



Configuring Quality of Service on Ethernet Routing Switch 4900 and 5900 Series

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! Important:

If you configure the shape rate to 0 for a specific queue or port, shaping is not performed on that queue or port.

Variable Definitions

Use the data in the following table to use the `qos if-queue-shaper` command.

Variable	Value
name <WORD>	Specifies an alphanumeric label used to identify the QoS interface queue shaper. Value is a character string ranging from 1–16 characters in length.
port <portlist>	Specifies the port or list of ports for which to apply egress queue shaping.
queue <1-8>	Specifies the queue for the selected interface port or ports, on which traffic is shaped. The range of available values is determined by the OoS agent default queue configuration.
shape-min-rate <0-10230000>	Specifies the minimum QoS interface queue shaping rate, in kilobits per second (Kbps). Values range from 0 to 10230000 Kbps.
shape-rate <0-10230000>	Specifies the QoS interface queue shaping rate, in kilobits per second (Kbps). Values range from 0 to 10230000 Kbps.

Delete a QoS Interface Queue Shaper

About this task

Use the following procedure to delete an egress queue shaper for one or more interfaces.

Procedure

1. Enter Interface Configuration mode:

```
enable
configure terminal
interface ethernet <port number>
```

2. Delete an egress queue shaper:

```
no qos if-queue-shaper [port <portlist>] [queue <1-8>]
```

Variable Definitions

Use the data in the following table to use the `no qos if-queue-shaper` command.

Variable	Value
name <WORD>	Specifies an alphanumeric label used to identify the QoS interface queue shaper. Value is a character string ranging from 1–16 characters in length.
port <portlist>	Specifies the port or list of ports for which to delete egress queue shaping.
queue <1-8>	Specifies the queue for the selected interface port or ports, on which traffic is shaped. The range of available values is determined by the OoS agent default queue configuration.

View QoS Interface Queue Shaper Information

About this task

Use the following procedure to display egress queue shaper information for one or more interfaces.

Procedure

1. Enter Interface Configuration mode:

```
enable
configure terminal
interface ethernet <port number>
```

2. Display egress queue shaper information:

```
show qos if-queue-shaper [port <portlist>]
```

Variable Definitions

Variable	Value
port <portlist>	Specifies the port or list of ports for which to display egress queue shaping.

Configure QoS Policies

About this task

Use the following procedure to configure QoS policies.

Important:

All components associated with a policy, including the interface group, element, classifier, classifier block, action, and meter, must be defined before referencing those components in a policy.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Configure QoS policies:

```
[no] qos policy <1-55000> [enable] [name <WORD>] [port <port_list>]
if-group <WORD> clfr-type {classifier | block} {clfr-id <1-55000> |
clfr-name <WORD>} {{in-profile-action <1-55000> | in-profile-action-
name <WORD>} | meter <1-55000> | meter-name <WORD>} precedence
<1-14> [track-statistics <individual | aggregate>]]
```

Use the **no** form of this command to delete QoS policy entries.

Variable Definitions

Use the data in the following table to use the **qos policy** command.

Variable	Value
<1-55000>	Enter an integer to specify the QoS policy; range is 1–55000.
enable	Enable (basic form) or disable (no form) the QoS policy.
name <WORD>	Enter the name for the policy; maximum is 16 alphanumeric characters.
port <port_list>	The ports to which to directly apply this policy.
if-group <WORD>	Enter the interface group name to which this policy applies; maximum number of characters is 32 US-ASCII. The group name must begin with a letter within the range a..z or A..Z.
clfr-type <classifier block>	Specify the classifier type; classifier or block.
clfr-id <1-55000>	Specify the classifier ID; range is 1–55000.
clfr-name <WORD>	Specify the classifier name or classifier block name; maximum is 16 alphanumeric characters.
in-profile-action <1-55000>	Enter the action ID for in-profile traffic; range is 1–55000.
in-profile-action-name <WORD>	Enter the action name for in-profile traffic; maximum is 16 alphanumeric characters.
meter <1-55000>	Enter meter ID associated with this policy; range is 1–55000.
meter-name <WORD>	Enter the meter name associated with this policy; maximum of 16 alphanumeric characters.
precedence <1-14>	Specifies the precedence of this policy in relation to other policies associated with the same interface group. Enter precedence number; range is 1–14.

Table continues...

Variable	Value
	 Important: Policies with a lower precedence value are evaluated after policies with a higher precedence number. Evaluation goes from highest value to lowest.
track-statistics <individual aggregate>	Specifies statistics tracking on this policy, either: <ul style="list-style-type: none"> • individual--statistics on individual classifiers • aggregate--aggregate statistics

Configuring User Based Policies using the CLI

Use the information in this section to configure and manage user based policies. You can include up to 128 classifier elements in a user based policy.

Configure User Based Policy using Classifiers

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Enter the following command:

```
qos ubp classifier name <WORD> [addr-type {ipv4|ipv6}] [alloc-mode
{best-effort|double|single}] [block <WORD>] [drop-action {disable|
enable}] [ds-field <0-63>] [dst-ip A.B.C.D/<0-32>] [dst-mac <H.H.H>
dst-mac-mask <H.H.H>] [dst-port-min <0-65535> dst-port-max
<0-65535>] [ethertype <0x0-0xFFFF>] [eval-order <1-255>] [ip-flag
<LINE>] [ipv4-option {no-opt |with -opt}] [master] [pkt-type
{etherII | llc | snap}] [priority {<0-7> | all}] [protocol <0-255>]
[set-drop-prec {high-drop | low-drop}] [src-ip <A.B.C.D/<0-32>]
[src-mac <H.H.H> src-mac-mask <H.H.H>] [src-port-min <0-65535> src-
port-max <0-65535>] [tcp-control <LINE>] [update-1p {<0-7> | use-
egress | use-tos-prec}] [update-dscp <0-63>] [vlan-min <1-4094>
vlan-max <1-4094>] [vlan-tag {tagged |untagged}]
```

 **Note:**

To modify an entry in a filter set, you must delete the entry and then add a new entry with the desired modifications.

Example

The following command is an example of adding a classifier to an existing filter set (in this example, the ALPHAYELLOW filter set):

```
qos ubp classifier name ALPHAYELLOW dst-ip 192.0.2.0/24 ethertype 0x0800 drop-action
disable eval-order 70
```

The following commands are an example of adding a classifier block (remedial) to an existing filter set (ALPHAYELLOW):

* Note:

To consume only one precedence level, group classifiers in a classifier block.

```
qos ubp classifier name ALPHAYELLOW dst-ip 192.0.2.0/24 ethertype 0x0800 drop-action
disable block remedial eval-order 70
qos ubp classifier name ALPHAYELLOW dst-ip 198.51.100.0/24 ethertype 0x0800 drop-action
disable block remedial eval-order 71
qos ubp classifier name ALPHAYELLOW dst-ip 203.0.113.0/24 ethertype 0x0800 drop-action
disable block remedial eval-order 72
```

The following commands are an example of classifiers configured to allow various TCP/UDP destination ports in the red filter set, and configured as a classifier block (novell):

```
qos ubp classifier name red protocol 17 dst-port-min 427 dst-port-max 427 ethertype
0x0800 drop-action disable block novell eval-order 101
qos ubp classifier name red protocol 6 dst-port-min 524 dst-port-max 524 ethertype 0x0800
drop-action disable block novell eval-order 102
qos ubp classifier name red protocol 6 dst-port-min 396 dst-port-max 396 ethertype 0x0800
drop-action disable block novell eval-order 103
```

Variable Definitions

Use the data in the following table to use the `qos ubp classifier name word` command.

Variable	Value
name <1–16>	Creates the user based policy classifier entry.
addr-type {ipv4 ipv6}	Specifies the type of IP address used by this classifier entry. The type is limited to IPv4 and IPv6 addresses.
alloc-mode {best-effort double single}	Specifies the allocation mode. It enables you to set the user based policy allocation mode to double, single, or best-effort. Blocks within a user based policy filter can be forced to use only the single legacy mode or to be installed in double mode even if it is not necessary. By default, the best-effort allocation mode is active. If you do not select an allocation mode, the system uses single mode. Only if using single allocation mode will fail the system uses double mode.
block <1–32>	Specifies the label to identify access list elements that are of the same block.
drop-action {enable disable}	Specifies whether or not to drop non-conforming traffic.
ds-field <0–63>	Specifies the value for the DiffServ Codepoint (DSCP) in a packet.

Table continues...

Variable	Value
dst-ip {<ipv4_destination> <0-32>}	Specifies the IP address to match against the destination IP address of a packet.
dst-mac <mac_address>	Specifies the MAC address against which the MAC destination address of incoming packets is compared.
dst-port-min <0-65535>	Specifies the minimum value for the layer 4 destination port number in a packet. dst-port-max must be terminated prior to configuring this parameter.
ethertype <0x0-0xFFFF>	Specifies a value that indicates the version of Ethernet protocol being used.
eval-order <1-255>	Specifies the evaluation order for all elements with the same name.
ip-flag<LINE>	Specifies IP flags.
ipv4-option{no-opt with-opt}	Specifies the IPv4 packet with or without options.
master	Specifies as the master member of the block.
pkt-type	Specifies if the packet is of the following type: <ul style="list-style-type: none"> • Ethernet II • LLC • SNAP
priority {<0-7> all}	Specifies the user priority classifier criteria.
protocol <0-255>	Specifies the IPv4 protocol classifier criteria.
set-drop-prec {high-drop low-drop}	Specifies the set drop precedence. Valid values are: <ul style="list-style-type: none"> • high-drop • low-drop
src-ip {<A.B.C.D> <0-32>}	Specifies the source IP classifier criteria.
src-mac <mac_address>	Specifies the source MAC classifier criteria.
src-port-min <0-65535>	Specifies the Layer 4 source port minimum value classifier criteria.
update-1p {<0-7> use-egress use-tos-prec}	Specifies the update user priority.
update-dscp <0-63>	Specifies the update DSCP.
vlan-min <1-4094>	Specifies the VLAN ID minimum value classifier criteria.
vlan-tag {tagged untagged}	Specifies the VLAN tag classifier criteria.

Configure User Based Policy filter set

About this task

Configure a user based policy filter set.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Enter one of the following commands:

- `qos ubp set name <WORD> [committed-rate <64-10230000> committed-burst-size <1024|128|16|16384|2048|256|32|4|4096|512|64|8|8192> drop-out-action {disable|enable} [set-drop-prec-out-action {high-drop|low-drop} | [set-priority <1-255>] | [track-statistics {aggregate|disable|individual}] | [update-dscp-out-action <0-63>]]`
- `qos ubp set name <WORD> [committed-rate <64-10230000> max-burst-rate <64-4294967295> [drop-out-action {disable|enable} | max-burst-duration <1-4294967295> | set-drop-prec-out-action {high-drop|low-drop} | update-dscp-out-action <0-63>]]`
- `qos ubp set name <WORD> [set-priority <1-255> track-statistics {aggregate|disable|individual}]`
- `qos ubp set name <WORD> [track-statistics {aggregate | disable | individual}]`

* Note:

To modify an entry in a filter set, you must delete the entry and add a new entry with the desired modifications.

Variable Definitions

Use the data in the following table to use the `qos ubp set name` command.

Variable	Value
set name	Creates the User Based Policy set.
committed-rate <64-10230000>	Specifies the committed rate value.
committed-burst-size	Specifies the burst size in KBytes.
drop-out-action {enable disable}	Specifies the action to take when a packet is out-of-profile. The device only applies this action if metering is being enforced, and if the device deems the traffic to be out of profile based on the level of traffic and the metering criteria. Options are enable (packet is dropped) and disable (packet is not dropped).
set-drop-prec-out-action {highdrop low-drop}	Specifies the set drop precedence out-of-profile action.
set-priority <1-255>	Specifies the filter set priority.
track-statistics <aggregate disable individual>	Specifies to track statistics on the policy.

Table continues...

Variable	Value
update-dscp-out-action <0-63>	Specifies the remark DSCP out-of-profile action.
max-burst-rate <64-4294967295>	Specifies the maximum burst rate value.
max-burst-duration <1-4294967295>	Maximum burst duration in milliseconds.
set-drop-prec-out-action {high-drop low-drop}	Specifies the set drop precedence out-of-profile action.
update-dscp-out-action <0-63>	Specifies the remark DSCP out-of-profile action.
set-priority <1-255>	Specifies the filter set priority.

Delete a Classifier, Classifier Block, or an Entire Filter Set

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Delete an entire filter set:

```
no qos ubp name <filter name>
```

*** Note:**

You cannot delete a filter set while it is in use. You cannot delete a classifier if there is no filter set for that classifier.

3. Delete a classifier:

```
no qos ubp name <filter name> eval-order <value>
```

*** Note:**

You cannot reset QoS defaults if the EAP/NEAP user based policy support references a QoS user based policy filter set.

Modify QoS Support Level for User Based Policies

About this task

Use this procedure to modify the level of QoS support for user based policies.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Modify the level of QoS support for user based policies:

```
qos agent ubp {disable | high-security-local | low-security-local}
```

Variable Definitions

Use the data in the following table to use the `qos agent ubp` command.

Variable	Value
disable	Disables QoS support for user based policies.
high-security-local	Enables the high security level of QoS support for user based polices.
low-security-local	Enables the low security level of QoS support for user based polices.

View QoS User Based Policy Configuration

About this task

Use this procedure to view QoS user based policy configuration that includes filter parameters, and specific filter set parameters. The configuration also includes ports, associated filter sets, and classifier entries.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. View User Based Policy filter parameters:

```
show qos ubp
```

3. View User Based Policy filter parameters for a specific filter set:

```
show qos ubp name <filter name>
```

4. View ports and the filter sets assigned to those ports:

```
show qos ubp interface
```

5. View UBP statistics:

```
show qos ubp statistics port <port number> name <word>
```

6. View classifier entries for user based policies, including those for dynamic user based policies:

```
show qos ubp classifier [name <WORD> | dynamic]
```

7. View QoS precedence usage:

```
show qos diag
```

*** Note:**

Use the command `show qos diag` to properly plan QoS precedence usage. The precedence limit for the device is 8, with 1 precedence reserved for ARP.

Maintaining the QoS Agent

The following procedures allow for the maintenance of the QoS agent.

Enable the QoS Agent

About this task

Use this procedure to enable QoS agent functionality for a switch or stack.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Enable QoS agent functionality for a switch or stack:

```
qos agent oper-mode
qos agent oper-mode enable
default qos agent oper-mode
```

Disable the QoS Agent

About this task

Use this procedure to disable QoS agent functionality for a switch or stack.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Disable QoS agent functionality for a switch or stack:

```
no qos agent oper-mode enable
OR
```

```
no qos agent oper-mode
```

Configure QoS Resource Buffer Sharing

About this task

Use this procedure to configure how the QoS buffer resources are shared across ports.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. Configure QoS resource buffer sharing:

```
qos agent buffer [regular|large|maximum]
```

Variable Definitions

Use the data in the following table to use the `qos agent buffer` command.

Variable	Value
regular	Specifies the minimum amount of resource sharing.
large	Specifies the medium amount of resource sharing.
maximum	Specifies the maximum amount of resource sharing.

Change the QoS Resource Buffer Size to Default

About this task

Use this procedure to change the QoS resource buffer size to the default value (large).

! Important:

Changes to the QoS buffer size are initiated only after the next switch restart.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. Configure the QoS resource buffer size to the default value:

```
default qos agent buffer
```

Configure Automatic QoS Support

About this task

This procedure describes how to configure the QoS agent AutoQoS mode.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. Configure QoS agent AutoQoS mode:


```
qos agent aq-mode [disable|mixed|pure]
```

Variable Definitions

Use the data in the following table to use the `qos agent aq-mode` command.

Variable	Value
disable	Specially marked application traffic processing is disabled on all ports.
mixed	Application traffic processing is enabled on all port with egress DSCP mapping.
pure	Application traffic processing is enabled on all ports without egress DSCP mapping.

Configure NVRAM Parameters

About this task

Use the following procedure to specify the maximum amount of time, in seconds, before nonvolatile QoS configuration is written to non-volatile storage. Delaying NVRAM access can be used to minimize file input and output. This can aid QoS agent efficiency if a large amount of QoS data is being configured.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. Configure NVRAM parameters:


```
qos agent nvramp-delay <0-604800>
```

Reset NVRAM Parameters

About this task

Use the following procedure to reset the NVRAM delay time to factory default.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. Reset NVRAM delay time:


```
default qos agent nvram-delay
```

Change the QoS CoS Queue Set

About this task

Use this procedure to modify the number of active QoS CoS queue sets.

! Important:

Changes to the QoS CoS queue set are initiated only after the next switch restart.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. Modify the number of active QoS CoS queue sets:


```
qos agent queue-set <1-8>
```

Variable Definitions

Use the data in the following table to use the `qos agent queue-set` command.

Variable	Value
<1-8>	Specifies the number of active QoS CoS queue sets. Values range from 1–8.

Change the QoS CoS Queue Set to Default

About this task

Use this procedure to change the number of active QoS CoS queue sets to the switch default.

Important:

Changes to the QoS CoS queue set are initiated only after the next switch restart.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. Change the number of active QoS CoS queue sets to the switch default:

```
default qos agent queue-set
```

Change the QoS Agent to Factory Defaults

About this task

Use this procedure to change all QoS agent parameters to factory default values.

Important:

You must restart the switch for changes to QoS CoS queue set and resource buffer size to take effect.

Procedure

1. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

2. Reset the QoS Agent to factory defaults:

```
default qos agent
```

OR

```
qos agent reset-default
```

Change the QoS Agent to Partial Factory Defaults

About this task

Use this procedure to change all QoS agent parameters to factory default values except resource buffer sharing and QoS CoS queue set.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. Reset the QoS Agent to partial factory defaults:


```
qos agent reset-partial-default
```

Configuring QoS statistics tracking

About this task

Use this procedure to configure the type of statistics tracking to use with QoS.

Procedure

1. Enter Global Configuration mode:


```
enable
configure terminal
```
2. Configure QoS statistics tracking:


```
qos agent statistics-tracking [aggregate|disable|individual]
```

Variable Definitions

Use the data in the following table to use the `qos agent statistics-tracking` command.

Variable	Value
<code>aggregate</code>	Allocates a single statistics counter to track data for all classifiers contained in the QoS policy being created.
<code>disable</code>	Disables statistics tracking.
<code>individual</code>	Allocates individual statistics counters to track data for each classifier contained in the QoS policy being created.

Change QoS Statistics Tracking to Default

About this task

Use this procedure to change the QoS statistics tracking type to the factory default.

Procedure

1. Enter Global Configuration mode:

```
enable  
configure terminal
```
2. Change the QoS statistics tracking type to the factory default:

```
default qos agent statistics-tracking
```

Configure DoS Attack Prevention Package

About this task

Use this procedure to configure the DoS Attack Prevention Package (DAPP).

Procedure

1. Enter Global Configuration mode:

```
enable  
configure terminal
```
2. To enable DAPP, enter the following command:

```
qos agent dos-attack-prevention enable
```
3. To disable DAPP, enter the following command:

```
no qos agent dos-attack-prevention [enable]
```

OR

```
default qos agent dos-attack-prevention
```
4. To enable DAPP status tracking, enter the following command:

```
qos agent dos-attack-prevention status-tracking
```

If adequate resources are not available to enable status tracking, this command fails.
5. To set the minimum TCP header size used by DAPP, enter the following command:

```
qos agent dos-attack-prevention min-tcp-header <0-255>
```

Default value is 20.
6. To set the maximum IPv4 ICMP length used by DAPP, enter the following command:

```
qos agent dos-attack-prevention max-ipv4-icmp <0-1023>
```

Default value is 512.

7. To set the maximum IPv6 ICMP length used by DAPP, enter the following command:

```
qos agent dos-attack-prevention max-ipv6-icmp <0-16383>
```

Default value is 512.

8. To set the DAPP parameters to their default values, enter the following command:

```
default qos agent dos-attack-prevention
```

View QoS Agent Configuration Information

About this task

Use this procedure to display general switch or stack QoS agent configuration information.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Display general switch or stack QoS agent configuration information:

```
show qos agent
```

View QoS Agent Configuration Details

About this task

Use this procedure to display detailed switch or stack QoS agent configuration information.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Display detailed switch or stack QoS agent configuration information:

```
show qos agent details
```

Clear QoS Statistics

About this task

Use this procedure to clear all counters associated with QoS policies and installed meters.

Procedure

1. Enter Global Configuration mode:
`enable`
`configure terminal`
2. Reset all QoS related counters:
`qos clear-stats`

Configure ADAC Auto-QoS

About this task

Use this procedure to configure ADAC Auto-QoS.

Procedure

1. Enter Global Configuration mode:
`enable`
`configure terminal`
2. At the prompt, enter the following command:
`qos agent aq-mode [disable] | [mixed] | [pure]`
3. Verify your configuration:
`show qos agent`

Example

```
Switch#show qos agent
QoS Operational Mode: Enabled
QoS NVRam Commit Delay: 10 seconds
QoS Current Queue Set: 2
QoS Next Boot Queue Set: 2
QoS Current Buffering: Large
QoS Next Boot Buffering: Large
QoS UBP Support Level: Disabled
QoS Default Statistics Tracking: Aggregate
QoS DoS Attack Prevention: Disabled
  Minimum TCP Header Length: 20
  Maximum IPv4 ICMP Length: 512
  Maximum IPv6 ICMP Length: 512
Auto QoS Mode: Disabled
```

Variable definitions

Use the data in the following table to use the `qos agent aq-mode` command.

Variable	Value
disable	Disables Auto QoS application traffic processing on all ports.
mixed	Enables Auto QoS application traffic processing with egress DSCP remapping on all ports.
pure	Enables Auto QoS application traffic processing without egress DSCP remapping on all ports.

Chapter 5: Configuring Quality of Service using Enterprise Device Manager

This section discusses how to configure DiffServ and Quality of Service (QoS) parameters for policy-enabled networks using Enterprise Device Manager (EDM).

! **Important:**

In addition to the QoS configurations created, the system creates some default classifier elements, classifiers, classifier blocks, policies, and actions. These system default entries cannot be modified or deleted.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Managing Interface Queues using the EDM

Use the information in the following sections to manage interface queues using the Enterprise Device Manager (EDM).

Display Interface Queues using EDM

Use the following procedure to display the interface queues:

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface Queue** tab to view the interface queues.

Field Descriptions

The following table describes the fields associated with interface queues.

Name	Description
SetId	Displays an integer between 1 and 65535 that identifies the specific queue set.
QueueId	Displays an integer that uniquely identifies a specific queue within a set of queues.
Discipline	Displays the paradigm used to empty the queue: <ul style="list-style-type: none"> • priorityQueuing • weightedRoundRobin
Bandwidth %	Displays relative bandwidth available to a given queue with respect to other associated queues.
AbsBandwidth	Displays absolute bandwidth available to this queue, in Kb/s.
BandwidthAllocation	Displays bandwidth allocation: relative or absolute.
ServiceOrder	Specifies the order in which a queue is serviced based on the defined discipline.
Size	Displays the size of the queue in bytes.

Filter Interface Queue Information

About this task

You can display selected parts of the **Interface Queue** tab.

Procedure

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, click **QoS Devices**.
3. In the work area, click the **Interface Queue** tab.
4. Click the **Filter** button on the toolbar.

The QoS Devices, Interface Queue - Filter screen appears.

5. Set the conditions to be used to filter the display of the **Interface Queue** table.
 - a. Select **AND** to include all entries in the table that include *all* specified parameters, or select **OR** to include *any* of the specified parameters.
 - b. Select **Ignore Case** to include all entries with the parameters being set, whether in lowercase or uppercase.

- c. Define the display filtering criteria to return all cases in which an entry **contains, equals to, does not contain, or does not equal to** the set parameters.
 - d. Select **All records** to display all the entries in the table.
 - e. To display the entries by parameter values, enter the values to display in the appropriate fields.
6. Click **Filter**.

Configuring Interface Groups using the EDM

Use the information to create and manage interface groups.

Display Interface Groups using EDM

Use the following procedure to display the interface groups.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface Group** tab to view the interface group information.

Field Descriptions

The following table describes the fields associated with the interface groups.

Name	Description
Id	Displays a unique identifier of an interface group.
Role	Specifies the tag used to identify interfaces with the characteristics specified by the attributes of this class instance. These identifiers can be used within a number of classes to identify a physical set of interfaces to which policy rules and actions can apply.
Capabilities	Specifies the list of the interface capabilities used by the PDP or network manager to select the policies and configurations that can be pushed to the Policy Enforcement Point (PEP).
InterfaceClass	Specifies the type of traffic interfaces associated with the specified role combination.
StatsTrackingType	Specifies the type of statistics tracking used.

Table continues...

Name	Description
StorageType	Displays storage type for this interface group: <ul style="list-style-type: none"> • Volatile • nonVolatile (default) • readOnly • other

Delete Ports from an Interface Group using EDM

Use the following procedure to remove ports from an interface group.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface Group** tab.
4. Highlight the interface group from which you want to delete ports.
5. Click **Interface Assignment** button on the toolbar. .
The Port Editor: undefined screen appears
6. De-select the port numbers to delete them from the interface group.
7. Click **OK**.

Add Interface Groups using EDM

Use the following procedure to add interface groups.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface Group** tab.
4. Click **Insert**.
The Insert Interface Group screen appears.
5. Enter the desired ID number.
6. Enter the **Role** combination tag for this Interface Group.
7. Select the interface class desired for this interface group: **trusted**, **nonTrusted**, **unrestricted**, **untrustedv4v6**, or **untrustedBasic**.

8. Click **Insert**.

Delete Interface Groups using the EDM

Use the following procedure to delete the interface groups.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface Group** tab.
4. Highlight the interface group to delete.
5. Click **Delete**.

 **Important:**

An interface group that is referenced by a policy cannot be deleted. The policy must first be deleted. Also, an interface group that has ports assigned to it cannot be deleted.

The association between interfaces, role combinations, and queue sets can be displayed. A role combination is a unique label that identifies a group of interfaces.

Assigning Ports to an Interface Group using the EDM

Use the following procedure to assign ports to an interface group.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface Group** tab.
4. Highlight the interface group for which you want to add parts.
5. Click the **Interface Assignment** button on the toolbar.
ThePort Editor: undefined screen appears.
6. Select the port numbers to add to the interface group.
7. Click **OK**.

! Important:

Adding or deleting a number of ports on a switch experiencing a heavy load can take a long time and can cause the EDM to time out.

Configuring Interface Groups using the EDM

Use the following procedure to create and manage interface IDs.

Display an Interface ID using EDM

About this task

Display the interface ID.

Procedure

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Interface ID Assignments** tab to view the interface id information.
4. On the toolbar, click **Apply**.

Field Descriptions

The following table describes the fields associated with creating and managing interface IDs.

Name	Description
Port	Displays ports numbers.
RoleCombination	Displays the role combination associated with the interface.
QueueSet	Displays the queue set associated with this interface.
Capabilities	Displays the capabilities.

Displaying Priority Queue Assignments

Display Priority Queue Assignments using EDM

Use the following procedure to view Priority Q Assignments.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Priority Q Assign** tab to view the priority queue.

Field Descriptions

The following table describes the fields associated with viewing the Priority Q Assignments.

Name	Description
Qset	Supports the assignment of 802.1p user priority values to a queue for each specific queue set. There are 8 queue sets and 8 priority classes, 0 through 7, for each supported queue set.
802.1pPriority	Specifies the 802.1 user priority value.
Queue	Specifies the queue in a specified queue set that is assigned a priority value. To change a Queue assignment, click in the cell and type a new value.

Filter Priority Queue Assignments

About this task

You can display selected parts of the Priority Q Assignments.

Procedure

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, click **QoS Devices**.
3. In the work area, click the **Priority Q Assign** tab.
4. Click the **Filter** button on the toolbar.

The QoS Devices, Priority Q Assign - Filter screen appears.

5. Set the conditions to be used to filter the display of the **Priority Q Assign** table.
 - a. Select **AND** to include all entries in the table that include *all* specified parameters, or select **OR** to include *any* of the specified parameters.
 - b. Select **Ignore Case** to include all entries with the parameters being set, whether in lowercase or uppercase.
 - c. Define the display filtering criteria to return all cases in which an entry **contains**, **equals to**, **does not contain**, or **does not equal to** the set parameters.

- d. Select **All records** to display all the entries in the table.
 - e. To display the entries by parameter values, enter the values to display in the appropriate fields.
6. Click **Filter**.

Displaying Priority Mapping using EDM

Use the following procedure to display priority mapping.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Priority Mapping** tab to view the priority mapping.

Field Descriptions

The following table describes the fields associated with priority mapping.

Name	Description
802.1pPriority	Specifies the 802.1 user priority value to map to a DSCP value at ingress.
Dscp	Specifies the DSCP value to associate with the specified 802.1 user priority value at ingress. To change a DSCP assignment, double-click in a Dscp cell and edit the value.
Name	Specifies the type of service.

Viewing and Modifying Egress Mapping Configuration using EDM

You can use the information in this section to view and modify DSCP to COS mapping configurations.

View Egress mapping information using EDM

Use this procedure to display existing DSCP mapping information.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **DSCP Mapping** tab.

Field Descriptions

The following table describes the fields associated with existing DSCP mapping information.

Name	Description
Dscp	Indicates the DSCP value.
802.1pPriority	Indicates the user priority value associated with the DSCP. Values range from 0–7.
DropPrecedence	Indicates the relative drop precedence value for mapping the DSCP value to a drop precedence. Values include: <ul style="list-style-type: none"> • lowDropPrec • highDropPrec When network congestion occurs, the system drops packets with a high drop precedence before those with a low drop precedence.
NewDscp	Indicates a new DSCP value to use when DSCP mutation is required.
ServiceClass	Specifies the type of service.

Configure Egress Mapping using EDM

Use the following procedure to configure DSCP-to-802.1p priority and drop precedence associations that are used for assigning these values at packet egress, based on the DSCP in the received packet.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **DSCP Mapping** tab.
4. To select a DSCP map to edit, click a **Dscp** row.
5. In the Dscp row, double-click the cell in the **802.1pPriority** column.
6. From the list, select a value.
7. In the Dscp row, double-click the cell in the **DropPrecedence** column.
8. From the list, select a value.
9. In the Dscp row, double-click the cell in the **NewDscp** column.
10. In the dialog box, type a value.
11. In the Dscp row, double-click the cell in the **ServiceClass** column.
12. In the dialog box, type a character string.

Field Descriptions

Use the data in the following table to configure egress mapping.

Name	Description
Dscp	Indicates the DSCP value. This is a read-only cell.
802.1pPriority	Specifies the user priority value associated with the DSCP. Values range from 0–7.
DropPrecedence	Specifies the relative drop precedence value for mapping the DSCP value to a drop precedence. Values include: <ul style="list-style-type: none"> • lowDropPrec • highDropPrec When network congestion occurs, the system drops packets with a high drop precedence before those with a low drop precedence.
NewDscp	Specifies a new DSCP value to use when DSCP mutation is required. Values range from 0–63.
ServiceClass	Specifies the type of service. Value is a character string with a maximum of 20 characters.

Displaying Meter Capability using EDM

Use the following procedure to display QoS interface meter capabilities.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.
3. In the work area, click the **Meter Capability** tab to view the meter capability information.

Field Descriptions

The following table describes the fields associated with QoS interface meter capabilities.

Name	Description
Port	Specifies the port to which the meter is applied.
MeterSupport	Specifies the supported Token Bucket metering algorithm.
Meter Rate(Kbps)/Bucket(KBytes)/Granularity (Kbps)	Displays maximum supported Meter Rate.

Displaying Shaper Capability using the EDM

Use the following procedure to display QoS interface shaper capabilities.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Devices**.

3. In the work area, click the **Shaper Capability** tab to view the information.

Field Descriptions

The following table describes the fields associated with QoS interface shaper capabilities.

Name	Description
Port	Specifies the port to which the meter is applied.
ShaperSupport	Displays the location where the shaper is applied.
Shaper Rate(Kbps)/Bucket (KBytes)/ Granulatiry (Kbps)	Displays the maximum supported Shaper Rate, Shaper Bucket size, and Shaper Granularity.

Managing QoS IP classifier element using EDM

Use the information in this section to configure and manage QoS IP classifier elements.

View IP Classifier Element Configuration using EDM

Use this procedure to display IP classifier element configuration information.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **IP Classifier Element** tab.

Field Descriptions

Use the data in the following table to view IP classifier element configuration.

Name	Description
Id	Indicates the number of the IP classifier element.
Name	Indicates the label of the IP classifier element.
AddressType	Indicates the type of IP address used by this classifier entry. The type is limited to IPv4 and IPv6 addresses.
DstAddr	Indicates the IP address to match against a packet destination IP address.
DstMaskLength	Indicates the length of the destination address mask. Values range from 0–32. The default is 0.
SrcAddr	Indicates the IP address to match against a packet's source IP address.

Table continues...

Name	Description
SrcMasklength	Indicates the length of the source address mask. Values range from 0–32. The default is 0.
Dscp	Indicates the value for the DSCP in a packet. Values range from -1–63 (0x00 to 0x3f hexadecimal).
Protoco/Next Header	Indicates the IPv4 protocol or IPv6 next header the classifier element will match. Values range from 0–255. The following are specific value designations: <ul style="list-style-type: none"> • 1 = ICMP-IPv4 • 2 = IGMP • 6 = TCP • 17 = UDP • 20 = FTP Data • 21 = FTP Control • 23 = Telnet • 25 = SMTP • 46 = RSVP • 58 = ICMP-IPv6 • L4Port:69 = TFTP • 80 = HTTP • 443 = HTTPS
DstL4PortMin	Indicates the minimum value permitted for the Layer 4 destination port number in a packet. Values range from 0–65535.
DstL4PortMax	Indicates the maximum value permitted for the Layer 4 destination port number in a packet. Values range from 0–65535.
SrcL4PortMin	Indicates the minimum value permitted for the Layer 4 source port number in a packet. Values range from 0–65535.
SrcL4PortMax	Indicates the maximum value permitted for the Layer 4 source port number in a packet. Values range from 0–65535.
IPv6Flowld	Indicates the flow identifier for IPv6 packets. Values range from -1–1048575 (0x00 to 0xffff hexadecimal).
IpFlags	Indicates the value of flags present in an IPv4 header. Values include: <ul style="list-style-type: none"> • MoreFragement • doNotFragement
TcpCtrlFlags	Indicates the control flags present in an TCP header. Values include: <ul style="list-style-type: none"> • Urg • Ack

Table continues...

Name	Description
	<ul style="list-style-type: none"> • Psh • Rst • Syn • Fin
Ipv4Options	Indicates whether the Option field is present in the packet header. Values include: <ul style="list-style-type: none"> • Present—indicates that only IPv4 packets with options match this classifier element. • Not Present—indicates that only IPv4 packets without options match this classifier element. • ignore—whether or not options are present in IPv4 packets is not considered when determining if the IPv4 packet matches this classifier
Version	Indicates the version type.
Storage	Indicates the type of storage: <ul style="list-style-type: none"> • volatile • nonVolatile (default) • readOnly

Create an IP Classifier Element using EDM

Use this procedure to create a new IP classifier element.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QosRules**.
3. In the work area, click the **IP Classifier Element** tab.
4. Click **Insert**.
5. Configure the parameters for the IP classifier element.
6. Click **Insert**.

Field Descriptions

Use the data in this table to create an IP classifier element.

Name	Description
Id	Specifies the identification number of the IP classifier element.

Table continues...

Name	Description
Name	Specifies the label of the IP classifier element.
AddressType	Specifies the type of IP address used by this classifier entry. The type is limited to IPv4 and IPv6 addresses.
DstAddr	Specifies the IP address to match against a packet destination IP address.
DstMaskLength	Specifies the length of the destination address mask. Values range from 0–32. The default is 0.
SrcAddr	Specifies the IP address to match against a packet source IP address.
SrcMasklength	Specifies the length of the source address mask. Values range from 0–32. The default is 0.
Dscp	Specifies the value for the DSCP in a packet. Values range from -1–63 (0x00 to 0x3f hexadecimal). A value of -1 indicates that the system ignores this parameter.
Protoco/Next Header	<p>Specifies the IPv4 protocol or IPv6 next header the classifier element will match. Values range from 0–255. A value of 255 indicates that the system ignores the parameter. The following are specific value designations:</p> <ul style="list-style-type: none"> • 1 = ICMP-IPv4 • 2 = IGMP • 6 = TCP • 17 = UDP • 20 = FTP Data • 21 = FTP Control • 23 = Telnet • 25 = SMTP • 46 = RSVP • 58 = ICMP-IPv6 • L4Port:69 = TFTP • 80 = HTTP • 443 = HTTPS
DstL4PortMin	Specifies the minimum value permitted for the Layer 4 destination port number in a packet. Values range from 0–65535.

Table continues...

Name	Description
DstL4PortMax	Specifies the maximum value permitted for the Layer 4 destination port number in a packet. Values range from 0–65535. When you configure DstL4PortMin to 0 and DstL4PortMax to 65535, the system ignores the DstL4Port parameters.
SrcL4PortMin	Specifies the minimum value permitted for the Layer 4 source port number in a packet. Values range from 0–65535.
SrcL4PortMax	Specifies the maximum value permitted for the Layer 4 source port number in a packet. Values range from 0–65535. When you configure SrcL4PortMin to 0 and SrcL4PortMax to 65535, the system ignores the SrcL4Port parameters.
IPv6FlowId	Specifies the flow identifier for IPv6 packets. Values range from -1–1048575 (0x00 to 0xffff hexadecimal). A value of -1 indicates that the system ignores this parameter.
IpFlags	Specifies the value of flags present in an IPv4 header. Values include: <ul style="list-style-type: none"> • MoreFragement • doNotFragement
TcpCtrlFlags	Specifies the control flags present in a TCP header. Values include: <ul style="list-style-type: none"> • Urg • Ack • Psh • Rst • Syn • Fin
Ipv4Options	Specifies whether the Option field is present in the packet header. Values include: <ul style="list-style-type: none"> • Present—indicates that only IPv4 packets with options match this classifier element. • Not Present—indicates that only IPv4 packets without options match this classifier element. • ignore—whether or not options are present in IPv4 packets is not considered when determining if the IPv4 packet matches this classifier

Delete IP Classifier Elements using EDM

Use this procedure to delete an IP classifier element:

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **IP Classifier Element** tab.
4. To select an IP classifier element to delete, click the element row.
5. Highlight the IP classifier element to delete.
6. Click **Delete**.

 **Important:**

You cannot delete an IP classifier element if it is referenced by a classifier or classifier block. Additionally, an IP classifier element cannot be deleted if it is of the storage type of other or readOnly.

Managing QoS L2 Classifier Element using the EDM

Use the information in this section to configure and manage QoS L2 classifier elements.

View L2 Classifier Element Information using EDM

Use this procedure to display information about configured L2 classifiers.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **L2 Classifier Element** tab.

Field Descriptions

Use the data in this table to describe the L2 classifier element information display.

Name	Description
Id	Indicates the index that enumerates the classifier entries.

Table continues...

Name	Description
Name	Indicates a label for the classifier entry.
DestMacAddr	Indicates the MAC address against which the MAC destination address of incoming packets will be compared
DstMacAddrMask	Indicates a mask identifying the destination MAC address.
SrcMacAddr	Indicates the MAC source address of incoming packets.
SrcMacAddrMask	Indicates a mask identifying the source MAC address.
VlanIdMin	Indicates the minimum value the inner VLAN ID in a double tagged packet must have to match this L2 classifier.
VlanIdMax	Indicates the minimum value the inner VLAN ID in a double tagged packet must have to match this L2 classifier.
VlanTag	Indicates the type of VLAN tagging in a packet. Values include: <ul style="list-style-type: none"> • untagged • tagged • ignore
EtherType	Indicates a value for the Ethernet type. Values range from 0x00 to 0xffff. If you enter a value of 0xffff, the system ignores this parameter.
802.1pPriority	Indicates a value for the 802.1p user priority. Values include: <ul style="list-style-type: none"> • priority0 • priority1 • priority2 • priority3 • priority4 • priority5 • priority6 • priority7 • ignore
PktType	Indicates the data link layer frame format that frames must have to match this L2 classifier entry. Values include: <ul style="list-style-type: none"> • ethernetII—only EthernetII format frames can match this classifier • snap—only IEEE 802 SNAP format frames can match this classifier • llc—only IEEE 802 LLC format frames can match this classifier • ignore—frame format is not considered in determining whether or not a frame matches this classifier
Version	Indicates the L2 classifier version.
Storage	Indicates the type of storage.

Create an L2 Classifier Element using EDM

Use this procedure to create an L2 classifier element.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **L2 Classifier Element** tab.
4. Click **Insert**.
5. Configure parameters for the L2 classifier element.
6. Click **Insert**.

Field Descriptions

Use the data in this table to create an L2 classifier element.

Name	Description
Id	Specifies the index that enumerates the classifier entries.
Name	Specifies a label for the classifier entry.
DestMacAddr	Specifies the MAC address against which the MAC destination address of incoming packets is compared.
DstMacAddrMask	Specifies a mask identifying the destination MAC address.
SrcMacAddr	Specifies the source MAC address of incoming packets.
SrcMacAddrMask	Specifies a mask identifying the source MAC address.
VlanRange	Specifies the VLAN range for the L2 classifier element. Values range from 1–4094. When Ignore is selected, the system ignores the VLAN range.
VlanTag	Specifies the type of VLAN tagging in a packet. Values include: <ul style="list-style-type: none"> • untagged • tagged • ignore
EtherType	Specifies a value for the Ethernet type. Values range from 0x00 to 0xffff. If you enter a value of 0xffff, the system ignores this parameter.
802.1pPriority	Specifies a value for the 802.1p user priority. Values include: <ul style="list-style-type: none"> • priority0 • priority1 • priority2 • priority3 • priority4

Table continues...

Name	Description
	<ul style="list-style-type: none"> • priority5 • priority6 • priority7 • ignore
PktType	<p>Specifies the data link layer frame format that frames must have to match this L2 classifier entry. Values include:</p> <ul style="list-style-type: none"> • ethernetII—only EthernetII format frames can match this classifier • snap—only IEEE 802 SNAP format frames can match this classifier • llc—only IEEE 802 LLC format frames can match this classifier • ignore—frame format is not considered in determining whether or not a frame matches this classifier

Delete L2 Classifier Elements using EDM

Use this procedure to delete L2 classifier elements from the table.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **L2 Classifier Element** tab.
4. To select an L2 classifier element to delete, click the element row.
5. Click **Delete**.

Important:

A L2 classifier element cannot be deleted if it is referenced by a classifier or classifier block. Additionally, a L2 classifier element cannot be deleted if it is of the storage type of other or readOnly.

Managing QoS system Classifier Element using EDM

Use the information in this section to configure and manage QoS system classifier elements.

View QoS System Classifier Elements using EDM

To display System Classifier Elements:

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **System Clfr Element** tab.

Field Descriptions

The following table describes the fields associated with System Classifier Elements.

Name	Description
Id	Indicates the index that enumerates the system classifier entries.
Name	Indicates the name of the system classifier element.
UnknownUcastFrames	Identifies frames with an unknown unicast destination address. <ul style="list-style-type: none"> • true—indicates frames containing an unknown unicast destination address match this classification entry. • false—indicates that no classification is requested based on this address type.
UnknownIpMcast	Identifies IP packets with an unknown IP multicast destination address. <ul style="list-style-type: none"> • true—indicates that IP packets containing an unknown multicast destination address match this classification entry. • false—indicates that no classification is requested based on this address type.
KnownIpMcast	Identifies IP packets with a known IP multicast destination address. <ul style="list-style-type: none"> • true—indicates that IP packets containing a known multicast destination address match this classification entry. • false—indicates that no classification is requested based on this address type.
UnknownNonIpMcast	Identifies non-IP packets with an unknown MAC multicast destination address. <ul style="list-style-type: none"> • true—indicates that non-IP packets containing an unknown multicast destination address match this classification entry. • false—indicates that no classification is requested based on this address type.
KnownNonIpMcast	Identifies non-IP packets with a known MAC multicast destination address. <ul style="list-style-type: none"> • true—indicates that non-IP packets containing a known multicast destination address match this classification entry.

Table continues...

Name	Description
	<ul style="list-style-type: none"> • false—indicates that no classification is requested based on this address type.
NonIpPkt	Indicates that targeting non-IP traffic is supported. <ul style="list-style-type: none"> • true—indicates that non IP packets match this classification entry. • false—indicates that no classification is requested based on this packet type.
PatternFormat	Indicates the data link layer packet format that is used when specifying pattern match data. <ul style="list-style-type: none"> • untagged—indicates that the specified pattern match data does not include an 802.1Q tag. • tagged—indicates that the specified pattern match data does include an 802.1Q tag. The default value is tagged.
PatternIpVersion	Indicates the IP packet format used to specify pattern match data. Values include: <ul style="list-style-type: none"> • nonIp - indicates that the specified pattern match data should be applied to non-IP packets • ipv4 - indicates that the specified pattern match data should be applied to IPv4 packets • ipv6 - indicates that the specified pattern match data should be applied to IPv6 packets
PatternL2Format	Indicates the L2 packet format used to specify pattern match data. Values include: <ul style="list-style-type: none"> • notApplicable—specify pattern match data without indicating the target L2 packet format • ethernetII—apply the pattern match data to EthernetII format frames • snap—apply the pattern match data to IEEE 802 SNAP format frames • llc—apply the pattern match data to IEEE 802 LLC format frames
Version	Indicates the system classifier version.
Storage	Indicates the storage type for this conceptual row. Conceptual rows that has the value permanent need not allow write-access to any columnar objects in the row. This object may not be modified if the associated status object is equal to 'active'.

View the QoS System Classifier Pattern using EDM

Use this procedure to display the QoS system classifier pattern.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **System Clfr Element** tab.
4. Click **Pattern**.

Configure a QoS System Classifier Element using EDM

Use this procedure to create and manage a QoS system classifier element.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **System Clfr Element** tab.
4. Click **Insert**.
5. In the Name dialog box, type label for the system classifier element.
6. In the **DestAddressType** section, click a radio button.
7. In the PatternData dialog box, type specific pattern data.
OR
Click the **PatternData** ellipsis to select specific pattern data.
8. In the PatternPosition dialog box, type specific pattern position data.
OR
Click the **PatternPosition** ellipsis to select specific pattern position data.
9. Click **Insert**.
10. Click **Apply**.

Field Descriptions

Use the data in this table to configure a QoS system classifier element.

Name	Description
Name	Specifies an alphanumeric label for the system classifier entry. Value is a character string from 1–16 characters in length.
DestAddressType	Specifies the address type for matching destination frames. <ul style="list-style-type: none"> • none—destination frames are not matched • unknownUcast—matches frames with an unknown unicast destination address • UnknownIpMcast—matches frames with an unknown IP multicast destination address • KnownIpMcast—matches frames with known IP multicast destination address • UnknownNonIpMcast—matches frames with an unknown non-IP multicast destination address • KnownNonIpMcast—matches frames with known non-IP multicast destination address • NonIpPkt—matches non-IP frames
PatternData	Matches frames with specific byte pattern data.
PatternPosition	Matches frames at a specific position in a packet.

Delete QoS System Classifier Elements using EDM

Use this procedure to delete QoS system classifier elements from the table.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoSRules**.
3. In the work area, click the **System Clfr Element** tab.
4. To select an system classifier element to delete, click the element row.
5. Click **Delete**.

Managing QoS Classifier using the EDM

Use the information in this section to configure and manage QoS classifiers.

Display Classifiers using EDM

Use the following procedure to display classifiers.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier** tab to view the classifiers.

Field Descriptions

The following table describes the fields associated with classifiers.

Name	Description
Name	Specifies the name of the classifier.
SetId	<p>Specifies the eEntries with the same SetId belong to the same classifier.</p> <p> Important:</p> <p>Click heading on this column to list entries in numerical order to view which entries have the same SetId.</p>
Specific	Describes the specific classifier element and its ID number (from the IP Classifier Element screen, the L2 Classifier Element screen, or System Clfr Element screen) that is included in the classifier.
Version	<p>Indicates the version. Values include:</p> <ul style="list-style-type: none"> • version1 • version2
Storage	Specifies the storage type for this conceptual row. Conceptual rows that has the value permanent need not allow write-access to any columnar objects in the row. This object may not be modified if the associated status object is equal to active.

Add Classifiers using EDM

Use the following procedure to add a classifier.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier** tab.
4. Click **Insert**.

The Insert Classifier screen appears.

5. Type the name of the classifier element.
6. Select the **IP Classifier Element**, **L2 Classifier Element**, or **System Classifier Element**.
7. Click **Insert**.

! Important:

A classifier can be created using the following classifier combinations:

- one IP classifier element
- one L2 classifier element
- one IP classifier element plus one L2 classifier elements

A classifier can also be created by using the following combination:

- one system classifier element
- one IP classifier, one system classifier
- one L2 classifier, one system classifier
- one IP, one L2, plus one system classifier

A classifier can be created by using any combination of classifier elements.

Entries with the same **SetId** belong to the same classifier. Click on the **SetId** column header to sort the table by **SetId** value; this makes it very easy to see which entries have the same **SetId** value.

Delete Classifiers using EDM

Use the following procedure to delete classifiers.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier** tab.
4. Highlight the classifier to delete.
5. Click **Delete**.

! Important:

A classifier that is referenced in a classifier block cannot be deleted. Additionally, a classifier cannot be deleted if it is of the storage type of **other** or **readOnly**.

Filter Classifiers using EDM

Use the following procedure to filter the display of classifiers.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier** tab.
4. Click **Filter** button on the toolbar.

The QoS Rules, Classifier - Filter screen appears.

5. Set the conditions to filter the display of the **Classifiers** table.
 - a. Select **AND** to include all entries in the table that include *all* specified parameters, or select **OR** to include any of the specified parameters.
 - b. Select **Ignore Case** to include all entries with the parameters being set, whether in lowercase or uppercase.
 - c. Define the search to return all cases in which an entry **contains**, is **equal to**, **does not contain**, or **does not equal to** the set parameters.
 - d. Select **All records** to display all the entries in the table.
 - e. To display the entries in the table by name, select **Name** and enter the **Name** values to display.
 - f. To display the entries in the table by setid, select **Setid** and enter the **Setid** values to display.
6. Click **Filter**.

Managing QoS Classifier Block using the EDM

Use the information in this section to view and manage QoS classifier blocks.

Display Classifier Blocks using EDM

Use the following procedure to display classifier blocks.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier Block** tab to view the blocks.

Field Descriptions

The following table describes the fields associated with classifier blocks.

Name	Description
BlockNum	Indicates the entries with the same BlockNum that belong to the same classifier block.  Important: Click heading on this column to list entries in numerical order to view which entries have the same BlockNum.
Name	Displays the name you assigned to that classifier block.
ClassifierSetId	Displays the ID number assigned to that classifier (from the Classifier screen).
Meter	Displays the meter associated with the classifier block.
Action	Displays the action followed for those flows not being metered. (For those flows being metered, this attribute is not applied.)
EvalOrder	Specifies the evaluation order number.
Version	Specifies the version.
Storage	Specifies the storage type for this conceptual row. Conceptual rows that has the value permanent need not allow write-access to any columnar objects in the row. This object may not be modified if the associated status object is equal to active.

Append Classifier Blocks using EDM

Use the following procedure to append a classifier block.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier Block** tab.
4. Click **Append Classifier** button on the toolbar.

The Insert Classifier Block screen appears.

5. Select the Classifier to append to the Classifier Block.
6. Click **Insert**.

Add Classifier Blocks using EDM

Use the following procedure to add classifier blocks.

Procedure steps

1. From the navigation tree, double-click **Qos**.

2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier Block** tab.
4. Click **Insert**.
The Insert Classifier Block screen appears.
5. Enter the name of the classifier block.
6. Select the **Classifier**, **Meter**, and **Action**.
7. Click **Insert**.

 **Important:**

If one of the classifiers in a classifier block has associated actions or meters; then all classifier elements of that classifier block must also have associated actions or meters (not identical values for the actions or meters, but also associated actions or meters).

Entries with the same **BlockNum** belong to the same classifier block. Click on the **BlockNum** column header to sort the table by **Block Number** value.

Delete Classifier Blocks using EDM

Use the following procedure to delete classifier blocks.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier Block** tab.
4. Highlight the classifier block to delete.
5. Click **Delete**.

 **Important:**

The last classifier element in a classifier block cannot be deleted if it is referenced by a policy. First delete the policy. Additionally, a classifier block cannot be deleted if it is of the storage type of **other** or **readOnly**.

Filter Classifier Blocks using EDM

Use the following procedure to filter a classifier block.

Procedure steps

1. From the navigation tree, double-click **Qos**.

2. In the QoS tree, double-click **QoS Rules**.
3. In the work area, click the **Classifier Block** tab.
4. Click **Filter**.
The **QoSRules, Classifier Block - Filter** dialog box appears.
5. Select the filtering condition, case, and column.
6. Type the **BlockNum** and **Name**.
7. Click **Filter**.

Configuring QoS action using EDM

Use the information in this section to manage QoS actions.

Display QoS Actions using EDM

Use the following procedure to display a QoS action.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Action** tab.

Field Descriptions

The following table describes the fields associated with a QoS action.

Name	Description
Id	Specifies the identifier for the action.
Name	Specifies a name for the action.
Drop	Specifies whether a packet is dropped, not dropped, or whether the decision is deferred.
UpdateDscp	Specifies a value used to update the DSCP field in an IPv4 packet.
SetDropPrecedence	Specifies automatic drop precedence.
UpdateUserPriority	Specifies a value for the 802.1p user priority.
Extension	Specifies linking additional actions. (These are defined on the Interface Action Ext Table.)

Table continues...

Name	Description
Storage	Specifies the type of storage: <ul style="list-style-type: none"> • volatile • nonVolatile • readOnly

Add QoS Actions using EDM

Use the following procedure to add a QoS action.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. Click the **Action** tab.
4. Click **Insert**.
5. Enter the information and make the selections to use for this QoS action.
6. Click **Insert**.

Delete QoS Actions using EDM

Use the following procedure to delete a QoS action.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. Click the **Action** tab.
4. Highlight the QoS action to delete.
5. Click **Delete**.

 **Important:**

A QoS action that is referenced by a meter, classifier block, or policy entry cannot be deleted. First delete the meter, classifier block, or policy. Additionally, a QoS action cannot be deleted if it is of the storage type of **other** or **readOnly**.

Configuring QoS Interface action Extension using EDM

Use the information in this section to create and manage QoS interface action extensions.

Display Interface Action Extensions using EDM

Use the following procedure to display a QoS interface action extension.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Action Ext** tab.

Field Descriptions

The following table describes the fields associated with a QoS interface action extension.

Name	Description
Id	Specifies the number of the interface action extension.
Name	Specifies the label of the interface action extension.
SetEgressUnicastPort	Specifies redirection of normally-switched unicast packets to a specified interface.
SetEgressNonUnicastPort	Specifies redirection of normally-switched non-unicast packets (broadcast and multicast traffic) to a specified interface.
Storage	Specifies the type of storage, either volatile or non-volatile.

Add Interface Action Extensions using EDM

Use the following procedure to add a QoS interface action extension.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Action Ext** tab.
4. Click **Insert**.

The Insert Interface Action Ext screen appears.
5. Enter the information and make the selections to use for this Interface action extension.
6. Click **Insert**.

Delete Interface Action Extensions using EDM

Use the following procedure to delete a QoS interface action extension.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Action Ext** tab.
4. Highlight the interface action extension to delete.
5. Click **Delete**.

 **Important:**

A QoS interface action extension that is referenced by an action entry cannot be deleted. First delete the action.

Configuring QoS Meter using EDM

Use the information in this section to create and manage QoS meters.

Display QoS Meters using EDM

Use the following procedure to display a QoS meter.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Meter** tab.

Field Descriptions

The following table describes the fields associated with QoS meter.

Name	Description
id	Specifies the unique identifier for this entry.
Name	Specifies a name for this entry.
CommittedRate	Specifies the committed rate (in Kbps).

Table continues...

Name	Description
BurstSize	Specifies the burst size (in bytes).
InProfileAction	Specifies in profile action.
OutOfProfileAction	Specifies out of profile action.
Version	Specifies the version.
Storage	Specifies the type of storage.

Add QoS Meters using EDM

Use the following procedure to add a QoS meter.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Meter** tab.
4. Click **Insert**.
The Insert Meter screen appears.
5. Enter the information and make the selections to use for this QoS meter.
6. Click **Insert**.

Delete QoS Meters using EDM

Use the following procedure to delete a QoS meter.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Meter** tab.
4. Highlight the QoS meter to delete.
5. Click **Delete**.

Important:

A QoS meter that is referenced by a classifier block or policy cannot be deleted. First delete the classifier block or policy.

Configuring QoS Interface Shaper using the EDM

Use the information in this section to create or delete a QoS interface shaper, or to view QoS interface shaper configuration information.

View QoS Interface Shaper Information using EDM

Use this procedure to display QoS interface shaper configuration information.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Shaper** tab.

Field Descriptions

Name	Description
Port	Indicates the interface port number associated with a QoS interface shaper. The port number must correspond to the interface table entry with the same port number.
Name	Indicates an alphanumeric label used to identify the QoS interface shaper.
ShapingRate	Indicates the token-bucket rate, in kilobits per second (Kbps).
BurstSize	Indicates the maximum number of bytes in a single transmission burst, in kilobits per second (Kbps).

Create a QoS Interface Shaper using EDM

Use this procedure to create a new QoS interface shaper.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Shaper** tab.
4. Click **Insert**.
5. Click the **Ports** ellipses.
6. Select the required ports for the interface shaper.
7. Click **Ok**.
8. In the **Name** dialog box, type a character string.

9. In the **Shaping Rate** dialog box, type a value.
10. In the **MaximumBurstRate** dialog box, type a value.
11. Double-click the **Duration** box.
12. From the list, select a value.
13. Click **Insert**.

Field Descriptions

Name	Description
Port	Specifies the interface port number associated with a QoS interface shaper. The port number must correspond to the interface table entry with the same port number.
Name	Specifies an alphanumeric label used to identify the QoS interface shaper.
ShapingRate	Specifies the token-bucket rate, in kilobits per second (Kbps). Value must be a multiple of 64 or 1000 Kbps.
BurstSize	Specifies the maximum number of bytes in a single transmission burst, in kilobits per second (Kbps).
Duration	Specifies the burst duration in milliseconds.

Delete a QoS Interface Shaper using EDM

Use this procedure to delete a QoS interface shaper.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Shaper** tab.
4. To select a shaper to delete, click the shaper row.
5. Click **Delete**.

Configuring QoS Interface Queue Shaper using the EDM

Use the information in this section to create or delete a QoS interface queue shaper, or to view QoS interface queue shaper configuration information.

View QoS Interface Queue Shaper Information using EDM

Use the following procedure to display QoS interface queue shaper configuration information.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Queue Shaper** tab.

Field Descriptions

Name	Description
Port	Indicates the interface port number associated with a QoS interface shaper. The port number must correspond to the interface table entry with the same port number.
Queue	Indicates the queue for the selected interface port or ports, on which traffic is shaped. The range of available values is determined by the QoS agent default queue configuration.
Name	Indicates an alphanumeric label used to identify the QoS interface queue shaper.
ShapingRate	Indicates the QoS interface queue shaping rate, in kilobits per second (Kbps). Values range from 64 to 10230000 Kbps. The value must be a multiple of 64 or 1000 Kbps.
ShapingMinRate	Indicates the minimum QoS interface queue shaping rate, in kilobits per second (Kbps). Values range from 0 to 10230000 Kbps. The value must be a multiple of 64 or 1000 Kbps.

Create a QoS Interface Queue Shaper using EDM

Use the following procedure to create a new QoS interface queue shaper.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Queue Shaper** tab.
4. Click **Insert**.
5. Click the **Ports** ellipses.
6. Select the required ports for the interface queue.
7. Click **Ok**.

8. In the **Queue** dialog box, type a value.
9. In the **Name** dialog box, type a character string.
10. In the **ShapingRate** dialog box, type a value.
11. In the **ShapingMinRate** dialog box, type a value.
12. Click **Insert**.

Field Descriptions

Name	Description
Port	Specifies the interface port number associated with a QoS interface shaper. The port number must correspond to the interface table entry with the same port number.
Queue	Specifies the queue for the selected interface port or ports, on which traffic is shaped. The range of available values is determined by the OoS agent default queue configuration.
Name	Specifies an alphanumeric label used to identify the QoS interface queue shaper.
ShapingRate	Specifies the QoS interface queue shaping rate, in kilobits per second (Kbps). Values range from 64 to 10230000 Kbps. The value must be a multiple of 64 or 1000 Kbps.
ShapingMinRate	Specifies the minimum QoS interface queue shaping rate, in kilobits per second (Kbps). Values range from 0 to 10230000 Kbps. The value must be a multiple of 64 or 1000 Kbps.

Delete a QoS Interface Queue Shaper using EDM

Use this procedure to delete a QoS interface shaper.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Interface Queue Shaper** tab.
4. To select a queue shaper to delete, click the queue shaper row.
5. Click **Delete**.

Configuring QoS Policy using the EDM

Use the information in this section to create and manage QoS policies.

Display QoS Policies using EDM

Use the following procedure to display QoS policies:

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Policy** tab.

Field Descriptions

Name	Description
Id	Specifies the number of the QoS policy.
Status	Allows you to enable or disable the policy.
Name	Displays the name for the policy.
ClassifierType	Specifies whether a classifier or a classifier block identifies traffic.
ClassifierName	Specifies the name of the classifier or classifier block associated with this policy.
InterfaceRoles	<p>Specifies the interfaces to which the policy applies.</p> <p> Important: You must configure the role combinations (refer to Configuring Interface Groups using the EDM on page 121) prior to associating it with a policy.</p>
InterfaceIndex	<p>The ifIndex field identifies the interface to which the policy is to be applied. A policy is associated with an interface explicitly using this attribute or implicitly using a role combination through the ntnQoSPolicyInterfaceRole attribute. An interface must be identified by one and only one of these attributes. This attribute can identify an interface that does not currently exist in the system, as long as the specified interface index represents a potentially valid system interface.</p> <p> Important: The InterfaceRoles and InterfaceIndex fields are mutually exclusive. When the InterfaceIndex field is not zero, the InterfaceRoles must be empty (select none when insert the policy). When the InterfaceRoles specifies a valid role combination, the InterfaceIndex field must be 0.</p>
Precedence	<p>Specifies the order in which multiple policies are associated with the same interface. Policies with greater precedence have higher numbers.</p> <p> Important: Policies with higher precedence values are applied before policies with lower precedence values.</p>

Table continues...

Name	Description
Meter	<p>Specifies metering associated with this policy. Specifying a metering component causes any action criteria specified explicitly by the policy to be rejected as an error.</p> <p> Important:</p> <p>You must configure meters before associating them with a policy.</p>
InProfileAction	<p>Identifies the action to be applied to traffic with this policy. This will not be used when a meter is specified.</p> <p> Important:</p> <p>You must configure actions before associating them with a policy.</p>
StatsType	<p>Specifies statistics tracking:</p> <ul style="list-style-type: none"> • none--no statistics tracked for this policy • individual--separate counters allocated, space permitting, for each classifier referenced by the policy • aggregate--a single counter accumulates all the statistics for all the classifiers referenced by the policy
Version	Specifies the version.
Storage	<p>Specifies the type of storage:</p> <ul style="list-style-type: none"> • volatile • nonVolatile • readOnly

Add QoS Policies using EDM

Use the following procedure to add a QoS policy.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Policy** tab.
4. Click **Insert**.

The Insert QoS Policy screen appears.

5. Enter the information to use for this QoS policy.
6. Click **Insert**.

! **Important:**

The **InterfaceRoles** and **InterfaceIndex** fields are mutually exclusive. When the **InterfaceIndex** field is not zero, the **InterfaceRoles** must be empty (select **none** when inserting the policy). When the **InterfaceRoles** specifies a valid role combination, the **InterfaceIndex** field must be 0.

Delete QoS Policies using EDM

Use the following procedure to delete QoS policies.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Policy** tab.
4. Highlight the QoS policy to delete.
5. Click **Delete**.

Viewing QoS Policy Stats using the EDM

Use the following procedure to view QoS Policy Stats information for a policy.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS**.
3. In the work area, click the **Policy** tab.
4. Select a policy from the list.
5. Click **Graph**.

Depending on the StatsType and parameters you specified for a policy, the Individual Policy Stats screen or the Policy Aggregate Stats screen can appear.

If the Policy Stats type is none, no policy statistics information appears.

If the Policy Stats type is aggregate, the following aggregate policy statistics information appears:

- total in-profile packets
- total out-profile packets

 **Note:**

If the Policy Meter is set to none, no total out-profile packet information appears.

If the Policy Stats type is individual, individual policy statistics are provided for each policy, filter, and each port and the following individual policy statistics information appears:

- in-profile packets
- out-profile packets

 **Note:**

If the Policy Meter is set to no, no out-profile packet information is available.

Viewing User Based Policies

Use this procedure to open the **User Based Policy** tab.

Procedure steps

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS**.
3. Select the **User Based Policy** tab.

User Based PolicyTab Field Descriptions

Use the data in the following table to use the **User Based Policy** tab.

Table 8: QoS User Based Pollicy tab parameters

Name	Description
Id	Displays the unique numerical identification for this entry.
IfIndex	Displays the interface index for this entry.
RoleCombination	Displays the role combination associated with the interface in the IfIndex field and the user identified by the UserName field. A user role combination logically identifies a physical interface to which policy rules and actions can be applied. The role combination string must unique from any other defined role combination.

Table continues...

Name	Description
UserName	Displays the name of the user associated with this entry.
UserGroup	Displays the group the user is associated with.
SessionStart	Displays the system-assigned session start timestamp. The value in this field corresponds to the value of the sysUpTime, converted to seconds, at the instant this user policy entry is created or updated.
SessionGroup	Displays the system-assigned session group identifier. TIP: Multiple user sessions belong to the same group if they share the same role combination and have the same value for this field. SessionGroup is associated with installed policy criteria to identify users and interfaces to which the QoS policy is applied.
SrcMacAddr	Displays the source MAC address associated with the identified user.
SrcMacAddrMask	Specifies the bits in a source MAC address that should be considered when an 802 MAC SA comparison is performed against the address specified in the SrcMacAddr field.
Storage	Specifies the storage type for this entry.

Configuring QoS Traffic Profile Filter Classifier using the EDM

Use the information in this section to view and manage QoS traffic profile filter classifier configurations.

View QoS Traffic Profile Filter Classifier Information

About this task

Use the following procedure steps to view QoS traffic profile filter classifier information in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Classifier** tab.

Field Descriptions

Use the data in the following table to help you understand the QoS traffic profile filter classifier display.

Variable	Value
Type	Indicates the classifier type. Values include: <ul style="list-style-type: none"> • UbpClfr • TrafficProfile
Name	Indicates the name of the classifier. All classifiers with the same name are part of the same filter set. That filter set has the same name as the classifiers.
Block	Indicates the block name with which the classifier is associated.
EvalPrec	Indicates the evaluation order number of the classifier in that filter set. Two classifiers in the same filter set cannot have the same evaluation order. A higher eval order means a lower precedence for the corresponding policy. Values range from 1–255.
AddrType	Indicates the type of IP address used by this classifier entry. Values include: <ul style="list-style-type: none"> • N/A—the address type is non-applicable • ipv4 • ipv6
DstIpAddr	Indicates the IP address to match against the destination IP address of a packet.
DstIpPrefixLength	Indicates the length of the destination address mask. Values range from 0–2040, with 0–32 reserved for IPv4 address masks and 0–128 reserved for IPv6 address masks.
SrclpAddr	Indicates the IP address to match against the source IP address of a packet.
SrclpPrefixLength	Indicates the length of the source address mask. Values range from 0–2040, with 0–32 reserved for IPv4 address masks and 0–128 reserved for IPv6 address masks.
Dscp	Indicates the value for a DiffServ Codepoint (DSCP) in a packet. Values range from -1–63 (0x00 to 0x3f hexadecimal). A value of -1 indicates that the system ignores this parameter.
Protocol/NextHeader	Indicates the IPv4 protocol value, or the IPv6 next-header value. Values range from 0–255. A value of 255 indicates that the system ignores the parameter. The following are specific value designations: <ul style="list-style-type: none"> • 1 = ICMP-IPv4 • 2 = IGMP • 6 = TCP • 17 = UDP • 20 = FTP Data

Table continues...

Variable	Value
	<ul style="list-style-type: none">• 21 = FTP Control• 23 = Telnet• 25 = SMTP• 46 = RSVP• 58 = ICMP-IPv6• L4Port:69 = TFTP• 80 = HTTP• 443 = HTTPS
DstL4PortMin	Indicates the minimum value for the Layer 4 destination port number in a packet. Values range from 0–65535.
DstL4PortMax	Indicates the maximum value for the Layer 4 destination port number in a packet. Values range from 0–65535.
SrcL4PortMin	Indicates the minimum value for the Layer 4 source port number in a packet. Values range from 0–65535.
SrcL4PortMax	Indicates the maximum value for the Layer 4 source port number in a packet. Values range from 0–65535.
Ipv6FlowId	Indicates the flow identifier for IPv6 packets. Values range from -1–1048575 (0x00 to 0xffff hexadecimal). A value of -1 indicates that the system ignores this parameter.
IpFlags	Indicates the classifier flag to match in traffic IPv4 headers. Values include: <ul style="list-style-type: none">• MoreFragement• doNotFragement
TcpCtrlFlags	Indicates the control flag to match in traffic TCP headers. Values include: <ul style="list-style-type: none">• Urg• Ack• Psh• Rst• Syn• Fin
Ipv4Options	Indicates if the presence of IPv4 options in an IPv4 packet are considered when the system is searching for a match for this classifier. Values include: <ul style="list-style-type: none">• ipv4OptionsPresent—only IPv4 packets with options match this classifier

Table continues...

Variable	Value
	<ul style="list-style-type: none"> • ipv4OptionsNotPresent—only IPv4 packets without options match this classifier • ignore—whether or not options are present in IPv4 packets is not considered when determining if the IPv4 packet matches this classifier
Storage	Indicates the storage type for this conceptual row.
DstMacAddr	Indicates the MAC address against which the MAC destination address of incoming packets is compared.
DstMacAddrMask	Indicates a mask identifying the destination MAC address.
SrcMacAddr	Indicates a MAC source address of incoming packets.
SrcMacAddrMask	Indicates a mask identifying the source MAC address.
VlanIdMin	Indicates the minimum value for the VLAN ID in a packet. Values range from 1–4094.
VlanIdMax	Indicates the maximum value for the VLAN ID in a packet. Values range from 1–4094.
VlanTag	Indicates the type of VLAN tagging in a packet. Values include: <ul style="list-style-type: none"> • untagged • tagged • ignore
EtherType	Indicates the value for the Ethernet type. Values range from 0x00 to 0xffff. If you enter a value of 0xffff, the system ignores this parameter.
UserPriority	Indicates the value for the 802.1p user priority. Values include: <ul style="list-style-type: none"> • matchPriority0 • matchPriority1 • matchPriority2 • matchPriority3 • matchPriority4 • matchPriority5 • matchPriority6 • matchPriority7 • matchAllPriorities
PktType	Indicates the data link layer frame format for that can match this classifier. Values include: <ul style="list-style-type: none"> • ethernetII—only Ethernet II format frames can match this classifier

Table continues...

Variable	Value
	<ul style="list-style-type: none"> • snap—only IEEE 802 SNAP format frames can match this classifier • llc—only IEEE 802 LLC format frames can match this classifier • ignore—frame format is not considered in determining whether or not a frame matches this classifier
ActionDrop	<p>Indicates whether or not to drop the traffic matching filtering data. Values include:</p> <ul style="list-style-type: none"> • drop • pass
UpdateDscp	<p>Indicates a value used to update the DSCP field in an IPv4 packet. Values range from -1–63 (0x00 to 0x3f hexadecimal). A value of -1 indicates that the system ignores this parameter.</p>
UpdateUserPriority	<p>Indicates 802.1p value used to update user priority. Values include:</p> <ul style="list-style-type: none"> • markAsPriority0 • markAsPriority1 • markAsPriority2 • markAsPriority3 • markAsPriority4 • markAsPriority5 • markAsPriority6 • markAsPriority7 • ignore
ActionSetPrec	<p>Indicates the automatic drop precedence. Values include:</p> <ul style="list-style-type: none"> • lowDropPrec—low drop precedence • highDropPrec—high drop precedence <p>When network traffic congestion occurs, packets with a high drop precedence are dropped before packets with a low drop precedence.</p>
MasterBlockMember	<p>Specifies whether the master classifier is within the block or not (Traffic Profile).</p>
Rate	<p>Specifies the Traffic Profile classifier meter rate (Traffic Profile Per-policy-individual-metering or Per-classifier-metering).</p>
BurstSize	<p>Specifies the committed burst (in bytes).</p>
OutActionDrop	<p>Specifies the drop action for out-of-profile packets (Traffic Profile Per-policy-individual-metering or Per-classifier-metering).</p>

Table continues...

Variable	Value
OutActionRemarkDscp	Specifies the remark DSCP action for out-profile-packets (Traffic Profile Per-policy-individual-metering or Per-classifier-metering).
OutActionSetPrec	Specifies the set precedence for out-profile-packets (Traffic Profile Per-policy-individual-metering or Per-classifier-metering).
Stage	Specifies the stage for Traffic Profile classifiers. <ul style="list-style-type: none"> • ingressStage—ingress traffic (default option) • egressStage—egress traffic

Filter QoS Traffic Profile Filter Classifier Information

About this task

Use the following procedure steps to filter QoS traffic profile filter classifier information in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Classifier** tab.
4. To select a traffic profile filter classifier to filter, click a traffic profile filter classifier row.
5. Configure the filter parameters for the traffic profile filter set.
6. Click **Filter**.
7. Click **Apply**.

Field Descriptions

Use the data in the following table to filter QoS traffic profile filter classifier information.

Name	Description
AND	Includes all entries in the table that include all specified parameters.
OR	Includes any of the specified parameters.
Ignore Case	When selected, includes entries with the parameters being set, whether in lower case or upper case.
contains	Returns all cases in which an entry contains the set parameters.
does not contain	Returns all cases in which an entry does not contain the set parameters.
equal to	Returns all cases in which an entry is equal to the set parameters.

Table continues...

Name	Description
does not equal to	Returns all cases in which an entry is not equal to the set parameters.
All Records	When selected, displays all entries in the table.

Create QoS Traffic Profile Filter Classifier

About this task

Use the following procedure steps to create a QoS traffic profile filter classifier in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Classifier** tab.
4. Click **Insert**.
5. Configure the parameters to classify traffic on the network.
6. Click **Insert**.
7. Click **Apply**.

Field Descriptions

Use the data in the following table to create a QoS traffic profile filter classifier.

Name	Description
Type	Specifies the classifier type. Values include: <ul style="list-style-type: none"> • UbpClfr • TrafficProfile
Name	Specifies the name of the classifier. All classifiers with the same name are part of the same filter set. That filter set has the same name as the classifiers.
Block	Specifies the block name with which the classifier is associated.
EvalPrec	Specifies the evaluation order number of the classifier in that filter set. Two classifiers in the same filter set cannot have the same evaluation order. A higher eval order means a lower precedence for the corresponding policy. Values range from 1–255.
AddrType	Specifies the type of IP address used by this classifier entry. Values include: <ul style="list-style-type: none"> • N/A—the address type is non-applicable

Table continues...

Name	Description
	<ul style="list-style-type: none"> • ipv4 • ipv6
DstIpAddr	Specifies the IP address to match against the destination IP address of a packet. If you leave this box empty, the system ignores this parameter.
DstIpPrefixLength	Specifies the length of the destination address mask. Values range from 0–2040, with 0–32 reserved for IPv4 address masks and 0–128 reserved for IPv6 address masks.
SrcIpAddr	Specifies the IP address to match against the source IP address of a packet. If you leave this box empty, the system ignores this parameter.
SrcIpPrefixLength	Specifies the length of the source address mask. Values range from 0–2040, with 0–32 reserved for IPv4 address masks and 0–128 reserved for IPv6 address masks.
Dscp	Specifies the value for a DiffServ Codepoint (DSCP) in a packet. Values range from -1–63 (0x00 to 0x3f hexadecimal). A value of -1 indicates that the system ignores this parameter.
Protocol/NextHeader	<p>Specifies the IPv4 protocol value, or the IPv6 next-header value. Values range from 0–255. A value of 255 indicates that the system ignores the parameter. The following are specific value designations:</p> <ul style="list-style-type: none"> • 1 = ICMP-IPv4 • 2 = IGMP • 6 = TCP • 17 = UDP • 20 = FTP Data • 21 = FTP Control • 23 = Telnet • 25 = SMTP • 46 = RSVP • 58 = ICMP-IPv6 • L4Port:69 = TFTP • 80 = HTTP • 443 = HTTPS
DstL4PortMin	Specifies the minimum value for the Layer 4 destination port number in a packet. Values range from 0–65535.
DstL4PortMax	Specifies the maximum value for the Layer 4 destination port number in a packet. Values range from 0–65535.

Table continues...

Name	Description
SrcL4PortMin	Specifies the minimum value for the Layer 4 source port number in a packet. Values range from 0–65535.
SrcL4PortMax	Specifies the maximum value for the Layer 4 source port number in a packet. Values range from 0–65535.
Ipv6FlowId	Specifies the flow identifier for IPv6 packets. Values range from -1–1048575 (0x00 to 0xffff hexadecimal). A value of -1 indicates that the system ignores this parameter.
IpFlags	Specifies the classifier flag to match in traffic IPv4 headers. Values include: <ul style="list-style-type: none"> • MoreFragement • doNotFragement
TcpCtrlFlags	Specifies the control flag to match in traffic TCP headers. Values include: <ul style="list-style-type: none"> • Urg • Ack • Psh • Rst • Syn • Fin
Ipv4Options	Specifies if the presence of IPv4 options in an IPv4 packet are considered when the system is searching for a match for this classifier. Values include: <ul style="list-style-type: none"> • present—only IPv4 packets with options match this classifier • notPresent—only IPv4 packets without options match this classifier • ignore—whether or not options are present in IPv4 packets is not considered when determining if the IPv4 packet matches this classifier
DstMacAddr	Specifies the MAC address against which the MAC destination address of incoming packets is compared. If you leave this box empty, the system ignores this parameter.
DstMacAddrMask	Specifies a mask identifying the destination MAC address. If you leave this box empty, the system ignores this parameter.
SrcMacAddr	Specifies a MAC source address of incoming packets. If you leave this box empty, the system ignores this parameter.
SrcMacAddrMask	Specifies a mask identifying the source MAC address. If you leave this box empty, the system ignores this parameter.
VlanIdMin	Specifies the minimum value for the VLAN ID in a packet. Values range from 1–4094.

Table continues...

Name	Description
VlanIdMax	Specifies the maximum value for the VLAN ID in a packet. Values range from 1–4094. If you set VlanIdMin to 1 and VlanIdMax to 4094, the system ignores the VLAN ID parameter.
VlanTag	Specifies the type of VLAN tagging in a packet. Values include: <ul style="list-style-type: none"> • untagged • tagged • ignore
EtherType	Specifies the value for the Ethernet type. Values range from 0x00 to 0xffff. If you enter a value of 0xffff, the system ignores this parameter.
UserPriority	Specifies the value for the 802.1p user priority. Values include: <ul style="list-style-type: none"> • matchPriority0 • matchPriority1 • matchPriority2 • matchPriority3 • matchPriority4 • matchPriority5 • matchPriority6 • matchPriority7 • matchAllPriorities
PktType	Specifies the data link layer frame format for that can match this classifier. Values include: <ul style="list-style-type: none"> • ethernetII—only Ethernet II format frames can match this classifier • snap—only IEEE 802 SNAP format frames can match this classifier • llc—only IEEE 802 LLC format frames can match this classifier • ignore—frame format is not considered in determining whether or not a frame matches this classifier
ActionDrop	Specifies whether or not to drop the traffic matching filtering data. Values include: <ul style="list-style-type: none"> • drop • pass
UpdateDscp	Specifies a value used to update the DSCP field in an IPv4 packet. Values range from -1–63 (0x00 to 0x3f hexadecimal). A value of -1 indicates that the system ignores this parameter.

Table continues...

Name	Description
UpdateUserPriority	Specifies 802.1p value used to update user priority. Values include: <ul style="list-style-type: none"> • markAsPriority0 • markAsPriority1 • markAsPriority2 • markAsPriority3 • markAsPriority4 • markAsPriority5 • markAsPriority6 • markAsPriority7 • ignore
ActionSetPrec	Specifies automatic drop precedence. Values include: <ul style="list-style-type: none"> • lowDropPrec—low drop precedence • highDropPrec—high drop precedence When network traffic congestion occurs, packets with a high drop precedence are dropped before packets with a low drop precedence.
Stage	Specifies the stage for Traffic Profile classifiers: <ul style="list-style-type: none"> • ingressStage—ingress traffic (default option) • egressStage—egress traffic

Delete QoS Traffic Profile Filter Classifier

About this task

Use the following procedure steps to delete a QoS traffic profile filter classifier in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Classifier** tab.
4. To select a classifier to delete, click the classifier Id.
5. Click **Delete**.

Configuring QoS Traffic Profile Filter Set using the EDM

Use the information in this section to create and manage QoS generic filter sets.

View QoS Traffic Profile Filter Set Information

About this task

Use the following procedure steps to view QoS traffic profile filter set information in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Set** tab.

Field Descriptions

Use the data in this table to help you understand the QoS traffic profile filter set display.

Variable	Value
AclType	Indicates the type of ACL. Values include: <ul style="list-style-type: none"> • UbpClfr • TrafficProfile
Name	Indicates a name for this traffic profile filter set. The name must be an existing classifier name. All classifiers with this name are part of this filter set. The filter set itself has this name.
IfIndex	Indicates the logical interface index assigned to the filter set.
MeteringMode	Specifies the Traffic Profile Metering Mode as: <ul style="list-style-type: none"> • noMetering • perPolicyUniformRateMetering • perPolicyIndividualRateMetring • perClassifierMetering
CommittedRate	Indicates the committed rate in kilobits per second (Kbps). Values are multiples of 64 or 1000 Kbps.
BurstSize	Indicates the size of a single transmission burst.
OutActionDrop	Specifies the action to take when packet is out-of-profile. This action is applied only if metering is being enforced, and if the traffic is deemed out-of-profile based on the level of traffic and the metering criteria. (Metering is applied only to traffic matching the filtering data.)

Table continues...

Variable	Value
	Options are the following: <ul style="list-style-type: none"> • drop—the packet is dropped • pass—the packet is not dropped The default value is pass.
StatsType	Options are: <ul style="list-style-type: none"> • individualClfr • aggregateClfr • noStatsTracking
OutActionUpdateDscp	Indicates the action to take to update DSCP when a packet is out-of-profile. Values range from -1–63. The default value is -1.
SetPriority	Indicates the set priority. Values range from 1–255.
Status	Indicates the set status.
Storage	Indicates the type of storage.

Create a QoS Traffic Profile Filter Set

About this task

Use the following procedure steps to create a new QoS traffic profile filter set in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Set** tab.
4. Click **Insert**.
5. Configure the parameters for the traffic profile filter set.
6. Click **Insert**.
7. Click **Apply**.

Field Descriptions

Use the data in this table to create a QoS traffic profile filter set.

Name	Description
AcIType	Specifies the type of ACL. Values include: <ul style="list-style-type: none"> • UbpClfr • TrafficProfile

Table continues...

Name	Description
Name	Specifies a name for this entry. The name must be an existing classifier name. All classifiers with this name are part of this filter set. The filter set itself has this name.
IfIndex	Specifies the logical interface index assigned to the filter set.
CommittedRate	Specifies the committed rate in kilobits per second (Kbps).
MaxBurstRate	Specifies the maximum rate for a single transmission burst in Kbps.
Duration	Specifies the maximum burst duration in milliseconds.
BurstSize	Indicates the size of a single transmission burst.
OutActionDrop	Specifies the action to take when packet is out-of-profile. This action is applied only if metering is being enforced, and if the traffic is deemed out-of-profile based on the level of traffic and the metering criteria. (Metering is applied only to traffic matching the filtering data.) Options are the following: <ul style="list-style-type: none"> • drop—packet is dropped • pass—packet is not dropped The default value is pass.
StatsType	Options are: <ul style="list-style-type: none"> • individualClfr • aggregateClfr • noStatsTracking
OutActionUpdateDscp	Specifies the action to take to update DSCP when a packet is out-of-profile. Values range from -1–63. The default value is -1.
SetPriority	Specifies the set priority. Values range from 1–255.
Storage	Indicates the type of storage.

Delete a QoS Traffic Profile Filter Set

About this task

Use the following procedure steps to delete a QoS traffic profile filter set in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Set** tab.
4. Click **Delete**.

Filter QoS Traffic Profile Filter Set Information

About this task

Use this procedure steps to display selected parts of the QoS traffic profile filter set in EDM.

Procedure

1. From the navigation tree, click **QoS**.
2. Click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Set** tab.
4. To select a traffic profile filter set to filter, click a traffic profile row.
5. Configure the parameters for the traffic profile filter set.
6. Click **Filter**.
7. Click **Apply**.

Field Descriptions

Use the data in the following table to filter QoS traffic profile filter set information.

Name	Description
AND	Includes all entries in the table that include all specified parameters.
OR	Includes any of the specified parameters.
Ignore Case	When selected, includes entries with the parameters being set, whether in lower case or upper case.
contains	Returns all cases in which an entry contains the set parameters.
does not contain	Returns all cases in which an entry does not contain the set parameters.
equal to	Returns all cases in which an entry is equal to the set parameters.
does not equal to	Returns all cases in which an entry is not equal to the set parameters.
All Records	When selected, displays all entries in the table.

Viewing QoS Traffic Profile Filter Set Stats

Use the following procedure to view QoS traffic profile filter set statistics.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS UBP/Traffic Profile**.
3. In the work area, click the **Set** tab.
4. Select a traffic profile set from the list.
5. Click **Graph**. TrafficProfileStats appears.
6. Select a traffic profile statistics and click **Apply**.

Field Descriptions

Name	Description
AccessAsgnId	Specifies the assigned access ID.
Precedence	Specifies the applied precedence.
EvalOrder	Specifies the evaluation order number.
InProfilePkts	Specifies the in-profile packets.
OutOfProfilePkts	Specifies the out-of-profile packets.

Configuring QoS Agent using EDM

Use the information in this section to configure QoS Agent and DoS Attack Prevention Package (DAPP).

View the QoS Configuration

About this task

Use the **Configuration** tab to view the QoS configuration.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.

Field Descriptions

Use the data in the following table to configure QoS Agent and DAPP.

Name	Description
QosOperMode	<p>Specifies whether the QoS Agent support is enabled or disabled.</p> <p>The QoS operational mode can not be disabled if QoS components are currently used by non-QoS applications.</p> <p>If disabled, requests related to QoS components by non-QoS applications are rejected.</p> <p>! Important:</p> <p>Re-enabling the QoS operational mode can result in errors if you have made changes affecting available resources while QoS was temporarily disabled.</p>
NVRamCommitDelay	<p>Specifies the maximum time before nonvolatile QoS data is written to NVRAM.</p> <p>Values range from 0 to 604800 seconds.</p>
NVRamCommitDelay	<p>Resets QoS configurations to default except for queue-set and buffering type.</p>
ResetToDefaults	<p>Resets all policy information to factory default values.</p> <p>* Note:</p> <p>You must restart the switch for changes to ResetToDefaults to take effect.</p>
QueueCfg	<p>Specifies the queue set associated with all egress interfaces. Values include:</p> <ul style="list-style-type: none"> • queueSetOne • queueSetTwo • queueSetThree • queueSetFour • queueSetFive • queueSetSix • queueSetSeven • queueSetEight <p>* Note:</p> <p>You must restart the switch for changes to QueueCfg to take effect.</p>

Table continues...

Name	Description
BufferingCaps	<p>Specifies the level of buffer sharing or over-allocation that can take place among ports sharing a buffer pool. Values include:</p> <ul style="list-style-type: none"> • minimumOverAllocation—only a small amount of resource sharing is permitted • mediumOverAllocation—a medium amount of resource sharing is permitted • maximumOverAllocation—maximizes the possibility of over-allocation occurring <p> Note: You must restart the switch for changes to BufferingCaps to take effect.</p>
UBPSupportLevel	<p>Sets the level of user based policy support. Values include:</p> <ul style="list-style-type: none"> • disabled • highSecurityLocalData • lowSecurityLocalData
TrackStatistics	<p>Specifies the type of statistics tracking. Values include:</p> <ul style="list-style-type: none"> • disabled • individual • aggregate
AQApplicationMode	<p>Specifies the behavior of Auto Qos application mode. Values include:</p> <ul style="list-style-type: none"> • disable • enablePureMode • enableMixedMode
DappEnable	<p>Specifies the DoS Attack Prevention Package (DAPP). The values include:</p> <ul style="list-style-type: none"> • disable—disabled by default • enableWithoutStatusTracking—enables DAPP without logging messages • enableWithStatusTracking—enables DAPP with logging messages
DappMinTcpHdrSize	<p>Specifies the DAPP minimum TCP header size.</p>
DappIpv4IcmpMaxLength	<p>Specifies the DAPP maximum length for IPv4 ICMP packets.</p>

Table continues...

Name	Description
Dapplpv6IcmpMaxLength	Specifies the DAPP maximum length for IPv6 ICMP packets.

Enable or Disable QoS Agent Support

About this task

Enable or disable QoS Agent support.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.
4. In the **QosOperMode**, select enable or disable.

Enable or Disable Automatic QoS

About this task

Enable or disable automatic QoS support.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.
4. Select the appropriate mode in the **AQApplicationMode** section from the following to enable automatic QoS:
 - enablePureMode - Enables Automatic QoS functionality with DSCP remarking at egress disabled.
 - enableMixedMode - Enables Automatic QoS functionality with DSCP remarking at egress enabled.
5. **(Optional)** Select **Disable** in the **AQApplicationMode** section to disable the automatic QoS.
6. Click **Apply**.

Configure the QoS Trusted Processing Mode

About this task

Configure the trusted processing mode.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.
4. Select the appropriate mode in the **TrustedProcessingMode** section from the following:
 - **partialDscpMapping** - Sets the QoS trusted processing mode to partial DSCP mapping.
 - **fullDscpMapping** - Sets the QoS trusted processing mode to full DSCP mapping.
5. Click **Apply**.

Enable DoS Attack Prevention Package

About this task

Enables DoS Attack Prevention Package.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.
4. Under the DoS Attack Prevention Package section, choose the **DappEnable** mode:
 - **disable** (Default) - Disables DAPP
 - **enableWithoutStatusTracking** - Enables DAPP without enabling status tracking.
 - **enableWithStatusTracking** - Enables DAPP and enables status tracking.
5. Click **Apply**.

Configure DAPP Minimum TCP Header Size

About this task

Sets the minimum TCP header size used by DAPP.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Under the **DoS Attack Prevention Package** section, enter a value in the range 0 to 255 in the **DappMinTcpHdrSize** text box.
4. Click **Apply**.

Configure DAPP Maximum IPv4 ICMP Length

About this task

Sets the maximum IPv4 ICMP length used by DAPP.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.
4. Under the **DoS Attack Prevention Package** section, enter a value in the range 0 to 1023 in the **Dapplpv4IcmpMaxLength** text box.
5. Click **Apply**.

Configure DAPP Maximum IPv6 ICMP Length

About this task

Sets the maximum IPv6 ICMP length that DAPP uses.

Procedure

1. From the navigation tree, double-click **QoS**.
2. From the QoS tree, double-click **QoS Agent**.
3. Select the **Configuration** tab.
4. Under the **DoS Attack Prevention Package** section, enter a value in the range 0 to 16383 in the **Dapplpv6IcmpMaxLength** text box.
5. Click **Apply**.

Displaying Policy Class Support using EDM

Use the following procedure to display policy class support.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Agent**.
3. In the work area, click the **Policy Class Support** tab.

Field Descriptions

Name	Description
PolicyClassName	Identifies the Policy Rule Classes (PRCs) supported by the device. A PRC is synonymous to a MIB table; therefore, the supported PRCs indicate which MIB tables are supported for QoS processing purposes.
CurrentInstances	Identifies the current number of Policy Rules Instances (PRIs) that are installed for a specific PRC (equates to the current number of entries in a given MIB table).
MaxInstalledInstances	Identifies the maximum number of PRIs that can be installed and/or modified by a user for a specific PRC (equates to the number of MIB table entries that can be created or modified by a user).

Displaying Policy Device Identification using EDM

Use the following procedure to display policy device identification data.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Agent**.
3. In the work area, click the **Policy Device Identification** tab to view the data.

Field Descriptions

Name	Description
Descr	Specifies the description of the policy agent.

Table continues...

Name	Description
	 Important: The description must include the name and version identification of the policy agent hardware and software.
MaxMsg	Specifies the maximum message size in octets that the device can support.

Managing QoS Resource Allocation using the EDM

Use the information in this section to filter and view resource allocation information.

Filter the Resource Allocation Table using EDM

Use the following procedure to filter the resource allocation table.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Agent**.
3. In the work area, click the **Resource Allocation (ERS5900)** tab.
4. Click **Filter**.
5. In QoS Agent, Resource Allocation (ERS5900)- Filter, set the filter conditions.
 - a. Select **AND** to include all entries in the table that include all specified parameters, or select **OR** to include any of the specified parameters.
 - b. Select **IGNORE CASE** to include all entries with the parameters being set, whether in lower case or upper case.
 - c. Define the search to return all cases in which an entry **CONTAINS, DOES NOT CONTAIN, EQUALS TO, DOES NOT EQUAL TO** the set parameters.
 - d. Select **ALL RECORDS** to display all entries in the table.
 - e. Set **Precedence** to filter by order of precedence.
 - f. Select **Port** to display the entries by port.
6. Click **Filter**.

Display Resource Allocation using EDM

Use the following procedure to display QoS resource Allocation information.

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Procedure steps

1. From the navigation tree, double-click **Qos**.
2. In the QoS tree, double-click **QoS Agent**.
3. In the work area, click the **Resource Allocation** tab.

Field Descriptions

Name	Description
Precedence	Displays the applied precedence (from 1–16).
Port	Displays the Port number.
FiltersConsumed	Displays the number of rules (filters) in use by policy and filter data by that interface.
MetersConsumed	Displays the number of meters in use by policy data by that interface.
CountersConsumed	Displays the number of counters in use by that interface.
NonQosFiltersConsumed	Tracks the current number of filters in use, not due to installed QoS filter data, for a given precedence level and interface.
NonQosMetersConsumed	Tracks the current number of meters in use, not due to installed QoS policy data, for a given precedence level and interface.
TotalFiltersAvail	Displays the maximum number of filters available (for each precedence and for each ASIC).
TotalMetersAvail	Displays the maximum number of meters available (for each precedence and for each ASIC).
TotalCountersAvail	Displays the maximum number of counters available (for each precedence and for each ASIC).
RangeCheckersConsumed	Displays the number of range checkers consumed by QoS.

View QoS Queue Statistics

Use the following procedure to display the number of bytes or packets dropped or passed on CoS queues, filtered by port, queue and/or non-zero queues.

Procedure

1. From the navigation tree, select **Qos > QoS Queue Stats**.
2. In the work area, click **Queue Statistics** to view the statistics.

3. On the toolbar, select **Filter** .
The Filter window displays.
4. Select the Condition option.
 - AND
 - OR
5. Select the Column filter options.
 - contains
 - does not contain
 - equals to
 - does not equal to
6. Select the columns to be filtered.
7. Specify the string criteria for the selected columns.
8. **(Optional)** Clear **Ignore Case** to make the string criteria for the selected columns case sensitive.
9. Click **Filter**.
The filtered options display in the table.

Field Descriptions

Name	Description
IfIndex	Indicates the interface index for the specified port.
Queue	Indicates the specified queue.
OutPackets	Indicates the number of packets transmitted.
OutBytes	Indicates the number of bytes transmitted.
DropPackets	Indicates the number of packets dropped.
DropBytes	Indicates the number of bytes dropped.

Glossary

Address Resolution Protocol (ARP)	Maps an IP address to a physical machine address, for example, maps an IP address to an Ethernet media access control (MAC) address.
Application-specific Integrated Circuit (ASIC)	An application-specific integrated circuit developed to perform more quickly and efficiently than a generic processor.
Auto-Detection and Auto-Configuration (ADAC)	Provides automatic switch configuration for IP phone traffic support and prioritization. ADAC can configure the switch whether it is directly connected to the Call Server or uses a network uplink.
bandwidth	A measure of transmission capacity for a particular pathway, expressed in megabits per second (Mb/s).
Class of Service (CoS)	A method used to manage traffic congestion based on the CoS level assigned to the packet.
CLI	Command Line Interface (CLI) is a text-based, common command line interface used for device configuration and management across Extreme Networks products.
CLI modes	Differing command modes are available within the text-based interface, dependant on the level of user permissions determined by logon password. Each successive mode level provides access to more complex command sets, from the most restrictive—show level only, to the highest configuration levels for routing parameters, interface configuration, and security.
Differentiated Services (DiffServ)	A network architecture enabling service providers and enterprise network environments to offer varied levels of service for different traffic types.
Differentiated Services Code Point (DSCP)	The first six bits of the DS field. The DSCP uses packet marking to guarantee a fixed percentage of total bandwidth to each of several applications (guarantees quality of service).
Differentiated Services Quality of Service (DiffServ QoS)	Allows specific level of performance designation, on a packet-by-packet basis, for high performance and reliable service for voice or video over IP, or for preferential treatment of data over other traffic.

DS field	Formerly called the IPv4 Type of Service (TOS) octet or the IPv6 Traffic Class octet. The DS field provides the Differentiated Services Code Point (DSCP) that is used for packet forwarding. These fields are part of the standard IPv4 header.
Dynamic Host Configuration Protocol (DHCP)	A standard Internet protocol that dynamically configures hosts on an Internet Protocol (IP) network for either IPv4 or IPv6. DHCP extends the Bootstrap Protocol (BOOTP).
Enterprise Device Manager (EDM)	A web-based embedded management system to support single-element management. EDM provides complete configuration management functionality for the supported devices and is supplied to the customer as embedded software in the device.
Extensible Authentication Protocol over LAN (EAPoL)	A port-based network access control protocol. EAPoL provides security in that it prevents users from accessing network resources before they are authenticated.
File Transfer Protocol (FTP)	A protocol that governs transferring files between nodes, as documented in RFC 959. FTP is not secure and does not encrypt transferred data. Use FTP access only after you determine it is safe in the network.
Hypertext Transfer Protocol (HTTP)	Communications protocol for the Web.
Hypertext Transfer Protocol, Secure (HTTPS)	Communications protocol used to access a secure Web server.
Internet Control Message Protocol (ICMP)	A collection of error conditions and control messages exchanged by IP modules in both hosts and gateways.
Internet Group Management Protocol (IGMP)	IGMP is a host membership protocol used to arbitrate membership in multicast services. IP multicast routers use IGMP to learn the existence of host group members on their directly attached subnets.
Internet Protocol version 4 (IPv4)	The protocol used to format packets for the Internet and many enterprise networks. IPv4 provides packet routing and reassembly.
Internet Protocol version 6 (IPv6)	An improved version of the IP protocol, IPv6 improves the IPv4 limitations of security and user address numbers.
Layer 2	Layer 2 is the Data Link Layer of the OSI model. Examples of Layer 2 protocols are Ethernet and Frame Relay.
Layer 3	Layer 3 is the Network Layer of the OSI model. An example of a Layer 3 protocol is Internet Protocol (IP).

Logical Link Control (LLC)	A protocol used in LANs to transmit protocol data units between two end stations. This LLC layer addresses and arbitrates data exchange between two endpoints.
management information base (MIB)	The MIB defines system operations and parameters used for the Simple Network Management Protocol (SNMP).
marking	A process that uses defined rules to assign the Differentiated Services Code Point (DSCP) in a packet.
mask	A bit string that the device uses along with an IP address to indicate the number of leading bits in the address that correspond with the network part.
Media Access Control (MAC)	Arbitrates access to and from a shared medium.
microflow	A single instance of an application-to-application packet flow identified by source address, destination address, protocol ID, and source port.
MultiLink Trunking (MLT)	A method of link aggregation that uses multiple Ethernet trunks aggregated to provide a single logical trunk. A multilink trunk provides the combined bandwidth of multiple links and the physical layer protection against the failure of a single link.
NonVolatile Random Access Memory (NVRAM)	Random Access Memory that retains its contents after electrical power turns off.
Policing	Ensures that a traffic stream follows the domain service-provisioning policy or service-level agreement (SLA).
Policy-Enabled Networking	User-defined characteristics that can be set in policies used to control and monitor traffic.
port	A physical interface that transmits and receives data.
port mirroring	A feature that sends received or transmitted traffic to a second destination.
quality of service (QoS)	QoS features reserve resources in a congested network, allowing you to configure a higher priority for certain devices. For example, you can configure a higher priority for IP deskphones, which need a fixed bit rate and split the remaining bandwidth between data connections if calls in the network are more important than the file transfers.
Rate Limiting	Rate limiting sets the percentage of traffic that is multicast, broadcast, or both, on specified ports.
routing switch	Virtualizes the physical router interfaces to switches. A virtual router port, or interface, acts as a router port to consolidate switching and routing

	functions in the broadcast domain, or between broadcast domains, and enable IP routing for higher traffic volumes.
Service Level Agreement (SLA)	A service contract that specifies the forwarding service that traffic receives.
stack	Stackable Extreme Networks Ethernet Routing Switch can be connected in a stack configuration of two or more units, up to eight units maximum. A switch stack operates and is managed as a single virtual switch.
Traffic Profile	The temporal properties of a traffic stream, such as rate.
Transmission Control Protocol (TCP)	Provides flow control and sequencing for transmitted data over an end-to-end connection.
Trivial File Transfer Protocol (TFTP)	A protocol that governs transferring files between nodes without protection against packet loss.
trunk	A logical group of ports that behaves like a single large port.
Type of Service (TOS)	A field in the IPv4 header that determines the Class of Service prior to the standardization of Differentiated Services.
User Datagram Protocol (UDP)	In TCP/IP, a packet-level protocol built directly on the Internet Protocol layer. TCP/IP host systems use UDP for application-to-application programs.
Virtual Local Area Network (VLAN)	A Virtual Local Area Network is a group of hosts that communicate as if they are attached to the same broadcast domain regardless of their physical location. VLANs are layer 2 constructs.
Voice over IP (VOIP)	The technology that delivers voice information in digital form in discrete packets using the Internet Protocol (IP) rather than the traditional circuit-committed protocols of the public switched telephone network (PSTN).
Weighted Round Robin (WRR)	A mechanism that uses the packet transmission opportunity (PTO) of a queue to determine which queue to process first.