

## Content

### CHAPTER 1 COMMANDS FOR QOS AND IPV4/IPV6 PBR ..... 1-1

1.1 ACCOUNTING.....	1-1
1.2 CLASS .....	1-1
1.3 CLASS-MAP.....	1-2
1.4 CLEAR MLS QOS STATISTICS .....	1-2
1.5 DROP.....	1-3
1.6 MATCH.....	1-3
1.7 MLS QOS AGGREGATE-POLICY .....	1-4
1.8 MLS QOS COS.....	1-6
1.9 MLS QOS INTERNAL-PRIORITY .....	1-6
1.10 MLS QOS MAP.....	1-6
1.11 MLS QOS QUEUE ALGORITHM .....	1-9
1.12 MLS QOS QUEUE DROP-ALGORITHM.....	1-9
1.13 MLS QOS QUEUE WRR WEIGHT .....	1-9
1.14 MLS QOS QUEUE WRED .....	1-10
1.15 MLS QOS QUEUE WDRR WEIGHT .....	1-10
1.16 MLS QOS QUEUE BANDWIDTH.....	1-11
1.17 MLS QOS TRUST .....	1-11
1.18 PASS-THROUGH-COS .....	1-12
1.19 PASS-THROUGH-DSCP.....	1-12
1.20 POLICY .....	1-12
1.21 POLICY AGGREGATE.....	1-14
1.22 POLICY-MAP .....	1-14
1.23 SERVICE-POLICY INPUT .....	1-15
1.24 SERVICE-POLICY INPUT VLAN .....	1-16

Commands for QoS, PBR and Flow-based Redirection	Content
1.25 SET .....	1-16
1.26 SHOW CLASS-MAP .....	1-17
1.27 SHOW POLICY-MAP .....	1-17
1.28 SHOW MLS QOS INTERFACE .....	1-18
1.29 SHOW MLS QOS IN {INTERFACE <INTERFACE-NAME> POLICY   VLAN <VLAN-ID>}.....	1-22
1.30 SHOW MLS QOS INTERFACE WRED.....	1-22
1.31 SHOW MLS QOS MAPS .....	1-23
1.32 SHOW MLS QOS VLAN.....	1-25
1.33 SHOW MLS QOS AGGREGATE-POLICY.....	1-25
1.34 TRANSMIT .....	1-25
 <b>CHAPTER 2 COMMANDS FOR FLOW-BASED REDIRECTION</b>	
.....	2-1
2.1 ACCESS-GROUP REDIRECT TO INTERFACE ETHERNET.....	2-1
2.2 SHOW FLOW-BASED-REDIRECT .....	2-1
 <b>CHAPTER 3 COMMANDS FOR EGRESS QOS</b> .....	3-1
3.1 MLS QOS EGRESS GREEN REMARK .....	3-1
3.2 MLS QOS MAP.....	3-1
3.3 SERVICE-POLICY OUTPUT .....	3-1
3.4 SERVICE-POLICY OUTPUT VLAN.....	3-1
3.5 SET .....	3-2
3.6 SHOW MLS QOS EGRESS GREEN REMARK .....	3-3
3.7 SHOW MLS QOS MAPS .....	3-3
 <b>CHAPTER 4 COMMANDS FOR FLEXIBLE QINQ</b> .....	4-1
4.1 ADD.....	4-1
4.2 DELETE.....	4-1
4.3 MATCH.....	4-2

Commands for QoS, PBR and Flow-based Redirection	Content
4.4 SERVICE-POLICY .....	4-3
4.5 SET .....	4-3
<b>CHAPTER 5 COMMANDS FOR MPLS QOS.....</b>	<b>5-1</b>
5.1 MATCH.....	5-1
5.2 MLS QOS TRUST EXP.....	5-1
5.3 MLS QOS MAP.....	5-1
5.4 SHOW MLS QOS MAPS .....	5-2
<b>CHAPTER 6 COMMANDS FOR EGRESS QUEUE SCHEDULING</b>	
.....	6-1
6.1 MLS QOS BANDWIDTH .....	6-1
6.2 MLS QOS ETS ENABLE .....	6-1
6.3 MLS QOS MC QUEUE BANDWIDTH .....	6-2
6.4 MSL QOS QUEUE ALGORITHM .....	6-2
6.5 MLS QOS QUEUE BANDWIDTH.....	6-3
6.6 MLS QOS QUEUE UC/MC HIGHER.....	6-4
6.7 MLS QOS QUEUE WEIGHT.....	6-4
6.8 MLS QOS SCHEDULE ALGORITHM .....	6-5
6.9 MLS QOS SCHEDULE LEVEL .....	6-5
6.10 MLS QOS SCHEDULE POLICY .....	6-6
6.11 MLS QOS SCHEDULE POLICY BIND.....	6-6
6.12 MLS QOS SCHEDULE QUEUE INPUT .....	6-6
6.13 MLS QOS SCHEDULE WEIGHT .....	6-7
6.14 SHOW MLS QOS ETS INTERFACE .....	6-8
6.15 SHOW MLS QOS SCHEDULE INTERFACE .....	6-8
<b>CHAPTER 7 COMMANDS FOR VLAN-SHAPING .....</b>	<b>7-1</b>
7.1 MLS QOS FORWARDING-CLASS .....	7-1
7.2 MATCH S-VID .....	7-1

## Commands for QoS, PBR

### and Flow-based Redirection

### Content

---

7.3	MLS QOS SCHEDULE ALGORITHM .....	7-2
7.4	MLS QOS SCHEDULE {WRR WDRR} WEIGHT .....	7-3
7.5	MLS QOS FORWARDING-PROFILE .....	7-4
7.6	BANDWIDTH .....	7-4
7.7	DROP.....	7-5
7.8	MLS QOS BANDWIDTH .....	7-6
7.9	MLS QOS DROP-PROFILE .....	7-6
7.10	DP DROP-STARTPOINT DROP-ENDPOINT MAX-DROP-RATE .....	7-7
7.11	MLS QOS SCHEDULE QUEUE INPUT FORWARDING-CLASS .....	7-8
7.12	SHOW MLS QOS VLAN SHAPING CAPABLE PORTS .....	7-9
7.13	SHOW MLS QOS FORWARDING-CLASS .....	7-10
7.14	SHOW MLS QOS FORWARDING-PROFILE .....	7-11
7.15	SHOW MLS QOS DROP-PROFILE.....	7-12
7.16	SHOW MLS QOS SCHEDULE INTERFACE .....	7-13

# Chapter 1 Commands for QoS and IPv4/IPv6 PBR

## 1.1 accounting

**Command:** `accounting`

`no accounting`

**Function:** Set statistic function for the classified traffic.

**Parameter:** None.

**Command mode:** Policy map configuration mode

**Default:** Do not set statistic function.

**Usage Guide:** After enable this function, add statistic function to the traffic of the policy class map. In single bucket mode, the messages can only red or green when passing police. In the print information, in-profile means green and out-profile means red. In dual bucket mode, there are three colors of messages. In the print information, in-profile means green **and out-profile means** red and yellow.

**Example:** Count the packets which satisfy c1 rule.

```
Switch(config)#policy-map p1
```

```
Switch(Config-PolicyMap-p1)#class c1
```

```
Switch(Config-PolicyMap-p1-Class-c1)#accounting
```

```
Switch(Config-PolicyMap-p1-Class-c1)#exit
```

```
Switch(Config-PolicyMap-p1)#exit
```

## 1.2 class

**Command:** `class <class-map-name> [insert-before <class-map-name>]`

`no class <class-map-name>`

**Function:** Associates a class to a policy map and enters the policy class map mode; the no command deletes the specified class.

**Parameters:** `<class-map-name>` is the class map name used by the class.

`insert-before <class-map-name>` insert a new configured class to the front of a existent class to improve the priority of the new class.

**Default:** No policy class is configured by default.

**Command mode:** Policy map configuration mode

**Usage Guide:** Before setting up a policy class, a policy map should be created and the policy map mode entered. In the policy map mode, classification and nexthop configuration can be performed on packet traffic classified by class map.

**Example:** After add a policy class map c1 to the policy map, add a policy class map c2 and insert it to the front of c1.

```
Switch(config)#policy-map p1
```

```
Switch(Config-PolicyMap-p1)#class c1
```

```
Switch(Config-PolicyMap-p1-Class-c1)#exit
```

```
Switch(Config-PolicyMap-p1)#class c2 insert-before c1
```

```
Switch(Config-PolicyMap-p1-Class-c2)#exit
```

## 1.3 class-map

**Command:** `class-map <class-map-name>`

`no class-map <class-map-name>`

**Function:** Creates a class map and enters class map mode; the no command deletes the specified class map.

**Parameters:** `<class-map-name>` is the class map name.

**Default:** No class map is configured by default.

**Command mode:** Global Mode

**Usage Guide:**

**Example:** Creating and then deleting a class map named "c1".

```
Switch(config)#class-map c1
```

```
Switch(Config-ClassMap-c1)#exit
```

```
Switch(config)#no class-map c1
```

## 1.4 clear mls qos statistics

**Command:** `clear mls qos statistics [in | out] {interface <interface-name> | vlan <vlan-id>}`

**Function:** Clear the in or out accounting data of the specified ports or VLAN Policy Map.

**Parameters:** `[in | out]`: the in or out direction of the port or vlan.

`<vlan-id>`: VLAN ID

`<interface-name>`: The interface name

**Default:** Do not set action.

**Command mode:** Admin Mode

**Usage Guide:** Clear the in or out accounting data of the specified ports or VLAN Policy Map.

**Example:** Clear the Policy Map statistic of VLAN 100.

```
Switch#Clear mls qos statistics vlan 100
```

## 1.5 drop

**Command:** drop

no drop

**Function:** Drop data package that match the class, the no command cancels the assigned action.

**Parameters:** None.

**Default:** Do not set the action.

**Command mode:** Policy class map configuration mode

**Usage Guide:** Drop the specified packet after configure this command.

**Example:** Drop the packet which satisfy c1.

```
Switch(config)#policy-map p1
Switch(Config-PolicyMap-p1)#class c1
Switch(Config-PolicyMap-p1-Class-c1)#drop
Switch(Config-PolicyMap-p1-Class-c1)#exit
Switch(Config-PolicyMap-p1)#exit
```

## 1.6 match

**Command:** match {access-group <acl-index-or-name> | ip dscp <dscp-list> | ip precedence <ip-precedence-list> | ipv6 access-group <acl-index-or-name> | ipv6 dscp <dscp-list> | ipv6 flowlabel <flowlabel-list> | vlan <vlan-list> | cos <cos-list>}

no match {access-group | ip dscp | ip precedence| ipv6 access-group| ipv6 dscp | ipv6 flowlabel | vlan | cos}

**Function:** Configure the match standard of the class map; the no form of this command deletes the specified match standard.

**Parameter:** access-group <acl-index-or-name> match specified IP ACL, MAC ACL or IPv6 standard ACL , the parameters are the number or name of the ACL;

ip dscp <dscp-list> and ipv6 dscp <dscp-list> match specified DSCP value, the parameter is a list of DSCP consisting of maximum 8 DSCP values, the range is 0~63;

ip precedence <ip-precedence-list> match specified IP Precedence, the

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

parameter is a IP Precedence list consisting of maximum 8 IP Precedence values with a valid range of 0~7;

**ipv6 access-group <acl-index-or-name>** match specified IPv6 ACL, the parameter is the number or name of the IPv6 ACL;

**ipv6 flowlabel <flowlabel-list>** match specified IPv6 flow label, the parameter is IPv6 flow label value, the range is 0~1048575;

**vlan <vlan-list>** match specified VLAN ID, the parameter is a VLAN ID list consisting of maximum 8 VLAN IDs, the range is 1~4094;

**cos <cos-list>** match specified CoS value, the parameter is a CoS list consisting of maximum 8 CoS, the range is 0~7.

**Default:** No match standard by default

**Command Mode:** Class-map Mode

**Usage Guide:** Only one match standard can be configured in a class map. When configuring the match ACL, permit rule as the match option, apply Policy Map action. Deny rule as the excluding option, do not apply Policy Map action. If configure another match rule after one was configured, the operation fails, but configure the same match rule will cover the previous.

**Example:** Create a class-map named c1, and configure the class rule of this class-map to match packets with IP Precedence of 0.

```
Switch(config)#class-map c1
Switch(Config-ClassMap-c1)#match ip precedence 0
Switch(Config-ClassMap-c1)#exit
```

## 1.7 mls qos aggregate-policy

**Command:**

**Single Bucket Mode:**

```
mls qos aggregate-policy <policer_name> <bits_per_second>
<normal_burst_bytes> [{conform-action ACTION | exceed-action ACTION }]
```

**Dual Bucket Mode:**

```
mls qos aggregate-policy <policer_name> <bits_per_second>
<normal_burst_bytes> (pir <peak_rate_bps> | <maximum_burst_bytes>)
({conform-action ACTION | exceed-action ACTION | violate-action ACTION )
```

**ACTION definition:**

```
drop | transmit | set-internal-priority <intp_value> | set-cos-transmit <new-cos> |
set-dscp-transmit <new-dscp> | set-prec-transmit <ip-precedence> |
```



**set-drop-precedence < new-drop-priority>**

**[no] mls qos aggregate-policy <policer\_name>**

**Function:** Define an aggregate policy command, analyze the working mode of the token bucket, whether it is single rate single bucket, single rate dual bucket or dual rate dual bucket, and set the corresponding action for different color packets. The no operation will delete the mode configuration.

**Parameters:** **policer\_name:** the name of aggregation policy;

**bits\_per\_second:** the committed information rate - CIR , in Kbps, ranging from 1 to 10000000;

**normal\_burst\_bytes:** the committed burst size – CBS, in kb, ranging from 1 to 1000000. When the configured CBS value exceeds the max limit of the chip, configure the hardware with max number supported by the chip without any CLI prompt;

**maximum\_burst\_bytes:** the peak burst size - PBS, in kb, ranging from 1 to 1000000. When the configured PBS value exceeds the max limit of the chip, configure the hardware with max number supported by the chip without any CLI prompt. Notice: this configuration only exists in dual bucket mode;

**pir peak\_rate\_bps:** the peak information rate - PIR, in kbps, ranging from 1 to 10000000. Without configuring PIR, the Police works in the single rate dual bucket mode; otherwise in the dual rate dual bucket mode. Notice: this configuration only exist in the dual bucket mode.

**conform-action:** When it does not exceed CIR rate and the packet is green, the default action is transmit.

**exceed-action:** the actions to take when the CIR is exceeded but PIR isn't, which means the messages are yellow, the default is Drop;

**violate-action:** the actions to take when the PIR is exceeded, which means the messages are red, the default is Drop.

**ACTION:**

**drop/transmit:** Drop/transmit the packets

**set-internal-priority <intp\_value>:** Modify the internal priority of the packets

**set-cos-transmit < new-cos >:** Modify the L2 COS value of the packets

**set-drop-precedence < new-drop-priority >:** Modify the drop priority of the packets

**set-dscp-transmit <new-dscp> :** Modify dscp

**set-prec-transmit < ip-precedence > :** Modify TOS

**Default:** No aggregation Policy is defined by default; the default action of exceed-action and violate-action both is drop.

**Command mode:** Global Mode

**Usage Guide:** The CLI can support both single bucket and dual bucket configuration, and

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

determine which one by checking whether PIR or PBS is configured. When configuring with CLI, after configuring CBS, if the action is directly configured, the mode is single rate single bucket; if only PBS is configured, the mode is single rate dual bucket three colors; if PIR and PBS are configured, the mode is dual rate dual bucket three colors. The actions of set and policy selected by policy map are same, the action of policy can cover the action of the set. Furthermore, If the actions of exceed-action and violate-action are set-internal-priority in policy, <intp\_value> must be same.

**Example:** Set the dual bucket mode, CIR is 1000, CBS is 1000, PIR is 20000, PBS is 10000. The action is transmit when CIR is exceeded but PIR isn't, which means the messages are yellow.

```
Switch(config)#mls qos aggregate-policy color 10000 1000 pir 20000 10000  
exceed-action transmit
```

## 1.8 mls qos cos

**Command:** mls qos cos {<default-cos>}

no mls qos cos

**Function:** Configures the default CoS value of the port; the “no mls qos cos” command restores the default setting.

**Parameters:** <default-cos> is the default CoS value for the port, the valid range is 0 to 7.

**Default:** The default CoS value is 0.

**Command mode:** Port Configuration Mode.

**Usage Guide:** Configure the default CoS value for switch port. In default configuration, the message ingress cos from this port are default value whether the message with tag. If the message without tag, the message cos value for tag is enacted.

**Example:** Setting the default CoS value of ethernet port 1/0/1 to 7, i.e., packets coming in through this port will be assigned a default CoS value of 7 if no CoS value present .

```
Switch(config)#interface ethernet 1/0/1  
Switch(Config-If-Ethernet1/0/1)#mls qos cos 7
```

## 1.9 mls qos internal-priority

This command is not supported by the switch.

## 1.10 mls qos map

**Command:** mls qos map (cos-dp <dp1...dp8>| cos-intp < in-cos list > | dscp-dscp

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

```
<in-dscp list> to <out-dscp> | dscp-intp <in-dscp list> to <intp> | dscp-dp <in-dscp list> to <dp> | intp-exp <exp1... exp8> )
```

```
no mls qos map (cos-dp | cos-intp | dscp-dscp | dscp-intp | dscp-dp| intp-exp)
```

```
mls qos map intp-exp <exp1... exp8>no mls qos map intp-exp
```

**Function:** Set the priority mapping of QoS, the **no** command restores the default mapping.

**Parameters:** **cos-dp <dp1...dp8>** defines the mapping from CoS to dp (drop precedence) value, <dp1..dp8> are 8 dp value corresponding to the 0 to 7 CoS value, each dp value is delimited with space, ranging from 0 to 2;

**cos-intp < in-cos list >** defines the mapping from ingress L2 COS value to the internal priority, <in-cos list> are 8 internal priority values, corresponding to the cos value from 0 to 7 respectively. each internal priority value is delimited with space, ranging from 0 to 7.

**dscp-dscp** defines the mapping from ingress DSCP to **egress** DSCP, <in-dscp list> stand for incoming DSCP values, up to 8 values are supported, each DSCP value is delimited with space, ranging from 0 to 63, <out-dscp> is the output DSCP value, ranging from 0 to 63;

**dscp-intp** defines the mapping from DSCP to intp;

**dscp-dp** defines the mapping from DSCP to dp;

**intp-exp < exp1... exp8>** defines the mapping from intp to exp, <exp1...exp8> are 8 exp value corresponding to the 0 to 7 intp value, each exp value is delimited with space, ranging from 0 to 7.

**Default:** Default mapping values are:

Ingress COS-TO-Drop-Precedence map:

```
COS: 0 1 2 3 4 5 6 7
```

```
-----  
DP: 0 0 0 0 0 0 0 0
```

Ingress COS-TO-Internal-Priority map:

```
COS: 0 1 2 3 4 5 6 7
```

```
-----  
INTP: 0 1 2 3 4 5 6 7
```

Ingress DSCP-TO-Internal-Priority map:

```
d1 : d2 0 1 2 3 4 5 6 7 8 9  
0:      0 0 0 0 0 0 0 0 0 1 1  
1:      1 1 1 1 1 1 2 2 2 2  
2:      2 2 2 2 3 3 3 3 3 3
```

## Commands for QoS, PBR

### and Flow-based Redirection

### Chapter 1 Commands for QoS and IPv4/IPv6 PBR

3:	3	3	4	4	4	4	4	4	4	4
4:	5	5	5	5	5	5	5	5	6	6
5:	6	6	6	6	6	6	7	7	7	7
6:	7	7	7	7						

#### Ingress DSCP-TO-DSCP map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	8	8
1:	8	8	8	8	8	8	16	16	16	16
2:	16	16	16	16	24	24	24	24	24	24
3:	24	24	32	32	32	32	32	32	32	32
4:	40	40	40	40	40	40	40	40	48	48
5:	48	48	48	48	48	48	56	56	56	56
6:	56	56	56	56						

#### Ingress DSCP-TO-Drop-Precedence map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	0	0
1:	0	0	0	0	0	0	0	0	0	0
2:	0	0	0	0	0	0	0	0	0	0
3:	0	0	0	0	0	0	0	0	0	0
4:	0	0	0	0	0	0	0	0	0	0
5:	0	0	0	0	0	0	0	0	0	0
6:	0	0	0	0						

#### Egress Internal-Priority-TO-EXP map:

INTP: 0	1	2	3	4	5	6	7
-----							
EXP: 0	1	2	3	4	5	6	7

**Command mode:** Global Mode

**Usage Guide:** INTP means the chip internal priority setting, DP means the drop precedence. Because of the internal DSCP value have 64 and the chip internal priority only 8, the dscp-cos mapping need 8 continuum dscp-inside mapping to the same INTP or DP.

**Example:** 1. Setting the CoS-to-dp mapping value to 1 1 1 1 1 1 1 1 from the default.

```
Switch(config)#mls qos map cos-dp 1 1 1 1 1 1 1 1
```

2. Mapping DSCP 1 to dp 2.

```
Switch(config)#mls qos map dscp-dp 1 to 2
```

## 1.11 mls qos queue algorithm

**Command:** `mls qos queue algorithm {sp | wrr | wdrr}`

**no mls qos queue algorithm**

**Function:** After configure this command, the queue management algorithm is set.

**Parameters:** **sp:** The strict priority, the queue number of bigger, then the priority is higher

**wrr:** Select wrr algorithm

**wdrr:** Select wdrr algorithm

**Default:** The default queue algorithm is wrr.

**Command mode:** Port Mode.

**Usage Guide:** After configure this command, the queue management algorithm is set.

**Example:** Setting the queue management algorithm as sp.

```
Switch(interface-ethernet1/0/1)#mls qos queue algorithm sp
```

## 1.12 mls qos queue drop-algorithm

**Command:** `mls qos queue drop-algorithm {wred | tail}`

**no mls qos queue drop-algorithm**

**Function:** After configured this command, drop-algorithm of port queue is set.

**Parameters:** **wred:** wred drop algorithm

**tail:** tail drop algorithm

**Default:** tail drop algorithm.

**Command Mode:** Port mode.

**Usage Guide:** After configured this command, queue drop-algorithm of port is set.

**Example:** Configure drop algorithm of port queue as wred.

```
Switch(interface-ethernet1/0/1)#mls qos queue drop-algorithm wred
```

## 1.13 mls qos queue wrr weight

**Command:** `mls qos queue wrr weight <weight0..weight7>`

**no mls qos queue wrr weight**

**Function:** After configure this command, the queue weight is set.

**Parameters:** `<weight0..weight7>` defines the queue weight, for WRR algorithm, this configuration is valid, for SP algorithm, this configuration is invalid, when the weight is 0, this queue adopts SP algorithm to manage, and WRR algorithm turns into SP+WRR algorithm. The absolute value of WRR is meaningless. WRR allocates bandwidth by using 8 weight values. The different chips support the different weight range, if the setting

exceeds the chip range will prompt the right range, when the chip supports 4 queues, it's parameter turns into <weight1..weight4>.

**Default:** The queue weight is 1 2 3 4 5 6 7 8.

**Command mode:** Port Mode.

**Usage Guide:** If the queue weight is configured as 0, it uses SP algorithm to manage, while WRR turns into SWRR. When removing the queue, the system will manage SP queue at first, then manage WRR queue, SP queue executes the strict priority management mode, WRR queue executes the weight rotation management mode.

**Example:** Configure the queue weight as 1 2 3 4 5 6 7 8.

```
Switch(interface-ethernet1/0/1)#mls qos queue wrr weight 1 2 3 4 5 6 7 8
```

## 1.14 mls qos queue wred

This command is not supported by switch.

## 1.15 mls qos queue wdr weight

**Command:** mls qos queue wdr weight <weight0..weight7>

**no mls qos queue wdr weight**

**Function:** After configure this command, the queue weight is set.

**Parameters:** <weight0..weight7> defines the queue weight, in Kbytes. For WDRR algorithm, this configuration is valid, but for SP algorithm, it is invalid. When the weight is 0, this queue adopts SP algorithm to manage, and WDRR algorithm turns into SP+WDRR algorithm. WRR, in byte, allocates bandwidth by using 8 weight values. The different chips support the different weight range, if the setting exceeds the chip range will prompt the right range, when the chip supports 4 queues, it's parameter turns into <weight1..weight4>.

**Default:** The queue weight is 10 20 40 80 160 320 640 1280.

**Command mode:** Port Mode.

**Usage Guide:** If the queue weight is configured as 0, it uses SP algorithm to manage, while WRR turns into SWDRR. When removing the queue, the system will manage SP queue at first, then manage WDRR queue, SP queue executes the strict priority management mode, WDRR queue executes the weight rotation management mode.

**Example:** Configure the queue bandwidth as 10kbytes, 10kbytes, 20kbytes, 20kbytes, 30kbytes, 30kbytes, 40kbytes, 40kbytes.

```
Switch(interface-ethernet1/0/1)#mls qos queue wdr weight 10 10 20 20 40 40 80 80
```

## 1.16 mls qos queue bandwidth

**Command:** `mls qos queue <queue-id> bandwidth <minimum-bandwidth>  
<maximum-bandwidth>`

`no mls qos queue <queue-id> bandwidth`

**Function:** After configure this command, the queue bandwidth guarantee is set.

**Parameters:** `<queue-id>` is the queue ID to configure the bandwidth guarantee, the different chip supports the different queue count, the range is different too, and the ranging from 1 to 8.

`<minimum-bandwidth >` is the minimum-bandwidth, ranging from 0 to 128000, when input 0, it means the min-bandwidth function is not take effect.

`<maximum-bandwidth >` is the maximum-bandwidth, ranging from 0 to 128000, when input 0, it means the max-bandwidth function is not take effect. The minimum-bandwidth must not bigger than maximum-bandwidth.

**Default:** The queue bandwidth have no guarantee.

**Command mode:** Port Mode.

**Usage Guide:** The minimum-bandwidth guarantee and maximum-bandwidth limit can be configured at the different or same queue. The queue bandwidth pledge for egress is relative to management mode, for example: one port is the strict priority-queue, the highest priority is queue 8 now, it will satisfy this queue traffic when block is happened. But if user want the lower priority of queue having bandwidth, it can remain bandwidth via this command, the lower priority queue's minimum-bandwidth will be satisfied at first, then the excess bandwidth is managed according to SP.

**Example:** Configure the minimum-bandwidth is 64kbps and the maximum-bandwidth is 128kbps for ethernet1/0/2 queue1.

```
Switch(config)#interface ethernet 1/0/2
```

```
Switch(Config-If-Ethernet1/0/2)# mls qos queue 1 bandwidth 64 128
```

## 1.17 mls qos trust

**Command:** `mls qos trust {cos | dscp}`

`no mls qos trust {cos | dscp}`

**Function:** Configures port trust; the no command disables the current trust status of the port.

**Parameters:** `cos` configures the port to trust CoS value; `dscp` configures the port to trust DSCP value.

**Default:** Trust CoS value.

**Command mode:** Port Configuration Mode.

**Usage Guide:**

trust dscp mode: can set the intp field based dscp-to-intp mapping, set the dp value based dscp-to-dp mapping, set DSCP value based dscp-to-dscp mapping.

**Example:**

```
Switch(config)#interface ethernet 1/0/1
Switch(config-if-ethernet1/0)# mls qos trust dscp
```

## 1.18 pass-through-cos

This command is not supported by the switch.

## 1.19 pass-through-dscp

This command is not supported by the switch.

## 1.20 policy

**Command:**

**Single Bucket Mode:**

```
policy <bits_per_second> <normal_burst_bytes> ({conform-action ACTION |
exceed-action ACTION} )
```

**Dual Bucket Mode:**

```
policy <bits_per_second> <normal_burst_bytes> [pir <peak_rate_bps>] |
<maximum_burst_bytes> [{conform-action ACTION | exceed-action ACTION |
violate-action ACTION }]
```

**ACTION definition:**

```
drop | transmit / set-dscp-transmit <dscp_value> | set-prec-transmit
<ip_precedence_value> | set-cos-transmit <cos_value> | set-internal-priority
<inp_value> | set-Drop-Precedence <dp_value>
```

**no policy**

**Function:** The non-aggregation policy command supporting three colors. Determine whether the working mode of token bucket is single rate single bucket, single rate dual bucket or dual rate dual bucket, set the corresponding action to the different color packets. The no command will delete the mode configuration.



## Commands for QoS, PBR

### and Flow-based Redirection

### Chapter 1 Commands for QoS and IPv4/IPv6 PBR

**Parameters: bits\_per\_second:** The committed information rate – CIR (Committed Information Rate), in Kbps, ranging from 1 to 10000000;

**normal\_burst\_bytes:** The committed burst size – CBS (Committed Burst Size), in byte, ranging from 1 to 1000000. When the configured CBS value exceeds the max limit of the chip, configure the hardware with max number supported by the chip without any CLI prompt;

**maximum\_burst\_bytes:** The peak burst size – PBS (Peak Burst Size), in byte, ranging from 1 to 10000000. When the configured PBS value exceeds the max limit of the chip, configure the hardware with max number supported by the chip without any CLI prompt.

Notice: this configuration only exists in dual bucket mode;

**pir\_peak\_rate\_bps:** The peak information rate – PIR (Peak Information Rate), in kbps, ranging from 1 to 10000000. Without configuring PIR, the Police works in the single rate dual bucket mode; otherwise in the dual rate dual bucket mode. Notice: this configuration only exists in dual bucket mode;

**violate-action:** The actions to take when the PIR is exceeded, which means the messages are red, the default as drop;

**conform-action:** The action to take when the CIR is not exceeded, which means the messages are green, the default as transmit;

**exceed-action:** The actions to take when the CIR is exceeded but PIR isn't, which means the messages are yellow, the default as drop.

ACTION include:

**drop/transmit:** Drop/transmit the packets

set-dscp-transmit sets DSCP, it is valid to IPv4 and IPv6 packets, only set-dscp-transmit or set-prec-transmit can be selected.

set-prec-transmit sets TOS, only set-prec-transmit or set-dscp-transmit can be selected

set-internal-priority sets the internal priority of the packets

set-Drop-Precedence sets the drop precedence of the packets

set-cos-transmit sets the CoS value of the L2 packets

**Default:** No policy action; the default action of conform-action is transmit, while that of exceed-action and violate-action are both drop.

**Command mode:** Policy class map configuration Mode

#### Usage Guide:

The CLI can support both single bucket and dual bucket configuration, and determine which one to select by checking whether PIR or PBS is configured. When configuring with CLI, after configuring CBS, if the action is directly configured, the mode is single bucket dual color; if only PBS is configured, the mode is single rate dual bucket three color; if PIR and PBS are configured, the mode is dual rate dual bucket three color. “set” and “policy”

(policy aggregate) are selected and have the same action in Policy Map, then the action selected by “policy” will cover the action of “set”.

**Example:** In the policy class table configuration mode, set the CIR as 1000, CBS as 2000 and the action when CIR is not exceeded as transmitting the messages after changing DSCP to 23, and the action triggered by exceeding CIR as transmit without changing the messages.

```
Switch(config)#class-map cm
Switch(config-classmap-cm)#match cos 0
Switch(config-classmap-cm)#exit
Switch(config)#policy-map 1
Switch(config-policymap-1)#class cm
Switch(config-policymap-1-class-cm)#policy 1000 2000 conform-action set-dscp-transmit
23
```

## 1.21 policy aggregate

**Command:** `policy aggregate <aggregate-policy-name>`

`no policy aggregate <aggregate-policy-name>`

**Function:** Police Map reference aggregate policy, applies an aggregate policy to classified traffic; the no command deletes the specified aggregate policy.

**Parameters:** `<aggregate-policy-name>` is the policy set name.

**Default:** No policy is configured by default.

**Command mode:** Policy class map configuration Mode

**Usage Guide:** The same policy set can be referred to by different policy class maps.

**Example:** Create class-map, the match rule is the cos value is 0; policy-map is 1, enter the policy map mode, set the Policy and choose the color policy for the current list.

```
Switch(config)#class-map cm
Switch(config-classmap-cm)#match cos 0
Switch(config-classmap-cm)#exit
Switch(config)#policy-map 1
Switch(config-policymap-1)#class cm
Switch(config-policymap-1-class-cm)#policy aggregate color
```

## 1.22 policy-map

**Command:** `policy-map <policy-map-name>`

`no policy-map <policy-map-name>`

**Function:** Creates a policy map and enters the policy map mode; the “no policy-map <policy-map-name>” command deletes the specified policy map.

**Parameters:** <policy-map-name> is the policy map name.

**Default:** No policy map is configured by default.

**Command mode:** Global Mode

**Usage Guide:** PBR classification matching and marking next hop operations can be done in policy map configuration mode.

**Example:** Creating and deleting a policy map named “p1”.

```
Switch(config)#policy-map p1
Switch(Config-PolicyMap-p1)#exit
Switch(config)#no policy-map p1
```

## 1.23 service-policy input

**Command:** service-policy input <policy-map-name>

no service-policy input {<policy-map-name>}

**Function:** Applies a policy map to the specified port; the no command deletes the specified policy map applied to the port or deletes all the policy maps applied on the ingress direction of the port .

**Parameters:** input <policy-map-name> applies the specified policy map to the ingress direction of switch port.

no command will delete all the policy maps applied on the ingress direction of the port if there is not the specified policy map name.

**Default:** No policy map is bound to port by default.

**Command mode:** Port Configuration Mode.

**Usage Guide:** Only one policy map can be applied to each direction of each port or VLAN interface. It is not recommended to use policy map on VLAN and VLAN's port at the same time.

**Example:**

```
Bind policy p1 to ingress Ethernet port1/0/1.
Switch(config)#interface ethernet 1/0/1
Switch(Config-If-Ethernet1/0/1)#service-policy input p1
Bind policy p1 to ingress redirection of v1 interface.
Switch(config)#interface vlan 1
Switch(Config-If-vlan1)#service-policy input p1
```

## 1.24 service-policy input vlan

**Command:** `service-policy input <policy-map-name> vlan <vlan-list>`

`no service-policy input {<policy-map-name>} vlan <vlan-list>`

**Function:** Applies a policy map to the specified VLAN interface; the no command deletes the specified policy map applied to the VLAN interface or deletes all the policy maps applied in the ingress direction of the vlan interface .

**Parameters:** `input <policy-map-name>` applies the specified policy map to the ingress direction of switch VLAN interface.

`vlan <vlan-list>` the vlan list of binding policy map.

no command will deletes all the policy maps applied in the ingress direction of the vlan interface if there is not the specified policy map name.

**Default:** No policy map is bound to VLAN interface by default.

**Command mode:** Global Configuration Mode.

**Usage Guide:** Only one policy map can be applied to each direction of each port or VLAN interface. It is not recommended to use policy map on VLAN and VLAN's port at the same time.

**Example:**

Bind policy p1 to ingress of VLAN interface v2, v3, v4, v6.

```
Switch(config)# service-policy input p1 vlan 2-4;6
```

## 1.25 set

**Command:** `set {ip dscp <new-dscp> | ip precedence <new-precedence> | internal priority <new-inp> | drop precedence <new-dp> | ip [default] nexthop [vrf <vrf>] <ip-address> | ipv6 [default] nexthop [vrf <vrf>] <nexthop-ip> | cos <new-cos>}`

`no set {ip dscp | ip precedence | internal priority | drop precedence | ip nexthop | ipv6 nexthop | cos}`

**Function:** Assign a new DSCP, IP Precedence for the classified traffic; the no form of this command delete assigning the new values.

**Parameter:** `ip dscp <new-dscp>` new DSCP value, do not distinguish v4 and v6.

`ip precedence <new-precedence>` new IP Precedence.

`ipv6 flowlabel <new-flowlabel>` new IPv6 FL value.

`ip default nexthop [vrf <vrf>] <ip-address>` next hop IP address, set the route of nexthop for PBR, default means a route of the lowest priority, it's priority is lower than route map and neighbor map, vrf means virtual route forwarding, the ranging from 0 to 252.

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

**ipv6 default nexthop [vrf <vrf>] <ip-address>** next hop IPv6 address, set the route of nexthop for IPv6 PBR, default means a route of the lowest priority, it's priority is lower than route map and neighbor map, vrf means virtual route forwarding, the ranging from 0 to 252.

**cos <new cos>** new COS value.

**Default:** Not assigning by default.

**Command Mode:** Policy Class-map Mode

**Usage Guide:** Only the classified traffic which matches the matching standard will be assigned with the new values.

**Example:** Set the IP Precedence of the packets matching the c1 class rule to 3.

```
Switch(config)#policy-map p1
```

```
Switch(Config-PolicyMap-p1)#class c1
```

```
Switch(Config-PolicyMap-p1-Class-c1)#set ip precedence 3
```

```
Switch(Config-PolicyMap-p1-Class-c1)#exit
```

```
Switch(Config-PolicyMap-p1)#exit
```

## 1.26 show class-map

**Command:** `show class-map [<class-map-name>]`

**Function:** Displays class map of QoS.

**Parameters:** `<class-map-name>` is the class map name.

**Default:** N/A.

**Command mode:** Admin Mode.

**Usage Guide:** Displays all configured class-map or specified class-map information.

**Example:**

```
Switch # show class-map
```

```
Class map name:c1, used by 1 times
```

```
match acl name:1
```

Displayed information	Explanation
Class map name:c1	Name of the Class map
used by 1 times	Used times
match acl name:1	Classifying rule for the class map.

## 1.27 show policy-map

**Command:** `show policy-map [<policy-map-name>]`

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

**Function:** Displays policy map of QoS.

**Parameters:** *<policy-map-name>* is the policy map name.

**Default:** N/A.

**Command mode:** Admin Mode.

**Usage Guide:** Displays all configured policy-map or specified policy-map information.

**Example:**

```
Switch#show policy -map
```

```
Policy Map p1, used by 0 port
```

```
Class Map name: c1
```

```
policy CIR: 1000 CBS: 1000 PIR: 200 PBS: 3000
```

```
conform-action:
```

```
transmit
```

```
exceed-action:
```

```
drop
```

```
violate-action:
```

```
drop
```

Displayed information	Explanation
Policy Map p1	Name of policy map
Class map name:c1	Name of the class map referred to
policy CIR: 1000 CBS: 1000 PIR: 200 PBS: 3000 conform-action: transmit exceed-action: drop violate-action: drop	Policy implemented

## 1.28 show mls qos interface

**Command:** `show mls qos {interface [<interface-id>] [policy | queuing] | vlan <vlan-id>} | [begin | include | exclude <regular-expression>]`

**Function:** Displays QoS configuration information on a port.

**Parameters:** *<interface-id>* is the port ID; *<vlan-id>*: VLAN ID; *policy* is the policy setting on the port; *queuing* is the queue setting for the port.

## Commands for QoS, PBR

### and Flow-based Redirection

### Chapter 1 Commands for QoS and IPv4/IPv6 PBR

**Default:** N/A.

**Command mode:** Admin Mode.

**Usage Guide:** In single rate single bucket mode, the messages can only red or green when passing police. In the print information, in-profile means green and out-profile means red. In dual bucket mode, there are three colors of messages. But the counter can only count two kinds of messages, the red and yellow ones will both be treated as out-profile. Only when configuring ingress policies, there is statistic information.

**Example:**

```
Switch#show mls qos interface ethernet 1/0/2
```

```
Ethernet 1/0/2
```

```
Default COS: 0
```

```
Trust: COS DSCP EXP
```

```
Attached Policy Map for Ingress: p1
```

```
Classmap      classified  in-profile  out-profile (in packets)
   c1          20          10          10
   c2          NA          NA          NA
```

(If there is no Accounting for Class Map, show NA)

Internal-Priority-TO-Queue map:

```
INTP      0  1  2  3  4  5  6  7
```

```
-----
Queue     0  1  2  3  4  5  6  7
```

Queue Algorithm: WRR

Queue weights:

```
Queue     0  1  2  3  4  5  6  7
```

```
-----
weight    1  2  3  4  5  6  7  8
```

Bandwidth Guarantee Configuration:

```
Queue     0  1  2  3  4  5  6  7
```

```
-----
MinBW(K)  128  0  0  0  0  0  0  0  0
```

```
MaxBW(K)  256  0  0  0  0  0  0  0
```

Display Information	Explanation
Ethernet1/0/2	Port name
default cos:0	Default CoS value of the port

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

Trust: COS DSCP EXP	The trust state of the port
Attached Policy Map for Ingress: p1	Policy name bound to port
ClassMap	ClassMap name
classified	Total data packets match this ClassMap. If there is no Accounting for Class Map, show NA
in-profile	Total in-profile data packets match this ClassMap. If there is no Accounting for Class Map, show NA
out-profile	Total out-profile data packets match this ClassMap. If there is no Accounting for Class Map, show NA
Internal-Priority-TO-Queue map::	Internal-Priority to queue mapping
Queue Algorithm:	WRR or PQ queue out method
Queue weights	Queue weights configuration
Bandwidth Guarantee Configuration	Bandwidth guarantee configuration

Switch(config)#show mls qos interface ethernet1/0/2 queuing

Ethernet1/0/2:

Internal-Priority-TO-Queue map:

INTP 0 1 2 3 4 5 6 7

-----  
 Queue 0 1 2 3 4 5 6 7

Queue Algorithm: WRR

Queue weights:

Queue 0 1 2 3 4 5 6 7

-----  
 weight 1 2 3 4 5 6 7 8

Bandwidth Guarantee Configuration:

Queue 0 1 2 3 4 5 6 7

-----  
 MinBW(K) 128 0 0 0 0 0 0 0



## Commands for QoS, PBR

### and Flow-based Redirection

### Chapter 1 Commands for QoS and IPv4/IPv6 PBR

```
MaxBW(K) 256 0 0 0 0 0 0 0
```

Display Information	Explanation
Internal-Priority-TO-Queue map::	Internal-Priority to queue mapping
Queue Algorithm:	WRR or PQ queue out method
Queue weights	Queue weights configuration
Bandwidth Guarantee Configuration	Bandwidth guarantee configuration

Switch # show mls qos interface ethernet 1/0/2 **policy**

Ethernet1/0/2:

Attached Policy Map for Ingress: p1

Accounting: ON

```
Classmap    classified    in-profile    out-profile (in packets)
      c1             0              0              0
```

Display Information	Explanation
Ethernet1/0/2	Port name
Attached Policy Map for Ingress: p1	Policy name bound to port
ClassMap	ClassMap name
classified	Total data packets match this ClassMap.
in-profile	Total in-profile data packets match this ClassMap.
out-profile	Total out-profile data packets match this ClassMap.

Switch #show mls qos vlan 100

Vlan 100:

Attached Policy Map for Ingress: p1

```
Classmap    classified    in-profile    out-profile (in packets)
      c1             20             10             10
      c2             NA             NA             NA
```

## 1.29 show mls qos in {interface <interface-name> policy | vlan <vlan-id>}

**Command:** show mls qos in {interface <interface-name> policy | vlan <vlan-id>}

**Function:** Show the policy configuration information of the in direction of port or vlan.

**Parameters:** <interface-name>: port name.

**Command Mode:** Admin and configuration mode

**Default:** None.

**Usage Guide:** Show the policy configuration information of the in direction.

**Example:** Show the policy configuration information of the in direction.

```
Switch#show mls qos in interface ethernet1/0 policy
```

```
Ethernet1/0:
```

```
Attached Policy Map for Ingress: p
```

## 1.30 show mls qos interface wred

**Command:** show mls qos interface <interface-id> wred [queue <queue-id>] [dp<dp>]

**Parameters:** <interface-id>: Interface ID

<queue-id>: Queue will be shown with wred, if no parameter is input, it will show wred configuration of all queues.

<dp>: Drop precedence, its range from 0 to 2. If no parameter is input, it will show wred parameter corresponded with all dp values in the specified queue.

**Command Mode:** Admin mode

**Default:** None.

**Usage Guide:** None.

**Example:** Show wred configuration of queue 1 with DP value of 1 on port1/0/2

```
switch#show mls qos interface ethernet 1/0/2 wred queue 1 dp 1
```

```
queue      dp      drop-startpoint  drop-endpoint  max-drop-rate
1          1        20                40              20
```

Displayed information	Description
Queue	Queue
DP	Drop precedence
drop-startpoint	Minimum queue length that drop packets

drop-endpoint	Maximum queue length
max-drop-rate	Maximum drop rate

### 1.31 show mls qos maps

**Command:** `show mls qos maps [cos-dp| cos-intp | dscp-dscp | dscp-intp | dscp-dp |intp-exp ] | [ begin | include | exclude <regular-expression> ]`

**Function:** Display the configuration of QoS mapping.

**Parameters:** **cos-dp:** The mapping from ingress L2 CoS to drop precedence

**cos-intp:** The mapping from ingress L2 COS to the internal priority

**dscp-dscp:** The mapping from ingress DSCP to DSCP

**dscp-intp:** The mapping from ingress DSCP to internal priority

**dscp-dp:** The mapping from ingress DSCP to drop precedence

**intp-exp:** The mapping from IntPrio to EXP

**Default:** None.

**Command mode:** Admin and Configuration Mode.

**Usage Guide:** Display the map configuration information of QoS.

**Example:** Display configuration information of the mapping table.

Switch (config)#show mls qos maps

Ingress COS-TO-Internal-Priority map:

COS: 0 1 2 3 4 5 6 7

-----

INTP: 0 1 2 3 4 5 6 7

Ingress DSCP-TO-Internal-Priority map:

d1 : d2 0 1 2 3 4 5 6 7 8 9

0: 0 0 0 0 0 0 0 0 1 1

1: 1 1 1 1 1 1 2 2 2 2

2: 2 2 2 2 3 3 3 3 3 3

3: 3 3 4 4 4 4 4 4 4

4: 5 5 5 5 5 5 5 5 6 6

5: 6 6 6 6 6 6 7 7 7 7

6: 7 7 7 7

Ingress COS-TO-Drop-Precedence map:

COS: 0 1 2 3 4 5 6 7

## Commands for QoS, PBR

### and Flow-based Redirection

### Chapter 1 Commands for QoS and IPv4/IPv6 PBR

-----  
DP: 0 0 0 0 0 0 0 0 0

#### Ingress DSCP-TO-DSCP map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	8	8
1:	8	8	8	8	8	8	16	16	16	16
2:	16	16	16	16	24	24	24	24	24	24
3:	24	24	32	32	32	32	32	32	32	32
4:	40	40	40	40	40	40	40	40	48	48
5:	48	48	48	48	48	48	56	56	56	56
6:	56	56	56	56						

#### Ingress DSCP-TO-Drop-Precedence map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	0	0
1:	0	0	0	0	0	0	0	0	0	0
2:	0	0	0	0	0	0	0	0	0	0
3:	0	0	0	0	0	0	0	0	0	0
4:	0	0	0	0	0	0	0	0	0	0
5:	0	0	0	0	0	0	0	0	0	0
6:	0	0	0	0						

#### Ingress EXP-TO-Internal-Priority map:

EXP: 0 1 2 3 4 5 6 7

-----  
INTP: 0 1 2 3 4 5 6 7

#### Ingress EXP-TO-Drop-Precedence map:

EXP: 0 1 2 3 4 5 6 7

-----  
DP: 0 0 0 0 0 0 0 0

#### Egress Internal-Priority-TO-EXP map:

INTP: 0 1 2 3 4 5 6 7

-----  
EXP: 0 1 2 3 4 5 6 7

## 1.32 show mls qos vlan

**Command:** show mls qos vlan <v-id>

**Parameters:** v-id: the ranging from 1 to 4094.

**Command Mode:** Admin mode.

**Default:** None.

**Example:**

```
Switch#show mls qos vlan 1
```

## 1.33 show mls qos aggregate-policy

**Command:** show mls qos aggregate-policy [<aggregate-policy-name>]

**Parameter:** [policy-name ] the policy name

**Default:** None.

**Command Mode:** Admin mode and configuration mode

**Usage Guide:** Show the aggregate-policy configuration.

**Example:**

```
Switch#show mls qos aggregate-policy
```

```
aggregate policy p
```

```
CIR: 1   CBS: 1   PBS: 1
```

```
conform-action:
```

```
transmit
```

```
exceed-action:
```

```
drop
```

```
violate-action:
```

```
drop
```

```
Not used by any policy map
```

## 1.34 transmit

**Command:** transmit

**no transmit**

**Function:** Transmit data package that match the class, the no command cancels the assigned action.

**Parameters:** None.

**Default:** Do not set the action.

**Command mode:** Policy class map configuration mode

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 1 Commands for QoS and IPv4/IPv6 PBR

---

**Usage Guide:** Send the packet directly after configure this command.

**Example:** Send the packet which satisfy c1.

```
Switch(config)#policy-map p1
```

```
Switch(Config-PolicyMap-p1)#class c1
```

```
Switch(Config-PolicyMap-p1-Class-c1)#transmit
```

```
Switch(Config-PolicyMap-p1-Class-c1)#exit
```

```
Switch(Config-PolicyMap-p1)#exit
```

# Chapter 2 Commands for Flow-based Redirection

## 2.1 access-group redirect to interface ethernet

**Command:** `access-group <aclname> redirect to interface [ethernet <IFNAME> | <IFNAME>]`

`no access-group <aclname> redirect`

**Function:** Specify flow-based redirection; “no access-group <aclname> redirect” command is used to delete flow-based redirection.

**Parameters:** **<aclname>** name of the flow , only supports digital standard IP ACL, digital extensive IP ACL, nomenclatural standard IP ACL, nomenclatural extensive IP ACL, digital standard IPv6 ACL, and nomenclatural standard IPv6 ACL. Parameters of **Timerange** and **Portrange** can not be set in ACL; the type of ACL should be Permit. **<IFNAME>** the destination port of redirection.

**Command Mode:** Physical Port Configuration Mode.

**Usage Guide:** “no access-group <aclname> redirect” command is used to delete flow-based redirection. Flow-based redirection function enables the switch to transmit the data frames meeting some special condition to another specified port.

**Examples:** Redirecting the frames whose source IP is 192.168.1.111 received from port 1 to port 6,

```
Switch(config)#access-list 1 permit host 192.168.1.111
```

```
Switch(config)# interface ethernet 1/0/1
```

```
Switch(Config-If-Ethernet1/0/1)# access-group 1 redirect to interface ethernet 1/0/6
```

## 2.2 show flow-based-redirect

**Command:** `show flow-based-redirect {interface [ethernet <IFNAME> | <IFNAME>]}`

**Function:** Display the information of current flow-based redirection in the system/port.

**Parameters:** 1. No specified port, display the information of all the flow-based redirection in the system.

2. Specify ports in **<IFNAME>**, display the information of the flow-based redirection configured in the ports listed in the interface-list.

**Command Mode:** Admin Mode and Configuration Mode.

**Usage Guide:** This command is used to display the information of current flow-based

## Commands for QoS, PBR

### and Flow-based Redirection Chapter 2 Commands for Flow-based Redirection

---

redirection in the system/port.

#### Examples:

Switch(config)# show flow-based-redirect

Flow-based-redirect config on interface ethernet 1/0/1:

RX flow (access-list 1) is redirected to interface Ethernet1/0/6



## Chapter 3 Commands for Egress QoS

### 3.1 mls qos egress green remark

This command is not supported by switch.

### 3.2 mls qos map

This command is not supported by switch.

### 3.3 service-policy output

**Command:** `service-policy input <policy-map-name>`

`no service-policy input {<policy-map-name>}`

**Function:** Applies a policy map to the egress of the port; no command deletes the specified policy map applied to the port or deletes all the policy maps applied on the egress direction of the port .

**Parameters:** `output <policy-map-name>` applies the specified policy map to the egress of the port.

`no` command will delete all the policy maps on the egress direction if there is not the specified policy map name.

**Default:** No policy map is bound to port.

**Command mode:** Port Mode.

**Usage Guide:** Only a policy map can be applied to each direction of each port. Policy may not be bound to the port if it uses the rule or action which is not supported by EFP.

**Example:** Bind policy-map p1 to egress Ethernet 1/0/1.

```
Switch(config)#interface ethernet 1/0/1
```

```
Switch(Config-If-Ethernet1/0/1)#service-policy output p1
```

### 3.4 service-policy output vlan

**Command:** `service-policy output <policy-map-name> vlan <vlan-list>`

`no service-policy output {<policy-map-name>} vlan <vlan-list>`

**Function:** Applies a policy map to the VLAN interface; no command deletes the specified

policy map applied to the VLAN interface or deletes all the policy maps applied in the egress direction of the vlan interface .

**Parameters:** **output** *<policy-map-name>* applies the specified policy map to the egress of VLAN interface.

no command will delete all the policy maps in the egress direction of vlan interface if there is not the specified policy map name.

**Default:** No policy map is bound to VLAN interface.

**Command mode:** Global Mode.

**Usage Guide:** Only a policy map can be applied to each direction of each VLAN. Policy may not be bound if it uses the rule or action which is not supported by EFP.

**Example:** Bind policy p1 to egress vlan1.

```
Switch(config)#service-policy output p1 vlan 1
```

## 3.5 set

**Command:** **set** {ip dscp *<new-dscp>* | ip precedence *<new-precedence>* | cos *<new-cos>* | c-vid *<new-c-vid>* | s-vid *<new-s-vid>* | s-tpid *<new-s-tpid>*}

no set {ip dscp | ip precedence | cos | c-vid | s-vid | s-tpid}

**Function:** Assign a new DSCP, IP Precedence for the classified traffic; no command deletes the new value.

**Parameter:** **ip dscp** *<new-dscp>* new DSCP value of IPv4 and IPv6 packets.

**ip precedence** *<new-precedence>* new IPv4 Precedence, only one can be selected for IPv4 Precedence and IP DSCP.

**cos** *<new cos>* new CoS value.

**c-vid** *<new-c-vid>* new c-vid value.

**s-vid** *<new-s-vid>* new s-vid value.

**s-tpid** *<new-s-tpid>* new s-tpid value.

**Default:** Do not assign a new value.

**Command Mode:** Policy Class-map Mode

**Usage Guide:** Only the classified traffic matching the standard will be assigned the new values.

**Example:** Set IP Precedence of the packets which satisfy c1 class rule as 3.

```
Switch(config)#policy-map p1
```

```
Switch(Config-PolicyMap-p1)#class c1
```

```
Switch(Config-PolicyMap-p1-Class-c1)#set ip precedence 3
```

```
Switch(Config-PolicyMap-p1-Class-c1)#exit
```

```
Switch(Config-PolicyMap-p1)#exit
```

### 3.6 show mls qos egress green remark

This command is not supported by switch.

### 3.7 show mls qos maps

**Command:** show mls qos maps [cos-dp| cos-intp | dscp-dscp | dscp-intp | dscp-dp |intp-exp ] | [ begin | include | exclude <regular-expression> ]

**Function:** Show the global mapping configuration of QoS.

**Parameters:** cos-dp: The mapping from ingress L2 COS to the drop priority

cos-intp: The mapping from ingress L2 COS to the internal priority

dscp-dscp: The mapping from ingress DSCP to DSCP

dscp-intp: The mapping from ingress DSCP to the internal priority

dscp-dp: The mapping from ingress DSCP to the drop priority

intp-exp: The mapping from IntPrio to EXP

**Default:** None.

**Command Mode:** Admin and configuration mode

**Usage Guide:** Show the global mapping configuration of QoS.

**Example:** Show mapping table configuration.

```
switch(config)#show mls qos maps
```

Ingress COS-TO-Internal-Priority map:

```
COS: 0  1  2  3  4  5  6  7
-----
INTP: 0  1  2  3  4  5  6  7
```

Ingress DSCP-TO-Internal-Priority map:

```
d1 : d2  0  1  2  3  4  5  6  7  8  9
0:      0  0  0  0  0  0  0  0  1  1
1:      1  1  1  1  1  1  2  2  2  2
2:      2  2  2  2  3  3  3  3  3  3
3:      3  3  4  4  4  4  4  4  4  4
4:      5  5  5  5  5  5  5  5  6  6
5:      6  6  6  6  6  6  7  7  7  7
6:      7  7  7  7
```

Ingress COS-TO-Drop-Precedence map:

COS: 0 1 2 3 4 5 6 7

-----

DP: 0 0 0 0 0 0 0 0

SWA(config)#show mls qos maps

Ingress COS-TO-Internal-Priority map:

COS: 0 1 2 3 4 5 6 7

-----

INTP: 0 1 2 3 4 5 6 7

Ingress DSCP-TO-Internal-Priority map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	1	1
1:	1	1	1	1	1	1	2	2	2	2
2:	2	2	2	2	3	3	3	3	3	3
3:	3	3	4	4	4	4	4	4	4	4
4:	5	5	5	5	5	5	5	5	6	6
5:	6	6	6	6	6	6	7	7	7	7
6:	7	7	7	7						

Ingress COS-TO-Drop-Precedence map:

COS: 0 1 2 3 4 5 6 7

-----

DP: 0 0 0 0 0 0 0 0

Ingress DSCP-TO-DSCP map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	8	8
1:	8	8	8	8	8	8	16	16	16	16
2:	16	16	16	16	24	24	24	24	24	24
3:	24	24	32	32	32	32	32	32	32	32
4:	40	40	40	40	40	40	40	40	48	48

5: 48 48 48 48 48 48 56 56 56 56  
6: 56 56 56 56

Ingress DSCP-TO-Drop-Precedence map:

d1 : d2	0	1	2	3	4	5	6	7	8	9
0:	0	0	0	0	0	0	0	0	0	0
1:	0	0	0	0	0	0	0	0	0	0
2:	0	0	0	0	0	0	0	0	0	0
3:	0	0	0	0	0	0	0	0	0	0
4:	0	0	0	0	0	0	0	0	0	0
5:	0	0	0	0	0	0	0	0	0	0
6:	0	0	0	0						

Ingress EXP-TO-Internal-Priority map:

EXP:	0	1	2	3	4	5	6	7
-----								
INTP:	0	1	2	3	4	5	6	7

Ingress EXP-TO-Drop-Precedence map:

EXP:	0	1	2	3	4	5	6	7
-----								
DP:	0	0	0	0	0	0	0	0

Egress Internal-Priority-TO-EXP map:

INTP:	0	1	2	3	4	5	6	7
-----								
EXP:	0	1	2	3	4	5	6	7

## Chapter 4 Commands for Flexible QinQ

### 4.1 add

**Command:** `add {s-vid <new-vid> | c-vid <new-vid>}`

**no add** <s-vid | c-vid>

**Function:** Add a specified external tag or inner tag for the packet which match the class map, no command cancels the operation.

**Parameters:** **s-vid <new-vid>** specifies VID of an external VLAN Tag, the range is from 1 to 4094.

**c-vid <new-vid>** specifies VID of a inner VLAN Tag, the range is from 1 to 4094.

**Default:** Do not add the tag.

**Command Mode:** Policy class-map configuration mode

**Usage Guide:** Add the external tag or inner tag for the packet which match the class map after this command is configured.

**Example:** Add an external VLAN Tag with VID of 2 for the packet which satisfy c1 class rule.

```
Switch(config)#policy-map p1
```

```
Switch(config-PolicyMap-p1)#class c1
```

```
Switch(config-PolicyMap-p1-Class-c1)#add s-vid 2
```

### 4.2 delete

**Command:** `delete c-vid`

**no delete** c-vid

**Function:** Delete the inner VLAN Tag for the packet which match the class map, no command cancels the operation.

**Parameters:** None.

**Default:** Do not delete the inner VLAN Tag.

**Command Mode:** Policy class-map configuration mode

**Usage Guide:** Delete the inner VLAN Tag for the packet which match the class map after this command is configured. When using flexible QinQ, the sent packets only with the inner VLAN Tag or without Tag, it needs to use **add s-vid** command to add the specified external VLAN Tag, otherwise the packets without the external VLAN Tag within the

switch.

**Example:** Delete the inner VLAN Tag for the packet which satisfy c1 class rule.

```
Switch(config)#policy-map p1
```

```
Switch(config-PolicyMap-p1)#class c1
```

```
Switch(config-PolicyMap-p1-Class-c1)#delete c-vid
```

## 4.3 match

**Command:** `match {access-group <acl-index-or-name> | c-vlan <vlan-list> | ip dscp <dscp-list>| ip precedence <ip-precedence-list>| ipv6 access-group <acl-index-or-name>| ipv6 dscp <dscp-list> | ipv6 flowlabel <flowlabel-list> | vlan <vlan-list> | cos <cos-list>}`

`no match {access-group | ip dscp | ip precedence | ipv6 access-group | ipv6 dscp | ipv6 flowlabel | vlan | cos}`

**Function:** Configure the match standard of the class map; the no command deletes the specified match standard.

**Parameter:** `access-group <acl-index-or-name>` match the specified IP ACL or MAC ACL, the parameters are the number or name of ACL

`c-vlan <vlan-list>` It maps the VLAN ID value of the appointed internal VLAN Tag, the parameter is the list of a VLAN ID, there are 8 VLAN ID at most and the range is from 1 to 4094.

`ip dscp <dscp-list>` and `ipv6 dscp <dscp-list>` match the specified DSCP value, the parameter is a list of DSCP consisting of maximum 8 DSCP values, the ranging is 0 to 63

`ip precedence <ip-precedence-list>` match the specified IP Precedence, the parameter is a IP Precedence list consisting of maximum 8 IP Precedence values with a valid range of 0 to 7

`ipv6 access-group <acl-index-or-name>` match the specified IPv6 ACL, the parameter is the number or name of IPv6 ACL

`ipv6 flowlabel <flowlabel-list>` match the specified IPv6 flow label, the parameter is IPv6 flow label value, the ranging is 0 to 1048575

`vlan <vlan-list>` match the specified VLAN ID, the parameter is a VLAN ID list consisting of maximum 8 VLAN IDs, the ranging is 1 to 4094

`<cost-list> match` the specified CoS value, the parameter is a CoS list consisting of maximum 8 CoS values, the ranging is 0 to 7

**Default:** There is no match standard.

**Command Mode:** Class-map Mode

**Usage Guide:** Only one match standard can be configured in a class map. When configuring the ACL match, permit rule is the match option, it will apply Policy Map action. Deny rule is the excluding option, it does not apply Policy Map action. If it has been configured other match rule, the operation is failure, but configuring the same match rule will cover the previous.

**Example:** Create a class-map named c1, and configure the class rule of the class-map to match packets with IP Precedence of 0.

```
Switch(config)#class-map c1
Switch(config-classmap-c1)#match ip precedence 0
Switch(config-classmap-c1)#exit
```

## 4.4 service-policy

**Command:** `service-policy input <policy-map-name>`

**no service-policy input [policy-map-name]**

**Function:** Bind the specified policy of flexible QinQ to the ingress of the port, the no command cancels the binding.

**Parameters:** `service-policy <policy-map-name>`: The specified policy-map name of flexible QinQ.

**Default:** No policy map is bound to port.

**Command mode:** Port Mode.

**Usage Guide:** Only one policy map can be bound to each port, the function takes effect after the policy map is bound to a port.

**Example:** Apply policy-map p1 to Ethernet port 1/0/1 for flexible QinQ.

```
Switch(Config-If-Ethernet1/0/1)#service-policy input p1
```

## 4.5 set

**Command:** `set { c-vid <new-vid> | s-tpid <0x8100 | 0x88a8 | 0x9100> | s-vid <new-vid> }`

**no set { c-vid | s-vid | s-tpid }**

**Function:** Assign the new CVid or SVid value to the packets which match the class map, no command cancels the operation.

**Parameters:** `c-vid <new-vid>` specifies VID of a inner VLAN Tag, the range is from 1 to 4094.

`s-tpid <0x8100 | 0x88a8 | 0x9100>` specifies the value of s-tpid.

`s-vid <new-vid>` specifies VID of an external VLAN Tag, the range is from 1 to 4094.



**Default:** Do not assign the value.

**Command Mode:** Policy class-map configuration mode

**Usage Guide:** After configure this command, add the specified external tag to the packets which match the class-map.

**Example:** Modify the VID value of the external VLAN Tag of the packet which satisfied c1 classification rules to be 2.

```
Switch(config)#policy-map p1
```

```
Switch(Config-PolicyMap-p1)#class c1
```

```
Switch(Config-PolicyMap-p1-Class-c1)#set s-vid 2
```

## Chapter 5 Commands for MPLS QoS

### 5.1 match

**Command:** `match exp <exp-list>`  
`no match exp`

**Function:** Set the match rules of the class map; the no operation will delete the specified match rule.

**Parameters:** <exp-list> the list of EXP value, containing at most 8 values, ranging from 0 to 7.

**Default:** No match rule by default.

**Command Mode:** Class-map Configuraiton Mode.

**Usage Guide:** This configuraiton only applies to MPLS messages. If this command is implemented more than once, only the last one will take effect.

**Example:** Create a class-map under the name of "c1" and set the match rule of this class-map as matching the EXP value 0 and 1 in the topmost label of MPSSL messages.

```
Switch(config)#class-map c1
Switch(Config-ClassMap-c1)#match exp 0 1
Switch(Config-ClassMap-c1)#exit
```

### 5.2 mls qos trust exp

This command is not supported by switch.

### 5.3 mls qos map

**Command:** `mls qos map {exp-intp <intp1..intp8> / exp-dp <dp1..dp8>}`  
`no mls qos map {exp-intp | exp-dp}`

`mls qos map intp-exp <exp1..exp8>`  
`no mls qos map intp-exp`

**Function:** Set the mapping from exp to internal priority, the mapping from exp to drop precedence and the mapping from internal priority to exp.

**Parameters:** `exp-intp <intp1...intp8>` defines the mapping from exp to internal priority, `<intp1..intp8>` are 8 internal priority values, separately corresponding with the exp value

0 ~ 7. Each internal priority value is separated with space, ranging from 0 to 7.

**exp-dp <dp1..dp8>** defines the mapping from exp to drop precedence, <dp1..dp8> are 8 drop precedence values, separately corresponding with the exp value 0 ~ 7. Each drop precedence value is separated with space, ranging from 0 to 2.

**intp-exp <exp1..exp8>** defines the mapping from internal priority to exp, <exp1..exp8> are 8 exp values, separately corresponding with the internal priority value 0 ~ 7. Each exp value is separated with space, ranging from 0 to 7.

**Default:** The default map is:

**Default EXP-TO-INTP Map**

EXP Value	0	1	2	3	4	5	6	7
INTP Value	0	1	2	3	4	5	6	7

**Default EXP-TO-DP Map**

EXP Value	0	1	2	3	4	5	6	7
DP Value	0	0	0	0	0	0	0	0

**Default INTP-TO-EXP Map**

INTP Value	0	1	2	3	4	5	6	7
EXP Value	0	1	2	3	4	5	6	7

**Command Mode:** Global Configuration Mode.

**Usage Guide:**

**Example:** Change the EXP-to-intp mapping from the default 0 1 2 3 4 5 6 7 to 1 1 2 2 3 3 4 4.

```
Switch(config)#mls qos map exp-intp 1 1 2 2 3 3 4 4
```

## 5.4 show mls qos maps

**Command:** show mls qos maps [exp-intp | exp-dp | intp-exp []]

**Function:** Display the mapping configuration information of MPLS QoS.

**Parameters:** **exp-intp** the mapping from the exp value to the internal priority value; **exp-dp** the mapping from the exp value to the drop precedence value; **intp-exp** the map from the internal priority value to the exp value.

**Default Settings:** None.

**Command Mode:** Admin Configuration Mode.

**Usage Guide:** Display the map configuration information of MPLS QoS.

**Examples:**

```
Switch # show mls qos maps exp-intp
```

Ingress EXP-TO-Internal-Priority map

EXP: 0 1 2 3 4 5 6 7

-----

INTP: 0 1 2 3 4 5 6 7

# Chapter 6 Commands for Egress Queue Scheduling

## 6.1 mls qos bandwidth

**Command:** `mls qos bandwidth <min-bandwidth> <max-bandwidth>`

`no mls qos bandwidth <min-bandwidth> <max-bandwidth>`

**Function:** Configure the bandwidth limit for a scheduling node.

**Parameters:** `<min-bandwidth>` is the minimum bandwidth, its range from 0 to 128000. 0 means there is no minimum bandwidth limit. `<max-bandwidth>` the maximum bandwidth, its range from 0 to 128000. 0 means there is no maximum bandwidth limit, besides the maximum bandwidth cannot be less than the minimum bandwidth.

**Default:** There is no bandwidth limit for scheduling node.

**Command Mode:** Scheduling node configuration mode

**Usage Guide:** Bandwidth unit is kbps, kbit is the rate per second. This command takes effect in scheduling node mode after scheduling policy is assigned to the port. The actual bandwidth limit may not consist with the value configured by users, because the chip only supports the fixed granularity, so we can check the actual bandwidth with `show mls qos schedule interface` command.

Note: Configuration of bandwidth limit cannot be supported by node of level 1.

**Example:** Set the minimum bandwidth is 32kbps and the maximum bandwidth is 64kbps on node 1 of level 3.

```
Switch(config-sche-policy-p1)#mls qos schedule level 3 node 1
```

```
Switch(config- sche-policy-p1-l13nod1)#mls qos bandwidth 32 64
```

## 6.2 mls qos ets enable

**Command:** `mls qos ets enable`

`no mls qos ets enable`

**Function:** Enable ETS queue scheduling mode for a port, the no command disables ETS mode.

**Parameters:** None.

**Default:** Disable.

**Command Mode:** Port mode

**Usage Guide:** Scheduling policy is distributed or UC/MC precedence is configured after a

port enables ETS.

**Example:** Enable ETS mode for port 1/0/1.

```
Switch(config)#interface ethernet 1/0/1
```

```
Switch(config-if-ethernet1/0/1)#mls qos ets enable
```

## 6.3 mls qos mc queue bandwidth

**Command:** `mls qos mc queue <queue-id> bandwidth <min-bandwidth> <max-bandwidth>`

`no mls qos mc queue <queue-id> bandwidth`

**Function:** Configure the bandwidth limit for a MC queue after a port enables ETS. The no command cancels the configuration.

**Parameters:** `<queue-id>`: multicast queue ID, its range from 1 to 4.

`<min-bandwidth>`: minimum bandwidth, its range from 0 to 128000, 0 means there is no minimum bandwidth limit.

`<max-bandwidth>`: maximum bandwidth, its range from 0 to 128000. 0 means there is no maximum bandwidth limit, besides the maximum bandwidth can not be less than the minimum bandwidth.

**Default:** There is no bandwidth limit for multicast queue.

**Command Mode:** Port mode

**Usage Guide:** Bandwidth unit is kbps, kbit is the rate per second. This command is used to set bandwidth limit of unicast queue. The actual bandwidth limit may not consist with the value configured by users, because the chip only supports the fixed granularity, so we can check the actual bandwidth with show mls qos schedule interface command.

**Example:** Set the minimum bandwidth is 8kbps and the maximum bandwidth is 64kbps of port 1/0/1.

```
Switch(config) #interface ethernet1/0/1
```

```
Switch(config-if-ethernet1/0/1)#mls qos mc queue 1 bandwidth 8 64
```

## 6.4 msl qos queue algorithm

**Command:** `mls qos queue algorithm {sp | wrr | wdr}`

`no mls qos queue algorithm`

**Function:** Configure queue scheduling algorithm for a port in normal scheduling mode, the no command restores the default scheduling algorithm.

**Parameters:** `sp`: Strict priority, the priority of the bigger queue is higher

`wrr`: wrr algorithm

**wrr:** wrr algorithm

**Default:** The default queue scheduling algorithm is wrr.

**Command Mode:** Port mode

**Usage Guide:** The configured scheduling algorithm is saved only but not be assigned after the port enables ETS mode. However, the configuration will be assigned immediately after the port disabled ETS. We suggest not to configure this command on the port which has already bond to the scheduling policy. User can configure the scheduling arithmetic through the arithmetic command under the scheduling node.

**Example:** Configure queue scheduling algorithm as sp for a port.

```
Switch(config-if-ethernet1/0/1)#mls qos queue algorithm sp
```

## 6.5 mls qos queue bandwidth

**Command:** `mls qos queue <queue-id> bandwidth <minimum-bandwidth> <maximum-bandwidth>`

`no mls qos queue <queue-id> bandwidth`

**Function:** Configure the bandwidth limit for UC queue on a port. The no command cancels the configuration.

**Parameters:** *<queue-id>*: unicast queue ID, its range from 1 to 8.

*<min-bandwidth>*: minimum bandwidth, its range from 0 to 128000, 0 means there is no minimum bandwidth limit.

*<max-bandwidth>*: maximum bandwidth, its range from 0 to 128000. 0 means there is no maximum bandwidth limit, besides the maximum bandwidth can not be less than the minimum bandwidth.

**Default:** There is no bandwidth limit for unicast queue.

**Command Mode:** Port mode

**Usage Guide:** Bandwidth unit is kbps, kbit is the rate per second. This command is used to set bandwidth limit of unicast queue. The actual bandwidth limit may not consist with the value configured by users, because the chip only supports the fixed granularity, so we can check the actual bandwidth with show mls qos schedule interface command.

Note: When ETS mode is not enabled, this command is valid for UC queue. Because of the chip defect, this command actually configures 8 queues of S3.1~S3.4 and UC5~UC8. If the port is bond to the scheduling policy, this command only configures 8 queues of UC1~UC8.

**Example:** Configure the minimum bandwidth as 8kbps, the maximum bandwidth as 64kbps for unicast queue uc8 on port 1/0/1.

```
Switch(config)#interface ethernet1/0/1
```

```
Switch(config-if-ethernet1/0/1)#mls qos queue 8 bandwidth 8 64
```

## 6.6 mls qos queue uc/mc higher

**Command:** `mls qos queue {uc | mc} higher`

`no mls qos queue {uc | mc} higher`

**Function:** Configure the priority of UC or MC, the no command disables the priority configuration.

**Parameters:** **uc:** known unicast packets

**mc:** unknown unicast, multicast, broadcast and monitor packets etc, except the known unicast packets.

**Default:** There is no priority for UC/MC queue on a port.

**Command Mode:** Port mode

**Usage Guide:** Priority of UC/MC queue is able to be configured after the port enables ETS and does not bind any scheduling policy. If it is configured as that UC is prior, the unicast flow will be forwarded prior when the egress is jammed. If it is configured as that MC is prior, the non-unicast flow (such as multicast, unknown unicast, broadcast. etc) will be forwarded prior when the egress is jammed.

**Example:** Configure the priority of UC is higher than the priority of MC.

```
Switch(config-if-ethernet1/0/1)#mls qos queue uc higher
```

## 6.7 mls qos queue weight

**Command:** `mls qos queue {wrr | wdr} weight <weight0..weight7>`

`no mls qos queue {wrr | wdr} weight`

**Function:** Configure queue scheduling weight when the port does not enable ETS, the no command restores the default weight.

**Parameters:** `<weight0..weight7>`: Define queue scheduling weight, it takes effect to WRR and WDRR.

**Default:** Weight of WRR queues (the number is 0 to 7) is 1 to 8.

Weight of WDRR queues (the number is 0 to 7) is 10:20:40:80:160:320:640:1280.

**Command Mode:** Port mode

**Usage Guide:** The configured scheduling algorithm is saved only but not be assigned after the port enables ETS mode. However, the configuration will be assigned to the port after ETS mode is disabled. When the queue weight is configured as 0, the queue is scheduled with SP algorithm, WRR algorithm turns into SP+WRR and WDRR algorithm



turns into SP+WDRR. The absolute value of WRR or WDRR weight is meaningless. It allocates the bandwidth by using the weight values. We suggest not to configure this command on the port which has already bond to the scheduling policy. User can configure the weight through the weight command under the scheduling node mode.

**Example:** Configure wdr queue weight as 10 20 30 40 50 60 70 80 for node 1 of level 3.  
Switch(config-sche-policy-p1)#mls qos schedule level 3 node 1  
Switch(config-sche-policy-p1-lel3nod1)#mls qos schedule wdr weight 10 20 30 40 50 60 70 80

## 6.8 mls qos schedule algorithm

**Command:** mls qos schedule algorithm {sp | wdr | wrr}  
no mls qos schedule algorithm

**Function:** Configure queue scheduling algorithm for a scheduling node, the no command restores the default scheduling algorithm.

**Parameters:** sp: Strict priority, the priority of the queue with the bigger ID is higher  
wrr: wrr algorithm  
wdr: wdr algorithm

**Default:** scheduling algorithm is SP on node of level 1, scheduling algorithm is WRR on node of level 2, scheduling algorithm is RR on node of level 3.

**Command Mode:** Scheduling node mode

**Usage Guide:** The default scheduling algorithm is RR for node of level 3. With no command, we can restore the default scheduling algorithm after scheduling algorithm is set as sp/wrr/wdr.

**Example:** Configure scheduling algorithm as WDRR on node 1 of level 3.  
Switch(config-sche-policy-p1)#mls qos schedule level 3 node 1  
Switch(config-sche-policy-p1-lel3nod1)#mls qos schedule algorithm wdr

## 6.9 mls qos schedule level

**Command:** mls qos schedule level <levelID> node <nodeID>  
no mls qos schedule level <levelID> node <nodeID>

**Function:** Create a scheduling node and enter the corresponding scheduling node mode, the no command cancels the specified scheduling node configuration.

**Parameters:** <levelID>: Level ID of scheduling node, its minimum value is 1, its maximum value relates to chip.

<nodeID>: Scheduling node ID on levelID, its minimum value is 1, its

maximum value relates to chip and levelID.

**Default:** There is no scheduling node in scheduling policy.

**Command Mode:** Scheduling policy mode

**Usage Guide:** Scheduling node can be distributed after a port enables ETS.

**Example:** Create node 2 on level 3.

```
Switch(config-sche-policy-p1)#mls qos schedule level 3 node 2
```

## 6.10 mls qos schedule policy

**Command:** `mls qos schedule policy <polcicyName>`

`no mls qos schedule policy <polcicyName>`

**Function:** Create a scheduling policy and enter the scheduling policy mode, the no command deletes the specified scheduling policy.

**Parameters:** *<polcicyName>*: Name of multi-level queue scheduling policy.

**Default:** There is no multi-level queue scheduling policy.

**Command Mode:** Global mode

**Usage Guide:** None.

**Example:** Create a scheduling policy p1.

```
Switch(config)#mls qos schedule policy p1
```

## 6.11 mls qos schedule policy bind

**Command:** `mls qos schedule policy bind <policyName>`

`no mls qos schedule policy bind <policyName>`

**Function:** Bind a scheduling policy to a port, the no command cancels the binding between the scheduling policy and the port.

**Parameters:** *<polcicyName>*: Name of multi-level queue scheduling policy.

**Default:** multi-level queue scheduling policy is not bound to a port.

**Command Mode:** Port mode

**Usage Guide:** Queue scheduling policy can be bound to a port after it enable ETS mode and does not configure the priority of UC/MC.

**Example:** Bind scheduling policy p to port 1/0/1.

```
Switch(config-if-ethernet1/0/1)#mls qos schedule policy bind p
```

## 6.12 mls qos schedule queue input

**Command:** `mls qos schedule queue <queueID> input {{UC <ucID>} | {MC <mcID>}} |`

```
{node <nodeID>}}
    no mls qos schedule queue <queueID> input {{UC <ucID>} | {MC <mcID>}
| {node <nodeID>}}
```

**Function:** Configure the input data source of a queue on a scheduling node, the no command cancels the operation.

**Parameters:** <queueID>: Queue ID of a scheduling node

<ucID>: Unicast queue ID

<MCID>: Multicast queue ID

<nodeID>: Node ID of the next level

**Default:** Queue mapping in normal mode.

**Command Mode:** Scheduling node mode

**Usage Guide:** Input source must be unicast queue UC1~UC4 or multicast queue MC1~MC4 for node of level 3, input source may be unicast queue or node of level 3 for node of level 2, input source must be node of level 2 for node of level 1. Note: Node of level 1 does not support queue mapping.

**Example:** Configure the input source of queue 1 and queue 2 as UC6 and S3.3 respectively for node of level 2.

```
Switch(config-sche-policy-p1)#mls qos schedule level 2 node 2
```

```
Switch(config-sche-policy-p1-l2nod1)#mls qos schedule node queue 1 input UC 6
```

```
Switch(config-sche-policy-p1-l2nod1)#mls qos schedule node queue 2 input node 3
```

## 6.13 mls qos schedule weight

**Command:** mls qos schedule {wrr | wdr} weight <weight0..weight17>

```
no mls qos schedule {wrr | wdr} weight
```

**Function:** Configure queue weight of scheduling node, the no command restores the default weight.

**Parameters:** <weight0..weight17>: Define queue scheduling weight, it takes effect to WRR and WDRR.

**Default:** Weight of WRR queues (the number is 0 to 17) is 1 to 18.

Weight of WDRR queues (the number is 1 to 18) is 10:20:40:80:160:320:640:1280:1280:1280:1280:1280:1280:1280:1280:1280:1280:1280.

**Command Mode:** Scheduling node mode

**Usage Guide:** If queue weight is configured as 0, this queue uses SP scheduling algorithm, and WRR turns into SP+WRR, WDRR turns into SP+WDRR. The absolute value of WRR or WDRR is meaningless, it allocates bandwidth by weight rate.

**Example:** Configure wdr queue weight as 10 20 30 40 50 60 70 80 for node 1 of level 3.

```
Switch(config-sche-policy-p1)#mls qos schedule level 3 node 1
Switch(config-sche-policy-p1-lel3nod1)#mls qos schedule wdr weight 10 20 30 40 50 60
70 80
```

## 6.14 show mls qos ets interface

**Command:** `show mls qos ets interface [<interface-name> | <interface-list>]`

**Function:** Show whether the interface enables ETS scheduling.

**Parameters:** **<interface-name>**: Interface name, such as ethernet 1/0/1.

**<interface-list>**: Interface list, it supports “;”, “-”, such as ethernet 1/0/1-5;7;10-15

**Default:** None.

**Command Mode:** Global mode, interface mode, policy mode, node mode, and so on.

**Usage Guide:** If Interface name or interface list is not specified, then queue scheduling configuration of all interfaces will be shown. If interface name is specified, queue scheduling configuration of the specified interfaces will be shown. If interface list is specified, ETS states of the corresponding interfaces are shown in turn according to interface order of list.

**Example:** Show ETS state of interface 1/0/1-2.

```
Switch#sho mls qos ets interface ethernet 1/0/1-2
Ethernet1/0/1:
ETS status: Disable
Ethernet1/0/2:
ETS status: Enable
```

## 6.15 show mls qos schedule interface

**Command:** `show mls qos schedule interface [<interface_name> | <interface_list>]`

**Function:** Show queue scheduling configuration for the interfaces.

**Parameters:** **<interface-name>**: Interface name, such as ethernet 1/0/1.

**<interface-list>**: Interface list, it supports “;”, “-”, such as ethernet 1/0/1-5;7;10-15

**Default:** None.

**Command Mode:** Global mode, interface mode, policy mode, node mode, and so on.

**Usage Guide:** If Interface name or interface list is not specified, then queue scheduling configuration of all interfaces will be shown. If interface name is specified, queue scheduling configuration of the specified interfaces will be shown. If interface list is

specified, the corresponding interface queue configuration is shown in turn according to interface order of list.

**Example:** Show queue scheduling configuration of interface 1/0/1.

Switch#show mls qos schedule interface ethernet1/0/1

Results are shown in the following:

Ethernet1/0/1:

Bandwidth Guarantee Configuration:

Queue	1	2	3	4	5	6	7	8
MinBW(Kbps)	0	0	0	0	0	0	0	0
MaxBW(Kbps)	0	0	0	0	0	0	0	0

Bandwidth Guarantee Configuration For MC Queue:

Queue	1	2	3	4
MinBW(Kbps)	0	0	0	0
MaxBW(Kbps)	0	0	0	0

ETS status: Enable

mls qos schedule policy bind p:

The information of level 1 node 1:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: sp

Queue Number	1	2	3	4
InputType	node	node	node	node
InputValue	1	2	3	4
WrrWeight	1	2	3	4
WdrrWeight	10	20	40	80

The information of level 2 node 1:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: wrr

Queue Number	1	2	3	4
InputType	none	none	none	none
InputValue	0	0	0	0
WrrWeight	1	2	3	4
WdrrWeight	10	20	40	80

The information of level 2 node 2:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: wrr

Queue Number	1	2	3	4	5	6	7	8
InputType	node	node	node	node	uc	uc	uc	uc
InputValue	1	2	3	4	5	6	7	8
WrrWeight	1	2	3	4	5	6	7	8
WdrWeight	10	20	40	80	160	320	640	1280

The information of level 2 node 3:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: wrr

Queue Number	1	2	3	4	5	6	7	8
InputType	none	none	none	none	none	none	none	none
InputValue	0	0	0	0	0	0	0	0
WrrWeight	1	2	3	4	5	6	7	8
WdrWeight	10	20	40	80	160	320	640	1280

The information of level 2 node 4:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: wrr

Queue Number	1	2	3	4	5	6	7	8
InputType	none	none	none	none	none	none	none	none
InputValue	0	0	0	0	0	0	0	0
WrrWeight	1	2	3	4	5	6	7	8
WdrWeight	10	20	40	80	160	320	640	1280

The information of level 3 node 1:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

Queue Number	1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18			
InputType	mc	uc	none	none	none	none	none	none	none	none
none	none	none	none	none	none	none	none			
InputValue	1	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0				
WrrWeight	1	2	3	4	5	6	7	8	9	10
									11	

```

12  13  14  15  16  17  18
  WdrWeight  10  20  40  80  160  320  640  1280  1280  1280
1280 1280 1280 1280 1280 1280 1280 1280

```

The information of level 3 node 2:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

```

Queue Number 1  2  3  4  5  6  7  8  9  10
11  12  13  14  15  16  17  18
  InputType  mc  uc  none none none none none none none none none
none none none none none none none none
  InputValue  2  2  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0

```

```

  WrrWeight  1  2  3  4  5  6  7  8  9  10  11
12  13  14  15  16  17  18
  WdrWeight  10  20  40  80  160  320  640  1280  1280  1280
1280 1280 1280 1280 1280 1280 1280 1280

```

The information of level 3 node 3:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

```

Queue Number 1  2  3  4  5  6  7  8  9  10
11  12  13  14  15  16  17  18
  InputType  mc  uc  none none none none none none none none none
none none none none none none none none
  InputValue  3  3  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0

```

```

  WrrWeight  1  2  3  4  5  6  7  8  9  10  11
12  13  14  15  16  17  18
  WdrWeight  10  20  40  80  160  320  640  1280  1280  1280
1280 1280 1280 1280 1280 1280 1280 1280

```

The information of level 3 node 4:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

```

Queue Number 1  2  3  4  5  6  7  8  9  10
11  12  13  14  15  16  17  18
  InputType  mc  uc  none none none none none none none none none

```

**Commands for QoS, PBR  
and Flow-based Redirection**

**Chapter 6 Commands for  
Egress Queue Scheduling**

---

none	none	none	none	none	none	none	none					
InputValue	4	4	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0						
WrrWeight	1	2	3	4	5	6	7	8	9	10	11	
12	13	14	15	16	17	18						
WdrWeight	10	20	40	80	160	320	640	1280	1280	1280		
1280	1280	1280	1280	1280	1280	1280	1280					



# Chapter 7 Commands for Vlan-shaping

## 7.1 mls qos forwarding-class

**Command:** `mls qos forwarding-class <fc-name> [id <fc-id>]`  
`no mls qos forwarding-class <fc-name>`

**Function:** Create a forwarding class and enter the mode of forwarding class; the **no** command deletes the specified forwarding class.

**Parameters:** **<fc-name>**, name of a forwarding class, it is a string of 1 to 64 character and it only supports the letter, number, underline and connector, it is distinguished by lowercase and capital letter; **<fc-id>**, number of a forwarding class, it only support the positive integer and it is the optional parameter, if user does not specified the parameter, the system will find the maximum id in the used id once and plus 1 to be the new id to assign to this forwarding class.

**Default:** No forwarding class

**Command Mode:** Global Mode

**Usage Guide:** If a forwarding class which is not existence is added, this forwarding class will be created and enter the mode of forwarding class. If a forwarding class which is not existence is deleted, then turn to error and it will prompt that the forwarding class does not exist. If a forwarding class which exists is added, then enter the mode of forwarding class. If a forwarding class which exists is deleted, the relationship between the scheduling queue that the forwarding class corresponds and the flow that the forwarding class matching rules instructs will be deleted. Then the flow that the forwarding class matching rules instructs will not be put into the scheduling queue that the forwarding class corresponds.

**Example:**

Create a forwarding class which named fc1 and specified the id number is 10:

```
(config)#mls qos forwarding-class fc1 id 10
```

Delete the forwarding class which named fc1:

```
(config)#no mls qos forwarding-class fc1
```

## 7.2 match s-vid

**Command:** `match s-vid<svid-list>`

**no match s-vid[svid-list]**

**Function:** Configure the matching standard of the forwarding class, the data flow can be classified according to vlan-id. The **no** command deletes the specified matching standard.

**Parameters:** < *svid-list* >, the list of vlan-id of the operators, it supports ";" and "-", the effective range of vid is 1 to 4094.

**Command Mode:** Forwarding class mode

**Default:** No matching rules

**Usage Guide:** Now it only supports that the matching rule is specified for the forwarding class through matching the outer vlan id. If it succeed, the flow which meet the matching rule will enter the scheduling queue that the forwarding class corresponds to participate the egress queue scheduling.

**Example:**

Create a forwarding class which named vlan1 and configure it corresponds the flow of vlan1:

```
(config)#mls qos forwarding-class vlan1
(config-ForwardingClass-vlan1)#match s-vid 1
```

Create a forwarding class which named fc2 and configure it corresponds the flow of vlan 1,vlan 2,vlan 3,vlan 5,vlan 7,vlan 8 and vlan 9:

```
(config)#mls qos forwarding-class fc2
(config-forwarding-class-fc2)#match svid 1-3;5;7-9
```

Cancel the relevance between fc2 and vlan1, vlan2, vlan 3:

```
(config)#mls qos forwarding-class fc2
(config-forwarding-class-fc2)#no match s-vid 1-3
```

## 7.3 mls qos schedule algorithm

**Command:** **mls qos schedule algorithm {sp|wrr|wdrr}**  
**no mls qos schedule algorithm**

**Function:** Configure the queue scheduling algorithm. For MRS-9800-24SFP+, it should configure this command under the mode of S3 schedule node, the default is rr.

**Parameters:** None

**Command Mode:** Schedule node mode

**Default:** rr

**Usage Guide:** Update the software entry according to the name of schedule node and the queue scheduling algorithm. If this policy has been binding to the port, it needs to be

modified dynamically and issues the configuration to the hardware register of the specified port.

**Example:**

Create the schedule policy which named p1 and configure the queue scheduling algorithm of vlan shaping to be wdr, then bind the policy to ethernet1/0/1:

```
(config)#mls qos schedule policy p1
(config-schedule-policy-p1)#mls qos schedule level 3 node 1
(config-schedule-policy-p1-l3nod1)#mls qos schedule algorithm wdr
(config-schedule-policy-p1-l3nod1)#exit
(config-schedule-policy-p1)#exit
(config)#interface ethernet1/0/1
(config-if-ethernet1/0/1)#mls qos ets enable
(config-if-ethernet1/0/1)#mls qos schedule policy bind p1
```

Cancel the queue scheduling algorithm of vlan shaping of p1:

```
(config)#mls qos schedule policy p1
(config-schedule-policy-p1)#mls qos schedule level 3 node 1
(config-schedule-policy-p1-l3nod1)#no mls qos schedule algorithm
```

## 7.4 mls qos schedule {wrr|wdr} weight

**Command:** mls qos schedule {wrr|wdr} weight <weight1...weight18>  
no mls qos schedule {wrr|wdr} weight

**Function:** Configure the queue weight of vlan shaping.

**Parameters:** <weight1...weight18>, the value of the queue weight, 18 queue weight is at least and 1 queue is at least.

**Command Mode:** Schedule node mode

**Default:** The default of wrr is 1, 2, 3 ... The default of wdr is 16, 32, 64, 127, 127, 127 ...

**Usage Guide:** For MRS-9800-24SFP+, it should configure this command under the mode of S3 schedule node; the node of S3.1 has 18 queues.

**Example:**

```
Configure wrr queue weight of vlan shaping 1 to 8 as 1,3,5,2,7,4,9,14 on ethernet1/0/1;
Configure wrr weight of vlan shaping 9 to 18 as 8,3,2,14,17,4,7,0,0,0:
(config)#mls qos schedule policy p1
(config-schedule-policy-p1)#mls qos schedule level 3 node 1
(config-schedule-policy-p1-l3nod1)#mls qos schedule wrr weight 1 3 5 2 7 4 9 14 8 3 2
14 17 4 7 0 0 0
```

```
(config-schedule-policy-p1-l3nod1)#exit
(config-schedule-policy-p1)#exit
(config)#interface ethernet1/0/1
(config-if-ethernet1/0/1)#mls qos ets enable
(config-if-ethernet1/0/1)#mls qos schedule policy bind p1
```

## 7.5 mls qos forwarding-profile

**Command:** `mls qos forwarding-profile <fp-name> [ id <fp-id>]`

`no mls qos forwarding-profile <fp-name>`

**Function:** Create a forwarding policy and enter the mode of forwarding policy. The **no** command deletes the specified forwarding policy.

**Parameters:** **<fp-name>**, the name of the forwarding policy, it is a string of 1 to 64 character and it only supports the letter, number, underline and connector, it is distinguished by lowercase and capital letter; **<fp-id>** is optional parameter and means the number of a forwarding policy, it only support the positive integer, if user does not specified the parameter, the system will find the maximum id in the used id once and plus 1 to be the new id to assign to this forwarding policy.

**Command Mode:** Global Mode

**Default:** No forwarding policy

**Usage Guide:** If a forwarding policy exists, it will enter the mode of forwarding policy. If a forwarding policy does not exist, this forwarding policy will be created and enter the mode of forwarding policy. If a forwarding policy which does not exist is deleted, then turn to the error of no finding.

**Example:**

Create a forwarding policy which named p1 and specified id as 10:

```
(config)#mls qos forwarding-profile p1 id 10
```

Delete the forwarding policy which named p1:

```
(config)#no mls qos forwarding-profile p1
```

## 7.6 bandwidth

**Command:** `bandwidth <minBandwidth> <maxBandwidth>`

`no bandwidth`

**Function :** Configure the minimum and the maximum bandwidth of the relevant vlan-shaping queue in the forwarding policy.

**Parameters:** *<minBandwidth>*, the minimum bandwidth, the range is 0 to 128000. 0 means there is no minimum bandwidth restriction. *<maxBandwidth>*, the maximum bandwidth, the range is 0 to 128000. 0 means there is no maximum bandwidth pledge. The maximum bandwidth must not be less than the minimum bandwidth.

**Command Mode:** Forwarding policy mode

**Default:** No minimum bandwidth pledge and maximum bandwidth restriction

**Usage Guide:** When the parameter is 0, it means there is no specified pledge or restriction, if the forwarding policy is not quoted by the schedule policy or the schedule policy of not binding to the port, this configuration will be saved into the software entry. If the forwarding policy is quoted, this configuration will be saved into the hardware.

**Example:**

Create a forwarding policy which named p1 and specified id as 10, then configure the minimum bandwidth pledge as 32kbps:

```
(config)#mls qos forwarding-profile p1 id 10
(config-forwarding-profile-p1)#bandwidth 32 0
```

Delete the minimum bandwidth of the forwarding policy which named p1:

```
(config-forwarding-profile-p1)#no bandwidth
```

## 7.7 drop

**Command:** drop *<dp-name>*

no drop

**Function:** Quote the drop policy in the forwarding policy.

**Parameters:** *< dp-name >* is the name of the drop policy.

**Command Mode:** Forwarding policy mode

**Default:** Do not quote the drop policy.

**Usage Guide:** Do not quote the drop policy means handle it with the drop policy. If the forwarding policy is not quoted by the schedule policy or the schedule policy of not binding to the port, this configuration will be saved into the software entry. If the forwarding policy is quoted, this configuration will be saved into the hardware.

**Example:**

Create a forwarding policy which named p1 and specified id as 10, then configure this forwarding policy quoting the drop policy which named dp1:

```
(config)#mls qos forwarding-profile p1 id 10
(config-forwarding-profile-p1)#drop dp1
```

Delete the drop policy of the forwarding policy which named p1:

```
(config-forwarding-profile-p1)#no drop
```

## 7.8 mls qos bandwidth

**Command:** `mls qos bandwidth <minBandwidth> <maxBandwidth>`  
`no mls qos bandwidth`

**Function:** Configure the minimum bandwidth pledge and maximum bandwidth restriction of the node of the relevant vlan shaping scheduling policy.

**Parameters:** `<minBandwidth>`, the minimum bandwidth, the range is 0 to 128000. 0 means there is no minimum bandwidth restriction. `< maxBandwidth >`, the maximum bandwidth, the range is 0 to 128000. 0 means there is no maximum bandwidth pledge. The maximum bandwidth must be larger than the minimum bandwidth or equal with it.

**Command Mode:** Schedule node mode

**Default:** No minimum bandwidth pledge and maximum bandwidth restriction

**Usage Guide:** The unit of minimum and maximum bandwidth is kbps which means the Kbit rate per second. If `<minBandwidth>` is 0, it means there is no minimum bandwidth pledge. If `<maxBandwidth>` is 0, it means there is no maximum bandwidth restriction. The maximum bandwidth must be larger than the minimum bandwidth or equal with it. For switch which support this function, it should configure this command under the mode of S3 schedule node.

**Example:**

Configure the overall minimum bandwidth pledge of vlan shaping queue as 64kbps on Ethernet 1/0/1, and the maximum bandwidth restriction is 256kbps:

```
(config)#mls qos schedule policy p1
(config-schedule-policy-p1)#mls qos schedule level 3 node 1
(config-schedule-policy-p1-l3nod1)#mls qos bandwidth 64 256
(config)#interface Ethernet 1/0/1
(config-if-ethernet1/0/1)#mls qos ets enable
(config-if-ethernet1/0/1)#mls qos schedule policy bind p1
```

## 7.9 mls qos drop-profile

**Command:** `mls qos drop-profile <dp-name> [id <dp-id>]`  
`no mls qos drop-profile <dp-name>`

**Function:** Create or delete the drop policy.

**Parameters:** **<dp-name>**, the name of the drop policy, it is a string of 1 to 64 character and it only supports the letter, number, underline and connector, it is distinguished by lowercase and capital letter; **<dp-id>** is optional parameter and only support the positive integer, if user does not specified the parameter, the system will find the maximum id in the used id once and plus 1 to be the new id to assign to this drop policy.

**Command Mode:** Global Mode

**Default:** No drop policy.

**Usage Guide:** When the port enabled wred successfully, it will issue the parameter of wred to the queue, the default minimum value is 10 and the default maximum value is 30, the default maximum drop probability is 10. Users can create the drop policy through this command and configure the parameter of wred, then create the relevance between the drop policy and a queue, it can control the specified queue as the configuration of users to avoid the congestion.

**Example:**

Create a drop policy which named dp1 and specify the number as 1, then enter the specified drop policy mode:

```
(config)#mls qos drop-profile dp1 id 1
```

Delete the drop policy which named dp1:

```
(config)#no mls qos drop-profile dp1
```

## 7.10 dp drop-startpoint drop-endpoint max-drop-rate

**Command:** **dp <dp> drop-startpoint <start> drop-endpoint <end> max-drop-rate <rate>**

**no dp [dp]**

**Function:** Configure the parameter of wred in the drop policy including type of color, minimum value, maximum value and the maximum drop probability.

**Parameters:** **<dp>** is the drop priority, the minimum value is 0 and the maximum is 2; **<start>** is the lower value of the beginning packet loss. It means the group begins to be dropped when the length of queue achieves this value, and this value is a percentage, the range is 0 to 100; **<end>** is the limit value of the complete packet loss. It means the group begins to be dropped completely when the length of queue achieves this value, and this value is a percentage, the range is 0 to 100; **<rate>** is the maximum drop probability. It means the proportion that the drop group occupied the overall group when the average length of all the queues achieves the value of **<end>**, the range is 0 to 100.

**Command Mode:** Drop policy mode

**Default:** The default of **<start>**, **<end>**, **<rate>** is 10, 30, 10.

**Usage Guide:** **<dp>** is the smaller, the priority is the higher. In the actual configuration, the **<start>** of the packet whose **<dp>** is smaller must larger than the **<start>** of the packet whose **<dp>** is greater; the **<end>** should larger than **<start>**.

**Example:**

To the packet whose probability is 1 in the drop policy which named dp1, the packets begin to be lost when the queue length achieving 30% of the maximum queue length. The packets begin to be lost in full speed when the queue length achieving 90% of the maximum queue length, but the lost packets occupied 50% in the overall packets:

```
(config)#mls qos drop-profile dp1
```

```
(config-drop-profile-dp1)# dp 1 drop-startpoint 30 drop-endpoint 90 max-drop-rate 50
```

## 7.11 mls qos schedule queue input forwarding-class

**Command:** **mls qos schedule queue <queueID> input forwarding-class <fc-name> profile <fp-name>**

**no mls qos schedule queue <queueID> input forwarding-class <fc-name>**

**Function:** Configure the input source of the queue of schedule node as forwarding class.

**Parameters:** **<queueID>** is a queue number of the schedule node, the minimum is 1, the maximum is related with the switch and the schedule node. For MRS-9800-24SFP+, the maximum is 18. **<fc-name>** is the name of the forwarding class, all the flow that is matching this forwarding class will be put into the queue with **<queueID>** to participate the schedule; **<fp-name>** is the name of the forwarding policy, the flow with **<fc-name>** is related to the forwarding policy.

**Command Mode:** Schedule node mode

**Default:** The forwarding class is not the input source of the queue.

**Usage Guide:** The forwarding class only matches outer vlan now, so the map from outer vlan to queue number can be configured by this command. Through configuration, vlan flow of the forwarding class will be put into the queue of **<queueID>** to participate the egress queue scheduling. Because the map from outer vlan to the queue number is a global map in the hardware register but not the map based on the port, users should ensure the specified schedule node number is same with the queue number on the schedule node when the same forwarding class is treated as the input source by different schedule policies. For example, configure the input source of the queue 3 of S3.1 in the schedule policy which named p1 as the forwarding class which named fc1, if configure the input source of the queue 3 of S3.1 in the schedule policy which named p2 as the



forwarding class which named fc2 or put the forwarding class which named fc1 onto another schedule node, the configuration will be failing. The same forwarding class in different schedule policies can relate different forwarding policies.

**Example:**

Create a forwarding class which named fc1 and configure the matching rule is the flow of vlan1 and vlan2. Create a schedule policy which named p1 and configure the input source of the first queue on S3.1 in p1 as fc1, Relate the forwarding policy which named fp1 and bind p1 to the port of ethernet1/0/1:

```
(config)#mls qos forwarding-class fc1
(config-forwarding-class-fc1)#match vlan 1-2
(config-forwarding-class-fc1)#exit
(config)#mls qos schedule policy p1
(config-schedule-policy-p1)#mls qos schedule level 3 node 1
(config-schedule-policy-p1-lel3nod1)#mls qos schedule queue 3 input forwarding-class
fc1 profile fp1
(config-schedule-policy-p1-lel3nod1)#exit
(config-schedule-policy-p1)#exit
(config)#interface ethernet1/0/1
(config-if-ethernet1/0/1)#mls qos ets enable
(config-if-ethernet1/0/1)#mls qos schedule policy bind p1
```

## 7.12 show mls qos vlan shaping capable ports

**Command:** show mls qos vlan shaping capable ports

**Function:** Show all the names of the ports which support vlan shaping now.

**Parameters:** None

**Command Mode:** Global Mode

**Default:** None

**Usage Guide:** Because the function of vlan shaping is not supported by all the ports in hardware, users should view and find the ports that support the function of vlan shaping through this command before enabling the function of vlan shaping.

**Example:**

Show all the names of the ports which support vlan shaping in hardware on the switch:

```
(config)#show mls qos vlan shaping capable ports
```

The following is the effect:

```
Interface Ethernet1/0/1; 5; 9; 13
```

## 7.13 show mls qos forwarding-class

**Command:** show mls qos forwarding-class [fc-name]

**Function:** Show the information of the specified forwarding class.

**Parameters:** [fc-name] is the name of forwarding class.

**Command Mode:** Global Mode

**Default:** None

**Usage Guide:** Show the name of forwarding class, the id of forwarding class and the specified rules of match. If the parameter of [fc-name] is not assigned, it means showing all the information of the forwarding class. If the parameter of [fc-name] is assigned, then show the information of the specified forwarding class.

**Example:**

Show all the information of the forwarding class(assume 3 forwarding class:vlan1, vlan2, vlan3):

```
(config)#show mls qos forwarding-class
```

The following is the effect:

```
Forwarding-Class name:vlan1, used by 0 time(s)
```

```
  Id: 1
```

```
  match: vlan 1
```

```
Forwarding-Class name:vlan2, used by 0 time(s)
```

```
  Id: 2
```

```
  match vlan: 2
```

```
Forwarding-Class name:vlan3, used by 0 time(s)
```

```
  id: 3
```

```
  match vlan 3
```

Show the information of vlan1:

```
(config)#show mls qos forwarding-class vlan1
```

The following is the effect:

```
Forwarding-Class name:vlan1, used by 0 time(s)
```

```
  id: 1
```

```
  match vlan 1
```

## 7.14 show mls qos forwarding-profile

**Command:** show mls qos forwarding-profile [fp-name]

**Function:** Show the information of the specified forwarding policy.

**Parameters:** [fp-name] is the name of forwarding policy

**Command Mode:** Global Mode

**Default:** None

**Usage Guide:** Show the name of forwarding policy, the id of forwarding policy, the minimum and maximum bandwidth and the name of the drop policy quoted. If the parameter of [fp-name] is not assigned, it means showing all the information of the forwarding policy. If the parameter of [fp-name] is assigned, then show the information of the specified forwarding policy.

**Example:**

Show all the information of the forwarding policy(assume 2 forwarding policy:p1, p2):

```
(config)#show mls qos forwarding-profile
```

The following is the effect:

```
Forwarding-Profile name:p1, used by 0 time(s)
```

```
  Id: 1
```

```
  bandwidth(minBW,maxBW): 32 64
```

```
  dropprofile: drop1
```

```
Forwarding-Profile name:p2, used by 0 time(s)
```

```
  Id: 2
```

```
  bandwidth(minBW,maxBW):64 0
```

```
  dropprofile:drop2
```

Show the information of p1:

```
(config)#show mls qos forwarding-profile p1
```

The following is the effect:

```
Forwarding-Profile name:p1, used by 0 time(s)
```

```
  Id: 1
```

```
  bandwidth(minBW,maxBW):32 64
```

```
  drop profile:drop1
```

## 7.15 show mls qos drop-profile

**Command:** show mls qos drop-profile [dp-name]

**Function:** Show the information of the specified drop policy.

**Parameters:** [dp-name] is the name of drop policy

**Command Mode:** Global Mode

**Default:** None

**Usage Guide:** According to the drop priority, 0, 1, 2 show the specified minimum value, the maximum value and the maximum drop probability. If the parameter of [dp-name] is not assigned, it means showing all the information of the drop policy. If the parameter of [dp-name] is assigned, then show the information of the specified drop policy.

**Example:**

Show all the information of the drop policy(assume 2 drop policy:drop1, drop2):

```
(config)#show mls qos drop-profile
```

The following is the effect:

```
Drop-Profile name:drop1, used by 1 time(s)
```

```
Id: 1
```

```
dp 0(start,end,rate): 50 70 30
```

```
dp 1(start,end,rate):40 60 40
```

```
dp 2(start,end,rate):30 50 50
```

```
Drop-Profile name:drop2, used by 1 time(s)
```

```
Id: 2
```

```
dp 0(start,end,rate):60 70 10
```

```
dp 1(start,end,rate):40 50 50
```

```
dp 2(start,end,rate):30 50 80
```

Show the information of drop1:

```
(config)#show mls qos drop-profile drop1
```

```
Drop-Profile name:drop1, used by 1 time(s)
```

```
Id: 1
```

```
dp 0(start,end,rate): 50 70 30
```

```
dp 1(start,end,rate): 40 60 40
```

```
dp 2(start,end,rate): 30 50 50
```

## 7.16 show mls qos schedule interface

**Command:** show mls qos schedule interface [<interface-name>|<interface-list>]

**Function:** Show the information of vlan shaping on the specified port including the queue scheduling algorithm of vlan shaping, the weight of the queue, node bandwidth limits and so on. In fact, the configuration information of vlan shaping will be shown when showing all the scheduling information on the specified port.

**Parameters:** <interface-name>, name of the port; <interface-list>, the list of the name of port, it supports the character of "-" and ";", such as ethernet1/0/1-3;5;7;9-12.

**Command Mode:** Global Mode

**Default:** None

**Usage Guide:** Show the configuration scheduling algorithm, the weight of the schedule, the minimum and maximum bandwidth on the specified port and so on with string. If the input source of the queue is forwarding class, show the name of forwarding class as input source.

**Example:** Show the information of vlan shaping on the port of ethernet9/5 on SFP+ (ethernet9/5 is assumed enabling the function of vlan shaping):

```
SWA(config)#show mls qos schedule interface ethernet 9/5
```

The effect is similar to the information bellow(the information of S3.1 is the information of vlan shaping)

Ethernet9/5:

Bandwidth Guarantee Configuration:

Queue	1	2	3	4	5	6	7	8
MinBW(Kbps)	0	0	0	0	0	0	0	0
MaxBW(Kbps)	0	0	0	0	0	0	0	0

Bandwidth Guarantee Configuration For MC Queue:

Queue	1	2	3	4
MinBW(Kbps)	0	0	0	0
MaxBW(Kbps)	0	0	0	0

ETS status: Enable

The following is the configuration information of the nodes in per layer:

mls qos schedule policy bind p1:

The information of level 1 node 1:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

```
Schedule Mode: sp
Queue Number 1 2 3 4
InputType node node node node
InputValue 1 2 3 4
InputForwardingProfile 0 0 0 0
WrrWeight 1 2 3 4
WdrrWeight 16 32 64 127
```

Notes: the node of S2.1 is prepared for binding the packet of mc exclusively:

The information of level 2 node 1:

```
MaxBandwidth(Kbps): 0
MinBandwidth(Kbps): 0
Schedule Mode: wrr
Queue Number 1 2 3 4
InputType none none none none
InputValue 0 0 0 0
InputForwardingProfile 0 0 0 0
WrrWeight 1 2 3 4
WdrrWeight 16 32 64 127
```

The information of level 2 node 2:

```
MaxBandwidth(Kbps): 0
MinBandwidth(Kbps): 0
Schedule Mode: wrr
Queue Number 1 2 3 4 5 6 7 8
InputType node node node node uc uc uc uc
InputValue 1 2 3 4 5 6 7 8
InputForwardingProfile 0 0 0 0 0 0 0 0 0 0
WrrWeight 1 2 3 4 5 6 7 8
WdrrWeight 16 32 64 127 127 127 127 127
```

The information of level 2 node 3:

```
MaxBandwidth(Kbps): 0
MinBandwidth(Kbps): 0
Schedule Mode: wrr
Queue Number 1 2 3 4 5 6 7 8
InputType none none none none none none none none
InputValue 0 0 0 0 0 0 0 0
InputForwardingProfile 0 0 0 0 0 0 0 0 0 0
WrrWeight 1 2 3 4 5 6 7 8
```

WdrWeight 16 32 64 127 127 127 127 127

The information of level 2 node 4:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: wrr

Queue Number 1 2 3 4 5 6 7 8

InputType none none none none none none none none

InputValue 0 0 0 0 0 0 0 0

InputForwardingProfile 0 0 0 0 0 0 0 0 0 0

WrrWeight 1 2 3 4 5 6 7 8

WdrWeight 16 32 64 127 127 127 127 127

The information of level 3 node 1:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

Queue Number 1 2 3 4 5 6 7 8 9 10 11

12 13 14 15 16 17 18

InputType mc uc none none none none none none none none

none none none none none none none none

InputValue 1 1 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0

InputForwardingProfile 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0

WrrWeight 1 2 3 4 5 6 7 8 9 10 11

12 13 14 15 16 17 18

WdrWeight 16 32 64 127 127 127 127 127 127 127

127 127 127 127 127 127 127 127

The information of level 3 node 2:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

Queue Number 1 2 3 4 5 6 7 8 9 10 11

12 13 14 15 16 17 18

InputType mc uc none none none none none none none none

none none none none none none none none

InputValue 2 2 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0

## Commands for QoS, PBR

### and Flow-based Redirection

### Chapter 7 Commands for Vlan-shaping

```
InputForwardingProfile 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
```

```
WrrWeight 1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18
```

```
WdrWeight 16 32 64 127 127 127 127 127 127 127
127 127 127 127 127 127 127 127
```

The information of level 3 node 3:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

```
Queue Number 1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18
```

```
InputType mc uc none none none none none none none none
none none none none none none none none
```

```
InputValue 3 3 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0
```

```
InputForwardingProfile 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
```

```
WrrWeight 1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18
```

```
WdrWeight 16 32 64 127 127 127 127 127 127 127
127 127 127 127 127 127 127 127
```

The information of level 3 node 4:

MaxBandwidth(Kbps): 0

MinBandwidth(Kbps): 0

Schedule Mode: rr

```
Queue Number 1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18
```

```
InputType mc uc none none none none none none none none
none none none none none none none none
```

```
InputValue 4 4 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0
```

```
InputForwardingProfile 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
```

```
WrrWeight 1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18
```

```
WdrWeight 16 32 64 127 127 127 127 127 127 127
127 127 127 127 127 127 127 127
```