Add Interfaces for SAN Operational Mode, Release 12.2.2

Table of Contents

New and Changed Information

The following table provides an overview of the significant changes up to this current release. The table does not provide an exhaustive list of all changes or of the new features up to this release.

Release Version	Feature	Description
NDFC release 12.2.2	Support for enhanced metrics for predicting the health of an SFP and automatic alerts when optics values exceed the default thresholds defined on the switch	With this feature, you can perform the following: • Predict the failure of a small form-factor pluggable (SFP) for Multilayer Distributed Switching (MDS) switches. • View usage data by day, week, month, or year for Rx power, Tx power, temperature, current, and voltage for the SFPs. • View usage trends and receive alerts when optics values exceed default thresholds. NDFC added an external **pm_optics_predict** alarm policy, so alerts are automatically sent out when optics values exceed the default thresholds as defined on the switch. For more information, see Viewing Performance Information for Optics and the section "Alarms Raised" in Event Analytics.

Interfaces

This document provides information about SAN interfaces, such as FC ports, Ethernet ports, and port groups.

FC Ports

Choose **Manage > Inventory > Interfaces > FC Ports** to view information about FC ports.

Viewing Inventory Information for FC Ports

Choose **Manage > Inventory > Interfaces > FC Ports > Inventory** tab to display the list of Fibre Chanel interfaces.

The following table describes the fields that appear on **Manage > Inventory > Interfaces > FC Ports > Inventory**.

Field	Description
Status	Specifies the status of the endport interface.
Admin Status	Specifies the administration status of an interface, depending on the action taken on an interface. Possible states: • Up: Reflects the state of a switch interface where a **No Shutdown** action was performed (**Actions > No Shutdown**). • Down: Reflects the state of a switch interface where a **Shutdown** action was performed (**Actions > Shutdown**)
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right-side of the page. Click the **Launch** icon on the top-right side of the pane to see Fabric Overview.
Switch	Specifies the name of the switch hosting the fiber chanel interface.
Interface	Specifies the interface name.
Enclosure	Specifies the enclosure.
Device Name	Specifies the device name.
VSAN	Specifies the VSAN to which the interface belongs.
Type	Specifies the interface type.
Port WWN	Specifies the port world wide name (pWWN).
Speed	Specifies the interface speed.
FCID	Specifies the interface FCID.

Viewing Performance Information for FC Ports

You can view the performance information for fibre channel ports by first navigating to the interfaces area for a switch using any of the following methods:

- **Manage > Inventory > Interfaces > FC Ports > Performance**
- **Manage > Inventory > Switches**, double-click on a switch to open the **Overview** page for that switch, then click the **Interfaces** tab

- **Manage > Inventory > Hosts**, double-click on a host to open the **Overview** page for that host, then click the **Interfaces** tab
- **Manage > Inventory > Storage Devices**, double-click on a storage device to open the **Overview** page for that storage device, then click the **Interfaces** tab

Then click the performance icon (upward arrow) next to the fibre channel interface where you want to view the performance information.

The following table describes the fields that appear in the **Interface Details and Performance Chart** page for a specific fibre channel interface.

Field	Description
Status	Provides the status of this interface.
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right-side of the page. Click the Launch icon on the top-right side of the pane to see Fabric Overview.
Name	Specifies the interface name. Click the chart icon in the **Name** column to view a graph of the traffic on that device according to the selected timeline. You can filter the data using the **Day, Week, Month**, and **Year** options.
VSAN	Specifies the VSAN to which the interface belongs.
Switch interface	Specified the interface name.
Speed	Specifies the interface speed.
Rx/Tx	
Avg	Specifies the average receiving or transmitting speed.
Avg %	Specifies the average percentage of receiving or transmitting speed.
Peak	Specifies the peak utilization of the receiving or transmitting speed.
Peak %	Specifies the peak utilization percentage of the receiving or transmitting speed.
Rx + Tx	Specifies the sum of Rx and Tx speeds.
Errors/Discards	
In Avg	Specifies the average of incoming errors or discards.
Out Avg	Specifies the average of outgoing errors or discards.
In Peak	Specifies the peak of incoming errors or discards.
Out Peak	Specifies the peak of outgoing errors or discards.

In the lower part of the page, you can filter the performance data that is shown by using the **Day, Week, Month**, and **Year** options.

Beginning with NDFC release 12.2.1, you can also filter the performance data that is shown using the following options:

- **Real time**: Gathers performance data every 10 seconds
- **Custom**: Gathers performance data based on the calendar begin and end dates that you select

You can also filter for **Host Ports** and **Storage Ports** using **Show Host Ports** drop-down list.

To enable Performance, navigate to the **Fabric** window, choose the required fabric, and choose **Actions > Configure Performance**.

Viewing Transceiver Information for FC Ports

Choose **Manage > Inventory > Interfaces > FC Ports > Transceiver** tab to view the transceivers in Fibre Chanel interfaces.

The following table describes the fields that appear on **Manage > Inventory > Interfaces > FC Ports > Transceiver**.

Field	Description
Enclosure	Specifies the enclosure name.
Device Alias	Displays the alias retrieved from the switch. A device aliases is a user-friendly name for a port WWN. Device alias name can be specified when configuring features.
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right-side of the page. Click the Launch icon on the top-right side of the pane to see Fabric Overview.
Port WWN	Specifies the port world wide name (pWWN).
Fcid	Specifies the associated interface FCID.
Switch interface	Specifies the interface name.
Link Status	Displays the operational status of the link.
Vendor	Specifies the name of the vendor.
Serial Number	Specifies the serial number of the enclosure.
Model	Specifies the name of the model.
Firmware	The version of the firmware that is executed by this HBA.
Driver	The version of the driver that is executed by this HBA.
Additional Info	The information list corresponding to this HBA.

Viewing FC FICON Ports

1. In the Cisco Nexus Dashboard Fabric Controller Web UI, navigate to **SAN > FICON**.

   The FICON page displays a list of Fiber Channel FICON interfaces and relevant data.

2. To enable or disable an interface, choose **Actions > Shutdown** or **No Shutdown**.

The following table describes the fields that appear on the **FICON** page. Use the **Show last day** drop-down list to filter the view by **Day**, **Week**, **Month**, and **Year**.

Field	Description
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right-side of the page. Click the Launch icon on the top-right side of the pane to see Fabric Overview.
Switch interface	Specifies the switch interface.
Description	Specifies the interface description.
FCID	Specifies the associated interface FCID.
Mode	Specifies the interface mode.
FICON ID	Specifies the FICON ID.
Connected To	Specifies where the interface is connected to.
VSAN	Specifies the VSAN to which the interface belongs to.
Speed	Specifies the interface speed.
Rx/Tx	
Avg	Specifies the average receiving or transmitting speed.
Avg %	Specifies the average percentage of receiving or transmitting speed.
Peak	Specifies the maximum utilization of the receiving or transmitting speed.
Peak %	Specifies the maximum utilization in percentage of the receiving or transmitting speed.
Rx + Tx	Specifies the sum of Rx and Tx speeds.
Errors/Discards	
In Avg	Specifies the average of incoming errors or discards.
Out Avg	Specifies the average of outgoing errors or discards.
In Peak	Specifies the maximum number of incoming errors or discards.
Out Peak	Specifies the maximum number of outgoing errors or discards.

Viewing Performance Information for Ethernet Ports

Choose **Manage > Inventory > Interfaces > Ethernet** tab to display the list of Ethernet interfaces.

Beginning with NDFC release 12.2.1, you can also filter the performance data that is shown using the following options:

- **Real time**: Gathers performance data every 10 seconds
- **Custom**: Gathers performance data based on the calendar begin and end dates that you select

The following table describes the fields that appear on **Manage > Inventory > Interfaces > Ethernet**. Use the **Show last day** menu drop-down list to filter the view by **Day**, **Week**, **Month**, and **Year**.

Field	Description
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right-side of the page. Click the Launch icon on the top-right side of the pane to see Fabric Overview.
Name	Specifies the interface name. Click the chart icon in the **Name** column to view a graph of the traffic on that device according to the selected timeline. You can filter the data using the **Day**, **Week**, **Month**, and **Year** options.
Description	Specifies the interface description.
Speed	Specifies the interface speed.
Rx/Tx	
Avg	Specifies the average receiving or transmitting speed.
Avg %	Specifies the average percentage of receiving or transmitting speed.
Peak	Specifies the peak utilization of the receiving or transmitting speed.
Peak %	Specifies the peak utilization percentage of the receiving or transmitting speed.
Rx + Tx	Specifies the sum of Rx and Tx speeds.
Errors/Discards	
In Avg	Specifies the average of incoming errors or discards.
Out Avg	Specifies the average of outgoing errors or discards.
In Peak	Specifies the peak of incoming errors or discards.
Out Peak	Specifies the peak of outgoing errors or discards.

Viewing Performance Information for Port Groups

Choose **Manage > Inventory > Interfaces > Port Groups** tab to display the list of port groups.

The following table describes the fields that appear on **Manage > Inventory > Interfaces > Port Groups**. Use the **Show last 24 hours** menu drop-down list to filter the view by **24 Hours**, **Week**, **Month**, and **Year**.

Field	Description
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right-side of the page. Click the Launch icon on the top-right side of the pane to see Fabric Overview.
Port Group Name	Specifies the port group name. Click the name to display the port group members.
Rx/Tx	
Avg	Specifies the average receiving or transmitting speed.
Peak	Specifies the peak utilization of the receiving or transmitting speed.
Rx + Tx	Specifies the sum of Rx and Tx speeds.
Errors/Discards	
In Avg	Specifies the average of incoming errors or discards.
In Peak	Specifies the peak of incoming errors or discards.
Last Updated	Specifies when the information was last updated.

Port Group Member

Choose **Manage > Inventory > Interfaces > Port Groups** and click a port group name to view the port group members.

The following table describes the fields that appear on **Port Group Member**.

Field	Description
Port Group Member	Specifies the port group member. Click the chart icon to view a graph of the traffic for the port group member according to the selected timeline. You can filter the data using the **Day**, **Week**, **Month**, and **Year** options.
Speed	Specifies the speed for the port group member.
Rx/Tx	
Avg	Specifies the average receiving or transmitting speed.
Peak	Specifies the peak utilization of the receiving or transmitting speed.
Rx + Tx	Specifies the sum of Rx and Tx speeds.
Errors/Discards	
In Avg	Specifies the average of incoming errors or discards.
In Peak	Specifies the peak of incoming errors or discards.
Last Updated	Specifies when the information was last updated.

Viewing Performance Information for Optics

To view the optic metrics information of devices that are connected to all the FC ports from the Cisco Nexus Dashboard Fabric Controller Web UI, perform the following steps:

1. Choose **Manage > Inventory > Interfaces > Optics**.

   The **Optics** page displays with a panel of hamburger icons representing the total number of devices in healthy, warning, or critical conditions for each category, **Temperature**, **Current**, **RxPower**, **TxPower**, and **Voltage**.

2. You can sort the table using the **Filter by attributes** field to enable filtering by **Fabric**, **Switch**, **Interface**, **Temperature**, **Current**, **RxPower**, **TxPower**, and **Voltage**.
3. You can choose the **Show All** option to view all or view switches with a **Warning** or **Critical** condition by choosing **Show Issues Only**.
4. Click the graph icon next to the interface name in the **Interface** column to filter the metrics by **Day**, **Week**, **Month**, and **Year**.
5. Click a fabric name to display the fabric health status on the slide-in panel.
6. Click the **Launch** icon to to open the **Fabric Overview** page.

   The following table describes the fields that appear on the **Manage > Inventory > Interfaces > Optics** page.

Field	Description
Fabric	Specifies the fabric name. Click the fabric name to display the fabric status on the right side of the page. Click the **Launch** icon on the slide-in panel to view the **Fabric Overview**.
Switch	Specifies the switch name.
Interface	Specifies the interface name. Click the chart icon in the **Interface** column to view a graph of the optics parameters on that device according to the selected timeline. You can filter the data for each interface using the **Day**, **Week**, **Month**, and **Year** options.
Temperature (C)	
Value	Specifies the average, minimum, and maximum temperature.
Prediction	Specifies if the temperature is one of the following conditions: · **Healthy** · **Warning** · **Critical**
Current (mA)	
Value	Specifies the average, minimum, and maximum current.

Field	Description
Prediction	Specifies if the current is one of the following conditions: · **Healthy** · **Warning** · **Critical**
RxPower (dBm)	
Value	Specifies the average, minimum, and maximum Rx power.
Prediction	Specifies if the **Rx Power** is one of the following conditions: · **Healthy** · **Warning** · **Critical**
TxPower (dBm)	
Value	Specifies the average, minimum, and maximum Tx power.
Prediction	Specifies if the **Tx Power** is one of the following conditions: · **Healthy** · **Warning** · **Critical**
Voltage (V)	
Value	Specifies the average, minimum, and maximum voltage.
Prediction	Specifies if the **Voltage** is one of the following conditions: · **Healthy** · **Warning** · **Critical**

Custom Port Groups

Choose **Manage > Inventory > Interfaces > Custom Port Groups** tab to view and create custom port groups.

The following table describes the fields that appear on **Manage > Inventory > Interfaces > Custom Port Groups**.

Field	Description
Group Name	Specifies the port group name. Click the name to view the performance and configure the port group. For more information, see Viewing Performance of Custom Port Groups and Configuring Custom Port Groups.
Devices	Specifies the number of devices.
Interfaces	Specifies the number of interfaces.

The following table describes the action items, in the **Actions** menu drop-down list, that appear on **Manage > Inventory > Interfaces > Custom Port Groups**.

Action Item	Description
Create Port Group	Select a port group from the table, choose **Create Port Group**, provide a port group name, and click **Save & Exit** to create a custom port group.
Edit port group	Select a port group from the table and choose **Edit port group** to edit port group.
Delete	Select a port group from the table and choose **Delete** to delete the port group.

Viewing Performance of Custom Port Groups

Choose **Manage > Inventory > Interfaces > Custom Port Groups** and click a port group name to view the performance of the port group.

The following table describes the fields that appear on the **Performance** tab of Custom Port Groups.

Field	Description
Device	Specifies the device name.
Connected To	Specifies where the interface is connected to.
Speed	Specifies the interface speed.
Rx/Tx	
Avg	Specifies the average receiving or transmitting speed.
Peak	Specifies the peak utilization of the receiving or transmitting speed.

Field	Description
Rx + Tx	Specifies the sum of Rx and Tx speeds.
Errors/Discards	
Avg	Specifies the average of incoming errors or discards.
Peak	Specifies the peak of incoming errors or discards.
Last Updated	Specifies when the information was last updated.

Use the **Show last day** menu drop-down list to filter the view by Day, Week, Month, and Year.

Configuring Custom Port Groups

Configuring Custom Port Groups Choose **Manage > Inventory > Interfaces > Custom Port Groups**, click a port group name, and click the **Configuration** tab to configure the custom port group.

The following table describes the fields that appear on the **Configuration** tab of Custom Port Groups.

Field	Description
Device	Specifies the device name. Click the device name to display the device status on the right-side of the page.
Connected To	Specifies where the interface is connected to.
Description	Specifies the interface description.

The following table describes the action items, in the **Actions** menu drop-down list, that appear on the **Configuration** tab.

Action Item	Description
Add Interfaces	Choose **Add Interfaces** to add interfaces to the port group. In the Add Interfaces window, select a device and click **Next Step - Add Interfaces.** Select the interfaces that you want to add to the port group and click **Save & Exit**.
Delete	Select a port group from the table and choose **Delete** to delete the port group.

Configuring Port Monitoring

The following topics provide information on configuring port monitoring.

Port Monitoring Policy

This feature allows you to save custom Port Monitoring policies in the Cisco SAN Controller database. It allows you to push the selected custom policy to one or more fabrics or Cisco MDS 9000 Series Switches. The policy is designated as active Port-Monitor policy in the switch.

This feature is supported only on the Cisco MDS 9000 SAN Switches and therefore the Cisco SAN Controller user can select the MDS switch to push the policy.

Cisco SAN Controller provides 12 templates to customize the policy. The user-defined policies are saved in the Cisco SAN Controller database. You can select any template or customized policy to push to the selected fabric or switch with the desired port type.

From Cisco SAN Controller Release 12.0.1a, a new port monitory policy **fabricmon_edge_policy** is added.

You can edit only user-defined policies.

The following table describes the fields that appear on Cisco Fabric Controller **Manage > Port Monitoring**.

Field	Description
Selected Port Monitoring Policy	This drop-down list shows the following templates for policies: • Normal_edgePort • Normal_allPort • Normal_corePort • Aggressive_edgePort • Aggressive_allPort • Aggressive_corePort • Most-Aggressive_edgePort • Most-Aggressive_allPort • Most-Aggressive_corePort • default • slowdrain • fabricmon_edge_policy

Field	Description
Logical Type	Specifies the type of port for selected policies. The available port types are: • Core • Edge • All
Save	Allows you to save your changes for the user-defined policies.  You cannot save configuration changes for default templates.
Save As	Allows you to save an existing policy as a new policy with a different name. This creates another item in the templates as Custom Policy. The customized policy is saved under this category. If you click **Save As** while the policy is edited, the customized policy is saved.To create new policy: • Choose required port monitoring policy, click **Save As**. The **New Port Monitoring Policy** pop window appears. • Enter the new policy name and select required logical type and click **Save**.
Delete	Allows you to delete any user-defined policies.

Field	Description
Push to switches	Allows you to select a fabric or switch and push the selected policies with the desired port type. The following policies select the Core policy type: • Normal_corePort • Aggressive_corePort • Most-Aggressive_corePort The following policies select the edge policy type: • Normal_edgePort • Aggressive_edgePort • Most-Aggressive_edgePort • fabricmon_edge_policy • slowdrain The following policies select all policy types: • Normal_allPort • Aggressive_allPort • Most-Aggressive_allPort • default Select the parameters and click **Push** to push the policies to the switches in the fabric. You can change the required port type for selected policy apart from the pre-defined port. • Choose required policy, click **Push to Switches**. The **Push to Switches** pop up window appears. • Choose required port type and click **Push**. If there is an active policy with the same or common port type, the push command configures the same policy on the selected devices. This policy replaces the existing active policy with the same or common port type. A warning message is displayed for replacing the existing policy. Click **Confirm** to rewrite the policy. A confirmation message is displayed for policy pushed to switches. Click **View logs** to view log details on the switch or click **OK** to return to the home page. If you click **Push to Switches** while the policy is edited, the customized policy will not be saved. SAN Controller enables Fabric Performance Monitor (FPM) feature when you push and activate the edge logical-type policy with FPIN or DIRL port guard. If you select Cisco MDS 9250i Multiservice Fabric Switch for policy with FPIN or DIRL feature counter, a warning window appears.

Field	Description
Description	Move the pointer to the " i" icon next to the description to view detailed information. Beginning with SAN Controller Release 12.0.1a, the following new counters are introduced: • Rx Datarate Burst • Tx Datarate Burst • SFP Rx Power Low Warning • SFP Tx Power Low Warning • Input Errors
Rising Threshold	Specifies the upper threshold limit for the counter type.
Rising Event	Specifies the type of event to be generated when the rising threshold is reached or crossed.
Falling Threshold	Specifies the lower threshold limit for the counter type.
Alerts	Specifies type of alert for the port. The alerts are syslog, rmon, and oblf. Alert is applicable for Cisco MDS switches with release 8.5(1) only.
Poll Interval	Specifies the time interval to poll for the counter value.
Warning Threshold	Allows you to set an optional threshold value lower than the rising threshold value and higher than the falling threshold value to generate syslogs. The range is 0-9223372036854775807.
Port Guard	Specifies if the port guard is enabled or disabled. The value can be false, flap, or errordisable. The default value is " false" .From Cisco SAN Controller Release 12.0.1a, new port guards **FPIN**, **DIRL**, and **cong-isolate-recover** are added for edge port type only. DIRL is a preview feature in Cisco SAN Controller 12.0.1a. It is recommended not to use in production environment.
Congestion-signal Warning	Indicates the building congestion between ports. This is available only for **TxWait (%)** counter only.
Congestion-signal Alarm	Indicates the critical congestion between ports. This is available only for Tx-Wait counter.
Monitor	Indicates the value either true or false.
Edit	Click to edit above details for each row and click tick mark to save configuration changes. You can overwrite configuration changes saved using Save and Save As option when you edit the configuration for each row.

Configuring SFP Counters

From Cisco MDS NX-OS Release 8.5(1), the SFP counters allow you to configure the low warning thresholds for Tx Power and Rx Power for SFPs. You will receive syslog when these threshold values drop below the configured values.

SFPs are monitored once in every 10 minutes. The rising threshold is the count of Rx or Tx Power times. This power time is less than or equal to the SFPs Rx or Tx Power low warning threshold multiplied by the percentage. Accordingly, you can increment the rising threshold once every 10 minutes. Configuring a rising threshold value that is more than the 600 multiple of the poll interval displays an error.

For example, for a polling interval of 1200, the rising threshold will be 2 (1200/600) and must be more than 2. The SFP counters are not included in the default policy and the only alert action that is available is syslog. You can configure the polling interval using the port monitor counter command.

You can choose one of the following to configure SFP counters, perform the following options:

- Configuring a low warning threshold percentage of 100% allows this counter to trigger when the Rx Power is less than or equal to the SFP's Rx Power low warning threshold.
- Configuring a low warning threshold percentage less than 100% allows this counter to trigger when the Rx Power is above the SFP's Rx Power low warning threshold.
- Configuring a low warning threshold percentage of greater than 100% allows this counter to trigger when the Rx Power is less than the SFP's Rx Power low warning threshold (between low warning and low alarm).

The following are the SFP counters:

- **sfp-rx-power-low-warn**

  Specifies the number of times a SFP's port reached a percentage of the SFP's Rx Power's low warning threshold. This threshold varies depending on the type, speed, and manufacturer of the SFP and this is displayed via show interface transceiver details command. This value is percentage of each individual SFP's Rx Power low warning threshold and not the perfect value. This percentage can be configured in the range of 50 to 150% to allow for alerting at values less than the Rx Power low warning threshold or greater than the Rx Power low warning threshold. This is an perfect value and varies between 50% to 150%. The low warning threshold value is calculated as the actual low warning threshold value of the SFP times the specified percentage. If the Rx power is lesser than or equal to the low warning threshold value, then this counter is incremented.

- **sfp-tx-power-low-warn**

  Specifies the number of times a SFP's port reached a percentage of the SFP's Tx Power's low warning threshold. This threshold varies depending on the type, speed, and manufacturer of the SFP and this is displayed via show interface transceiver details command. This value is percentage of each individual SFP's Tx Power low warning threshold and not the perfect value. This percentage can be configured in the range of 50 to 150% to allow for alerting at values less than the Tx Power low warning threshold or greater than the Tx Power low warning threshold. This is an perfect value and varies between 50% to 150%. The low warning threshold value is calculated as the actual low warning threshold value of the SFP times the specified percentage. If the Tx power is lesser than or equal to the low warning threshold value, then this counter is

incremented.

From Cisco MDS NX-OS Release 8.5(1), the datarate burst counters monitor the number of times the datarate crosses the configured threshold datarate in one second intervals. If the number crosses the configured number for rising threshold, the configured alert actions are taken as the condition is met. Datarate burst counters are polled every second. The datarate burst counters are not included in the default policy. For configuring the datarate burst counters, see *Configuring a Port Monitor Policy* section in *Cisco MDS 9000 Series Interfaces Configuration Guide.*

Copyright