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

Cisco Network Convergence System 1010
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1 Cisco Optical Site Manager Overview

Topics:

- Cisco Optical Site Manager

This chapter provides a brief overview of the Cisco Optical Site Manager.

Cisco Optical Site Manager

This topic describes Cisco Optical Site Manager and its functionality for optical site topology visualization and management.

Cisco Optical Site Manager is an optical site management application that provides a unified view of topology and enables management of optical devices within a single site.

- Aggregates optical devices such as transponders, muxponders, and transceivers across supported platforms including NCS 1000 and NCS 2000.
- Represents ROADM functionality by abstracting Optical Line System (OLS), Optical Terminal (OT), or combined OLS+OT sites.
- Enables software-defined network automation for site-level operations and management.

It provides centralized visibility and control of site topology, inventory, performance, and alarms across optical network devices.

Key Features of Cisco Optical Site Manager

Cisco Optical Site Manager provides the following capabilities:

- **Site aggregation:** Provides a consolidated topology view for Optical Sites with NCS 1000 (NCS 1010, NCS 1014, NCS 1004, NCS 1001) and supported NCS 2000 devices.
- **Site-level management:** Collects and manages inventory, topology, performance data, and correlated alarms.
- **Web-based user interface:** Enables visualization of chassis, cards, passive devices, and alarm states through an intuitive interface.
- **High availability:** Supports deployment across two devices to ensure continuous operation during failures.
- **Performance monitoring:** Provides access to real-time and historical performance metrics, connection verification, and loopback capabilities.

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

Part I

Install and Setup for NCS 1000

Topics:

- Install Cisco Optical Site Manager on NCS 1000
- Configure Cisco Optical Site Manager on NCS 1000
- Setup Cisco Optical Site Manager on NCS 1000
- Migrate Cisco Optical Site Manager between standalone and high availability modes

This section provides detailed instructions for installing and configuring Cisco Optical Site Manager on NCS 1000.

2 Install Cisco Optical Site Manager on NCS 1000

Topics:

- Cisco Optical Site Manager installation workflow
- Install a Cisco Optical Site Manager SMU
- Cisco Optical Site Manager software upgrade matrix

This chapter describes the workflow and requirements to deploy the application on supported NCS 1000 platforms. Explains how to enable NETCONF over SSH, configure routing, install service packs, and use the upgrade matrix for software management.

Cisco Optical Site Manager installation workflow

Learn how to install and configure Cisco Optical Site Manager on NCS 1000 platforms.

This workflow helps you install and configure Cisco Optical Site Manager. You will set up Cisco Optical Site Manager, configure it for standalone or high availability (HA) operation, manage interfaces, and activate the application as needed.

Before you begin

Verify that the installation requirements are met before proceeding. For details, see Cisco Optical Site Manager installation prerequisites for NCS 1000 devices on page 11.

Perform these tasks to install and configure Cisco Optical Site Manager on NCS 1000 platforms.

Procedure

1. Install Cisco Optical Site Manager. For more details, see Install Cisco Optical Site Manager on NCS 1010 or NCS 1014 on page 15.
2. Configure Cisco Optical Site Manager in standalone or high availability mode. For more details, see Configure Cisco Optical Site Manager on NCS 1000 on page 24.
3. Perform these tasks to setup Cisco Optical Site Manager:
   a) Enable or disable Cisco Optical Site Manager interfaces individually. For more details, see Enable or disable Cisco Optical Site Manager north-bound interfaces on page 55.

   Note

   By default, these interfaces are enabled
   - NETCONF
   - RESTCONF
   - Interactive Web-UI

   b) Activate Cisco Optical Site Manager. For more details, see Activate Cisco Optical Site Manager on page 56.

Cisco Optical Site Manager installation prerequisites for NCS 1000 devices

This topic explains the prerequisites for installing Cisco Optical Site Manager and preparing the network for managing NCS 1000 devices, including reachability, SSH and Netconf-YANG configuration, rate limits, interface requirements, and static routing considerations.

This section lists the prerequisites for installing Cisco Optical Site Manager.

These requirements must be met before using Cisco Optical Site Manager to manage NCS 1000 devices.

- 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.

- Before Release 24.3.1, use the *MgmtEth0/RP0/CPU0/1* interface for auto-onboarding of subtended devices. The interface uses IP addresses *192.168.1.1/30* and *192.168.1.2/30*. From Release 26.1.1, this requirement does not apply.
- Before Release 26.1.1, ensure that static routes are added on devices that belong to different subnets or configired as peer devices. For more details, see Configure static routes on peer devices on page 14.
- Verify IP reachability between the Cisco Optical Site Manager host device and each managed device when they are in different subnets. If either direction is not reachable, configure a static route from the Cisco IOS XR CLI.

  For example, if the NCS 1014 device is not reachable from the NCS 1010 host, configure the static route on the NCS 1010 host device.

```
RP/0/RP0/CPU0:onc-oltc-225-70(config)#router static
RP/0/RP0/CPU0:onc-oltc-225-70(config-static)# address-family ipv4 unicast
RP/0/RP0/CPU0:onc-oltc-225-70(config-static-afi)# <managed-device-ip>/32
<default-gateway>
RP/0/RP0/CPU0:onc-oltc-225-70(config-static-afi)#commit
```

Enable NETCONF over SSH for secure host device communication

Learn how to enable NETCONF over SSH on host devices so that Cisco Optical Site Manager can securely connect for configuration and monitoring. Use this procedure to configure the required SSH settings and activate the NETCONF protocol.

Enable NETCONF over SSH so that Cisco Optical Site Manager can connect to host devices for configuration and monitoring. Enable NETCONF on each Cisco Optical Site Manager host device.

Before you begin

Follow these steps to enable NETCONF:

Procedure

1. Enter the configuration mode using the **configure terminal** command.

   Example

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

2. Enable NETCONF-YANG agent over SSH connection using the **netconf-yang agent ssh** command.

   Example

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

3. Configure the device to use SSH protocol v2 using the **ssh server v2** command.

> **Note**
>
> Only SSH version 2 is supported.

Example

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

4. Set the rate limit for incoming SSH connection requests to 600 per minute using the **ssh server rate-limit** *rate-limit* command.

   Example

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

5. Set the SSH session limit to 110 using the **ssh server session-limit** *session-limit* command.

   Example

   ```
   RP/0/RP0/CPU0:ios(config)# ssh server session-limit 110
   ```

6. Enable SSH server access in the default VRF using the **ssh server vrf** *vrf-name* command.

   Example

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

7. Enable NETCONF over SSH in the default VRF using the **ssh server netconf vrf** *vrf-name* command.

   Example

   ```
   RP/0/RP0/CPU0:ios(config)# ssh server netconf vrf default
   ```

8. Enable NETCONF protocol over SSH connection using the **ssh server netconf** command.

   Example

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

9. Commit the changes using the **commit** command.

After you enable NETCONF, Cisco Optical Site Manager can establish a secure communication with the device using the NETCONF protocol over SSH.

This example describes the commands to enable NETCONF over SSH on the host devices:

```
RP/0/RP0/CPU0:ios# configure terminal
                RP/0/RSP0/CPU0:ios(config)# netconf-yang agent ssh
                RP/0/RP0/CPU0:ios(config)# ssh server v2
```

```
RP/0/RP0/CPU0:ios(config)# ssh server rate-limit 600
RP/0/RP0/CPU0:ios(config)# ssh server session-limit 110
RP/0/RP0/CPU0:ios(config)# ssh server vrf default
RP/0/RP0/CPU0:ios(config)# ssh server netconf vrf default
RP/0/RP0/CPU0:ios(config)# ssh server netconf
```

What to do next

Configure static route on peer devices

Configure static routes on peer devices

Learn how to configure static routes on peer devices to ensure Cisco Optical Site Manager host reachability for management and high-availability communication. Use this procedure to define IPv4 static routes, verify the configuration, and maintain reliable connectivity between redundant devices.

Configure static route to ensure that the Cisco Optical Site Manager host device can reach its peer device for management and high availability communication. This is an optional configuration.

In a high-availability setup, two Cisco Optical Site Manager devices located remotely are connected to each other through their *MgmtEth* interfaces.

- Each device must have either a static route or a routing protocol configuration that defines how to reach the peer's redundancy interface.
- Static route configuration is optional.

Follow these steps to configure a static route on the peer devices:

Procedure

1. Enter the configuration mode using the **configure terminal** command.

   Example

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

2. Enter the static router configuration mode using the **router static** command.

   Example

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

3. Configure the IPv4 unicast address static routes using the **address-family ipv4 unicast 0.0.0.0/0** *default gateway* command.

   Example

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

4. Exit the configuration mode using the **exit** command.
5. Verify the configuration using the **show running-config router static** command.

Example

```
RP/0/RP0/CPU0:ios#show running-config router static
router static
 address-family ipv4 unicast
  0.0.0.0/0 192.168.2.1
 !
!
```

Caution

When using OLC, do not configure **redistribute static** under OSPF if there are static routes configured for any of the IP addresses belonging to OLT nodes or ILA nodes in optical network. This can cause OLC topology discovery failures and prevent control loops from operating properly.

The Cisco Optical Site Manager host device gains reliable network reachability to its peer devices, enabling effective management and failover operations.

This example describes the commands to configure a static route on the peer devices:

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#router static
RP/0/RSP0/CPU0:ios(config-static)#address-family ipv4 unicast 0.0.0.0/0
192.168.2.1
RP/0/RSP0/CPU0:ios(config-static)#exit
RP/0/RP0/CPU0:ios#show running-config router static
router static
 address-family ipv4 unicast
  0.0.0.0/0 192.168.2.1
 !
!
```

What to do next

- Install Cisco Optical Site Manager on NCS 1010 or NCS 1014 on page 15
- Install Cisco Optical Site Manager on NCS 1001 or NCS 1004 on page 17

Install Cisco Optical Site Manager on NCS 1010 or NCS 1014

Learn how to install Cisco Optical Site Manager on NCS 1010 or NCS 1014 platforms using IOS XR optional RPM packages. Use this procedure to add, activate, commit, and verify the software in synchronous mode before configuring standalone or high availability deployment.

Cisco Optical Site Manager can be installed on NCS 1010 or NCS 1014 platforms in these two ways:

1. As part of a Golden ISO (GISO) image where the Cisco Optical Site Manager package is already bundled with Cisco IOS XR image.
2. On NCS 1010 or NCS 1014 platforms where Cisco IOS XR is already installed, you can install Cisco Optical Site Manager as an optional software component.

In the second scenario, you must manually install the Cisco Optical Site Manager software using the provided *.rpm* files. You can download the Cisco Optical Site Manager software image from the Software Download page.

Table 1: Supported software packages and device management capacities for NCS 1010 and NCS 1014

Cisco Optical Site Manager hosting platform	Supported software package in repository	Device management capacity
NCS 1010	Eight	Can manage NCS 1010, NCS 1014, NCS 1004, and NCS 1001 devices.
NCS 1014	Eight	Can manage NCS 1014, NCS 1004, and NCS 1001 devices.

Before you begin

Download the *NCS1010/NCS1020 and NCS1014 IOS XR Software optional-rpms* optional package from Software Download page.

Follow these steps to install Cisco Optical Site Manager:

Procedure

1. Copy all the *.rpm* files in the **cosm** folder of the downloaded package to the device storage.

```
RP/0/RP0/CPU0:vmxCisco_T1#mkdir /misc/disk1/cosm
RP/0/RP0/CPU0:vmxCisco_T1# scp user@[RPM_SERVER]:/nobackup/ncs1010_image/*.rpm
    /misc/disk1/cosm
Password: ********
```

2. Add the Cisco Optical Site Manager package source folder to the Cisco IOS XR software management system in synchronous mode using the **install package add source file:** *rpm-folder* **synchronous** command.

   Example

```
RP/0/RP0/CPU0:ios#install package add source file:/harddisk:/cosm/ synchronous
Install add operation 2.1.1 has started
```

   Installation in synchronous mode is optional and runs in the foreground and waits for the operation to complete before returning control to the user.

3. Install the Cisco Optical Site Manager RPM in synchronous mode using the **install package add** *package-name* **synchronous** command.

   Example

```
RP/0/RSP0/CPU0:ios#install package add xr-cosm synchronous
```

4. Apply the latest changes in synchronous mode on the NCS 1000 device using the **install apply restart synchronous** command.

   Example

```
RP/0/RP0/CPU0:ios#install apply restart synchronous
```

   The latest changes are applied to all processes, including the impacted processes.

5. Commit the changes using the **install commit synchronous** command.

Example

```
RP/0/RP0/CPU0:ios#install commit synchronous
```

6. Verify that Cisco Optical Site Manager rpm is installed using the **show install active | include xr-cosm** command.

Example

```
RP/0/RP0/CPU0:ios#show install active | include xr-cosm
Fri Nov 14 11:07:17.877 UTC
xr-cosm
26.1.1v1.0.1-1
```

Cisco Optical Site Manager is installed on the device.

This example describe the commands to install Cisco Optical Site Manager:

```
RP/0/RP0/CPU0:ios#install package add source file:/harddisk:/cosm/ synchronous
RP/0/RSP0/CPU0:ios#install package add xr-cosm synchronous
RP/0/RP0/CPU0:ios#install apply restart synchronous
RP/0/RP0/CPU0:ios#install commit synchronous
RP/0/RP0/CPU0:ios#sh install active | include xr-cosm
Fri Nov 14 11:07:17.877 UTC
xr-cosm                                                          26.1.1v1.0.1-1
```

What to do next

Configure Cisco Optical Site Manager in Standalone or High Availability mode.

Install Cisco Optical Site Manager on NCS 1001 or NCS 1004

Use this procedure to install Cisco Optical Site Manager on NCS 1001 or NCS 1004 platforms using IOS XR optional RPM packages.

Cisco Optical Site Manager is an optional software component that can be installed on NCS 1001 or NCS 1004 platforms. If Cisco IOS XR is already running on your device, you can manually install Cisco Optical Site Manager using the supplied *.rpm* packages.

For release 25.4.1, NCS 1001 and NCS 1004 host devices do not support storing multiple software packages of the same release; downloading a new package of the same build replaces the existing one.

This table outlines the supported software package count and device management capacity based on the platform hosting Cisco Optical Site Manager.

Table 2: Supported software packages and device management capacities for NCS 1001 and NCS 1004

Cisco Optical Site Manager hosting platform	Supported software package in repository	Device management capacity
NCS 1001	One	Can manage up to two NCS 1001 devices–including the host device. Only NCS 1001 devices are supported for management.

Cisco Optical Site Manager hosting platform	Supported software package in repository	Device management capacity
NCS 1004	• Before R26.1.1: One • From R26.1.1: Two	Can manage up to • three NCS 1004 devices and • three NCS 1001 devices. **Note** The software upgrade on the NCS1004 or NCS 1001 from Cisco Optical Site Manager does not succeed when using a mini ISO file.

Note

NCS 1001 does not support the iXPE boot of a golden ISO with Cisco Optical Site Manager.

Before you begin

Download the *NCS1001 and NCS1004 IOS XR Software optional-rpms* optional package from Software Download page.

Follow these steps to install Cisco Optical Site Manager on NCS 1001 or NCS 1004:

Procedure

1. Copy the downloaded *.rpm* files to the device storage.
2. Install the Cisco Optical Site Manager package source file in synchronous mode using the **install add source** *<folder> <pkg name>* **synchronous** command.

   Example

   ```
   RP/0/RP0/CPU0:ios#install add source /harddisk:/cosm
   ncs1001-cosm-1.0.0.0-r253107I.x86_64.rpm synchronous
   Install add operation 2.1.1 has started
   ```

3. Identify the inactive Cisco Optical Site Manager package name using the **show install inactive** command.

   Example

   The bold line in this example shows the inactive package name. You will use this package name to activate the package in the next step.

   ```
   RP/0/RP0/CPU0:ios#show install inactive
   Fri Apr 11 08:10:57.969 UTC
   1 inactive package(s) found:
       ncs1001-cosm-1.0.0.0-r253107I
   ```

4. Activate the package using the **install activate** *<package name>* **synchronous** command.

   Example

   ```
   RP/0/RP0/CPU0:ios#install activate ncs1001-cosm-1.0.0.0-r253107I synchronous
   ```

   Use the *<package name>* from the output of the **show install inactive** command.

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

   Example

   ```
   RP/0/RP0/CPU0:ios#install commit
   ```

Cisco Optical Site Manager is installed on the device.

This example shows the commands to install Cisco Optical Site Manager on NCS 1001 or NCS 1004:

```
RP/0/RP0/CPU0:ios#install add source /harddisk:/cosm
ncs1001-cosm-1.0.0.0-r253107I.x86_64.rpm synchronous
Install add operation 2.1.1 has started
RP/0/RP0/CPU0:ios#show install inactive
Fri Apr 11 08:10:57.969 UTC
1 inactive package(s) found:
    ncs1001-cosm-1.0.0.0-r253107I
RP/0/RP0/CPU0:ios#install activate ncs1001-cosm-1.0.0.0-r253107I synchronous
RP/0/RP0/CPU0:ios#install commit
```

What to do next

Configure Cisco Optical Site Manager in Standalone mode.

Install a Cisco Optical Site Manager SMU

Learn how to install a Software Maintenance Upgrade (SMU) to update your Cisco Optical Site Manager with bug fixes and enhancements.

A Software Maintenance Upgrade (SMU) is a package that can be installed on a system to deliver patch fixes or security updates to a released image. A Cisco Optical Site Manager SMU is an updated Cisco Optical Site Manager image bundled as an XR SMU, providing the latest enhancements or fixes for Cisco Optical Site Manager \within the XR environment.

Install a SMU to update your Cisco Optical Site Manager with bug fixes and enhancements. Transfer the installation file, install the SMU, and verify that the new image is active.

In high availability (HA) deployments, install the SMU on the standby node first. Then, install it on the active node.

> **Warning**
>
> Installing a SMU triggers the host device's controller to reload.

Before you begin

Download the SMU from the Cisco Software Download page.

Follow these steps to install a Cisco Optical Site Manager SMU:

Procedure

1. Use the **scp** command to copy the file to the standby node and confirm the md5sum value.

   Example

   ```
   [root@NCS1k-ZTP smu]# scp
   /harddisk/cosm/smu/ncs1010-x86_64-25.1.1-CSCwr67302.tgz
   cixxx@10.xx.xx.xx:/harddisk:/

   [node0_RP0_CPU0:/harddisk:]$md5sum ncs1010-x86_64-25.1.1-CSCwr67302.tgz
   c28dcced4e562e329e36baf1d7621ca0  ncs1010-x86_64-25.1.1-CSCwr67302.tgz
   ```

2. Use the **install source** command to install the SMU.

   Example

   ```
   RP/0/RP0/CPU0:COSM_OLT-3_214# install source
   /harddisk:/ncs1010-x86_64-25.1.1-CSCwr67302.tgz
   ```

   Wait for the installation to complete.

3. Use the **show install request** command to verify the status of installation was successful.

   Example

   ```
   RP/0/RP0/CPU0:COSM_OLT-3_214#show install request
   Mon Oct 27 11:12:05 UTC

   User request: install source /harddisk:/ncs1010-x86_64-25.1.1-CSCwr67302.tgz
   Operation ID: 33.1
   State:        Success since 2025-10-27 11:09:59 UTC
   Current activity:    Await user input
   Time started:        2025-10-27 11:09:59 UTC
   The following actions are available:
       install package add
       install package remove
       install package upgrade
       install package downgrade
       install package replace
       install package rollback
       install replace
       install rollback
       install source
       install commit
       install replace reimage
   ```

4. Use the **install commit** command to commit the SMU.

   Example

   ```
   RP/0/RP0/CPU0:COSM_OLT-3_214#install commit
   ```

5. Use the **show install fixes committed** command to verify that the SMU image is committed.

Example
The bold text displays the committed SMU *CSCwr67302 xr-cosm-25.1.1v1.0.1-1*.

```
RP/0/RP0/CPU0:ios#show install fixes committed
Mon Dec  8 05:16:35.319 UTC

Committed Fixes (count: 2):
Bug Id      Packages
----------- ------------------------------------------------------------
CSCwr31650  xr-ncs1010-forwarder-25.1.1v1.0.1-1
CSCwr67302  xr-cosm-25.1.1v1.0.1-1
```

6. Use the **show install fixes active** command to verify that the SMU image is active.

Example
The text in bold in this example displays the active SMU version *CSCwr67302 xr-cosm-25.1.1v1.0.1-1*.

```
RP/0/RP0/CPU0:ios#show install fixes active
Tue Dec  9 06:51:23.276 UTC

Active Fixes (count: 2):
Bug Id      Packages
----------- ------------------------------------------------------------
CSCwr31650  xr-ncs1010-forwarder-25.1.1v1.0.1-1
CSCwr67302  xr-cosm-25.1.1v1.0.2-1
RP/0/RP0/CPU0:ios#show cosm status
Tue Dec  9 06:51:31.549 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 13 hours
Last error: No error
COSM version: 25.1.1.D0372
```

7. Use the **show cosm status** command to verify that the Cisco Optical Site Manager SMU version is activated.

Example
The text in bold in this example displays the active Cisco Optical Site Manager version *25.1.1.R0366*.

```
RP/0/RP0/CPU0:HAN-1#show cosm status
Thu Oct 30 10:21:25.374 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 2 days
Last error: No error
COSM version: 25.1.1.R0366
Redundancy role: ACTIVE (NONE)
```

The status of the standby node appears as **NONE** in the output of the **show cosm status** command.

8. Perform the same installation process on the active node.
After the installation is completed and the controller is reloaded, these redundancy status changes occur:
   - On the active node, during the SMU installation, the redundancy status transitions through **UNKNOWN** → **STARTING** → **NONE** → **STANDBY** (connected active 1.1.1.1-COSM) after the active node reloads.

- The redundancy status of the standby node changes to **NONE** during the SMU installation on the active node and updates to **ACTIVE (standby not connected)** after the active node completes its reload.

The Cisco Optical Site Manager SMU is installed.

This table explains the redundancy status changes in the output of the `show cosm status` command on both nodes during the SMU installation.

Table 3: Cisco Optical Site Manager redundancy status transitions during SMU installation

Node	Node Operation	Redundancy Status	Details
Standby Node	Install SMU, the reloads	Status varies (install / reload in progress)	The standby node temporarily disconnects during SMU installation.
Active Node	No action / monitoring	**ACTIVE (standby not connected)**	The active node displays **standby not connected** while the SMU installs on the standby node.
Active Node	Install SMU, then reloads	Transitions: **UNKNOWN** → **STARTING** → **NONE** → **STANDBY (connected active 1.1.1.1-COSM)**	The active node undergoes state transitions while coming back online.
Standby Node (becomes new Active)	Monitors while old active reloads	**NONE** → **ACTIVE (standby not connected)** → **ACTIVE (connected active 2.2.2.2-COSM)**	• The standby node initially shows a redundancy status of **NONE** during the SMU installation on the active node. • Once the active node completes its reload, the standby node transitions to **ACTIVE (connected active 2.2.2.2-COSM)** and remains active thereafter.

Cisco Optical Site Manager software upgrade matrix

This topic describes supported upgrade paths for Cisco Optical Site Manager, including supported source and destination release combinations for NCS 1000 host platforms.

For Cisco Optical Site Manager deployments on NCS 1000 host platforms, these source and target software release combinations are supported for upgrades.

Table 4: Cisco Optical Site Manager software upgrade matrix

Host platform	Source release	Destination release
NCS1010	25.1.1	26.1.1
NCS1014	24.3.1	26.1.1
	25.1.1	
	25.2.1	

Important

For upgrades from a Cisco IOS XR release earlier than Release 25.3.1 to Release 25.3.1 or later, include the required bridge SMU in the Golden ISO (GISO). This is a mandatory prerequisite for Cisco Optical Site Manager upgrades on Cisco NCS 1010 and Cisco NCS 1014 host platforms. For information about installing SMUs by using a GISO and verifying the Cisco IOS XR install state, see the Cisco IOS XR SMU installation procedures in the Cisco Optical Automation Solution Workflow guide.

If activation is started from Cisco Optical Site Manager or Cisco Optical Network Controller with a GISO that does not include the required bridge SMU, Cisco IOS XR receives the activation request and fails the activation during compatibility validation. In this scenario, Cisco Optical Site Manager might continue to show the activation status as **Activating** instead of **Failed**.

If Cisco Optical Site Manager shows **Activating** for an unusually long time, log in to the Cisco IOS XR CLI on the device and use the **show install request** command to check the actual install status. Correct the issue reported by Cisco IOS XR, add the required bridge SMU to the GISO, and start activation again.

3 Configure Cisco Optical Site Manager on NCS 1000

Topics:

- Configure Cisco Optical Site Manager in standalone mode for NCS 1010 or NCS 1014
- Configure Cisco Optical Site Manager in standalone mode for NCS 1001 or NCS 1004
- High availability for NCS 1000
- Deployment models for HA in Cisco Optical Site Manager

This chapter details the workflow and associated topics for configuring Cisco Optical Site Manager in both standalone and high availability modes on supported NCS 1000 platforms.

Configure Cisco Optical Site Manager in standalone mode for NCS 1010 or NCS 1014

Learn how to configure Cisco Optical Site Manager in standalone mode on NCS 1010 or NCS 1014. This procedure covers setting management interfaces, defining user credentials, enabling optional auto-onboarding, committing changes, and verifying the configuration.

Cisco Optical Site Manager can be configured in standalone mode on a single NCS 1010 or NCS 1014 device.

The configuration involves setting up Cisco Optical Site Manager interfaces, defining management interface parameters, and establishing user credentials for access.

Before you begin

Verify that these configurations are enabled before configuring Cisco Optical Site Manager in standalone mode on NCS 1010 or NCS 1014:

- Enable NETCONF over SSH for secure host device communication on page 12
- Keep these configuration parameters at their default values unless there is a specific need to change them.

Follow these steps to configure Cisco Optical Site Manager in standalone mode:

Procedure

1. Enter into the IOS XR and COSM configuration mode using the **configure terminal** and **cosm** commands.

   Example

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

2. Configure the interface of the device running the Cisco Optical Site Manager by using **mgmt-interface-name MgmtEth** *R/S/I/P* command.

   Example

   ```
   RP/0/RP0/CPU0:ios(config-cosm)# mgmt-interface-name Loopback1
   ```

   This is the interface used to reach Cisco Optical Site Manager. This interface can be a physical interface or a loopback interface. For a standalone Cisco Optical Site Manager deployment, use the same interface for device onboarding.

3. Configure the username using the **user-name** *user name* command.

   Example

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

   Note

   The username must match the username of the host device.

4. Configure the password using the **user-password** *password* command.

Example

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

Note

The Cisco Optical Site Manager username and password can be the same as, or different from, the XR host device credentials. These credentials are saved in the Cisco Optical Site Manager application database and are not displayed in the XR show running-config output.

5. Commit the changes and exit the configuration modes using the **commit** and **end** commands.

Example

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

6. Verify the configuration using the **show running-config cosm** command.

Example
This example shows the standalone Cisco Optical Site Manager configuration.

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

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

Cisco Optical Site Manager is configured in the standalone mode.

What to do next

Enable or disable Cisco Optical Site Manager north-bound interfaces

Configure Cisco Optical Site Manager in standalone mode for NCS 1001 or NCS 1004

Learn how to configure Cisco Optical Site Manager in standalone mode on an NCS 1001 or NCS 1004 controller card. Use this procedure to set management interfaces, routing, and NETCONF over SSH parameters, and verify operational status.

Cisco Optical Site Manager can be configured in standalone mode on a single NCS 1001 or NCS 1004 controller card.

The configuration involves setting up Cisco Optical Site Manager interfaces and defining management interface parameters.

Before you begin

Verify that these NETCONF over SSH is enabled. For more details, see Enable NETCONF over SSH for secure host device communication on page 12.

Follow these steps to configure Cisco Optical Site Manager in standalone mode on a single NCS 1001 or NCS 1004 controller card:

Procedure

1. Enter global configuration mode.

   Example

   ```
   RP/0/RP0/CPU0:1001-otdr-187#configure terminal
   ```

2. Configure Linux networking, VRF, and interface parameters for the management interface and a loopback interface.

   Example

   ```
   RP/0/RP0/CPU0:1001-otdr-187(config)#linux networking
   RP/0/RP0/CPU0:1001-otdr-187(config-lnx-net)# vrf default
   RP/0/RP0/CPU0:1001-otdr-187(config-lnx-vrf)# east-west Loopback2
   RP/0/RP0/CPU0:1001-otdr-187(config-lnx-vrf)#address-family ipv4
   RP/0/RP0/CPU0:1001-otdr-187(config-lnx-vrf)# source-hint default-route
   interface mgmtEth 0/RP0/CPU0/0
   RP/0/RP0/CPU0:1001-otdr-187(config)#interface Loopback2
   RP/0/RP0/CPU0:1001-otdr-187(config-if)# ipv4 address 2.2.2.2 255.255.255.255
   RP/0/RP0/CPU0:1001-otdr-187(config-if)#interface MgmtEth0/RP0/CPU0/0
   RP/0/RP0/CPU0:1001-otdr-187(config-if)# ipv4 address 10.0.0.123 255.255.255.0
   ```

3. Configure a static default route for IPv4 unicast traffic.

   Example

   ```
   RP/0/RP0/CPU0:1001-otdr-187(config)#router static
   RP/0/RP0/CPU0:1001-otdr-187(config-static)# address-family ipv4 unicast
   RP/0/RP0/CPU0:1001-otdr-187(config-static-afi)#  0.0.0.0/0 10.0.0.1
   ```

4. Configure the management interface for Cisco Optical Site Manager by using the **mgmt-interface-name MgmtEth** *R/S/I/P* command.

   Example

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

5. Commit the changes and exit the configuration modes using the **commit** and **end** commands.

   Example

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

6. Verify the Cisco Optical Site Manager status using the **show cosm status** command.

   Example

   ```
   P/0/RP0/CPU0:ios#show cosm status
   Fri Nov 14 10:26:44.215 UTC
   ```

```
COSM state: CLIENT_REGISTERED
AppMgr app state: UNKNOWN
AppMgr container state: UNKNOWN
Container status: Not present
Last error: 'Appmgr' detected the 'warning' condition 'Application not found'
Role: UNKNOWN
```

You can also use the **show running-config cosm** command to verify the configured parameters, though user credentials are not displayed.

Cisco Optical Site Manager is configured in the standalone mode.

What to do next

- (Optional) Enable or disable Cisco Optical Site Manager north-bound interfaces on page 55.
- Activate Cisco Optical Site Manager on page 56

High availability for NCS 1000

This topic describes Cisco Optical Site Manager high availability (HA), including its architecture, roles, interfaces, and configuration on NCS 1000 devices. Use this topic to understand how Cisco Optical Site Manager maintains management continuity by using active and standby roles, shared management interfaces, and redundancy interfaces that support failover during device or link failures.

Cisco Optical Site Manager High Availability (HA) provides continuous management and operational resilience for Cisco optical devices. By deploying two instances, one as Active and the other as Standby, HA ensures that device management remains uninterrupted even if one instance fails.

How does Cisco Optical Site Manager high availability ensure operational continuity?

Cisco Optical Site Manager High Availability (HA) provides a robust solution for managing device operations by utilizing dual application instances and specialized network interfaces.

The main features of Cisco Optical Site Manager high availability include:

- Two devices must be able to communicate with each other, allowing their respective Cisco Optical Site Manager instances to coordinate application roles (active or standby) and manage operations.
- Each device requires a Cisco Optical Site Manager management interface configured with the same IP address, starting in a shutdown state. This interface automatically transitions between UP and DOWN states based on whether the device is active or standby.
- A dedicated Cisco Optical Site Manager redundancy interface is used to establish the high availability communication channel and typically serves as the device's management interface.
- When in the active role, Cisco Optical Site Manager binds the HA server to the redundancy interface's IP address on port 5454.
- When in the Standby role, Cisco Optical Site Manager connects to the peer's redundancy interface IP address on port 5454 to communicate with the active instance.

HA roles and interfaces

- **Active role**: manages all device operations and binds the HA server to its redundancy interface and port.

- **Standby role**: monitors the active instance and connects to the peer's redundancy IP and port. It is ready to take over if needed.
- **Redundancy interface**: network interface used solely for HA communication between Cisco Optical Site Manager instances.
- **Management interface**: interface with the same IP address on both devices, managed automatically depending on the instance role.

> **Note**
>
> High availability is not supported on NCS 1004 and NCS 1001.

Configure Cisco Optical Site Manager in high availability on NCS 1000

Learn how to configure Cisco Optical Site Manager high availability on NCS 1000 by setting gateway, peer, and redundancy interface parameters in IOS XR. Use this procedure to apply settings on both hosts and verify HA status.

Configure High Availability (HA) on Cisco Optical Site Manager is to enable fast recovery from faults in the optical transport network and to maintain service continuity by switching to standby components when active ones fail.

Cisco Optical Site Manager HA configuration requires these interfaces configured.

- `cosm mgmt-interface-name`: This interface must be configured with same IP address on both Cisco Optical Site Manager active and standby devices. This interface must be configured in a shutdown state and will automatically transition between UP and DOWN states based on the role (Active or Stand-By) assigned by the application.
- `cosm redundancy interface-name`: This interface must be configured with the redundancy interface and is used to establish the high availability communication channel and is typically the interface used for device management.
- `redundancy gateway-ip`: Specifies the gateway IP address (for example, *10.0.2.1*) used by Cisco Optical Site Manager to reach peer devices or for routing HA traffic in environments where a direct path to the peer is not available.

Before you begin

Verify that Cisco Optical Site Manager rpm is installed. For more details, see Install Cisco Optical Site Manager on NCS 1010 or NCS 1014 on page 15.

Follow these steps to configure Cisco Optical Site Manager in HA mode on a NCS 1010 or NCS 1014 device:

Procedure

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
   ```

2. Configure the gateway IP address.

Example

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

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.x.x and 25.x.x, verify that the *redundancy interface-name* IP address and the *redundancy peer-ip* address are not substrings of each other. For example, configuring 10.0.1.1 as the *redundancy interface-name* and 10.0.1.10 or 10.0.1.101 as the *redundancy peer-ip* (or vice-versa) causes Cisco Optical Site Manager HA to fail during startup.

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
   ```

5. Configure the username using the **user-name** *user name* command.

   Example

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

   Note

   The username must match the username of the host device.

6. Configure the password using the **user-password** *password* command.

   Example

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

   Note

   The Cisco Optical Site Manager username and password can be the same as, or different from, the XR host device credentials. These credentials are saved in the Cisco Optical Site Manager application database and are not displayed in the XR show running-config output.

7. 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
```

8. Perform the steps 1 to 6 on the second Cisco Optical Site Manager host device.
9. Verify the HA configuration on both host devices.

Example

```
RP/0/RP0/CPU0:ios#show cosm status
Fri Nov 14 10:26:44.215 UTC
COSM state: CLIENT_REGISTERED
AppMgr app state: UNKNOWN
AppMgr container state: UNKNOWN
Container status: Not present
Last error: 'Appmgr' detected the 'warning' condition 'Application not found'
Role: UNKNOWN
```

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.

This example explains how to configure Cisco Optical Site Manager HA on a NCS 1010 or NCS 1014 device.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RSP0/CPU0:ios(config)# cosm
RP/0/RP0/CPU0:ios(config-cosm)# redundancy gateway-ip 10.0.2.1
RP/0/RP0/CPU0:ios(config-cosm)# redundancy peer-ip 10.0.1.12
RP/0/RP0/CPU0:ios(config-cosm)# redundancy interface-name MgmtEth 0/RP0/CPU0/2

RP/0/RP0/CPU0:ios(config-cosm)# user-name cisco
RP/0/RP0/CPU0:ios(config-cosm)# user-password ***
RP/0/RP0/CPU0:ios(config-cosm)# commit
RP/0/RP0/CPU0:ios(config-cosm)# end
RP/0/RP0/CPU0:ios#show cosm status
Fri Nov 14 10:26:44.215 UTC
COSM state: CLIENT_REGISTERED
AppMgr app state: UNKNOWN
AppMgr container state: UNKNOWN
Container status: Not present
Last error: 'Appmgr' detected the 'warning' condition 'Application not found'
Role: UNKNOWN
```

What to do next

Enable or disable Cisco Optical Site Manager north-bound interfaces

HA commands for Cisco Optical Site Manager

This topic explains the HA command set used to configure Cisco Optical Site Manager on NCS 1000 devices. It summarizes each command's purpose so you can apply configuration steps accurately and understand management and redundancy parameter usage.

These commands are used to configure HA in Cisco Optical Site Manager on a NCS 1000 device.

Command	Description
configure	Enters global configuration mode.
cosm user-name <username>	Configures Cisco Optical Site Manager application username.
cosm user-password <password>	Configures Cisco Optical Site Manager application password.
cosm mgmt-interface-name <type> <number>	Configures the Cisco Optical Site Manager management interface. All Cisco Optical Site Manager NBI services (web UI, NETCONF, RESTCONF) are available on this interface.
cosm redundancy interface-name <type> <number>	Configures Cisco Optical Site Manager high availability interface. The interface is used to communicate with the peer device.
cosm redundancy peer-ip <IP-address>	Configures the IP address of the peer device, where other Cisco Optical Site Manager is running.
cosm redundancy gateway-ip <IP-address>	Configures the IP address of a target device that is always reachable by both devices hosting Cisco Optical Site Manager in high availability. Configuring the same gateway IP on both devices is strongly recommended. Cisco Optical Site Manager uses this target device to perform checks in certain high availability scenarios. The target device must be different from the **cosm redundancy peer-ip**. The target device may be the subnet gateway, the multilayer switch connecting the two devices, or another suitable device.
commit	Commits the changes.
end	Exits the global configuration mode.

Deployment models for HA in Cisco Optical Site Manager

This topic explains the supported Cisco Optical Site Manager HA deployment models and the differences in connectivity, interface design, and failure behavior. It helps you compare options and select a model that matches site topology and operational requirements.

Cisco Optical Site Manager supports several deployment models for implementing high availability (HA), each with distinct configuration requirements, advantages, and dependencies on the Data Communication Network (DCN) architecture and local site availability. Each model:

- analyzes possible deployment scenarios, detailing device connections and configurations,

- covers routing protocols in use and information on any additional devices involved.

Cisco Optical Site Manager supports these deployment models:

- **Dual-homing deployment with devices connected to DCN:** This model involves connecting devices to the DCN using a dual-homing setup.
- **Single-homing deployment with devices connected to DCN:** This model utilizes a single-home connection for devices to the DCN.
- **Deployment with devices interconnected and managed remotely:** In this model, devices are interconnected and managed remotely through the Optical Service Channel (OSC).
- **Deployment with devices interconnected with redundancy and managed remotely:** This model extends the previous one by incorporating redundancy for devices interconnected and remotely managed via OSC.

Dual-homing deployment with devices connected to DCN

This topic explains the dual-homing deployment model where devices connect through redundant interfaces, cables, and switches to the DCN. It outlines routing and interface requirements that preserve peer reachability and improve resilience during single-path failures.

This deployment model ensures that Cisco Optical Site Manager can always communicate with its peer, routing traffic through an alternative interface, cable, or switch if one fails.

Requirements for the dual-homing deployment

This HA deployment model requires following conditions:

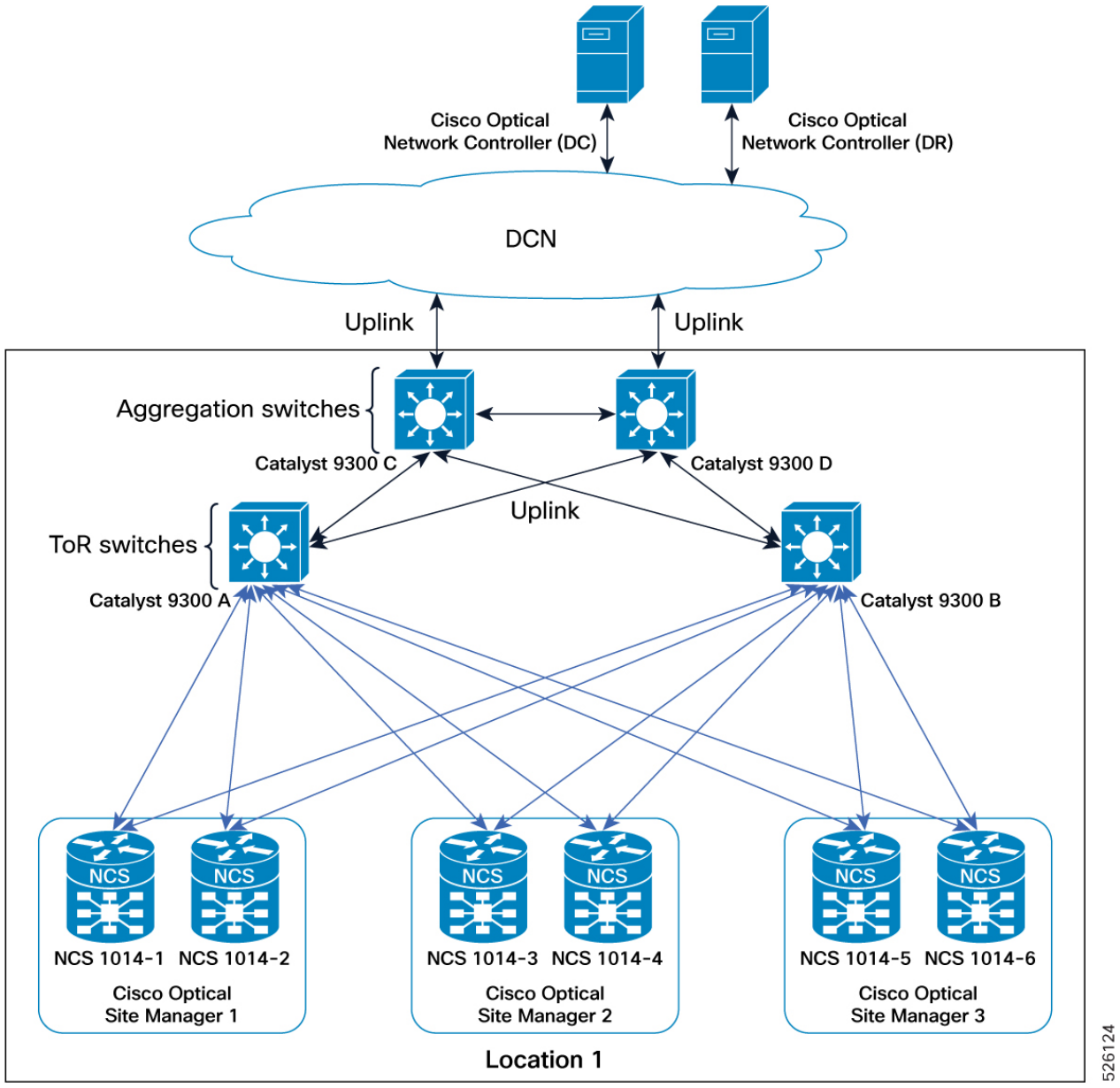
- Both Cisco Optical Site Manager redundancy and management interfaces must be configured as Loopback interfaces.
- The IP addresses assigned to the MgmtEth interfaces of the devices are typically part of a private subnet, isolated under the Top-of-Rack (ToR) switches.
- Loopback IP addresses are distributed within the Data Communication Network (DCN) and must be reachable from Cisco Optical Network Controller.
- Loopback 0 interfaces are designated as Cisco Optical Site Manager management interfaces.
- Loopback 1 interfaces serve as Cisco Optical Site Manager redundancy interfaces, also providing direct access to the devices.

Implementing this deployment model requires specific network configurations and routing considerations:

- ToR switches must advertise the default route to downstream devices. This can be achieved by configuring a static route on the devices or by using `default-information originate` with OSPF on the switches.
- The two devices hosting Cisco Optical Site Manager in high availability must have a static route or routing protocol configuration to reach the peer's Cisco Optical Site Manager redundancy interface (for example, Loopback 1 interface) using the VRRP IP as the next hop.
- ToR switches should implement VRRP and channel aggregation on multiple ports towards the peer switch for enhanced redundancy.

This figure explains the connections diagram of two-degrees node deployment model with devices connected to DCN in dual-homing.

Figure 1: Conceptual Explanation of High Availability Deployment for Devices Connected to DCN in a Dual-Homing Model



IP addressing schema for devices connected to DCN in dual-homing

This table details the IP addressing for the devices connected to DCN in dual-homing deployment model, with MgmtEth interfaces of the devices using the 192.168.1.0/24 subnet and loopback interfaces distributed within the DCN as part of the 10.1.1.0/27 subnet.

Table 5: IP addressing schema for dual-homing deployment

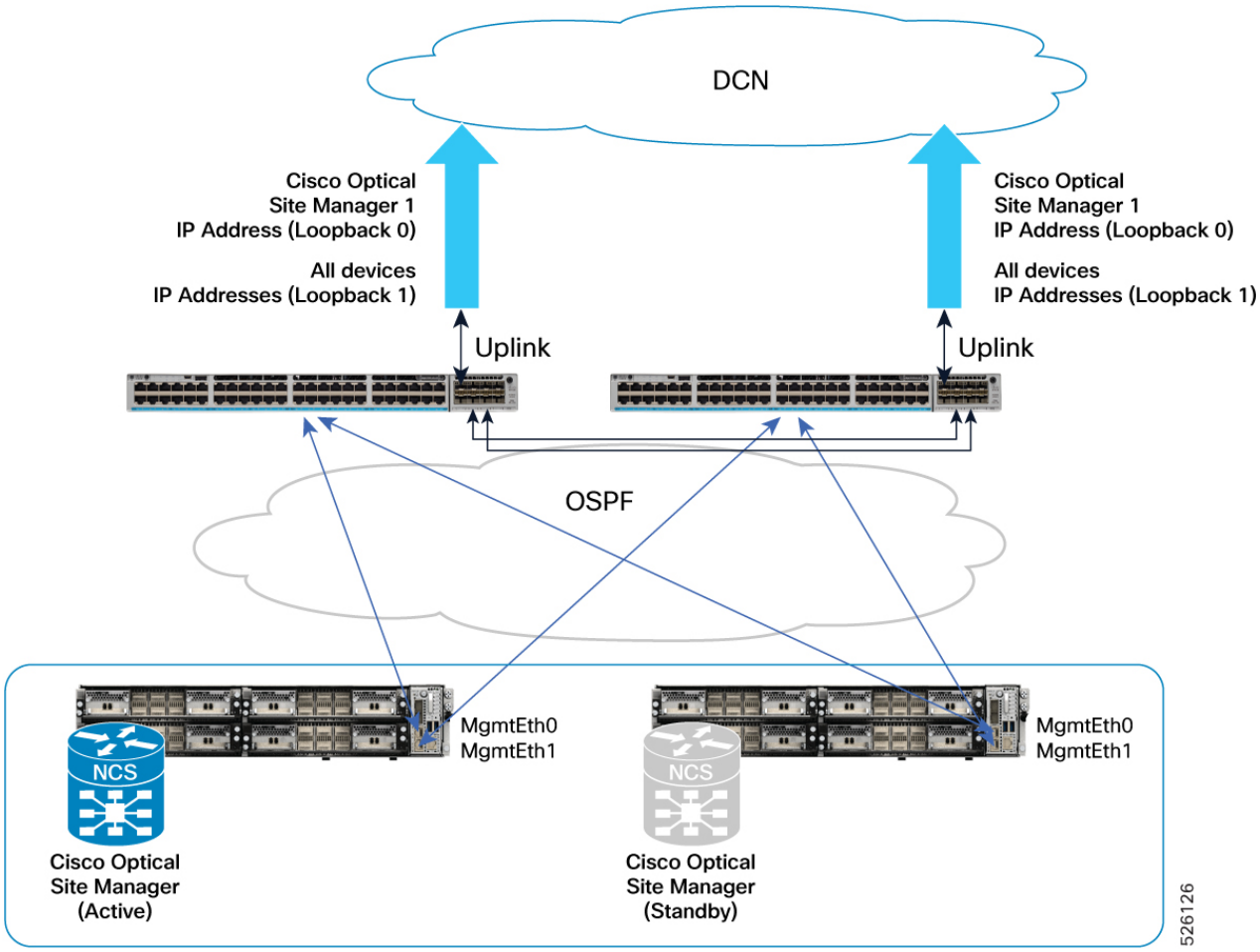
Cisco Optical Site Manager instance	NCS device	NCS device interface	NCS device IP/Mask	Connected to switch	Connected to switch interface
Cisco Optical Site Manager 1	NCS 1000-1	MgmtEth0/RP0/CPU0/0	192.168.1.11/24	Catalyst 9300 (A)	Gil/0/1
		MgmtEth0/RP0/CPU0/1	192.168.1.12/24	Catalyst 9300 (B)	Gil/0/1
		Loopback 0	10.1.1.1/32	-	-
		Loopback 1	10.1.1.11/32	-	-
	NCS 1000-2	MgmtEth0/RP0/CPU0/0	192.168.1.13/24	Catalyst 9300 (A)	Gil/0/2
		MgmtEth0/RP0/CPU0/1	192.168.1.14/24	Catalyst 9300 (B)	Gil/0/2
		Loopback 0	10.1.1.1/32	-	-
		Loopback 1	10.1.1.12/32	-	-
Cisco Optical Site Manager 2	NCS 1000-3	MgmtEth0/RP0/CPU0/0	192.168.1.15/24	Catalyst 9300 (A)	Gil/0/3
		MgmtEth0/RP0/CPU0/1	192.168.1.16/24	Catalyst 9300 (B)	Gil/0/3
		Loopback 0	10.1.1.2/32	-	-
		Loopback 1	10.1.1.13/32	-	-
	NCS 1000-4	MgmtEth0/RP0/CPU0/0	192.168.1.17/24	Catalyst 9300 (A)	Gil/0/4
		MgmtEth0/RP0/CPU0/1	192.168.1.18/24	Catalyst 9300 (B)	Gil/0/4
		Loopback 0	10.1.1.2/32	-	-
		Loopback 1	10.1.1.14/32	-	-

Cisco Optical Site Manager instance	NCS device	NCS device interface	NCS device IP/Mask	Connected to switch	Connected to switch interface
Cisco Optical Site Manager 3	NCS 1000-5	MgmtEth0/RP0/CPU0/0	192.168.1.19/24	Catalyst 9300 (A)	Gil/0/5
		MgmtEth0/RP0/CPU0/1	192.168.1.20/24	Catalyst 9300 (B)	Gil/0/5
		Loopback 0	10.1.1.3/32	-	-
		Loopback 1	10.1.1.15/32	-	-
	NCS 1000-6	MgmtEth0/RP0/CPU0/0	192.168.1.21/24	Catalyst 9300 (A)	Gil/0/6
		MgmtEth0/RP0/CPU0/1	192.168.1.22/24	Catalyst 9300 (B)	Gil/0/6
		Loopback 0	10.1.1.3/32	-	-
		Loopback 1	10.1.1.16/32	-	-

Practical example of devices connected to DCN in dual-homing

This figure provides a practical example of this deployment model, implemented with two Catalyst 9300 switches and two NCS1014 devices.

Figure 2: Deployment model featuring Catalyst 9300 Switches and Active/Standby NCS1014 devices



Cisco Optical Site Manager 1

This example details the configurations for a Dual-Homing HA deployment model of NCS1014 devices connected to a DCN via Catalyst 9300 switches.

Catalyst 9300-A configuration

```
hostname CAT9300-A

fhrp version vrrp v3
ip routing

interface Vlan1
 ip address 192.168.1.253 255.255.255.0
 ip ospf 1 area 0
 vrrp 1 address-family ipv4
  address 192.168.1.1 primary
  exit-vrrp

interface TenGigabitEthernet1/1/1
 no switchport
 ip address <Uplink IP> <Uplink mask>

interface TenGigabitEthernet1/1/2
 channel-group 1 mode active

interface TenGigabitEthernet1/1/3
 channel-group 1 mode active
```

```
router ospf 1
 router-id 192.168.1.253
 default-information originate

ip route 0.0.0.0 0.0.0.0 <Uplink gateway IP>
```

Catalyst 9300-B configuration

```
hostname CAT9300-B

fhrp version vrrp v3
ip routing

interface Vlan1
 ip address 192.168.1.254 255.255.255.0
 ip ospf 1 area 0
 vrrp 1 address-family ipv4
  address 192.168.1.1 primary
  exit-vrrp

interface TenGigabitEthernet1/1/1
 no switchport
 ip address <Uplink IP> <Uplink mask>

interface TenGigabitEthernet1/1/2
 channel-group 1 mode active

interface TenGigabitEthernet1/1/3
 channel-group 1 mode active

router ospf 1
 router-id 192.168.1.254
 default-information originate

ip route 0.0.0.0 0.0.0.0 <Uplink gateway IP>
```

NCS 1014-A configuration

```
hostname COSM1-NCS1014-A

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.1 255.255.255.255
 shutdown

interface Loopback1
 ipv4 address 10.1.1.11 255.255.255.255

interface MgmtEth0/RP0/CPU0/0
 ipv4 address 192.168.1.11 255.255.255.0

interface MgmtEth0/RP0/CPU0/1
 ipv4 address 192.168.1.12 255.255.255.0

router static
 address-family ipv4 unicast
  10.1.1.12/32 192.168.1.1
```

```
router ospf 1
 router-id 10.1.1.11
 area 0
 interface Loopback0
 interface Loopback1
 interface MgmtEth0/RP0/CPU0/0
 interface MgmtEth0/RP0/CPU0/1

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 10.1.1.12
 redundancy gateway-ip 192.168.1.1
 redundancy interface-name Loopback1
 auto-onboard enable
 mgmt-interface-name Loopback0
```

NCS 1014-B configuration

```
hostname COSM1-NCS1014-B

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.1 255.255.255.255
 shutdown

interface Loopback1
 ipv4 address 10.1.1.12 255.255.255.255

interface MgmtEth0/RP0/CPU0/0
 ipv4 address 192.168.1.13 255.255.255.0

interface MgmtEth0/RP0/CPU0/1
 ipv4 address 192.168.1.14 255.255.255.0

router static
 address-family ipv4 unicast
  10.1.1.11/32 192.168.1.1

router ospf 1
 router-id 10.1.1.12
 area 0
 interface Loopback0
 interface Loopback1
 interface MgmtEth0/RP0/CPU0/0
 interface MgmtEth0/RP0/CPU0/1

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 10.1.1.11
 redundancy gateway-ip 192.168.1.1
 redundancy interface-name Loopback1
 auto-onboard enable
 mgmt-interface-name Loopback0
```

Single-homing deployment with devices connected to DCN

This topic explains the single-homing deployment model that uses one ToR switch and one management Ethernet path for device connectivity. It describes required interface behavior, routing assumptions, and expected availability outcomes for this simplified HA design.

This deployment model for utilizes a single Top-of-Rack (ToR) switch and a single Management Ethernet interface for device connectivity.

Requirements for the single-homing deployment

This HA deployment model requires following conditions:

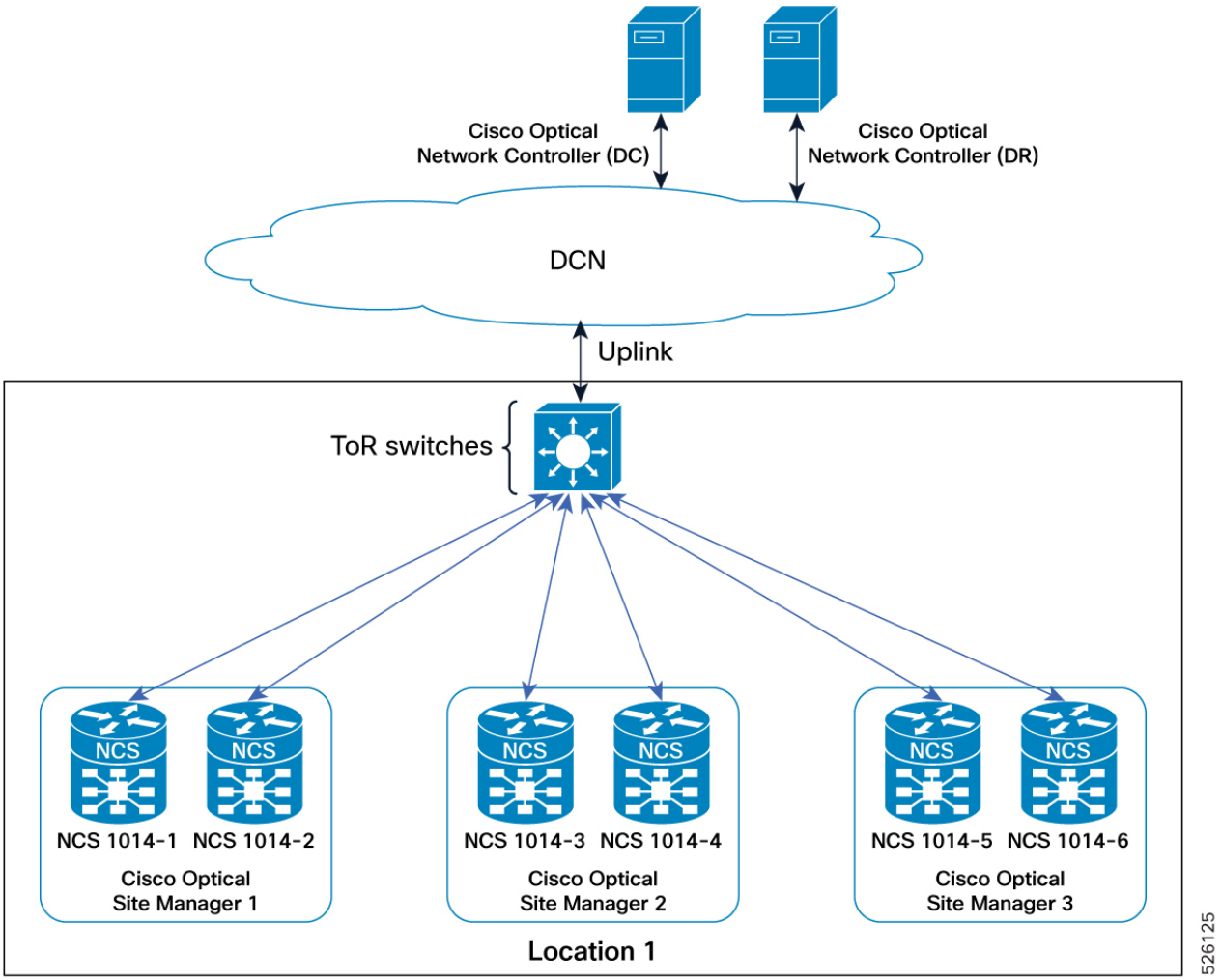
- Devices connect to the network over a single MgmtEth interface with a single cable to a single ToR switch.
- The Cisco Optical Site Manager redundancy interface can match the cabled interface (MgmtEth 0).
- The Cisco Optical Site Manager management interface must be configured as a Loopback interface (Loopback 0).
- IP addresses assigned to the MgmtEth interfaces can be part of a private subnet isolated under the ToR switches.
- The Loopback IP address should be distributed within the Data Communication Network (DCN) and be reachable from CONC.
- Direct access to the devices is always possible through the MgmtEth 0 IP addresses.

This deployment model offers specific operational characteristics and configuration guidelines:

- While a single failure can impact the reachability of a device, Cisco Optical Site Manager configured in high availability remains continuously reachable.
- The address plan and configurations described are specifically focused on the deployment of transponder platforms (e.g., NCS1014) to highlight differences from other deployment models.
- For optical line system platforms (e.g., NCS1010) in a mesh network, where an alternative path to reach the Cisco Optical Site Manager peer device exists via OSC, the address plan and configurations are consistent with models using Loopback interfaces for both Cisco Optical Site Manager redundancy and management interfaces (excluding MgmtEth0/RP0/CPU0/1 configuration if not cabled).

This figure explains the connections diagram of three Cisco Optical Site Manager instances configured in high availability mode on NCS 1000 device with devices connected to DCN in single-homing.

Figure 3: Conceptual explanation of HA deployment for devices connected to DCN in a single-homing model



IP addressing schema for devices connected to DCN in single-homing

This table details the IP addressing for the devices connected to DCN in single-homing deployment model, with the *MgmtEth* interface of the devices in subnet **192.168.1.0/24** and the *Loopback* interface distributed in the DCN as part of the subnet **10.1.1.0/27**.

Table 6: IP addressing schema for single-homing deployment

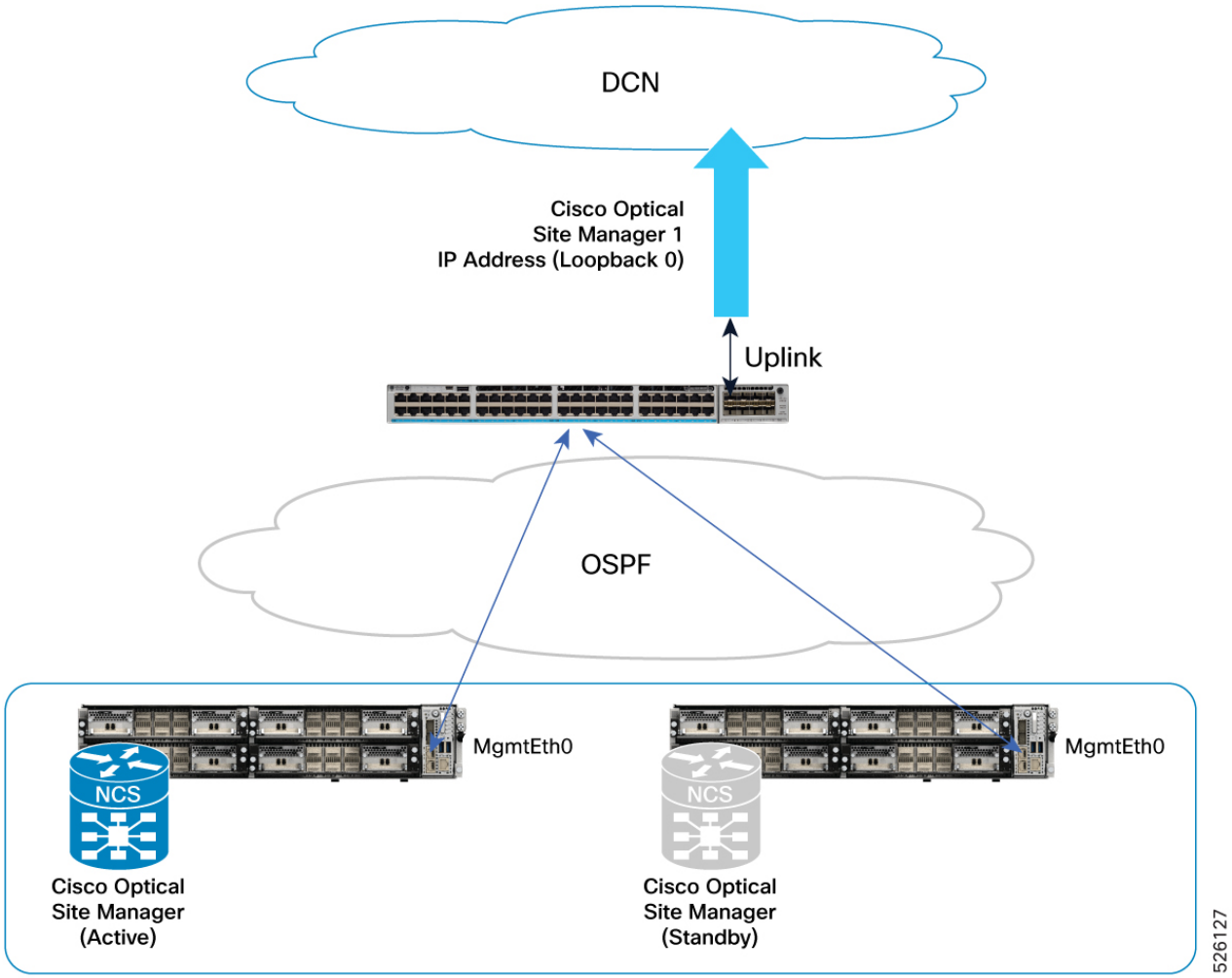
Cisco Optical Site Manager instance	NCS device	NCS device interface	NCS device IP/Mask	Connected to switch	Connected to switch interface
Cisco Optical Site Manager-1	NCS 1000-1	MgmtEth0/RP0/CPU0/0	192.168.1.11/24	Catalyst 9300	Gi1/0/1
		Loopback 0	10.1.1.1/32	-	-
	NCS 1000-2	MgmtEth0/RP0/CPU0/0	192.168.1.12/24	Catalyst 9300	Gi1/0/2
		Loopback 0	10.1.1.1/32	-	-

Cisco Optical Site Manager instance	NCS device	NCS device interface	NCS device IP/Mask	Connected to switch	Connected to switch interface
Cisco Optical Site Manager-2	NCS 1000-3	MgmtEth0/RP0/CPU0/0	192.168.1.13/24	Catalyst 9300	Gi1/0/3
		Loopback 0	10.1.1.2/32	-	-
	NCS 1000-4	MgmtEth0/RP0/CPU0/0	192.168.1.14/24	Catalyst 9300	Gi1/0/4
		Loopback 0	10.1.1.2/32	-	-
Cisco Optical Site Manager-3	NCS 1000-5	MgmtEth0/RP0/CPU0/0	192.168.1.15/24	Catalyst 9300	Gi1/0/5
		Loopback 0	10.1.1.3/32	-	-
	NCS 1000-6	MgmtEth0/RP0/CPU0/0	192.168.1.16/24	Catalyst 9300	Gi1/0/6
		Loopback 0	10.1.1.3/32	-	-

Practical example of devices connected to DCN in single-homing

This figure provides a practical example of this deployment model, implemented with one Catalyst 9300 switch and two NCS 1014 devices.

Figure 4: Deployment model featuring Catalyst 9300 switch and Active/Standby NCS 1014 devices



Cisco Optical Site Manager 1

This example details the configurations for a single-homing HA deployment model of NCS 1014 devices connected to a DCN via a Catalyst 9300 switch.

Catalyst 9300 configuration

```
hostname CAT9300

ip routing
interface Vlan1
 ip address 192.168.1.1 255.255.255.0
 ip ospf 1 area 0

interface TenGigabitEthernet1/1/1
 no switchport
 ip address <Uplink IP> <Uplink mask>

router ospf 1
 router-id 192.168.1.1
 default-information originate

ip route 0.0.0.0 0.0.0.0 <Uplink gateway IP>
```

NCS 1014-A configuration

```
hostname COSM1-NCS1014-A

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.1 255.255.255.255
 shutdown

interface MgmtEth0/RPO/CPU0/0
 ipv4 address 192.168.1.11 255.255.255.0

router ospf 1
 router-id 192.168.1.11
 area 0
  interface Loopback0
  interface MgmtEth0/RPO/CPU0/0

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 192.168.1.12
 redundancy gateway-ip 192.168.1.1
 redundancy interface-name MgmtEth0/RPO/CPU0/0
 auto-onboard enable
 mgmt-interface-name Loopback0
```

NCS 1014-B configuration

```
hostname COSM1-NCS1014-B

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.1 255.255.255.255
 shutdown

interface MgmtEth0/RPO/CPU0/0
 ipv4 address 192.168.1.12 255.255.255.0

router ospf 1
 router-id 192.168.1.12
 area 0
  interface Loopback0
  interface MgmtEth0/RPO/CPU0/0

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 192.168.1.11
 redundancy gateway-ip 192.168.1.1
 redundancy interface-name MgmtEth0/RPO/CPU0/0
 auto-onboard enable
 mgmt-interface-name Loopback0
```

Deployment with devices interconnected and managed remotely via OSC

This topic explains the deployment model for remotely managed nodes interconnected through OSC without direct DCN access. It covers required HA conditions, routing expectations, and addressing patterns that enable reachability and management continuity for remote ROADM locations.

This deployment model facilitates the management of a remote node, specifically a 2-degrees ROADM, where devices are interconnected without direct Data Communication Network (DCN) connectivity.

Requirements for devices interconnected and managed remotely via OSC

This HA deployment model requires these conditions:

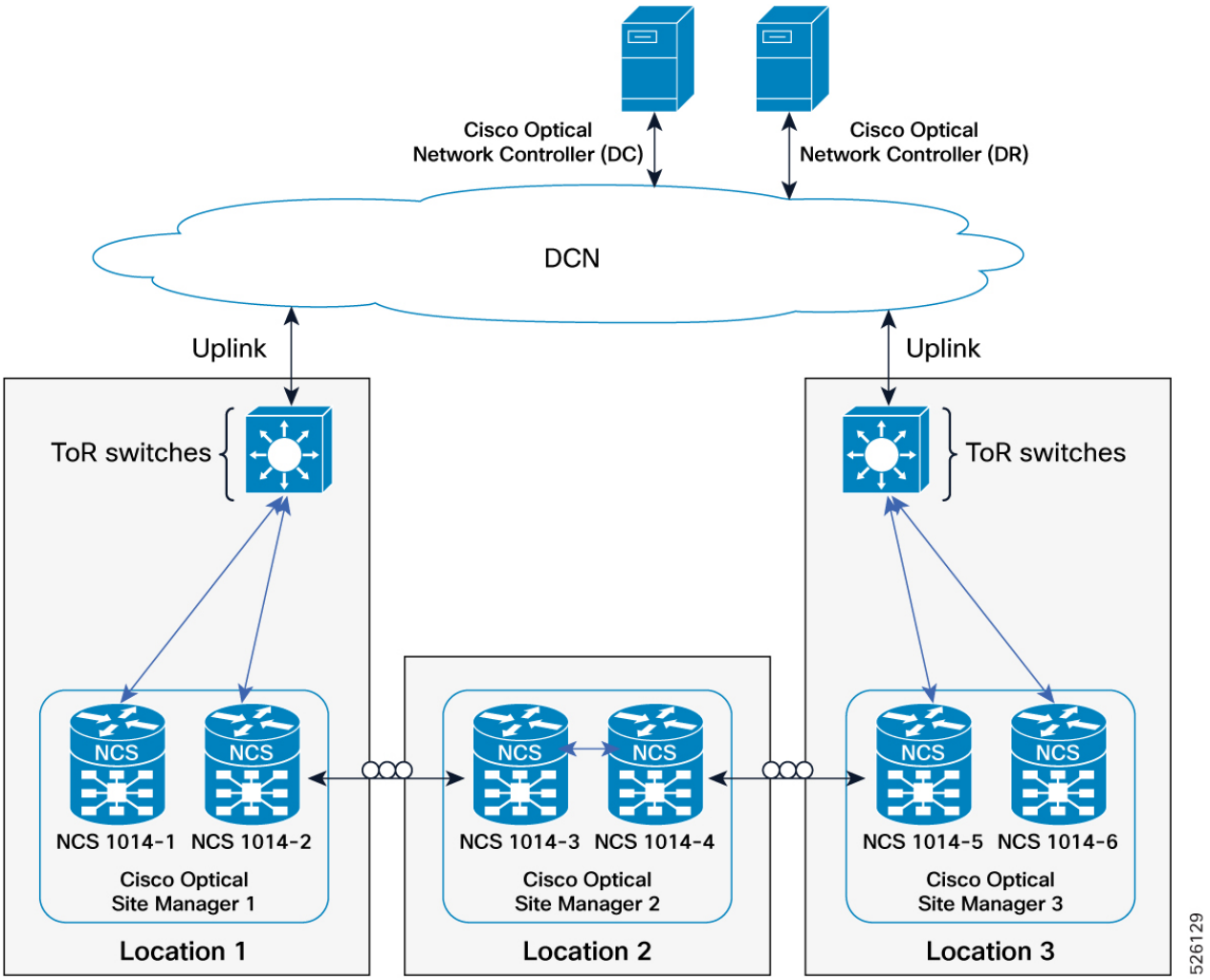
- Cisco Optical Site Manager is configured in high availability mode on the remote node.
- The remote node is reachable over the Optical Service Channel (OSC) from other nodes connected to the customer's DCN.
- Devices within the remote node (e.g., Location 2) achieve DCN reachability through multiple paths over the OSC of different degrees.
- The two devices hosting Cisco Optical Site Manager in high availability are directly interconnected through an Ethernet cable connected to their MgmtEth interfaces.

Implementing this deployment model requires specific interface configurations and routing to ensure high availability and remote manageability, independent of failures.

- Both Cisco Optical Site Manager redundancy and management interfaces must be configured as Loopback interfaces to ensure reachability independent of potential failures.
- IP addresses assigned to the MgmtEth interfaces (used for device interconnection) and GigabitEthernet interfaces must be strategically distributed within the network to support interconnection failures.
- Loopback IP addresses must be distributed within the DCN and be reachable from the Centralized Operations and Network Control (CONC) system.
- The two devices hosting Cisco Optical Site Manager in high availability in the remote location, which are directly interconnected via an Ethernet cable on their MgmtEth interfaces, require a static route or routing protocol configuration.
- This routing configuration must define how to reach the peer's Cisco Optical Site Manager redundancy interface (e.g., Loopback 1 interface) using the peer's MgmtEth interface as the next hop.

This figure shows a network diagram with three Cisco Optical Site Manager instances in three different locations, configured in HA mode on NCS 1000 family devices. The Cisco Optical Site Manager-2 device in the middle is managed as a remote device.

Figure 5: Conceptual explanation of HA deployment for devices interconnected and managed remotely via OSC



IP addressing schema for devices interconnected and managed remotely via OSC

This table details the IP addressing for devices in the managed remotely via OSC deployment model. The *MgmtEth* interfaces are in subnet **192.168.1.12/31**, and the *Loopback* interfaces are distributed in the DCN as part of subnet **10.1.1.0/27**.

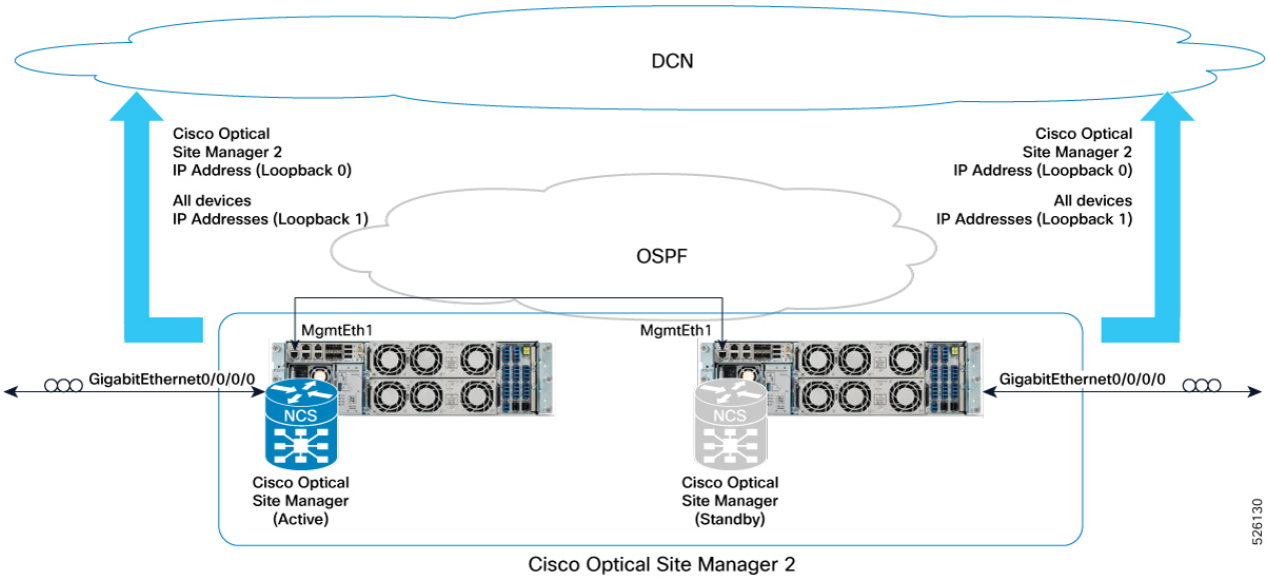
Table 7: IP addressing schema for deployment with devices interconnected and managed remotely

Cisco Optical Site Manager instance	NCS device	NCS device interface	NCS device IP/Mask	Connected to NCS device	Connected to NCS device interface
Cisco Optical Site Manager 2	NCS 1010-3	MgmtEth0/RP0/CPU0/1	192.168.1.12/31	Peer NCS 1010	MgmtEth0/RP0/CPU0/1
		GigabitEthernet0/0/0/0	172.18.0.1/31	Neighbor	GigabitEthernet0/0/0/0
		Loopback 0	10.1.1.2/32	-	-
		Loopback 1	10.1.1.13/32	-	-
	NCS 1010-4	MgmtEth0/RP0/CPU0/1	192.168.1.13/31	Peer NCS 1010	MgmtEth0/RP0/CPU0/1
		GigabitEthernet0/0/0/0	172.18.0.2/31	Neighbor	GigabitEthernet0/0/0/0
		Loopback 0	10.1.1.2/32	-	-
		Loopback 1	10.1.1.14/32	-	-

Practical example of deployment with devices interconnected managed remotely via OSC

This figure provides a practical example of this deployment model, implemented with two NCS 1010 devices.

Figure 6: Example of deployment model with two NCS 1010 and Catalyst 93000 configured as 2-degrees ROADM



This example describes the configuration of two NCS 1010 devices deployed as a 2-degree ROADM, interconnected and managed remotely through the OSC.

NCS 1010-A configuration

```
hostname COSM1-NCS1010-A

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600
```

```
interface Loopback0
 ipv4 address 10.1.1.2 255.255.255.255
 shutdown

interface Loopback1
 ipv4 address 10.1.1.13 255.255.255.255

interface MgmtEth0/RP0/CPU0/1
 ipv4 address 192.168.1.12 255.255.255.254

interface GigabitEthernet0/0/0/0
 ipv4 address 172.18.0.1 255.255.255.254

router static
 address-family ipv4 unicast
  10.1.1.14/32 192.168.1.13

router ospf 1
 router-id 10.1.1.13
 area 0
 interface Loopback0
 interface Loopback1
 interface MgmtEth0/RP0/CPU0/1
 interface GigabitEthernet0/0/0/0

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 10.1.1.14
 redundancy gateway-ip <gateway>
 redundancy interface-name Loopback1
 auto-onboard enable
 mgmt-interface-name Loopback0
```

NCS 1010-B configuration

```
hostname COSM1-NCS1010-B

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.2 255.255.255.255
 shutdown

interface Loopback1
 ipv4 address 10.1.1.14 255.255.255.255

interface MgmtEth0/RP0/CPU0/1
 ipv4 address 192.168.1.13 255.255.255.254

interface GigabitEthernet0/0/0/0
 ipv4 address 172.18.0.2 255.255.255.254

router static
 address-family ipv4 unicast
  10.1.1.13/32 192.168.1.12

router ospf 1
 router-id 10.1.1.14
```

```
 area 0
 interface Loopback0
 interface Loopback1
 interface MgmtEth0/RP0/CPU0/1
 interface GigabitEthernet0/0/0/0

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 10.1.1.13
 redundancy gateway-ip <gateway>
 redundancy interface-name Loopback1
 auto-onboard enable
 mgmt-interface-name Loopback0
```

Deployment with devices interconnected with redundancy and managed remotely via OSC

This topic explains the remote-management deployment model with physical redundancy, where devices are interconnected and reachable through OSC. It details interface, routing, and addressing requirements that maintain HA communication and operational reachability during network or link disruptions.

This deployment model describes the management of a remote node, a 2-degrees ROADM, with physical redundancy, where Cisco Optical Site Manager is configured in high availability and reachable over the Optical Service Channel.

Requirements for devices interconnected with redundancy and managed remotely via OSC

This HA deployment model requires these conditions:

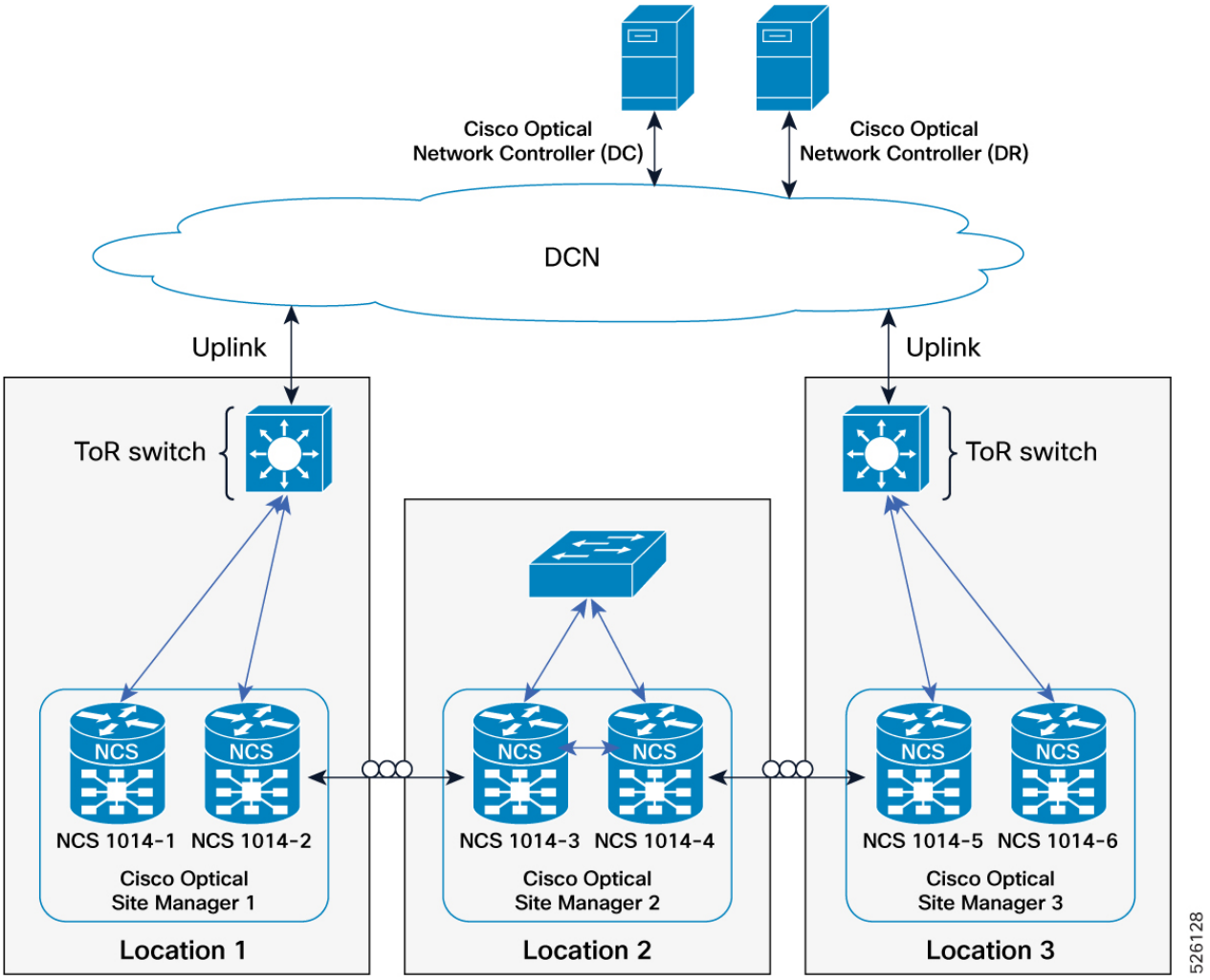
- Devices in the remote node are interconnected with physical redundancy and lack direct DCN connectivity.
- Cisco Optical Site Manager instances are configured in high availability, accessible via OSC from other nodes connected to the customer's DCN.
- Devices within the remote node (Location 2) achieve DCN reachability through multiple paths over the OSC with varying degrees.
- Two devices hosting Cisco Optical Site Manager in high availability are directly interconnected through both an Ethernet cable plugged into MgmtEth interfaces and an external switch.

Implementing this deployment model requires specific interface configurations and routing to ensure high availability and remote manageability, even with physical redundancy.

- Both Cisco Optical Site Manager redundancy and management interfaces must be configured as Loopback interfaces to ensure reachability independent of potential failures.
- IP addresses assigned to the MgmtEth interfaces (used for device interconnection) and GigabitEthernet interfaces must be strategically distributed within the network to support interconnection failures.
- Loopback IP addresses must be distributed within the DCN and be reachable from the Centralized Operations and Network Control (CONC) system.
- The two devices hosting Cisco Optical Site Manager in high availability in the remote location require a static route or routing protocol configuration.
- This routing configuration must define how to reach the redundancy interface for Cisco Optical Site Manager on the peer device (e.g., Loopback 1 interface) using the peer's MgmtEth interface as the next hop.

This figure illustrates the connection diagram of three Cisco Optical Site Manager instances in three different locations, configured in HA mode on NCS 1000 family devices. The device in the middle, Cisco Optical Site Manager-2, is managed as a remote device.

Figure 7: Conceptual explanation of deployment with devices interconnected with redundancy and managed remotely via OSC deployment



IP addressing schema for devices interconnected with redundancy and managed remotely via OSC deployment

This table details the IP addressing for the devices interconnected with redundancy and managed remotely via OSC deployment model, with the *MgmtEth* interfaces of the devices in subnets **192.168.1.0/24** and **192.168.2.12/31** and the *Loopback* interfaces distributed in the DCN as part of the subnet **10.1.1.0/27**.

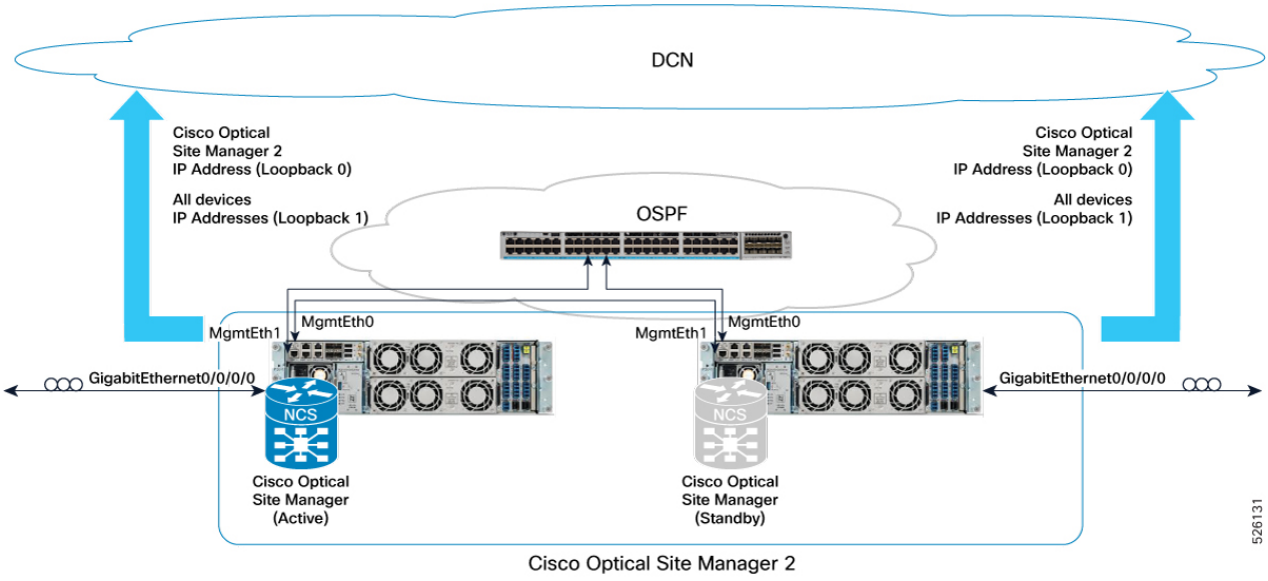
Table 8: IP addressing schema for devices interconnected with redundancy and managed remotely via OSC deployment

Cisco Optical Site Manager instance	NCS device	NCS device interface	NCS device IP/Mask	Connected to switch	Connected to switch interface
Cisco Optical Site Manager 2	NCS 1010-3	MgmtEth0/RP0/CPU0/0	192.168.1.12/24	Ext Switch	-
		MgmtEth0/RP0/CPU0/1	192.168.2.12/31	Peer NCS1K	MgmtEth0/RP0/CPU0/1
		GigabitEthernet0/0/0/0	172.18.0.1/31	Neighbor NCS1K	GigabitEthernet0/0/0/0
		Loopback 0	10.1.1.2/32	-	-
		Loopback 1	10.1.1.13/32	-	-
	NCS 1010-4	MgmtEth0/RP0/CPU0/0	192.168.1.13/24	Ext Switch	-
		MgmtEth0/RP0/CPU0/1	192.168.2.13/31	Peer NCS1K	MgmtEth0/RP0/CPU0/1
		GigabitEthernet0/0/0/0	172.18.0.2/31	Neighbor NCS1K	GigabitEthernet0/0/0/0
		Loopback 0	10.1.1.2/32	-	-
		Loopback 1	10.1.1.14/32	-	-

Practical example of devices interconnected with redundancy and managed remotely via OSC deployment

This figure provides a practical example of this deployment model, implemented with one Catalyst 9300 switch and two NCS 1010 devices.

Figure 8: Example of deployment model with two NCS 1010 configured as 2-degrees ROADM



Example configuration for the deployment

This example describes the configuration of two NCS 1010 devices set up as a 2-degree ROADM with redundancy and remote management through the OSC.

NCS 1010-A configuration

```
hostname COSM1-NCS1010-A

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.2 255.255.255.255
 shutdown

interface Loopback1
 ipv4 address 10.1.1.13 255.255.255.255

interface MgmtEth0/RP0/CPU0/0
 ipv4 address 192.168.1.12 255.255.255.0

interface MgmtEth0/RP0/CPU0/1
 ipv4 address 192.168.2.12 255.255.255.254

interface GigabitEthernet0/0/0/0
 ipv4 address 172.18.0.1 255.255.255.254

router static
 address-family ipv4 unicast
 10.1.1.14/32 192.168.2.13
 router ospf 1
 router-id 10.1.1.13
 area 0
 interface Loopback0
 interface Loopback1
 interface MgmtEth0/RP0/CPU0/0
 interface MgmtEth0/RP0/CPU0/1
 interface GigabitEthernet0/0/0/0

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 10.1.1.14
 redundancy gateway-ip <gateway>
 redundancy interface-name Loopback1
 auto-onboard enable
 mgmt-interface-name Loopback0
```

NCS 1010-B configuration

```
hostname COSM1-NCS1010-B

netconf-yang agent ssh
ssh server v2
ssh server netconf
ssh server rate-limit 600

interface Loopback0
 ipv4 address 10.1.1.2 255.255.255.255
 shutdown

interface Loopback1
 ipv4 address 10.1.1.14 255.255.255.255
```

```
interface MgmtEth0/RP0/CPU0/0
 ipv4 address 192.168.1.13 255.255.255.0

interface MgmtEth0/RP0/CPU0/1
 ipv4 address 192.168.2.13 255.255.255.254

interface GigabitEthernet0/0/0/0
 ipv4 address 172.18.0.2 255.255.255.254

router static
 address-family ipv4 unicast
 10.1.1.13/32 192.168.2.12
 router ospf 1
 router-id 10.1.1.14
 area 0
 interface Loopback0
 interface Loopback1
 interface MgmtEth0/RP0/CPU0/0
 interface MgmtEth0/RP0/CPU0/1
 interface GigabitEthernet0/0/0/0

cosm
 user-name <device username>
 user-password <device password>
 redundancy peer-ip 10.1.1.13
 redundancy gateway-ip <gateway>
 redundancy interface-name Loopback1
 auto-onboard enable
 mgmt-interface-name Loopback0
```

4 Setup Cisco Optical Site Manager on NCS 1000

Topics:

- Enable or disable Cisco Optical Site Manager north-bound interfaces
- Activate Cisco Optical Site Manager
- Deactivate Cisco Optical Site Manager

This chapter describes the workflow to enable, disable, activate, and deactivate Cisco Optical Site Manager on NCS 1000 devices. Helps administrators manage interfaces and maintain proper configuration by outlining required steps and related considerations.

Enable or disable Cisco Optical Site Manager north-bound interfaces

Learn how to enable or disable Cisco Optical Site Manager north-bound interfaces (NETCONF, RESTCONF, and Web-UI) using IOS XR and COSM configuration modes. Use this procedure to configure interface availability, modify the default NETCONF port if required, and commit changes to control management access.

Cisco Optical Site Manager provides three north-bound interfaces. By default, all these interfaces are enabled. If required, individual interfaces can be disabled.

- NETCONF
- RESTCONF
- Interactive Web-UI

> **Warning**
>
> Disabling all the interfaces will make Cisco Optical Site Manager inaccessible!

This configuration is optional and must be completed before activating Cisco Optical Site Manager on the device. Use the device's CLI in COSM configuration mode to enable or disable interfaces individually. The default NETCONF port is *2022*. You may change this port during configuration.

Before you begin

Ensure that Cisco Optical Site Manager is configured Standalone or High Availability mode.

Follow these steps to enable or disable Cisco Optical Site Manager north-bound interfaces.

Procedure

1. Enter IOS XR and COSM configuration modes using the **configure terminal** and **cosm** commands.

   Example

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

2. (Optional) Configure the NETCONF port if you want to use a port other than 2022 using the **netconf port** *port-number* command

   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.
3. Enable or disable the Cisco Optical Site Manager interfaces using the *<interface-name>* **enable | disable** command.

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.

4. Commit the changes using the **commit** command.

After configuration changes are committed, the application operates with the specified interface availability. Only enabled interfaces are accessible for management and monitoring, and disabled interfaces do not accept connections.

What to do next

Activate Cisco Optical Site Manager on page 56

Activate Cisco Optical Site Manager

Learn how to activate Cisco Optical Site Manager after completing configuration in standalone or high availability mode, verify activation status, and confirm required parameter consistency before enabling the application and accessing the GUI.

After configuration is complete, activate Cisco Optical Site Manager to enable the application.

After configuring Cisco Optical Site Manager in standalone or high availability mode, including setting management interfaces, user credentials, and optional features like auto-onboarding, the application remains inactive until explicitly activated.

Cisco Optical Site Manager activation takes about 11 minutes on the NCS 1001 and about eight minutes on the NCS 1004 to initialize.

Important

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

Before you begin

- Before activating Cisco Optical Site Manager in HA mode, verify that these parameter values are same on both host devices, if configured.
  - *netconf (optional)*
  - *restconf (optional)*
  - *webui (optional)*
  - *user-name*
  - *user-password*
  - 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.

- Before Release 24.3.1, use the *MgmtEth0/RP0/CPU0/1* interface for auto-onboarding of subtended devices. The interface uses IP addresses *192.168.1.1/30* and *192.168.1.2/30*. From Release 26.1.1, this requirement does not apply.
- Before Release 26.1.1, ensure that static routes are added on devices that belong to different subnets or configired as peer devices. For more details, see Configure static routes on peer devices on page 14.
- Verify IP reachability between the Cisco Optical Site Manager host device and each managed device when they are in different subnets. If either direction is not reachable, configure a static route from the Cisco IOS XR CLI.

  For example, if the NCS 1014 device is not reachable from the NCS 1010 host, configure the static route on the NCS 1010 host device.

```
RP/0/RP0/CPU0:onc-oltc-225-70(config)#router static
RP/0/RP0/CPU0:onc-oltc-225-70(config-static)# address-family ipv4 unicast
RP/0/RP0/CPU0:onc-oltc-225-70(config-static-afi)# <managed-device-ip>/32
 <default-gateway>
RP/0/RP0/CPU0:onc-oltc-225-70(config-static-afi)#commit
```

Follow these steps to activate Cisco Optical Site Manager.

Procedure

1. Activate Cisco Optical Site Manager using the **cosm activate** command.

   Example

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

2. Verify the status of the application using the **show cosm status** command.
   It may take a few minutes to activate Cisco Optical Site Manager.

- After activating, wait for few minutes before logging in to the Cisco Optical Site Manager GUI.
- Upon successful activation, the application transitions to an active state. Status commands display APP_ACTIVATED and ACTIVATED states.

This example shows the status of Cisco Optical Site Manager configured in standalone mode.

```
RP/0/RP0/CPU0:OLT-2#show cosm status
Fri Oct 18 13:06:09.862 UTCCOSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 1 hours
Last error: No error
COSM version: 26.1.1.D0362
```

This example shows the status of Active instance of the Cisco Optical Site Manager configured in HA mode.

```
RP/0/RP0/CPU0:HAN-1#show cosm status
Thu Oct 30 10:21:25.374 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 1 hours
Last error: No error
```

```
COSM version: 26.1.1.D0362
Redundancy role: ACTIVE (connected standby 2.2.2.2-COSM)
```

This example shows the status of Standby instance of the Cisco Optical Site Manager configured in HA mode.

```
RP/0/RP0/CPU0:HAN-2#show cosm status
Thu Oct 30 10:23:01.366 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 4 days
Last error: No error
COSM version: 26.1.1.D0362
Redundancy role: STANDBY (connected active 1.1.1.1-COSM)
```

What to do next

- Login to Cisco Optical Site Manager
- Auto onboarding of the NCS 1001 device hosting Cisco Optical Site Manager does not complete because the XR device communicates with the third-party docker through the east-west interface. To onboard a NCS 1001 device, manually add it in Cisco Optical Site Manager using the east-west interface. For more details, see Add a device.
- Import a Cisco Optical Network Planner configuration file.

Deactivate Cisco Optical Site Manager

Learn how to deactivate the Cisco Optical Site Manager when IP address changes, HA migration, device relocation, or reinstallation is required.

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.

Warning

Deactivating Cisco Optical Site Manager removes its database and the Disaster Recovery backup.

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 .
- Download the current diagnostic logs in case required for troubleshooting. For more details, see View Cisco Optical Site Manager Diagnostics .
- Ensure that all the devices are in sync completed state in Cisco Optical Site Manager. If multiple devices are managed in Cisco Optical Site Manager, prepare to delete all associated devices simultaneously.

Follow these steps to deactivate Cisco Optical System Manager from your host devices. This process is not traffic impacting.

Procedure

1. Perform these steps from the Cisco Optical Site Manager WEB-UI.
   a. Lock the devices.
   b. Back up the device configuration.
   c. Unlock the devices.
   d. Wait for synchronization to complete for all devices.
   e. Select all devices and delete them from the Cisco Optical Site Manager.
2. Perform these steps from the IOS XR CLI.
   a. Run the `no lldp system-description` command to remove the LLDP system description on each device deleted from the Cisco Optical Site Manager.

      Example:

      ```
      RP/0/RP0/CPU0:COSM_OLT-4_215#configure terminal
      Thu Oct 23 16:34:24.928 +0530
      RP/0/RP0/CPU0:COSM_OLT-4_215(config)#no lldp system-description
      RP/0/RP0/CPU0:COSM_OLT-4_215(config)#commit
      ```

   b. Run the **cosm deactivate** command to deactivate the Cisco Optical System Manager.

      Example:

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

   c. Run the **show cosm status** command to verify the status of the Cisco Optical Site Manager instance.

      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
      ```

5 Migrate Cisco Optical Site Manager between standalone and high availability modes

Topics:

- Migrate Cisco Optical Site Manager between standalone and high availability modes

Provides details about the requirements and procedures that help you migrate Cisco Optical Site Manager from standalone to high availability mode or from high availability to standalone mode.

Migrate Cisco Optical Site Manager between standalone and high availability modes

Provides details about the requirements and procedures that help you migrate Cisco Optical Site Manager from standalone to high availability mode or from high availability to standalone mode.

Cisco Optical Site Manager standalone and high availability migration requirements

This section provides details about the requirements, commands, and status values used when you migrate Cisco Optical Site Manager between standalone and high availability modes.

Review these requirements before you migrate Cisco Optical Site Manager from standalone to high availability, or from high availability to standalone.

Migration scope

Cisco Optical Site Manager supports migration between standalone and high availability modes through the IOS XR CLI. The **cosm reconfigure** command applies committed Cisco Optical Site Manager configuration changes on the device that continues to host Cisco Optical Site Manager, without requiring you to deactivate and activate the application again or losing the Cisco Optical Site Manager database.

This table describes the supported migration flows.

Table 9: Cisco Optical Site Manager migration flows

Migration flow	Use	Result
Standalone to high availability	Adds Cisco Optical Site Manager redundancy configuration to the standalone device and activates Cisco Optical Site Manager on the peer device.	Cisco Optical Site Manager preserves persistent data on the active device. The peer device joins the deployment as standby.
High availability to standalone	Removes one Cisco Optical Site Manager device from a high availability deployment.	Cisco Optical Site Manager continues to run on the remaining device in standalone mode. Cisco Optical Site Manager data is deleted from the decommissioned device.

Requirements and restrictions

This table lists the requirements and restrictions for Cisco Optical Site Manager standalone and high availability migration.

Table 10: Cisco Optical Site Manager migration requirements

Requirement	Description
Supported platforms	Cisco Optical Site Manager supports this migration flow on Cisco NCS 1010 and Cisco NCS 1014 devices.
IP version	The migration flow supports IPv4 addresses only in this release.
Configuration interface	Use the IOS XR CLI and the `cosm reconfigure` command. Migration through the Cisco Optical Site Manager web UI, NETCONF, and RESTCONF is not supported.
Device state before standalone-to-high-availability migration	Only the first device must run Cisco Optical Site Manager. The peer device must have Cisco Optical Site Manager installed, but not activated.

Requirement	Description
Software and Cisco Optical Site Manager settings	Both devices must run the same Cisco IOS XR software version and use the same Cisco Optical Site Manager credentials, northbound interface enablement state, and northbound interface port settings.
High availability reachability	Both devices must reach each other through the configured redundancy interfaces. The redundancy gateway IP address must be reachable from both devices and must be different from the peer IP address. Use the same redundancy gateway IP address on both devices.
Peer device onboarding	Before you activate Cisco Optical Site Manager on the peer device, onboard the peer device in the Cisco Optical Site Manager **Devices** tab and wait until **Sync Status** shows **sync-completed, alarm synchronized**.
Certificate cleanup	Delete `harddisk:/data/COSM/certs/host.cert` before you run `cosm reconfigure` when the Cisco Optical Site Manager management IP address changes and the certificate contains the previous management IP address. When you migrate from high availability to standalone, also remove the high availability certificate directory for the peer device.
Operational state	Do not start the migration while a software download or activation operation is in progress. Keep power stable and do not reload or switch over the device during `cosm reconfigure`.
Backup and disaster recovery files	Create a new database backup before starting the migration and after the migration or rollback completes. For standalone-to-high-availability migration, use a newly generated disaster recovery file by Cisco Optical Site Manager because the old standalone backup and disaster recovery file are not valid for the migrated deployment.

Migration status values

This table describes the status values that help you verify Cisco Optical Site Manager migration progress.

Table 11: Cisco Optical Site Manager migration status values

Status value	Description
`APP_ACTIVATED`	Cisco Optical Site Manager is active on the device.
`APP_DEACTIVATED`	Cisco Optical Site Manager is deactivated on the device.
`ACTIVE`	The device hosts the active Cisco Optical Site Manager instance.
`ACTIVE (standby not connected)`	The device hosts the active Cisco Optical Site Manager instance, but the standby Cisco Optical Site Manager instance is not connected yet. This state can appear after you reconfigure the first device and before you activate Cisco Optical Site Manager on the peer device. This state appears after redundancy is configured on the SA device but before Cisco Optical Site Manager is reconfigured.
`STANDBY` with connected active peer information	The device hosts the standby Cisco Optical Site Manager instance and is connected to the active Cisco Optical Site Manager instance.
`Configuration changes`	The `show cosm status` command displays committed Cisco Optical Site Manager configuration changes that are not yet applied by `cosm reconfigure`.

Status value	Description
sync-completed, alarm synchronized	The peer device is synchronized in the Cisco Optical Site Manager **Devices** tab before you activate Cisco Optical Site Manager on that peer device.

Migrate Cisco Optical Site Manager from standalone to high availability

Use this task to convert a standalone Cisco Optical Site Manager deployment to high availability through IOS XR CLI commands.

Migrate a running standalone Cisco Optical Site Manager deployment to high availability while preserving persistent Cisco Optical Site Manager data on the active device.

In this task, Device-1 is the device that runs Cisco Optical Site Manager in standalone mode. Device-2 is the peer device that joins the high availability deployment as standby. The `cosm reconfigure` command applies the committed Cisco Optical Site Manager redundancy configuration on Device-1 without deleting the Cisco Optical Site Manager database on Device-1.

Follow these steps to migrate Cisco Optical Site Manager from standalone to high availability.

Procedure

1. Log in to Device-1 and verify that Cisco Optical Site Manager is running in standalone mode.
   a) Display the Cisco Optical Site Manager running configuration on Device-1.

      Example

      ```
      DEVICE-1# show running-config cosm
      cosm mgmt-interface-name <standalone-management-interface>
      ```

   b) Verify the Cisco Optical Site Manager status on Device-1.

      Example

      ```
      DEVICE-1# show cosm status
      COSM state: APP_ACTIVATED
      Role: ACTIVE
      ```

   The `show cosm status` command shows that the Cisco Optical Site Manager state is `APP_ACTIVATED` and the role is `ACTIVE`.

2. Log in to Device-2 and verify that Cisco Optical Site Manager is installed, but not activated.

   Example

   ```
   DEVICE-2# show cosm status
   COSM state: APP_DEACTIVATED
   AppMgr app state: DEACTIVATED
   Role: UNKNOWN
   ```

   The `show cosm status` command shows that the Cisco Optical Site Manager state is `APP_DEACTIVATED`.

3. In the Cisco Optical Site Manager web UI, onboard Device-2 from the **Devices** tab of the Cisco Optical Site Manager web UI.

Wait until **Sync Status** shows **sync-completed, alarm synchronized** for Device-2.

4. Configure the Cisco Optical Site Manager high availability settings on Device-1 and commit the configuration.
   a) Enter IOS XR global configuration mode and Cisco Optical Site Manager configuration mode on Device-1.

      Example

      ```
      DEVICE-1# configure terminal
      DEVICE-1(config)# cosm
      ```

   b) Configure the Cisco Optical Site Manager management interface and high availability interface.

      Example

      ```
      DEVICE-1(config-cosm)# mgmt-interface-name <type> <number>
      DEVICE-1(config-cosm)# redundancy interface-name <type> <number>
      ```

   c) Configure the peer IP address for Device-2 and the gateway IP address.

      Example

      ```
      DEVICE-1(config-cosm)# redundancy peer-ip
      <device-2-redundancy-interface-IP-address>
      DEVICE-1(config-cosm)# redundancy gateway-ip <gateway-IP-address>
      ```

   d) Commit the configuration changes and exit all configuration modes.

      Example

      ```
      DEVICE-1(config-cosm)# commit
      DEVICE-1(config-cosm)# end
      ```

   Use the IP address assigned to the redundancy interface on Device-2 for `redundancy peer-ip`.

5. Verify that Device-1 has committed Cisco Optical Site Manager configuration changes that still require reconfiguration.

   Example

   ```
   DEVICE-1# show cosm status
   COSM state: APP_ACTIVATED
   Last error: No error
   Role: ACTIVE (standby not connected)
   Configuration changes:
   ```

   The output can show `Role: ACTIVE (standby not connected)` and a `Configuration changes` section before you run `cosm reconfigure`. Cisco Optical Site Manager may be unavailable until the reconfiguration is complete.

6. If the Cisco Optical Site Manager management IP address changes and the certificate contains the previous management IP address, delete the Cisco Optical Site Manager host certificate on Device-1.
   a) Display the certificate directory.

Example

```
DEVICE-1# dir harddisk:/data/COSM/certs/
host.cert is listed.
<device-2-redundancy-interface-IP-address>-COSM is listed.
```

b) Delete the Cisco Optical Site Manager host certificate.

Example

```
DEVICE-1# delete harddisk:/data/COSM/certs/host.cert
Delete harddisk:/data/COSM/certs/host.cert[confirm]
```

c) Confirm the delete prompt.

7. Run `cosm reconfigure` on Device-1 and monitor the reconfiguration progress.

The `PROTNA` alarm is expected until Device-2 connects as the standby Cisco Optical Site Manager instance.

a) Run the reconfigure command.

Example

```
DEVICE-1# cosm reconfigure
Deactivating : execute 'show cosm status' to monitor the progress
```

b) Monitor the reconfiguration progress.

Example

```
DEVICE-1#show cosm status
Mon Feb  2 10:52:23.327 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 3 days
Last error: No error
COSM version: 26.1.1.P1D0108
Role: ACTIVE (connected standby 2.2.2.2-COSM)

Configuration changes:

 interface Loopback1
- ipv4 address 5.5.5.5 255.255.255.255
+ ipv4 address 3.3.3.3 255.255.255.255
 !
```

Device-1 shows the Cisco Optical Site Manager state as `APP_ACTIVATED`, `Last error: No error`, and `Role: ACTIVE (standby not connected)`.

8. Verify the current configuration on Device 1 using the **show running-config cosm** command.

Example

```
RP/0/RP0/CPU0:HAN-1#show running-config cosm
Wed Feb  4 10:26:59.324 UTC
cosm
 redundancy peer-ip 2.2.2.2
```

```
 redundancy gateway-ip 192.168.1.2
 redundancy interface-name Loopback0
 mgmt-interface-name Loopback1
!
```

9. Configure and activate Cisco Optical Site Manager on Device-2 as the standby peer.

a) Enter IOS XR global configuration mode and Cisco Optical Site Manager configuration mode on Device-2.

Example

```
DEVICE-2# configure terminal
DEVICE-2(config)# cosm
```

b) Configure the Cisco Optical Site Manager management interface and high availability interface.

Example

```
DEVICE-2(config-cosm)# mgmt-interface-name <type> <number>
DEVICE-2(config-cosm)# redundancy interface-name <type> <number>
```

c) Configure the peer IP address for Device-1 and the gateway IP address.

Example

```
DEVICE-2(config-cosm)# redundancy peer-ip
<device-1-redundancy-interface-IP-address>
DEVICE-2(config-cosm)# redundancy gateway-ip <gateway-IP-address>
```

d) Configure the Cisco Optical Site Manager username and password.

Example

```
DEVICE-2(config-cosm)# user-name <username>
DEVICE-2(config-cosm)# user-password <password>
```

e) Commit the configuration changes and exit all configuration modes.

Example

```
DEVICE-2(config-cosm)# commit
DEVICE-2(config-cosm)# end
```

f) Activate Cisco Optical Site Manager on Device-2.

Example

```
DEVICE-2# cosm activate
Activating : execute 'show cosm status' to monitor the progress
```

g) Verify that Device-2 connects as the standby Cisco Optical Site Manager instance.

Example

```
DEVICE-2# show cosm status
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Last error: No error
Role: STANDBY (connected active
<device-1-redundancy-interface-IP-address>-COSM)
```

Device-2 shows the Cisco Optical Site Manager state as `APP_ACTIVATED`, `Last error: No error`, and the role as `STANDBY`. The status also shows that Device-2 is connected to the active Cisco Optical Site Manager instance.

10. Verify the migrated high availability deployment.

    Confirm these post-migration checks:

    - Device-1 runs as the active Cisco Optical Site Manager instance.
    - Device-2 runs as the standby Cisco Optical Site Manager instance.
    - The peer device is synchronized in the Cisco Optical Site Manager Web UI.
    - The PRONTA alarm is automatically cleared after the standby Cisco Optical Site Manager instance connects.

Cisco Optical Site Manager runs in high availability mode. Device-1 hosts the active Cisco Optical Site Manager instance, and Device-2 hosts the standby Cisco Optical Site Manager instance.

What to do next

- Create a new database backup after the migration completes.
- Do not use the old standalone backup or disaster recovery file for the migrated high availability deployment.
- If migration changes the management IP address of the active Cisco Optical Site Manager host device, update the corresponding device entry in Cisco Optical Site Manager with the new management IP address.
- If a route processor (RP) swap is required, wait 2 to 3 minutes after the migration completes before you start the RP swap.

Migrate Cisco Optical Site Manager from high availability to standalone

Use this task to convert a Cisco Optical Site Manager high availability deployment to standalone mode on the remaining device.

Migrate a Cisco Optical Site Manager high availability deployment to standalone mode when you remove a peer device or roll back a standalone-to-high-availability migration.

In this task, the remaining device is the device that continues to run Cisco Optical Site Manager after the migration. The decommissioned device is the device that you remove from the Cisco Optical Site Manager high availability pair.

Warning

The `cosm deactivate` command deletes Cisco Optical Site Manager data from the device on which you run the command. Run this command only on the device that you want to remove from the Cisco Optical Site Manager deployment.

Before you begin

- Identify the device that continues to host Cisco Optical Site Manager and the device that you want to remove from the high availability deployment.
- Verify that the remaining device and the decommissioned device are reachable through the IOS XR CLI.
- Record the standalone Cisco Optical Site Manager management interface configuration that the remaining device must use after migration.
- Do not start the migration while a software download or activation operation is in progress.
- Keep power stable during the `cosm reconfigure` operation. Do not reload or switch over the devices while reconfiguration is in progress.

Follow these steps to migrate Cisco Optical Site Manager from high availability to standalone.

Procedure

1. Verify the Cisco Optical Site Manager role on both devices.
   a) Verify the Cisco Optical Site Manager role on the remaining device.

      Example

      ```
      DEVICE-1# show cosm status
      COSM state: APP_ACTIVATED
      Last error: No error
      Role: ACTIVE (connected standby
      <device-2-redundancy-interface-IP-address>-COSM)
      ```

   b) Verify the Cisco Optical Site Manager role on the decommissioned device.

      Example

      ```
      DEVICE-2# show cosm status
      COSM state: APP_ACTIVATED
      Last error: No error
      Role: STANDBY (connected active
      <device-1-redundancy-interface-IP-address>-COSM)
      ```

   Confirm which device shows `Role: ACTIVE` and which device shows `Role: STANDBY`.

2. If the decommissioned device is active, switch the active role to the remaining device.
   a) Switch the active role to the remaining device.

Example

```
DEVICE-2# cosm switchover
The remaining device becomes the active Cisco Optical Site Manager instance.
```

b) Verify the role on the decommissioned device.

Example

```
DEVICE-2# show cosm status
COSM state: APP_ACTIVATED
Role: STANDBY (connected active
<device-1-redundancy-interface-IP-address>-COSM)
```

The decommissioned device displays `Role: STANDBY`.

3. Deactivate Cisco Optical Site Manager on the decommissioned device.
   a) Deactivate Cisco Optical Site Manager.

Example

```
DEVICE-2# cosm deactivate
All COSM data will be deleted, do you want to proceed? [y/N]:
Deactivating : execute 'show cosm status' to monitor the progress
```

   b) Enter **y** at the confirmation prompt.
   c) Verify the Cisco Optical Site Manager status on the decommissioned device.

Example

```
DEVICE-2# show cosm status
COSM state: APP_DEACTIVATED
AppMgr app state: DEACTIVATED
AppMgr container state: UNKNOWN
Last error: No error
Role: UNKNOWN
```

The decommissioned device shows the Cisco Optical Site Manager state as `APP_DEACTIVATED` and the role as `UNKNOWN`.

4. Remove the Cisco Optical Site Manager high availability configuration from the remaining device and commit the standalone Cisco Optical Site Manager configuration.
   a) Enter IOS XR global configuration mode and Cisco Optical Site Manager configuration mode on the remaining device.

Example

```
DEVICE-1# configure terminal
DEVICE-1(config)# cosm
```

   b) Remove the high availability interface, peer IP address, and gateway IP address.

Example

```
DEVICE-1(config-cosm)# no redundancy interface-name
DEVICE-1(config-cosm)# no redundancy peer-ip
DEVICE-1(config-cosm)# no redundancy gateway-ip
```

c) (Optional) Configure the standalone Cisco Optical Site Manager management interface.

Example

```
DEVICE-1(config-cosm)# mgmt-interface-name <type> <number>
```

d) Commit the configuration changes and exit all configuration modes.

Example

```
DEVICE-1(config-cosm)# commit
DEVICE-1(config-cosm)# end
```

Use the management interface that Cisco Optical Site Manager must use in standalone mode.

5. Verify that the remaining device has committed Cisco Optical Site Manager configuration changes that still require reconfiguration.

Example

```
RP/0/RP0/CPU0:HAN-1#show cosm status
Tue Jan 27 10:40:12.140 UTC
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Container status: Up 3 days
Last error: No error
COSM version: 26.1.1.P1D0108
Role: ACTIVE

Configuration changes:
 cosm
- redundancy peer-ip 2.2.2.2
- redundancy gateway-ip 192.168.1.2
- redundancy interface-name Loopback0
- mgmt-interface-name Loopback1
-!
-
-interface Loopback1
- ipv4 address 5.5.5.5 255.255.255.255
+ mgmt-interface-name Loopback0
 !
```

The output can show `Role: ACTIVE` and a `Configuration changes` section before you run `cosm reconfigure`. Cisco Optical Site Manager still runs with the previous runtime configuration until reconfiguration completes.

6. If the Cisco Optical Site Manager management IP address changes and the certificate contains the previous management IP address, delete the Cisco Optical Site Manager host certificate on the remaining device.
   a) Display the certificate directory.

Example

```
DEVICE-1# dir harddisk:/data/COSM/certs/
host.cert is listed.
<peer-redundancy-interface-IP-address>-COSM is listed.
```

b) Delete the Cisco Optical Site Manager host certificate.

Example

```
DEVICE-1# delete harddisk:/data/COSM/certs/host.cert
Delete harddisk:/data/COSM/certs/host.cert[confirm]
```

c) Confirm the delete prompt.

7. Remove the high availability certificate directory for the peer device from the remaining device.
   a) Display the certificate directory.

Example

```
DEVICE-1# dir harddisk:/data/COSM/certs/
<peer-redundancy-interface-IP-address>-COSM is listed.
```

   b) Remove the high availability certificate directory for the peer device.

Example

```
DEVICE-1# rmdir
harddisk:/data/COSM/certs/<peer-redundancy-interface-IP-address>-COSM/
Do you want to delete directory :
harddisk:/data/COSM/certs/<peer-redundancy-interface-IP-address>-COSM/
[y|n][y] ?
```

   c) Confirm the remove directory prompt.

8. Run `cosm reconfigure` on the remaining device and monitor the reconfiguration progress.
   a) Run the reconfigure command.

Example

```
DEVICE-1# cosm reconfigure
Deactivating : execute 'show cosm status' to monitor the progress
```

   b) Monitor the reconfiguration progress.

Example

```
DEVICE-1# show cosm status
COSM state: APP_ACTIVATED
AppMgr app state: ACTIVATED
AppMgr container state: RUNNING
Last error: No error
Role: ACTIVE
```

The remaining device shows the Cisco Optical Site Manager state as `APP_ACTIVATED`, `Last error: No error`, and `Role: ACTIVE`.

9. Verify the migrated standalone deployment.

Confirm these post-migration checks:

- The remaining device runs as the active standalone Cisco Optical Site Manager instance.
- The decommissioned device no longer runs Cisco Optical Site Manager.
- The **Devices** tab of the Cisco Optical Site Manager web UI shows the expected managed devices.

If the removed device is decommissioned, remove it from the **Devices** tab of the Cisco Optical Site Manager web UI. If you migrate to standalone for another reason, skip this action.

Cisco Optical Site Manager runs in standalone mode on the remaining device.

What to do next

Create a new database backup after the migration completes. Use the new backup for future restore operations.

Part II

Install and Setup for NCS 2000

Topics:

- Install Cisco Optical Site Manager on NCS 2000 SVO-LC
- Configure Cisco Optical Site Manager on NCS 2000 SVO-LC
- NCS 2000 node upgrades to Cisco Optical Site Manager

This section provides detailed instructions for installing and configuring Cisco Optical Site Manager on the NCS 2000.

6 Install Cisco Optical Site Manager on NCS 2000 SVO-LC

Topics:

- Cisco Optical Site Manager installation workflow on NCS 2000 SVO-LC
- Resource allocations for SVO instances in high-availability deployments
- HA deployment modes for NCS 2000

This chapter describes the workflow and configuration steps to deploy the application on an NCS 2000 SVO-LC, including line card installation, network preparation, use of the installation tool, resource planning, and high availability deployment options.

Table 12: Feature History

Feature Name	Release Information	Description
Geographic Redundancy Support for High Availability	Cisco NCS 2000 Release 25.1.1	The Cisco Optical Site Manager now facilitates geographic redundancy by connecting two NCS 2000 nodes located in different places. The Geo HA Mode configuration in SVO-LCs ensures that redundancy is maintained if one of the NCS 2000 nodes fails. HA mode can be deployed in three modes: • Local HA • Geo HA using the UDC channel • Geo HA between near-by NCS 2000 nodes The YAML file is updated to include the redundancy mode setting: `redundancy-mode: "GEO_HA".`

Cisco Optical Site Manager installation workflow on NCS 2000 SVO-LC

Learn how to install Cisco Optical Site Manager on an NCS 2000 SVO-LC by preparing the required network configuration and completing the software installation steps to enable node management through the application.

This workflow helps you install Cisco Optical Site Manager on NCS 2000 SVO-LC.

Before you begin

- SVO-LC card is physically installed in the NCS 2000 chassis. For more details, see Install the SVO line card on page 79.
- Review the SVO-LC network requirements.

Follow these steps to install Cisco Optical Site Manager on NCS 2000 SVO-LC.

Procedure

1. Prepare the network configuration. For more details, see Network YAML configuration file for Geo HA on page 79.
2. Install Cisco Optical Site Manager. For more details, see Install Cisco Optical Site Manager on NCS 2000 SVO-LC on page 81.

SVO-LC network requirements

This section provides details about the management network, devices network, and NCS 1000 reachability requirements for Cisco Optical Site Manager deployments on NCS 2000 SVO-LC.

Review the network requirements before you install Cisco Optical Site Manager on NCS 2000 SVO-LC or onboard NCS 1000 devices.

Network scopes

Cisco Optical Site Manager uses separate network scopes for user access and device communication.

Use this table to identify each network scope, its purpose, and its requirement.

Table 13: SVO-LC network scopes

Network scope	Purpose	Requirement
Management network	Provides access to the Cisco Optical Site Manager application.	The SVO-LC management interface must be reachable from the customer Data Communication Network (DCN).
Devices network	Provides communication between Cisco Optical Site Manager and managed devices.	The devices network must allow traffic between Cisco Optical Site Manager and each managed NCS 2000 or NCS 1000 device.

Management network ports

The management network must allow these ports for access to Cisco Optical Site Manager on SVO-LC.

Use this table to identify the TCP ports, protocols, and uses required for Cisco Optical Site Manager access on SVO-LC.

Table 14: Management network port requirements

TCP port	Protocol	Use
22	SSH	Provides SSH access.
443	HTTPS	Provides access to the Cisco Optical Site Manager web UI.
830	NETCONF	Provides NETCONF access.
2611	SNMP	Provides SNMP access.

Devices network ports

The devices network must allow these ports between Cisco Optical Site Manager and the managed devices.

Use this table to identify the source, destination, port, protocol, and use for traffic between Cisco Optical Site Manager and managed devices.

Table 15: Devices network port requirements

Source	Destination	Port	Protocol	Use
Cisco Optical Site Manager	NCS 2000	TCP 80	HTTP	Provides HTTP access to the NCS 2000 device.
Cisco Optical Site Manager	NCS 2000	TCP 443	HTTPS	Provides secure HTTP access to the NCS 2000 device.
Cisco Optical Site Manager	NCS 2000	TCP 57790	CORBA	Provides CORBA access to the NCS 2000 device.
Cisco Optical Site Manager	NCS 2000	TCP 57991	CORBA SSL	Provides secure CORBA access to the NCS 2000 device.
Cisco Optical Site Manager	NCS 1000	TCP 2022	NETCONF	Provides NETCONF over SSH access to the NCS 1000 device.
NCS 1000	Cisco Optical Site Manager	UDP 7514	Syslog	Provides syslog access from the NCS 1000 device to Cisco Optical Site Manager.
NCS 1000	Cisco Optical Site Manager	UDP 7514	Telemetry	Provides telemetry access from the NCS 1000 device to Cisco Optical Site Manager.

NCS 1000 onboarding requirements

These requirements apply when you onboard NCS 1000 devices to Cisco Optical Site Manager on SVO-LC.

- The NCS 1000 device must be reachable from the SVO-LC. Configure all intermediate network devices to allow reachability between the SVO-LC and the NCS 1000 device.
- In Cisco Optical Site Manager, add a route in the **Devices Gateway** table from **Devices** > **Networking**. Specify the NCS 1000 subnet or host address and use `192.168.254.65` as the gateway.

Install the SVO line card

Use this procedure to install the SVO line card in an NCS 2000 chassis, connect required interfaces, and power up the card safely.

Use this task to install the SVO card.

Before you begin

Ensure recommended resources are met:

Procedure

1. Plug in the SVO line card into the NCS 2000 chassis.
2. Connect the SVO line card to other cards in the NCS 2000 chassis. For common real cabling scenarios, see HA deployment modes for NCS 2000 on page 84.

   Warning

   Any different cabling must be reported to Cisco engineering for an official validation.

3. Power up the SVO line card.

The SVO line card is successfully installed.

What to do next

Run the Cisco Optical Site Manager installation tool. See Install Cisco Optical Site Manager on NCS 2000 SVO-LC on page 81.

Network YAML configuration file for Geo HA

This topic explains the network YAML structure required to configure SVO-LC interfaces and Cisco Optical Site Manager application networking for Geo HA. It details required and optional fields, valid values, and server-specific differences needed for successful installation.

Prepare the network YAML configuration file that includes essential network details needed to set up the SVO-LC interfaces and the Cisco Optical Site Manager application network infrastructure.

Use one network YAML file for each SVO-LC during installation.

- Set `redundancy-mode` to `GEO_HA` to enable Geo high availability.
- For high-availability deployment with two SVO-LCs, keep both files identical except for **server-name**.

This example shows an IPv4 network YAML configuration file for Geo HA:

```
server-name: "Server-A"
mgmt-address-family: "IPv4"
ospf-area-id: "0.0.0.0"
redundancy-mode: "GEO_HA"
servers:
- name: "Server-A"
  mgmt:
```

```
    ipv4:
      ip: "10.0.123.0"
      prefix: 22
      gateway: "10.0.123.1"
      host-nic: "10.0.123.2"
  devices:
    ipv4:
      ip: "10.0.1.123"
      prefix: 24
      gateway: "10.0.123.1"
      host-nic: "10.0.123.2"
- name: "Server-B"
  mgmt:
    ipv4:
      ip: "10.1.123.123"
      prefix: 22
      gateway: "10.1.123.1"
      host-nic: "10.1.123.2"
  devices:
    ipv4:
      ip: "10.1.123.123"
      prefix: 24
      gateway: "10.1.123.1"
      host-nic: "10.1.123.2"
```

Network YAML parameter description

This table lists and explains the parameters included in the network YAML file.

Table 16: Network YAML fields

Field	Description
`server-name`	Name of the SVO-LC being installed. The value must match one of the `servers.name` entries.
`mgmt-address-family`	Address family for the management network. Use `IPv4` and include the `mgmt:ipv4` section.
`ospf-area-id`	OSPF area ID associated with the NCS 2000 device.
`redundancy-mode`	Optional field required only in Geo HA mode. Valid value: `GEO_HA`.
`servers`	List of SVO-LCs and associated network details.
`servers.name`	Name of the SVO-LC.
`mgmt`	Management network details. • `ip`: Management subnet. • `prefix`: Subnet mask length. • `gateway`: Gateway for the subnet. • `host-nic`: IP address assigned to the SVO-LC `br-management` interface and used by the Cisco Optical Site Manager Admin Plane web UI over HTTPS on port 443.

Field	Description
`devices`	NCS 2000 devices network details. • `ip`: Device subnet. • `prefix`: Subnet mask length. • `gateway`: Gateway for the subnet. • `host-nic`: IP address assigned to the SVO-LC `br-management` interface and used by the Cisco Optical Site Manager Admin Plane web UI over HTTPS on port 443.

Install Cisco Optical Site Manager on NCS 2000 SVO-LC

Learn how to launch the COSM Installation Tool, set administrator credentials, upload the network YAML file, and start Cisco Optical Site Manager installation.

Use this task to install Cisco Optical Site Manager on NCS 2000 SVO-LC by using the **COSM Installation Tool**.

Before you begin

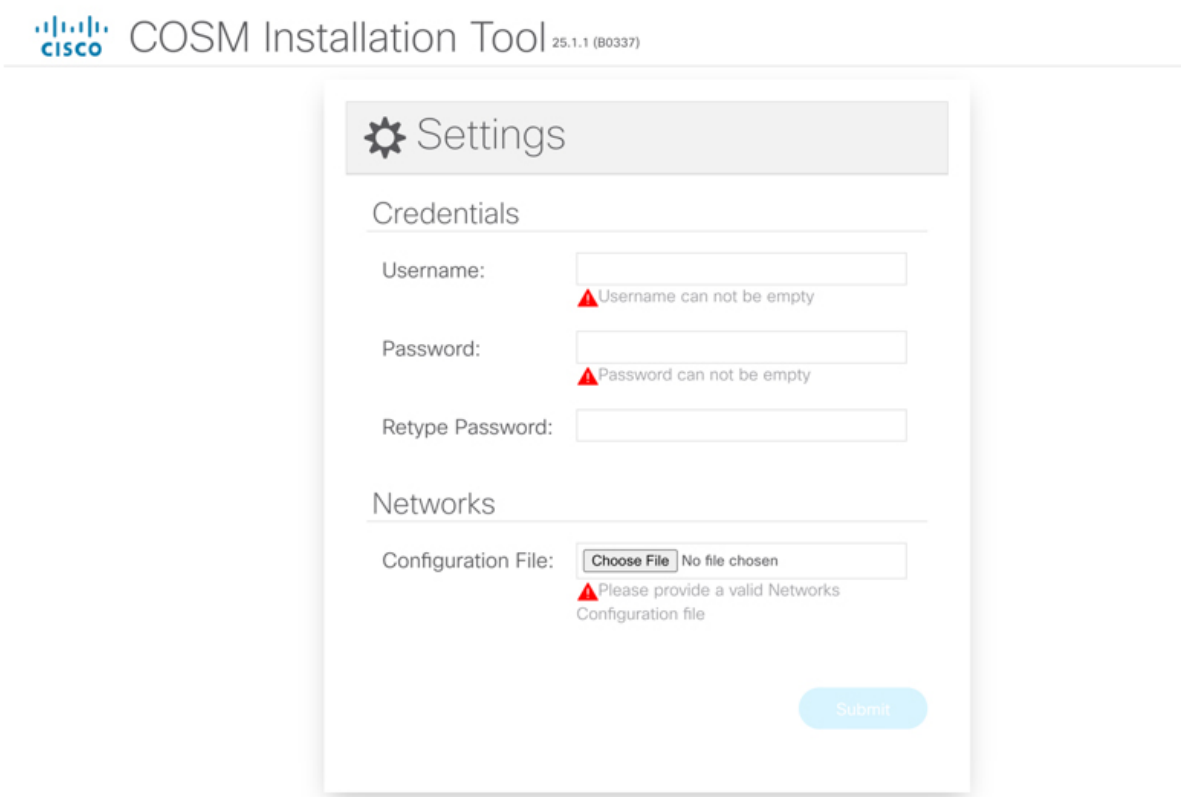
Verify that the network configuration file is ready. For details, see Network YAML configuration file for Geo HA on page 79.

Follow these steps to install Cisco Optical Site Manager by using the **COSM Installation Tool**.

Procedure

1. Open http://192.168.0.66 in a browser.
2. In the **Credentials** section, enter the username and password.
   - Enter a username in **Username**.
   - Enter a password in **Password**. The password must be 8 to 127 characters and include at least one uppercase letter, one lowercase letter, one number, and one special character.
   - Retype the password in **Retype Password**.

Figure 9: COSM Installation Tool settings page

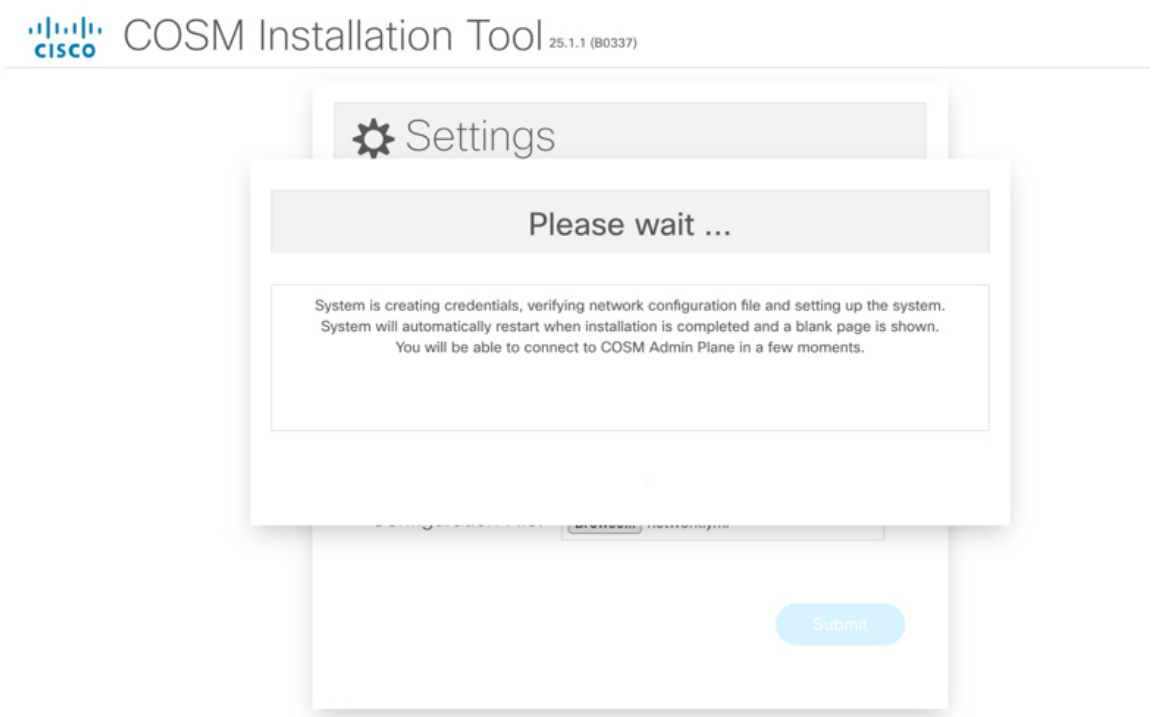


3. Select **Choose File**, and choose `network.yml` from **Configuration File**.

   For details about the configuration file, see Network YAML configuration file for Geo HA on page 79.

4. Select **Submit** to start the installation.

   A confirmation message indicates that credentials are created, the network configuration file is verified, and the system is brought up.



After the installation completes, a blank web page appears to indicate that the Cisco Optical Site Manager Admin Plane started successfully.

What to do next

Log in to the Cisco Optical Site Manager Admin Plane.

Resource allocations for SVO instances in high-availability deployments

This topic explains the minimum and recommended resource allocations for SVO instances in high-availability deployments to help ensure stable failover and consistent sizing across virtual machines.

To define SVO instances, ensure the necessary resources are allocated. For high availability, allocate identical resources on both VMs to maintain consistency and failover support.

Supported resources per node or instance

Table 17: Supported resources per Node or Instance

Node or Instance	Memory	Degree	Maximum memory allowed
OLA / ROADM	2.1 GB	up to 4 degrees	32 GB
ROADM	4 GB	greater than 4 degrees	

HA deployment modes for NCS 2000

This topic explains available HA deployment modes for NCS 2000, including Local HA and Geo HA options using UDC or nearby-node links. It clarifies connectivity requirements, failover behavior, and practical design considerations for resilient service operation.

HA deployment modes for NCS 2000 define how two SVO-LCs are connected to provide service continuity during failures.

- Local HA uses two SVO-LCs in the same node.
- Geo HA uses two SVO-LCs in separate nodes and exchanges HA traffic through UDC or optical links.
- The selected mode determines cabling, management reachability, and failover behavior.

Supported HA deployment modes

You can deploy HA in these modes:

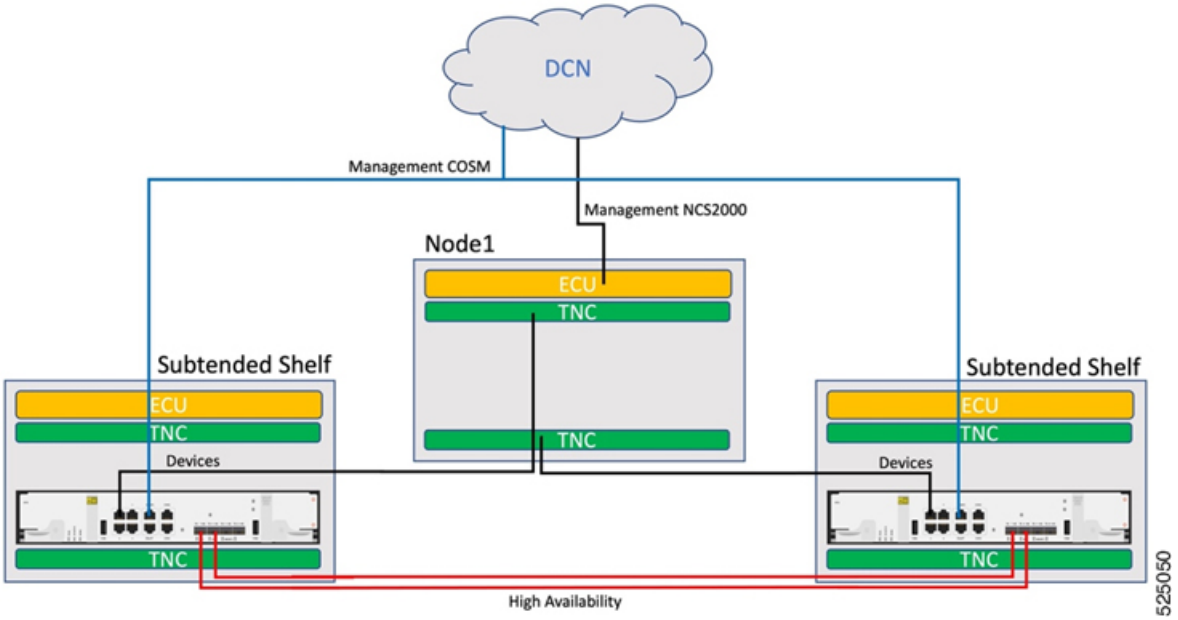
- Local HA
- Geo HA between adjacent nodes by using the UDC channel
- Geo HA between nearby NCS 2000 nodes

Local HA mode and connectivity requirements

Local HA mode provides high availability by installing two SVO-LCs in the same NCS 2000 node. This mode enables failover to the standby SVO-LC if the primary SVO-LC fails.

This image shows the Local HA connection for NCS 2000 multishelf node.

Figure 10: Local HA connection for NCS 2000 multishelf node



The connection requirements for each SVO-LC are:

- Connect MGMT1 port to the customer Data Communication Network (DCN).
- Connect two optical fibers by inserting two pluggables in HA1 and HA2 ports.

- Connect port 1 to one TNC, and connect peer SVO-LC port 1 to the other TNC.
- (Optional) Connect NCS 2000 ECU EMS to the customer DCN. For multishelf setups, use the ECU of the master chassis when direct accessibility to the NCS 2000 device is required.

Geo HA overview and benefits

In Geo HA mode, two SVO-LCs are installed in separate NCS 2000 nodes. Each SVO-LC runs a Cisco Optical Site Manager Admin Plane and communicates with its peer to maintain active and standby roles for the virtual network element (vNE).

Geo HA provides these benefits:

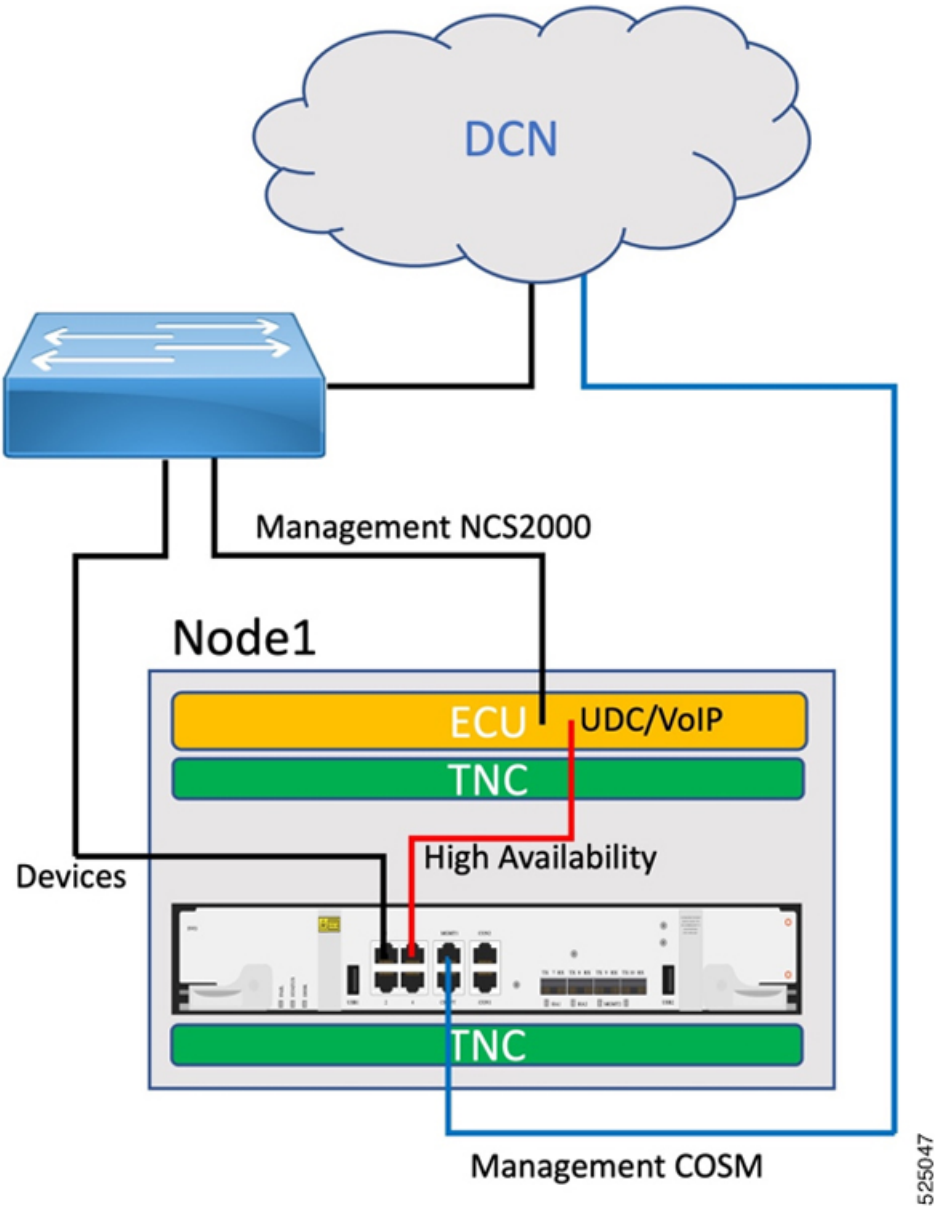
- Uses two SVO-LCs in separate nodes to provide robust redundancy.
- Uses UDC or optical pluggables to transport HA traffic between nodes.
- Supports failover to the standby SVO-LC if the primary SVO-LC fails.

Geo HA using the UDC channel

Geo HA by using the UDC channel places two SVO-LCs in two adjacent NCS 2000 nodes. The UDC channel transports high-availability traffic and supports continuous service during failures.

This image shows the Geo HA connection using the UDC channel.

Figure 11: Geo HA connection using the UDC channel



The Geo HA link uses the available NCS 2000 UDC channel and supports packet processing at hardware level without affecting the NCS 2000 controller CPU. It supports a single-path UDC HA link with a theoretical bandwidth of 80 Mbps.

Connecting an optical HA port to the local ECU UDC port by using the electrical ONS-SE-ZE-EL-C pluggable is unsupported. This limitation occurs because a connected re-timer supports 1G, while the NCS 2000 UDC port operates at FE rate. To address this limitation, reconfigure port 3 as an electrical HA port to negotiate FE speed.

Configure UDC through CTC because Cisco Optical Site Manager does not support UDC configuration. Configure UDC on the Transponder Node Controller (TNC) pluggable associated with the Optical Supervisory Channel (OSC) connected toward the adjacent node. Apply the same configuration to the corresponding TNC pluggable on the adjacent NCS 2000 node.

Each SVO-LC must be connected as follows:

- Connect MGMT1 port to the customer Data Communication Network (DCN).
- Connect port 3 to the NCS 2000 ECU UDC/VoIP.
- Connect port 1 to the NCS 2000 ECU EMS, or to the same switch and VLAN where NCS 2000 ECU EMS is connected.

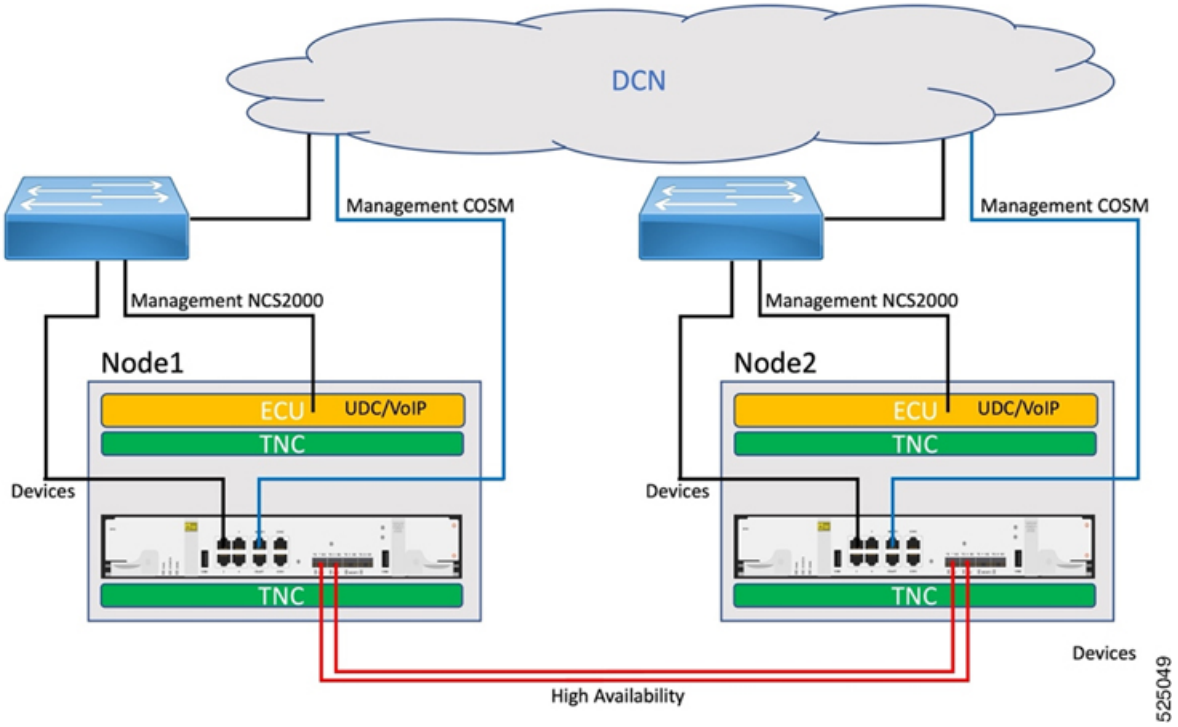
- (Optional) NCS 2000 ECU EMS can connect directly to the customer DCN for multishelf setups when direct accessibility to the NCS 2000 device is required.

Geo HA between nearby NCS 2000 nodes

In this mode, two SVO-LCs are installed in separate nearby NCS 2000 nodes, typically in the same building. The two SVO-LCs are directly interconnected through HA optical pluggables.

This image shows Geo HA between nearby NCS 2000 nodes.

Figure 12: Geo HA between nearby NCS 2000 nodes



7 Configure Cisco Optical Site Manager on NCS 2000 SVO-LC

Topics:

- Cisco Optical Site Manager admin plane
- User management features in the Admin Plane
- Cisco Optical Site Manager instances
- Download diagnostic log files
- View certificate
- Cisco Optical Site Manager instances statistics
- Admin Plane utilities
- Modify admin plane properties
- Custom scripts

This chapter details how the Cisco Optical Site Manager admin plane empowers administrators to oversee instances, manage networking, handle certificates, and perform routine actions within Cisco Optical Site Manager.

Cisco Optical Site Manager admin plane

This topic describes the Cisco Optical Site Manager admin plane, including its role in instance lifecycle management, high-availability coordination, and network configuration for NCS 2000 SVO card deployments.

Cisco Optical Site Manager admin planes are management interfaces that

- install and manage Cisco Optical Site Manager network element instances,
- coordinate active and standby roles between paired SVO cards, and
- use shared network configuration data to automate instance deployment and recovery behavior for Cisco NCS 2000 SVO card deployments.

Core functions

The admin plane is available only for the Cisco NCS 2000 SVO card.

The admin plane provides a web user interface for creating, updating, monitoring, and deleting Cisco Optical Site Manager instances.

During instance creation, you can set the management interface address, while the admin plane selects the remaining parameters from the constraints defined in the shared configuration file.

The shared configuration file stores the networking data that both SVO cards use for admin plane operation.

High-availability behavior

In an SVO card deployment, two Cisco Optical Site Manager line cards reside in different ROADM node chassis and form a redundant pair.

The cards communicate through the HA network as the primary link and through the devices network as the secondary link. The primary link also replicates configuration transactions from the active Cisco Optical Site Manager instance to the related standby instance.

The admin planes automatically assign active and standby roles and perform automatic switchover when a software or hardware fault affects the active instance.

Administrative capabilities

The admin plane supports these common administrative actions:

- Create the super user for the SVO card model.
- Create, update, delete, and view Cisco Optical Site Manager instances of type ROADM, OLA, DGE, or TXP.
- Control, monitor, and run health checks for Cisco Optical Site Manager instances.
- Trigger automatic or manual switchovers between active and standby instances.
- View network configuration parameters and the allowed or blocked IP address lists.
- Download diagnostic log files and reset the SVO card to factory defaults.

Key limits

- The super user must exist before you can log in to the admin plane.
- The deployment supports only IPv4 address configuration.
- Only one ROADM Cisco Optical Site Manager instance can exist; subsequent instances must use the OLA, DGE, or TXP type.

- Resetting the SVO card removes all containers and configurations.

Log in to the admin plane

Use this task to sign in to the Cisco Optical Site Manager admin plane so that you can access and manage Cisco Optical Site Manager instances.

Use this task to access the Cisco Optical Site Manager admin plane.

Only the super user can log in to the admin plane.

Create the super user account before you log in.

Before you begin

Ensure that the super user account is created. See Create the admin user.

Procedure

1. In a web browser, enter the admin plane URL: *https://IP_address/login*.
2. Enter the username in the **Username** field.
3. Enter the password in the **Password** field.
4. Click **Login**.

The **COSM Instances** page opens.

Admin Plane home page

This topic explains admin plane home page in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

This topic explains admin plane home page in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

Side menu items

In the Cisco Optical Site Manager Admin Plane home page, the menu items are present in the left panel. The menu items allow you to monitor and troubleshoot Cisco Optical Site Manager instances, view certificates, and restart admin plane. The following list describes the menu items.

- **Instances**–Create, edit, and monitor Cisco Optical Site Manager instances.
- **Diagnostics**–Download log files to troubleshoot Cisco Optical Site Manager instances.
- **Networks**–Configure networks and assign IP addresses.
- **Certificates**–View and renew the self-signed admin plane certificates.
- **Statistics**–Monitor and download collected memory allocation and usage details for each Cisco Optical Site Manager instance.
- **Tools**
  - **Utilities**–Restart the admin plane, reset of SVO-LC card to factory defaults, and reset and erase all data to prepare the system for a fresh installation.
  - **Properties**–Configure admin plane properties, including monitor timeout and file transfer timeout.

- **Scripts**–Create and manage custom scripts that extend the admin plane by adding UI and REST actions, validations, data exports, event-driven tasks, and scripted HA services.
- **Users**–Create and manage user accounts for the Cisco Optical Site Manager Admin Plane.

Bell icon (HA status)

The icon on the top right of the Cisco Optical Site Manager home page indicates the status of high availability network (primary link) and devices network (secondary link). The icon statuses are:

- **Green**–Both the primary and secondary links are up. High availability is working successfully.
- **Yellow**–A warning that the primary link is up but the secondary link is down.
- **Red**–There are two cases:
  - **Small red icon**–The primary link is down but the admin planes are able to communicate because the secondary link is up.
  - **Large red icon**–Both the primary and secondary links are down and the server is functioning in standalone mode.

User profile icon

The user profile icon displays the username and the log out option for the user to exit the current Cisco Optical Site Manager session.

User management features in the Admin Plane

This topic explains how user management profiles organize access and authorization in the Admin Plane for Cisco Optical Site Manager platforms.

Starting with Release 26.1.1, the Cisco Optical Site Manager Admin Plane supports a multi-user, multi-session environment. While a single Superuser is defined during the initial installation and retains full administrative privileges, you can now add multiple additional users to the system. Each of these users is assigned a predefined profile that dictates their specific access rights, ensuring consistent and secure authorization management.

> **Note**
>
> For the user management feature to take effect, you must update the card controller when you upgrade from Release 25.1.1 to 26.1.1 from the COSM node that is onboarding the NCS 2000 device where the SVO-LC is inserted. Refer to Activate NCS 1000 and NCS 2000 device software.

Table 18: Feature History

Feature Name	Release Information	Feature Description
Admin Plane user management enhancements	Cisco NCS 2000 26.1.1	The Admin Plane in Cisco NCS 2000 has been enhanced to support improved multi-user management and authorization capabilities. The new features include: • Multiple users can be defined in addition to the Superuser. • Different users can be logged in to the Admin Plane simultaneously (multi-user / multi-session). • Each user is associated with a predefined profile that grants specific authorizations. • Available profiles include Admin, Operator, and Viewer, each with tailored permissions.

Limitations of user management

Consider these important limitations when managing users on the SVO-LC platform.

- Created users exist only on the SVO-LC host that runs the Admin Plane.
- There is no automatic alignment of users between two Admin Planes in HA. Because each SVO-LC operates as a separate server, you must create and manage users independently on each card.
- The “Reset to Factory” and “Reset to Install” operations also delete user data.

Create and manage user accounts in Admin Plane

Use this procedure to create user accounts in the Admin Plane to assign different levels of system access based on roles such as Admin, Operator, or Viewer.

This task enables administrators to create new user accounts in the Admin Plane, allowing for secure and role-based access to the system. By assigning appropriate roles, Admin, Operator, or Viewer.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane

Log in as the super user to create the first admin user. Subsequently, you can log in as the admin user to create additional users.

Procedure

1. Click **Users** in the left panel.

   The **Users Management** panel appears. This panel is available only to the Admin users.

2. Click the + icon.
3. In the **Create Users** dialog box:
   a) Enter the **Username**, **Password**, and **Confirm Password**.
   b) From the **Profile** drop-down list, select the appropriate profile.
      - ADMIN: Manages system-wide settings and user accounts with full privileges. This user can create, delete, and reset passwords for all users.
      - OPERATOR: Manages COSM virtual nodes on the SVO-LC instance, including creation, deletion, and memory configuration. This user can also create, delete, edit memory, restart, and perform switchovers on COSM instances.
      - VIEWER: Accesses system information with read-only permissions. No operations or modifications are permitted.

   c) Click **Submit**.

   Note

   Once a profile is assigned to a user, it cannot be changed.

   The user account is created, and the new user appears in the Users Management panel with the assigned profile.
4. (Optional) Click the **Delete** icon in that row to delete a user account.
5. (Optional) Click the **Password reset** icon in that row. Then enter and confirm the new password.

Cisco Optical Site Manager instances

This topic describes Cisco Optical Site Manager instances, including their properties, lifecycle operations, and management using the admin plane. It also explains how to create, modify, monitor, and troubleshoot instances in high-availability deployments.

A Cisco Optical Site Manager instance is a virtualized software representation of a physical NCS 2000 optical network node, deployed within the SVO (Shelf Virtualization Option) card model to manage and control optical network elements such as ROADM and OLA.

Each Cisco Optical Site Manager instance operates in a high-availability (HA) setup, where it runs as

- an active instance on one server, and
- a standby instance on a peer server,

ensuring redundancy and service continuity. These instances communicate over primary (HA network) and secondary (devices network) links and can automatically or manually switch roles (active/standby) to maintain connectivity with managed devices.

Cisco Optical Site Manager instances details

A Cisco Optical Site Manager instance is a software virtualization of the physical NCS 2000 node that has been configured to manage.

In a SVO card model, you can configure these Cisco Optical Site Manager instances:

Table 19: Number of instances supported

Instance Type	Number of Instances Supported
ROADM and OLA	15

You can create, update and delete Cisco Optical Site Manager instances using the admin plane. Each Cisco Optical Site Manager instance runs as an active instance on one server and as a standby instance on the other server. It is also possible to manually switch the roles of the Cisco Optical Site Manager instance between active and standby.

The peer admin planes that are running on the local and remote server respectively have two intercommunication links, one through the HA network (primary link) and the other through the devices network (secondary link).

The table displays the Cisco Optical Site Manager instances that were created. Each row has two entries relating to the local and remote SVO card or server. In each row, the first entry is the local instance and the second entry is the remote instance. The details are:

- **Name**–Name of the Cisco Optical Site Manager instance.
- **IP Address**–The IP address of the Cisco Optical Site Manager instance. It is IPv4 for the SVO card model.
- **SW version**–SW version on the server.
- **State**–State of the Cisco Optical Site Manager instance.
- **App State**–State of the Cisco Optical Site Manager application that is running on the Cisco Optical Site Manager instance.
  - During a manual switching process, the **App State** field displays different statuses such as SWITCHING, SWITCH_DONE, or UP.
  - The **App State** field displays ACTIVATING or ACTIVATE_RESTART only after the Cisco Optical Site Manager web UI has requested the admin plane to orchestrate the activation process.
- **Role** –Role of the Cisco Optical Site Manager instance. The roles are ACTIVE, STANDBY, NONE, and UNKNOWN. In case of issues or specific Cisco Optical Site Manager states, special tags are displayed such as NOT_RESPONDING, STARTING,STOPPED, or BAD_CLUSTER.

  Note

  The green icon indicates the reachability of the Cisco Optical Site Manager instance to the connected NCS 2000 device. If the active Cisco Optical Site Manager instance is unable to reach the NCS 2000 device due to a network segregation, it performs an auto-switch.

- **Up Time**–Up time of the Cisco Optical Site Manager instance.
- **Type**–Label for the Cisco Optical Site Manager instance.
- **Action**–A set of actions can be performed on the Cisco Optical Site Manager instance:

- **Details of the Cisco Optical Site Manager instance–**Click this icon to view the summary of the local and remote Cisco Optical Site Manager instance.
- **Edit Cisco Optical Site Manager Instance**–Click this icon to edit the memory size of the Cisco Optical Site Manager instance.
- **Switch Cisco Optical Site Manager Instance**–Click this icon to manually switch the Cisco Optical Site Manager instance between servers.

> **Note**
>
> A switch operation is possible only if both the Cisco Optical Site Manager instances are up and running and the role of the instances are Active and Standby.

- **Delete Cisco Optical Site Manager Instance**–Click this icon to delete an Cisco Optical Site Manager instance.

> **Note**
>
> This icon is disabled when a switch operation is in progress.

Create a Cisco Optical Site Manager instance

Use this task to create a Cisco Optical Site Manager instance in the admin plane so that you can manage the required network element.

Use this task to create a Cisco Optical Site Manager instance on the Admin Plane.

Complete this task after network configuration is complete and required resources are available.

Before you begin

- Log in to the admin plane on page 90
- Verify that the High Availability (HA) link between the two Admin planes is operational so that any container memory changes made on the active instance are automatically reflected on the standby instance.

Procedure

1. Click the + button at the top-left of the **COSM Instances** page.

   The **COSM Instance Configuration** page appears.

2. In the **General Info** section, perform these steps:
   a) Enter the name for the new Cisco Optical Site Manager instance in the **Name** field.

      The name is mandatory and must be unique among the Cisco Optical Site Manager instances managed by the admin plane. It can contain a minimum of two characters and a maximum of 64 characters. It can include numbers, uppercase letters, lowercase letters, dashes (-), or underscores (_).

   b) Choose the version from the **Software Version** drop-down list.

c) Choose the type of the Cisco Optical Site Manager instance from the **TDM Terminology** drop-down list.

The two options are ANSI and ETSI.

d) Choose the label of the Cisco Optical Site Manager instance from the **Type** drop-down list.

> **Note**
>
> When **Type** is selected, a default value for memory size is displayed in the **Reserved Memory GB** field.

e) Choose the memory size to be allocated to the Cisco Optical Site Manager instance from the **Profile** drop-down list **Reserved Memory GB** field.

Ensure the High Availability link between the two Adminplanes is properly operating before editing COSM container memory. This guarantees that the configuration change is applied to both containers simultaneously.

> **Note**
>
> In addition to the reserved memory, Cisco Optical Site Manager solution automatically sets the Limit Memory with a threshold value of 2 GB higher than the configured reserved memory. This threshold acts as a buffer to absorb the temporary peak memory requirements. Docker engine kills the operations that cross the Limit Memory threshold due to Out-of-Memory (OOM).
>
> If the reserved memory is alloted more than the server or VM memory, the docker engine fails the allocation. Allocate only up to 80 percent of the server or VM memory for the Reserved Memory.

3. In the **Admin User** section, perform these steps:
   a) Enter the username in the **Username** field.

   The values "admin," "oper," "private," or, "public" cannot be used as the admin username.

   b) Enter the password in the **Password** field.

   The password must be a minimum of eight characters. The password must contain at least an uppercase letter a number, and a special character. The special characters supported are ! $ % ^ ( ) [ ] _ - ~ { } . +

   c) Enter the password again in the **Retype Password** field.
4. In the **Management Network** section, the system suggests the management subnets to be used in the **IPv4 Address** fields, depending on the type of addressing defined during the installation. The system checks for constraints defined in the network configuration file and ensures that the IP addresses that are assigned are not in use.
   a) Enter the IPv4 Address in the **IPv4 Address** field in a SVO card model.
5. Click **Create**.
   A message is displayed indicating the creation of the Cisco Optical Site Manager instance.
6. Click **OK**.
   The Cisco Optical Site Manager Instances page appears. The table displays the new Cisco Optical Site Manager instance.

The Cisco Optical Site Manager instance can now be accessed through a web browser.

View the details of a Cisco Optical Site Manager instance

Use this task to view the details of a Cisco Optical Site Manager instance in the Cisco Optical Site Manager admin plane.

Use this task to view details of a Cisco Optical Site Manager instance.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click the **Details** icon under the **Actions** column corresponding to the the Cisco Optical Site Manager instance you want to view.
   The **COSM Instance Details** page is displayed. See Cisco Optical Site Manager instance details on page 98.
2. Click the heartbeat icon next to the desired instance to view the runtime status of the instance.

   The **COSM Runtime Status** page is displayed.
3. Expand the related sections to view the details of the Cisco Optical Site Manager instances.

   The sections are **NCS Status**, **HA Agent**, and **NCS Launcher**.
4. Click the hyperlink above the expandable sections to view the details as a plaint text in a new window.

The instance details are displayed.

Edit the instance memory allocation

Use this task to edit the memory allocation for a Cisco Optical Site Manager instance in the admin plane.

Use this task to edit the memory profile of a Cisco Optical Site Manager instance.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click the **Edit COSM Instance** icon under the **Actions** column corresponding to the instance you want to edit.
   The **COSM Instance Edit** page is displayed.
2. Specify the memory in the **Reserved Memory GB** field.
3. Click **Edit**.

The instance memory allocation is updated.

Switch Cisco Optical Site Manager instances

Use this task to switch Cisco Optical Site Manager instances when you need to change the active and standby roles.

Use this task to switch active and standby Cisco Optical Site Manager instances.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click the **Switch COSM Instance** icon under the **Actions** column corresponding to the instance you want to switch.
   A warning message is displayed prompting you to confirm instance switch.
2. Click **Confirm**.

   During the switching process, the **App State** field displays different statuses such as SWITCHING, SWITCH_DONE, and UP. The **Role** field displays NONE, ACTIVE, and STANDBY.

The instance switchover starts.

Delete a Cisco Optical Site Manager instance

Use this task to delete a Cisco Optical Site Manager instance from the admin plane when the instance is no longer required.

Use this task to delete a Cisco Optical Site Manager instance from the Admin Plane.

Delete an instance only after confirming it is no longer required for operations.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click the **Delete** button under the **Actions** column corresponding to the Cisco Optical Site Manager instance you want to delete.
   A confirmation message is displayed.
2. Click **Confirm**.

The Cisco Optical Site Manager instance is deleted.

Cisco Optical Site Manager instance details

This topic explains cisco Optical Site Manager Instance Details in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

The Cisco Optical Site Manager Instance Details page is a user interface that displays the property information of both local and remote Cisco Optical Site Manager instances.

- Shows properties for both local and remote Cisco Optical Site Manager instances.
- Includes an Admin & Troubleshooting property with action icons for both instances.
- Action icons enable troubleshooting and management of Cisco Optical Site Manager instances.

Admin and troubleshooting actions

The admin amd troubleshooting property provides a set of action icons for both Cisco Optical Site Manager instances. These icons allow you to perform troubleshooting and management actions.

Table 20: Action icons for Cisco Optical Site Manager instances

Icon	Icon Name	Description
	**Get local COSM runtime status**	Click this icon to extract detailed information about the runtime status of both local and remote Cisco Optical Site Manager applications.
	**Restart local COSM container**	Click this icon to restart the target Cisco Optical Site Manager container.
	**Delete local COSM container**	Click this icon to delete the target Cisco Optical Site Manager container.
	**Force active local COSM container**	Click this icon to force the local Cisco Optical Site Manager container to become the active instance if high availability is not working.

Retrieve the runtime status of an instance

Use this task to retrieve the runtime status of an instance in the Cisco Optical Site Manager admin plane.

Use this task to retrieve runtime status for a Cisco Optical Site Manager instance.

Procedure

1. Click the heartbeat icon next to the required instance.

   The **Cisco Optical Site Manager Runtime Status** page is displayed.

2. Expand the related sections to view the details of the Cisco Optical Site Manager instances.

   These sections are dispalyed:

   - NCS Status
   - HA Agent
   - NCS Launcher

3. Click the hyperlink above the expandable sections to view the details in a separate window as plain text.

The runtime status details are displayed.

Restart the local instance

Use this task to restart the local Cisco Optical Site Manager instance from the admin plane when troubleshooting requires it.

Use this task to restart a local or remote Cisco Optical Site Manager container.

Procedure

Click the **Restart local COSM container** (reload) icon.

You are redirected to the Cisco Optical Site Manager Instances page.

The Cisco Optical Site Manager instance reloads.

You are redirected to the **COSM Instances** page. The COSM instance restarts.

Delete the local container

Use this task to delete the local Cisco Optical Site Manager container from the admin plane when it is no longer required.

Use this task to delete a local Cisco Optical Site Manager container.

Procedure

---

1. Click the **Delete local COSM container** (trashcan) icon.

   A warning message is displayed.
2. Click **Confirm**.

   A success message is displayed.
3. Click **OK**.

   You are redirected to the **COSM Instances** page.

The local Cisco Optical Site Manager container is deleted.

Force activate the local instance

Use this task to force activate the local Cisco Optical Site Manager instance when a manual role change is required.

Use this task to force a local Cisco Optical Site Manager container to active state.

Procedure

Click the **Force active local COSM container** icon.

You are redirected to the **COSM Instances** page. The status of the local instance changes from NONE to ACTIVE.

Download diagnostic log files

Use this task to download admin plane diagnostic log files so that you can review troubleshooting data for the deployment.

Use this task to download Admin Plane diagnostic log files.

Before you begin

Log in to the admin plane on page 90

Procedure

---

1. Click **Diagnostics** in the left panel.

   The **Diagnostics** page appears.

2. Click the **Download Log Files** button.

   A zip file that contains the admin plane logs is downloaded.

A zip file that contains the admin plane logs is downloaded.

View certificate

Use this task to view certificate details in the Cisco Optical Site Manager admin plane and renew the certificate when required.

Use this task to open the Certificates page and review the admin plane certificate details.

The Certificates page displays the certificate details.

Lifetime of self-signed admin plane certificates can be extended by five years. In HA deployments, run the renewal individually for each admin plane application.

Before you begin

Log in to the admin plane. See Log in to the admin plane on page 90.

Procedure

1. Click **Certificates** in the left panel.
2. If you need to renew the certificate, click **Renew Certificate**.

   Note

   Renewing the certificate requires restarting the admin plane container. The operation is blocked if any orchestrated operation is running on the admin plane, such as software download.

The Certificates page displays the admin plane certificate details. If you renew the certificate, the certificate lifetime is extended.

View and renew the certificate

Use this task to view the admin plane certificate details and renew the certificate when required.

Use this task to view and renew Admin Plane certificates.

Before you begin

Log in to the admin plane on page 90.

Procedure

1. Click **Certificates** in the left panel.

   The **Certificates** page displays the certificate details.

2. If you need to renew the certificate, click **Renew Certificate**.

The Certificates page displays the certificate details. If you renew the certificate, the certificate lifetime is extended.

Generate and apply certificates

Certificates are required to enable security protocols for Cisco Optical Site Manager. Use this task to generate a self-signed certificate or upload your own certificate.

Before you begin

Log into Cisco Optical Site Manager .

Procedure

1. Click **Users & Access** in the left panel.

   The **Users & Access** page is displayed.
2. Click the **x509 Certificates** tab.
3. Click to expand the **Certificates Configuration** section.
4. To automatically generate and apply certificate, click **Auto Generate & Apply Certificate** .
5. To manually generate and apply certificates, perform these steps:
   a) In the **Certificate file** field, click the **Select Files** to select a certificate file in *.crt* , *.cert* , or *.cer* formats.
   b) In the **Key file** field, click the **Select Files** to select a key file in *.key* format.
   c) Click **Apply** to upload and apply the certificate.

Cisco Optical Site Manager instances statistics

This topic explains cisco Optical Site Manager Instances Statistics in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

This topic explains cisco Optical Site Manager Instances Statistics in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

Cisco Optical Site Manager instances statistics details

Cisco Optical Site Manager instances statistics table is a collection of memory resource details for each Cisco Optical Site Manager instance. The table periodically collects details such as allocation and consumption of memory for each Cisco Optical Site Manager instance. The statistics table is similar to the Cisco Optical Site Manager instances table with a **Memory** column.

You can view and download the statistical data of the Cisco Optical Site Manager instances using the icons in the **Actions** column. Each Cisco Optical Site Manager instance runs as an active instance on one server and as a standby instance on the other server.

The table displays the created Cisco Optical Site Manager instances and the associated memory details. Each row has two entries relating to the local and remote SVO card or server. In each row, the first entry is the local instance and the second entry is the remote instance. The details are:

- **Name**–Name of the Cisco Optical Site Manager instance.

- **IP Address**–The IP address of the Cisco Optical Site Manager instance. It is IPv4 for the SVO card model, and IPv4 for the external server model.
- **SW version**–SW version on the server.
- **Role**–Role of the Cisco Optical Site Manager instance.

> **Note**
>
> The green icon indicates the reachability of the Cisco Optical Site Manager instance to the connected NCS 2000 device. If the active Cisco Optical Site Manager instance is unable to reach the NCS 2000 device due to a network segregation, it performs an auto-switch.

- **Type**–Label for the Cisco Optical Site Manager instance.
- **Memory (GB) Min/Max/Actual**–Minimum and maximum memory allocated for each instance and actual memory utilized by each instance.
- **Actions**–A set of actions performed on the Cisco Optical Site Manager instance. The actions are:
  - **Memory Statistics Graph**–Click this icon to view the summary of the local and remote Cisco Optical Site Manager instance.
  - **Download Local Statistics File**–Click this icon to download all the statistics files of the local Cisco Optical Site Manager instance as a zip package.

View the memory statistics graphical summary

Use this task to view the memory statistics graphical summary for a Cisco Optical Site Manager instance in the admin plane.

Use this task to view memory statistics for local and remote instances in graphical format.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click **Statistics** in the left panel.

   The **Statistics** page appears.

2. Click **Memory Statistics Graph** for an Cisco Optical Site Manager instance.

   The **Cisco Optical Site Manager Instance Memory Statistics** page appears displaying memory statistics for both local and remote instances.

> **Note**
>
> The **Memory Statistics** graph displays a fine-grained collection of memory usage of the Cisco Optical Site Manager instance in the last few days. Memory limits defined at creation time are also displayed for reference. The **Historical Daily Statistics** graph displays the daily memory details such as average memory usage and maximum memory usage of the Cisco Optical Site Manager instances since creation.

3. (Optional) Click the calender icon to view the statistics for the required period.
4. Click the table icon to export the data as plain text in a new window.

The memory statistics graphical summary is displayed.

Download local instance memory files

Use this task to download local instance memory files from the Cisco Optical Site Manager admin plane for troubleshooting and analysis.

Use this task to download memory files for local Cisco Optical Site Manager instances.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click **Statistics** in the left panel.

   The **Statistics** page appears.
2. Click **Download Local Statistics File** for an Cisco Optical Site Manager instance.

   A confirmation message appears.
3. Click **OK**.

   The statistics files for the local Cisco Optical Site Manager instance downloads as a zip package.

The local instance memory file is downloaded.

Admin Plane utilities

Use this task to reset the SVO card to factory defaults or restart the admin plane when maintenance requires it.

Use this task to reset the SVO card to factory defaults or restart the Admin Plane or reset to install the SVO card.

Before you begin

Table 21: Feature History

Feature Name	Release Information	Description
Reset To Install	Cisco NCS 2000 Release 26.1.1	The new **Reset To Install** feature enhances the existing **Reset To Factory Default** feature. It allows you to reset and reconfigure an SVO card without requiring a full factory reset. This feature preserves your currently running and previously downloaded software images, helping you resolve networking or installation issues while minimizing downtime and eliminating the need to re-download or reinstall software.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click **Tools** in the left panel and select **Utilities**.

   The **Utilities** page appears.

2. Perform one of the following steps:

   - Click **Reset to Factory Default** to reset the SVO card to the factory defaults.

     ⚠ **Caution**

     All the instances and configurations available on the SVO card are erased.

   - Click **Restart Admin Plane** to restart the admin plane.

     ⚠ **Caution**

     Restarting admin plane may interrupt any running procedure.

   - Click **Reset To Install** to reset or reconfigure an installed SVO card. This preserves the latest running software image and retains all installed software images in both the software directory and docker repositories.

   A **Warning!** dialog box appears.

3. Click **Confirm**.

The selected operation starts.

Modify admin plane properties

Use this task to modify admin plane properties so that you can update the required runtime settings for the deployment.

Use this task to modify Admin Plane properties.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click **Tools** in the left panel and choose **Properties**.

   The **Properties** page appears to display the admin plane properties, current values, and edited values.

   Table 22: Properties table

Label	Description
Property	Displays the customizable admin plane properties
Current Value	Displays the current values of each admin plane property
Edited Value	This field is editable. Enter the values for the admin plane properties.

2. To modify the values for the admin plane properties, perform one of the following actions:

   Tip

   When you hover over a property, a tooltip appears to explain the property purpose.

   - In **Edited Value**, enter the needed values for the properties that you want to customize.
   - Click **Reset to default** to restore the default settings for all the properties.

3. Click **Apply** to apply the modified values.

   A **Warning!** message appears.

4. Click **Continue**.

   A **Success!** message appears.

5. Click **OK**.
6. Restart the admin plane to commit the modified values in the properties files. See Admin Plane utilities on page 104.

   Remember

   Modified properties are not automatically propagated to the peer server. Make the same changes on the peer server to align the properties files with the host server.

The modified admin plane property values are saved.

Custom scripts

This topic explains custom Scripts in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

This topic explains custom Scripts in the Cisco Optical Site Manager admin plane. It describes key behavior, required inputs, and operational considerations so you can understand the feature before configuration, monitoring, or troubleshooting.

Custom scripts details

Custom scripts are quick solutions that are specific to each feature. The scripts provide access to the full application object model to extend the capabilities of the admin plane at runtime

The custom scripts let you do the following actions and more:

- Add UI- and REST-based custom actions
- Define in a declarative way web input forms for action parameters
- Export data in different text formats
- Add custom validation logic, for example, when creating a new Cisco Optical Site Manager instance
- Perform custom tasks on application events, for example, when the HA role changes
- Define scripted HA services that can communicate through the Admin Plane GRPC channels

The scripts table displays the added scripts and the relevant script details. The following list describes the table items.

- **Name**–Name of the custom script
- **Type**–Type of the custom script
- **Target**–Target GUI of the Cisco Optical Site Manager admin plane
- **Status**–Status of the custom script
- **Version**–Version of the custom script added
- **Lifetime**–Duration of the script in the admin plane in **dd:hh:mm:ss** format
- **Action**–Action to delete the added script

Add custom scripts

Use this task to add custom scripts in the Cisco Optical Site Manager admin plane so that you can extend available admin plane actions.

Use this task to add custom scripts to the Admin Plane.

Before you begin

Log in to the admin plane on page 90

Procedure

1. Click **Scripts** in the left panel.

   The Scripts page appears.

2. Click **Add new Cisco Optical Site Manager script**.

   An explorer window opens.

3. Select a custom script and click **Open**, for example, **importInstancesCSV** file.

   A Success message appears.

4. Click **OK**.

   The **importInstancesCSV** script is added to the scripts table.

5. Check the Cisco Optical Site Manager Instances table in the admin plane for the **Import CSV** button.

   The **Import CSV** button allows you to import the Cisco Optical Site Manager instances using a CSV file.

The custom script is added to the scripts table and is available in the admin plane.

8 NCS 2000 node upgrades to Cisco Optical Site Manager

Topics:

- Prerequisites for adding NCS 2000 nodes and SVO line cards with Cisco Optical Site Manager
- Upgrade NCS 2000 nodes hosting SVO line cards
- NCS 2000 node upgrade issues in Cisco Optical Site Manager

This topic explains the procedure to upgrade NCS 2000 nodes from supported 11.x SSON releases to R25.1.1 and transition node management from CTC to Cisco Optical Site Manager in a non-traffic-affecting sequence.

A NCS 2000 node upgrade is a software upgrade procedure that

- transitions NCS 2000 node management from CTC to Cisco Optical Site Manager,
- upgrades supported SSON releases (R11.1.1.4, R11.1.2.3, R11.1.3, R11.1.3.1, and R11.1.3.2) to R25.1.1, and
- performs a non-traffic-affecting upgrade when executed in the required order.

The upgrade standardizes the node software to R25.1.1 and allows management of NCS 2000 nodes in the Node view of the Cisco Optical Site Manager application.

Table 23: Feature History Table

Feature Name	Release Information	Feature Description
NCS 2000 Node upgrade	R25.1.1	The NCS 2000 nodes are upgraded to R25.1.1 to transition NCS 2000 node management from CTC to Cisco Optical Site Manager. With this upgrade, you can manage the NCS 2000 nodes in the Node view of the Cisco Optical Site Manager application.

Supported SSON releases for upgrade to R25.1.1

The list of SSON releases that are supported for upgrade to R25.1.1 SSON are:

- R11.1.1.4
- R11.1.2.3
- R11.1.3
- R11.1.3.1
- R11.1.3.2

NCS 2000 node upgrade sequence

The node upgrade is a non-traffic-affecting operation and must be performed in this order:

1. Upgrade the NCS 2000 node from an 11.x release using CTC.
2. Install and configure the SVO line card.
3. Launch Cisco Optical Site Manager via the SVO line card admin plane and onboard the NCS 2000 device hosting the SVO line card(s).
4. (Optional) Add other nodes, either NCS 2000 or NCS 1000 nodes, into the Cisco Optical Site Manager.

> **Tip**
>
> Perform the upgrade steps in the specified order to ensure a successful transition from CTC to Cisco Optical Site Manager.

Transitioning node management to Cisco Optical Site Manager

This example illustrates how node management transitions from CTC to Cisco Optical Site Manager during an upgrade to R25.1.1:

- A network runs NCS 2000 nodes on R11.1.3.
- The administrator upgrades the node to R25.1.1 using CTC.
- The administrator installs and configures the SVO line card.
- The administrator launches Cisco Optical Site Manager through the SVO line card admin plane.
- The administrator onboards the node.
- The node appears in the Node view.
- Management transitions from CTC to Cisco Optical Site Manager without affecting traffic.

Prerequisites for adding NCS 2000 nodes and SVO line cards with Cisco Optical Site Manager

This topic explains the prerequisites to add the NCS 2000 nodes to Cisco Optical Site Manager.

To successfully add NCS 2000 nodes and SVO line cards to Cisco Optical Site Manager, complete these prerequisites:

Pre-requisites for NCS 2000 upgrade

Complete these prerequisite checks and configurations in CTC before you upgrade NCS 2000 nodes and add them to Cisco Optical Site Manager:

- Ensure that the NCS 2000 node is **not** in Factory Defaults mode. The SVO line card fails to boot in this mode.
- Verify that each NCS 2000 node is configured as multishelf.
- Confirm that Rack IDs and Chassis IDs are set according to requirements on every NCS 2000 node.
- Enable SOCKS-proxy by selecting **Node View** > **Provisioning** > **Network** > **General** and then select the **Enable SOCKS-proxy only** check box.

  Note

  This configuration applies to all NCS 2000 nodes such as ROADM, OLA, and remote transponders.

- Run the node diagnostic and capture a snapshot.
- For any NCS 2000 Remote TXP nodes, adjust Rack IDs and Chassis IDs to prevent shelf overlap with the associated ROADM node. Set the Rack Number for the remote transponder node to be different from that of the ROADM node.

  Choose **Node View** > **Provisioning** > **General** > **Rack Layout Config** and click **Edit**.

  Note

  Set the Rack Number for the NCS 2000 remote transponder node that is different from the Rack Number of the NCS 2000 ROADM node to which you want to add the NCS 2000 remote transponder node.

Pre-requisites for Cisco Optical Site Manager

Complete these prerequisites before adding NCS 2000 SVO line cards to Cisco Optical Site Manager:

- Install the new SVO line cards. Refer to Install the SVO line card for more information.
- Define the SVO line card high availability configuration and its placement within the network. In high availability setups, upgrade both NCS 2000 nodes hosting the SVO line card.
- Plan Cisco Optical Site Manager node IP addresses according to SVO line card installation rules.

Upgrade NCS 2000 nodes hosting SVO line cards

Use this procedure to upgrade NCS 2000 nodes from R11.x to R25.1.1 to host SVO line cards, enable required OSPF and UDC settings, deploy Cisco Optical Site Manager, and onboard the nodes for management through the WebUI, including geo HA configurations.

Use this task to upgrade NCS 2000 nodes from R11.x to R25.1.1 so the nodes can host SVO line cards and be managed through Cisco Optical Site Manager WebUI.

- Upgrade the NCS 2000 node software and validate post-upgrade access in CTC.
- Enable required OSPF and UDC settings for SVO line card deployments, including geo HA.

Table 24: Feature History Table

Feature Name	Release Information	Feature Description
SSH upgrade	Release R25.1.1	When you upgrade to R25.1.1, the SSH and SSL libraries upgrade to the latest revisions that provide better security, addressing vulnerabilities. New versions Cisco Optical Site Manager supports after upgrade (25.x) CISCOSSL: 1.1.1y.7.3.377 (6/6/2024) CISCOSSH: 1.14.55

Use this task to upgrade the NCS 2000 nodes that will install a fresh R25.1.1 SVO line cards from R11.x to R25.1.1.

Note

If SVO line cards are present in the NCS 2000 nodes in the geo HA configuration, repeat this task on both NCS 2000 nodes.

Before you begin

Before you begin, ensure that you have access to the target NCS 2000 nodes and the required software packages, and that you can access Cisco Optical Site Manager Admin Plane and WebUI.

- Obtain the NCS2K-S-package for R25.1.1.
- Ensure that you can access the node using CTC and that you have the required credentials for node and SVO line card onboarding.
- For geo HA deployments, ensure that both adjacent NCS 2000 nodes are available for configuration.

Procedure

1. Upgrade the NCS 2000 nodes to R25.1.1.

   After upgrade, reopen CTC and clear cached data because this is a major release upgrade.

a) Download and activate the NCS2K-S-package for R25.1.1.

For more information on the software activation, refer to *Cisco NCS 2000 Series Upgrade Guide*.

> **Note**
>
> While the NCS 2000 nodes upgrade to R25.1.1, both Active and Standby controller cards perform an additional boot during the upgrade.

b) Reopen CTC in the R25.1.1 node.
c) Delete the cache option on the login window.

> **Note**
>
> The CTC R25.1.1 will now have some panels disabled as some node management will be performed via the Cisco Optical Site Manager WebUI.

2. In CTC, configure required OSPF and UDC settings.

a) Enable OSPF on LAN.

This setting is required on the NCS 2000 node that is hosting the SVO line card irrespective of any HA configuration. The **LAN Port Area ID** value is the same as the **ospf-area-id** value in the network configuration YAML file that is used to install the SVO line card.

1. In Tab View, go to **Provisioning** > **Network** > **OSPF**.
2. In the **OSPF on LAN** pane, enable the **OSPF active on LAN** check box.

b) Enable UDC on the controller card that connects to the other NCS 2000 node.

The SVO line cards in geo HA configuration use the UDC ports. Enable UDC on both adjacent NCS 2000 nodes.

1. In Tab View, go to **Provisioning** > **UDC/VOIP**.
2. In the **UDC/VOIP** pane, select **UDC** for the available **Service Type**.

3. Install the SVO line card. See Install the SVO line card.

a) Plug in the first SVO line card into the NCS 2000 node with proper cabling.
b) Install the second SVO line card in high availability configuration.

> **Note**
>
> For the geo HA configuration, install the SVO line cards in two different NCS 2000 nodes.

Two NCS 2000 nodes are upgraded with two SVO line card ready to configure the Cisco Optical Site Manager application.

The CTC view of the SVO line card will be a double slot line card with the name reported.

4. Connect to Cisco Optical Site Manager Admin Plane WebUI. For more information, refer to Cisco Optical Site Manager Admin Plane.

   Note

   In the geo HA configuration, there are two SVO line cards. Each SVO instance has its own IP address. You can connect to one of the two instances for the initial Cisco Optical Site Manager application setup.

5. Create a Cisco Optical Site Manager instance using the Admin Plane WebUI. For more information, refer to Cisco Optical Site Manager Instances.

   Cisco Optical Site Manager application runs in a container environment via docker. This step requires settings used by the virtual environment.

6. Log in to the Cisco Optical Site Manager WebUI. For more information, refer to Log into Cisco Optical Site Manager.

   Note

   Use the *Username* and *Password* that you configured in Step 5 for Cisco Optical Site Manager instance creation.

   The Cisco Optical Site Manager WebUI opens in **Node Functional View**.

7. Create a Cisco Optical Site Manager Authorization Group for SVO line cards and NCS 2000 nodes.

   The *Authorization Group* defines the username and password that Cisco Optical Site Manager uses to connect to the SVO line card, NCS 2000 node, or remote device.

   a) Choose **Devices** > **Authorization Group**.

      1. For the SVO line card, Cisco Optical Site Manager creates the Authorization Group automatically. Edit the password field to enter the password of the added SVO line card.

         Note

         The SVO line card password is the password that you created during the SVO line card installation.

         Note

         SVO line card is considered as a separate device for the Cisco Optical Site Manager node although it is physically a line card plugged into the NCS 2000 node.

         In HA mode, both line cards are added to the *Authorization Group*.

      2. For the NCS 2000 node, refer to *Manage Authorization Groups*.

> **Note**
>
> After creating the Authorization Group, Cisco Optical Site Manager manages only one NCS 2000 node.

After you create the Authorization Group, all the SVO line cards, NCS 2000 nodes, and remote nodes appear in a list.

8. (Optional) Set the NTP server for Cisco Optical Site Manager WebUI.

   Cisco Optical Site Manager requires its own NTP server settings.

   a) Click the settings icon and then click **NTP**.

      You can either maintain the NTP settings on NCS 2000 device or remove them depending on your network choice.

If you decide to	then
maintain the NCS 2000 NTP settings	the Cisco Optical Site Manager node NTP setting affects only the Cisco Optical Site Manager application.
remove the NCS 2000 NTP settings	the Cisco Optical Site Manager application pushes the time information to the NCS 2000 node.

   b) Click **Edit** and update the NTP server settings.

9. Onboard the NCS 2000 node to Cisco Optical Site Manager WebUI.

   a) Choose **Devices** > **Devices** and click the **+** icon to add a device.

      In Cisco Optical Site Manager, a subtended network element (NCS 2000) is referred to as a device.

      The **Add Device** dialog box opens.

   b) Enter the device information.

Fields	Actions
Device Type	Select **ncs2000** from the drop-down list.
Device Flavor	**any-config** is the default option.
Device Name	Enter a name to identify the device in Cisco Optical Site Manager.
First Active Chassis UID	Leave this field blank for the first NCS2K device that you add to the Cisco Optical Site Manager node.
IP Address	Enter the IP address of the NCS2K node.
Auth Group	Select the Authorization Group that contains credentials for the NCS2K node.

> **Note**
>
> *Device Name* and *Device Flavor* cannot be changed afterwards unless you delete and re-add the device.

c) Click **Add**.

Device onboarding may take a few minutes.

10. Verify that the NCS 2000 device **Sync Status** is *sync completed, alarm-synchronized*.

If **Sync Status** has a different message, refer to the troubleshooting upgrades.

The NCS 2000 node is upgraded to R25.1.1 and managed by its Cisco Optical Site Manager application accessible via WebUI. Cisco Optical Site Manager represents the new view of the node as the Cisco Optical Site Manager node. The Cisco Optical Site Manager node is reachable via its IP address in the DCN planned for Cisco Optical Site Manager management. The Cisco Optical Site Manager node is ready to be imported into CONC.

What to do next

Upgrade the remaining NCS 2000 nodes in the network.

Upgrade the remaining NCS 2000 nodes

Learn how to upgrade the remaining NCS 2000 nodes to release R25.1.1 that do not host SVO line cards. Use this procedure to download and activate the NCS2K-S-package, enable Cisco Optical Site Manager WebUI management, and verify successful node onboarding and operation.

Use this task to upgrade NCS 2000 nodes that do not host SVO line cards, to release R25.1.1 and enable management through Cisco Optical Site Manager WebUI.

- Download and activate the NCS2K-S-package.
- Create and access a Cisco Optical Site Manager instance.
- Onboard and manage the upgraded nodes through the Cisco Optical Site Manager WebUI.

Table 25: Feature History Table

Feature Name	Release Information	Feature Description
SSH upgrade	Release R25.1.1	When you upgrade to R25.1.1, the SSH and SSL libraries upgrade to the latest revisions that provide better security, addressing vulnerabilities. New versions Cisco Optical Site Manager supports after upgrade (25.x) CISCOSSL: 1.1.1y.7.3.377 (6/6/2024) CISCOSSH: 1.14.55

Use this task to upgrade the remaining NCS 2000 nodes in the network that do not host the SVO line card.

The NCS 2000 nodes in this task do not have SVO line cards. However, they are connected to NCS 2000 nodes that have an operational SVO line card. Each SVO line card supports up to 15 Cisco Optical Site Manager nodes.

Before you begin

Follow these steps to upgrade the remaining NCS 2000 nodes.

Procedure

1. Upgrade the NCS 2000 node to release R25.1.1.

   For more information about software activation, see the Cisco NCS 2000 Series Upgrade Guide.

   During the upgrade to R25.1.1, both Active and Standby controller cards perform an additional boot.
2. Download and activate the NCS2K-S-package for release R25.1.1.
3. Reopen CTC on the R25.1.1 node.
4. Delete the cache from the login window.

   This step is required because R25.1.1 is a major release upgrade.

   Some CTC panels are disabled in R25.1.1 because node management is performed through the Cisco Optical Site Manager WebUI.
5. Log in to the Cisco Optical Site Manager Admin Plane WebUI.

   For more information, see Cisco Optical Site Manager Admin Plane.
6. Create a Cisco Optical Site Manager instance.

   The Cisco Optical Site Manager application runs in a containerized Docker environment and requires virtual environment configuration settings.

   For more information, see Cisco Optical Site Manager Instances.
7. Log in to the Cisco Optical Site Manager WebUI.

   Use the *Username* and *Password* configured during Cisco Optical Site Manager instance creation.

   For more information, see Log into Cisco Optical Site Manager.

   The Cisco Optical Site Manager WebUI opens in **Node Functional View**.
8. Create an Authentication Group for the NCS 2000 nodes.

   The *Authentication Group* defines the credentials that Cisco Optical Site Manager uses to connect to the NCS 2000 node.

   For more information, see Manage Authorization Groups.

   The NCS 2000 nodes appear in the Authorization Group list.
9. Onboard the NCS 2000 node to the Cisco Optical Site Manager WebUI.

   Repeat Steps 8 to 10 in Upgrade NCS 2000 Nodes Hosting SVO Line Cards to complete onboarding.

The NCS 2000 node is upgraded to release R25.1.1 and managed through the Cisco Optical Site Manager WebUI.

The node is represented as a Cisco Optical Site Manager node and is reachable through its IP address in the planned DCN for Cisco Optical Site Manager management.

The node is ready to be imported into Cisco Optical Network Controller.

Add an NCS 2000 remote TXP node to a Cisco Optical Site Manager

Learn how to add the remote transponder node to the Cisco Optical Site Manager.

Use this task to add an NCS 2000 remote TXP (transponder) node to an existing Cisco Optical Site Manager so that the remote transponder can be managed from the Cisco Optical Site Manager WebUI.

- Verify prerequisites and required identifiers (UIDs) before adding the device.
- Add the remote transponder as an *ncs2000* device with *txp-only* flavor in the Cisco Optical Site Manager WebUI.
- Ensure the device is added with a valid, unused chassis UID and the correct authentication group.

Use this task after the associated ROADM node is already present and managed, and you need to bring the remote transponder under the same Cisco Optical Site Manager node view.

Adding the remote TXP requires selecting the correct device type and flavor, and assigning a chassis UID that does not conflict with existing UIDs in Cisco Optical Site Manager.

- Verify available UIDs before you start the add-device workflow.

Follow these steps to add an NCS 2000 remote TXP node to a Cisco Optical Site Manager node.

Procedure

1. Upgrade the NCS 2000 transponder nodes to release R25.1.1.

   Repeat Step 1 from Upgrade NCS 2000 nodes hosting SVO line cards.
2. Log in to the Cisco Optical Site Manager WebUI using the credentials of the required Cisco Optical Site Manager instance.
3. Go to **Devices** > **Devices** > **Device Hardware Details** and verify the available UIDs.
4. Add the remote transponder node to the Cisco Optical Site Manager node.
   a) In the **Devices** tab, click **+** to add a device.

      The **Add Device** window opens.

   b) Select **Device Type** as *ncs2000* and **Device Flavor** as *txp-only*.
   c) Enter the **Device Name**, **First Active Chassis UID**, and **IP Address**.

      Verify the value of **First Active Chassis UID** is a not in use. The value must follow the sequence of free UIDs as the chassis UID for the remote transponder. If you enter an incorrect UID, wait for the device addition to complete. Then delete the device and repeat the steps.

   d) Select the required **Auth Group** and then click **Add**.

The NCS 2000 remote TXP node is added to the Cisco Optical Site Manager node and is available for management in the Cisco Optical Site Manager WebUI.

NCS 2000 node upgrade issues in Cisco Optical Site Manager

This topic explains how to identify and resolve common issues encountered during NCS 2000 node upgrades in Cisco Optical Site Manager, including rack number conflicts, authentication misconfigurations, out-of-sync status, and incorrect device settings.

NCS 2000 node upgrade issues in Cisco Optical Site Manager are problems with configuration or integration. These issues prevent proper device onboarding, synchronization, or visualization in the Cisco Optical Site Manager UI.

- These problems are typically caused by rack number conflicts, authentication misconfigurations, or incorrect device parameters.
- These issues affect how the device is represented, synchronized, or managed in Cisco Optical Site Manager.
- You can usually resolve these issues by correcting the configuration and re-adding the device.

Common upgrade and onboarding issues and their resolutions

Common issues during NCS 2000 upgrade and onboarding to Cisco Optical Site Manager are:

- remote TXP rack overlap in the UI,
- device synchronization status OUT-OF-SYNC, and
- incorrect device name or device flavor configuration.

The table provides a summary of each issue, its cause, and the resolution.

Table 26: NCS 2000 upgrade and onboarding troubleshooting

Issue	Cause	Resolution
Remote TXP nodes overlap in the UI	The Rack Number of the remote TXP matches an existing rack number, causing the chassis to appear in an occupied rack.	Delete the remote TXP device, correct the Rack Number in CTC, and add the device again.
Device Sync Status is OUT-OF-SYNC	Admin Plane credentials are not included in the Authentication Group for the SVO controller.	Edit the Authentication Group and add the required Admin Plane credentials.
Incorrect device name	The device name is used as a key in the device YANG models and cannot be modified after the device is added.	Delete the device and add it again with the correct device name.
Incorrect device flavor	The selected device flavor does not match the actual node type, affecting device behavior in Cisco Optical Site Manager.	Delete the device and add it again with the correct device flavor.

Note

You must delete and re-add the device after correcting configuration issues to ensure that the changes take effect.