Cisco Nexus Dashboard Insights Inventory, Release 6.5.x - For Cisco ACI

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New and Changed Information

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

New Features and Changed Behavior in the Cisco Nexus Dashboard Insights

Feature	Description	Release	Where Documented
Terminology change	The term Sites has now been renamed as Fabrics	6.5.1	Entire document

This document is available from your Cisco Nexus Dashboard Insights GUI as well as online at www.cisco.com. For the latest version of this document, visit Cisco Nexus Dashboard Insights Documentation.

Inventory

About Inventory

Inventory provides information on controllers and switches in Nexus Dashboard Insights.

Click **Manage** > **Inventory** to access Inventory.

At the top of Inventory, choose whether you want to view the inventory from **Online Fabrics** or **Snapshot Fabrics**.

Click **Controllers** to see high-level information on the controllers. Click **Switches** to see high-level information on the switches.

If a switch or hostname is modified, it takes around 2 hours for the updated switch or hostname to be reflect in Inventory.

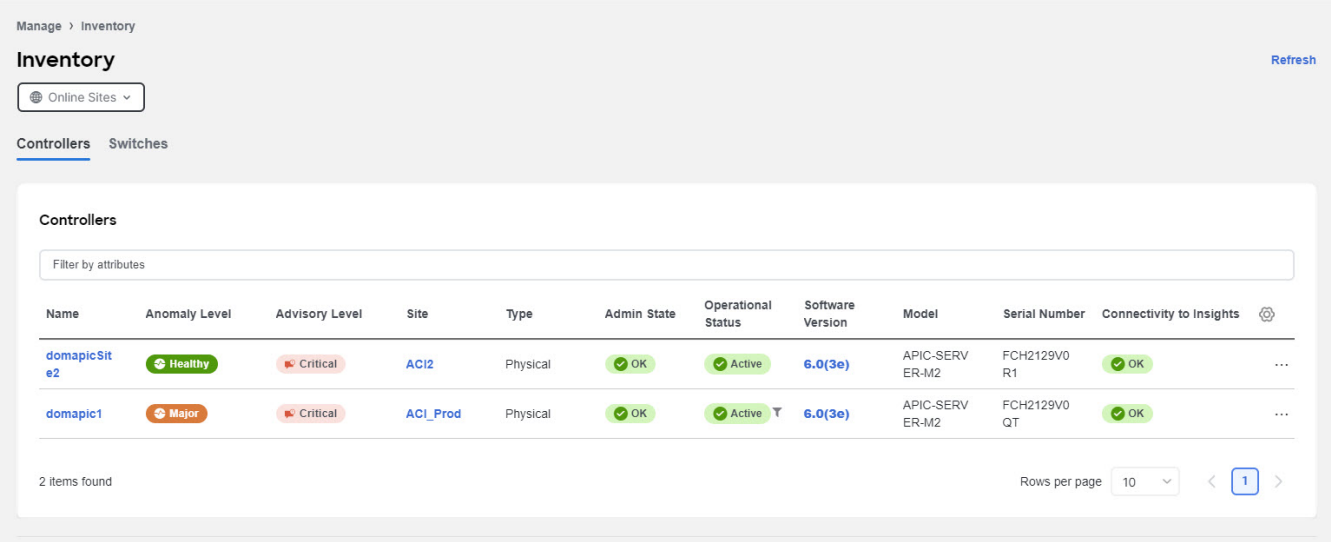
Controllers

About Controllers

Controllers provides the following high-level information on all of the controllers in Nexus Dashboard Insights. Click on the fabric name to be redirected to all the fabric details. See Fabrics for more information. The gear icon allows you to customize the table by hiding some of the columns. By default, all columns are visible. Use the ellipse icon to **Launch APIC** directly from the controllers page.

To get additional information on any single controller, click that controller under the **Name** column. The table can also be filtered based on the columns available.

Launch APIC is only available for online fabrics.

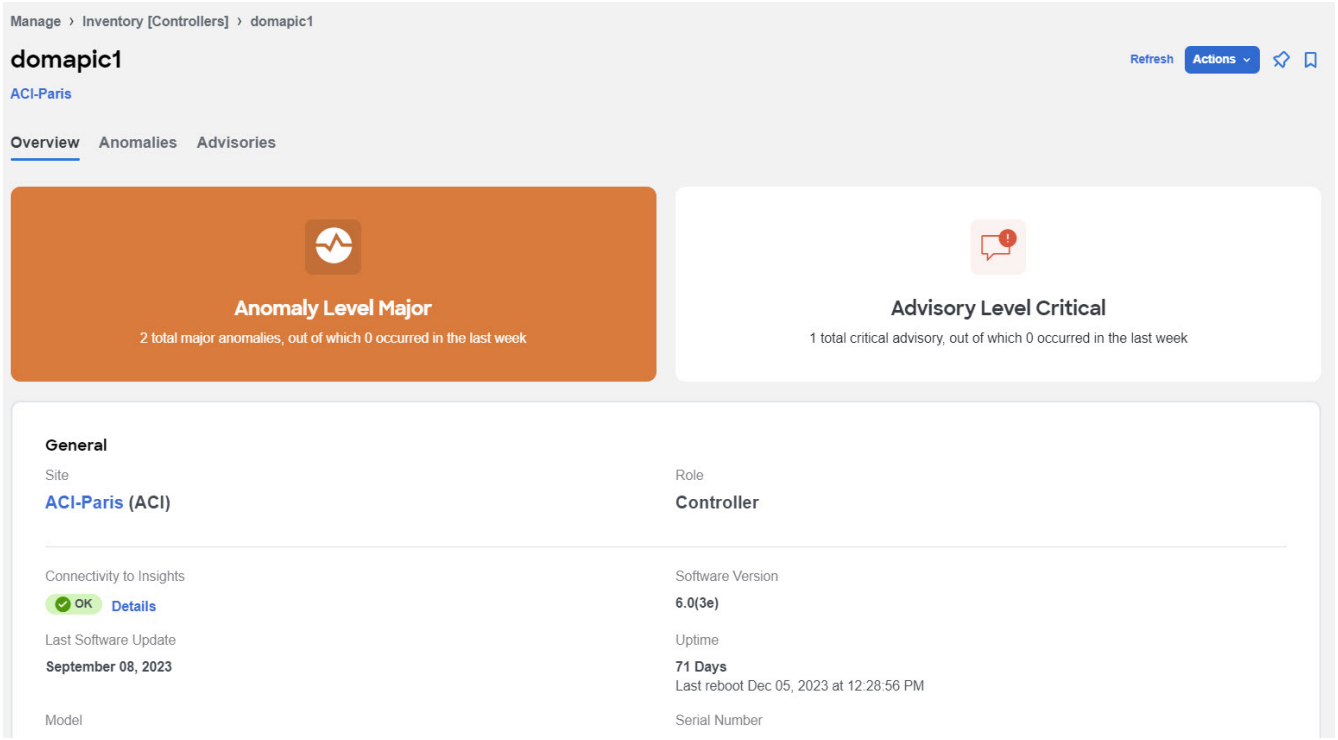


Field	Description
Name	The name of each controller
Anomaly Level	The anomaly levels experienced by each controller
Advisory Level	The advisory levels experienced by each controller
Fabric	The fabric where each controller resides
Type	The type for each controller (physical or virtual)
Admin State	The administrative state for each controller to Nexus Dashboard Insights
Operational Status	The operational status for each controller to Nexus Dashboard Insights
Software Version	The version of the software on the controller
Model	The model type for each controller

Field	Description
Serial Number	The serial number for the specific switch
Connectivity to Insights	The connectivity of the switches

Controller Details

You'll see **Overview**, **Anomalies** and **Advisories** that will provide more information on the controller, with **Overview** shown first by default.



Overview

Overview has the following additional information.

- **Anomaly Level**

Click Anomaly Level to get more specific information on the anomalies present for this controller. A slide-in appears, showing all the anomalies that occurred for this controller. See Anomalies to understand how to navigate across the anomalies.

- **Advisory Level**

Hover over the Advisory Level to see what category the advisories belong to. Click Advisory Level to get more specific information on the advisories present for this controller. A slide-in appears, showing all the advisories that occurred for this controller. See Advisories to understand how to navigate across the advisories.

- **General**

General displays the following information:

Field	Description
Fabric	The fabric where each controller resides
Role	The role defines what the device is
Connectivity to Insights	This shows the connectivity of the controller.
Software Version	The version of the software on the controller
Last Software Update	The date when the software was last updated on this controller.
Uptime	The amount of time that this controller has been up. You will also see when the controller was last rebooted.
Model	The model type for each controller
Serial Number	The serial number for this controller.
Out-of-Band IPv4 Address	The IP address for the out-of-band management of this controller.
Out-of-Band IPv6 Address	The IP address for the out-of-band management of this controller.
In-Band IPv4 Address	The IP address for the in-band management of this controller.
In-Band IPv6 Address	The IP address for the in-band management of this controller.
Type	The type for each controller (physical or virtual)
Created At	The date when the controller was created.

Anomalies

The Anomaly level shows the total number of anomalies that have occurred and the number of anomalies that have occurred in the last week.

Hover over the Anomaly Level to view the category of the anomalies occurred. Click the Anomaly Level to get specific information on the anomalies present for the specific controller or switch.

See Anomalies to understand how to navigate across the anomalies.

Advisories

The **Advisories** displays several levels of advisory severity for controller hardware and software in your network. To see an overall advisories dashboard for this controller, click **Advisories**. An advisories dashboard appears for this controller.

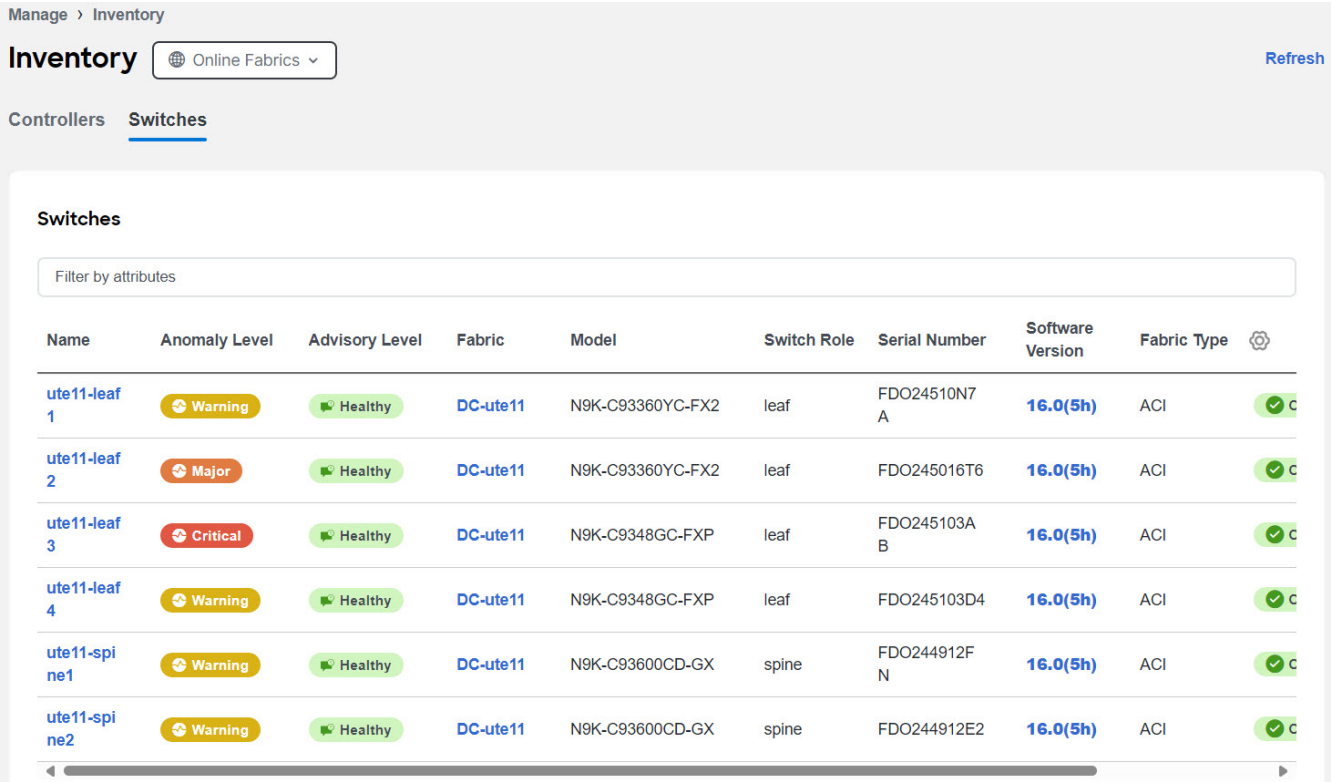
See Advisories to understand how to navigate across the advisories. See Filtering Information for filter refinement using certain operators.

Switches

About Switches

Switches provides the following high-level information on the switches. The gear icon allows you to customize the table by hiding some of the columns. By default, all columns are visible. The table can also be filtered based on the columns available. Click on the fabric name to be redirected to all the fabric details. See Fabrics for more information.

To get additional information on any single switch, click that switch under the **Name** column.



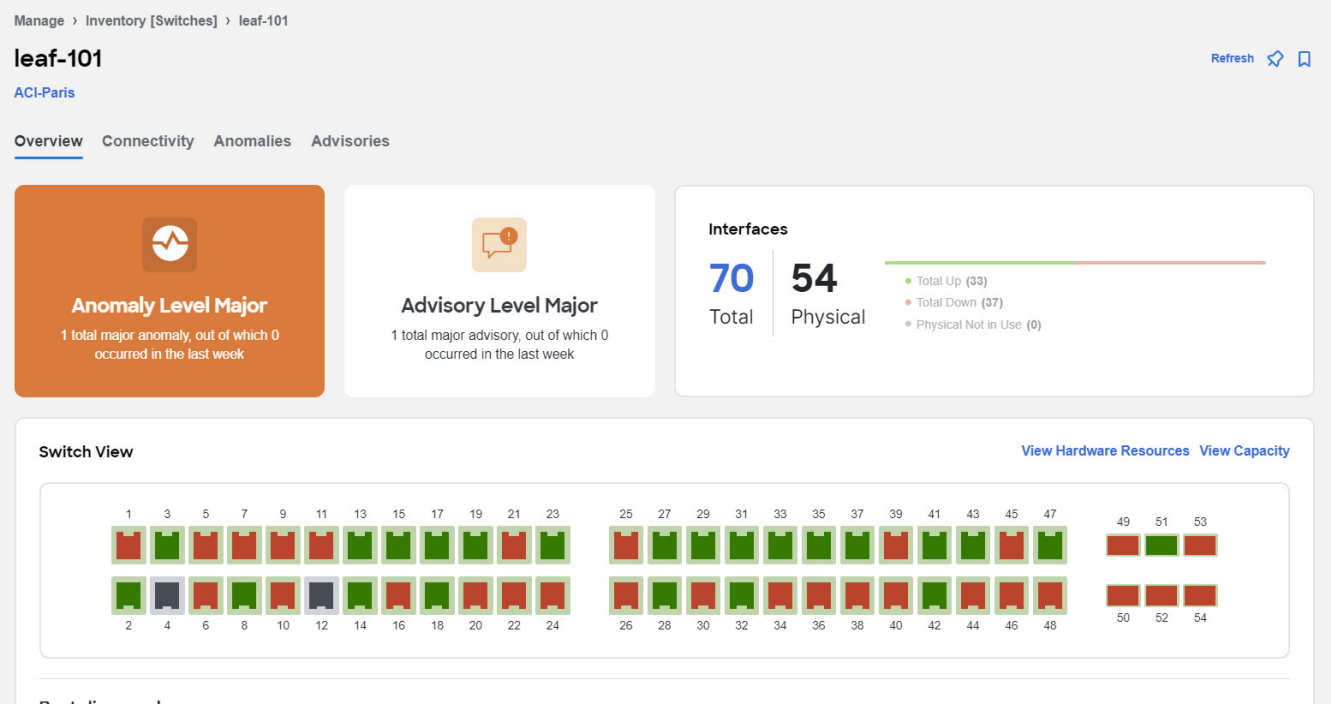
Field	Description
Name	The name of each switch
Anomaly Level	The anomaly levels experienced by each switch
Advisory Level	The advisory levels experienced by each switch
Fabric	The fabric where each switch resides
Model	The model type for each switch
Switch Role	Displays the role of switch.
Connectivity to Insights	The connectivity of the switches
Serial Number	The serial number for the specific switch
Software Version	The software version in which the switch is available

Field	Description
Fabric Type	Displays the type of switch: • ACI • NDFC • NX-OS

Switch Details

You'll see the following that will provide more information on that switch.

- Overview
- Connectivity
- Anomalies
- Advisories



Overview Details

The following appear below **Overview**.

- **Anomaly Level**

Hover over the Anomaly Level to see what category the anomalies belong to. Click the Anomaly Level to get more specific information on the anomalies present for this controller. A slide-in appears, showing all the anomalies that occurred for this controller. See Anomalies to understand how to navigate across the anomalies.

- **Advisory Level**

Hover over the Advisory Level to see what category the advisories belong to. Click the Advisory Level

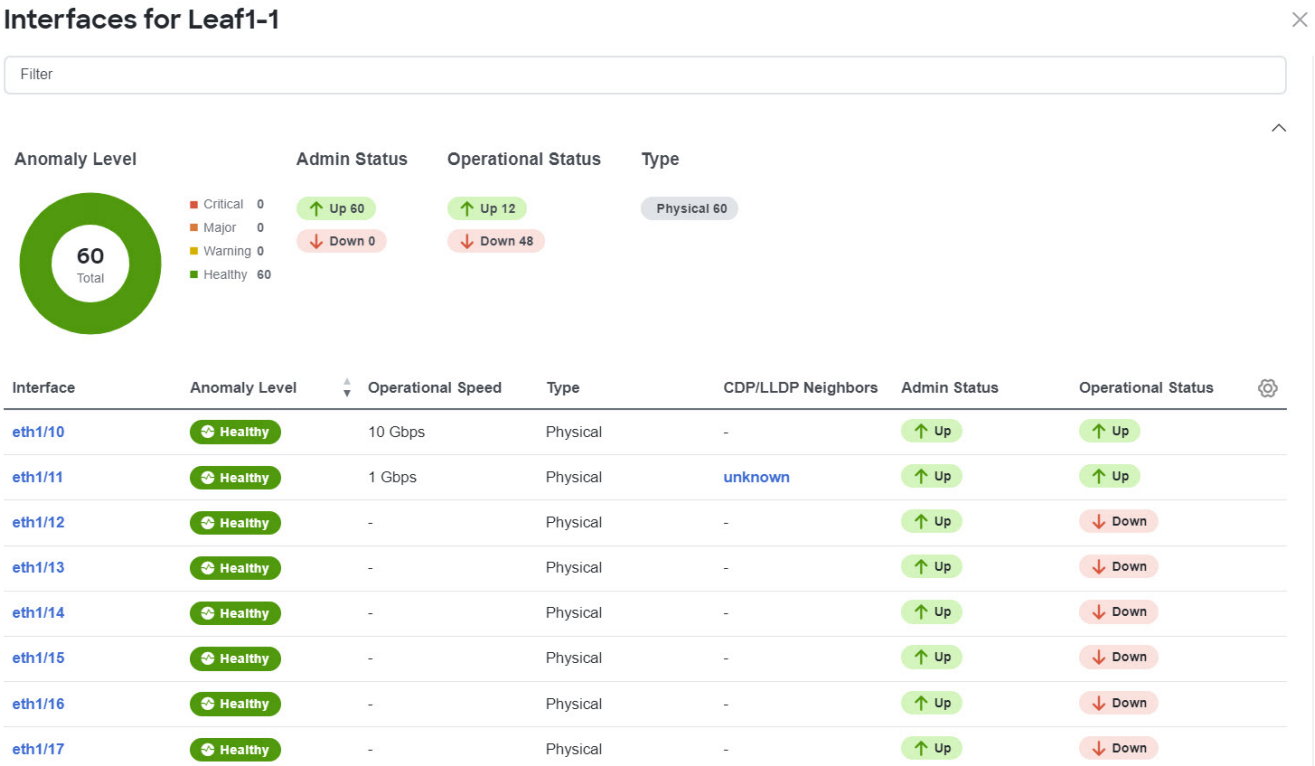
to get more specific information on the advisories present for this switch. A slide-in appears, showing all the advisories that occurred for this switch. See Advisories to understand how to navigate across the advisories tab.

- **Interfaces**

Interfaces provides the following information:

- The total number of interfaces in this switch
- The number of physical interfaces
- The overall status of the interfaces in the switch (the number of interfaces that are up, down, or physical not in use)

Click on the number above the **Total** text to get additional information on the interfaces in this switch.



You can filter the list of interfaces based on Anomaly Level, Interface, Type, Operational status and Admin status. Click on a specific interface listed under the Interface column to get additional information on that particular interface. See Interface Details for more information.

- **Switch View**

Within the **Switch View**, you can see the status of the interfaces, where the state could be Up (green),Down (red), or Not in Use (gray).

If the switch has multiple modules installed, you can switch the views between the different modules. Click **View All** to see the switch view for all modules installed.

Real Time Visualization (RTEV) feature facilitates real-time event rendering within a user interface (UI) environment. This feature allows for the smooth integration of real-time events directly into the UI, ultimately enhancing the user experience and delivering the most up-to-date information in real-time. RTEV supported features provide the current data in 1 minute when the change happens which

otherwise takes 5 minutes to get updated via the regular pipeline.

Real-time values are shown to the right of the vertical bar. Historical values (past 2 hours) are shown to the left of the bar and may have larger gaps between data points.

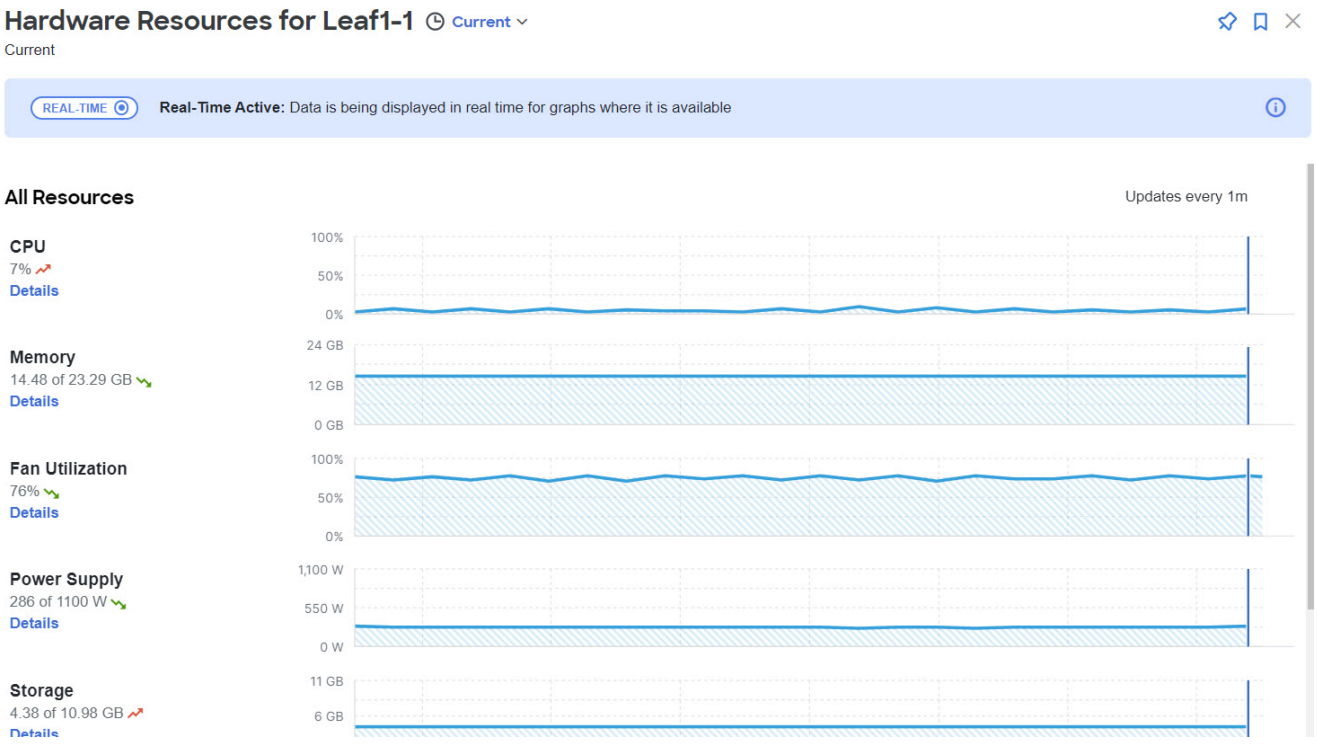
Controller events are not real time and RTEV is limited to switches only. Only 10 sessions per pod can have real-time data for physical and virtual deployment profiles. If there are more than 10 sessions then the data will be sent via regular pipeline. All other deployment profiles support 20 sessions.

Click these links in the Switch View to get additional information:

View Hardware Resources

Click **View Hardware Resources** to view a slide-in which appears with information on the hardware resources for this switch in real time. Real Time Visualization helps view up to date information about the resources. Hardware resources shows the variations in the hardware resources over the time range selected. The hardware resources displayed with the percentage utilized per component are CPU, Fan Utilization, Memory, Power Supply, Storage, and Temperature. Click any resource to view further details about it.

For hardware resources all parameters are updated in real-time based on the cadence from the switch when it sends the data.

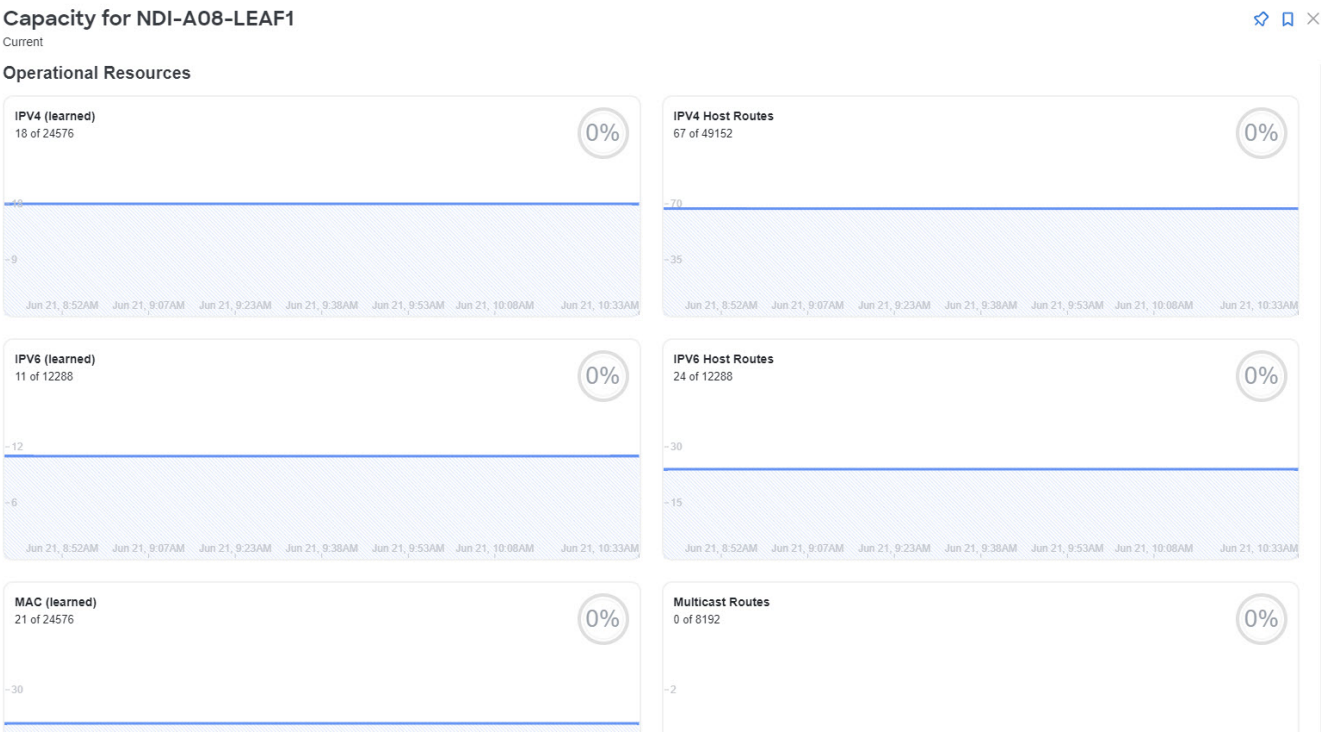


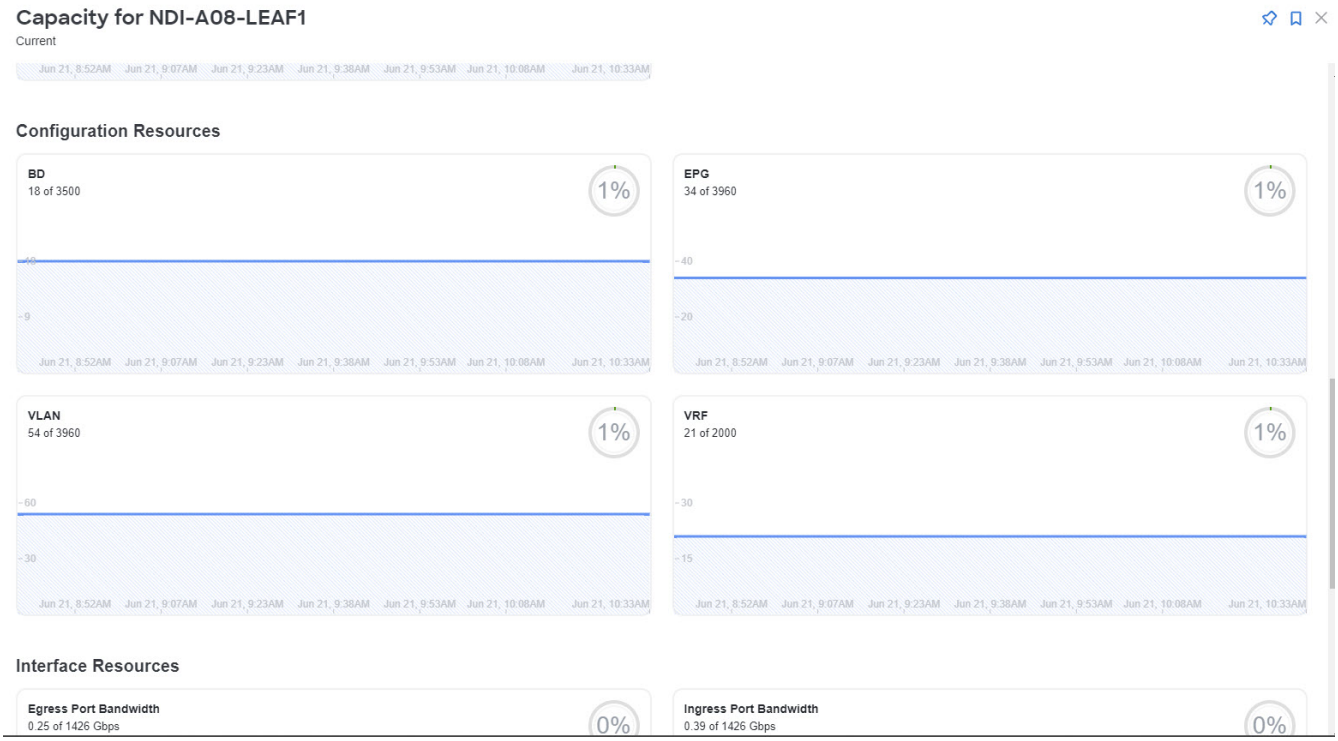
View Capacity

Click **View Capacity** to view a slide-in appears with capacity information for the switch. Capacity details shows the variations in operational, configuration and interface resources over the time range selected.

Type of Resource	List of resources
Operational Resources	• IPV4 (learned) • IPV4 Host Routes • IPV6 (learned) • IPV6 Host Routes • MAC (learned) • Multicast Routes • Policy TCAM • LPM
Configuration Resources	• BD • EPG • VLAN • VRF
Interface Resources	• Egress Port Bandwidth • Ingress Port Bandwidth • Port Usage

The port diagram key helps understand the switch view. Click any interface in the switch view to get more details about the interface. See [IInterface Details] for more information.





- **General**

General provides the following information :

Field	Description
Fabric	The fabric where each switch resides
Role	The role defines what the device is
Type	The type defines the type of switch
Connectivity to Insights	Connectivity status for switch

Field	Description
Telemetry Collection Status	Telemetry collection status provides insights into the health and performance of the switches and devices in your network. The different telemetry collection statuses at the fabric level include: • OK – This status indicates that the telemetry data streaming from a switch to Nexus Dashboard Insights is functioning correctly. This is the desired state, as it ensures comprehensive monitoring and visibility into the network's performance. • Not OK – This status indicates the telemetry data streaming from a switch to Nexus Dashboard Insights is not functioning correctly. This could be as a result of various problems, such as network outages, misconfigurations, or hardware failures. • Partial OK – This status indicates that telemetry data streaming from the switch to Nexus Dashboard Insights is not functioning correctly from some parts of the switch but it is functioning correctly from others. This suggests an inconsistent or partial telemetry data flow within the network which could be caused by various factors, such as switch specific issues or misconfigurations.
Software Version	The version of the software on the switch
Last Software Update	The date when the software was last updated on this switch
Uptime	The amount of time that this switch has been up. You will also see when the switch was last rebooted
Model	The model type for this switch
Serial Number	The serial number for this switch
Out-of-Band IPv4 Address	The IPv4 address for the out-of-band management of this switch
Out-of-Band IPv6 Address	The IPv6 address for the out-of-band management of this switch
In-Band IPv4 Address	The IPv4 address for the in-band management of this switch
Switch ID	The ID of the switch
Created At	The date and time the switch was created

- **Connectivity**

Connectivity provides the following information:

Field	Description
Endpoints	The number of endpoints associated with this switch
L3 Neighbors	The number of Layer 3 neighbors associated with this switch

Click on the number shown in either of these areas to get additional information on the endpoints or the Layer 3 neighbors.

Connectivity Details

Click **Connectivity** to view connectivity information for this switch. The following appear below **Connectivity**, with **Interfaces** shown first by default.

Click any of these to view additional connectivity information for this switch:

- **Interfaces**

Click Interfaces to view the Interfaces for this switch. The following information is available in Interfaces:

- Anomaly level (Only interface down anomaly is in Realtime)
- Admin Status (Real time visualization)
- Operational status (Real time visualization)
- Type

The Interfaces are listed in a tabular form with the following data available:

- Anomaly level
- Operational speed
- Type
- CDP/LLDP
- Admin Status
- Operational Status

There are various other columns that are optional and can be added to the table by clicking on the gear icon using the toggle to show or hide.

See Interface Details for more information.

- **L3 Neighbors**

Click L3 Neighbors to view L3 Neighbors for this switch. You can filter the results based on Neighbor, Local Switch, routing protocol, VRF, and Operational Status. BGP and OSPF protocols can now be

viewed in real time. The switch will report the interface logical neighbor event immediately upon modification or change or properties. OSPF support includes OSPF statistics, operational statistics, interface statistics, and neighbor statistics. Click the IP address in the Neighbor column to view details on this neighbor.

- **Endpoints**

Click Endpoints to view the Endpoints for this switch. You can filter the results based on Anomaly Level, MAC Address, IP Addresses, Hostname, Connected To, Interface, Time, Status, Tenant, VRF, BD, EPG/l3out, Search Deleted IPs, VM Name, and Hypervisor.

Click a MAC address in the **MAC** column to get the following additional information on that endpoint:

1. Overview
    - General
        - VM Name
        - Hypervisor
        - MAC Address
        - IP Address
        - Hostname
        - Last Updated
        - Status
    - Network Configuration
        - Tenant
        - VRF
        - EPG/L3 Out
        - BD
        - Encap
    - Connected To
        - Nodes
        - Interface
2. Endpoint history – Determine how you want to show endpoint history. The time range for the history is only based on the time selector chosen at the fabric level.
3. Anomalies

You can also click the IP address or the hostname (if clickable) to view additional information about them.

- **vPC Domains**

Click **vPC Domains** to view the vPC Domain for this switch. You can filter the results based on Domain ID.

The table lists the domain ID, the primary switch, the secondary switch and the number of vPCs up and down. Click a domain in the **Domain ID** column to view vPC domain details on that domain.

- **Multicast**

The Multicast card lists the IGMP, IGMP snooping and the PIM details for the switch. The Instances table shows the following information:

Protocol Type	Fields for Instances Table
IGMP DETAILS	• Interface • Admin State • Operational Status • Tenant • VRF • IP Address • Querier Address • Membership Count • Querier Version • Errors • View Stats
IGMP SNOOPING DETAILS	• Tenant • VRF • BD • Admin State • Querier Version • Multicast Routing State • Fabric Querier State • Errors • View Stats
PIM DOMAINS DETAILS	• Tenant • VRF • Admin State • Border Leaf Node • Rendezvous Point Addresses

- **Multicast Routes**

Click **Multicast Routes** to view the Multicast PIM Groups for this switch. You can filter the information by Source, Multicast Group, Tenant, VRF, Incoming Interface, Outgoing Interface, RPF Neighbor, RPF Source, and Flags.

Interface Details

The following interface types (Real time visualization) are supported:

- **Physical Interface**: To view the interface details of the node such as, node name, physical interface name, operational status, and admin state. The page also displays protocols, QoS, and DOM properties of the physical interface.
- **Port Channel Interface**: The port channel is an aggregate of physical interfaces and they can be statistically channeled or can be dynamic using LACP protocols. The statistical data that collects the counters for packets, bytes and various errors are similar to that of physical interface. The 150 *sourcename* differentiates the physical interface from port-channel (aggregated interfaces). The operational data is obtained by looking at an additional set of objects that gives the admin-status, oper-status and list of member interfaces for both PC and vPC.
- **vPC Interface**: The vPC is a logical interface that spans across two physical switches for fault tolerance. For a vPC interface type, the Logical Neighbors information is also displayed. The categories that are supported are L3Out, IPN, ISN, L4-L7.
- **SVI Interface**: An SVI is a virtual routed interface that connects a VLAN on the device to the Layer 3 router engine on the same device. Specific information such as Member Interfaces over which the SVI is deployed, VLAN ID, VLAN Type, Encap VLAN are displayed for the SVI interface.

Click an interface to view more details about it.

Overview

The Anomaly level is available at the top. The fields for overview change depending on the type of interface supported.

1. **INTERFACE TYPE : PHYSICAL**

Section	
General	• Interface • Type (Host Port, Fabric Port, L3 Port) • Operational Speed • IP Address • Admin Status • Operational Status • CDP/LLDP neighbors • Total Endpoints • SFP Diagnostics (You can click on 'View SFP Diagnostics' to view further details)  If LLDP is disabled, the tag will show 'LLDP disabled', otherwise it will show the count. This is applicable for CDP neighbors as well.

Section	
EPGSs with Active Endpoints (This is available for Host Ports)	• Tenant name • Endpoints in EPG • EPG Name • Mapped Domains • VLAN
L3 Neighbors (This is available for L3 Ports with SVI)	In this area, details are displayed such as IP, Operational Status, Routing Protocol, and Type.

2. **INTERFACE TYPE : PORT CHANNEL**

Section	
General	• Interface • Description • Type (Host Port, L3 Port) • Aggregation Type • Bandwidth • IP Address • Admin Status • Operational Status • CDP/LLDP neighbors (Real time visualization) • Total Endpoints • SFP Transceiver (You can click on 'View SFP Diagnostics' to view further details)  If LLDP is disabled, the tag will show 'LLDP disabled', otherwise it will show the count. This is applicable for CDP neighbors as well.
LACP Details	• Interface • Admin Status • Operational Status • LACP Packets received • LACP Packets transmitted • Errors

Section	
EPGSs with Active Endpoints (This is available for Host Ports)	• Tenant name • Endpoints in EPG • EPG Name • Mapped Domains • VLAN
Associated L3 Out (For L3 Port)	• L3 Out Name • Switch • Port • Routing protocol • External EPGs
SFP Diagnostics (DOM)	• Lane • Voltage • Temperature • Current • Transmit Power Value • Receive Power Value

An interface must be active for you to be able to view the neighbor details.

Configured 'IP Unnumbered' will show as “unassigned” in IP address field.

3. **INTERFACE TYPE : vPC**

Section	
General	• Interface • Description • Type (vPC) • vPC Domain • Aggregation Type • Bandwidth • IP Address • Admin Status • Operational Status • CDP/LLDP neighbors (Real time visualization) • Total Endpoints • SFP Transceiver (You can click on 'View SFP Diagnostics' to view further details)  If LLDP is disabled, the tag will show 'LLDP disabled', otherwise it will show the count. This is applicable for CDP neighbors as well.
Members	• Switch • Port Channel • Aggregation Type • Interface • Operational Status
EPGSs with Active Endpoints (This is available for Host Ports)	• Tenant name • Endpoints in EPG • EPG Name • Mapped Domains • VLAN
SFP Diagnostics (DOM)	• Lane • Voltage • Temperature • Current • Transmit Power Value • Receive Power Value

4. **INTERFACE TYPE : SVI**

Section	
General	• Interface • Description • Type • Encap • Admin Status • Operational Status • SFP Transceiver (You can click on 'View SFP Diagnostics' to view further details)
Associated L3 Out (For L3 Port)	• L3 Out Name • Switch • Port • Routing protocol • External EPGs
L3 Logical Neighbors (For L3 ports with SVI)	• IP • Operational State • Routing Protocol • Switch • Interface • Type

Multicast

Click Multicast to view details for multicast routes on this interface.

Field	
General	• IP Address • IGMP Version • IGMP Querier • IGMP Last Reporter • Admin State • Oper State • VRF • Tenant • Designated Router Address • Designated Router Priority • Neighbor Address

Field	
Multicast Groups	• Tenant • Source • Multicast Group • VRF • Last Reporter • Receiver Interfaces

For any interface, you can choose to view either the **IGMP** details or the **PIM** details.

IGMP DETAILS :

- General Information
  - Fast-leave
  - Allow V3 ASM
  - Report Link-local Groups
- Statistics
  - V2 Leave Received
  - V2 Leave Sent
  - V2 Query Received
  - V2 Query Sent
  - V2 Report Received
  - V2 Report Sent
  - V3 Query Received
  - V3 Query Sent
  - V3 Report Received
  - V3 Report Sent

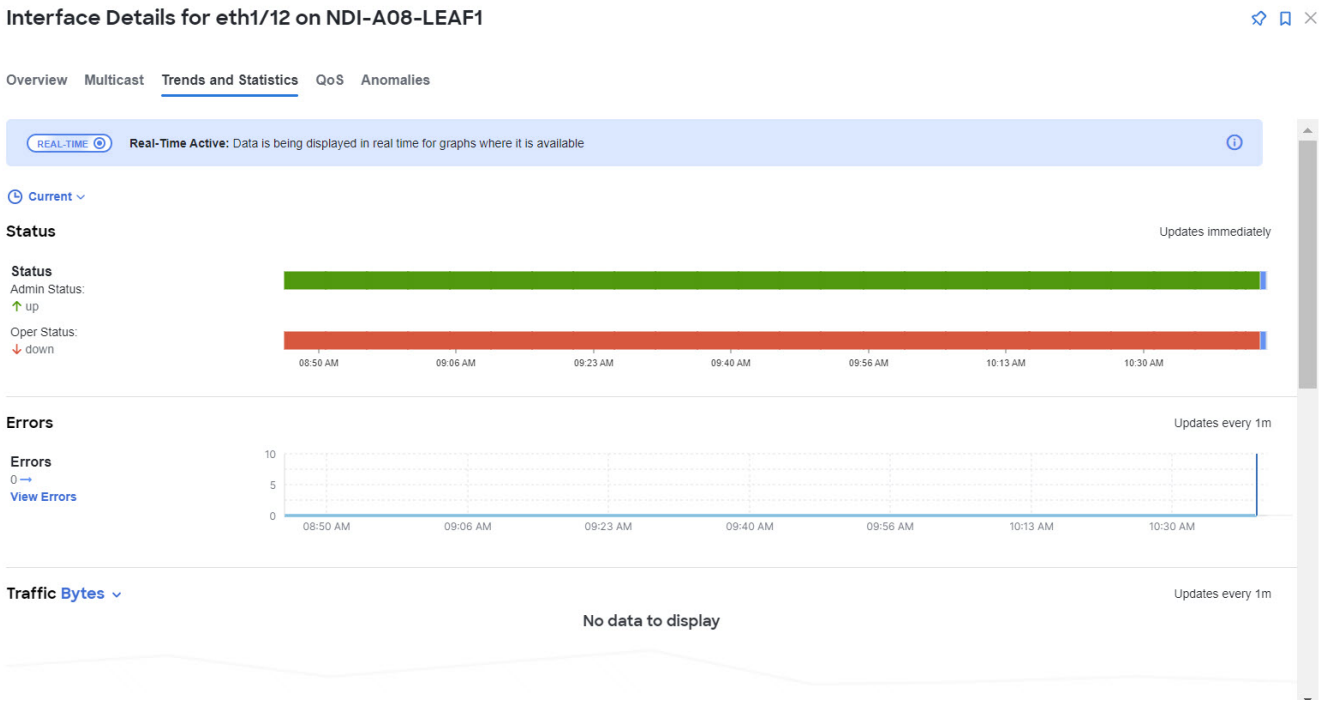
PIM DETAILS :

- Neighbor Details
  - Neighbor
  - BFD Config
  - Bi-Dir Config
- Statistics
  - Authentication failed
  - Bad Version Packet
  - Checksum Errors
  - Invalid Packet Received

- Invalid Packet Sent
- Join No RP
- Join Wrong RP
- Packet from Self
- Packet Length Error
- Packet on Passive Interface

Trends and Statistics

Click Trends and Statistics to view trends and statistics information on this specific interface in this switch. You see information about the admin and operational status, traffic that is flowing over the interface, the bandwidth and various statistics for congestion and errors. All of the information is now available in real time. Real Time Visualization helps view up-to-date information.



ACI switches do not support gNMI-based subscriptions, so Nexus Dashboard Insights will provide notifications based on a cadence, with statistics updates occurring at 1-minute intervals.

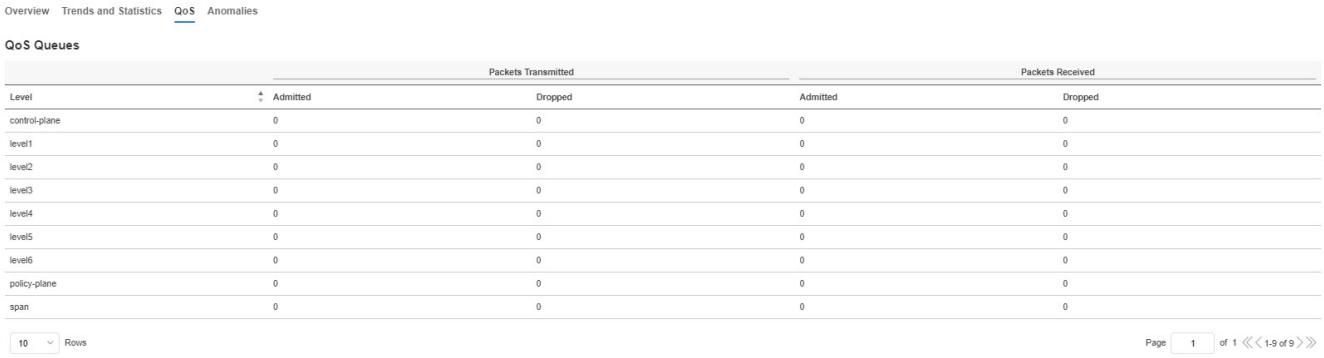
- Admin Status (Real time visualization)
- Operational Status (Real time visualization)
- Errors
- Traffic (by bytes or by packets) (Real time visualization)
  - Flood
  - Multicast
  - Unicast
  - Total
- Bandwidth

- Utilization
- Rate

- Microbursts

QOS

Quality of Service (QoS) in networking is a process that controls traffic to adjust the overall network traffic based on the requirements of specific applications.



Anomalies

Click to view anomaly information on this specific interface in this switch. See Anomalies for more information.

The Anomaly level shows the total number of anomalies that have occurred and the number of anomalies that have occurred in the last week.

Hover over the Anomaly Level to view the category of the anomalies occurred. Click the Anomaly Level to get specific information on the anomalies present for the specific controller or switch.

The **View all anomalies** takes you to the Anomalies tab. See Anomalies to understand how to navigate across the anomalies.

Microbursts

Microbursts

Click **Switches** > **Any switch** > **Connectivity** > **Interfaces** > **Any interface** > **Trends and Statistics** to view Microbursts in Inventory.

A burst of traffic impacts the output buffer of a physical interface port given the channel is already subscribed with line-rate flows. These bursts are often hard to detect with just given queuing parameters, such as buffer cells used and buffer cells unused as there is a high variance of usage of these buffers.

The Cisco Nexus 9000 series switches provide a capability of detecting this by issuing an interrupt that is triggered when a queue occupancy rises above x bytes and falls below y bytes. You can configure up to 8 output queues per physical interface port.

To configure Microburst in Nexus Dashboard Insights, navigate to **Admin** > **System Settings** > **Microburst**.

See the **Microburst** section in Getting Started to view more details.

You can view the microbursts details such as Queue, Start Time, Number of Bursts, Max Duration, Avg. Duration, Max Peak, and Avg Peak in the Microbursts section. A chart view and a tabular view is available.

Microburst Anomaly

Anomalies are raised in Nexus Dashboard Insights based on the number of microbursts at the interface level. Microburst anomaly jobs run every 5 minutes in a container environment, which checks for microburst records in microburst database. If the number of microbursts per interface is greater than microburst count threshold at any given point of time, then a minor anomaly is raised per interface in a node.

Nexus Dashboard Insights raises these anomalies:

1. The flows that are displayed in the summary table are gathered from Flow Telemetry data for a corresponding egress interface. Nexus Dashboard Insights matches the egress interface and egress queue to gather the corresponding microburst.
2. Based on the percentage of threshold, microburst is either low, high, or medium. The percentage of threshold is inverse to sensitivity. When the number of microbursts are greater than 100 on a particular interface, an anomaly is raised.
3. If flow telemetry is enabled and microburst is also enabled, then Nexus Dashboard Insights displays the estimated impact of flows for a particular microburst anomaly.
4. If the flow telemetry is disabled and microburst anomaly is enabled, then Nexus Dashboard Insights displays no Estimated Impact for that anomaly.
5. Flows that are contributing or impacted by microburst.

Filtering Information

In some cases, you might be able to filter results to find information more easily.

For example, you might have a situation where there a large number of endpoints under a single leaf switch, but you are only interested in endpoints that have a certain VLAN value.

You could filter the information to show only those specific endpoints in this situation.

Use the following operators for the filter refinement:

Operator	Description
==	With the initial filter type, this operator, and a subsequent value, returns an exact match.
!=	With the initial filter type, this operator, and a subsequent value, returns all that do not have the same value.
contains	With the initial filter type, this operator, and a subsequent value, returns all that contain the value.
!contains	With the initial filter type, this operator, and a subsequent value, returns all that do not contain the value.
<	With the initial filter type, this operator, and a subsequent value, returns a match less than the value.
< =	With the initial filter type, this operator, and a subsequent value, returns a match less than or equal to the value.
>	With the initial filter type, this operator, and a subsequent value, returns a match greater than the value.
> =	With the initial filter type, this operator, and a subsequent value, returns a match greater than or equal to the value.

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