



Cisco Cyber Vision Sensor Application for Cisco Switches Installation Guide, Release 4.3.0

First Published: 2021-01-01

Last Modified: 2023-12-14

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CHAPTER 1

About this documentation

- [Document purpose, on page 1](#)
- [Warnings and notices, on page 2](#)

Document purpose

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

- Cisco Catalyst IE3300 10G Rugged Series Switch
- Cisco Catalyst IE3400 Rugged Series Switch
- Cisco Catalyst IE3400 Heavy Duty Series Switch



Note The manual refers to these devices as "IE3x00".

- Cisco Catalyst IE9300 Rugged Series Switch



Note The manual refers to this device as "IE9x00".

- Cisco Catalyst 9300 Series Switch
- Cisco Catalyst 9300X Series Switch
- Cisco Catalyst 9400 Series Switch



Note The manual refers to these devices as "Catalyst 9x00".

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

This documentation is applicable to **system version 4.3.0**.

Warnings and notices

To ensure your personal safety and to prevent damage to property, observe the following: Warnings and notices and Safety Alert symbols. 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, on page 3](#)

Overview

Proposed architecture:

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 switch 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 blue on the schema. Mirrored OT traffic is represented in yellow.

The architecture in this document is meant for a switch with an embedded sensor directly connected to the Cisco Cyber Vision Center. The schema presents two types of architecture:

- one with a direct connection to the Center (link="switchport access vlan 507").
- the other with a trunk to another switch or router which is connected to the Center (link="switch mode trunk").

Several types of installation are explained. One of them is the installation with the Sensor Management extension. This method requires an access for the Cisco Cyber Vision Center to the switch's Local Manager. Several solutions exist:

having the Center on the same subnet than the switch's Local Manager (<admin_VLAN> and <collection_VLAN> are the same).

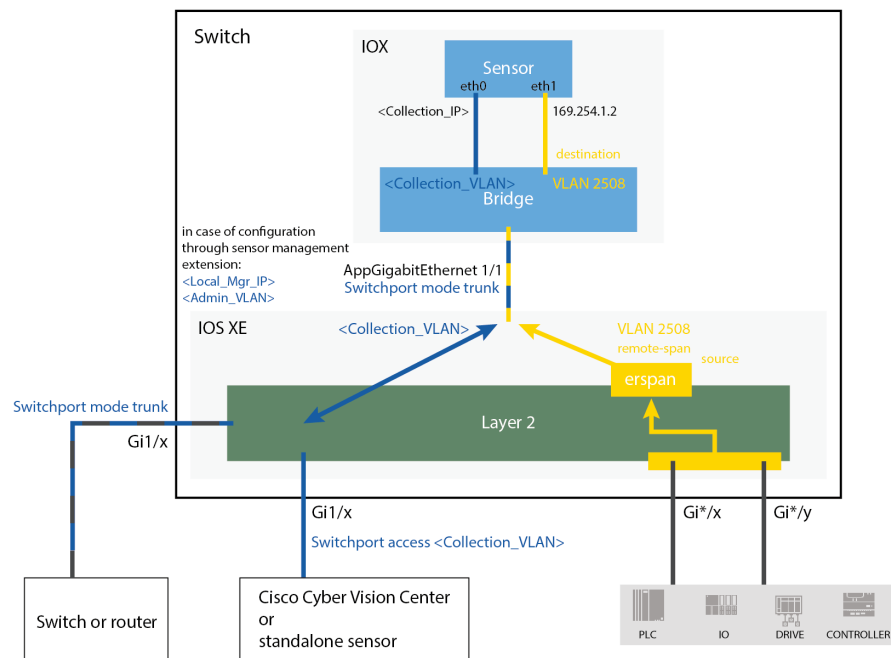
having a route path from the Center to an <admin_VLAN> that is different from <collection_VLAN>.

Any port of the switch can be used for the communication with the Center or for OT traffic.

Architecture diagram for:

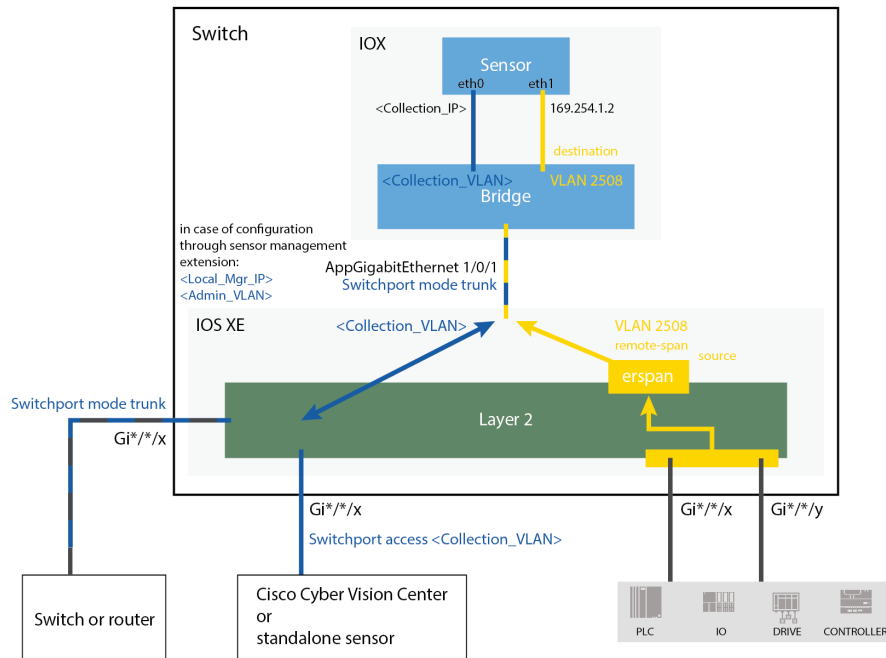
- **Cisco Catalyst IE3300 10G Rugged Series Switch**
- **Cisco Catalyst IE3400 Rugged Series Switch**

- Cisco Catalyst IE3400 Heavy Duty Series Switch



Architecture diagram for:

- Cisco Catalyst 9300 Series Switch
- Cisco Catalyst 9300X Series Switch
- Cisco Catalyst 9400 Series Switch
- Cisco Catalyst IE9300 Rugged Series Switch





CHAPTER 3

Requirements

- [Requirements, on page 7](#)

Requirements

The hardware must have an access set to the Local Manager and to the CLI (ssh or console port).

Elements to collect

- The Cisco Cyber Vision Sensor application to collect from Cisco.com, i.e.
 - CiscoCyberVision-IOx-aarch64-<version>.tar (Cisco IE3300 10G, Cisco IE3400, Cisco IE9300)
 - CiscoCyberVision-IOx-x86-64-<version>.tar (Cisco Catalyst 9300)
 - CiscoCyberVision-IOx-Active-Discovery-aarch64-<version>.tar (Cisco IE3300 10G, Cisco IE3400, Cisco IE9300 with Active Discovery)
 - CiscoCyberVision-IOx-Active-Discovery-x86-64-<version>.tar (Cisco Catalyst 9300 with Active Discovery)
- A console cable, for the connection to the hardware's console port.
OR
- An Ethernet cable, for the connection to one of the hardware's port.



CHAPTER 4

Additional remarks

- [Additional remarks, on page 9](#)

Additional remarks

About the IE3400 and IE3300 10G platforms:

Cisco Cyber Vision Sensor application will receive ERSPAN traffic. Due to ERSPAN overhead it is recommended to not update the MTU of the platform (switch IE3x00) above 1940 bytes. Otherwise, large packets above 1940 will not be received by the sensor application.

About the initial configuration:

Configurations described in the initial configuration are given as examples to use a Cisco Cyber Vision sensor embedded in a switch.

However, in case a more complex installation is required, a trained user will have to configure the switch with all the necessary VLAN and port settings.



CHAPTER 5

Known issues

- [Known issues, on page 11](#)

Known issues

- The deployment procedure with the Local Manager is not supported by firmware version 17.3.x. Perform the [Procedure with the Cisco Cyber Vision sensor management extension, on page 23](#) instead.
- Cisco Catalyst 9300: deployments will be possible for sensors on firmware version 17.6.x as of Cisco Cyber Vision version 4.0.1.
- IOx redundancy is not supported: sensors will not persist after a failover. This applies in particular to stacks of Cisco Catalyst 9300, stacks of Cisco Catalyst 9300X, stacks of Cisco IE9300 and Cisco Catalyst 9400 with redundant processor boards.
- The sensor application supports RSPAN on Catalyst 9x00 in addition to ERSPAN in Cisco Cyber Vision version 4.1.3. In case of RSPAN usage, multicast packets and packet VLAN information are not transferred to the sensor application.



CHAPTER 6

Initial configuration

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

- [Configure the switch access, on page 13](#)
- [Check the software version, on page 13](#)
- [SD Card \(IE3x00/IE9x00\), on page 14](#)
- [SSD Disk \(Catalyst 9x00\), on page 15](#)
- [Check date and time, on page 15](#)
- [Enable IOx, on page 16](#)
- [Add the necessary configuration parameters \(IE3x00\), on page 17](#)
- [Add the necessary configuration parameters \(Catalyst 9x00/IE9x00\), on page 19](#)

Configure the switch access

To configure each Cisco switch access refer to its corresponding installation guide available through the following links:

- Cisco Catalyst IE3x00:
 - <https://www.cisco.com/c/en/us/support/switches/catalyst-ie3300-rugged-series/series.html#~tab-documents>
 - <https://www.cisco.com/c/en/us/support/switches/catalyst-ie3400-rugged-series/series.html#~tab-documents>
 - <https://www.cisco.com/c/en/us/support/switches/catalyst-ie3400-heavy-duty-series/series.html>
- Cisco Catalyst IE9x00:
 - <https://www.cisco.com/c/en/us/support/switches/catalyst-ie9300-rugged-series/series.html>
- Cisco Catalyst 9x00:
 - <https://www.cisco.com/c/en/us/support/switches/catalyst-9300-series-switches/series.html#~tab-documents>
 - <https://www.cisco.com/c/en/us/support/switches/catalyst-9400-series-switches/series.html#~tab-documents>

Check the software version

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

```
Show version
```

To be compatible with the Cisco Cyber Vision Sensor Application:

- the displayed version for Cisco IE3x00 and Cisco Catalyst 9x00 must be 17.02.01 or higher.
- the displayed version for Cisco IE9x00 must be 17.09.01 or higher.

For example: Cisco IE3400

```
IE340CCV#
IE340CCV#show version
Cisco IOS XE Software, Version 17.02.01
Cisco IOS Software [Amsterdam], IE3x00 Switch Software (IE3x00-UNIVERSALK9-M), Version 17.2.1, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 26-Mar-20 01:42 by mcpre
```

If the version is lower, you must update the switch firmware. To do so, follow the links to the products page in [Configure the switch access](#).

SD Card (IE3x00/IE9x00)

If not already done, insert a 4GB Cisco SD card minimum into the switch SD card slot.

- You can format the SD card using the following command:

```
format sdflash: ext4
```

```
IE340CCV#format sdflash: ext4
Format operation may take a while. Continue? [confirm]
Format operation will destroy all data in "sdflash:". Continue? [confirm]
format completed with no errors

Format of sdflash: complete
IE340CCV#
```

- You can partition the SD card using the following command:

```
partition sdflash: iox
```

```
IE3400PERF#partition sdflash: iox
Partitioning IOS:IOX(34%:66%) Default
Partition command reloads the switch, Continue?[confirm]
Please make sure to back-up "sdflash:" contents
Partition operation will destroy all data in "sdflash:". Continue?[confirm]
```

Partition is intended for SD swap drive usage. For more information, refer to the corresponding switch user manual.

- You can check the file system using the following command (check for ext4 and Read/Write):

```
show sdflash: fileys
```

```
IE340CCV#show sdflash: fileys
Filesystem: sdflash
Filesystem Path: /flash11
Filesystem Type: ext4
Mounted: Read/Write
```


SSD Disk (Catalyst 9x00)

If not already done, insert a 120GB Cisco SSD disk minimum in the SSD slot.

- You can format the SSD disk using the following command:

```
format usbflash1: ext4
```

```
CAT9KCCV#  
CAT9KCCV#format usbflash1: ext4  
Format operation may take a while. Continue? [confirm]  
Format operation will destroy all data in "usbflash1:". Continue? [confirm]  
Format of usbflash1: complete  
CAT9KCCV#
```

- You can check the file system using the following command (check for ext4 and Read/Write):

```
show usbflash1: fileys
```

```
CAT9KCCV#show usbflash1: fileys  
Filesystem: usbflash1  
Filesystem Path: /vol/usb1  
Filesystem Type: ext4  
Mounted: Read/Write  
CAT9KCCV#
```

Check date and time

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



Note Unlike hardware sensors (i.e. Cisco IC3000) that fetch their time from the Center, the Cyber Vision IOX application sensor gets the time from the host (switch platform). Therefore, it is critical that the host synchronizes its time with the Center or a valid NTP server if it's synchronized with the Center. If the time difference is large (hours or more), the user should adjust the Cisco IE3400 time using the Local Manager 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
```

For examples:

Cisco IE3400:

```
IE340CCV#  
IE340CCV#show clock  
*13:48:03.650 UTC Wed Apr 8 2020  
IE340CCV#
```

Cisco Catalyst 9300:

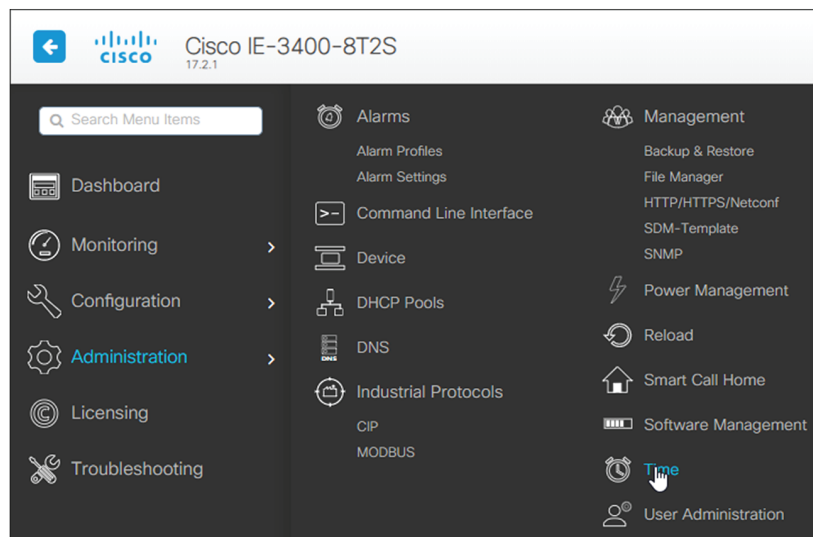
```
CAT9KCCV#
CAT9KCCV#show clock
*16:02:57.900 UTC Thu Apr 30 2020
CAT9KCCV#
```

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

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

Or go to the Local Manager:

For example: Cisco IE3400



Enable IOx

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

- Enable IOx using the following command:

```
configure terminal
iox
```

For examples:

Cisco IE3400:

```
IE340CCV#
IE340CCV#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
IE340CCV(config)#iox
Warning: Do not remove SD flash card when IOx is enabled or errors on SD device could occur.
IE340CCV(config)#
```

Cisco Catalyst 9300:

```
CAT9KCCV#
CAT9KCCV#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
CAT9KCCV(config)#iox
CAT9KCCV(config)#
```

2. Check the IOx service status using the following command:

```
exit
show iox
```

For examples:

Cisco IE3400:

```
IE340CCV#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
```

Cisco Catalyst 9300:

```
CAT9KCCV#
CAT9KCCV#show iox

IOx Infrastructure Summary:
-----
IOx service (CAF) 1.10.0.1 : Running
IOx service (HA)           : Running
IOx service (IOxman)       : Running
IOx service (Sec storage)  : Not Running
Libvirtd 1.3.4              : Running
Dockerd 18.03.0            : Running
Application DB Sync Info  : Available
Sync Status : Disabled

CAT9KCCV#
```

Add the necessary configuration parameters (IE3x00)

The example of configuration given below is a simple one. This configuration is only valid if a direct link exists between the Center and the switch with the embedded sensor. In this case, the dedicated port is configured with the Collection VLAN (for example, 507). In many other cases, the port used for communication between the Center and the sensor will have to be configured as trunk.

1. Open the Cisco IE3300 10G/IE3400 CLI through ssh or via the console terminal.

2. Configure a VLAN for traffic mirroring using the following commands:

```
configure terminal
vtp mode off
vlan 2508
remote-span
exit
```

```
IE34ERIC(config)#vtp mode off
Setting device to VTP Off mode for VLANs.
IE34ERIC(config)#vlan 2508
IE34ERIC(config-vlan)#remote-span
IE34ERIC(config-vlan)#exit
IE34ERIC(config)#
```

The VTP off command is performed here since VTP is enabled by default and is not compatible with a high VLAN number.

If needed, select another VLAN number and use the VTP configuration requested by the network.

3. Configure the AppGigabitEthernet port for communications to reach the IOx virtual application.

If communication with the sensor is done on VLAN1, the native VLAN of the AppGigabit interface must be changed to a different value, where "xxx" is the existing VLAN in the switch.

```
interface AppGigabitEthernet 1/1
switchport mode trunk
switchport trunk native vlan xxx
exit
```

```
IE340CCV(config)#
IE340CCV(config)#interface AppGigabitEthernet 1/1
IE340CCV(config-if)#switchport mode trunk
IE340CCV(config-if)#exit
IE340CCV(config)#
```

4. Configure the SPAN session and add to the session the interfaces to monitor:

```
monitor session 1 source interface Gi1/10 both
monitor session 1 destination remote vlan 2508
monitor session 1 destination format-erspan 169.254.1.2
```

```
IE340CCV(config)#monitor session 1 source interface Gi1/10 both
IE340CCV(config)#monitor session 1 destination remote vlan 508
IE340CCV(config)#monitor session 1 destination format-erspan 169.254.1.2
```

5. Configure one of the switch's ports to enable the communication between the virtual sensor and the Center:

```
int gi1/3
switchport access vlan 507
no shutdown
```

```
IE340CCV(config)#
IE340CCV(config)#int gi1/3
IE340CCV(config-if)#switchport access vlan 507
% Access VLAN does not exist. Creating vlan 507
IE340CCV(config-if)#no shutdown
IE340CCV(config-if)#exit
```

6. Save the configuration using the following commands:

```
exit
write mem
```

```
IE340CCV(config)#exit
IE340CCV#write mem
Building configuration...
[OK]
IE340CCV#
```

The initial configuration is now complete. Proceed with the application installation and deployment following one of the procedures below:

- [Procedure with the Cisco Cyber Vision sensor management extension, on page 23](#)
- [Procedure with the Local Manager, on page 33](#)
- [Procedure with the CLI, on page 51](#)

Add the necessary configuration parameters (Catalyst 9x00/IE9x00)

The configuration examples given in this section are simple ones. They are only valid if a direct link exists between the Center and the switch with the embedded sensor. In this case, the dedicated port is configured with the Collection VLAN (for example, 507). In many other cases, the port used for communication between the Center and the sensor will have to be configured as trunk.

Configuration with ERSPAN is recommended but requires routing to be enabled on the switch. If this is not possible, RSPAN is available on the Catalyst 9x00. However, note that Multicast and VLAN information will be missing with this configuration.

Configure with ERSPAN

Procedure

-
- Step 1** Open the switch's CLI through ssh or via the console terminal.
- Step 2** Configure a VLAN for traffic mirroring using the following commands:
- ```
configure terminal
ip routing
vlan 2508
exit
int vlan 2508
ip address 169.254.1.1 255.255.255.252
no shutdown
exit
```
- Step 3** Configure the AppGigabitEthernet port which will enable the communication to the IOx virtual application.

If communication with the sensor is done on VLAN1, the native VLAN of the Appgigabit interface must be changed to a different value, where "xxx" is the existing VLAN in the switch.

```
interface AppGigabitEthernet 1/0/1
switchport mode trunk
switchport trunk native vlan xxx
exit
```

```
CAT9KCCV(config)#
CAT9KCCV(config)#interface AppGigabitEthernet 1/0/1
CAT9KCCV(config-if)#switchport mode trunk
CAT9KCCV(config-if)#exit
CAT9KCCV(config)#
```

**Step 4** Configure the SPAN session and add to the session the interfaces to monitor:

**Note** Disabling the ip routing command for IPv4 connections and ipv6 unicast-routing command for IPv6 connections stops ERSPAN traffic flow to the destination port. [Link to Catalyst 9300 manual.](#)

```
monitor session 1 type erspan-source
source interface Gi1/0/2 - 24 both
no shutdown
destination
erspan-id 2
mtu 9000
ip address 169.254.1.2
origin ip address 169.254.1.1
exit
exit
```

```
CAT9KCCV(config)#
CAT9KCCV(config)#monitor session 1 type erspan-source
CAT9KCCV(config-mon-erspan-src)#source interface Gi1/0/2 - 24 both
CAT9KCCV(config-mon-erspan-src)#no shutdown
CAT9KCCV(config-mon-erspan-src)#destination
CAT9KCCV(config-mon-erspan-src-dst)#erspan-id 2
CAT9KCCV(config-mon-erspan-src-dst)#mtu 9000
CAT9KCCV(config-mon-erspan-src-dst)#ip address 169.254.1.2
CAT9KCCV(config-mon-erspan-src-dst)#origin ip address 169.254.1.1
CAT9KCCV(config-mon-erspan-src-dst)#exit
CAT9KCCV(config-mon-erspan-src)#exit
CAT9KCCV(config)#
```

**Step 5** Configure one of the switch's ports to enable the communication between the virtual sensor and the Center:

```
interface GigabitEthernet1/0/1
switchport access vlan 507
no shutdown
exit
```

```
CAT9KCCV(config)#interface GigabitEthernet1/0/1
CAT9KCCV(config-if)#switchport access vlan 507
% Access VLAN does not exist. Creating vlan 507
CAT9KCCV(config-if)#no shutdown
CAT9KCCV(config-if)#exit
CAT9KCCV(config)#
```

**Step 6** Save the configuration:

```
exit
write mem
```

```
CAT9KCCV(config)#
CAT9KCCV(config)#exit
CAT9KCCV#write mem
Building configuration...
[OK]
CAT9KCCV#
```

### What to do next

The initial configuration is now complete. Proceed with the application installation and deployment following one of the procedures below:

- [Procedure with the Cisco Cyber Vision sensor management extension, on page 23](#)
- [Procedure with the Local Manager, on page 33](#)
- [Procedure with the CLI, on page 51](#)

## Configure with RSPAN (Catalyst 9x00 only)

### Before you begin

The VLAN configured for RSPAN (here 2508) must be filtered on all trunk ports except for the AppGigabitEthernet interface.

### Procedure

**Step 1** Open the switch's CLI through ssh or via the console terminal.

**Step 2** Configure a VLAN for traffic mirroring using the following commands:

```
configure terminal
vlan 2508
exit
int vlan 2508
remote-span
exit
```

**Step 3** Configure the AppGigabitEthernet port which will enable the communication to the IOx virtual application.

If communication with the sensor is done on VLAN1, the native VLAN of the Appgigabit interface must be changed to a different value, where "xxx" is the existing VLAN in the switch.

```
interface AppGigabitEthernet 1/0/1
switchport mode trunk
switchport trunk native vlan xxx
exit
```

```
CAT9KCCV(config)#
CAT9KCCV(config)#interface AppGigabitEthernet 1/0/1
CAT9KCCV(config-if)#switchport mode trunk
CAT9KCCV(config-if)#exit
CAT9KCCV(config)#
```

**Step 4** Configure the SPAN session and add to the session the interfaces to monitor:

```
monitor session 1 source interface Gi1/0/2 - 24 both
monitor session 1 destination remote vlan 2508
```

**Step 5** Configure one of the switch's ports to enable the communication between the virtual sensor and the Center:

```
interface GigabitEthernet1/0/1
switchport access vlan 507
no shutdown
exit
```

```
CAT9KCCV(config)#interface GigabitEthernet1/0/1
CAT9KCCV(config-if)#switchport access vlan 507
% Access VLAN does not exist. Creating vlan 507
CAT9KCCV(config-if)#no shutdown
CAT9KCCV(config-if)#exit
CAT9KCCV(config)#
```

**Step 6** Save the configuration:

```
exit
write mem
```

```
CAT9KCCV(config)#
CAT9KCCV(config)#exit
CAT9KCCV#write mem
Building configuration...
[OK]
CAT9KCCV#
```

---

### What to do next

The initial configuration is now complete. Proceed with the application installation and deployment following one of the procedures below:

- [Procedure with the Cisco Cyber Vision sensor management extension, on page 23](#)
- [Procedure with the Local Manager, on page 33](#)
- [Procedure with the CLI, on page 51](#)





## CHAPTER 7

# Installation

---

- [Procedure with the Cisco Cyber Vision sensor management extension, on page 23](#)
- [Procedure with the Local Manager, on page 33](#)
- [Procedure with the CLI, on page 51](#)

## Procedure with the Cisco Cyber Vision sensor management extension

After the [Initial configuration](#), proceed to the steps described in this section.



---

**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.

---

## 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 Extension administration page in Cisco Cyber Vision.
- Step 3** Import the extension file.

Once the sensor management extension is installed, you will find a new management job under the sensor administration menu ([Management jobs, on page 24](#)), 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.

| 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 (FOC2337LOCW) |       |
| Single redeployment (FCW23500HDC) |       |

**Enroll - Error**

Enroll

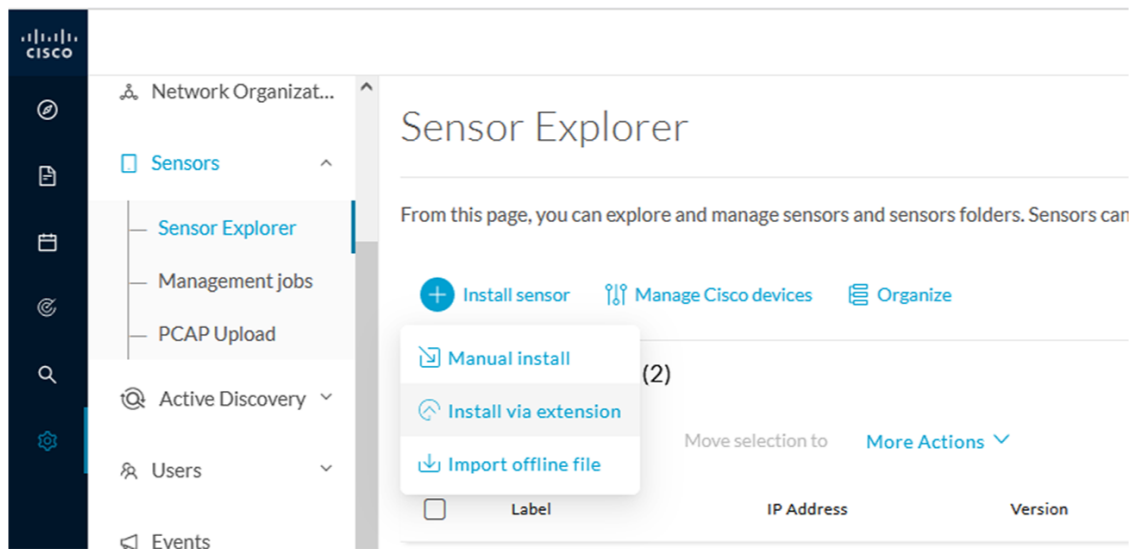
Error

```
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 in the sensor management extension

### Procedure

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



**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*                                | Port*                                  |
| <input type="text" value="192.168.49.20"/> | <input type="text" value="443"/>       |
|                                            | <small>For example 443 or 8443</small> |

Center collection IP

leave blank to use current collection IP

---

Credentials

Login\*

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

---

[Exit](#) **Connect**

**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 a sensor in the sensor management extension

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

**Form for the Cisco IE3x00 and the Cisco IE9x00:**

Install via extension

## Configure Cyber Vision IOx sensor app

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

Cisco device: IE-3400-8T2S

Capture IP address\*

169.254.1.2

Capture prefix length\*

30

Like 24, 16 or 8

Capture VLAN number\*

2508

Collection IP address\*

192.168.49.21

Collection prefix length\*

24

Like 24, 16 or 8

Collection gateway

Collection VLAN number\*

507

Exit

Next

**Form for the Cisco Catalyst 9x00 with RSPAN configuration available:**

Cisco device: C9300L-48T-4X

Monitor session type:

- ERSPAN: recommended choice  
 RSPAN: use it only when using ERSPAN is not possible

Capture IP address\*

169.254.1.2

Capture prefix length\*

30

Like 24, 16 or 8

Capture VLAN number\*

2508

Collection IP address\*

192.168.0.248

Collection prefix length\*

24

Like 24, 16 or 8

Collection gateway

Collection VLAN number\*

4

Exit

Next

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 sensor
- Capture prefix length: mask of the capture IP address
- Capture VLAN number: VLAN of the monitor session in the sensor
- Collection IP address: IP address of the sensor in the device
- Collection prefix length: mask of the Collection IP address
- Collection gateway: gateway of the Collection IP address
- Collection VLAN number: VLAN of the sensor

### Step 2

Click **Next**.

### Step 3

**Active Discovery:**

If you want to enable Active Discovery on the sensor, select **Passive and Active Discovery**.

You can:

- use the sensor Collection interface by selecting it:

Install via extension

---

### Configure Active Discovery

Please select an application type. If you want to enable Active Discovery on the application, select "Passive and Active Discovery". You will have to add some network interfaces parameters.

**Passive only**  
 **Passive and Active Discovery**

---

| Add Active Discovery configuration                                                                      | Network interfaces                                                                                 |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Use collection interface<br><a href="#">+ New network interface</a> | <ul style="list-style-type: none"> <li>• 192.168.49.21/24 VLAN#1 (collection interface)</li> </ul> |

- add new network interfaces filling the following parameters to set dedicated network interfaces and clicking Add:
  - IP address
  - Prefix length
  - VLAN number

Add Active Discovery configuration

Use collection interface

+ New network interface

IP address\*

IP address interface used to do Active Discovery

Prefix length\*

Like 24, 16 or 8

VLAN number\*

Use 1 by default

Add

Cancel

Network interfaces

- 192.168.50.21/24 VLAN#50

delete

Back

Deploy

#### Step 4 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.

The screenshot shows the 'Management jobs' page in a web interface. On the left is a navigation sidebar with 'Management jobs' selected. The main content area shows a table with one job: 'Single deployment (FCW2445P6X5)'. The job progress is visualized as a horizontal line with three circular indicators: the first is blue with a white checkmark, and the other two are grey with a white power symbol. A page indicator '< 1 >' is visible in the top right of the table area.

Once the deployment is finished, a new sensor appears in the sensors list.

The sensor's status will eventually turn to connected.

|                          |             |               |                    |           |              |         |        |
|--------------------------|-------------|---------------|--------------------|-----------|--------------|---------|--------|
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.1.0+202202151440 | Connected | Pending data | Enabled | 4 days |
|--------------------------|-------------|---------------|--------------------|-----------|--------------|---------|--------|

If the Active Discovery has been enabled and set -that is if the option **Passive and Active Discovery** was selected when configuring the sensor in the sensor management extension- the sensor is displayed as below with Active Discovery's status as Enabled.



| <input type="checkbox"/> | Label       | IP Address    | Version            | Location      | Health status | Processing status | Active Discovery | Uptime |
|--------------------------|-------------|---------------|--------------------|---------------|---------------|-------------------|------------------|--------|
| <input type="checkbox"/> | FCW2445P6X5 |               |                    | 192.168.49.21 | Disconnected  | Disconnected      |                  | Not    |
| <input type="checkbox"/> | FCW2445P6X5 |               |                    | 192.168.49.21 | Disconnected  | Disconnected      |                  | Not    |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.1.0+202202151440 |               | Connected     | Pending data      | Enabled          | 4 days |

## 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.

The screenshot shows the 'Sensor Explorer' interface for sensor FCW2445P6X5. The main panel displays a list of folders and sensors. The sensor FCW2445P6X5 is selected, and its configuration panel is visible on the right. The configuration panel includes fields for Label, Serial Number, IP address, Version, System date, Deployment, Active Discovery, and Capture mode. The 'Active Discovery' field is set to 'Enabled'. Below the configuration panel, there are several action buttons: 'Move to', 'Capture mode', 'Redeploy', 'Uninstall', and 'Active Discovery'. The 'Active Discovery' button is highlighted with a red box.

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)

Configure Cancel

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

From here you can configure Active Discovery

+ New network interface

IP address\*

192.168.52.24

Prefix length\*

24

VLAN number\*

52

Add Cancel

Configure Cancel

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.

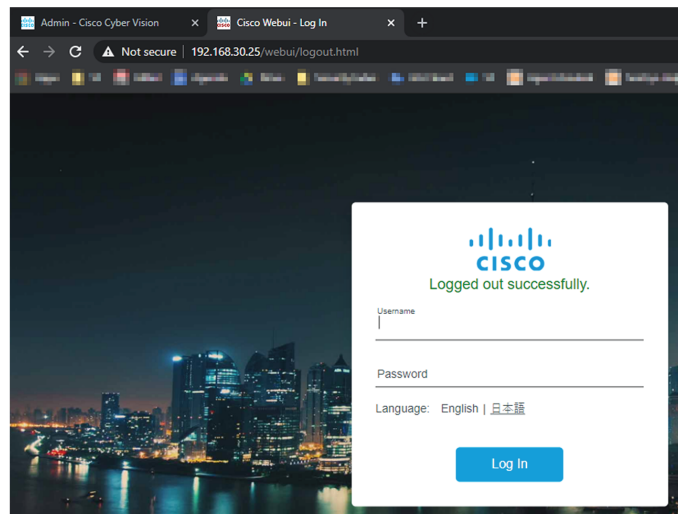
---

## Procedure with the Local Manager

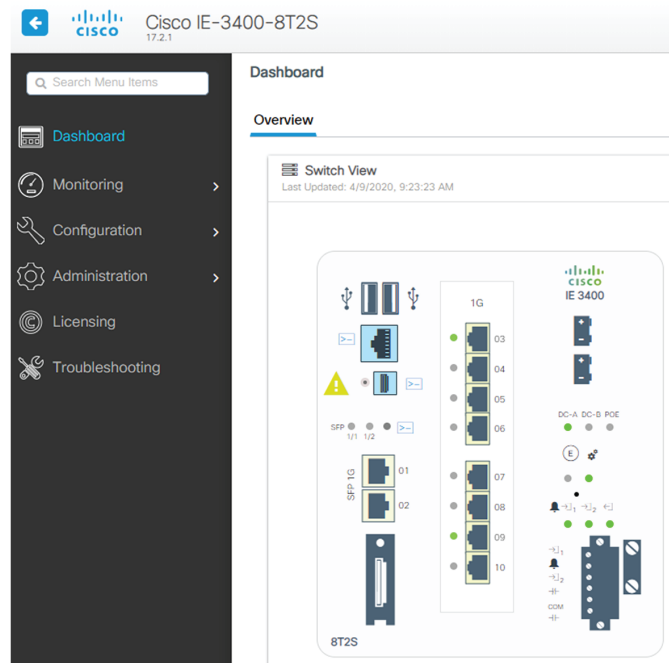
After the [Initial configuration, on page 13](#), proceed to the steps described in this section.

### Access the Local manager

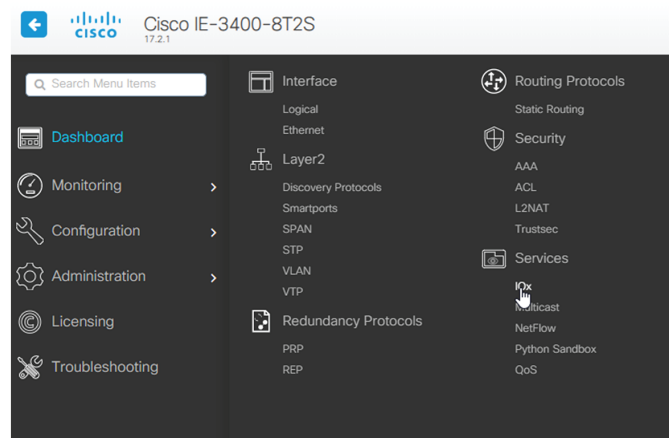
1. Open a browser and navigate to the IP address you configured on the interface you are connected to.
2. Log in using the Local Manager user account and password.



For example: Cisco IE3300 10G/IE3400



- Once logged into the Local Manager, navigate to Configuration > Services > IOx.  
For example: Cisco IE3300 10G/IE3400

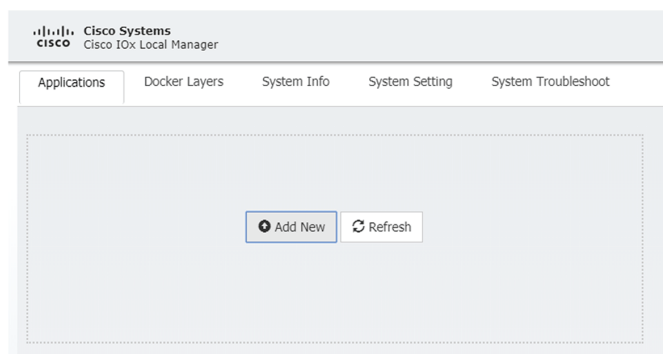


- Log in using the user account and password.

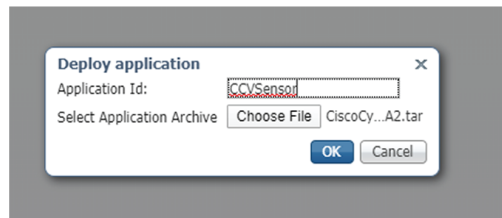


## Install the sensor virtual application

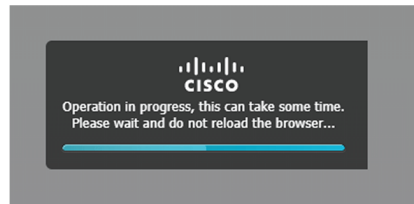
Once logged in, the following menu appears:



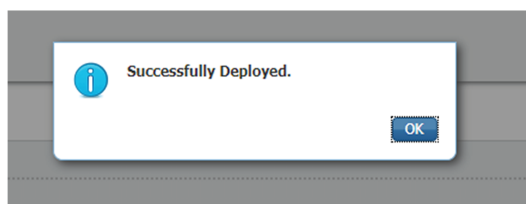
1. Click **Add New**.
2. Add an Application id name (e.g. CCVSensor).
3. Select the application archive file
  - "CiscoCyberVision-IOx-aarch64-xxx.tar" for the Cisco IE3300/IE3400/IE9300
  - "CiscoCyberVision-IOx-Active-Discovery-aarch64.tar" for the Cisco IE3300/IE3400/IE9300 with Active Discovery
  - "CiscoCyberVision-IOx-x86-64-xxx.tar" for the Cisco Catalyst 9300
  - "CiscoCyberVision-IOx-Active-Discovery-x86-64.tar" for the Cisco Catalyst 9300



The installation takes a few minutes.

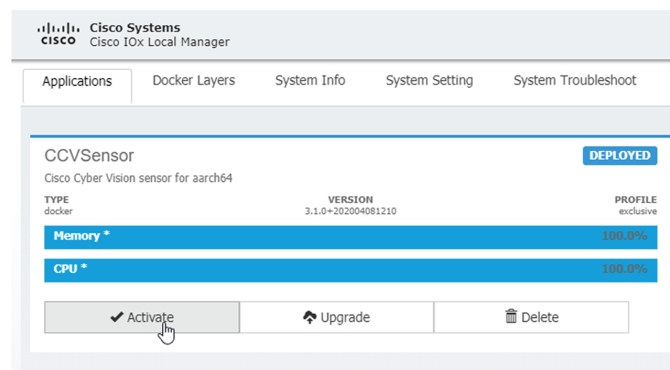


When the application is installed, the following message is displayed:

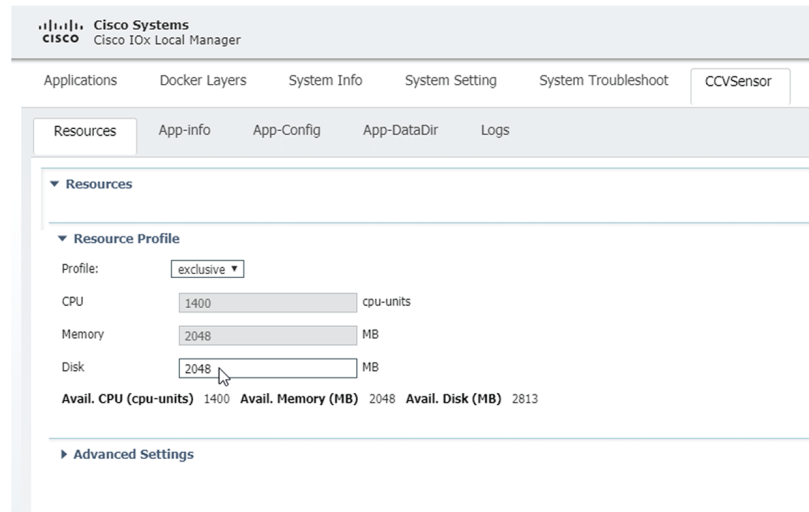


## Configure the sensor virtual application (IE3x00/IE9x00)

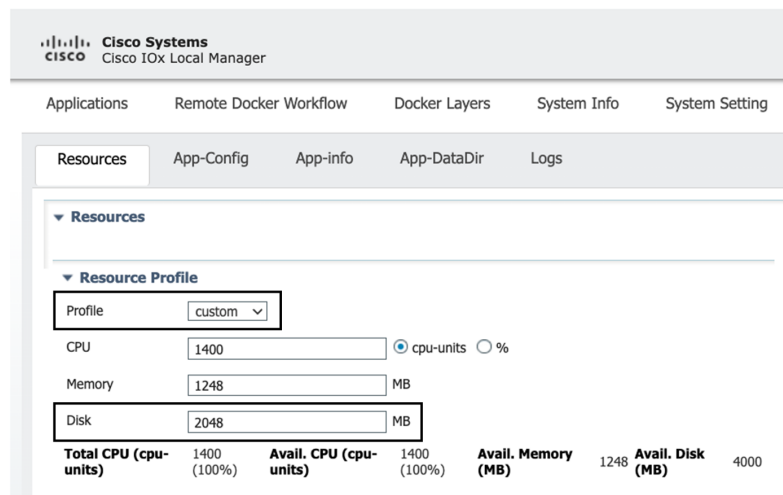
1. Click **Activate** to launch the configuration of the sensor application.



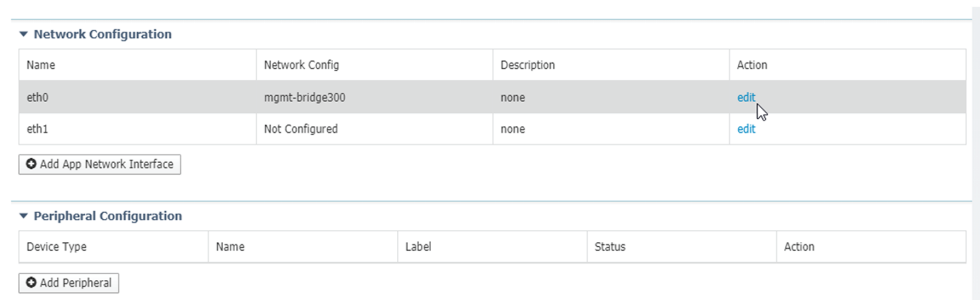
2. Change the disk size from the default size to **1248 MB**. The disk size must **not** be larger than this.



If the field is grayed out, change the profile to **custom** to change the disk value.



3. Bind the interfaces in the container to an interface on the host in Network Configuration. Start with eth0 by clicking **edit** in the eth0 line.



4. Click **Interface Setting**.

▼ Network Configuration

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge300 | none        | <a href="#">edit</a> |
| eth1 | Not Configured | none        | <a href="#">edit</a> |

eth0 mgmt-bridge300 L2br network ▼ [Interface Setting](#)

Description (optional):

5. Apply the following configurations:

- Select **Static**
- IP/Mask: IP and mask of the sensor
- Default gateway: IP address of the Center
- Vlan ID, which is defined below, is the VLAN in the Cisco IE3300 10G/IE3400 dedicated to the Collection network interface (link between the Center and the sensors), e.g. 507.

Interface Setting

IPv4 Setting

Static  Dynamic  Disable

IP/Mask:  /

DNS:

Default Gateway IP:

Vlan ID

Vlan ID:

6. IPV6 must be set to Disable.

IPv6 Setting

Static  Dynamic  Disable

7. Click **OK** twice.



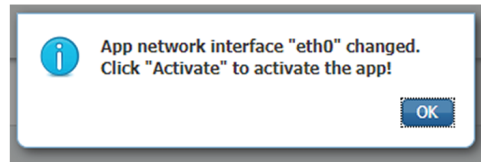
▼ Network Configuration

| Name | Network Config |
|------|----------------|
| eth0 | mgmt-bridge300 |
| eth1 | Not Configured |

eth0 mgmt-bridge300 L2br network ▼ [Interface Setting](#)

Description (optional):

8. Click **OK** again on the popup.



9. Then, apply the following parameters to eth1:

- Select **Static**.
- IP/Mask: the IP and mask of the sensor for the mirrored traffic.
- Vlan ID, which is defined below, is the VLAN in the Cisco IE3300 10G/IE3400/IE9300 dedicated to traffic mirroring.

Interface Setting

IPv4 Setting

Static  Dynamic  Disable

IP/Mask:  /

DNS:

Default Gateway IP:

Vlan ID

Vlan ID:

10. IPV6 must be set to **Disable**.

IPv6 Setting

Static  Dynamic  Disable

- If configuring a sensor with **Active Discovery**, you must set an additional interface (eth2 without IP address) dedicated to this feature.

▼ Network Configuration

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge300 | none        | <a href="#">edit</a> |
| eth1 | Not Configured | none        | <a href="#">edit</a> |
| eth2 | Not Configured | none        | <a href="#">edit</a> |

eth2   [Interface Setting](#)

Description (optional):

- Click **Interface Setting** for eth2 and set IPV4 and IPV6 as Disable. Click **OK** to confirm.

Interface Setting

IPv4 Setting

Static  Dynamic  Disable

IPv6 Setting

Static  Dynamic  Disable

Vlan ID

Vlan ID

- Click the **Activate App** button.

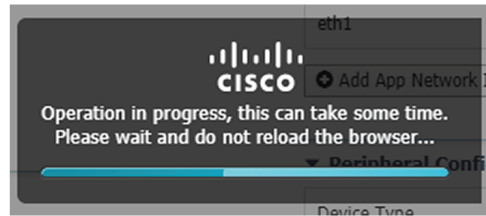
▼ Network Configuration

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge300 | none        | <a href="#">edit</a> |
| eth1 | mgmt-bridge300 | none        | <a href="#">edit</a> |

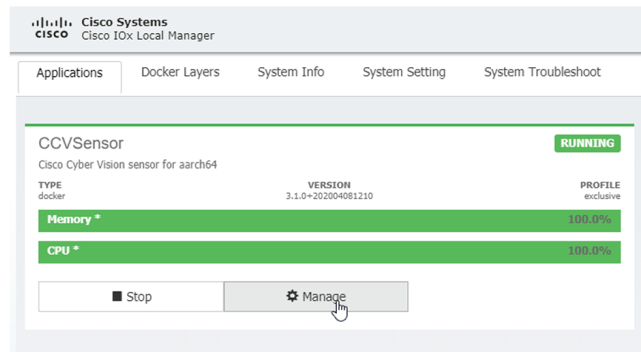
▼ Peripheral Configuration

| Device Type | Name | Label | Status | Action |
|-------------|------|-------|--------|--------|
|-------------|------|-------|--------|--------|

The operation takes several minutes.

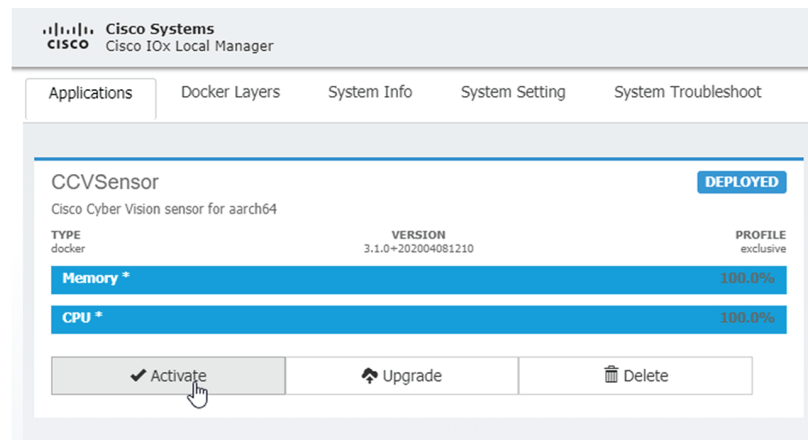


The application status changes to "RUNNING":



## Configure the sensor virtual application (Catalyst 9x00)

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



2. Change the disk size from the default size to 80,000 MB. The disk size must not be smaller than this.

▼ Resource Profile

Profile:

CPU:  cpu-units

Memory:  MB

Disk:  MB

|                        |      |                    |      |                  |        |
|------------------------|------|--------------------|------|------------------|--------|
| Avail. CPU (cpu-units) | 7400 | Avail. Memory (MB) | 2048 | Avail. Disk (MB) | 101289 |
|------------------------|------|--------------------|------|------------------|--------|

► Advanced Settings

- Bind the interfaces in the container to an interface on the host in Network Configuration. Start with eth0 by clicking **edit** in the eth0 line.

▼ Network Configuration

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge100 | none        | <a href="#">edit</a> |
| eth1 | Not Configured | none        | <a href="#">edit</a> |

- Select the mgmt-bridge300 entry in the interface list.

▼ Network Configuration

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge100 | none        | <a href="#">edit</a> |
| eth1 | Not Configured | none        | <a href="#">edit</a> |

eth0

Description (optional):

- Click **Interface Setting**.

▼ Network Configuration

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge300 | none        | <a href="#">edit</a> |
| eth1 | Not Configured | none        | <a href="#">edit</a> |

eth0 mgmt-bridge300 L2br network ▼ [Interface Setting](#)

Description (optional):

6. Apply the following configurations:

- Select **Static**
- IP/Mask: the IP and mask of the sensor
- Default gateway: the IP address of the Center
- Vlan ID, which is defined below, is the VLAN in the Cisco Catalyst 9300 dedicated to the Collection network interface (link between the Center and the sensors), e.g. 507.

Interface Setting

IPv4 Setting

Static  Dynamic  Disable

IP/Mask:  /

DNS:

Default Gateway IP:

Vlan ID

Vlan ID:

7. IPV6 must be set to **Disable**.

IPv6 Setting

Static  Dynamic  Disable

8. Click **OK** twice.

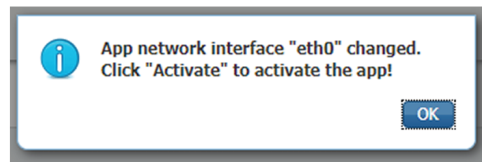
▼ Network Configuration

| Name | Network Config |
|------|----------------|
| eth0 | mgmt-bridge300 |
| eth1 | Not Configured |

eth0  L2br network [Interface Setting](#)

Description (optional):

9. Click **OK** again on the following popup.



10. Apply the following configurations to eth1:
- Set IPv4 as **Static** and the IP and mask of the sensor for mirrored traffic.
  - Disable IPv6.
  - Set the VLAN id.
  - **Set the mirror mode as enabled.**

**Interface Setting**

**IPv4 Setting**

Static  Dynamic  Disable

IP/Mask:  /

DNS:

Default Gateway IP:

**Vlan ID**

Vlan ID:

**Mirror Mode**

Mirror Mode:  Enabled

11. Click **OK** until you come back to the screen below.
12. If configuring a sensor with **Active Discovery**, you must set an additional interface (eth2 without IP address) dedicated to this feature. Then, click **Interface Setting** for eth2 and set IPV4 and IPV6 as Disable. Click **OK** to confirm.

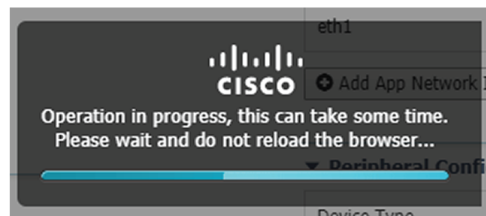
13. Click the **Activate App** button.

| Name | Network Config | Description | Action               |
|------|----------------|-------------|----------------------|
| eth0 | mgmt-bridge300 | none        | <a href="#">edit</a> |
| eth1 | mgmt-bridge300 | none        | <a href="#">edit</a> |

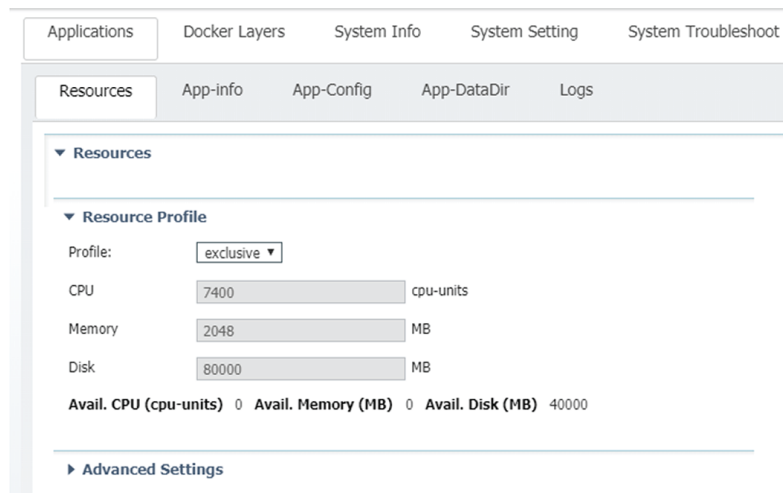
  

| Device Type | Name | Label | Status | Action |
|-------------|------|-------|--------|--------|
|-------------|------|-------|--------|--------|

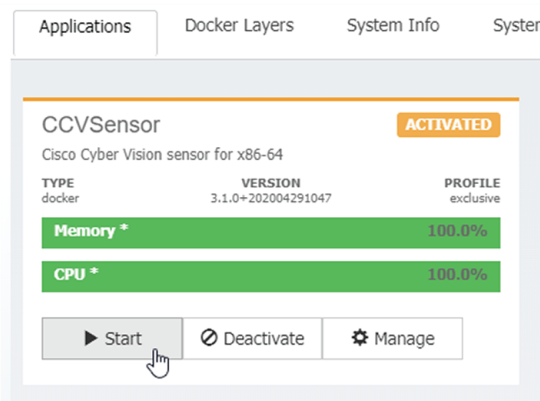
The operation takes several seconds.



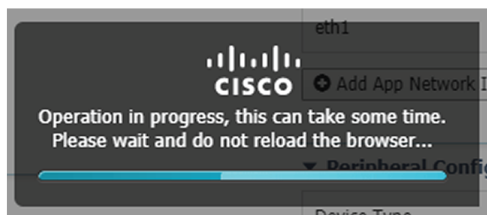
14. Click **Applications** to display the application status:



15. The application is activated and needs to be started. To do so, click the **Start** button.

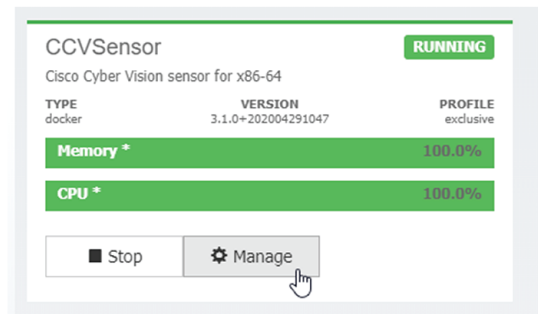


The operation takes several seconds.



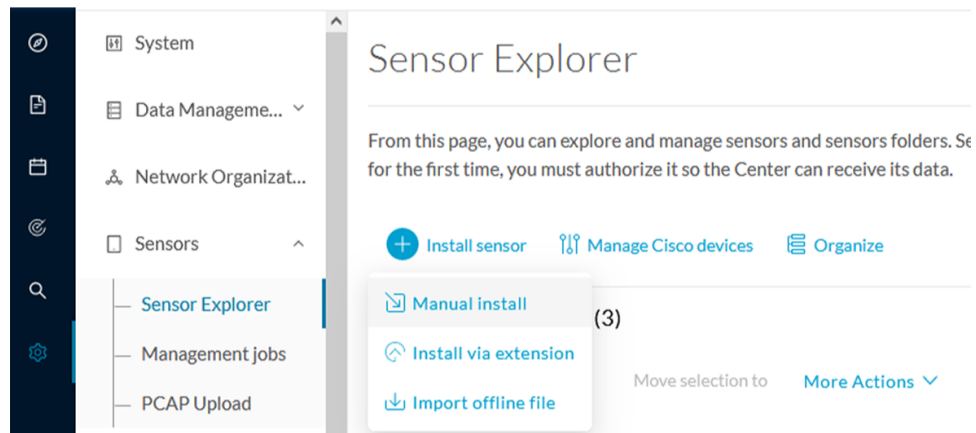
The application status changes to "RUNNING".





## Generate the provisioning package

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



The manual install wizard appears.

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

The screenshot shows a web interface titled "Manual install". On the left is a dark sidebar with navigation icons. The main content area has the heading "Select hardware model". Below the heading is a paragraph: "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." There are five radio button options: "Cisco IC3000", "Cisco IOx Application" (which is selected), "Sentryo SENSOR3", "Sentryo SENSOR5", and "Sentryo SENSOR7". At the bottom left is an "Exit" button with a back arrow, and at the bottom right is a "Next" button.

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

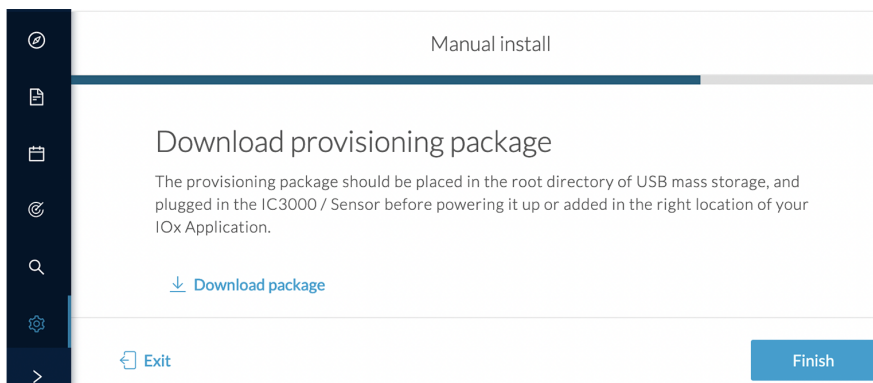
- Optimal (default): analyze the most relevant flows
- All: analyze all the flows
- Industrial only: analyze industrial flows
- Custom: set your filter using a packet filter in tcpdump-compatible syntax

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**.

- Click the link to download the provisioning package.



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").

- Click **Finish**.
- A new entry for the sensor appears in the Sensor Explorer list.

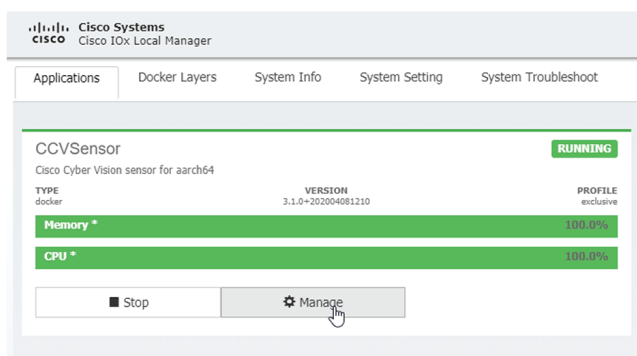
The sensor status will switch from Disconnected to Connected.

| <input type="checkbox"/> | Label       | IP Address    | Version            | Location | Health status | Processing status | Active Discovery | Uptime |
|--------------------------|-------------|---------------|--------------------|----------|---------------|-------------------|------------------|--------|
| <input type="checkbox"/> | FCW23500    |               |                    | FCW23500 | Disconnected  | Disconnected      |                  | 5h     |
| <input type="checkbox"/> | FCW23500    |               |                    | FCW23500 | Disconnected  | Disconnected      |                  | 5h     |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.1.0+202202151440 |          | Connected     | Pending data      | Enabled          | 4 days |

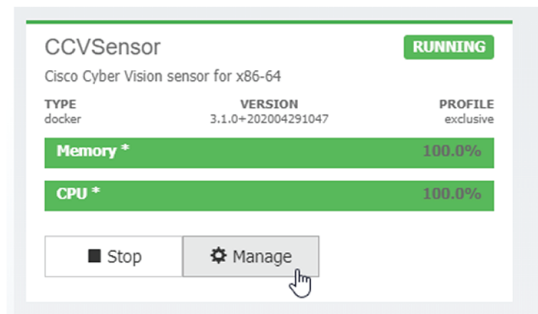
## Import the provisioning package

- In the Local manager, in the IOx configuration menu, click **Manage**.

Cisco IE3400:

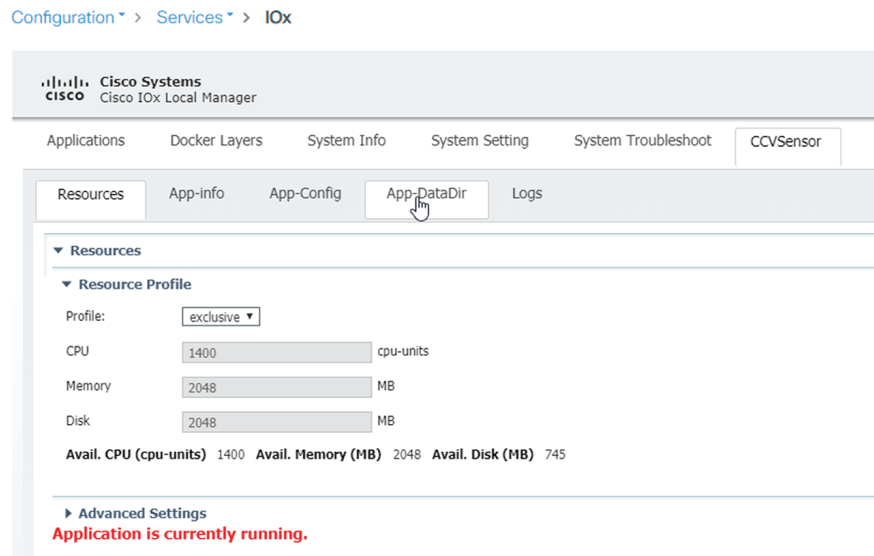


Cisco Catalyst 9300:

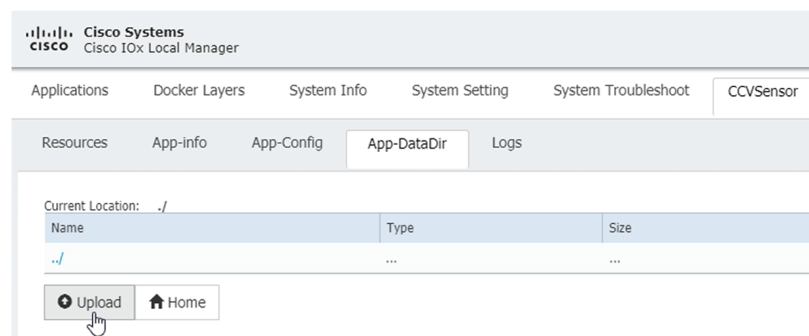


## 2. Navigate to **App\_DataDir**.

For example Cisco IE3400:

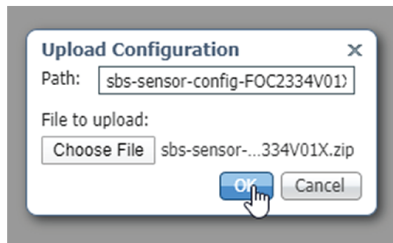


## 3. Click **Upload**.



## 4. Choose the provisioning package downloaded (i.e. "sbs-sensor-config-FOC2334V01X.zip") and add the exact file name in the path field (i.e. "sbs-sensor-config-FOC2334V01X.zip").

5. Click **OK**.



A popup indicating that Cisco Cyber Vision has been deployed successfully appears.

6. Click **OK**.

## Procedure with the CLI

After the [Initial configuration, on page 13](#), proceed to the steps described in this section.

### Configure the sensor application



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

1. Connect to the device through SSH or a console.
2. Configure the application payload by typing the following commands.

To enable **Active Discovery**, you must add `guest-interface 2` (in bold in the examples below).

Cisco IE3300 10G/IE3400:

```
enable
configure terminal
app-hosting appid CCVSensor
app-vnic AppGigabitEthernet trunk
guest-interface 2
vlan 507 guest-interface 0
guest-ipaddress 192.168.69.208 netmask 255.255.255.0
vlan 2508 guest-interface 1
guest-ipaddress 169.254.1.2 netmask 255.255.255.0
app-default-gateway 192.168.69.1 guest-interface 0
app-resource profile custom
persist-disk 2048
cpu 1400
memory 1248
vcpu 2
end
```

```

IE3400esc00#
IE3400esc00#enable
IE3400esc00#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
IE3400esc00(config)#app-hosting appid CCVSensor
IE3400esc00(config-app-hosting)#app-vnic AppGigabitEthernet trunk
IE3400esc00(config-config-app-hosting-trunk)#guest-interface 2
IE3400esc00(config-config-app-hosting-trunk-mode-guest)#vlan 507 guest-interface 0
IE3400esc00(config-config-app-hosting-vlan-access-ip)#guest-ipaddress 192.168.69.208 netmask 255.255.255.0
IE3400esc00(config-config-app-hosting-vlan-access-ip)#vlan 2508 guest-interface 1
IE3400esc00(config-config-app-hosting-vlan-access-ip)#guest-ipaddress 169.254.1.2 netmask 255.255.255.0
IE3400esc00(config-config-app-hosting-vlan-access-ip)#app-default-gateway 192.168.69.1 guest-interface 0
IE3400esc00(config-app-hosting)#app-resource profile custom
IE3400esc00(config-app-resource-profile-custom)#persist-disk 2048
IE3400esc00(config-app-resource-profile-custom)#cpu 1400
IE3400esc00(config-app-resource-profile-custom)#memory 1248
IE3400esc00(config-app-resource-profile-custom)#vcpu 2
IE3400esc00(config-app-resource-profile-custom)#end
IE3400esc00#
IE3400esc00#
IE3400esc00#

```

### Cisco IE9300:

```

enable
configure terminal
app-hosting appid CCVSensor
 app-vnic AppGigabitEthernet trunk
guest-interface 2
 vlan 507 guest-interface 0
 guest-ipaddress 192.168.69.90 netmask 255.255.255.0
 vlan 2508 guest-interface 1
 guest-ipaddress 169.254.1.2 netmask 255.255.255.252
 app-default-gateway 192.168.69.190 guest-interface 0
 app-resource docker
 run-opts 1 --rm
 app-resource profile custom
 cpu 1000
 memory 862
 persist-disk 4000
end

```

```

IE9300_1#
IE9300_1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
IE9300_1(config)#app-hosting appid CCVSensor
IE9300_1(config-app-hosting)#app-vnic AppGigabitEthernet trunk
IE9300_1(config-config-app-hosting-trunk)#vlan 507 guest-interface 0
IE9300_1(config-config-app-hosting-vlan-access-ip)#guest-ipaddress 192.168.69.90 netmask 255.255.255.0
IE9300_1(config-config-app-hosting-vlan-access-ip)#vlan 2508 guest-interface 1
IE9300_1(config-config-app-hosting-vlan-access-ip)#guest-ipaddress 169.254.1.2 netmask 255.255.255.252
IE9300_1(config-config-app-hosting-vlan-access-ip)#app-default-gateway 192.168.69.190 guest-interface 0
IE9300_1(config-app-hosting)#app-resource docker
IE9300_1(config-app-hosting-docker)#run-opts 1 "--rm"
IE9300_1(config-app-hosting-docker)#app-resource profile custom
IE9300_1(config-app-resource-profile-custom)#cpu 1000
IE9300_1(config-app-resource-profile-custom)#memory 862
IE9300_1(config-app-resource-profile-custom)#persist-disk 4000
IE9300_1(config-app-resource-profile-custom)#end
IE9300_1#

```

### Cisco Catalyst 9300:

```

enable
configure terminal
app-hosting appid CCVSensor
 app-vnic AppGigabitEthernet trunk
guest-interface 2
 vlan 507 guest-interface 0
 guest-ipaddress 192.168.69.210 netmask 255.255.255.0
 vlan 2508 guest-interface 1
 mirroring
 guest-ipaddress 169.254.1.2 netmask 255.255.255.0

```

```

app-default-gateway 192.168.69.1 guest-interface 0
app-resource profile custom
persist-disk 8192
cpu 7400
memory 2048
vcpu 2
end

```

```

CAT9KCCV#
CAT9KCCV#enable
CAT9KCCV#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
CAT9KCCV(config)#app-hosting appid CCVSensor
CAT9KCCV(config-app-hosting)#app-vnic AppGigabitEthernet trunk
CAT9KCCV(config-config-app-hosting-trunk)#vlan 507 guest-interface 0
CAT9KCCV(config-config-app-hosting-vlan-access-ip)#guest-ipaddress 192.168.69.210 netmask 255.255.255.0
CAT9KCCV(config-config-app-hosting-vlan-access-ip)#vlan 2508 guest-interface 1
CAT9KCCV(config-config-app-hosting-vlan-access-ip)#guest-ipaddress 169.254.1.2 netmask 255.255.255.0
CAT9KCCV(config-config-app-hosting-vlan-access-ip)#app-default-gateway 192.168.69.1 guest-interface 0
CAT9KCCV(config-app-hosting)#app-resource profile custom
CAT9KCCV(config-app-resource-profile-custom)#persist-disk 8192
CAT9KCCV(config-app-resource-profile-custom)#cpu 7400
CAT9KCCV(config-app-resource-profile-custom)#memory 2048
CAT9KCCV(config-app-resource-profile-custom)#vcpu 2
CAT9KCCV(config-app-resource-profile-custom)#end
CAT9KCCV#

```

For the app-resource profile's custom values, refer to the result of the show app-hosting resource command.

In this example, all maximum values are used for:

- the CPU (CPU available units, here 1400 for the Cisco IE3300 10G/IE3400, 1000 for the Cisco IE9300, and 7400 for the Cisco Catalyst 9300)
- the VCPU (here 2), the memory (Memory available, here 2048)
- the disk (only 2048 MB and 8192 MB respectively are used to let space for application updates)

## Install the sensor application

The sensor package is to be retrieved on cisco.com. The file has the following name structure:

- CiscoCyberVision-IOx-aarch64-<VERSION>.tar (Cisco IE3300 10G/IE3400/IE9300).
- CiscoCyberVision-IOx-x86-64-<VERSION>.tar (Cisco Catalyst 9300).

1. Copy the package to a USB key or in the flash memory.
2. Type the following commands on the CLI:

```

enable
app-hosting install appid CCVSensor package usbflash0:<FILENAME>.tar

```

Cisco IE3300 10G/IE3400/IE9300:

```

IE340CCV#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.
IE340CCV#

```

Cisco Catalyst 9300:

```
CAT9KCCV#
CAT9KCCV#enable
CAT9KCCV#app-hosting install appid CCVSensor package usbflash0:CiscoCyberVision-IOx-x86-64-3.1.0-RC4.tar
Installing package 'usbflash0:CiscoCyberVision-IOx-x86-64-3.1.0-RC4.tar' for 'CCVSensor'. Use 'show app-hosting list' for progress.
CAT9KCCV#
```



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



**Note** Replace "CiscoCyberVision-IOx-aarch64-<VERSION>.tar" with the right filename.

3. Check that the application is in "DEPLOYED" state:

```
show app-hosting list
```

For example: Cisco IE3400

```
IE340CCV#
IE340CCV#show app-hosting list
App id State

CCVSensor DEPLOYED
IE340CCV#
```

4. Activate the application using the following command:

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

For example: Cisco IE3400

```
IE340CCV#app-hosting activate appid CCVSensor
CCVSensor activated successfully
Current state is: ACTIVATED
IE340CCV#
```

5. Start the application using the following command:

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

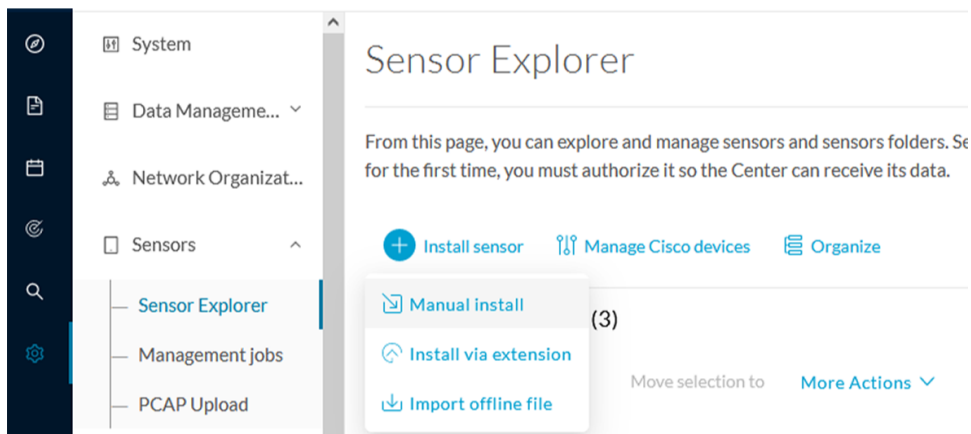
For example: Cisco IE3400:

```
IE340CCV#
IE340CCV#app-hosting start appid CCVSensor
CCVSensor started successfully
Current state is: RUNNING
IE340CCV#
```



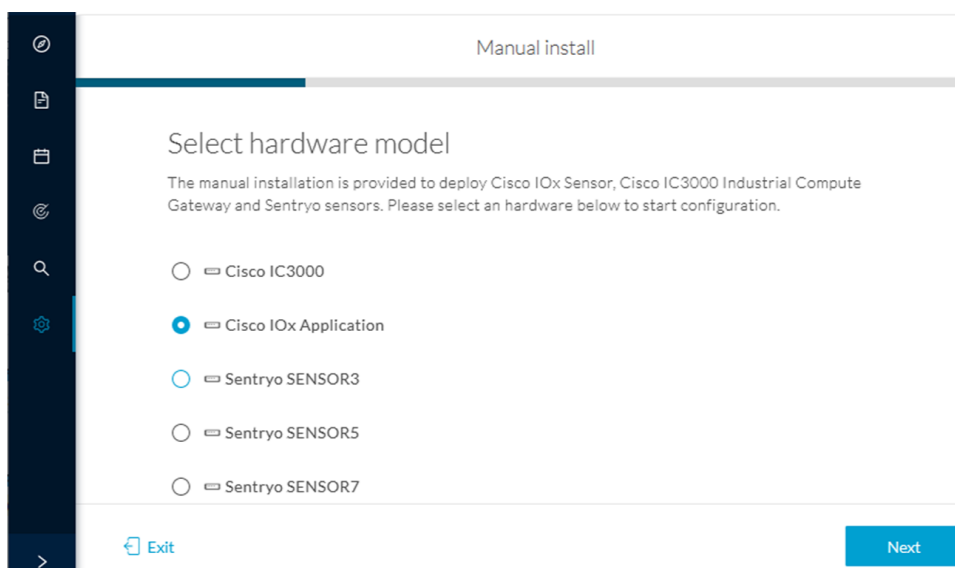
## Generate the provisioning package

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



The manual install wizard appears.

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



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.

[Download package](#)

[Exit](#) [Finish](#)

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 Connected.

| <input type="checkbox"/> | Label       | IP Address    | Version            | Location | Health status | Processing status | Active Discovery | Uptime |
|--------------------------|-------------|---------------|--------------------|----------|---------------|-------------------|------------------|--------|
| <input type="checkbox"/> |             |               |                    |          | Disconnected  | Disconnected      |                  | NA     |
| <input type="checkbox"/> |             |               |                    |          |               |                   |                  | NA     |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.1.0+202202151440 |          | Connected     | Pending data      | Enabled          | 4 days |

## Copy the sensor application provisioning package

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

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

For example: Cisco IE3400

```
IE340CCV#
IE340CCV# data appid CCVSensor copy usbflash0:sbs-sensor-config-FOC2334V01X.zip sbs-sensor-config-FOC2334V01X.zip
Successfully copied file /usbflash0/sbs-sensor-config-FOC2334V01X.zip to CCVSensor as sbs-sensor-config-FOC2334V01X.zip
IE340CCV#
```

## Final step

In the sensor's CLI save the product's configuration by typing the following command:

```
write mem
```





# CHAPTER 8

## Configuration

- [Configure Active Discovery, on page 59](#)
- [Configure sensor configuration template, on page 61](#)
- [Set a capture mode, on page 66](#)

## 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 securely installed. 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](#)

| <input type="checkbox"/> | Label       | IP Address    | Version            | Location | Health status |
|--------------------------|-------------|---------------|--------------------|----------|---------------|
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.1.0+202202151440 |          | Connected     |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.1.0+202202151440 |          | Connected     |
| <input type="checkbox"/> | 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

[Go to statistics](#)

[Start Recording](#)

[Move to](#)

[Capture mode](#) [Redeploy](#)

[Uninstall](#) [Active Discovery](#)

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.

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**.

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:

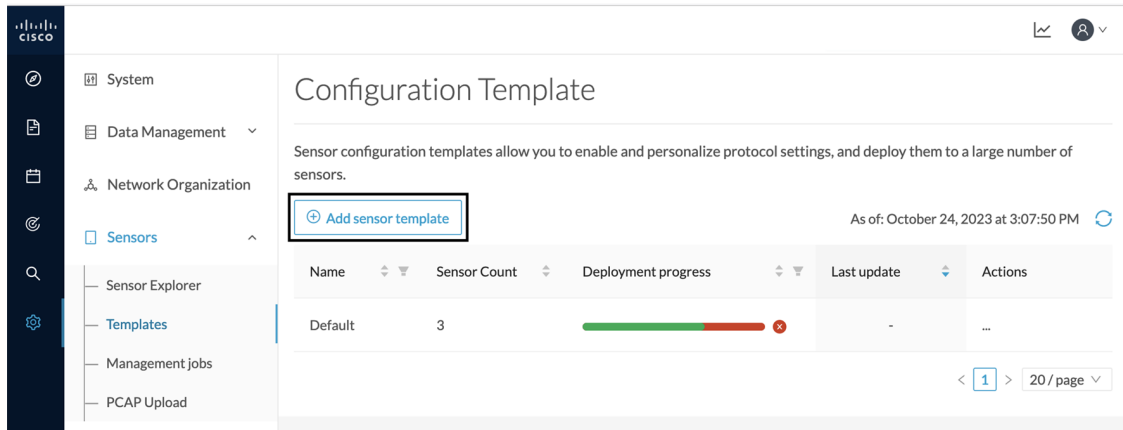
- if the sensor is disconnected,
- if there is connection issues,
- if the sensor version is too old.

## Create templates

### Procedure

---

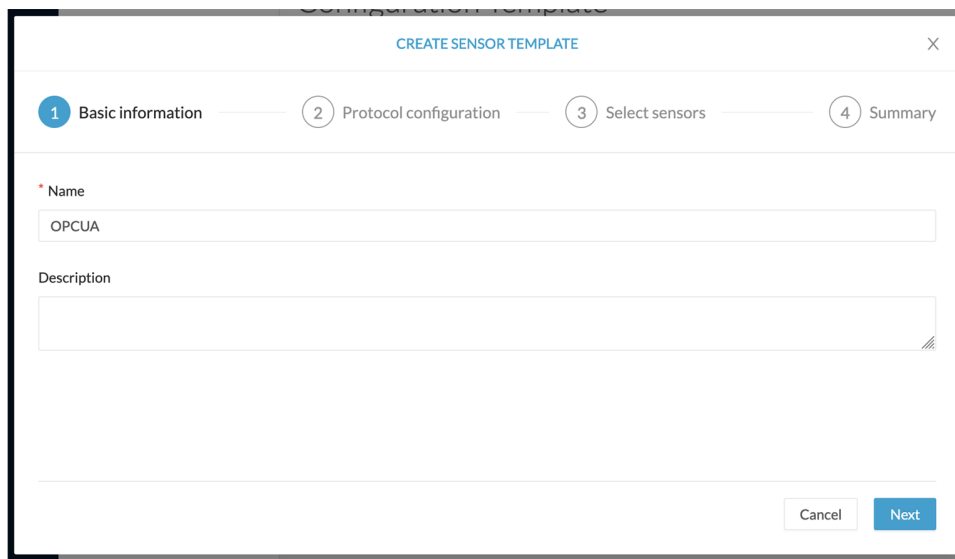
- Step 1** In Cisco Cyber Vision, navigate to Admin > Sensors > Templates.
- Step 2** Click **Add sensor template**.



The Create sensor template window pops up.

**Step 3**

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

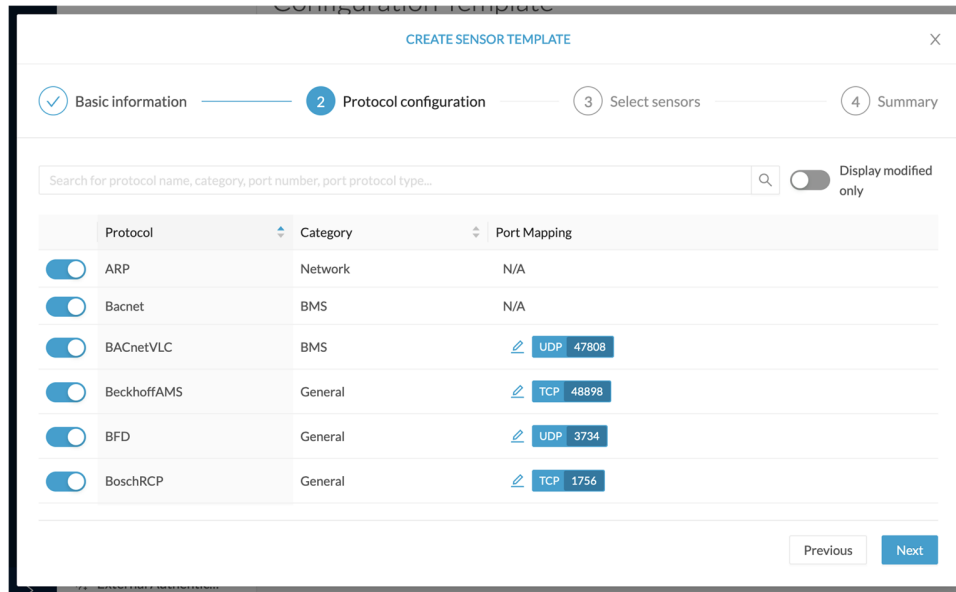


**Step 4**

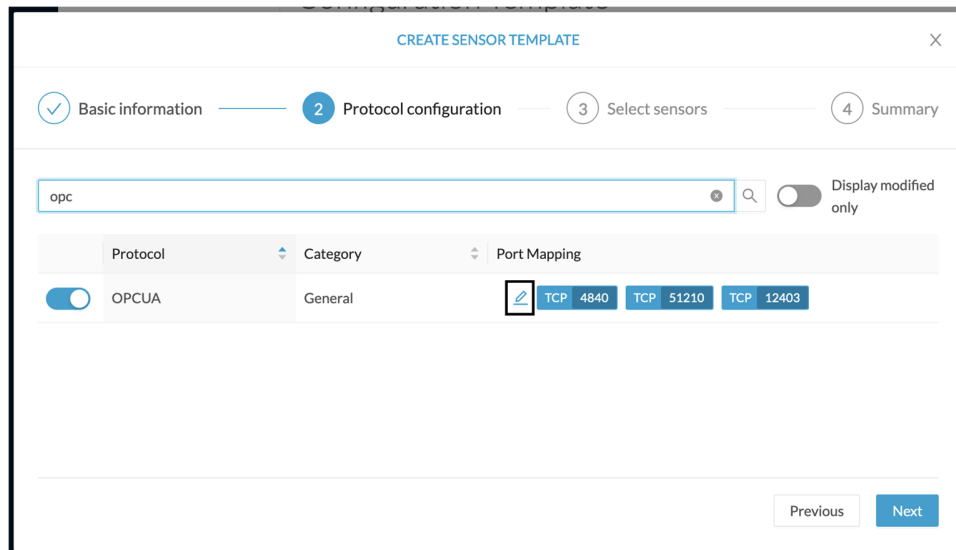
Click **Next**.

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



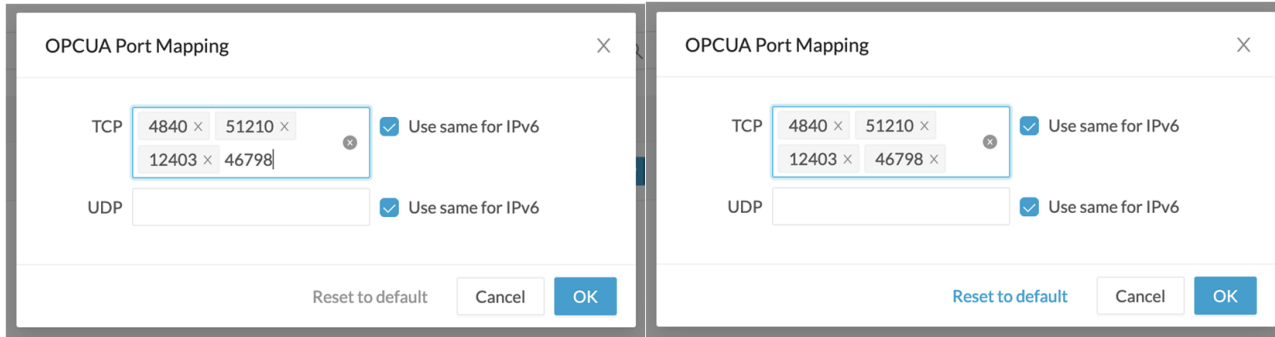


**Step 5** In the search bar, type the protocol you want to configure.  
 In our example, we will add a port to the OPCUA default settings.



**Step 6** Under the Port Mapping column, click the **pen** button to edit its settings.  
 The protocol's port mapping window pops up.

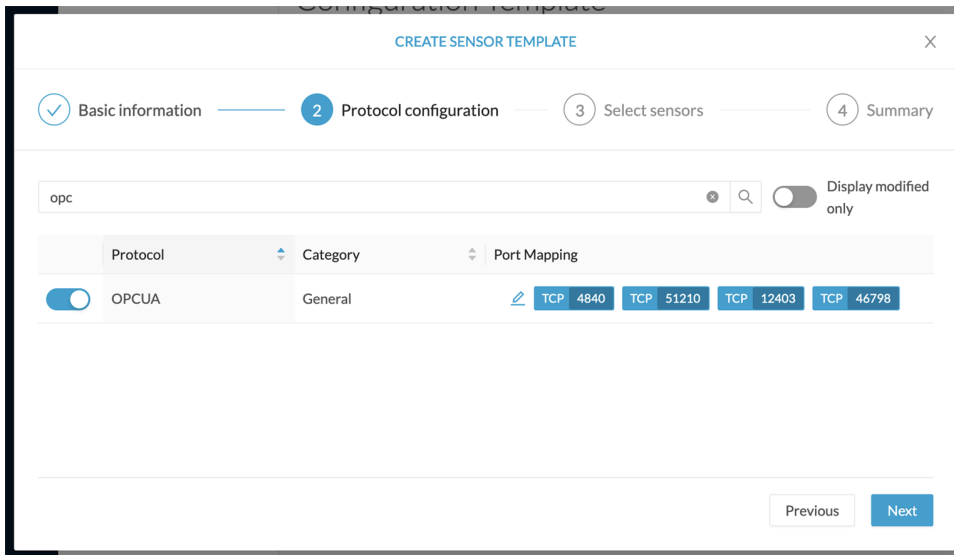
**Step 7** Write down the port number you want to add and hit enter.



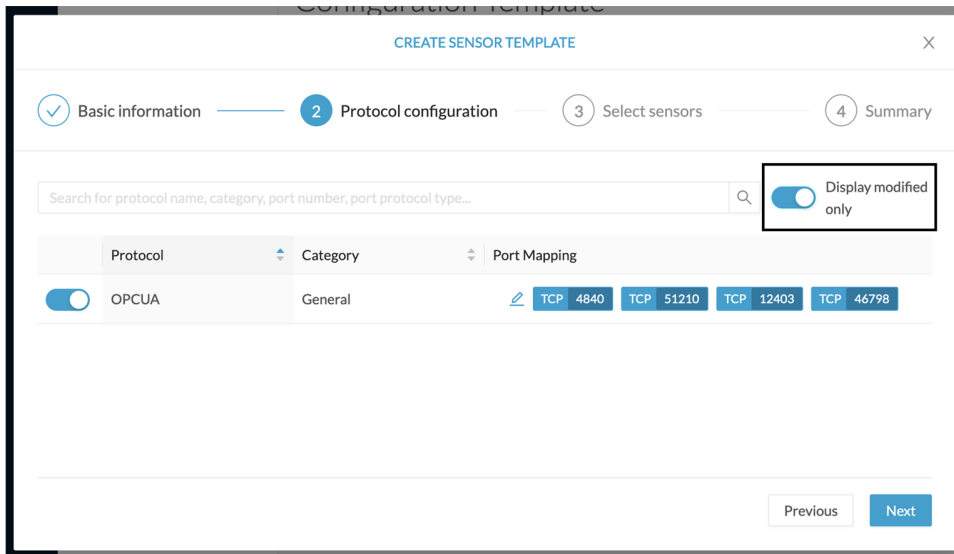
**Step 8**

Click **OK**.

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

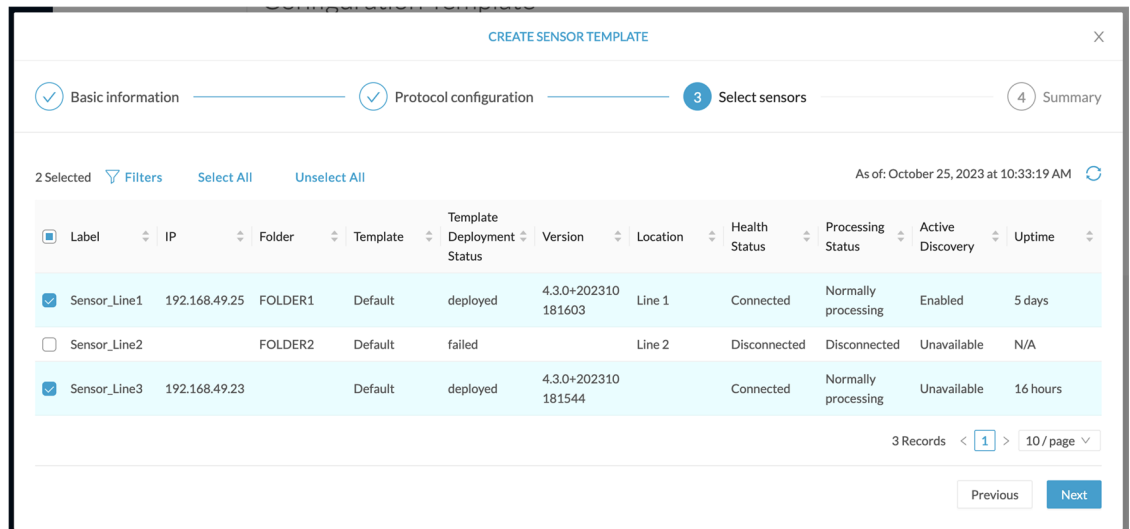


toggling ON the **Displayed modified only** button allows you to quickly find this protocol.



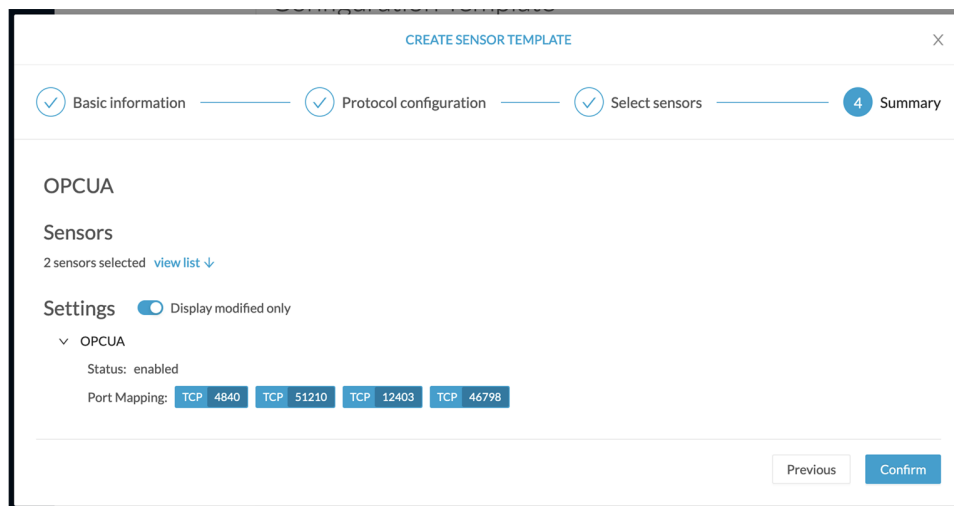
**Step 9** Click **Next**.

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



**Step 11** Click **Next**.

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



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            | <div style="width: 100%; height: 10px; background-color: red;"></div>   | -           | ...     |
| OPCUA   | 2            | <div style="width: 100%; height: 10px; background-color: green;"></div> | 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 and 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](#)

| <input type="checkbox"/> | Label       | IP Address    | Version            | Location | Health status |
|--------------------------|-------------|---------------|--------------------|----------|---------------|
| <input type="checkbox"/> | FOLDER1     |               |                    | Lyon     |               |
| <input type="checkbox"/> | FOLDER2     |               |                    | Paris    |               |
| <input type="checkbox"/> | FCY014567   | 192.168.49.41 |                    |          | Disco         |
| <input type="checkbox"/> | FCH2309Y01Z | 192.168.49.23 | 4.1.0+202202151504 |          | Conne         |
| <input type="checkbox"/> | 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

[Go to statistics](#)

[Start Recording](#)

[Move to](#)

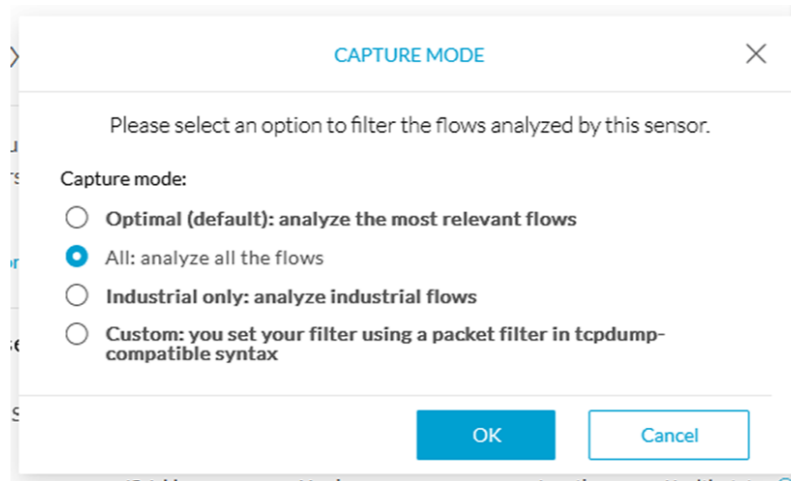
[Download package](#) **[Capture mode](#)**

[Redeploy](#) [Enable IDS](#)

[Reboot](#) [Shutdown](#)

[Uninstall](#) [Active Discovery](#)

*Capture modes:*



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 9

# Maintenance

---

- [Upgrade procedures, on page 69](#)
- [Replace SD card, on page 76](#)
- [Reconfigure/Redeploy a sensor, on page 77](#)
- [Certificate renewal, on page 81](#)

## Upgrade procedures

### 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 24](#) 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   | <a href="#">Update</a> <a href="#">Remove</a> |

## 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**.

**Sensor Explorer**

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.

[Install sensor](#) [Manage Cisco devices](#) [Organize](#)

[Update Cisco devices](#) [Manage credentials](#)

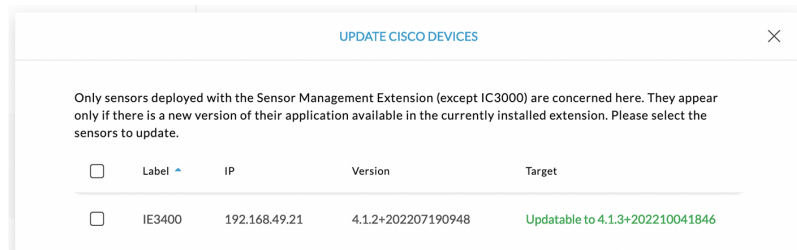
**Folders and sensors**

Filter 0 Selected MOVE SELECTION TO More Actions

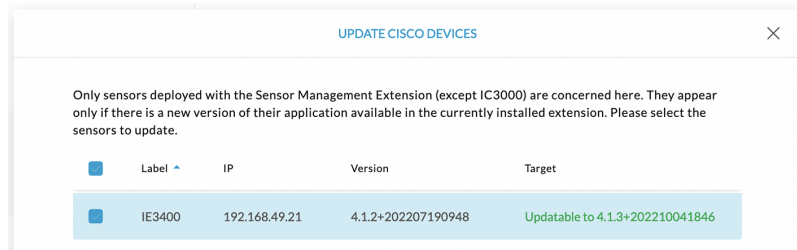
|                          | Label                   | IP Address    | Version            | Location | Health status |
|--------------------------|-------------------------|---------------|--------------------|----------|---------------|
| <input type="checkbox"/> | <a href="#">FOLDER1</a> |               |                    | Lyon     |               |
| <input type="checkbox"/> | <a href="#">FOLDER2</a> |               |                    | Paris    |               |
| <input type="checkbox"/> | IC3000                  | 192.168.49.23 | 4.1.1+202205161124 |          | Connected     |
| <input type="checkbox"/> | 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.



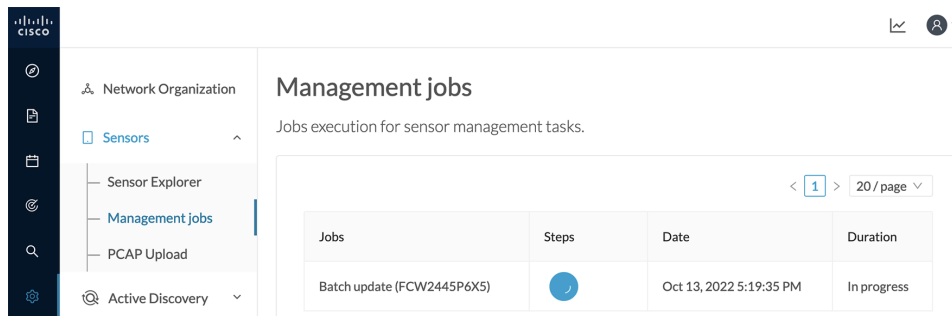


**Step 3** Select the sensors you want to update.

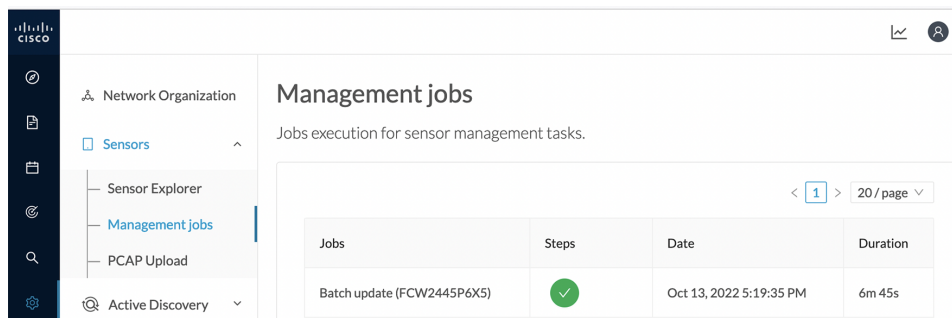


**Step 4** Click **Update**.

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



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



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

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

**Update - Error**

**Update**

Batch update (FJ...)

Single deployment (FCH2312Y03Z)

Batch update (FC...)

Single redeployment (FOC2334V045)

Single redeployment (FOC2334V00D)

Single redeployment (FCW2435P3KV)

Single redeployment (FOC2413V0X3)

Single redeployment (FOC2412V0DL)

Single redeployment

**Error**

Fatal error: at least one device failed

**Logs**

```
x 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
x 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
x 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.



**Note** In the case of Cisco Cyber Vision upgrade for a Catalyst 9x00 from a release 4.1.2 or lower to a release 4.1.3, the update will fail due to the addition of the RSPAN option. The sensor application must be removed and deployed again.

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

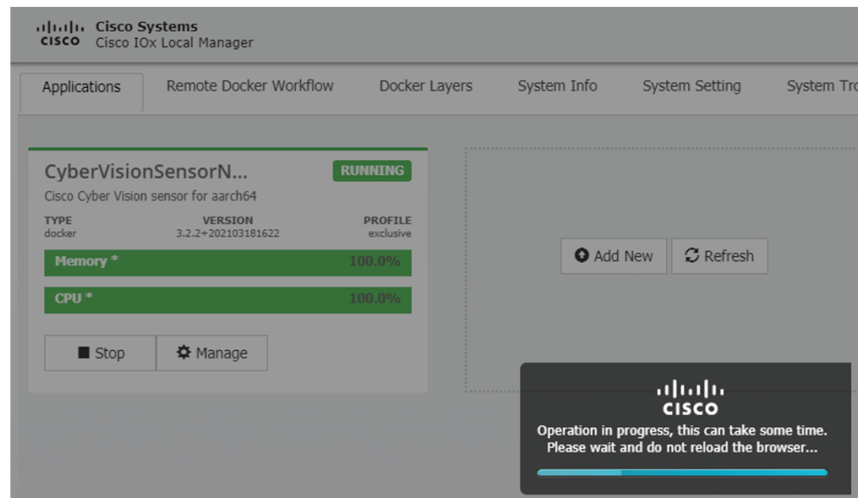
Figure 1: The sensor in version 3.2.2 in the Sensors administration page of Cisco Cyber Vision

The screenshot displays the 'Sensors' administration page. On the left is a navigation menu with options like System, Data management, Sensors, Capture, Users, Events, API, License, LDAP Settings, Snort, Integrations, and Extensions. The main content area shows a table of sensors. The first sensor, FOC2334V00H, is selected and its details are shown below the table. The details include: 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, and Capture mode: All. There are also buttons for 'Start recording sensor' and 'Go to statistics'. At the bottom of the page, there are buttons for 'UPDATE CISCO DEVICES', 'DEPLOY CISCO DEVICE', 'INSTALL SENSOR MANUALLY', and 'IMPORT OFFLINE FILE'.

1. Access the IOx Local Manager.
2. Stop the application.

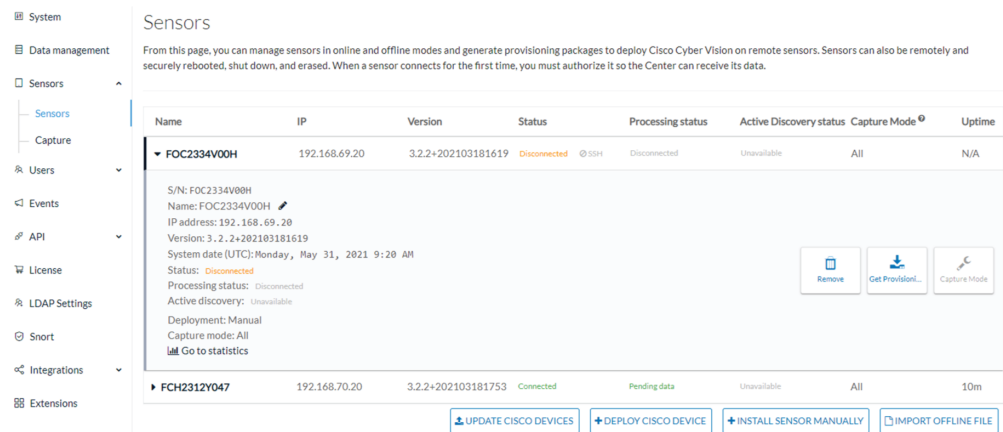
The screenshot shows the Cisco IOx Local Manager interface for a Cisco IE-3400-8T2S switch. The breadcrumb navigation is 'Configuration > Services > IOx'. The main content area shows the configuration for the 'CyberVisionSensorN...' application. The application is in a 'RUNNING' state. The details shown are: TYPE: docker, VERSION: 3.2.2+202103181622, PROFILE: exclusive. There are also indicators for Memory and CPU usage, both at 100.0%. A 'Stop' button is highlighted with a red box, and a 'Manage' button is also visible. There is also an 'Add New' button.

The operation takes a few moments.



The application status switches to STOPPED.

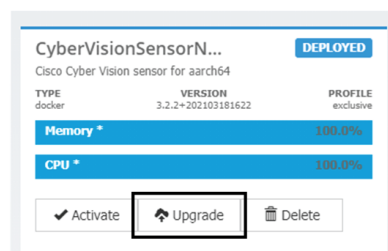
In Cisco Cyber Vision, the sensor status switches to Disconnected.



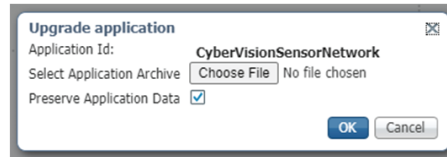
3. In the IOx Local Manager, click the **Deactivate** button.

The application status moves to DEPLOYED.

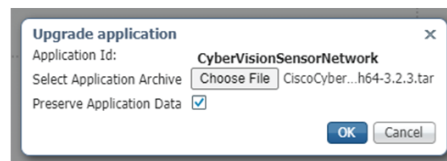
4. Click **Upgrade**.



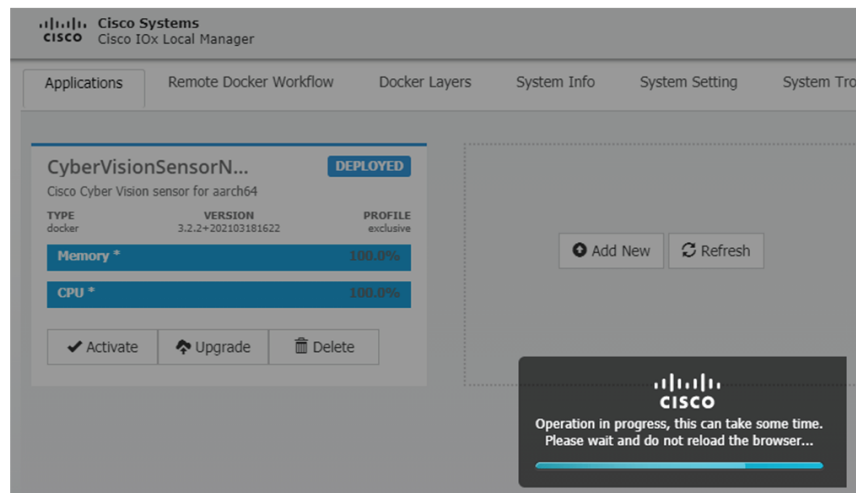
The pop up Upgrade application appears.



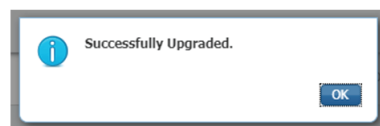
5. Select the **Preserve Application Data** option.
6. Select the new version of the application archive file.  
e.g. CiscoCyberVision-IOx-aarch64-3.2.3.tar



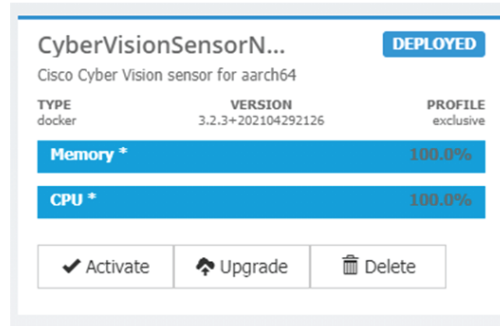
The operation takes a few moments.



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



7. Check the number of the new version.
8. Click **Activate**.



9. Check configurations.

**It can happen that network configurations are lost during the upgrade. If they are, refer to Configure the sensor virtual application in the [Procedure with the Local Manager](#) corresponding to the switch used and do as explained.**

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.

## Replace SD card

This section explains how to replace a SD card on a Cisco IE3x00.

## Procedure

---

**Step 1** Connect to the device CLI and use the following commands to disable IoX:

```
configure terminal
no iox
exit
```

**Step 2** Replace the SD card.

**Step 3** Format the SD card using the following command:

```
format sdflash: ext4
```

```
IE340CCV#format sdflash: ext4
Format operation may take a while. Continue? [confirm]
Format operation will destroy all data in "sdflash:". Continue? [confirm]
format completed with no errors

Format of sdflash: complete
IE340CCV#
```

**Step 4** Enable IOx using the following command:

```
configure terminal
iox
```

```
IE340CCV#
IE340CCV#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
IE340CCV(config)#iox
Warning: Do not remove SD flash card when IOx is enabled or errors on SD device could occur.
IE340CCV(config)#
```

**Step 5** Follow the instructions described in the following section to redeploy the sensor.

---

### What to do next

[Reconfigure/Redeploy a sensor, on page 77](#)

## Reconfigure/Redeploy a sensor

The Redeploy button is used when you need to replace a sensor model with another one keeping the same network configurations (e.g. replacing a Cisco IE3400 with a Cat 9300), change configurations, or if you need to reconfigure the sensor (e.g. to enable Active Discovery).

To do so:

### Procedure

---

**Step 1** On the Sensor Explorer page, click the sensor to reconfigure/redeploy. The sensor right side panel appears.

**Step 2** Click **Redeploy**.

The screenshot shows the 'Sensor Explorer' interface. On the left is a navigation pane with options like System, Data Management, Network Organization, Sensors, Management jobs, PCAP Upload, Active Discovery, Users, Events, and API. The main area displays a table of sensors under the heading 'Folders and sensors (3)'. The table has columns for Label, IP Address, Version, Location, Health status, and Pro. One sensor is listed: FCW2445P6X5 with IP address 192.168.49.21 and a 'Disconnected' health status. A red box highlights the 'Redeploy' button for this sensor. On the right, a details pane for the selected sensor shows its label, serial number, IP address, version, system date, deployment, active discovery status, capture mode, system health status (Disconnected), processing status (Disconnected), and uptime (N/A). Below the details are buttons for 'Move to', 'Redeploy', and 'Uninstall'.

A pop up asking to confirm the redeployment of the sensor appears.

**Step 3** Click **OK** to proceed.

A summary of the sensor configuration is displayed. In this example, we're going to change the Collection VLAN number.

**Step 4** Click **Start**.

Redeploy Cisco device

## Get Cisco device configuration

The current configuration of your Cisco device enables you to:

- Reconfigure the Cyber Vision IOx sensor app on this device;
- Reconfigure your Cisco device for Cyber Vision (i.e modify the IP address);
- Deploy the Cyber Vision IOx sensor app on a new device using this configuration.

|                                                          |                                             |
|----------------------------------------------------------|---------------------------------------------|
| Device IP:<br>192.168.49.20                              | Device port:<br>443                         |
| Capture IP address:<br>169.254.1.2                       | Capture prefix length:<br>30                |
| Capture VLAN number:<br>2508                             | Collection IP address:<br>192.168.49.21     |
| Collection prefix length:<br>24                          | Collection VLAN number:<br>507              |
| Use global credentials:<br>No                            | Disk size:<br>Use as much space as possible |
| Active Discovery interfaces:<br>192.168.50.21/24 VLAN#50 |                                             |

Exit

Start



**Step 5** Enter the credentials to reach the sensor to redeploy and click **Connect**.

### Redeploy Cisco device

## Reach Cisco device

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

IP address\*

Port\*

For example 443 or 8443

Center collection IP

leave blank to use current collection IP

Credentials

Login\*

Password\*

[Exit](#)

[Connect](#)

**Step 6** Click the blue link to fill the warning fields with the current sensor configuration. We change the Collection VLAN number value to 49.

## Redeploy Cisco device

## Configure Cyber Vision IOx sensor app

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

 [Click here to fill the warning fields with the current sensor configuration](#)

Cisco device: IE-3400-8T2S

Capture IP address\*

Capture prefix length\*

Like 24, 16 or 8

Capture VLAN number\*

Collection IP address\*

Collection prefix length\*

Like 24, 16 or 8

Collection gateway

Collection VLAN number\*



 Exit

Next

**Step 7**

Click **Next**.

**Step 8**

You can enable Active Discovery selecting Passive and Active Discovery.

**Step 9**

Click **Deploy**.

A message saying that the sensor is being redeployed appears. You can either go the jobs page or go back to the Sensor Explorer page.

**Step 10**

Click **Go to the jobs page**.

## Redeploy Cisco device

## Done!

The Cyber Vision IOx sensor application is being redeployed on your device. A job has been created to track deployment progress.

What's next?

[Back to Sensor Explorer](#)

[Go to the jobs page](#)

You are redirected to the [Management jobs](#) to see the redeployment advancement. This can take several minutes.

The screenshot shows the 'Management jobs' interface. On the left is a navigation sidebar with 'Management jobs' selected. The main content area shows a job titled 'Single redeployment (FCW2445P6X5)'. Below the title is a progress bar with four steps: the first is a green checkmark, the second is a blue checkmark, and the last two are grey circles with a clock icon. The 'Duration' column indicates the job is 'In progress'.

If you go back to the Sensor Explorer page, you will see that the sensor is in Redeploying status.

## 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: Feb 23, 2022 4:50 PM [Refresh](#)

| <input type="checkbox"/> | Label                       | IP Address    | Version | Location | Health status | Processing status | Active Discovery |
|--------------------------|-----------------------------|---------------|---------|----------|---------------|-------------------|------------------|
| <input type="checkbox"/> | <a href="#">FCW2445P6X5</a> |               |         |          | Disconnected  | Disconnected      |                  |
| <input type="checkbox"/> | <a href="#">FCW2445P6X5</a> |               |         |          | Disconnected  | Disconnected      |                  |
| <input type="checkbox"/> | <a href="#">FCW2445P6X5</a> | 192.168.49.21 |         |          | Redeploying   | Not enrolled      | Unavailable      |

Once the redeployment is finished, the sensor will switch status to connected and the Active Discovery to Enabled.

|                          |                             |               |                    |  |           |              |         |          |
|--------------------------|-----------------------------|---------------|--------------------|--|-----------|--------------|---------|----------|
| <input type="checkbox"/> | <a href="#">FCW2445P6X5</a> | 192.168.49.21 | 4.1.0+202202151440 |  | Connected | Pending data | Enabled | a minute |
|--------------------------|-----------------------------|---------------|--------------------|--|-----------|--------------|---------|----------|

## 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 82](#).
- If the sensor was deployed with the sensor management extension, refer to [Sensor certificate renewal, on page 82](#).

- If the certificate is outdated, and was deployed manually, refer to [Sensor certificate renewal through the Local Manager, on page 85](#).

## 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).

The screenshot shows the Cisco Sensor Explorer interface. At the top right, there is a red notification banner for 'System issues Actions required'. Below this, the main content area is split into two panels. The left panel, titled 'Sensor Explorer', contains a message '2 sensor certificates expired' and a table of sensors. The right panel shows details for the selected sensor 'FOC2330V0T0'.

**Sensor Explorer Table:**

|                          | Label       | IP Address    | Version            |
|--------------------------|-------------|---------------|--------------------|
| <input type="checkbox"/> | FCH2309Y01Z | 192.168.49.23 | 4.2.2+202306261711 |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.2.2+202306261519 |
| <input type="checkbox"/> | FOC2330V0T0 | 192.168.49.41 | 4.2.2+202306261519 |

**Sensor Details (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
- Buttons: Move to, Capture mode, Redeploy, Uninstall

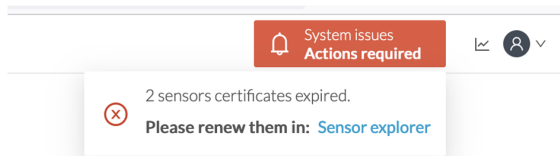
- In the case of sensors deployed manually, it only applies if the sensors certificate have not expired yet (i.e. the sensor certificate status is Expire Soon).

If sensors have been deployed manually and the certificate expiration date is exceeded, refer to [Sensor certificate renewal through the Local Manager, on page 85](#).

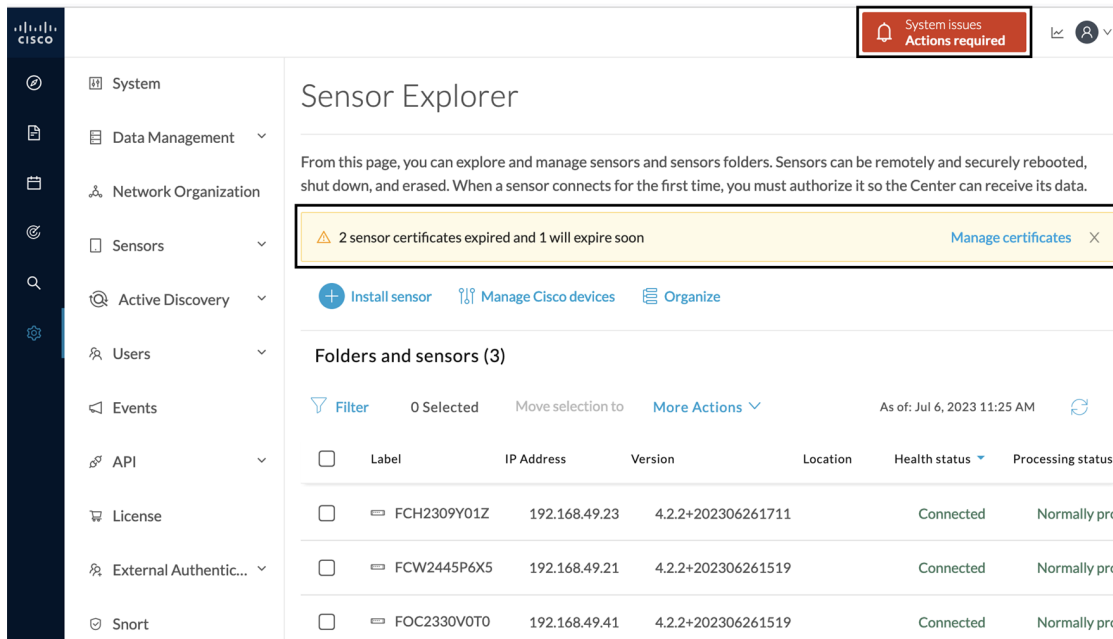
### Procedure

#### Step 1

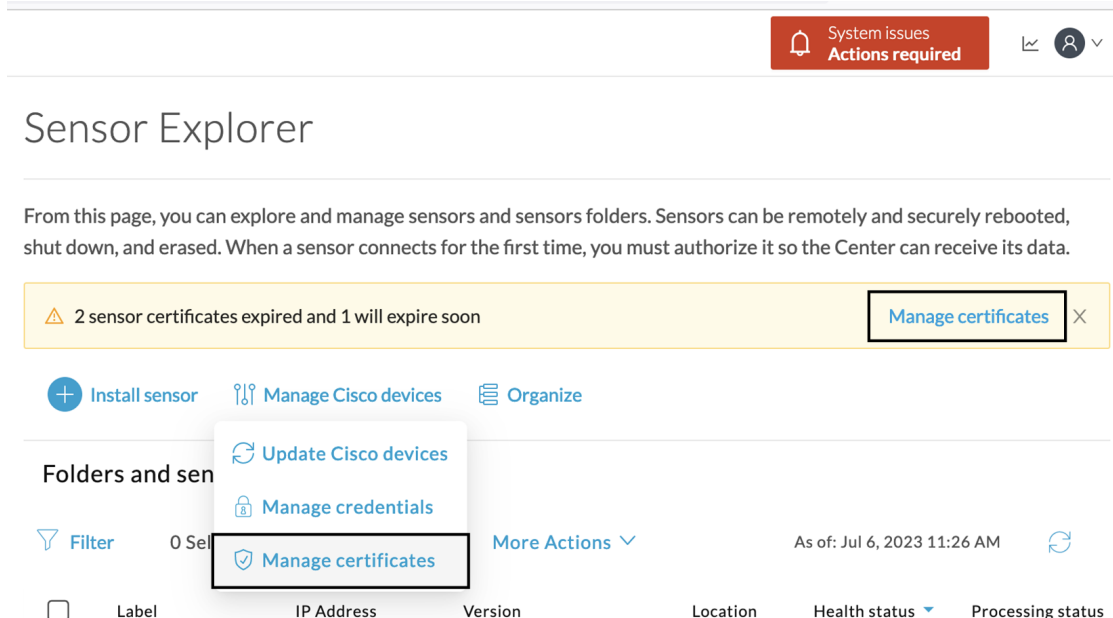
In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer or click the top banner alert to access the Sensor Explorer page directly.



Another alert is displayed.



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



The **Manage sensors certificates** window opens.

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 |
|----------------------------------|--------------|---------------|--------------------|-----------------|
| <input type="radio"/>            | FCH2309Y01Z  | 192.168.49.23 | Expired            | Jul 2, 2023     |
| <input type="radio"/>            | FOC2330V0T0  | 192.168.49.41 | Expired            | Jul 2, 2023     |
| <input checked="" type="radio"/> | FCW2445P6X5  | 192.168.49.21 | Expiring Soon      | Jul 14, 2023    |

Cancel Renew certificate

**Step 3** Select the sensor with the status Expiring Soon.

**Step 4** Click **Renew certificate**.

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 |
|-----------------------|--------------|---------------|--------------------|-----------------|
| <input type="radio"/> | FOC2330V0T0  | 192.168.49.41 | Expired            | Jul 2, 2023     |
| <input type="radio"/> | FCH2309Y01Z  | 192.168.49.23 | Expired            | Jul 2, 2023     |
| <input type="radio"/> | FCW2445P6X5  | 192.168.49.21 | Valid              | Sep 3, 2025     |

Cancel Renew certificate

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

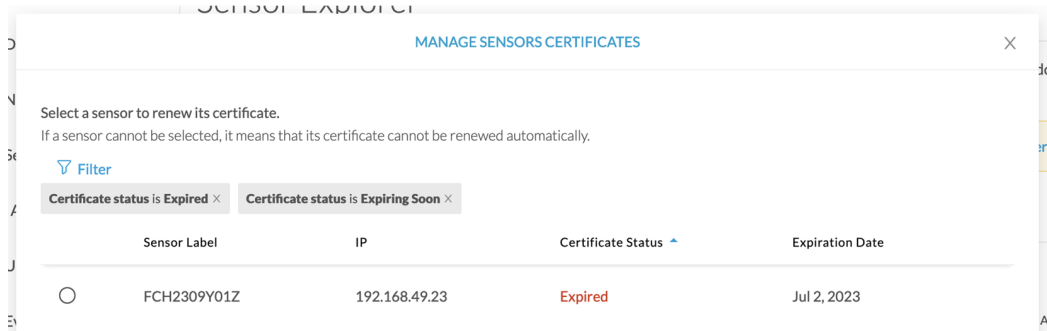
In case of certificate expiration, communication with the sensor is no longer possible if it was deployed manually (i.e. without the sensor management extension). In this case, the certificate is renewed by sending it to the sensor manually. As the certificate is part of the provisioning package, the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

The screenshot shows the 'Sensor Explorer' interface for a sensor labeled 'FCH2309Y01Z'. A notification banner at the top indicates '1 sensor certificate expired'. Below this, there are buttons for 'Install sensor', 'Manage Cisco devices', and 'Organize'. A table lists three sensors, with the first one, 'FCH2309Y01Z', selected. The right-hand panel displays details for the selected sensor, including its label, serial number, IP address, version, system date, and deployment method (Manual). The 'Deployment' field is highlighted with a red box. Below the details, there are buttons for 'Go to statistics', 'Start Recording', 'Move to', 'Download package', 'Capture mode', 'Enable IDS', 'Reboot', 'Shutdown', and 'Uninstall'.

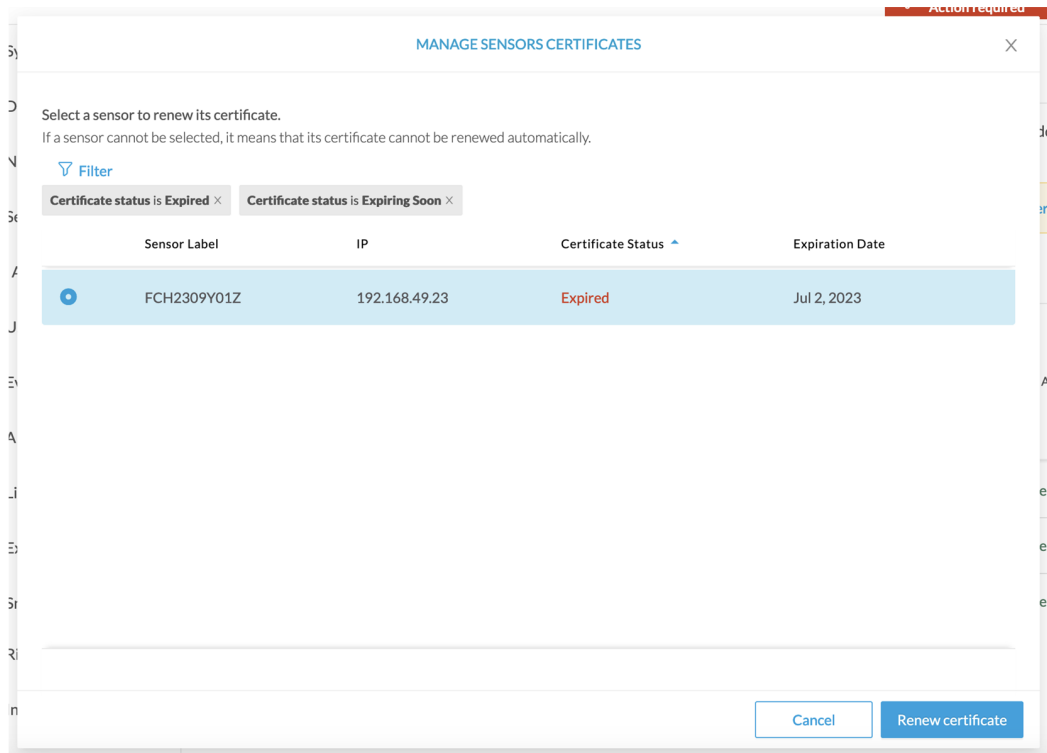
| Label       | IP Address    | Version            |
|-------------|---------------|--------------------|
| FCH2309Y01Z | 192.168.49.23 | 4.2.2+202306261711 |
| FCW2445P6X5 | 192.168.49.21 | 4.2.2+202306261519 |
| FOC2330V0T0 | 192.168.49.41 | 4.2.2+202306261519 |

### Procedure

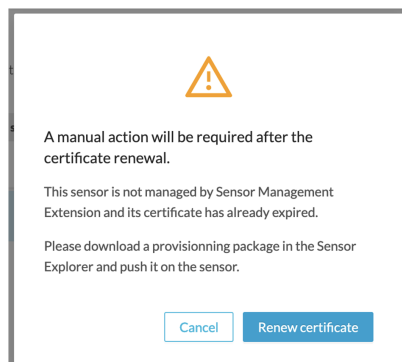
- Step 1** In Cisco Cyber Vision, navigate to Admin > Sensors > Sensor Explorer.
- Step 2** Click **Manage Certificates**.
- The Manage sensors certificates window appears.



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



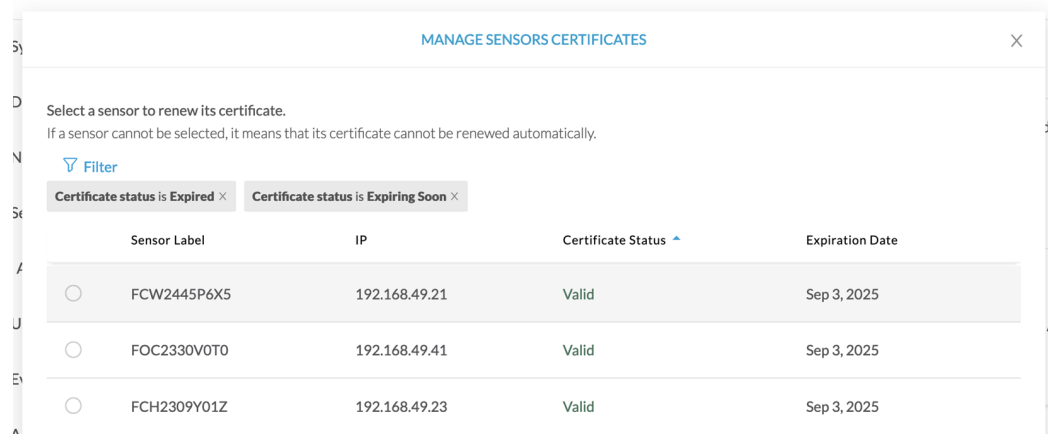
A message is displayed.



**Step 4** Click **Renew certificate** again.



The sensor certificate status appears as valid.



**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 [Refresh](#)

| <input type="checkbox"/> | Label       | IP Address    | Version            | Location | Health status | Processing status   | Active Di |
|--------------------------|-------------|---------------|--------------------|----------|---------------|---------------------|-----------|
| <input type="checkbox"/> | FCH2309Y01Z | 192.168.49.23 | 4.2.2+202306261711 |          | Disconnected  | Disconnected        | Disa      |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.2.2+202306261519 |          | Connected     | Normally processing | Unav      |
| <input type="checkbox"/> | 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.

The screenshot shows the 'Sensor Explorer' interface. On the left, there's a list of sensors under 'Folders and sensors (3)'. The table below shows the details of these sensors:

| <input type="checkbox"/> | Label       | IP Address    | Version            | Lo |
|--------------------------|-------------|---------------|--------------------|----|
| <input type="checkbox"/> | FCH2309Y01Z | 192.168.49.23 | 4.2.2+202306261711 |    |
| <input type="checkbox"/> | FCW2445P6X5 | 192.168.49.21 | 4.2.2+202306261519 |    |
| <input type="checkbox"/> | FOC2330V0T0 | 192.168.49.41 | 4.2.2+202306261519 |    |

On the right, the detailed view for sensor 'FCH2309Y01Z' is shown. It includes the following information:

- 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

Below the details, there are several action buttons: 'Move to', 'Download package' (highlighted with a red box), 'Enable IDS', 'Reboot', 'Shutdown', and 'Uninstall'. There is also a 'Go to statistics' link.

**Step 8****Step 9**

Import the provisioning package in the Local Manager. To do so, refer to [Import the provisioning package, on page 49](#).

**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.

[+ Install sensor](#)
[🔍 Manage Cisco devices](#)
[📁 Organize](#)

### Folders and sensors (3)

[Filter](#)
0 Selected
Move selection to
[More Actions](#)
As of: Jul 6, 2023 11:56 AM
🔄

| <input type="checkbox"/> | Label         | IP Address    | Version            | Location | Health status | Processing status   | Active Di |
|--------------------------|---------------|---------------|--------------------|----------|---------------|---------------------|-----------|
| <input type="checkbox"/> | ⇒ FCH2309Y01Z | 192.168.49.23 | 4.2.2+202306261711 |          | Connected     | Normally processing | Disal     |
| <input type="checkbox"/> | ⇒ FCW2445P6X5 | 192.168.49.21 | 4.2.2+202306261519 |          | Connected     | Normally processing | Unav      |
| <input type="checkbox"/> | ⇒ FOC2330V0T0 | 192.168.49.41 | 4.2.2+202306261519 |          | Connected     | Normally processing | Unav      |





# CHAPTER 10

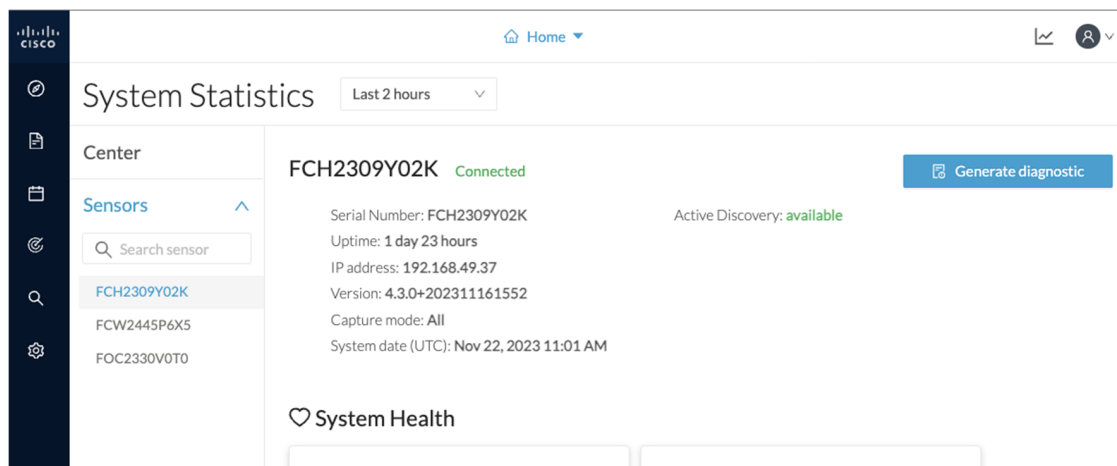
## Troubleshooting

- [Collect IOx sensor logs, on page 91](#)
- [Collect IOx sensor logs from the Local Manager, on page 92](#)

### 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 Vision GUI to generate the sensor diagnostic from the sensor statistics page.



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 snapshot file** button.

Configuration > Services > IOx

**Cisco Systems**  
Cisco IOx Local Manager

Hello, admin | Log Out | About

Applications
Remote Docker Workflow
Docker Layers
System Info
System Setting
System Troubleshoot
CVSensor

▼ Events
Refresh

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

Events Errors

Current CAF stats  

|         |       |          |           |
|---------|-------|----------|-----------|
| Warning | Error | Critical | Events    |
| ...     | ...   | ...      | <b>14</b> |

Supports RegEx

| Timestamp                  | #Record | Type | Message | Details |
|----------------------------|---------|------|---------|---------|
| No data available in table |         |      |         |         |

Page Size 10 ▾

▼ Logs
Refresh

Logging Management Select Log Type All Logs ▾

| Log name  | Timestamp         | Log Size | Error | View                     |
|-----------|-------------------|----------|-------|--------------------------|
| caf.log   | Wed Nov 22 14:... | 564034   | 0     | <a href="#">download</a> |
| caf.log.1 | Wed Nov 22 14:... | 1039013  | 0     | <a href="#">download</a> |
| caf.log.2 | Wed Nov 22 13:... | 1048528  | 0     | <a href="#">download</a> |
| caf.log.3 | Wed Nov 22 13:... | 1048565  | 0     | <a href="#">download</a> |
| caf.log.4 | Wed Nov 22 13:... | 1048304  | 0     | <a href="#">download</a> |

TechSupport Information

| Tech Support snapshot file name         | File Size | Download                 | Delete                           |
|-----------------------------------------|-----------|--------------------------|----------------------------------|
| tech_support_2023-11-22_12.22.51.tar.gz | 864159    | <a href="#">download</a> | <input type="button" value="X"/> |

| Core file name | File Size | Download | Delete |
|----------------|-----------|----------|--------|
|                |           |          |        |

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