

Contents

Introduction	1
Prerequisites	1
Example: Configuring congestion avoidance and queue scheduling	1
Network configuration	1
Analysis	2
Applicable hardware and software versions	3
Procedures	4
Verifying the configuration	6
Configuration files	7

Introduction

This document provides examples for configuring congestion avoidance and queue scheduling profiles.

Prerequisites

The configuration examples in this document were created and verified in a lab environment, and all the devices were started with the factory default configuration. When you are working on a live network, make sure you understand the potential impact of every command on your network.

This document assumes that you have basic knowledge of congestion avoidance and queue scheduling profiles.

Example: Configuring congestion avoidance and queue scheduling

Network configuration

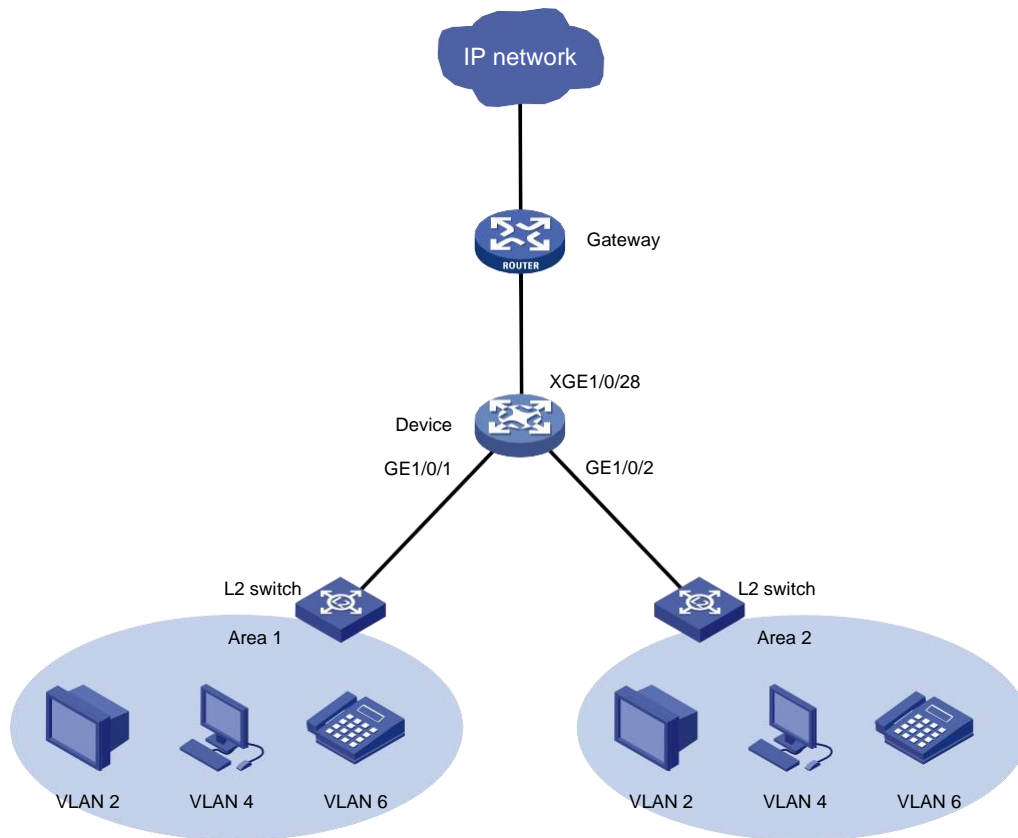
As shown in [Figure 1](#), three types of traffic come from the Internet to the device through the gateway.

- **Voice traffic**—Transmitted in VLAN 6 and carries 802.1p priority 6.
- **Video traffic**—Transmitted in VLAN 4 and carries 802.1p priority 4.
- **Data traffic**—Transmitted in VLAN 2 and carries 802.1p priority 2.

Configure congestion avoidance and queue scheduling on the device to meet the following requirements:

- The voice traffic, video traffic, and data traffic are scheduled in the ratio of 1:2:2 when congestion occurs.
- WRED drop is used when serious congestion occurs.

Figure 1 Network diagram



Analysis

To configure congestion avoidance and queue scheduling, you must perform the following tasks:

- To assign different types of traffic to different queues, configure the inbound interface to trust the 802.1p priority in packets.
- To schedule the three types of traffic in the ratio of 1:2:2, assign their queues to one WRR group and configure weights for these queues.
- To minimize performance degradation for different types of traffic, use the drop parameters in [Table 1](#).

Table 1 Drop parameters

Traffic type	Packet color	Lower limit	Upper limit	Drop probability
Voice	Yellow	1000	1500	3%
	Red	500	1000	30%
Video	Yellow	1000	1500	2%
	Red	500	1000	20%
Data	Yellow	1000	1500	1%
	Red	500	1000	10%

Applicable hardware and software versions

The following matrix shows the hardware and software versions to which this configuration example is applicable:

Hardware	Software version
SC 3570 switch series	Release 11xx
SC 5525 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 5520 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 3170 switch series	Release 11xx
SC 3130 switch series	Not supported

Procedures

1. Allow VLANs for different types of traffic to pass through:

Create three VLANs .

```
<Device> system-view
[Device] vlan 2
[Device-vlan2] quit
[Device] vlan 4
[Device-vlan4] quit
[Device] vlan 6
[Device-vlan6] quit
```

Assign interfaces to VLANs.

```
[Device] interface ten-gigabitethernet 1/0/28
[Device-Ten-Gigabitethernet1/0/28] port link-type trunk
[Device-Ten-Gigabitethernet1/0/28] port trunk permit vlan 2 4 6
[Device-Ten-Gigabitethernet1/0/28] quit
[Device] interface gigabitethernet 1/0/1
[Device-Gigabitethernet1/0/1] port link-type trunk
[Device-Gigabitethernet1/0/1] port trunk permit vlan 2 4 6
[Device-Gigabitethernet1/0/1] quit
[Device] interface gigabitethernet 1/0/2
[Device-Gigabitethernet1/0/2] port link-type trunk
[Device-Gigabitethernet1/0/2] port trunk permit vlan 2 4 6
[Device-Gigabitethernet1/0/2] quit
```

2. Configure interface Gigabitethernet 1/0/28 to trust the 802.1p priority in packets.

```
[Device] interface ten-gigabitethernet 1/0/28
[Device-Ten-Gigabitethernet1/0/28] qos trust dot1p
[Device-Ten-Gigabitethernet1/0/28] quit
```

3. Configure WRR on Gigabitethernet 1/0/1 and Gigabitethernet 1/0/2:

Display the 802.1p-to-local precedence map to determine the local precedence for each type of traffic.

```
[Device] display qos map-table inbound dot1p-lp
MAP-TABLE NAME: dot1p-lp    TYPE: pre-define
IMPORT   :   EXPORT
  0       :       2
  1       :       0
  2       :       1
  3       :       3
  4       :       4
  5       :       5
  6       :       6
  7       :       7
```

Enable weight-based WRR on Gigabitethernet 1/0/1.

```
[Device] interface gigabitethernet 1/0/1
[Device-Gigabitethernet1/0/1] qos wrr weight
```

Configure the weights of queue 1 (for data traffic), queue 4 (for video traffic), and queue 6 (for voice traffic) as 2, 2, and 1, respectively.

```
[Device-Gigabitethernet1/0/1] qos wrr 1 group 1 weight 2
[Device-Gigabitethernet1/0/1] qos wrr 4 group 1 weight 2
[Device-Gigabitethernet1/0/1] qos wrr 6 group 1 weight 1
[Device-Gigabitethernet1/0/1] quit
```

Enable weight-based WRR on Gigabitethernet 1/0/2.

```
[Device] interface gigabitethernet 1/0/2
[Device-Gigabitethernet1/0/2] qos wrr weight
```

Configure the weights of queue 1 (for data traffic), queue 4 (for video traffic), and queue 6 (for voice traffic) as 2, 2, and 1, respectively.

```
[Device-Gigabitethernet1/0/2] qos wrr 1 group 1 weight 2
[Device-Gigabitethernet1/0/2] qos wrr 4 group 1 weight 2
[Device-Gigabitethernet1/0/2] qos wrr 6 group 1 weight 1
[Device-Gigabitethernet1/0/2] quit
```

4. Configure congestion avoidance:

Configure a WRED table.

```
[Device] qos wred queue table droppolicy
[Device-wred-table-droppolicy] queue 6 drop-level 1 low-limit 1000 high-limit 1500 discard-probability 3
[Device-wred-table-droppolicy] queue 6 drop-level 2 low-limit 500 high-limit 1000 discard-probability 30
[Device-wred-table-droppolicy] queue 4 drop-level 1 low-limit 1000 high-limit 1500 discard-probability 2
[Device-wred-table-droppolicy] queue 4 drop-level 2 low-limit 500 high-limit 1000 discard-probability 20
[Device-wred-table-droppolicy] queue 1 drop-level 1 low-limit 1000 high-limit 1500 discard-probability 1
[Device-wred-table-droppolicy] queue 1 drop-level 2 low-limit 500 high-limit 1000 discard-probability 10
[Device-wred-table-droppolicy] quit
```

Apply the WRED table to interfaces Gigabitethernet 1/0/1 and Gigabitethernet 1/0/2.

```
[Device] interface gigabitethernet 1/0/1
[Device-Gigabitethernet1/0/1] qos wred apply droppolicy
[Device-Gigabitethernet1/0/1] quit
[Device] interface gigabitethernet 1/0/2
[Device-Gigabitethernet1/0/2] qos wred apply droppolicy
[Device-Gigabitethernet1/0/2] quit
```

Verifying the configuration

Verify the WRR configuration on interfaces Gigabitethernet 1/0/1 and Gigabitethernet 1/0/2.

```
[Device] display qos queue wrr interface
```

Interface: Gigabitethernet1/0/1

Output queue: Weighted Round Robin queuing

Queue ID	Queue name	Group	Weight
0	be	1	1
1	af1	1	2
2	af2	1	3
3	af3	1	4
4	af4	1	2
5	ef	1	9
6	cs6	1	1
7	cs7	1	15

Interface: GigabitEthernet1/0/2

Output queue: Weighted Round Robin queuing

Queue ID	Queue name	Group	Weight
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0	be	1	1
1	af1	1	2
2	af2	1	3
3	af3	1	4
4	af4	1	2
5	ef	1	9
6	cs6	1	1
7	cs7	1	15

Display the WRED table configuration.

Table name: droppolicy

Table type: Queue based WRED

QID	gmin	gmax	gprob	ymin	ymin	yprob	rmin	rmax	rprob	exponent	ECN
0	100	1000	10	100	1000	10	100	1000	10	9	N
1	100	1000	10	1000	1500	1	500	1000	10	9	N
2	100	1000	10	100	1000	10	100	1000	10	9	N
3	100	1000	10	100	1000	10	100	1000	10	9	N
4	100	1000	10	1000	1500	2	500	1000	20	9	N
5	100	1000	10	100	1000	10	100	1000	10	9	N
6	100	1000	10	1000	1500	3	500	1000	30	9	N
7	100	1000	10	100	1000	10	100	1000	10	9	N

Configuration files

```
#
vlan 1
#
vlan 2
#
vlan 4
#
vlan 6
#
qos wred queue table droppolicy
  queue 1 drop-level 1 low-limit 1000 high-limit 1500 discard-probability 1
  queue 1 drop-level 2 low-limit 500 high-limit 1000 discard-probability 10
  queue 4 drop-level 1 low-limit 1000 high-limit 1500 discard-probability 2
  queue 4 drop-level 2 low-limit 500 high-limit 1000 discard-probability 20
  queue 6 drop-level 1 low-limit 1000 high-limit 1500 discard-probability 3
  queue 6 drop-level 2 low-limit 500 high-limit 1000 discard-probability 30
#
interface GigabitEthernet1/0/1
  port link-mode bridge
  port link-type trunk
```

```

port trunk permit vlan 1 to 2 4 6
qos wrr weight
qos wrr af1 group 1 weight 2
qos wrr af4 group 1 weight 2
qos wrr cs6 group 1 weight 1
qos wred apply droppolicy
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 to 2 4 6
qos wrr weight
qos wrr af1 group 1 weight 2
qos wrr af4 group 1 weight 2
qos wrr cs6 group 1 weight 1
qos wred apply droppolicy
#
interface Ten-GigabitEthernet1/0/28
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 to 2 4 6
#
return

```