

Edge Streaming Manager

System Manual

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

1	Document history	6
2	Getting Started with Edge Streaming Manager	7
3	Edge Streaming Manager Overview	8
3.1	What Is Edge Streaming Manager?	8
3.2	Key Concepts	8
3.2.11	Asset	8
3.2.22	Deployment	9
3.2.33	Project	9
3.2.44	Streaming Server	9
3.2.55	Job Template	9
3.2.66	Job	10
3.3	Access Edge Streaming Manager	10
3.4	Understanding the User Interface	11
3.4.1	Pages	11
3.4.2	Panes	12
3.4.3	Tiles	12
3.4.4	Windows	13
3.4.5	Toolbars	13
3.4.6	Arrange Information in Tables	14
3.5	Overview of Managing Assets	15
3.6	Production Assets	16
4	Working with Deployments	18
4.1	Create a Deployment	18
4.2	Edit a Deployment	19
4.3	Change the Production Status of a Deployment	19
4.4	Delete a Deployment	19
5	Working with Streaming Servers	20
5.1	Add Streaming Servers	20
5.2	Connecting Directly to a Streaming Server	21
5.3	Edit a Streaming Server	23
5.4	Remove Streaming Servers	23
5.4.1	Remove Streaming Servers from a Deployment	23
5.4.2	Remove Streaming Servers from Edge Streaming Manager	24
6	Working with Projects	25
6.1	View a Project	25
6.1.1	Overview	25

6.1.2	The Diagram Tab	25
6.1.3	The XML Tab	26
6.1.4	The Details Tab.....	26
6.1.5	The Versions Tab.....	26
6.2	Upload a Project.....	27
6.3	Change the Production Status of a Project.....	28
7	Working with Filters.....	29
7.1	Filters	29
7.2	Working with Filters for a Specific Deployment	29
7.2.1	Show the Result of Applying a Filter.....	30
7.2.2	Save a Filter	30
7.3	Managing Filters.....	31
7.3.11	Sort Filters.....	31
7.3.22	Create a Filter	31
7.3.33	Edit a Filter	32
7.3.44	Delete a Filter.....	32
7.4	Filter Expression Syntax	32
8	Working with Job Templates	34
8.1	Job Template	34
8.2	Create a Job Template	35
8.3	Upload a Job Template.....	35
8.4	Edit a Job Template	37
8.5	Change the Production Status of a Job Template	37
8.6	Deploy a Job Template	38
8.7	Download a Job Template	38
8.8	Delete a Job Template	39
9	Job Template Content.....	40
9.1	Overview of Job Template Content.....	40
9.2	Job Template	40
9.3	localization-strings	41
9.4	parameters	43
9.4.1	Overview of the parameters Element	43
9.4.2	Common Attributes of Selectors	44
9.4.3	project-selector.....	45
9.4.4	server-selector	46
9.4.5	running-project-selector	46
9.4.6	text-input-selector.....	47
9.4.7	query-selector	48
9.4.8	window-selector	48
9.4.9	enum-selector	48
9.4.10	server-filter-selector	49

9.5	enumerations	50
9.6	server-filters	51
9.7	instructions	52
9.7.11	instructions	52
9.7.22	Common Attributes of Instructions and the group Element	55
9.7.33	load-project	57
9.7.44	start-project	58
9.7.55	start-connectors	58
9.7.66	modify-project	58
9.7.77	stop-project	60
9.7.88	unload-project	60
9.7.99	group	60
9.8	failure-instructions	62
9.9	initialization	63
10	Monitoring a Deployment	65
10.1	Monitor Deployments	65
10.1.11	Monitor All Deployments	65
10.1.22	Monitor a Specific Deployment	67
10.2	View Sample Data	69
10.3	Monitor Unassigned Streaming Servers	71
10.4	Monitor Jobs	71
10.4.1	View All Jobs	71
10.4.2	View Job Details	73
10.5	Delete a Job	73
10.6	Rerun a Job	74
10.7	Stop a Running Job	74
10.8	Load and Start a Project	75
10.9	Stop and Unload a Project	75
11	Metering Servers	77
11.1	Metering	77
11.2	Add a Metering Server	77
11.3	Monitor a Metering Server	77
11.3.1	View Metering Server Details	77
11.3.2	Export Detailed Events Information	78
11.3.3	Group Metering Servers	79
12	Glossary	80

Document history

Version	Date	Changes	Link
V1801.Oct/2019.1	2019-09-09	New document	-

Getting Started with Edge Streaming Manager

Audience

The target audience for Edge Streaming Manager: User's Guide is Edge Streaming Analytics application administrators. Edge Streaming Manager enables application administrators to effectively manage the Edge Streaming Analytics environment, including deploying Edge Streaming Analytics projects to Streaming Servers, monitoring deployments, and managing change.

Requirements for Solution Access and Use

Here are the requirements for accessing and using Edge Streaming Manager:

- You have a MindSphere account with roles assigned to log on to Edge Streaming Manager.
- A supported web browser has been installed.

Note

For detailed information about supported browsers, in Edge Streaming Manager click the user icon in the top-right corner and then click About. The About window appears. Click Supported browsers and platforms to view supported browsers. Edge Streaming Manager requires the use of cookies to maintain the session state.

- Your screen has a minimum screen resolution of 1,280 x 1,024.
- JavaScript has been enabled in your brows.

Purpose of This Document

This document provides usage and operational assistance for the typical user of Edge Streaming Manager.

Note

Deployments of Edge Streaming Manager may vary in future to meet the needs of a specific tenant. The information and windows, including the color and layout themes, shown in this document are intended to show the functionality of Edge Streaming Manager and are only examples.

Edge Streaming Manager Overview

3

3.1 What Is Edge Streaming Manager?

Edge Streaming Manager is a web-based client that enables you to manage your Edge Streaming Analytics environment.

You can use Edge Streaming Manager to perform the following tasks:

- Deploy Edge Streaming Analytics projects into production environments and test environments.
- Monitor the status of your deployments.
- Administer your deployments and manage change.
- Monitor your Edge Streaming Analytics metering servers.

You can use Edge Streaming Creator to create the projects that you deploy to Streaming Servers using Edge Streaming Manager.

3.2 Key Concepts

This topic introduces the key concepts in Edge Streaming Manager.

3.2.1 Asset

An asset is any identifiable part of an Edge Streaming Analytics deployment that Edge Streaming Manager can monitor or act upon. Examples of assets include projects and Streaming Servers.

Edge Streaming Manager tracks changes to assets that it manages. Here are examples of details recorded by Edge Streaming Manager for most assets:

- Creation timestamp
- Last update timestamp
- Created by (user ID or name)
- Last updated by (user ID or name)
- Version
- Comments

3.2.2 Deployment

A deployment is a logical grouping of assets as a single unit for life cycle management and monitoring in Edge Streaming Manager. That is, a deployment is a group of assets that together does something useful.

3.2.3 Project

A project is a data processing model that can be executed on a Streaming Server.

A project is stored as an XML document. You can create a project in Edge Streaming Creator, or you can upload a project to it. When you publish the project using Edge Streaming Creator, it becomes visible in Edge Streaming Manager.

Here are examples of project metadata captured by Edge Streaming Manager:

- Version
- Project repository ID
- Whether the project is a production asset. (for more information, Production Assets 16)

3.2.4 Streaming Server

In Edge Streaming Analytics, the Streaming Server is an engine-executable program that instantiates and executes Edge Streaming Analytics projects.

A Streaming Server and the equipment on which it is running can have different states. For example, a Streaming Server might not be running even though the server on which it is located is available.

Here are examples of Streaming Server metadata captured by Edge Streaming Manager:

- Status.
- The host on which the Streaming Server is running.
- The Edge Streaming Analytics version that is installed on the host on which the Streaming Server is running.
- Memory use and CPU use.

3.2.5 Job Template

A job template is an XML document that contains a set of instructions to create a job. That is, a job template outlines the steps required to load, start, stop, or unload a project on a Streaming Server.

You can create a job template by using an editor provided within Edge Streaming Manager. A job template contains the following high-level elements:

- Localizations
- Parameters
- Enumerations
- Initializations
- Instructions
- Failure instructions

When you deploy a job template, a job is created.

3.2.6 Job

A job is a set of tasks to be executed by Edge Streaming Manager on various assets associated with one or more deployments.

A job includes the tasks to be performed on assets (such as projects and Streaming Servers) and the status of each task.

Here are examples of job metadata that Edge Streaming Manager records:

- Job status.
- The deployment that the job relates to.
- Start date and time.

Projects can include placeholders where values are injected to customize project behavior at run time. These placeholder values can be recorded and displayed as part of the details of a job.

Jobs cannot be changed after they are created. If you want to alter a job, you must create a new job instead.

3.3 Access Edge Streaming Manager

1. Ensure that your administrator has granted the role for ESM to your user.

Roles are granted to a user in the application User settings. An application tile for Edge Streaming Manager should then appear in your launchpad.

2. Click on the launchpad icon Edge Streaming Manager and wait for the application to load.

3.4 Understanding the User Interface

3.4.1 Pages

A page is the highest-level container in the user interface. All other user interface elements are contained within the confines of a page.

When you access Edge Streaming Manager, the **Deployments** page appears.

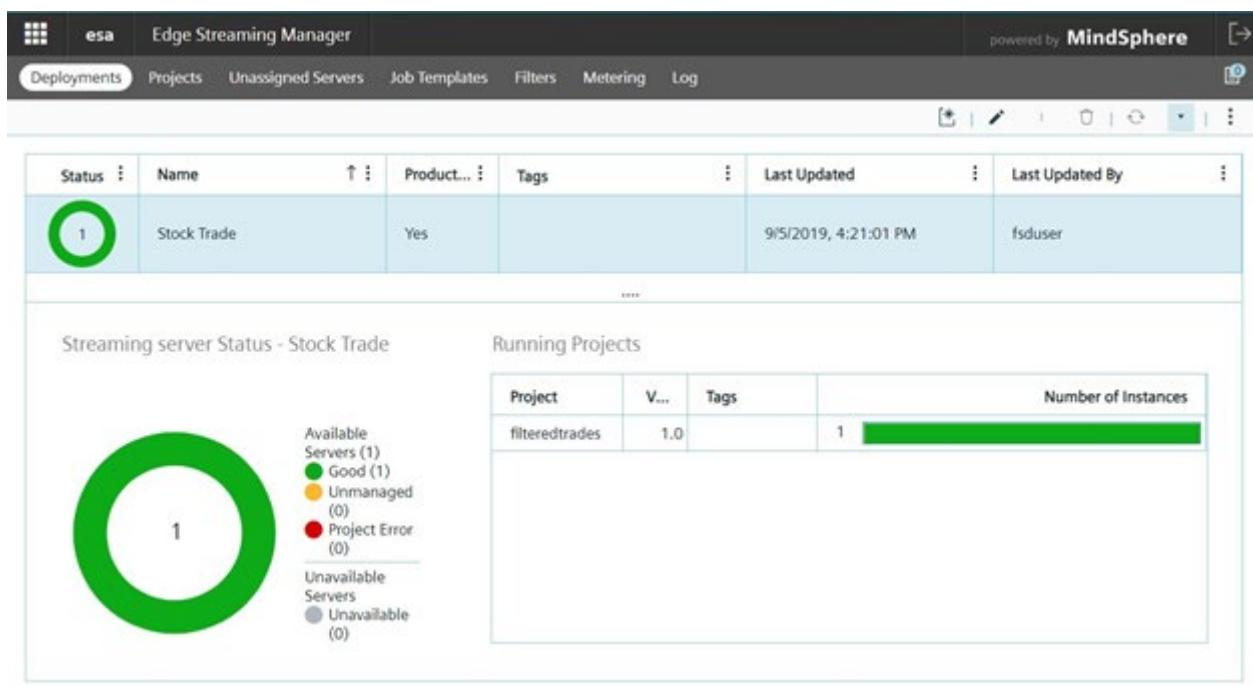


Figure 3-1 Deployments Page with Three Deployments

Edge Streaming Manager contains the following main pages:

- The **Deployments** page enables you to create deployments and then monitor and manage them.
- The **Projects** page enables you to view projects that have been published using Edge Streaming Creator.
- The **Unassigned Servers** page enables you to view available Streaming Servers that Edge Streaming Manager is aware of, and to connect directly to other Streaming Servers. Streaming Servers that already belong to a deployment are not displayed.
- The **Job Templates** page enables you to create and upload job templates, which you can then deploy to create running jobs.
- The **Filters** page enables you to manage filters that are available in Edge Streaming Manager.

3.4 Understanding the User Interface

- The **Metering** page enables you to monitor the metering servers that track usage data.
- The **Log** page displays details of currently running jobs and historical jobs.

For more information about the main tasks that you perform using Edge Streaming Manager, see [Overview of Managing Assets 15](#).

3.4.2 Panes

Edge Streaming Manager pages contain panes. The following figure shows the **Filters** page, which contains a bottom pane with a tile called **Details**.

The screenshot shows the Edge Streaming Manager interface. At the top, there's a navigation bar with icons for Deployments, Projects, Unassigned Servers, Job Templates, **Filters**, Metering, and Log. The title "Edge Streaming Manager" is displayed next to the "esa" logo. On the right, it says "powered by MindSphere". Below the navigation bar is a toolbar with various icons. The main content area has a table titled "Filters" with columns: Name, Usage, Tags, Updated, and Updated By. One row is visible: "Test servers" under Usage, and "Any Deployment" under Tags. The "Updated" column shows "9/5/2019, 4:29:17 PM" and the "Updated By" column shows "fsduser". At the bottom of the page is a large pane titled "Details" containing several key-value pairs:

Publisher connector types:	Filter expression:
Test servers	label~"Test"
Usage:	Created:
Any Deployment	9/5/2019, 4:29:17 PM
Description:	Created by:
Finds ESA servers with the tag "test"	fsduser
Tags:	Last updated:
(none)	9/5/2019, 4:29:17 PM
	Last updated by:
	fsduser

Figure 3-2 Example of a Page with a Pane

To resize a pane, drag a border that is marked with upward or downward.

To hide a pane, click . To display it again, click the same button again.

3.4.3 Tiles

A tile is a self-contained block of information that resides within a pane or sometimes directly on a page. The same tile can appear on several pages. For example, the **Details** tile appears in the bottom pane on more than one page.

3.4.4 Windows

A Windows is a floating user interface element that often appears as a result of a user action. Windows generally provide a means by which to perform an action. Closing a window returns you to the page from which the window was launched. The following figure shows a window that can create a new deployment in Edge Streaming Manager.

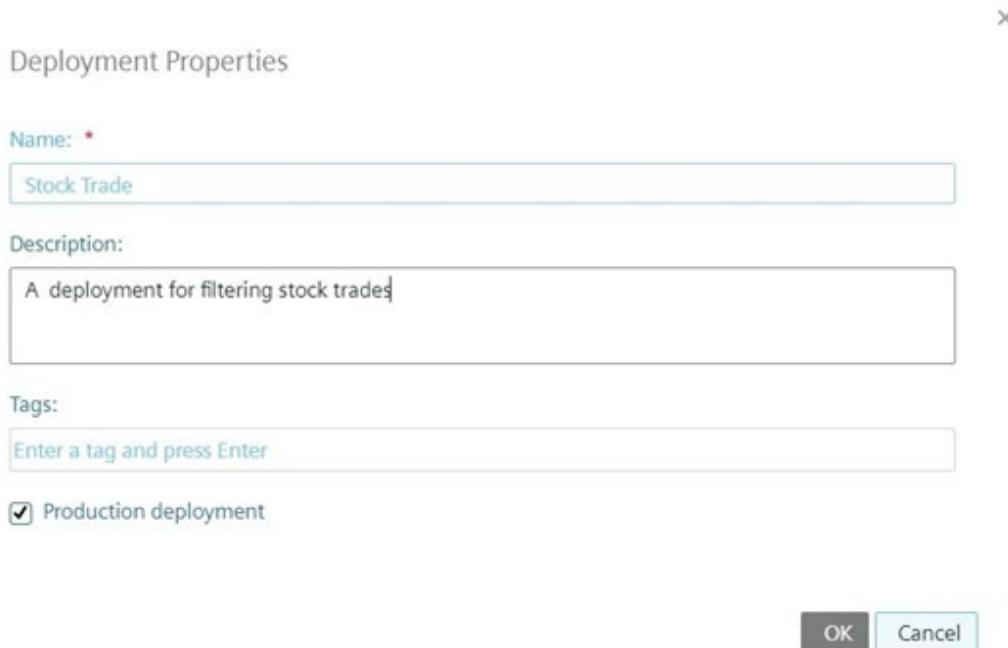


Figure 3-3 Example of a Window

3.4.5 Toolbars

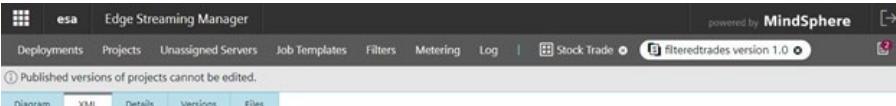
There are three main toolbars in Edge Streaming Manager, as shown in the following figure. For information about each toolbar, see the subsequent table.

Name	↑ :	Pro... :	Tags	:	Created By	:	Created	:	Last Updated	:	Last Updated
Aggregate		Yes			fsduser		9/5/2019, 4:33:49 PM		9/5/2019, 4:33:49 PM		
Filter Trades by Stock Code		No			fsduser		9/5/2019, 4:34:36 PM		9/5/2019, 4:34:36 PM		
Remove a Running Project		No			fsduser		9/5/2019, 4:34:54 PM		9/5/2019, 4:34:54 PM		

Figure 3-4 Edge Streaming Manager Toolbars

3.4 Understanding the User Interface

Item Number	Name	Description
1	Application bar	<p>Displays your user icon, which shows the first character of your name or user ID. Click the user icon to access the following functionality:</p> <ul style="list-style-type: none"> • View Help and product information • Sign out from Edge Streaming Manager (unless your system has been configured so that you do not need to sign in)
2	Menu bar	<ul style="list-style-type: none"> • Provides access to the main Edge Streaming Manager pages: Deployments, Projects, Unassigned Servers, Job Templates, Filters, Metering, and Log. • Provides access to each deployment, Streaming Server, project, job template, or job that is currently open. The navigation overflow menu button displays the total number of these pages that are currently open, for example, .
3	Toolbar or tabs	<p>Includes buttons or tabs specific to the open page. For example, the preceding figure shows toolbar buttons on the Job Templates page. The following figure shows tabs on a page for an open project.</p>



```

1+ <?xml version="1.0"?><project name="filteredtrades" threads="8" pubsub="auto">
2+   <description>this project finds trades that match a specified stock code.</description>
3+   <queries>
4+     <query name="cq">
5+       <window>
6+         <window-source collapse-updates="true" insert-only="true" name="source_win" index="p1_EMPTY">
7+           <schemas>
8+             <fields>
9+               <field name="ID" type="int32" key="true"/>
10+              <field name="symbol" type="string"/>
11+              <field name="currency" type="int32"/>
12+              <field name="volume" type="int32"/>
13+              <field name="secs" type="int32"/>
14+              <field name="price" type="double"/>
15+              <field name="quantity" type="int32"/>

```

Figure 3-5 Example of an Open Project, with Tabs Instead of a Toolbar

3.4.6 Arrange Information in Tables

Sometimes a large amount of information is displayed in tables. To make it easier to work with a large amount of information, you can arrange this information in different ways.

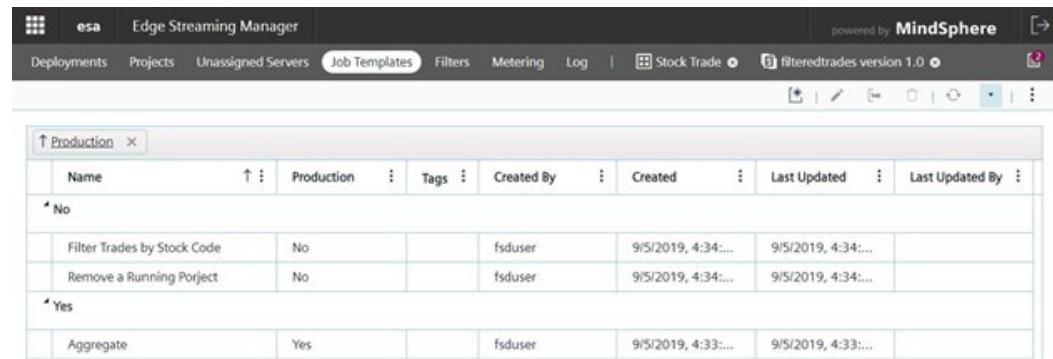
You can sort the contents of many columns by ascending or descending order. To do this, click the heading of the column that you want to sort.

You can create filter criteria by which to display only a subset of information for a column. To create filter criteria, click  for the column that you want to apply filter criteria to, select **Filter**, and enter your filter criteria. The use of filter criteria is not available for some columns.

You can configure the columns that you want to display. To do this, click  in any column, select **Columns**, and deselect the columns that you do not want to appear.

You can re-order columns. To do this, click and hold the column heading and drag it to a different location.

In some tables, you can group information by column. To do this, click  and select **Group columns**. If this option is not available, it means that you cannot group information by columns in this table. A horizontal bar appears at the top of the table, with the text **Drag a column heading here to group by that column**. To group information by column, drag a column heading to the bar. If required, you can drag additional columns to the bar. In the following example, information about the **Job Templates** page has been grouped by the **Production** column:



Name	Production	Tags	Created By	Created	Last Updated	Last Updated By
No						
Filter Trades by Stock Code	No		fsduser	9/5/2019, 4:34:....	9/5/2019, 4:34:....	
Remove a Running Project	No		fsduser	9/5/2019, 4:34:....	9/5/2019, 4:34:....	
Yes						
Aggregate	Yes		fsduser	9/5/2019, 4:33:....	9/5/2019, 4:33:....	

Figure 3-6 Example of Grouping Information by Column

3.5 Overview of Managing Assets

Before Edge Streaming Manager can interact with assets, you must do the following:

1. Create a deployment.

For more information, see [Create a Deployment 18](#).

2. Associate a Streaming Server with the deployment.

For more information, see [Add Streaming Servers 20](#).

3. Create or upload a project in Edge Streaming Creator and publish it. When you publish a project in Edge Streaming Creator, it becomes visible in Edge Streaming Manager.

For more information, see [View a Project 25](#).

3.6 Production Assets

4. Create or upload a job template.

For more information about creating a new job template, see [Create a Job Template 35](#).

For more information about uploading a job template, see [Upload a Job Template 35](#).

5. Deploy a job template.

For more information, see [Deploy a Job Template 38](#).

TIP

Instead of deploying a job template that you have created or uploaded, in some cases you can use controls in the user interface to load and start a project. For more information, see [Load and Start a Project 75](#).

For more information about the meaning of the terms mentioned here, see [Key Concepts 8](#).

This guide includes an end-to-end example of how to use Edge Streaming Manager to complete the tasks listed above. For more information, see [Overview of the Stock Trade Example](#).

3.6 Production Assets

You can mark certain assets as production assets to prevent assets meant for testing from accidentally being used for production (that is, being used in a live environment). The following assets can be marked as production assets:

- Deployments
- Projects
- Job templates

You can mark these assets as production assets when you create them. You can change the production status to a different status later. For example, you can change a production deployment to a non-production deployment, or you can change a non-production deployment to a production deployment.

You can deploy a non-production job template only against a non-production deployment. In such a situation, Edge Streaming Manager permits you to select either a production project or a non-production project to deploy. This choice enables you to test your current production projects or to test non-production projects to assess whether they are suitable for being marked as production projects in the future.

You can deploy a production job template against a production deployment or against a non-production deployment:

- If you deploy a production job template against a production deployment, Edge Streaming Manager permits you to select only a production project to deploy.
- If you deploy a production job template against a non-production deployment, Edge Streaming Manager permits you to select either a production project or a non-production project to deploy.

The following diagram illustrates this information:

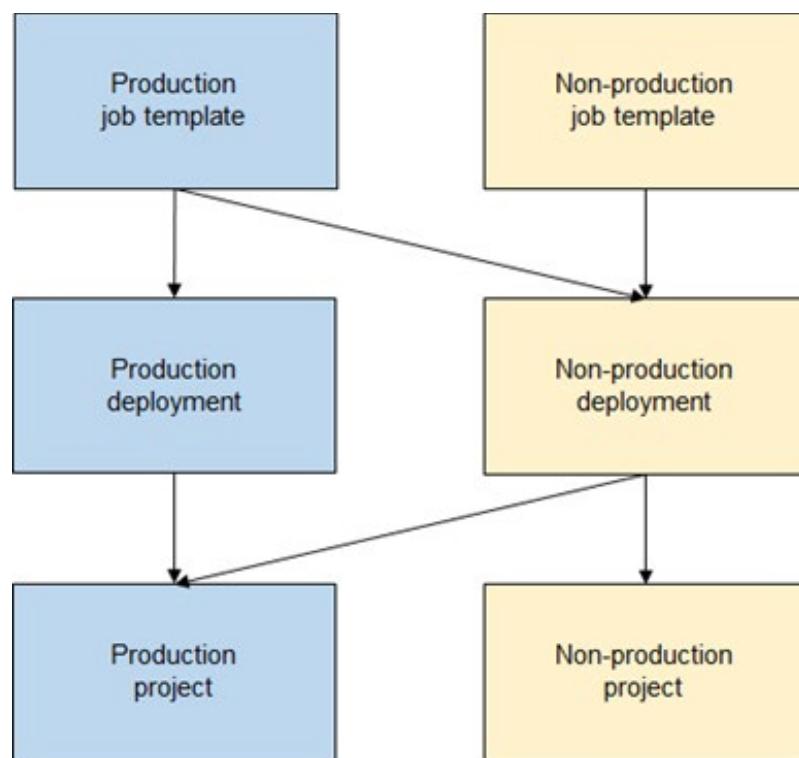


Figure 3-7 Options for Deploying Job Templates

Working with Deployments

4.1 Create a Deployment

1. On the **Deployments** page, click .

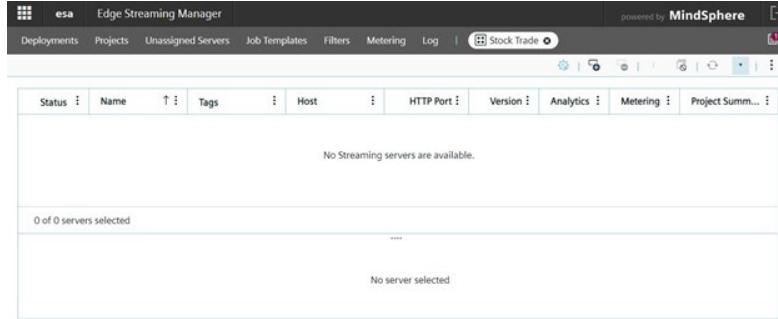
The Deployment Properties window appears.

2. In the **Name** field, enter a unique name for the deployment.
3. In the **Description** field, enter a description for the deployment. For example, you can enter the purpose of the deployment to allow users to differentiate between deployments with similar names. This description is displayed as a tooltip when you place the cursor over the deployment name in the **Name** column on the **Deployments** page.
4. In the **Tags** field, you can attribute one or more tags to the deployment.

To add a tag, enter text and press Enter. Tags can be used to group and filter deployments. Tags are single-term descriptors for the deployment. Tags cannot contain spaces. Duplicate tags are not permitted on a single deployment.

5. If you want to create a production deployment, select the **Production deployment** check box. For more information, see Production Assets 16.
6. Click OK.

Your deployment appears on a new page. The following figure shows an example:



The screenshot shows the Edge Streaming Manager interface with the title bar "esa Edge Streaming Manager" and "powered by MindSphere". The main menu includes "Deployments", "Projects", "Unassigned Servers", "Job Templates", "Filters", "Metering", and "Log". A sub-menu for "Stock Trade" is open. Below the menu is a toolbar with icons for search, refresh, and other functions. The main content area is a table titled "Deployments" with columns: Status, Name, Tags, Host, HTTP Port, Version, Analytics, Metering, and Project Summ... . The table displays the message "No Streaming servers are available." and "0 of 0 servers selected". At the bottom, it says "No server selected".

4.2 Edit a Deployment

1. On the **Deployments** page, select the deployment that you want to edit and click . The Deployment Properties window appears.
2. Edit the **Description** and **Tags** fields as required. You can also select or deselect the Production deployment check box to move a deployment from test to production or from production to test. For more information about these fields, see Create a Deployment 18.

Note

You cannot edit the **Name** field.

3. If required, you can add or remove Streaming Servers, or filter Streaming Servers associated with the deployment:
 - For more information about adding Streaming Servers, see Add Streaming Servers 20.
 - For more information about removing Streaming Servers, see Remove Streaming Servers 23.
 - For more information about filtering Streaming Servers, see Working with Filters for a Specific Deployment 29.

4.3 Change the Production Status of a Deployment

Certain assets can be marked as production assets. For more information, see Production Assets 16.

To change the production status of a deployment, on the **Deployments** page, right-click the deployment and select **Set as production** or **Remove as production**.

The Production column on the Deployments page changes to reflect your choice.

4.4 Delete a Deployment

You can delete a deployment if no Streaming Servers are associated with it. For more information, see Remove Streaming Servers 23.

To delete a deployment:

1. On the **Deployments** page, select the deployment that you want to delete.
 2. Click .
- The Delete Deployment window appears.
3. Click **Delete**.

Working with Streaming Servers

5.1 Add Streaming Servers

You can associate a Streaming Server with a deployment only if the Streaming Server has been onboarded to MindSphere as asset prior to this step. In the future, Edge Streaming Analytics informs Edge Streaming Manager automatically about Streaming Servers that exist in the Edge Streaming Analytics environment.

If Edge Streaming Manager is not aware of a particular Streaming Server, you can connect directly to that Streaming Server. A direct connection to a specific Streaming Server is necessary for each Streaming Server onboarded via MindConnect or the Streaming Server is connected via VPN (future version). In this case, Edge Streaming Manager becomes aware of the Streaming Server only after you have made the direct connection. For more information, see Connecting Directly to a Streaming Server 21.

Each Streaming Server can belong to only one deployment. If you want to add a Streaming Server that already belongs to another deployment, you must first remove that Streaming Server from its original deployment. For more information, see Remove Streaming Servers 23.

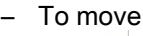
Each deployment can contain several Streaming Servers. To add Streaming Servers to a deployment:

1. Open the deployment if it is not already open: on the Deployments page, select the deployment that you want to open and click . A separate page that displays the deployment opens.
2. Click  and select Add an unassigned server.

Note

The New server menu option, which is adjacent to the Add an unassigned server menu option, relates to making a direct connection to a Streaming Server that Edge Streaming Manager has not yet detected. For more information, see Connecting Directly to a Streaming Server 21.

The Add and Remove Streaming Servers window appears.

3. Move the required Streaming Servers from the **Available servers** table to the **Selected servers** table, using the buttons between the two tables:
 - To move a single Streaming Server, select the Streaming Server in the **Available servers** table and click .
 - To move all Streaming Servers that are displayed in the **Available servers** table, click .
4. Click **OK**.

The Streaming Servers appear in the table on the deployment page. To view more information about a particular Streaming Server, select it in the main table and view the

information that appears in the tabs in the bottom pane. The following figure shows an example:

The screenshot shows the Edge Streaming Manager interface with the title bar "esa Edge Streaming Manager" and "powered by MindSphere". The top navigation bar includes links for Deployments, Projects, Unassigned Servers, Job Templates, Filters, Metering, Log, and a search bar with the placeholder "Stock Trade". Below the navigation is a toolbar with various icons. A main table lists one server entry:

Status	Name	Tags	Host	HTTP Port	Version	Analytics	Metering	Project Summ...
Green circle	Edge		gateway.eu1.m... 2fada334fcbb1f9572c33ea210e	443	6.1	Yes	No	

Below the table, a message says "1 of 1 servers selected". Underneath the table, there are four tabs: Projects (selected), Server Properties, Server Configuration, and Performance. The "Server Properties" tab displays the following details:

Name: Edge	Host: gateway.eu1.mindsphere.io/api/esaproxy/v3/04407 2fada334fcbb1f9572c33ea210e	Authentication: (none)
Description: (none)	HTTP port: 443	SSL: true
Tags: (none)	ESA version: 6.1	

[Edit properties...](#)

5.2

Connecting Directly to a Streaming Server

You can associate a Streaming Server with a deployment only if the Streaming Server has been onboarded to MindSphere as asset prior to this step. In the future, Edge Streaming Analytics informs Edge Streaming Manager automatically about Streaming Servers that exist in the Edge Streaming Analytics environment. You can configure the esm.xml file in Edge Streaming Analytics to enable Edge Streaming Analytics to pass this information to Edge Streaming Manager. For more information about the esm.xml file in a Linux environment, see Edge Streaming Manager. For more information about the esm.xml file in a Windows environment, see ["Start the Streaming Server" in Edge Streaming Manager for Windows: Deployment Guide](#).

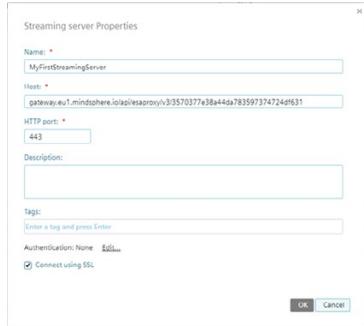
If Edge Streaming Manager is not aware of a particular Streaming Server, you can connect directly to that Streaming Server. A direct connection to a specific Streaming Server is necessary for each Streaming Server onboarded via MindConnect or the Streaming Server runs with VPN (future version).

5.2 Connecting Directly to a Streaming Server

To connect directly to a Streaming Server:

1. On the **Unassigned Servers** page, click .

The Streaming Server Properties window appears.



2. In the **Name** field, enter a name for the Streaming Server.
3. In the **Host** field, enter the MindSphere gateway proxy url and the asset id provided during the onboarding process. The MindSphere gateway proxy url is defined as follows:
`"gateway."{region}[-{env}].{mindsphere-domain}"/api/esaproxy/v3/"{asset-id}`
4. In the **HTTP port** field, replace the default value with the port number used for HTTP administration requests and for the HTTP publish/subscribe server.

Note

This port is specified in the http argument to the dfesp_xml_server command in Edge Streaming Analytics.

5. In the **Description** field, enter a description for the Streaming Server. For example, you can specify the purpose of this Streaming Server, to allow users to differentiate between Streaming Servers with similar names.
6. In the **Tags** field, you can attribute one or more tags to the Streaming Server.
To add a tag, enter text and press Enter. Tags can be used to group and filter Streaming Servers. Tags are single-term descriptors for the Streaming Server. Tags cannot contain spaces. Duplicate tags are not permitted on a single Streaming Server.
7. If required, change the setting for the **Authentication** field:
 - **None**: This is the default option.
8. If required, select the Connect using SSL check box. Selecting this check box is relevant only if the Streaming Server is configured to require SSL encryption.
9. Click **OK**.

The Streaming Server is displayed on the **Unassigned Servers** page, along with your other Streaming Servers. The **Unassigned Servers** page does not indicate which Streaming Servers were detected automatically and which ones you connected to directly.

You can now associate the Streaming Server with a deployment. For more information, see Add Streaming Servers 20.

5.3 Edit a Streaming Server

1. Open the Streaming Server if it is not already open: on the **Unassigned Servers** page, select the Streaming Server that you want to open and click .
- The Edit Streaming Server Properties window appears.
2. Edit the fields as required:
 - **Name:** Edit the name of the Streaming Server.
 - **Tags:** You can attribute one or more tags to the Streaming Server. To add a tag, enter text and press Enter. Tags can be used to group and filter Streaming Servers. Tags are single-term descriptors for the Streaming Server. Tags cannot contain spaces. Duplicate tags are not permitted on a single Streaming Server.
 - **Description:** Edit the description for the Streaming Server. For example, you can specify the purpose of this Streaming Server, to allow users to differentiate between Streaming Servers with similar names.
3. If required, change the setting for the **Authentication** field:
 - **None:** This is the default option.
4. If required, select the **Connect using SSL** check box. Selecting this check box is relevant only if the Streaming Server is configured to require SSL encryption.
5. Click **OK**.

5.4 Remove Streaming Servers

5.4.1 Remove Streaming Servers from a Deployment

Removing a Streaming Server from a deployment enables you to add that Streaming Server to another deployment.

Before you can remove a Streaming Server from a deployment, you must stop and unload any projects that were previously running on the Streaming Server. For more information, see Stop and Unload a Project 75.

To remove Streaming Servers from a deployment:

1. Open the deployment if it is not already open: on the **Deployments** page, select the deployment that you want to open and click .
- A separate page that displays the deployment opens.
2. Select the Streaming Servers that you want to remove. You can select multiple Streaming Servers by holding down the Ctrl key and using your mouse to select the Streaming Servers. You can also select all Streaming Servers by clicking .
3. Click .
4. If you want to remove the Streaming Servers from the deployment, select **Return the Streaming Servers to the list of unassigned servers** if you want to remove the Streaming

Servers from the deployment. If you want to remove the Streaming Servers from Edge Streaming Manager, select **Remove the Streaming Servers permanently**.

5.4.2 Remove Streaming Servers from Edge Streaming Manager

Removing a Streaming Server from Edge Streaming Manager means that Edge Streaming Manager is not aware of that Streaming Server. The Streaming Server itself continues to exist.

To remove a Streaming Server from Edge Streaming Manager, you must first remove it from any deployment that it belongs to. For more information, see Remove Streaming Servers 23.

Edge Streaming Manager is no longer aware of the Streaming Servers. However, the Streaming Servers themselves continue to exist.

Working with Projects

6.1 View a Project

6.1.1 Overview

You can create a project in Edge Streaming Creator or upload a project to Edge Streaming Creator. If you publish the project using Edge Streaming Creator, it becomes visible in Edge Streaming Manager. If you delete a published project in Edge Streaming Creator, it remains visible in Edge Streaming Manager.

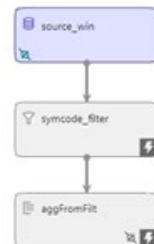
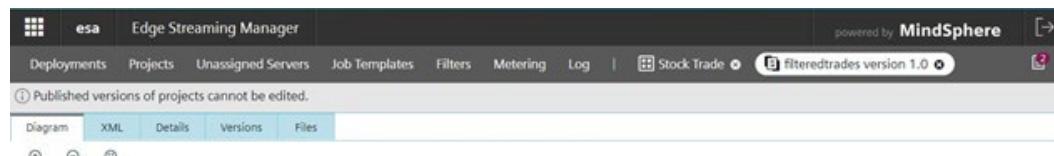
Note

For a project to be visible in Edge Streaming Manager, you must download it from Edge Streaming Creator and then upload it to Edge Streaming Manager. For more information, see [\(Optional\) Upload a Project 27](#).

To view detailed information about a project, select the project on the **Projects** page and click . A page with five tabs appears.

6.1.2 The Diagram Tab

The **Diagram** tab displays a graphical representation of the project's windows and edges. Each window can display icons that represent its state. For more information, see Edge Streaming Analytics Creator. The following figure shows an example of the **Diagram** tab:

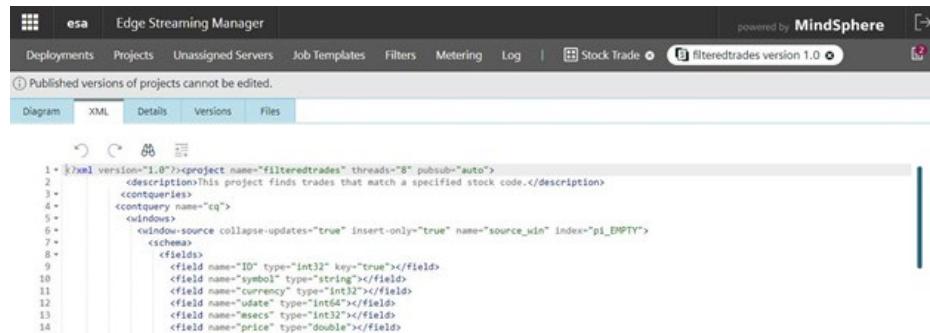


You can use the buttons on the toolbar to zoom in and out of the view, or to zoom to fit the view.

6.1 View a Project

6.1.3 The XML Tab

The **XML** tab displays a read-only view of the XML used to construct the model. You can collapse XML elements to restrict your view to the elements that you are interested in. The following figure shows an example of the XML tab:



```

1 <?xml version="1.0"?><project name="filteredtrades" threads="8" pubsub="auto">
2   <description>This project finds trades that match a specified stock code.</description>
3   <contqueries>
4     <contquery name="cq">
5       <outputs>
6         <window-source collapse-updates="true" insert-only="true" name="source_win" index="pi_EMPTY">
7           <schema>
8             <fields>
9               <field name="ID" type="int32" key="true"></fields>
10              <field name="symbol" type="string"></field>
11              <field name="currency" type="int32"></field>
12              <field name="udate" type="int64"></field>
13              <field name="mscs" type="int32"></field>
14              <field name="price" type="double"></field>

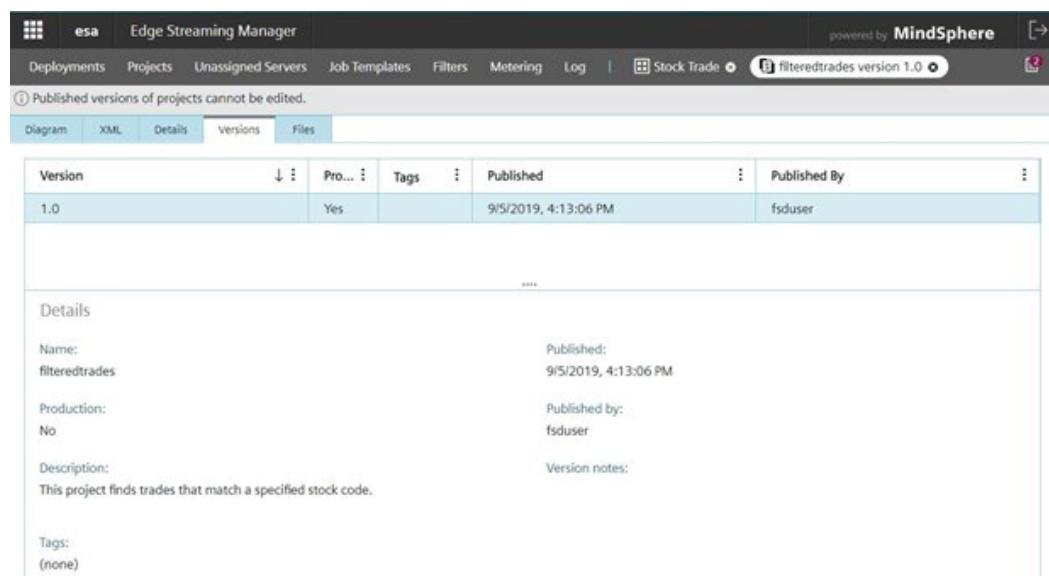
```

6.1.4 The Details Tab

The **Details** tab displays general information relating to the project entered when the current version of the project was uploaded. The following figure shows an example:

6.1.5 The Versions Tab

The **Versions** tab displays the current version and any previous versions of the project. The following figure shows an example:



Version	Pro...	Tags	Published	Published By
1.0	Yes		9/5/2019, 4:13:06 PM	fsduser

Details

Name:	Published:
filteredtrades	9/5/2019, 4:13:06 PM
Production:	Published by:
No	fsduser
Description:	Version notes:
This project finds trades that match a specified stock code.	
Tags:	
(none)	

To open a previous version, right-click it and select **Open project version**. A separate page appears where you can review the metadata and XML content relating to that version.

The major version is updated when you publish a new version of the project in Edge Streaming Creator. For example, the version is updated from 1.0 to 2.0.

6.2 Upload a Project

For a project to be visible in Edge Streaming Manager, you must download it from Edge Streaming Creator and then upload it to Edge Streaming Manager. For more information about downloading a project from Edge Streaming Creator, see [Edge Streaming Creator](#).

Before Edge Streaming Manager accepts an uploaded project, it validates the project's content against an active Streaming Server. Therefore, a Streaming Server must be available to Edge Streaming Manager before you attempt to upload a project.

To upload a project to Edge Streaming Manager:

1. On the **Projects** page, click  and select **Upload projects**. The Upload Projects window appears.
2. Click .
3. Navigate to the file that contains the project that you want to upload and click **Open**.

Note

If you want to upload multiple projects that are located in the same folder, you can select the relevant projects and upload them simultaneously. To select multiple projects, hold down the Ctrl key and select each project that you want to upload, and click **Open**. If your projects are located in different folders, click  again, select one or more relevant projects, and click **Open**.

4. Click **Upload**.

An icon is displayed to indicate whether the project was successfully uploaded. Successfully uploaded projects are indicated by the icon .

Projects that failed to upload are indicated by the icon .

5. Click **OK**.

The projects that you uploaded appear on the **Projects** page.

If the project fails validation, an error message appears. You can use the information in the message to correct the issue and then upload the project again.

When you upload a new version of a project that was updated in Edge Streaming Creator, the project's major version number is updated in Edge Streaming Manager. Change the Production Status of a Project 28.

Manager. For example, in Edge Streaming Creator, the version number in the project XML file is incremented from 1.0 to 2.0, and the updated version is displayed in Edge Streaming Manager. However, if you update the project XML file manually (that is, outside Edge Streaming Creator), then the version number is always set to 1.0. The version number is set to 1.0 even if the major and minor version numbers are set manually in the project XML file. To ensure that the version number is incremented as expected, update the project in Edge Streaming Creator.

6.3 Change the Production Status of a Project

Certain assets can be marked as production assets. For more information, see Production Assets 16.

To change the production status of a project, on the **Projects** page, right-click the project and select **Set as production** or **Remove as production**.

The Production column on the **Projects** page changes to reflect your choice.

Working with Filters

7.1

Filters

Edge Streaming Manager enables you to search for Streaming Servers that match certain criteria and save those criteria as a filter that you can reference in job templates. For example, you might want to deploy a project to Streaming Servers that have the tag primary. If the number of Streaming Servers that have this tag changes, a filter that references this tag still finds any matching Streaming Servers.

A filter contains a filter expression. The filter expression specifies the search criteria for Streaming Servers.

You can specify that a filter is available only to a specific deployment or that a filter is available for use with all deployments. For example, this means that the filters available to a deployment called Deployment1 include filters specific to that deployment as well as filters available to all deployments. However, filters specific to another deployment called Deployment2 are not available to Deployment1.

In addition, the Edge Streaming Manager user interface can show the result of applying a filter. This means that for a given deployment, the user interface lists the Streaming Servers that match the filter criteria. This functionality is different from applying a filter. A filter is applied when a job template that references the filter is deployed.

You can reference filters from the server filters and server filter selector elements in job templates. You can also specify a filter expression directly in the server filters element. For more information about the server filters element, see [server-filters 51](#). For more information about the server filter selector element, see [server-filter-selector 49](#).

In addition to creating filters yourself, there is one situation where Edge Streaming Manager constructs a filter expression that you can then save as a filter. If a job fails to execute on some Streaming Servers, Edge Streaming Manager enables you to save a filter that references those failed servers. For more information, see [Rerun a Job 74](#).

7.2

Working with Filters for a Specific Deployment

When you open a deployment, you can work with filters that are available for that specific deployment.

To work with filters that are available for use with all deployments, use the Filters page instead. For more information, see [Managing Filters 31](#).

7.2.1 Show the Result of Applying a Filter

Showing the result of applying a filter means showing only those Streaming Servers that match a selected filter. This functionality is different from applying a filter. A filter is applied when a job template that references the filter is deployed.

1. Open the deployment if it is not already open: on the **Deployments** page, select the deployment that you want to open and click .

A separate page opens to display the deployment.

2. Click  on the toolbar and select Advanced Filtering.

The **Advanced Filtering** area appears on the page.

3. In the drop-down list that displays the text Enter a filter expression, either select an existing filter or enter a filter expression. For more information, see Filter Expression Syntax 32.

4. Click **Apply** to see what the result of applying this filter would be.

The table on the page changes to display only those Streaming Servers that match the filter expression.

You can save your filter for further use. For more information, see Save a Filter 30.

To display all Streaming Servers in the table again, click **Clear**.

7.2.2 Save a Filter

1. Complete the steps in Show the Result of Applying a Filter 30.

2. Click **Save**.

The Filter Properties window appears.

3. Edit the fields as required:

- **Name:** The name of the filter. To rename an existing filter, enter a new name.
- To overwrite an existing filter, select the filter name from the drop-down list. The contents of all fields, except for **Filter expression**, are replaced with the values from the selected existing filter.
- **Description:** A description of the purpose of the filter.
- **Tags:** One or more tags attributed to the filter.

To add a tag, enter text and press Enter. Tags can be used to group and sort filters. Tags are single-term descriptors for the filter. Tags cannot contain spaces. Duplicate tags are not permitted on a single filter.

- **Filter expression:** A valid expression that defines the filter criteria. For more information, see Filter Expression Syntax 32.
- **Scope:** Select **One deployment** or **Any deployment**. If you select **One deployment**, the filter is assigned to the current deployment only. You cannot assign the filter to a different deployment on this page. This functionality is available only when you edit the filter on the **Filters** page. For more information, see Edit a Filter 32.

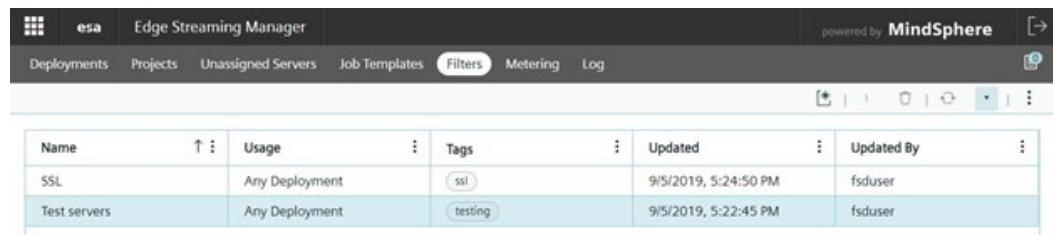
4. Click **OK**.

7.3 Managing Filters

The **Filters** page enables you to manage filters that are available in Edge Streaming Manager. This includes filters that are available for use only with specific deployments as well as filters that are available for use with all deployments.

7.3.1 Sort Filters

You can arrange the information in the table on the **Filters** page in several ways. However, you might find it particularly helpful to sort the table using the Usage column, so that filters available to different deployments or to all deployments are listed together. For more information about sorting tables, see [Arrange Information in Tables 14](#). The following figure shows an example where filters have been sorted using the Usage column:



The screenshot shows the Edge Streaming Manager interface with the 'Filters' tab selected. A table lists two filters: 'SSL' and 'Test servers'. The 'Usage' column is sorted, showing 'Any Deployment' for both. The 'Tags' column shows 'ssl' for 'SSL' and 'testing' for 'Test servers'. The 'Updated' column shows the date and time of creation. The 'Updated By' column shows 'fsduser' for both. The table has columns for Name, Usage, Tags, Updated, and Updated By.

Name	Usage	Tags	Updated	Updated By
SSL	Any Deployment	ssl	9/5/2019, 5:24:50 PM	fsduser
Test servers	Any Deployment	testing	9/5/2019, 5:22:45 PM	fsduser

7.3.2 Create a Filter

The Filters page enables you to create a filter by entering a filter expression. However, you cannot check the result of applying your filter on this page. This functionality is available only when you open the page for a specific deployment and enter a filter expression there. For more information, see [Working with Filters for a Specific Deployment 29](#).

1. Click .

The Filter Properties window appears.

2. Edit the fields as required:

- **Name:** The name of the filter.
- **Description:** A description of the purpose of the filter.
- **Tags:** One or more tags attributed to the filter.
- To add a tag, enter text and press Enter. Tags can be used to group and sort filters. Tags are single-term descriptors for the filter. Tags cannot contain spaces. Duplicate tags are not permitted on a single filter.
- **Filter expression:** A valid expression that defines the filter criteria. For more information, see [Filter Expression Syntax 32](#).
- **Scope:** Select **One deployment** and then select the desired deployment or select **Any deployment**.

3. Click **OK**.

7.3.3 Edit a Filter

1. Click .

The Filter Properties window appears.

2. Edit the fields as required. For more information about how to use the fields in this window, see Create a Filter 31.
3. Click **OK**.

7.3.4 Delete a Filter

1. Click .

The Delete Filter window appears.

2. Click **Delete**.

7.4 Filter Expression Syntax

Here are examples of supported filter expressions:

- `hostname='server1234.example.com'`
Finds Streaming Servers that are running on the host server1234.example.com.
- `label~'Test*'`
Finds Streaming Servers whose names begin with the characters Test and are followed by any other characters. For example, this filter finds a Streaming Server with the name Test_1 but not ESP_Test_1 or test_1.

Note

If the name of the Streaming Server contains an apostrophe, enclose the filter term in double quotation marks, and escape the apostrophe with a backslash or an apostrophe. For example, the filter `label~"SiteA's*"` finds a Streaming Server with the name SiteA's_ESP_server.

- `((tags='tag1')|(tags='tag2'))`
Finds Streaming Servers that have the tag tag1 or tag2 or both.
- `((tags='tag1')&(tags='tag2'))`
Finds Streaming Servers that have the tags tag1 and tag2.
- `((tags='tag1')&(tags='tag3')&!(tags='tag5'))`
Finds Streaming Servers that have the tags tag1 and tag3, but do not have the tag tag5.
- `metering=true`
Finds Streaming Servers whose hosts have metering enabled.

- **version='1.0'**
Finds Streaming Servers that run with Edge Streaming Analytics 1.0.
- **ssl=true**
Finds Streaming Servers with SSL authentication.
- **analyticsLicensed=true**
Finds Streaming Servers whose hosts have an Edge Streaming Analytics Analytics license installed.

Working with Job Templates

8.1 Job Template

A job template is an XML document that contains a set of instructions used to create a job. That is, a job template outlines the steps required to execute a project on a Streaming Server. When you deploy a job template, a job is created.

The job template also specifies what input you must supply when you deploy the job template. For example, when you deploy a job template that contains an instruction to load a project, Edge Streaming Manager prompts you to select the project that you want to load.

A job template contains the following high-level elements:

- `localization strings` – a collection of strings that display localized output.
- `parameters` – a collection of user parameters that allow a user to enter data into the deployment and customize a job template when it is deployed.
- `enumerations` – a collection of definitions that restrict user input when used with user parameters.
- `initialization` – a collection of definitions to replace placeholders to alter a project when it is deployed.
- `server filters` – a collection of definitions that specify filters for Streaming Servers.
- `instructions` – a collection of instructions that describe operations that must be performed to create or modify a deployment.
- `failure instructions` – a collection of instructions that attempt to return the system to normal operation after an instruction has failed to execute.

If the job template contains a `parameters` element, you are prompted to enter each of the user parameters when you deploy the job template. Edge Streaming Manager displays a list of projects and Streaming Servers that are available.

The string values from a job template's `localization strings` elements are used to construct labels used when specifying user parameters. After you have selected your user parameters, Edge Streaming Manager produces and executes a job derived

from the job template and the user parameters that you entered. As the job executes, you receive progress updates. The string values from the `localization strings` elements are used to display labels for each instruction.

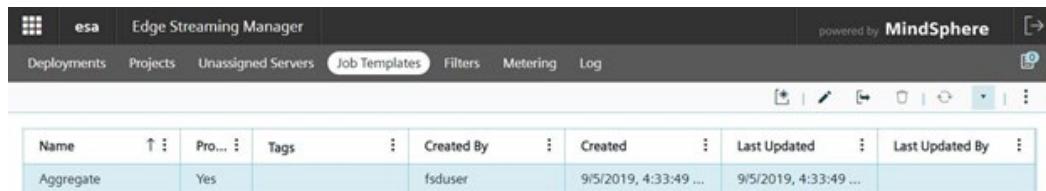
For example, job templates, see [Overview of Example Job Templates](#).

For more information about job template contents, see [Overview of Job Template Content](#) 40.

8.2 Create a Job Template

1. On the **Job Templates** page, click  .
The Create New Job Template window appears.
2. In the **Name** field, enter a unique ID for the job template.
3. In the **Description** field, you can enter the purpose of the job template.
4. In the **Tags** field, you can attribute one or more tags to the job template.
To add a tag, enter text and press Enter. Tags can be used to group and filter job templates. Tags are single-term descriptors for the job template. Tags cannot contain spaces. Duplicate tags are not permitted on a single job template.
5. If you want to create a production job template, select the **Production template** check box.
For more information, see Production Assets 22.
6. In the **Version notes** field, you can add notes to further describe the job template.
Adding notes is especially useful if you want to track changes between versions of the same job template within Edge Streaming Manager.
7. Click **OK**.

Your new job template appears on the **Job Templates** page. The following figure shows an example:



Name	Pro...	Tags	Created By	Created	Last Updated	Last Updated By
Aggregate	Yes		fsduser	9/5/2019, 4:33:49 ...	9/5/2019, 4:33:49 ...	

You must now add content to your job template to make it functional. For more information, see Edit a Job Template 37.

8.3 Upload a Job Template

To upload a job template:

1. On the **Job Templates** page, click  and select **Upload job template**.
The Upload Job Template window appears.
2. In the **File** field, click **Browse** and navigate to the location of your job template. Job templates must be in XML format.
3. In the **Tags** field, you can attribute one or more tags to the job template.
To add a tag, enter text and press Enter. Tags can be used to group and filter job templates. Tags are single-term descriptors for the job template. Tags cannot contain spaces. Duplicate tags are not permitted on a single job template.
4. If you want this job template to be a production job template, select the **Production template** check box. For more information, see Production Assets 16.

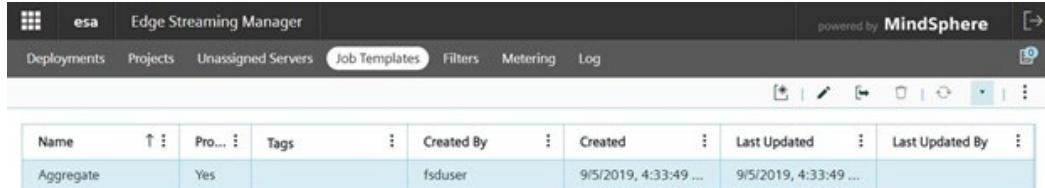
8.3 Upload a Job Template

5. In the **Version notes** field, you can add notes to further describe the job template.

Adding notes is especially useful if you want to track changes between versions of the same job template within Edge Streaming Manager.

6. Click **OK**.

When successfully uploaded, the job template appears on the **Job Templates** page. The following figure shows an example:



Name	Pro...	Tags	Created By	Created	Last Updated	Last Updated By
Aggregate	Yes		fsduser	9/5/2019, 4:33:49 ...	9/5/2019, 4:33:49 ...	

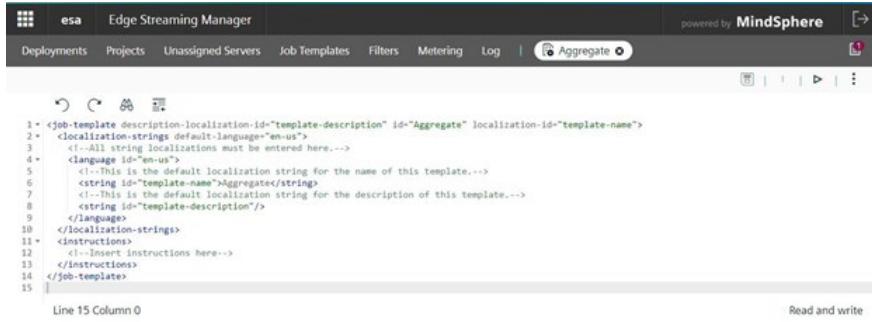
Note

If the job template fails validation, an error message appears. You can use the information in the message to correct the issue and then upload a revised job template.

8.4 Edit a Job Template

- On the **Job Templates** page, select the job template that you want to edit and click .

A separate page appears, displaying the XML that defines the job template. The following figure shows an example:



```

<job-template description-localization-id="template-description" id="Aggregate" localization-id="template-name">
  <localization-strings default-language="en-us">
    <!--All string localizations must be entered here.-->
    <string id="template-name">Aggregate</string>
    <!--This is the default localization string for the name of this template.-->
    <string id="template-description"><!--This is the default localization string for the description of this template.-->
      <!--Insert instructions here-->
    </instructions>
  </localization-strings>
</job-template>

```

Line 15 Column 0 Read and write

- Edit the content of the job template as required. For more information, see [Overview of Job Template Content 40](#).

The following table describes the buttons on the XML editor toolbar:

Icon	Action	Keyboard Shortcut
	Reverts your previous change.	Ctrl + Z
	Reverts the effects of the undo action.	Ctrl + Y
	Searches for specific text.	Ctrl + F
	Formats manually entered XML code.	not available

- Click . Alternatively, you can click  and select **Save template** as to save your changes as a new job template.

8.5 Change the Production Status of a Job Template

Certain assets can be marked as production assets. For more information, see [Production Assets 16](#).

To change the production status of a job template, on the **Job Templates** page, right-click the job template and select **Set as production** or **Remove as production**.

The Production column on the **Job Templates** page changes to reflect your choice.

8.6 Deploy a Job Template

1. On the **Job Templates** page, select a job template and click  .

The Job Template window appears.

2. In the **Deployment** field, select the deployment to which you want to deploy the job template.

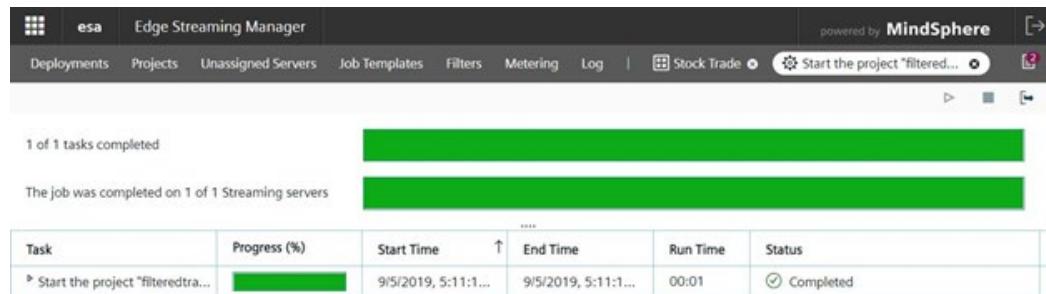
The Job Template window is refreshed to display additional fields, which reflect the `parameters` element of the job template that you are deploying. Complete these additional fields.

Note

By default, Edge Streaming Manager deploys the latest version of the project. To deploy a different version, select a value from the **Project version** drop-down list. You cannot specify the minor version number — instead, Edge Streaming Manager always uses the latest minor version of the specified major version.

3. Click **OK**.

Edge Streaming Manager creates a job from the job template that you deployed. The result of running the job is displayed on a new page. The following figure shows an example:



You can now monitor the running job. For more information, see Monitor Jobs 71.

You can also monitor the deployment. For more information, see Monitor Deployments 65.

For information about stopping a running job, see Stop a Running Job 74.

8.7 Download a Job Template

1. On the **Job Templates** page, select the job template that you want to download.
2. Click  and select **Download job template**.

The job template is downloaded to your computer. The location of the downloaded job template might vary depending on your browser's configuration.

8.8 Delete a Job Template

You can delete a job template if there are no running jobs that reference it. To delete a job template:

1. On the Job Templates page, select the job template that you want to delete.
 2. Click .
- The Delete Job Template window appears.
3. Click Yes to confirm the deletion.

Job Template Content

9.1 Overview of Job Template Content

The topics in this chapter contain information about the content that you can add to job templates.

For a high-level introduction to job templates, see Job Template 40.

For an overview of example job templates, see Overview of Example Job Templates.

9.2 Job Template

The `job-template` element is the top-level element in a job template. Here is an example:

```
<job-template id="test1"
  localization-id="template-name"
  description-localization-id="template-description"/>
<!-- The rest of the job template contents are added here. --&gt;
&lt;/job-template&gt;</pre>

```

Attributes	Description
<code>id</code>	This attribute specifies the unique identifier of this job template. <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression <code>[A-z0-9_]+</code>.
<code>localization-id</code>	This attribute references a string value for the job template name used in Edge Streaming Manager. <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression <code>[0-9A-z][0-9A-Z_-]+</code>.
<code>description-localization-id</code>	This attribute references a string value for a job template description used in Edge Streaming Manager. <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression <code>[0-9A-z][0-9A-Z_-]+</code>.

Child Elements	Description
localization-strings	<p>This element contains strings that display localized output.</p> <ul style="list-style-type: none"> • Required: Yes. • The localization-strings element must appear as the first child element of the job-template element. • For more information, see localization-strings 41.
parameters	<p>This element contains user parameters that allow a user to enter data into the deployment and customize a job template when it is deployed.</p> <ul style="list-style-type: none"> • Required: No. • The parameters element must appear before the initialization, • instructions, server-filters, and failure-instructions elements. • For more information, see parameters 43.
enumerations	<p>This element contains definitions that restrict user input when used with user parameters.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see enumerations 50.
initialization	<p>This element contains definitions to replace placeholders to alter a project when it is deployed.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see initialization 63.
server-filters	<p>This element specifies filters for Streaming Servers.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see server-filters 51.
instructions	<p>This element contains instructions that describe operations that must be performed to create or modify a deployment.</p> <ul style="list-style-type: none"> • Required: No. • The instructions element must appear before the failure-instructions element. • For more information, see instructions 52.
failure-instructions	<p>This element contains instructions that attempt to return the system to normal operation after an instruction has failed to execute.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see failure-instructions 62.

9.3 localization-strings

The localization-strings element of the job template contains the string values for the labels displayed by Edge Streaming Manager when executing that job template. Each string value is fully localizable within one or more language groups. The localization-strings element requires a default language.

Here is an example:

```
<job-template id="test1" localization-id="template-name"
description-localization-id="template-description">
<localization-strings default-language="en-us">
<language id="en-us">
<string id="template-name">test1</string>
<string id="template-description">Loads a project</string>
</language> </localization-strings>
```

Each string element has an id attribute that is referred to by other elements of the job template when a string value is required. In the example here, template-name and template-description are referred to in the top-level job-template element.

In the Edge Streaming Manager user interface, the string values are displayed in the following locations:

- On the **Job Templates** page.
- In the window that appears when you deploy a job template from the **Job Templates**.
- On the **Log** page when the job created from the job template is executing.

Attribute	Description
default-language	<p>This attribute specifies the language to be used if the user's current locale is not supported.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must correspond to a defined language identifier. The value must be a valid ISO locale code. The locale code must be lowercase and, in the format, aa-bb(for example: en-us).

Child Element	Description
language	<p>There must be one language element for each supported language and at least one that corresponds to the default-language attribute of the parent localization-strings element.</p>

Attribute	Description
id	<p>This attribute specifies the locale code for this language.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: A valid ISO locale code. The locale code must be lowercase and in the format aa-bb (for example: en-us).

Child Element	Description
string	<p>There must be one string element for each localization string.</p>

9.4 parameters

9.4.1 Overview of the parameters Element

The parameters element of the job template tells Edge Streaming Manager what user input to capture and assign to internally stored variables that can be referenced throughout the job template. The parameters element includes child elements whose purpose is to guide user input. These selectors restrict the user's text input or enable the user to select an option from a list. In the following example, the project-selector element enables the user to select from a list of projects stored in Edge Streaming Manager's repository:

```
<parameters>
<project-selector id="projectSelector" localizationid="projectSelectorLabel" required="true"/>
</parameters>
```

You can nest some selectors inside other selectors. For example, information might be needed to populate available values for the selector in the user interface. In addition, you might need to show some parameters only upon selection of a valid value for another parameter. In such cases, the selectors should be nested inside each other, as shown in the following example:

```
<parameters>
<project-selector id="projectSelector"
localization-id="projectSelectorLabel"
required="true">
<query-selector id="querySelector"
localization-id="checkQuery" required="true">
<window-selector id="windowSelector"
localization-id="checkWindow"
required="true"/>
</query-selector>
</project-selector>
</parameters>
```

Table 9- 1 Properties of the parameters XML Element

Child Element	Description
project-selector	This element enables the user to select from a list of projects stored in Edge Streaming Manager's repository. For more information, see project-selector 45.
server-selector	This element enables the user to select from a list of Streaming Servers that are managed by Edge Streaming Manager. For more information, see server-filters 51.

Child Element	Description
running-project-selector	This element enables the user to select a project that is either running on a specific Edge Streaming Analytics server or contained in a project that has been published in Edge Streaming Creator. For more information, see running-project-selector 46 .
text-input-selector	This element enables the user to enter a text string that is checked against a regular expression. For more information, see text-input-selector 47 .
query-selector	This element enables the user to select a currently running continuous query inside a project on a specific Edge Streaming Analytics server. For more information, see query-selector 48 .
window-selector	This element enables the user to select a currently running window within a continuous query inside a project on a specific Edge Streaming Analytics server. For more information, see window-selector 48 .
enum-selector	This element enables the user to select from a list of Unrestricted values of an enumeration defined either globally or locally in the deployment. For more information, see enum-selector 48 .
server-filter-selector	This element enables the user to select a previously created filter. For more information, see server-filter-selector 49 .

9.4.2 Common Attributes of Selectors

Selectors have some common attributes, as shown in the following table:

Table 9- 2 Common Attributes of Selectors

Attributes	Description
id	<p>This attribute specifies the unique identifier of the selector. This identifier is placed into the execution context.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must match the regular expression [0-9A-z][0-9A-Z_-]+.
localization-id	<p>This attribute specifies the localization string ID.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must exist in the default language localization-strings element.

Attributes	Description
required	<p>This attribute indicates whether it is mandatory for the user to provide input. If you set this attribute to true, the user must provide input, and an asterisk (*) is displayed next to the user interface control to indicate this to the user.</p> <ul style="list-style-type: none"> Required: No. Valid values: true and false.
validation-localization	<p>This attribute specifies the localization string ID that is displayed if validation fails.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must exist in the default language localization-strings element.

When a user selects the value of a selector, that value is stored internally by Edge Streaming Manager. You can reference this value in the job template by the selector's id value. To do this, enclose the id value in braces: { and }.

An id value can have one or more attributes. To access these attributes, use a dot (.) notation. For example, if the selector's id value is alpha and this id value has the attribute beta, you can reference the selector by writing {alpha.beta}. Additional examples are provided in the following sections, where each selector is discussed in more detail.

9.4.3 project-selector

The project-selector element enables the user to select from a list of projects stored in Edge Streaming Manager's repository. This action produces a project object that has the following variables:

- id: the unique identifier of the project that has been selected by the user
- version: the major version number of the project that has been selected by the user.
- friendlyName: the name of the project that has been selected by the user.

The friendlyName project object can be particularly useful if you need to identify the project using its name rather than its identifier. For example, some Edge Streaming Analytics adapters need to reference the project name.

The project-selector element is a top-level selector and does not need to be nested inside any other selectors to function properly.

When deploying a job template, the user is prompted to select the project version. By default, the latest major version of the project is selected.

The project-selector element is useful for choosing a project that is then published to the Streaming Server. An example from a simplified job template is shown here:

```
<parameters>
<project-selector id="projectSelector" localizationid="projectSelectorLabel" required="true" />
<server-selector id="serverSelector" localization-id="serverLabel" required="true" />
</parameters>
```

```

<server-filters>
<server-filter id="serverFilter" filter-
expression="(objectId='{serverSelector.id}')" />
</server-filters/>
<instructions>
<load-project id="loadProjectInstruction" localizationid="
loadProjectLabel" server-filter="serverFilter" project-
id="{projectSelector.id}" project-
version="{projectSelector.version}" running-project-
name="{projectSelector.friendlyName}" start="true" />
</instructions>

```

9.4.4

server-selector

The server-selector element enables the user to select from a list of Streaming Servers that are associated with the selected deployment. This action produces a Streaming Server object that has the following variable:

id: the unique identifier of the Streaming Server that has been selected by the user.

The server-selector element is a top-level selector and does not need to be nested inside any other selectors to function properly.

Alongside the project-selector element, the server-selector element is one of the most commonly used parameter types. The server-selector element is typically used to help define a server-filter element, as shown in the simplified example job template here:

```

<parameters>
<project-selector id="projectSelector" localizationid="
projectSelectorLabel" required="true" />
<server-selector id="serverSelector" localization-id="serverLabel"
required="true" />
</parameters>
<server-filters>
<server-filter id="serverFilter" filter-
expression="(objectId='{serverSelector.id}')" />
</server-filters/>
<instructions>
<load-project id="loadProjectInstruction" localizationid="
loadProjectLabel" server-filter="serverFilter" project-
id="{projectSelector.id}" project-
version="{projectSelector.version}" running-project-
name="{projectSelector.friendlyName}" start="true" />
</instructions>

```

9.4.5

running-project-selector

The running-project-selector element enables the user to select a project that is either running on a specific Edge Streaming Analytics server or contained in a project that has been published in Edge Streaming Creator. This action produces a project object that has the following variable:

`id`: the unique identifier of the project that has been selected by the user the running-project-selector element must be nested inside a server-selector element to function properly.

Not all job templates relate to new installations. In some cases, you might need to make changes to existing projects or unload existing projects to complete the deployment successfully. The example here demonstrates how the following tasks are performed:

1. prompts the user to select a Streaming Server.
2. prompts the user to select a project.
3. stops the selected project running on that server.

```
<parameters>
<server-selector id="serverSelector" localization-id="serverLabel"
required="true"
<running-project-selector id="runningProjectSelector"
localizationid=" runningProjectLabel" required="true" />
</server-selector>
</parameters>
<server-filters>
<server-filter id="serverFilter" filter-
expression="(objectId='{serverSelector.id}')" />
</server-filters/>
<instructions>
<stop-project id="stopProjectInstruction" localizationid=""
stopProjectLabel" server-filter="serverFilter" running-project-
name="{runningProjectSelector.friendlyName}" />
</instructions>
```

Note

The stop-project instruction stops the project. To entirely unload a project, use the unload-project instruction. For more information, see [unload-project 60](#).

9.4.6 text-input-selector

The text-input-selector element enables the user to enter a text string that is checked against a regular expression. This action produces a string object that can be used throughout the job template.

The text-input-selector element is a top-level selector and does not need to be nested inside any other selectors to function properly. In addition to properties common to all selectors (for more information, see [Common Attributes of Instructions](#) and the [group Element 55](#)), the text—input-selector element has the XML attribute shown in the following table:

Attributes	Description
<code>validation-expression</code>	<p>This attribute defines the regular expression that is used to perform validation.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: The valid regular expression.

In the following example, the user's choice of a project name is Unrestricted so that the name must begin with a letter. The remainder of the string must contain letters, numbers, or underscores. If validation fails, the localized string defined in project-not-valid is displayed to the user.

```
<parameters>
<project-selector id="projectSelector" localizationid="projectSelectorLabel" required="true" />
<server-selector id="serverSelector" localization-id="serverLabel" required="true" />
<text-input-selector id=" projectName" localizationid="invalidProjectLabel" required="true" validation-expression="^ [A-Z] [A-z0-9_]+ $" validation-localizationid=" project-not-valid" />
</parameters>
<server-filters>
<server-filter id="filter1" filter-expression="(objectId='{server.id}')" />
<server-filters/> <instructions> <load-project id="loadProjectInstruction" localizationid=" loadProjectLabel" server-filter="serverFilter" project-id="{projectSelector.id}" project-version="{projectSelector.version}" running-projectname="{projectSelector}" start="true" />
</instructions>
```

9.4.7 query-selector

The query-selector element enables the user to select a currently running continuous query inside a project on a particular Edge Streaming Analytics server. This action produces a query object with the following variable: id: the unique identifier of the query that has been selected by the user. The query-selector element must be nested inside a project-selector element or a running-project-selector element to function properly.

9.4.8 window-selector

The window-selector element enables the user to select a currently running window within a continuous query inside a project on a particular Edge Streaming Analytics server. This action produces a query object with the following variable:

id: the unique identifier of the window that has been selected by the user

The window-selector element must be nested inside a query-selector element to function properly.

9.4.9 enum-selector

The enum-selector element enables the user to select from a list of Unrestricted values of an enumeration defined either globally or locally in the deployment. This action produces a string that can then be used anywhere in the job template.

The enum-selector element is a top-level selector and does not need to be nested inside any other selectors to function properly.

In addition to properties common to all selectors (for more information, see [Common Attributes of Selectors 44](#)), the enum-selector element has the XML attribute shown in the following table:

Table 9- 3 Properties of the enum–selector XML Element

Attributes	Description
source	<p>This attribute provides additional information about the source of the data.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: The name of a defined enumeration.

For more information about enumerations, see [enumerations 50](#).

9.4.10 server-filter-selector

The server-filter-selector element enables the user to select a filter. A separate window is displayed to the user. The window lists filters available only to the specific deployment as well as filters available for use with all deployments. The window also provides additional details (such as the filter expression) for each filter to help the user select an appropriate filter.

For more information, see [Filters 29](#).

The server-filter-selector element does not need to be nested inside any other selectors to function properly.

Here is an example:

```
<parameters>
<server-filter-selector id="failedServerFilter" required="true"
localization-id="serverFilterLabel" />
</parameters>
<server-filters>
<server-filter id="filter1" filter-
expression="{failedServerFilter.filterExpression}">
</server-filters>
<instructions>
<group id="group1" localization-id="groupLabel" serverfilter="
filter1">
<!-- appropriate instructions are added here -->
</group>
</instructions>
```

This simplified example shows a server-filter-selector element called serverFilter. This element is then referenced in a server-filter element called filter1. This means that the set of Streaming Servers included in filter1 is the set of Streaming Servers returned by whichever filter a user selects for the serverFilter selector. Within the instruction's element, the group element called group1 then refers to filter1. In this way, you can specify a group of instructions to execute against a set of

Streaming Servers that a user selects. The strings shown in this example must be referenced in the localization-strings element, which is not shown in the example code here.

9.5 enumerations

An enumeration is a finite list of options that is presented to the user to restrict input. Each job template can support the declaration of local localized enumerations. Such declarations are optional. The enumerations element of the job template specifies a set of enumerations that can be used in the deployment. Each enumeration is fully localized and produces output to the user in the user's specified locale (subject to the job template supporting the locale). Here is an example enumerations element that defines a single enumeration:

```
<enumerations>
<enumeration id="country">
<enumeration-value id="USA" localization-id="united-states" />
<enumeration-value id="UK" localization-id="united-kingdom" />
</enumeration>
</enumerations>
```

Table 9- 4 Properties of the enumerations XML Element

Child Element	Description
enumeration	There must be one enumeration element for each enumeration.

Table 9- 5 Properties of the enumeration XML Element

Attribute	Description
id	<p>This attribute specifies the unique identifier of the enumeration. If a global enumeration with the same identifier is defined, this one takes precedence.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression [0-9A-z][0-9A-Z_-]+.

Child Element	Description
enumeration-value	Each distinct value in the enumeration must be listed as a child element.

9.6 server-filters

The server filters element specifies filters for Streaming Servers. A filter resolves to a set of Streaming Servers to which the project will be deployed or with which the project is associated. For more information about how filters work, see Filters 29.

Table 9- 6 Properties of the server-filters XML Element

Child Element	Description
server-filter	This element specifies a filter for Streaming Servers.

Table 9- 7 Properties of the server-filter XML Element

Attribute	Description
id	<p>This attribute specifies the unique identifier of the server-filter element.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression [0-9A-z][0-9A-Z_-]+.
localization-id	<p>This attribute specifies the localization string ID. If a job fails, Edge Streaming Manager enables the user to create a filter that references the failed Streaming Servers (for more information, see Rerun a Job 74). The job template that was used to create the failed job can include multiple <code>server-filter</code> elements. In this case, Edge Streaming Manager creates a separate filter for each Streaming Server group on which the job failed. (For more information about the <code>group</code> element, group 60.) The <code>id</code> attribute of the relevant <code>server-filter</code> element is added to the filter name that is entered by the user.</p> <p>If the <code>server-filter</code> element includes a <code>localization-id</code> attribute, this attribute's value is used instead of the <code>id</code> attribute to provide a friendly, localizable name. If a translated string is available in the user's language, that translation is used. If no translated string is available, the value of the <code>id</code> attribute is used instead.</p> <ul style="list-style-type: none"> Valid values: This value must exist in the default language information within the <code>localization-strings</code> element.
filter-expression	<p>This attribute contains a filter expression or references a previously saved filter (which contains a filter expression).</p> <ul style="list-style-type: none"> Required: Yes. Valid values: A valid filter expression or the name of a previously saved filter. For more information, see Filter Expression Syntax 32.

Here is an example where the `filter-expression` attribute references an existing filter called `failedserverfilter1`:

```
<server-filters>
<server-filter id="filter1"
filter-expression="{failedserverfilter1.filterExpression}" />
</server-filters>
```

Here is a second example, where the `filter-expression` attribute includes a filter expression:

In this second example, the filter expression contains a `{server.id}` variable. This code extract is from the Stock Trade example, where the `{server.id}` variable references the `server-selector` element (within the `parameters` element). The filter resolves to the Streaming Server selected by the user when the job template is deployed. For more information, see Example Job Template: Stock Trade.

The `server-filters` element can also be used together with the `server-filter-selector` element (within the `parameters` element). In addition, a `server-filter` element can be referenced from a group element (within the `instructions` element). For more information, including additional example code, see server-filter-selector 49.

9.7 instructions

The `instructions` element is at the core of the job template. It contains the commands that Edge Streaming Manager executes. The `instructions` often contain identifiers for selectors used with the `parameter's` element, as well as string identifiers from the `localization-strings` element.

9.7.1 instructions

The `instructions` element is the parent element that contains specific instructions.

Here is an example that shows the outline of the instruction's element. The details of the `stop-project` and `unload-project` instructions have been removed.

```
<instructions>
<stop-project <!-- The details for the stop-project instruction are
added here. --> />
<unload-project <!-- The details for the unload-project instruction
are added here. --> />
</instructions>
```

The `instructions` element can also contain a `group` element that groups instructions together.

Here is an example. The details of the elements have been removed.

```
<instructions>
<group <!-- The attributes of the first group element are added
here.--> >
<load-project <!-- The details for the load-project instruction are
added here. --> />
<start-project <!-- The details for the start-project instruction
are added here. --> />
<start-connectors <!-- The details for the start-connectors
instruction are added here. --> />
```

```

</group>
<group <!-- The attributes of the second group element are added here. --> >
<load-project <!-- The details for the load-project instruction are added here. --> />
<start-project <!-- The details for the start-project instruction are added here. --> />
<start-connectors <!-- The details for the start-connectors instruction are added here. --> />
</group>
</instructions>

```

Table 9-8 Properties of the instructions XML Element

Attributes	Description
server-filter	<p>This attribute specifies a filter for Streaming Servers. The filter resolves to a set of Streaming Servers to which the project will be deployed or with which the project is associated.</p> <p>server-filter attribute. This attribute can be included in the instruction itself or in the enclosing group element or instructions element.</p> <p>A server-filter attribute on a child element overrides a server-filter attribute on a parent element. For example, a server-filter attribute on a specific instruction overrides a server-filter attribute on the parent instructions element.</p> <ul style="list-style-type: none"> Valid values: The ID of a server-filter element. For more information, see server-filters 51.
on-failure	<p>This attribute specifies how Edge Streaming Manager handles an instruction that fails to execute. By default, if an instruction fails to execute, any instructions that depend on the failed instruction are canceled. You can use the on-failure attribute to specify different behavior.</p> <ul style="list-style-type: none"> Required: No. This attribute can be included in a specific instruction or in the enclosing group element or instructions element. An on-failure attribute on a child element overrides an on-failure attribute on a parent element. For example, an on-failure attribute on a specific instruction overrides an on-failure attribute on the parent instructions element. Valid values: continue. Setting the on-failure attribute to continue means that dependent instructions will be executed even if the original instruction fails. If you do not want this to happen, remove the on-failure attribute.

Child Elements	Description
load-project	<p>This instruction takes a specific project that has previously been published in Edge Streaming Creator and loads it to an active Streaming Server.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see load-project 57.
start-project	<p>This instruction starts an already loaded Edge Streaming Analytics project.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see start-project 58.
start-connectors	<p>This instruction starts any connectors associated with a published Edge Streaming Analytics project.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see start-connectors 58.
modify-project	<p>This instruction updates an existing running project, subject to the rules imposed by Edge Streaming Analytics.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see modify-project 58.
stop-project	<p>This instruction stops a published Edge Streaming Analytics project. Stopping a project does not remove the project, but it stops any new connections to it.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see stop-project 60.
unload-project	<p>This instruction unloads a published Edge Streaming Analytics project.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see unload-project 60.
group	<p>This element groups instructions together.</p> <ul style="list-style-type: none"> • Required: No. • For more information, see group 60.

9.7.2 Common Attributes of Instructions and the group Element

Instructions and the group element have some common attributes, as shown in the following table:

Attributes	Description
id	<p>This attribute specifies the unique identifier of the instruction or the group element.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression [0-9A-Z][0-9A-Z_-]+.
localization-id	<p>This attribute specifies the localization string ID.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must exist in the default language information within the localization strings element.
server-filter	<p>This attribute specifies a filter for Streaming Servers. The filter resolves to a set of Streaming Servers to which the project will be deployed or with which the project is associated.</p> <ul style="list-style-type: none"> Required: Each instruction must have a server filter attribute. This attribute can be included in the instruction itself or in the enclosing group element or instructions element. A server filter attribute on a child element overrides a server filter attribute on a parent element. For example, a server filter attribute on a specific instruction overrides a server filter attribute on the parent instructions element. Valid values: The ID of a server filter element. For more information, see server-filters 51.

Attributes	Description
on-failure	<p>This attribute specifies how Edge Streaming Manager handles an instruction that fails to execute. By default, if an instruction fails to execute, any instructions that depend on the failed instruction are canceled. You can use the on-failure attribute to specify different behavior.</p> <ul style="list-style-type: none"> Required: No. This attribute can be included in a specific instruction or in the enclosing group element or instructions element. An on-failure attribute on a child element overrides an on-failure attribute on a parent element. For example, an on-failure attribute on a specific instruction overrides an on-failure attribute on the parent instructions element. Valid values: continue. Setting the on-failure attribute to continue means that dependent instructions will be executed even if the original instruction fails. If you do not want this to happen, remove the on-failure attribute.
depends-on	<p>This attribute lists the instructions that this instruction or group depends on.</p> <ul style="list-style-type: none"> Required: No. Valid values: The values of id attributes of other instructions in the same job template.

The common attributes have been omitted from subsequent sections, which describe additional XML properties for each instruction and the group element.

9.7.3 load-project

This instruction takes a specific project that has previously been published in Edge Streaming Creator and loads it to an active Streaming Server. In addition to properties common to all instructions (for more information, see Common Attributes of Instructions and the group Element 55) the load-project instruction has the XML attributes shown in the following table:

Table 9- 9 Properties of the load-project XML Element

Attributes	Description
project-id	<p>This attribute specifies the ID of the project to be loaded to the Edge Streaming Analytics factory server. The project ID is generated by Edge Streaming Creator when a project is published. The ID is available using the project selector element, or the literal value can be obtained from the application when viewing the project metadata.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: A valid project ID stored internally by Edge Streaming Manager.
project-version	<p>This attribute specifies the major version of the project to be published to the Edge Streaming Analytics factory server.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: A valid project version, which is specified by using the {project.version} placeholder. Project XML files created in Edge Streaming Creator 5.2 and later versions contain separate variables that correspond to a project's major version number and a project's minor version number. This attribute specifies a project's major version number as follows: project version="{project.version}". You cannot specify the minor version number. Instead, Edge Streaming Analytics always uses the latest minor version of the specified major version.
running-project-name	<p>This attribute specifies the name of the Edge Streaming Analytics project that you want to use to publish the model.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression [A z0 9_]+.
start	<p>This attribute specifies whether the project starts automatically.</p> <p>If set to true, the project automatically starts upon publication. Otherwise, a manual start project instruction is required. The default value is true.</p> <ul style="list-style-type: none"> Required: No. Valid values: true or false.

9.7.4 start-project

This instruction starts an already loaded Edge Streaming Analytics project. In addition to properties common to all instructions (for more information, see Common Attributes of Instructions and the group Element 55), the start project instruction has the XML attributes shown in the following table:

Table 9- 10 Properties of the start-project XML Element

Attributes	Description
running-project-name	<p>This attribute specifies the name of the Edge Streaming Analytics project that you want to use to publish the model.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression [A z0 9_]+.

9.7.5 start-connectors

This instruction starts any connectors associated with a published Edge Streaming Analytics project. In addition to properties common to all instructions (for more information, see Common Attributes of Instructions and the group Element 55), the start connectors instruction has the XML attributes shown in the following table:

Table 9- 11 Properties of the start-connectors XML Element

Attributes	Description
running-project-name	<p>This attribute specifies the name of the Edge Streaming Analytics project that you want to use to publish the model.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must match the regular expression [A z0 9_]+.

9.7.6 modify-project

This instruction updates an existing running project, subject to the rules imposed by Edge Streaming Analytics. The modify project instruction uses the following Edge Streaming Analytics command to set the state of the project to modified:

```
PUT http://<server>:<port>/SASESP/projects/<projectId>/state?value=modified
```

In addition to properties common to all instructions (for more information, see Common Attributes of Instructions and the group Element 55), the modify project instruction has the XML attributes shown in the following table:

Table 9- 12 Properties of the modify-project XML Element

Attributes	Description
project-id	<p>This attribute specifies the ID of the project to be loaded to the Edge Streaming Analytics factory server. The project ID is generated by Edge Streaming Creator when a project is published. The ID is available using the project selector element, or the literal value can be obtained from the application when viewing the project metadata.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: A valid project ID stored internally by Edge Streaming Manager.
project-version	<p>This attribute specifies the version of the project to be published to the Edge Streaming Analytics factory server.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: A valid project version, which is specified by using the {project.version} placeholder. Project XML files created in Edge Streaming Creator 5.2 and later versions contain separate variables that correspond to a project's major version number and a project's minor version number. This attribute specifies a project's major version number as follows: project version="{project.version}". You cannot specify the minor version number. Instead, Edge Streaming Analytics always uses the latest minor version of the specified major version.
running-project-name	<p>This attribute specifies the name of the Edge Streaming Analytics project that you want to use to publish the model.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must match the regular expression [A z0 9_]+.

9.7.7**stop-project**

This instruction stops a published Edge Streaming Analytics project. Stopping a project does not remove the project, but it stops any new connections to it. In addition to properties common to all instructions (for more information, see Common Attributes of Instructions and the group Element 55), the stop project instruction has the XML attributes shown in the following table:

Table 9- 13 Properties of the stop-project XML Element

Attributes	Description
running-project-name	<p>This attribute specifies the name of the Edge Streaming Analytics project to stop.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must match the regular expression [A z0 9_]+.

For an example of how to use the stop project instruction, see Example Job Template: Stop a Project.

9.7.8**unload-project**

This instruction unloads a published Edge Streaming Analytics project. In addition to properties common to all instructions (for more information, see Common Attributes of Instructions and the group Element 55), the unload project instruction has the XML attributes shown in the following table:

Table 9- 14 Properties of the unload-project XML Element

Attributes	Description
running-project-name	<p>This attribute specifies the name of the Edge Streaming Analytics project to unload.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must match the regular expression [A z0 9_]+.

For an example of how to use the unload project instruction, (see Example Job Template: Stop a Project. If a project is reported as missing  in the Running Projects tile, you might not be able to unload it using the unload project instruction. For more information, see Stop a Running Job 74.

9.7.9**group**

The group element enables you to group instructions together. Grouping instructions can make it easier to manage common dependencies. Grouping instructions also enables you to execute a job on several Streaming Servers.

In addition to properties common to instructions (for more information, see Common Attributes of Instructions and the group Element 55), the group element has the XML properties shown in the following table:

Table 9- 15 Properties of the group XML Element

Child Elements	Description
instruction	Any type of instruction is permitted inside a group element.

Here is an example in which two projects are deployed to two different sets of Streaming Servers:

```
<instructions>
<group id="startgroup1" localization-id="startgroup1" server-
filter="filter1">
<load-project id="load-project1" localization-id="load-project"
project-id="{project1.id}"
project-version="{project1.version}" running-project-
name="{project1display}" start="false" />
<start-project id="start-project1" localization-id="start-project"
running-project-name="{project1}" depends-on="load-project1" />
<start-connectors id="start-connectors1" localization-id="start-
connectors" running-project-name="{project1}" depends-on="start-
project1" />
</group>
<group id="startgroup2" localization-id="startgroup2" server-
filter="filter2">
<load-project id="load-project2" localization-id="load-project"
project-id="{project2.id}"
project-version="{project2.version}" running-project-
name="{project2display}" start="false" />
<start-project id="start-project2" localization-id="start-project"
running-project-name="{project2}" depends-on="load-project2" />
<start-connectors id="start-connectors2" localization-id="start-
connectors" running-project-name="{project2}" depends-on="start-
project2" />
</group>
</instructions>
```

The first group element provides instructions for loading and starting a project and for starting connectors. When a user deploys the template, the user selects the project to deploy (project1) and enters a display name for the project (project1display).

These strings must be referenced in the localization strings element (these are not shown in the example code here). The project is deployed to a set of Streaming Servers that match a filter (filter1). This filter must be referenced in the server—filters element (this is not shown in the example code here).

Similarly, the second group element enables the user to select a second project to deploy to another set of Streaming Servers.

9.8 failure-instructions

An element called failure instructions is activated if any of the commands in the instructions element of the job template fail. The failure instructions element has the same child elements as the instruction's element. That is, the failure instructions element can contain any instructions as well as the group element. For more information, see instructions 52.

Table 9- 16 Properties of the group XML Element

Attributes	Description
localization-id	<p>This attribute specifies the localization string ID.</p> <ul style="list-style-type: none"> Required: Yes. Valid values: This value must exist in the default language localization strings element.
server-filter	<p>This attribute specifies a filter for Streaming Servers. The filter resolves to a set of Streaming Servers to which the project will be deployed or with which the project is associated.</p> <ul style="list-style-type: none"> Required: Each instruction must have a server filter attribute. This attribute can be included in the instruction itself or in the enclosing group element or failure instructions element. A server filter attribute on a child element overrides a server filter attribute on a parent element. For example, a server filter attribute on a specific instruction overrides a server filter attribute on the parent failure instructions element. Valid values: The ID of a server filter element. For more information, see server-filters 51.
on-failure	<p>This attribute specifies how Edge Streaming Manager handles a failure instruction that fails to execute. By default, if an instruction fails to execute, any instructions that depend on the failed instruction are canceled. You can use the on-failure attribute to specify different behavior.</p> <ul style="list-style-type: none"> Required: No. This attribute can be included in a specific instruction or in the enclosing group element or failure instructions element. An on-failure attribute on a child element overrides an on-failure attribute on a parent element. For example, an on-failure attribute on a specific instruction overrides an on-failure attribute on the parent failure instructions element. Valid values: continue. Setting the on-failure attribute to continue means that dependent instructions will be executed even if the original instruction fails. If you do not want this to happen, remove the on-failure attribute.

Child Elements	Description
failure-instructions	The failure instructions element has the same child elements as the instruction's element. That is, the failure instructions element can contain any instructions as well as the group element. For more information, see instructions 52.

Here is an example of a failure instructions element:

```
<failure-instructions localization-id="recovery-steps">
<unload-project id="unload" localization-id="unload" server-
filter="filter1" project="example_proj" />
</failure-instructions>
```

9.9 initialization

You can use the initialization element of the job template to alter Edge Streaming Analytics projects as the projects are deployed by using the project transformation instruction. The transform looks for a placeholder variable in the project and replaces it with the contents of the XML element. Here is an example:

```
<initialization>
<project>
<project-transformation id="transformed-project" project-
id="{project.id}"
project-version="{project.version}">
<placeholder id="lang">{language}</placeholder>
</project-transformation>
</projects>
</initialization>
```

Variables used for {project} are resolved at execution when the user selects a project. This is defined in the parameter's element of the job template. The placeholder element within the initialization element has an attribute id that is set to the value of the placeholder in the project. In the example here, the project for deployment uses the Edge Streaming Analytics Twitter adapter. The placeholder allows the user to set the language to filter on when deploying: <expression>tw_Lang == '{lang}'</expression>

Table 9- 17 Properties of the placeholder XML Element

Attributes	Description
id	<p>This attribute specifies the placeholder as it appears in the project.</p> <ul style="list-style-type: none"> • Required: Yes. • Valid values: This value must match the value of the placeholder in the project.

9.9 initialization

Child Elements	Description
placeholder	This content specifies the value that the placeholder resolves to. The content can be a job template variable enclosed in braces: { and }.

Monitoring a Deployment

10.1 Monitor Deployments

You can use Edge Streaming Manager to review details of the active deployments in an Edge Streaming Analytics environment.

10.1.1 Monitor All Deployments

The **Deployments** page displays any active deployments in your Edge Streaming Analytics environment.

The **Deployments** page displays the following information about the deployment:

The screenshot shows the Edge Streaming Manager interface with the 'Deployments' tab selected. The main area displays a table with one row for the 'Stock Trade' deployment. The table columns are: Status (green circle with '2'), Name (Stock Trade), Product... (Yes), Tags (empty), Last Updated (9/5/2019, 4:21:01 PM), and Last Updated By (fduser). Below the table, there are two sections: 'Streaming server Status - Stock Trade' (showing 2 available servers) and 'Running Projects' (listing 'filteredtrades' with version 1.0 and 1 instance).

Status	Name	Product...	Tags	Last Updated	Last Updated By
2	Stock Trade	Yes		9/5/2019, 4:21:01 PM	fduser

Project	Vers...	Tags	Number of Instances
filteredtrades	1.0		1

Figure 10-1 Deployments Page with Three Deployments

- The number of Streaming Servers associated with the deployment.
- The status of the Streaming Servers associated with the deployment.
- The deployment's name. If the deployment has a description, it is displayed as a tooltip when you place the cursor over the deployment name.
- Whether the deployment is a production deployment. For more information, see Production Assets 16.
- The tags attributed to the deployment. Tags can be used to group and filter deployments. You can attribute tags to a deployment by editing the deployment. For more information, see Edit a Deployment 19.
- The date on which the deployment was last updated.
- The user ID or username of the account that last updated the deployment.

10.1 Monitor Deployments

The Status column provides a summary of the condition of the Streaming Servers associated with the deployment. The condition of a Streaming Server is determined by comparing the state of its projects with their expected state. This information helps you focus on those deployments that have problems. The number of Streaming Servers associated with the deployment is shown in the center of the icon. The following icons can appear in the Status column:

Icon	Description
A green circle with a white center containing the number 2.	Available (good) - The Streaming Servers associated with this deployment are available and do not have any projects in a warning or error state.
A red circle with a white center containing the number 2.	Available (project error) - The Streaming Servers associated with this deployment are available, but at least one Streaming Server has one or more projects that are in an error state. For more information about the status of Streaming Servers, see Monitor a Specific Deployment 67 .
A yellow circle with a white center containing the number 2.	Available (unmanaged) - The Streaming Servers associated with this deployment are available and do not have any projects that are in an error state. However, at least one Streaming Server has one or more unmanaged projects (that is, projects that were not initiated from within Edge Streaming Manager).
A grey circle with a white center containing the number 2.	Unavailable - The Streaming Servers associated with this deployment are not available.
A grey circle with a white center containing the number 0.	This deployment (for example, a newly created deployment) does not contain any associated Streaming Servers.

The icons shown in the preceding table assume that the deployment has multiple Streaming Servers that are all in the same state. If a deployment has more than one Streaming Server that are in different states, the icon in the Status column is displayed in multiple colors. These colors indicate the status of each of the Streaming Servers associated with the deployment. For example, the following icon shows a deployment that has five Streaming Servers — three are in the state Available (good), one is Available (unmanaged), and one is Unavailable:



You can arrange information in the table in several ways. For more information, see [Arrange Information](#).

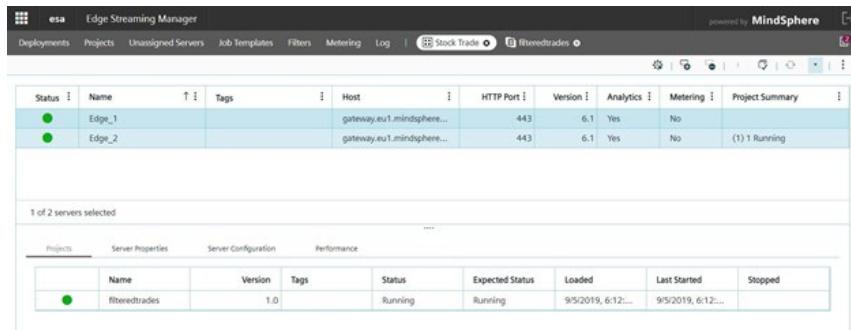
Clicking a deployment populates the **Streaming Server Status** and **Running Projects** tiles:

- The **Streaming Server Status** tile shows the number of Streaming Servers in each state.
- The **Running Projects** tile shows the number of running instances for each project in the deployment and the state of the instances. The project names and versions displayed in this tile correspond to the project names and versions displayed on the **Projects** page. The name of a running instance can be different from the project name, but in this tile such running instances are grouped under the project name.

10.1.2 Monitor a Specific Deployment

To view more details for a specific deployment, select the deployment on the **Deployments** page and click  . A separate page appears, displaying information about the Streaming Servers assigned to the deployment and the projects running on those Streaming Servers. Clicking a Streaming Server in the main table populates the bottom pane with tabs that contain further information about that Streaming Server.

The main table displays the following information for each server or device defined as a Streaming Server:



The screenshot shows the Edge Streaming Manager interface. At the top, there's a navigation bar with links for Deployments, Projects, Unassigned Servers, Job Templates, Filters, Metering, Log, and a search bar. Below the navigation bar is a table titled "Deployments". The table has columns for Status, Name, Tags, Host, HTTP Port, Version, Analytics, Metering, and Project Summary. Two rows are visible: "Edge_1" and "Edge_2". Both rows show a green status indicator, "gateway.eu1.mindsphere..." as the host, port 443, version 6.1, and analytics/no metering. The Project Summary column indicates "(1) 1 Running". Below the table, a message says "1 of 2 servers selected". Underneath the table, there are three tabs: Projects, Server Properties, and Server Configuration. The "Projects" tab is selected, showing a table with columns Name, Version, Tags, Status, Expected Status, Loaded, Last Started, and Stopped. One row is listed: "Filteredtrades" with version 1.0, status Running, expected status Running, loaded at 9/5/2019, 6:12:..., last started at 9/5/2019, 6:12:..., and stopped.

Figure 10-2 Example of a Page for a Specific Deployment

- The Streaming Server's status.
- The Streaming Server's name.
- The tags attributed to the Streaming Server. Tags can be used to group and filter Streaming Servers. You can attribute tags to a Streaming Server by editing the Streaming Server. For more information, see Edit a Streaming Server 23.
- The host on which the Streaming Server is running.
- The port for HTTP administration requests and for the HTTP publish/subscribe server.
- The Edge Streaming Analytics version installed on the host on which the Streaming Server is running.
- Whether an Edge Streaming Analytics license is installed on the host. To deploy a project that contains Edge Streaming Analytics windows, an appropriate license must be available.
- Whether Edge Streaming Analytics has been enabled to meter the number of events that are processed on the Streaming Server.
- A count of projects with different statuses. An example is (4) 2 Running, 1 Loaded, 1 Stopped.

10.1 Monitor Deployments

The Status column provides a summary of the Streaming Server's condition. The condition of a Streaming Server is determined by comparing the state of its projects with their expected state. This information helps you focus on those Streaming Servers that have problems. The following icons can appear in the Status column:

Icon	Description
	Available (good) — The Streaming Server is available and does not have any projects in a warning or error state.
	Available (project error) — The Streaming Server is available, but at least one project is in an error state. For more information about the status of Streaming Servers, see Monitor Unassigned Streaming Servers 71.
	Available (unmanaged) — The Streaming Server is available and does not have any projects that are in an error state. However, it is running at least one unmanaged project (that is, a project that was not initiated from within Edge Streaming Manager).
	Unavailable — The Streaming Server is not available.

You can arrange information in the table in several ways. For more information, see [Arrange Information](#).

Clicking a Streaming Server populates the bottom pane with tabs that contain information relating to that Streaming Server:

- The **Projects** tab displays projects that are running on the Streaming Server.
The status icon provides information that is similar to the status icon in the main table on the page for a specific deployment: the status of a project is determined by comparing its state with its expected state. For example, if the status and the expected status do not match, the icon is red and its tooltip shows the message:
Unexpected status.
- The **Server Properties** tab displays the Streaming Server's basic properties. You can click **Edit properties** to change most of these properties.
- The **Server Configuration** tab displays more detailed information about the Streaming Server.
- The **Performance** tab provides information about memory use. It also provides information about CPU use for each project and window.

On this page you can also perform actions on projects associated with your deployment:

- Load and start projects. For more information, see [Load and Start a Project 75](#).
- View sample data for running projects. For more information, see [View Sample Data 69](#).
- Stop and unload projects. For more information, see [Stop and Unload a Project 75](#).

10.2 View Sample Data

To view sample data for a running project:

1. On the **Deployments** page, select a deployment that has a running project and click .

TIP

You can use the Running Projects tile on the Deployments page to identify deployments that have running projects. For more information, see [Monitor Deployments](#).

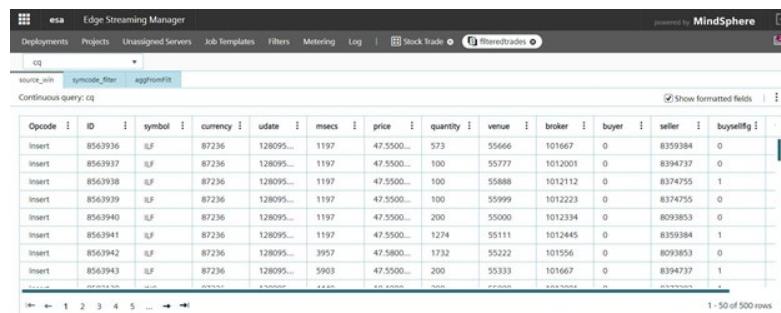
A page that displays information about the selected deployment appears.

2. In the main table, select the Streaming Server that contains the running project that you are interested in.

Tabs appear in the bottom pane.

3. Right-click a running project in the **Projects** tab in the bottom pane and select **Open running project**.

A new page opens, where sample data is displayed using tables, with a tab for each window. The following figure shows an example:



The screenshot shows the Edge Streaming Manager interface with the following details:

- Header:** The title bar says "esa Edge Streaming Manager" and "powered by MindSphere".
- Navigation:** A top navigation bar includes links for Deployments, Projects, Unsigned Servers, Job Templates, Filters, Metering, Log, Stock Trade, and Threaded trades.
- Filter Bar:** Below the navigation is a filter bar with dropdowns for "cq", "source_min", "tymode", and "aggfromfilter".
- Table:** The main area is a large table with the following columns:

Opcod	ID	symbol	currency	udate	msecs	price	quantity	venue	broker	buyer	seller	buysellflg
Insert	8563936	ILF	87236	128095...	1197	47.5500...	573	55666	101667	0	8395384	0
Insert	8563937	ILF	87236	128095...	1197	47.5500...	100	55777	1012001	0	8394737	0
Insert	8563938	ILF	87236	128095...	1197	47.5500...	100	55888	1012112	0	8374755	1
Insert	8563939	ILF	87236	128095...	1197	47.5500...	100	55999	1012223	0	8374755	0
Insert	8563940	ILF	87236	128095...	1197	47.5500...	200	55000	1012334	0	8093853	0
Insert	8563941	ILF	87236	128095...	1197	47.5500...	1274	55111	1012445	0	8395384	1
Insert	8563942	ILF	87236	128095...	3957	47.5800...	1732	55222	101556	0	8093853	0
Insert	8563943	ILF	87236	128095...	5903	47.5500...	200	55333	101667	0	8394737	1
- Pagination:** At the bottom left, there are navigation arrows and a page number indicator showing "1 - 50 of 500 rows".

Note

Edge Streaming Manager displays a real-time view of the data. If your data source contains a limited number of events (for example, the data source is a CSV file rather than a stream of data), the table will be empty after all the events have been displayed.

You can arrange information in the table in several ways. For more information, see [Arrange Information](#).

You can use the **Show formatted fields** check box to choose whether data appears exactly as it was received from the Streaming Server or with additional formatting. Here are some examples of additional formatting that is applied when the check box is selected:

- Dates are shown as Coordinated Universal Time (UTC) in ISO 8601 format. An example is 2018-11-30T13:33:47.000Z. If you clear the check box, dates appear in UNIX Epoch time, as this is the format in which the data is received from the Streaming Server.
- A dot is used as a separator in certain types of numerical data, rather than another separator, such as a comma. If you clear the check box and your locale is set to a locale that uses another separator, that separator is displayed instead of a dot.
- Opcodes are displayed using their localized names if your locale is not set to an English-language locale. If you clear the check box, opcodes are always shown in English, as this is how the data is received from the Streaming Server.

You can use the buttons on the navigation toolbar below the table to move between pages of sample data, or to jump to a specific page of sample data. Here is an example:

Insert	8563940	ILF	87236	128095.
Insert	8563941	ILF	87236	128095.
Insert	8563942	ILF	87236	128095.
Insert	8563943	ILF	87236	128095.
...
←	→	1	2	3
...	...	4	5	...
...

The following table describes the buttons on the navigation toolbar:

Icon	Action
←	Displays the first page of sample data.
←	Displays the previous page of sample data.
→	Displays the next page of sample data.
→	Displays the last page of sample data.

10.3

Monitor Unassigned Streaming Servers

You can use the **Unassigned Servers** page to view all Streaming Servers that Edge Streaming Manager is aware of, and which are available to be assigned to a deployment. Streaming Servers that already belong to a deployment are not displayed. The following figure shows an example:

The screenshot shows a table with the following columns: Opcode, ID, symbol, currency, update, msecs, price, quantity, venue, broker, buyer, seller, and buyselfing. The data consists of multiple rows of inserts for the symbol ILF, with various values for ID, update, msecs, price, quantity, and venue.

Opcode	ID	symbol	currency	update	msecs	price	quantity	venue	broker	buyer	seller	buyselfing
Insert	8563936	ILF	87236	128095...	1197	47.5500...	573	55666	101667	0	8359384	0
Insert	8563937	ILF	87236	128095...	1197	47.5500...	100	55777	1012001	0	8394737	0
Insert	8563938	ILF	87236	128095...	1197	47.5500...	100	55888	1012112	0	8374755	1
Insert	8563939	ILF	87236	128095...	1197	47.5500...	100	55999	1012223	0	8374755	0
Insert	8563940	ILF	87236	128095...	1197	47.5500...	200	55000	1012334	0	8093853	0
Insert	8563941	ILF	87236	128095...	1197	47.5500...	1274	55111	1012445	0	8359384	1
Insert	8563942	ILF	87236	128095...	3957	47.5800...	1732	55222	1011556	0	8093853	0
Insert	8563943	ILF	87236	128095...	5903	47.5500...	200	55333	101667	0	8394737	1

The **Unassigned Servers** page does not indicate whether Edge Streaming Manager is aware of a particular Streaming Server, for one of these reasons:

- Edge Streaming Manager received information about the specific Streaming Server from Edge Streaming Analytics.
- You made a direct connection to the specific Streaming Server.

For more information, see [Connecting Directly to a Streaming Server 21](#).

The information about the status and properties of Streaming Servers is similar to the information about the page for a specific deployment. For more information, see [Monitor a Specific Deployment 67](#).

10.4

Monitor Jobs

10.4.1

View All Jobs

The **Log** page displays the status of active and historical jobs, except for any jobs that you have deleted from the page. You can use this information to help resolve problems with your deployments. The following information is displayed for each job:

- the name of the job template from which the job was created.
- the name of the deployment that the job template belongs to.
- the user who deployed the job template.
- the time at which the job template was deployed.
- the time at which the job was completed.
- the time it took for all the tasks in this job to be completed (whether they were completed successfully or not).

10.4 Monitor Jobs

- the status of the job.
- the job's progress (specified as a percentage).

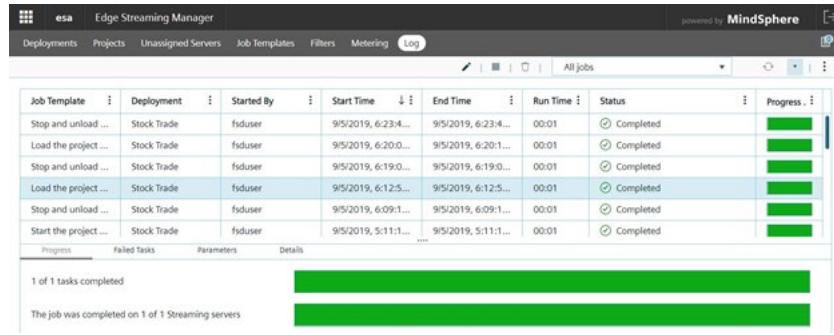


Figure 10-3 Log Page

To refresh the table, click .

If the table contains too much information, you can arrange the information in several ways to find the jobs that you are interested in. For more information, see [Arrange Information](#). In addition, you can use the drop-down menu that has the text [Jobs started today](#) to select a time period. You can also delete jobs from the table. For more information, see [Delete a Job](#) 73.

To view more information for a specific job, select the job in the table at the top of the page. The bottom pane displays the following information:

- The **Progress** tab shows how many tasks were completed and whether tasks were completed on all relevant Streaming Servers.
- The **Failed Tasks** tab lists tasks that were not completed.
- The **Parameters** tab lists parameters in the job template along with the value entered by the user for each parameter.
- The **Details** tab shows the job template description and other basic information.

10.4.2 View Job Details

To view further job details, select a job in the main table on the **Log** page and click  . The job appears on a separate page. The following figure shows an example:

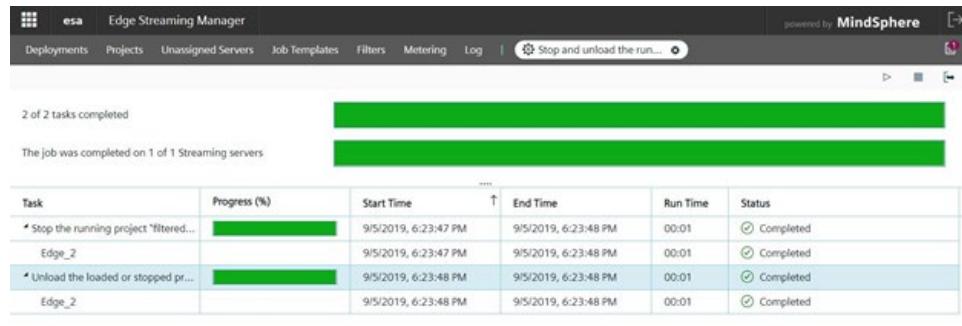


Figure 10-4 Open Job

The top of the page shows a summary and contains information about how many tasks were completed and whether tasks were completed on all relevant Streaming Servers.

The table on this page shows all tasks for the job, in the order in which the instructions are executed. You can expand items in the **Task** column to view the required level of detail. In the example, the **Load Project**, **Start Project**, and **Start Pub/Sub Connectors** rows relate to instructions in this specific example. That is, the names of the rows are derived from the job template. The table also shows that each task was completed on the same Streaming Server **fraud_esp5_1**.

You can also use the following check boxes to filter the contents of the table: **Running**, **Not started**, **Completed**, and **Completed with failures**.

10.5 Delete a Job

Deleting a job removes it from the main table on the **Log** page. Deleting jobs can be useful if the table contains jobs that are no longer relevant.

Deleting a job affects only the information that appears in the table; it does not affect job execution. Nevertheless, you cannot delete a job that is still running.

1. Do one of the following:

- To delete a specific job from the **Log** page, select the job and click .
- To delete several jobs, click  and select **Delete all canceled jobs**, **Delete all failed jobs**, or **Delete all successful jobs**.

The Delete Job window appears.

2. Click **OK**.

10.6 Rerun a Job

If a job fails to complete successfully, you can run it again. For example, a job might not complete successfully because a Streaming Server was unavailable, or a data file was not present. After you have resolved the problem, you can rerun the job quickly from the page for that specific job rather than deploying the job template again. You can also rerun jobs that completed successfully.

Rerunning a job creates a new job, as opposed to starting the original job again. To rerun a job:

1. Open the job if it is not already open: on the Log page, select the job and click .

2. Click .

The Rerun Job window appears.

3. In the **Strategy** field, select your preferred option:

- **Rerun all instructions**
- **Rerun all instructions on servers that failed to complete successfully**
- **Save failed servers to a filter**

Select this option to create a filter that references the failed Streaming Servers. If you select this option, you must enter a name in the **Filter name** field. You can then reference this filter in another job template that addresses errors or cleans up Streaming Servers. For example, consider a situation where a project was loaded but a connector was not started because files were not available. A job template that addresses this error might include the `start connectors` instruction. Consider another situation where a project could not be loaded because it had already been loaded. A cleanup job template might contain the `unload project` and `stop project` instructions.

If the original job template needs to be run instead, use the **Rerun all instructions on servers that failed to complete successfully**.

For more information about how you can use filters, see Filters 29.

4. If required, select **Skip failed instructions**.

5. Click **OK**.

Edge Streaming Manager reruns the job. The result appears on a new page and also on a new row in the table on the Log page.

10.7 Stop a Running Job

Stopping a running job can be helpful if, for example, you want to stop a job that is taking a long time to complete. Stopping a running job means canceling the execution of instructions that have not yet been executed. That is, when you stop a running job, the instruction that is currently being processed will be executed, but any subsequent instructions will not be executed.

Stopping a running job does not stop a running project. For more information, see Stop and Unload a Project 75.

To stop a running job:

1. Select the job in the main table of the **Log** page and click . The Cancel Job window appears.
2. Click **OK**.

10.8 Load and Start a Project

You can load and start projects by including the load project and start project instructions in a job template. For more information, see instructions 52. You can also load and start projects by using the user interface controls on the page for a specific deployment. Loading and starting projects using these user interface controls is appropriate in many situations. However, for complex situations, using instructions in a job template might be more useful. For example, in the Stock Trade example, where you collect user input about selected stock codes, using instructions in a job template is appropriate. For more information, see Overview of the Stock Trade Example.

To load or start a project with user interface controls:

1. Open the deployment if it is not already open: on the **Deployments** page, select the deployment that you want to open and click .
2. In the main table, select the Streaming Servers on which you want to load or start a project. To select multiple Streaming Servers, hold down the Ctrl key and click the Streaming Servers. You can also select all Streaming Servers by clicking .
3. Click  and select **Load project**, **Start project**, or **Load and start project**, as required. The Load Project window, the Start Loaded or Stopped Project window, or the Load and Start Project window appears.
4. Select the project, and if prompted for select the version, and click **OK**. A new page appears, displaying details about the job. For more information, see View Job Details 73.

10.9 Stop and Unload a Project

You can stop and unload projects by including the stop project and unload project instructions in a job template. For an example of a job template like this, see “Example Job Template: Stop a Project”. For more information, see instructions 52.

You can also stop and unload projects by using the user interface controls on the page for a specific deployment.

To stop or unload a project with user interface controls:

1. Open the deployment if it is not already open: on the **Deployments** page, select the deployment that you want to open and click .
2. In the main table, select the Streaming Servers on which you want to load or start a project. To select multiple Streaming Servers, hold down the Ctrl key and click the Streaming Servers. You can also select all Streaming Servers by clicking .

10.9 Stop and Unload a Project

3. Click  and select **Stop project**, **Unload project**, or **Stop and unload project**, as required.

The Stop Running Project window, the Unload Project window, or the Stop and Unload Running Project window appears.

4. Select the project and click **OK**.

A new page appears, displaying details about the job. For more information, see [View All Jobs 71](#).

When a project has stopped, the Projects tab in the bottom pane of the **Deployments** page displays the project's status as stopped. When a project has been unloaded, it no longer appears in the **Projects** tab.

If a project is reported as missing, the Status column in the **Projects** tab displays the value Missing and the status icon is red . In this case, you might not be able to unload the project using an instruction. A project is reported as missing if the Streaming Server that it is running on is restarted. A project might be reported as missing if it was started, but never stopped, by Edge Streaming Manager, and now is no longer available to the Streaming Server. To clean up a missing project, right-click the Streaming Server that contains the affected project and select **Clean up missing projects**. The affected project no longer appears in the **Projects** tab.

Metering Servers

11.1 Metering

Edge Streaming Manager enables you to monitor your metering servers. This ensures that your production Streaming Servers are in compliance with the terms of your software license. You must run at least one metering server to track usage data (that is, event counts) on your production Streaming Servers.

You do not need to track events on development servers because they do not contribute to the event volume assigned to your software license.

11.2 Add a Metering Server

To monitor an ESP metering server, you must add it to the list of defined metering servers in Edge Streaming Manager.

To add a metering server:

1. On the **Metering** page, click  .
2. The Metering Server Properties window appears.
In the **Host** field, enter the host name of the server containing the metering server.
3. In the **Metering port** field, either accept the default value (31001) or replace it with the network port defined on the metering server.
4. Click **OK**.

The metering server is displayed on the **Metering** page, along with any other metering servers that were added previously.

11.3 Monitor a Metering Server

11.3.1 View Metering Server Details

To view details about a metering server, select the required metering server on the **Metering** page.

Note

If the metering server that you want to monitor is not listed, you must add it to Edge Streaming Manager. For more information, see Add a Metering Server 77.

11.3 Monitor a Metering Server

The Events tile displays each license associated with the selected metering server. It also displays the total number of events recorded for that license for each month or year in the selected time period.

To change the time period, click the drop-down list and select the required time period. For example, select **Show yearly totals**, **Show last 12 months**, or Show monthly breakdown for year. The event information is shown for the selected time period.

You can click  to refresh the results in the **Events** tile to reflect any further metered events that have taken place after you selected the metering server.

Expanding each license in the Events tile enables you to view the total number of events for each host that uses the license. For metering servers that run with Edge Streaming Analytics 6.1 or a later release, each host can be expanded to view events for individual servers.

11.3.2 Export Detailed Events Information

You can export detailed information about metering server events to a comma-separated values (CSV) file. The CSV file contains the following events information, with separate rows for each unique combination: license, host, Streaming Server, server type, event date, event time (for each hour), continuous query, project, and window. The total number of events for the specific hour is displayed in the final column.

To export a CSV file:

1. On the Events tile, click the drop-down list and select a time period.
2. (Optional) Select a row in the table to specify the license, host, or server that you want to export detailed event information for. If you do not select a row in the table, detailed event information is exported for all licenses, hosts, and servers on the metering server.

Note

All rows within a group are included in the export file. For example, if you select a license, the export file will contain details of all hosts that use that license and all servers on each of those hosts.

-
3. Click .

The Export Metering Data window appears. The **Months** field contains a filter token for each month in the selected time period. Here is an example of a filter token:  .

Note

To add a month to the export, click in the **Months** field and select a month from the drop-down list. To remove a month from the export, click  in the corresponding filter token. If you remove all filter tokens, so that the **Months** field is empty, the CSV file will contain details of all events on the metering server regardless of date.

-
4. Edit the file name as required and click **OK**.

The CSV file containing the exported data is downloaded to your computer.

11.3.3 Group Metering Servers

You can arrange the information in the table on the **Metering** page in several ways. However, you might find it particularly helpful to group the table by the **Host** column, so that all ESP metering servers on a particular host are grouped together.

For more information, see [Arrange Information in Tables 14](#).

Glossary

12

adapter

a standalone program that publishes event streams into or subscribes event streams from an event stream processing engine.

asset

See event stream asset.

connector

See ESP connector.

container

a standardized package of applications and their dependencies that can be run reliably in various computing environments.

continuous query

a container that holds a set of windows that are connected by an edge element and are usually represented by a directed graph.

data event

an event that streams input data to be processed by the receiving window.

data flow (flow)

a data processing model that can be executed on a Edge Streaming Analytics engine.

deployment

a logical grouping of assets as a single unit for lifecycle management and monitoring in Edge Streaming Manager.

derived window

a window that processes events that have been fed through other windows and that performs computations or transformations on these incoming events.

directed graph

a set of nodes connected by edges, where the edges have a direction associated with them.

edge element

an XML element that defines a conduit for events between windows.

edge role

an assignment that corresponds to the event type that is coming into, or streaming of, one of the following window types: Score, Train, Calculate, Model Reader, or Model Supervisor.

engine

the top-level container in an event stream processing model.

ESP

See event stream processing.

ESP connector (connector)

an inline process that publishes event streams to, or subscribes event streams from, an event stream processing engine.

Streaming Server

See event-stream processing server.

event block

a grouping of binary events with a unique ID for use in a continuous query.

event stream (stream)

a continuous flow of events.

event stream asset (asset)

an identifiable part of a deployment that can be modified and monitored by Edge Streaming Manager. Examples include projects and Streaming Servers.

event stream processing (ESP)

a process that enables real-time decision making by continuously analyzing large volumes of data as it is received.

events engine

the top-level container in an event stream processing model.

events project

See project

flow

See data flow.

job template

an XML file that contains instructions for creating a set of tasks to be executed by Edge Streaming Manager.

metering server

a server that aggregates event counts based on license, source window, and hour of the day.

model event

an event that streams model metadata into a Score window or into a Model Supervisor window.

offline model

a model that are specified, developed, trained, and stored separately from the Streaming Server.

online model

a model that uses an algorithm that is packaged with Edge Streaming Analytics.

opcode (operation code)

an instruction that specifies an action to be performed.

operation code

See opcode.

persist-and-restore operation

a process that preserves a model's state on one computer system and restores it on another system.

project (events project)

a container that holds one or more continuous queries. See also events engine, continuous query.

publish/subscribe API

a library that enables you to publish event streams into an event stream processor, or to subscribe to event streams, within the event stream processing model. The publish/subscribe API also includes C, JAVA, and Python event stream processing object support libraries.

request event

an event that initiates an action, such as reconfiguring a model.

Source window

a window that has no windows feeding into it and is the entry point for publishing events into the continuous query.

stream

See event stream.

thread pool

a set of threads that can be used to execute tasks, post work items, process asynchronous I/O, wait on behalf of other threads, and process timers.

window

a processing node in an event stream processing model. Source and derived windows can perform aggregations, computations, pattern matching, and other operations.