HPE StoreOnce

Integration Guide

ESKM

utimaco®

Imprint

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1 About This Guide

This guide provides information on how to configure the HPE StoreOnce to work with the Utimaco Enterprise Secure Key Manager (ESKM). It describes only the features in the HPE StoreOnce and the ESKM necessary for the configuration and integration.

For more information on installing an Utimaco Enterprise Secure Key Manager refer to the *Utimaco Enterprise Secure Key Manager Installation and Replacement Guide (Chapter 1 Installing Hardware).*

1.1 Intended Audience

This guide is intended for system and security administrators with knowledge of:

- Data security administration.
- Network configuration.

1.2 Document Conventions and Symbols

The following conventions are used in this guide:

Convention	Use	Example
Bold	Items of the Graphical User Interface (GUI), e.g., menu options	Select **Details** and click on **Properties** button
`Monospaced`	Code that is given for explanation or as an example, file paths	`certreq.exe -new request.inf IISCertRequest.csr`
Italic	References and important terms	Operating system listed in *Tested Versions*

Table 1: Document conventions

We use special icons to highlight the most important notes and information.

Indicates an action that can have consequences such as deletion of keys or changes to security settings.

Provides clarifying information or specific instructions.

Provides helpful hints and shortcuts.

1.3 Related Documentation

The following documents provide related information:

- *Enterprise Secure Key Manager v8.53.0 Installation and Replacement Guide.*
- *Enterprise Secure Key Manager v8.53.0 Software Version 8.53.0 Release Notes.*
- *Enterprise Secure Key Manager v8.53.0 User's Guide.*

1.4 Utimaco Websites

For additional information, see the following Utimaco websites: Enterprise Secure Key Manager - Utimaco.

1.4.1 OASIS Websites

In addition to the Utimaco websites, see the OASIS websites for more information on the Key Management Interoperability Protocol (KMIP) specification, usage guides and profiles:

- https://www.oasis-open.org/standards
- https://wiki.oasis-open.org/kmip/KnownKMIPImplementations

1.5 Documentation Feedback

Utimaco welcomes your feedback. To make comments and suggestions about product documentation, please send an email to:

support-atalla@utimaco.com

All submissions become the property of Utimaco.

1.6 What is new in the ESKM v8.0 Appliance

The ESKM v8.0 appliance is a complete solution for generating, storing, serving, controlling and auditing access to data encryption keys. It enables you to protect and preserve access to business-critical, sensitive, data-at-rest encryption keys, either locally or remotely.

2 Configuring the ESKM Server

ESKM server must be configured with specific values such as time zone, IP address, netmask, gateway, host name, and port number used for the ESKM Management Console interface.

This section includes procedures on the following topics:

- First run.
- Setting up local CA.
- Setting up ESKM certificate.
- Setup cluster.
- Setup KMIP server.
- Setup KMS server.

2.1 First Run

To configure the time zone, IP address, netmask, gateway, host name, and port number used for the ESKM Management Console interface, the following procedure must be performed once for each ESKM server. Ensure that the ESKM server is powered off before starting this procedure.

- Power on the ESKM server by pressing the Power On/Standby button located behind the front bezel door.
- When the startup sequence completes, the following prompt displays on the monitor that is running the terminal emulator program (such as PuTTY):

To set up and configure PuTTY, please refer to *Accessing serial console via PuTTY*.

```
Are you ready to begin setup? (y/halt): Enter y.
```

- Follow the prompts to enter the necessary information and press Enter to accept the default.
    - Admin account password. Be sure to record this value and store it in a safe place. The Security Officer will use the admin account to configure the ESKM servers.
    - Time zone.
    - Date.

- Time. The time is based on a 24–hour clock; there is no a.m. or p.m. designation. For example, 1:20 p.m. is 13:20:00.
- The static IPv4 address of the ESKM server. The ESKM server cannot obtain an IP address from a Dynamic Host Configuration Protocol (DHCP) server.
- Subnet mask.
- Default gateway.
- Hostname, including the domain. For example, eskm.example.com[2]. The screen displays the information you entered and the message "Is this correct? (y/n):"If the information displayed is correct, enter y; if not, enter n and make the necessary corrections.
- Enable IPv6. If the ESKM server will be installed in an IPv6 network, enter y to the prompt and also the confirmation prompt. If the ESKM server will not be installed in an IPv6 network, or you wish to enable IPv6 later, enter n. If you entered y, you will be prompted to specify the IPv6 address. If you know the IPv6 address enter y, and then at the next prompt enter the IPv6 address with prefix in this format. IPv6 address/ prefix . The default prefix is /64. If you do not know the IPv6 address, enter n. You can enter IPv6 addresses later using either the ESKM Management Console or Command Line Interface.
- Web interface port number.
- Press Enter to complete and save the configuration settings. At this point, you have given the setup program everything it needs. The ESKM creates SSH keys and also a self-signed Web Admin server certificate. They are used to authenticate the ESKM to users making SSH and Web Admin connections to the ESKM. Because the actual key is fairly large, the ESKM displays the key fingerprint on the console, as shown below.

```
Creating certificate for Web administration server...

Creating certificate for signing logs...

Creating SSH host keys...

SSH RSA key fingerprint:

2048 SHA256:aTp6A447vp8dOj43FTT5B/aux6V7zddPzNXxZB0C1SE SSH ECDSA key
fingerprint:

521 SHA256:BKO/EfVUKSFpIzVn/WiJ4fS+8CqLyGJSawoQAsvmUoM SSH ed25519
key fingerprint:
```

```
256 SHA256:/hWJGM+7hzDRWPsyCP6/gKqWR99cgMh9/TV5WLTFIrs Webadmin
certificate fingerprint (SHA-1):

2048 64:50:e2:01:fb:2a:28:54:1a:3b:30:94:3b:25:b7:ff:97:73:13:70

Initializing key store. This could take several minutes.

Performing KMIP setup Starting services...

The Web-based Management Console will now be available at this URL:

<https://xxx.xxx.xxx.xxx:9443> This device has now been configured.

Press Enter to continue.
```

A log-in prompt displays.

Press Enter to accept the default.

Utimaco has no ability to assist or recover access if administrator credentials (username, password) are lost.

Only enable IPv6 if you are certain that the ESKM server is required to operate on an IPv6 network. Once enabled it cannot be disabled via the ESKM Management Console or the Command Line Interface.

Client systems can use IPv4 addresses to connect to the KMS and KMIP services running on the ESKM system. ESKM supports IPv6 addresses for clients that use either the KMIP or ESKM XML protocols, and are on the same subnet as the ESKM server. The following ESKM features, which utilize SCP to move files, support IPv6 addresses:- backup, restore, scheduled backup, transfer logs, and software upgrade/ install

In addition, you can also use a server which has an IPv6 address to perform the following functions:

- Remotely administer the ESKM server via the ESKM Management Console or the command line interface.

- Perform network diagnostics (ping and netstat).

If you decide later, after completing the setup process, that you need to enable IPv6 support, you can use the Command Line Interface command `ipv6 enable`, to enable IPv6. You can then use the ipv6 address command or the ESKM Management Console interface to specify the `IPv6 address`.

To prevent a "man-in-the-middle" attack when connecting to the ESKM, Utimaco recommends that you write down these fingerprints and compare them with what is presented when you connect to the ESKM via SSH or HTTPS.

If necessary, you can install and specify a different server certificate for remote Web Administration. See the sub-section Configuring the web admin server certificate, which is located in section 4 of the Enterprise Secure Key Manager 8.53.0 User Guide.

- Unplug the null modem cable from the laptop or PC and from the ESKM server. All additional configuration will be done from the ESKM Management Console.

2.2 Setting up Local CA

The local CA is used to sign and verify the server certificate and may also be used to sign client certificate requests. To create and install a local CA, perform the following steps:

- Log in to the ESKM Management Console using the admin username and the password you supplied in *First run*, step 3.
- Select the Security tab.
- In **Certificates & CAs**, click **Local CAs**.
- Enter information required by the **Create Local Certificate Authority** section of the window to create your local CA.

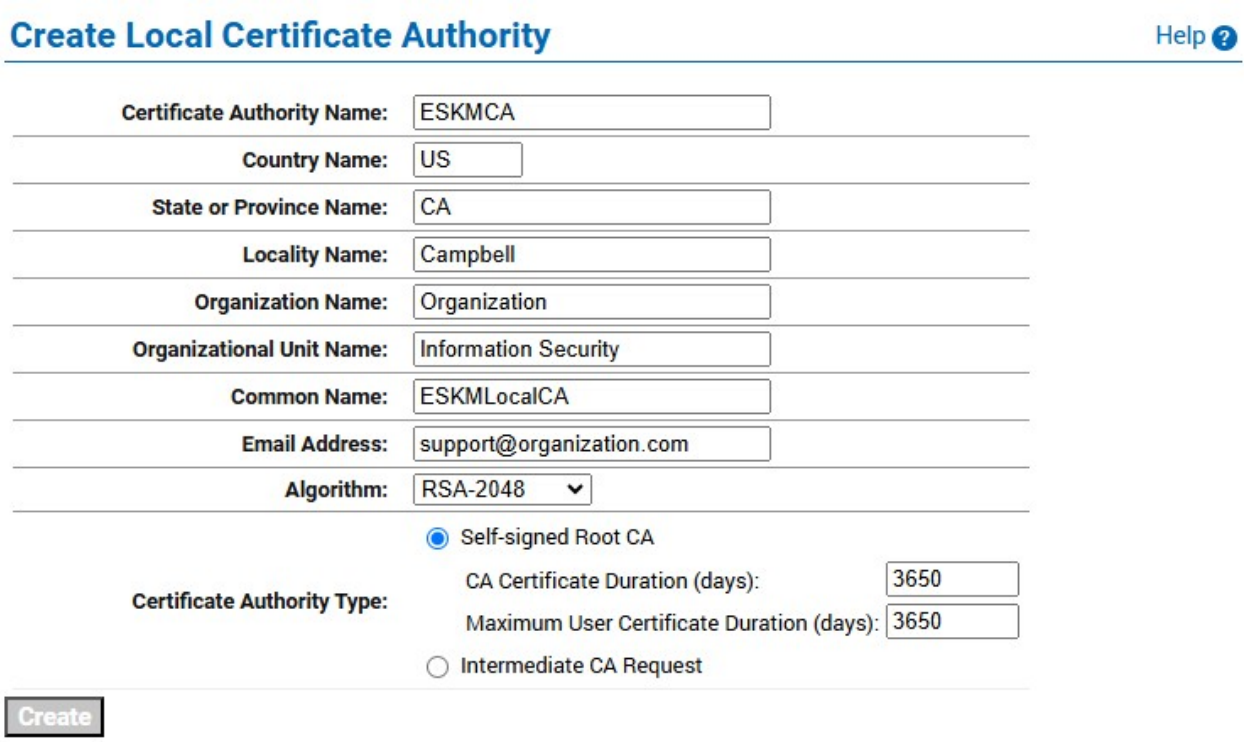


Figure 1 : Create Local Certificate Authority

- Enter a **Certificate Authority Name** and **Common Name**. These may have the same value, for example ESKM Local CA.
- Enter your organizational information.
- Select the **Algorithm** (e.g., RSA-2048).
- Click **Self-signed Root CA** and enter the **CA Certification Duration** and **Maximum User Certificate Duration**. These values determine when the certificate must be renewed and should be set in accordance with your company's security policies. The default value for both is 3650 days or 10 years.
- Click **Create**.
- If the local CA will be used to sign ESKM client certificate requests, add the CA to the **Trusted CA** list.
    - In **Certificates & CAs**, click **Trusted CA Lists** to display the **Trusted Certificate Authority List Profiles**.
    - Click on the **Default Profile Name** (not the radio button).
    - In the **Trusted Certificate Authority List**, click **Edit**.

- From the list of **Available CAs** in the right panel, select the CA you created in step 4. For example, ESKM Local CA.
- Click **Add**.
- Click **Save**.

Repeat the steps above any time another local CA is needed. For example, you may want to create a KMIP Local CA to support the KMIP Certify/Re-certify operations.

Add a third-party CA certificate.

If your client certificates were signed by a third-party CA, you must install the third-party CA certificate, and then add it to the **Trusted CA** list.

To install a third-party CA certificate, perform the following steps:

1. In **Certificates & CAs**, click **Known CAs** to display the **Install CA Certificate** section.
2. Enter a value for the **Certificate Name** and paste the CA certificate text in the **Certificate** field.
3. Click **Install**. The CA certificate will be added to the **Known CAs** list.

To add the third-party CA certificate to the **Trusted CAs** list, perform the following steps:

1. In **Certificates & CAs**, click **Trusted CA Lists** to display the **Trusted Certificate Authority List Profiles**.
2. Click on the **Default Profile Name**.
3. In the **Trusted Certificate Authority List**, click **Edit**.
4. From the list of **Available CAs** in the right panel, select the third-party CA you require.
5. Click **Add**.
6. Click **Save**.

2.3 Setting up ESKM Certificate

ESKM server certificates are used by the client to authenticate the ESKM server during the TLS/SSL handshake. ESKM supports two types of clients.

- Clients that use the ESKM protocol are referred to as ESKM clients.
- Clients that use the KMIP protocol are referred to as KMIP-enabled clients.

The ESKM clients communicate with the KMS server and KMIP-enabled clients communicate with the KMIP server.

During the execution of the Setup utility a default KMIP Server Certificate is automatically created. This certificate should only be used for testing purposes, as it is a self-signed certificate. If your ESKM system will be communicating with KMIP-enabled clients, Utimaco highly recommends that you create a new KMIP server certificate. The name you assign to these server certificates should clearly indicate their purpose. For example: ESKM KMS Server and ESKM KMIP Server.

KMIP requires mutual authentication. After configuring the KMIP server, **enable** KMIP client certificate authentication. The KMIP client certificate authentication status is **disabled** by default.

By default, REST Server uses the system-generated server certificate. Utimaco highly recommends replacing the default certificate.

If you will be using a third-party CA, and wish to use an existing server certificate, see *Import a third-party server certificate*.

To create an ESKM server certificate, perform the following steps:

1. Click the **Security** tab.
2. In **Certificates and CAs**, select **Certificates**.
3. Enter information required by the **Create Certificate** section of the window to create the ESKM server certificate.

Figure 2 : Create Certificate

- Enter a **Certificate Name** and **Common Name**. (For example, ESKM Cert).
- Enter your **Organizational** information.
- Enter/select the **Subject Alternative Name**, **Algorithm**, **Creation Type** as **Certificate Signed by Local CA**, **Local CA** (CA name you created in *Setting up local CA*, for example ESKM Local CA) and **Certificate Purpose**.

4. Click **Create**.

Certificate Information

Help

Certificate Name:	ESKMServerCert
Key Size:	2048
Start Date:	Nov 13 08:37:33 2022 GMT
Expiration:	Nov 10 08:37:33 2032 GMT
Issuer:	C: US ST: CA L: Campbell O: Organization OU: Information Security CN: ESKMLocalCA emailAddress: infosec@organization.com
Subject:	C: US ST: CA L: Campbell O: Organization OU: Information Security CN: ESKM emailAddress: infosec@organization.com
Subject Alternative Name:	IP Address: 10.222.55.196
Purpose:	SSL Server


```
-----BEGIN CERTIFICATE-----
MIID6zCCAtOgAwIBAgIBATANBgkqhkiG9w0BAQsFADCBojELMAkGA1UEBhMCVVMx
CzAJBgNVBAgTAkNEMREwDwYDVQQHEwhDYW1wYmVsbDEVMBMGA1UEChMMT3JnYW5p
emF0aW9uMR0wGwYDVQQLExRJbmZvcm1hdGlvbiBTZWN1cml0eTEUMBIGA1UEAxML
RVNLTUxvY2FsQ0ExJzAlBgkqhkiG9w0BCQEWGGluZm9zZWNAb3JnYW5pemF0aW9u
LmNvbTAeFw0yMjExMTMwODM3MzNaFw0zMjExMTAwODM3MzNaMIGbMQswCQYDVQQG
EwJVUzELMAkGA1UECBMCQ0ExETAPBgNVBAcTCENhbXBiZWxsMRUwEwYDVQQKEwxP
cmdhbml6YXRpb24xHTAbBgNVBAsTFEluZm9ybWF0aW9uIFNlY3VyaXR5MQ0wCwYD
VQQDEwRFU0tNM3cwJQYJKoZIhvcNAQkBFhhpbmZvc2VjQG9yZ2FuaXphdGlvbi5j
b20wggEiMA0GCSqGSIb3DQEBAQUAA4IBDwAwggEKAoIBAQDZeJpAadCp0oUuwVC3
+6ICftWmFfEXk3FuKpwD1RRiVhKcbhGokbYwwp/zmdb+3Kolt3ho9H/uBxEz+MA8
XI5rg9sg4VDrMMwtj78Eq4eOYhFop4orEyKxUfOnB8DFFM/hoy+PBWfVw74OzYJA
/sBY8jv9Bx2M4eaIaWbgncy9F2KsMMID/y/TcCNjik8eheOTn78dWRVoy/UORwWI
Q5n81HXQGOonL6IGjeAd5lPG19CdNeFCX2fW8bBL1mWuTZUEzAHVJA8oN1A1YoOQ
U2FFzBQmMPQinAQBXaXFhPDarQOTGe4isEUtpfkaPnoaPzLdt1Oox9aKBgMeQMKv
MKP5AgMBAAGjMTAvMAkGA1UdEwQCMAAwEQYJYIZIAYb4QgEBBAQDAgZAMA8GA1Ud
EQQIMAaHBAreN8QwDQYJKoZIhvcNAQELBQADggEBAJF02UfWn+1mlomHswi8DnG3
NkNj16OLco1POPiZrpP/s7U03tBi96GhVmb7UvwdyblAF0GEq50od8d6zGRJwC9g
rV/1A3nvQeaVV3wyYJWHWeKxtxP0Ck8Fn4cqYOZfAPrJ+a+01+jrha8G0YPc4guV
21M4xbkA35UNB+vPTWwQkPMkWlu5Pn8BL2Ett87LuOtjUfanYb59CwZoQ5gxo2PO
9QU6ekRR6XvRVt/9GcaTYTulD83x95R83uivdbmTO77xPAIF+7ENxringMPo1pg5
lHubYnQ9aBL1qjb0r1H4bwrLja6h5647+NBEEAy/3Es4/r6BkccBuD960e3pJzM=
-----END CERTIFICATE-----
```


Download | Install Certificate | Back

Figure 3 : Certificate Information

Key Size refers to the size of the key or elliptic curve associated with this certificate.

Repeat all of the steps above for the KMIP server certificate. You must perform these steps on each ESKM server after joining the cluster.

The "Certificate Name" must remain same on all ESKM servers across the cluster.

Import a third-party server certificate

An externally generated public/private key pair can be imported into the ESKM system for use as a server certificate. The encrypted private key data and the public key certificate must be present in the third-party server certificate file. For example:

```
-----BEGIN ENCRYPTED PRIVATE KEY-----

MIIFDjBAB.........vvbKI=

-----END ENCRYPTED PRIVATE KEY-----

-----BEGIN CERTIFICATE-----

MIIDhjCCA.........MKH9Fk

-----END CERTIFICATE-----
```

In addition, the password for the private key file must be known.

To import a third-party server certificate, perform the following steps:

- In **Certificates & CAs**, click **Certificates** to display the **Import Certificate** section.
- Provide the source location of the certificate file.
- Specify the method for importing the certificate to the Enterprise Secure Key Manager.
    - If you are uploading the certificate through the browser, select **Upload from browser**, then click **Browse** and locate the file on the local drive or network.
    - If you are using SCP to copy the file to the Enterprise Secure Key Manager, select the appropriate option and enter the following information:
        - Host: the source host. IPv4 addresses are supported. IPv6 addresses are also supported if IPv6 is enabled.
        - Filename: the name of the file on the source host.

- Username: the username of the account on the source host.
- Password: the password for the user account on the source host.

- Enter the **Certificate Name** and **Private Key Password**.
- Click **Import Certificate**.

The Enterprise Secure Key Manager can import certificates in PEM-encoded PKCS #7, PEM-encoded PKCS #12, and PEM-encoded X509, as long as the private key is included with the certificate.

2.4 Set up Cluster

The procedures in this section will establish a cluster configuration on one ESKM server and then transfer that configuration to the remaining ESKM servers.

If you only have one ESKM server, skip this section.

- In *Creating the Cluster*, the cluster is created on one ESKM server.

Skip this section if you already have an ESKM cluster.

In *Adding ESKM Servers to the Cluster* each of the additional ESKM servers will be added to the cluster.

2.4.1 Creating the Cluster

To create the cluster, perform the following steps on one of the ESKM servers to be clustered:

- From the ESKM Management Console, click the **Device** tab.
- In the **Device Configuration** menu, click **Cluster**.

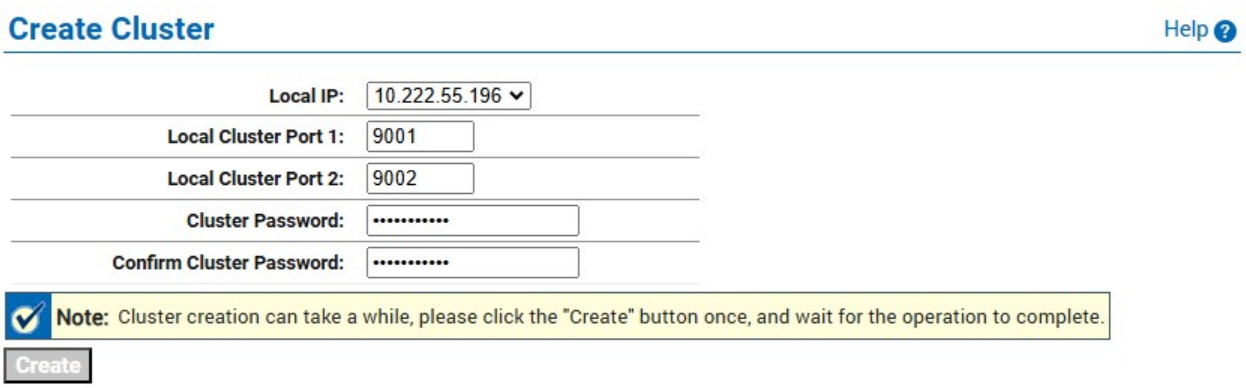


Figure 4 : Create Cluster

- If required, change the Local IP value. If you have enabled Ethernet#2 you can use its IP address for clustering.

All ESKM servers in a cluster must use an IPv4 address for the cluster.

All ESKM servers in a cluster must be time synchronized before creating the cluster.

- If required, change the **Local Cluster Port 1** value. Utimaco recommends using the default value of 9001.
- If required, change the **Local Cluster Port 2** value. Utimaco recommends using the default value of 9002.
- Choose a cluster password and enter it into the **Cluster Password** field. Enter the password a second time into the **Confirm Cluster Password** field.
- Click the **Create** button.
- In the **Cluster Settings** section of the window, click **Download Cluster Key** and save the key to a convenient location, such as your computer's desktop.

The cluster key is a text file and is only required temporarily. It may be deleted from your computer's desktop after all ESKM servers have been added to the cluster.

2.4.2 Adding ESKM Servers to the Cluster

To set up ESKM servers to the cluster, perform the following steps in the **Join Cluster** section on each additional ESKM server.

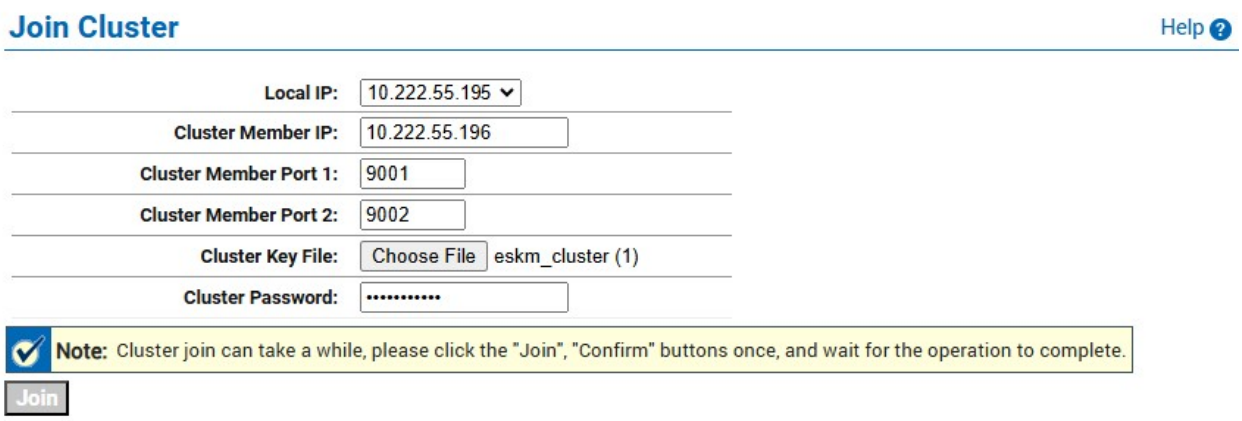


Figure 5 : Join Cluster

Adding multiple ESKM servers to the cluster is a serial process. Add the first ESKM server and then monitor the system log for the status of the synchronization process. Wait until the “Cluster synchronization succeeded.” message appears in the system log before attempting to add the next ESKM server to the cluster. The amount of time required to complete the synchronization process is a function of the number of keys in the cluster.

If the new ESKM server is a replacement and is configured with the same IP address as the failed ESKM server, make sure the client does not send any key generation requests until the new ESKM server has successfully completed the cluster synchronization process. Alternately, you can stop the KMS and KMIP servers and then start them once the cluster synchronization process is complete. Use the system log to monitor the progress of the cluster synchronization process.

- Join the ESKM server to the cluster.
  - Select the **Device** tab.
  - In the **Device Configuration** menu, click on **Cluster**.
  - In the **Join Cluster** section of the window, select the appropriate **Local IP** value.
    - All ESKM servers in a cluster must use an IPV4 address for the cluster.
    - All ESKM servers in a cluster must be time-synchronized before creating the cluster.
  - Type the original cluster member's IP into **Cluster Member IP**.

- Type the original cluster member's port into **Cluster Member Port1**. The default value of this port is 9001. If this value was changed in while creating the cluster, use that value.
- Type the original cluster member's port into **Cluster Member Port2**. The default value of this port is 9002. If this value was changed in while creating the cluster, use that value.
- Click **Browse** and select the **Cluster Key File** you saved in while creating the cluster.
- Type the cluster password into **Cluster Password**.
- Click **Join**.
- Click **Confirm** to synchronize with the cluster.

- After adding all members to the cluster, you can then delete the cluster key file from the desktop.
- After clustering the ESKM servers, follow the steps in *Setting up ESKM certificate* to create and install the server certificates on each ESKM server that has joined the cluster. Depending on the KMS and KMIP configuration, two server certificates may need to be created for each ESKM server in the cluster.

Make sure to use the same server certificate name as specified under KMS Server Settings and KMIP Server Settings.

- After creating the KMIP server certificate, restart the KMIP server manually. Navigate to the **Services List** section of the **Services Configuration** page (**Device** -> **Maintenance** -> **Services** -> **KMIP Server**).

If the ESKM server joining the cluster is SSL enabled, this step will cause the WebAdmin service and the KMS and KMIP servers to restart, resulting in a temporary connection loss. To restore the connection, refresh the browser.

2.5 Set up KMIP Server

Skip this section if your ESKM system will not be communicating with KMIP-enabled clients.

The KMIP server provides the interface to clients that use the KMIP protocol. Transport Layer Security (TLS) is required, therefore you must specify the name of the server certificate.

To configure the KMIP server, perform the following steps:

- Select the **Device** tab.
- In the **Device Configuration** menu, click **KMIP Server** to display the **KMIP Server Configuration** window.
- In the **KMIP Server Settings** section, click **Edit**.
- Configure the **KMIP Server Settings**. The IP address can be an IPv4 address, or IPv6 address. If support for IPv6 has been enabled, see First run. If necessary, change the **Port and Connection Timeout** values. Utimaco recommends the default values of 5696 for the Port and 3600 for the **Connection Timeout**. For **Server Certificate**, select the name of the certificate you created in *Setting up ESKM Certificate*. For example, ESKM KMIP Server.

If your ESKM server is operating in FIPS compliant mode, you must specify a KMIP server certificate that complies with the FIPS requirements.

If your ESKM servers are in a cluster and you are selecting a new KMIP server certificate from the "Server Certificate:" field, you must make sure that all of the ESKM servers in the cluster already have a KMIP server certificate installed with this same name.

If your ESKM server will support the KMIP Certify or Re-certify operations you must specify the name of a Local CA that will be used to create the certificate. In addition, you must set the KMIP user group permissions for these operations to enabled. For more information on setting KMIP user group permissions, see the KMIP Permission model description, which is located in section 3 of the *Enterprise Secure Key Manager User Guide*.

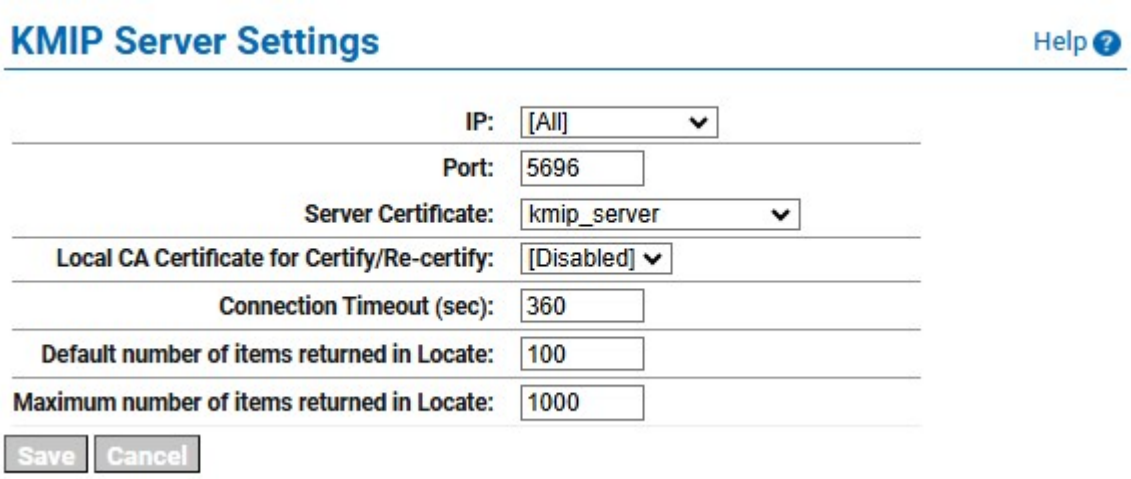


Figure 6 : KMIP Server Settings

- Click **Save**.

Changing the KMIP server setting causes the KMIP server to restart.

- Confirm that the KMIP server is started.
  - Go to the **Services List** section of the **Services Configuration** page (**Device** -> **Maintenance** -> **Services** -> **KMIP Server**).
  - The status of the KMIP server should be **Started**. If the status is **Stopped**, select the **KMIP Server**, and then click **Start**.

During the execution of the Setup utility a default KMIP Server Certificate is automatically created. This certificate should only be used for testing purposes, as it is a self-signed certificate. If your ESKM system will be communicating with KMIP-enabled clients, Utimaco highly recommends that you create a new KMIP server certificate. The name you assign to these server certificates should clearly indicate their purpose. For example: ESKM KMS Server and ESKM KMIP Server.

KMIP requires mutual authentication. After configuring the KMIP server, enable KMIP client certificate authentication. The KMIP client certificate authentication status is disabled by default.

To enable KMIP client certificate, perform the following steps.

- In the **KMIP Server Authentication Settings** section of the window, click **Edit**.

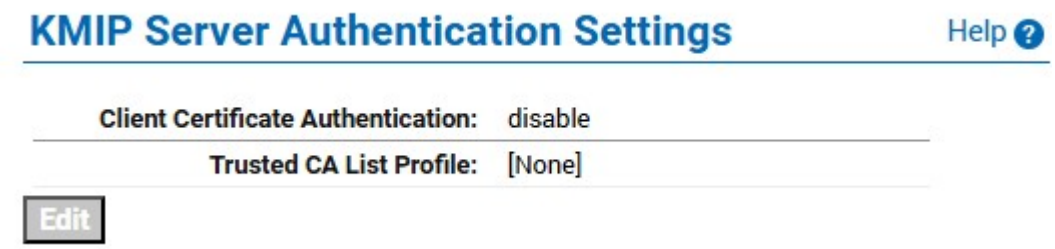


Figure 7 : KMIP Server Authentication Settings

- Click enable, select the appropriate **Trusted CA** list and click **Save**.

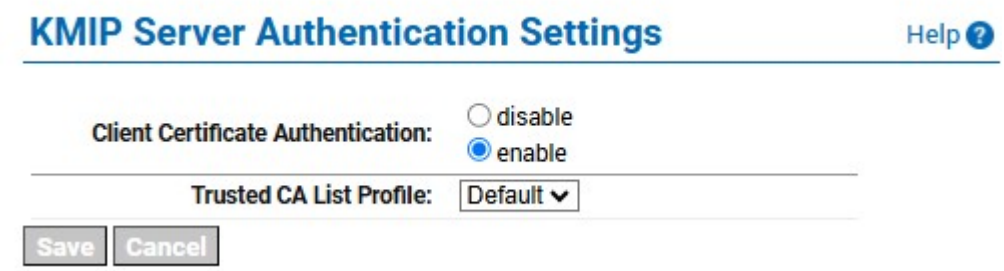


Figure 8 : Enable - MIP Server Authentication Settings

2.6 Set up KMS Server

The KMS server provides the interface to clients that use the KMS protocol. Secure Sockets Layer (SSL) is required, therefore you must specify the name of the server certificate.

To configure the KMS server, perform the following steps:

- Select the **Device** tab.
- In the **Device Configuration** menu, click **KMS Server** to display the **KMS Server Configuration** window.
- In the **KMS Server Settings** section, click **Edit**.
- Configure the **KMS Server Settings**. The IP address can be an IPv4 address, or IPv6 address. If support for IPv6 has been enabled, see *First run*. If necessary, change the **Port** and **Connection Timeout** values. Utimaco recommends the default values of 9000 for the

Port and 3600 for the **Connection Timeout**. For **Server Certificate**, select the name of the certificate you created in *Setting up ESKM Certificate*. For example, ESKM KMS Server.

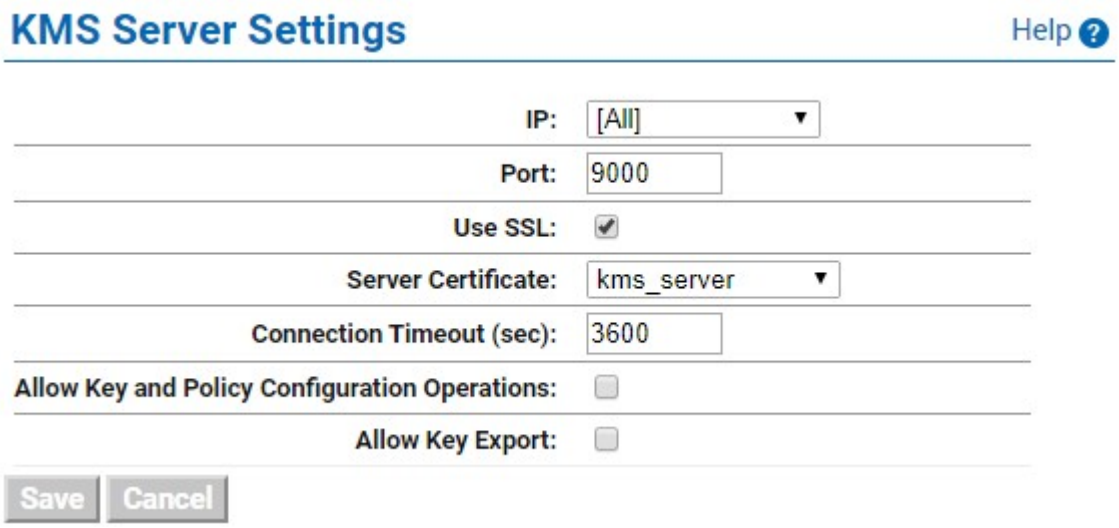


Figure 9 : KMS Server Settings

- Click **Save**.
- Confirm that the KMS server is started.
    - Go to the **Services List** section of the **Services Configuration** page (**Device** -> **Maintenance** -> **Services** -> **KMS Server**).
    - The status of the KMS server should be Started. If the status is **Stopped**, select the KMS **Server**, and then click **Start**.

To enable KMIP client certificate, perform the following steps.

- In the **KMS Server Authentication Settings** section, click **Edit**.

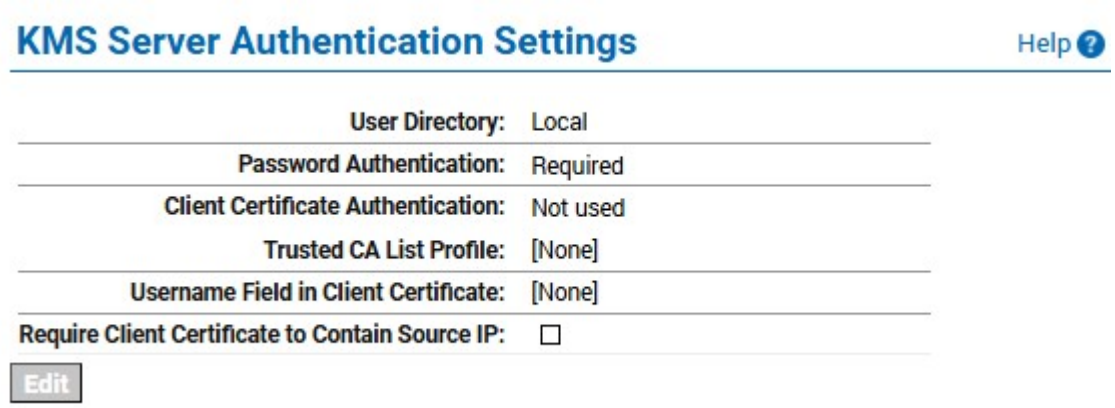


Figure 10 : KMS Server Authentication Settings

- Click appropriate option under **User Directory**, **Password Authentication**, and **Client Certificate Authentication**. Select the appropriate **Trusted CA** list, and **Username** in **Client Certificate** and click **Save**.

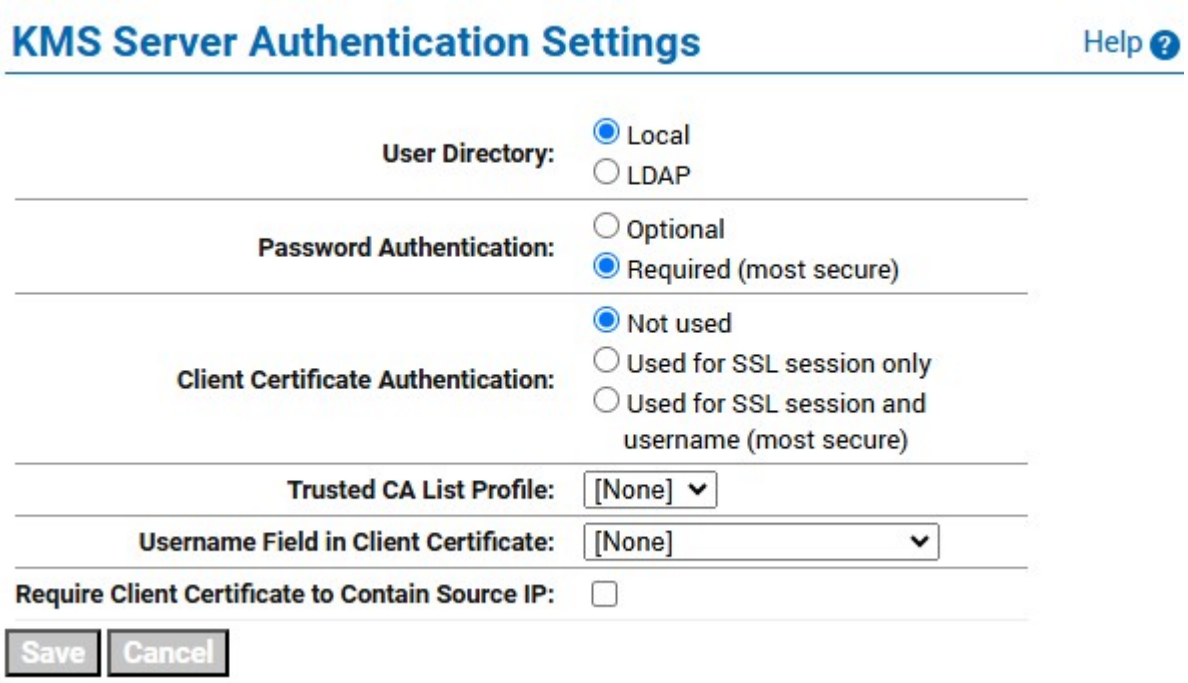


Figure 11 : Edit KMS Server Authentication Settings

3 Configuring the HPE StoreOnce

3.1 Introduction

Utimaco's Enterprise Secure Key Manager (ESKM) is a most versatile scalable key manager to securely manage encryption keys across the enterprise. The ESKM can use its native protocol (KMS – Key Management Service) or industry-standard OASIS KMIP (Key Management Interoperability Protocol) for its client integrations.

This integration guide concentrates on enabling client-side encryption for HPE StoreOnce and centralized key management to simplify security operations like compliance auditing, centralized key management and policy execution along with enforcement.

This section is not a substitute for HPE StoreOnce documentation. Should this section offer different instructions than StoreOnce's documentation, follow the instructions issued by HPE StoreOnce.

3.1.1 Pre-requisites for Integration

- You have “admin” access to and are familiar with the ESKM appliance and the HPE StoreOnce procedures, configuration, and protocols.
- The HPE StoreOnce is configured and functioning.

The examples in this document use ESKM v8.53.0 software and HPE StoreOnce v4500 Backup.

3.2 Configuration Overview

The solution presented here integrates HPE StoreOnce with ESKM into a purpose-built system to protect the backup data with the easy and efficient data protection (encryption) capability of HPE StoreOnce and the key management capability of ESKM.

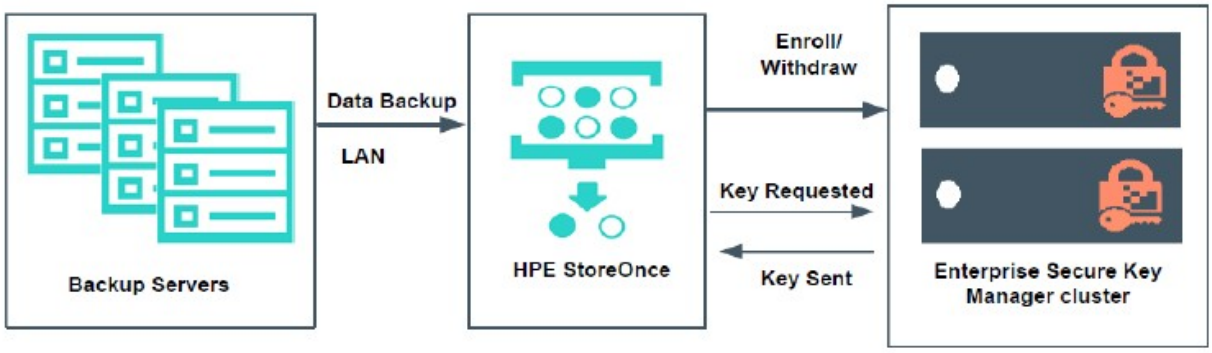
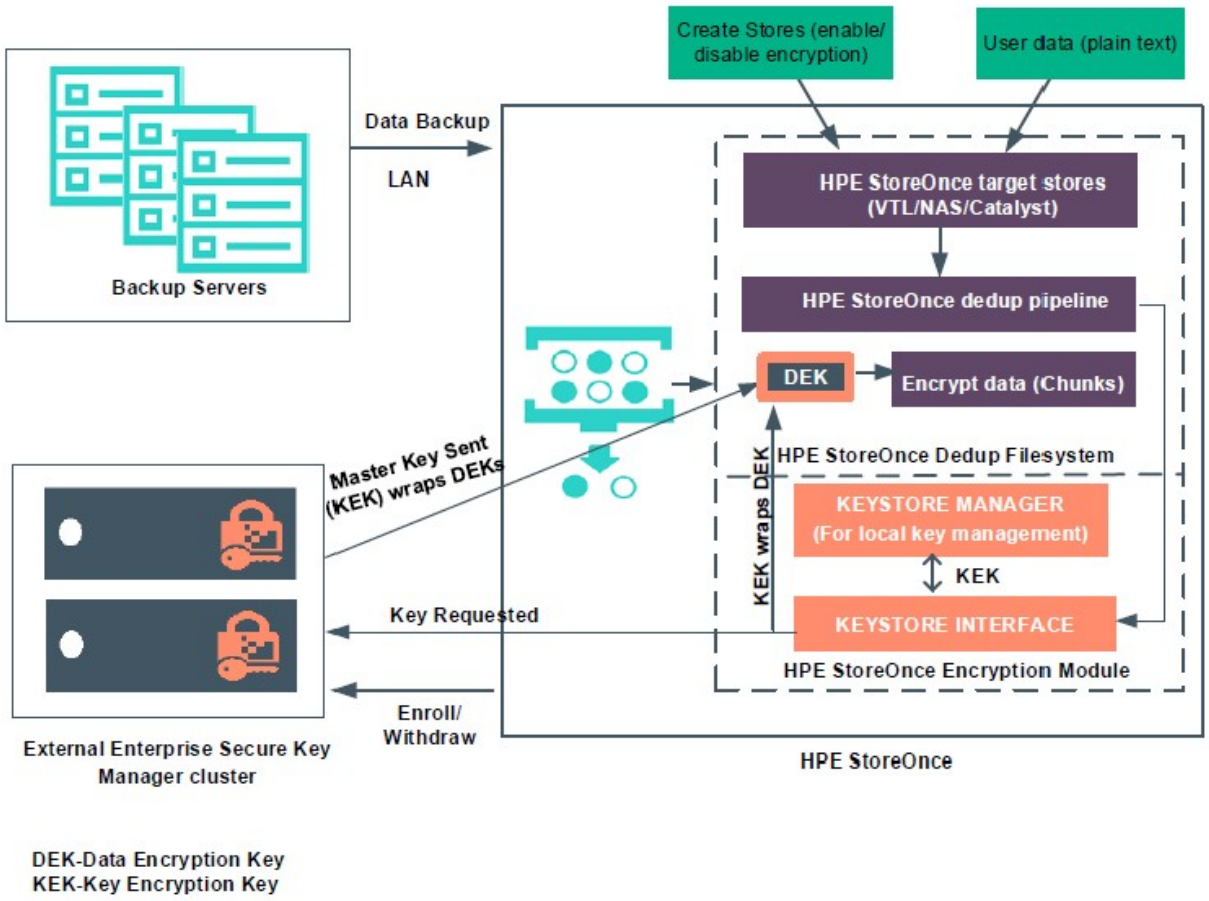


Figure 12 : HPE StoreOnce Configuration Overview

To perform the data backup, we have deployed a backup server on HPE Hyper Converged 380 with VMware® vSphere 6.0. However, please note that any backup platform is supported for data protection, provided the backup software installed on it supports integration with HPE StoreOnce.

HPE StoreOnce supports both local and external key management. Keys generated and managed are the Data Encryption Key (DEK), which is used for actual encryption of data on HPE StoreOnce, and the Key Encryption Key (KEK), which is used to encrypt the data encryption key itself. With local key management, the HPE StoreOnce key management system creates, manages, and stores both the data encryption key and the key encryption key. The HPE StoreOnce local keystore manager keeps track of all of the keys used for data encryption. With external key management, HPE StoreOnce is enrolled as a client to an external Enterprise Secure Key Manager.

ESKM creates and manages the key encryption key (KEK) that is used to encrypt the data encryption keys (DEKs) on HPE StoreOnce. There is one key encryption key created per node of HPE StoreOnce on ESKM and this KEK is also known as the “Master Key” which encrypts and decrypts all the data encryption keys belonging to the HPE StoreOnce.



So, both the StoreOnce OS in local key management mode and ESKM in external key management mode manage and store the Key Encryption Key, which is used to wrap (encrypt) the data encryption keys doing the actual encryption of data on HPE StoreOnce.

4 Integration

This section provides the detailed procedure of integrating ESKM with HPE StoreOnce.

4.1 Data at Rest Encryption

Data at Rest encryption ensures protection of stored data on StoreOnce so that data cannot be accessed from stolen, discarded or replaced disks. It is software based encryption that can be enabled on a per-store basis, which encrypts the data before writing it onto the disk. Data at Rest encryption can be used with Local Key Management or Centralized Encryption Key Management.

Data at Rest encryption must be enabled when creating a new VTL library, NAS share, or StoreOnce Catalyst store and it requires the StoreOnce Security Pack license to be in place.

4.1.1 Local Key Management

When using the local key management mode, the keystore manager on StoreOnce manages the encryption keys used for Data at Rest encryption and Data in Flight encryption. Each time a new encrypted VTL library, NAS share, or StoreOnce Catalyst store is created or deleted, the keystore on StoreOnce is updated. The keystore is also updated when a Data in Flight encryption link is created or deleted.

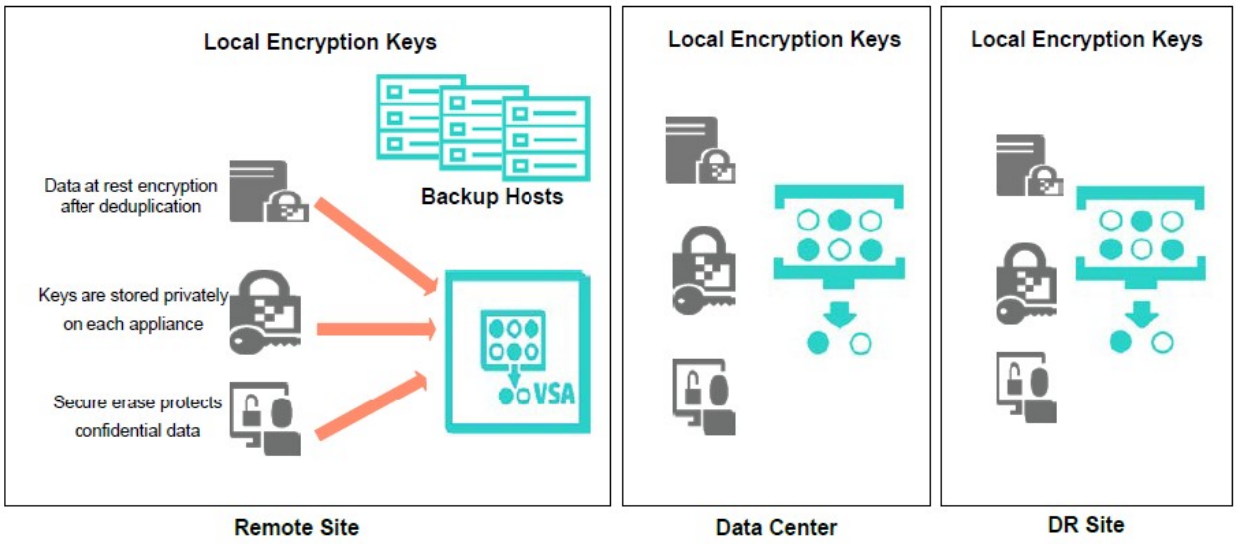


Figure 13 : Local key management

The above figure shows data protection of HPE StoreOnce VSA at the remote site, and also HPE StoreOnce at the primary data center and disaster recovery site using local encryption keys.

If using local key management, ensure to back up the local keystore using the StoreOnce CLI commands, and save it securely off-site in case the original keystore is corrupted. However, only the latest version of the keystore must be kept after each creation or deletion of an encrypted VTL library, NAS share, StoreOnce Catalyst store, or Data in Flight encryption link.

Encryption has to be enabled manually for each target store (either Catalyst, NAS or VTL libraries) created on HPE StoreOnce. To enable Data at Rest encryption on StoreOnce, select the Store Encryption Enabled checkbox of the StoreOnce at store creation time.

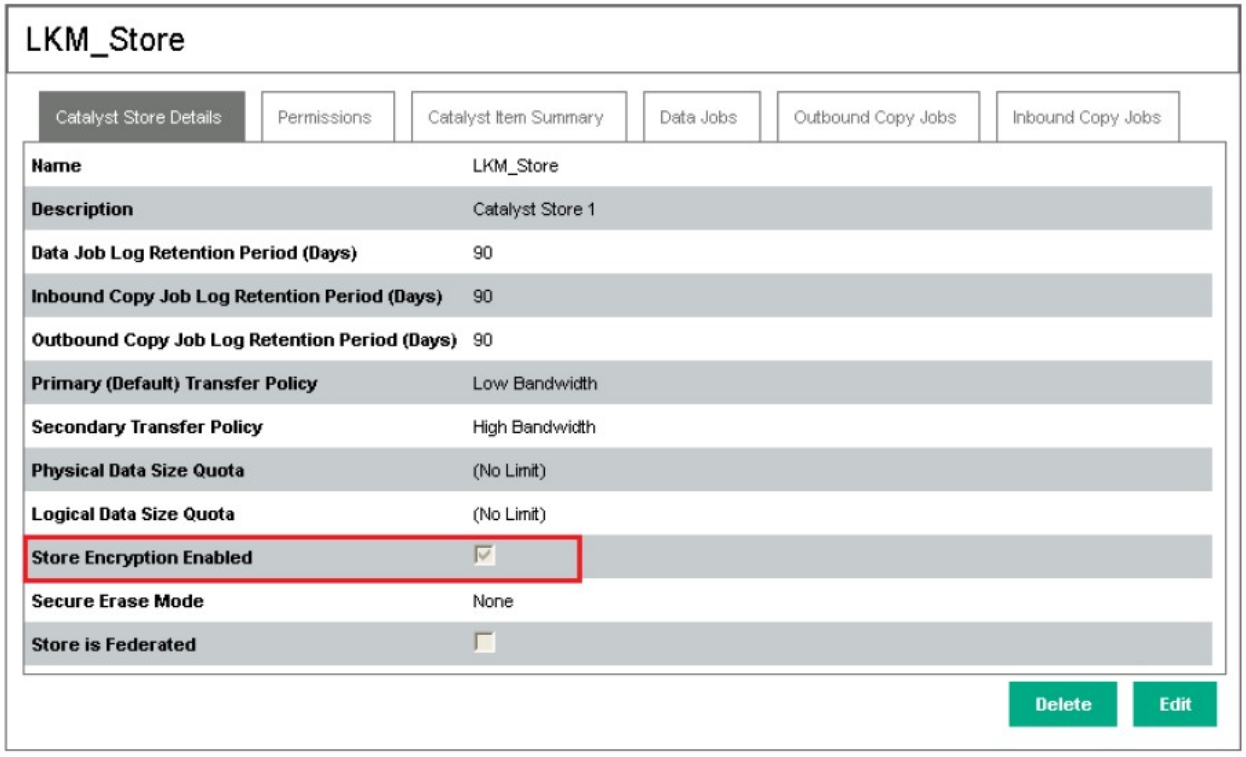


Figure 14 : LKM-Store

After the encryption is enabled on a store, it cannot be disabled.

4.1.2 Centralized Key Management

When using external key manager mode, StoreOnce is enrolled to an external key manager as a client. After successful enrollment, the key encryption key (KEK) used for encrypting data encryption keys (DEKs) on StoreOnce is generated, served, stored, and managed by the external key manager. One KEK is generated as a KMIP key on ESKM for one node of HPE StoreOnce, and it is used to encrypt and decrypt all the DEKs on that particular node of HPE StoreOnce.

Enrolling HPE StoreOnce to ESKM is based on secure identity-based access, administration, and logging, and HPE StoreOnce leverages the standard Key Management Interoperability Protocol (KMIP) for accessing and communicating with the external key manager.

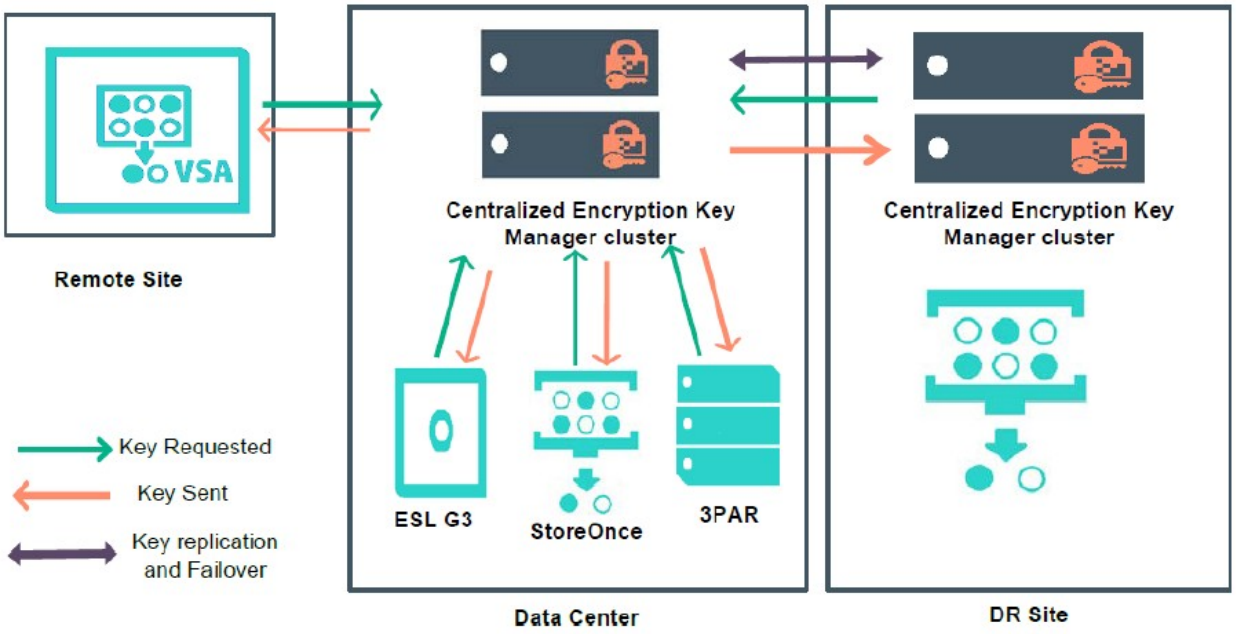
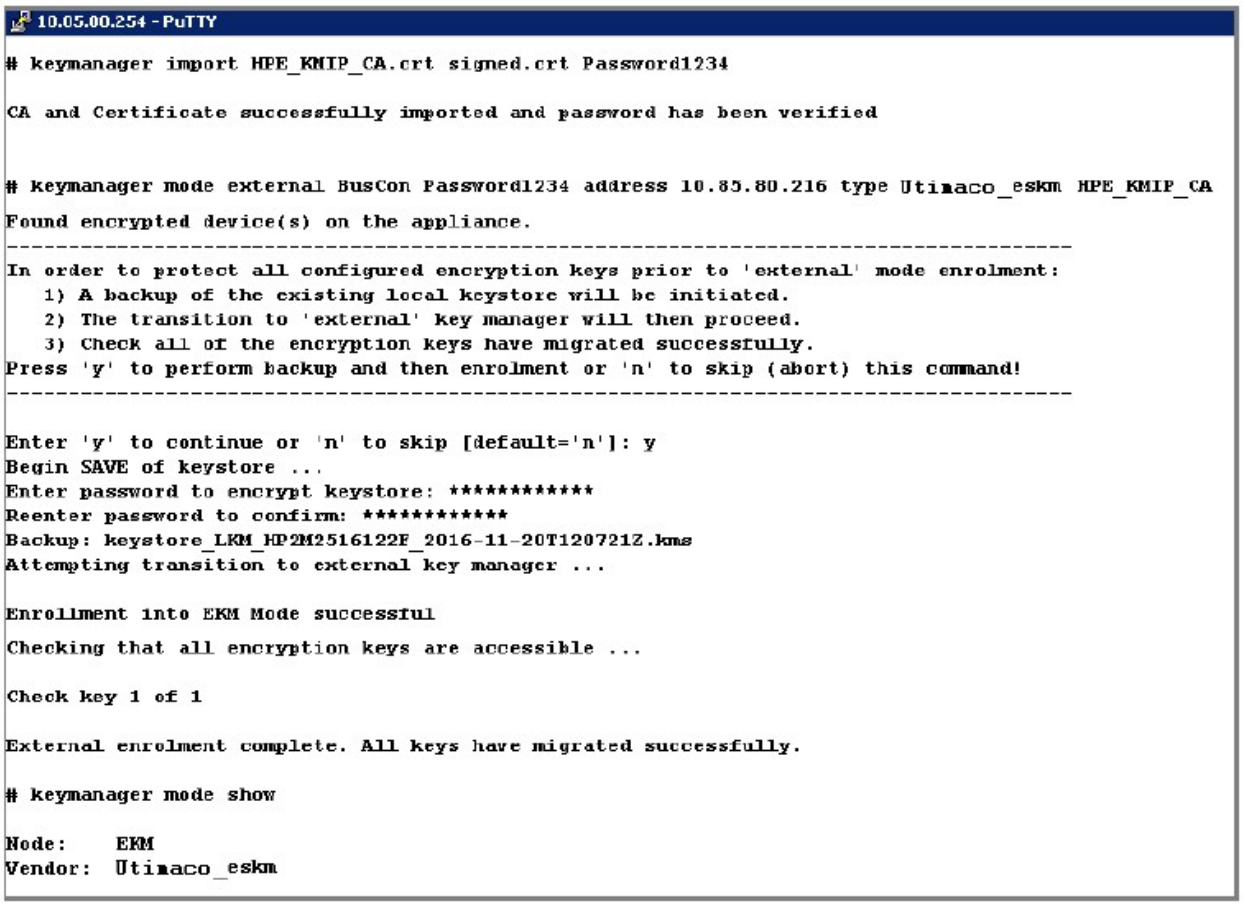


Figure 15 : Centralized key management

When enrolling StoreOnce to ESKM, if there are any target stores on StoreOnce using local key management mode, StoreOnce does a backup of the keystore for these existing LKM stores before enrolling StoreOnce to ESKM.



The HPE StoreOnce can be configured to use only the local key manager or the external key manager. Both key manager types cannot be used at the same time.

After successful enrollment of HPE StoreOnce to ESKM, one KMIP key is created per node of HPE StoreOnce. This KMIP key is the key encryption key (KEK) that is used to encrypt the data encryption keys (DEKs) on HPE StoreOnce. Typically, one key is generated per service set running on HPE StoreOnce and since each StoreOnce node has one service set running on a regular basis, one key is generated per node of StoreOnce on ESKM.

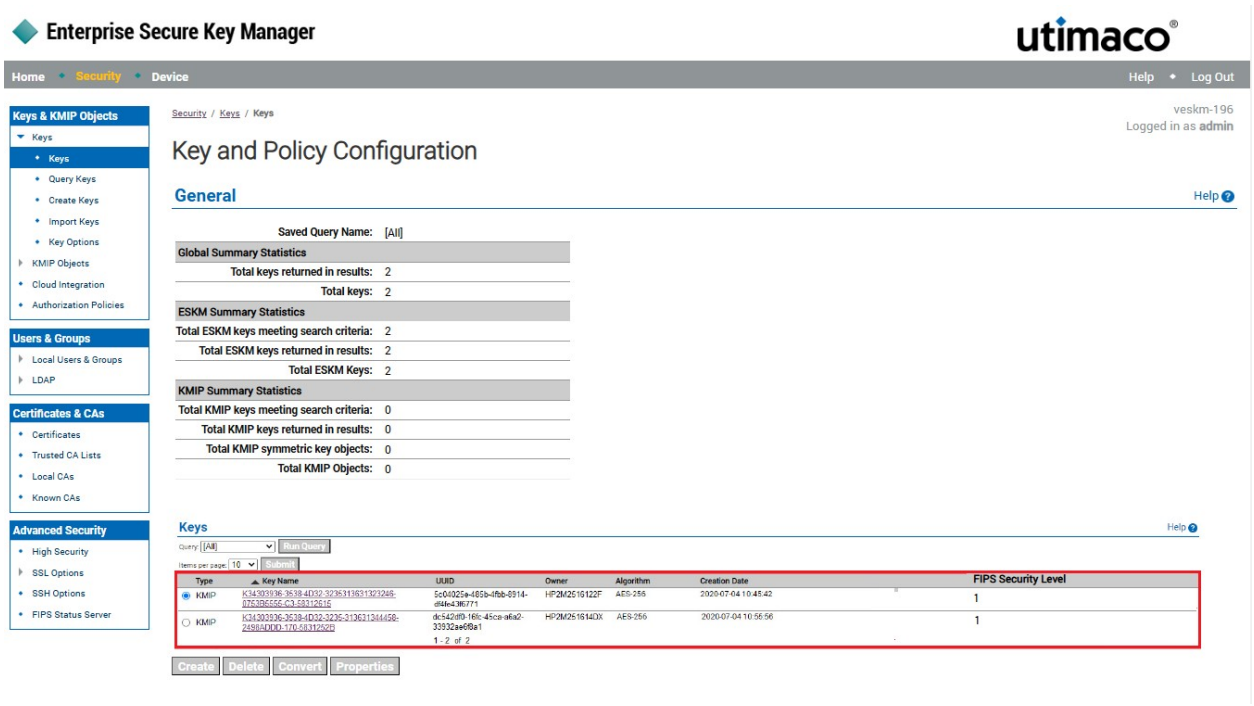


Figure 16 : Key and Policy Configuration

4.2 Data in Flight Encryption

Data in Flight encryption provides protection against unauthorized access to data replicated between HPE StoreOnce appliances or data transferred between clients (Microsoft® Windows® and Linux®) and an HPE StoreOnce appliance. When enabled, the Data in Flight encryption security feature protects data that is in transit, from forensic attack using the IPsec protocol. The data can be moving between two HPE StoreOnce appliances over a WAN, or a StoreOnce appliance and a backup server over a LAN or WAN.

Data in Flight encryption is not supported for IPv6 subnets. Using Data in Flight encryption for direct backup operations to the StoreOnce appliance over a local network is not supported due to the performance impact of the encryption.

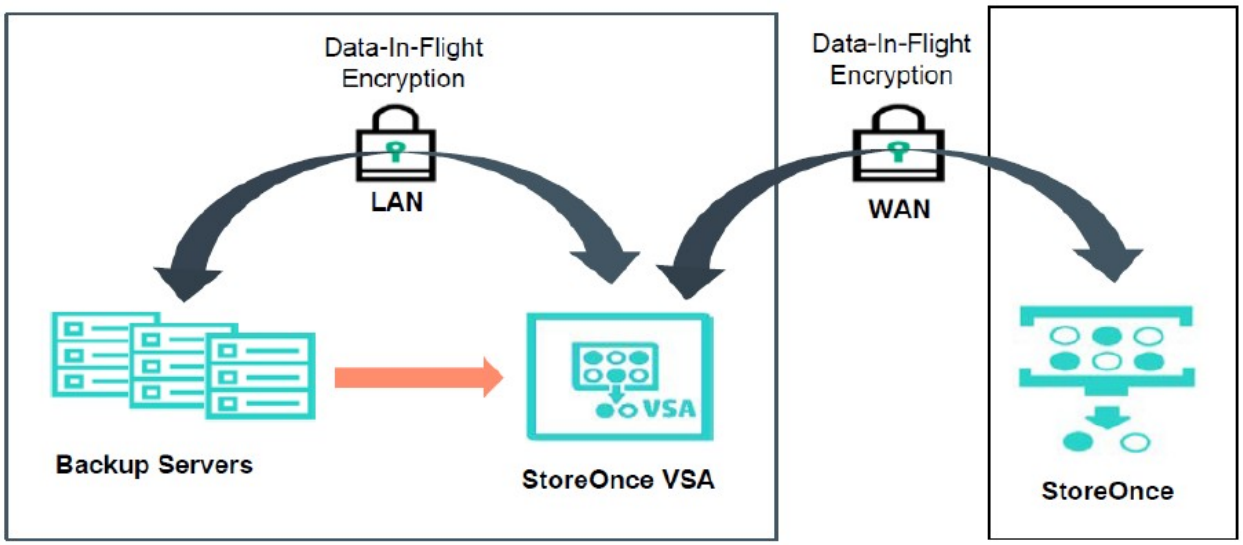


Figure 17 : Data in Flight encryption

After successfully enrolling HPE StoreOnce as a client to ESKM, the key management mode on HPE StoreOnce changes from local to external. When a new encryption link is created on HPE StoreOnce for Data in Flight encryption, one KMIP key is generated on ESKM which protects the data in transit by encrypting the data packets moving through the network. Each time a new encryption link is created or deleted, the keystore on StoreOnce is updated to include all the latest clients added for Data in Flight encryption.

Data in Flight requires customers to use a Static IP, not DHCP, for the client IP address.

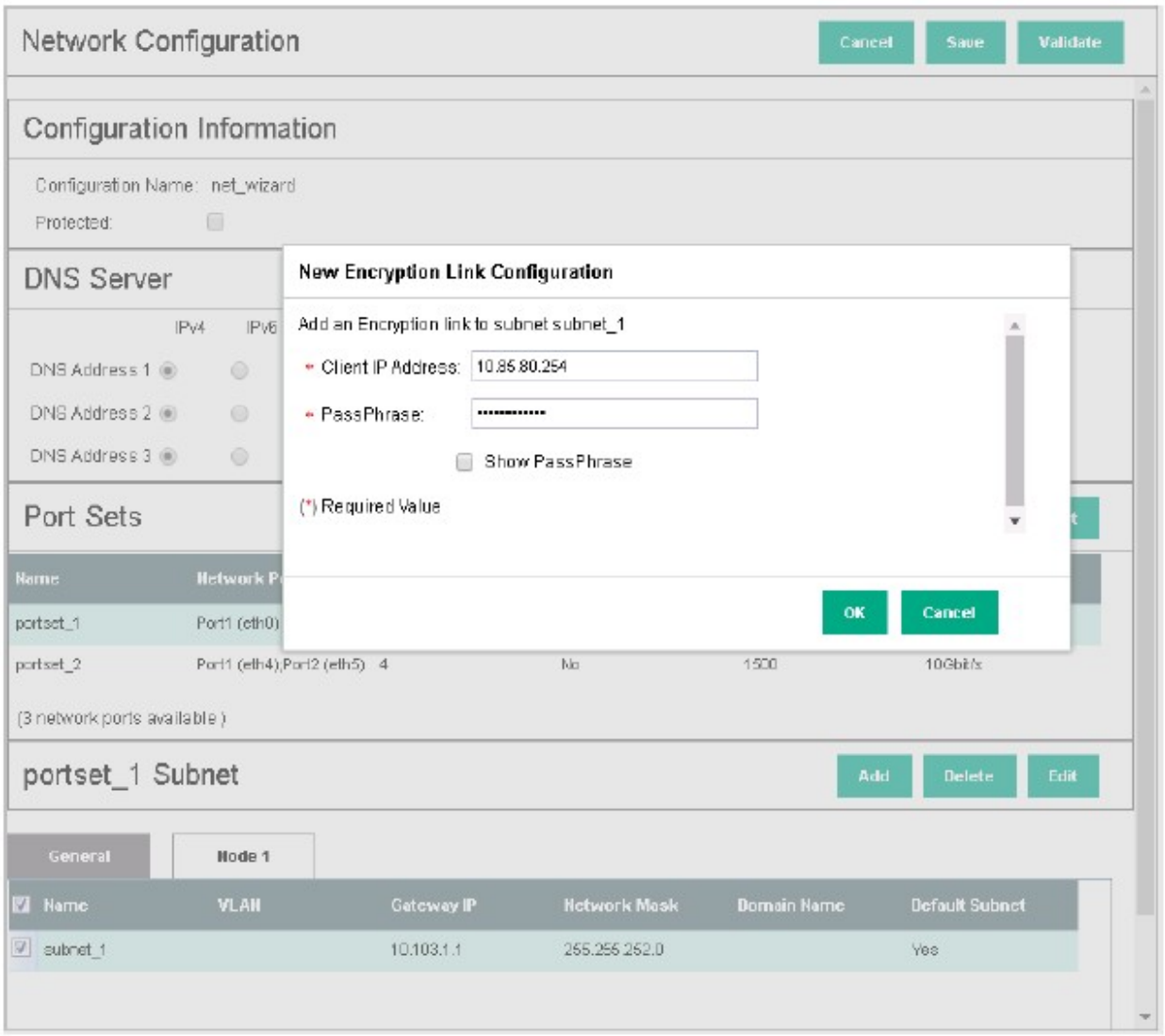


Figure 18 : Network Configuration

4.3 Steps for Integration

This procedure uses both KMS and KMIP protocols along with creating “Registration User”. This “Registration User” is used to register the KMS StoreOnce nodes with the ESKM. Post registration, it uses KMIP protocol for key life cycle management activities.

4.3.1 Creating an Admin User

To create admin user, perform the following steps:

Admin user should not be confused with the administrator which is created on the ESKM to login to the **Management Console**.

Before proceeding, please make sure that you have created the **Local CA**, **Certificates**, and the KMS and KMIP servers are configured. Also make sure that the **Date & Time** is syncing with the NTP server and HPE StoreOnce and KMS and KMIP services are running.

Please refer to the *Configuring the ESKM server* page for details.

- Log in to the **Management Console** as an administrator and navigate to **Security**>**Local Users & Groups**>**Local Users**.
- Click on **Add**.

Please select **User Administration Permission** and **Change Password Permission** and do not select **Enable KMIP**.

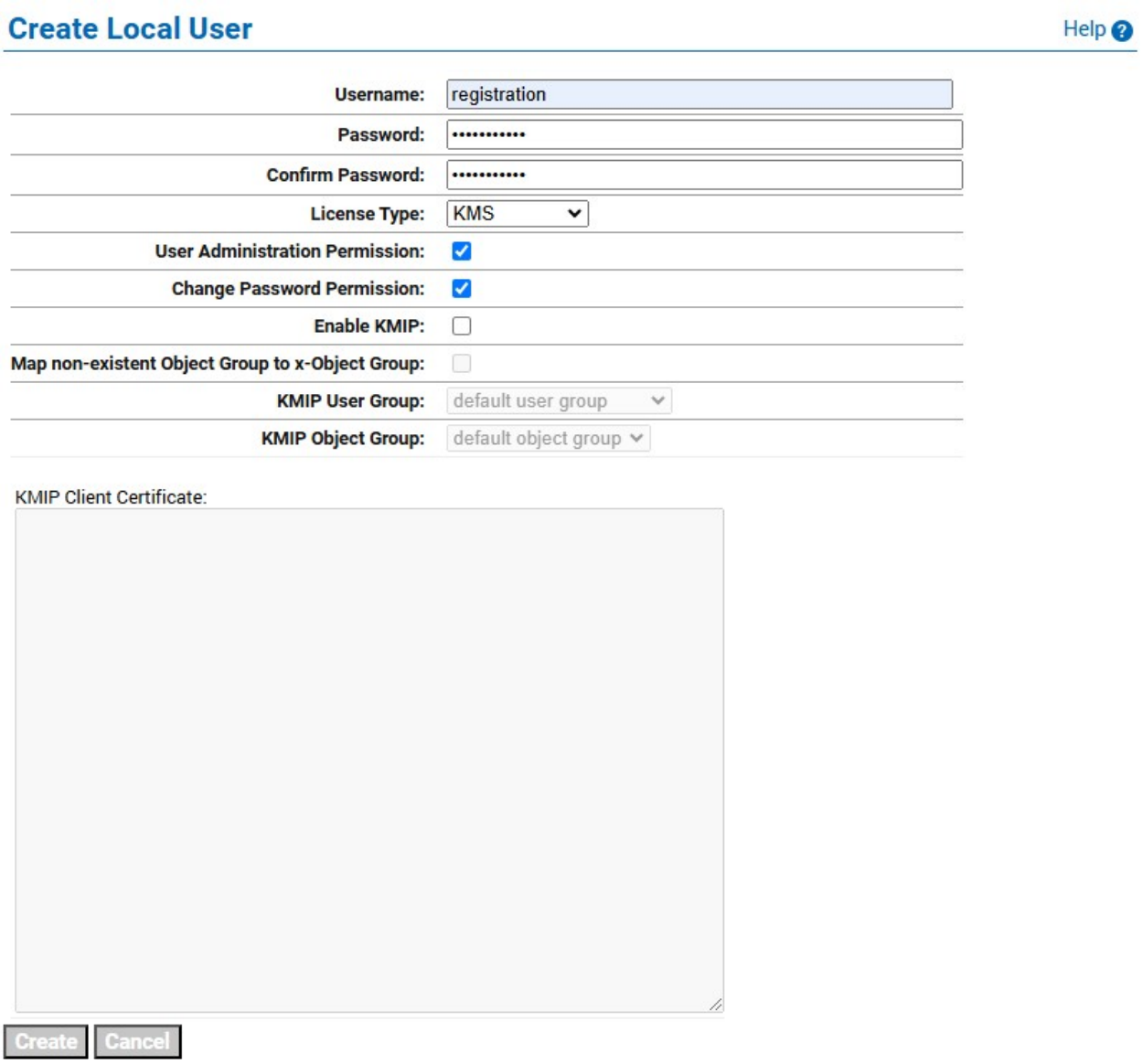


Figure 19 : Create Local User

- Click **Create**.

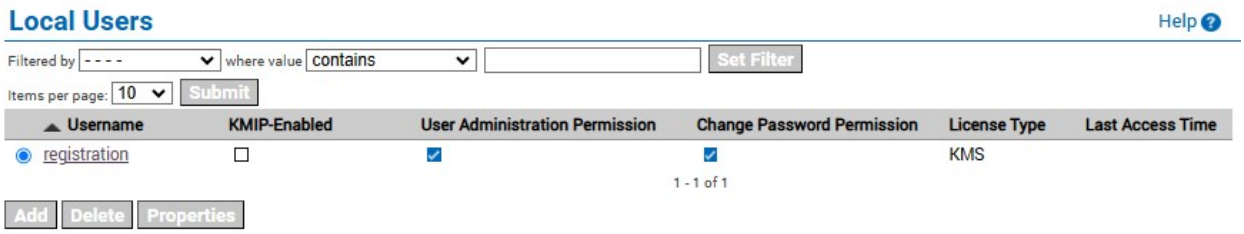


Figure 20 : Local Users

- Go to HPE StoreOnce CLI.
- Enter the command: `keymanager# create <username> <passwrod> <DNvakue>`.
- Click enter to obtain the CSR.

```
create  - command takes as input a username, password and optionally the DN information and generates a CSR
import  - command imports the CA certificate and signed client certificate of the StoreOnce appliance.
expand  - command enrols new nodes of a cluster with the Key Manager.
update  - command updates EKM information.

keymanager# create registration storeonce123 "/OU=Atalla/O=Utimaco/L=Sunnyvale/ST=CA/C=US"

-----BEGIN CERTIFICATE REQUEST-----
MIICrTCCAZUCAQAwaDEVMBMGA1UEAwwMcmVnaXN0cmF0aW9uMQ8wDQYDVQQLDAZB
dGFsbGExEDAOBgNVBAoMB1V0aW1hY28xEjAQBgNV8AcMCVN1bm55dmFsZTELMAkG
A1UECAwCQ0ExCzAJBgNVBAYTAlVTMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIB
CgKCAQEAs5kK5VLofF2cB749dD7Y+L1/I5nwC2MKyeXBEEJnngnH48ZxuLdoHgpe
30oDVg+tQvHk1nEYJA/an3zd2eEMaFSMp5m0pMN/x3dmVMyVGIL98pPJAPjeItoT
WwJP1dqLQRpQCH9VhXtWvzCWyHmaExFtQUczfQl8AOx9HZBhN6TBsQYRcXePWqjQ
ZVeG9+dn64Vw+k8vPFd1apk8o5vaTyrQdozyFxOARbwVvjdaShaJMMr83oq6+T0X
KeSEmPGCwvY94yF2LTz95oz84/EnLHeDxSvXsHVlgI32MytdlWGKcip7y8+jajxS
U5E8MIpQqTT7QnoOJyJpv+bCUrS0jwIDAQABoAAwDQYJKoZIhvcNAQELBQADggEB
ADZU4zahdqW/TR07N1xoxIyZioVTAP+wFhL8TBvFdWYOWqbQ8CRjl5uEcU83CD5h
pbnysmLQn67pY3w3FwzNdvj2HjncvnHPuzsZgWb2rppnYX2jRLc5REM3Th5QUAs0
aFsWokOYc8kvJd9nEAoVTR8yR0O0IvJ8ZqJFglKYJuiIRDmSQZiYZTKMkBQN+AtS
qmYFaD7yidLchSoMTCd3VH2MH5/ULawyqs9NQKQDK79OIU57ae6e3nFQuxMC8Twk
OTXLW+FJiwWSepkMkkEer3//g44ctEVg8pCh469cDiDlm0CkjRq+V0ZYQsybaXgC
9B3hZJ4s8HofdFLgFTxa4UU=
-----END CERTIFICATE REQUEST-----

keymanager#
```

- Copy the CSR from `-----BEGIN CERTIFICATE REQUEST----- to -----END CERTIFICATE REQUEST--------` lines.
- Go to the ESKM **Management Console** and navigate to **Security**>**Certificates & CAs**>**Local CAs** and click on **Sign Request**.

Figure 21 : Local Certificate Authority List

- Paste the CSR from `-----BEGIN CERTIFICATE REQUEST----- to -----END CERTIFICATE REQUEST--------` lines into the **Certificate Request** field.
- Select **Client** and click on **Sign Request**.

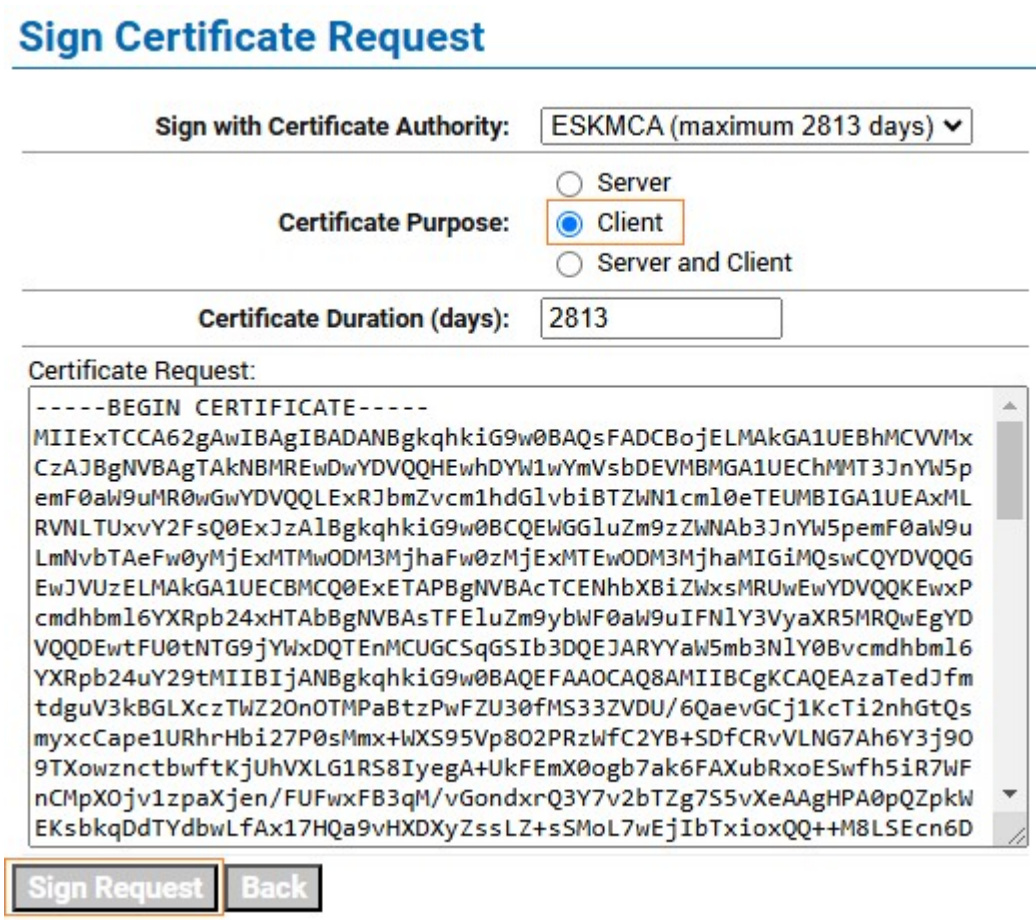


Figure 22 : Sign Certificate Request

CA Certificate Information

Help

Key Size:	2048
Start Date:	Jul 8 06:35:11 2020 GMT
Expiration:	Mar 16 06:35:11 2030 GMT
Issuer:	C: US ST: CA L: Campbell O: Organization OU: Information Security CN: ESKMLocalCA emailAddress: infosec@organization.com
Subject:	C: US ST: CA L: Sunnyvale O: Utimaco OU: Atalla CN: registration


```
-----BEGIN CERTIFICATE-----
MIID3TCCAsWgAwIBAgIBEjANBgkqhkiG9w0BAQsFADCBojELMAkGA1UEBhMCVVMx
CzAJBgNVBAgTAkNBMREwDwYDVQQHEwhDYW1wYmVsbDEVMBMGA1UEChMMT3JnYW5p
emF0aW9uMR0wGwYDVQQLExRJbmZvcm1hdGlvbiBTZWN1cml0eTEUMBIGA1UEAxML
RVNLTUxvY2FsQ0ExJzAlBgkqhkiG9w0BCQEWGGluZm9zZWNAb3JnYW5pemF0aW9u
LmNvbTAeFw0yMDA3MDgwNjM1MTFaFw0zMDAzMTYwNjM1MTFaMIGNMQswCQYDVQQG
EwJVUzELMAkGA1UECBMCQ0ExETAPBgNVBAcTCENhbXBiZWxsMRUwEwYDVQQKEwxD
b21wYW55LCBJbmMxEDAOBgNVBAsTB0ZpbmFuY2UxETAPBgNVBAMTCE1vbmdvREIx
MSIwIAYJKoZIhvcNAQkBFhNmaW5hbmNlQGNvbXBhbnkuY29tMIIBIjANBgkqhkiG
9w0BAQEFAAOCAQ8AMIIBCgKCAQEA4Zff7hxc6LMc9LE11bfPagsnsXuFyWQJSXiI
3rG0htHwDV7Ese3+WaQ6DQaRrculYMtRcUUfQynbAZSQWsjVWeafgIhoBrO3bhRy
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oLBF1mOmMk+Nt8QONHixig0uUaKFsLJqasm7ZMnB6cp6A4Y6eZ/HXctECzopRc1k
VbcxXHawH2z7qrGRdb/f0DMWT5bybMod7EV23gM+DeA7PBcgf8XHaC+qsP6tj/tY
9zdFZ7xJ27QatuA+8XF80ByLT4pmj4fmpp7rRIgWAWJVZLfEiwIDAQABozEwLzAJ
BgNVHRMEAjAAMBEGCWCGSAGG+EIBAQQEAwIHgDAPBgNVHREECDAGhwQK3rLxMA0G
CSqGSIb3DQEBCwUAA4IBAQCIEBkeI636KVALPAANut74GQsExwNVaWpQYKGQo98d
LkPC1mGT8aJDva5bbnCRP8Y91TPWbVANkkoiC1VRSVtBrtk9vi1SJKujHtmc6J8c
pCLdPF/n+77dbPmkKqFpWOZVWZGbxr9vfnsg4DZ7219BOlyldbWVuHmEuNGT1Pyt
Qn6gOC33KVacvqKzYAopeUcER3oFL8yyNYgrAFDE61WUfM3PHzlAfXwc7/eQ87Hu
v9dLX5AQGyuzjGPfCvnC1Rw2M9l6jviC/KdK6uwTaazF/ebMh6gL/4hvfwwC1930
pw1RAS5/z9szTYajIA1wvJucjWqCjwTcwD+mdML4c4e5
-----END CERTIFICATE-----
```


Download Back

Figure 23 : Certificate Information

- Click on **Download** to save the certificate onto the system. For example: `signed.crt`.
- To download the local CA, navigate to **Security**>**Certificates & CAs**>**Local CAs**.
- Select the CA **Name** and click **Download** to save onto the system. For example `ESKMCA.crt`.

Figure 24 : Local Certificate Authority List - Download

4.3.2 Importing Certificate

To import the certificates, perform the following steps:

1. Go to HPE StoreOnce CLI.
2. Enter the command: `Keymanager # import <ESKMCA.crt> <signed.crt> <password>`.
3. Click on enter and a message will be displayed as “CA and Certificate successfully imported and password has been verified.”

```
keymanager# create registration storeonce123 "/OU=Atalla/O=Utimaco/L=Sunnyvale/ST=CA/C

-----BEGIN CERTIFICATE REQUEST-----
MIICrTCCAZUCAQAwaDEVMBMGA1UEAwwMcmVnaXN0cmF0aW9uMQ8wDQYDVQQLDAZB
dGFsbGExEDAOBgNVBAoMB1V0aW1hY28xEjAQBgNVBAcMCVN1bm55dmFsZTELMAkG
A1UECAwCQ0ExCzAJBgNVBAYTAlVTMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIB
CgKCAQEAs5kK5VLofF2cB749dD7Y+L1/I5nwC2MKyeXBEEJnngnH4BZxuLdoHgpe
30oDVg+tQvHk1nEYJA/an3zd2eEMaFSMp5m0pMN/x3dmVMyVGIL98pPJAPjeItoT
WwJP1dqLQRpQCH9VhXtWvzCWyHmaExFtQUczfQl8AOx9HZBhN6TBsQYRcXePWqjQ
ZVeG9+dn64Vw+k8vPFd1apk8o5vaTyrQdozyFxOARbwVvjdaShaJMMr83oq6+T0X
KeSEmPGCwvY94yF2LTz95oz84/EnLHeDxSvXsHVlgI32MytdlWGKcip7y8+jajxS
U5E8MIpQqTT7QnoOJyJpv+bCUrS0jwIDAQABoAAwDQYJKoZIhvcNAQELBQADggEB
ADZU4zahdqW/TR07N1xoxIyZioVTAP+wFhL8T8vFdWYOWqbQ8CRjl5uEcU83CD5h
pbnysmLQn67pY3w3FwzNdvj2HjncvnHPuzsZgWb2rppnYX2jRLc5REM3Th5QUAs0
aFsWokOYc8kvJd9nEAoVTR8yR0O0IvJ8ZqJFglKYJuiIRDmSQZiYZTKMkBQN+AtS
qmYFaD7yidLchSoMTCd3VH2MH5/ULawyqs9NQKQDK79OIU57ae6e3nFQuxMC8Twk
OTXLW+FJiwWSepkMkkEer3//g44ctEVg8pCh469cDiDlm0CkjRq+V0ZYQsybaXgC
9B3hZJ4s8HofdFLgFTxa4UU=
-----END CERTIFICATE REQUEST-----

keymanager# import ESKMCA.crt signed.crt storeonce123

CA and Certificate successfully imported and password has been verified

keymanager#
```

Figure 25 : CA and Certificate successfully imported

4.3.3 Enrolling into External Key Manager Mode

To enroll in external key manager mode, perform the following steps:

1. Go to HPE StoreOnce CLI.
2. Enter the command: `Keymanager # mode external <username> <password> address <ip address of the EKM> type <ESKM brand> <ESKMCA>`.
3. Click on enter and a message will be displayed as “Enrollment into EKM Mode successful.”

Figure 26 : Enrollment into EKM Mode successful

4. The KMIP account is now created in the ESKM.
5. Go to ESKM and navigate to **Device>Logs & Statistics>Log Viewer>Activity**.
6. Under the "Activity Log", click on **Display Log**.

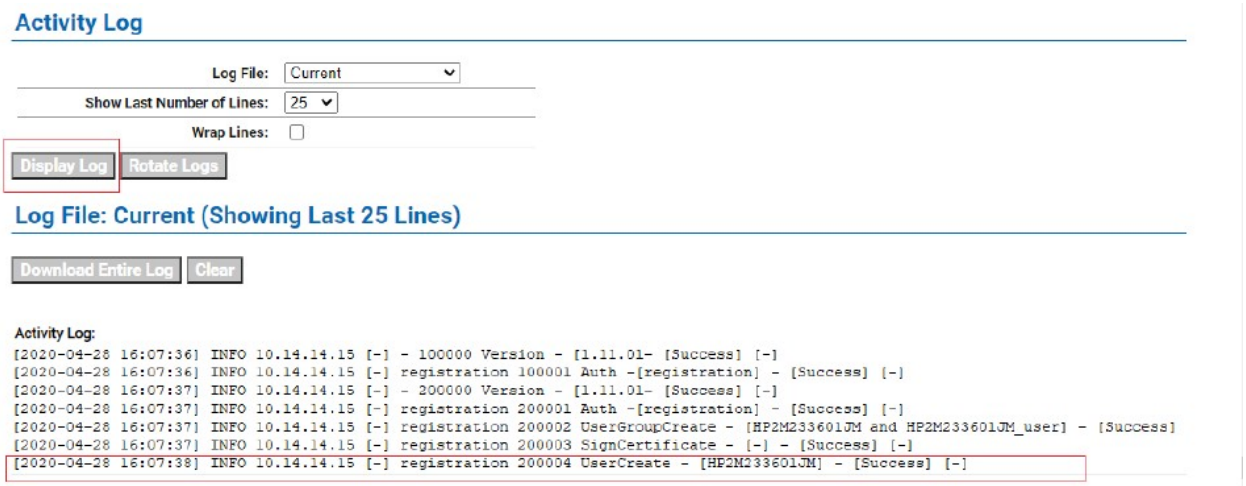

Figure 27 : Activity Log

7. The user is now created.
8. Now again, navigate to **Device>Logs & Statistics>Log Viewer>KMIP**.
9. Under the "KMIP Log", click on **Display Log**.

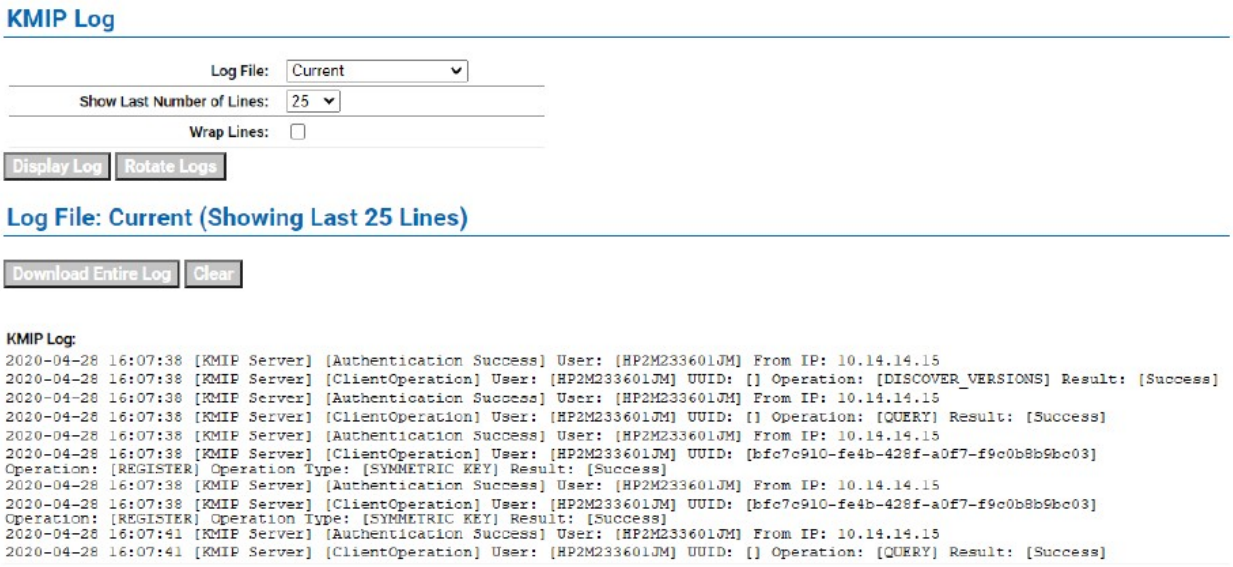

Figure 28 : KMIP Log

10. To view the created group, navigate to **Security>Users & Groups>Local Groups**.

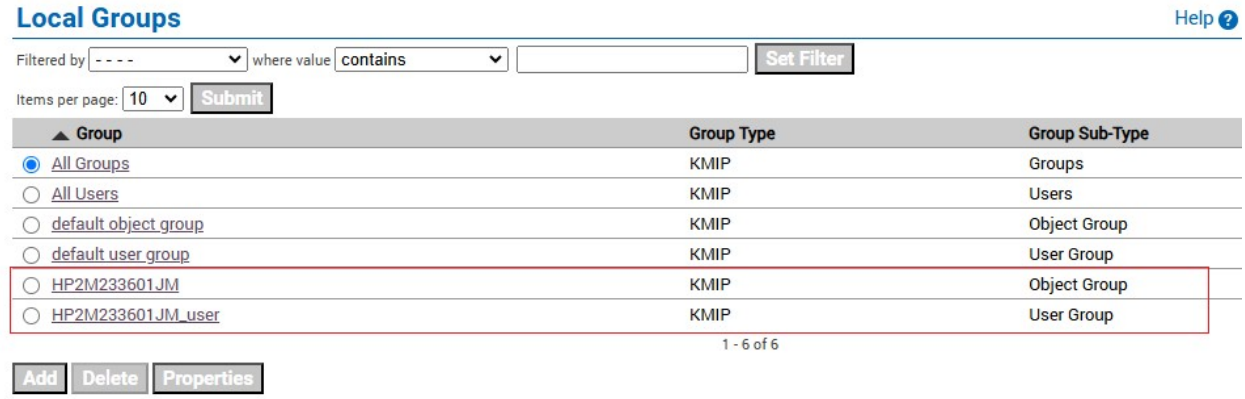

Figure 29 : Local Groups

11. To view the created user, navigate to **Security>Users & Groups>Local Users**. It has "KMIP-Enabled" selected and "User Administration Permission" and "Change Password Permission" unselected.

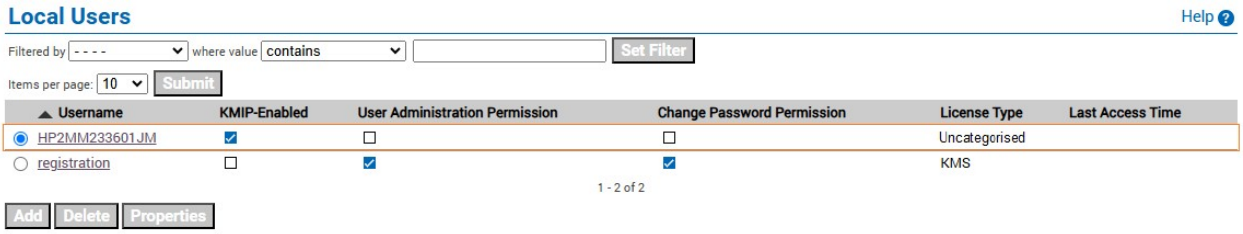

Figure 30 : Local Users

Selected Local User

Help

Username:	HP2M233601JM
Password:	********
License Type:	Uncategorised
User Administration Permission:	☐
Change Password Permission:	☐
Enable KMIP:	☑
Default KMIP Object Group:	HP2M233601JM
Client Certificate:	Subject: C: US ST: MA L: Andover O: HP emailAddress: Common Name: HP2M233601JM Not Valid Before: Apr 20 13:13:35 2020 GMT Not Valid After: Oct 19 13:13:35 2029 GMT
Date Created:	2020-07-09 00:56:14
Date Last Modified:	2020-07-09 00:56:14
Last Access Time:	

KMIP Client Certificate Contents:

```
-----BEGIN CERTIFICATE-----
MIID0jCCArqgAwIBAgIBDzANBgkqhkiG9w0BAQsFADCBiTELMAkGA1UEBhMCVVMx
CzAJBgNVBAgTAkNBMREwDwYDVQQHEwhDYW1wYmVsbDEUMBIGA1UEChMLVXRpbWFj
byBJbmMxEDAOBgNVBAsTB1V0aW1hY28xETAPBgNVBAMTCEVTS00gQ0ExMR8wHQYJ
KoZIhvcNAQkBFhB0ZXN0QHV0aW1hY28uY29tMB4XDTIwMDQyMDEzMTMzNVoXDTI5
MTAxOTEzMTMzNVowgZsxCzAJBgNVBAYTAlVTMQswCQYDVQQIEwJDQTERMA8GA1UE
BxMIQ2FtcGJlbGwxFTATBgNVBAoTDE9yZ2FuaXphdGlvbjEdMBsGA1UECxMUSW5m
b3JtYXRpb24gU2VjdXJpdHkxDTALBgNVBAMTBEVTS00xJzAlBgkqhkiG9w0BCQEW
GGluZm9zZWNAb3JnYW5pemF0aW9uLmNvbTCCASIwDQYJKoZIhvcNAQEBBQADggEP
ADCCAQoCggEBAM8HVyfLgAHizQzxB8oei3R+Bz/WyVvSGDTVCZd9QUg9Iary/IWg
ftZGMo4ppI6O+l6qUKI78X+NlDFR7oltlAD2Bf6b93OYgcVSioBhMfMqmeGsYLcX
q7NH9/F4WPDBsPnPNdPPSH0sl8X8Bl+mNckkMIKPEmCMjmmdniH+gQhRQvIcokDK
v/ckp5LLg49/1V7qCeWYnwy9/TXYQWMMkKhS/jxH9hjFIssUWW63XJM1ktHytCm3
g/ra38iL7f8f8M6cdqQ3EsQCm5WwgjGr4eulNHX16+N7EQSG0kFxowi2hltN4DED
BbISN0k5nAOXgaHFCEHr6EHnMokzyMmmZL8CAwEAAaMxMC8wCQYDVR0TBAIwADAR
BglghkgBhvhCAQEEBAMCBkAwDwYDVR0RBAgwBocECt6y8TANBgkqhkiG9w0BAQsF
AAOCAQEA2F/o/9ldofF+51ZsvxhoLnoHqTlqLZMteXr1++nzH8Mly4CyGYPqk3FB
wb2yiKnWFGJrvLFpCNWXEd4LeB+T9fDR+FJlX0uOXuqlNp+r0DVcsyoM7tdATVL/
wAniQwrVI+63WlyaPZPipKXgqH4+rEK6F8oarTCCGJYwjDLOjaLHDI5IZeaCdgvO
WkhoE+nPag2gEOEeiFtPr6zS83m6ZPpSllz22SbqB03jUh4UuggSg4LRYEwRHgEP
PHp9S3BHJzKeOA+ixj/JW53Ft/V6LmK6enmqaZCCI5twHHxtoe41P9gzmnXaG72q
Iw/+GfA0vqx3fydiN1VctWyW5rlTow==
-----END CERTIFICATE-----
```

Edit Back

Figure 31 : Selected local user

12. Now it is safe to delete the “registration” user. Navigate to **Security>Users & Groups>Local Users** and select “registration” and click on **delete**.

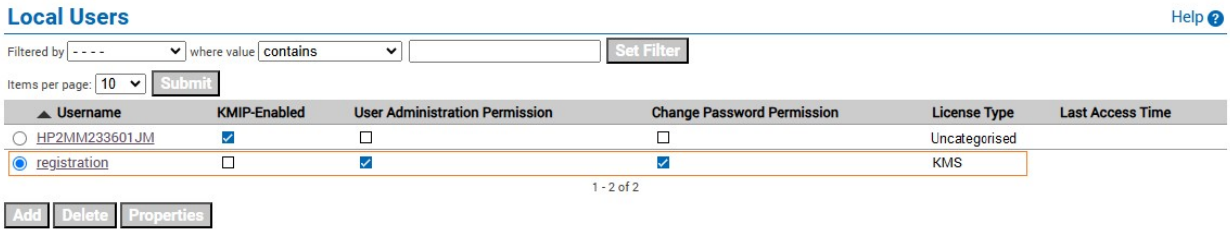

Figure 32 : Delete Local User

13. To confirm, navigate to **Security>Certificates & CAs>LocalCAs** and click on the “**CA Name**”.

Figure 33 : Local Certificate Authority List

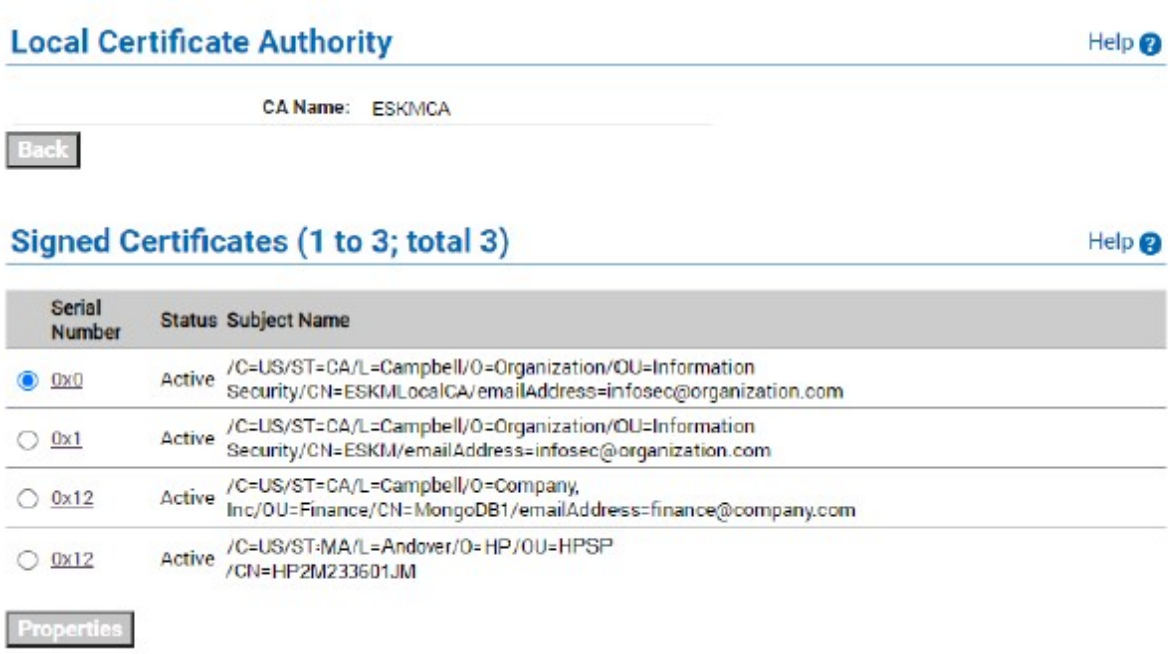

Figure 34 : Local Signed Certs

4.3.4 Integrating HPE StoreOnce with ESKM

To integrate HPE StoreOnce with ESKM, perform the following steps:

- Login to the HPE StoreOnce Management Console.

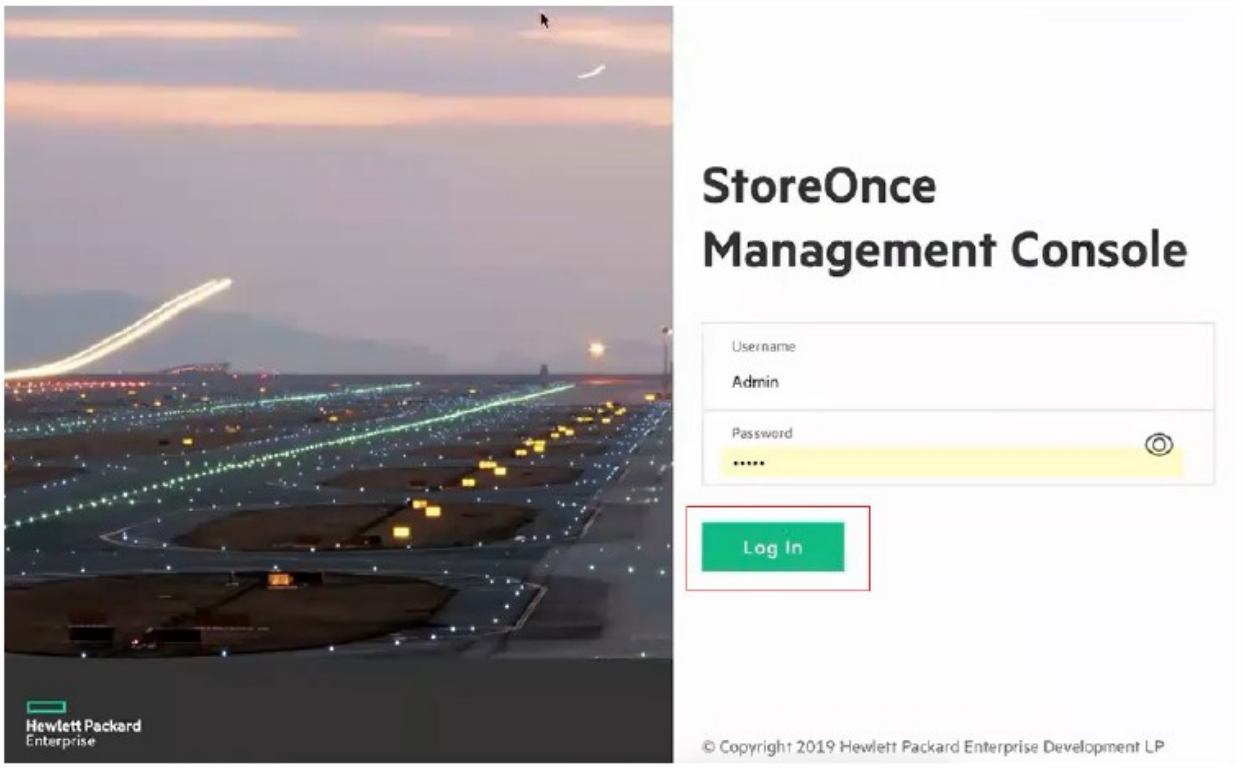

Figure 35 : StoreOnce Console - Log In

- Navigate to **StoreOnce>System Dashboard** and check the availability of the encryption license.

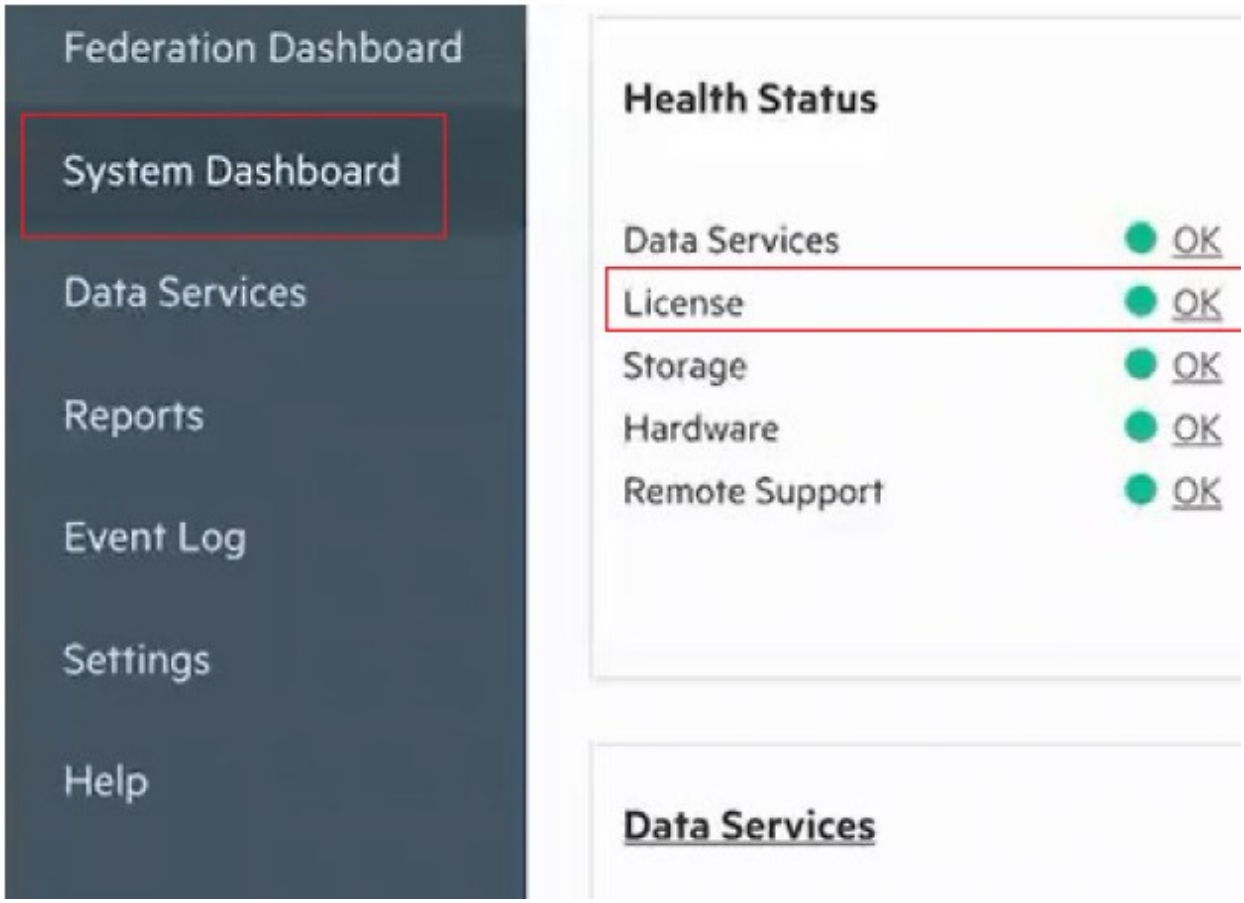

Figure 36 : System Dashboard

To start with the integration, navigate to **StoreOnce>Settings>Key Manager**.

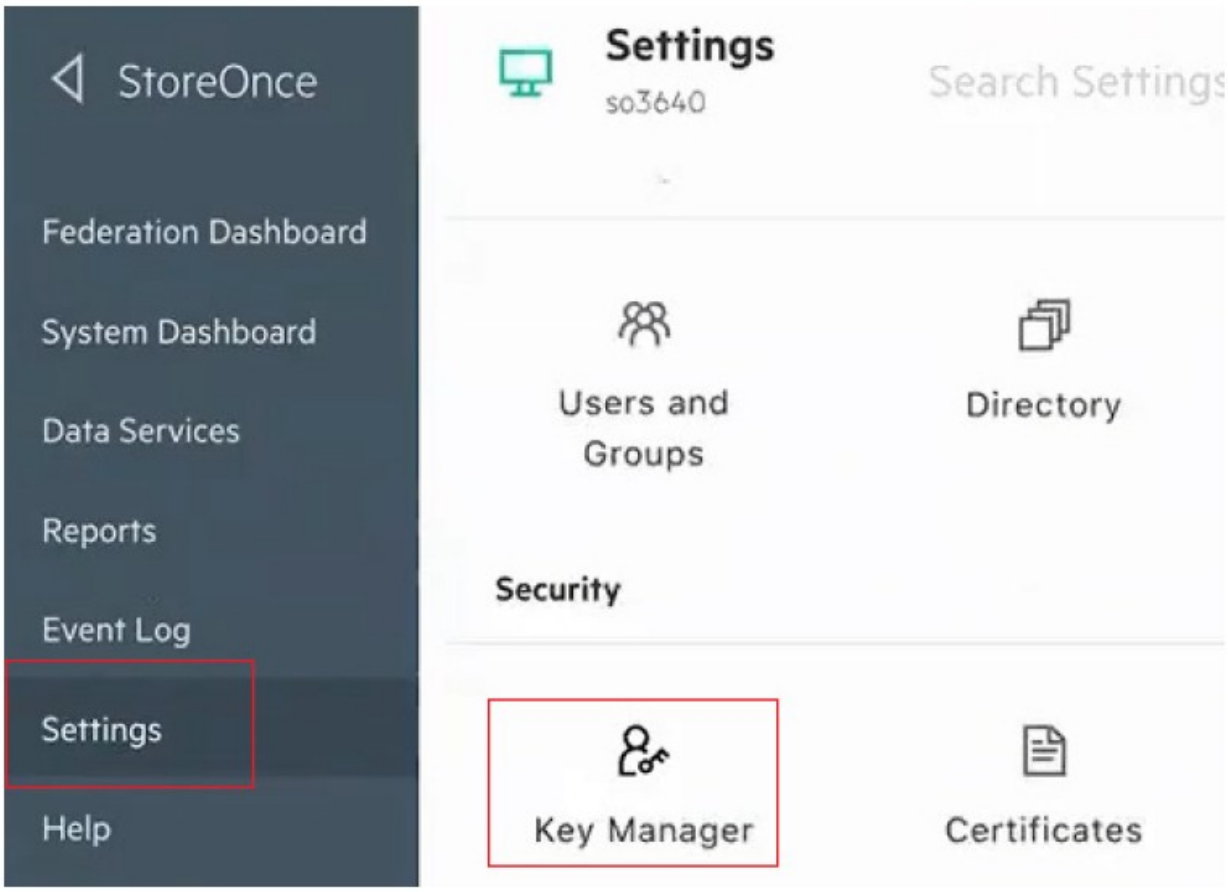

Figure 37 : Key Manager

- Click on **Generate CSR** and click on “Provide External Key Manager Credentials”.

The “External Key Manager Credentials” are to be created on the ESKM.

Login to the ESKM and create a local user with username as “registration”, choose a password and confirm it, select the license type as storage, select the user administration permission and change password permission, do not select KMIP, and click create.

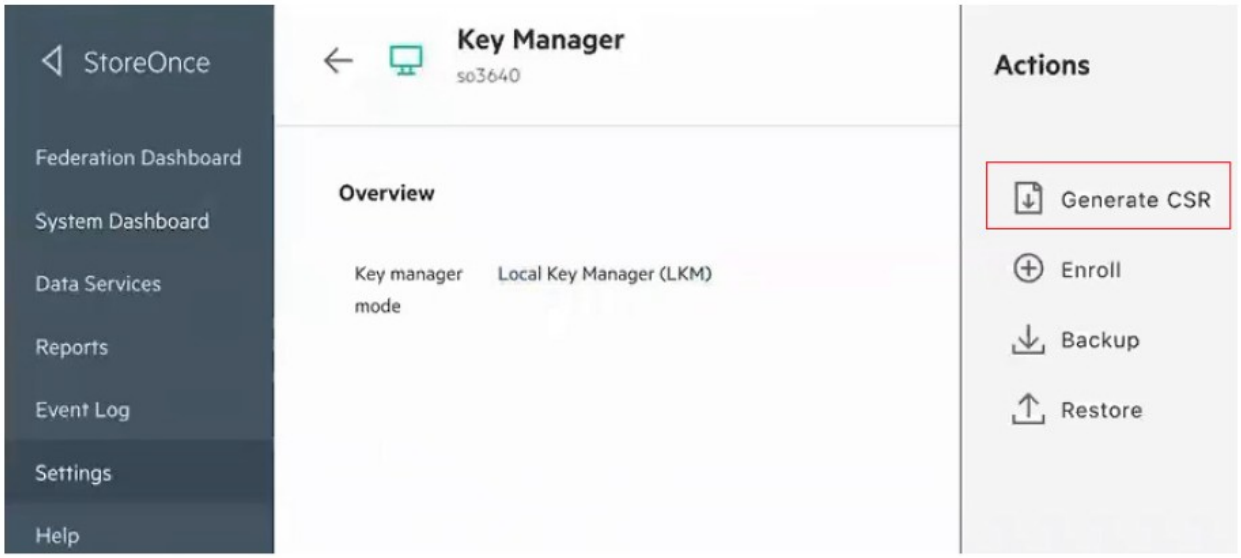

Figure 38 : Generate CSR

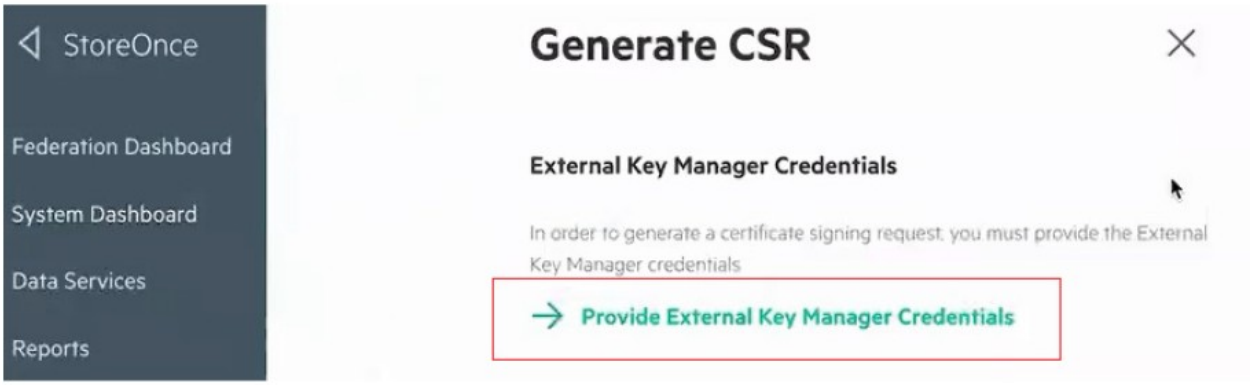

Figure 39 : Generate CSR

- Provide the same username and password that was created on the ESKM and click **OK**.

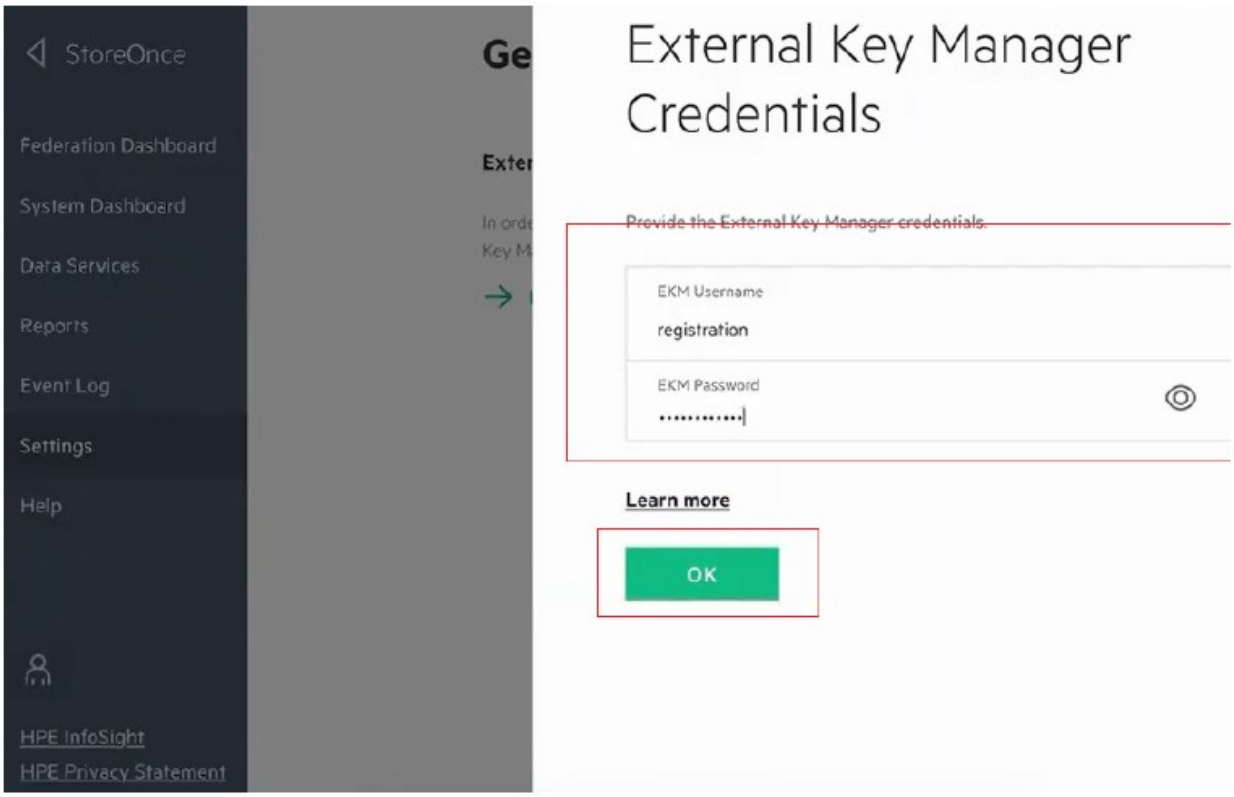

Figure 40 : External key manager credentials

- Click on **Generate** and the CSR will be displayed. Click on **Select and Copy** to copy the certificate and go to ESKM.

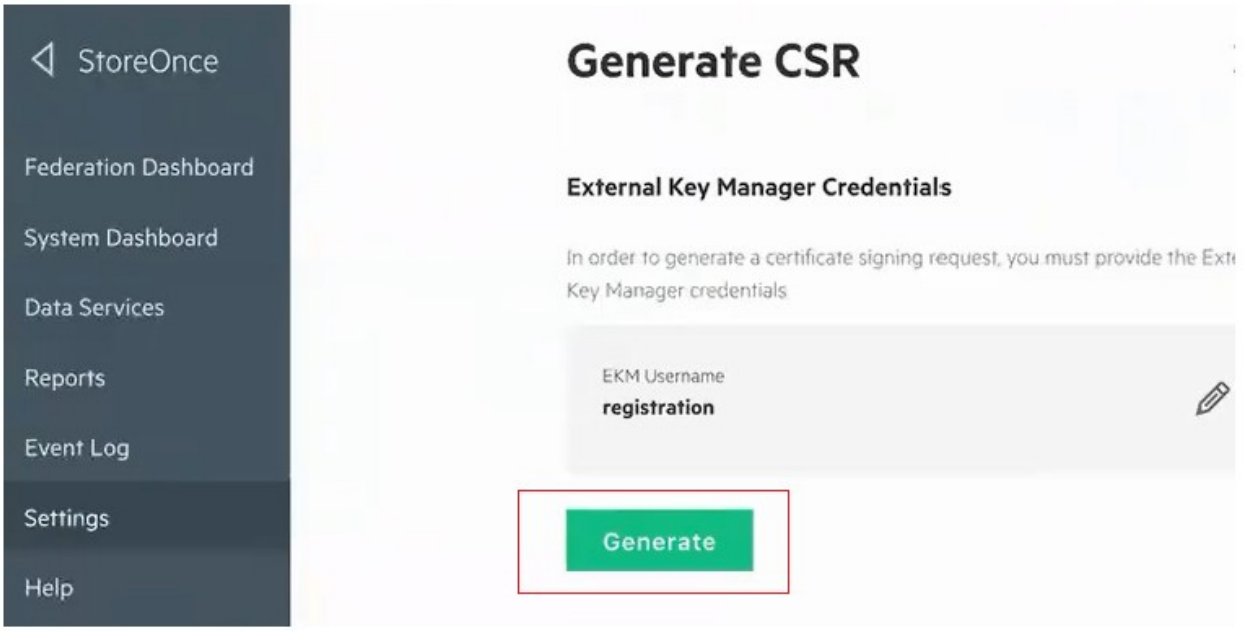

Figure 41 : Generate CSR

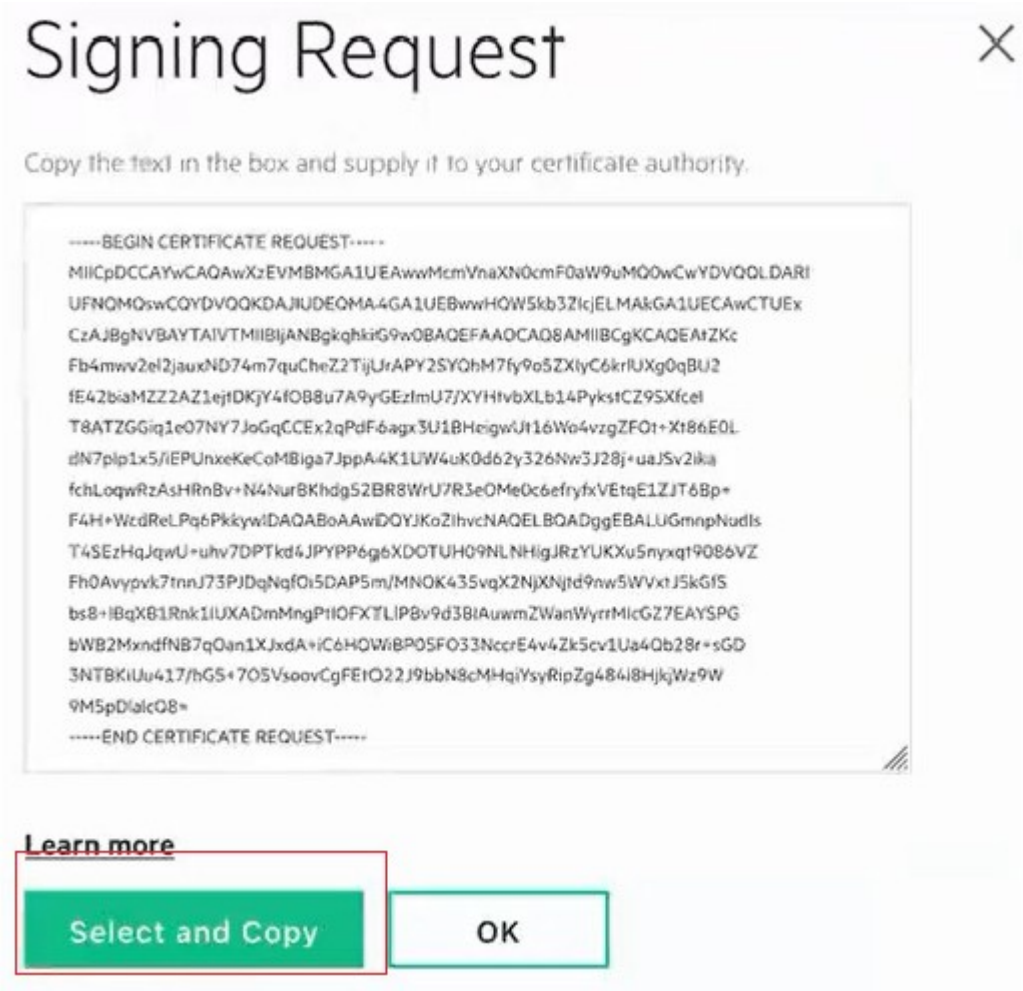

Figure 42 : Sign Request

- Navigate to **Security>Certificates & CAs>Local CAs** and click on **Sign Request**. Select the certificate purpose as “Client” and paste the certificate in “Certificate Request” pane and click on **Sign Request**.

Figure 43 : Local Certificate Authority List

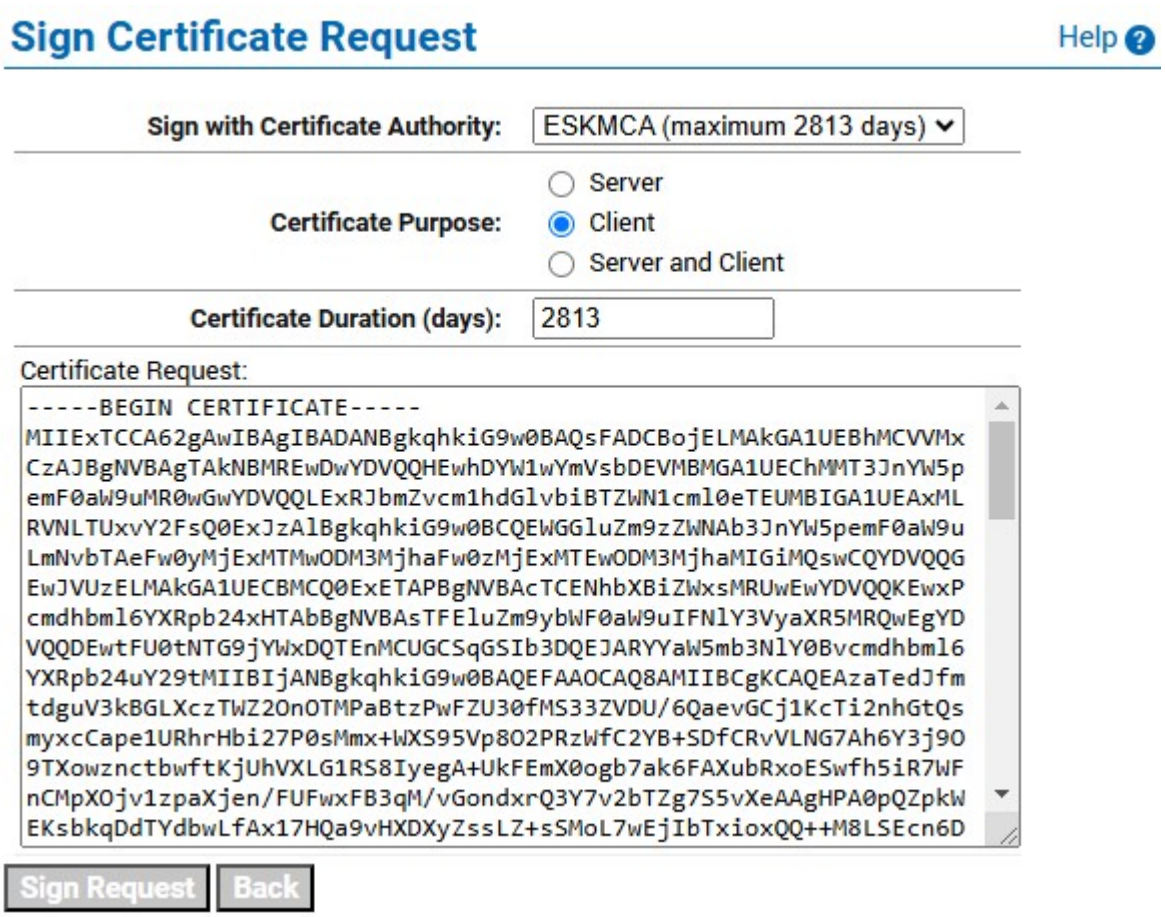

Figure 44 : Sign Request

CA Certificate Information

Help

Key Size:	2048
Start Date:	Jul 8 06:35:11 2020 GMT
Expiration:	Mar 16 06:35:11 2030 GMT
Issuer:	C: US ST: CA L: Campbell O: Organization OU: Information Security CN: ESKMLocalCA emailAddress: infosec@organization.com
Subject:	C: US ST: CA L: Andover O: HP OU: HPSP CN: registration


```
-----BEGIN CERTIFICATE-----
MIID3TCCAsWgAwIBAgIBEjANBgkqhkiG9w0BAQsFADCBojELMAkGA1UEBhMCVVMx
CzAJBgNVBAgTAkNBMREwDwYDVQQHEwhDYW1wYmVsbDEVMBMGA1UEChMMT3JnYW5p
emF0aW9uMR0wGwYDVQQLExRJbmZvcm1hdGlvbiBTZWN1cml0eTEUMBIGA1UEAxML
RVNLTUxvY2FsQ0ExJzAlBgkqhkiG9w0BCQEWGGluZm9zZWNAb3JnYW5pemF0aW9u
LmNvbTAeFw0yMDA3MDgwNjM1MTFaFw0zMDAzMTYwNjM1MTFaMIGNMQswCQYDVQQG
EwJVUzELMAkGA1UECBMCQ0ExETAPBgNVBAcTCENhbXBiZWxsMRUwEwYDVQQKEwxD
b21wYW55LCBJbmMxEDAOBgNVBAsTB0ZpbmFuY2UxETAPBgNVBAMTCE1vbmdvREIx
MSIwIAYJKoZIhvcNAQkBFhNmaW5hbmNlQGNvbXBhbnkuY29tMIIBIjANBgkqhkiG
9w0BAQEFAAOCAQ8AMIIBCgKCAQEA4Zff7hxc6LMc9LE11bfPagsnsXuFyWQJSXiI
3rG0htHwDV7Ese3+WaQ6DQaRrculYMtRcUUfQynbAZSQWsjVWeafgIhoBrO3bhRy
iCCjpIsQe0VLeOpEZg1pbhFl1puZzQv5BH8XK5vfdQYoFMPUM9fbkiZKxj+FQkGj
oLBF1mOmMk+Nt8QONHixig0uUaKFsLJqasm7ZMnB6cp6A4Y6eZ/HXctECzopRc1k
VbcxXHawH2z7qrGRdb/f0DMWT5bybMod7EV23gM+DeA7PBcgf8XHaC+qsP6tj/tY
9zdFZ7xJ27QatuA+8XF80ByLT4pmj4fmpp7rRIgWAWJVZLfEiwIDAQABozEwLzAJ
BgNVHRMEAjAAMBEGCWCGSAGG+EIBAQQEAwIHgDAPBgNVHREECDAGhwQK3rLxMA0G
CSqGSIb3DQEBCwUAA4IBAQCIEBkeI636KVALPAANut74GQsExwNVaWpQYKGQo98d
LkPC1mGT8aJDva5bbnCRP8Y91TPWbVANkkoiC1VRSVtBrtk9vi1SJKujHtmc6J8c
pCLdPF/n+77dbPmkKqFpWOZVWZGbxr9vfnsg4DZ7219BOlyldbWVuHmEuNGT1Pyt
Qn6gOC33KVacvqKzYAopeUcER3oFL8yyNYgrAFDE61WUfM3PHzlAfXwc7/eQ87Hu
v9dLX5AQGyuzjGPfCvnC1Rw2M916jviC/KdK6uwTaazF/ebMh6gL/4hvfwwC1930
pw1RAS5/z9szTYajIA1wvJucjWqCjwTcwD+mdML4c4e5
-----END CERTIFICATE-----
```


Download Back

Figure 45 : Certificate Information

- Go to HPE StoreOnce Management Console, navigate **StoreOnce>Settings>Key Manager>Actions** and click on **Enroll**.

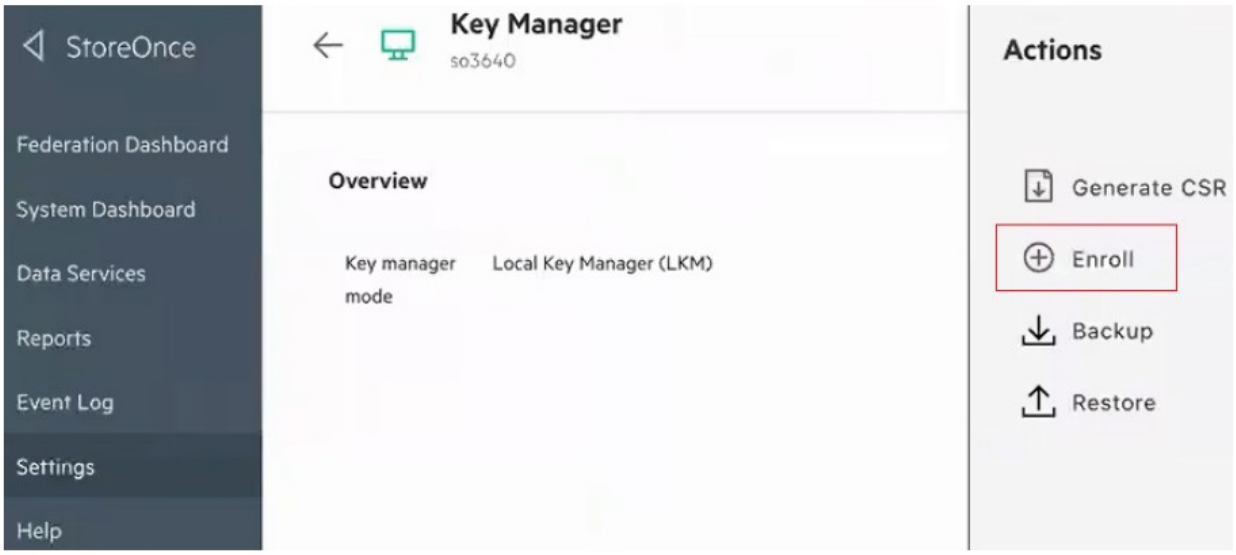

Figure 46 : Key Manager - Enroll

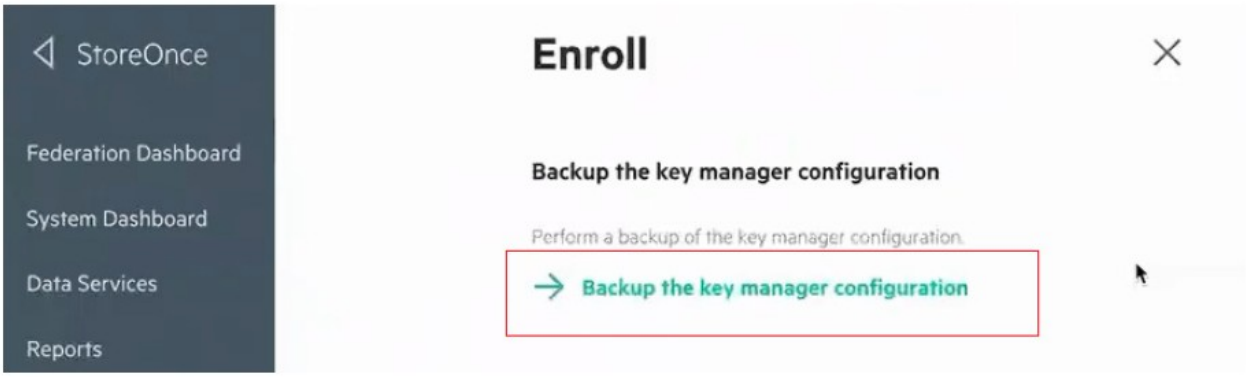

Figure 47 : Backup Configuration

- To backup the local configuration, create a password and confirm it and click **Backup**.

The backup of local configuration is important if the local key management configuration mode has to be switched back or unenroll from the key manager.

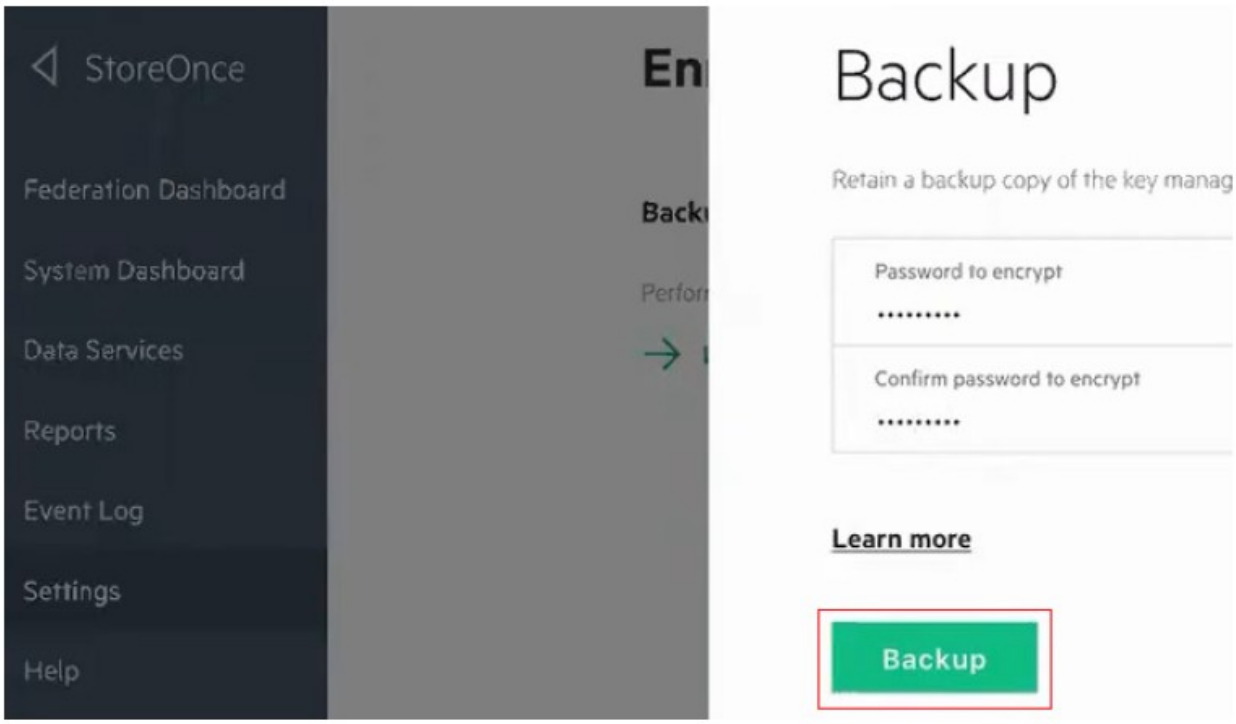

Figure 48 : Backup

- Download the backup file and save it onto the local machine.
- To configure the external key manager server, click on **Configure External Key Manger Server**. A pop-up window will be displayed. Select the “ESKM” as option and enter the IP address, CA name, Port, EKM username, EKM password, and click **OK**. The ESKM is now registered.

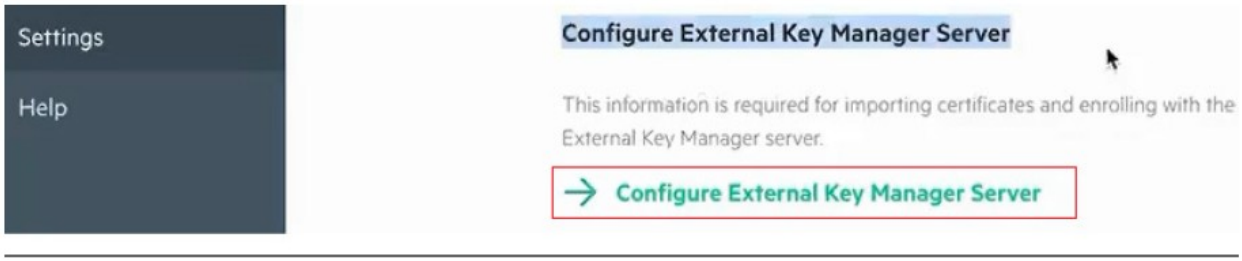

Figure 49 : Configure External Key Manager Server

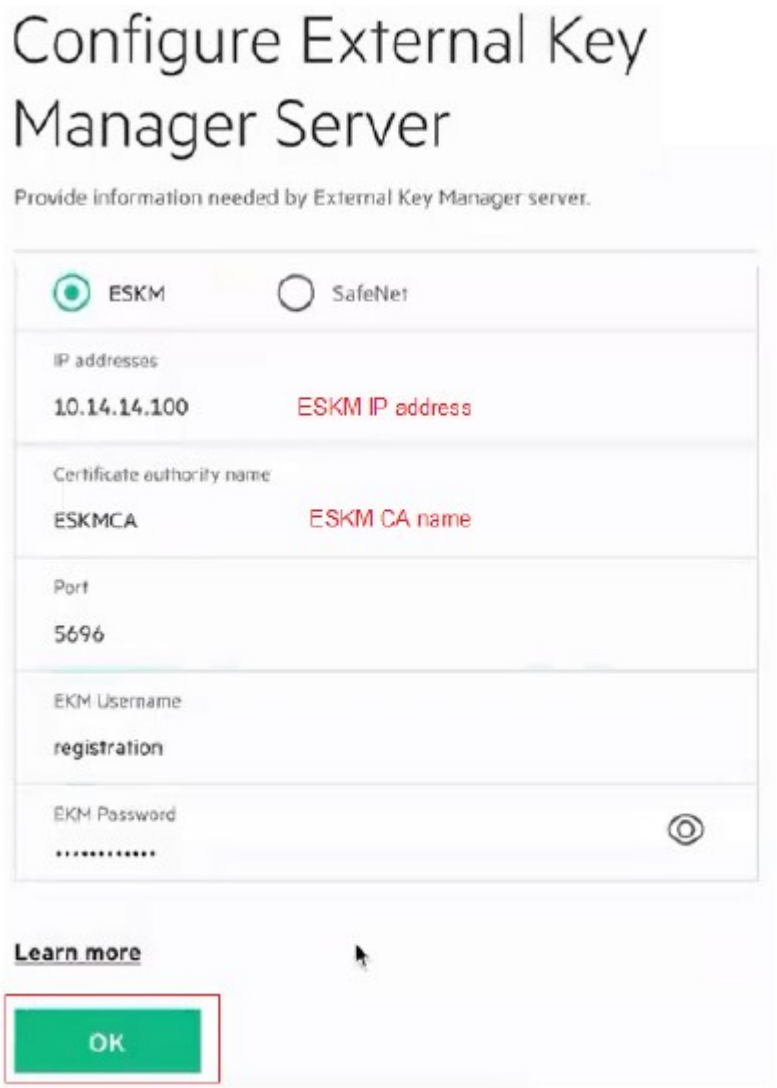

Figure 50 : Configure External Key Manager server

4.3.4.1 Importing Root Certificate

1. To import the root certificate, click on “Import Root Certificate” and a popup window will be displayed. Go to ESKM and navigate to **Security>Certificates and CAs>Local CAs**. Select the CA name and click on it. In the "CA Certificate Information" page copy the certificate from `----- BEGIN CERTIFICATE ----- to -----END CERTIFICATE --------` lines.

2. Go to StoreOnce Management Console and paste the certificate from `--- --BEGIN CERTIFICATE ----- to -----END CERTIFICATE --------` lines into "Import Root Certificate" pane. Click OK. The root certificate in now provided.

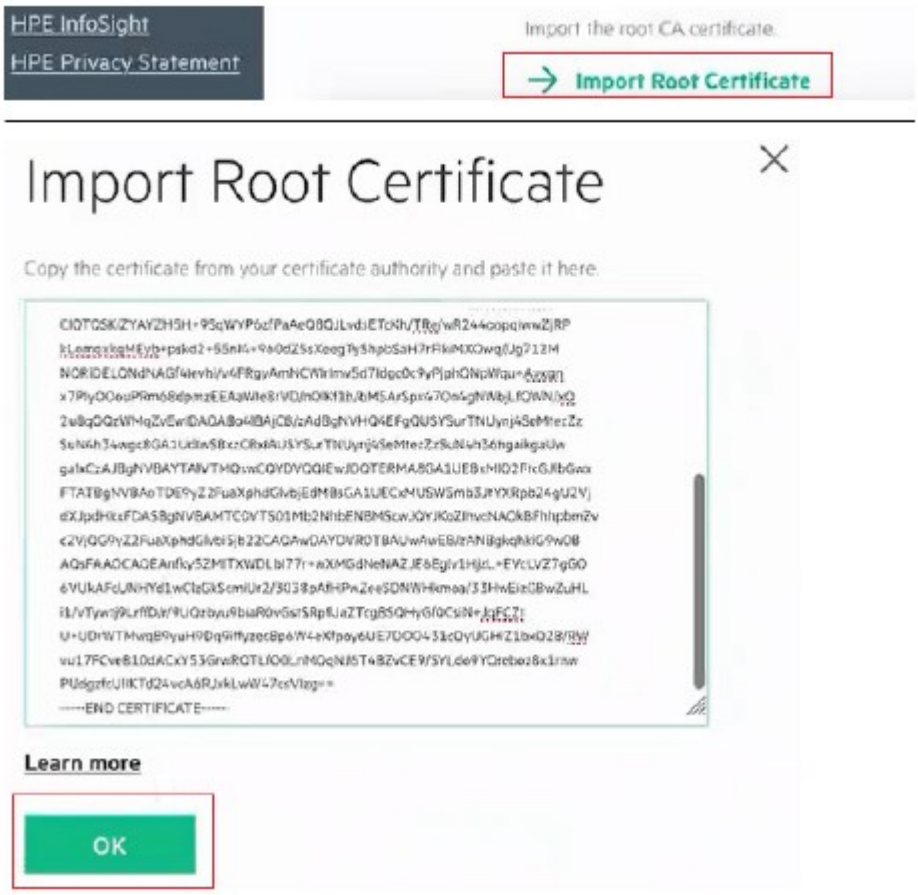

Figure 51 : Import root certificate

4.3.4.2 Importing Signed Certificate

1. To import the root certificate, click on “Import Signed Certificate” and a pop-up window will be displayed. Go to ESKM and navigate to **Security>Certificates and CAs>Local CAs** and click on **Show Signed Certs**. Click on the appropriate signed certificate. In this case it is the one with the name “registration”. In the "Signed Certificate Information" page copy the certificate from `-----BEGIN CERTIFICATE ----- to -----END CERTIFICATE --------` lines.

2. Go to StoreOnce Management Console and paste the certificate from `--- --BEGIN CERTIFICATE ----- to -----END CERTIFICATE --------` lines into "Import Signed Certificate" pane. Click **OK**. The signed certificate in now provided.

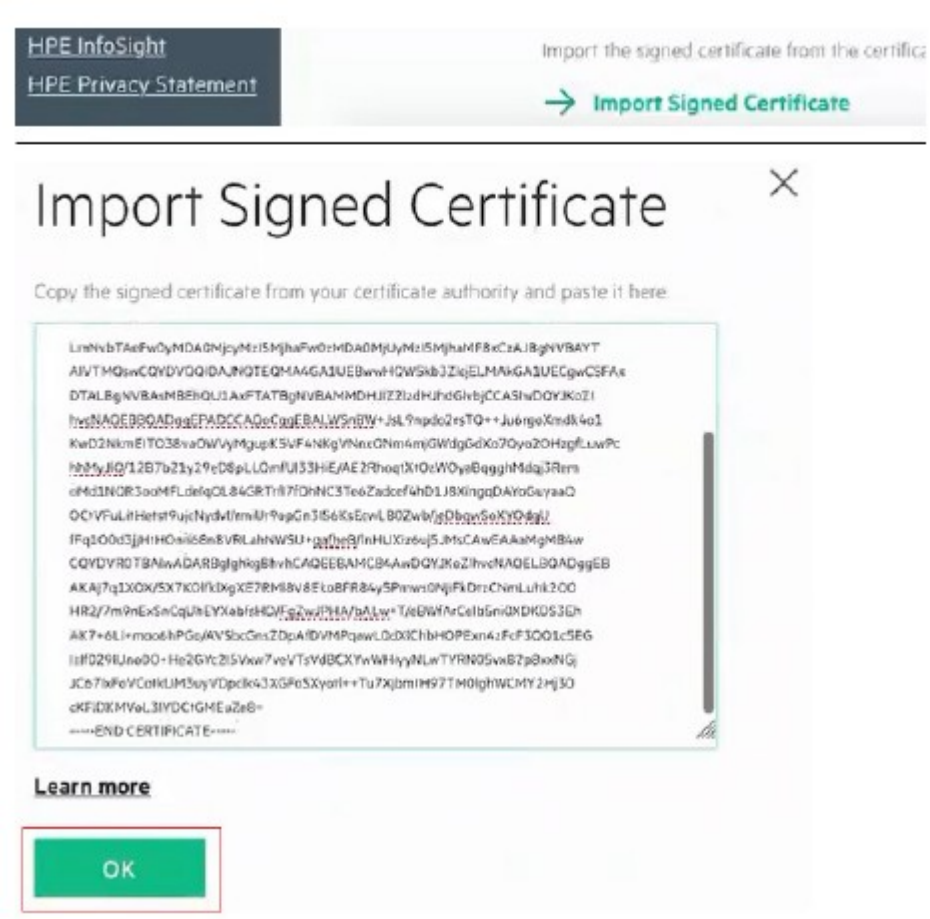

Figure 52 : Import signed certificate

4.3.5 Enrolling the StoreOnce

Once all the information related to backup key manager configuration, external key manager, root certificate authority, and signed certificate click on **Enroll**.

In case there are any failed integrations, please make sure to delete all the entries related to failed integration from the ESKM.

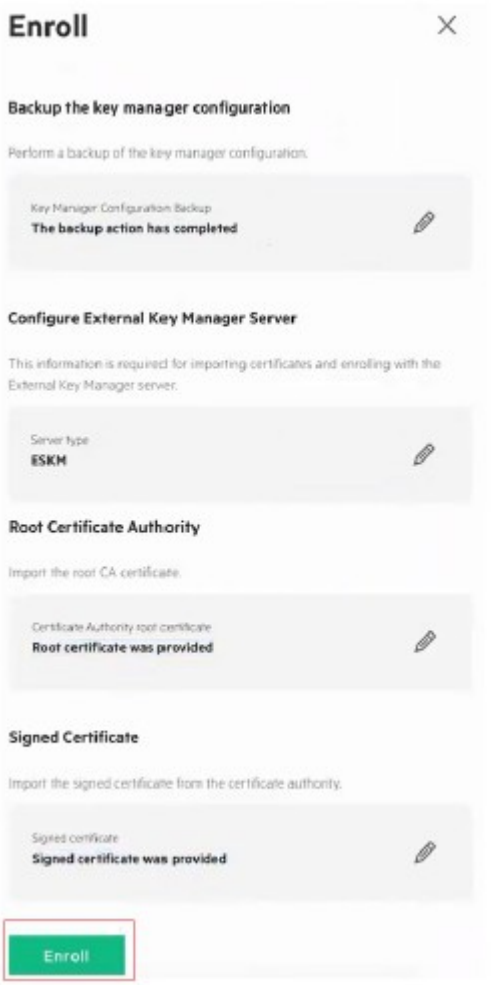

Figure 53 : Enrolling StoreOnce

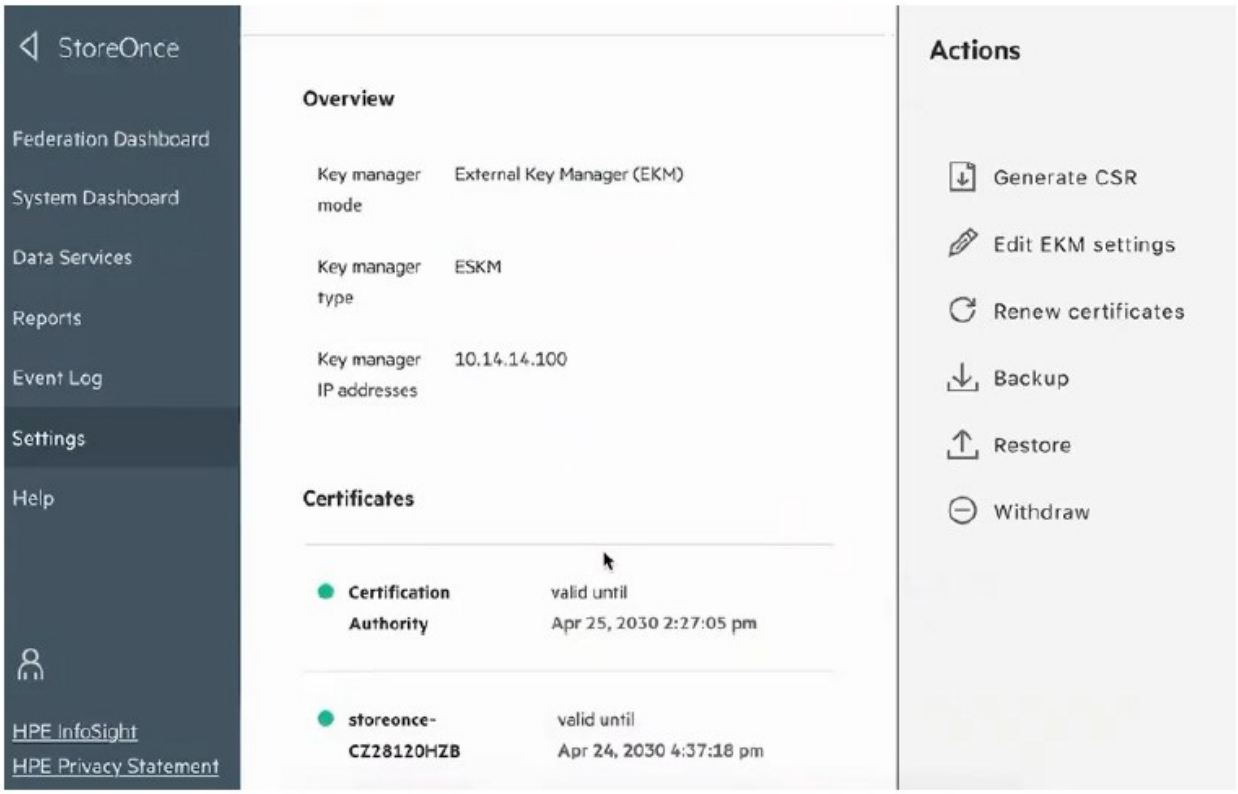

Figure 54 : Enrolling StoreOnce

With this, the HPE StoreOnce is now integrated with the ESKM.

5 Accessing Serial Console via PuTTY

Use the following steps to set up PuTTY and access serial console.

1. Navigate to device manager and figure out the COM port that you'll be using.

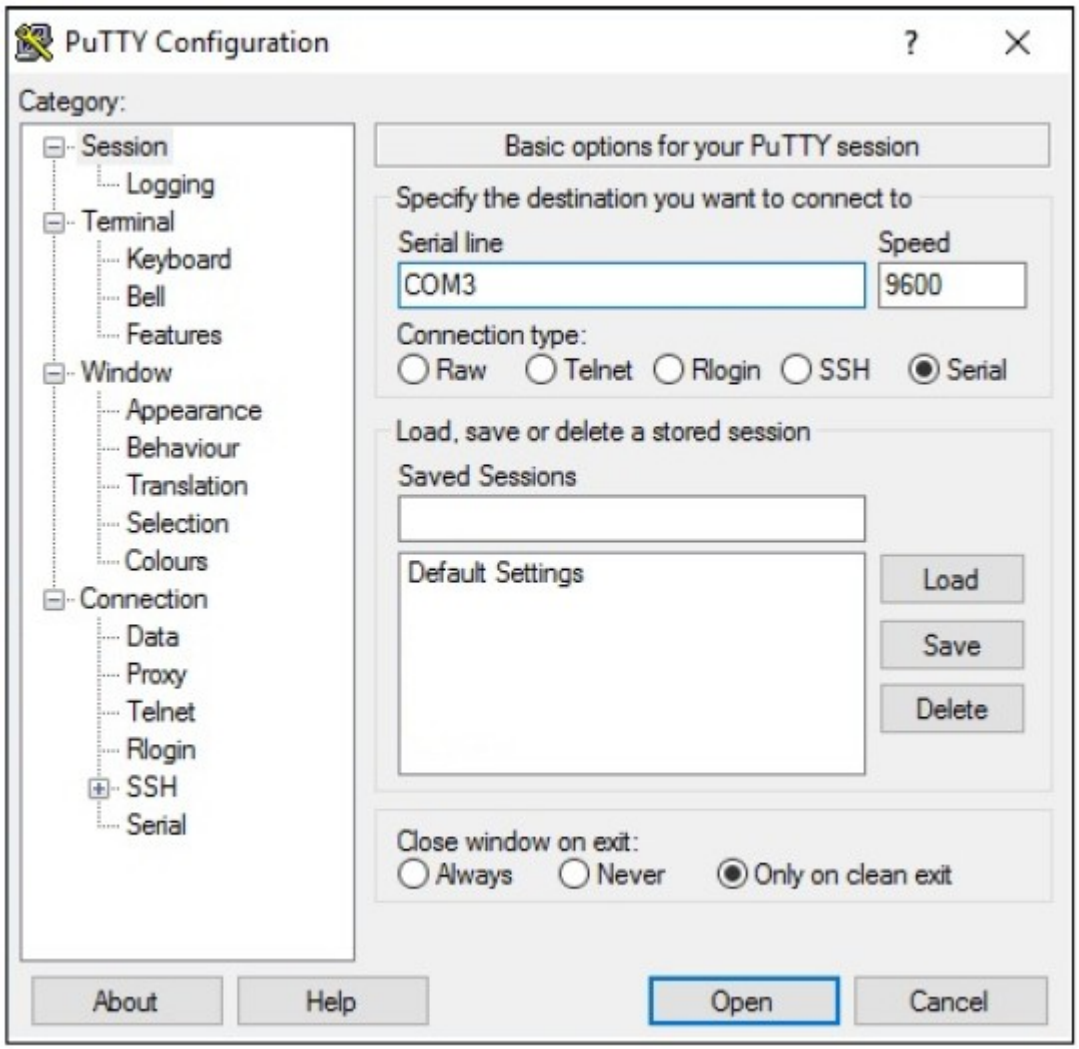

Figure 55 : PuTTY configuration

2. Run PuTTY.
3. Switch the Connection Type to Serial.
4. Edit the Serial Line to match the COM port you want to use.

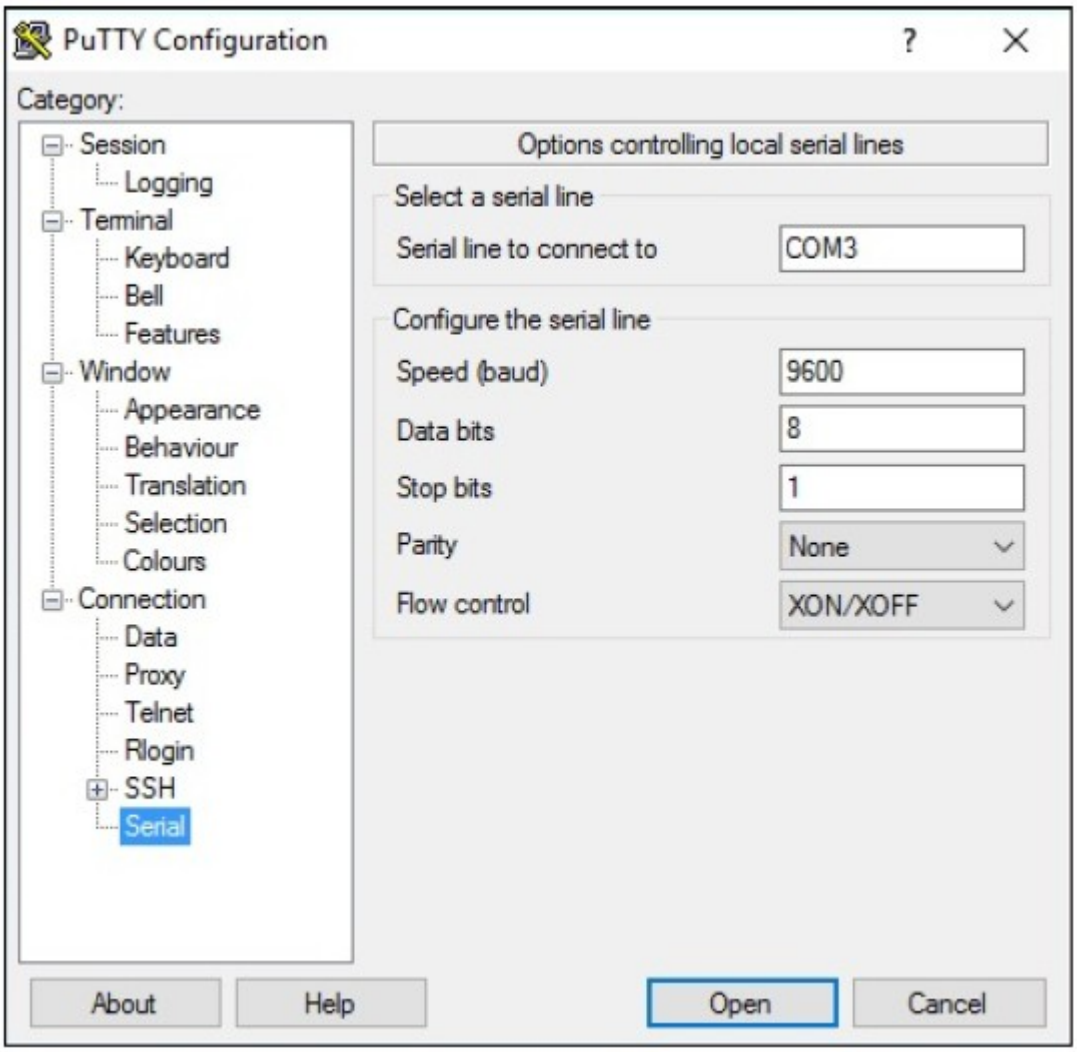

Figure 56 : Edit Serial Line

5. Make sure all of the settings are correct.
6. Click **Open** to start the session.

6 Contact and Support Information

6.1 Utimaco Technical Support

For technical questions, contact Utimaco Technical Support:

- E-mail: support-atalla@utimaco.com[3]
- Telephone: 800-500-7858 (U.S.A.) +1-916-414-0216 (International)
- Website:https://support.utimaco.com/

Before contacting Utimaco with your questions, collect the following information:

- Product model names and numbers
- Technical support registration number or NonStop system number (if applicable)
- Service Agreement ID number (SAID)
- Product serial numbers
- Error messages Software version number

6.2 24-hour support

24-hour emergency support is available to those customers who have valid service contracts. Use this service for product and system emergencies that occur after normal working hours or on weekends and U.S. holidays. Questions about product installation and setup are supported during normal working hours.

For 24-hour emergency support call: 800-500-7858 (U.S.A.) +1-916-414-0216 (International).