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

***Table 1: Feature History***

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| 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.<br>The Geo HA Mode configuration in SVO-LCs ensures that redundancy is maintained if one of the NCS2000 nodes fails.<br>HA mode can be deployed in three modes:<br>• Local HA<br>• Geo HA using the UDC channel<br>• Geo HA between near-by NCS2000 nodes<br>The YAML file is updated to include the redundancy mode setting:<br>`redundancy-mode: "GEO_HA".` |

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# HA deployment modes

You can deploy HA in the different modes:

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

### Local HA (Local High Availability)

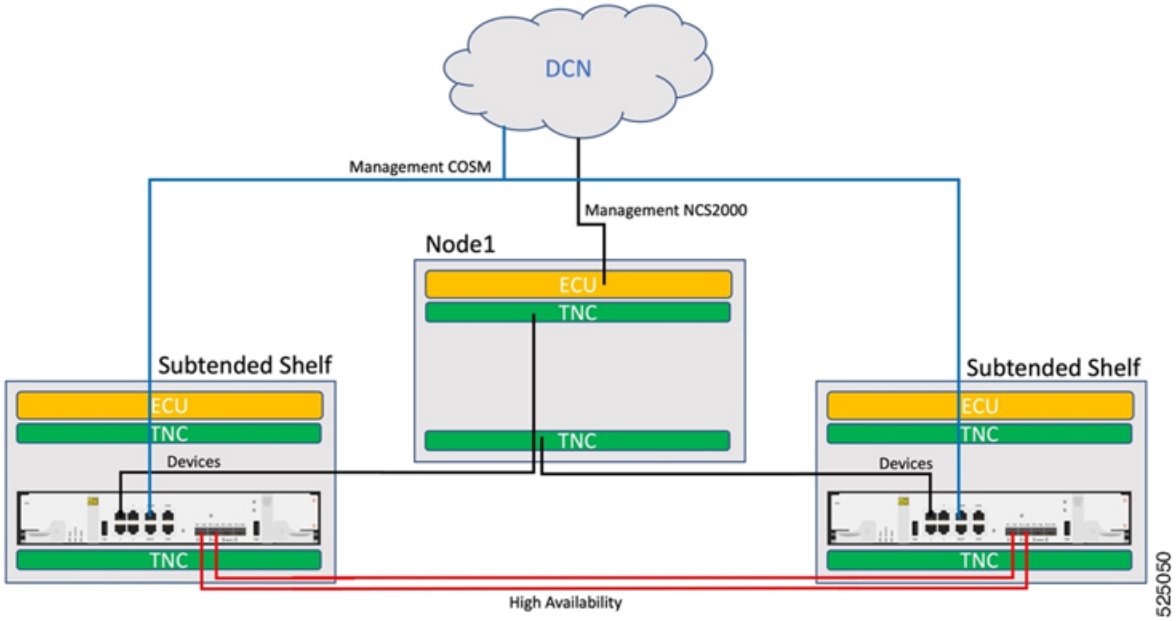
Local HA mode provides high availability by inserting two SVO-LCs into the same NCS2000 node. This setup ensures redundancy within a single node.

In Local HA mode, two SVO-LCs are installed within the same NCS 2000 node. It provides redundancy by using two SVO-LCs in the same NCS 2000 node and ensures high availability by enabling failover to the

standby SVO-LC in case of primary SVO-LC failure. Simplifies deployment by keeping all components within a single node.

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

***Figure 1: Local HA connection for NCS 2000 multishelf node***




The connection requirements for each SVO-LC are outlined below:

- Connect MGMT1 port to the customer Data Communication Network (DCN).
- Connect two optical fibers, necessitating the insertion of two pluggables into the SVO-LC card's HA1 and HA2 ports.
- Connect Port 1 to one TNC and peer SVO-LC port 1 connected to the other TNC.
- (Optional) Connect NCS 2000 ECU EMS connected to customer DCN (in case of multishelf, the ECU of master chassis), in case there is a specific requirement of direct accessibility of the NCS 2000 device.

### Geographic high availability

In Geo HA mode, two SVO-LCs are installed in separate NCS 2000 nodes. The high availability network between these SVO-LCs is transported through the User-Defined Channel (UDC) channel. Each SVO-LC runs a Cisco Optical Site Manager Admin Plane, managing its local line card and communicating with its peer on the other SVO-LC. A Cisco Optical Site Manager instance, representing a virtual network element (vNE), runs on both SVO-LCs, with one in Active state and the other in Standby state.

### Benefits of geo HA

Geo HA offers several benefits in terms of redundancy and network reliability:

- Utilizes two SVO-LCs located in separate NCS2000 nodes to provide robust redundancy.
- Utilizes the UDC channel or the SVO-LC optical pluggables to transmit high-availability data between adjacent nodes, ensuring uninterrupted operations.

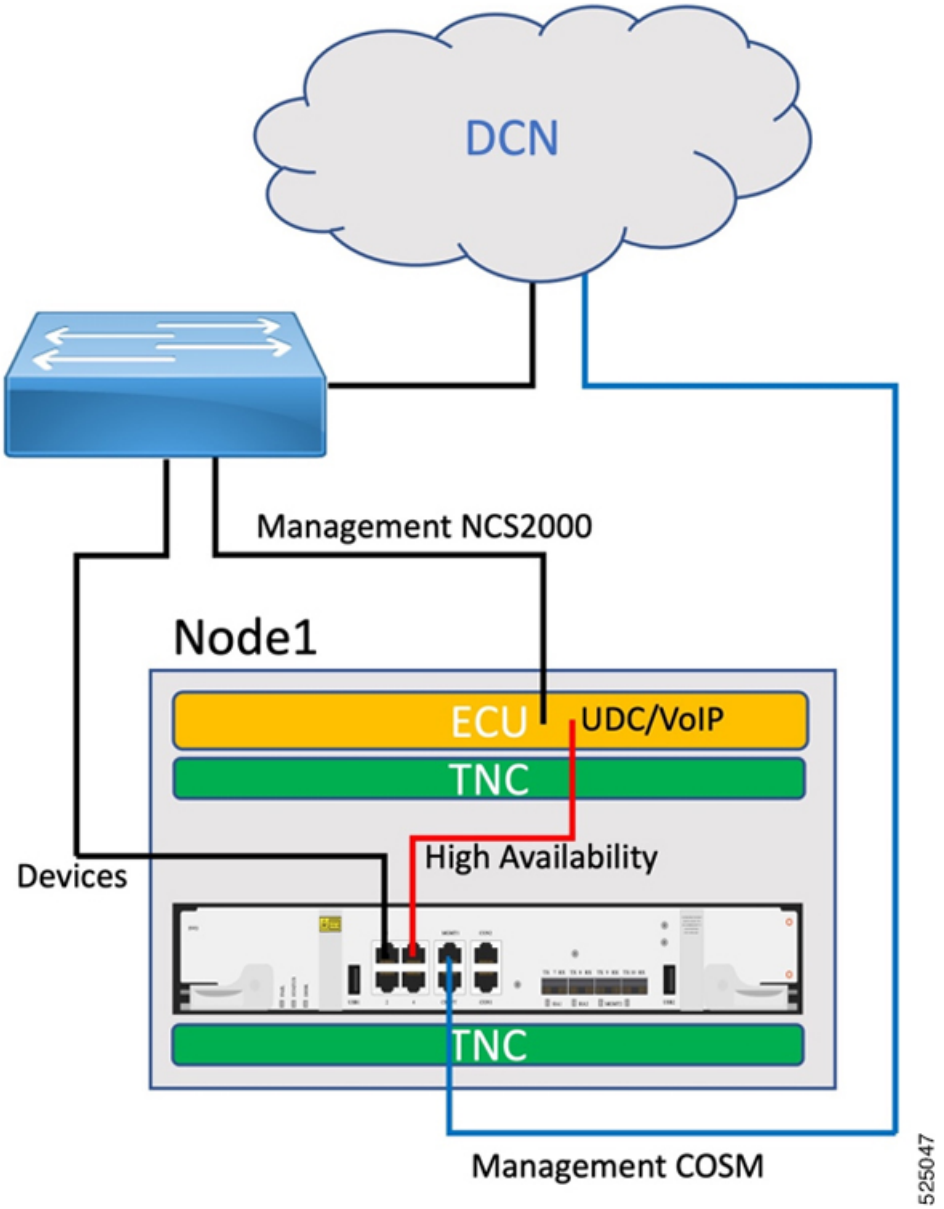
- Facilitates failover to the standby SVO-LC in the event of primary SVO-LC failure, increasing network resilience.

### Geo HA using the UDC channel

Geo HA Mode is a configuration that enhances network reliability and availability by placing two SVO-LC cards into two adjacent NCS 2000 nodes. The UDC channel is utilized to transport the high availability network, ensuring continuous service even in the event of failures.

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

***Figure 2: Geo HA connection using the UDC channel***



The Geo HA link is implemented using the available NCS 2000 UDC channel, enabling packet processing at the hardware level without impacting the NCS 2000 controller CPU. It supports a single-path UDC HA link with a theoretical bandwidth of 80 Mbps.

It is important to note that connecting one of the optical HA ports to the local ECU UDC port using the electrical ONS-SE-ZE-EL-C pluggable is not possible. This limitation arises from a re-timer connected to the PPM, which only supports a 1G rate, whereas the NCS 2000 UDC port operates at an FE rate. To address this, port 3 is reconfigured as an electrical HA port and will properly negotiate the FE speed.

The UDC must be configured through CTC, as the Cisco Optical Site Manager does not support this functionality. The UDC is set on the Transponder Node Controller (TNC) pluggable associated with the Optical Supervisory Channel (OSC) connected to the side facing the adjacent node. The same configuration is applied to the corresponding TNC pluggable on the adjacent NCS 2000 node.

Each SVO-LC must be connected as below:

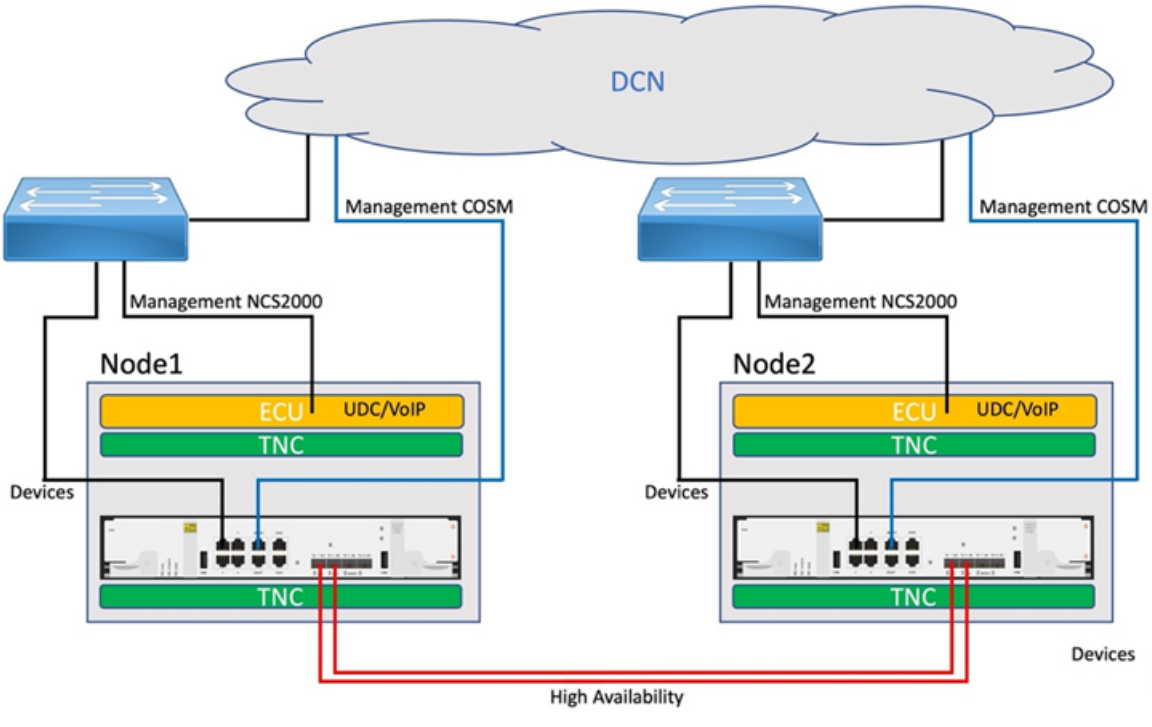
- Connect MGMT1 port to the customer Data Communication Network (DCN).
- Connect port 3 to the NCS 2000 ECU UDC/VoIP.
- Connect port 1 to the NCS 2000 ECU EMS or the same switch (same VLAN) where NCS 2000 ECU EMS is connected.
- (Optional) NCS 2000 ECU EMS may connect directly to the customer DCN for multishelf setups, offering direct accessibility to the NCS2000 device if needed.

### Geo HA between nearby NCS 2000 nodes

In Geo HA mode involving nearby NCS 2000 nodes, the two SVO-LCs are installed in separate NCS 2000 nodes, likely situated within the same building or close enough to allow direct interconnection of the two SVO-LCs through HA optical pluggables.

This image shows Geo HA between nearby NCS 2000 nodes.

*Figure 3: Geo HA between nearby NCS 2000 nodes*




# Network YAML configuration file

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

The redundancy-mode must be set to "GEO_HA" for initiating Geo high availability.

Each SVO-LC has an individual network YAML file for installation. When deploying two SVO-LCs for high availability, the only difference between the two files should be the value of the **server-name** field.

Here an example of IPv4 Network YAML configuration file for Geo HA configuration.

```
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"
```

This table describes the fields in the network.yml configuration files.

***Table 3:***

| Field | Description |
|---|---|
| **server-name** | The name of the SVO-LC being installed. It name must be same as one of the server.name entries. |
| **mgmt-address-family** | Indicates the address family for the management network. Acceptable values include:<br>• IPv4<br>In all three scenarios, the `mgmt:ipv4` section must be included. |
| **ospf-area-id** | The OSPF area ID associated with the NCS 2000 device. |
| **redundancy-mode** | This is an optional field, necessary only when using Geo HA mode; otherwise, it can be omitted.<br>The valid value is: `GEO_HA` |
| **servers** | A list of SVO-LCs along with their network details. |
| **servers.name** | The name of the SVO-LC. |
| **mgmt** | Details about the management network.<br>Subsection is ipv4 for the mgmt-address-family value.<br>• **ip**: Specify the subnet.<br>• **prefix**: Specify the subnet mask.<br>• **gateway**: Specify the gateway for the subnet.<br>• **host-nic**: Represents the IP address assigned to the SVO-LC br-management interface, which is also used by the Cisco Optical Site Manager Administration Plane web UI via HTTPS on port 443. |

| Field | Description |
|---|---|
| `devices` | The network details for NCS 2000 devices.<br>• **ip**: Specify the subnet.<br>• **prefix**: Specify the subnet mask.<br>• **gateway**: Specify the gateway for the subnet.<br>• **host-nic**: Represents the IP address assigned to the SVO-LC br-management interface, which is also used by the Cisco Optical Site Manager Administration Plane web UI via HTTPS on port 443. |

# Prepare the Network Configuration

Use this task to prepare the network configuration for the SVO card model.

### Procedure

**Step 1** Create a configuration file (*network.yml)* for each server with the networking configuration data. This file is uploaded during the installation.

**Step 2** Cable and configure the related network interfaces (physical or virtual).

Both the configuration files are identical and contain the data for both the servers in HA. The only difference is the *server-name* attribute that contains the name of the server to which the file is applied.

# Install Cisco Optical Site Manager Tool

The Cisco Optical Site Manager installation tool is a web-based application designed to streamline the setup of the Cisco Optical Site Manager environment. It requires user credentials and a network YAML configuration file to create the administration user, configure the network infrastructure and resources, and set up the environment.

Use this task to install the Cisco Optical Site Manager application.

### Before you begin

Ensure you have the necessary login credentials and the *network.yml* configuration file.

### Procedure

**Step 1** Start the Cisco Optical Site Manager installation tool using the pre-defined IP address, http://192.168.0.66.

**Step 2** In the **Credentials** section, perform these steps:

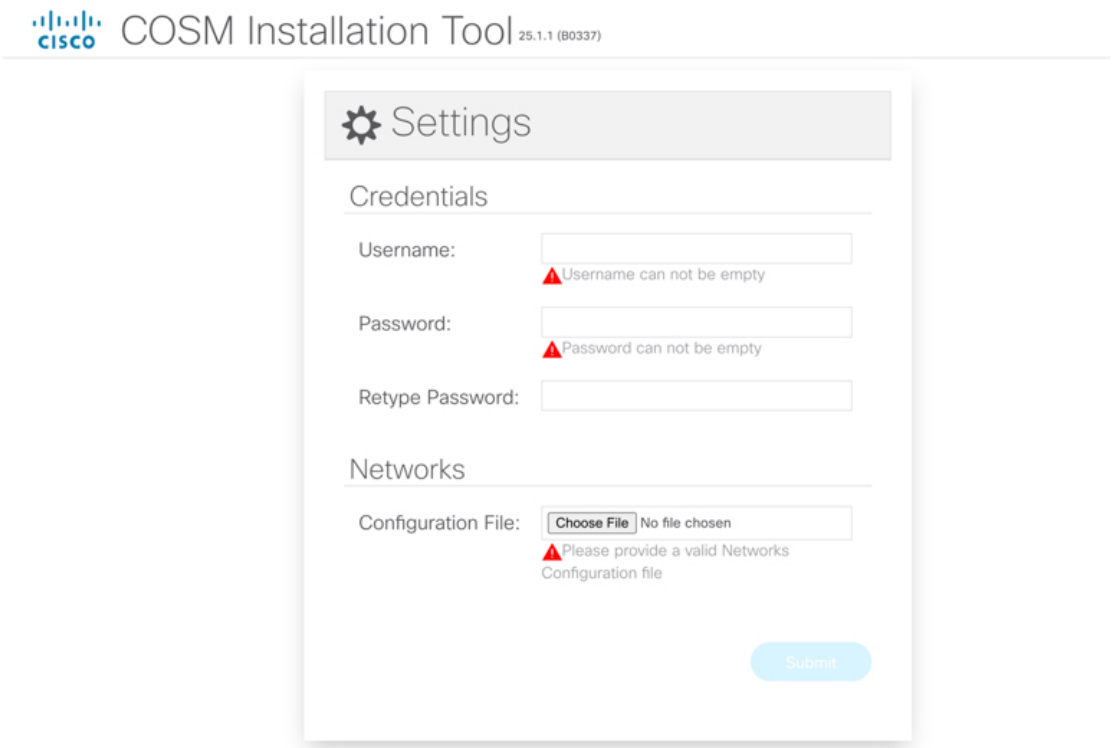
**a.** Enter a username in the **Username** field.

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

The password must be a minimum of eight characters, and it can be a maximum of 127 characters. The password must have at least one uppercase letter, one lowercase character, one number, and one special character.

**c.** Retype the password in the **Retype Password** field.

***Figure 4: COSM Installation Tool Settings page***

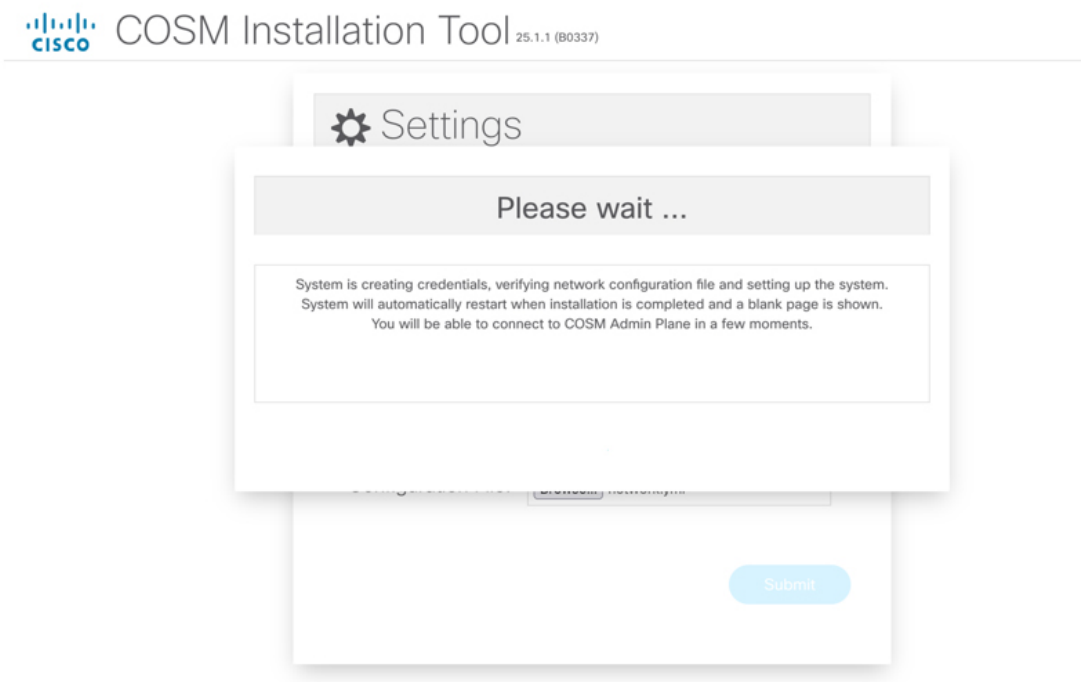



**Step 3** Click **Choose File** to select the *network.yml* file from the **Configuration File** field.

For more details about the confighuration file, see Network YAML configuration file, on page 6.

**Step 4** Click the **Submit** button to start the installation process.

A confirmation message is displayed, indicating that the credentials have been created, the network configuration file has been verified, and the system has been brought up.




After the installation completes, a blank web page appears, indicating that the COSM Admin Plane has successfully started.

### What to do next

Log into the Cisco Optical Site Manager Admin Plane

# Recommended resources

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

***Table 4: Supported Resources per Node/Instance***

| Node/Instance | Memory | Degree | Maximum Memory Allowed |
|---|---|---|---|
| OLA / ROADM | 2.1 GB | up to 4 degrees | 32 GB |
| ROADM | 4 GB | greater than 4 degrees | |