

Use Cisco Optical Network Controller

Table 1: Feature History

Feature	Release Information	Description
Network Periodic Full Sync Configuration	Cisco Optical Network Controller Release 1.1	You can now configure a periodic full sync for all the devices onboarded to Cisco Optical Network Controller.

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Onboard Devices and Discover Network

A device is added after a REST API call is issued to onboard the device. The Device Manager initiates data collection and this data is collected and translated into TAPI model which is eventually published to Hierarchical Controller.

For more information, see *Cisco Optical Network Controller TAPI Northbound Interface API Guide*.

You can onboard a device using Cisco Optical Network Controller GUI.

Onboard Devices to Cisco Optical Network Controller

Devices must be onboarded to Cisco Optical Network Controller to enable collection of device related information. Cisco Optical Network Controller supports Cisco NCS 2000 Shelf Virtualization Orchestrator (SVO) Series, Release 12.3.1 devices and Cisco NCS 1010, Release 7.9.1 devices.

Manage Devices on Cisco Optical Network Controller

Use the following tasks to add, import, edit, delete, resync, or reconnect the devices onboarded to Cisco Optical Network Controller.

Add Devices on Cisco Optical Network Controller

Use this task to add the devices onboarded to Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller.

Procedure

Step 1 Click **Devices** in the left panel.

Step 2 Click **New**.

Step 3 Enter the device details necessary connect to the device.

The following fields are mandatory:

- Name
- IP
- Port
- Type
- GRPC Port (only for NCS1010)
- Username
- Password
- Site Name

Note

- Ensure that you enter valid a username and password of the device to enable Cisco Optical Network Controller to connect to the device.
- If the device type is NCS1010, GRPC Port is a mandatory field. For NCS2000 devices, do not fill this field.
- NCS 1010 OLT nodes at a multidegree site can share a common site name. All other devices must have unique site names.

Step 4 Click **Save**.

The new device is onboarded and added to the **Devices** table. Cisco Optical Network Controller validates the connection with the onboarded device.

The **Name** column includes name, image, device connection status, and an icon indicating the connection status.

- Green—Device is connected.
- Yellow—Device is waiting to be connected.
- Red—Device is disconnected or a resync is needed or device deletion failed.
- Orange—Device deletion in progress.

Note
If you hover over the status in the collection status, you can see:

- The reason for the failure if discovery failed
- Last successful time if discovery was completed

Import Devices on Cisco Optical Network Controller

Use this task to import the devices onboarded to Cisco Optical Network Controller.



Restriction When you import devices into Cisco Optical Network Controller using an excel file, do not include more than 200 devices in one excel file.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Devices** in the left panel.

Step 2 Click **Import Devices**.

Note
A template for the Excel file for use in the next step is available in this screen. You can customize this Excel file to suit your network.

Step 3 Select the spreadsheet which has all the device details and click **Open**.

The new devices are onboarded and added to the **Devices** table.

Edit Devices on Cisco Optical Network Controller

Use this task to edit the devices onboarded to Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Devices** in the left panel.

Step 2 Select the target device and click **Edit** or click the device name under the **Name** column.

Note
You can modify only the username and password fields for the device.

Delete Devices on Cisco Optical Network Controller

Use this task to delete the devices onboarded to Cisco Optical Network Controller.



Restriction Do not delete more than 10 devices in a 5 minute interval.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Devices** in the left panel.

Step 2 Select the target device and click **Delete**.

Note

- You cannot delete a device if collection is in progress.
- You cannot delete devices if they have circuits provisioned. Remove the circuits before deleting the devices.

Resync Devices on Cisco Optical Network Controller

Use this task to resync the devices onboarded to Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Devices** in the left panel.

Step 2 Select the device that you want to resync and click **Resync**.

To resync multiple devices, select the devices and click **Resync**.

To resync all the devices, click **ResyncAll**.

To schedule a periodic resync of all the devices, see Configure Network Periodic Full Sync, on page 5.

Note

- If a device is in **Disconnected** status, either **Reconnect** the device or **Resync** the device directly to recover the device connection.
- The Resync All operation is faster than initial onboarding.
- The time the Resync All operation takes depends on the number of devices in the network and amount misaligned data detected in the network.

Reconnect a Device on Cisco Optical Network Controller

Use this task to reconnect the devices onboarded to Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Devices** in the left panel.

Step 2 Click **Reconnect** next to the **Disconnected** status or select the device and click **Reconnect**.

Configure Network Periodic Full Sync

Use this task to schedule a periodic sync for all the devices that are onboarded to Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Configurations** in the left panel.

Step 2 In the **Periodic Network Full Sync** tab, click **Enable**.

Step 3 In the **Scheduled Start Time** field, enter the start time of full network sync in HH:MM:SS format in UTC.

Step 4 In the **Repeat Every** field, enter the interval rate in hours at which full network sync must run. Minimum value is 1 and maximum value is 23.

Step 5 Click **Apply**.

Note
To disable the periodic sync for the entire network, click **Disable** and click **Apply**.

Use the Sites Page

This task and the following tasks describe how to use the Sites page on Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.
Cisco Optical Network Controller displays the Sites page. This page lists the sites of the devices that Cisco Optical Network Controller manages. The Sites page displays the Site Name, Type, and Operational status of each site.

Note
Devices that share a site are grouped in this view.

Restriction
The sites page lists only NCS 1010 devices.

Step 2 Click the site that you want to view the details of.
Cisco Optical Network Controller displays the Site details page. By default, Cisco Optical Network Controller displays the Alarms tab in the tabular view. This tab displays all alarms related to the selected site.

Use the Functional View

Node functional view is an option available after you open a site from the **Sites** page. The default view is **Tabular** view. To switch to Functional view, click **Functional** on the top right of the screen. To switch back to Tabular view, click **Tabular**.

There are three subviews in the Functional view. They are:

1. Degree view (Only for OLT and multidegree sites)
2. Component view
3. Detailed view

The views are hierarchical and drill down into more detailed views.

All three views have a toggle for the Legend. Click **Show Legends** to show the Legend. When the Legend is visible, click **Hide Legends** to hide the Legend. The Legend shows the different symbols, colors, and styles used in the view.

To get a PDF file with the view that you see, click **Export**.

Autorefresh is disabled by default. But you can set the autorefresh interval by selecting the target interval in the **Auto-refresh** drop-down list.

Degree View

The degree view visualizes the site and also shows the neighboring sites.

To view details about the nodes or connections, hover over the node or connection. The Cisco Optical Network Controller interface displays a tooltip with information about the node or connection.

To view the neighboring site:

1. Right click the site.
2. Click **Navigate to Site**.

   If the neighboring site is an ILA site, the site opens in Component view.

To select a node, click the node. You can select multiple nodes. To select all nodes, click **Select All**. To clear selections, click **Clear All**.

An alarms floating window is available in Functional view. The alarms floating window is an expandable section. To bring up the floating window, click **x Alarms** on the bottom of the screen. 'x' is the number of active alarms in the current selection in the degree view. The Alarms expander label shows the number of active alarms. The Alarms window shows the alarms for the nodes that you select in the degree view. The expander label shows a blue dot on the top right of the label, if the alarms window is showing a filtered set of alarms. The alarms window is available in all three subviews of **Functional** view. You see the alarms for the selection of nodes in the degree view. The selection in other views does not affect the alarms window.

To go to the component view, select the target nodes and click the **Component View** button.



Restriction When there are three or more degrees, Degree IPCs overlap and degree view hides IPC links.

Component View

The component view shows the internal components of the selected nodes from the degree view. This view does not show the connections between nodes in a multidegree site. The component view displays each node with active (OLT and ILA) and passive components and the IPCs between the nodes. The component view shows the PID of each component on the component. You can view up to 8 nodes in the component view.

The components show the port numbers. You can see both the hardware port numbers and software port numbers in the Rack/Slot/Interface/Port format.

Component view does not show the neighboring sites.

Zoom in and out in the component view using the + and – buttons, the scroll wheel, or the pinching gesture on the trackpad or touchscreen. You can pan around the screen by clicking and dragging the mouse.

Use the overlays drop-down to toggle alarms and CV status overlays. Both overlays are enabled by default.

If you enable either overlay, the Overlays button displays a blue badge on the top right of the button.

Hover over a component to see the rack placement of the component in a tooltip.

If you enable the alarms overlay, the component view displays alarm indicators on the components as per the respective origins of the alarm. The alarm indicators are color-coded according to the severity. If multiple alarms have the same origin, you see the highest severity indicator. Hover on the indicator to see a tooltip that displays alarm information. The tooltip displays information about the highest severity alarm and shows the count for all alarm severities that are active. This view shows the component level alarms indicators on the top-right corner of the component.

If you enable CV status overlay, the component view displays IPC CV status indicators on the IPC. Some IPCs pass behind other components in the component view. To view the IPC hover on the IPC.

To view details of an IPC, click the IPC. The component view centers on the IPC and highlights the components that the IPC is connecting. The other components are dimmed. The component view also displays a table containing the IPC details. Each row in the table corresponds to one direction. To close the IPC details, click the close button.

To go back to degree view, click the **degree view** button. To go to detailed view, click the **detailed view** button after selecting the target active component.

Detailed View

Detailed view shows a detailed internal schematic diagram of the NCS 1010 equipment. Detailed view shows the neighboring sites.

To view a neighboring site, right click the site and click **Navigate to Site**. **Navigate to Site** takes you to the highest level view available. For ILA nodes, the highest level view is the Component view. For OLT nodes, the highest level view is Degree View.

If you enable Alarms Overlay, you can see color-coded alarm indicators on the originating components of the equipment. Detailed view shows only the NCS 1010 data path alarms. For more information on these alarms, see Troubleshooting of Data Path Alarms.

Use Rack View

Rack View is available in the Alarms and Inventory tabs of a Site page. The position of equipment in Rack view is the Physical location in the inventory table. The rack view supports up to 8 racks, it shows all the equipment at a site.

On the right of the page, you can see the rack view.



Note Rack view supports only NCS 1010 devices.

Before you begin

Procedure

Step 1 (Optional) To see the rack view in full screen, click the full screen button.

If you use a filter in the Inventory or Alarm tabs, the equipment that does not match the filter is dimmed. The filtered view is available even after you make the rack view full screen.

Note
Rack view shows each degree at a site as a rack. You cannot create, delete, or hide racks.

Step 2 (Optional) To see the PID and Site name, hover over the equipment. You get a tooltip with the PID and Site name.

For NCS1K-BRK-SA, you can see the PID for each passive module in the BRK-SA chassis also.

Step 3 (Optional) To relocate equipment in a rack or across racks:

a) Click Edit.
b) Right click the device.
c) Click relocate.
d) Click the target location Invalid locations are highlighted in red.

You cannot place the devices in locations that are highlighted in red. Some locations are locations invalid because you cannot accommodate the height of the equipment or the location already has a device present. You can move equipment across racks and within a rack.

e) click Apply changes

Step 4 (Optional) To see the rack view in Optical Configurations tab and Optical XC tab, click Show Rack on the right of the screen.

Step 5 (Optional) To export the rack view as a PDF file, click Export on the top left of the screen.

View and Export Alarms

This task describes how to view and export alarms information from the Sites page on Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.
Cisco Optical Network Controller displays the Site details page. By default, Cisco Optical Network Controller displays the Alarms tab. This tab displays all alarms for the site.

Step 3 To export the alarm information into an Excel file, click Export.

View and Export Inventory

This task describes how to view inventory details from the Sites page on Cisco Optical Network Controller.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Inventory**.
Cisco Optical Network Controller displays the Inventory tab. This tab displays all the inventory at the selected site.

Step 4 (Optional) To export inventory data into an excel file, click **Export**.

View Optical Configurations

This task describes how to use the **Optical Configurations** tab of the Sites page. You can view information about Internal Patch Cords (IPC) and Pre-provisioned Passives.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical Configurations**.
Cisco Optical Network Controller displays the Optical Configurations tab. The Optical Configurations tab displays information about Internal Patch Cords (IPC) and Pre-provisioned Passives.

Add IPC

This task describes how to add an IPC from the Optical Configurations tab of the Sites page.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical Configurations**.

Step 4 Under Internal Patch Cords, click **Add**.

Step 5 Select the source and destination devices and ports from the respective drop-down lists.

Step 6 Enter a ToneID.

ToneID is a user-defined hexadecimal string of 8–64 characters <0-9a-f> (lowercase). Cisco Optical Network Controller supports ToneID for NCS1K-MD-32O-C, NCS1K-MD-32E-C, and NCS1K-BRK-8 modules. ToneID for NCS1K-BRK-8 modules must be 8 comma-separated strings.

Step 7 Click **Add**.

Delete IPC

This task describes how to delete an IPC from the Optical Configurations tab of the Sites page.

Before you begin

Log into Cisco Optical Network Controller

Note Cisco Optical Network Controller does not allow you to delete an IPC if services are running on it.

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical Configurations**.

Step 4 Under Internal Patch Cords, select the target IPC.

You can select multiple IPCs.

Step 5 Click **Delete**.

Verify Connections

This task describes how to perform Connection Verification from the Optical Configurations tab of the Sites page.

Before you begin

- Log into Cisco Optical Network Controller
- IPC must be added in Cisco Optical Network Controller.
- You must have provided a unique 8 or more digit tone pattern while adding an IPC.

Restriction Cisco Optical Network Controller supports connection verification only for NCS 1010 BRK-8 and MD-32 modules.

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical Configurations**.

Step 4 Select the target IPC.

You can select multiple IPCs.

Step 5 Click **Verify Connection**. Accept the warning prompt.

The CV status columns in the IPC table changes to IN PROGRESS. When the Connection Verification process is complete, the status changes to SUCCESS or FAILURE.

Note If you trigger connection verification for multiple IPCs, the connection verification requests are queued, and the requests in the queue show the status as **Started**.

You can see the reason for a failure by hovering over the failure status. Connection verification may fail for the following reasons:

- Tone ID not configured
- Empty Tone ID
- Empty Expected Tone ID
- Empty Tone Rate
- Empty Tone Info
- Tone ID not matching

- Reverse CV failed
- Forward CV failed
- Empty response received
- Could not Start Tone Generation or Detection
- Could not Stop Tone Generation or Detection
- Couldn't configure tone on given port
- Could not get interface names
- Could not apply src tone config
- Could not apply dst tone config
- Exception while sleeping
- Internal Error
- Could not Start Tone Generation
- Could not Start Tone Detection
- Could not Stop Tone Generation
- Could not Stop Tone Detection

Add Passive

This task describes how to add a Passive to be Pre-provisioned from the Optical Configurations tab of the Sites page.

Note

- BRK-8 and BRK-24 are added as 1 RU modules in Cisco Optical Network Controller 2.1.
- Cisco Optical Network Controller 2.1 does not support the BRK-SA module.
- Cisco Optical Network Controller supports the following passive modules:
  - NCS1K-MD-32O-C
  - NCS1K-MD-32E-C
  - NCS1K-BRK-24
  - NCS1K-BRK-8

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.
Step 2 Click the site that you want to view the details of.
Step 3 Click **Optical Configurations**.
Step 4 Under Passive Pre-provisioning, click **Add**.
Step 5 Select the device the passive is connected to, the type of passive module and the USB port on the device the passive module is connected to from the drop-down lists.
Step 6 Click **Add**.

Delete Passive Module

This task describes how to delete a passive module from the Optical Configurations tab of the Sites page.



Note Cisco Optical Network Controller 2.1 does not support deleting multiple passives.

Cisco Optical Network Controller 2.1 does not support deleting BRK-8 and BRK-24 modules. If you try to delete a BRK-8 or BRK-24 module, the delete operation fails.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.
Step 2 Click the site that you want to view the details of.
Step 3 Click **Optical Configurations**.
Step 4 Under Passive Pre-provisioning, select the target passive module.
Step 5 Click **Delete** and confirm the delete operation.

Export Optical Configuration

This task describes how to export information to an Excel file from the Optical Configurations tab of the Sites page.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical Configurations**.

Step 4 (Optional) To export the IPC information into an Excel file, click **Export** under **Internal Patch Cords**.

To export information about specific IPCs, select the IPCs before clicking **Export**.

Step 5 (Optional) To export the passives information into an Excel file, click **Export** under **Passive Pre-provisioning**.

To export information about specific passives, select the passives before clicking **Export**.

View Optical Cross-Connects

This task describes how to use the **Optical XC** tab of the Sites page.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical XC**.
Cisco Optical Network Controller displays the Optical XC tab. The Optical XC tab displays information about Optical Cross-connects.

Step 4 Click + for the target cross-connect to view additional information.

Allocate Fan-Outs for Optical Cross-Connects

This task describes how to perform fan-out allocation for optical cross-connects from the Optical XC tab of the Sites page. After successful fan-out allocation, the cross-connect status becomes discovered.

Before you begin

Log into Cisco Optical Network Controller

You must create the IPCs necessary for the cross-connect. To create an IPC, perform the steps at Add IPC, on page 10.

Procedure

Step 1 Click **Sites** in the left panel.
Step 2 Click the site that you want to view the details of.
Step 3 Click **Optical XC**.
Step 4 Select the target cross-connect.
Step 5 Click **Fan-Out Allocation**.
Step 6 Choose the **Add-Drop** port from the drop-down list and click **Apply**.
The cross-connect status changes to Discovered after successful Fan-Out Allocation.

Delete Optical Cross-Connect

This task describes how to delete optical cross-connects from the Optical XC tab of the Sites page.

Note Cisco Optical Network Controller 2.1 does not support deleting multiple cross-connects.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.
Step 2 Click the site that you want to view the details of.
Step 3 Click **Optical XC**.
Step 4 Select the target cross-connect.
Step 5 Click **Delete** and confirm the delete operation.

Export Optical Cross-Connects

This task describes how to export information to an Excel file from the Optical XC tab of the Sites page.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Click **Sites** in the left panel.

Step 2 Click the site that you want to view the details of.

Step 3 Click **Optical XC**.

Step 4 To export the cross-connect information into an Excel file, click **Export**.

To export information about specific cross-connects, select the cross-connects before clicking **Export**.

Use Planning Data Import

This task describes how to use Cisco Optical Network Controller to:

- Import the planning data from Cisco Optical Network Planner.
- Push the configurations on to the devices.

  You can push the following configurations:

  - Equipment: For preprovisioning and checking if there is any mismatch in the actual equipment
  - Internal Patch Cords: You can create IPCs with ToneIDs for connection verification for BRK-8 and MD-32 modules.
  - Optical Attributes

    The supported attributes are:

    - `DROP PSD`, `PSD MIN`, and `Connector Loss` for the OLT
    - `Spectral Density`, `AmpliGainRange`, `WkgMode`, `Total Power`, `Gain`, and `Tilt` for different amplifiers in ILAs and OLTs
    - `PSDShape`, `PSD`, and `Attenuation` for the different VOAs in the ILAs and OLTs
    - `Fiber length` and `Fiber type` for each span

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Hover over the **Import** icon in the left panel and click **Planning Data Import**.

Step 2 Click **Import**.

Step 3 Upload the JSON file from Cisco Optical Network Planner.

The Planning Data Import page displays the details of the imported devices. Map the planning data to actual data in the next step. Cisco Optical Network Controller autocorrelates and preassociates the devices with the same device name and site name.

Step 4 Click **Edit**.

a) Select the Actual Site Name and Actual Device Name for each device from the respective drop-down lists.

b) Click **Apply changes**.

Step 5 Select the target devices and click **Bulk Push** to push the configurations from Cisco ONP on to the target devices.

Note
You can push equipment, internal patchcords (IPC), and optical attributes configurations individually or in combination. IPC push must always include equipment configuration.

Restriction
ToneID configuration for NCS 1010 BRK-24 modules are not pushed to the devices as connection verification only supports BRK-8 and MD-32 modules.

The results of a bulk push are available in the log page that is in the **Last Push** column.

Use Alien Import

This task describes how to use Cisco Optical Network Controller to:

- Import the alien device data.

Before you begin

Log into Cisco Optical Network Controller

Procedure

Step 1 Hover over the **Import** icon in the left panel and click **Alien Import**.

Step 2 Click **Import**.
Cisco Optical Network Controller imports and displays the information of all the alien devices from the XML file. After successful import, the alien device information is available for applications that use the Cisco Optical Network Controller TAPI and REST API.

Step 3 To export the alien device information in JSON or XML formats, click **Export** and choose the target format from the drop-down list.

Cisco Optical Network Controller TAPI Northbound Interface

Cisco Optical Network Controller exposes a standard T-API Northbound Interface (NBI) towards northbound clients. The TAPI NBI supports RESTCONF and NETCONF protocols. An SDN-C client such as Hierarchical

Controller can communicate with Cisco Optical Network Controller TAPI NBI Server (SDN-C) using one these protocols and exchange TAPI model information.

For more information, see *Cisco Optical Network Controller TAPI Northbound Interface API Guide*.