

QoS

GS1900 Series

Support Note

Version 2.00 Nov. 2022

Overview of QoS

QoS encompasses functions and features that guarantee quality of provided service. These include functions for bandwidth control (Rate limit) or traffic priority (802.1p and DSCP).

Quality of Service allows the prioritization and management of bandwidth for specific traffic and services such as voice or data.

QoS operation

1. **Port** – According to the port for incoming packets, each port of the switch will have a default priority.
2. **Existing priority tag** – Classify the incoming packets by the existing priority tag.
 - I. CoS/802.1p – Class of Service (CoS) is a 3-bit field called the Priority Code Point (PCP) within an Ethernet frame header when using VLAN tagged frames as defined by IEEE 802.1Q. It specifies a priority value of between 0 and 7 inclusive that can be used by QoS disciplines to differentiate traffic.
 - II. DSCP or IP precedence – The Type of Service field in the IP header was originally defined in RFC 791. It defined a mechanism for assigning a priority to each IP packet as well as a mechanism to request specific treatment such as high throughput, high reliability or low latency.

3. Queuing

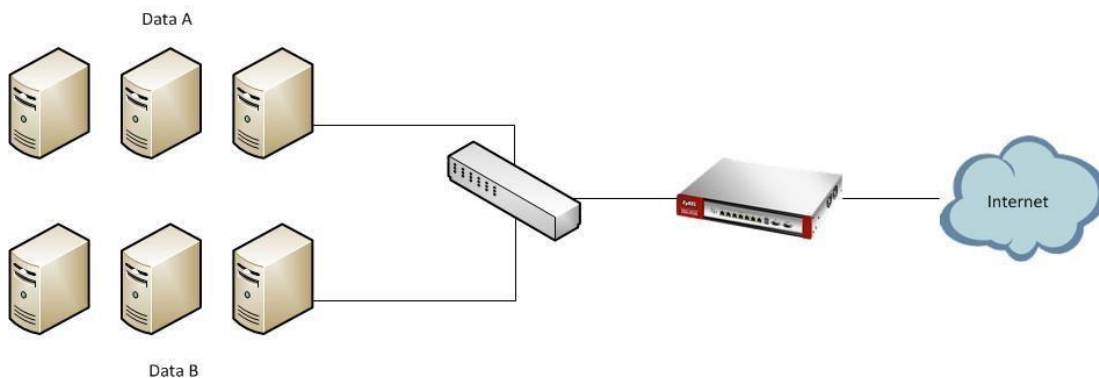
Queue management is a part of packet classification and QoS schemes, in which flows are identified and classified, and then placed in queues that provide appropriate service levels.

- I. **Strict priority** – The highest priority queue should be managed first and then turn to the lower priority queue. But the only problem with this method is that lower-priority queues may not get serviced at all if high-priority traffic is excessive.
- II. **WRR** – make sure each queue gets some service time without fear of starvation. However, it provides no true mechanism for giving higher priority traffic preferential treatment.
- III. **SP+WRR** – The combination of SP+WRR. Normally, it will set the high priority queue into the strict priority queue. When an important information enters into the strict priority queue, it will get high priority service and will not share the bandwidth with WRR. And for the lower priority information, it will use WRR to share with the bandwidth to prevent starvation.

Rate limit

Bandwidth control, the bandwidth limit per port.

Scenario



In an enterprise network, there are various types of traffic. But since most of companies' Internet bandwidth is limited, all traffic will contend for it and this may result in some important traffic, for example, the traffic from Data A getting slow or even starved.

Therefore, intelligent bandwidth management for improved productivity becomes a matter of high concern for network administrators. The GS1900 series can provide QoS features in such a scenario. Below is an example which uses rate limit and 802.1p to implement this case.

Network conditions:

GS1900-8HP

- Data A VLAN : VLAN 100
- Data B VLAN : VLAN 100
- Port 3 is for Data A VLAN usage.
- Port 4 is for Data B VLAN usage.
- Port 8 is an uplink port.

Web GUI configuration

Step 1. Create VLAN 100.

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Edit VLAN

VLAN ID	VLAN Name
100	VLAN100

Apply Cancel

Step 2. Configure PVID=100 for port 3, port 4 and port 8

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Port

	Port	PVID	Accept Frame Type	Ingress Check	VLAN Trunk
<input type="checkbox"/>	1	1	ALL	Disable	Disable
<input type="checkbox"/>	2	1	ALL	Disable	Disable
<input type="checkbox"/>	3	100	ALL	Disable	Disable
<input type="checkbox"/>	4	100	ALL	Disable	Disable
<input type="checkbox"/>	5	1	ALL	Disable	Disable
<input type="checkbox"/>	6	1	ALL	Disable	Disable
<input type="checkbox"/>	7	1	ALL	Disable	Disable
<input type="checkbox"/>	8	100	ALL	Disable	Disable
<input type="checkbox"/>	LAG1	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG2	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG3	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG4	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG5	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG6	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG7	1	ALL	Disable	Disable
<input type="checkbox"/>	LAG8	1	ALL	Disable	Disable

Edit Cancel

Step 3. Set port members for VLAN 100.

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VLAN Port

VLAN Port

VLAN ID

100

Port	Membership			
	Excluded			
1	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
2	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
3	<input type="radio"/> Forbidden	<input type="radio"/> Excluded	<input type="radio"/> Tagged	<input checked="" type="radio"/> Untagged
4	<input type="radio"/> Forbidden	<input type="radio"/> Excluded	<input type="radio"/> Tagged	<input checked="" type="radio"/> Untagged
5	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
6	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
7	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
8	<input type="radio"/> Forbidden	<input type="radio"/> Excluded	<input checked="" type="radio"/> Tagged	<input type="radio"/> Untagged
LAG1	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG2	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG3	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG4	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG5	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG6	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG7	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged
LAG8	<input type="radio"/> Forbidden	<input checked="" type="radio"/> Excluded	<input type="radio"/> Tagged	<input type="radio"/> Untagged

Apply

Cancel

Step 4. Setup CoS value for port 3 and port 4.

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QoS Port			Port	Queue	CoS Mapping	DSCP Mapping	IP Precedence Mapping
<input type="checkbox"/>	Port	CoS Value	Remark CoS		Remark DSCP	Remark IP Precedence	
<input type="checkbox"/>	1	0	Disable		Disable	Disable	
<input type="checkbox"/>	2	0	Disable		Disable	Disable	
<input checked="" type="checkbox"/>	3	2	Disable		Disable	Disable	
<input type="checkbox"/>	4	5	Disable		Disable	Disable	
<input type="checkbox"/>	5	0	Disable		Disable	Disable	
<input type="checkbox"/>	6	0	Disable		Disable	Disable	
<input type="checkbox"/>	7	0	Disable		Disable	Disable	
<input type="checkbox"/>	8	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG1	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG2	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG3	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG4	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG5	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG6	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG7	0	Disable		Disable	Disable	
<input type="checkbox"/>	LAG8	0	Disable		Disable	Disable	

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QoS Port		Port	Queue	CoS Mapping	DSCP Mapping	IP Precedence Mapping
Port List	3					
CoS Value	2					
CoS Remark	<input type="radio"/> Enable <input checked="" type="radio"/> Disable					
DSCP Remark	<input type="radio"/> Enable <input checked="" type="radio"/> Disable					
IP Precedence Remark	<input type="radio"/> Enable <input checked="" type="radio"/> Disable					

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QoS Port
Port Queue CoS Mapping DSCP Mapping IP Precedence Mapping

<input type="checkbox"/>	Port	CoS Value	Remark CoS	Remark DSCP	Remark IP Precedence
<input type="checkbox"/>	1	0	Disable	Disable	Disable
<input type="checkbox"/>	2	0	Disable	Disable	Disable
<input type="checkbox"/>	3	2	Disable	Disable	Disable
<input checked="" type="checkbox"/>	4	5	Disable	Disable	Disable
<input type="checkbox"/>	5	0	Disable	Disable	Disable
<input type="checkbox"/>	6	0	Disable	Disable	Disable
<input type="checkbox"/>	7	0	Disable	Disable	Disable
<input type="checkbox"/>	8	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG1	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG2	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG3	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG4	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG5	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG6	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG7	0	Disable	Disable	Disable
<input type="checkbox"/>	LAG8	0	Disable	Disable	Disable

Edit Cancel

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QoS Port
Port Queue CoS Mapping DSCP Mapping IP Precedence Mapping

Port List	4
CoS Value	5
CoS Remark	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
DSCP Remark	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
IP Precedence Remark	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Apply Cancel

Step 5. Set the QoS queue.

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Queue ID	Schedule Algorithm	Weight(1 - 127)
0	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	1
1	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	2
2	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	3
3	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	4
4	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	5
5	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	9
6	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	13
7	<input checked="" type="radio"/> Strict <input type="radio"/> WRR	15

Apply Cancel

Step 6. Configure the CoS mapping.

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Class of Service(CoS)	Queue ID (0 - 7)
0	1
1	0
2	2
3	3
4	4
5	7
6	6
7	5

Queue ID	Class of Service (CoS) (0 - 7)
0	1
1	0
2	2
3	3
4	4
5	5
6	6
7	7

Apply Cancel