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Quality of Service for Network Mode

Quality of Service

This article outlines the supported Quality of Service (QoS) features, their functions, and associated limitations for the N9324C-SE1U and N9348Y2C6D-SE1U Smart switches. The features classify traffic, manage queues, schedule transmission, and provide statistics. Use the related articles in this guide for configuration requirements and feature-specific limitations.

QoS concepts and relationships

QoS controls how the switch handles different traffic classes, especially when traffic competes for limited bandwidth. Classification identifies traffic, policy actions modify or limit it, and queuing and scheduling determine transmission order.

Table 1: QoS terminology

Term	Definition	Relationship
Classification	Assigning packets to a traffic class.	Provides the input for marking, policing, queuing, and scheduling actions.
System QoS policy	A device-level classification policy for system QoS.	Supports IPv4 and IPv6 DSCP matching and updates the default qos-map profile table when configured.
Interface QoS policy	A classification policy applied to a Layer 2 or Layer 3 interface.	Layer 3 supports qos-group and DSCP for IP traffic; Layer 2 also supports CoS for non-IP traffic.
Queue	A buffer that holds packets awaiting transmission.	Stores packets by class so scheduling can apply the intended priority or bandwidth.
Scheduling	Selecting which queued packets transmit next.	Controls service during congestion and affects latency, throughput, and drops.
QoS statistics	Counters that show how policies and queues handle traffic.	Validate whether the configured classification and treatment match the design.

QoS queuing and scheduling

QoS queuing and scheduling is a two-part process where **Queuing** first orders packets into different traffic classes, and **Scheduling** then methodically controls the output of those packets based on priority to ensure a consistent and efficient flow of network traffic.

For information on Queuing and Scheduling, refer to Configure Queuing and Scheduling.

Supported or unsupported queuing and scheduling features

Supported features

- Eight queues - SPAN and CPU Queues that are overloaded with eight user queues are supported.
- SP and DWRR are supported. However, the shaper and DWRR accuracy will have a 5% variance.
- QoS statistics are supported.

- Maximum shaper and static limit are supported.

Unsupported features

- Micro-Burst monitoring is not supported.
- Link Level Flow Control (LLFC) is not supported.
- Dynamic queue-limit is not supported.
- Multicast queuing statistics is not supported.

Feature limitation

- During congestion on an egress interface, the VoQ architecture does not guarantee fair packet drops among ingress interfaces in the same slice. You can expect fair packet drops only when the ingress interfaces belong to different slices.

QoS classification

QoS classification is the process of separating packets into traffic classes to apply specific actions such as policing or marking.

For information on QoS classification, refer to Configure QoS Classification.

QoS classification guidelines and limitations

Beginning with NX-OS Release 10.6(2)F, N9324C-SE1U and N9348Y2C6D-SE1U Smart switches support QoS classification policies for system QoS with these capabilities:

- System QoS supports DSCP matching for IPv4 and IPv6.
- When you configure a system QoS policy, the default qos-map profile table entries update to match the policy settings.
- System QoS supports setting the qos-group and DSCP for IP packets and CoS for non-IP traffic.
- System QoS does not support collecting, displaying, or analyzing traffic statistics managed by QoS policies.

Beginning with NX-OS Release 10.6(3)F, N9324C-SE1U and N9348Y2C6D-SE1U Smart switches support QoS classification policies for interface QoS with these capabilities:

- Layer 3 interface QoS supports setting the qos-group and DSCP for IP packets, but it does not support CoS for non-IP traffic.
- Layer 2 interface QoS supports setting the qos-group and DSCP for IP packets and CoS for non-IP traffic.

QoS statistics

QoS statistics are a collection of performance counters, enabled by default on a network device, used to monitor and display the behavior and effectiveness of applied Quality of Service policies.

For information on QoS statistics, refer to Monitoring the Statistics.

QoS statistics guidelines and limitations

Beginning with NX-OS Release 10.6(2)F, N9324C-SE1U and N9348Y2C6D-SE1U Smart switches support queuing statistics.

Queuing statistics and QoS policy statistics use different collection behavior:

- When you apply a queuing policy with the **no-stats** option, the device does not collect policy statistics for detailed **show policy-map interface** output.
- The **clear qos statistics** command does not clear the counters displayed by **show queuing interface**. The **show queuing interface** command reads counters on demand and operates independently of QoS statistics collection.

For information on QoS statistics, refer to Monitoring the Statistics.