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# 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 [interface <interface-name> | vlan <vlan-id>]`

**Function:** Clear accounting data of the specified ports or VLAN Policy Map. If there are no parameters, clear accounting data of all policy map.

**Parameters:** `<vlan-id>`: VLAN ID

`<interface-name>`: The interface name

**Default:** Do not set action.

**Command mode:** Admin Mode

**Usage Guide:** Clear accounting data of the specified ports or VLAN Policy Map. If there are no parameters, clear accounting data of all policy map.

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

---

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

## 1.5 clear mls qos queue statistics

This command is not supported by switch.

## 1.6 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
```

## 1.7 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 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. (The deny rule is not supported issuing in PBR, please pay attention to avoid it.) 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
```

## 1.8 mls qos aggregate-policy

This command is not supported by the switch.

## 1.9 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
```

## 1.10 mls qos internal-priority

This command is not supported *by the* switch.

## 1.11 mls qos map

**Command:** `mls qos map (cos-dp <dp1...dp8> | dscp-dscp <in-dscp list> to <out-dscp> | dscp-intp <in-dscp list> to <intp> | dscp-dp <in-dscp list> to <dp> )`  
`no mls qos map (cos-dp | dscp-dscp | dscp-intp | dscp-dp)`

`mls qos map intp-dscp <dscp1..dscp8>`  
`no mls qos map intp-dscp`

**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;

`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-dscp` defines the mapping from intp to DSCP, <dscp1..dscp8> are 8 DSCP value corresponding to the 0 to 7 intp value, each DSCP value is delimited with space, ranging from 0 to 63.

**Default:** Default mapping values are:

Default CoS-TO-DP Map



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

#### Default DSCP-TO-DSCP Map

In-DSCP Value	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63
Out-DSCP Value	0	8	16	24	32	40	48	56

#### Default DSCP-TO-INTP Map

In-DSCP Value	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63
INTP Value	0	1	2	3	4	5	6	7

#### Default DSCP-TO-DP Map

In-DSCP Value	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63
DP Value	0	0	0	0	0	0	0	0

**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-DSCP mapping value to the default 0 8 16 24 32 40 48 56 to 0 1 2 3 4 5 6 7.

```
Switch(config)#mls qos map cos-dscp 0 1 2 3 4 5 6 7
```

2. Mapping DSCP 1, 2 to COS 7.

```
Switch(config)#mls qos map dscp-cos 1 2 to 7
```

## 1.12 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

## 1.13 mls qos queue drop-algorithm

This command is not supported by switch.

## 1.14 mls qos queue statistics enable

This command is not supported by switch.

## 1.15 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

## 1.16 mls qos queue wred

This command is not supported by switch.

## 1.17 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
```

## 1.18 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
```

## 1.19 mls qos trust

**Command:** mls qos trust dscp

no mls qos trust dscp

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

**Parameters:** 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
```

## 1.20 pass-through-cos

This command is not supported by switch.

## 1.21 pass-through-dscp

This command is not supported by the switch.

## 1.22 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.

**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;

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**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. ( policy

aggregate ) "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
```

## 1.23 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
```

## 1.24 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
```

## 1.25 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. Egress policy map is not supported yet.

**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
```

## 1.26 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. Egress policy map is not supported yet.

**Example:**

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

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

## 1.27 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.

`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

## 1.28 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.

## 1.29 show policy-map

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

**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

### 1.30 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.

**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
```

## Commands for QoS, PBR

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

```

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
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

## Commands for QoS, PBR

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	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  
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

### 1.31 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 ethernet1/0/1 policy

Ethernet1/0/1:

Attached Policy Map for Ingress: p

## 1.32 show mls qos interface wred

This command is not supported by switch.

## 1.33 show mls qos maps

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

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

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

**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-dscp:** The mapping from egress internal priority to DSCP

**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#show mls qos maps

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	1	2	3	4	5	6	7	8	9
----	---	---	---	---	---	---	---	---	---	---

1:	10	11	12	13	14	15	16	17	18	19
----	----	----	----	----	----	----	----	----	----	----

2:	20	21	22	23	24	25	26	27	28	29
----	----	----	----	----	----	----	----	----	----	----

3:	30	31	32	33	34	35	36	37	38	39
----	----	----	----	----	----	----	----	----	----	----

4:	40	41	42	43	44	45	46	47	48	49
----	----	----	----	----	----	----	----	----	----	----

5:	50	51	52	53	54	55	56	57	58	59
----	----	----	----	----	----	----	----	----	----	----

6:	60	61	62	63
----	----	----	----	----

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
----	---	---	---	---	---	---	---	---	---	---

## Commands for QoS, PBR

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

---

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 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-DSCP map

INTP: 0 1 2 3 4 5 6 7

-----  
DSCP: 0 8 16 24 32 40 48 56

## 1.34 show mls qos queue statistics

This command is not supported by switch.

## 1.35 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



## 1.36 show mls qos aggregate-policy

This command is not supported by the switch.

## 1.37 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

**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 match vlan *<1-4096>* redirect interface (ethernet|)

#### IFNAME

This command is not supported by switch.

### 2.3 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 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
```

## **2.4 vlan-port-redirect vlan maximum <1-1000>**

This command is not supported by switch.

## 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**

This command is not supported by switch.

## Chapter 4 Commands for Flexible QinQ

### 4.1 add

This command is *not* supported by switch.

### 4.2 delete

This command is *not* supported by switch.

### 4.3 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 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

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

**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 p1 in
```

## 4.5 set

**Command:** `add s-vid <vid>`  
`no add s-vid`

**Function:** Add the specified external tag to the packets which match the class-map, the no command cancels the operation.

**Parameter:** `<vid>` specifies VID of the external VLAN Tag.

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

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



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

**Example:** Add a external tag with VID of 2 for the packets 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
```

## 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 "cl" and set the match rule of this class-map as matching the EXP value 0 and 1 in the topmost label of MPSL 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

**Command:** `mls qos trust exp`  
`no mls qos trust`

**Function:** Set the interface to trust the MPSL EXP value; the no operation will disable the trust state of the switch interface.

**Parameter:** `exp`: configure the interface to trust the EXP value.

**Default:** the interface does not trust the EXP of MPLS messages.

**Command Mode:** Port Configuration Mode.

**Usage Guide:** The

### 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
```