System Setup and Software Installation Guide for Cisco Optical Site Manager, IOS XR

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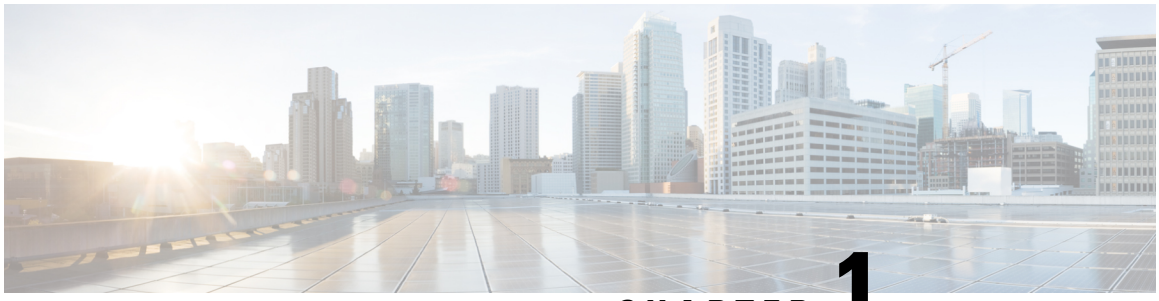


CHAPTER 1

Cisco Optical Site Manager Overview

This chapter gives us an overview of the Cisco Optical Site Manager.

- Cisco Optical Site Manager Overview, on page 1

Cisco Optical Site Manager Overview

Cisco Optical Site Manager is an application that allows you to view and access the topology of all the optical devices located in the same optical site. It represents a ROADM functionality by aggregating any transponder or muxponder (or optical transceiver in general) present in the same location.

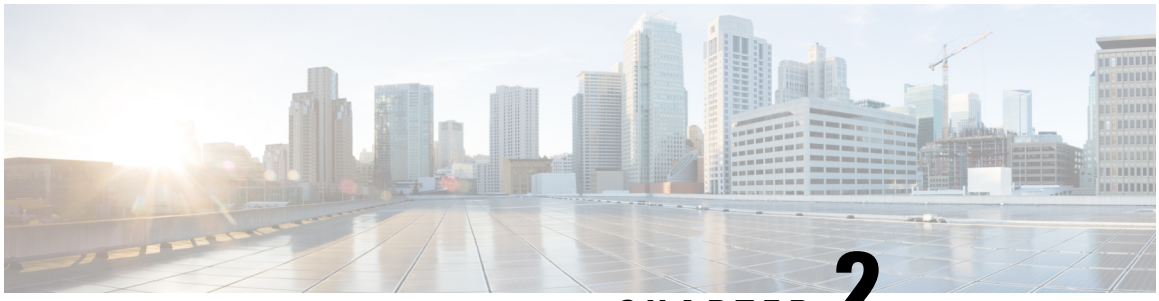
Cisco Optical Site Manager enables software-defined networks to automate site operations. Its site aggregation feature for Optical Sites includes any NCS 1000 devices connected to the network.

Cisco Optical Site Manager provides the following features:

1.
2. **Site-Level Management:** Cisco Optical Site Manager collects and manages site-level information, including inventory details, site topology, performance monitoring, and correlated alarms.
3. **Web-Based User Interface:** Cisco Optical Site Manager offers a web-based user interface (Web UI) that provides improved management control for NCS 1000 devices and their configurations. This interface allows you to easily view the layout of chassis, cards, and passive devices. Additionally, you can check the active and acknowledged alarms for the NCS 1000 devices.
4. **Performance Monitoring:** Cisco Optical Site Manager enables you to keep track of the performance of different cards and chassis that are hosted on the device. You can access both current and historical performance monitoring counters at various intervals. Additionally, you can verify connections and perform loopbacks.

For more information about Cisco Optical Site Manager, see the data sheet.

Cisco Optical Site Manager Overview



CHAPTER 2

Install Cisco Optical Site Manager

This chapter describes the steps to install Cisco Optical Site Manager.

- Install Cisco Optical Site Manager, on page 3
- Configure Static Route on Peer Devices, on page 4

Install Cisco Optical Site Manager

Cisco Optical Site Manager is a software application designed to provide detailed information about a particular site. This information includes inventory, site topology, correlated alarms, and performance monitoring. The application can be hosted on either NCS 1010 or NCS 1014. Once enabled on the two devices, the application hosted on NCS 1010 can also provide High Availability.

Cisco Optical Site Manager has the ability to manage different following configurations for NCS 1000 devices:

- NCS1010 OLT-C
- NCS1010 OLT-C and NCS1014

The Cisco Optical Site Manager package is available as an optional component as a separate GISO image bundled with the Cisco IOS XR image.

Pre-requisites for a NCS 1000 Device to be Managed

Ensure that the following prerequisites are met to manage the NCS 1000 devices with Cisco Optical Site Manager.

- All the Cisco NCS 1000 devices on the network are reachable from the device hosting Cisco Optical Site Manager.
- SSH is configured on all the devices.
- Netconf-Yang agent is configured to use SSH for communication.
- The SSH rate limit is set to 600.
- For auto-onboarding of directly connected devices (peer devices), use *MgmtEth0/RP0/CPU0/1* port with IP addresses *192.168.1.1/30* and *192.168.1.2/30*.
- Static routes are added on devices that belong to different subnets or configured as peer devices. For more details, see Configure Static Route on Peer Devices, on page 4.

- The authentication credentials of Cisco Optical Site Manager match the authentication credentials of the device.

Configure Static Route on Peer Devices

To configure a static route on the peer devices, perform these steps:

Note From R24.3.1, in a High Availability (HA) configuration where the HA subnet is different from the management subnet, Cisco Optical Site Manager automatically adds a route to reach the peer HA loopback interface. However, if management cables are disconnected and reconnected, the management subnet configuration is removed and not automatically re-added. To prevent this issue, it is recommended to configure a static IP address to maintain continued connectivity.

Procedure

Step 1 **configure terminal**

Example:

```
RP/0/RP0/CPU0:ios#configure terminal
```

Step 2 **router static**

Example:

```
RP/0/RP0/CPU0:ios(config)#router static
```

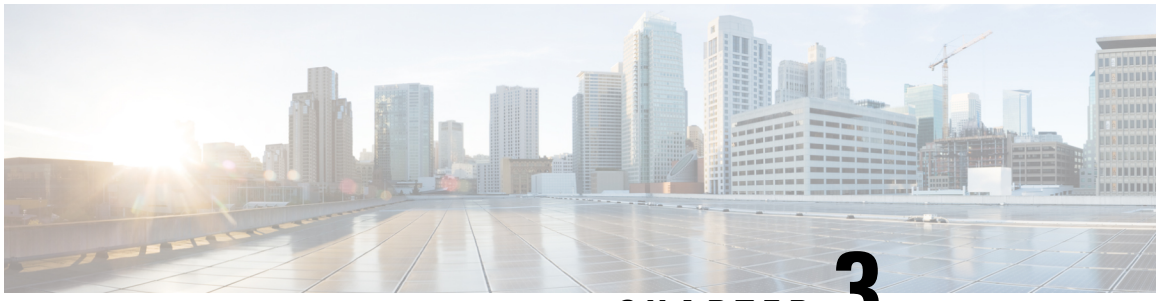
Enters the static router configuration mode.

Step 3 **address-family ipv4 unicast 0.0.0.0/0** *default gateway*

Example:

```
RP/0/RSP0/CPU0:ios(config-static)#address-family ipv4 unicast 0.0.0.0/0 192.168.2.1
```

Enters address family configuration mode and configures the IPv4 unicast address static routes.



CHAPTER 3

Setup Cisco Optical Site Manager

This chapter describes the tasks related to standalone Cisco Optical Site Manager configuration and activating Cisco Optical Site Manager.

Setting up Cisco Optical Site Manager invoves the following tasks:

- Enable Netconf, on page 5
- Standalone Cisco Optical Site Manager Configuration, on page 6
- Activate Cisco Optical Site Manager, on page 7
- Deactivate Cisco Optical Site Manager, on page 8
- Enable or Disable Cisco Optical Site Manager Interfaces, on page 9

Enable Netconf

Using the Network Configuration Protocol (NETCONF) over the Secure Shell Version 2 (SSHv2), you can securely configure networks through the Cisco command-line interface (CLI). The NETCONF client, also known as the NETCONF Network Manager, must communicate with the NETCONF server using Secure Shell Version 2 (SSHv2) as the network transport. The NETCONF server allows multiple NETCONF clients to connect to it for network configuration purposes.

To enable netconf, perform these steps:

Procedure

Step 1 **configure terminal**
Enters the configuration mode.

Step 2 **netconf-yang agent ssh**

Example:

```
RP/0/RSP0/CPU0:ios(config)# netconf-yang agent ssh
```

Enables NETCONF agent over SSH connection.

Step 3 **ssh server v2**.

Example:

```
RP/0/RP0/CPU0:ios(config)# ssh server v2
```

If you choose the **ssh server v2** command, only the SSH v2 client connections are accepted.

Step 4 **ssh server rate-limit** *rate-limit*.

Example:

```
RP/0/RP0/CPU0:ios(config)# ssh server rate-limit 600
```

limit the number of incoming SSH connection requests allowed per minute to 600.

Step 5 **ssh server netconf**
Brings up the netconf subsytem support with SSH server.

Step 6 Commit the changes using the **commit** command.

Standalone Cisco Optical Site Manager Configuration

You can also configure Cisco Optical Site Manager in Standalone mode. After configuring the Cisco Optical Site Manager interfaces, you need to set up the Cisco Optical Site Manager admin user ID and password. Additionally, you must configure the management interface of the node on which Cisco Optical Site Manager is installed.

To configure Cisco Optical Site Manager in standalone mode, perform these steps:

Procedure

Step 1 **configure terminal**

Example:

```
RP/0/RP0/CPU0:ios#configure terminal
```

Enters the XR configuration mode.

Step 2 **cosm**

Example:

```
RP/0/RSP0/CPU0:ios(config)# cosm
```

Enters the Cisco Optical Site Manager configuration mode.

Step 3 (Optional) **optical-type olt**.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# optical-type olt
```

If optical-type is not specified, it is auto-detected from chassis PID. Available options: *ila*, *olt*, and *txp*.

Step 4 **mgmt-interface-name MgmtEth** *R/S/I/P*.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# mgmt-interface-name MgmtEth 0/RP0/CPU0/0
```

Step 5 **user-name** *user name*.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# user-name cisco
```

Note

For automatic onboarding of peer devices, the configured credentials must match those of all devices on the network.

Step 6 **user-password** *password*.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# user-password ***
```

Step 7 (Optional) From R24.3.1, enable auto-onboarding of the Cisco Optical Site Manager host devices.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)#cosm auto-onboard enable
```

Step 8 Commit the changes using the **commit** command.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm) commit
```

Step 9 Exit the configuration mode.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm) end
```

Step 10 Verify the configuration.

Example:

```
RP/0/RP0/CPU0:ios#show running-config cosm
Fri Oct 18 12:53:47.056 UTC
cosm
 optical-type olt
 auto-onboard enable
 mgmt-interface-name Loopback1
!
```

The configured *user-name* and *user-password* are not displayed in the output of the **show running-config cosm** command.

Activate Cisco Optical Site Manager

Once you have finished configuring the Cisco Optical Site Manager standalone, you need to activate it.

To activate Cisco Optical Site Manager, perform these steps:

Procedure

Step 1 **cosm activate**.

Example:

```
RP/0/RP0/CPU0:ios# cosm activate
```

Activates Cisco Optical Site Manager.

Step 2 **show cosm status**.

Example:

```
RP/0/RP0/CPU0:OLT-2#show cosm status
Fri Oct 18 13:06:09.862 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 3 weeks
Last error: No error
COSM version: 24.3.1.D0186
```

Note
The configuration of interfaces used by Cisco Optical Site Manager should not be changed after activation.

It may a few minutes to activate Cisco Optical Site Manager. After activating, wait a few minutes before logging into the Cisco Optical Site Manager GUI.

Deactivate Cisco Optical Site Manager

Deactivating Cisco Optical Site Manager should be performed only when:

- A change in the IP address of the Cisco Optical Site Manager instance is required.
- The deployment is transitioning from a standalone setup to a high availability (HA) configuration.
- The device hosting Cisco Optical Site Manager is being decommissioned and needs to be relocated to another device within the same aggregation site.
- The Cisco Optical Site Manager installation is incomplete or corrupted, and requires removal and reinstallation.

Note Deactivating Cisco Optical Site Manager for general debugging or troubleshooting is not recommended.

Follow these steps to deactivate Cisco Optical Site Manager:

Before you begin

Before deactivating Cisco Optical Site Manager:

- Create a backup of Cisco Optical Site Manager database. For more details, see Backup and Download Database.
- Dowload the current diagnostic logs in case required for troubleshooting. For more details, see View Cisco Optical Site Manager Diagnostics.

Procedure

Step 1 Deactivate Cisco Optical Site Manager.

cosm deactivate

Example:

```
RP/0/RP0/CPU0:ios# cosm deactivate
```

Step 2 Verify the status of the Cisco Optical Site Manager instance.

show cosm status.

Example:

```
RP/0/RP0/CPU0: ios#show cosm status
COSM state: APP DEACTIVATED
AppMgr app state: DEACTIVATED
AppMgr container state: UNKNOWN
Container status: Not present
Last error: No error
COSM version: 24.3.1.D0186
```

Enable or Disable Cisco Optical Site Manager Interfaces

Cisco Optical Site Manager provides three control interfaces: NETCONF, RESTCONF, and an interactive Web-UI. By default, all these interfaces are enabled. If required, individual interfaces can be disabled and the NETCONF port can be changed. Ensure that you make these changes before activating Cisco Optical Site Manager.

To enable or disable Cisco Optical Site Manager interfaces, perform these steps:

Procedure

Step 1 **configure terminal**

Example:

```
RP/0/RP0/CPU0:ios#configure terminal
```

Enters the XR configuration mode.

Step 2 **cosm**

Example:

```
RP/0/RSP0/CPU0:ios(config)# cosm
```

Enters the Cisco Optical Site Manager configuration mode.

Step 3 (Optional) Configure the NETCONF port if you want to use a port other than 2022.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)#netconf port 2021
```

Configures the specified port for the NETCONF SSH server. If no port is specified, port 2022 is used by default.

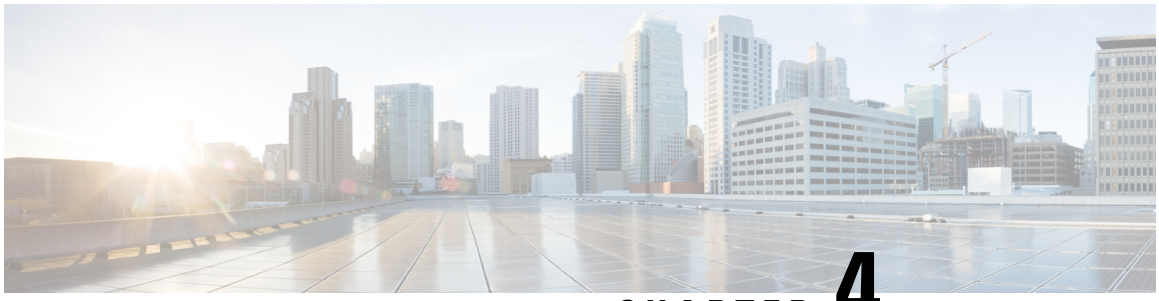
Step 4 Enable the Cisco Optical Site Manager interface.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# netconf enable
RP/0/RP0/CPU0:ios(config-cosm)# restconf disable
RP/0/RP0/CPU0:ios(config-cosm)# webui enable
```

Enables or disables the specified Cisco Optical Site Manager interfaces.

Step 5 Commit the changes using the **commit** command.



CHAPTER 4

Cisco Optical Site Manager High Availability

This chapter describes how to configure Cisco Optical Site Manager in High Availability (HA).

Table 1: Feature History

Feature Name	Release Information	Description
Cisco Optical Site Manager High Availability	Cisco IOS XR Release 24.3.1	You can now configure Cisco Optical Site Manager with High Availability (HA). In this setup, if the primary device hosting Cisco Optical Site Manager fails, another device configured with HA will take over immediately, minimizing downtime and maintaining operational continuity.

- High Availability (HA), on page 11
- Configure High Availability on NCS 1000, on page 14

High Availability (HA)

To ensure operational continuity, Cisco Optical Site Manager High Availability (HA) allows you to designate a backup manager for devices. The system supports Active/Standby roles. One application operates actively, managing the devices, while the standby application remains inactive until needed.

This setup allows the standby Cisco Optical Site Manager to take over if the active application fails. The active unit replicates data for both applications and shares information with the standby application as required.

Cisco Optical Site Manager HA Deployment for NCS 1000

Cisco Optical Site Manager HA can be deployed on a network using these device combinations:

- Two host devices and Cisco Optical Site Manager in the same subnet.
- Two host devices in the same subnet, with Cisco Optical Site Manager on another subnet.
- Two host devices in different subnets.

- Two host devices in the same subnet, using the loopback interface as the Cisco Optical Site Manager interface.

Figure 1: Cisco Optical Site Manager HA Deployment for NCS 1000 Devices

Configure High Availability on NCS 1000

To configure Cisco Optical Site Manager HA on a NCS 1010 or NCS 1014 device, perform these steps:

Before you begin

Before activating Cisco Optical Site Manager in HA configuration, verify that these parameter values are same on both host devices, if configured.

- *optical-type*
- *auto-onboard*
- *netconf*
- *restconf*
- *webui*
- *user-name*
- *user-password*

Procedure

Step 1 Enter into the IOS XR and Cisco Optical Site Manager configuration modes.

Example:

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RSP0/CPU0:ios(config)# cosm
```

Step 2 Configure the gateway IP address.

This IP address is used by HA to verify connectivity of the HA device with the Active device.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# redundancy gateway-ip 10.0.2.1
```

Step 3 Configure the peer IP address.

This is the IP address of the peer device running the Cisco Optical Site Manager HA instance.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# redundancy peer-ip 10.0.1.12
```

For releases 24.3.x and 25.x.x, the *redundancy interface-name* ip address and *redundancy peer-ip* address are not substrings of each other. For example, using 10.0.2.1 as the *redundancy interface-name* and 10.0.2.2 as the *redundancy peer-ip* may cause Cisco Optical Site Manager HA to fail during startup.

Step 4 Configure the HA interface name.

This is the interface of the device running the Cisco Optical Site Manager HA instance, which is used for all HA traffic.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# redundancy interface-name MgmtEth 0/RP0/CPU0/2
```

Step 5 Commit the changes and exit all configuration modes.

Example:

```
RP/0/RP0/CPU0:ios(config-cosm)# commit
RP/0/RP0/CPU0:ios(config-cosm)# end
```

Step 6 Activate the HA application.

Example:

```
RP/0/RP0/CPU0:ios# cosm activate
```

Step 7 Verify the HA configuration and check the device status on both host devices.

Example:

The entry highlighted in bold show the status of the active and standby device.

```
//Check status on active device//
RP/0/RP0/CPU0:ios#show cosm status

COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 4 days
Last error: No error
COSM version: 24.3.1.D0151
Redundancy role: ACTIVE (connected standby 10.0.123.123-COSM)

//Check status on standby device//
RP/0/RP0/CPU0:ios#show cosm status

COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 4 days
Last error: No error
COSM version: 24.3.1.D0151
Redundancy role: STANDBY (connected active 10.11.111.111-COSM)
```

Note
After reloading the standby device, the status of both Cisco Optical Site Manager host devices is displayed as *ACTIVE* for 1 minute 15 seconds.

You can view the active and standby application status in the **Device Software** section of the **Software Manager** menu.

Note If the HA node is on loopback, the MAC address of the HA device is displayed as **N/A** in the **Devices** section of the **Device Configuration** page.