# How to setup 802.1p and Scheduler (Strict/WRR/DRR) on DGS-6600?

[About 802.1p]

802.1p user priority provided a mechanism for implementing Quality of Service (QoS) at the Media Access Control (MAC) level.

However, the QoS technique developed by the working group, also known as class of service (CoS), is a 3-bit field within an Ethernet frame header when using VLAN tagged frames as defined by IEEE 802.1Q, as the figure below:
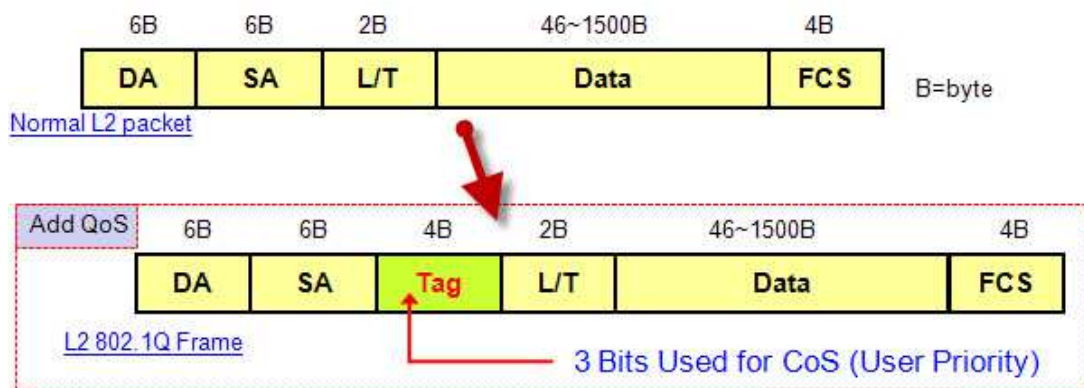
[Target]

The packets will be promoted the priority (CoS) by DGS-6600, so DGS-6600 will forward these packets of setting high priority first.

For example, based on the topology, we will modify the ingress traffic priority (CoS) on eth2.1~2.3. And then change the QoS scheduler (Strict mode/DRR mode/WRR mode) on eth2.4 to verify if the ingress traffic will be promoted the priority or not.
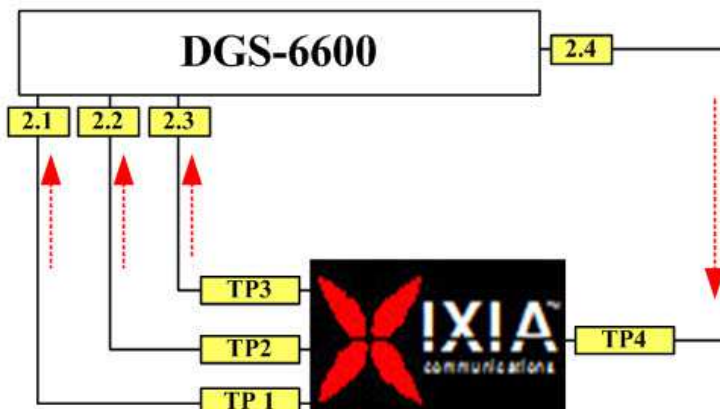
[Setup 802.1p]

(1) Setup CoS on eth2.1, eth2.2, and eth2.3

First, setup each interface to match the 802.1p CoS priority respectively, such as the commands:

eth2.1 → CoS 2

DGS-6600:15(config)# interface eth2.1

DGS-6600:15(config-if)# qos cos 2

eth2.2 → CoS 3

DGS-6600:15(config)# interface eth2.2

DGS-6600:15(config-if)# qos cos 3

eth2.3 → CoS 4

DGS-6600:15(config)# interface eth2.3

DGS-6600:15(config-if)# qos cos 4

Display the port CoS status:

DGS-6600:15(config)# sh qos interface eth2.1,eth2.2,eth2.3 cos

Interface	CoS
eth2.1	2 (qos)
eth2.2	3 (qos)
eth2.3	4 (qos)

(2) Setup the trust on eth2.1, eth2.2, and eth2.3

Then we should configure these ports to compare the CoS of packets first. such as the commands:

DGS-6600:15(config)# interface range eth2.1,eth2.2,eth2.3

DGS-6600:15(config-if)# qos trust cos

DGS-6600:15(config)# show qos interface eth2.1,eth2.2,eth2.3 trust

Interface	Trust State
eth2.1	trust CoS
eth2.2	trust CoS
eth2.3	trust CoS

Total Entries: 3

[Setup Scheduling Mechanism]

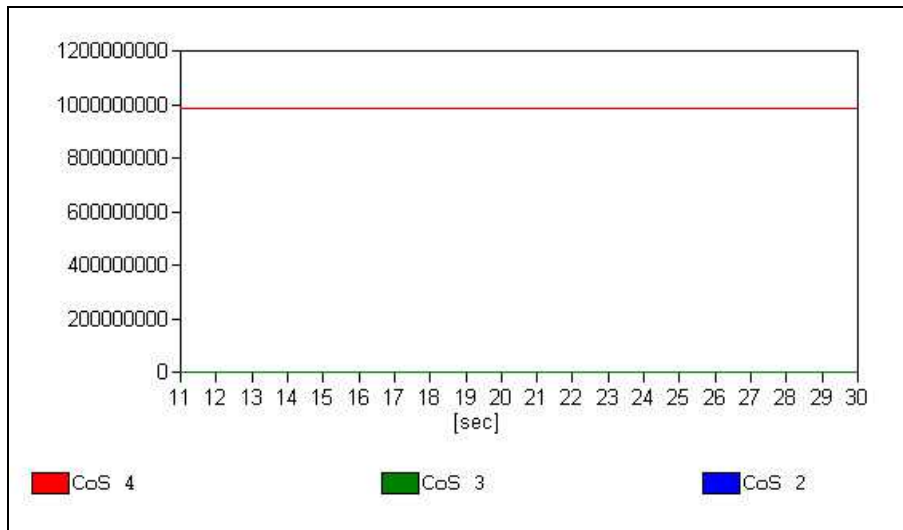**(1) Default mode (Strict Mode) on eth2.4**

Definition:

The strict priority scheduler mode provides strict priority access to the egress port across the transmit priority queue from the highest priority index to the lowest. The purpose of the strict priority scheduler is to provide lower latency service to the higher CoS classes of traffic.

In order to make sure the scheduler mode is Strict mode on eth2.4, we can apply the commands below:
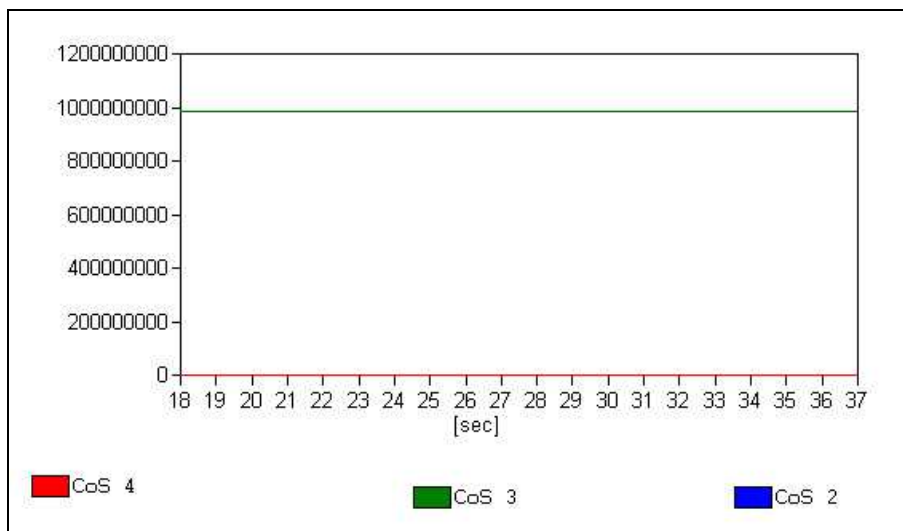
DGS-6600:15(config)# interface eth2.4

DGS-6600:15(config-if)# default qos   <= start Strict mode in this interface

After sending traffic from eth2.1~2.3 to eth2.4, we can find there are only CoS 4 packets seen on eth2.4.

If stop sending traffic on eth2.3 (CoS 4), we can find there are only CoS 3 seen on eth2.4. This is Strict Mode.

(2) Deficit-Round-Robin mode (DRR Mode) on eth2.4

Definition:

DRR operates by serving a mount of backlogged credits into the transmit queue in round robin order. Initially, each queue sets its credit counter to a configurable quantum value. Every time a packet from a CoS queue is sent, the size of the packet is subtracted from the corresponding credit counter. When the credit counter drops below 0, the queue is no longer serviced until its credits are replenished.

All queues are serviced until their credit counter is zero or negative and a packet is transmitted completely. As this condition happens, the credits are replenished. When the credits are replenished, as a quantum of credits are added to each CoS queue credit counter. The quantum for each CoS queue may different based on the user configuration.

We should configure each quantum for each CoS, such as the commands:

DGS-6600:15(config)# interface eth2.4

DGS-6600:15(config-if)# qos deficit-round-robin 2 quantum 2

DGS-6600:15(config-if)# qos deficit-round-robin 3 quantum 4

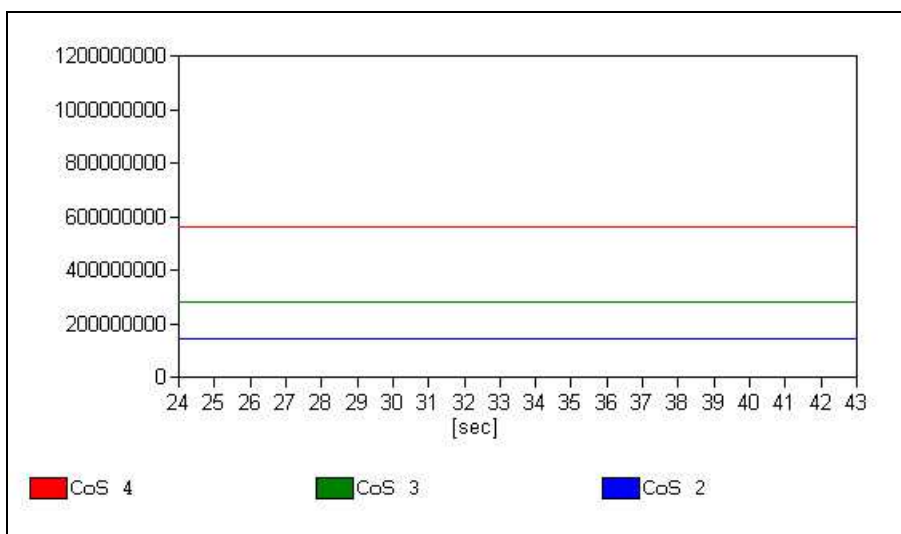*DGS-6600:15(config-if)# qos deficit-round-robin 4 quantum 8*

DGS-6600:15(config-if)# qos deficit-round-robin   <=start DRR mode in this interface

DGS-6600:15(config-if)# show qos interface eth2.4 deficit-round-robin

CoS	Quantum (Kbytes)
2	32
3	64
4	128

After sending traffic from eth2.1~2.3 to eth2.4, we can find every kind of CoS packets will be forwarded by the fixed rate on eth2.4.

(3) Weight-Round-Robin (WRR Mode) on eth2.4

Definition:

WRR operates by transmitting permitted packets into the transmit queue in round robin order. Initially, each queue sets its weight to a configurable weighting. Every time a packet from a higher priority CoS queue is sent, the number of the packet is subtracted from the corresponding weight. When the credit counter reaches zero, the queue is no longer serviced until its weight is replenished. After this repeats for each queue, the next lower priority CoS queue is serviced in turn.

All queues are serviced until their weight is zero and a packet is transmitted completely. As this condition happens, the weights are replenished. When the weights are replenished, weight is added to each CoS queue credit counter. The weight for each CoS queue may different based on the user configuration.

We should configure each weight for each CoS, such as the commands:

DGS-6600:15(config)# interface eth2.4

DGS-6600:15(config-if)# qos weight-round-robin 2 weight 2

DGS-6600:15(config-if)# qos weight-round-robin 3 weight 4

DGS-6600:15(config-if)# qos weight-round-robin 4 weight 8

DGS-6600:15(config-if)# qos weight-round-robin   <=start WRR mode in this interface

DGS-6600:15(config-if)# show qos interface eth2.4 weight-round-robin

CoS	weight
====	==========
2	2
3	4
4	8

After sending traffic from eth2.1~2.3 to eth2.4, we can find every kind of CoS packets will be forwarded by the fixed rate on eth2.4.