



FEX QoS Configuration

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FEX QoS Configuration Information



Note FEX QoS is not supported on the Cisco Nexus 9508 switch (NX-OS 7.0(3)F3(3).



Note Only 4Q queuing policy model is supported on FEX. When you try to bring up FEX in 8Q queuing policy mode you will get an error message.

- Classification (system type qos policy)

Type	System Level Action	Hardware Implementation	
		Direction: IN	
		FEX	Switch
match	cos	Yes	No
	ip access list	No	No
	dscp	No	No
	ip	No	No
	precedence	No	No
	protocol	No	No
set	qos-group	Yes	No

	precedence	No	No
	dscp	No	No
	cos	No	No
Type	Interface Level Action	Hardware Implementation	
		Direction: IN	
		FEX	Switch
match	cos	No	Yes
	ip access list	No	Yes
	dscp	No	Yes
	ip	No	Yes
	precedence	No	Yes
	protocol	No	Yes
set	dscp	No	Yes
	precedence	No	Yes
	qos-group	No	Yes
	cos	No	Yes

- Input queuing

System Level Action	Hardware Implementation	
	Direction: IN	
	FEX	Switch
Bandwidth	Yes	No
Bandwidth Remaining	Yes	No
Priority (only level 1)	Yes	No
Interface Level Action	Hardware Implementation	
	Direction: IN	
	FEX	Switch
Bandwidth	No	No
Bandwidth Remaining	No	No
Priority	No	No

- Output queuing

System Level Action	Hardware Implementation	
	Direction: OUT	
	FEX	Switch
Bandwidth	Yes	Yes
Bandwidth Remaining	Yes	Yes
Priority (only level 1 on FEX, 3 levels on switch)	Yes	Yes
Interface Level Action	Hardware Implementation	
	Direction: OUT	
	FEX	Switch
Bandwidth	No	Yes
Bandwidth Remaining	No	Yes
Priority	No	Yes

TCAM Carving for FEX QoS

You must free up unused TCAM space to accommodate TCAM carving for FEX QoS.



Note FEX QoS is not supported on the Cisco Nexus 9508 switch (NX-OS 7.0(3)F3(3)).

- For FEX QoS TCAM carving for IPv4 traffic, you can use the **hardware access-list tcam region fex-qos 256** command.

As a best practice, you can use the **hardware access-list tcam region fex-qos-lite 256** command when policers are not used.



Note The fex-qos-lite region does not have conformed policer statistics support for IPv4.

- For IPv6 QoS TCAM carving support, you can use the **hardware access-list tcam region fex-ipv6-qos 256** command.
- For MAC based QoS TCAM carving support, you can use the **hardware access-list tcam region fex-mac-qos 256** command.

- When configuring end to end queuing from the HIF to the front panel port, the QoS classification policy needs to be applied to both system and HIF. This allows the FEX to queue on ingress appropriately (system) and allows the egress front panel port to queue appropriately (HIF).

Example:

```
system qos
  service-policy type qos input LAN-QOS-FEX

interface Ethernet101/1/12
  service-policy type qos input LAN-QOS-FEX
```

Example of a FEX QoS Marking Policy Configuration

The following example is to configure set cos when the incoming traffic is untagged on the Layer 3 uplink port with DSCP values. In this way, it carries cos values to the FEX ports when traffic comes on the Layer 3 port and egress out on the FEX HIF port.

```
class-map type qos match-all DSCP8
  match dscp 8
class-map type qos match-all DSCP16
  match dscp 16
class-map type qos match-all DSCP32
  match dscp 32
policy-map type qos-remark
  class DSCP8
    set qos-group 1
    set cos 0
  class DSCP16
    set qos-group 2
    set cos 1
  class DSCP32
    set qos-group 3
    set cos 3
  class class-default
```

For configuring the uplink Layer 3 ports:

```
Int ethx/y
  Service-policy type qos input qos-remark
```

FEX QoS Configuration Example



Note FEX QoS is not supported on the Cisco Nexus 9508 switch (NX-OS 7.0(3)F3(3)).

The following are examples of the aspects of a FEX QoS configuration.

Classification (system type qos policy)

Policies of type qos are applied to classify incoming packets.

- Class map configuration:

```

switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.

switch(config)# class-map type qos match-all cos0
switch(config-cmap-qos)# match cos 0
switch(config-cmap-qos)#
switch(config-cmap-qos)# class-map type qos match-all cos1
switch(config-cmap-qos)# match cos 1
switch(config-cmap-qos)#
switch(config-cmap-qos)# class-map type qos match-all cos2
switch(config-cmap-qos)# match cos 2
switch(config-cmap-qos)#
switch(config-cmap-qos)# class-map type qos match-all cos3
switch(config-cmap-qos)# match cos 3
switch(config-cmap-qos)#

```

- Policy map configuration:

```

switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.

switch(config)# policy-map type qos setpol
switch(config-pmap-qos)# class cos0
switch(config-pmap-c-qos)# set qos-group 1
switch(config-pmap-c-qos)# class cos1
switch(config-pmap-c-qos)# set qos-group 2
switch(config-pmap-c-qos)# class cos3
switch(config-pmap-c-qos)# set qos-group 3
switch(config-pmap-c-qos)# class class-default
switch(config-pmap-c-qos)#

```

- Attach service policy to system target configuration:

```

switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.

switch(config)# system qos
switch(config-sys-qos)# service-policy type qos input setpol

```

- Verifying classification:

```

switch# show policy-map system type qos

Service-policy (qos) input:  setpol
policy statistics status:  disabled (current status: disabled)

Class-map (qos):  cos0 (match-all)
Match: cos 0
set qos-group 1

Class-map (qos):  cos1 (match-all)
Match: cos 1
set qos-group 2

Class-map (qos):  cos23 (match-all)
Match: cos 2-3
set qos-group 3

Class-map (qos):  class-default (match-any)

```

```
switch# show queuing interface ethernet 101/1/1
```

```
slot 1
=====
```

```
Ethernet101/1/1 queuing information:
```

```
Input buffer allocation:
```

```
Qos-group: ctrl
```

```
frh: 0
```

```
drop-type: drop
```

```
cos: 7
```

```
xon      xoff      buffer-size
```

```
-----+-----+-----
```

```
2560      7680      10240
```

```
Qos-group: 0 1 2 3 (shared)
```

```
frh: 2
```

```
drop-type: drop
```

```
cos: 0 1 2 3 4 5 6
```

```
xon      xoff      buffer-size
```

```
-----+-----+-----
```

```
19200      24320      48640
```

```
Queueing:
```

queue	qos-group	cos	priority	bandwidth	mtu
ctrl-hi	n/a	7	PRI	0	2400
ctrl-lo	n/a	7	PRI	0	2400
2	0	4 5 6	WRR	10	9280
3	1	0	WRR	20	9280
4	2	1	WRR	30	9280
5	3	2 3	WRR	40	9280

```
Queue limit: 66560 bytes
```

```
Queue Statistics:
```

queue	rx	tx	flags
0	0	68719476760	ctrl
1	1	1	ctrl
2	0	0	data
3	1	109453	data
4	0	0	data
5	0	0	data

```
Port Statistics:
```

rx drop	rx mcast drop	rx error	tx drop	mux overflow
0	0	0	0	InActive

```
Priority-flow-control enabled: no
```

```
Flow-control status: rx 0x0, tx 0x0, rx_mask 0x0
```

```
cos      qos-group  rx pause  tx pause  masked rx pause
```

```
-----+-----+-----+-----+-----
```

```
0          1      xon      xon      xon
```

```
1          2      xon      xon      xon
```

```
2          3      xon      xon      xon
```

```
3          3      xon      xon      xon
```

```
4          0      xon      xon      xon
```

```
5          0      xon      xon      xon
```

```
6          0      xon      xon      xon
```

```
7          n/a     xon      xon      xon
```

```
DSCP to Queue mapping on FEX
```

```
-----+-----+-----+-----
```

```
DSCP to Queue map disabled
```

```

FEX TCAM programmed successfully

switch#

switch# attach fex 101

fex-101# show platform software qosctrl port 0 0 hif 1
number of arguments 6: show port 0 0 3 1
-----
QoSCtrl internal info {mod 0x0 asic 0 type 3 port 1}

PI mod 0 front port 0 if_index 0x00000000
  ups 0 downs 0 binds 0
Media type 0
Port speed 0
MAC addr b0:00:b4:32:05:e2
Port state: , Down

Untagged COS config valid: no
Untagged COS dump:
rx_cos_def[0]=0, tx_cos_def[0]=0
rx_cos_def[1]=3, tx_cos_def[1]=3
Last queueing config recvd from supId: 0
-----SUP 0 start -----

Queueing config per qos_group
Interface queueing config valid: no

Queueing per qos_group: 00006|
  |id|bw%|bw_unit|priority
grp |00|100|00000000|00000000
grp |01|000|00000000|00000000
grp |02|000|00000000|00000000
grp |03|000|00000000|00000000
grp |04|000|00000000|00000000
grp |05|000|00000000|00000000

Scheduling Classes 00008|
  |id|cbmp|qid|bw%|nor_bw%|bw_unit|prio|dir |q2cos|class_grp|wk_gmap
class |00|0x01|000|000|00000000|00000007|0001| TX| 0x80|000000000|00000000
class |01|0x02|001|000|00000000|00000007|0001| TX| 0x00|000000000|00000000
class |02|0x04|002|000|00000000|00000007|0000| TX| 0x08|000000002|00000000
class |03|0x08|003|100|0000100|00000007|0000| TX| 0xf7|000000003|00000000
class |04|0x10|004|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
class |05|0x20|005|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
class |06|0x40|006|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
class |07|0x80|007|000|00000000|00000007|0000| TX| 0x00|000000003|00000000

-----SUP 0 end -----

-----SUP 1 start -----

Queueing config per qos_group
Interface queueing config valid: no

Queueing per qos_group: 00006|
  |id|bw%|bw_unit|priority
grp |00|100|00000000|00000000
grp |01|000|00000000|00000000
grp |02|000|00000000|00000000
grp |03|000|00000000|00000000

```

```
grp |04|000|00000000|00000000
grp |05|000|00000000|00000000
```

```
Scheduling Classes 00008|
  |id|cbmp|qid|bw%|nor_bw%|bw_unit|prio|dir |q2cos|class_grp|wk_gmap
class |00|0x01|000|000|00000000|00000007|0001| TX| 0x80|000000000|00000000
class |01|0x02|001|000|00000000|00000007|0001| TX| 0x00|000000000|00000000
class |02|0x04|002|000|00000000|00000007|0000| TX| 0x08|000000002|00000000
class |03|0x08|003|100|0000100|00000007|0000| TX| 0xf7|000000003|00000000
class |04|0x10|004|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
class |05|0x20|005|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
class |06|0x40|006|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
class |07|0x80|007|000|00000000|00000007|0000| TX| 0x00|000000003|00000000
```

```
-----SUP 1 end -----
```

```
PFC 0 (disabled), net_port 0x0
END of PI SECTION
HIF0/0/1
```

Default CoS: 0

CoS	Rx-Remap	Tx-Remap	Class
0	0	0	3
1	1	1	4
2	2	2	5
3	3	3	5
4	4	4	2
5	5	5	2
6	6	6	2
7	7	7	1

Class	FRH	CT-En	MTU-Cells	[Bytes]
0	0	0	30	[2400]
1	0	0	30	[2400]
2	2	0	116	[9280]
3	2	0	116	[9280]
4	2	0	116	[9280]
5	2	0	116	[9280]
6	2	0	127	[10160]
7	2	0	127	[10160]

FRH configuration:

```
Port En: 1, Tail Drop En: 0, Emergency Stop En: 1, Err Discard En: 1
```

FRH	Xon	Xoff	Total	Pause	u-Pause	Class-Map
0	2	6	8	1	0	0x03
1	0	0	0	0	0	0x00
2	15	19	38	1	0	0x3c
3	0	0	0	0	0	0x00
4	0	0	0	0	0	0x00
5	0	0	0	0	0	0x00
6	0	0	0	0	0	0x00
7	0	0	0	0	0	0x00

Global FRH:

```
FRH Map: 0x00, Pause Class Map: 0x00
Xoff Threshold: 0, Total Credits: 0
```

Pause configuration:

PFC disabled
 Rx PFC CoS map: 0x00, Tx PFC CoS map: 0x00

Index	CoS-to-Class	Class-to-CoS
0	0x00	0xff
1	0x00	0xff
2	0x00	0xff
3	0x00	0xff
4	0x00	0xff
5	0x00	0xff
6	0x00	0xff
7	0x00	0xff

OQ configuration:
 Credit Quanta: 1, IPG Adjustment: 0
 PQ0 En: 0, PQ0 Class: 0
 PQ1 En: 0, PQ1 Class: 0

Class	XoffToMap	TD	HD	DP	Grp	LSP	GSP	CrDec	bw
0	0 0	1	0	0	0	1	0	0	0
1	0 0	1	0	0	1	0	1	0	0
2	0 0	1	0	0	2	0	0	50	10
3	0 0	1	0	0	2	0	0	24	20
4	0 0	1	0	0	2	0	0	16	30
5	0 0	1	0	0	2	0	0	12	40
6	0 0	1	0	0	2	0	0	0	0
7	0 0	1	0	0	2	0	0	0	0

SS statistics:

Class	Rx (WR_RCVD)	Tx (RD_SENT)
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

Rx Discard (WR_DISC): 0
 Rx Multicast Discard (WR_DISC_MC): 0
 Rx Error (WR_RCV_ERR): 0

OQ statistics:
 Packets flushed: 0
 Packets timed out: 0

Pause statistics:

CoS	Rx PFC Xoff	Tx PFC Xoff
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

Rx Xoff: 0
 Rx Xon: 0
 Tx Xoff: 0
 Tx Xon: 0

```

Rx PFC:          0
Tx PFC:          0
Rx Xoff Status: 0x00
Tx Xoff Status: 0x00

SS  RdPort  Class  Head   Tail   QCount  RealQCountRx
-----+-----+-----+-----+-----+-----
0   1        0     3113  9348   0        0
0   1        1    11057  4864   0        0
0   1        2     5356  4257   0        0
0   1        3    12304 10048   0        0
0   1        4    11346  2368   0        0
0   1        5      162   165    0        0
0   1        6   14500  112    0        0
0   1        7   12314  9602   0        0
fex-101#

```

Input queuing (system type queuing input policy)



Note System input queuing is applied on NIF Ports for HIF to NIF traffic.

- Class map (system defined class map) configuration:

```

switch# show class-map type queuing
Type queuing class-maps
=====
class-map type queuing match-any c-out-q3
  Description: Classifier for Egress queue 3
  match qos-group 3

class-map type queuing match-any c-out-q2
  Description: Classifier for Egress queue 2
  match qos-group 2

class-map type queuing match-any c-out-q1
  Description: Classifier for Egress queue 1
  match qos-group 1

class-map type queuing match-any c-out-q-default
  Description: Classifier for Egress default queue
  match qos-group 0

class-map type queuing match-any c-in-q3
  Description: Classifier for Ingress queue 3
  match qos-group 3

class-map type queuing match-any c-in-q2
  Description: Classifier for Ingress queue 2
  match qos-group 2

class-map type queuing match-any c-in-q1
  Description: Classifier for Ingress queue 1
  match qos-group 1

class-map type queuing match-any c-in-q-default
  Description: Classifier for Ingress default queue
  match qos-group 0
switch#

```

- Policy map configuration:

```
switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# policy-map type queuing inq_pri
switch(config-pmap-que)# class type queuing c-in-q3
switch(config-pmap-c-que)# priority level 1
switch(config-pmap-c-que)# class type queuing c-in-q2
switch(config-pmap-c-que)# bandwidth remaining percent 50
switch(config-pmap-c-que)# class type queuing c-in-q1
switch(config-pmap-c-que)# bandwidth remaining percent 30
switch(config-pmap-c-que)# class type queuing c-in-q-default
switch(config-pmap-c-que)# bandwidth remaining percent 20
switch(config-pmap-c-que)#
```

- Attach service policy to system target configuration:

```
switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.

switch(config)# system qos
switch(config-sys-qos)# service-policy type queuing input inq_pri
```

- Verifying input queuing:

```
switch# show policy-map system type queuing input

Service-policy (queuing) input:  inq_pri
policy statistics status:  disabled (current status: disabled)

Class-map (queuing):  c-in-q3 (match-any)
priority level 1

Class-map (queuing):  c-in-q2 (match-any)
bandwidth remaining percent 50

Class-map (queuing):  c-in-q1 (match-any)
bandwidth remaining percent 30

Class-map (queuing):  c-in-q-default (match-any)
bandwidth remaining percent 20

switch# attach fex 101

fex-101# show platform software qosctrl port 0 0 nif 1
number of arguments 6: show port 0 0 2 1
-----
QoSctrl internal info {mod 0x0 asic 0 type 2 port 1}

PI mod 0 front port 0 if_index 0x00000000
ups 0 downs 0 binds 0
Media type 3
Port speed 10000
MAC addr 00:00:00:00:00:00
Port state: , Down

fabric_num 0, ctrl_vntag 0
ctrl_vlan 0, vntag_etype 0

Untagged COS config valid: no
Untagged COS dump:
```

```

rx_cos_def[0]=0, tx_cos_def[0]=0
rx_cos_def[1]=3, tx_cos_def[1]=3

Last queueing config recvd from supId: 0

-----SUP 0 start -----

Queueing config per qos_group
Interface queueing config valid: no

Queueing per qos_group: 00006|
  id|bw%|bw_unit|priority
grp |00|100|0000000|00000000
grp |01|000|0000000|00000000
grp |02|000|0000000|00000000
grp |03|000|0000000|00000000
grp |04|000|0000000|00000000
grp |05|000|0000000|00000000

Scheduling Classes 00008|
  id|cbmp|qid|bw%|nor_bw%|bw_unit|prio|dir |q2cos|class_grp|wk_gmap
class |00|0x01|000|000|0000000|0000007|0001| TX| 0x80|00000000|00000004
class |01|0x02|001|000|0000000|0000007|0001| TX| 0x00|00000000|00000005
class |02|0x04|002|000|0000000|0000007|0000| TX| 0x08|00000002|00000000
class |03|0x08|003|100|0000100|0000007|0000| TX| 0xf7|00000003|00000000
class |04|0x10|004|000|0000000|0000007|0000| TX| 0x00|00000003|00000000
class |05|0x20|005|000|0000000|0000007|0000| TX| 0x00|00000003|00000000
class |06|0x40|006|000|0000000|0000007|0000| TX| 0x00|00000003|00000000
class |07|0x80|007|000|0000000|0000007|0000| TX| 0x00|00000003|00000000

-----SUP 0 end -----

-----SUP 1 start -----

Queueing config per qos_group
Interface queueing config valid: no

Queueing per qos_group: 00006|
  id|bw%|bw_unit|priority
grp |00|100|0000000|00000000
grp |01|000|0000000|00000000
grp |02|000|0000000|00000000
grp |03|000|0000000|00000000
grp |04|000|0000000|00000000
grp |05|000|0000000|00000000

Scheduling Classes 00008|
  id|cbmp|qid|bw%|nor_bw%|bw_unit|prio|dir |q2cos|class_grp|wk_gmap
class |00|0x01|000|000|0000000|0000007|0001| TX| 0x80|00000000|00000004
class |01|0x02|001|000|0000000|0000007|0001| TX| 0x00|00000000|00000005
class |02|0x04|002|000|0000000|0000007|0000| TX| 0x08|00000002|00000000
class |03|0x08|003|100|0000100|0000007|0000| TX| 0xf7|00000003|00000000
class |04|0x10|004|000|0000000|0000007|0000| TX| 0x00|00000003|00000000
class |05|0x20|005|000|0000000|0000007|0000| TX| 0x00|00000003|00000000
class |06|0x40|006|000|0000000|0000007|0000| TX| 0x00|00000003|00000000
class |07|0x80|007|000|0000000|0000007|0000| TX| 0x00|00000003|00000000

-----SUP 1 end -----

PFC 1 (enabled), net_port 0x0
END of PI SECTION
NIFO/0/1

```

Default CoS: 0

CoS	Rx-Remap	Tx-Remap	Class
0	0	0	3
1	1	1	4
2	2	2	5
3	3	3	5
4	4	4	2
5	5	5	2
6	6	6	2
7	7	7	1

Class	FRH	CT-En	MTU-Cells [Bytes]
0	0	1	30 [2400]
1	0	1	30 [2400]
2	2	1	116 [9280]
3	3	1	116 [9280]
4	4	1	116 [9280]
5	5	1	116 [9280]
6	2	1	127 [10160]
7	2	1	127 [10160]

FRH configuration:

Port En: 1, Tail Drop En: 1, Emergency Stop En: 1, Err Discard En: 1

FRH	Xon	Xoff	Total	Pause	u-Pause	Class-Map
0	2	6	16	1	0	0x03
1	0	0	0	0	0	0x00
2	0	0	0	0	0	0x04
3	0	0	0	0	0	0x08
4	0	0	0	0	0	0x10
5	0	0	0	0	0	0x20
6	0	0	0	0	0	0x00
7	0	0	0	0	0	0x00

Global FRH:

FRH Map: 0x3c, Pause Class Map: 0x3c
Xoff Threshold: 0, Total Credits: 0

Pause configuration:

PFC disabled

Rx PFC CoS map: 0x00, Tx PFC CoS map: 0x00

Index	CoS-to-Class	Class-to-CoS
0	0x00	0xff
1	0x00	0xff
2	0x00	0xff
3	0x00	0xff
4	0x00	0xff
5	0x00	0xff
6	0x00	0xff
7	0x00	0xff

OQ configuration:

Credit Quanta: 1, IPG Adjustment: 0

PQ0 En: 0, PQ0 Class: 0

PQ1 En: 0, PQ1 Class: 0

Class	XoffToMap	TD	HD	DP	Grp	LSP	GSP	CrDec	bw
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0

```

0      0 0      0 0 1 0 1 0 0 0
1      0 0      0 0 1 1 0 1 0 0
2      0 0      0 0 1 2 0 0 24 20
3      0 0      0 0 1 2 0 0 16 30
4      0 0      0 0 1 2 0 0 10 50
5      0 0      0 0 1 2 0 1 255 0
6      0 0      0 0 1 2 0 0 0 0
7      0 0      0 0 1 2 0 0 0 0

```

SS statistics:

```

Class  Rx (WR_RCVD)          Tx (RD_SENT)
-----+-----
0      0                    68719476736
1      0                    0
2      0                    0
3      0                    0
4      0                    0
5      0                    0
6      0                    0
7      0                    0

```

```

Rx Discard (WR_DISC):      0
Rx Multicast Discard (WR_DISC_MC): 0
Rx Error (WR_RCV_ERR):    0

```

OQ statistics:

```

Packets flushed: 0
Packets timed out: 0

```

Pause statistics:

```

CoS    Rx PFC Xoff          Tx PFC Xoff
-----+-----
0      0                    0
1      0                    0
2      0                    0
3      0                    0
4      0                    0
5      0                    0
6      0                    0
7      0                    0

```

```

Rx Xoff:      0
Rx Xon:       0
Tx Xoff:      0
Tx Xon:       0
Rx PFC:       0
Tx PFC:       0
Rx Xoff Status: 0x00
Tx Xoff Status: 0x00

```

```
fex-101#
```

Output queuing (system type queuing output policy)



Note System Output queuing is applied on HIF Ports for NIF to HIF traffic.

- Policy map (system defined policy map):

```
switch# show policy-map type queuing default-out-policy
```

```
Type queuing policy-maps
=====

policy-map type queuing default-out-policy
  class type queuing c-out-q3
    priority level 1
  class type queuing c-out-q2
    bandwidth remaining percent 0
  class type queuing c-out-q1
    bandwidth remaining percent 0
  class type queuing c-out-q-default
    bandwidth remaining percent 100
```

- Policy map (user defined policy map) configuration:

```
switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# policy-map type queuing outq
switch(config-pmap-que)# class type queuing c-out-q3
switch(config-pmap-c-que)# bandwidth percent 40
switch(config-pmap-c-que)# class type queuing c-out-q2
switch(config-pmap-c-que)# bandwidth percent 30
switch(config-pmap-c-que)# class type queuing c-out-q1
switch(config-pmap-c-que)# bandwidth percent 20
switch(config-pmap-c-que)# class type queuing c-out-q-default
switch(config-pmap-c-que)# bandwidth percent 10
switch(config-pmap-c-que)#
```

- Attach service policy to system target configuration:

```
switch# conf t
Enter configuration commands, one per line. End with CNTL/Z.

switch(config)# system qos
switch(config-sys-qos)# service-policy type queuing output outq
```

- Verifying output queuing:

```
switch# show policy-map system type queuing output

Service-policy (queuing) output:  outq
policy statistics status:  disabled (current status: disabled)

Class-map (queuing):  c-out-q3 (match-any)
bandwidth percent 40

Class-map (queuing):  c-out-q2 (match-any)
bandwidth percent 30

Class-map (queuing):  c-out-q1 (match-any)
bandwidth percent 20

Class-map (queuing):  c-out-q-default (match-any)
bandwidth percent 10

switch# show queuing interface ethernet 101/1/1

slot 1
=====
Ethernet101/1/1 queuing information:
Input buffer allocation:
Qos-group: ctrl
```

```

frh: 0
drop-type: drop
cos: 7
xon      xoff      buffer-size
-----+-----+-----
2560     7680     10240
Qos-group: 0 1 2 3 (shared)
frh: 2
drop-type: drop
cos: 0 1 2 3 4 5 6
xon      xoff      buffer-size
-----+-----+-----
19200    24320    48640
    
```

```

Queueing:
queue    qos-group    cos            priority  bandwidth  mtu
-----+-----+-----+-----+-----+-----
ctrl-hi  n/a              7             PRI       0          2400
ctrl-lo  n/a              7             PRI       0          2400
2        0                4 5 6        WRR       10         9280
3        1                0             WRR       20         9280
4        2                1             WRR       30         9280
5        3                2 3          WRR       40         9280
Queue limit: 66560 bytes
    
```

Queue Statistics:

```

queue  rx          tx          flags
-----+-----+-----+-----
0      0          68719476760  ctrl
1      1           1           ctrl
2      0           0           data
3      1          109453       data
4      0           0           data
5      0           0           data
    
```

Port Statistics:

```

rx drop      rx mcast drop  rx error      tx drop      mux overflow
-----+-----+-----+-----+-----
0            0              0              0            InActive
    
```

Priority-flow-control enabled: no

Flow-control status: rx 0x0, tx 0x0, rx_mask 0x0

```

cos      qos-group  rx pause  tx pause  masked rx pause
-----+-----+-----+-----+-----
0        1        xon      xon      xon
1        2        xon      xon      xon
2        3        xon      xon      xon
3        3        xon      xon      xon
4        0        xon      xon      xon
5        0        xon      xon      xon
6        0        xon      xon      xon
7        n/a     xon      xon      xon
    
```

DSCP to Queue mapping on FEX

```

-----+-----+-----+-----+-----
    
```

DSCP to Queue map disabled

FEX TCAM programmed successfully

switch#

```

switch# attach fex 101
fex-101# show platform software qosctrl port 0 0 hif 1
    
```



```

number of arguments 6: show port 0 0 3 1
-----
QoSCtrl internal info {mod 0x0 asic 0 type 3 port 1}

PI mod 0 front port 0 if_index 0x00000000
  ups 0 downs 0 binds 0
Media type 0
Port speed 0
MAC addr b0:00:b4:32:05:e2
Port state: , Down

Untagged COS config valid: no
Untagged COS dump:
rx_cos_def[0]=0, tx_cos_def[0]=0
rx_cos_def[1]=3, tx_cos_def[1]=3
Last queueing config recvd from supId: 0
-----SUP 0 start -----

Queueing config per qos_group
Interface queueing config valid: no

Queueing per qos_group: 00006|
  |id|bw%|bw_unit|priority
grp |00|100|00000000|00000000
grp |01|000|00000000|00000000
grp |02|000|00000000|00000000
grp |03|000|00000000|00000000
grp |04|000|00000000|00000000
grp |05|000|00000000|00000000

Scheduling Classes 00008|
  |id|cbmp|qid|bw%|nor_bw%|bw_unit|prio|dir |q2cos|class_grp|wk_gmap
class |00|0x01|000|000|0000000|00000007|0001| TX| 0x80|000000000|00000000
class |01|0x02|001|000|0000000|00000007|0001| TX| 0x00|000000000|00000000
class |02|0x04|002|000|0000000|00000007|0000| TX| 0x08|000000002|00000000
class |03|0x08|003|100|0000100|00000007|0000| TX| 0xf7|000000003|00000000
class |04|0x10|004|000|0000000|00000007|0000| TX| 0x00|000000003|00000000
class |05|0x20|005|000|0000000|00000007|0000| TX| 0x00|000000003|00000000
class |06|0x40|006|000|0000000|00000007|0000| TX| 0x00|000000003|00000000
class |07|0x80|007|000|0000000|00000007|0000| TX| 0x00|000000003|00000000

-----SUP 0 end -----

-----SUP 1 start -----

Queueing config per qos_group
Interface queueing config valid: no

Queueing per qos_group: 00006|
  |id|bw%|bw_unit|priority
grp |00|100|00000000|00000000
grp |01|000|00000000|00000000
grp |02|000|00000000|00000000
grp |03|000|00000000|00000000
grp |04|000|00000000|00000000
grp |05|000|00000000|00000000

Scheduling Classes 00008|
  |id|cbmp|qid|bw%|nor_bw%|bw_unit|prio|dir |q2cos|class_grp|wk_gmap
class |00|0x01|000|000|0000000|00000007|0001| TX| 0x80|000000000|00000000
class |01|0x02|001|000|0000000|00000007|0001| TX| 0x00|000000000|00000000
class |02|0x04|002|000|0000000|00000007|0000| TX| 0x08|000000002|00000000
class |03|0x08|003|100|0000100|00000007|0000| TX| 0xf7|000000003|00000000
class |04|0x10|004|000|0000000|00000007|0000| TX| 0x00|000000003|00000000

```

```

class |05|0x20|005|000|0000000|0000007|0000| TX| 0x00|000000003|00000000
class |06|0x40|006|000|0000000|0000007|0000| TX| 0x00|000000003|00000000
class |07|0x80|007|000|0000000|0000007|0000| TX| 0x00|000000003|00000000

```

```

-----SUP 1 end -----

```

```

PFC 0 (disabled), net_port 0x0
END of PI SECTION
HIF0/0/1

```

Default CoS: 0

CoS	Rx-Remap	Tx-Remap	Class
0	0	0	3
1	1	1	4
2	2	2	5
3	3	3	5
4	4	4	2
5	5	5	2
6	6	6	2
7	7	7	1

Class	FRH	CT-En	MTU-Cells	[Bytes]
0	0	0	30	[2400]
1	0	0	30	[2400]
2	2	0	116	[9280]
3	2	0	116	[9280]
4	2	0	116	[9280]
5	2	0	116	[9280]
6	2	0	127	[10160]
7	2	0	127	[10160]

FRH configuration:

```

Port En: 1, Tail Drop En: 0, Emergency Stop En: 1, Err Discard En: 1

```

FRH	Xon	Xoff	Total	Pause	u-Pause	Class-Map
0	2	6	8	1	0	0x03
1	0	0	0	0	0	0x00
2	15	19	38	1	0	0x3c
3	0	0	0	0	0	0x00
4	0	0	0	0	0	0x00
5	0	0	0	0	0	0x00
6	0	0	0	0	0	0x00
7	0	0	0	0	0	0x00

Global FRH:

```

FRH Map: 0x00, Pause Class Map: 0x00
Xoff Threshold: 0, Total Credits: 0

```

Pause configuration:

```

PFC disabled
Rx PFC CoS map: 0x00, Tx PFC CoS map: 0x00

```

Index	CoS-to-Class	Class-to-CoS
0	0x00	0xff
1	0x00	0xff
2	0x00	0xff
3	0x00	0xff
4	0x00	0xff
5	0x00	0xff

```

6      0x00      0xff
7      0x00      0xff

```

```

OQ configuration:
Credit Quanta: 1, IPG Adjustment: 0
PQ0 En: 0, PQ0 Class: 0
PQ1 En: 0, PQ1 Class: 0

```

Class	XoffToMap	TD	HD	DP	Grp	LSP	GSP	CrDec	bw
0	0 0	1	0	0	0	1	0	0	0
1	0 0	1	0	0	1	0	1	0	0
2	0 0	1	0	0	2	0	0	50	10
3	0 0	1	0	0	2	0	0	24	20
4	0 0	1	0	0	2	0	0	16	30
5	0 0	1	0	0	2	0	0	12	40
6	0 0	1	0	0	2	0	0	0	0
7	0 0	1	0	0	2	0	0	0	0

```

SS statistics:
Class  Rx (WR_RCVD)          Tx (RD_SENT)
-----+-----+-----
0      0                      0
1      0                      0
2      0                      0
3      0                      0
4      0                      0
5      0                      0
6      0                      0
7      0                      0

```

```

Rx Discard (WR_DISC):          0
Rx Multicast Discard (WR_DISC_MC): 0
Rx Error (WR_RCV_ERR):        0

```

```

OQ statistics:
Packets flushed: 0
Packets timed out: 0

```

```

Pause statistics:
CoS    Rx PFC Xoff          Tx PFC Xoff
-----+-----+-----
0      0                      0
1      0                      0
2      0                      0
3      0                      0
4      0                      0
5      0                      0
6      0                      0
7      0                      0
Rx Xoff:          0
Rx Xon:           0
Tx Xoff:          0
Tx Xon:           0
Rx PFC:           0
Tx PFC:           0
Rx Xoff Status:  0x00
Tx Xoff Status:  0x00

```

SS	RdPort	Class	Head	Tail	QCount	RealQCountRx
0	1	0	3113	9348	0	0
0	1	1	11057	4864	0	0
0	1	2	5356	4257	0	0

```

0 1 3 12304 10048 0 0
0 1 4 11346 2368 0 0
0 1 5 162 165 0 0
0 1 6 14500 112 0 0
0 1 7 12314 9602 0 0
fex-101#

```

Verifying the FEX QoS Configuration

Use the following commands to verify the FEX QoS configuration:

Command	Purpose
show class-map type [qos queuing]	Displays information about configured class maps of type qos or queuing.
show policy-map type [qos queuing]	Displays information about configured policy maps of type qos or queuing.
show policy-map system type [qos queuing]	Displays information about all configured policy maps of type qos or queuing on the system.
show queuing interface ethernet	Displays information about queuing on the ethernet interface.