

## Securing Streams Replication Manager

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# Streams Replication Manager security overview

Configuring Streams Replication Manager security involves enabling and setting security-related features and properties for the Streams Replication Manager service (Driver and Service roles) and the srm-control command line tool. This permits Streams Replication Manager to access source and target clusters and replicate data between them. In addition, it also enables the subcomponents of Streams Replication Manager that act as servers to function in a secure way.

Streams Replications Manager functions both as a client and a server. When Streams Replication Manager replicates data and connects to Kafka clusters it functions as a client. In addition however, some processes and components of Streams Replication Manager act as servers. For example the Streams Replication Manager Service role spins up a REST server. Similarly, the Streams Replication Manager Driver role has replication specific Connect REST servers which provide background functionality.

As a result of this, configuring security for Streams Replication Manager has two distinct aspects as you can configure security for Streams Replication Manager not only when it acts as client, but also when it acts as a server.

## Server configuration

Security for Streams Replication Manager processes and components that act as servers can be configured by enabling the TLS/SSL and/or Kerberos feature toggles as well as configuring key and truststore related properties available in Cloudera Manager. For more information see, *Enable TLS/SSL for the Streams Replication Manager service* or *Enable Kerberos authentication for the Streams Replication Manager service*.



**Note:** While the security feature toggles enable security for the components of Streams Replication Manager that function as servers, they are multi-purpose and also configure the security properties that are needed for Streams Replication Manager to connect, as a client, to the co-located clusters. As a result of this, if you have followed *Defining and adding clusters for replication* and have a secured co-located cluster, it is likely that security is already set up for the components that act as servers.

## Client configuration

Configuring security for Streams Replication Manager when it functions as a client involves enabling and setting security-related features and properties for the Streams Replication Manager service and the srm-control command line tool. This permits both the service and the tool to access your source and target clusters and replicate data between them. The configuration workflow and the steps you need to take differ for the service and tool.

### Streams Replication Manager service

Before you can start replicating data with Streams Replication Manager, you must define the clusters that take part in the replication process and add them to the configuration of Streams Replication Manager. When you define a cluster, you also specify the required keys, certificates, and credentials needed to access the clusters that you define. This means that when you define a cluster for replication, at the same time, you also configure the necessary security-related properties needed for Streams Replication Manager to connect as a client.

The clusters and their security properties can be defined in multiple ways. What method you use depends on the clusters in your deployment and the type of security these clusters use. For more information regarding the workflow and the available options for configuration, see *Defining and adding clusters for replication*.

### srm-control tool

In addition to configuring security for the Streams Replication Manager service, you also need to configure security related properties for the srm-control tool. This is because the srm-control tool also functions as a client and must have access to the clusters in the deployment. The exact configuration steps you need to take depends on how your deployment is set up, how you configured the service, and the type of security used on the clusters. For more information regarding the workflow and the available options for configuration, see *Configuring srm-control*.

### Related Information

[Enabling TLS/SSL for the Streams Replication Manager service](#)

[Defining and adding clusters for replication](#)

[Configuring srm-control](#)

[Enabling Kerberos for the Streams Replication Manager service](#)

## Enabling TLS/SSL for the Streams Replication Manager service

TLS/SSL can be enabled and configured for the Streams Replication Manager service (Driver and Service roles) with various configuration properties available in Cloudera Manager. Configuring these properties affects the security configuration of Streams Replication Manager in multiple ways.

### About this task

Both the Driver and Service roles of Streams Replication Manager have a number of TLS/SSL related properties associated with them. A dedicated TLS/SSL feature toggle exists for both roles. These are the Enable TLS/SSL for SRM Driver and Enable TLS/SSL for SRM Service properties. In addition to the feature toggles, there are a number of other properties that can be used to configure key and truststore information.

Configuring the feature toggles and the key/truststore related properties have the following effects on Streams Replication Manager's security configuration:

- The Streams Replication Manager Service role's REST server becomes secured and uses HTTPS.
- The Streams Replication Manager Driver role's replication specific Connect REST servers become secured and use HTTPS. In addition, client authentication will also be required from any client connecting to these servers.



**Note:** The replication specific Connect REST servers are for internal use only. They enable communication between Driver role instances. Third party clients should not interface with them.

- If the deployment has a co-located Kafka cluster and that cluster was configured using a service dependency, both the Service and Driver roles will use the keystore and truststore information when they establish a connection with the co-located Kafka cluster.
- Both the Driver and Service roles will use these properties as fallback configurations when establishing a connection to a Kafka cluster.

That is, if there is a Kafka cluster in your configuration that has its protocol specified as SSL, but no trust or keystore information is set for it, the roles will use the truststore and keystore configured with these properties.



**Important:** Configuring the feature toggles and key/truststore properties on their own do not enable Streams Replication Manager to connect to or replicate a TLS/SSL enabled external Kafka cluster. They also do not have an effect on the srm-control tool's security configuration.

Configuring these properties is part of the process of defining and adding clusters described in *Defining and adding clusters for replication*. Depending on how you set up your co-located cluster, these properties might already be configured.

If you configured the co-located cluster with a service dependency, then these properties are configured in your deployment and no additional steps are needed to enable or configure TLS/SSL.

However, if you chose to set up the co-located cluster with a Kafka credential, these properties might not be configured. Although in a case like this the properties required by Streams Replication Manager to access the co-located cluster will be set, the server functionality of the roles will not be TLS/SSL enabled. Additionally, while not crucial, no fallback properties will be set up for security either. In a case like this Cloudera recommends that you complete the following steps.

**Procedure**

1. In Cloudera Manager, go to Clusters and select the Streams Replication Manager service.
2. Go to Configuration.
3. Find and configure the following properties based on your cluster and requirements:

**Table 1:**

| Cloudera Manager Property                             | Description                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enable TLS/SSL for SRM Driver                         | Encrypt communication between clients and Streams Replication Manager Driver using Transport Layer Security (TLS) (formerly known as Secure Socket Layer (SSL)).                                                                                                                                                                                                              |
| SRM Driver TLS/SSL Server JKS Keystore File Location  | The path to the TLS/SSL keystore file containing the server certificate and private key used for TLS/SSL. Used when Streams Replication Manager Driver is acting as a TLS/SSL server. The keystore must be in JKS format.                                                                                                                                                     |
| SRM Driver TLS/SSL Server JKS Keystore File Password  | The password for the Streams Replication Manager Driver JKS keystore file.                                                                                                                                                                                                                                                                                                    |
| SRM Driver TLS/SSL Server JKS Keystore Key Password   | The password that protects the private key contained in the JKS keystore used when Streams Replication Manager Driver is acting as a TLS/SSL server.                                                                                                                                                                                                                          |
| SRM Driver TLS/SSL Trust Store File                   | The location on disk of the trust store, in .jks format, used to confirm the authenticity of TLS/SSL servers that Streams Replication Manager Driver might connect to. This trust store must contain the certificate(s) used to sign the service(s) connected to. If this parameter is not provided, the default list of well-known certificate authorities is used instead.  |
| SRM Driver TLS/SSL Trust Store Password               | The password for the Streams Replication Manager Driver TLS/SSL Trust Store File. This password is not required to access the trust store; this field can be left blank. This password provides optional integrity checking of the file. The contents of trust stores are certificates, and certificates are public information.                                              |
| Enable TLS/SSL for SRM Service                        | Encrypt communication between clients and Streams Replication Manager Service using Transport Layer Security (TLS) (formerly known as Secure Socket Layer (SSL)).                                                                                                                                                                                                             |
| SRM Service TLS/SSL Server JKS Keystore File Location | The path to the TLS/SSL keystore file containing the server certificate and private key used for TLS/SSL. Used when Streams Replication Manager Service is acting as a TLS/SSL server. The keystore must be in JKS format.                                                                                                                                                    |
| SRM Service TLS/SSL Server JKS Keystore File Password | The password for the Streams Replication Manager Service JKS keystore file.                                                                                                                                                                                                                                                                                                   |
| SRM Service TLS/SSL Server JKS Keystore Key Password  | The password that protects the private key contained in the JKS keystore used when Streams Replication Manager Service is acting as a TLS/SSL server.                                                                                                                                                                                                                         |
| SRM Service TLS/SSL Trust Store File                  | The location on disk of the trust store, in .jks format, used to confirm the authenticity of TLS/SSL servers that Streams Replication Manager Service might connect to. This trust store must contain the certificate(s) used to sign the service(s) connected to. If this parameter is not provided, the default list of well-known certificate authorities is used instead. |
| SRM Service TLS/SSL Trust Store Password              | The password for the Streams Replication Manager Service TLS/SSL Trust Store File. This password is not required to access the trust store; this field can be left blank. This password provides optional integrity checking of the file. The contents of trust stores are certificates, and certificates are public information.                                             |

4. Click Save Changes.
5. Restart the Streams Replication Manager service.

### Related Information

[Defining and adding clusters for replication](#)

## Enabling Kerberos for the Streams Replication Manager service

Kerberos can be enabled and configured for the Streams Replication Manager service with the Enable Kerberos Authentication Cloudera Manager property.

### About this task

Kerberos authentication can be enabled for the Streams Replication Manager service (Driver and Service roles) with the Enable Kerberos Authentication property. Enabling this property generates a JAAS configuration that is used by default for all SASL connections made by the Streams Replication Manager service. That is, Streams Replication Manager will connect to the co-located Kafka cluster using this JAAS configuration. Additionally, Streams Replication Manager will fall back to using this JAAS configuration for all other SASL connections where a connection (cluster) specific configuration is not configured.



**Important:** Configuring the Enable Kerberos Authentication on its own does not enable Streams Replication Manager to connect to or replicate a Kerberos enabled external Kafka cluster. Additionally, configuring the property does not have an effect on the srm-control tool's security configuration.

Configuring this property is part of the process of defining and adding clusters described in *Defining and adding clusters for replication*. Depending on how you set up your co-located cluster, the property might already be enabled.

### Procedure

1. In Cloudera Manager, go to Clusters and select the Streams Replication Manager service.
2. Go to Configuration.
3. Find and enable the Enable Kerberos Authentication property
4. Click Save Changes.
5. Restart the Streams Replication Manager service.

### Related Information

[Defining and adding clusters for replication](#)

## Configuring custom Kerberos principal for Streams Replication Manager

In a Kerberos-enabled cluster, the Streams Replication Manager service uses the streamsrepmgr principal by default. The principal can be configured in Cloudera Manager with the Kerberos Principal property.

### About this task

The principal specified in the Kerberos Principal property is used by the Streams Replication Manager service (Driver and Service roles) when it establishes a connection with its co-located Kafka cluster. Additionally, this principal is also used for Kerberos-enabled clusters defined with a Kafka credential, but only if there is no specific JAAS configuration set for that cluster.

For example, if you have a Kerberos-enabled external Kafka cluster that you defined with a Kafka credential, but did not specify a JAAS configuration, Streams Replication Manager falls back to using the default JAAS configuration which contains the principal defined in the Kerberos Principal property.



**Important:** The principal set in the Kerberos Principal property is only used by the Streams Replication Manager service. Configuring the property does not affect the principal used by the srm-control tool. For more information on how to configure the srm-control tool, see *Configuring srm-control*.

### Procedure

1. In Cloudera Manager select the Streams Replication Manager service.
2. Go to Configuration.
3. Find the Kerberos Principal property and enter the custom Kerberos principal.
4. Click Save Changes.
5. Restart the Streams Replication Manager service.

### Results

The custom principal used by Streams Replication Manager is configured.

### What to do next

If you use Ranger for authorization, update all resource-based services and policies that use the old principal and add the new principal. For more information on updating resource-based services and policies, see *Using Ranger to Provide Authorization in Cloudera*.

### Related Information

[Using Ranger to Provide Authorization in Cloudera](#)

[Configuring srm-control](#)

## Configuring Basic Authentication for the Streams Replication Manager service

The REST API of the Streams Replication Manager Service can be secured using Basic Authentication (BA). Once enabled, all clients and services will be required to present valid credentials. Configuration is done in Cloudera Manager using Streams Replication Manager configuration properties and external accounts.

### Enabling Basic Authentication for the Streams Replication Manager service

Basic Authentication (BA) can be enabled for the Streams Replication Manager Service in Cloudera Manager. After BA is enabled, the REST API of the Streams Replication Manager Service becomes secured. Any clients or services accessing the REST API will need to present valid credentials for access.

#### About this task

BA is set up for the Streams Replication Manager Service by creating Basic Authentication Credentials. A Basic Authentication Credential is an item that securely stores a username/password pair that can be used by the Streams Replication Manager Service for BA. Once the credential is defined, you must turn on BA for the Streams Replication Manager Service and reference the credentials you created in the configuration of Streams Replication Manager. After configuration is complete, the Streams Replication Manager Service and its Rest API will only be accessible by clients and services that present valid credentials.

In addition to the credentials configured with Basic Authentication Credentials, another username/password pair is generated automatically. This username and password pair is used by other services that depend on Streams Replication Manager and are deployed in the same cluster. These credentials are automatically passed to the dependent services. This way, any co-located dependent service automatically has access to the Streams Replication Manager REST API when BA is enabled. For example, Streams Messaging Manager is a service like this. It provides



replication monitoring by accessing and gathering metrics from the Streams Replication Manager REST API. As a result it requires access to the REST API. If required, the automatically generated credentials can be updated. However their configuration is optional.

## Procedure

### 1. Create Basic Authentication Credentials:

Streams Replication Manager supports BA for multiple users. This means that you can create more than one credential. Cloudera recommends that you create at least two. One for any external services and clients, and one that can be used by Streams Replication Manager internally.

- a) In Cloudera Manager go to Administration External Accounts Basic Authentication Credentials .
- b) Click Add Basic Authentication Credentials.
- c) Configure the following properties:

- Name

Add a unique and easily identifiable name. Note down the name you configure, you will need to provide it in a later step.

- Username and Password

Add a username and password. These credentials will be accepted by Streams Replication Manager when an external client or service tries to access the REST API. Take note of the username and password that you configure. Depending on your cluster and setup, you might need to provide these credentials when configuring other Streams Replication Manager features or external clients and services that access the Streams Replication Manager REST API.

### 2. Enable BA for the Streams Replication Manager Service:

- a) Go to Clusters and select the Streams Replication Manager Service.
- b) Go to Configuration.
- c) Find and enable the SRM Service Use Basic Authentication property.
- d) Find and configure the External Basic Authentication Accounts Accepted By SRM Service property.

Add the names of all Basic Authentication Credentials that you created in Step 1. For example:

```
external_1
external_2
internal_1
```

- e) Find and configure the SRM Service Intra Cluster Account Name property.

This property controls which credential should be used by the individual Streams Replication Manager Service roles within the cluster to communicate with each other. Add one of the Basic Authentication Credential names that you added to the External Basic Authentication Accounts Accepted By SRM Service property. For example:

```
internal_1
```

### 3. Configure the automatically generated credentials used by dependent services.

The automatically generated username and password can be configured with the following properties:

- SRM Service Co-Located Service Username
- SRM Service Co-Located Service User Password

### 4. Click Save Changes.

### 5. Restart Streams Replication Manager.

## Results

BA is configured for the Streams Replication Manager Service

### What to do next

- If you have previously enabled Remote Querying for a separate Streams Replication Manager Service that targets this Streams Replication Manager Service (the one that you enabled BA for) with Remote Querying, complete *Configuring Basic Authentication for Remote Querying* for the Streams Replication Manager Service that has Remote Querying enabled.
- Query metrics. You can do either of the following:
  - Access the **Replications** page on the Streams Messaging Manager UI. Replications will be visible in the UI.
  - Query metrics using the Streams Replication Manager REST API. For example:
    1. Go to Streams Replication Manager Web UI SRM Service Swagger UI .
    2. Find and open the /v2/replications endpoint.
    3. Click Try it out then click Execute.You are prompted to enter a username and password.
  - 4. Enter the credentials you configured using Basic Authentication Credentials.

The response includes all discovered replications, replicated topics, and various other metrics.

### Related Information

[Configuring Basic Authentication for Remote Querying](#)

## Configuring Basic Authentication for Streams Replication Manager Services that have Remote Querying enabled

If a Streams Replication Manager Service has Remote Querying enabled, it will connect to other, remote Streams Replication Manager Services to fetch the remote cluster replication metrics. If the remote Streams Replication Manager Service has Basic Authentication (BA) enabled, the Streams Replication Manager Service that has Remote Querying enabled must be provided with valid credentials that it can use to connect to the remote Streams Replication Manager Service.

### About this task

Remote Querying is a feature of the Streams Replication Manager Service that enables you to configure a Streams Replication Manager Service in your deployment to connect to other, remote Streams Replication Manager Services and fetch the remote cluster replication metrics gathered by the remote Service. This allows you to monitor the replications of a whole deployment that has multiple installations of Streams Replication Manager through a single Streams Replication Manager and Streams Messaging Manager service. For more information on Remote Querying, see *Remote Querying*.

If the remote Streams Replication Manager Services are configured to use BA, the Streams Replication Manager Services that have Remote Querying enabled (monitoring gateways) require valid credentials that can be used to access the remote Streams Replication Manager Services. As a result, the credentials required to access the remote Streams Replication Manager Services must be provided to the monitoring gateways.

Configuration is done in Cloudera Manager by creating Streams Replication Manager Service Credentials and then configuring the monitoring gateways to use these credentials for Remote Querying.

### Before you begin

- Basic authentication is set up and configured for the remote Streams Replication Manager Services. For more information on how to enable Basic authentication see, [Enabling Basic Authentication for the Streams Replication Manager Service](#).



**Note:** Your deployment might include multiple remote Streams Replication Manager Services and some of them might not have BA enabled. In a case like this, you only need to create and configure credentials for the remote services that have BA enabled. Unsecured remote Streams Replication Manager Services can be remotely queried without additional configuration.

- Remote querying is enabled and configured. For more information see, [Enabling Remote Querying](#)
- Ensure that you have access to the BA usernames and passwords used by the remote Streams Replication Manager Services. You will need to provide these during configuration. These usernames and passwords were configured using Basic Authentication Credentials when you enabled BA for the remote Streams Replication Manager Services.

### Procedure

1. Access the Cloudera Manager instance managing the Streams Replication Manager Service that has Remote Querying enabled (monitoring gateway).
2. Create Streams Replication Manager Credentials:

A Streams Replication Manager Credential represents a remote Streams Replication Manager Service that has Basic Authentication enabled. The credential stores the information necessary to establish a connection with the remote Streams Replication Manager Service. Create a credential for each BA enabled remote Streams Replication Manager Service.

- a) Go to Administration External Accounts Streams Replication Manager Credentials .
- b) Click Add Streams Replication Manager Service Credentials.
- c) Configure the following properties:

- Name

Add a unique and easily identifiable name. Note down the name you configure, you will need to provide it in a later step.

- Remote Streams Replication Manager Service target Kafka cluster alias

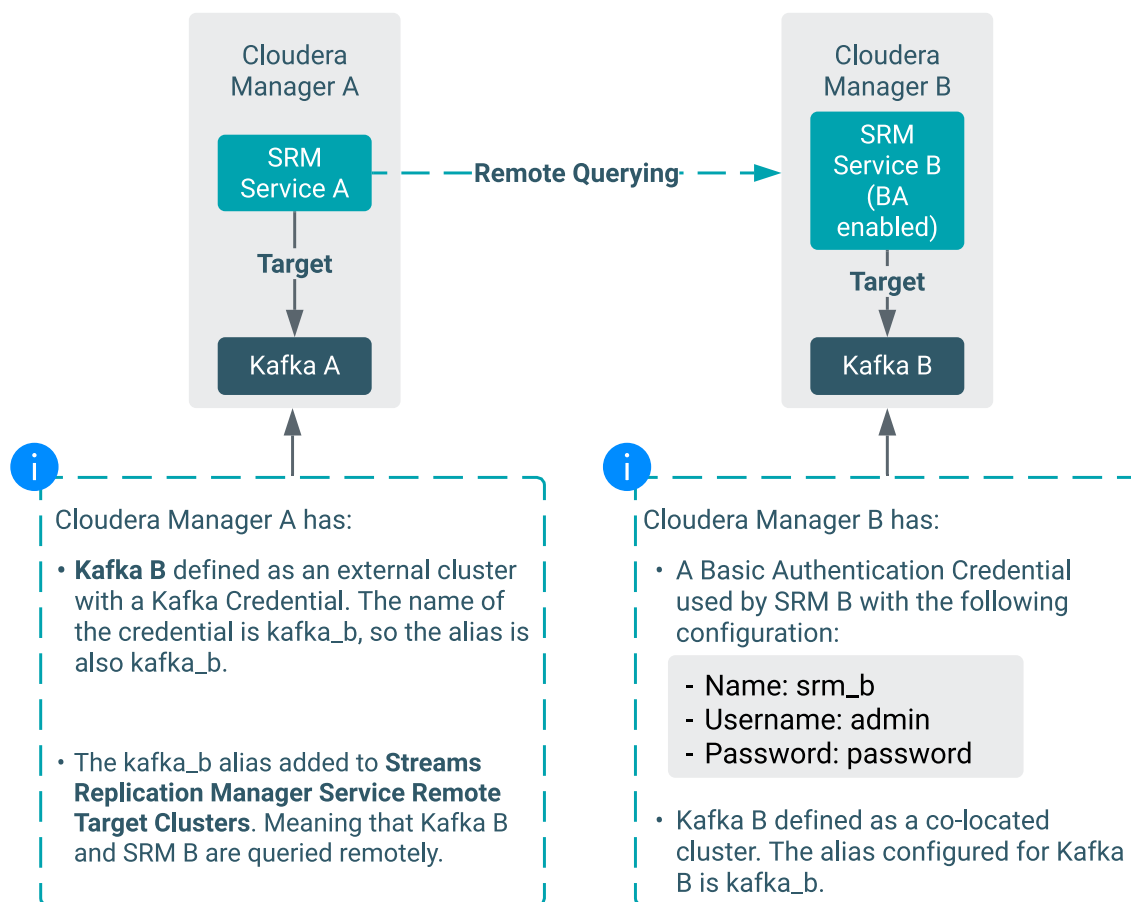
This is the alias of the Kafka cluster that the remote Streams Replication Manager Service (which this credential represents) is targeting. The alias that you add here must be one of the aliases that you added to the Streams Replication Manager Service Remote Target Clusters property when you enabled Remote Querying.

- Username and Password

Add the username and password pair that can be used to access the remote Streams Replication Manager Service that this credential represents. Both the username and password that you add here must be valid. That is, in the Cloudera Manager instance managing the remote Streams Replication Manager Service, a

Basic Authentication credential must exist with this username and password combination. Additionally, the remote Streams Replication Manager Service must be configured to use these credentials.

To better understand how Streams Replication Manager Service Credentials should be configured, review the following two cluster example:



In this specific example, a single Streams Replication Manager Service Credential must be created in Cloudera Manager A. This credential represents Streams Replication Manager Service B and will be used by Streams Replication Manager Service A to access Streams Replication Manager Service B. The credential would be configured as follows:

```
Name: srm_b
Remote Streams Replication Manager Service target Kafka cluster alias: k
afka_b
Username: admin
Password: password
```

3. Configure this Streams Replication Manager Service (monitoring gateway) to use the credentials when querying the remote Streams Replication Manager Service:
  - a) Go to Clusters and select the Streams Replication Manager Service.
  - b) Go to Configuration.
  - c) Find and Configure the External Accounts For Remote Querying SRM Services property.
  - d) Add the names of all Streams Replication Manager Service Credentials you created in Step 1. For example:

```
remote_1
```

```
remote_2  
remote_3
```

4. Click Save Changes.
5. Restart Streams Replication Manager.

### Results

The credentials required to access the remote Streams Replication Manager Services are set up and configured. When this Streams Replication Manager Service establishes a connection with the configured remote Streams Replication Manager Services, it uses the configured credentials.

### What to do next

- Access the **Replications** page on the Streams Messaging Manager UI. Remote replications will be visible in the UI.
- Query metrics using the Streams Replication Manager REST API. For example:
  1. Go to Streams Replication Manager Web UI SRM Service Swagger UI.
  2. Find and open the /v2/replications endpoint.
  3. Click Try it out then click Execute.

The response includes all discovered replications, replicated topics, and various other metrics. This includes replications that target remote clusters.

### Related Information

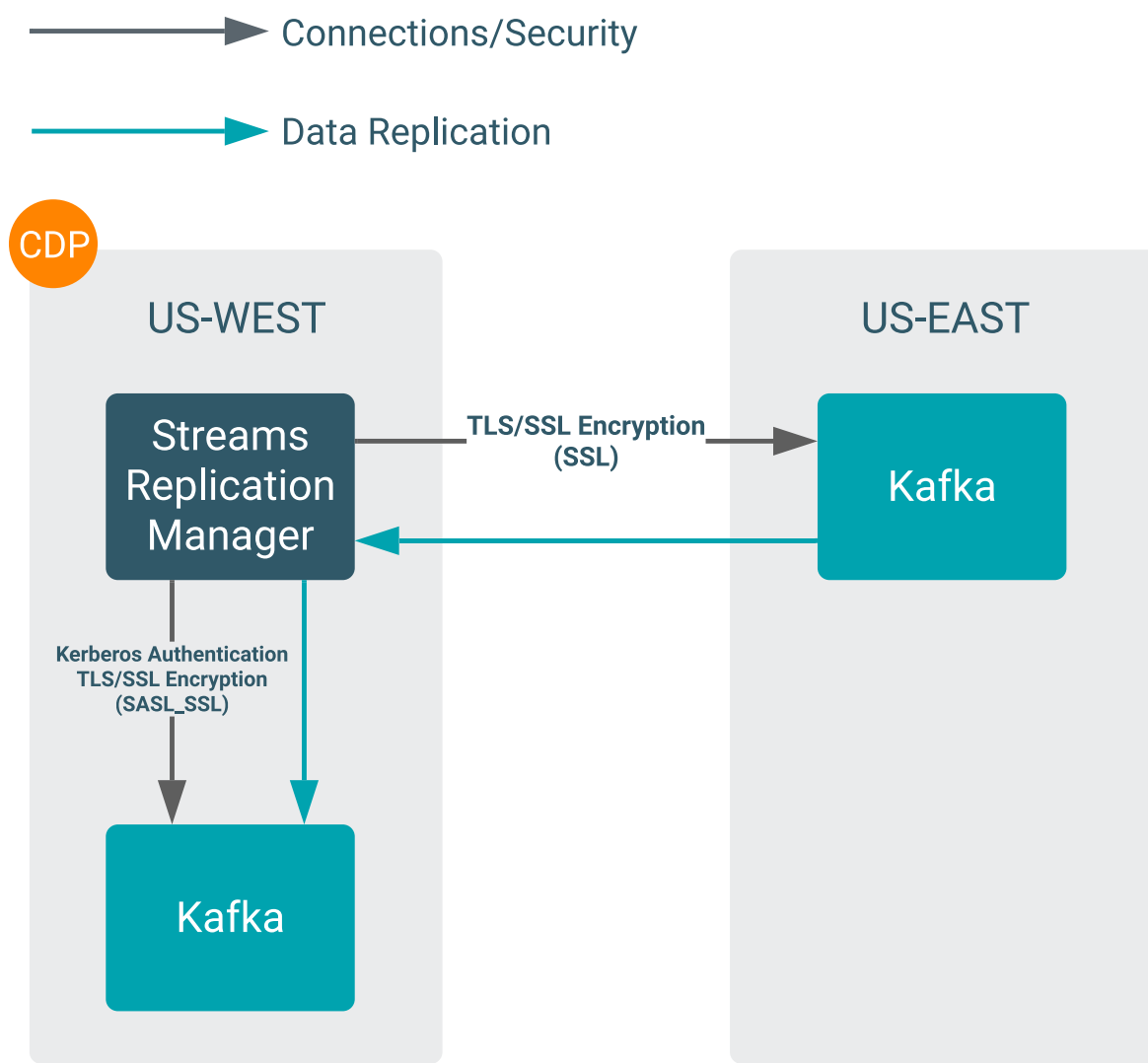
[Remote Querying](#)

## Streams Replication Manager security example

Streams Replication Manager is capable of replicating data between Cloudera and non-Cloudera clusters that are secured. A setup like this involves configuring security for the Streams Replication Manager service (Driver and Service roles) and the srm-control command line tool.

### About this task

Consider the following replication environment.



There are two clusters, US-West and US-East. US-West is a Cloudera cluster that has both Kafka and Streams Replication Manager deployed on it. The Kafka service on this cluster is both Kerberos and TLS/SSL enabled. That is, clients connecting to this cluster (including Streams Replication Manager) use the SASL\_SSL protocol.

US-East has Kafka deployed on it but not Streams Replication Manager. Kafka on this cluster has TLS/SSL encryption enabled. More importantly, the platform that this cluster is running on is not defined. This is because this example is meant to demonstrate that Streams Replication Manager can connect to and replicate data to or from non-Cloudera clusters. As long as that cluster is running Kafka, Streams Replication Manager will be able to connect to it.

Data replication is unidirectional. The Streams Replication Manager service deployed in US-West is replicating Kafka data from US-East to US-West. From the perspective of the Streams Replication Manager service, US-West is its co-located Kafka cluster, while US-East is an external Kafka cluster.

The following example walks you through the steps required to set up both the Streams Replication Manager service and the srm-control tool for this replication environment.

## Before you begin

The following steps assume that the Streams Replication Manager service is already installed and available on US-West. Additionally, it is also assumed that key and truststore files as well as other credentials required to establish a connection with each cluster are known and are available. The instructions do not go into detail on how you can generate or acquire these credentials.

## Procedure

### 1. Define the external Kafka cluster (US-East):

- a) Log into the Cloudera Manager instance managing US-West.
- b) Go to AdministrationExternal Accounts.
- c) Go to the Kafka Credentials tab.
- d) Click Add Kafka credentials.
- e) Create a Kafka credential for US-East:

The security configuration of the external cluster determines which of the available properties you must set. Because in this example US-East has TLS/SSL encryption enabled, the following properties must be set:

- Name
- Bootstrap servers
- Security protocol
- Truststore Password
- Truststore Path
- Truststore Type



**Note:** Click the icon next to each property in Cloudera Manager to reveal additional information about each property.

- f) Click Add.

If credential creation is successful, a new entry corresponding to the Kafka credential you specified appears on the page.

### 2. Define the co-located Kafka cluster (US-West):

Co-located Kafka clusters can be defined in two separate ways. Either with a service dependency or with Kafka credentials. Because in this example US-West is Kerberos and TLS/SSL enabled, the service dependency method is used. This is in-line with Cloudera best practices.

- a) In Cloudera Manager, go to Clusters and select the Streams Replication Manager service.
- b) Go to Configuration.
- c) Find and enable the Kafka Service property.
- d) Find and configure the Streams Replication Manager Co-located Kafka Cluster Alias property.

The alias you configure represents the co-located cluster. Enter an alias that is unique and easily identifiable. For example:

```
uswest
```

- e) Enable relevant security feature toggles

Because US-West is both TLS/SSL and Kerberos enabled, you must enable all feature toggles for both the Driver and Service roles. The feature toggles are the following:

- Enable TLS/SSL for SRM Driver
- Enable TLS/SSL for SRM Service
- Enable Kerberos Authentication

**3. Add both clusters to the configuration of Streams Replication Manager:****a) Find and configure the External Kafka Accounts property.**

Add the name of the Kafka credential you created for US-East to this property. This can be done by clicking the add button to add a new line to the property and then entering the name of the Kafka credential. For example:

```
useast
```

**b) Find and configure the Streams Replication Manager Cluster alias property.**

Add all cluster aliases to this property. This includes the aliases present in both the External Kafka Accounts and Streams Replication Manager Co-located Kafka Cluster Alias properties. Delimit the aliases with commas. For example:

```
useast, uswest
```

**4. Configure replications:**

In this example, data is replicated unidirectionally from US-West to US-East. As a result, only a single replication must be configured.

**a) Find the Streams Replication Manager's Replication Configs property.****b) Click the add button and add new lines for each unique replication you want to add and enable.****c) Add and enable your replications.**

For example:

```
useast->uswest.enabled=true
```

**5. Configure Driver and Service role targets:****a) Find and configure the Streams Replication Manager Service Target Cluster property.**

Add the co-located cluster's alias to the property. In the case of this example:

```
useast
```

**b) Find and configure the Streams Replication Manager Driver Target Cluster property.**

This property should contain all cluster aliases. In the case of this example, you can either add the aliases of both US-West and US-East or leave the property empty. Leaving the property empty is the same as adding all aliases.

**6. Click Save Changes.****7. Restart the Streams Replication Manager service.**



**8. Configure and run the srm-control tool:**

- a) Click Gateway in the Filters pane.
- b) Find and configure the following properties:

**SRM Client's Secure Storage Password**

The password used to access the secure storage. Take note of the password you configure. You need to provide it in your CLI session before running the tool.

**Environment Variable Holding SRM Client's Secure Storage Password**

The name of the environment variable that stores the secure storage password. Take note of the name that you configure. You need to set it in your CLI session before running the tool.

**Gateway TLS/SSL Trust Store File**

The path to the TLS/SSL truststore file containing the server (co-located cluster's) certificate and public key. Ensure that this file is available on all Streams Replication Manager hosts.

**Gateway TLS/SSL Truststore Password**

The password used to access the truststore file specified in the Gateway TLS/SSL Trust Store File property.

**SRM Client's Kerberos Principal Name**

The kerberos principal that the tool uses for authentication when connecting to the co-located Kafka cluster.

**SRM Client's Kerberos Keytab Location**

The path to the Kerberos keytab file that the tool uses for authentication when connecting to the co-located Kafka cluster.

- c) Click Save Changes.
- d) Re-deploy client configuration.
- e) SSH into one of the Streams Replication Manager hosts in your cluster.
- f) Set the secure storage password as an environment variable.

```
export [***SECURE STORAGE ENV VAR***]="[***SECURE STORAGE PASSWORD***]"
```

Replace `[***SECURE STORAGE ENV VAR***]` with the name of the environment variable you specified in Environment Variable Holding SRM Client's Secure Storage Password. Replace `[***SECURE STORAGE PASSWORD***]` with the password you specified in SRM Client's Secure Storage Password. For example:

```
export SECURESTOREPASS="mypassword"
```

- g) Run the tool.
- For example:

```
srm-control topics --source USEAST --target USWEST --add TOPIC1,TOPIC2
```