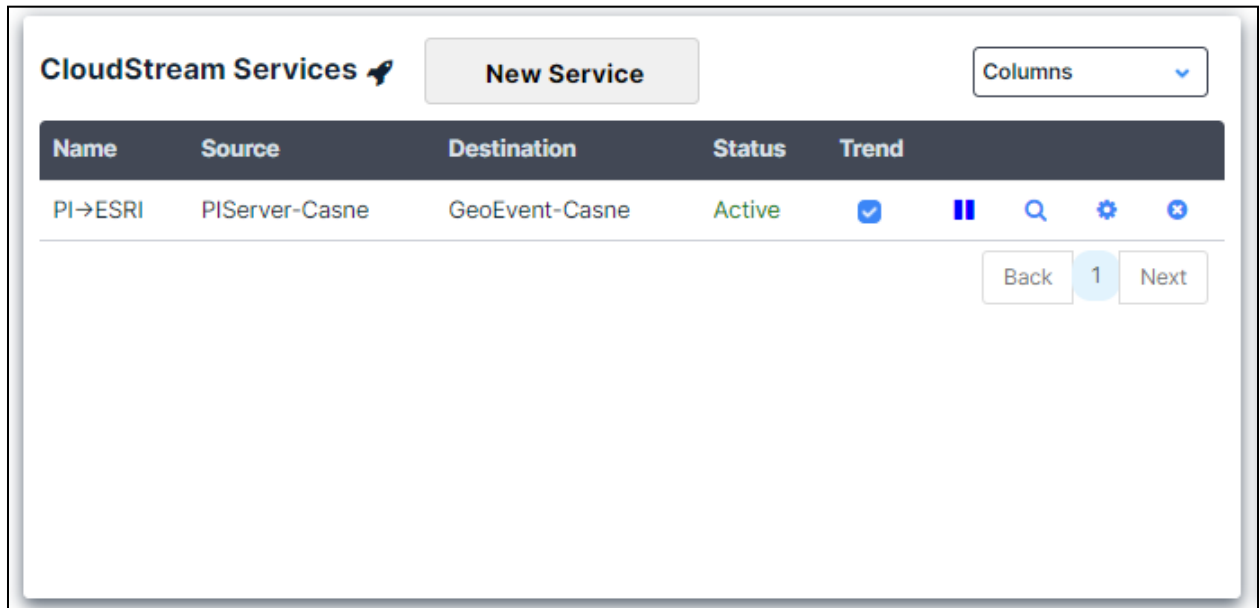
**Live Data View for Service: PI→ESRI**

Send Time	Data
7/30/2024, 2:33:49 PM	Name: "Central", Humidity: 152.09278877480386, Lat: 47.66413142810518, Lon: -122.32400408629573, Pressure: 118.8073504428727, Level: 38.61760330200195, timestamp: "2024-07-30T18:33:41Z", Temperature: 2850.2127327832836
7/30/2024, 2:33:49 PM	Name: "East", Humidity: 716.918487922442, Lat: 47.65887832245105, Lon: -117.41794949154846, Pressure: 2390.991112945838, Level: 38.61760330200195, timestamp: "2024-07-30T18:33:41Z", Temperature: 1303.7788300192826
7/30/2024, 2:33:50 PM	Name: "South", Humidity: 3000.0915859001934, Lat: 45.62178000903894, Lon: -122.72034040092487, Pressure: 1170.3836271604691, Level: 38.61760330200195, timestamp: "2024-07-30T18:33:41Z", Temperature: 1680.8833848027334
7/30/2024, 2:33:50 PM	Name: "North", Humidity: 17.255720439331867, Lat: 49.343282797245905, Lon: -123.01150856263054, Pressure: 433.42729130802513, Level: 38.61760330200195, timestamp: "2024-07-30T18:33:41Z", Temperature: 1026.1510055088597

Close

## 5.2 Service Control

CloudStream Services may be paused by clicking on the Pause icon in the service table:



While paused, services that poll data from Data Sources will stop polling. Services that receive data from remote sources will stop routing data.

CloudStream services may be deleted by clicking on the “X” icon in the services table.

**Note:** As of CloudStream Version 1.4, no services require additional configuration, and therefore cannot be edited, as all data is in the JSON Array format. Clicking the gear icon will open up the service configuration pop-up with no configuration options. To alter a CloudStream Service, delete the existing service and create a new one.

## 6. Revision History

Date	Author	Changelist
5/20/2024	Renner Burkle	Initial Document for CloudStream v1.4
7/15/2024	Kai Chenhaun	Initial versions of CloudStream Destination Creation pages Initial version of CloudStream Service Creation page