Prepare to install the SnapCenter Plug-in for SAP HANA Database

SnapCenter Software 4.5

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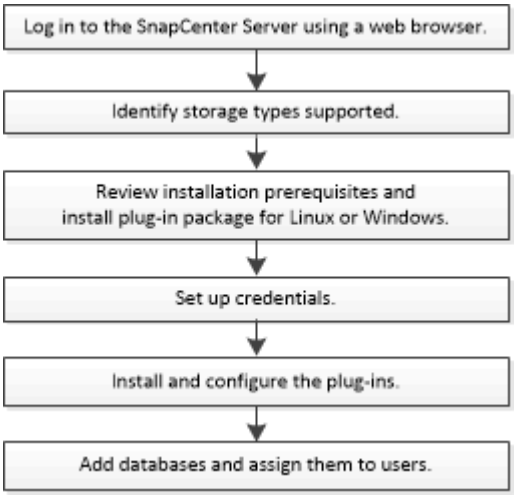
Prepare to install the SnapCenter Plug-in for SAP HANA Database

Installation workflow of SnapCenter Plug-in for SAP HANA Database

You should install and set up the SnapCenter Plug-in for SAP HANA Database if you want to protect SAP HANA databases.



Prerequisites for adding hosts and installing SnapCenter Plug-in for SAP HANA Database

Before you add a host and install the plug-in packages, you must complete all the requirements. SnapCenter Plug-in for SAP HANA Database is available in both Windows and Linux environments.

- You must have installed Java 1.8 64-bit on your host.

  IBM Java is not supported.

- You must have installed SAP HANA database interactive terminal (HDBSQL client) on the host.
- For Windows, plug-in Creator Service should be running using the “LocalSystem” windows user, which is the default behavior when Plug-in for SAP HANA Database is installed as domain administrator.
- For Windows, user store keys should be created as SYSTEM user.
- When installing a plug-in on a Windows host, if you specify a credential that is not built-in or if the user belongs to a local workgroup user, you must disable UAC on the host. SnapCenter Plug-in for Microsoft Windows will be deployed by default with the SAP HANA plug-in on Windows hosts.
- For Linux host, HDB Secure User Store keys are accessed as HDBSQL OS user.
- SnapCenter Server should have access to the 8145 or custom port of Plug-in for SAP HANA Database host.

Windows hosts

- You must have a domain user with local administrator privileges with local login permissions on the remote host.
- While installing Plug-in for SAP HANA Database on a Windows host, SnapCenter Plug-in for Microsoft Windows is installed automatically.
- You must have enabled the password-based SSH connection for the root or non-root user.
- You must have installed Java 1.8 64-bit on your Windows host.

  Java Downloads for All Operating Systems

  The Interoperability Matrix Tool contains the latest information about requirements.

Linux hosts

- You must have enabled the password-based SSH connection for the root or non-root user.
- You must have installed Java 1.8 64-bit on your Linux host.

  Java Downloads for All Operating Systems

  The Interoperability Matrix Tool contains the latest information about requirements.

- For SAP HANA databases that are running on a Linux host, while installing Plug-in for SAP HANA Database, SnapCenter Plug-in for UNIX is installed automatically.

Host requirements to install SnapCenter Plug-ins Package for Windows

Before you install the SnapCenter Plug-ins Package for Windows, you should be familiar with some basic host system space requirements and sizing requirements.

Item	Requirements
Operating Systems	Microsoft Windows For the latest information about supported versions, see the NetApp Interoperability Matrix Tool.
Minimum RAM for the SnapCenter plug-in on host	1 GB

Item	Requirements
Minimum install and log space for the SnapCenter plug-in on host	5 GB You should allocate sufficient disk space and monitor the storage consumption by the logs folder. The log space required varies depending on the number of the entities to be protected and the frequency of data protection operations. If there is no sufficient disk space, the logs will not be created for the recently run operations.
Required software packages	• Microsoft .NET Framework 4.5.2 or later • Windows Management Framework (WMF) 4.0 or later • PowerShell 4.0 or later For the latest information about supported versions, see the NetApp Interoperability Matrix Tool.

Host requirements for installing the SnapCenter Plug-ins Package for Linux

Before you install the SnapCenter Plug-ins Package for Linux, you should be familiar with some basic host system space and sizing requirements.

Item	Requirements
Operating systems	• Red Hat Enterprise Linux • SUSE Linux Enterprise Server (SLES) For the latest information about supported versions, see the NetApp Interoperability Matrix Tool.
Minimum RAM for the SnapCenter plug-in on host	1 GB

Item	Requirements
Minimum install and log space for the SnapCenter plug-in on host	2 GB You should allocate sufficient disk space and monitor the storage consumption by the logs folder. The log space required varies, depending on the number of the entities to be protected and the frequency of data protection operations. If there is no sufficient disk space, the logs will not be created for the recently run operations.
Required software packages	Java 1.8.x (64-bit)Oracle Java and OpenJDK flavors If you have upgraded JAVA to the latest version, you must ensure that the JAVA_HOME option located at /var/opt/snapcenter/spl/etc/spl.properties is set to the correct JAVA version and the correct path. For the latest information about supported versions, see the NetApp Interoperability Matrix Tool. .

Set up credentials for the SnapCenter Plug-in for SAP HANA Database

SnapCenter uses credentials to authenticate users for SnapCenter operations. You should create credentials for installing SnapCenter plug-ins and additional credentials for performing data protection operations on databases or Windows file systems.

About this task

- Linux hosts

  You must set up credentials for installing plug-ins on Linux hosts.

  You must set up the credentials for the root user or for a non-root user who has sudo privileges to install and start the plug-in process.

  Best Practice: Although you are allowed to create credentials for Linux after deploying hosts and installing plug-ins, the best practice is to create credentials after you add SVMs, before you deploy hosts and install plug-ins.

- Windows hosts

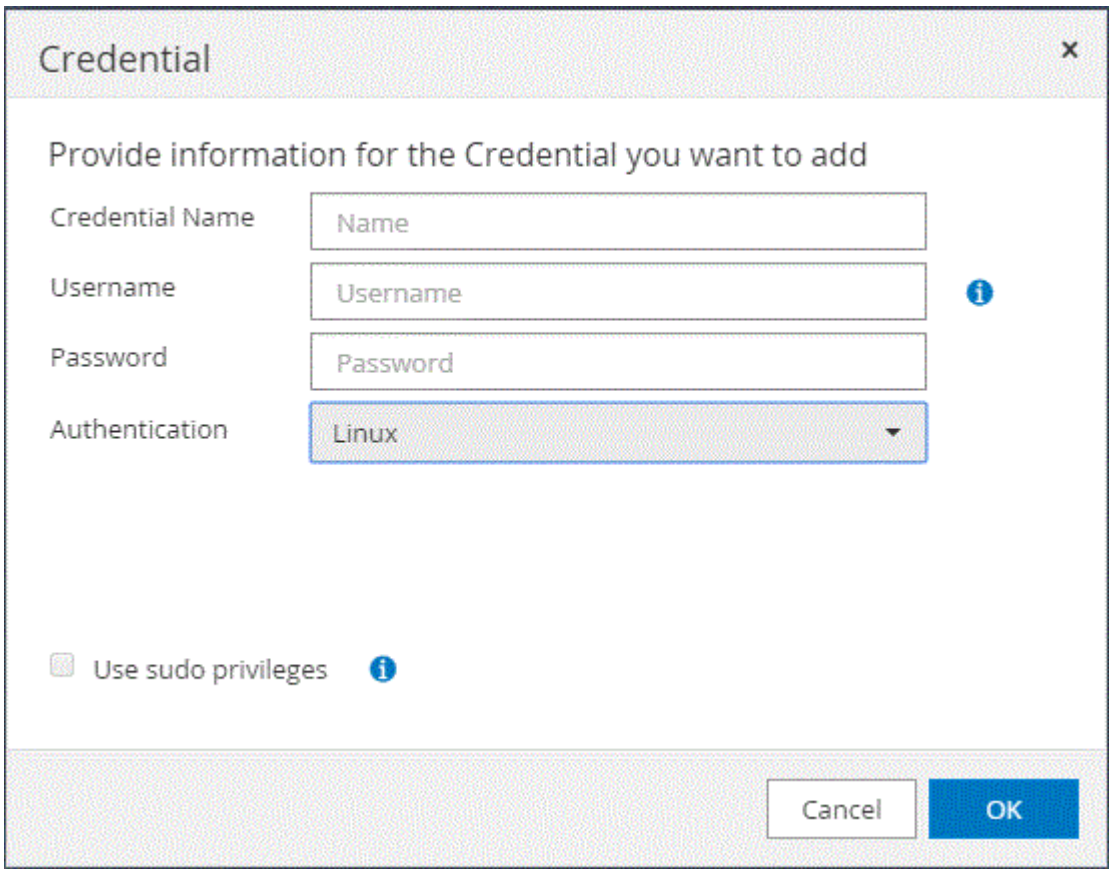
  You must set up Windows credentials before installing plug-ins.

  You must set up the credentials with administrator privileges, including administrator rights on the remote host.

If you set up credentials for individual resource groups and the username does not have full admin privileges, you must assign at least the resource group and backup privileges to the username.

Steps

1. In the left navigation pane, click **Settings**.
2. In the **Settings** page, click **Credential**.
3. Click **New**.



4. In the **Credential** page, specify the information required for configuring credentials:

For this field…	Do this…
Credential name	Enter a name for the credentials.

For this field…	Do this…
User name	Enter the user name and password that are to be used for authentication. • Domain administrator or any member of the administrator group Specify the domain administrator or any member of the administrator group on the system on which you are installing the SnapCenter plug-in. Valid formats for the Username field are: ◦ *NetBIOS\UserName* ◦ *Domain FQDN\UserName* • Local administrator (for workgroups only) For systems that belong to a workgroup, specify the built-in local administrator on the system on which you are installing the SnapCenter plug-in. You can specify a local user account that belongs to the local administrators group if the user account has elevated privileges or the User Access control feature is disabled on the host system. The valid format for the Username field is: *UserName* Do not use double quotes (") or backtick (`) in the passwords. You should not use the less than (<) and exclamation (!) symbols together in passwords. For example, lessthan<!10, lessthan10<!, backtick`12.
Password	Enter the password used for authentication.
Authentication Mode	Select the authentication mode that you want to use.
Use sudo privileges	Select the **Use sudo privileges** check box if you are creating credentials for a non-root user. Applicable to Linux users only.

5. Click **OK**.

After you finish setting up the credentials, you might want to assign credential maintenance to a user or group of users on the **User and Access** page.

Configure gMSA on Windows Server 2012 or later

Windows Server 2012 or later enables you to create a group Managed Service Account (gMSA) that provides automated service account password management from a managed domain account.

What you will need

- You should have a Windows Server 2012 or later domain controller.
- You should have a Windows Server 2012 or later host, which is a member of the domain.

Steps

1. Create a KDS root key to generate unique passwords for each object in your gMSA.
2. For each domain, run the following command from the Windows domain controller: Add-KDSRootKey -EffectiveImmediately
3. Create and configure your gMSA:
   a. Create a user group account in the following format:

      ```
      domainName\accountName$
      ```

   b. Add computer objects to the group.
   c. Use the user group you just created to create the gMSA.

      For example,

      ```
      New-ADServiceAccount -name <ServiceAccountName> -DNSHostName <fqdn>
      -PrincipalsAllowedToRetrieveManagedPassword <group>
      -ServicePrincipalNames <SPN1,SPN2,…>
      ```

   d. Run `Get-ADServiceAccount` command to verify the service account.
4. Configure the gMSA on your hosts:
   a. Enable the Active Directory module for Windows PowerShell on the host where you want to use the gMSA account.

      To do this, run the following command from PowerShell:

```
PS C:\> Get-WindowsFeature AD-Domain-Services

Display Name                            Name                Install
State
------------                            ----
-------------
[ ] Active Directory Domain Services   AD-Domain-Services  Available


PS C:\> Install-WindowsFeature AD-DOMAIN-SERVICES

Success Restart Needed Exit Code      Feature Result
------- -------------- ---------      --------------
True    No             Success        {Active Directory Domain
Services, Active ...
WARNING: Windows automatic updating is not enabled. To ensure that
your newly-installed role or feature is
automatically updated, turn on Windows Update.
```

b. Restart your host.

c. Install the gMSA on your host by running the following command from the PowerShell command prompt: `Install-AdServiceAccount <gMSA>`

d. Verify your gMSA account by running the following command: `Test-AdServiceAccount <gMSA>`

5. Assign the administrative privileges to the configured gMSA on the host.
6. Add the Windows host by specifying the configured gMSA account in the SnapCenter Server.

   SnapCenter Server will install the selected plug-ins on the host and the specified gMSA will be used as the service log on account during the plug-in installation.

Install the SnapCenter Plug-in for SAP HANA Databases

Add hosts and install plug-in packages on remote hosts

You must use the SnapCenter Add Host page to add hosts, and then install the plug-ins packages. The plug-ins are automatically installed on the remote hosts. You can add a host and install plug-in packages either for an individual host or for a cluster.

What you will need

- You must be a user that is assigned to a role that has the plug-in install and uninstall permissions, such as the SnapCenter Admin role.
- When installing a plug-in on a Windows host, if you specify a credential that is not built-in, or if the user belongs to a local workgroup user, you must disable UAC on the host.
- You should ensure that the message queueing service is running.

- The administration documentation contains information about managing hosts.
- If you are using group Managed Service Account (gMSA), you should configure gMSA with administrative privileges.

  Configure group Managed Service Account on Windows Server 2012 or later for SAP HANA

About this task

You cannot add a SnapCenter Server as a plug-in host to another SnapCenter Server.

Steps

1. In the left navigation pane, click **Hosts**.
2. Verify that the **Managed Hosts** tab is selected at the top.
3. Click **Add**.
4. On the **Hosts** page, perform the following actions:

For this field…	Do this…
Host Type	Select the type of host: • Windows • Linux The Plug-in for SAP HANA is installed on the HDBSQL client host, and this host can be on either a Windows system or a Linux system.
Host name	Enter the communication host name. Enter the fully qualified domain name (FQDN) or the IP address of the host. SnapCenter depends on the proper configuration of the DNS. Therefore, the best practice is to enter the FQDN. You must configure the HDBSQL client and HDBUserStore on this host.

For this field…	Do this…
Credentials	Either select the credential name that you created or create new credentials. The credential must have administrative rights on the remote host. For details, see the information about creating credentials. You can view details about the credentials by positioning your cursor over the credential name that you provided. The credentials authentication mode is determined by the host type that you specify in the Add Host wizard.

5. In the Select Plug-ins to Install section, select the plug-ins to install.
6. (Optional) Click **More Options**.

For this field…	Do this…
Port	Either retain the default port number or specify the port number. The default port number is 8145. If the SnapCenter Server was installed on a custom port, that port number will be displayed as the default port. If you manually installed the plug-ins and specified a custom port, you must specify the same port. Otherwise, the operation fails.
Installation Path	The Plug-in for SAP HANA is installed on the HDBSQL client host, and this host can be on either a Windows system or a Linux system. • For the SnapCenter Plug-ins Package for Windows, the default path is C:\Program Files\NetApp\SnapCenter. Optionally, you can customize the path. • For the SnapCenter Plug-ins Package for Linux, the default path is /opt/NetApp/snapcenter. Optionally, you can customize the path.
Skip preinstall checks	Select this check box if you already installed the plug-ins manually and you do not want to validate whether the host meets the requirements for installing the plug-in.

For this field…	Do this…
Use group Managed Service Account (gMSA) to run the plug-in services	For Windows host, select this check box if you want to use group Managed Service Account (gMSA) to run the plug-in services. Provide the gMSA name in the following format: domainName\accountName$. gMSA will be used as a log on service account only for SnapCenter Plug-in for Windows service.

7. Click **Submit**.

   If you have not selected the Skip prechecks checkbox, the host is validated to verify whether the host meets the requirements for installing the plug-in. The disk space, RAM, PowerShell version, .NET version, location (for Windows plug-ins), and Java version (for Linux plug-ins) are validated against the minimum requirements. If the minimum requirements are not met, appropriate error or warning messages are displayed.

   If the error is related to disk space or RAM, you can update the web.config file located at C:\Program Files\NetApp\SnapCenter WebApp to modify the default values. If the error is related to other parameters, you must fix the issue.

   In an HA setup, if you are updating web.config file, you must update the file on both nodes.

8. If host type is Linux, verify the fingerprint, and then click **Confirm and Submit**.

   In a cluster setup, you should verify the fingerprint of each of the nodes in the cluster.

   Fingerprint verification is mandatory even if the same host was added earlier to SnapCenter and the fingerprint was confirmed.

9. Monitor the installation progress.

   The installation-specific log files are located at /custom_location/snapcenter/logs.

Install SnapCenter Plug-in Packages for Linux or Windows on multiple remote hosts by using cmdlets

You can install the SnapCenter Plug-in Packages for Linux or Windows on multiple hosts simultaneously by using the Install-SmHostPackage PowerShell cmdlet.

What you will need

You must have logged in to SnapCenter as a domain user with local administrator rights on each host on which you want to install the plug-in package.

Steps

1. Launch PowerShell.
2. On the SnapCenter Server host, establish a session using the Open-SmConnection cmdlet, and then enter your credentials.
3. Install the plug-in on multiple hosts using the Install-SmHostPackage cmdlet and the required parameters.

   The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running *Get-Help command_name*. Alternatively, you can also refer to the SnapCenter Software Cmdlet Reference Guide.

   You can use the -skipprecheck option when you have installed the plug-ins manually and do not want to validate whether the host meets the requirements to install the plug-in.

4. Enter your credentials for remote installation.

Install the SnapCenter Plug-in for SAP HANA Database on Linux hosts by using the command-line interface

You should install the SnapCenter Plug-in for SAP HANA Database by using the SnapCenter user interface (UI). If your environment does not allow remote installation of the plug-in from the SnapCenter UI, you can install the Plug-in for SAP HANA Database either in console mode or in silent mode by using the command-line interface (CLI).

What you will need

- You should install the Plug-in for SAP HANA Database on each of the Linux host where the HDBSQL client resides.
- The Linux host on which you are installing the SnapCenter Plug-in for SAP HANA Database must meet the dependent software, database, and operating system requirements.

  The Interoperability Matrix Tool (IMT) contains the latest information about the supported configurations.

  NetApp Interoperability Matrix Tool

- The SnapCenter Plug-in for SAP HANA Database is part of SnapCenter Plug-ins Package for Linux. Before you install SnapCenter Plug-ins Package for Linux, you should have already installed SnapCenter on a Windows host.

Steps

1. Copy the SnapCenter Plug-ins Package for Linux installation file (snapcenter_linux_host_plugin.bin) from C:\ProgramData\NetApp\SnapCenter\Package Repository to the host where you want to install the Plug-in for SAP HANA Database.

   You can access this path from the host where the SnapCenter Server is installed.

2. From the command prompt, navigate to the directory where you copied the installation file.
3. Install the plug-in: `path_to_installation_bin_file/snapcenter_linux_host_plugin.bin -i silent -DPORT=port_number_for_host -DSERVER_IP=server_name_or_ip_address -DSERVER_HTTPS_PORT=port_number_for_server`

   - -DPORT specifies the SMCore HTTPS communication port.

- -DSERVER_IP specifies the SnapCenter Server IP address.
- -DSERVER_HTTPS_PORT specifies the SnapCenter Server HTTPS port.
- -DUSER_INSTALL_DIR specifies the directory where you want to install the SnapCenter Plug-ins Package for Linux.
- DINSTALL_LOG_NAME specifies the name of the log file.

```
/tmp/sc-plugin-installer/snapcenter_linux_host_plugin.bin -i silent
-DPORT=8145 -DSERVER_IP=scserver.domain.com -DSERVER_HTTPS_PORT=8146
-DUSER_INSTALL_DIR=/opt
-DINSTALL_LOG_NAME=SnapCenter_Linux_Host_Plugin_Install_2.log
-DCHOSEN_FEATURE_LIST=CUSTOM
```

4. Edit the /<installation directory>/NetApp/snapcenter/scc/etc/SC_SMS_Services.properties file, and then add the PLUGINS_ENABLED = hana:3.0 parameter.
5. Add the host to the SnapCenter Server using the Add-Smhost cmdlet and the required parameters.

   The information regarding the parameters that can be used with the command and their descriptions can be obtained by running *Get-Help command_name*. Alternatively, you can also refer to the SnapCenter Software Cmdlet Reference Guide.

Monitor the status of installing Plug-in for SAP HANA

You can monitor the progress of SnapCenter plug-in package installation by using the Jobs page. You might want to check the progress of installation to determine when it is complete or if there is an issue.

About this task

The following icons appear on the Jobs page and indicate the state of the operation:

- In progress
- Completed successfully
- Failed
- Completed with warnings or could not start due to warnings
- Queued

Steps

1. In the left navigation pane, click **Monitor**.
2. In the **Monitor** page, click **Jobs**.
3. On the **Jobs** page, to filter the list so that only plug-in installation operations are listed, do the following:
   a. Click **Filter**.
   b. Optional: Specify the start and end date.
   c. From the Type drop-down menu, select **Plug-in installation**.
   d. From the Status drop-down menu, select the installation status.

e. Click **Apply**.

4. Select the installation job and click **Details** to view the job details.
5. In the **Job Details** page, click **View logs**.

Configure CA Certificate

Generate CA Certificate CSR file

You can generate a Certificate Signing Request (CSR) and import the certificate that can be obtained from a Certificate Authority (CA) using the generated CSR. The certificate will have a private key associated with it.

CSR is a block of encoded text that is given to an authorized certificate vendor to procure the signed CA certificate.

For information to generate a CSR, see How to generate CA Certificate CSR file.

If you own the CA certificate for your domain (*.domain.company.com) or your system (machine1.domain.company.com), you can skip generating the CA Certificate CSR file. You can deploy the existing CA certificate with SnapCenter.

For cluster configurations, the cluster name (virtual cluster FQDN), and the respective host names should be mentioned in the CA certificate. The certificate can be updated by filling the Subject Alternative Name (SAN) field before procuring the certificate. For a wild card certificate (*.domain.company.com), the certificate will contain all the hostnames of the domain implicitly.

Import CA certificates

You must import the CA certificates to the SnapCenter Server and the Windows host plug-ins using the Microsoft management console (MMC).

Steps

1. Go to the Microsoft management console (MMC), and then click **File** > **Add/Remove Snapin**.
2. In the **Add or Remove Snap-ins** window, select **Certificates** and then click **Add**.
3. In the **Certificates snap-in** window, select the **Computer account** option, and then click **Finish**.
4. Click **Console Root** > **Certificates – Local Computer** > **Trusted Root Certification Authorities** > **Certificates**.
5. Right-click on the folder “Trusted Root Certification Authorities”, and then select **All Tasks** > **Import** to start the import wizard.
6. Complete the wizard, as follows:

In this wizard window…	Do the following…
Import Private Key	Select the option **Yes**, import the private key, and then click **Next**.
Import File Format	Make no changes; click **Next**.

In this wizard window…	Do the following…
Security	Specify the new password to be used for the exported certificate, and then click **Next**.
Completing the Certificate Import Wizard	Review the summary, and then click **Finish** to start the import.

Importing certificate should be bundled with the private key (supported formats are: *.pfx, *.p12, *.p7b).

7. Repeat Step 5 for the “Personal” folder.

Get the CA certificate thumbprint

A certificate thumbprint is a hexadecimal string that identifies a certificate. A thumbprint is calculated from the content of the certificate using a thumbprint algorithm.

Steps

1. Perform the following on the GUI:
   a. Double-click the certificate.
   b. In the Certificate dialog box, click the **Details** tab.
   c. Scroll through the list of fields and click **Thumbprint**.
   d. Copy the hexadecimal characters from the box.
   e. Remove the spaces between the hexadecimal numbers.

      For example, if the thumbprint is: "a9 09 50 2d d8 2a e4 14 33 e6 f8 38 86 b0 0d 42 77 a3 2a 7b", after removing the spaces, it will be: "a909502dd82ae41433e6f83886b00d4277a32a7b".

2. Perform the following from PowerShell:
   a. Run the following command to list the thumbprint of the installed certificate and identify the recently installed certificate by the subject name.

      Get-ChildItem -Path Cert:\LocalMachine\My

   b. Copy the thumbprint.

Configure CA certificate with Windows host plug-in services

You should configure the CA certificate with Windows host plug-in services to activate the installed digital certificate.

Perform the following steps on the SnapCenter Server and all the plug-in hosts where CA certificates are already deployed.

Steps

1. Remove the existing certificate binding with SMCore default port 8145, by running the following command:

```
> netsh http delete sslcert ipport=0.0.0.0:_<SMCore Port>
```

For example:

```
> netsh http delete sslcert ipport=0.0.0.0:8145
```

2. Bind the newly installed certificate with the Windows host plug-in services, by running the following commands:

```
> $cert = "<certificate thumbprint>"

> $guid = [guid]::NewGuid().ToString("B")

> netsh http add sslcert ipport=0.0.0.0: <SMCore Port> certhash=$cert
appid="$guid"
```

For example:

```
> $cert = "a909502dd82ae41433e6f83886b00d4277a32a7b"
> $guid = [guid]::NewGuid().ToString("B")
> netsh http add sslcert ipport=0.0.0.0:8145 certhash=$cert
appid="$guid"
```

Configure the CA Certificate for the SnapCenter SAP HANA Plug-ins service on Linux host

You should manage the password of the custom plug-ins keystore and its certificate, configure the CA certificate, configure root or intermediate certificates to the custom plug-ins trust-store, and configure CA signed key pair to custom plug-ins trust-store with SnapCenter Custom Plug-ins service to activate the installed digital certificate.

Custom plug-ins uses the file 'keystore.jks', which is located at */opt/NetApp/snapcenter/scc/etc* both as its trust-store and key-store.

Manage password for custom plug-in keystore and alias of the CA signed key pair in use

Steps

1. You can retrieve custom plug-in keystore default password from custom plug-in agent property file.

   It is the value corresponding to the key 'KEYSTORE_PASS'.

2. Change the keystore password:

```
keytool -storepasswd -keystore keystore.jks
```

3. Change the password for all aliases of private key entries in the keystore to the same password used for the keystore:

```
keytool -keypasswd -alias "alias_name_in_cert" -keystore keystore.jks
```

Update the same for the key KEYSTORE_PASS in *agent.properties* file.

4. Restart the service after changing the password.

> Password for custom plug-in keystore and for all the associated alias password of the private key should be same.

Configure root or intermediate certificates to custom plug-in trust-store

You should configure the root or intermediate certificates without the private key to custom plug-in trust-store.

Steps

1. Navigate to the folder containing the custom plug-in keystore: /opt/NetApp/snapcenter/scc/etc.
2. Locate the file 'keystore.jks'.
3. List the added certificates in the keystore:

```
keytool -list -v -keystore keystore.jks
```

4. Add a root or intermediate certificate:

```
keytool -import -trustcacerts -alias myRootCA -file
/root/USERTrustRSA_Root.cer -keystore keystore.jks
```

5. Restart the service after configuring the root or intermediate certificates to custom plug-in trust-store.

> You should add the root CA certificate and then the intermediate CA certificates.

Configure CA signed key pair to custom plug-in trust-store

You should configure the CA signed key pair to the custom plug-in trust-store.

Steps

1. Navigate to the folder containing the custom plug-in keystore /opt/NetApp/snapcenter/scc/etc.
2. Locate the file 'keystore.jks'.
3. List the added certificates in the keystore:

```
keytool -list -v -keystore keystore.jks
```

4. Add the CA certificate having both private and public key.

```
keytool -importkeystore -srckeystore /root/snapcenter.ssl.test.netapp.com.pfx
-srcstoretype pkcs12 -destkeystore keystore.jks -deststoretype JKS
```

5. List the added certificates in the keystore.

```
keytool -list -v -keystore keystore.jks
```

6. Verify that the keystore contains the alias corresponding to the new CA certificate, which was added to the keystore.
7. Change the added private key password for CA certificate to the keystore password.

   Default custom plug-in keystore password is the value of the key KEYSTORE_PASS in agent.properties file.

   ```
   keytool -keypasswd -alias "alias_name_in_CA_cert" -keystore keystore.jks
   ```

8. If the alias name in the CA certificate is long and contains space or special characters ("*",","), change the alias name to a simple name:

   ```
   keytool -changealias -alias "long_alias_name" -destalias "simple_alias"
   -keystore keystore.jks
   ```

9. Configure the alias name from CA certificate in agent.properties file.

   Update this value against the key SCC_CERTIFICATE_ALIAS.

10. Restart the service after configuring the CA signed key pair to custom plug-in trust-store.

Configure certificate revocation list (CRL) for SnapCenter Custom Plug-ins

About this task

- SnapCenter Custom Plug-ins will search for the CRL files in a pre-configured directory.
- Default directory for the CRL files for SnapCenter Custom Plug-ins is ' opt/NetApp/snapcenter/scc/etc/crl'.

Steps

1. You can modify and update the default directory in agent.properties file against the key CRL_PATH.

   You can place more than one CRL file in this directory. The incoming certificates will be verified against each CRL.

Configure the CA Certificate for the SnapCenter SAP HANA Plug-ins service on Windows host

You should manage the password of the custom plug-ins keystore and its certificate, configure the CA certificate, configure root or intermediate certificates to the custom plug-ins trust-store, and configure CA signed key pair to custom plug-ins trust-store with SnapCenter Custom Plug-ins service to activate the installed digital certificate.

Custom plug-ins uses the file *keystore.jks*, which is located at *C:\Program Files\NetApp\SnapCenter\Snapcenter Plug-in Creator\etc* both as its trust-store and key-store.

Manage password for custom plug-in keystore and alias of the CA signed key pair in use

Steps

1. You can retrieve custom plug-in keystore default password from custom plug-in agent property file.

   It is the value corresponding to the key *KEYSTORE_PASS*.

2. Change the keystore password:

   keytool -storepasswd -keystore keystore.jks

   > If the "keytool" command is not recognized on the Windows command prompt, replace the keytool command with its complete path.

   C:\Program Files\Java\<jdk_version>\bin\keytool.exe" -storepasswd -keystore keystore.jks

3. Change the password for all aliases of private key entries in the keystore to the same password used for the keystore:

   keytool -keypasswd -alias "alias_name_in_cert" -keystore keystore.jks

   Update the same for the key KEYSTORE_PASS in *agent.properties* file.

4. Restart the service after changing the password.

   > Password for custom plug-in keystore and for all the associated alias password of the private key should be same.

Configure root or intermediate certificates to custom plug-in trust-store

You should configure the root or intermediate certificates without the private key to custom plug-in trust-store.

Steps

1. Navigate to the folder containing the custom plug-in keystore *C:\Program Files\NetApp\SnapCenter\Snapcenter Plug-in Creator\etc*
2. Locate the file 'keystore.jks'.
3. List the added certificates in the keystore:

   keytool -list -v -keystore keystore.jks

4. Add a root or intermediate certificate:

   keytool -import -trustcacerts -alias myRootCA -file /root/USERTrustRSA_Root.cer -keystore keystore.jks

5. Restart the service after configuring the root or intermediate certificates to custom plug-in trust-store.

> You should add the root CA certificate and then the intermediate CA certificates.

Configure CA signed key pair to custom plug-in trust-store

You should configure the CA signed key pair to the custom plug-in trust-store.

Steps

1. Navigate to the folder containing the custom plug-in keystore *C:\Program Files\NetApp\SnapCenter\Snapcenter Plug-in Creator\etc*
2. Locate the file *keystore.jks*.
3. List the added certificates in the keystore:

   keytool -list -v -keystore keystore.jks

4. Add the CA certificate having both private and public key.

   keytool -importkeystore -srckeystore /root/snapcenter.ssl.test.netapp.com.pfx -srcstoretype pkcs12 -destkeystore keystore.jks -deststoretype JKS

5. List the added certificates in the keystore.

   keytool -list -v -keystore keystore.jks

6. Verify that the keystore contains the alias corresponding to the new CA certificate, which was added to the keystore.
7. Change the added private key password for CA certificate to the keystore password.

   Default custom plug-in keystore password is the value of the key KEYSTORE_PASS in agent.properties file.

   keytool -keypasswd -alias "alias_name_in_CA_cert" -keystore keystore.jks

8. Configure the alias name from CA certificate in *agent.properties* file.

   Update this value against the key SCC_CERTIFICATE_ALIAS.

9. Restart the service after configuring the CA signed key pair to custom plug-in trust-store.

Configure certificate revocation list (CRL) for SnapCenter Custom Plug-ins

About this task

- To download the latest CRL file for the related CA certificate see How to update certificate revocation list file in SnapCenter CA Certificate.
- SnapCenter Custom Plug-ins will search for the CRL files in a pre-configured directory.
- Default directory for the CRL files for SnapCenter Custom Plug-ins is *'C:\Program Files\NetApp\SnapCenter\Snapcenter Plug-in Creator\ etc\crl'*.

Steps

1. You can modify and update the default directory in *agent.properties* file against the key CRL_PATH.
2. You can place more than one CRL file in this directory.

   The incoming certificates will be verified against each CRL.

Enable CA Certificates for plug-ins

You should configure the CA certificates and deploy the CA certificates in the SnapCenter Server and the corresponding plug-in hosts. You should enable the CA certificate validation for the plug-ins.

What you will need

- You can enable or disable the CA certificates using the run *Set-SmCertificateSettings* cmdlet.
- You can display the certificate status for the plug-ins using the *Get-SmCertificateSettings*.

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running *Get-Help command_name*. Alternatively, you can also refer to the SnapCenter Software Cmdlet Reference Guide.

Steps

1. In the left navigation pane, click **Hosts**.
2. In the Hosts page, click **Managed Hosts**.
3. Select single or multiple plug-in hosts.
4. Click **More options**.
5. Select **Enable Certificate Validation**.

After you finish

The Managed Hosts tab host displays a padlock and the color of the padlock indicates the status of the connection between SnapCenter Server and the plug-in host.

- indicates that the CA certificate is neither enabled nor assigned to the plug-in host.
- indicates that the CA certificate is successfully validated.
- indicates that the CA certificate could not be validated.
- indicates that the connection information could not be retrieved.

When the status is yellow or green, the data protection operations completes successfully.

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