

## IPv4 ToS/IPv6 traffic class byte

IPv4 packet headers contain a Type of Service (ToS) byte; IPv6 packet headers contain a Traffic Class byte. In an IPv6 packet, the Traffic Class byte is used in the same way as the ToS byte in an IPv4 packet. A ToS/Traffic Class byte includes a DSCP codepoint and precedence bits:

- Differentiated Services Codepoint (DSCP)

Consists of the upper six bits of the ToS/Traffic Class byte. There are 64 possible codepoints.

In the switches covered in this guide, the default QoS configuration includes some codepoints, such as Assured Forwarding and Expedited Forwarding, that are preconfigured with an 802.1p priority setting. All other codepoints are not configured with an 802.1p priority and display `No-override`.

Use the `qos dscp map` command to configure the switch to assign different 802.1p priorities to IP packets with different codepoints. Also, you can configure the switch to assign a new codepoint with its associated priority level (0-7) to matching packets as follows:

1. Configure a DSCP codepoint with the desired priority in an edge switch.
2. Configure the local switch to mark specified inbound traffic with the DSCP (and thus create a policy for that traffic type).
3. Configure the internal switches in your LAN to honor the policy.

For example, you could configure an edge switch to assign a codepoint of 000001 to all packets received from a specific VLAN, and then handle all traffic with that codepoint at high priority.

- Precedence Bits

A subset of the DSCP codepoint, consisting of the upper three bits of the ToS/Traffic Class byte. When a global IP-Precedence classifier is configured, the switch uses the precedence bit set to determine the priority for selected packets as shown in the following table. (The switch does not change the setting of the precedence bits.)

### IP precedence-to-802.1p priority mapping

ToS/Traffic Class Byte: IP Precedence Bits	Corresponding 802.1p Priority	Service Priority Level
000	1	Lowest
001	2	Low
002	0	Normal
003	3	
004	4	
005	5	
006	6	
007	7	Highest



**NOTE:** Using a global IP-Precedence classifier to prioritize IP packets relies on priorities set in upstream devices and applications.

[IPv4 ToS/IPv6 traffic class byte with DSCP codepoint and precedence bits](#) shows the difference between the diffserv bits and precedence bits in an IPv4 ToS byte and an IPv6 Traffic Class byte. Note that:

- Precedence bits are a subset of the Differentiated Services bits.
- The right-most two bits are reserved.

### IPv4 ToS/IPv6 traffic class byte with DSCP codepoint and precedence bits

IPv4 Fields:	Destination MAC Address	Source MAC Address	802.1Q Field	Type and Version	Type-of-Service Byte	...
<b>Sample IPv4 Packet:</b>	FF FF FF FF FF FF	08 00 09 00 00 16	08 00	45	<b>E 0</b>	...
IPv6 Fields:	Destination MAC Address	Source MAC Address	...		Traffic Class Byte	...
<b>Sample IPv6 Packet:</b>	FF FF FF FF FF FF	2001:db8:260:0212::01b4	...		<b>E 0</b>	...

  

Differentiated Services Codepoint							
Precedence Bits			Delay Throughput Reliability Bits			Rsvd.	
1	1	1	0	0	0	0	0
<b>E</b>			<b>0</b>				

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