
Micro Focus Security ArcSight Transformation Hub and SmartConnectors

Configuring Security Mode for SmartConnectors with Transformation Hub Destinations

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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: Configuring Security Mode for Transformation Hub Destinations

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

- Note:** These procedures are provided with the following assumptions:
- You 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.
 - You are on the Linux platform. For Windows platforms, use backslashes (\) when entering commands instead of the forward slashes given here.
 - You using a command prompt window to enter Windows commands. Do not use Windows PowerShell.

The following procedures are described in this section.

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Configure an Transformation Hub Destination with Client Authentication in FIPS Mode

Follow these steps to configure a Transformation Hub (TH) 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=${CURRENT}/user/agent/agent.security"  
export TH=<Transformation Hub hostname>_<Transformation Hub port>  
export STORES=${CURRENT}/user/agent/stores  
export STORE_PASSWD=changeit  
export TH_HOST={TH 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 TH=<Transformation Hub hostname>_<Transformation Hub port>  
set STORES=%CURRENT%\user\agent\stores  
set STORE_PASSWD=changeit  
set TH_HOST={TH 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 ${TH} -keystore  
${STORES}/${TH}.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 %TH% -keystore  
%STORES%\%TH%.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 changeit.

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

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

On Windows platforms:

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

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

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

On Windows platforms:

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

Step 2: On the Transformation Hub Server

1. When Transformation Hub 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 Transformation Hub:

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

Note: After the new certificate is imported to the Transformation Hub, the Transformation Hub will need to be uninstalled and then re-installed with FIPS and Client Authentication enabled. See the *Transformation Hub Deployment Guide* for details.

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 TH=<Transformation Hub hostname>_<Transformation Hub port>
```
3. Create a temporary location on the Transformation Hub master server:

```
mkdir $FIPS_ CA_TMP
```


Step 3: On the Connector Server

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

Step 4: On the Transformation Hub Server

Create the signed certificate, for example:

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

Step 5: On the Connector Server

1. Copy the `${TH}-cert-signed` certificate from the Transformation Hub to the connector's `${STORES}` directory. (On the Windows platform, copy the `%TH%-cert-signed` certificate to the connector's `%STORES%` directory.)
2. Copy the `ca.cert.pem` certificate from the Transformation Hub to the connector's `${STORES}` directory. (On the Windows platform, copy the certificate to the `%STORES%` directory.)
3. Copy the `intermediate.cert.pem` certificate from the Transformation Hub to the connector's `${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 ${STORES}/${TH}.truststore.bcfips -storepass ${STORE_  
PASSWD}
```

On Windows platforms:

```
jre\bin\keytool %BC_OPTS% -importcert -file %STORES%\ca.cert.pem -alias  
CARoot -keystore %STORES%\%TH%.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  
${STORES}/${TH}.truststore.bcfips -storepass ${STORE_PASSWD}
```

On Windows platforms:

```
jre\bin\keytool %BC_OPTS% -importcert -file
```

```
%STORES%\intermediate.cert.pem -aliasINTCARoot -keystore  
%STORES%\%TH%.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 ${STORES}/${TH}.keystore.bcfips -storepass ${STORE_  
PASSWD}
```

On Windows platforms:

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

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

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

On Windows platforms:

```
jre\bin\keytool %BC_OPTS% -importcert -file %STORES%\%TH%-cert-signed  
-alias %TH% -keystore %STORES%\%TH%.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

Transformation Hub 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 Transformation Hub 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 Transformation Hub. These files are very sensitive and should not be distributed to other machines.

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

On Windows platforms:

```
del %STORES%\intermediate.cert.pem  
del %STORES%\intermediate.key.pem  
del %STORES%\%TH%-cert-signed  
del %STORES%\%TH%-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 Transformation Hub Server

To cleanup the Transformation Hub 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 Transformation Hub. These files are very sensitive and should not be distributed to other machines.

Configure an Transformation Hub Destination with Client Authentication in Non-FIPS Mode

Follow these steps to configure an Transformation Hub (TH) 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** and set it to **Disabled**.
- **If the connector is already installed:** Run the installer. Select **Set Global Parameters** and make sure **Set FIPS Mode** is set to **Disabled**.

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 TH=<th hostname>_<th port>
export STORES=${CURRENT}/user/agent/stores
export STORE_PASSWD=changeit
export TH_HOST={TH 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 TH=<th hostname>_<th port>
set STORES=%CURRENT%\user\agent\stores
set STORE_PASSWD=changeit
set TH_HOST={TH 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 ${TH} -keystore
${STORES}/${TH}.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 %TH% -keystore
%STORES%\%TH%.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 ${STORES}/${TH}.keystore.jks -storepass
${STORE_PASSWD}
```

On Windows platforms:

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

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

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

On Windows platforms:

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

Step 2: On the Transformation Hub Server

1. When Transformation Hub 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 Transformation Hub:

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

Note: After the new certificate is imported to the Transformation Hub, the Transformation Hub will need to be uninstalled and then re-installed with FIPS and Client Authentication enabled. See the *Transformation Hub Deployment Guide* for details.

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 CERT_CA_TMP=/opt/fips_ca_tmp
export TH=<Transformation Hub hostname>_<Transformation Hub port>
```
3. Create a temporary location on the Transformation Hub master server:

```
mkdir $CERT_CA_TMP
```

Step 3: On the Connector Server

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

Step 4: On the Transformation Hub Server

Create the signed certificate, for example:

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

Step 5: On the Connector Server

1. Copy the `${TH}-cert-signed` certificate from the Transformation Hub to the connector's `${STORES}` directory. (On the Windows platform, copy the `%TH%-cert-signed` certificate to the connector's `%STORES%` directory.)
2. Copy the `ca.cert.pem` certificate from the Transformation Hub to the connector's `${STORES}` directory. (On the Windows platform, copy the certificate to the `%STORES%` directory.)
3. Copy the `intermediate.cert.pem` certificate from the Transformation Hub to the connector's `${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 ${STORES}/${TH}.truststore.jks -storepass ${STORE_PASSWD}
```

On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\${CA_CERT} -alias CARoot
-keystore %STORES%\%TH%.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 ${STORES}/${TH}.truststore.jks -storepass ${STORE_
PASSWD}
```

On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\intermediate.cert.pem -
aliasINTCARoot -keystore %STORES%\%TH%.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 ${STORES}/${TH}.keystore.jks -storepass ${STORE_PASSWD}
```

On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\${CA_CERT} -alias CARoot -
keystore %STORES%\%TH%.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 ${STORES}/${TH}.keystore.jks -storepass ${STORE_
PASSWD}
```

On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\intermediate.cert.pem -alias
INTCARoot -keystore %STORES%\%TH%.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 ${STORES}/${TH}-cert-signed -alias ${TH}
-keystore ${STORES}/${TH}.keystore.jks -storepass ${STORE_PASSWD}
```


On Windows platforms:

```
jre\bin\keytool -importcert -file %STORES%\%TH%-cert-signed -alias %TH%
-keystore %STORES%\%TH%.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 ${STORES}/${TH}.truststore.jks
echo ${STORES}/${TH}.keystore.jks
```

On Windows platforms:

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

12. Navigate to the `bin` directory and run agent setup. Install a connector with Transformation Hub 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 Transformation Hub 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 Transformation Hub. These files are very sensitive and should not be distributed to other machines.

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

On Windows platforms:

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

Step 6: On the Transformation Hub Server

To cleanup the Transformation Hub 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 Transformation Hub. These files are very sensitive and should not be distributed to other machines.

Configure an Transformation Hub Destination without Client Authentication in FIPS Mode

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

On the Transformation Hub Server

When Transformation Hub 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 Transformation Hub:

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

Note: After the new certificate is imported to the Transformation Hub, the Transformation Hub will need to be uninstalled and then re-installed with FIPS and Client Authentication enabled. See the *Transformation Hub Deployment Guide* for details.

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 -providername BCFIPS -providerclass
org.bouncycastle.jcajce.provider.BouncyCastleFipsProvider -providerpath
${CURRENT}/lib/agent/fips/bc-fips-1.0.0.jar
-J-Djava.security.egd=file:/dev/urandom"
export TH=<Transformation Hub hostname>_<Transformation Hub port>
export STORES=${CURRENT}/user/agent/stores
export STORE_PASSWD=changeit
```

On Windows platforms:

```
set CURRENT=<full path to this "current" folder>
set BC_OPTS="-storetype BCFKS -providername BCFIPS
-J-Djava.ext.dirs=%CURRENT%\jre\lib\ext;%CURRENT%\lib\agent\fips
-J-Djava.security.properties=%CURRENT%\user\agent\agent.security"
set TH=<Transformation Hub hostname>_<Transformation Hub 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 Transformation Hub 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 ${STORES}/${TH}.truststore.bcfips -storepass ${STORE_
PASSWD}
```

On Windows platforms:

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

On Windows platforms:

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

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

9. Note the trust store path:

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

On Windows platforms:

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

10. Navigate to the `bin` directory and run agent setup. Install a connector with Transformation Hub 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 Transformation Hub 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 Transformation Hub. 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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