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# **Micro Focus Security**

## **ArcSight Event Broker and SmartConnectors**

### **Configuring TLS, Client Authentication and FIPS between Event Broker and SmartConnectors**

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## Revision History

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# Chapter 1: What is FIPS?

Under the Information Technology Management Reform Act (Public Law 104-106), the Secretary of Commerce approves standards and guidelines that are developed by the National Institute of Standards and Technology (NIST) for Federal computer systems. These standards and guidelines are issued by NIST as Federal Information Processing Standards (FIPS) for use government-wide. NIST develops FIPS when there are compelling Federal government requirements such as for security and interoperability and there are no acceptable industry standards or solutions.

FIPS Suite B includes cryptographic algorithms for hashing, digital signatures, and key exchange. The entire suite of cryptographic algorithms is intended to protect both classified and unclassified national security systems and information.

**Note:** When FIPS-compliant connectors connect to a non-FIPS-compliant destination, the solution is not considered FIPS compliant. When the destination is installed in FIPS Suite B compliant mode, the SmartConnectors must also be installed in FIPS Suite B compliant mode.

# Chapter 2: Client Authentication

Follow these instructions to enable Client Authentication for Event Broker and SmartConnectors with Event Broker destinations. For additional Event Broker configuration, see the *Administrator's Guide for Event Broker* and "Event Broker" in the *Smart Connector User Guide* on the [Micro Focus Community](#).

**Note:** The following examples:

- Use the default password. See the appendix for FIPS Compliant SmartConnectors in the *SmartConnector User Guide* on the [Micro Focus Community](#) to set a non-default password.
- Assume that you are on the Linux platform. For Windows platforms, use backslashes when entering commands.
- Assume you are using a command prompt window to enter Windows commands. Do not use Windows PowerShell.

## Configure an Event Broker Destination with Client Authentication in FIPS Mode

Follow these steps to configure an Event Broker (EB) destination from the SmartConnector with client authentication in FIPS mode.

### Step 1: On the Connector Server

1. Prepare the connector:
  - **If the connector is not yet installed:** Run the installer. After core software has been installed, you will see a window that lets you select **Add a Connector** or **Select Global Parameters**. Check **Select Global Parameters**, and on the window displayed, select **Set FIPS mode**. Set to **Enabled**.
  - **If the connector is already installed:** Run the installer. Select **Set Global Parameters** and set **Set FIPS Mode** to **Enabled**.
2. Navigate to the connector's current directory, for example:

```
cd <install_dir>/current
```
3. Apply the following workaround for a Java keytool issue:
  - a. Create a new file, `agent.security`, at `<install_dir>/current/user/agent` (or at `<install_dir>\current\user\agent` on Windows platforms).
  - b. Add the following content to the file and save:

```
security.provider.1=org.bouncycastle.jcajce.provider
.BouncyCastleFipsProvider
security.provider.2=com.sun.net.ssl.internal.ssl.Provider BCFIPS
security.provider.3=sun.security.provider.Sun
```

c. Move the `lib/agent/fips/bcprov-jdk14-119.jar` file to the current directory.

4. Set the environment variables for static values used by keytool:

```
export CURRENT=<full path to this "current" folder>
export BC_OPTS="-storetype BCFKS -providertype BCFIPS
-J-Djava.security.egd=file:/dev/urandom
-J-Djava.ext.dirs=${CURRENT}/jre/lib/ext:${CURRENT}/lib/agent/fips
-J-Djava.security.properties=${CURRENT}/user/agent/agent.security"
export EB=<event broker hostname>_<event broker port>
export STORES=${CURRENT}/user/agent/stores
export STORE_PASSWD=changeit
export EB_HOST={EB master host IP}
export CA_CERT=/tmp/ca.cert.pem
export INTERMEDIATE_CA_CERT=/tmp/intermediate.cert.pem
export FIPS_CA_TMP=/opt/fips_ca_tmp
```

**On Windows platforms:**

```
set CURRENT=<full path to this "current" folder>
set BC_OPTS=-storetype BCFKS -providertype BCFIPS
-J-Djava.ext.dirs=%CURRENT%\jre\lib\ext;%CURRENT%\lib\agent\fips
-J-Djava.security.properties=%CURRENT%\user\agent\agent.security
set EB=<event broker hostname>_<event broker port>
set STORES=%CURRENT%\user\agent\stores
set STORE_PASSWD=changeit
set EB_HOST={EB master host IP}
set CA_CERT=C:\Temp\ca.cert.pem
set INTERMEDIATE_CA_CERT=C:\Temp\intermediate.cert.pem
set FIPS_CA_TMP=/opt/fips_ca_tmp
```

5. Create the `user/agent/stores` directory if it does not already exist, for example:

```
mkdir ${STORES}
```

**On Windows platforms:**

```
mkdir %STORES%
```

6. Create the connector key pair, for example (the connector FQDN, OU, O, L, ST, and C values must be changed for your company and location):

```
jre/bin/keytool ${BC_OPTS} -genkeypair -alias ${EB} -keystore  
${STORES}/${EB}.keystore.bcfips -dname "cn=<Connector  
FQDN>,OU=Arcsight,O=MF,L=Sunnyvale,ST=CA,C=US" -validity 365
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -genkeypair -alias %EB% -keystore  
%STORES%\%EB%.keystore.bcfips -dname "cn=<Connector  
FQDN>,OU=Arcsight,O=MF ,L=Sunnyvale,ST=CA,C=US" -validity 365
```

When prompted, enter the password. Note the password; you will need it again in a later step. Press **Enter** to use the same password for the key. If you want to match the default value in the properties file, use the password change it.

7. List the key store entries. There should be one private key.

```
jre/bin/keytool ${BC_OPTS} -list -keystore ${STORES}/${EB}.keystore.bcfips  
-storepass ${STORE_PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -list -keystore %STORES%\%EB%.keystore.bcfips  
-storepass %STORE_PASSWD%
```

8. Create a Certificate Signing Request (CSR), for example:

```
jre/bin/keytool ${BC_OPTS} -certreq -alias ${EB} -keystore  
${STORES}/${EB}.keystore.bcfips -file ${STORES}/${EB}-cert-req -storepass  
${STORE_PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -certreq -alias %EB% -keystore  
%STORES%\%EB%.keystore.bcfips -file %STORES%\%EB%-cert-req -storepass  
%STORE_PASSWD%
```

## Step 2: On the Event Broker Server

1. When EB is first installed, it's setup to use self-signed certificates. To replace the self-signed certificates, obtain your company's root CA certificate, and an intermediate certificate and key pair. Place them in /tmp with the following names:

```
/tmp/intermediate.cert.pem
```

```
/tmp/intermediate.key.pem
```

```
/tmp/ca.cert.pem
```

Use the following command to add them to Event Broker:

```
/opt/arcsight/kubernetes/scripts/arcsight-cert-util.sh write --re-  
key=/tmp/intermediate.key.pem --re-crt=/tmp/intermediate.cert.pem --re-  
ca=/tmp/ca.cert.pem
```

**Note:** If EB was already deployed when running the above command, all Kafka broker nodes must be restarted. Either redeploy EB, or delete each Kafka pod. For example:

To list the pods:

```
kubectl get pods --all-namespaces
```

To delete the first Kafka pod:

```
kubectl delete pod eb-kafka-0 -n eventbroker1
```

Repeat for all the kafka pods.

2. 

```
export CA_CERT=/tmp/ca.cert.pem  
export INTERMEDIATE_CA_CERT=/tmp/intermediate.cert.pem  
export INTERMEDIATE_CA_KEY=/tmp/intermediate.key.pem  
export FIPS_CA_TMP=/opt/fips_ca_tmp  
export EB=<event broker hostname>_<event broker port>
```
3. Create a temp location on the eb master server: 

```
mkdir $FIPS_CA_TMP
```

## Step 3: On the Connector Server

Copy the `${STORES}/${EB}-cert-req` file (`%STORES%\%EB%-cert-req` on Windows platforms) from the connector to the Event Broker directory created above, `/opt/fips_ca_tmp`.

## Step 4: On the Event Broker Server

Create the signed certificate, for example:

```
/bin/openssl x509 -req -CA $INTERMEDIATE_CA_CERT -CAkey $INTERMEDIATE_CA_KEY -  
in ${EB} -cert-req -out ${EB} -cert-signed -days 365 -CAcreateserial -sha256
```

## Step 5: On the Connector Server

1. Copy the `${EB}-cert-signed` certificate from the Event Broker to the connector's `${STORES}` directory. (On the Windows platform, copy the `%EB%-cert-signed` certificate to the connector's `%STORES%` directory.)
2. Copy the `ca.cert.pem` certificate from the Event Broker to the connector's `${STORES}` directory. (On the Windows platform, copy the certificate to the `%STORES%` directory.)

3. Copy the `intermediate.cert.pem` certificate from the Event Broker to the connector's `${STORES}` directory. (On the Windows platform, copy the certificate to the `%STORES%` directory.)

4. Import the CA certificate to the trust store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file ${STORES}/ca.cert.pem -alias  
CARoot -keystore ${STORES}/${EB}.truststore.bcfips -storepass ${STORE_  
PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file %STORES%\ca.cert.pem -alias  
CARoot -keystore %STORES%\%EB%.truststore.bcfips -storepass %STORE_  
PASSWD%
```

5. Import the intermediate certificate to the trust store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file  
${STORES}/intermediate.cert.pem -alias INTCARoot -keystore  
${STORES}/${EB}.truststore.bcfips -storepass ${STORE_PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file  
%STORES%\intermediate.cert.pem -aliasINTCARoot -keystore  
%STORES%\%EB%.truststore.bcfips -storepass %STORE_PASSWD%
```

6. Import the CA certificate to the key store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file ${STORES}/ca.cert.pem -alias  
CARoot -keystore ${STORES}/${EB}.keystore.bcfips -storepass ${STORE_  
PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file %STORES%\ca.cert.pem -alias  
CARoot -keystore %STORES%\%EB%.keystore.bcfips -storepass %STORE_  
PASSWD%
```

7. When prompted, enter **yes** to trust the certificate.
8. Import the intermediate certificate to the key store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file  
${STORES}/intermediate.cert.pem -alias  
INTCARoot -keystore ${STORES}/${EB}.keystore.bcfips -storepass ${STORE_  
PASSWD}
```

If successful, this command will return the message, `Certificate reply was installed in keystore.`

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file  
%STORES%\intermediate.cert.pem -alias  
INTCARoot -keystore %STORES%\%EB%.keystore.bcfips -storepass %STORE_  
PASSWD%
```

9. Import the signed certificate to the key store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file ${STORES}/${EB}-cert-signed  
-alias ${EB} -keystore ${STORES}/${EB}.keystore.bcfips -storepass ${STORE_  
PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file %STORES%\%EB%-cert-signed  
-alias %EB% -keystore %STORES%\%EB%.keystore.bcfips -storepass %STORE_  
PASSWD%
```

If successful, this command will return the message, *Certificate reply was installed in keystore.*

10. Navigate to the `bin` directory and run agent setup. Install a connector with Event Broker as the destination, for example:

```
cd <installation dir>/current/bin  
./runagentsetup.sh
```

**On Windows platforms:**

```
cd <installation dir>\current\bin  
runagentsetup.bat
```

- a. When completing the Event Broker destination fields, use the same values as in Step 8 for the path and password.
  - b. Set **Use SSL/TLS** to **true**.
  - c. Set **Use SSL/TLS Authentication** to **true**.
11. Cleanup. Delete the following files:

**Caution:** The following files should be deleted to prevent the distribution of security certificates that could be used to authenticate against the Event Broker. These files are very sensitive and should not be distributed to other machines.

```
rm ${STORES}/intermediate.cert.pem  
rm ${STORES}/intermediate.key.pem  
rm ${STORES}/${EB}-cert-signed  
rm ${STORES}/${EB}-cert-req
```

**On Windows platforms:**

```
del %STORES%\intermediate.cert.pem  
del %STORES%\intermediate.key.pem  
del %STORES%\%EB%-cert-signed  
del %STORES%\%EB%-cert-req
```

12. Move the `bcprov-jdk14-119.jar` file back to the `lib/agent/fips` directory (or `lib\agent\fips` on Windows platforms).

## Step 6: On the Event Broker Server

To cleanup the Event Broker server, delete the temporary folder where the certificate was signed and the certificate and key files in `/tmp`.

**Caution:** The temporary folder should be deleted to prevent the distribution of security certificates that could be used to authenticate against the Event Broker. These files are very sensitive and should not be distributed to other machines.

# Configure an Event Broker Destination with Client Authentication in Non-FIPS Mode

Follow these steps to configure an Event Broker (EB) destination from the SmartConnector with client authentication, but in non-FIPS mode.

## Step 1: On the Connector Server

1. Prepare the SmartConnector:

- **If the connector is not yet installed:** Run the installer. After core software has been installed, you will see a window that lets you select **Add a Connector** or **Select Global Parameters**. Check **Select Global Parameters**, and on the window displayed, select **Set FIPS mode**. Set to **Enabled**.
- **If the connector is already installed:** Run the installer. Select **Set Global Parameters** and set **Set FIPS Mode** to **Enabled**.

2. Navigate to the connector's current directory, for example:

```
cd <install dir>/current
```

**On Windows platforms:**

```
cd <install dir>\current
```

3. Set the environment variables for the static values used by keytool, for example:

```
export CURRENT=<full path to this "current" folder>
export EB=<eb hostname>_<eb port>
export STORES=${CURRENT}/user/agent/stores
export STORE_PASSWD=changeit
export EB_HOST={EB master host IP}
export CA_CERT=/tmp/ca.cert.pem
export INTERMEDIATE_CA_CERT=/tmp/intermediate.cert.pem
export CERT_CA_TMP=/opt/cert_ca_tmp
```

**On Windows platforms:**

```
set CURRENT=<full path to this "current" folder>
set EB=<eb hostname>_<eb port>
set STORES=%CURRENT%\user\agent\stores
set STORE_PASSWD=changeit
set EB_HOST={EB master host IP}
set CA_CERT=C:\Temp\ca.cert.pem
set INTERMEDIATE_CA_CERT=C:\Temp\intermediate.cert.pem
set CERT_CA_TMP=/opt/cert_ca_tmp
```

4. Create the user/agent/stores directory if it does not already exist, for example:

```
mkdir ${STORES}
```

**On Windows platforms:**

```
mkdir %STORES%
```

5. Create the connector key pair, for example:

```
jre/bin/keytool -genkeypair -alias ${EB} -keystore  
${STORES}/${EB}.keystore.jks -dname "cn=<Connector  
FQDN>,OU=Arcsight,O=MF,L=Sunnyvale,ST=CA,C=US" -validity 365
```

**On Windows platforms:**

```
jre\bin\keytool -genkeypair -alias %EB% -keystore  
%STORES%\%EB%.keystore.jks -dname "cn=<Connector  
FQDN>,OU=Arcsight,O=MF,L=Sunnyvale,ST=CA,C=US" -validity 365
```

When prompted, enter the password. Note the password; you will need it again in a later step. Press Enter to use the same password for the key.

6. List the key store entries. There should be one private key.

```
jre/bin/keytool -list -keystore ${STORES}/${EB}.keystore.jks -storepass  
${STORE_PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool -list -keystore %STORES%\%EB%.keystore.jks -storepass  
%STORE_PASSWD%
```

7. Create a Certificate Signing Request (CSR), for example:

```
jre/bin/keytool -certreq -alias ${EB} -keystore  
${STORES}/${EB}.keystore.jks -file ${STORES}/${EB}-cert-req -storepass  
${STORE_PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool -certreq -alias %EB% -keystore  
%STORES%\%EB%.keystore.jks -file %STORES%\%EB%-cert-req -storepass  
%STORE_PASSWD%
```

## Step 2: On the Event Broker Server

1. When EB is first installed, it's setup to use self-signed certificates. To replace the self-signed certificates, obtain your company's root CA certificate, and an intermediate certificate and key pair. Place them in /tmp with the following names:

```

/tmp/intermediate.cert.pem
/tmp/intermediate.key.pem
/tmp/ca.cert.pem

```

Use the following command to add them to Event Broker:

```

/opt/arcsight/kubernetes/scripts/arcsight-cert-util.sh write --re
key=/tmp/intermediate.key.pem --re-crt=/tmp/intermediate.cert.pem --re-
ca=/tmp/ca.cert.pem

```

**Note:** If EB was already deployed when running the above command, all Kafka broker nodes must be restarted. Either redeploy EB, or delete each Kafka pod. For example:

To list the pods:

```
kubectl get pods --all-namespaces
```

To delete the first Kafka pod:

```
kubectl delete pod eb-kafka-0 -n eventbroker1
```

Repeat for all the kafka pods.

- ```

export CA_CERT=/tmp/ca.cert.pem
export INTERMEDIATE_CA_CERT=/tmp/intermediate.cert.pem
export INTERMEDIATE_CA_KEY=/tmp/intermediate.key.pem
export CERT_CA_TMP=/opt/fips_ca_tmp
export EB=<event broker hostname>_<event broker port>

```
- Create a temp location on the eb master server:

```
mkdir $CERT_CA_TMP
```

## Step 3: On the Connector Server

Copy the `${STORES}/${EB}-cert-req` file (`%STORES%\%EB%-cert-req` on Windows platforms) from the connector to the Event Broker directory created above.

## Step 4: On the Event Broker Server

Create the signed certificate, for example:

```

/bin/openssl x509 -req -CA ${INTERMEDIATE_CA_CERT} -CAkey ${INTERMEDIATE_CA_
KEY} -in ${EB} -cert-req -out ${EB} -cert-signed -days 365 -CAcreateserial -
sha256

```

## Step 5: On the Connector Server

1. Copy the `${EB}-cert-signed` certificate from the Event Broker to the connector's `${STORES}` directory. (On the Windows platform, copy the `%EB%-cert-signed` certificate to the connector's `%STORES%` directory.)
2. Copy the `ca.cert.pem` certificate from the Event Broker to the connector's `${STORES}` directory. (On the Windows platform, copy the certificate to the `%STORES%` directory.)
3. Copy the `intermediate.cert.pem` certificate from the Event Broker to the connector's `${STORES}` directory. (On the Windows platform, copy the certificate to the `%STORES%` directory.)

4. Import the CA certificate to the trust store, for example:

```
jre/bin/keytool -importcert -file ${STORES}/${CA_CERT} -alias CARoot
-keystore ${STORES}/${EB}.truststore.jks -storepass ${STORE_PASSWD}
```

### On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\${CA_CERT} -alias CARoot
-keystore %STORES%\%EB%.truststore.jks -storepass %STORE_PASSWD%
```

5. Import the intermediate certificate to the trust store, for example:

```
jre/bin/keytool -importcert -file ${STORES}/intermediate.cert.pem -alias
INTCARoot -keystore ${STORES}/${EB}.truststore.jks -storepass ${STORE_
PASSWD}
```

### On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\intermediate.cert.pem -
aliasINTCARoot -keystore %STORES%\%EB%.truststore.jks -storepass
%STORE_PASSWD%
```

6. When prompted, enter **yes** to trust the certificate.
7. Import the CA certificate to the key store, for example:

```
jre/bin/keytool -importcert -file ${STORES}/${CA_CERT} -alias CARoot -
keystore ${STORES}/${EB}.keystore.jks -storepass ${STORE_PASSWD}
```

### On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\${CA_CERT} -alias CARoot -
keystore %STORES%\%EB%.keystore.jks -storepass %STORE_PASSWD%
```

8. Import the intermediate certificate to the key store, for example:

```
jre/bin/keytool -importcert -file ${STORES}/intermediate.cert.pem -alias
INTCARoot -keystore ${STORES}/${EB}.keystore.jks -storepass ${STORE_
PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool -importcert -file %STORES%\intermediate.cert.pem -alias
INTCARoot -keystore %STORES%\%EB%.keystore.jks -storepass %STORE_
PASSWD%
```

If successful, this command will return the message, *Certificate reply was installed in keystore.*

9. When prompted, enter **yes** to trust the certificate.
10. Import the signed certificate to the key store, for example:

```
jre/bin/keytool -importcert -file ${STORES}/${EB}-cert-signed -alias ${EB}
-keystore ${STORES}/${EB}.keystore.jks -storepass ${STORE_PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool -importcert -file %STORES%\%EB%-cert-signed -alias %EB%
-keystore %STORES%\%EB%.keystore.jks -storepass %STORE_PASSWD%
```

If successful, this command will return the message, *Certificate reply was installed in keystore.*

11. Note the key store and trust store paths:

```
echo ${STORES}/${EB}.truststore.jks
echo ${STORES}/${EB}.keystore.jks
```

**On Windows platforms:**

```
echo %STORES%\%EB%.truststore.jks
echo %STORES%\%EB%.keystore.jks
```

12. Navigate to the `bin` directory and run agent setup. Install a connector with Event Broker as the destination, for example:

```
cd <installation dir>/current/bin
./runagentsetup.sh
```

**On Windows platforms:**

```
cd <installation dir>\current\bin
runagentsetup.bat
```

- a. When completing the Event Broker destination fields, use the same values as in Step 8 for the path and password.
- b. Set **Use SSL/TLS** to **true**.
- c. Set **Use SSL/TLS Authentication** to **true**.
13. Cleanup. Delete the following files:

**Caution:** The following files should be deleted to prevent the distribution of security certificates that could be used to authenticate against the Event Broker. These files are very

sensitive and should not be distributed to other machines.

```
rm ${STORES}/intermediate.cert.pem  
rm ${STORES}/intermediate.key.pem  
rm ${STORES}/${EB}-cert-signed  
rm ${STORES}/${EB}-cert-req
```

**On Windows platforms:**

```
del %STORES%\intermediate.cert.pem  
del %STORES%\intermediate.key.pem  
del %STORES%\%EB%-cert-signed  
del %STORES%\%EB%-cert-req
```

## Step 6: On the Event Broker Server

To cleanup the Event Broker server, delete the temporary folder where the certificate was signed and the certificate and key files in /tmp.

**Caution:** The temporary folder should be deleted to prevent the distribution of security certificates that could be used to authenticate against the Event Broker. These files are very sensitive and should not be distributed to other machines.

# Configure an Event Broker Destination without Client Authentication in FIPS Mode

Follow these steps to configure an Event Broker destination from the SmartConnector without client authentication in FIPS mode.

## On the Event Broker Server

When EB is first installed, it's setup to use self-signed certificates. To replace the self-signed certificates, obtain your company's root CA certificate, and an intermediate certificate and key pair. Place them in /tmp with the following names:

```
/tmp/intermediate.cert.pem
```

```
/tmp/intermediate.key.pem
```

```
/tmp/ca.cert.pem
```

Use the following command to add them to Event Broker:

```
/opt/arcsight/kubernetes/scripts/arcsight-cert-util.sh write --re-key=/tmp/intermediate.key.pem --re-crt=/tmp/intermediate.cert.pem --re-ca=/tmp/ca.cert.pem
```

**Note:** If EB was already deployed when running the above command, all Kafka broker nodes must be restarted. Either redeploy EB, or delete each Kafka pod. For example:

To list the pods:

```
kubectl get pods --all-namespaces
```

To delete the first Kafka pod:

```
kubectl delete pod eb-kafka-0 -n eventbroker1
```

Repeat for all the kafka pods.

## On the SmartConnector Server

1. Prepare the SmartConnector:

- **If the connector is not yet installed:** Run the installer. After core software has been installed, you will see a window that lets you select **Add a Connector** or **Select Global Parameters**. Check **Select Global Parameters**, and on the window displayed, select **Set FIPS mode**. Set to **Enabled**.

- **If the connector is already installed:** Run the installer. Select **Set Global Parameters** and set **Set FIPS Mode** to **Enabled**.

2. Navigate to the connector's current directory, for example:

```
cd <install dir>/current
```

3. Set the environment variables for the static values used by keytool, for example:

```
export CURRENT=<full path to this "current" folder>
export BC_OPTS="-storetype BCFKS -providertype BCFIPS -providerclass
org.bouncycastle.jcajce.provider.BouncyCastleFipsProvider -providerpath
${CURRENT}/lib/agent/fips/bc-fips-1.0.0.jar
-J-Djava.security.egd=file:/dev/urandom"
export EB=<event broker hostname>_<event broker port>
export STORES=${CURRENT}/user/agent/stores
export STORE_PASSWD=changeit
```

#### On Windows platforms:

```
set CURRENT=<full path to this "current" folder>
set BC_OPTS="-storetype BCFKS -providertype BCFIPS
-J-Djava.ext.dirs=%CURRENT%\jre\lib\ext;%CURRENT%\lib\agent\fips
-J-Djava.security.properties=%CURRENT%\user\agent\agent.security"
set EB=<event broker hostname>_<event broker port>
set STORES=%CURRENT%\user\agent\stores
set STORE_PASSWD=changeit
```

4. Create the user/agent/stores directory if it does not already exist, for example:

```
mkdir ${STORES}
```

#### On Windows platforms:

```
mkdir %STORES%
```

5. Copy the ca.cert.pem and the intermediate.cert.pem certificates from the Event Broker to the connector's \${STORES} directory. (On the Windows platform, copy the certificate to the %STORES% directory.)

6. Import the CA certificate to the trust store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file ${STORES}/ca.cert.pem -alias
CARoot -keystore ${STORES}/${EB}.truststore.bcfips -storepass ${STORE_
PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file %STORES%\ca.cert.pem -alias
CARoot -keystore %STORES%\%EB%.truststore.bcfips -storepass %STORE_
PASSWD%
```

7. Import the intermediate certificate to the trust store, for example:

```
jre/bin/keytool ${BC_OPTS} -importcert -file
${STORES}/intermediate.cert.pem -alias
INTCARoot -keystore ${STORES}/${EB}.truststore.bcfips -storepass ${STORE_
PASSWD}
```

**On Windows platforms:**

```
jre\bin\keytool %BC_OPTS% -importcert -file
%STORES%\intermediate.cert.pem -alias
INTCARoot -keystore %STORES%\%EB%.truststore.bcfips -storepass %STORE_
PASSWD%
```

8. When prompted, enter **yes** to trust the certificate.

9. Note the trust store path:

```
echo ${STORES}/${EB}.truststore.bcfips
```

**On Windows platforms:**

```
echo %STORES%\%EB%.truststore.bcfips
```

10. Navigate to the bin directory and run agent setup. Install a connector with Event Broker as the destination, for example:

```
cd <installation dir>/current/bin
./runagentsetup.sh
```

**On Windows platforms:**

```
cd <installation dir>\current\bin
runagentsetup.bat
```

- a. When completing the Event Broker destination fields, use the value from Step 7 for the trust store path and the password used in Step 6 for the trust store password.
  - b. Set **Use SSL/TLS** to **true**.
  - c. Set **Use SSL/TLS Authentication** to **false**.
11. Cleanup. Delete the certificate file, for example:

**Caution:** The following file should be deleted to prevent the distribution of security certificates

that could be used to authenticate against the Event Broker. These files are very sensitive and should not be distributed to other machines.

```
rm ${STORES}/ca.cert.pem  
rm ${STORES}/intermediate.cert.pem
```

**On Windows platforms:**

```
del %\STORES%\ca.cert.pem  
del %\STORES%\intermediate.cert.pem
```

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