Cisco Cyber Vision Network Sensor Installation Guide for Cisco IR1101 and IR1800, Release 5.0.0

First Published: 2019-01-01

Last Modified: 2024-07-12

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CONTENTS

CHAPTER 1

About this documentation

Document purpose

This installation guide describes how to perform a clean installation of Cisco Cyber Vision on the following devices:

- Cisco Catalyst IR1101 Rugged Series Router
- Cisco Catalyst IR1800 Rugged Series Router

Consequently, all instructions about the Cisco Catalyst IR1101 are also applicable to the Cisco Catalyst IR1800.

Moreover, this document describes how to upgrade sensors through different methods.

This documentation is applicable to **system version 5.0.0**.

Note To be able to use the Cisco Cyber Vision sensor management extension, an IP address reachable by the Center Collection interface must be set on the Collection VLAN.

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

Overview

Overview

The architecture proposed and described in this document is for demonstration. The local network engineer should be consulted before applying the parameters used in this document. IP addresses, port numbers and VLAN IDs used should be verified beforehand as wrong configurations could stop normal exchanges and stop the process.

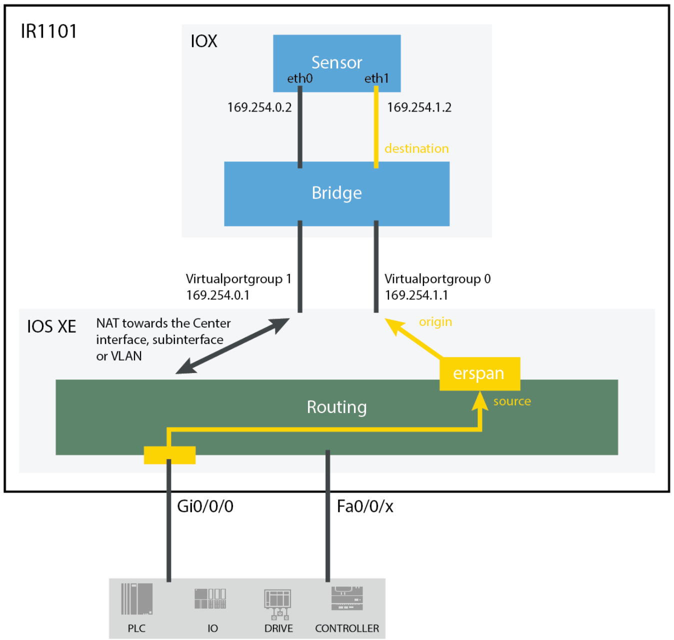
The schema below explains the architecture virtually deployed in the router to embed the sensor application. VLAN and physical ports configuration will allow OT traffic to be copied and communication with the Cisco Cyber Vision Center to be established.

The communication between the Cisco Cyber Vision Center and the sensor is represented in black on the schema. Mirrored OT traffic is represented in yellow.

Any port of the router can be used for the communication with the Center.

Only the routed traffic to the port gi0/0/0 can be spanned to the sensor.

Figure 1: Cisco IR1101 Integrated Services Router Rugged:



The sensor can be installed on the Cisco IR1101 with different disk configurations: on a SSD, or on the flash if there is no SSD.

SD card is not supported and will be ignored.

In case the sensor management extension is used and if a SSD is detected, Cisco Cyber Vision will be automatically deployed on it. If there is none, the application will be installed on the flash memory.

For other deployment modes (IOx Local Manager or CLI), the procedures describe how the installation is done for both cases.

CHAPTER 3

Requirements

Requirements

The Cisco IR1101 needs to be configured with access to the CLI (ssh or console port). An access to the IOx Local Manager could be necessary depending on the installation procedure chosen.

To be able to use the Cisco Cyber Vision sensor management extension, it has to be deployed on the Center and an IP address reachable by the Center Collection interface must be set on the device.

In case of manual installation (IOx Local Manager or CLI), the Cisco Cyber Vision Sensor application must be collected from Cisco.com, i.e.

CiscoCyberVision-sensor-IOx-aarch64-<VERSION>.tar

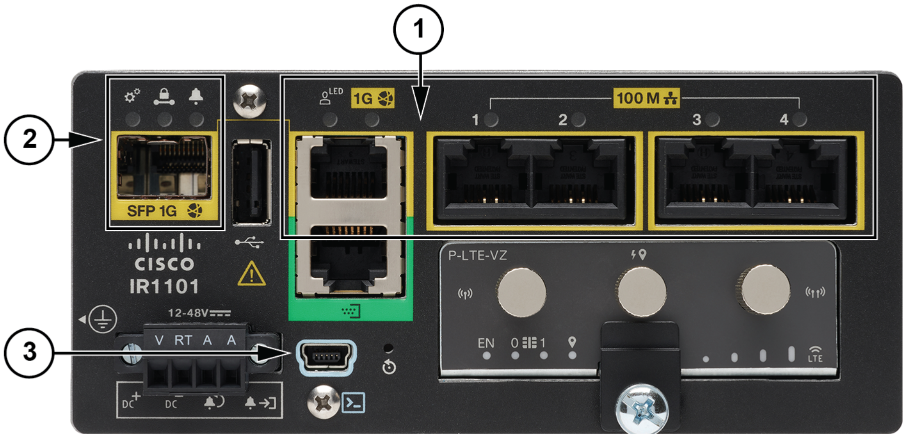
CHAPTER 4

Hardware front view

Hardware front view

Before starting, take a moment to note the following parts you're going to use during the procedure.

Cisco Cisco IR1101 Integrated Services Router Rugged:



- 1x RJ45 10/100/1000 BaseT connector (the one on the left) **(1)**
- 4x RJ45 10/100 BaseT connector (the ones on the right) **(1)**
- SFP fiber port **(2)**
- mini-USB console connector **(3)**

CHAPTER 5

Known issues

Known issues

The deployment procedure with the Local Manager is not supported by firmware version 17.3.x.

Perform the procedure with Procedure with the Cisco Cyber Vision sensor management extension instead.

CHAPTER 6

Initial configuration

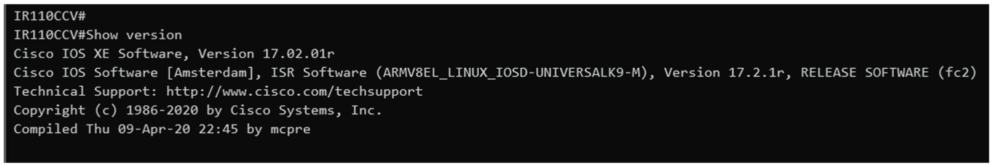
To install Cisco Cyber Vision on the Cisco IR1101, you must perform the Initial configuration which steps are described in this section.

Check the software version

- Check the software version using the following command in the router's CLI:

  ```
  Show version
  ```

  The displayed version must be 17.2.1 or higher to be compatible with the Cisco Cyber Vision Sensor Application.



```
IR110CCV#
IR110CCV#Show version
Cisco IOS XE Software, Version 17.02.01r
Cisco IOS Software [Amsterdam], ISR Software (ARMV8EL_LINUX_IOSD-UNIVERSALK9-M), Version 17.2.1r, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 09-Apr-20 22:45 by mcpre
```

  If the version is lower, you must update the router firmware. To do so, go to cisco.com and refer to the Cisco IR1101's documentation.

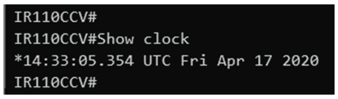
Check date and time

The internal clock of the router must be synchronized and configured properly.

Note The Cisco Cyber Vision IOx sensor application gets the time from the host. Therefore, it is critical that the host synchronizes its time with the Center or a valid NTP server. If the time difference is large (hours or more), the user should adjust the Cisco IR1101 time using the CLI or the WebUI so it is close to the reference time. If not, the synchronization may take many update cycles.

1. Check the date and time using the following command:

   ```
   Show clock
   ```

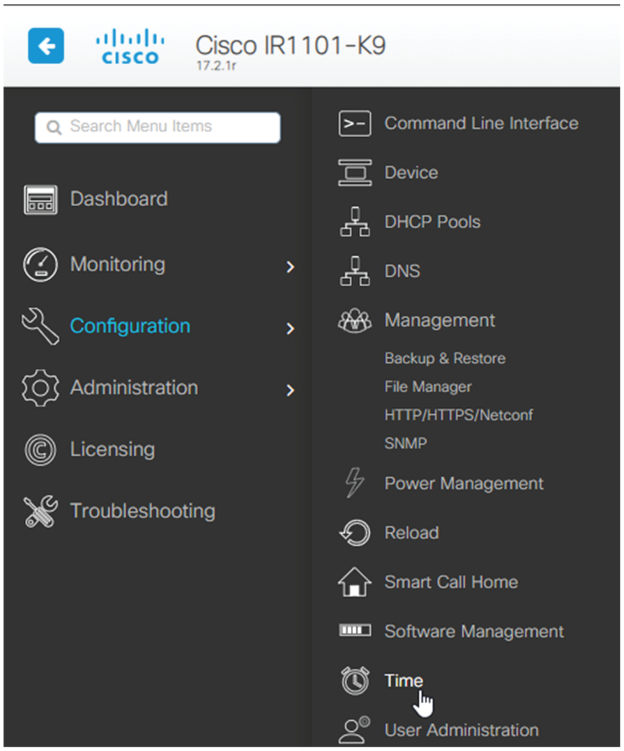
   

   ```
   IR110CCV#
   IR110CCV#Show clock
   *14:33:05.354 UTC Fri Apr 17 2020
   IR110CCV#
   ```

2. If needed, adjust to the UTC time using the following command:

   ```
   clock set [hh:mm:ss] [month] [day] [year]
   ```

Or in the WebUI, navigate to Configuration > Time.



Enable IOx

Before installing the Cisco Cyber Vision sensor on the Cisco IR1101, you must enable IOx.

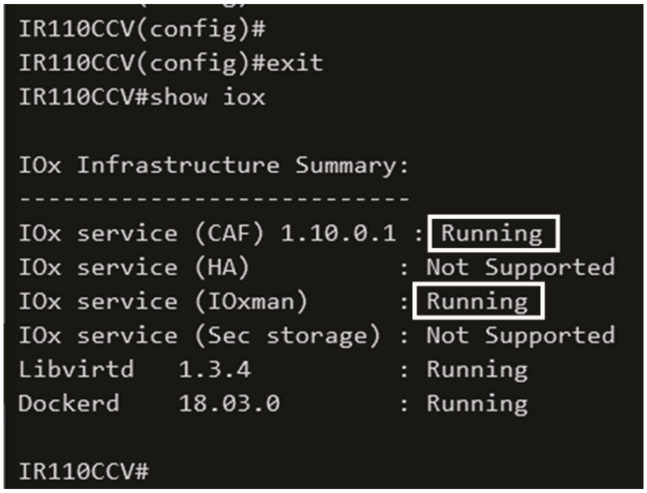
Procedure

Step 1 Enable IOx using the following command.

```
configure terminal
iox
```

Step 2 Check that the CAF and IOxman services are running using the following command.

```
exit
show iox
```



```
IR110CCV(config)#
IR110CCV(config)#exit
IR110CCV#show iox

IOx Infrastructure Summary:
---------------------------
IOx service (CAF) 1.10.0.1 : Running
IOx service (HA)           : Not Supported
IOx service (IOxman)       : Running
IOx service (Sec storage) : Not Supported
Libvirtd   1.3.4           : Running
Dockerd    18.03.0         : Running

IR110CCV#
```

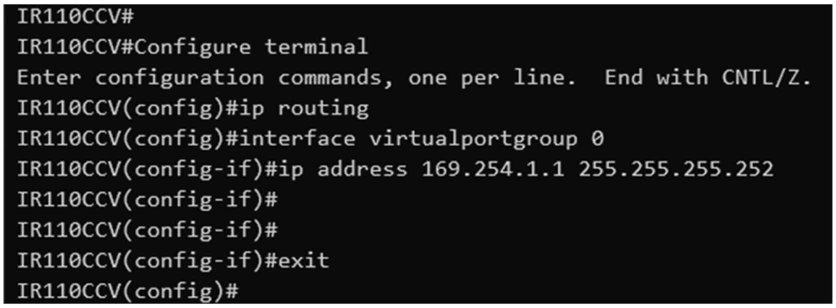
Setup ERSPAN

In order to receive traffic in the Cisco Cyber Vision IOx application, the application:

- must be connected to a VirtualPortGroup,
- must have the correct IP address assigned,
- must have a monitor session created.

1. Connect the application to a VirtualPortGroup and set an IP address using the following commands:

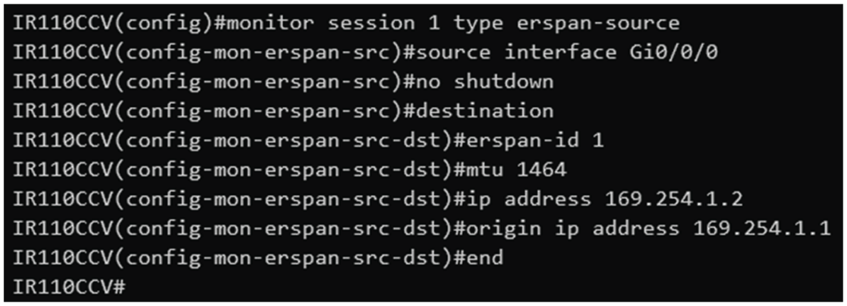
```
Configure terminal
ip routing
interface virtualportgroup 0
ip address 169.254.1.1 255.255.255.252
exit
```



```
IR110CCV#
IR110CCV#Configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
IR110CCV(config)#ip routing
IR110CCV(config)#interface virtualportgroup 0
IR110CCV(config-if)#ip address 169.254.1.1 255.255.255.252
IR110CCV(config-if)#
IR110CCV(config-if)#
IR110CCV(config-if)#exit
IR110CCV(config)#
```

2. Create the monitor session using the following commands:

```
monitor session 1 type erspan-source
source interface Gi0/0/0
no shutdown
destination
erspan-id 1
mtu 1464
ip address 169.254.1.2
origin ip address 169.254.1.1
end
```



```
IR110CCV(config)#monitor session 1 type erspan-source
IR110CCV(config-mon-erspan-src)#source interface Gi0/0/0
IR110CCV(config-mon-erspan-src)#no shutdown
IR110CCV(config-mon-erspan-src)#destination
IR110CCV(config-mon-erspan-src-dst)#erspan-id 1
IR110CCV(config-mon-erspan-src-dst)#mtu 1464
IR110CCV(config-mon-erspan-src-dst)#ip address 169.254.1.2
IR110CCV(config-mon-erspan-src-dst)#origin ip address 169.254.1.1
IR110CCV(config-mon-erspan-src-dst)#end
IR110CCV#
```

Setup NAT

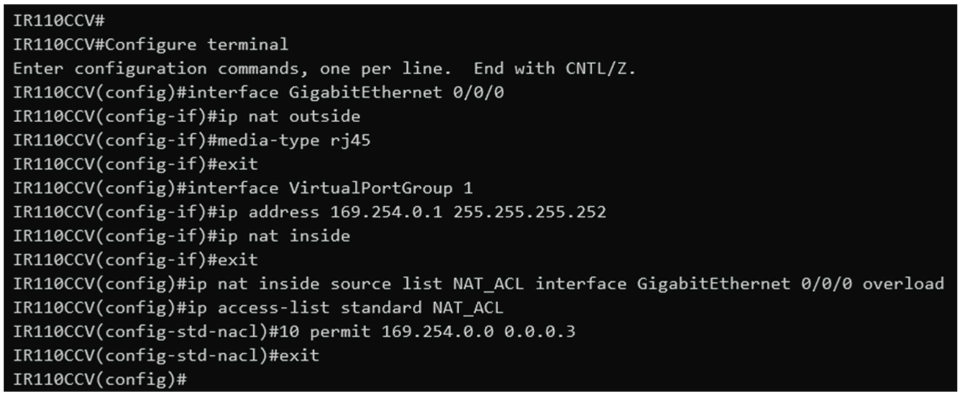
You must add NAT rules so that the container can reach the outside. This will be on a different virtual port group from the ERSPAN to separate the traffic.

Procedure

Step 1 Type the following commands to achieve this configuration.

```
Configure terminal
interface GigabitEthernet 0/0/0
ip nat outside
media-type rj45
exit
interface VirtualPortGroup 1
ip address 169.254.0.1 255.255.255.252
ip nat inside
```

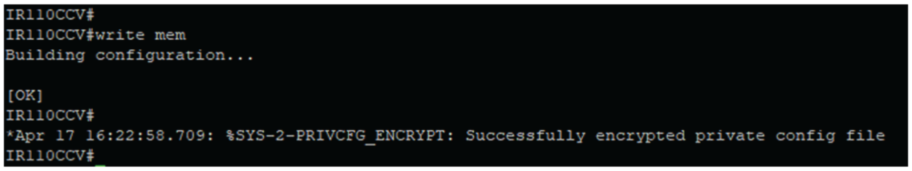
```
exit
ip nat inside source list NAT_ACL interface GigabitEthernet 0/0/0 overload
ip access-list standard NAT_ACL
10 permit 169.254.0.0 0.0.0.3
exit
```



```
IR110CCV#
IR110CCV#Configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
IR110CCV(config)#interface GigabitEthernet 0/0/0
IR110CCV(config-if)#ip nat outside
IR110CCV(config-if)#media-type rj45
IR110CCV(config-if)#exit
IR110CCV(config)#interface VirtualPortGroup 1
IR110CCV(config-if)#ip address 169.254.0.1 255.255.255.252
IR110CCV(config-if)#ip nat inside
IR110CCV(config-if)#exit
IR110CCV(config)#ip nat inside source list NAT_ACL interface GigabitEthernet 0/0/0 overload
IR110CCV(config)#ip access-list standard NAT_ACL
IR110CCV(config-std-nacl)#10 permit 169.254.0.0 0.0.0.3
IR110CCV(config-std-nacl)#exit
IR110CCV(config)#
```

Step 2 Save the configuration.

```
exit
write mem
```



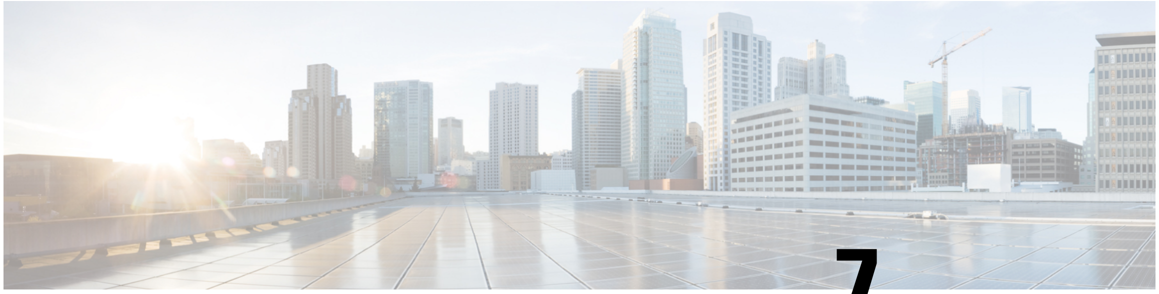
```
IR110CCV#
IR110CCV#write mem
Building configuration...

[OK]
IR110CCV#
*Apr 17 16:22:58.709: %SYS-2-PRIVCFG_ENCRYPT: Successfully encrypted private config file
IR110CCV#
```

What to do next

Proceed with one of the following procedures:

- Procedure with the Cisco Cyber Vision sensor management extension, on page 17
- Procedure with the Local Manager, on page 23
- Procedure with the CLI, on page 37



CHAPTER 7

Procedure with the Cisco Cyber Vision sensor management extension

After the Initial configuration, proceed to the steps described in this section.

- Install the sensor management extension, on page 17
- Create a sensor, on page 19
- Configure the sensor, on page 20

Install the sensor management extension

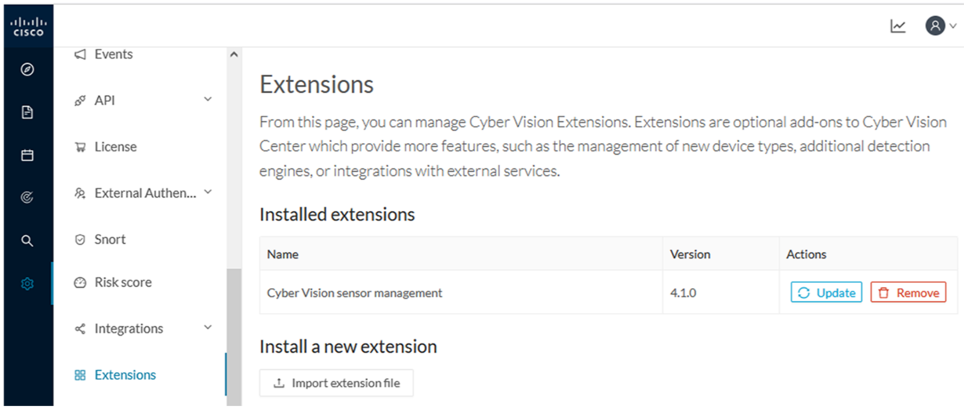
To install the Sensor Management extension, you must:

Procedure

Step 1 Retrieve the extension file (i.e. CiscoCyberVision-sensor-management-<version>.ext) from cisco.com.

Step 2 Access the Extensions administration page in Cisco Cyber Vision.

Step 3 Import the extension file.



Extensions

From this page, you can manage Cyber Vision Extensions. Extensions are optional add-ons to Cyber Vision Center which provide more features, such as the management of new device types, additional detection engines, or integrations with external services.

Installed extensions

Name	Version	Actions
Cyber Vision sensor management	4.1.0	Update Remove

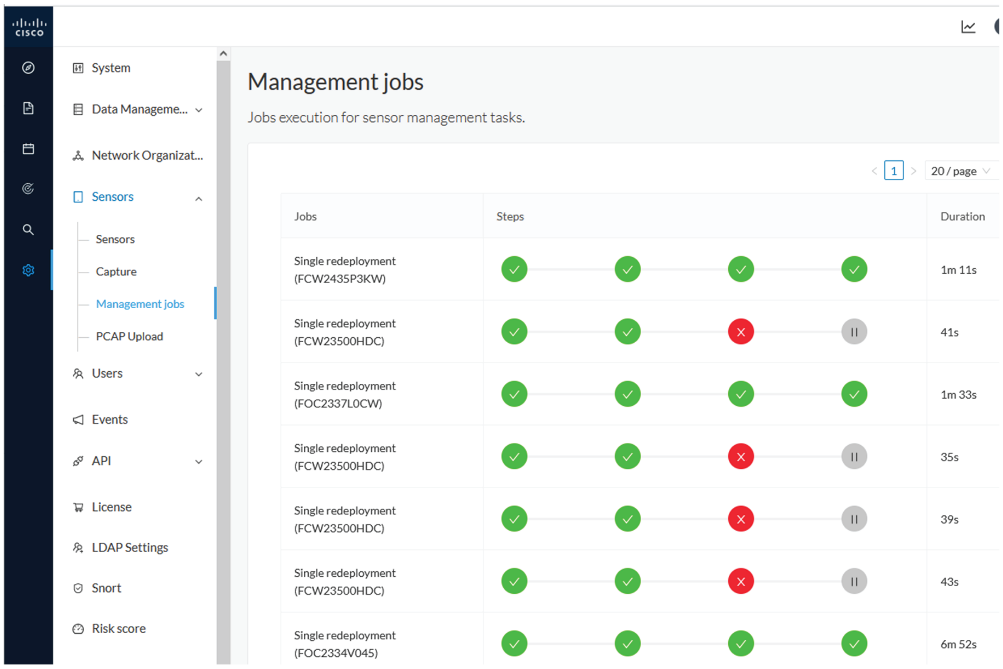
Install a new extension

Once the sensor management extension is installed, you will find a new management job under the sensor administration menu (Management jobs), and the Install via extension button will be enabled in the Sensor Explorer page.

Management jobs

As some deployment tasks on sensors can take several minutes, this page shows the jobs execution status and advancement for each sensor deployed with the sensor management extension.

This page is only visible when the sensor management extension is installed in Cisco Cyber Vision.



Management jobs

Jobs execution for sensor management tasks.

Jobs	Steps				Duration
Single redeployment (FCW2435P3KW)	✓	✓	✓	✓	1m 11s
Single redeployment (FCW23500HDC)	✓	✓	✗	⏸	41s
Single redeployment (FOC2337L0CW)	✓	✓	✓	✓	1m 33s
Single redeployment (FCW23500HDC)	✓	✓	✗	⏸	35s
Single redeployment (FCW23500HDC)	✓	✓	✗	⏸	39s
Single redeployment (FCW23500HDC)	✓	✓	✗	⏸	43s
Single redeployment (FOC2334V045)	✓	✓	✓	✓	6m 52s

You will find the following jobs:

- Single deployment

  This job is launched when clicking the Deploy Cisco device button in the sensor administration page, that is when a new IOx sensor is deployed.

- Single redeployment

  This job is launched when clicking the Reconfigure Redeploy button in the sensor administration page, that is when deploying on a sensor that has already been deployed. This option is used for example to change the sensor's parameters like enabling active discovery.

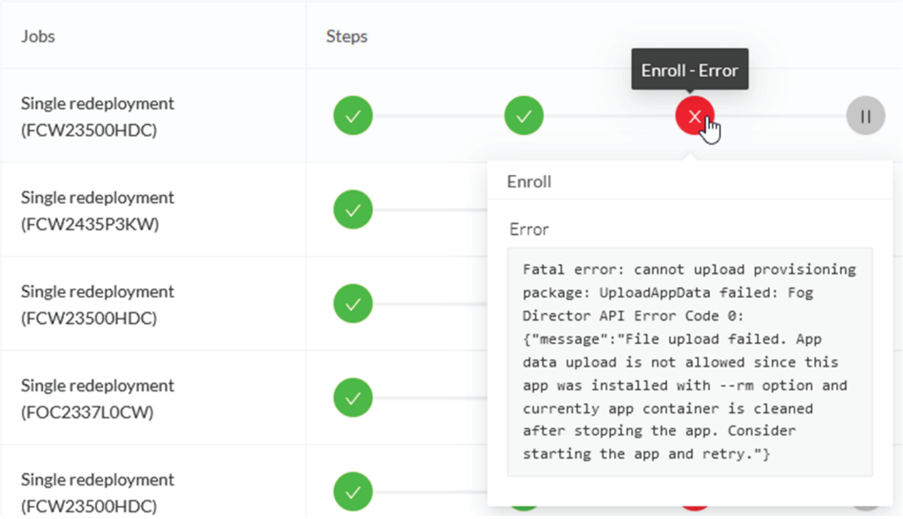
- Single removal

  This job is launched when clicking the Remove button from the sensor administration page.

- Update all devices

This job is launched when clicking the Update Cisco devices button from the sensor administration page. A unique job is created for all managed sensors that are being updated.

If a job fails, you can click on the error icon to view detailed logs.



Jobs	Steps
Single redeployment (FCW23500HDC)	
Single redeployment (FCW2435P3KW)	
Single redeployment (FCW23500HDC)	
Single redeployment (FOC2337L0CW)	
Single redeployment (FCW23500HDC)	

Enroll - Error

Enroll

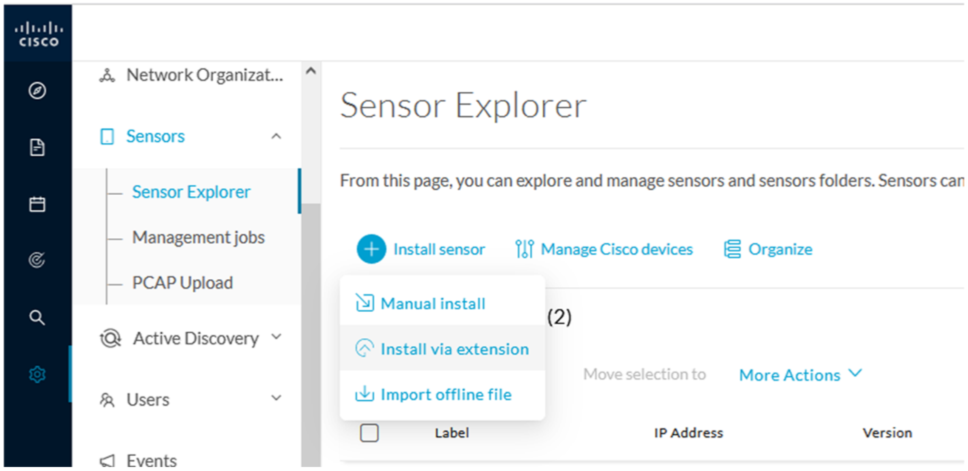
Error

```
Fatal error: cannot upload provisioning
package: UploadAppData failed: Fog
Director API Error Code 0:
{"message":"File upload failed. App
data upload is not allowed since this
app was installed with --rm option and
currently app container is cleaned
after stopping the app. Consider
starting the app and retry."}
```

Create a sensor

Procedure

Step 1 In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer and click **Install sensor**, then **Install via extension**.



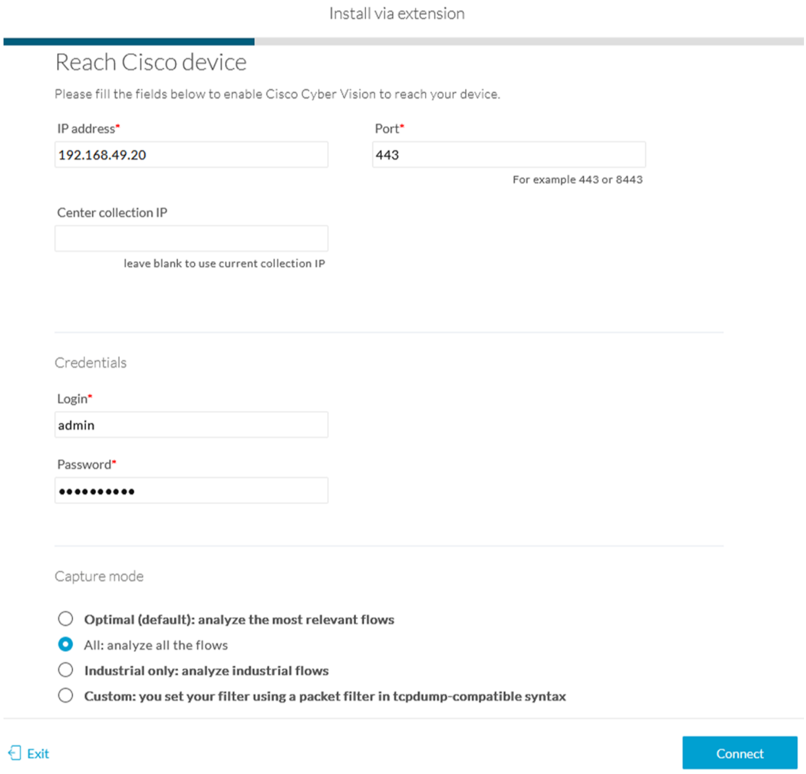
Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can

Step 2 Fill the requested fields so Cisco Cyber Vision can reach the device:

- IP address: admin address of the device.

- Port: management port (443).
- Login: user with the admin rights of the device.
- Password: password of the admin user.
- Capture Mode: Optionally, select a capture mode.



Install via extension

Reach Cisco device

Please fill the fields below to enable Cisco Cyber Vision to reach your device.

IP address*: 192.168.49.20

Port*: 443

For example 443 or 8443

Center collection IP:

leave blank to use current collection IP

Credentials

Login*: admin

Password*: ••••••••••

Capture mode

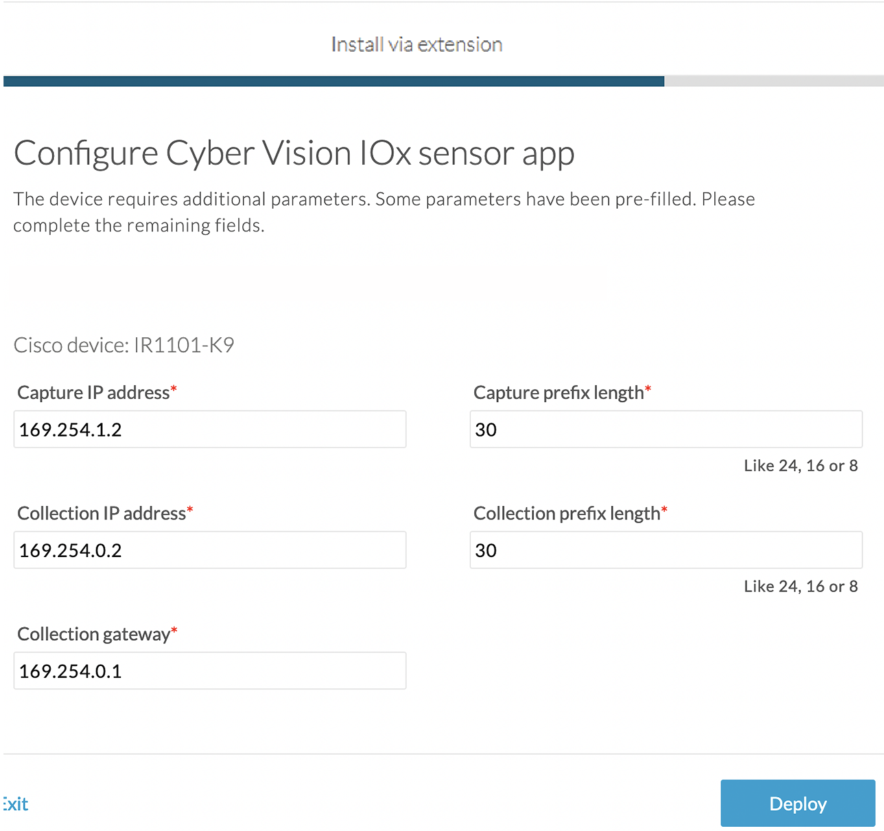
○ Optimal (default): analyze the most relevant flows
● All: analyze all the flows
○ Industrial only: analyze industrial flows
○ Custom: you set your filter using a packet filter in tcpdump-compatible syntax

Step 3 Click **Connect**.

The Center will join the device and the second parameter list will be displayed. For this step to succeed, the device needs to be reachable by the Center on its eth1 connection.

Configure the sensor

If the Center can join the device, the following form appears:



Configure Cyber Vision IOx sensor app

The device requires additional parameters. Some parameters have been pre-filled. Please complete the remaining fields.

Cisco device: IR1101-K9

Capture IP address*: 169.254.1.2

Capture prefix length*: 30

Like 24, 16 or 8

Collection IP address*: 169.254.0.2

Collection prefix length*: 30

Like 24, 16 or 8

Collection gateway*: 169.254.0.1

While some parameters are filled automatically, you can still change them if necessary.

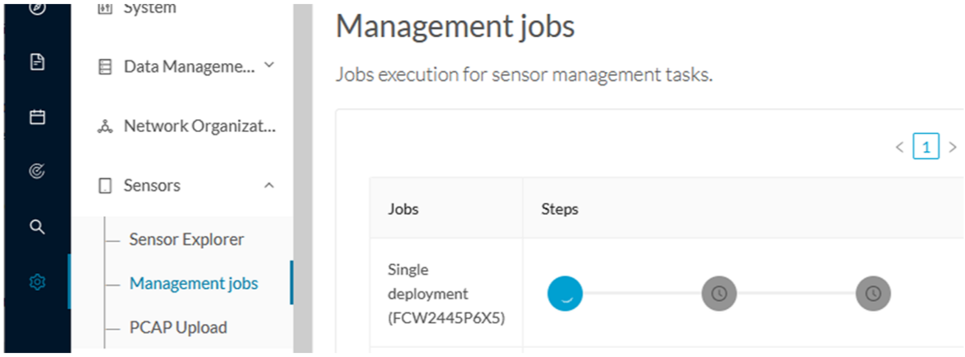
Procedure

Step 1 Fill the following parameters for the Collection interface:

- Capture IP address: IP address destination of the monitor session in the Cisco IR1101
- Capture prefix length: mask of the capture IP address
- Collection IP address: IP address of the sensor in the Cisco IR1101
- Collection prefix length: mask of the Collection IP address
- Collection gateway: gateway of the Collection IP address

Step 2 Click **Deploy**.

The Center starts deploying the sensor application on the target equipment. This can take a few minutes. You can go to the Management jobs page to check the deployment advancements.



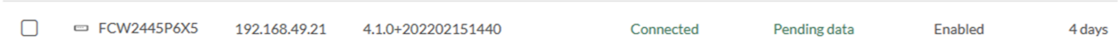
Management jobs

Jobs execution for sensor management tasks.

Jobs	Steps
Single deployment (FCW2445P6X5)	

Once the deployment is finished, a new sensor appears in the sensors list of the Sensor Explorer page.

The sensor's status will eventually turn to Connected.



□	FCW2445P6X5	192.168.49.21	4.1.0+202202151440	Connected	Pending data	Enabled	4 days

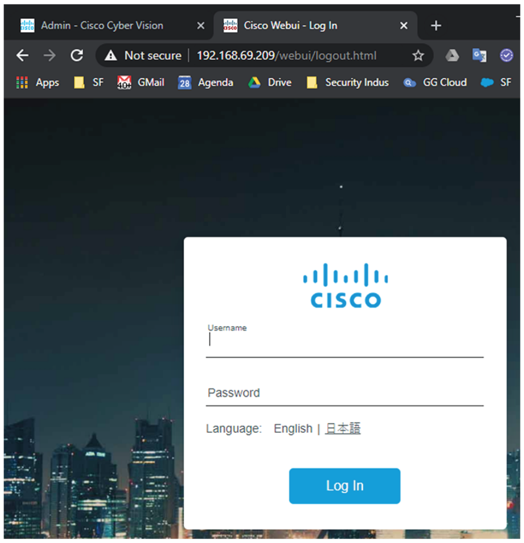
CHAPTER 8

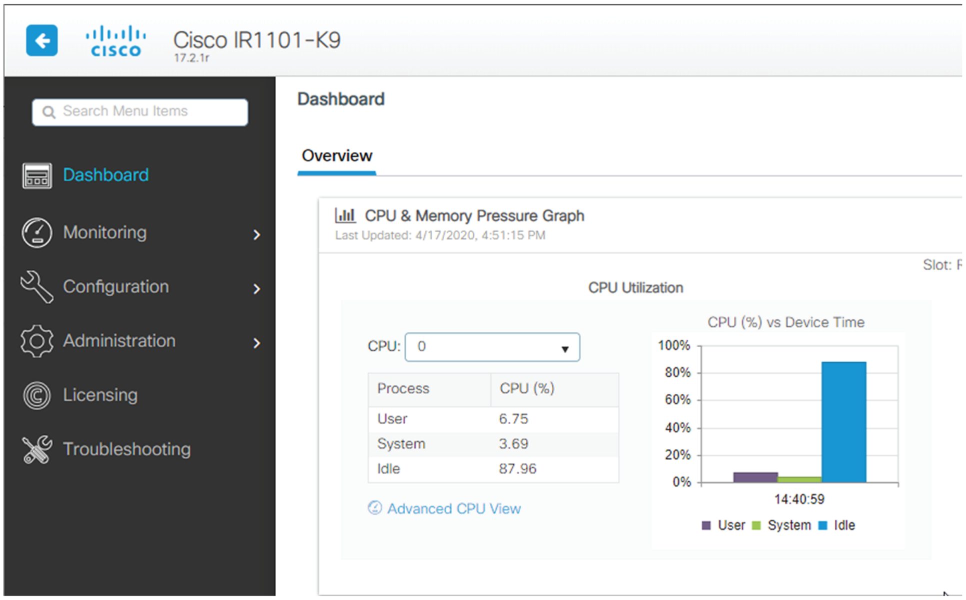
Procedure with the Local Manager

After the Initial configuration, proceed to the steps described in this section.

Access the IOx Local Manager

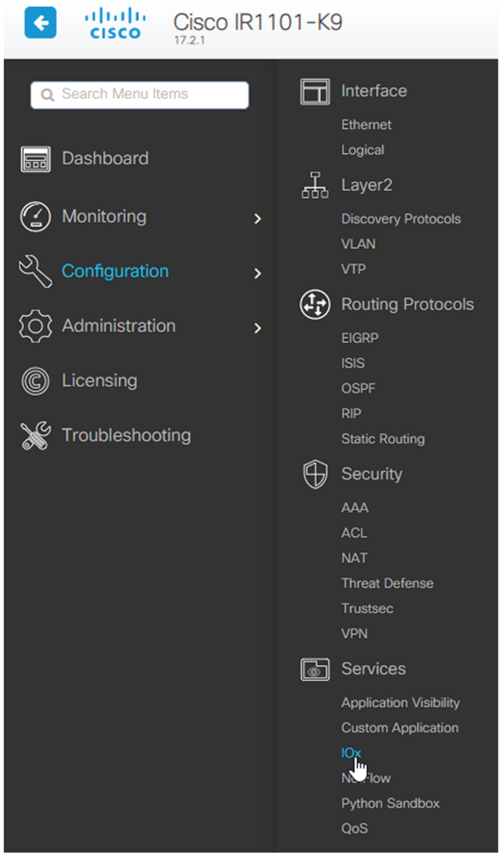
1. Open a browser and navigate to the IP address you configured on the interface you are connected to.
2. Log in using the Cisco IR1101 admin user account and password.



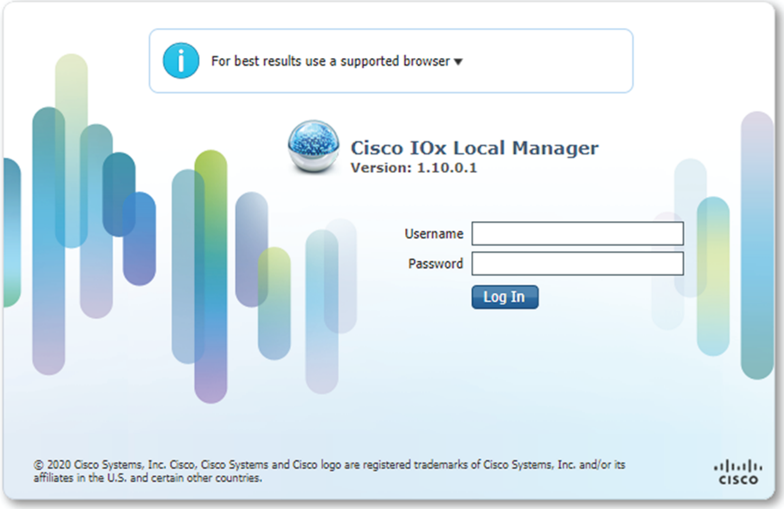


Process	CPU (%)
User	6.75
System	3.69
Idle	87.96

3. Once logged into the Local Manager, navigate to Configuration > Services > IOx.



4. Log in using the user account and password.


For best results use a supported browser ▾

Cisco IOx Local Manager
Version: 1.10.0.1

Username
Password
Log In

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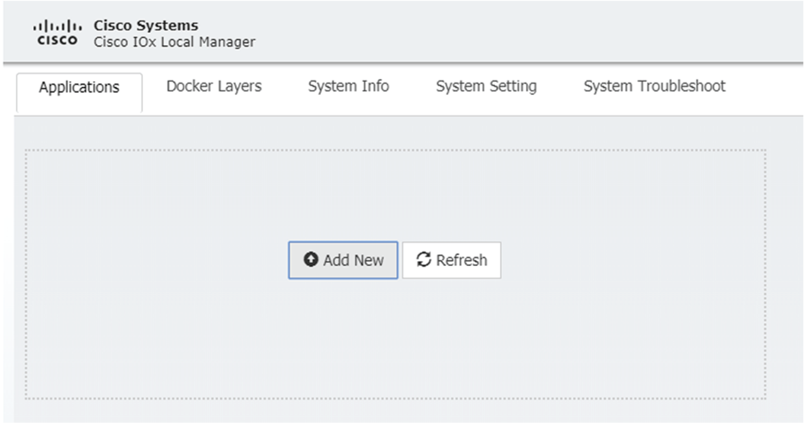
Install the sensor virtual application

Once logged in, the following menu appears:


Cisco Systems
Cisco IOx Local Manager

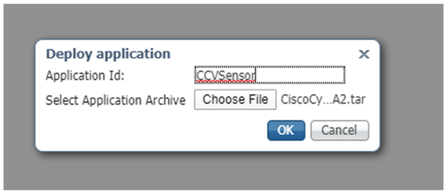
Applications | Docker Layers | System Info | System Setting | System Troubleshoot

Add New
Refresh

1. Click **Add New**.
2. Add an Application id name (e.g. CCVSensor).
3. Select the application archive file

   (i.e. "CiscoCyberVision-IOx-aarch64-<version>.tar").

Note If you aim to install a sensor with **Active Discovery**, select the required application archive file (i.e. "CiscoCyberVision-IOx-Active-Discovery-aarch64-<version>.tar").

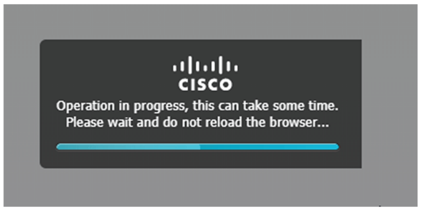


Deploy application

Application Id: CCVSensor

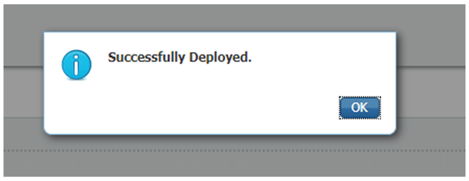
Select Application Archive: Choose File CiscoCy...A2.tar

The installation takes a few minutes.

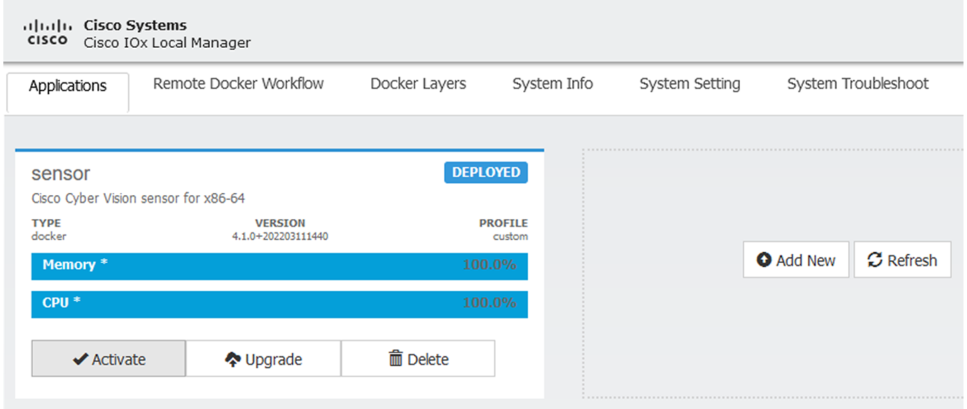


Operation in progress, this can take some time.
Please wait and do not reload the browser...

When the application is installed, the following message is displayed and the sensor application appears:



Successfully Deployed.



Cisco Systems
Cisco IOx Local Manager

sensor — DEPLOYED

Cisco Cyber Vision sensor for x86-64

TYPE: docker
VERSION: 4.1.0+202203111440
PROFILE: custom

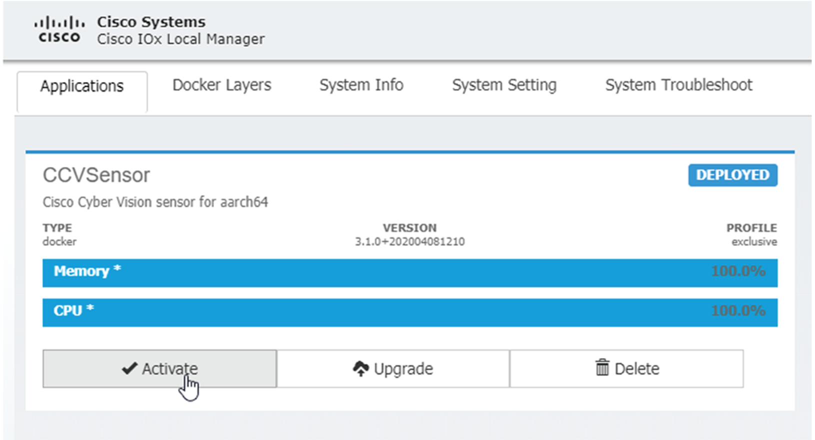
Memory * 100.0%

CPU * 100.0%

Configure the sensor virtual application

Procedure

Step 1 Click **Activate** to launch the configuration of the sensor application.



CCVSensor DEPLOYED

Cisco Cyber Vision sensor for aarch64

TYPE docker

VERSION 3.1.0+202004081210

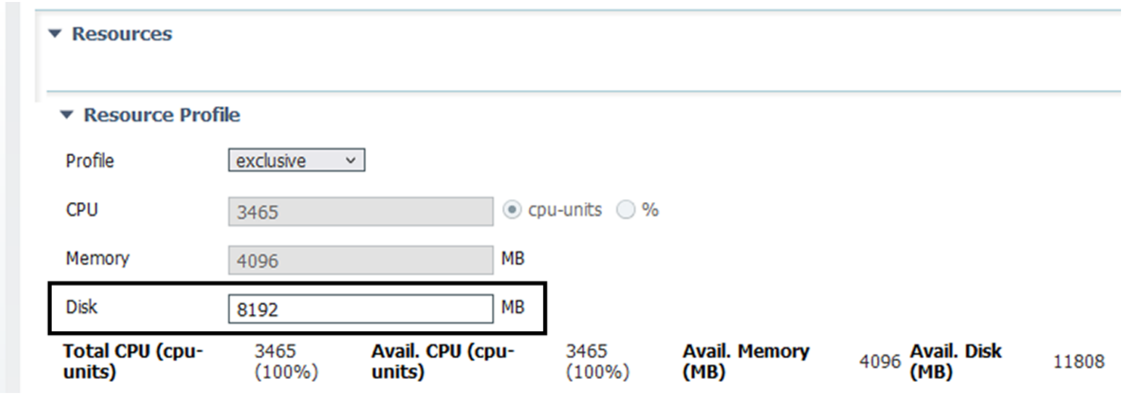
PROFILE exclusive

Memory * 100.0%

CPU * 100.0%

Step 2 Deploy the Resource Profile menu and set the disk size. The procedure differs whether the device has a SSD or not:

- If the device has a SSD, set the necessary disk size. It should be at least 4GB.



Profile: exclusive

CPU: 3465 ● cpu-units ○ %

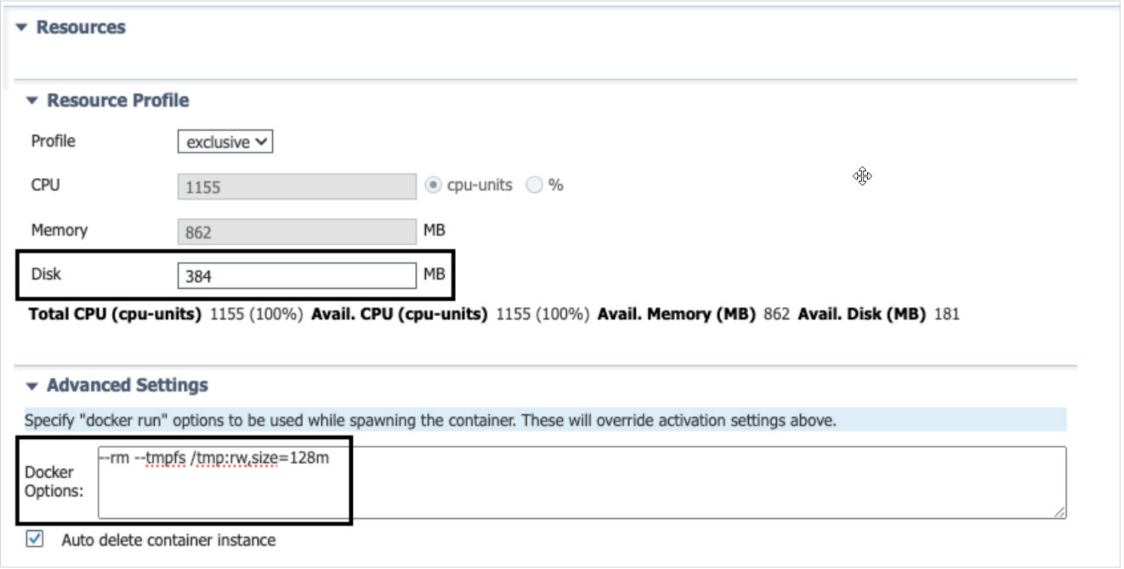
Memory: 4096 MB

Disk: 8192 MB

Total CPU (cpu-units) 3465 (100%) **Avail. CPU (cpu-units)** 3465 (100%) **Avail. Memory (MB)** 4096 **Avail. Disk (MB)** 11808

- If the device has no SSD, set the disk size to 384MB, then deploy the Advanced Settings menu and configure tmpfs by filling the docker options text area with:

```
--tmpfs /tmp:rw,size=128m
```



Resources

Resource Profile

Profile	exclusive	
CPU	1155	● cpu-units ○ %
Memory	862	MB
Disk	384	MB

Total CPU (cpu-units) 1155 (100%) **Avail. CPU (cpu-units)** 1155 (100%) **Avail. Memory (MB)** 862 **Avail. Disk (MB)** 181

Advanced Settings

Specify "docker run" options to be used while spawning the container. These will override activation settings above.

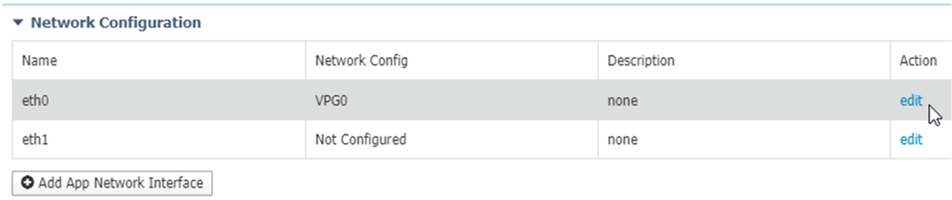
Docker Options: --rm --tmpfs /tmp:rw,size=128m

☑ Auto delete container instance

Step 3 Bind the eth0 and eth1 interfaces in the container to an interface on the host in the Network Configuration menu.

eth0:

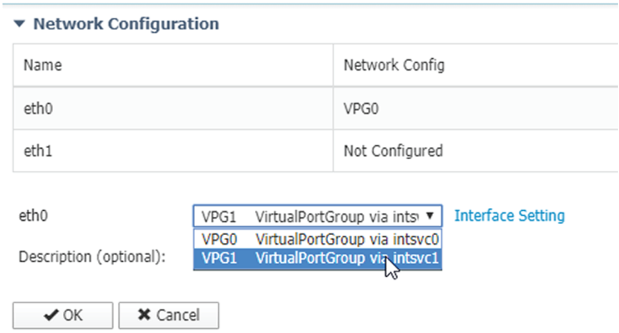
a) Click **edit** in the eth0 line.



Network Configuration

Name	Network Config	Description	Action
eth0	VPG0	none	edit
eth1	Not Configured	none	edit

b) Select the **VPG1** interface.



Network Configuration

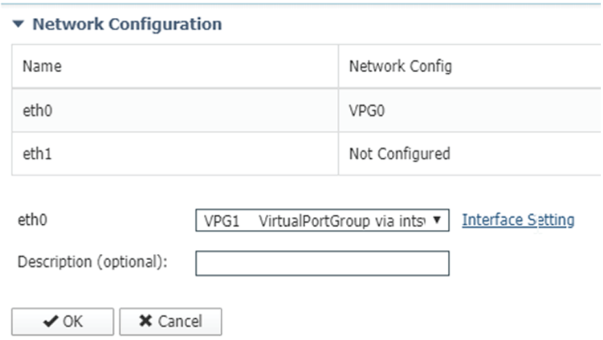
Name	Network Config
eth0	VPG0
eth1	Not Configured

eth0: VPG1 VirtualPortGroup via ints▾ Interface Setting

Description (optional):

VPG0 VirtualPortGroup via intsvc0
VPG1 VirtualPortGroup via intsvc1
✔ OK
✖ Cancel

c) Click **Interface setting**.



▼ Network Configuration

Name	Network Config
eth0	VPG0
eth1	Not Configured

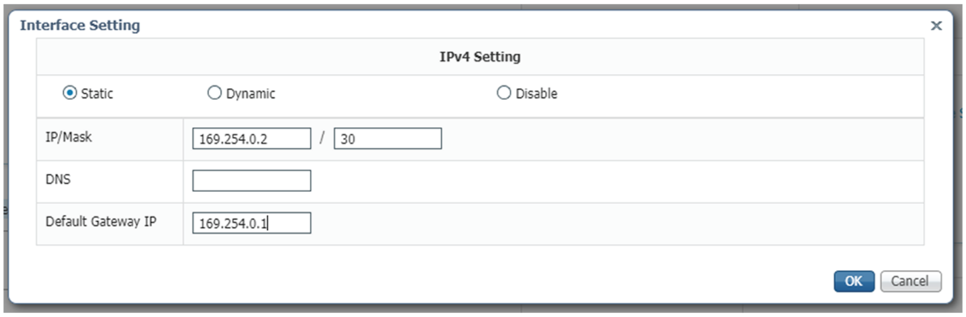
eth0: VPG1 VirtualPortGroup via ints▾

Description (optional):

The Interface Setting window pops up.

d) Apply the following configurations:

- Set IPv4 as **Static**.
- IP/Mask: 169.254.0.2 / 30
- Default gateway: 169.254.0.1



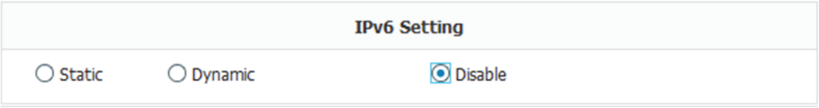
Interface Setting

IPv4 Setting

● Static ○ Dynamic ○ Disable

IP/Mask	169.254.0.2 / 30
DNS	
Default Gateway IP	169.254.0.1

e) Check that IPV6 is set to **Disable**.

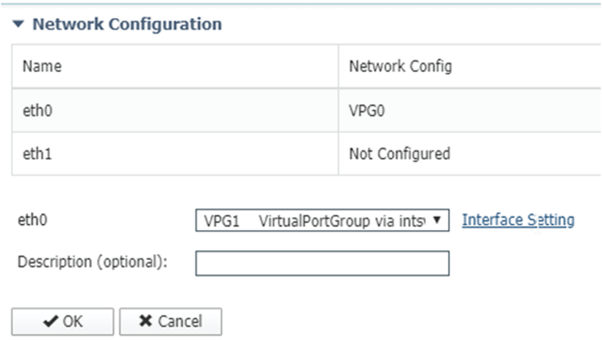


IPv6 Setting

○ Static ○ Dynamic ● Disable

f) Click **OK** to save the interface settings.

You're back to the Network Configuration menu.



▼ Network Configuration

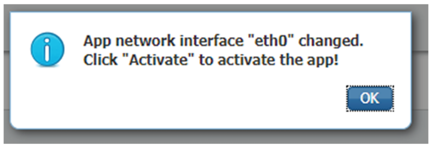
Name	Network Config
eth0	VPG0
eth1	Not Configured

eth0 VPG1 VirtualPortGroup via ints ▾ Interface Setting

Description (optional):

g) Click **OK** to save the network configurations.

A popup that confirms changes appears.



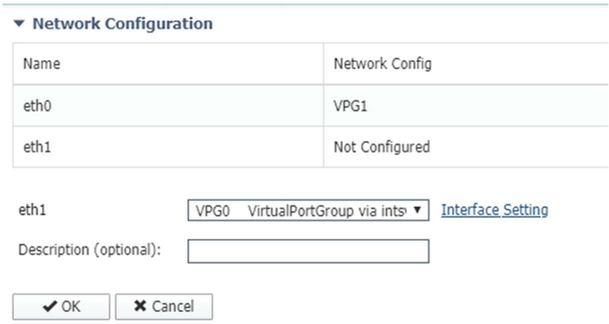
App network interface "eth0" changed.
Click "Activate" to activate the app!

h) Click **OK**.

Step 4 **eth1:**

a) Click **edit** in the eth1 line.

b) Select the **VPG0** interface.



▼ Network Configuration

Name	Network Config
eth0	VPG1
eth1	Not Configured

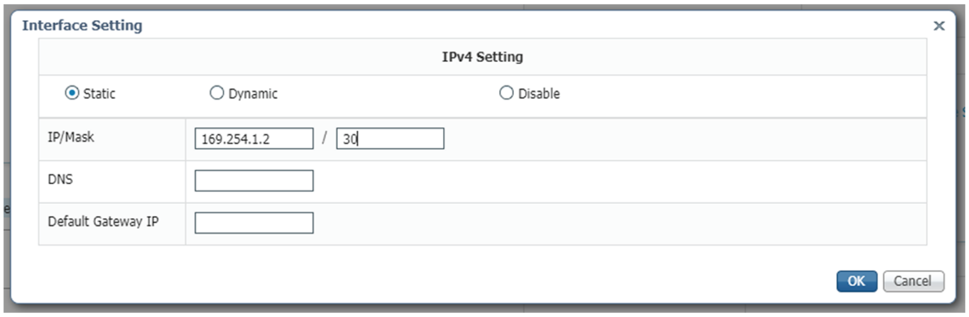
eth1 VPG0 VirtualPortGroup via ints ▾ Interface Setting

Description (optional):

c) Click **Interface setting**.

d) Apply the following configurations:

- Set IPv4 as **Static**.
- IP/Mask: 169.254.1.2 / 30



IPv4 Setting

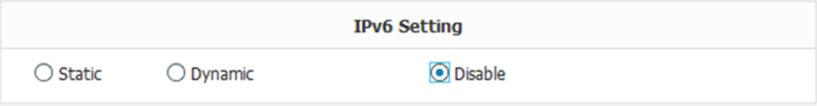
● Static ○ Dynamic ○ Disable

IP/Mask: 169.254.1.2 / 30

DNS:

Default Gateway IP:

e) **Disable** IPv6.



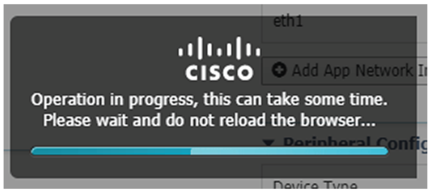
IPv6 Setting

○ Static ○ Dynamic ● Disable

f) Click **OK**, and click **OK** again when you're back to the Network Configuration menu to save the interface settings.

Step 5 Click the **Activate App** button.

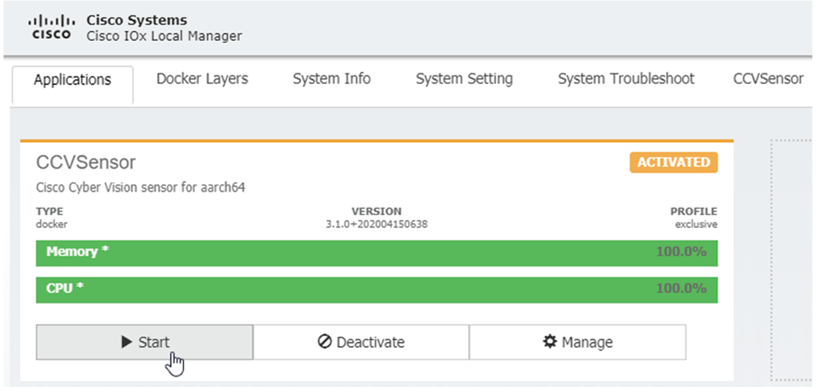
The operation takes several seconds.



Operation in progress, this can take some time.
Please wait and do not reload the browser...

Step 6 Go to the Applications menu to see the application's status.

The application is activated and needs to be started.



CCVSensor ACTIVATED

Cisco Cyber Vision sensor for aarch64

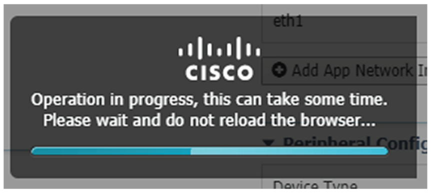
TYPE: docker
VERSION: 3.1.0+202004150638
PROFILE: exclusive

Memory * 100.0%

CPU * 100.0%

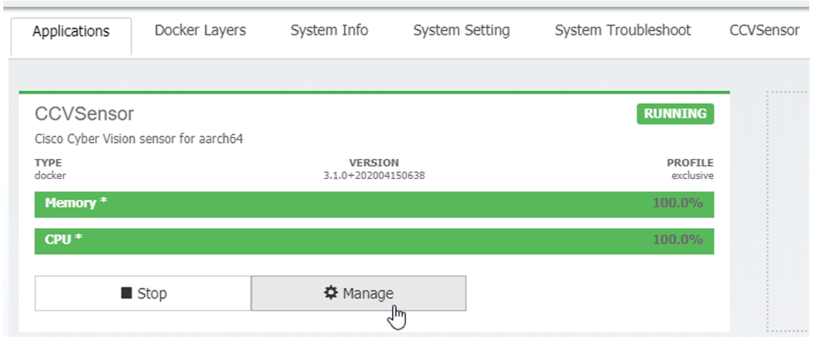
Step 7 Click the **Start** button.

The operation takes several seconds.



Operation in progress, this can take some time.
Please wait and do not reload the browser...

The applications' status changes to RUNNING.



CCVSensor RUNNING

Cisco Cyber Vision sensor for aarch64

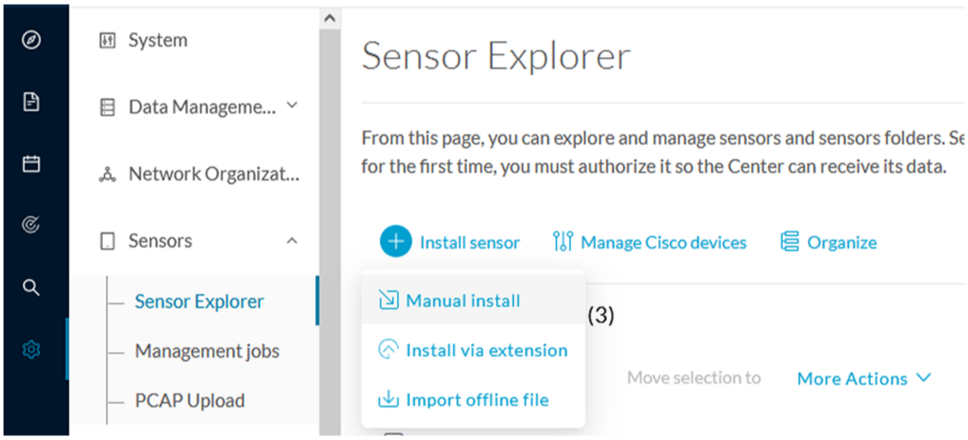
TYPE	VERSION	PROFILE
docker	3.1.0+202004150638	exclusive

Memory * 100.0%

CPU * 100.0%

Generate the provisioning package

1. In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer and click **Install sensor**, then **Manual install**.

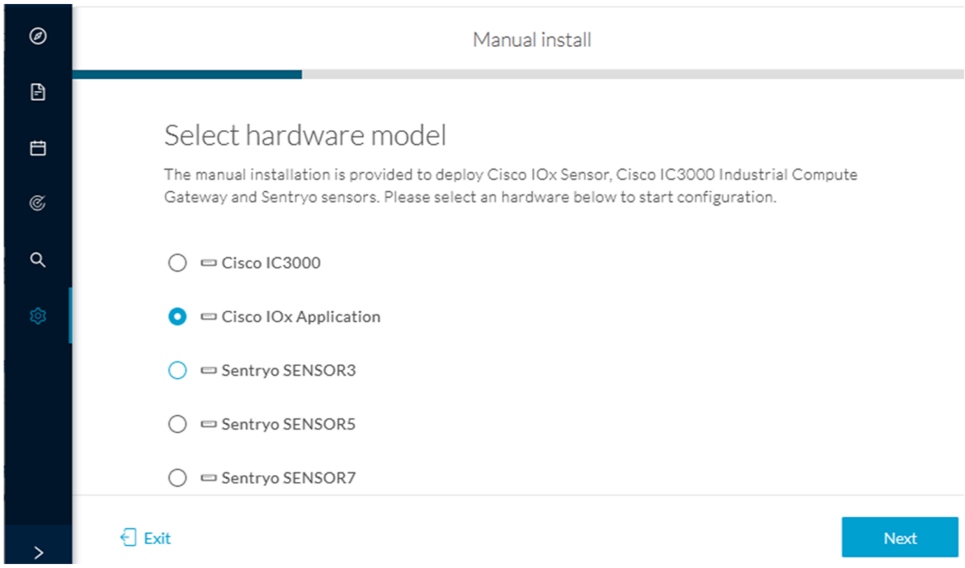


Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Se
for the first time, you must authorize it so the Center can receive its data.

The manual install wizard appears.

2. Select **Cisco IOx Application** and click **Next**.



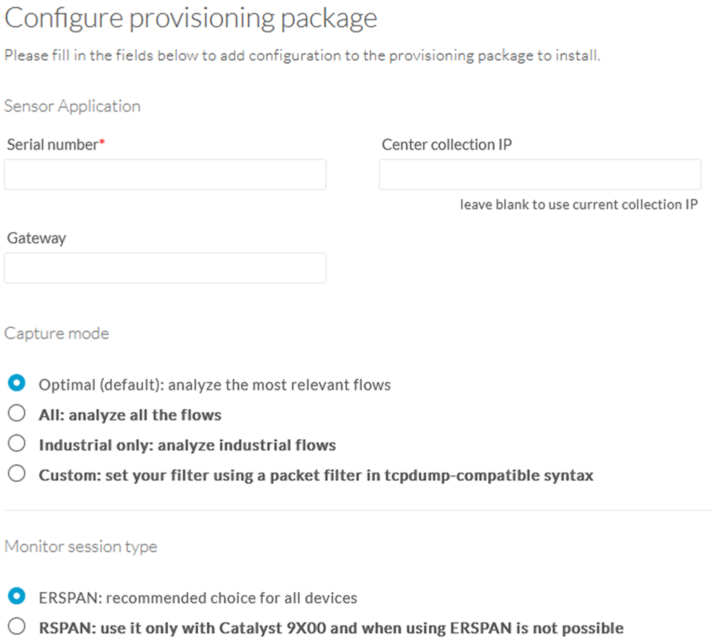
Manual install

Select hardware model

The manual installation is provided to deploy Cisco IOx Sensor, Cisco IC3000 Industrial Compute Gateway and Sentryo sensors. Please select an hardware below to start configuration.

- ○ Cisco IC3000
- ● Cisco IOx Application
- ○ Sentryo SENSOR3
- ○ Sentryo SENSOR5
- ○ Sentryo SENSOR7

3. Fill the fields to configure the sensor provisioning package:
    - The serial number of the hardware.
    - Center IP: leave blank.
    - Gateway: add if necessary.
    - Optionally, select a capture mode.
    - Optionally, select RSPAN (only with Catalyst 9x00 and if using ERSPAN is not possible).



Configure provisioning package

Please fill in the fields below to add configuration to the provisioning package to install.

Sensor Application

Serial number*

Center collection IP

leave blank to use current collection IP

Gateway

Capture mode

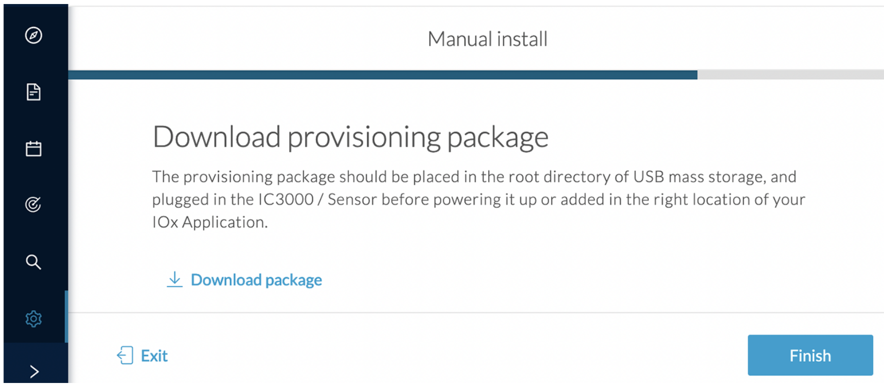
- ● Optimal (default): analyze the most relevant flows
- ○ All: analyze all the flows
- ○ Industrial only: analyze industrial flows
- ○ Custom: set your filter using a packet filter in tcpdump-compatible syntax

Monitor session type

- ● ERSPAN: recommended choice for all devices
- ○ RSPAN: use it only with Catalyst 9X00 and when using ERSPAN is not possible

4. Click **Create sensor**.

5. Click the link to download the provisioning package.



Manual install

Download provisioning package

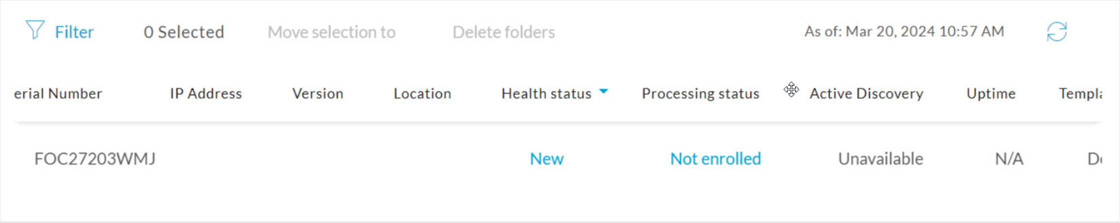
The provisioning package should be placed in the root directory of USB mass storage, and plugged in the IC3000 / Sensor before powering it up or added in the right location of your IOx Application.

This will download the provisioning package which is a zip archive file with the following name structure: sbs-sensor-config-<serialnumber>.zip (e.g. "sbs-sensor-configFCW23500HDC.zip").

6. Click **Finish**.

7. A new entry for the sensor appears in the Sensor Explorer list.

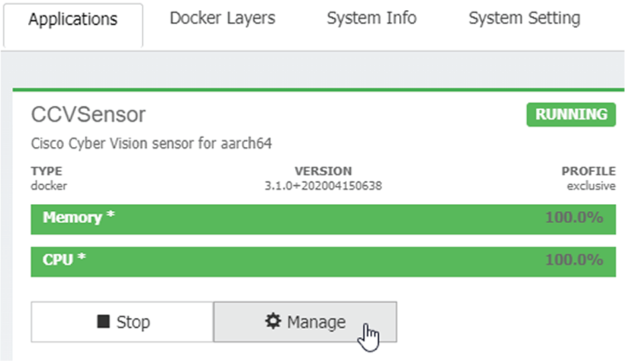
The sensor status will switch from Disconnected to New.



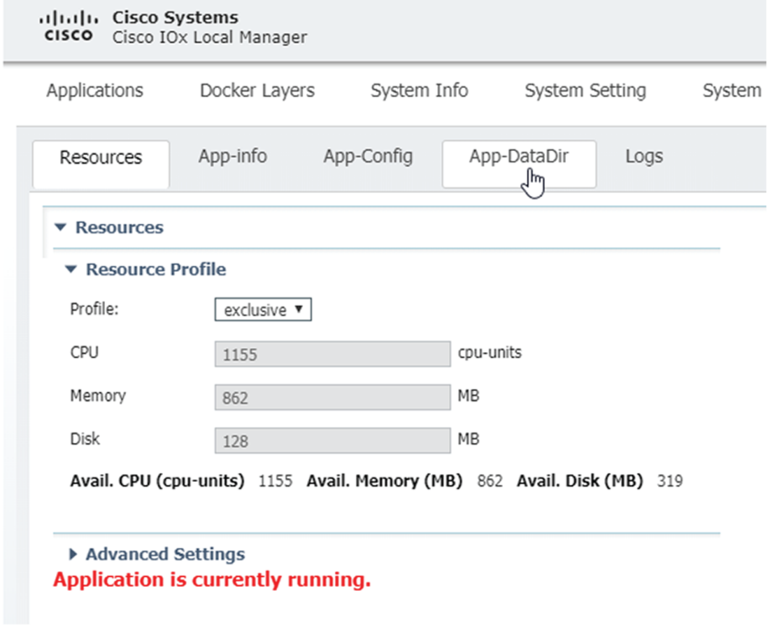
erial Number	IP Address	Version	Location	Health status	Processing status	Active Discovery	Uptime	Templ:
FOC27203WMJ				New	Not enrolled	Unavailable	N/A	D

Import the provisioning package

1. In the Local Manager, in the IOx configuration menu, click **Manage**.



2. Navigate to **App-DataDir**.



Profile: exclusive

CPU 1155 cpu-units

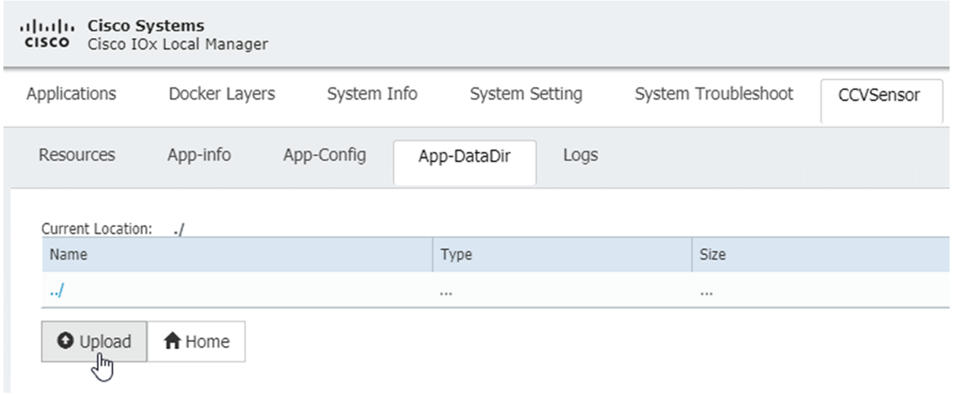
Memory 862 MB

Disk 128 MB

Avail. CPU (cpu-units) 1155 **Avail. Memory (MB)** 862 **Avail. Disk (MB)** 319

Application is currently running.

3. Click **Upload**.

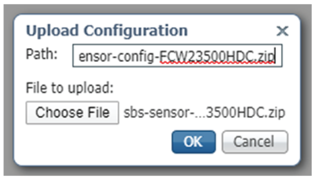


Current Location: ./

Name	Type	Size
../	...	...

4. Choose the provisioning package downloaded (i.e. "sbs-sensor-config-FCW23500HDC.zip"), and add the exact file name in the path field (i.e. "sbs-sensor-config-FCW23500HDC.zip").

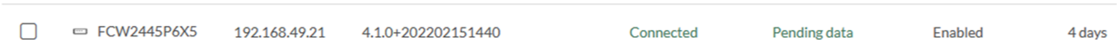
5. Click **OK**.



Path: ensor-config-FCW23500HDC.zip

File to upload: sbs-sensor-...3500HDC.zip

6. After a few seconds, the sensor appears as Connected in Cisco Cyber Vision.



□	FCW2445P6X5	192.168.49.21	4.1.0+202202151440	Connected	Pending data	Enabled	4 days

CHAPTER 9

Procedure with the CLI

After the Initial configuration, proceed to the steps described in this section.

Configure the sensor application

without SSD

Note In this section, "CCVSensor" is used as the appid.

Procedure

Step 1 Connect to the Cisco IR1101 through SSH or a console.

Step 2 Configure the application payload by typing the following commands:

```
enable
configure terminal
app-hosting appid CCVSensor
  app-vnic gateway0 virtualportgroup 1 guest-interface 0
    guest-ipaddress 169.254.0.2 netmask 255.255.255.252
  app-vnic gateway1 virtualportgroup 0 guest-interface 1
      guest-ipaddress 169.254.1.2 netmask 255.255.255.252
  app-default-gateway 169.254.0.1 guest-interface 0
  app-resource docker
    run-opts 1 "--tmpfs /tmp:rw,size=128m"
end
```

with SSD

Note In this section, "CCVSensor" is used as the appid.

Procedure

Step 1 Connect to he Cisco IR1101 through SSH or a console.

Step 2 Configure the application payload by typing the following commands:

```
enable
configure terminal
app-hosting appid CCVSensor
  app-vnic gateway0 virtualportgroup 1 guest-interface 0
    guest-ipaddress 169.254.0.2 netmask 255.255.255.252
  app-vnic gateway1 virtualportgroup 0 guest-interface 1
      guest-ipaddress 169.254.1.2 netmask 255.255.255.252
  app-default-gateway 169.254.0.1 guest-interface 0
  app-resource docker
    run-opts 1
end
```

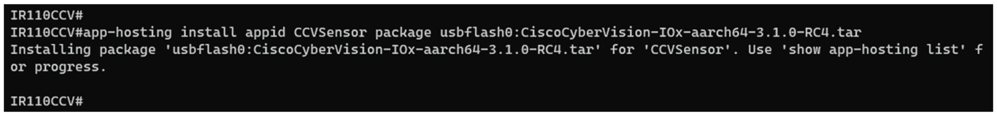
Install the sensor application

The sensor package needs to be collected from cisco.com. The file has the following name structure:

CiscoCyberVision-IOx-aarch64-<version>.tar.

1. Copy the package to a USB key or in the flash memory.
2. Type the following command on the Cisco IR1101's CLI:

```
app-hosting install appid CCVSensor package
usbflash0:CiscoCyberVision-IOx-aarch64-4.1.0.tar
```



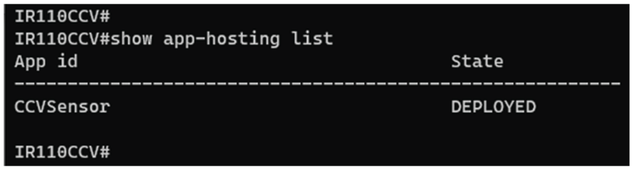
```
IR110CCV#
IR110CCV#app-hosting install appid CCVSensor package usbflash0:CiscoCyberVision-IOx-aarch64-3.1.0-RC4.tar
Installing package 'usbflash0:CiscoCyberVision-IOx-aarch64-3.1.0-RC4.tar' for 'CCVSensor'. Use 'show app-hosting list' f
or progress.

IR110CCV#
```

Note Adjust "usbflash0:" in accordance with the sensor package's localization (USB port or flash memory).

Note Replace "CiscoCyberVision-IOx-aarch64-4.1.0.tar" with the right filename.

3. Check that the application is in DEPLOYED state:

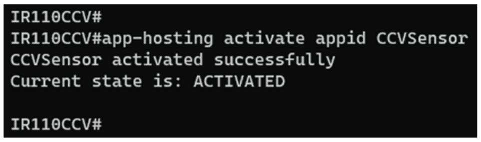
```
show app-hosting list
```



```
IR110CCV#
IR110CCV#show app-hosting list
App id                                   State
---------------------------------------------------------
CCVSensor                                DEPLOYED

IR110CCV#
```

4. Activate the application using the following command:

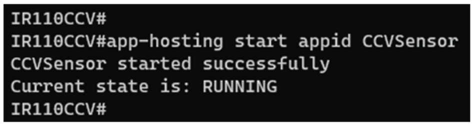
```
app-hosting activate appid CCVSensor
```



```
IR110CCV#
IR110CCV#app-hosting activate appid CCVSensor
CCVSensor activated successfully
Current state is: ACTIVATED

IR110CCV#
```

5. Start the application using the following command:

```
app-hosting start appid CCVSensor
```

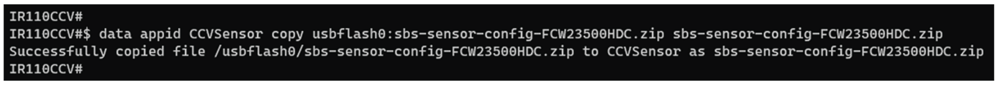


```
IR110CCV#
IR110CCV#app-hosting start appid CCVSensor
CCVSensor started successfully
Current state is: RUNNING
IR110CCV#
```

Copy the sensor application's provisioning package

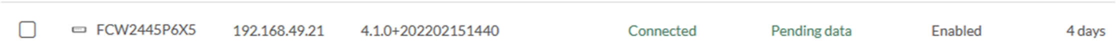
- Copy the provisioning package from the USB key to the application by typing the following command:

```
app-hosting data appid CCVSensor copy usbflash0:sbs-sensor-config-<serialnumber>.zip
sbs-sensor-config-<serialnumber>.zip
```



```
IR110CCV#
IR110CCV#$ data appid CCVSensor copy usbflash0:sbs-sensor-config-FCW23500HDC.zip sbs-sensor-config-FCW23500HDC.zip
Successfully copied file /usbflash0/sbs-sensor-config-FCW23500HDC.zip to CCVSensor as sbs-sensor-config-FCW23500HDC.zip
IR110CCV#
```

The sensor will appear as Connected in Cisco Cyber Vision's Sensor Explorer page.



□	▭ FCW2445P6X5	192.168.49.21	4.1.0+202202151440	Connected	Pending data	Enabled	4 days

CHAPTER 10

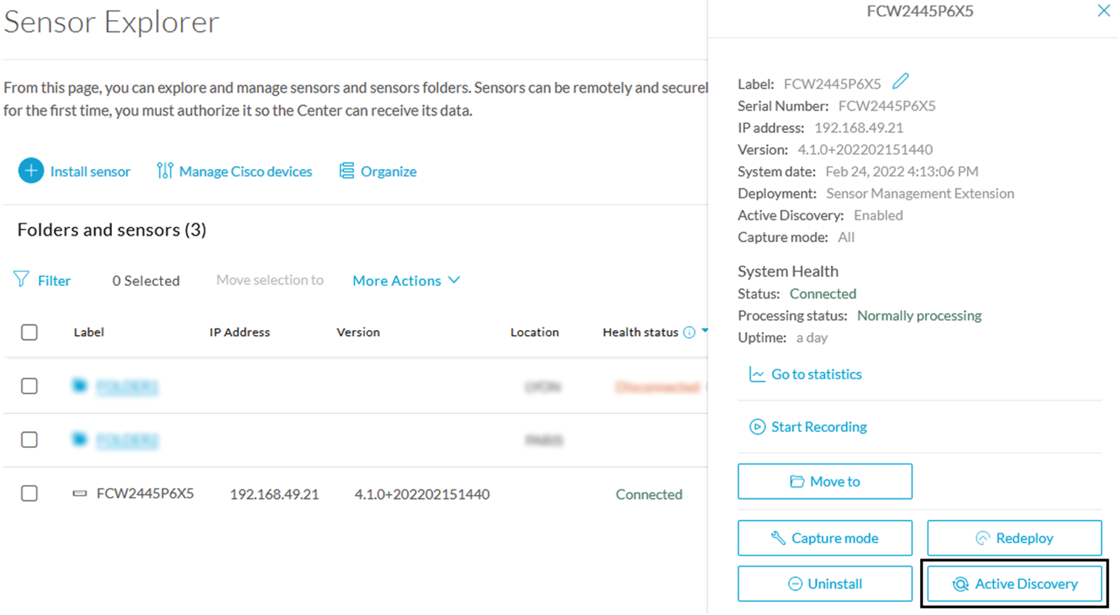
Configuration

Configure Active Discovery

Once the sensor is connected, you can change the Active Discovery's network interface so it uses the Collection network interface instead, and add several network interfaces for the sensor to perform Active Discovery on several subnetworks at the same time.

Procedure

Step 1 Click the sensor to configure and click the **Active Discovery** button on its right side panel.



Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can be remotely and securel
for the first time, you must authorize it so the Center can receive its data.

Folders and sensors (3)

□	Label	IP Address	Version	Location	Health status
□	[redacted]			[redacted]	[redacted]
□	[redacted]			[redacted]	
□	FCW2445P6X5	192.168.49.21	4.1.0+202202151440		Connected

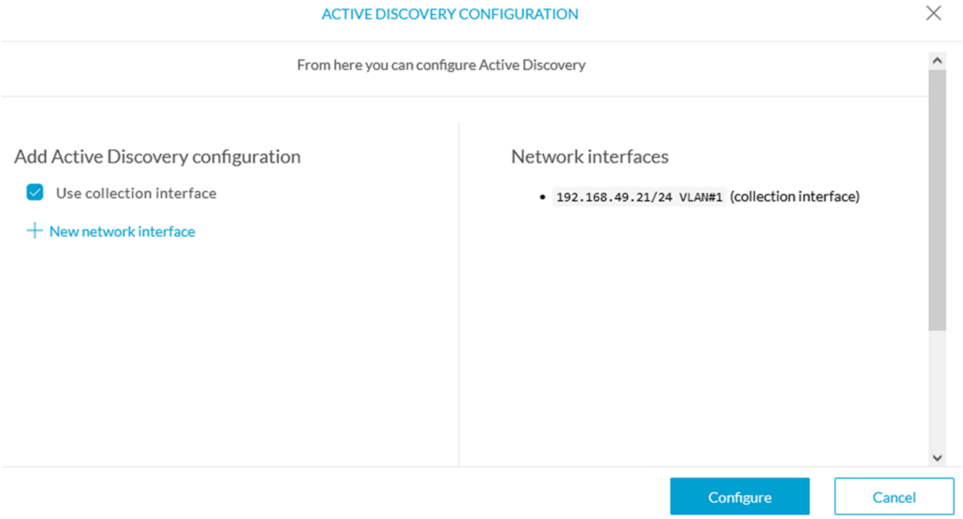
FCW2445P6X5

Label: FCW2445P6X5
Serial Number: FCW2445P6X5
IP address: 192.168.49.21
Version: 4.1.0+202202151440
System date: Feb 24, 2022 4:13:06 PM
Deployment: Sensor Management Extension
Active Discovery: Enabled
Capture mode: All

System Health
Status: Connected
Processing status: Normally processing
Uptime: a day

The Active Discovery configuration appears with the interface currently set.

Step 2 Select **Use collection interface** for the Active Discovery to use the Collection network interface.



ACTIVE DISCOVERY CONFIGURATION

From here you can configure Active Discovery

Add Active Discovery configuration

☑ Use collection interface

+ New network interface

Network interfaces

- `192.168.49.21/24 VLAN#1` (collection interface)

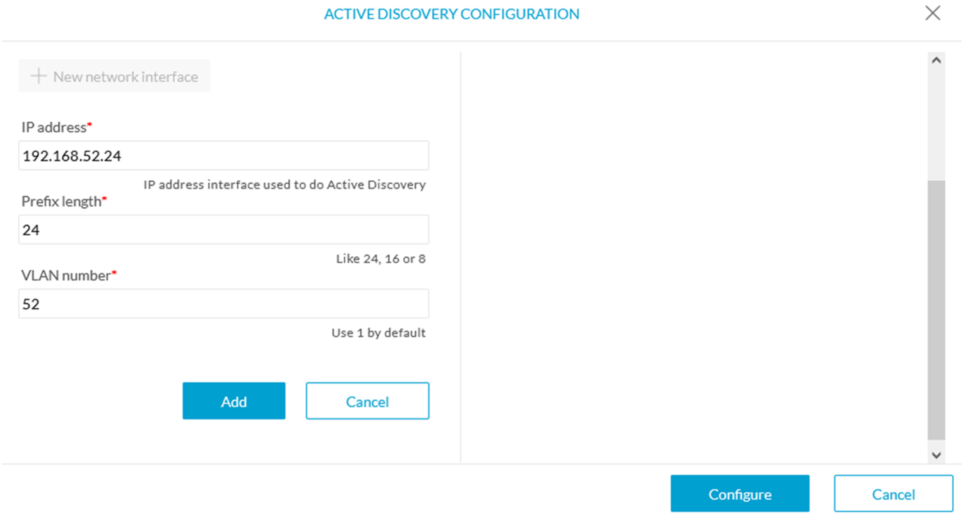
To add a network interface to Active Discovery for the sensor to perform active monitoring on another subnetwork:

Step 3 Add a new network interface by clicking the corresponding button.

Step 4 Fill the following parameters to set dedicated network interfaces:

- IP address
- Prefix length
- VLAN number

Step 5 Click **Add**.



ACTIVE DISCOVERY CONFIGURATION

IP address*

192.168.52.24

IP address interface used to do Active Discovery

Prefix length*

24

Like 24, 16 or 8

VLAN number*

52

Use 1 by default

You can add as many network interfaces as needed.

Step 6 When you are done, click **Configure**.

A message saying that the configuration has been applied successfully appears.

Configure sensor configuration template

Templates

This page allows you to create and set templates with protocol configurations and assign them to specific sensors.

Sensor templates contain protocol configurations which allow you:

- To enable or disable protocol DPI (Deep Packet Inspection) engines.
- To map UDP and TCP ports for each protocol's packet received by the sensor.

By enabling/disabling a protocol DPI engine you can decide which protocols will be analyzed.

Disabling a protocol DPI engine avoid false positives in Cisco Cyber Vision, that is when a protocol appears on the user interface when it's actually not the case because same UDP/TCP ports can be used by other non-standardized protocols.

Some protocols are disabled in the Default template because they are not commonly used or used in specific fields such as transportation. The Default template is applied on all compatible sensors.

As previously mentioned, UDP/TCP ports default configurations are mostly standardized, but conflicts still exist among field-specific protocols or with limited usage. Mapping UDP/TCP port numbers will allow packets to be sent to the correct DPI engine so they can be accurately analyzed and correctly represented in the user interface.

If the protocol's packet is sent to the wrong port, related information will end up in Security Insights/Flows with no tag.

A sensor can be associated with a single template only. Deployment of the template can fail:

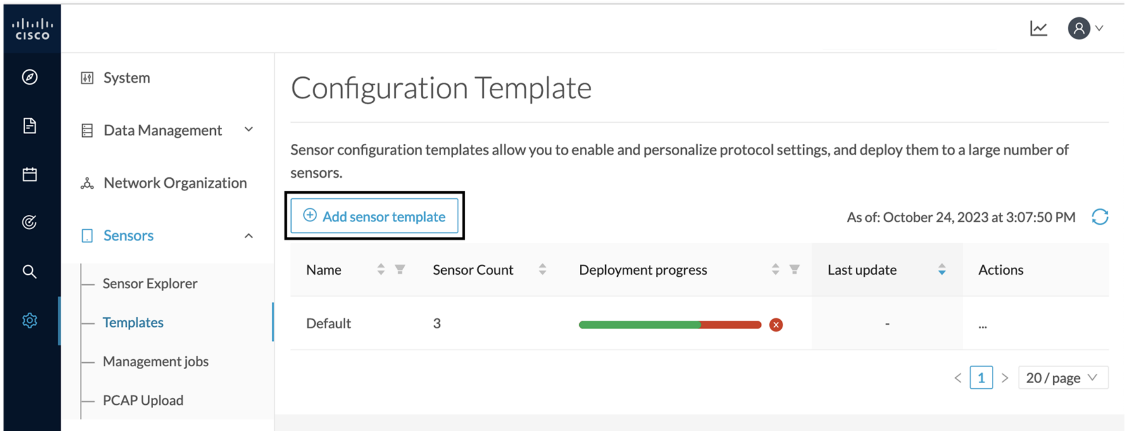
- if the sensor is disconnected,
- if there is connection issues,
- if the sensor version is too old.

Create templates

Procedure

Step 1 In Cisco Cyber Vision, navigate to Admin > Sensors > Templates.

Step 2 Click **Add sensor template**.



Configuration Template

Sensor configuration templates allow you to enable and personalize protocol settings, and deploy them to a large number of sensors.

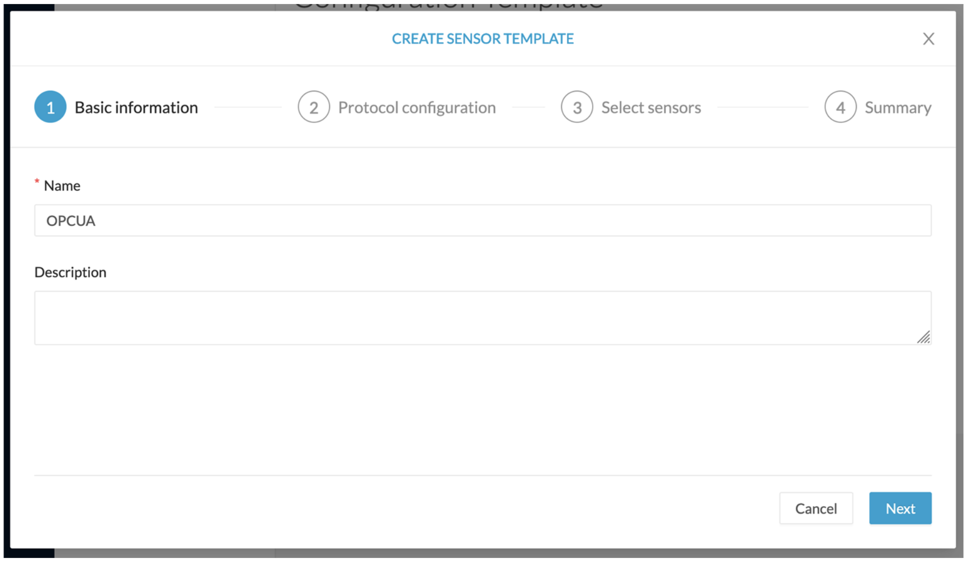
Add sensor template

As of: October 24, 2023 at 3:07:50 PM

Name	Sensor Count	Deployment progress	Last update	Actions
Default	3		-	...

The Create sensor template window pops up.

Step 3 Add a name to the template. You can also add a description.

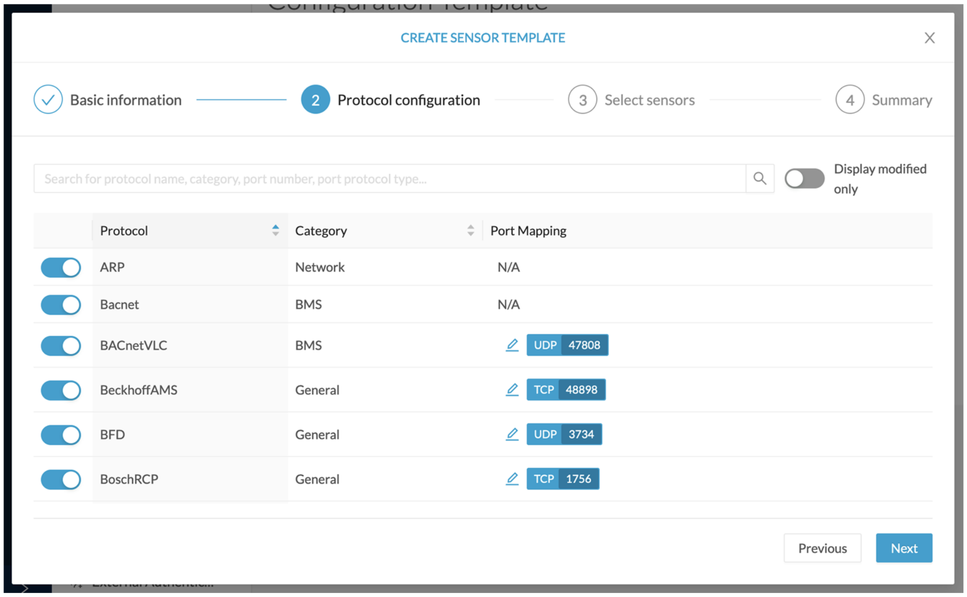


* Name: OPCUA

Description:

Step 4 Click **Next**.

The list of protocol DPI engines with their basic configurations appears.



CREATE SENSOR TEMPLATE

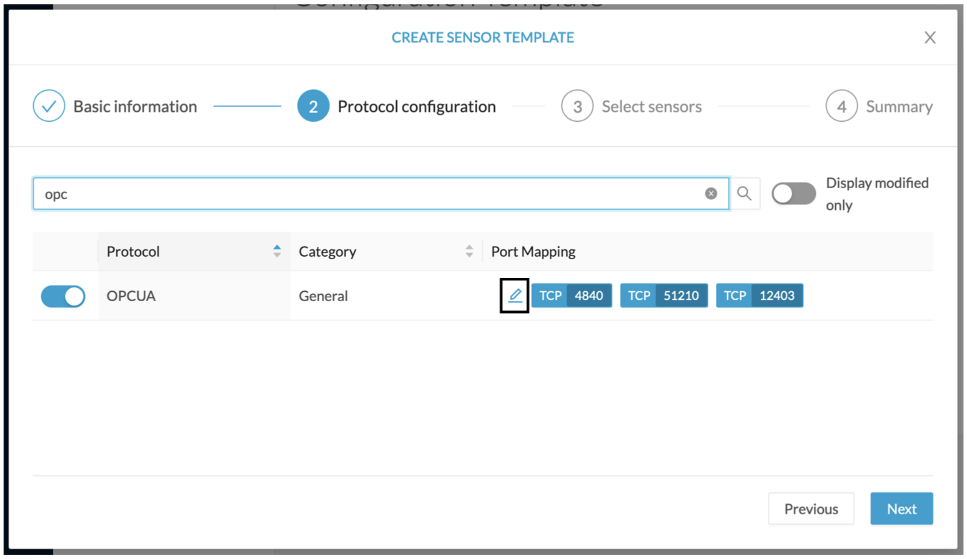
Search for protocol name, category, port number, port protocol type...

Display modified only

	Protocol	Category	Port Mapping
	ARP	Network	N/A
	Bacnet	BMS	N/A
	BACnetVLC	BMS	UDP 47808
	BeckhoffAMS	General	TCP 48898
	BFD	General	UDP 3734
	BoschRCP	General	TCP 1756

Step 5 In the search bar, type the protocol you want to configure.

In our example, we will add a port to the OPCUA default settings.



CREATE SENSOR TEMPLATE

opc

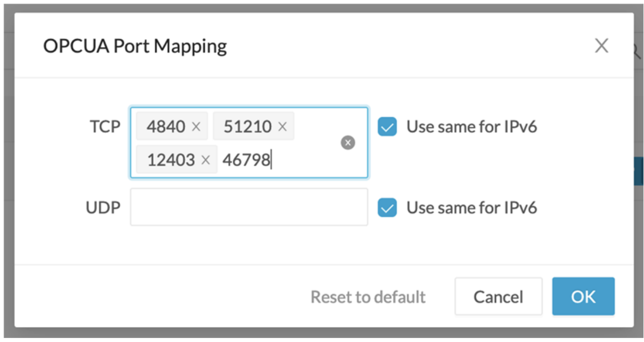
Display modified only

	Protocol	Category	Port Mapping
	OPCUA	General	TCP 4840 TCP 51210 TCP 12403

Step 6 Under the Port Mapping column, click the **pen** button to edit its settings.

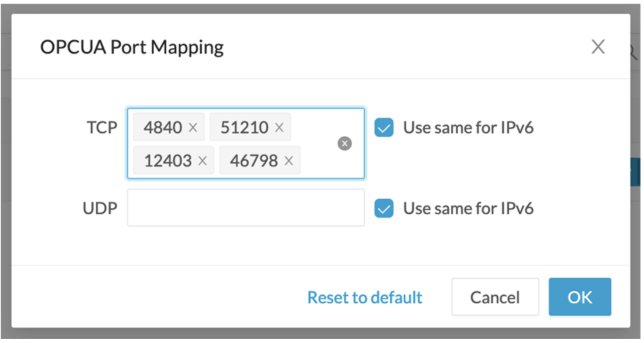
The protocol's port mapping window pops up.

Step 7 Write down the port number you want to add and hit enter.



TCP: 4840 × 51210 × 12403 × 46798 ☑ Use same for IPv6

UDP: ☑ Use same for IPv6

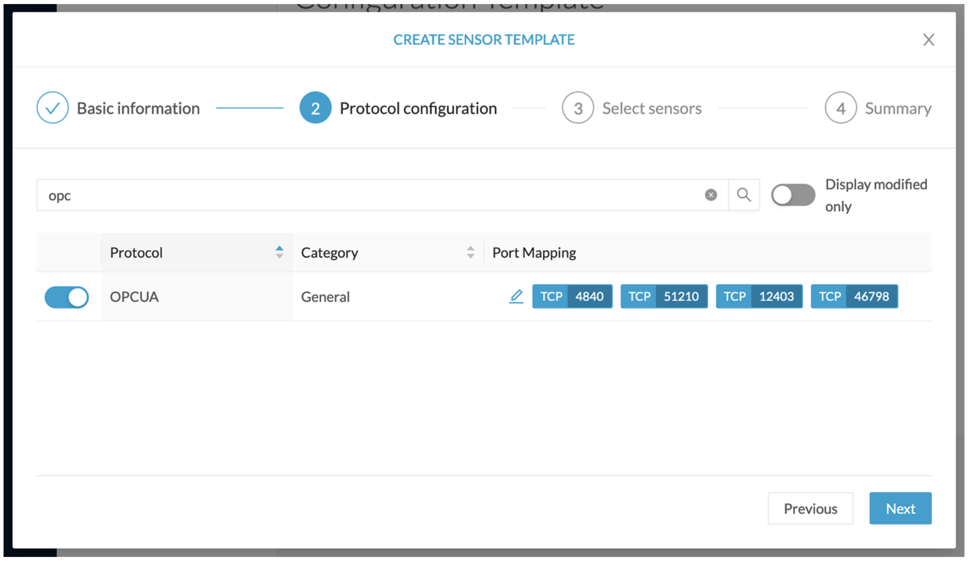


TCP: 4840 × 51210 × 12403 × 46798 × ☑ Use same for IPv6

UDP: ☑ Use same for IPv6

Step 8 Click **OK**.

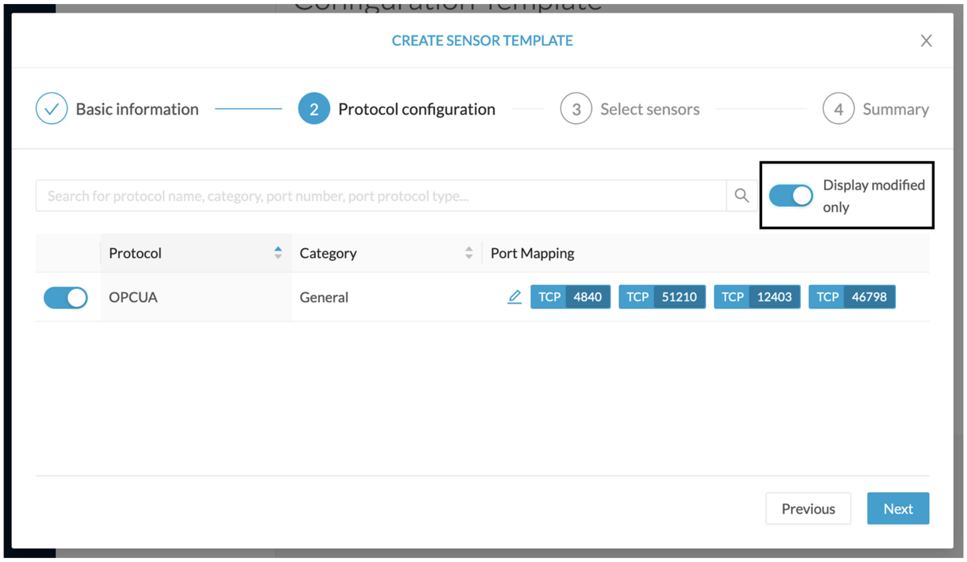
The port number is added to the protocol's default settings.



opc

	Protocol	Category	Port Mapping
●	OPCUA	General	TCP 4840 TCP 51210 TCP 12403 TCP 46798

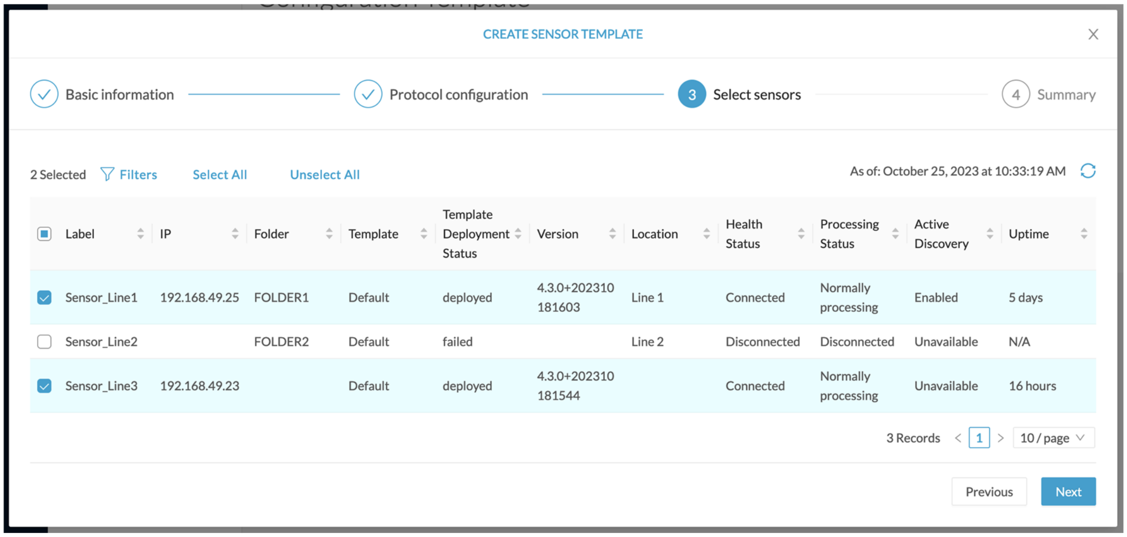
Toggling ON the **Displayed modified only** button allows you to quickly find this protocol.



	Protocol	Category	Port Mapping
●	OPCUA	General	TCP 4840 TCP 51210 TCP 12403 TCP 46798

Step 9 Click **Next**.

Step 10 Select the sensor(s) you want to apply the template to.



CREATE SENSOR TEMPLATE

✓ Basic information — ✓ Protocol configuration — 3 Select sensors — 4 Summary

2 Selected Filters Select All Unselect All

As of: October 25, 2023 at 10:33:19 AM

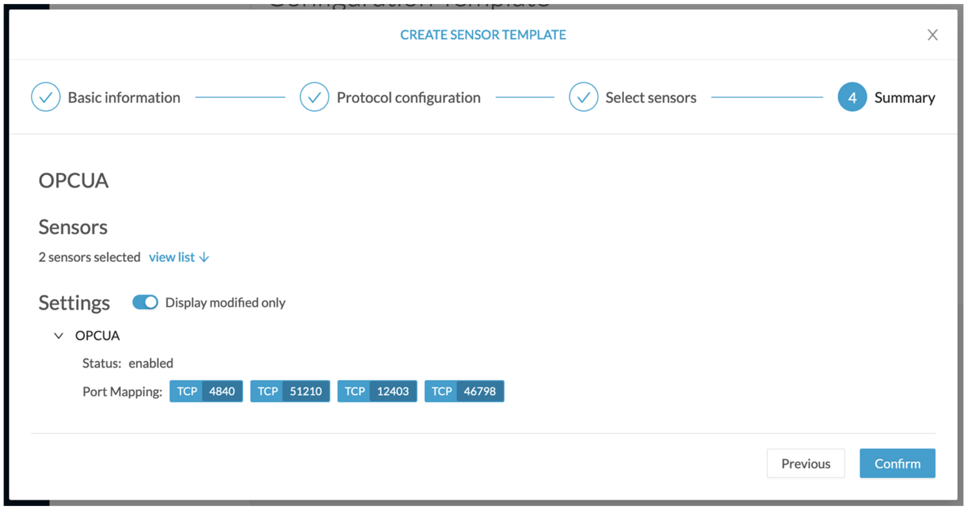
☐	Label	IP	Folder	Template	Template Deployment Status	Version	Location	Health Status	Processing Status	Active Discovery	Uptime
☑	Sensor_Line1	192.168.49.25	FOLDER1	Default	deployed	4.3.0+202310 181603	Line 1	Connected	Normally processing	Enabled	5 days
☐	Sensor_Line2		FOLDER2	Default	failed		Line 2	Disconnected	Disconnected	Unavailable	N/A
☑	Sensor_Line3	192.168.49.23		Default	deployed	4.3.0+202310 181544		Connected	Normally processing	Unavailable	16 hours

3 Records < 1 > 10 / page

Previous Next

Step 11 Click **Next**.

Step 12 Check the template configurations and **Confirm** its creation.



CREATE SENSOR TEMPLATE

✓ Basic information — ✓ Protocol configuration — ✓ Select sensors — 4 Summary

OPCUA

Sensors

2 sensors selected view list ↓

Settings Display modified only

OPCUA

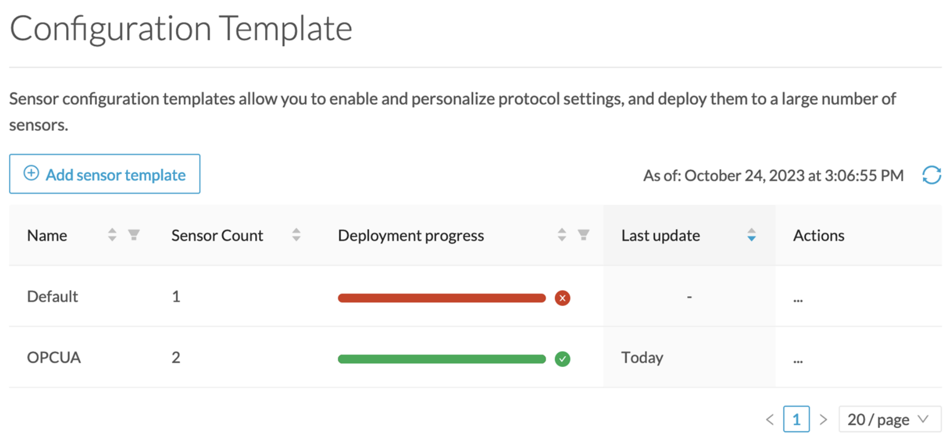
Status: enabled

Port Mapping: TCP 4840 TCP 51210 TCP 12403 TCP 46798

Previous Confirm

The configuration is sent to the sensors. Configuration deployment will take a few moments.

The OPCUA template appears in the template list with its two assigned sensors.



Configuration Template

Sensor configuration templates allow you to enable and personalize protocol settings, and deploy them to a large number of sensors.

⊕ Add sensor template

As of: October 24, 2023 at 3:06:55 PM

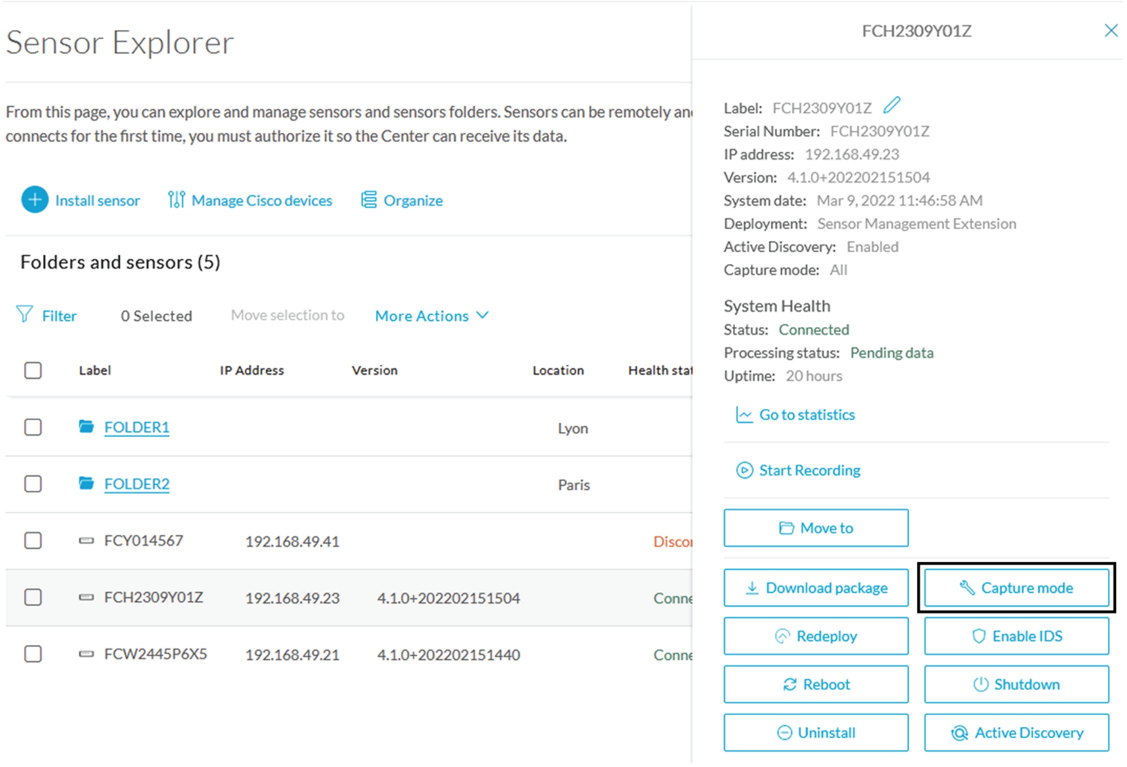
Name	Sensor Count	Deployment progress	Last update	Actions
Default	1	✗	-	...
OPCUA	2	✓	Today	...

< 1 > 20 / page

Set a capture mode

The Capture mode feature lets you choose which network communications will be analyzed by the sensors. You can set it by clicking an online sensor in the sensors list of the Sensor Explorer page or during a sensor installation.

Setting the capture mode on a sensor from the right side panel:



Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can be remotely an connects for the first time, you must authorize it so the Center can receive its data.

Install sensor   Manage Cisco devices   Organize

Folders and sensors (5)

Filter   0 Selected   Move selection to   More Actions

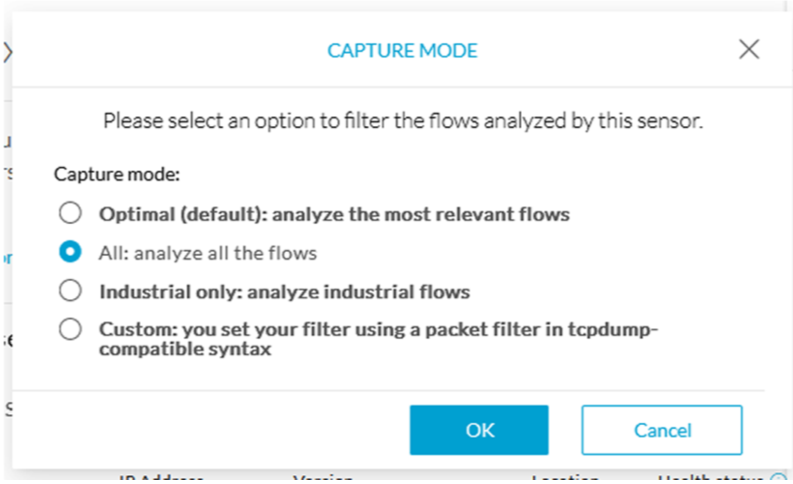
□	Label	IP Address	Version	Location	Health stat
□	FOLDER1			Lyon	
□	FOLDER2			Paris	
□	FCY014567	192.168.49.41			Disco
□	FCH2309Y01Z	192.168.49.23	4.1.0+202202151504		Conne
□	FCW2445P6X5	192.168.49.21	4.1.0+202202151440		Conne

FCH2309Y01Z

Label: FCH2309Y01Z
Serial Number: FCH2309Y01Z
IP address: 192.168.49.23
Version: 4.1.0+202202151504
System date: Mar 9, 2022 11:46:58 AM
Deployment: Sensor Management Extension
Active Discovery: Enabled
Capture mode: All

System Health
Status: Connected
Processing status: Pending data
Uptime: 20 hours

Capture modes:



CAPTURE MODE

Please select an option to filter the flows analyzed by this sensor.

Capture mode:

○ **Optimal (default): analyze the most relevant flows**

● All: analyze all the flows

○ **Industrial only: analyze industrial flows**

○ **Custom: you set your filter using a packet filter in tcpdump-compatible syntax**

The aim is mainly to focus the monitoring on relevant traffic but also to reduce the load on the Center.

For example, a common filter in a firewall can consist of removing the network management flows (SNMP). This can be done by setting a filter like "not (port 161 and host 10.10.10.10)" where "10.10.10.10" is the network management platform.

Using Capture mode Cisco Cyber Vision performance can be improved on large networks.

Capture modes operate because of filters applied on each sensor. Filters are set to define which types of incoming packets are to be analyzed by the sensors. You can set a different filter on each sensor according to your needs.

You can set the capture mode in the installation wizard when enrolling the sensors during the Center installation. This option is recommended if you already know which filter to set. Otherwise, you can change it at any time through the Sensor Explorer page in the GUI (provided that the SSH connection is allowed from the Center to the sensors).

Note You can set a capture mode to offline sensors from a file containing the filter and registered on the USB drive. This will be then plugged on the Offline USB port of the device. For more information about setting a capture mode on an offline sensor contact the support.

The different capture modes are:

- ALL: No filter is applied. The sensor analyzes all incoming flows and they will all be stored inside the Center database.
- OPTIMAL (Default): The applied filter selects the most relevant flows according to Cisco expertise. Multicast flows are not recorded. This capture mode is recommended for long term capture and monitoring.
- INDUSTRIAL ONLY: The filter selects industrial protocols only like modbus, S7, EtherNet/IP, etc. This means that IT flows of the monitored network won't be analyzed by the sensor and won't appear in the GUI.
- CUSTOM (advanced users): Use this capture mode if you want to fully customize the filter to be applied. To do so you will need to use the tcpdump syntax to define the filtering rules.

CHAPTER 11

Maintenance

Upgrade procedures

Sensor Self Update

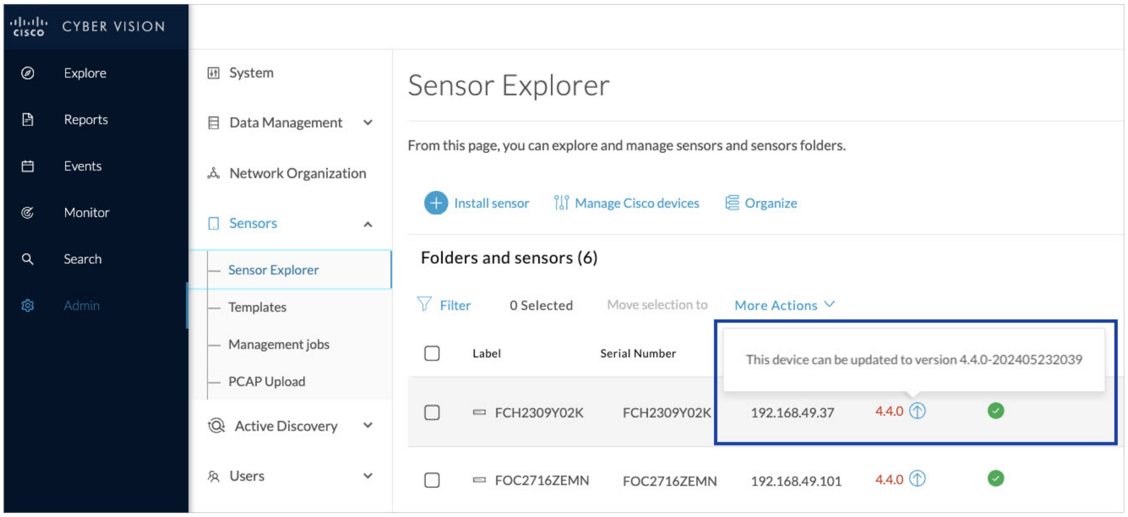
Cisco Cyber Vision now allows sensor updates regardless of the install method (i.e., without the extension). Release 4.4.1 provides the necessary foundation for sensor self-updates. However, the self-update feature will only be functional in future releases.

Starting with Cisco Cyber Vision release 4.4.1, you can update all sensors automatically. The required steps are:

- Select sensors to update.
- The Center adds a new job to the sensor queue.
- The sensor automatically collects and validates the update file.
- The sensor restarts with the new version.

Update Warnings

In the Cisco Cyber Vision center on the Sensor Explorer page (Admin – Sensors – Sensor Explorer), users receive an alert to update the sensor. When this happens, the version number turns red, and a blue arrow with a tooltip indicates the sensor is upgradeable.



Sensor Explorer

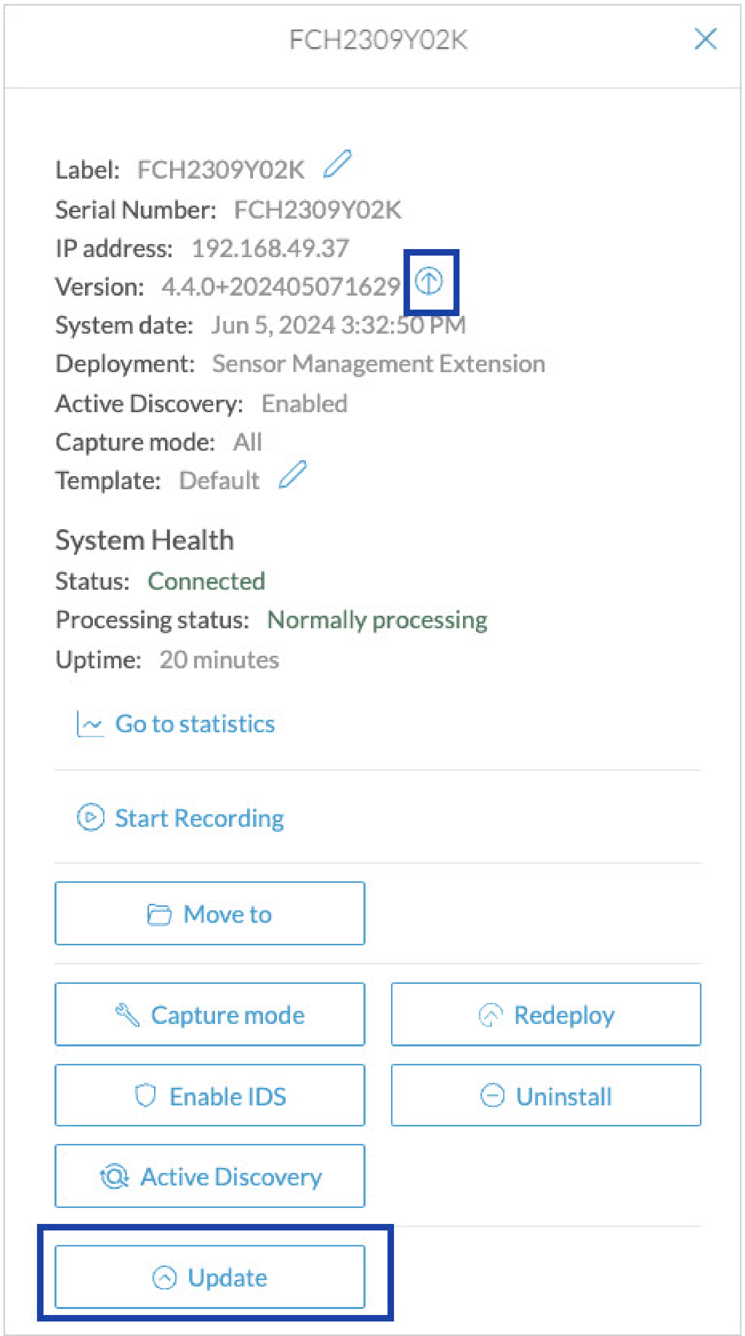
From this page, you can explore and manage sensors and sensors folders.

Folders and sensors (6)

This device can be updated to version 4.4.0-202405232039

	Label	Serial Number			
□	FCH2309Y02K	FCH2309Y02K	192.168.49.37	4.4.0	✓
□	FOC2716ZEMN	FOC2716ZEMN	192.168.49.101	4.4.0	✓

On the sensor's right-side, the same blue arrow and an **Update** button is visible.



FCH2309Y02K

Label: FCH2309Y02K

Serial Number: FCH2309Y02K

IP address: 192.168.49.37

Version: 4.4.0+202405071629

System date: Jun 5, 2024 3:32:50 PM

Deployment: Sensor Management Extension

Active Discovery: Enabled

Capture mode: All

Template: Default

System Health

Status: Connected

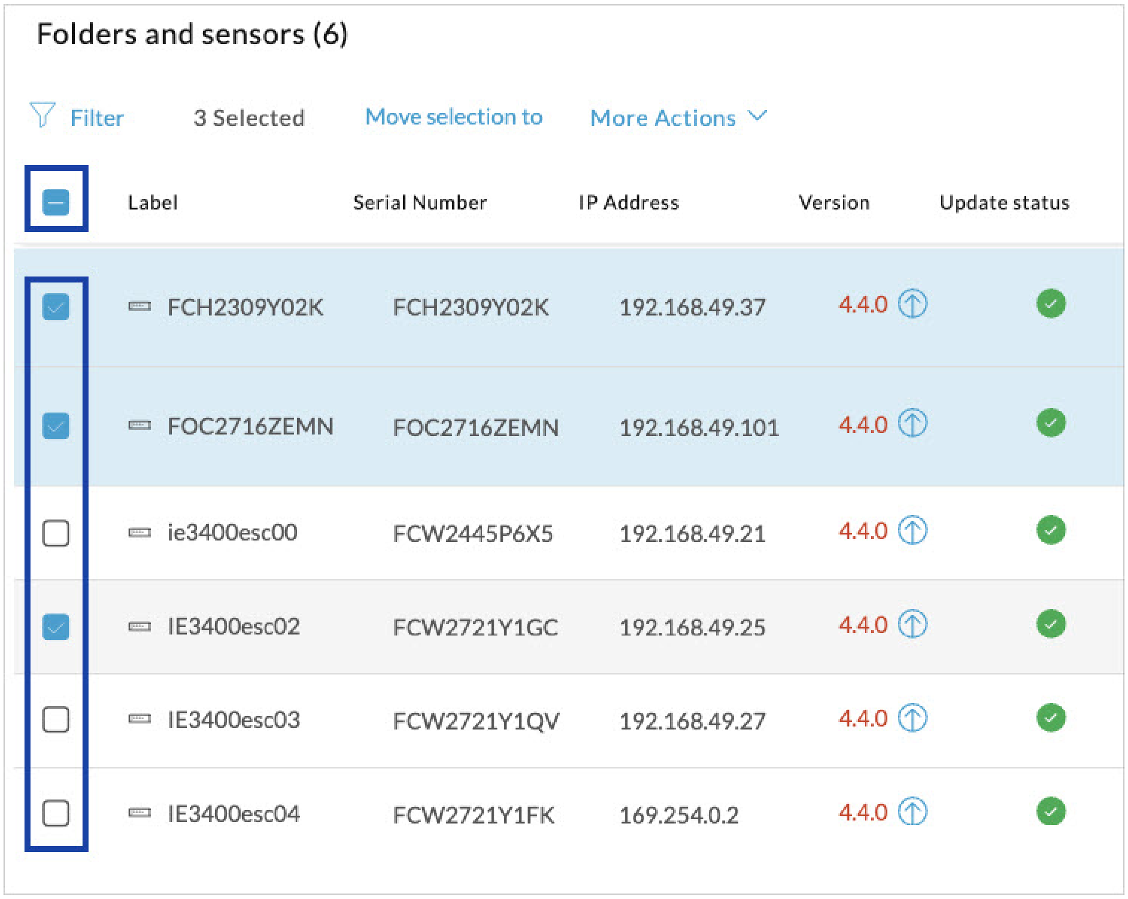
Processing status: Normally processing

Uptime: 20 minutes

Update Procedure

Procedure

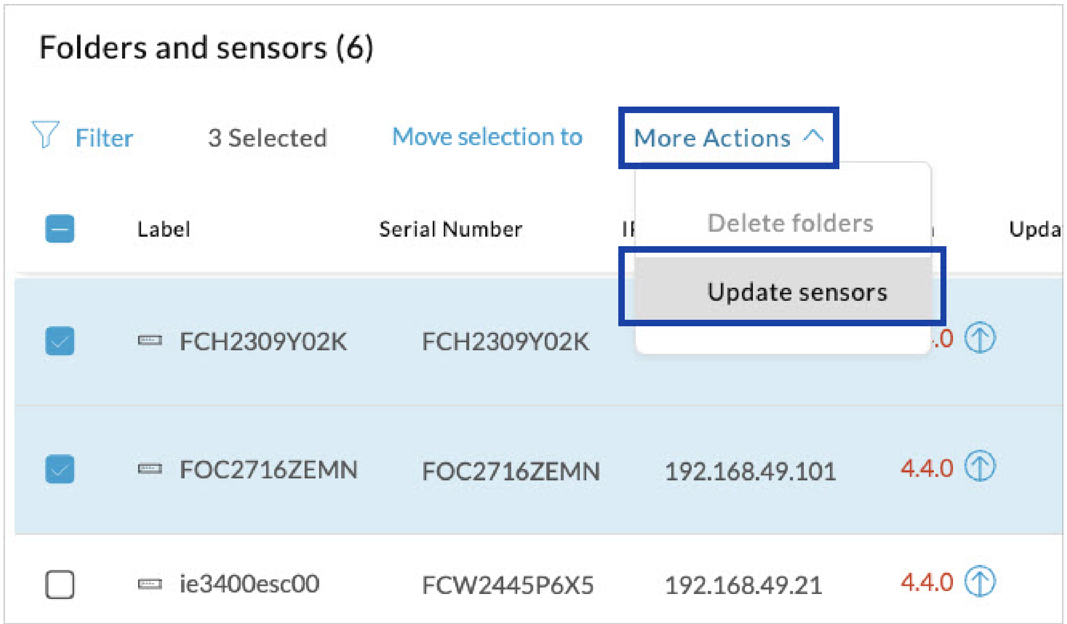
Step 1 Use the checkboxes on the left to select multiple sensors.



☐	Label	Serial Number	IP Address	Version	Update status
☑	FCH2309Y02K	FCH2309Y02K	192.168.49.37	4.4.0	✓
☑	FOC2716ZEMN	FOC2716ZEMN	192.168.49.101	4.4.0	✓
☐	ie3400esc00	FCW2445P6X5	192.168.49.21	4.4.0	✓
☑	IE3400esc02	FCW2721Y1GC	192.168.49.25	4.4.0	✓
☐	IE3400esc03	FCW2721Y1QV	192.168.49.27	4.4.0	✓
☐	IE3400esc04	FCW2721Y1FK	169.254.0.2	4.4.0	✓

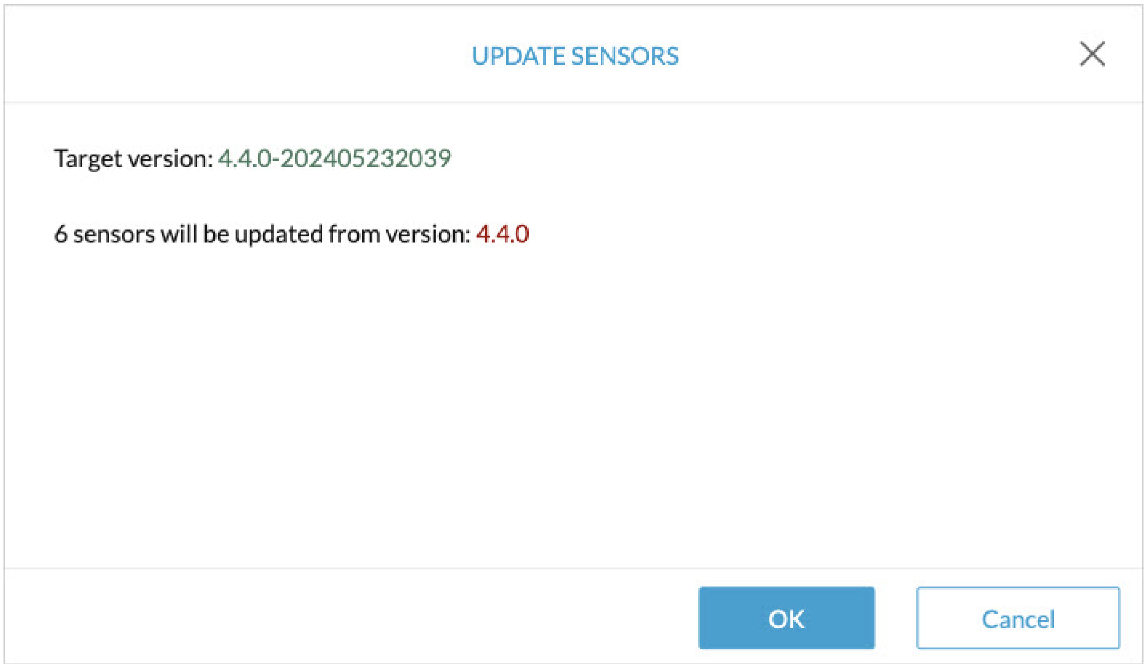
Step 2 Go to the **More Actions** and click **Update sensors**.

The sensor self-update menu appears.



☐	Label	Serial Number	IP		Upda
☑	FCH2309Y02K	FCH2309Y02K		.0	
☑	FOC2716ZEMN	FOC2716ZEMN	192.168.49.101	4.4.0	
☐	ie3400esc00	FCW2445P6X5	192.168.49.21	4.4.0	

Step 3 Click **OK**.

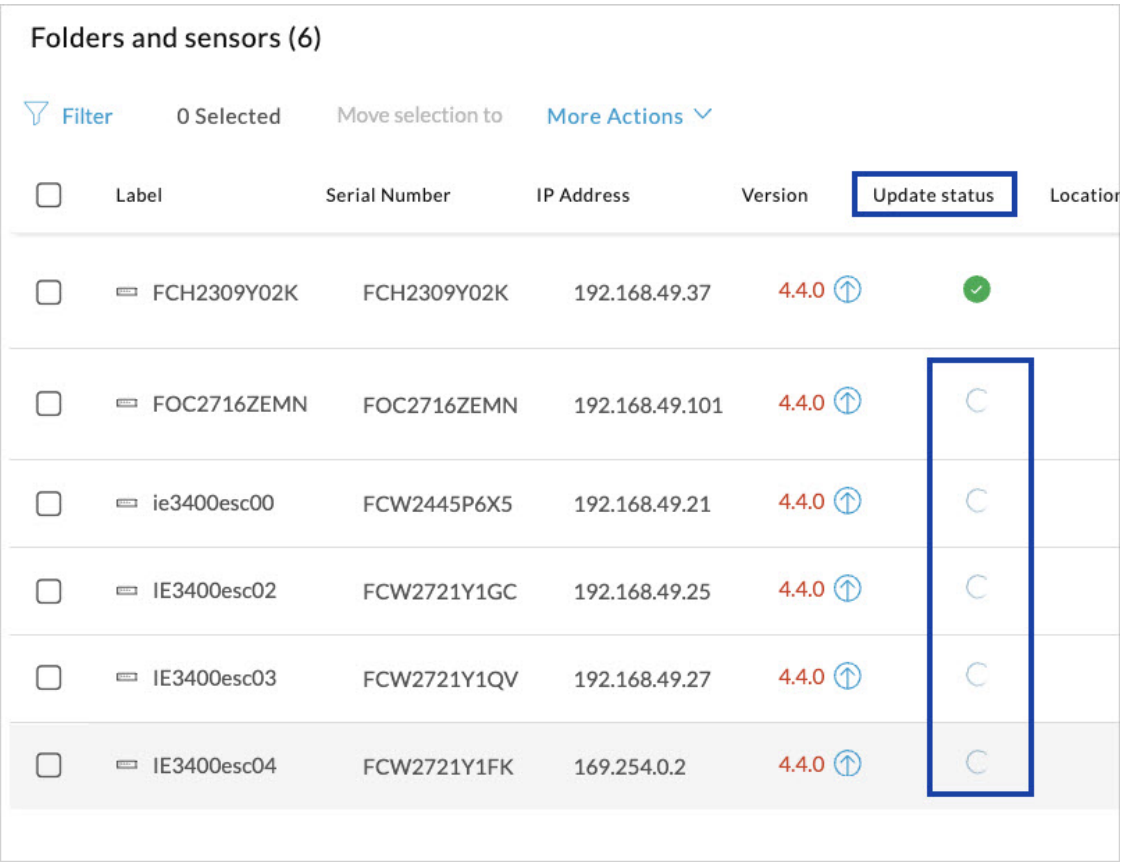


UPDATE SENSORS

Target version: 4.4.0-202405232039

6 sensors will be updated from version: 4.4.0

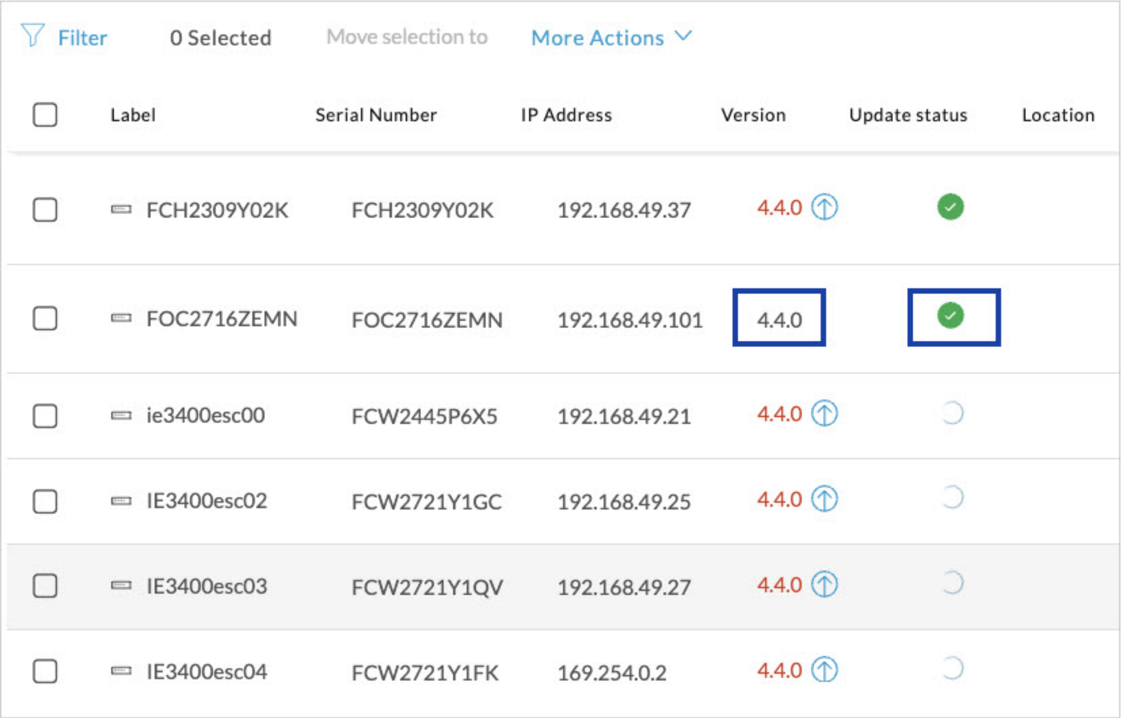
Step 4 During the update, a blue circle appears in the **Update status** column.



Folders and sensors (6)

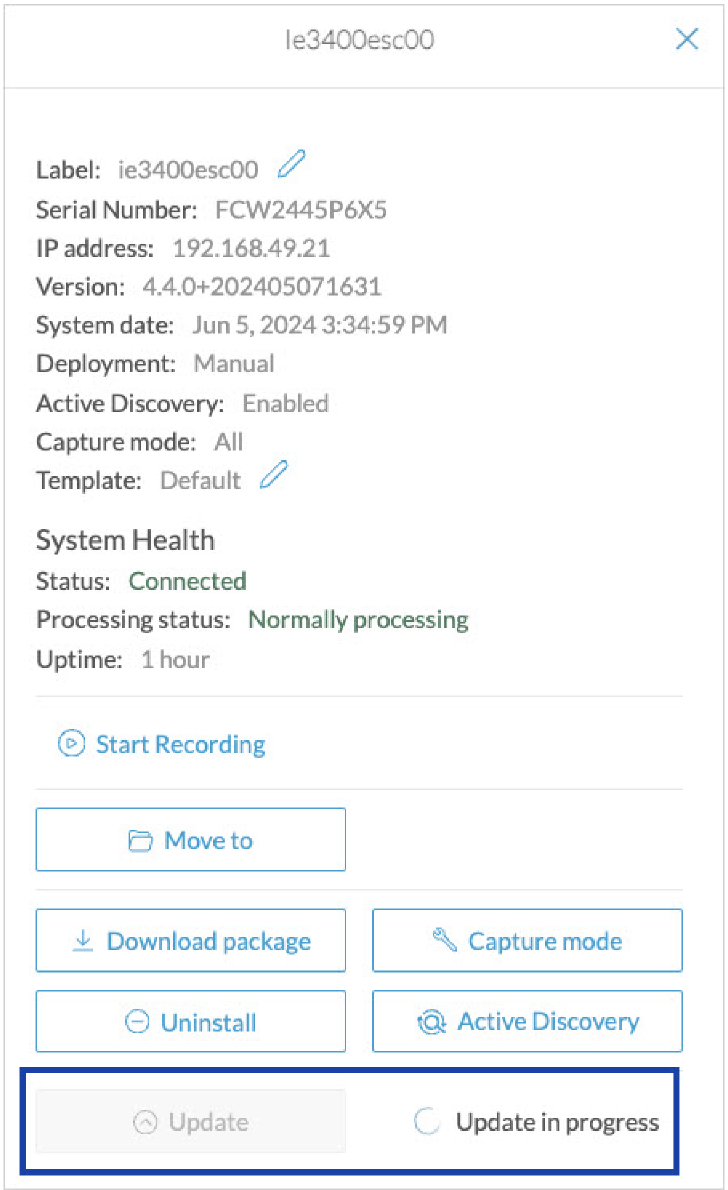
☐	Label	Serial Number	IP Address	Version	Update status	Location
☐	FCH2309Y02K	FCH2309Y02K	192.168.49.37	4.4.0	✓	
☐	FOC2716ZEMN	FOC2716ZEMN	192.168.49.101	4.4.0		
☐	ie3400esc00	FCW2445P6X5	192.168.49.21	4.4.0		
☐	IE3400esc02	FCW2721Y1GC	192.168.49.25	4.4.0		
☐	IE3400esc03	FCW2721Y1QV	192.168.49.27	4.4.0		
☐	IE3400esc04	FCW2721Y1FK	169.254.0.2	4.4.0		

Step 5 After the update, the version number turns black, and a green symbol appears in the **Update status** column.



□	Label	Serial Number	IP Address	Version	Update status	Location
□	FCH2309Y02K	FCH2309Y02K	192.168.49.37	4.4.0 ↑	✓	
□	FOC2716ZEMN	FOC2716ZEMN	192.168.49.101	4.4.0	✓	
□	ie3400esc00	FCW2445P6X5	192.168.49.21	4.4.0 ↑	◌	
□	IE3400esc02	FCW2721Y1GC	192.168.49.25	4.4.0 ↑	◌	
□	IE3400esc03	FCW2721Y1QV	192.168.49.27	4.4.0 ↑	◌	
□	IE3400esc04	FCW2721Y1FK	169.254.0.2	4.4.0 ↑	◌	

Step 6 The **Update in progress** status is visible.



Ie3400esc00

Label: ie3400esc00

Serial Number: FCW2445P6X5

IP address: 192.168.49.21

Version: 4.4.0+202405071631

System date: Jun 5, 2024 3:34:59 PM

Deployment: Manual

Active Discovery: Enabled

Capture mode: All

Template: Default

System Health

Status: Connected

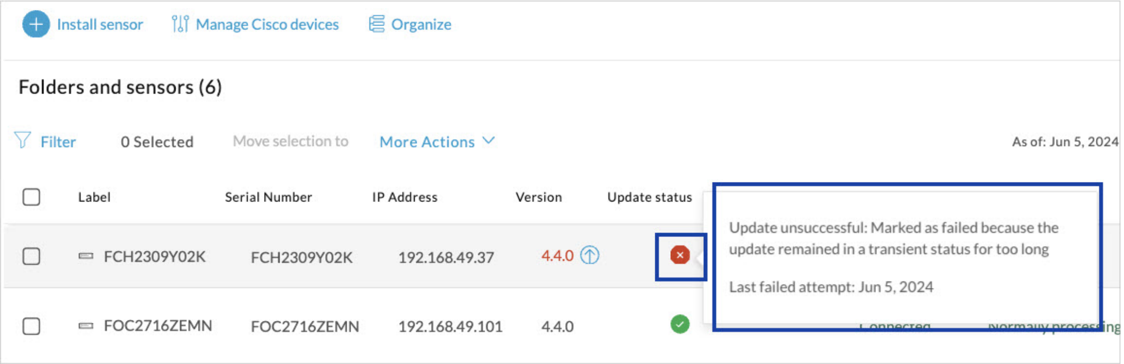
Processing status: Normally processing

Uptime: 1 hour

Update in progress

Update Failure

If the update is unsuccessful, the **Update status** column displays a red cross and a message that provides the details.



Folders and sensors (6)

0 Selected

As of: Jun 5, 2024

Label	Serial Number	IP Address	Version	Update status
FCH2309Y02K	FCH2309Y02K	192.168.49.37	4.4.0	✕
FOC2716ZEMN	FOC2716ZEMN	192.168.49.101	4.4.0	✓

Update unsuccessful: Marked as failed because the update remained in a transient status for too long

Last failed attempt: Jun 5, 2024

Upgrade through the Cisco Cyber Vision sensor management extension

Before updating sensors, the Cisco Cyber Vision sensor management extension must be up-to-date.

It is possible to select which sensors to update. The update status will be visible in the Management jobs, on page 18 page.

Update the sensor management extension

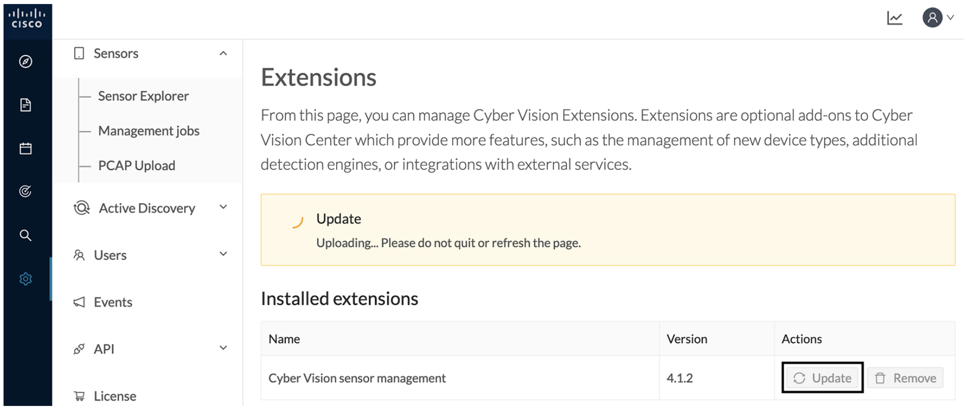
The Cisco Cyber Vision sensor management extension must be up-to-date to update IOx sensors.

Procedure

Step 1 Retrieve the sensor management extension file (i.e. CiscoCyberVision-sensor-management-<version>.ext) on cisco.com.

Step 2 In Cisco Cyber Vision, navigate to Admin > Extensions.

Step 3 Click **Update** to browse the new version of the extension file.



Extensions

From this page, you can manage Cyber Vision Extensions. Extensions are optional add-ons to Cyber Vision Center which provide more features, such as the management of new device types, additional detection engines, or integrations with external services.

Update

Uploading... Please do not quit or refresh the page.

Installed extensions

Name	Version	Actions
Cyber Vision sensor management	4.1.2	Update Remove

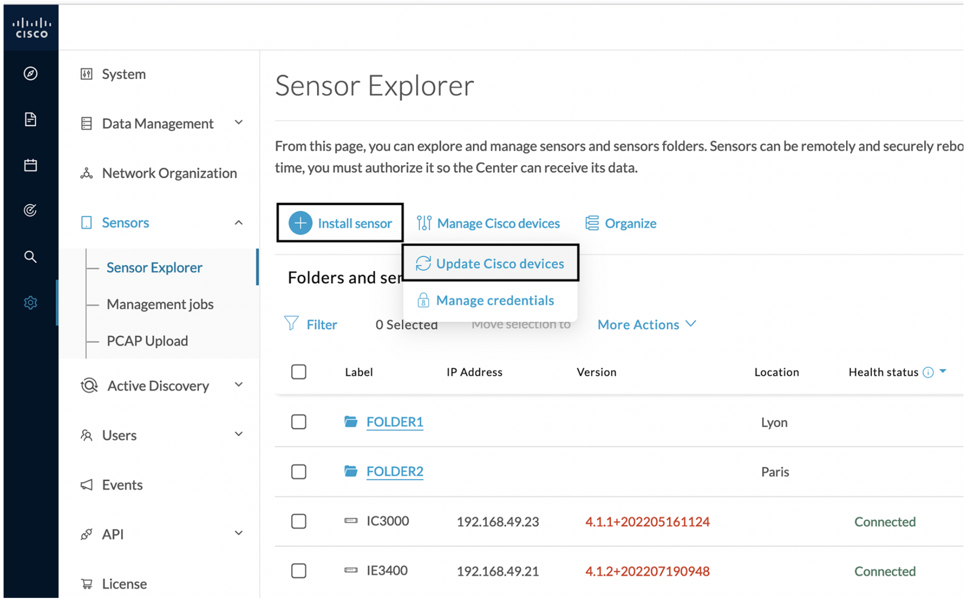
Update the sensors

Procedure

Step 1 In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer.

Sensors that are not up-to-date have their version displayed in red.

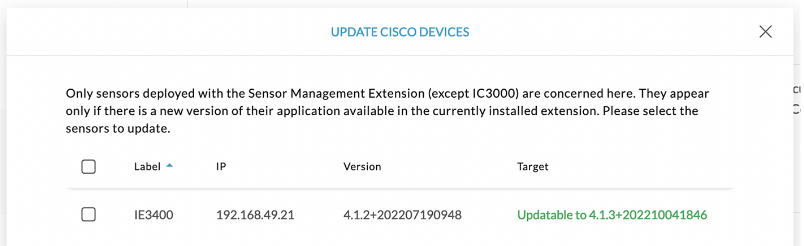
Step 2 Click **Install sensor**, then **Update Cisco devices**.



From this page, you can explore and manage sensors and sensors folders. Sensors can be remotely and securely rebo
time, you must authorize it so the Center can receive its data.

☐	Label	IP Address	Version	Location	Health status
☐	FOLDER1			Lyon	
☐	FOLDER2			Paris	
☐	IC3000	192.168.49.23	4.1.1+202205161124		Connected
☐	IE3400	192.168.49.21	4.1.2+202207190948		Connected

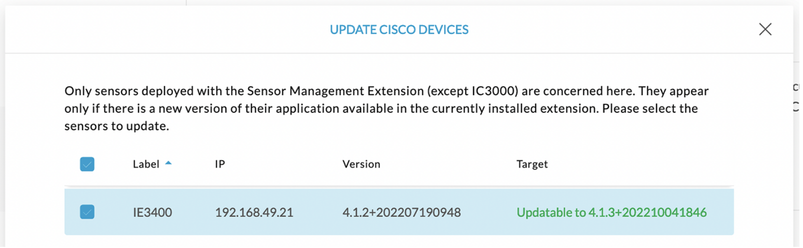
The update Cisco devices window pops up listing all sensors that have been deployed with the sensor management extension.



Only sensors deployed with the Sensor Management Extension (except IC3000) are concerned here. They appear only if there is a new version of their application available in the currently installed extension. Please select the sensors to update.

☐	Label	IP	Version	Target
☐	IE3400	192.168.49.21	4.1.2+202207190948	Updatable to 4.1.3+202210041846

Step 3 Select the sensors you want to update.

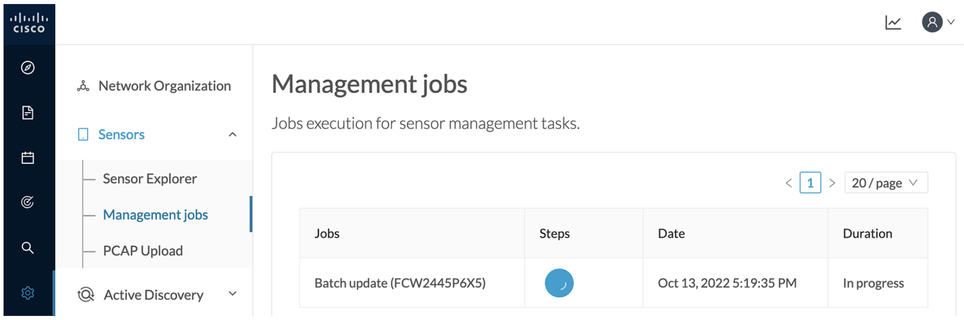


Only sensors deployed with the Sensor Management Extension (except IC3000) are concerned here. They appear only if there is a new version of their application available in the currently installed extension. Please select the sensors to update.

☑	Label	IP	Version	Target
☑	IE3400	192.168.49.21	4.1.2+202207190948	Updatable to 4.1.3+202210041846

Step 4 Click **Update**.

The sensors' update status appear in the Management jobs page in batches per sensor type and of maximum ten sensors per batch.

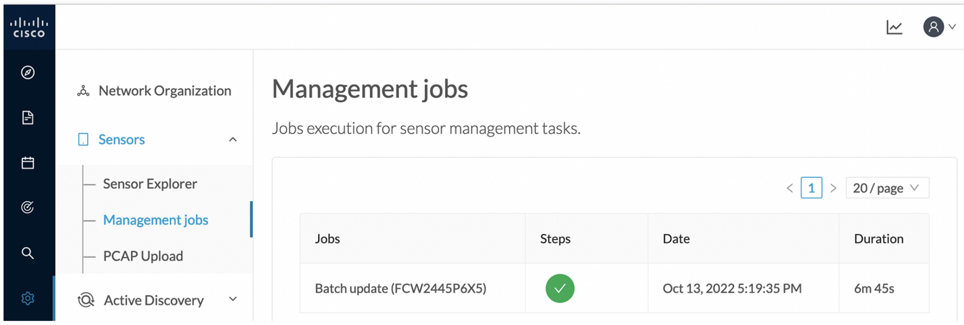


Management jobs

Jobs execution for sensor management tasks.

Jobs	Steps	Date	Duration
Batch update (FCW2445P6X5)	●	Oct 13, 2022 5:19:35 PM	In progress

Herebelow the management jobs indicate that the batch of sensors updated successfully.

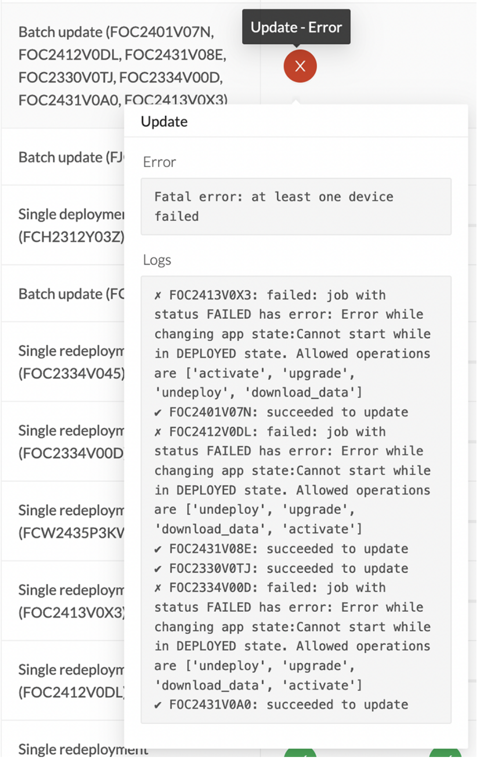


Management jobs

Jobs execution for sensor management tasks.

Jobs	Steps	Date	Duration
Batch update (FCW2445P6X5)	✓	Oct 13, 2022 5:19:35 PM	6m 45s

If the batch update fails, click the red update error icon to see logs.



Batch update (FOC2401V07N, FOC2412V0DL, FOC2431V08E, FOC2330V0TJ, FOC2334V00D, FOC2431V0A0, FOC2413V0X3)

Batch update (FJ

Single deployme (FCH2312Y03Z)

Batch update (FC

Single redeploym (FOC2334V045)

Single redeploym (FOC2334V00D

Single redeploym (FCW2435P3KV

Single redeploym (FOC2413V0X3)

Single redeploym (FOC2412V0DL)

Single redeployment

Update - Error

Update

Error

```
Fatal error: at least one device
failed
```

Logs

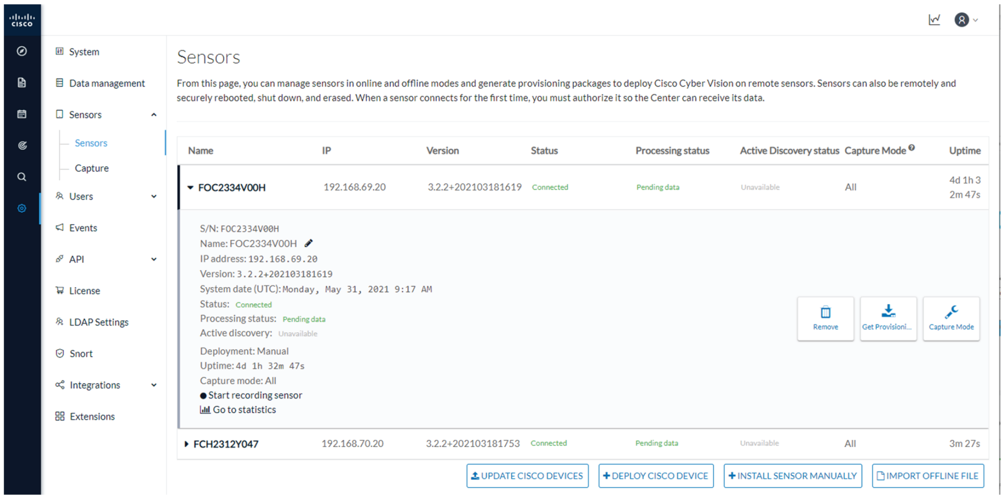
```
✗ FOC2413V0X3: failed: job with
status FAILED has error: Error while
changing app state:Cannot start while
in DEPLOYED state. Allowed operations
are ['activate', 'upgrade',
'undeploy', 'download_data']
✔ FOC2401V07N: succeeded to update
✗ FOC2412V0DL: failed: job with
status FAILED has error: Error while
changing app state:Cannot start while
in DEPLOYED state. Allowed operations
are ['undeploy', 'upgrade',
'download_data', 'activate']
✔ FOC2431V08E: succeeded to update
✔ FOC2330V0TJ: succeeded to update
✗ FOC2334V00D: failed: job with
status FAILED has error: Error while
changing app state:Cannot start while
in DEPLOYED state. Allowed operations
are ['undeploy', 'upgrade',
'download_data', 'activate']
✔ FOC2431V0A0: succeeded to update
```

Upgrade through the IOx Local Manager

The following section explains how to upgrade the sensor through the IOx Local Manager.

In the example below, the sensor is upgraded from Cisco Cyber Vision version 3.2.2 to version 3.2.3.

Figure 2: The sensor in version 3.2.2 in the Sensors administration page of Cisco Cyber Vision



Sensors

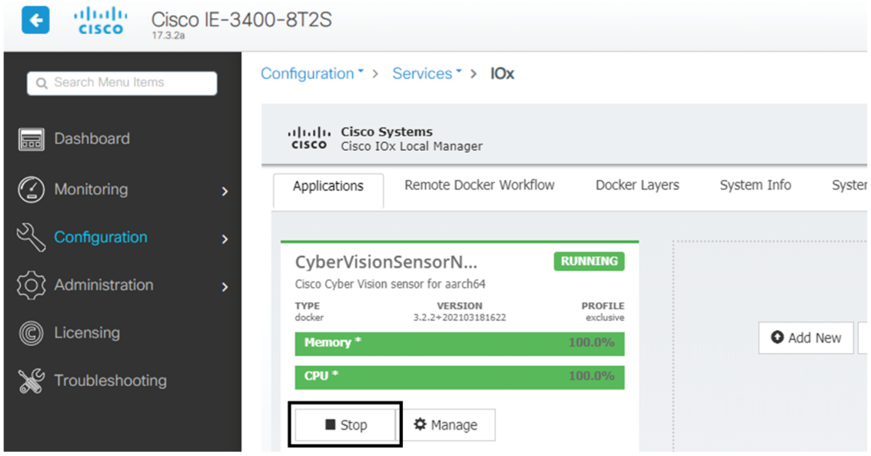
From this page, you can manage sensors in online and offline modes and generate provisioning packages to deploy Cisco Cyber Vision on remote sensors. Sensors can also be remotely and securely rebooted, shut down, and erased. When a sensor connects for the first time, you must authorize it so the Center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

Name	IP	Version	Status	Processing status	Active Discovery status	Capture Mode	Uptime
FOC2334V00H	192.168.69.20	3.2.2+202103181619	Connected	Pending data	Unavailable	All	4d 1h 32m 47s
FCH2312Y047	192.168.70.20	3.2.2+202103181753	Connected	Pending data	Unavailable	All	3m 27s

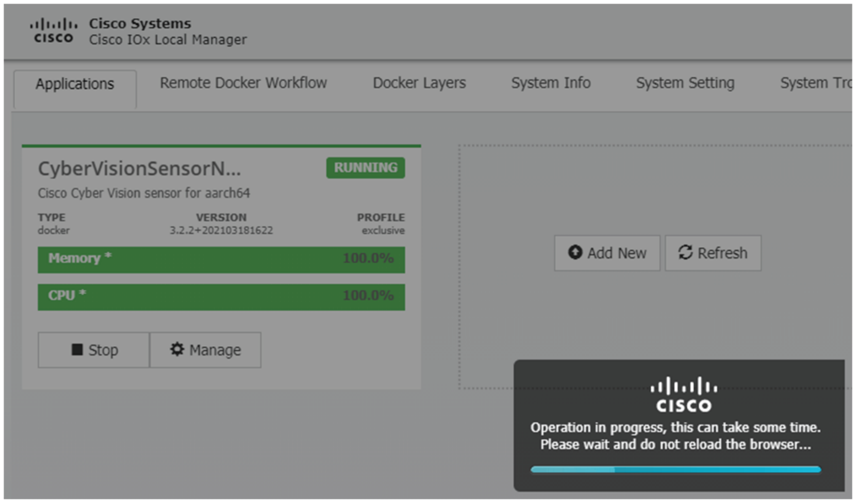
S/N: FOC2334V00H
Name: FOC2334V00H
IP address: 192.168.69.20
Version: 3.2.2+202103181619
System date (UTC): Monday, May 31, 2021 9:17 AM
Status: Connected
Processing status: Pending data
Active discovery: Unavailable
Deployment: Manual
Uptime: 4d 1h 32m 47s
Capture mode: All
● Start recording sensor
Go to statistics

1. Access the IOx Local Manager.

2. Stop the application.



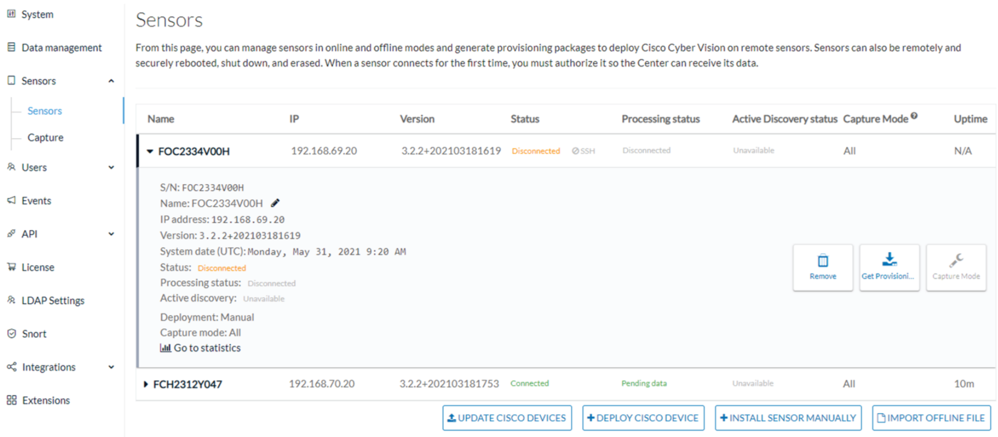
The operation takes a few moments.



Operation in progress, this can take some time. Please wait and do not reload the browser...

The application status switches to STOPPED.

In Cisco Cyber Vision, the sensor status switches to Disconnected.



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.

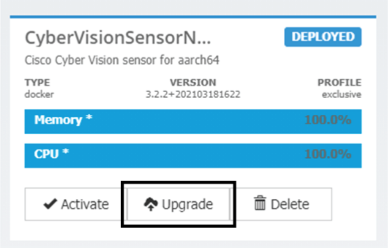
Name	IP	Version	Status	Processing status	Active Discovery status	Capture Mode	Uptime
FOC2334V00H	192.168.69.20	3.2.2+202103181619	Disconnected SSH	Disconnected	Unavailable	All	N/A
FCH2312Y047	192.168.70.20	3.2.2+202103181753	Connected	Pending data	Unavailable	All	10m

S/N: FOC2334V00H
Name: FOC2334V00H
IP address: 192.168.69.20
Version: 3.2.2+202103181619
System date (UTC): Monday, May 31, 2021 9:20 AM
Status: Disconnected
Processing status: Disconnected
Active discovery: Unavailable
Deployment: Manual
Capture mode: All
Go to statistics

3. In the IOx Local Manager, click the **Deactivate** button.

   The application status moves to DEPLOYED.

4. Click **Upgrade**.

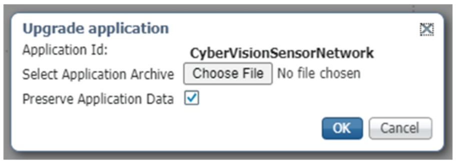


CyberVisionSensorN... DEPLOYED
Cisco Cyber Vision sensor for aarch64

TYPE	VERSION	PROFILE
docker	3.2.2+202103181622	exclusive

Memory * 100.0%
CPU * 100.0%

The pop up Upgrade application appears.

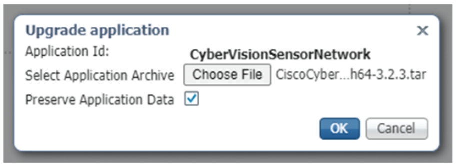


Upgrade application
Application Id: CyberVisionSensorNetwork
Select Application Archive No file chosen
Preserve Application Data ☑

5. Select the **Preserve Application Data** option.

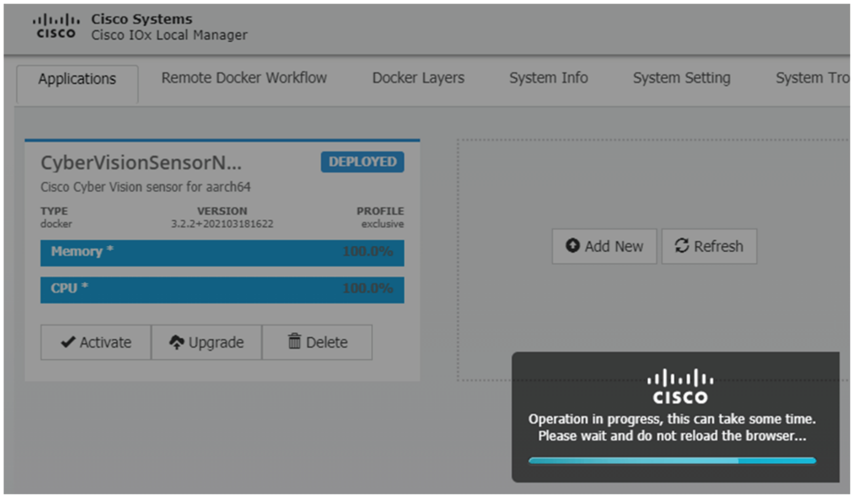
6. Select the new version of the application archive file.

   e.g. CiscoCyberVision-IOx-aarch64-3.2.3.tar



Upgrade application
Application Id: CyberVisionSensorNetwork
Select Application Archive CiscoCyber...h64-3.2.3.tar
Preserve Application Data ☑

The operation takes a few moments.



CyberVisionSensorN... DEPLOYED

Cisco Cyber Vision sensor for aarch64

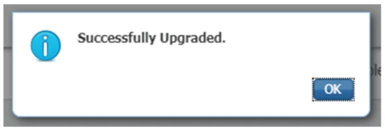
TYPE	VERSION	PROFILE
docker	3.2.2+202103181622	exclusive

Memory * 100.0%

CPU * 100.0%

Operation in progress, this can take some time.
Please wait and do not reload the browser...

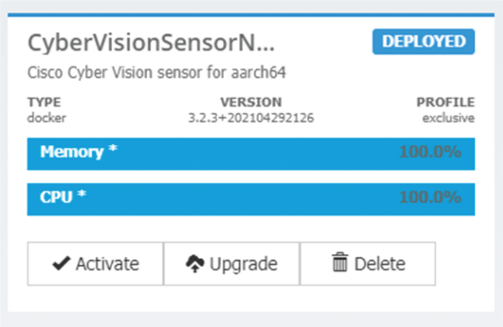
A message indicating that the sensor has been successfully upgraded is displayed.



Successfully Upgraded.

7. Check the number of the new version.

8. Click **Activate**.



CyberVisionSensorN... DEPLOYED

Cisco Cyber Vision sensor for aarch64

TYPE	VERSION	PROFILE
docker	3.2.3+202104292126	exclusive

Memory * 100.0%

CPU * 100.0%

9. Check configurations.

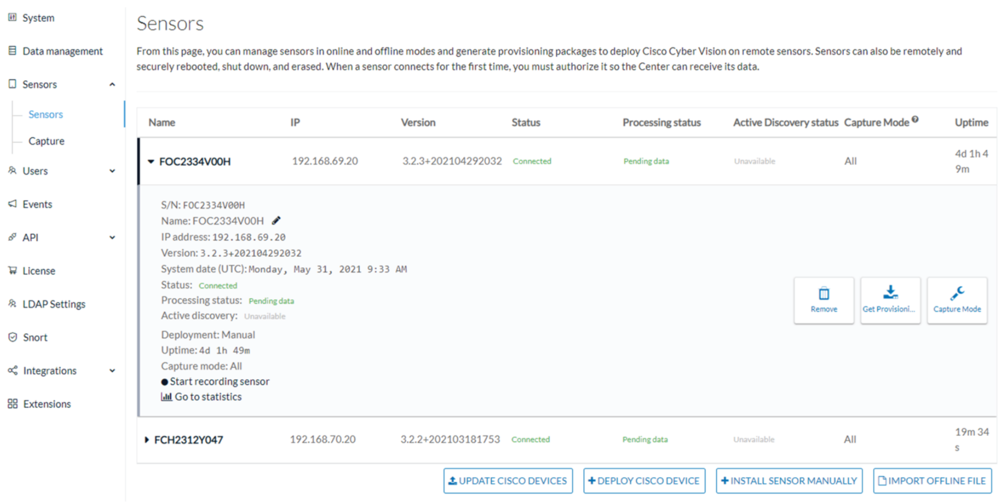
10. Click the **Activate App** button.

    The application status moves to ACTIVATED.

11. Click the **Start** button.

    The application status changes to RUNNING.

    In Cisco Cyber Vision, the sensor is upgraded from version 3.2.2 to 3.2.3 and its status moves to Connected.



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
FOC2334V00H	192.168.69.20	3.2.3+202104292032	Connected	Pending data	Unavailable	All	4d 1h 49m
FCH2312Y047	192.168.70.20	3.2.2+202103181753	Connected	Pending data	Unavailable	All	19m 34 s

S/N: FOC2334V00H
Name: FOC2334V00H
IP address: 192.168.69.20
Version: 3.2.3+202104292032
System date (UTC): Monday, May 31, 2021 9:33 AM
Status: Connected
Processing status: Pending data
Active discovery: Unavailable
Deployment: Manual
Uptime: 4d 1h 49m
Capture mode: All
● Start recording sensor
Go to statistics

Certificate renewal

The certificates generated by Cisco Cyber Vision have a validity of two years.

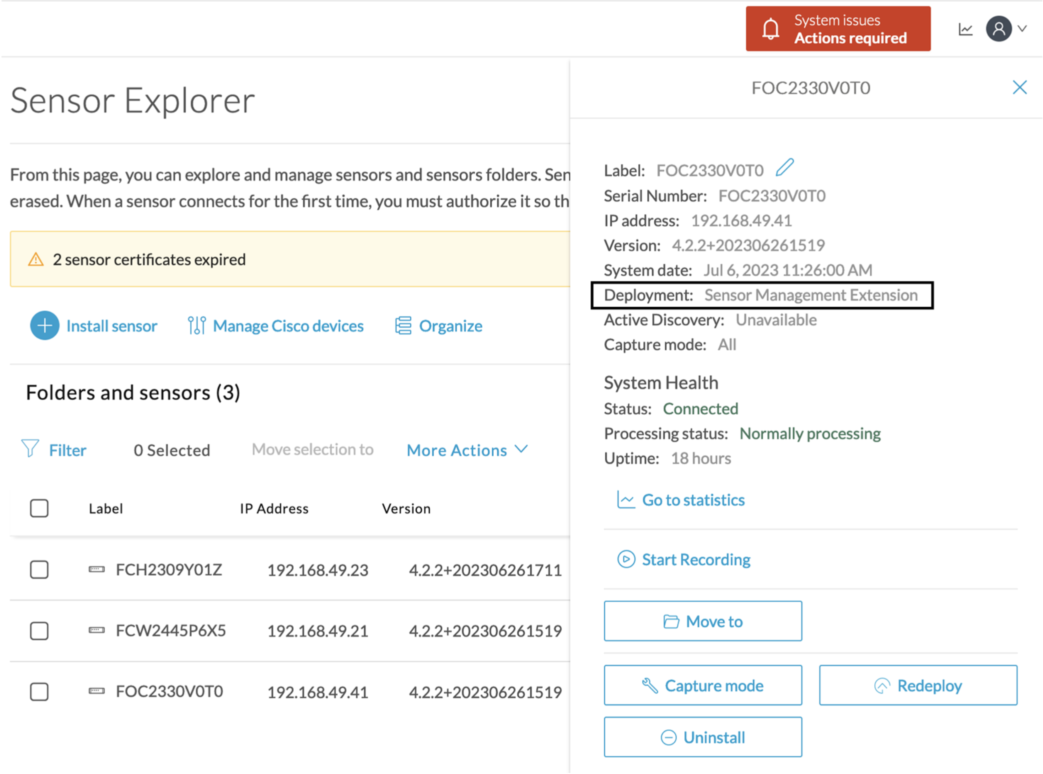
Sensor certificates must be renewed manually. The procedure used differs whether the certificate is already expired or not and whether the sensor has been deployed using the sensor management extension.

- If the certificate is still valid, refer to Sensor certificate renewal, on page 66.
- If the sensor was deployed with the sensor management extension, refer to Sensor certificate renewal, on page 66.
- If the certificate is outdated, and was deployed manually, refer to Sensor certificate renewal through the Local Manager, on page 70.

Sensor certificate renewal

The following procedure applies to:

- Sensors deployed with the sensor management extension, whether the certificate expiration date is exceeded or not (i.e. the deployment method is indicated in the sensor's right side panel).



From this page, you can explore and manage sensors and sensors folders. Sen
erased. When a sensor connects for the first time, you must authorize it so th

⚠ 2 sensor certificates expired

Folders and sensors (3)

0 Selected

□	Label	IP Address	Version
□	FCH2309Y01Z	192.168.49.23	4.2.2+202306261711
□	FCW2445P6X5	192.168.49.21	4.2.2+202306261519
□	FOC2330V0T0	192.168.49.41	4.2.2+202306261519

FOC2330V0T0

Label: FOC2330V0T0
Serial Number: FOC2330V0T0
IP address: 192.168.49.41
Version: 4.2.2+202306261519
System date: Jul 6, 2023 11:26:00 AM
Deployment: Sensor Management Extension
Active Discovery: Unavailable
Capture mode: All

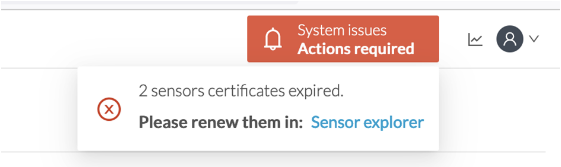
System Health
Status: Connected
Processing status: Normally processing
Uptime: 18 hours

- In the case of sensors deployed manually, it only applies if the sensors certificate have not expired yet (i.e. the sensor certificate status is Expire Soon).

If sensors have been deployed manually and the certificate expiration date is exceeded, refer to Sensor certificate renewal through the Local Manager, on page 70.

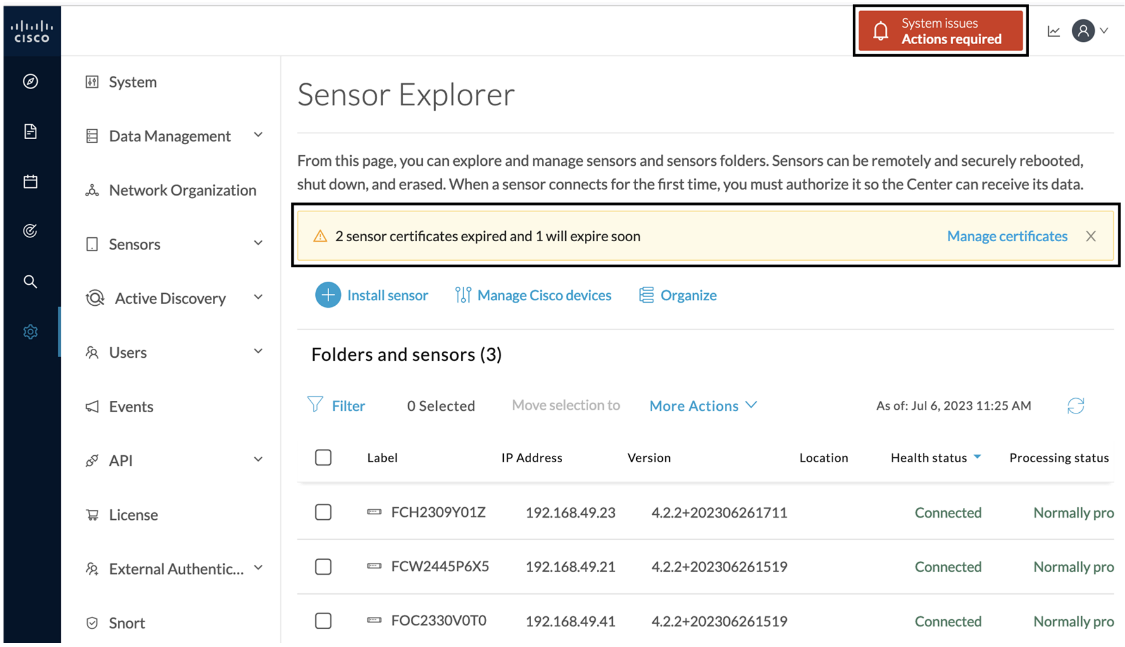
Procedure

Step 1 In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer or click the top banner alert to access the Sensor Explorer page directly.



2 sensors certificates expired.
Please renew them in: Sensor explorer

Another alert is displayed.


Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can 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.

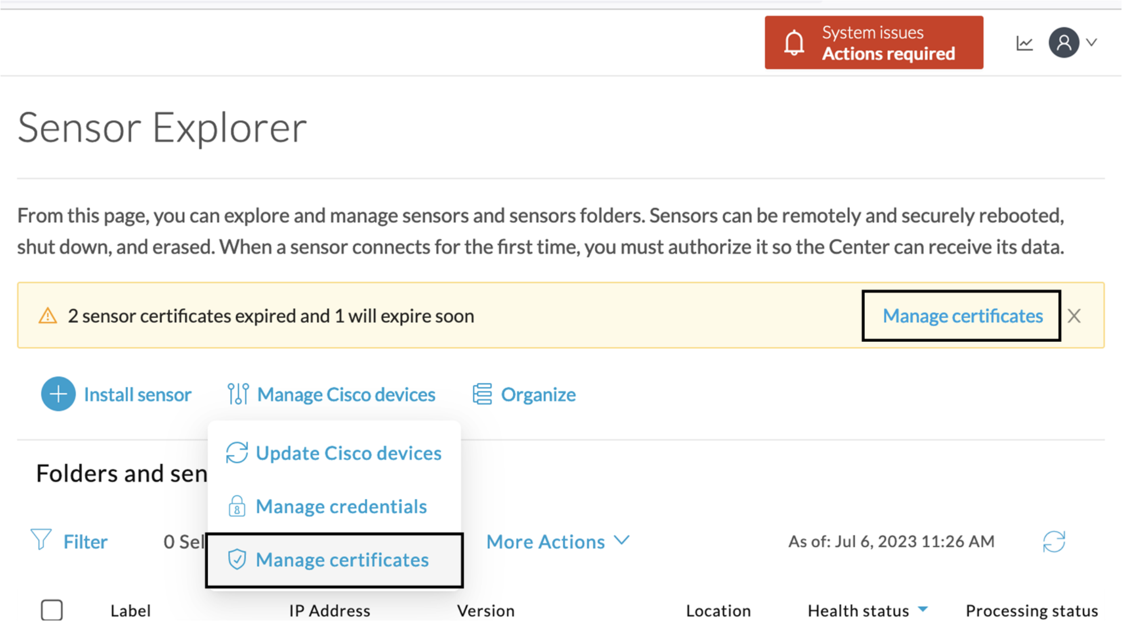
2 sensor certificates expired and 1 will expire soon — Manage certificates

Folders and sensors (3)

As of: Jul 6, 2023 11:25 AM

Label	IP Address	Version	Location	Health status	Processing status
FCH2309Y01Z	192.168.49.23	4.2.2+202306261711		Connected	Normally pro
FCW2445P6X5	192.168.49.21	4.2.2+202306261519		Connected	Normally pro
FOC2330V0T0	192.168.49.41	4.2.2+202306261519		Connected	Normally pro

Step 2 Click **Manage certificates** in the alert or **Manage Cisco devices** > **Manage certificates**.

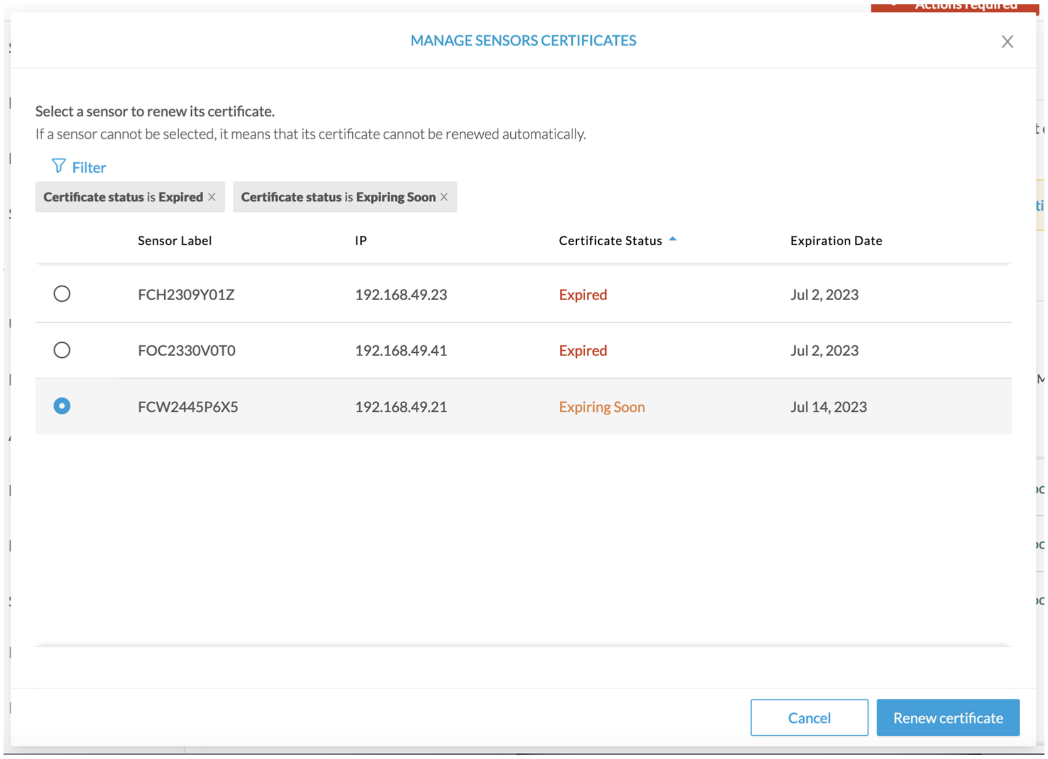

Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can 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.

2 sensor certificates expired and 1 will expire soon — Manage certificates

As of: Jul 6, 2023 11:26 AM

The **Manage sensors certificates** window opens.



MANAGE SENSORS CERTIFICATES

Select a sensor to renew its certificate.

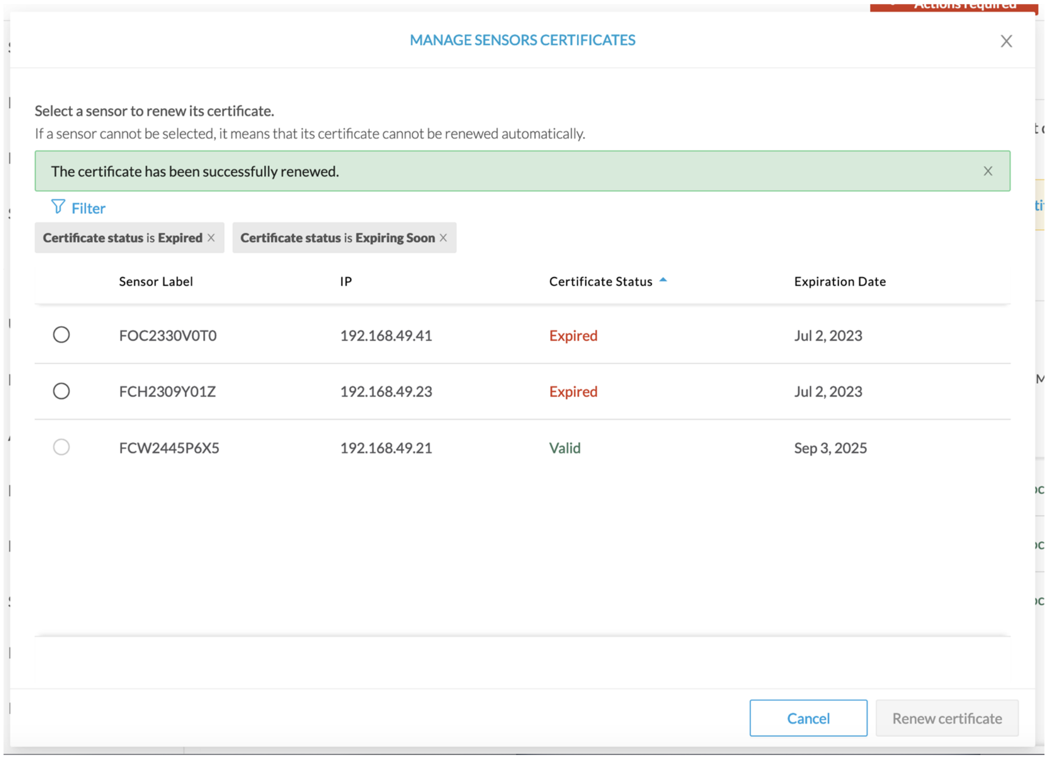
If a sensor cannot be selected, it means that its certificate cannot be renewed automatically.

Filter
Certificate status is Expired ×
Certificate status is Expiring Soon ×

	Sensor Label	IP	Certificate Status	Expiration Date
○	FCH2309Y01Z	192.168.49.23	Expired	Jul 2, 2023
○	FOC2330V0T0	192.168.49.41	Expired	Jul 2, 2023
●	FCW2445P6X5	192.168.49.21	Expiring Soon	Jul 14, 2023

Step 3 Select the sensor with the status Expiring Soon.

Step 4 Click **Renew certificate**.



MANAGE SENSORS CERTIFICATES

Select a sensor to renew its certificate.

If a sensor cannot be selected, it means that its certificate cannot be renewed automatically.

The certificate has been successfully renewed.

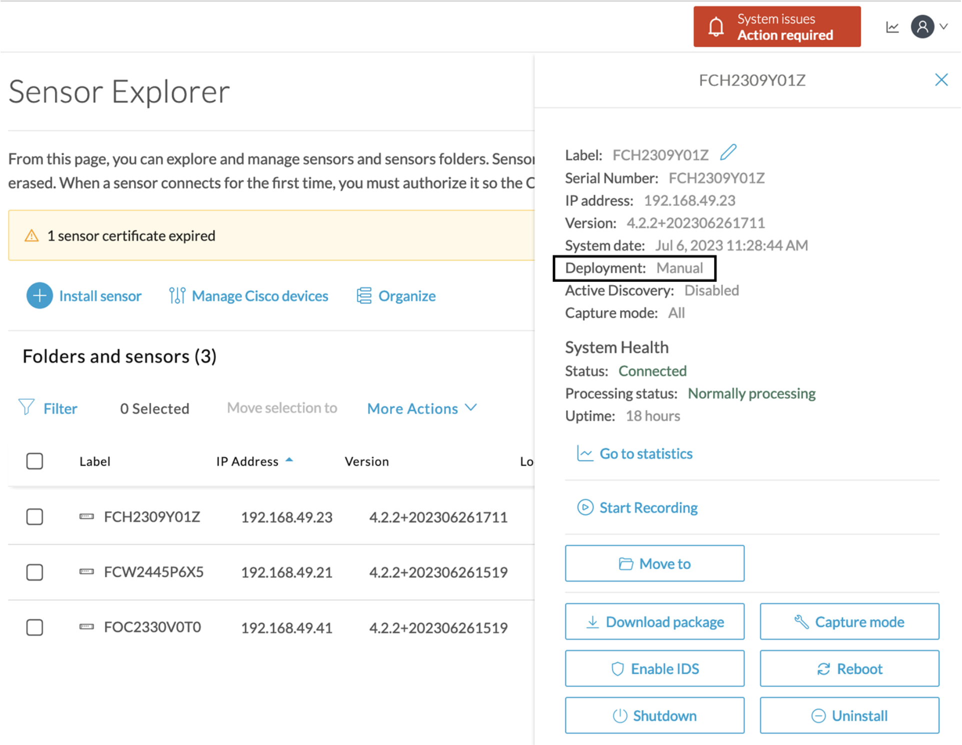
Filter
Certificate status is Expired ×
Certificate status is Expiring Soon ×

	Sensor Label	IP	Certificate Status	Expiration Date
○	FOC2330V0T0	192.168.49.41	Expired	Jul 2, 2023
○	FCH2309Y01Z	192.168.49.23	Expired	Jul 2, 2023
○	FCW2445P6X5	192.168.49.21	Valid	Sep 3, 2025

The certificate is renewed and automatically sent to the sensor. Its status switches to Valid and the new expiration date appears.

Sensor certificate renewal through the Local Manager

In case of certificate expiration, communication with the sensor is no longer possible if it was deployed manually (i.e. without the sensor management extension). In this case, the certificate is renewed by sending it to the sensor manually. As the certificate is part of the provisioning package, the action consists in generating the provisioning package and sending it to the sensor application through the Local Manager.



Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Senso
erased. When a sensor connects for the first time, you must authorize it so the C

⚠ 1 sensor certificate expired

Folders and sensors (3)

0 Selected

□	Label	IP Address ▲	Version	Lo
□	FCH2309Y01Z	192.168.49.23	4.2.2+202306261711	
□	FCW2445P6X5	192.168.49.21	4.2.2+202306261519	
□	FOC2330V0T0	192.168.49.41	4.2.2+202306261519	

FCH2309Y01Z

Label: FCH2309Y01Z
Serial Number: FCH2309Y01Z
IP address: 192.168.49.23
Version: 4.2.2+202306261711
System date: Jul 6, 2023 11:28:44 AM
Deployment: Manual
Active Discovery: Disabled
Capture mode: All

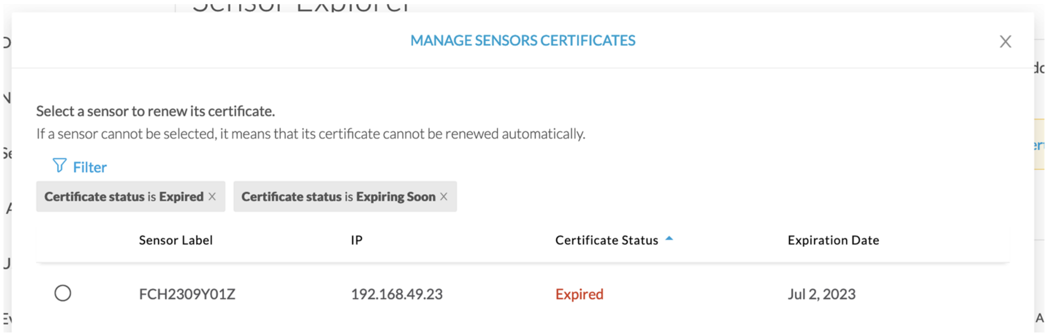
System Health
Status: Connected
Processing status: Normally processing
Uptime: 18 hours

Procedure

Step 1 In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer.

Step 2 Click **Manage Certificates**.

The Manage sensors certificates window appears.



MANAGE SENSORS CERTIFICATES

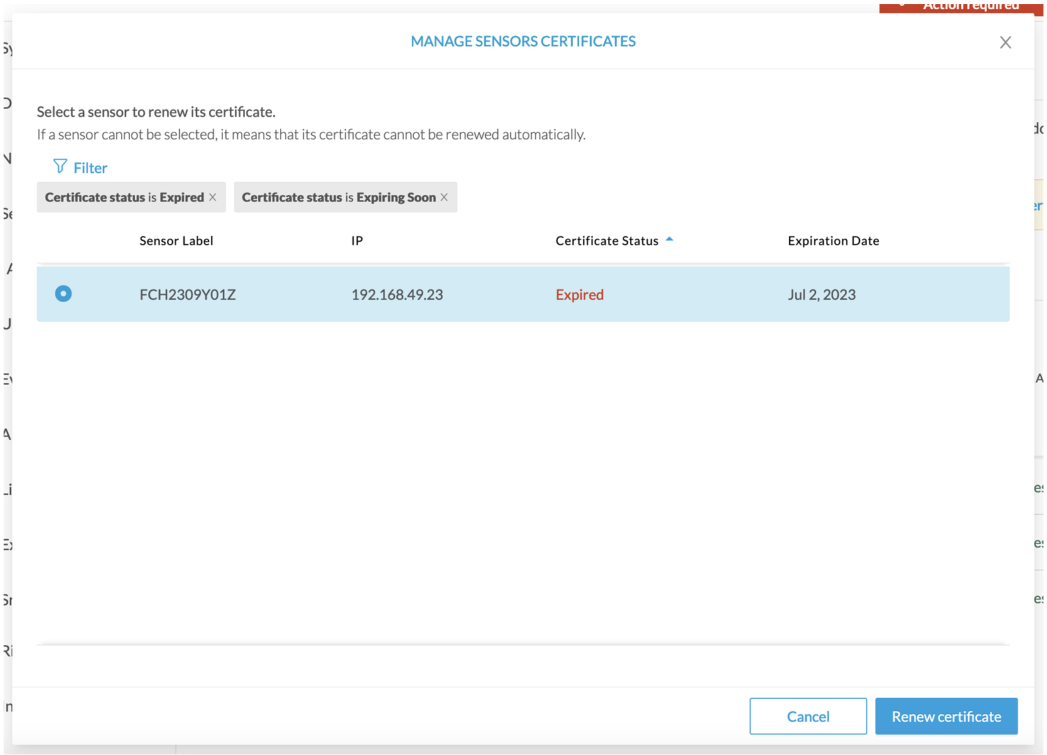
Select a sensor to renew its certificate.

If a sensor cannot be selected, it means that its certificate cannot be renewed automatically.

Filter
Certificate status is Expired ×
Certificate status is Expiring Soon ×

	Sensor Label	IP	Certificate Status	Expiration Date
○	FCH2309Y01Z	192.168.49.23	Expired	Jul 2, 2023

Step 3 Select the sensor and click **Renew Certificate**.



MANAGE SENSORS CERTIFICATES

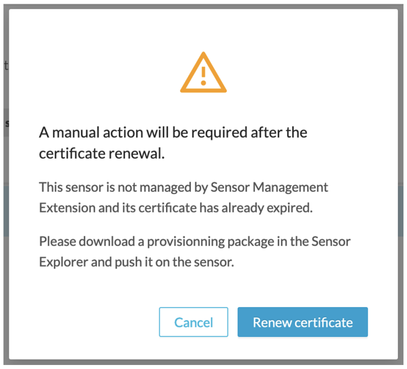
Select a sensor to renew its certificate.

If a sensor cannot be selected, it means that its certificate cannot be renewed automatically.

Filter
Certificate status is Expired ×
Certificate status is Expiring Soon ×

	Sensor Label	IP	Certificate Status	Expiration Date
●	FCH2309Y01Z	192.168.49.23	Expired	Jul 2, 2023

A message is displayed.



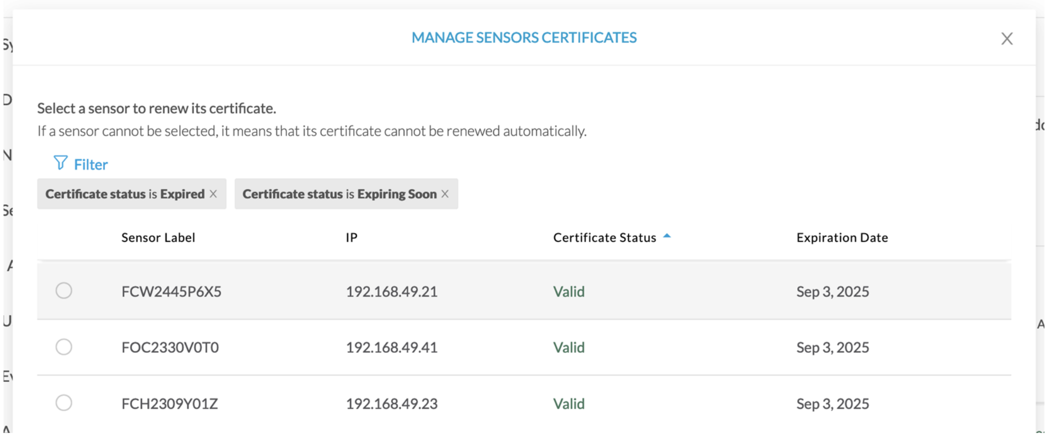
A manual action will be required after the certificate renewal.

This sensor is not managed by Sensor Management Extension and its certificate has already expired.

Please download a provisionning package in the Sensor Explorer and push it on the sensor.

Step 4 Click **Renew certificate** again.

The sensor certificate status appears as valid.



MANAGE SENSORS CERTIFICATES

Select a sensor to renew its certificate.

If a sensor cannot be selected, it means that its certificate cannot be renewed automatically.

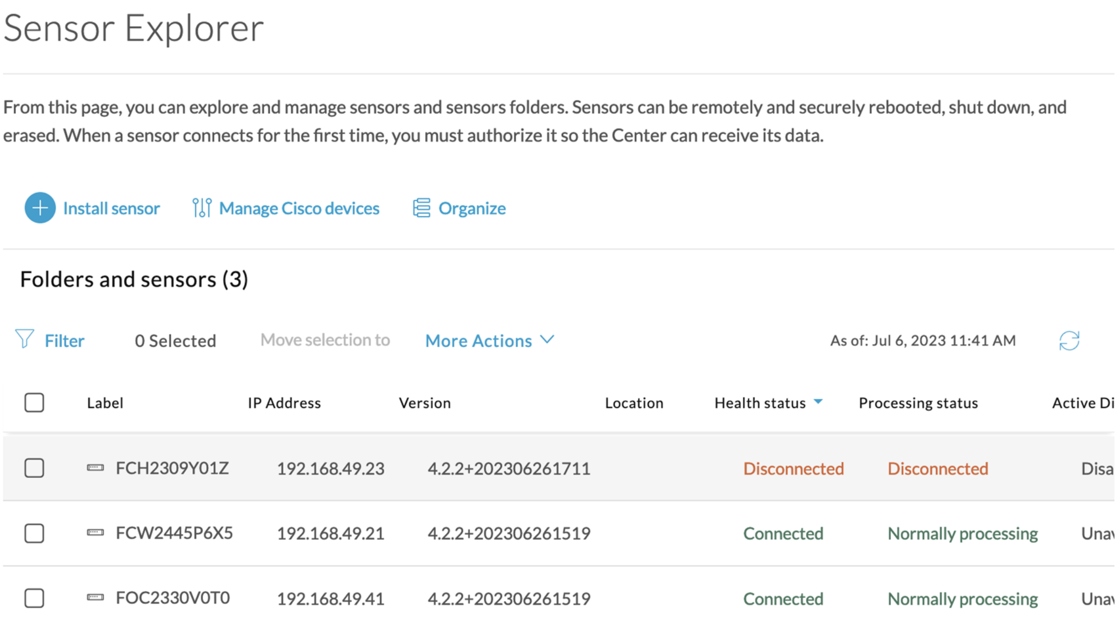
Filter

Certificate status is Expired × Certificate status is Expiring Soon ×

	Sensor Label	IP	Certificate Status	Expiration Date
○	FCW2445P6X5	192.168.49.21	Valid	Sep 3, 2025
○	FOC2330V0T0	192.168.49.41	Valid	Sep 3, 2025
○	FCH2309Y01Z	192.168.49.23	Valid	Sep 3, 2025

Step 5 Close the Manage sensors certificates window.

The sensor's health and processing status appear as Disconnected.



Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can 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.

Install sensor Manage Cisco devices Organize

Folders and sensors (3)

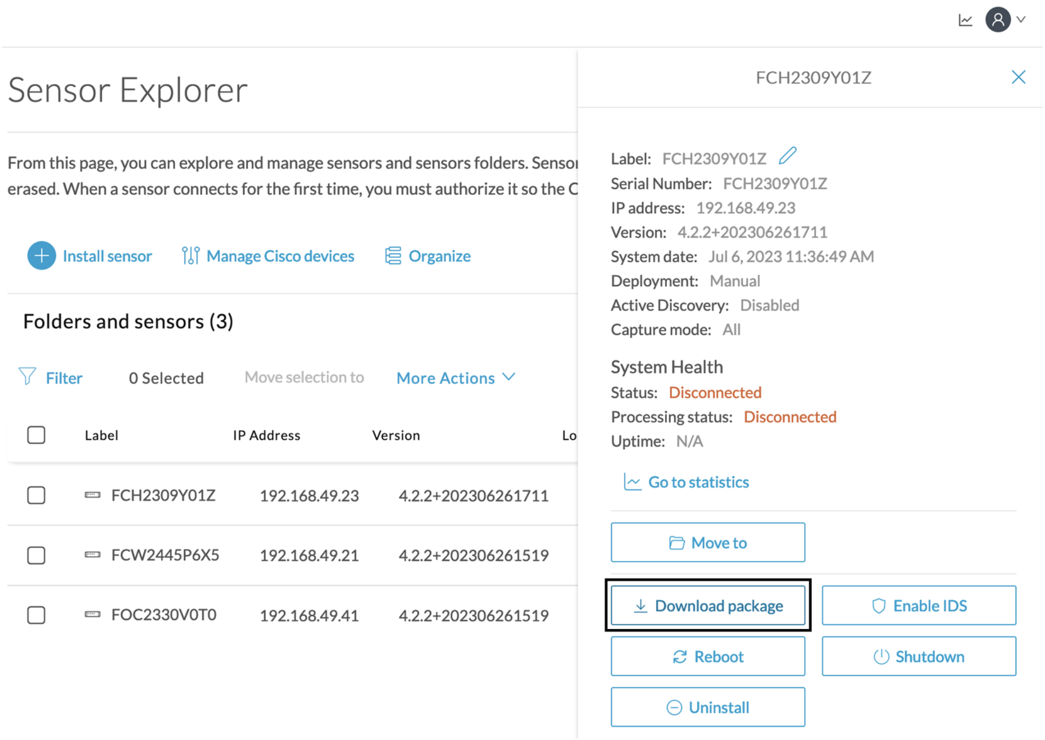
Filter 0 Selected Move selection to More Actions As of: Jul 6, 2023 11:41 AM

□	Label	IP Address	Version	Location	Health status	Processing status	Active Di
□	FCH2309Y01Z	192.168.49.23	4.2.2+202306261711		Disconnected	Disconnected	Disa
□	FCW2445P6X5	192.168.49.21	4.2.2+202306261519		Connected	Normally processing	Unav
□	FOC2330V0T0	192.168.49.41	4.2.2+202306261519		Connected	Normally processing	Unav

Step 6 Click the sensor in the list.

Its right side panel opens.

Step 7 Click the **Download package** button.



Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensoı
erased. When a sensor connects for the first time, you must authorize it so the C

Folders and sensors (3)

☐	Label	IP Address	Version	Lo
☐	FCH2309Y01Z	192.168.49.23	4.2.2+202306261711	
☐	FCW2445P6X5	192.168.49.21	4.2.2+202306261519	
☐	FOC2330V0T0	192.168.49.41	4.2.2+202306261519	

FCH2309Y01Z

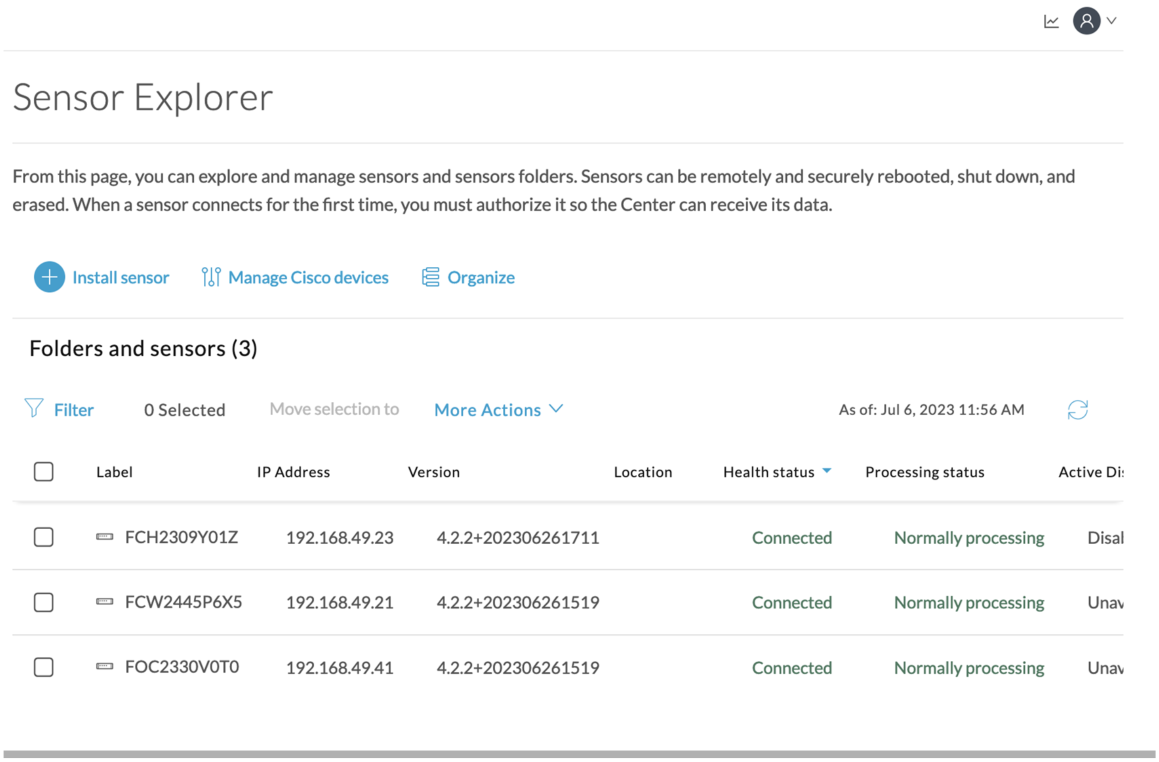
Label: FCH2309Y01Z
Serial Number: FCH2309Y01Z
IP address: 192.168.49.23
Version: 4.2.2+202306261711
System date: Jul 6, 2023 11:36:49 AM
Deployment: Manual
Active Discovery: Disabled
Capture mode: All

System Health
Status: Disconnected
Processing status: Disconnected
Uptime: N/A

Step 8

Step 9 Import the provisioning package in the Local Manager. To do so, refer to Import the provisioning package, on page 34

Step 10 The sensor's health status switches to Connected and its processing status to Normally processing.



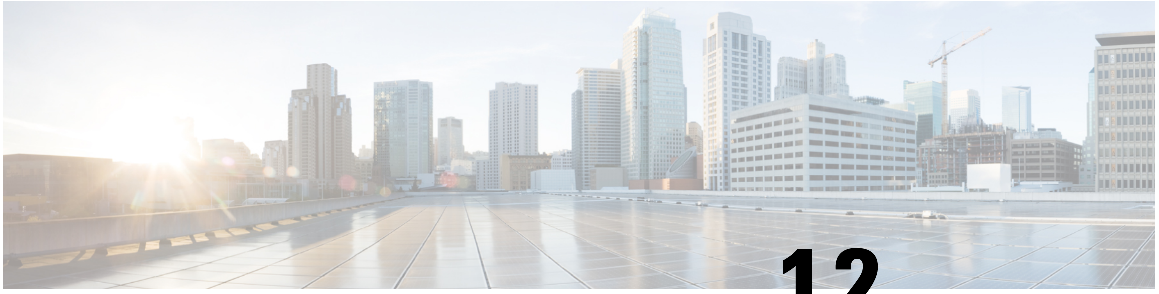
Sensor Explorer

From this page, you can explore and manage sensors and sensors folders. Sensors can 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.

Folders and sensors (3)

As of: Jul 6, 2023 11:56 AM

□	Label	IP Address	Version	Location	Health status	Processing status	Active Di
□	FCH2309Y01Z	192.168.49.23	4.2.2+202306261711		Connected	Normally processing	Disal
□	FCW2445P6X5	192.168.49.21	4.2.2+202306261519		Connected	Normally processing	Unav
□	FOC2330V0T0	192.168.49.41	4.2.2+202306261519		Connected	Normally processing	Unav



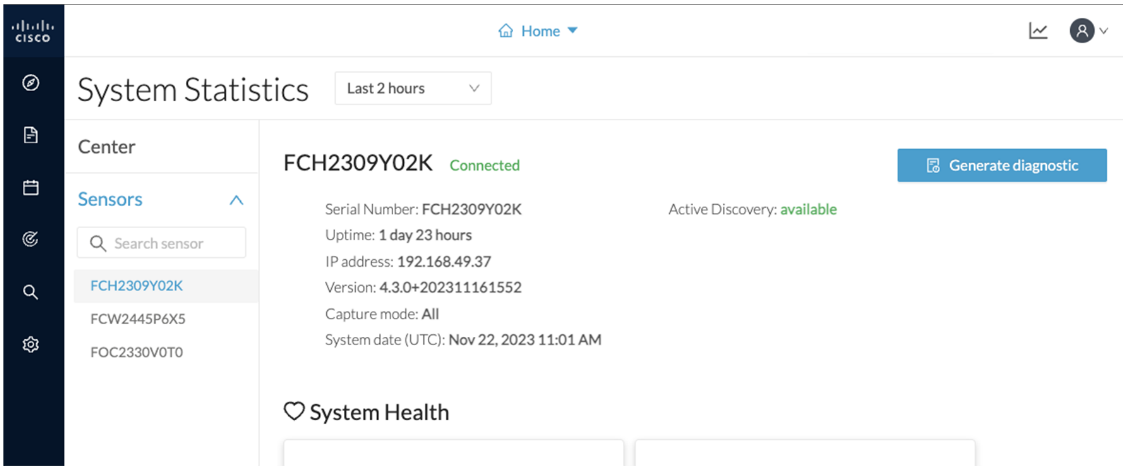
CHAPTER 12

Troubleshooting

Collect IOx sensor logs

In case of sensor issues Cisco Cyber Vision support can ask you to retrieve IOx sensor logs.

If the sensor is communicating with the Center, use the Cisco Cyber VisionGUI to generate the sensor diagnostic from the sensor statistics page.



FCH2309Y02K Connected

Serial Number: FCH2309Y02K

Uptime: 1 day 23 hours

IP address: 192.168.49.37

Version: 4.3.0+202311161552

Capture mode: All

System date (UTC): Nov 22, 2023 11:01 AM

Active Discovery: available

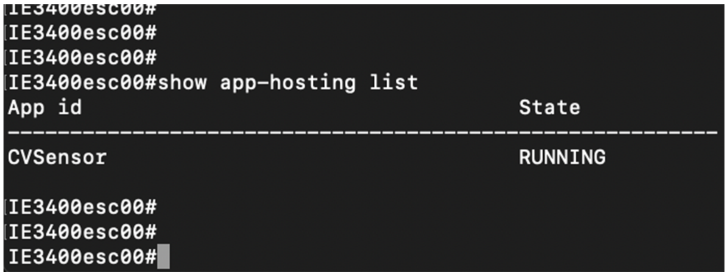
If the sensor is not communicating with the Center, you can collect the logs from the sensor command line. To do so:

Procedure

Step 1 Connect to the sensor in ssh.

Step 2 Use the following command to get the sensor application id:

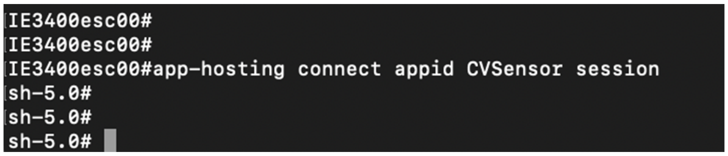
```
show app-hosting list
```



```
IE3400esc00#
IE3400esc00#
IE3400esc00#
IE3400esc00#show app-hosting list
App id                                   State
------------------------------------------------------
CVSensor                                 RUNNING

IE3400esc00#
IE3400esc00#
IE3400esc00#
```

Step 3 Use the following command to connect to the sensor application:

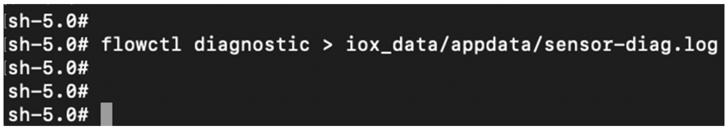
```
app-hosting connect appid <sensor-app-id> session
```



```
IE3400esc00#
IE3400esc00#
IE3400esc00#app-hosting connect appid CVSensor session
sh-5.0#
sh-5.0#
sh-5.0#
```

Step 4 Use the following command and copy the results returned in a file to be sent to Cisco Cyber Vision support.

```
flowctl diagnostic
```



```
sh-5.0#
sh-5.0# flowctl diagnostic > iox_data/appdata/sensor-diag.log
sh-5.0#
sh-5.0#
sh-5.0#
```

Collect IOx sensor logs from the Local Manager

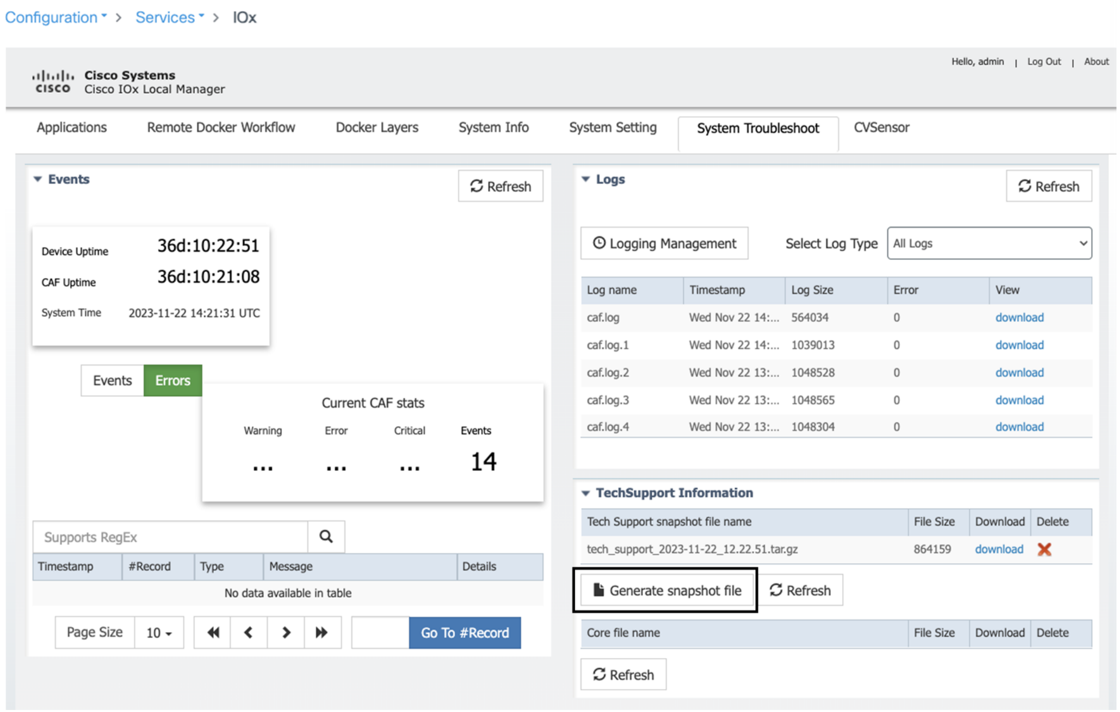
In case of sensor issues Cisco Cyber Vision support can ask you to retrieve IOx sensor logs. You can retrieve them through the IOx Local Manager.

Procedure

Step 1 Access the sensor's IOx Local Manager.

Step 2 Click the **System Troubleshoot** tab.

Step 3 Click the **Generate snaptshot file** button.



Device Uptime 36d:10:22:51
CAF Uptime 36d:10:21:08
System Time 2023-11-22 14:21:31 UTC

Current CAF stats

Warning	Error	Critical	Events
...	...	...	14

Timestamp	#Record	Type	Message	Details
		No data available in table		

Log name	Timestamp	Log Size	Error	View
caf.log	Wed Nov 22 14:...	564034	0	download
caf.log.1	Wed Nov 22 14:...	1039013	0	download
caf.log.2	Wed Nov 22 13:...	1048528	0	download
caf.log.3	Wed Nov 22 13:...	1048565	0	download
caf.log.4	Wed Nov 22 13:...	1048304	0	download

Tech Support snapshot file name	File Size	Download	Delete
tech_support_2023-11-22_12.22.51.tar.gz	864159	download	✗

Core file name	File Size	Download	Delete