

Configuration Examples

802.1p priority and QoS

Ingress (incoming frame):

- If receiving **untagged** frame, add the tag into this frame with VID=PVID and priority= 802.1p default priority
- If receiving **tagged** frame, the VID/priority values are unchanged.

Inside the Switch (all frames are tagged)

- For VLAN, based on the VID to lookup the VLAN table, and forward frame to member ports of this VLAN.
- For priority, based on the “Class of Service mapping” to process the frame with associated priority Queue.

Egress (outgoing frame):

- **Untagged** egress port: Remove the tagging.
- **Tagged** Egress port: Un-change the tagging, so that the 1p/1q info can be carried to next 802.1p/q aware switch.

802.1p default priority

Used to specify how to tag an incoming packet that has no 802.1p/1q tag. By default, the default priority for each port is 0.

```
DGS-3324SR:4# show 802.1p default_priority
```

```
Command: show 802.1p default_priority
```

```
Port Priority
```

```
-----
```

```
1:1      0
```

```
1:2      0
```

```
1:3      0
```

Example: Change the default priority for ports 1-4 to 7:

```
config 802.1p default_priority 1-4 7
```

Used to map the 802.1p user priority of an incoming packet to one of the hardware queues available on the switch.

Note: 1p=7 usually map to the highest Queue, but 1p=0 is not necessary map to lowest Queue.

The priority of a packet inside the switch is determined by what Queue it is mapped, not 1p value it has.

```
DGS-3324SR:4# show 802.1p
user_priority
COS Class of Traffic
Priority-0 -> <Class-2>
Priority-1 -> <Class-0>
Priority-2 -> <Class-1>
Priority-3 -> <Class-3>
Priority-4 -> <Class-4>
Priority-5 -> <Class-5>
Priority-6 -> <Class-6>
Priority-7 -> <Class-6>
```

```
DES-3526:4# show 802.1p user_priority
COS Class of Traffic
Priority-0 -> <Class-1>
Priority-1 -> <Class-0>
Priority-2 -> <Class-0>
Priority-3 -> <Class-1>
Priority-4 -> <Class-2>
Priority-5 -> <Class-2>
Priority-6 -> <Class-3>
Priority-7 -> <Class-3>
```

```
config 802.1p user_priority <priority 0-7> <class_id 0-6>
```

Priority scheduling Strict Mode

Priority scheduling is implemented using two types of methods, strict priority and weight fair priority.

For **strict priority-based scheduling**, packets residing in the higher priority queues are transmitted first. Only when these queues are empty, are packets of lower priority allowed to be transmitted. Higher priority packets always receive preference regardless of the amount of lower priority packets in the buffer and regardless of the time elapsed since any lower priority packets have been transmitted. By default the switch is configured to empty the buffer using strict priority.

Problem: Packet in lowest may be starved.

Scheduling Weighted Round-Robin mode

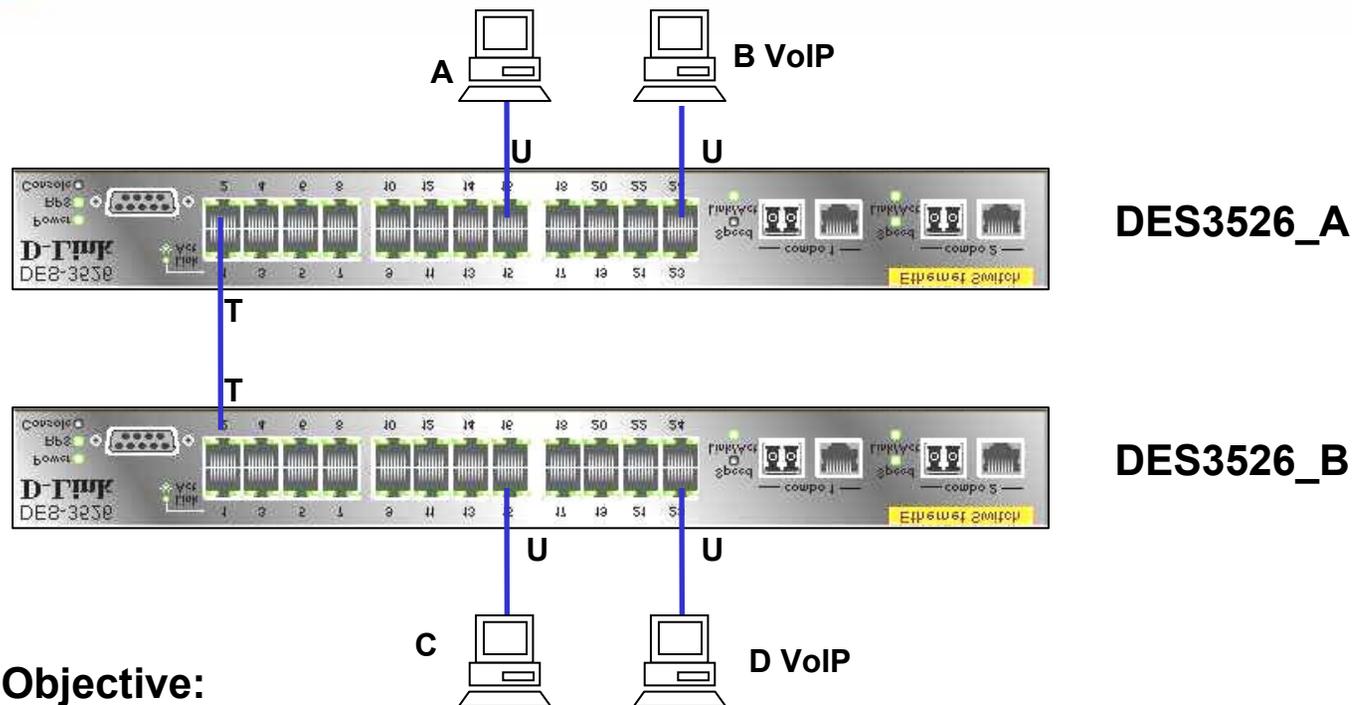
To use implement weight fair priority, the switch's eight priority queues can be configured to reduce the buffer in a weighted round-robin (**WRR**) fashion - beginning with the highest priority queue, and proceeding to the lowest priority queue before returning to the highest priority queue.

The weighted-priority based scheduling alleviates the main disadvantage of strict priority-based scheduling . in that lower priority queues get starved of bandwidth by providing a minimum bandwidth to all queues for transmission. This is accomplished by configuring the maximum number of packets allowed to be transmitted from a given priority queue before being allowed to transmit its accumulated packets. This establishes a Class of Service (CoS) for each of the switch's eight priority queues.

The **config scheduling** command can be used to specify the weighted round-robin (**WRR**) rotation by which these eight hardware priority queues are reduced. To use a weighted round-robin (**WRR**) scheme, the *max_packets* parameters must not have a value of zero (0). The **max_packet** parameter allows you to specify the maximum number of packets a given priority queue can transmit per weighted round robin (**WRR**) scheduling cycle. This provides for a controllable CoS behavior while allowing for other queues to empty as well. A value between 0 and 15 packets can be specified per priority queue.

```
config scheduling <class_id 0-6> {max_packet <value 0-15>}
```

802.1p Example 1/2



Objective:

B and D are running VoIP application, and need the higher QoS than other stations running other regular application.

How: By configuring the VoIP connected ports with 1p=7, and based on default “1p to queue mapping” and “schedule”, the incoming VoIP packet will be mapped to class 3, and will have higher priority than other packets coming from other ports (1p=0, and mapped to Class1) both on Des3526_1 and Des3526_2 devices.

802.1p example 1/2

DES-3526_A configuration

- 1. Change the port connecting Des-3526_1 and 2 from “untagged” to “Tagged” so that the 1p info can be carried across the switch.**

config vlan default delete 1

config vlan default add tagged 1

- 2. Change the default priority of port 23, the VoIP device connected, from default 0 to 7.**

config 802.1p default_priority 23 7

- 3. “User priority” and “Scheduling” use the default value.**

DES-3526_B configuration

- 1. Change the port connecting Des-3526_1 and 2 from “untagged” to “Tagged” so that the 1p info can be carried across the switch.**

config vlan default delete 1

config vlan default add tagged 1

- 2. Change the default priority of port 24, the port VoIP device connected, from default 0 to 7.**

config 802.1p default_priority 24 7

- 3. “User priority” and “Scheduling” use the default value.**