



Cisco Cyber Vision Center VM Installation Guide, Release 4.2.0

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CHAPTER 1

About this documentation

- [Document purpose, on page 1](#)
- [Warnings and notices, on page 1](#)

Document purpose

This installation guide shows how to connect, configure and install Cisco Cyber Vision as a virtual machine running on VMware ESXi and on HyperV.

You will also find the upgrade procedures for an architecture with a Global Center and for an architecture with one Center only.

This documentation is applicable to **system version 4.2.0**.

Warnings and notices

This manual contains notices you have to observe to ensure your personal safety as well as to prevent damage to property.

The notices referring to your personal safety and to your property damage are highlighted in the manual by a safety alert symbol described below. These notices are graded according to the degree of danger.



Warning

Indicates risks that involve industrial network safety or production failure that could possibly result in personal injury or severe property damage if proper precautions are not taken.



Important

Indicates risks that could involve property or Cisco equipment damage and minor personal injury if proper precautions are not taken.



Note Indicates important information on the product described in the documentation to which attention should be paid.



CHAPTER 2

Information and characteristics

- [Information and Characteristics](#), on page 3

Information and Characteristics

The Cisco Cyber Vision solution can have a 2-tier or 3-tier architecture made of:

- **Edge sensors** which are installed in the industrial network. These sensors are dedicated to capture network traffic, decode protocols using the Cisco Deep Packet Inspection engine and send meaningful information to the Cisco Cyber Vision Center.
- The Cisco Cyber Vision **Center**, a central platform gathering data from all the Edge Sensors and acting as the monitoring, detection and management platform for the whole solution.
- Optionally, a third-tier **Global Center** to which all Centers are connected, to provide a central view of all Centers deployed within an organization for alerting, reporting and management functions.

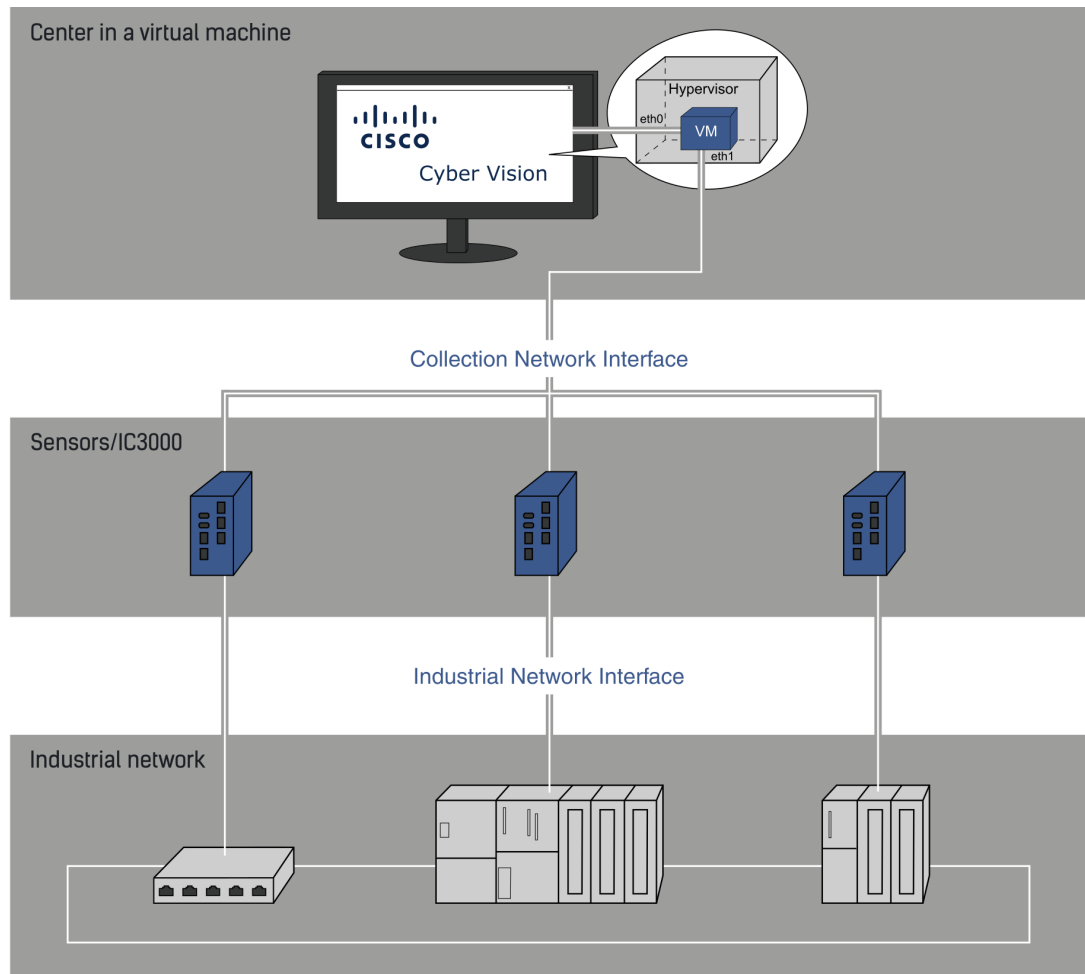
During the installation of the Center, you will have the opportunity to set up Center data synchronization to a Global Center. However, if you choose to set up a global infrastructure, you must install the Global Center first, then the Centers, and finally, the sensors.

Networks or segments involved

From Cisco Cyber Vision perspective, three important networks will be involved with the platform:

- The **Administration network**, used to access the Center User Interface (UI) and interact with authorized external services (NTP, DNS, API, SIEM, etc.).
- The **Collection network**, used to manage all Cisco Cyber Vision sensors. This network must be isolated from the operational traffic plant (separated VLAN/subnet).
- The **Acquisition/Industrial network**, used for all industrial plant traffic and/or external interconnection under consideration that will be analyzed by the sensors (SPAN traffic collected).

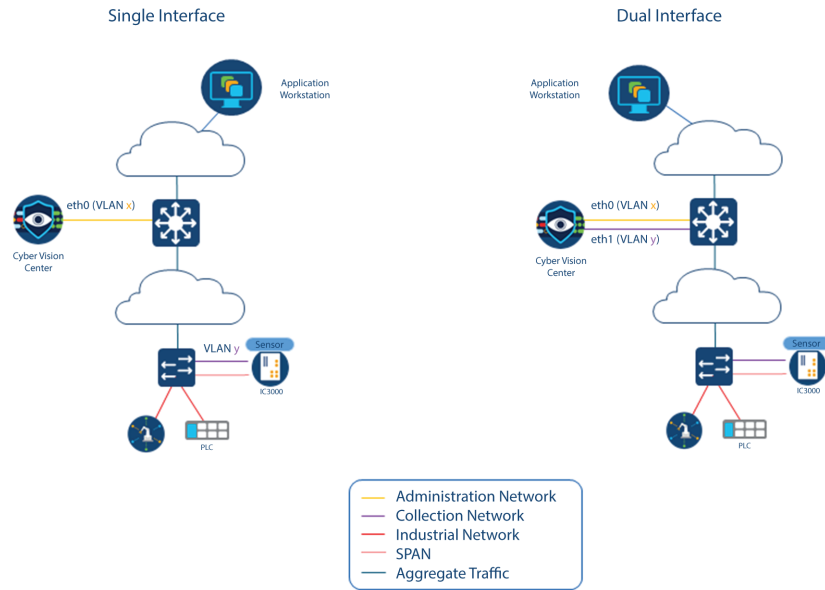
Example of a Cisco Cyber Vision installation (without Global Center):



Configuring single or dual interface (not applicable to a Global Center)

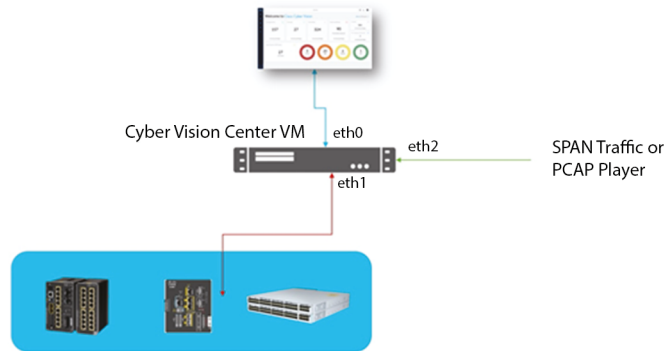
For security reasons, it is recommended to use the Center on **two separate networks**, respectively connected to the following interfaces:

- The **Administration network interface (eth0)**, which gives access to the user interface.
- The **Collection network interface (eth1)**, which connects the Center to the sensors.



- An additional interface dedicated to DPI (eth2) is required to deploy a Center with sensor function on EXSi.

eth0 is the first network interface of the VM
 eth1 is the second network adapter of the VM
 eth2 is the third network adapter of the VM



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Cisco IoT

However, in case of incompatibility with the industrial network infrastructure or for limited environments, you can use a single network interface (eth0).

Refer to the Cisco Cyber Vision Architecture Guide for more information about defining Cisco Cyber Vision environment configuration.



CHAPTER 3

Requirements for installation

- [Requirements for installation, on page 7](#)

Requirements for installation

Make sure the conditions listed below are met before installing Cisco Cyber Vision as a virtual machine.

Required configuration for a VM:

Hypervisor:

- VMware vSphere 6.x or later.
- OR
- Microsoft Hyper-V Server 2016 or later.

Make sure the hypervisor used is set with the rights necessary for a new VM instantiation.

VM sizing
Minimum – up to 500 components: <ul style="list-style-type: none">• CPU: Intel Xeon, 8 cores• RAM: 16GB minimum• Storage: 500GB SSD

VM sizing

Recommended:

For 10,000 components w/o Center DPI:

- CPU: Intel Xeon, 10 cores
- RAM: 32GB minimum
- Storage: 1TB SSD minimum, RAID-10

For more than 10,000 components or Center DPI:

- CPU: Intel Xeon, 16 cores
- RAM: 64GB minimum
- Storage: 1TB SSD minimum, RAID-10

Required resources:

- One or two IP addresses, depending on a Center installed with single or dual interface. Dual interface: one interface receives protocol data from the sensors (Collection network interface), the other is used to access the web interface and for SSH remote administration (Administration network interface) (n/a to a Global Center or a Center configured with single interface).

An additional interface dedicated to DPI is required to deploy a Center with sensor function on EXSi.

- An IP address for each sensor to connect (preferably on a dedicated LAN or VLAN for connections between the sensors and the Center i.e. the Industrial network interface) (n/a to a Global Center).
- A NTP server accessible from the Center (time is generally retrieved on a router).
- A machine name which has to be unique (either configured on the DNS, or to be configured on each client). This is essential for the security exchanges setup between a client (humans or API) and the Center.



CHAPTER 4

Install the Virtual Center

You need to complete several steps to install the Virtual Center:

1. Retrieve the Cisco Cyber Vision installation file.
2. Create a Virtual Machine on ESXi and deploy Cisco Cyber Vision ova file on the VM.
OR
Create a Virtual Machine on Hyper-V, set the disk size, create and map the network interfaces.
The only configurations that may be required during deployment are memory and disks size customization.
3. Configure the Cisco Cyber Vision Center.
 - [Retrieve the installation file, on page 9](#)
 - [ESXi, on page 10](#)
 - [Hyper-V, on page 17](#)

Retrieve the installation file

Before starting the VM installation, you must retrieve the virtual machine installation ova file.

To retrieve the virtual machine installation file:

Procedure

- Step 1** Access Cisco Cyber Vision Software Download platform.
- Step 2** Download the ova file required for Hyper-V or ESXi from the last version released. Ova files with the DPI option are also available.

To verify that the file you just downloaded is healthy, it is recommended to use the SHA512 checksum provided by Cisco.

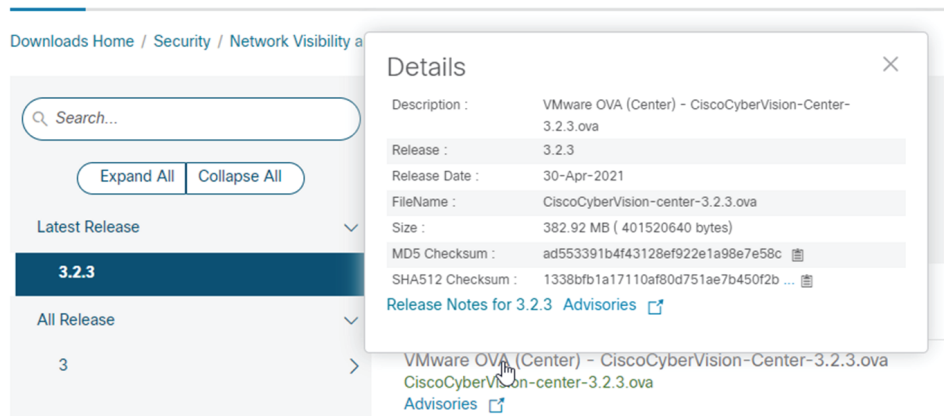
To do so (Windows users):
- Step 3** Access Cisco Cyber Vision download page.
- Step 4** Download the file.
- Step 5** Open a shell prompt such as Windows Powershell and use the following command to retrieve the file checksum:

```
Get-FileHash .\CiscoCyberVision-<TYPE>-<VERSION>.<EXT> -Algorithm SHA512 | Format-List
```

```
PS C:\Users\ > Get-FileHash .\Downloads\CiscoCyberVision-center-3.2.3.ova -Algorithm SHA512 | Format-List
Algorithm : SHA512
Hash      : 1338BFB1A17110AF80D751AE7B450F2B29CCB4C854F550F38B8E6B4236865EC9EDF773FD05D1055C7F1EF76E68C2B8A96CFE69AB
          : 18622E4B0BB8EBB9E94DB16
Path      : C:\Users\ \Downloads\CiscoCyberVision-center-3.2.3.ova
```

Step 6 In the download page, mouse over the file and copy the SHA512 checksum.

Software Download



Step 7 Compare both checksums.

- If both checksums are identical it means the file is healthy.
- If the checksums do not match try to download the file again.
- If, after downloading the file again the checksums still don't match, please contact Cisco support.

ESXi

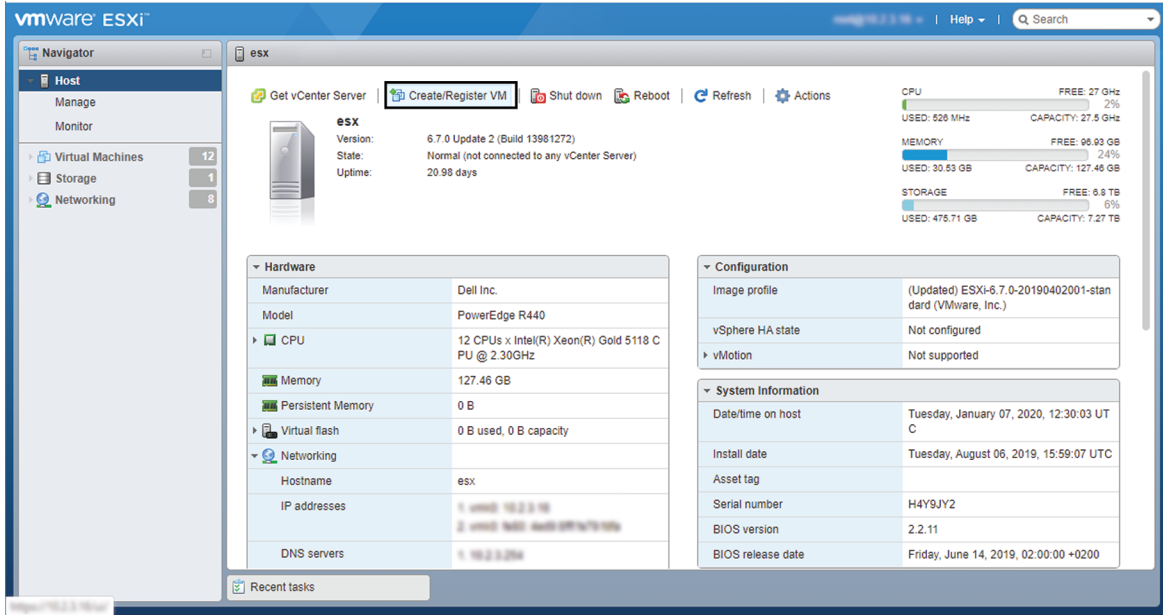
Create a Virtual Machine

Before taking the steps below to create a VM on ESXi, **you must set two network interfaces** (the Administration and the Collection network interfaces), and a third if deploying a Center with DPI (the DPI network interface), accordingly to the infrastructure of the network. To do so, refer to VMware ESXi documentation.

To create the Virtual Machine and deploy Cisco Cyber Vision:

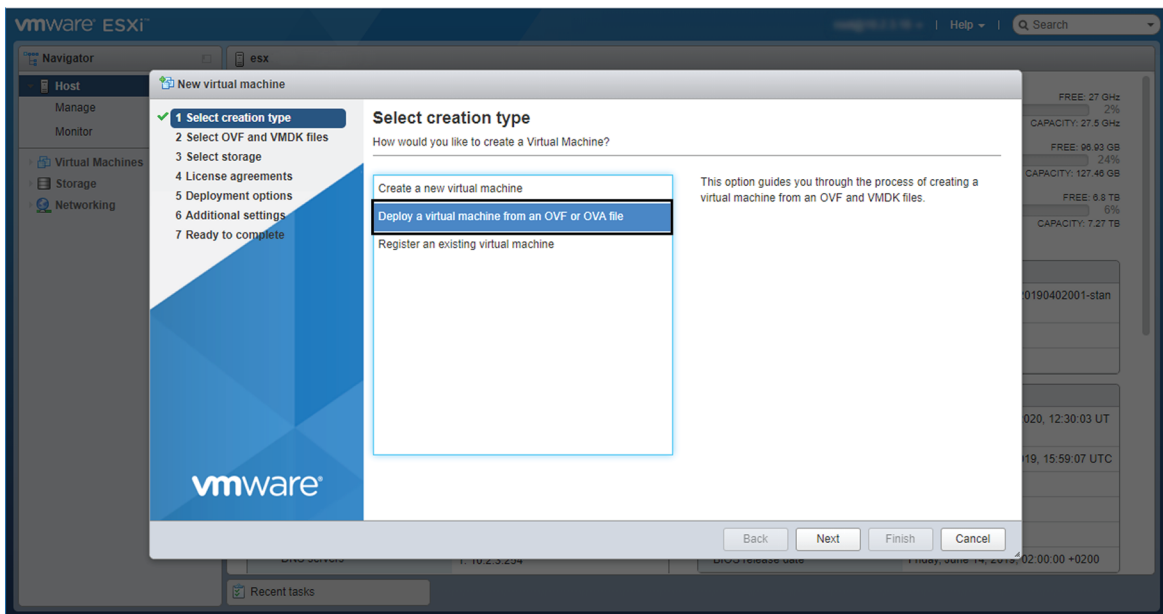
Procedure

- Step 1** Login to VMware ESXi.
Step 2 Click Create/Register VM.

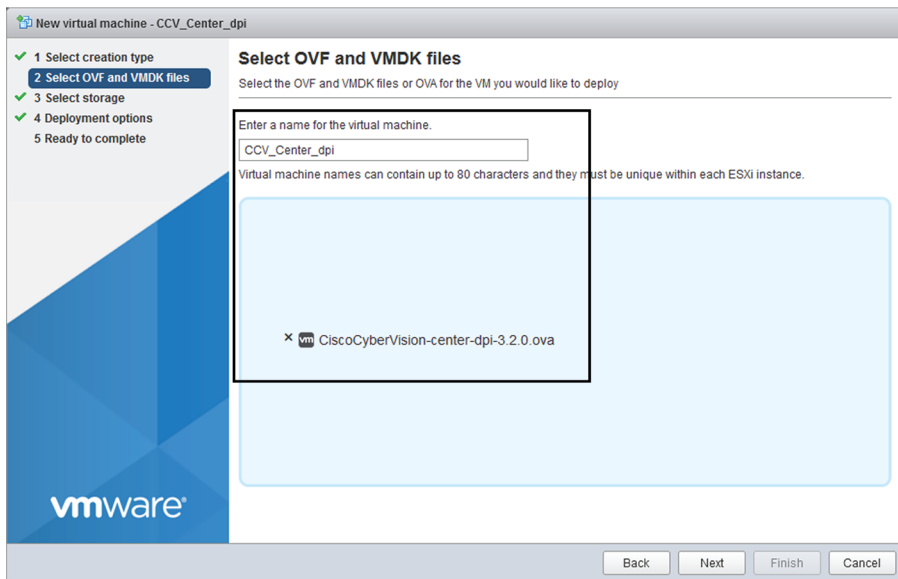
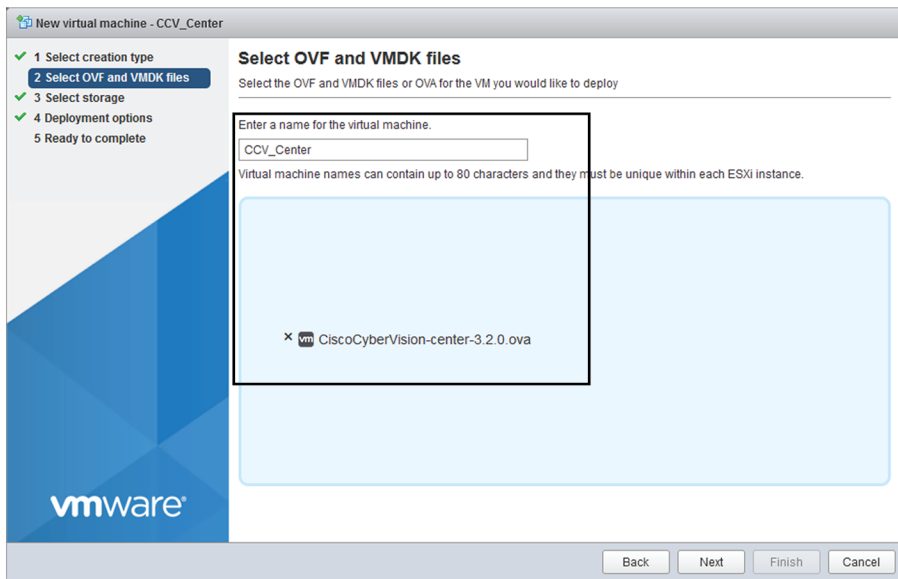


The wizard to create a new virtual machine opens.

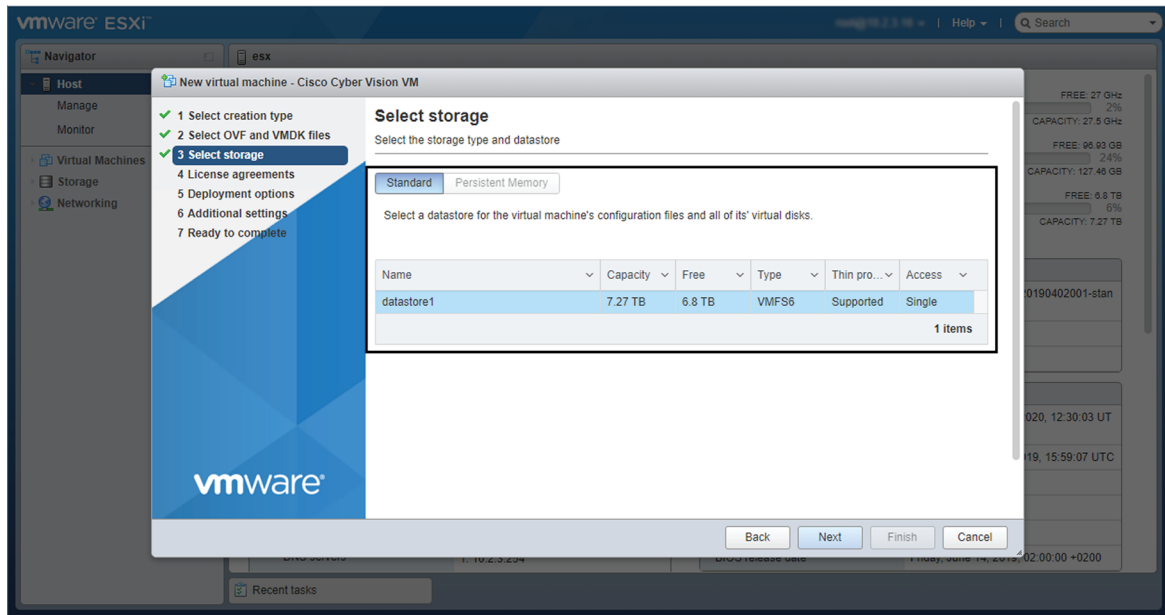
- Step 3** Click Deploy a virtual machine from an OVF or OVA file.



Step 4 Give a name to the virtual machine and select the Cisco Cyber Vision OVA file. Select the DPI OVA file to enable the sensor function on the Center VM.



Step 5 Select a disk with sufficient storage. Refer to [Requirements for installation, on page 7](#).



Step 6 Map the network interfaces you have previously created to the VM's ports (1), as shown below:

- The Administration network interface as eth0.
- The Collection network interface as eth1.
- If deploying a Center with DPI, the DPI network interface as eth2.

Step 7 Set disk provisioning as Thin (2).

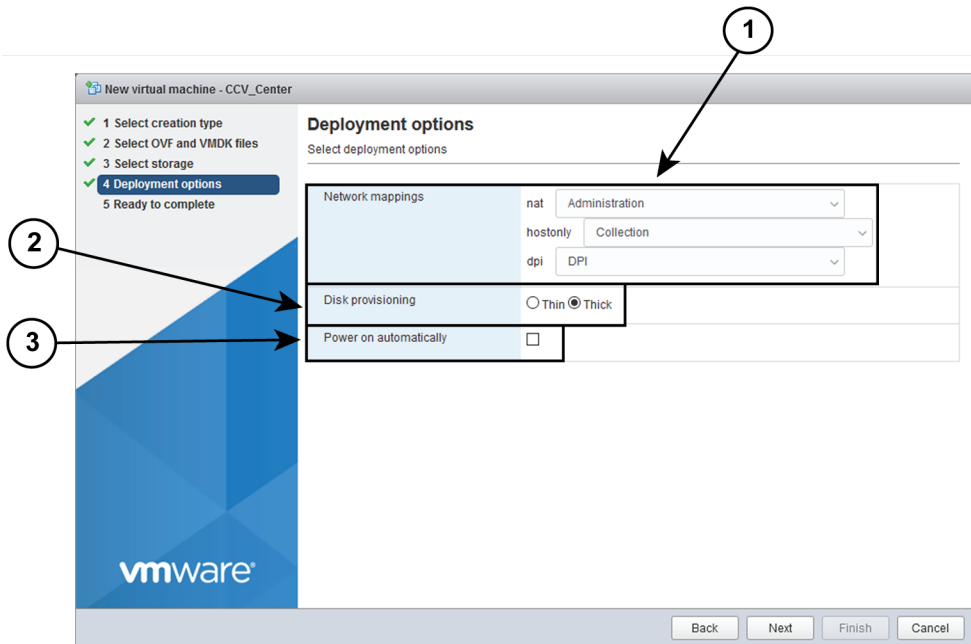
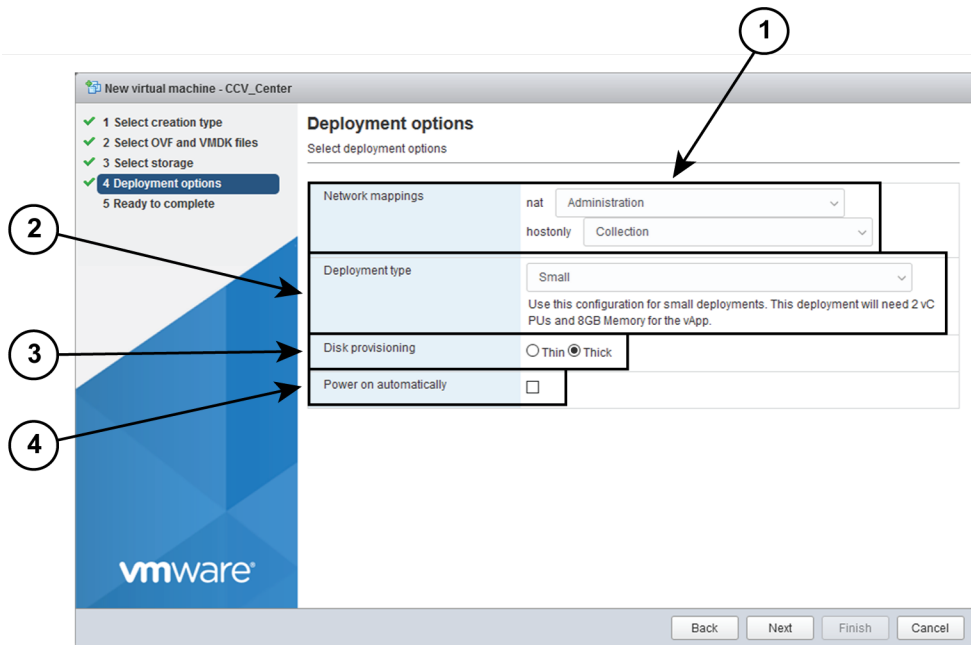
Step 8 Set the Deployment type as Small, Medium or Large (3). The deployment size for an OVA DPI file is Large by default.

Small: Intel Xeon, 8 cores, 16GB RAM

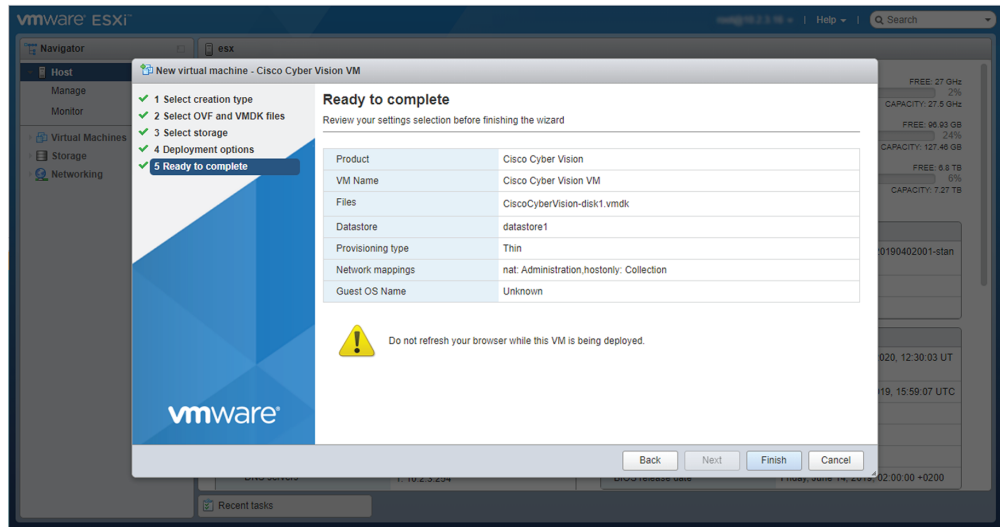
Medium: Intel Xeon, 10 cores, 32GB RAM

Large: Intel Xeon, 16 cores, 64GB RAM

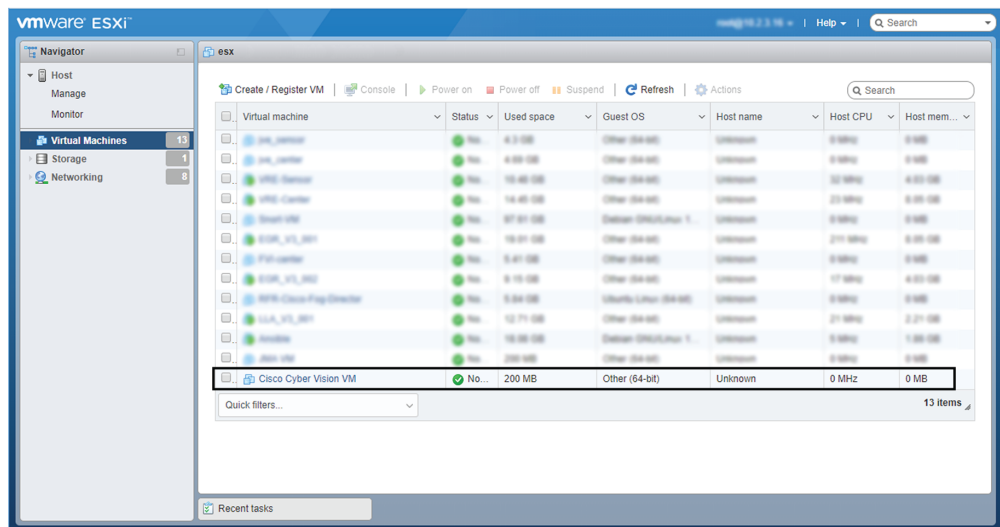
Step 9 Disable the virtual machine's automatic start (4).



Step 10 Check the new VM's settings before clicking Finish.



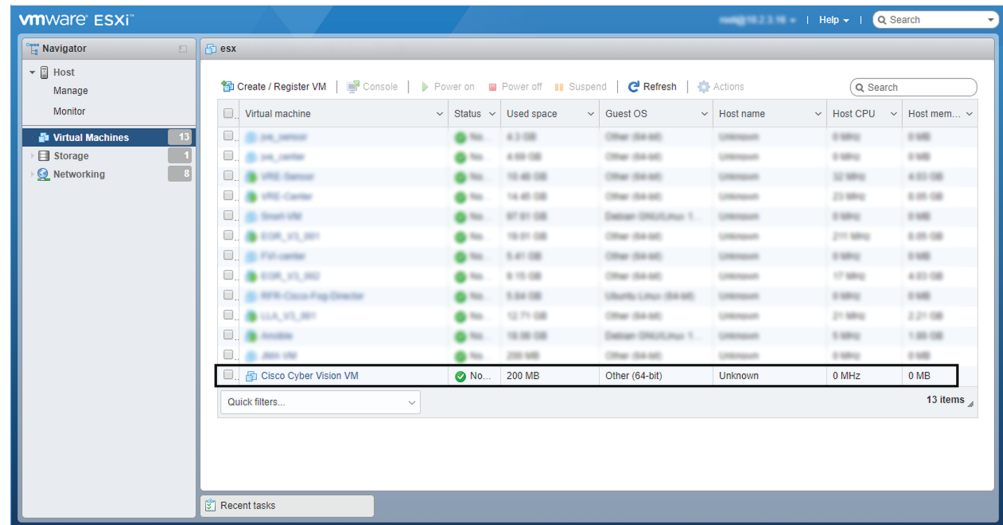
Your new VM is displayed in the virtual machine list.



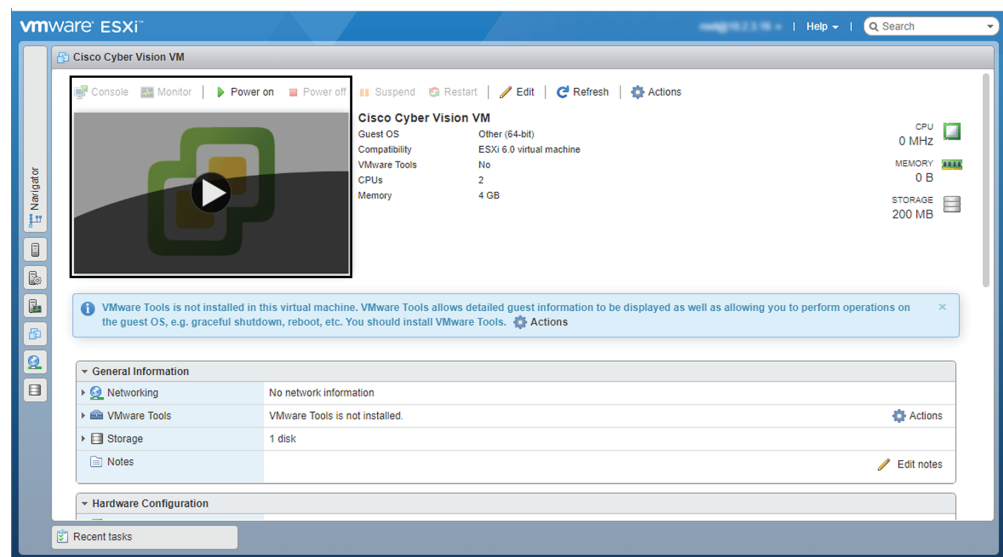
Boot the Virtual Machine

After creating the VM, you can proceed to its first boot.

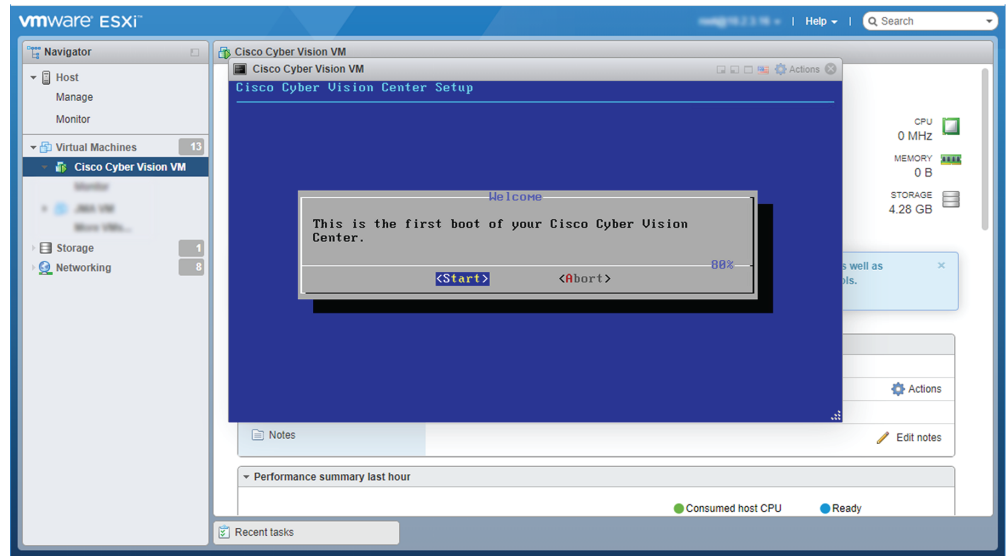
1. Click the VM in the list.



2. Power on the VM.



3. Wait a few moments for the VM initiation to complete. The following screen is displayed:



4. Press Ctrl+Alt to retrieve the control of your keyboard and mouse.
The Virtual Center is now ready for basic configuration.

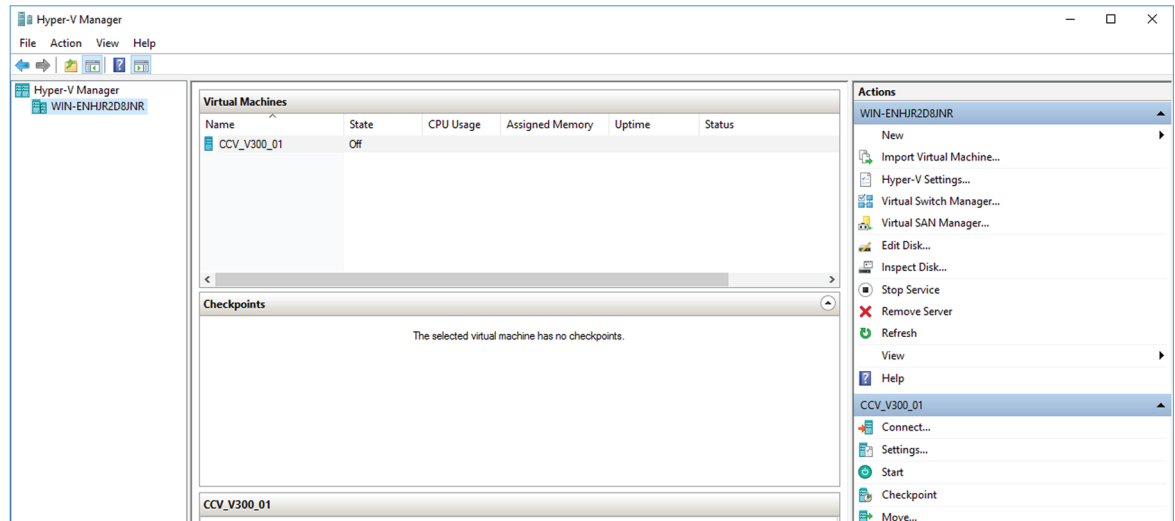
Hyper-V

Create a Virtual Machine

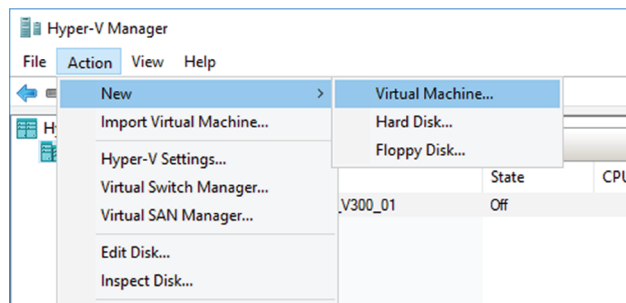
To create a new VM:

Procedure

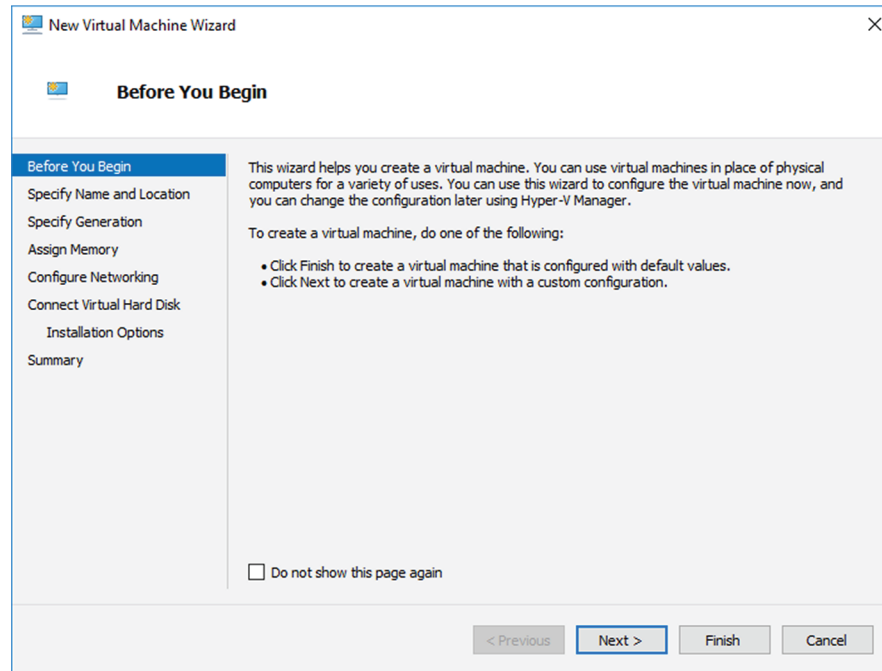
- Step 1** Open Hyper-V Manager.
The following home screen appears:



Step 2 Access the New Virtual Machine Wizard by clicking Action > New > Virtual Machine.



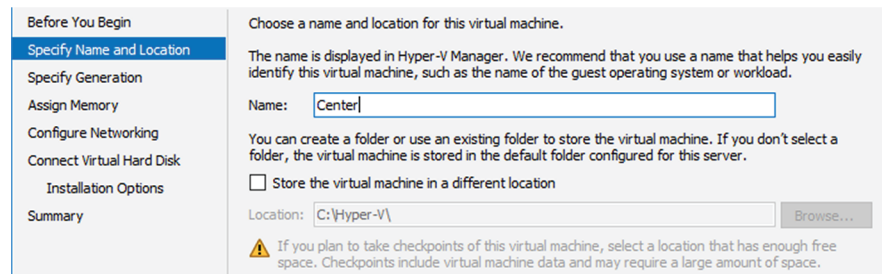
The New Virtual Machine Wizard is displayed.



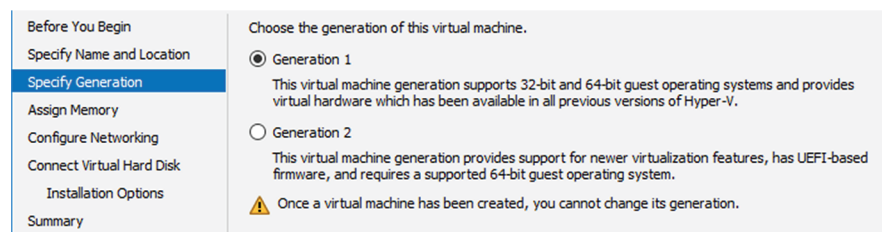
Step 3 Click Next to start.

Step 4 Give the new VM a name (e.g. 'Center').

Step 5 If necessary, give the Virtual Center a different location on the server than the one set by default. In any case, the location chosen must have enough remaining space in case you plan to create snapshots (i.e. VM backups).



Step 6 Set the VM as Generation 1.



Step 7 Assign memory to the VM.

Note The minimum configuration required is 8192 MB.

Before You Begin	<p>Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 12582912 MB. To improve performance, specify more than the minimum amount recommended for the operating system.</p> <p>Startup memory: <input type="text" value="8192"/> MB</p> <p><input checked="" type="checkbox"/> Use Dynamic Memory for this virtual machine.</p> <p>i When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.</p>
Specify Name and Location	
Specify Generation	
Assign Memory	
Configure Networking	
Connect Virtual Hard Disk	
Installation Options	
Summary	

Step 8 Leave the network connection disconnected.

Before You Begin	<p>Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.</p> <p>Connection: <input type="text" value="Not Connected"/></p>
Specify Name and Location	
Specify Generation	
Assign Memory	
Configure Networking	
Connect Virtual Hard Disk	
Installation Options	
Summary	

Step 9 Select 'Use an existing hard disk' and choose the VHDX file.

Before You Begin	<p>A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.</p> <p><input type="radio"/> Create a virtual hard disk</p> <p>Use this option to create a VHDX dynamically expanding virtual hard disk.</p> <p>Name: <input type="text" value="Center.vhdx"/></p> <p>Location: <input type="text" value="C:\Hyper-V\Virtual hard Disks\"/> <input type="button" value="Browse..."/></p> <p>Size: <input type="text" value="127"/> GB (Maximum: 64 TB)</p> <p><input checked="" type="radio"/> Use an existing virtual hard disk</p> <p>Use this option to attach an existing virtual hard disk, either VHD or VHDX format.</p> <p>Location: <input type="text" value="C:\Hyper-V\Virtual hard Disks\CiscoCyberVision-3.0.0_1.vhdx"/> <input type="button" value="Browse..."/></p> <p><input type="radio"/> Attach a virtual hard disk later</p> <p>Use this option to skip this step now and attach an existing virtual hard disk later.</p>
Specify Name and Location	
Specify Generation	
Assign Memory	
Configure Networking	
Connect Virtual Hard Disk	
Summary	

Step 10 Click 'Finish' to create the VM and close the wizard.

Before You Begin	<p>You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.</p> <p>Description:</p> <p>Name: Center</p> <p>Generation: Generation 1</p> <p>Memory: 8192 MB</p> <p>Network: Not Connected</p> <p>Hard Disk: C:\Hyper-V\Virtual hard Disks\CiscoCyberVision-3.0.0_1.vhdx (VHDX, dynamically expanding)</p> <p>< <input type="text"/> ></p> <p>To create the virtual machine and close the wizard, click Finish.</p>
Specify Name and Location	
Specify Generation	
Assign Memory	
Configure Networking	
Connect Virtual Hard Disk	
Summary	

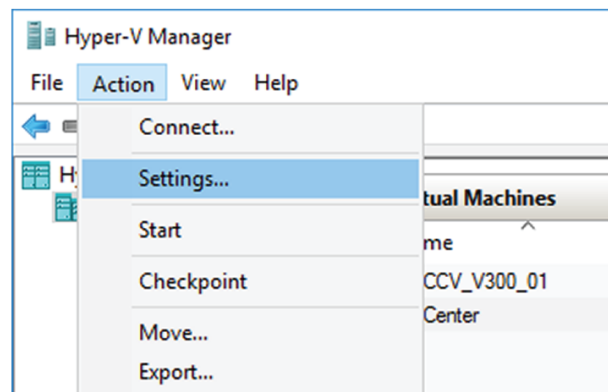
The Virtual Center created is displayed inside Hyper-V Manager home screen.

Configure the disk size

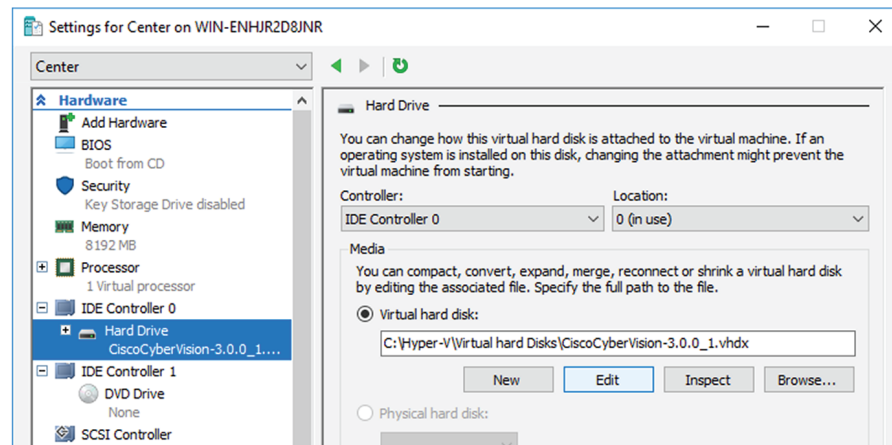
To configure the disk size:

Procedure

- Step 1** In the Hyper-V Manager select the Center.
- Step 2** Click **Action** > **Settings**.

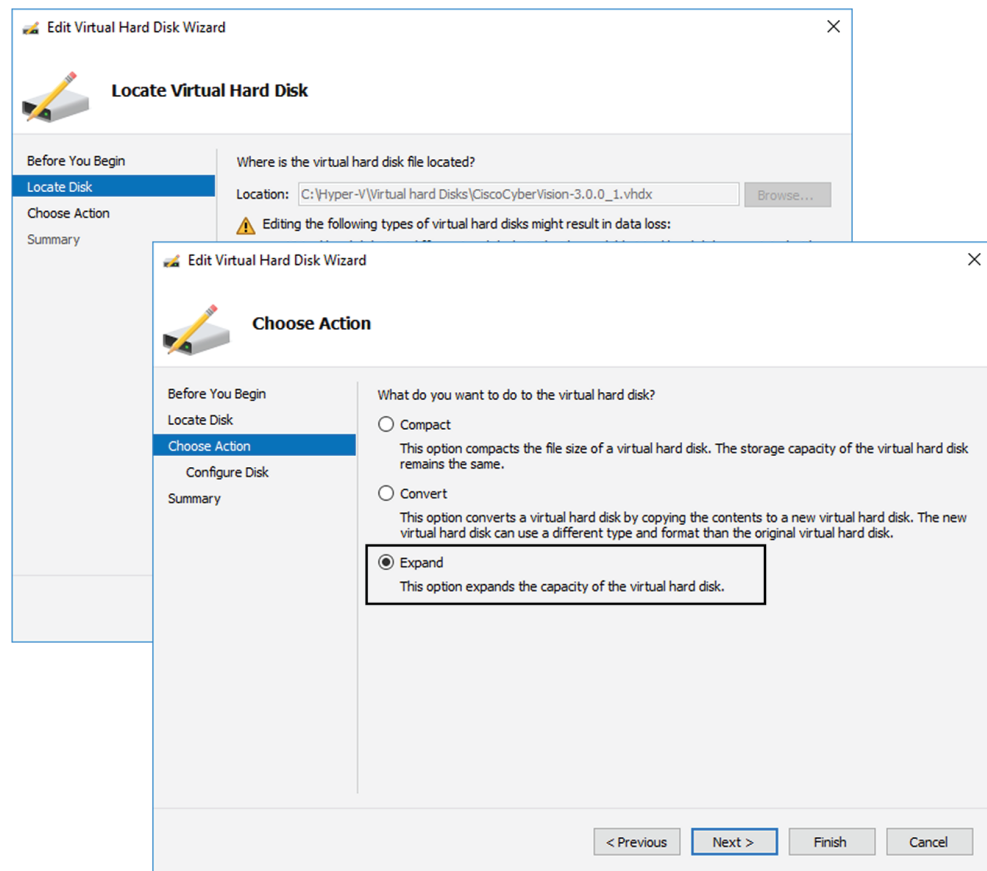


- Step 3** Click **Hard Drive**, then **Edit**.



The Edit Virtual Hard Disk Wizard displays.

- Step 4** Click **Next** to proceed until the Choose Action tab.



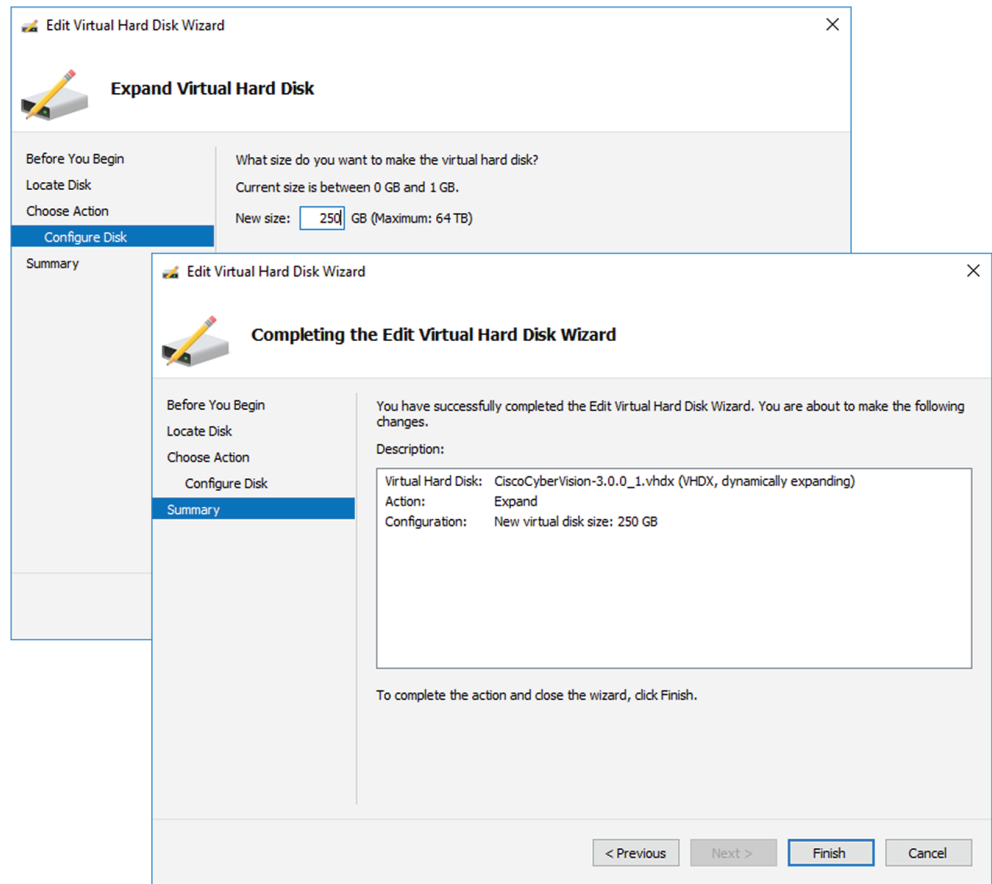
Step 5 As you are on the Choose Action tab select the **Expand** option.

Step 6 Configure a new size for the virtual hard disk.

It is recommended:

- that you set the minimum size at 100GB for a demo installation with small amounts of data.
- that you set the minimum size at 250GB for a cartography.
- that you set the minimum size at 800GB for a Center with sync or 1.5TB for a Global Center for a production environment.

The size you set here is a minimum. The virtual drive will expand as data is written on the virtual disk.



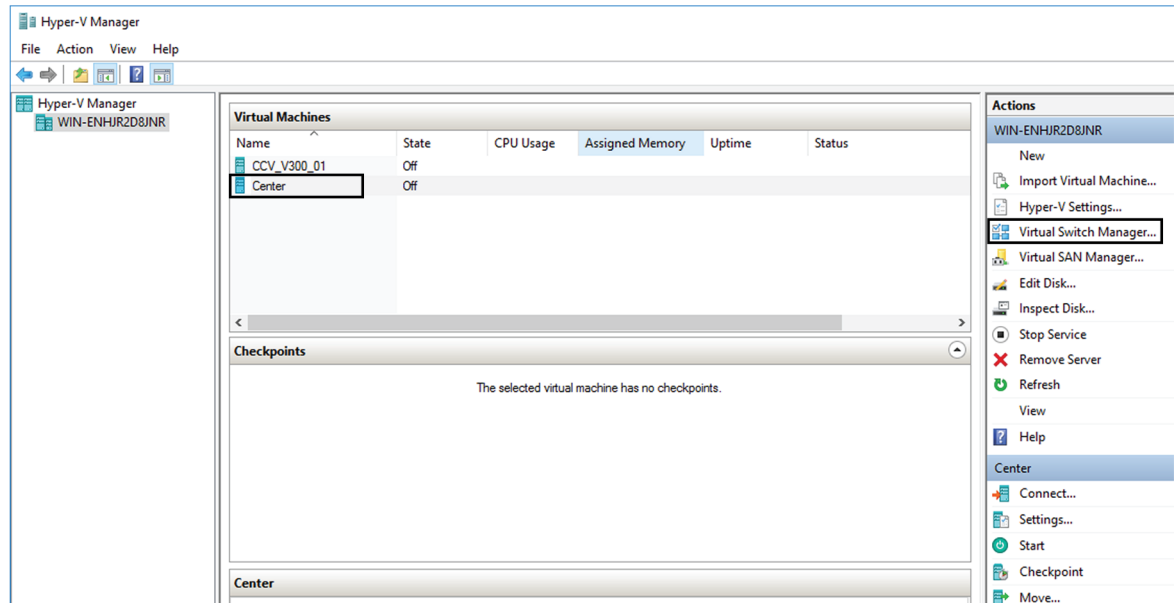
Step 7 Click **Finish**.

Create the network interfaces

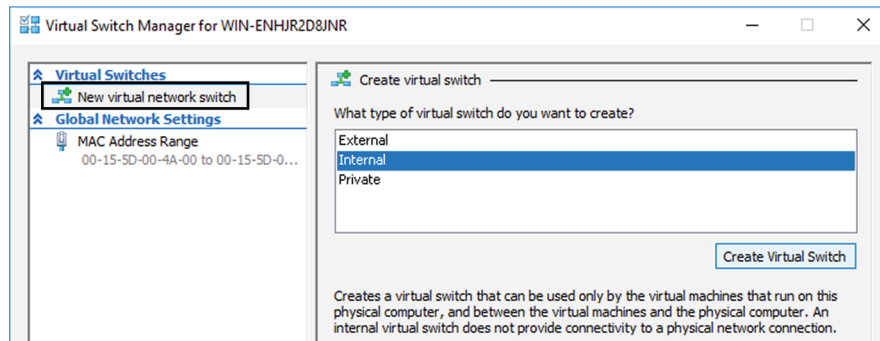
To create the Admin and Collection network interfaces:

Procedure

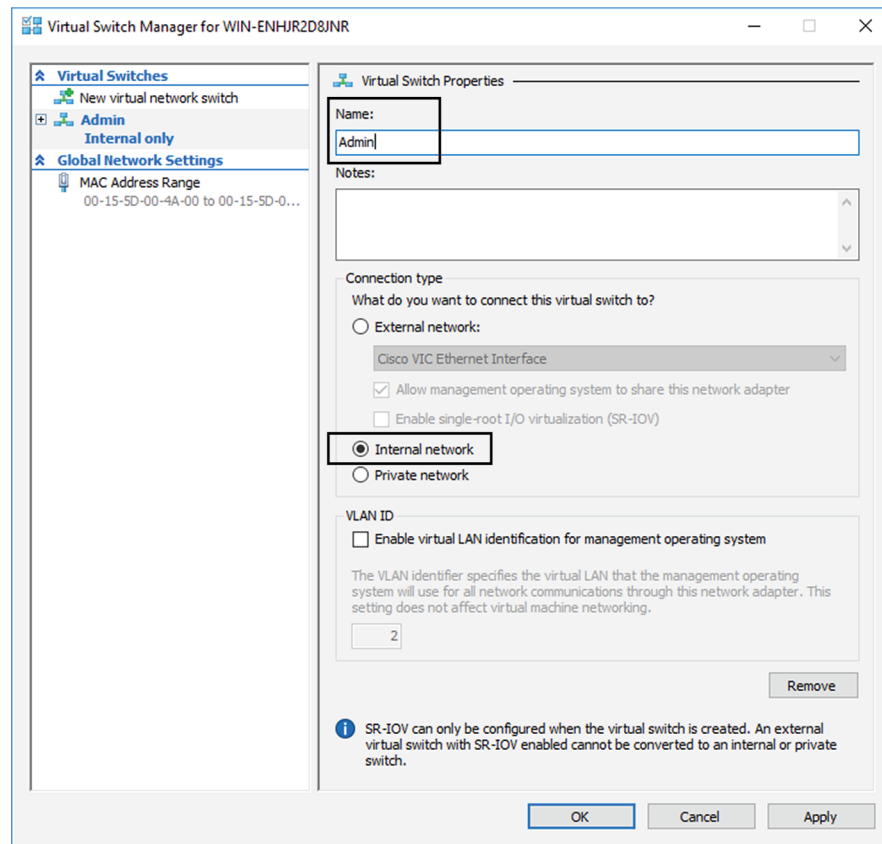
- Step 1** Select the Center.
- Step 2** On the Actions menu, open the Virtual Switch Manager.



The Virtual switch manager opens.

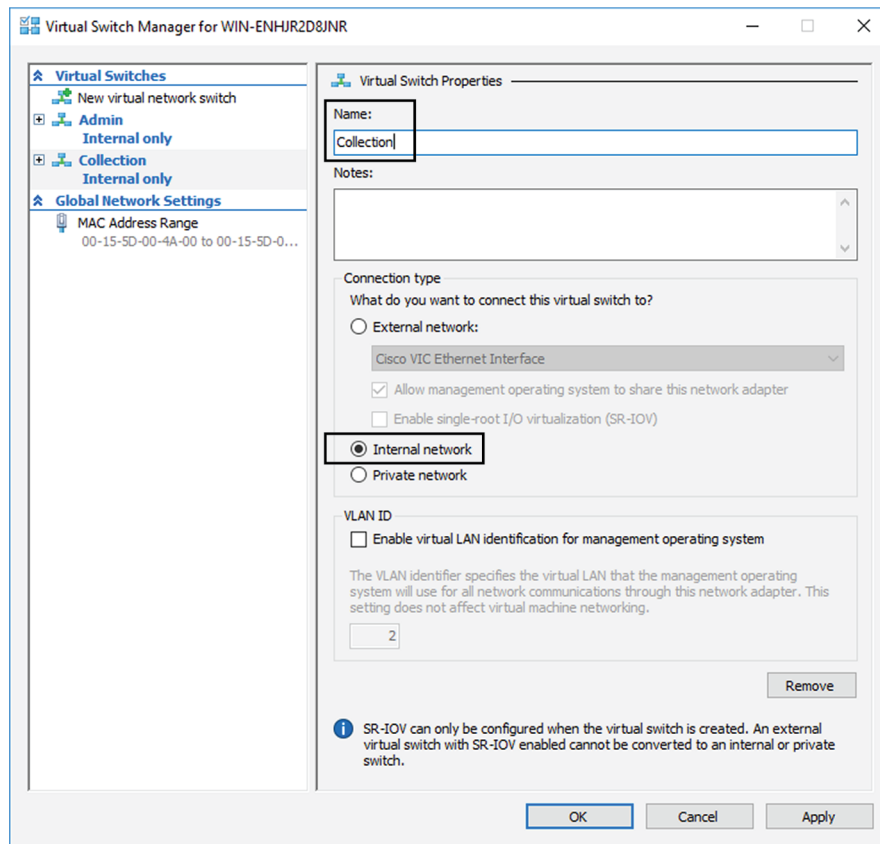


- Step 3** Click 'New virtual network switch'.
- Step 4** The new virtual switch displays.
- Step 5** Name it 'Admin'.
- Step 6** Select 'Internal network'.



Step 7 Create a second virtual switch and name it 'Collection'.

Step 8 Select 'Internal network'.



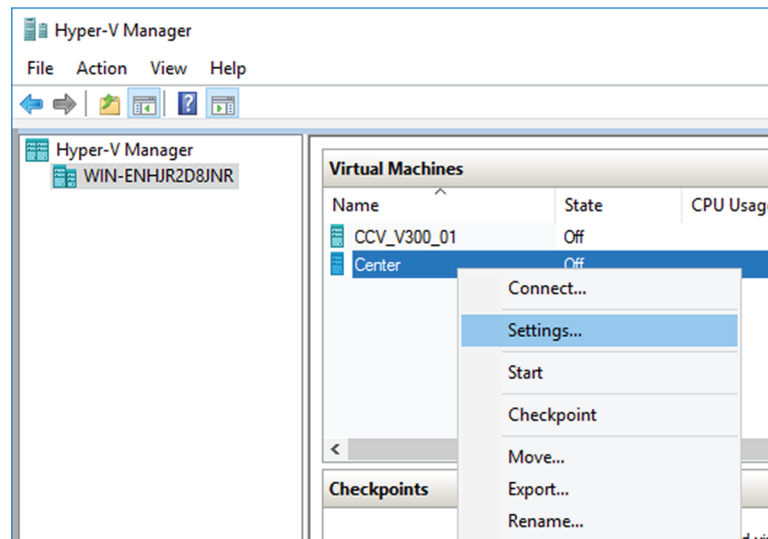
Map the network interfaces

To add a network card:

ICS CyberVision needs two network adapters (i.e. network card) to which the Admin and Collection network interfaces will be assigned. Each new VM includes a network card when created which is available within the hardware list. Therefore, you need to create another one during this step.

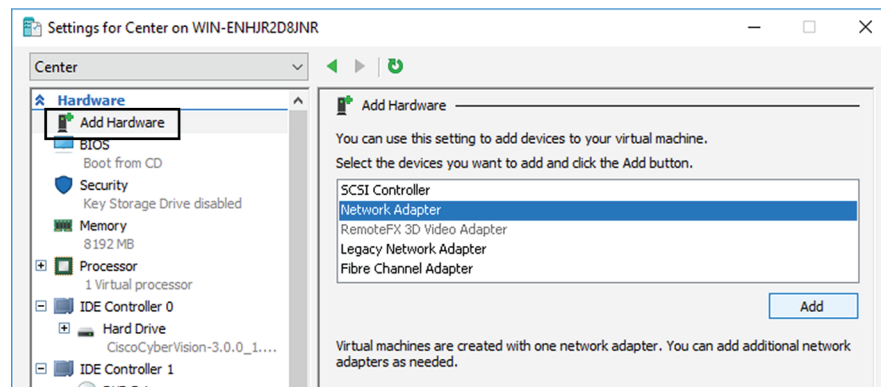
Procedure

- Step 1** Right click the Center and click again 'Settings'.



The settings window for the Virtual Center is displayed.

- Step 2** Click 'Add Hardware'.
- Step 3** Select 'Network Adapter'.
- Step 4** Click 'Add'.



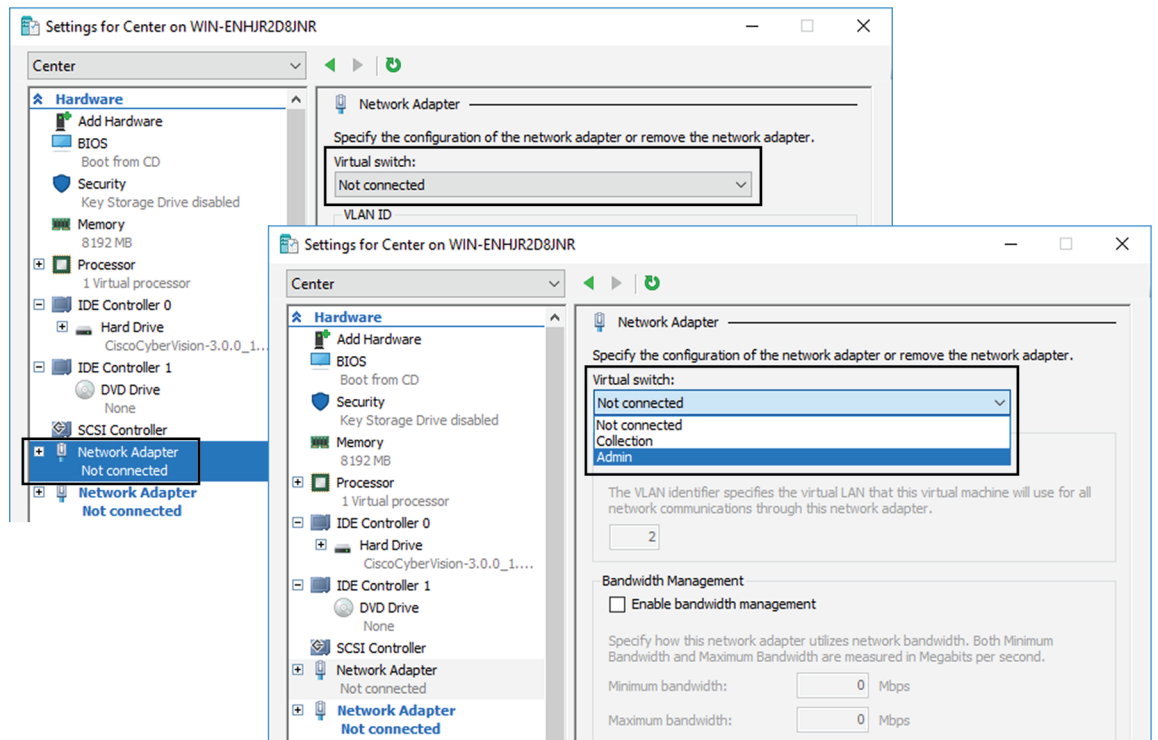
The second network adapter needed is created. Now you need to map each network adapter to a Virtual Switch.

To proceed to the network mapping:

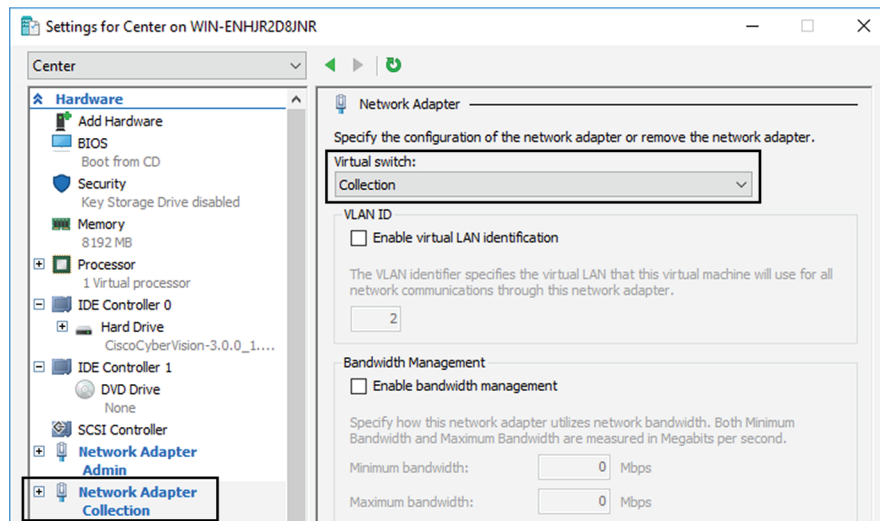
- Step 5** Select the first network adapter.
- Step 6** Select 'Admin' as Virtual Switch.

Note You must configure network interfaces in order of appearance inside the network list to avoid confusion:

- The first network card as the Administration network interface (eth0).
- The second one as the Collection network interface (eth1).



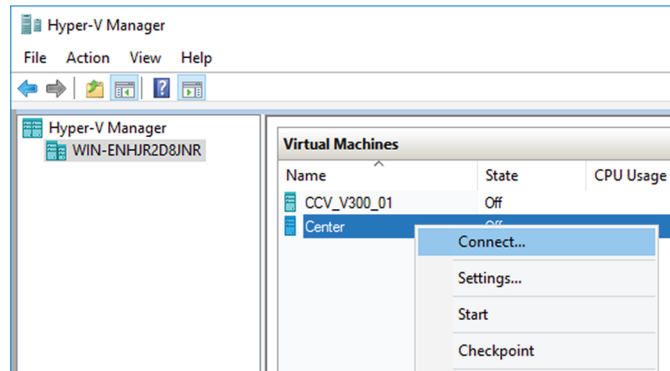
Step 7 Repeat the previous action for the second network adapter and select 'Collection' as Virtual Switch.



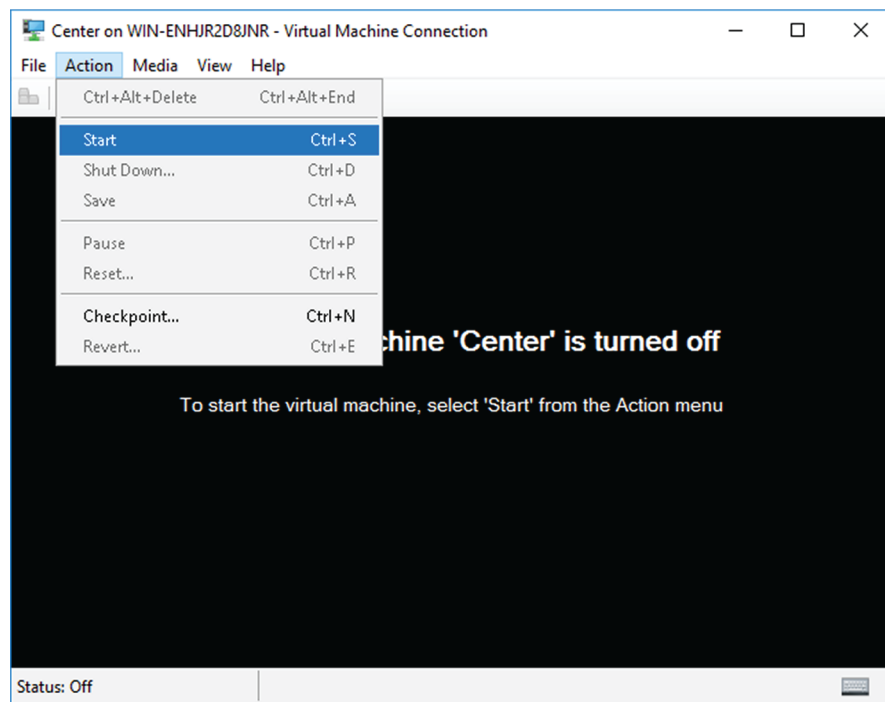
Boot the Virtual Machine

You can now proceed to the Virtual Center first boot.

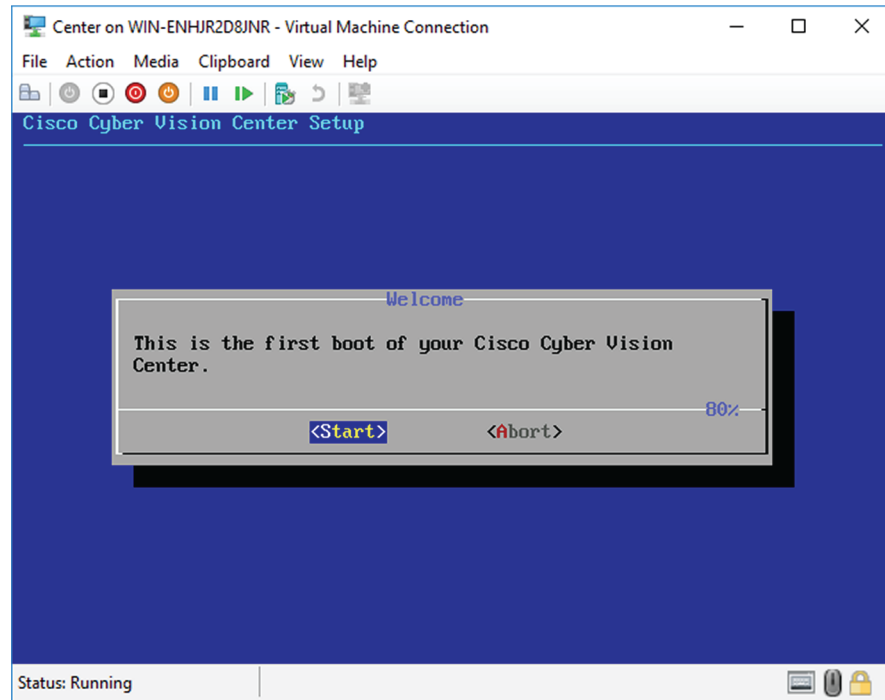
1. Click Center on Hyper-V Manager and click 'Connect'.



2. Start the Virtual Center.



Once the VM configuration completed successfully, the following screen appears:



Note To retrieve the control of your keyboard and mouse, press Ctrl+Alt.

The Virtual Center is now ready for basic configuration.



Note Keeping your Virtual environment safe and clean. Once the VM first boot has completed successfully, Cisco recommends to shut down the Virtual Center and delete the Virtual Disk from Hyper-V hardware list. Keeping interfaces to the minimum lowers possible access doors for attackers.



CHAPTER 5

Configure the Center

You will need to complete two steps to configure the Center:

1. The basic Center configuration through a VGA display and a keyboard or a console, to:
 - Set the Center and the sensor passwords.
 - Synchronize the Center to the NTP server.
 - Configure the Administration and Collection interfaces (n/a for a Global Center or a Center using a single interface).
 2. The Cisco Cyber Vision configuration, through a browser, to:
 - Create an admin account.
 - Configure the Center's data synchronization (Global Center and synchronized Centers only).
- [Basic Center configuration, on page 31](#)
 - [Cisco Cyber Vision configuration, on page 44](#)

Basic Center configuration

This step will allow you to configure the Center network settings before using it with the user interface.

Required information:

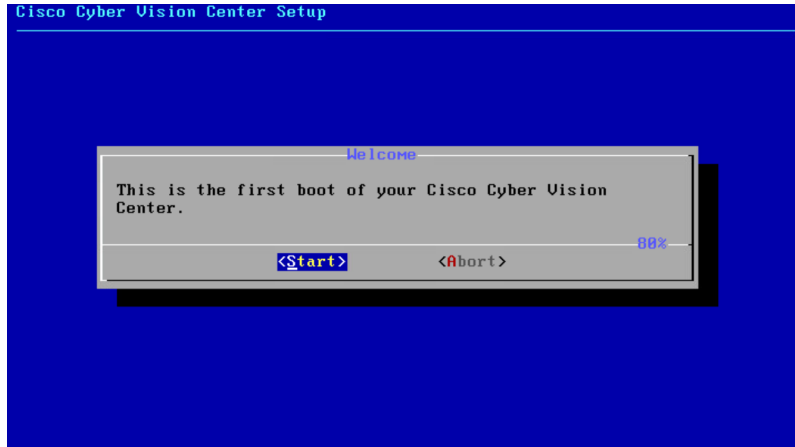
- Local NTP and DNS IP addresses.
- The Collection interface network address (n/a for a Global Center or a Center using a single interface).

In the case of manual Administration network interface configuration:

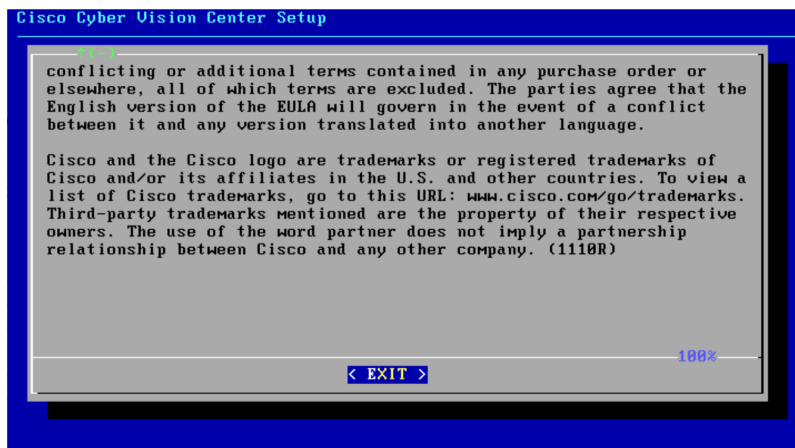
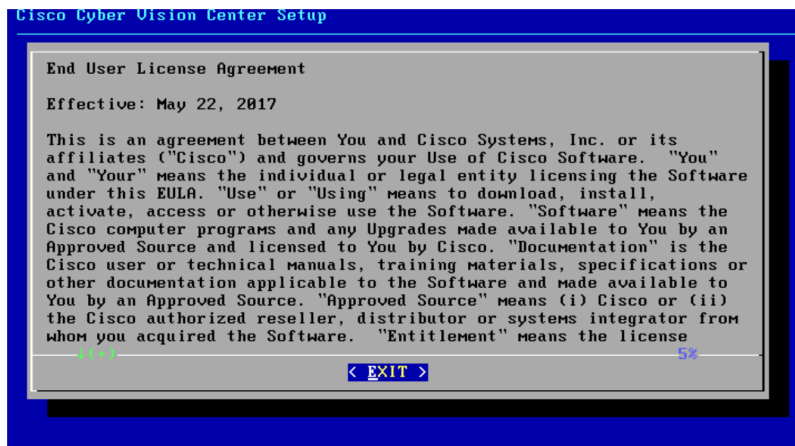
- Its IP address.
- Its netmask (in a two-number format, e.g. 192.168.1.0/24).
- Its default gateway (to reach devices located outside the local network).

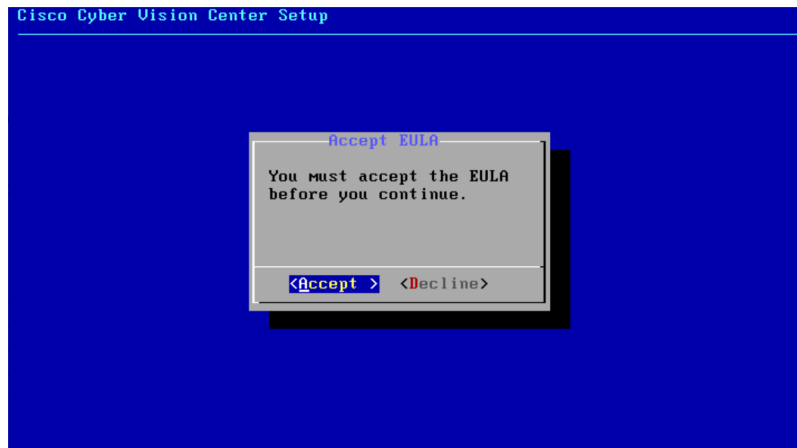
Access the basic Center configuration

The Center wizard is displayed on your screen as you power on the Center. Enter Start to start configuring the Center.



Accept the End User License Agreement

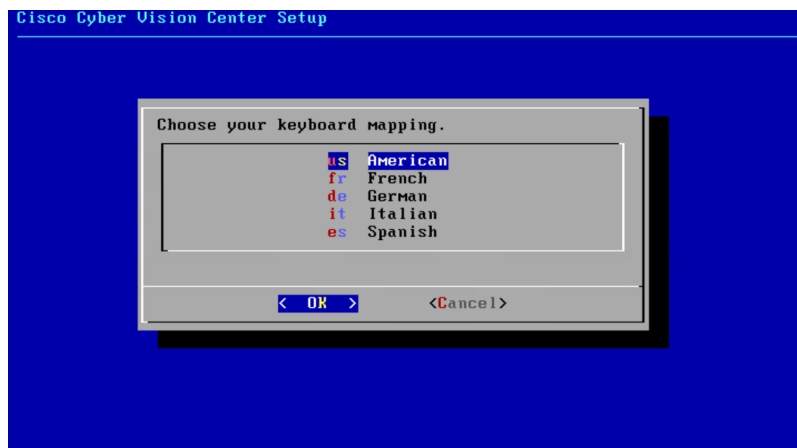




Select the language to match your keyboard



Note By default, the system is configured to work with a US QWERTY keyboard.

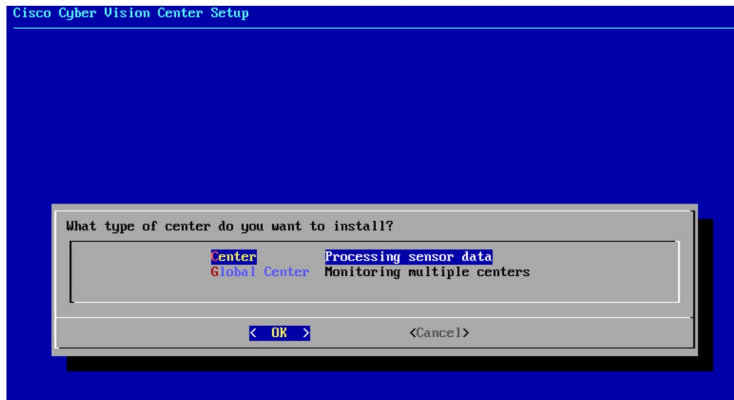


Select the Center type

During this procedure you will choose which type of Center to install. There are two types of Centers:

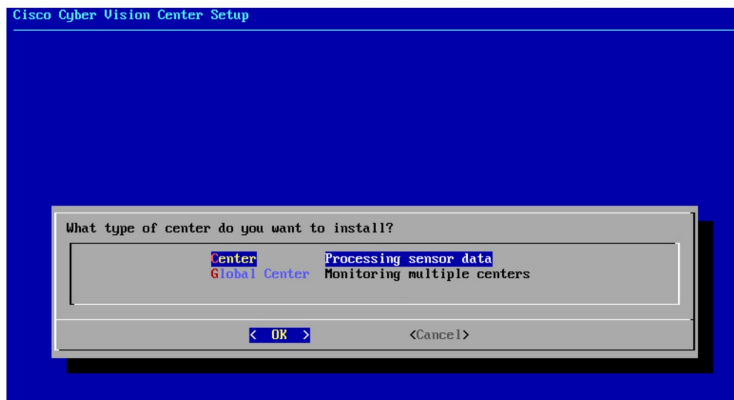
- A **Center** receives metadata from sensors and store them into an internal database (Postgresql). It can be standalone or synchronized with a Global Center. A Center with sync is similar to a standalone Center from a functionality point of view, except for the link to a Global Center. You must install Centers with sync **after** the Global Center. This will enable the system to enroll and start pushing events to the Global Center.
- A **Global Center** introduces a centralized architecture which collects all industrial insights and events from synchronized Centers and aggregates it on a single global point of view. It will also allow you to manage the knowledge database (KDB) and upgrade the whole platform.

Select the type of Center you want to install.



Center

If installing a Center, select the first option.

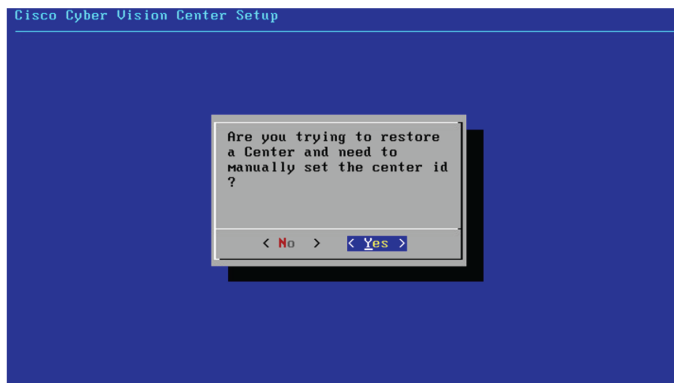


Then, you will have the opportunity to set the Center id. It can be used in case of Center restoration to reuse the same id previously set in the Global Center. Thus, some data can be retrieved.

If you're installing the Center for the first time, this id will be automatically generated. Select No. You will be directed to the next step.



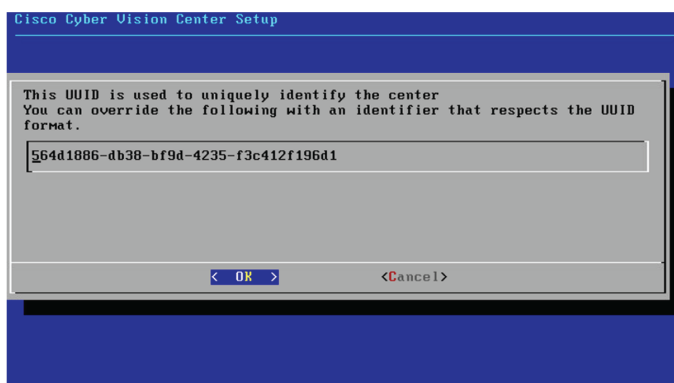
If you're reinstalling the Center and want to restore it, select Yes.



Use the following command from the Global Center's CLI to get a list of all Center's id:

```
sbs-db exec "select name, id from center"
```

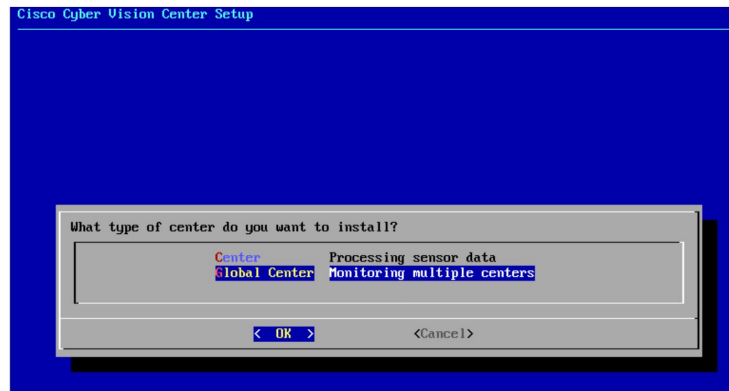
Type the id into the basic Center configuration UUID field.



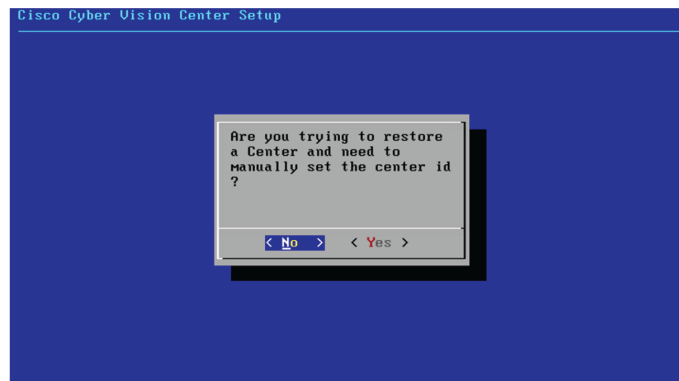
Click OK. You will be directed to the next step.

Global Center

If installing a Global Center, select the second option.



As this step does not apply to a Global Center, select No.



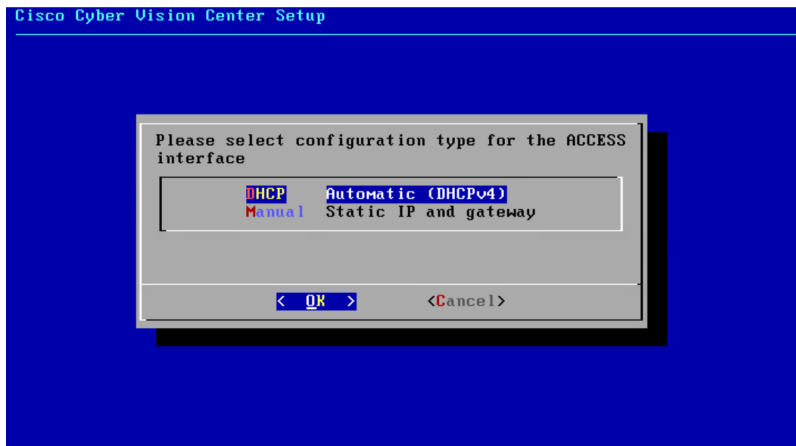
You will be directed to the next step.

Configure the Center's Administration Network Interface

The Center uses a dedicated sub-network on the Administration interface. It is possible to change it if the default one doesn't fit the environment on which the Center will be connected.

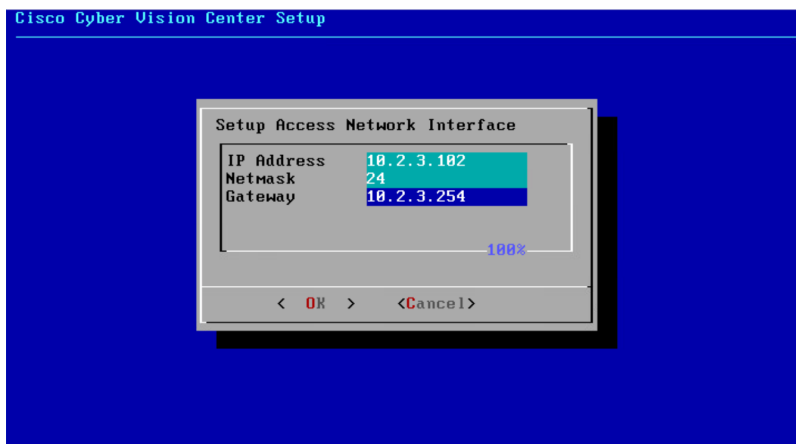
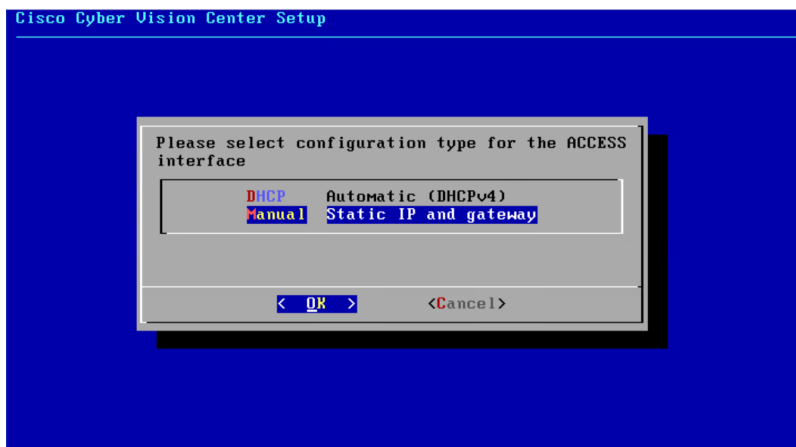
The Administration network interface configuration can be done either:

- Using a DHCP server, if there is one available on the network.



In this case, enter OK. Settings will be adjusted automatically, and you will be directed to the next step.

- Manually:



Enter the Administration network interface's IP address, netmask (in a two-number format), and gateway.

Set interfaces (dual or single)

This step is not applicable to a Global Center.

Regarding a Center, it is possible to:

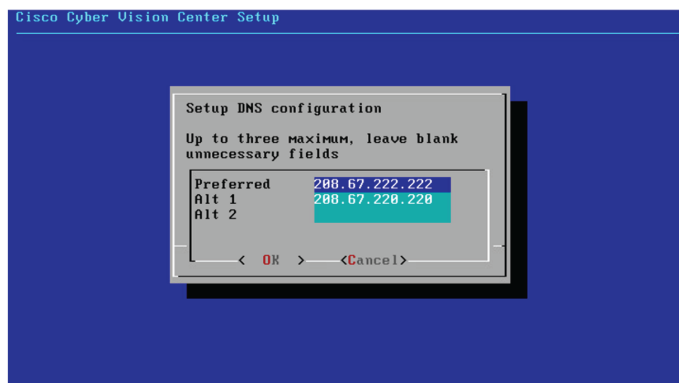
- Use a single interface. In this case, select the Single option.
- Set the Administration and Collection network interfaces on two distinct interfaces (recommended for security). In this case, select the Dual option.



If you choose the Dual option, you will later be directed to: [Configure the Center's Collection network interface, on page 41](#).

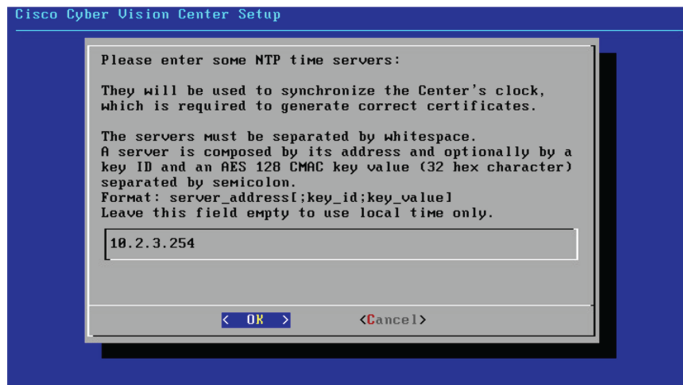
Configure the Center's DNS

Type a DNS server address and optional fallbacks.

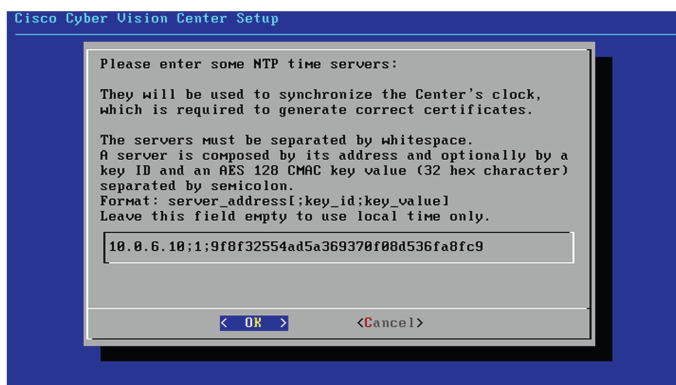


Synchronize the Center and the sensors to NTP servers

Enter IP addresses of local or remote NTP servers (gateway configuration needed) to synchronize the Center and the sensors with a clock reference. Each address must be separated by a space.



Optionally, add a key ID and an AES A28 CMAC key value separated by a semicolon with the corresponding NTP server.

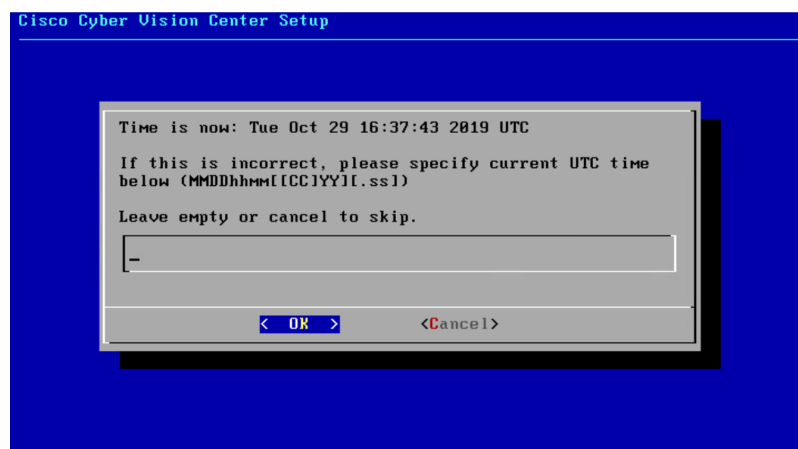


The synchronization takes a few seconds.

Check that the time is correct, or set the time manually.



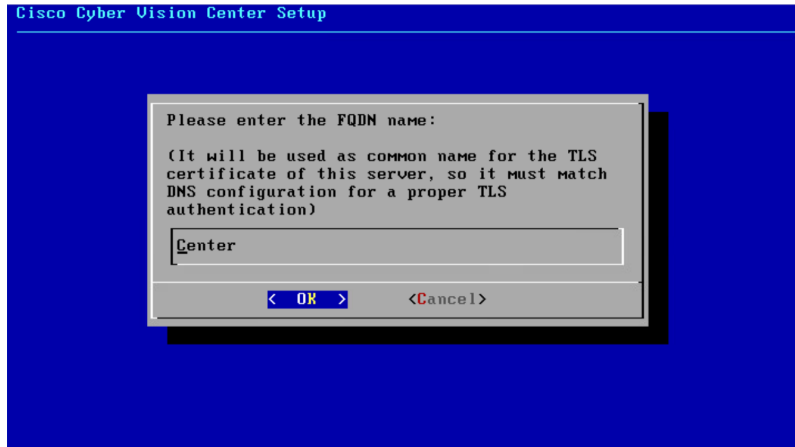
Note The time is set in UTC standard.



Give the Center a name



Note This name will be used in the Center certificate.



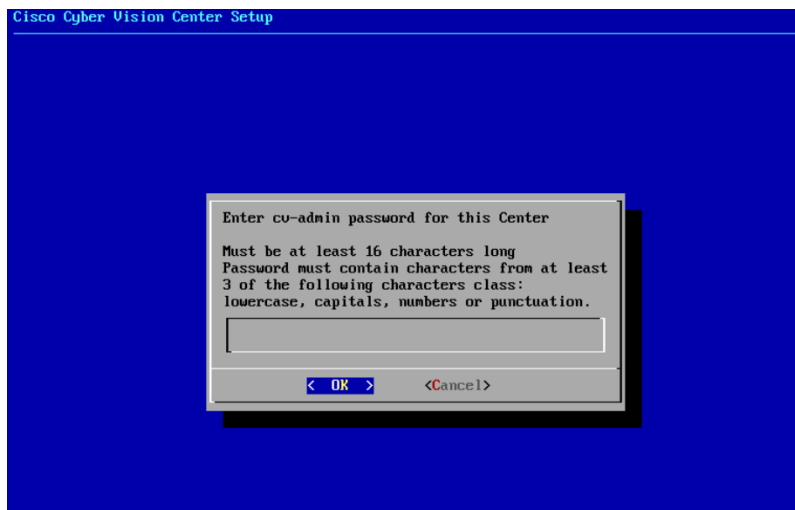
Enter the Center name provided by your administrator or type 'Default' which is a secure value.



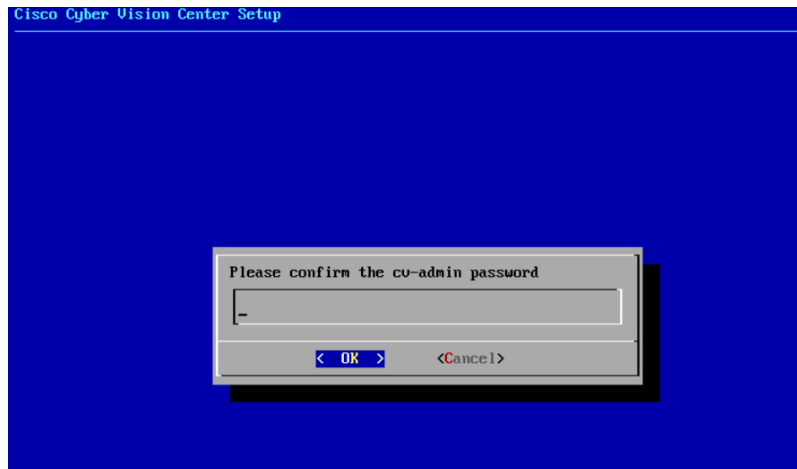
Note This name must match the DNS name you will use to access the Center through SSH or a browser.

Set the Center's password

The administrator account (i.e. cv-admin) password of the Center must be set for security reasons. It is hidden for confidentiality reasons.



Confirm the password.



Configure the Center's Collection network interface

This step is not applicable to a Global Center.

This step will only appear if the dual interface option has been selected during the [Set interfaces \(dual or single\)](#), on page 38 step.

Type the IP address of the Collection network interface:



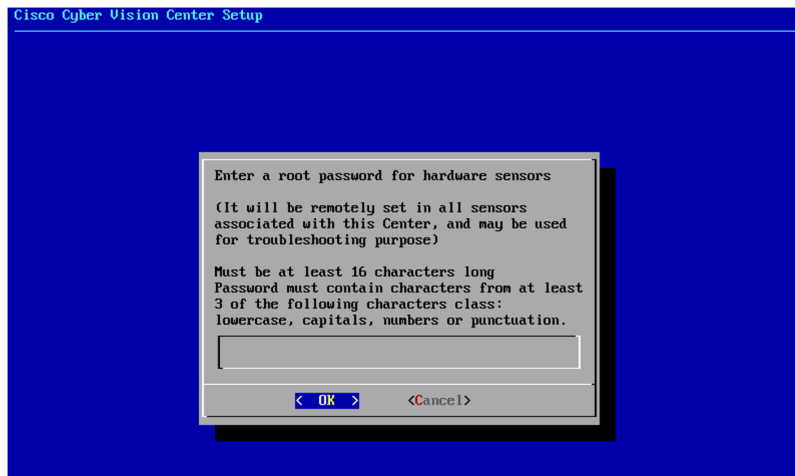
Configure the sensors' password

Not applicable to a Global Center. Instead, you'll be directed to [Authorize networks](#).

Although, if you're installing a Center, proceed as below.

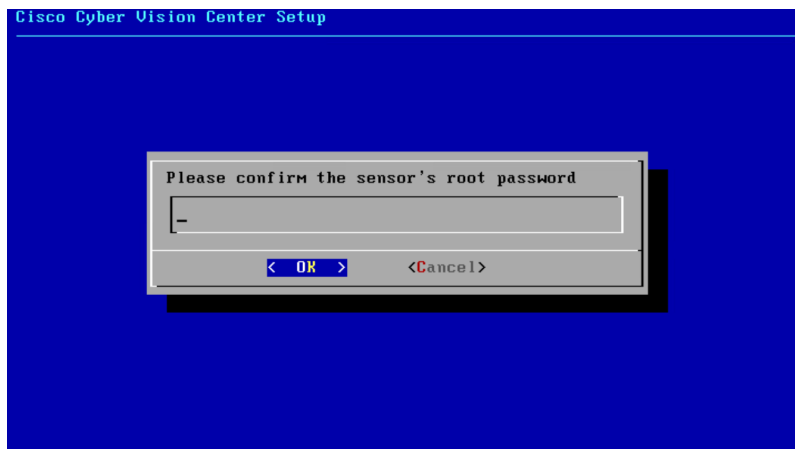
The sensors' root password must be set for security reasons.

This password must be different than the one used for the Center, otherwise you will get an error message.



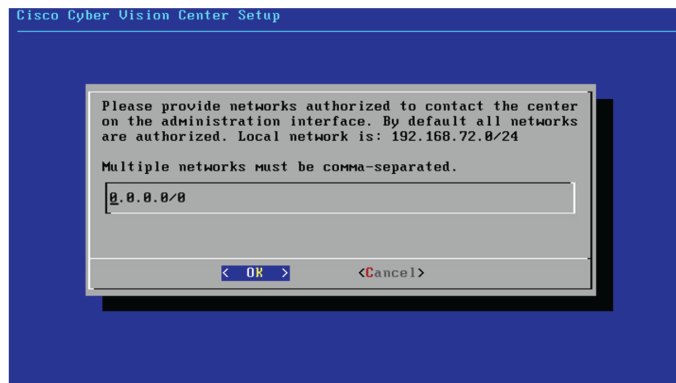
This password will be assigned once you will have enrolled the sensors on the Center. You will need this password for troubleshooting, diagnostics, and updates.

Confirm the password.



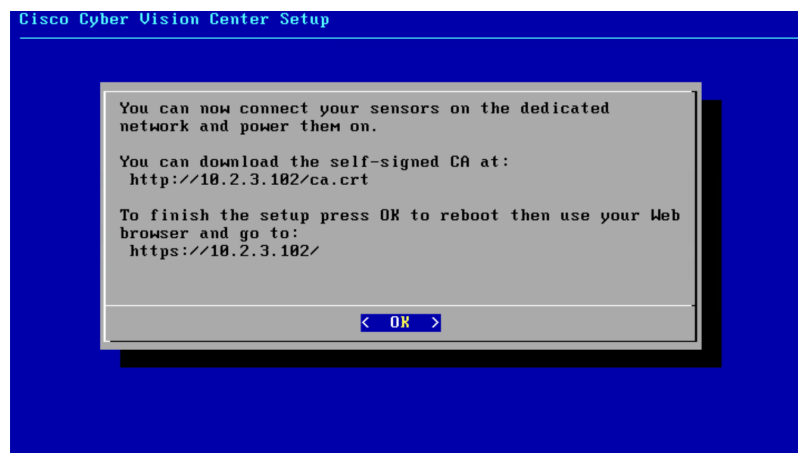
Authorize networks

This step allows you to restrict IP addresses that can connect to the Administration interface. If no IP is entered, all networks are authorized by default.

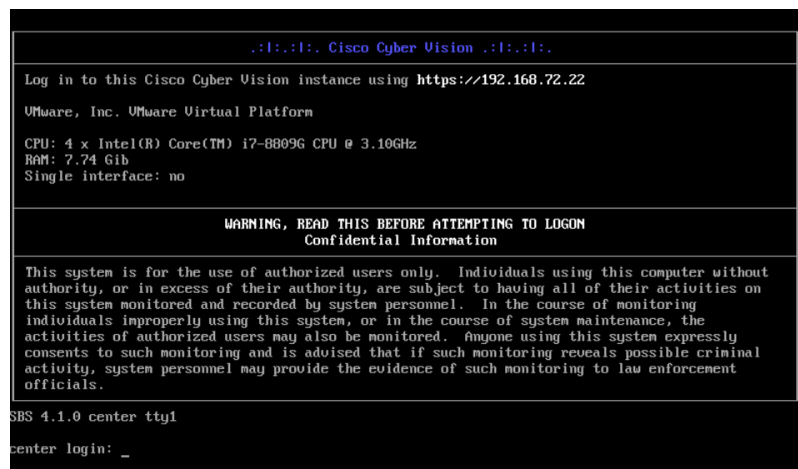


Complete the basic Center configuration

Next is the last screen of the basic Center configuration. It reminds you the addresses set to be used to download the CA certificate and access Cisco Cyber Vision. Save these addresses somewhere, you will need them later to access the user interface.



Enter OK to finish the basic Center configuration.





Note A major change regarding the Center command line (CLI) access through serial console or SSH was made in Cisco Cyber Vision version 4.1.0. The user root is no longer usable to establish the connection. A new user called 'cv-admin' must be used. This user has limited rights and many CLI commands will require permission elevation:

- prefix the command with "sudo".
- or open a root shell using "sudo -i" and enter the command.

Close the Center configuration window before proceeding with the next steps of Cisco Cyber Vision configuration.

To proceed with the Cisco Cyber Vision configuration, open your browser and go to the URL previously indicated to access the user interface.



Note Each Cisco Cyber Vision Center includes its own PKI (Public Key Infrastructure), with a CA (Certification Authority), that will be used to establish the TLS connection with the sensors and to clients. The CA must be installed on each client browser (see the following chapters).

Cisco Cyber Vision configuration

Once the Basic Center configuration is done, you must connect through a web browser to the URL displayed on the last step of the basic configuration wizard (i.e. the Center's IP address). A message saying that the URL is not secure will appear.

- If you plan to use a self-signed certificate, you must [Install the certificate in your browser, on page 44](#) and then access the [Install Cisco Cyber Vision](#) to configure users and sensors.
- If you plan to use an enterprise certificate, you must ignore the security message and perform the following steps in this order:
 1. Access the [Install Cisco Cyber Vision](#) to configure users and sensors.
 2. [Configure the user interface security](#) itself.

Then, you will configure the Centers data synchronization (Global Center and its Centers' only).

Browser requirements:

Cisco Cyber Vision supports Chrome 54, Firefox 49 and newer versions.

Install the certificate in your browser

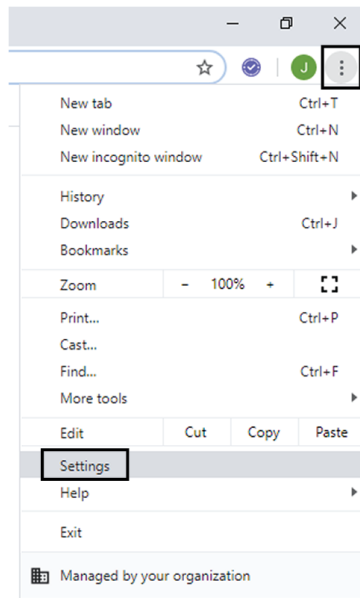
This task explains how to install a Cisco Cyber Vision self-signed certificate in your browser.

Before you begin

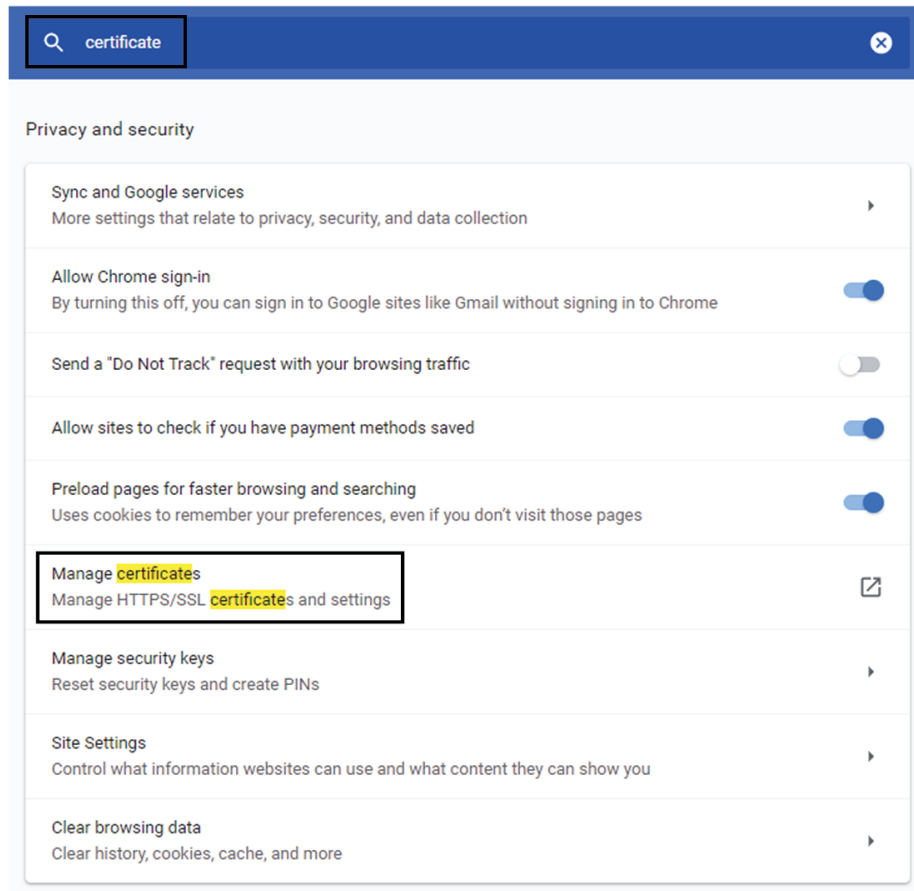
Perform this task if you aim to install a self-signed certificate. If you're planning to use an enterprise certificate, proceed directly with [Install Cisco Cyber Vision, on page 50](#).

Procedure

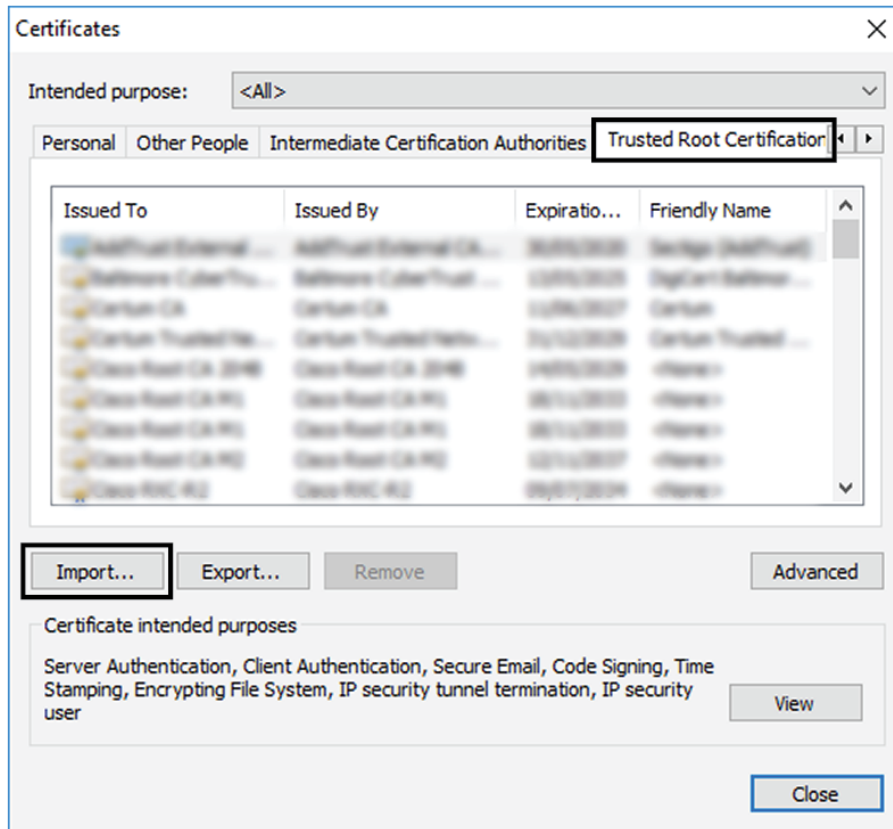
- Step 1** Open your browser.
- Step 2** Enter 'http://<CENTERIPADDRESS>/ca.crt' inside the search bar.
The certificate is downloaded.
- Step 3** Save the certificate on your computer.
- Step 4** In the browser, access the settings.
Example: Chrome



- Step 5** Type 'certificate' in the search bar and access the certificates management menu.



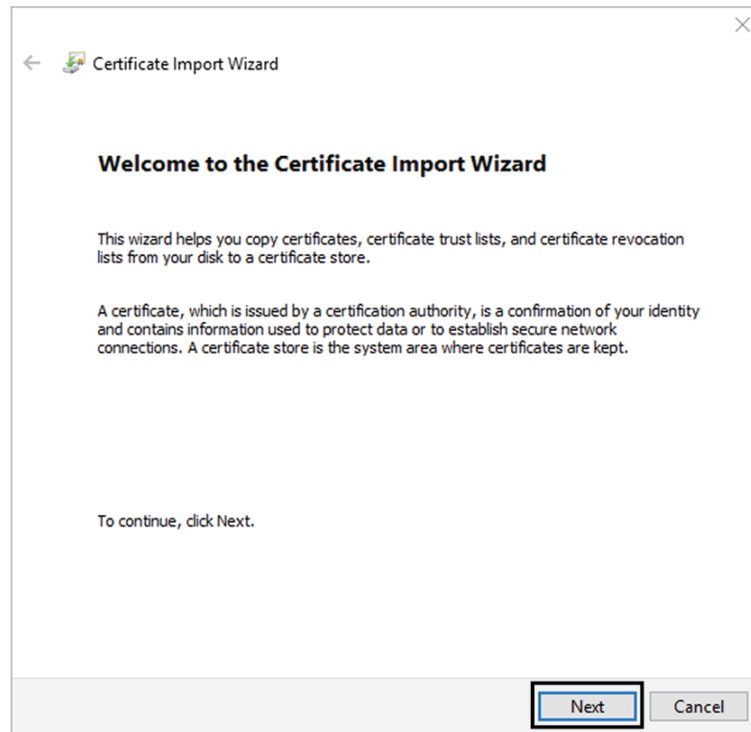
Step 6 Access the Trusted Root Certification tab and click Import.



A certificate importation wizard opens.

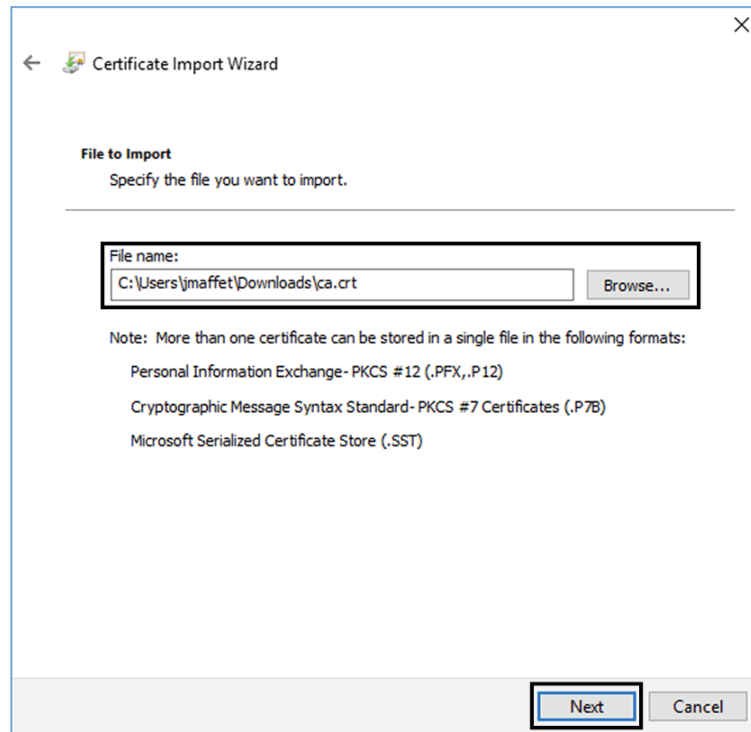
Step 7

Go to the next step.

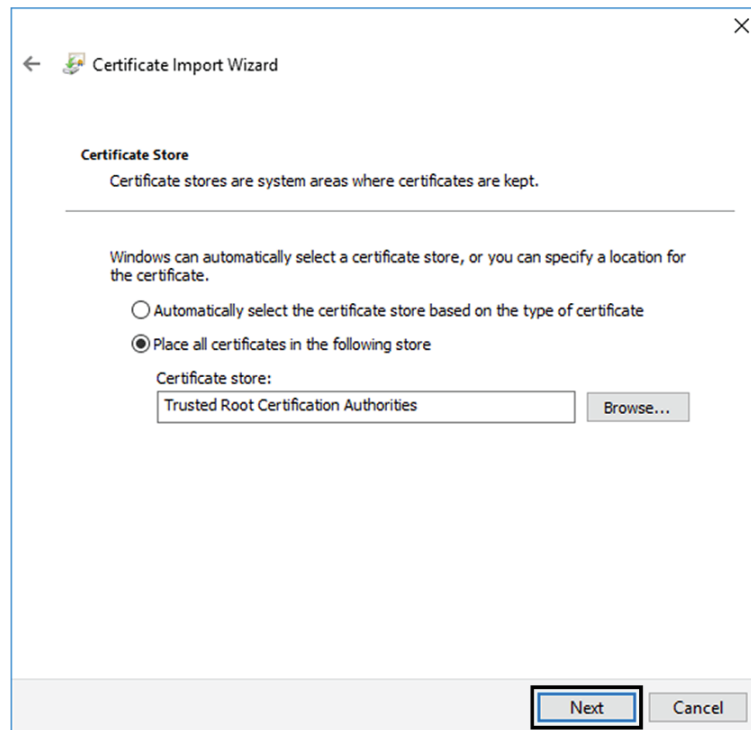


Step 8 Search for the certificate you downloaded earlier.

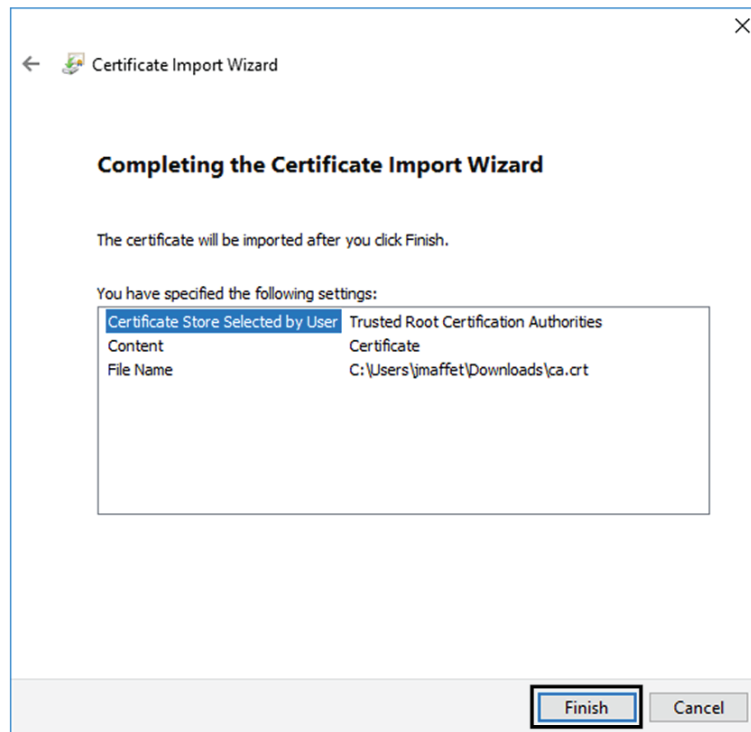
Step 9 Go to the next step.



Step 10 Accept the default values by accessing the next step.



Step 11 The certificate is now considered as trusted by the browser. It will be imported as soon as you will click Finish.



What to do next

[Install Cisco Cyber Vision, on page 50](#)

Install Cisco Cyber Vision

Access the Cisco Cyber Vision installation wizard:


Procedure

Step 1 With your browser, access <https://<CENTERNAME>/>.

Note Accessing the Center using its name enables HTTPS secure interface. Yet, this requires a DNS or local host configuration to associate the name and the IP address. The Center access through its IP address is possible but the connection is not secure.

Step 2 The setup wizard used for the first access to Cisco Cyber Vision is displayed:

Step 3 **Create an admin account:**


Welcome to Cyber Vision
 Please follow this few steps to be fully ready to use the product

👤 Create the first user ————— 📄 Agree to the license terms ————— ✅ Done

Firstname : Lastname :
 Email :
 Password : Confirm password :
 Suggested password:
 SkvIH2Qq*odz90fj0E3 📄 📋

[Create](#)

Step 4**Step 5**

Enter the information required.

Note Email will be asked for login access.

Note Passwords must contain at least 6 characters and comply with the rules below. Passwords:

- Must contain a lower case character: a-z.
- Must contain an upper case character: A-Z.
- Must contain a numeric character: 0-9.
- Cannot contain the user id.
- Must contain a special character: ~!"#\$%&'()*+,-./:;<=>?@[^_{}.

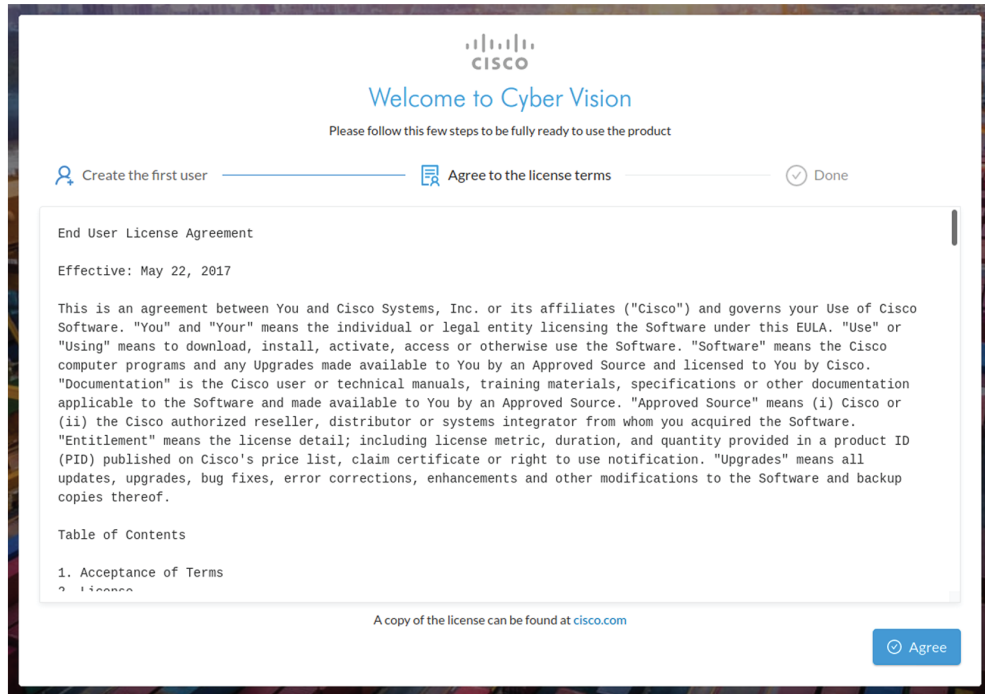
Passwords should be changed regularly to ensure the integrity of the platform and the industrial network security.

Note You can reset users using the following command in the Center's CLI:

```
sbs-db reset-users
```

Step 6

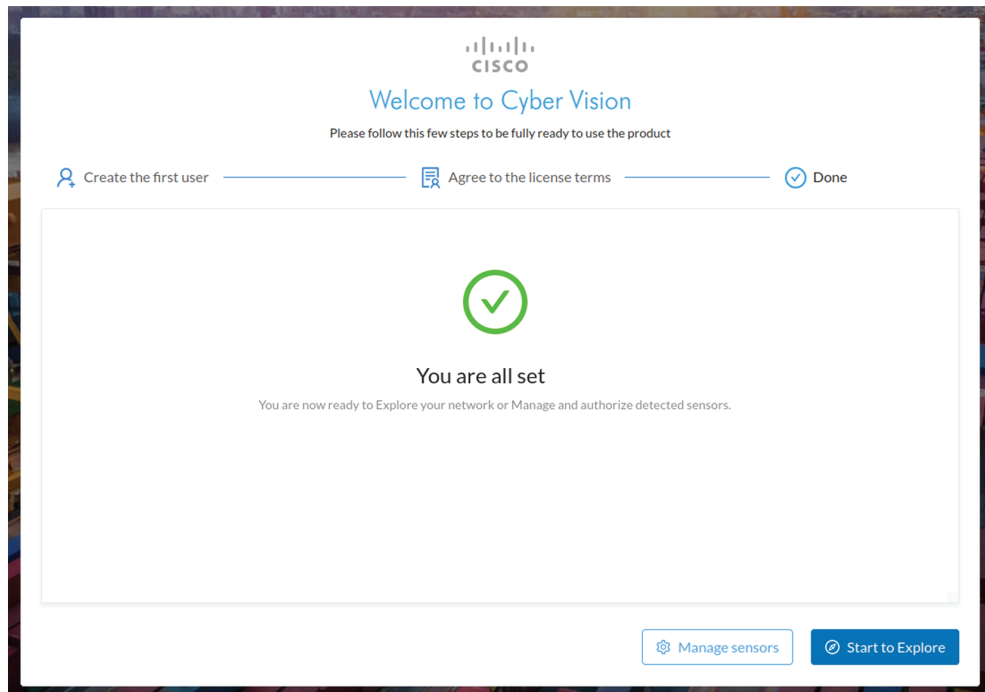
Accept the software license agreement:

**Step 7****Step 8 Finish the installation:**

The Center is now correctly installed and Cisco Cyber Vision is ready to operate.

Step 9

Click Start to Explore.



Cisco Cyber Vision installation is now complete.

What to do next

If you aim to use an enterprise certificate, proceed with [Configure the user interface security, on page 53](#).

If you already installed a self-signed certificate, and if you are installing a Global Center or a synchronized Center, proceed with [Configure Center data synchronization, on page 58](#).

If you already installed a self-signed certificate, and if you are installing a standalone Center, you can start installing the sensors. To do so, refer to the corresponding Cisco Cyber Vision Sensor Installation Guides.

Configure the user interface security

This section explains how to configure Cisco Cyber Vision user interface security with an enterprise certificate. You will have the option to upload a .p12 or to generate a CSR.

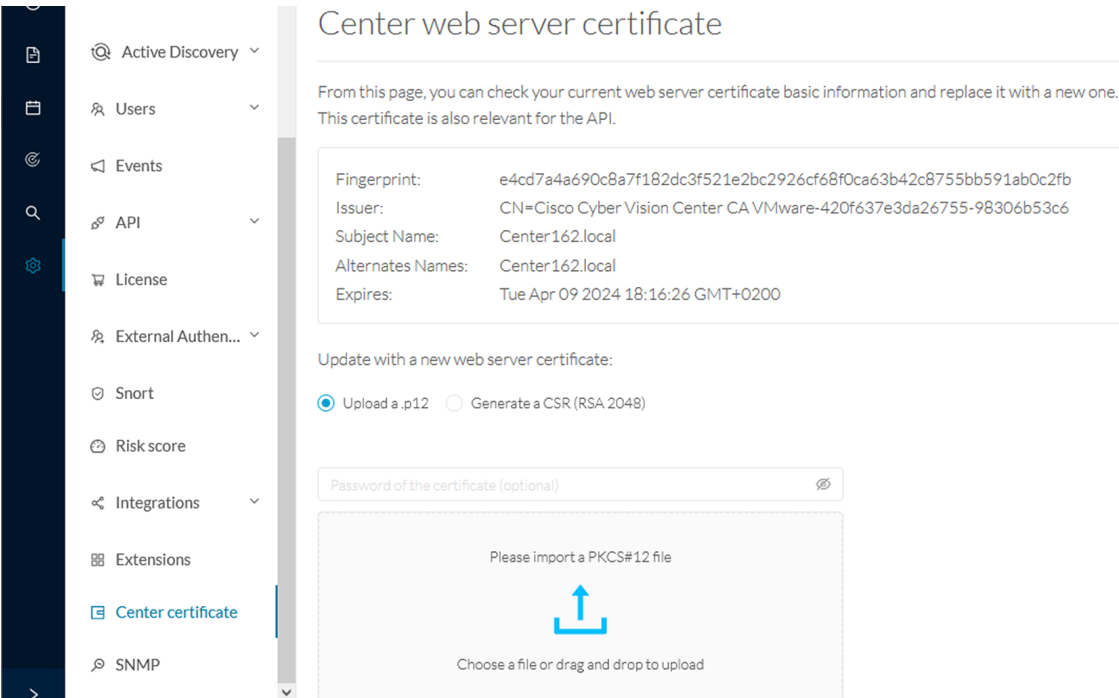
Before you begin

Perform this task if you're planning to use an enterprise certificate. You must [Install Cisco Cyber Vision](#) beforehand.

Procedure

Step 1

To use an enterprise certificate, navigate to Admin > Center certificate.



The screenshot shows the 'Center web server certificate' configuration page in the Cisco Cyber Vision Center. The left sidebar contains a navigation menu with 'Center certificate' selected. The main content area shows the following information:

- Center web server certificate**
- From this page, you can check your current web server certificate basic information and replace it with a new one. This certificate is also relevant for the API.
- Current Certificate Details:**
 - Fingerprint: e4cd7a4a690c8a7f182dc3f521e2bc2926cf68f0ca63b42c8755bb591ab0c2fb
 - Issuer: CN=Cisco Cyber Vision Center CA VMware-420f637e3da26755-98306b53c6
 - Subject Name: Center162.local
 - Alternates Names: Center162.local
 - Expires: Tue Apr 09 2024 18:16:26 GMT+0200
- Update with a new web server certificate:**
 - Upload a .p12
 - Generate a CSR (RSA 2048)
- Field: Password of the certificate (optional) [🔒]
- Upload area: Please import a PKCS#12 file. Choose a file or drag and drop to upload.

Step 2 You can [Upload a p12](#) or [Generate a CSR](#).

Upload a p12

Before you begin

The p12 (or Microsoft pfx) file must contain a private key, a password, and the field "X509v3 Subject Alternative Name" must contain the Center DNS name.

Procedure


Step 1 Select Upload a .p12.

Update with a new web server certificate:

Upload a .p12 Generate a CSR (RSA 2048)

Password of the certificate (optional) 🔒

Please import a PKCS#12 file



Choose a file or drag and drop to upload

 Save


Click Please import a PKCS12 file and choose you pfx or p12 file generated from your certification server.


Step 2 Type the certificate password.

Step 3 Click the Import a PKCS#12 file button or drag and drop the file to import it.

Update with a new web server certificate:

Upload a .p12 Generate a CSR (RSA 2048)

..... 

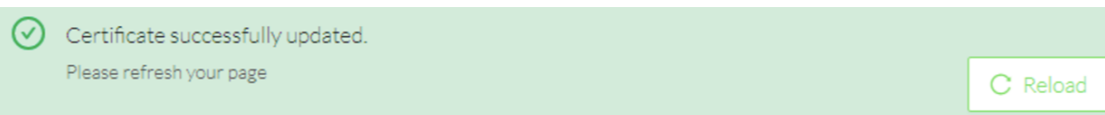


File selected: CenterAD2019.2019lab.local1.pfx

 Save

Step 4 Click Save.

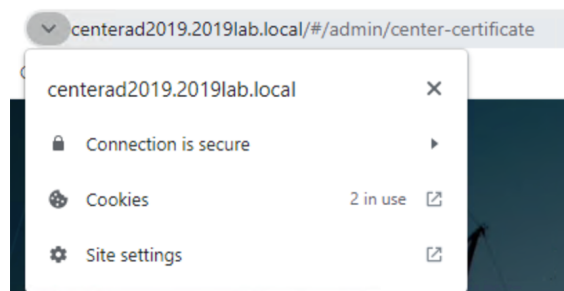
The following message appears:



Step 5 Click Reload.

Step 6 In your browser, use the DNS name to connect to your Cisco Cyber Vision instance.

The error message does not appear and the connection is secure.



What to do next

If you are installing a Global Center or a synchronized Center, proceed with [Configure Center data synchronization, on page 58](#).

If you are installing a standalone Center, you can start installing the sensors. To do so, refer to the corresponding Cisco Cyber Vision Sensor Installation Guides.

Generate a CSR

Procedure

Step 1 Select Generate a CSR.

Update with a new web server certificate:

Upload a .p12 Generate a CSR (RSA 2048)

Enter your FQDN

 Generate and download CSR

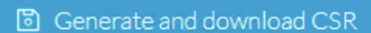
Step 2 Enter the Center FQDN as registered on your DNS server.

Step 3 Click the Generate and download CSR button.

Update with a new web server certificate:

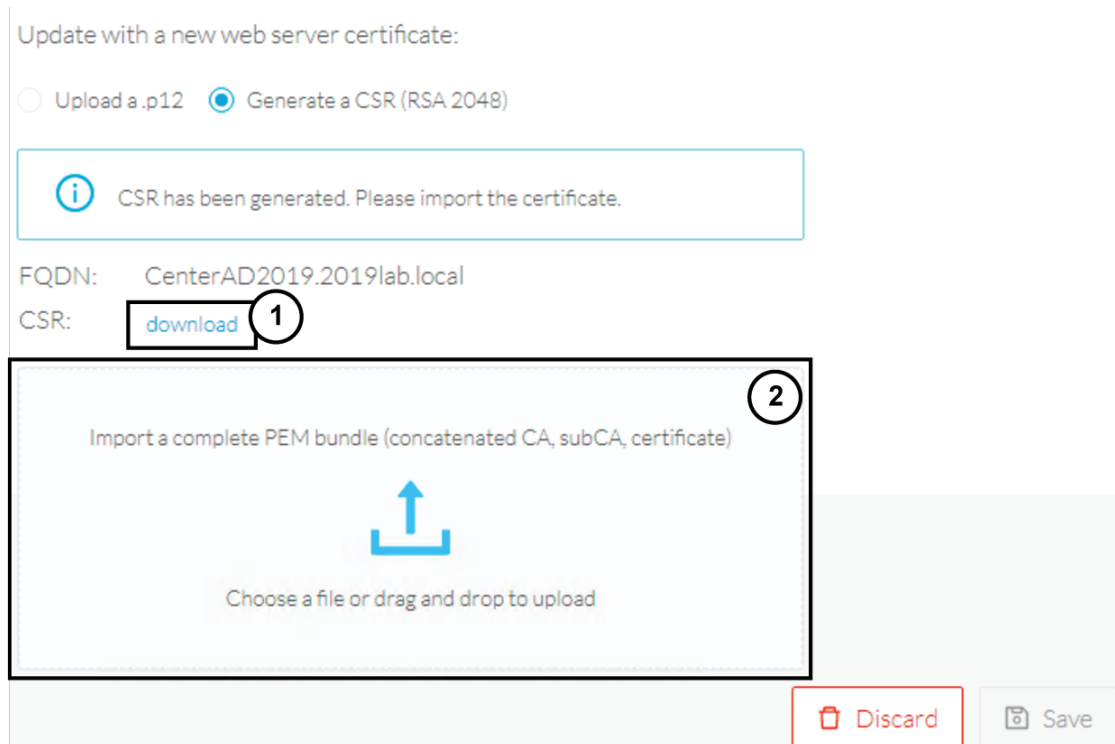
Upload a .p12 Generate a CSR (RSA 2048)

CenterAD2019.2019lab.local

 Generate and download CSR

A message indicating that the CSR has been generated is displayed.

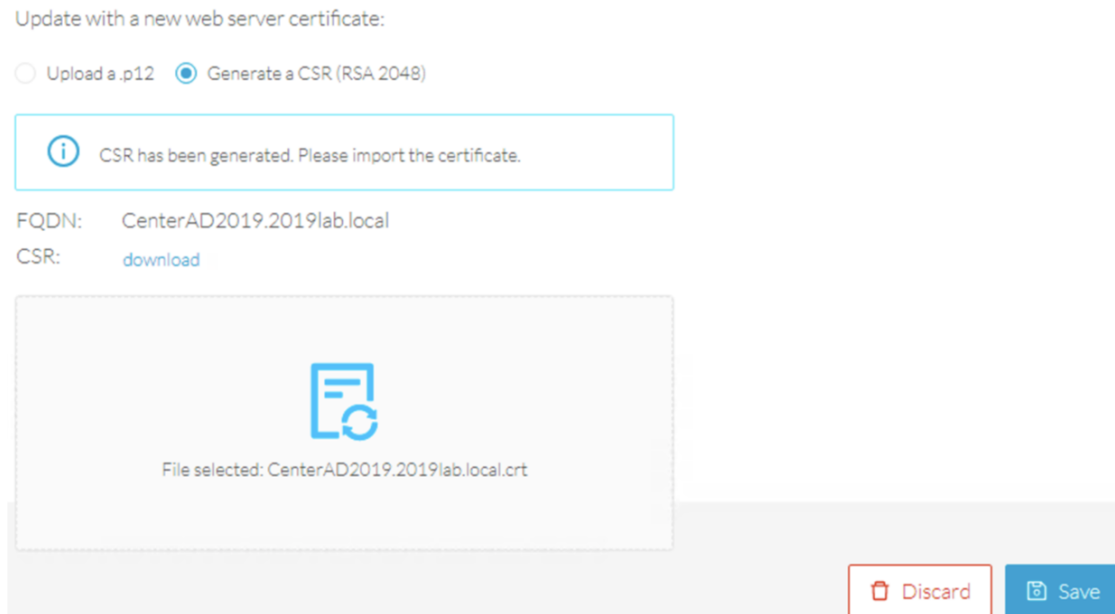
Step 4 Click the download button (1).



A <FQDN>.csr file is downloaded.

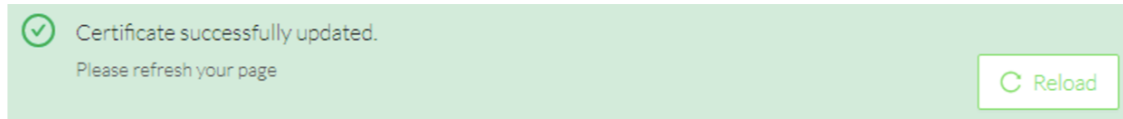
Step 5 Use the <FQDN>.csr file to generate a pem certificate from your enterprise Certification Authority.

Step 6 Once the pem certificate is generated, return to Cisco Cyber Vision and click the Import a complete PEM bundle button (2) or drag and drop it to import it.



Step 7 Click Save.

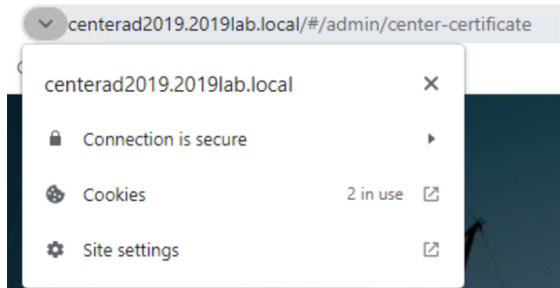
The following message appears:



Step 8 Click Reload.

Step 9 In your browser, use the DNS name to connect to your Cisco Cyber Vision instance.

The error message does not appear and the connection is secure.



What to do next

If you are installing a Global Center or a synchronized Center, proceed with [Configure Center data synchronization, on page 58](#).

If you are installing a standalone Center, you can start installing the sensors. To do so, refer to the corresponding Cisco Cyber Vision Sensor Installation Guides.

Configure Center data synchronization

This step is applicable to the Global Center and its synchronized Centers.

Once the Global Center and its synchronized Centers are installed, proceed to data synchronization, which consists of registering the Center in the Global Center and enrolling the Center to the Global Center. To do so, you need to open each's Cisco Cyber Vision's GUI.

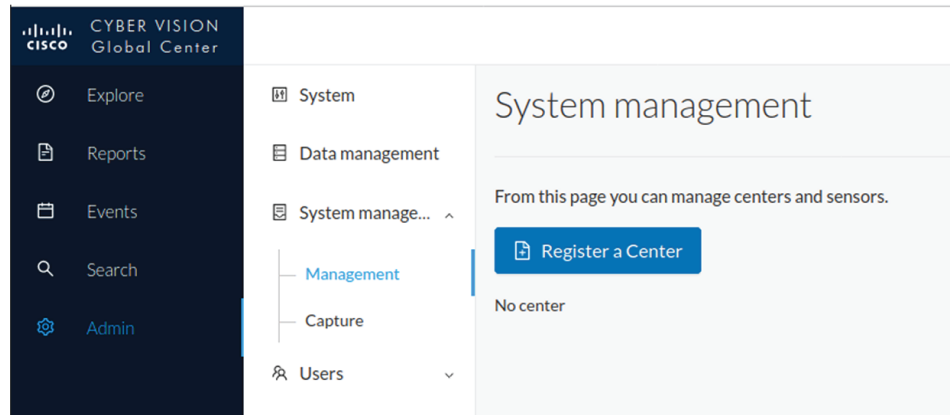


Note To differentiate each user interface, check the top left corner of Cisco Cyber Vision's "Global Center" or "Center".

Procedure

Step 1 In the Global Center's Cisco Cyber Vision GUI, navigate to Admin > System Management > Management.

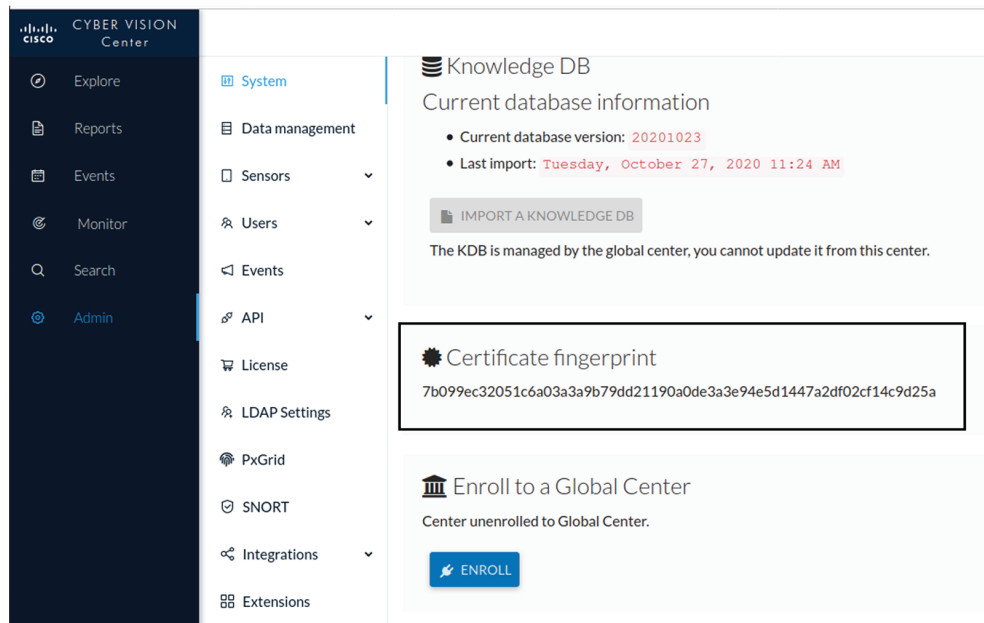
Step 2 Click the **Register a Center** button.



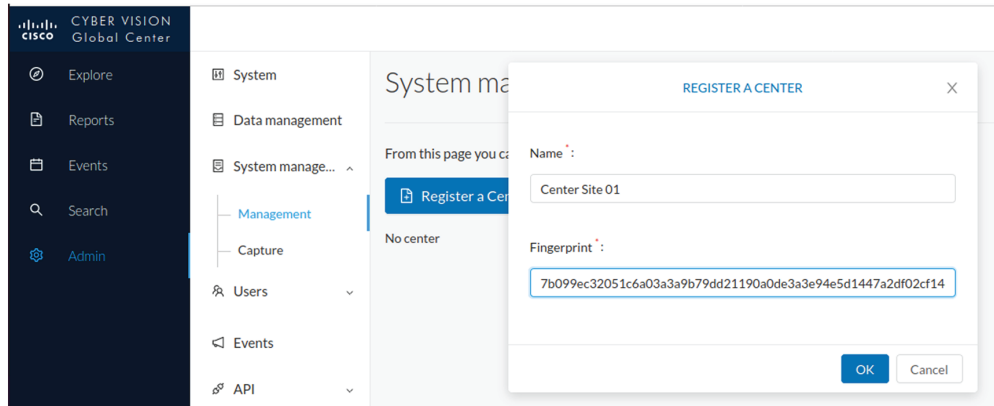
The window "Register a Center" pops up, ready to be filled. Now you must access the Center's GUI to retrieve its fingerprint.

Step 3 In the Center's Cisco Cyber Vision GUI, navigate to Admin > System.

Step 4 Scroll down to Certificate fingerprint and copy it.



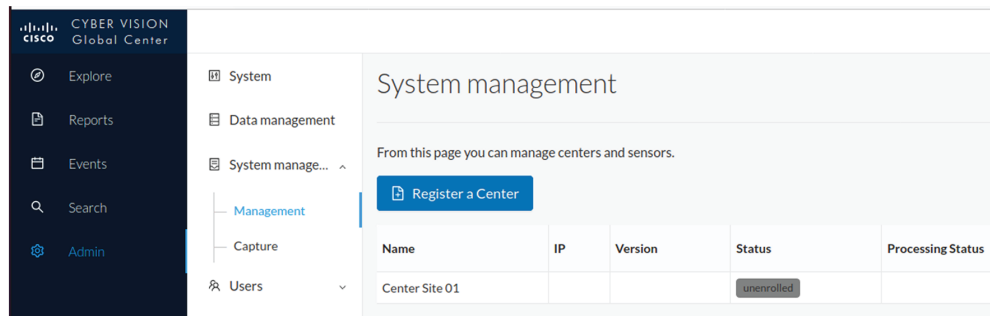
Step 5 In the Global Center's GUI, give a name to the Center, and paste the Center's fingerprint into the corresponding



field

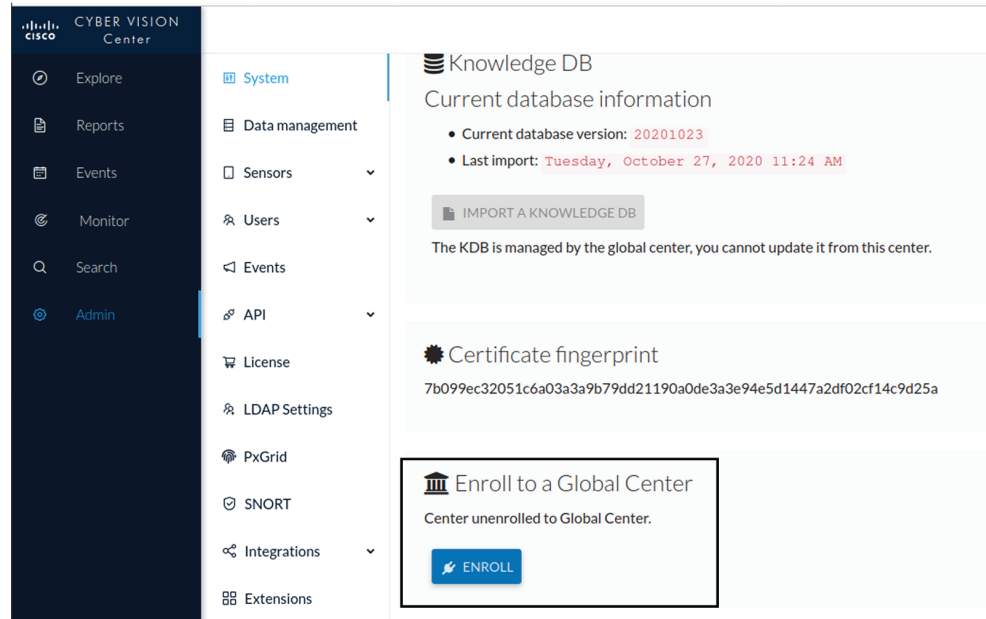
Step 6 Click **OK**.

The Center appears in the list as unenrolled.



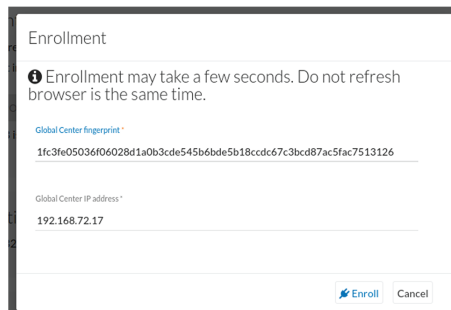
At this point you must switch to the Center's GUI and enroll it to the Global Center.

Step 7 In the Center's GUI, scroll down to Enroll a Global Center and click the **Enroll** button.



The Enrollment window pops up.

- Step 8** Copy the Global Center's fingerprint from its GUI's System administration page (same location as the Center's).
- Step 9** Enter the Global Center's IP address and click **Enroll**.



Once the synchronization is complete, it is indicated that the Center is enrolled to the Global Center.



CHAPTER 6

Configure a Center DPI

- [Configure a Center DPI, on page 63](#)

Configure a Center DPI

This section describes how to configure a Center DPI, that is, a virtual sensor in the Center.

Requirements:

Make sure an ethernet interface is available for the Center DPI traffic, depending on:

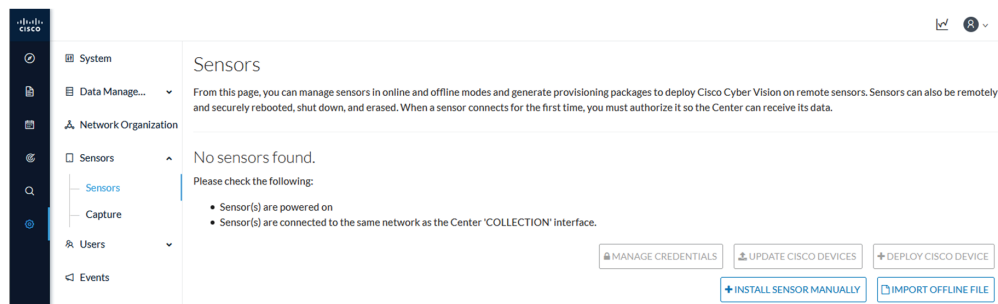
- If the server has a dual interface, that is, the Administration interface is on eth0 and the Collection interface is on eth1, then eth2 will be used for the Center DPI.
- If the server has a single interface, that is, the Administration and Collection interfaces are on the same interface, then eth1 will be used for the Center DPI.

In the example below, the server has a single interface.

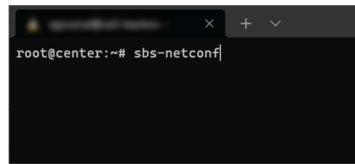
To configure a Center DPI:

Procedure

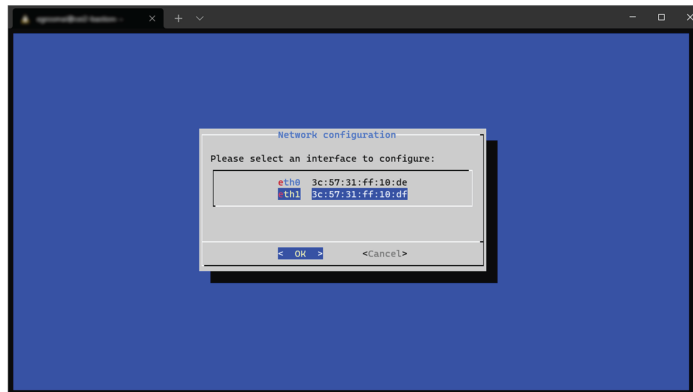
Step 1 Access the Cisco Cyber Vision sensors administration page.



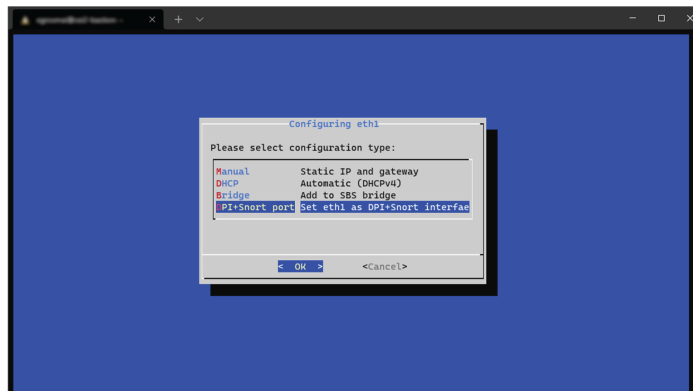
Step 2 Open the Center shell prompt and type the following command:
`sbs-netconf`



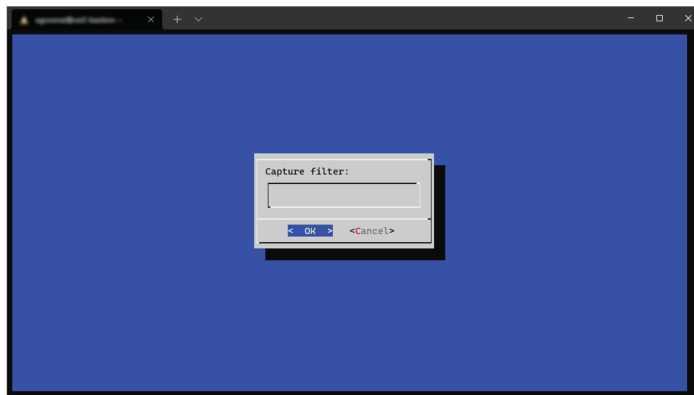
- Step 3** In the case of a single interface, select the eth1 interface.
In the case if a dual interface, select eth2.



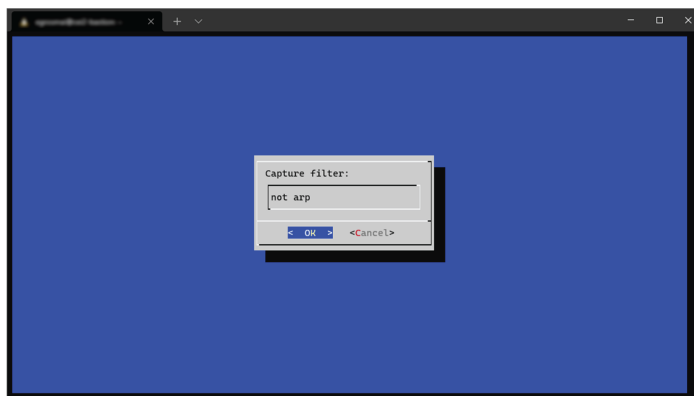
- Step 4** Select the interface as DPI+Snort port.



- Step 5** Configure a capture filter mode. You can do that later in the Cisco Cyber Vision sensor page clicking the Capture mode button.
For more information on how to configure a capture mode filter, refer to the Cisco Cyber Vision GUI user guide.



For example, you can type "not arp".



In the Cisco Cyber Vision administration sensor page, the new virtual sensor appears and is ready to receive data.

Sensors

From this page, you can manage sensors in online and offline modes and generate provisioning packages to deploy Cisco Cyber Vision on remote sensors. Sensors can also be remotely and securely rebooted, shut down, and erased. When a sensor connects for the first time, you must authorize it so the Center can receive its data.

Name	IP	Version	Status	Processing status	Active Discovery status	Capture Mode [®]	Uptime
▼ CENTER-ETH1	N/A	N/A	Running	Waiting for data	Unavailable	not arp	N/A

Name: CENTER-ETH1 ✎
 Status: Running
 Processing status: Waiting for data
 Active discovery: Unavailable
 Deployment: Automatic via DHCP
 Capture mode: not arp
 ● Start recording sensor

Remove Capture Mode Disable IDS

MANAGE CREDENTIALS UPDATE CISCO DEVICES DEPLOY CISCO DEVICE
 + INSTALL SENSOR MANUALLY IMPORT OFFLINE FILE



CHAPTER 7

Global Center Configuration

Cisco Cyber Vision Global Center feature will allow synchronization of several Centers within a single repository. The Global Center will aggregate Centers into a single application and will present a summary of several Center activities.

Once the setup of a Center and a Global Center is done, the Center synchronization could be initialized with a Global Center. This process consist of the enrollment of a Center with a Global Center. When the center is enrolled, it's data with be synchronized incrementally. Later on, if needed, the Center could be unenrolled. The Global Center will then remove all data form that particular Center. The Center will become unenrolled and will be ready for a future enrollment.

Enrollment and unenrollement will be described below.

- [Center enrollment, on page 67](#)
- [Center unenrollment, on page 70](#)
- [Force the unenrollement of a Center, on page 71](#)

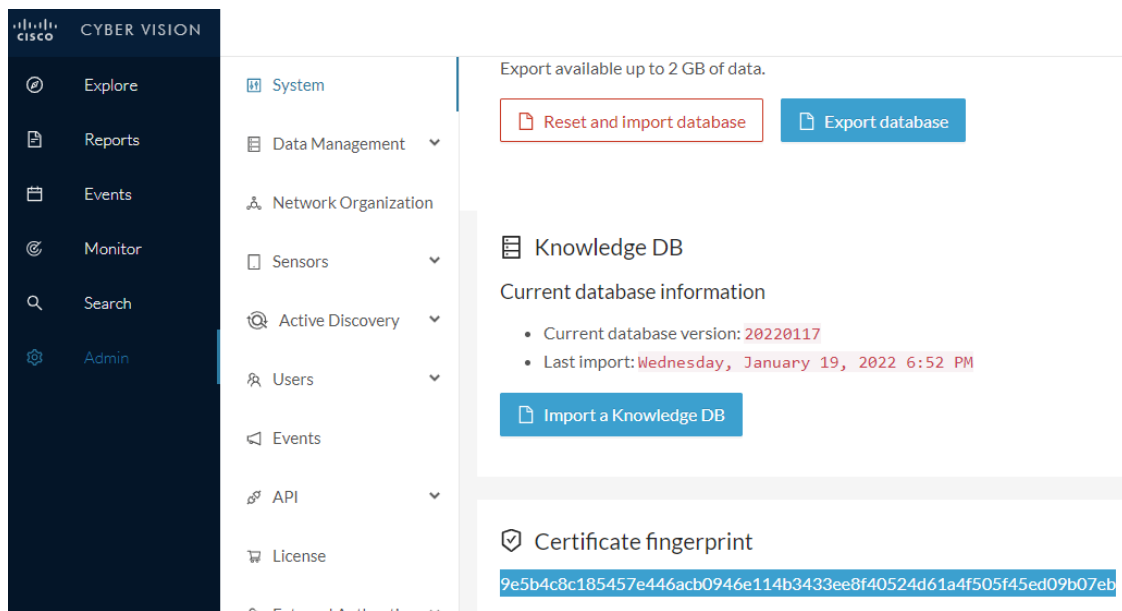
Center enrollment

Before you begin

A Global Center and its Centers need to be reachable in order to be enrolled.

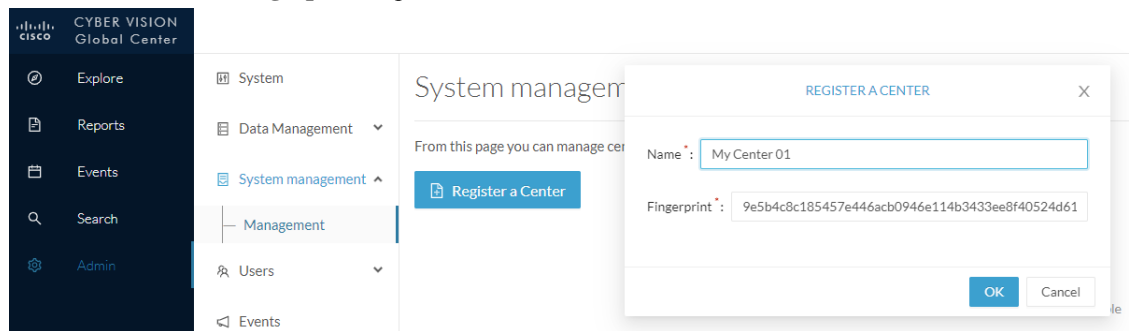
Procedure

- Step 1** Start the process in the Center to be synchronized user interface , navigate to the Admin menu, in the system page, you will find a **Certificate fingerprint**. Copy it, it will be needed.



Step 2 Move to the Global Center user interface, Admin menu, in the **System management**, navigate to the **Management** menu. Click on the button **Register a Center** and:

- Fill the **Name** field with the name you would like to have for this center
- Paste the **Certificate fingerprint** copied above



Step 3 Stay in the Global Center, on the same menu (Admin - System management - Management) and copy the **Fingerprint** of the Global Center.

System management

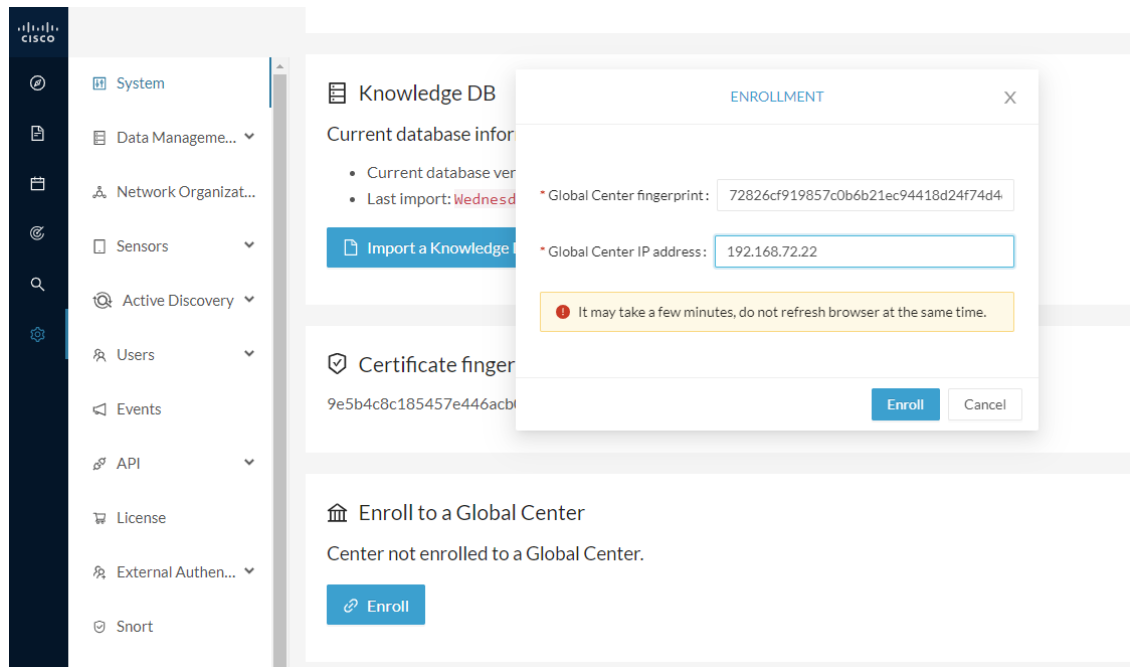
From this page you can manage centers and sensors.

Register a Center Fingerprint: `72826cf919857c0b6b21ec94418d24f74d4d2cf2bc742e768444554078abaa0c`

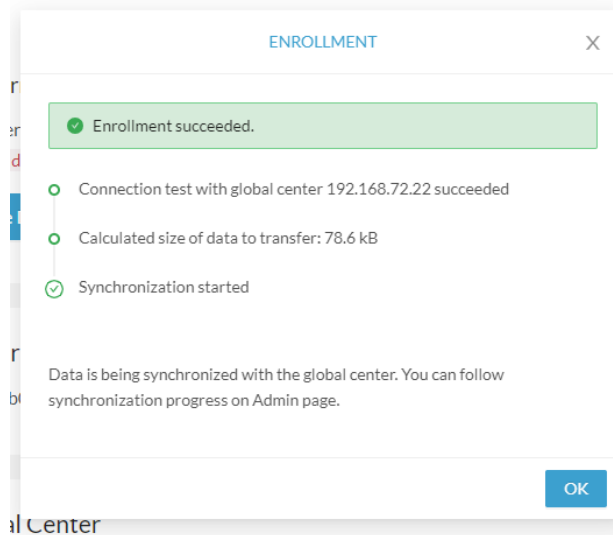
Center Name	IP	Version	Enrollment status	Up time	Connectivity Status	Action
My Center 01			Registered		Not enrolled	Unregister

Step 4 On the Center, in the Admin menu, System page, click on the button **Enroll** and:

- add the **Global Center fingerprint** (paste it with the value copied above in the Global Center)
- add the **Global Center IP address**
- press on **Enroll**



Step 5 The first synchronization will occur. The Center will send all the needed historical information. Once done, a green message is displayed: **Enrollment succeeded.**



What to do next

After the enrollment, the Center is synchronized regularly with the Global Center. In the Global Center, in the Admin menu, the System Management page gives a status of all Centers Synchronized and their Sensors.

System management

From this page you can manage centers and sensors.

Register a Center Fingerprint: 72826cf919857c0b6b21ec94418d24f74d4d2cf2bc742e768444554078abaa0c

Center Name	IP	Version	Enrollment status	Up time	Connectivity Status	Action
My Center 01	192.168.72.21	SBS: 4.1.0+202201171404 KDB: 20220117	Enrolled	5 days 16 hrs 52 mins 12 secs	Connected	Unenroll

Sensor Name	IP	Version	Status	Processing Status	Capture mode	Up Time
Sensor My Sensor 1	192.168.69.21	4.1.0+202201171423	Connected	Pending data	All	N/A

Center unenrollment

Before you begin

A Center can be unenrolled whenever it is needed, for example as a maintenance operation to replace the Center or the Global Center. This will delete all the Center's data in the Global Center.

Procedure

Step 1 In Cisco Cyber Vision, navigate to Admin > System management > Management.
All Centers of the Global Center are listed.

Step 2 Click Unenroll on the Center required.

System management

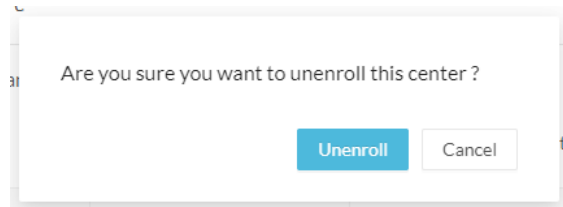
From this page you can manage centers and sensors.

Register a Center Fingerprint: 72826cf919857c0b6b21ec94418d24f74d4d2cf2bc742e768444554078abaa0c

Center Name	IP	Version	Enrollment status	Up time	Connectivity Status	Action
My Center 01	192.168.72.21	SBS: 4.1.0+202201171404 KDB: 20220117	Enrolled	5 days 16 hrs 53 mins 12 secs	Connected	Unenroll

In case of a Global Center replacement, you need to unenroll all its synchronized Centers.

Step 3 A popup asking for confirmation appears. Click **Unenroll** to start the process.



All Center's data are deleted from the Global Center. The Center is then ready to be enrolled again in the Global Center or in another Global Center.

Step 4 If enrolled in another Global Center, the Center will remain listed in its former Global Center as Not enrolled. You can use the **Unregister** button to remove it from the list.

From this page you can manage centers and sensors.

Center Name	IP	Version	Enrollment status	Up time	Connectivity Status	Action
My Center 01			Registered		Not enrolled	Unregister

Force the unenrollement of a Center

When a Center with sync has been disconnected for a very long time, for example because of a hardware failure, it is possible to unenroll it from the Global Center. This will allow you to delete all Center's data and to replace it.



Important Make sure the Center with sync is definitely lost before performing this action. As all the Center's data will be deleted from the Global Center, the Center trying to send data to the Global Center would cause significant data synchronization issues.

In Cisco Cyber Vision, navigate to Admin > System management > Management. All Centers of the Global Center are listed.

Whenever a Center has been disconnected for a long time, the red button **Force unenrollment** appears in the Action column. Use this button to delete all the Center's data from the Global Center. The Center will be removed from the list.

System management

From this page you can manage centers and sensors.

Center Name	IP	Version	Enrollment status	Up time	Connectivity Status	Action
My Center 01	192.168.72.21	SBS: 4.1.0+202201171404 KDB: 20220117	Enrolled	5 days 18 hrs 41 mins 40 secs	Disconnected	Force unenrollment

Force the unenrollement of a Center



CHAPTER 8

Upgrade procedures

- [Architecture with a Global Center, on page 73](#)
- [Architecture with a single Center, on page 76](#)

Architecture with a Global Center

Check the Global Center and Centers' health

It is highly recommended that you check the health of the Centers connected to the Global Center and of the Global Center itself before proceeding to the update. To do so:

Procedure

Step 1 Connect to the Center in SSH.

Step 2 Type the following command:

```
systemctl --failed
```

The number of listed sbs-* units should be 0, otherwise the failure must be fixed before proceeding with the update.

```
root@Center21:~# systemctl --failed
0 loaded units listed.
root@Center21:~#
```

If one or several sbs services are in failed state like below, it has to be fixed before proceeding to the update.

```
root@Center21:~# systemctl --failed
UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
● sbs-marmotd.service loaded failed failed marmotd persistence service

LOAD    = Reflects whether the unit definition was properly loaded.
ACTIVE  = The high-level unit activation state, i.e. generalization of SUB.
SUB     = The low-level unit activation state, values depend on unit type.

1 loaded units listed.
root@Center21:~#
```

Usually, a reboot of the Center is enough to solve the issue. If not, contact the product support.

Step 3 Repeat the previous steps for the other Centers and the Global Center.

Update the Global Center

In the case of a distributed architecture, **you must first update the Global Center, then its Centers.**

You can do so through the corresponding Center's Cisco Cyber Vision application or using its Command Line Interface.

To update the Global Center:

- Through the Cisco Cyber Vision application:

1. Go to cisco.com and retrieve the following file:

File name: CiscoCyberVision-update-combined-<VERSION>.dat

2. Navigate to Admin > System.

3. Click **System Update**.

4. Browse to select the update file.

- Through the Command Line Interface (CLI):

1. Go to cisco.com and retrieve the following file:

File name: CiscoCyberVision-update-center-<VERSION>.dat

2. Launch the update using the following command:

```
sbs-update install /data/tmp/CiscoCyberVision-update-center-<VERSION>.dat
```

To update the Centers:

Connect to each Center's Cisco Cyber Vision application or CLI and repeat the same procedure used to update the Global Center.

Update the sensors

The update of the sensors is done from their corresponding Center (not from the Global Center). You must repeat the following procedures from each of your Centers to cover all sensors of your industrial network. Procedures differ between hardware sensors and IOx sensors.

Update hardware sensors

To update hardware sensors:

If you used the combined file to update the Center which owned the sensor, the hardware sensors (IC3000 and Sentryo Sensors) were updated at the same time.

If not, the update needs to be done from the Command Line Interface (CLI):

Procedure

- Step 1** Go to cisco.com and retrieve the following file:
File name: CiscoCyberVision-update-sensor-<VERSION>.dat
- Step 2** Launch the update using the following command:

```
sbs-update install /data/tmp/CiscoCyberVision-update-sensor-<VERSION>.dat
```
-

Update IOx sensors

To update IOx sensors:

If you have installed the sensor with the sensor management extension, the upgrade of the extension will also update all sensors reachable by the Center.

Procedure

- Step 1** Go to cisco.com and retrieve the following file:
File name: CiscoCyberVision-sensor-management-<VERSION>.ext
- Step 2** In Cisco Cyber Vision, navigate to Admin > Extensions.
- Step 3** In the Actions column, click the **Update** button, and browse to select the update file.
If one or several sensors were not updated by the extension update:
- Step 4** Navigate to Admin > Sensors > Sensor Explorer.
- Step 5** Click **Manage Cisco devices**, then click **Update Cisco devices**.
A pop up with all remaining IOx sensors connected to the Center appears. Click **Update**.
If you have not installed one or several sensors with the sensor management extension, you can upgrade them with the sensor package from the platform's local manager or from the platform's Command Line Interface. This procedure is detailed in the corresponding sensor installation guide.
- Cisco IE3x00 and Cisco IR1101 file names: CiscoCyberVision-IOx-aarch64-<VERSION>.tar or CiscoCyberVision-IOx-Active-Discovery-aarch64-<VERSION>.tar
 - Catalyst 9300 and Catalyst 9400 file names: CiscoCyberVision-IOx-x86-64-<VERSION>.tar or CiscoCyberVision-IOx-Active-Discovery-x86-64-<VERSION>.tar
-

Architecture with a single Center

Update the Center

You can update the Center through its Cisco Cyber Vision application or using its Command Line Interface.

- Through the Cisco Cyber Vision application:

1. Go to cisco.com and retrieve the following file:

File name: CiscoCyberVision-update-combined-<VERSION>.dat

2. Navigate to Admin > System.

3. Click **System Update**.

4. Browse to select the update file.

- Through the Command Line Interface (CLI):

1. Go to cisco.com and retrieve the following file:

File name: CiscoCyberVision-update-center-<VERSION>.dat

2. Launch the update using the following command:

```
sbs-update install /data/tmp/CiscoCyberVision-update-center-<VERSION>.dat
```

Update the sensors

Sensor upgrade is done from the Center. Update procedures differ between hardware sensors and IOx sensors.

Update hardware sensors

To update hardware sensors:

If you used the combined file to update the Center which owned the sensor, the hardware sensors (IC3000 and Sentryo Sensors) were updated at the same time.

If not, the update needs to be done from the Command Line Interface (CLI):

Procedure

- Step 1** Go to cisco.com and retrieve the following file:

File name: CiscoCyberVision-update-sensor-<VERSION>.dat

- Step 2** Launch the update using the following command:

```
sbs-update install /data/tmp/CiscoCyberVision-update-sensor-<VERSION>.dat
```

Update IOx sensors

To update IOx sensors:

If you have installed the sensor with the sensor management extension, the upgrade of the extension will also update all sensors reachable by the Center.

Procedure

- Step 1** Go to cisco.com and retrieve the following file:
File name: CiscoCyberVision-sensor-management-<VERSION>.ext
- Step 2** In Cisco Cyber Vision, navigate to Admin > Extensions.
- Step 3** In the Actions column, click the **Update** button, and browse to select the update file.

If one or several sensors were not updated by the extension update:

- Step 4** Navigate to Admin > Sensors > Sensor Explorer.
- Step 5** Click **Manage Cisco devices**, then click **Update Cisco devices**.

A pop up with all remaining IOx sensors connected to the Center appears. Click **Update**.

If you have not installed one or several sensors with the sensor management extension, you can upgrade them with the sensor package from the platform's local manager or from the platform's Command Line Interface. This procedure is detailed in the corresponding sensor installation guide.

- Cisco IE3x00 and Cisco IR1101 file names: CiscoCyberVision-IOx-aarch64-<VERSION>.tar or CiscoCyberVision-IOx-Active-Discovery-aarch64-<VERSION>.tar
 - Catalyst 9300 and Catalyst 9400 file names: CiscoCyberVision-IOx-x86-64-<VERSION>.tar or CiscoCyberVision-IOx-Active-Discovery-x86-64-<VERSION>.tar
-

