Configure 3750 MLS to 3850 MQC Conversion of QoS

Contents

Introduction

This document describes the difference between 3750 Multilayer Switching (MLS) Quality of Service (QoS) and 3850 Switches with Modular QoS CLI (MQC).

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco IOS® Software
- 3750 Multilayer Switching (MLS)
- Switches Modular QoS CLI (MQC)

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

This document also describes detailed information about conversion through sample configurations. This document only applies to the Wired QoS. This document is for networking professionals who are responsible for the design, implementation, or administration of a network that includes a standalone Cisco Catalyst 3850 Switch or a Cisco Catalyst 3850 Switch stack, referred to as the switch.

Overview for the Difference Between 3750 MLS QoS and 3850 MQC QoS

The configuration of QoS in the 3850 line has been improved due to its implementation of MQC (universal QoS configuration model) configuration instead of the old MLS QoS (platform-dependent QoS configuration) commands from the 3750 and 3560 lines of switches.

The main differences are highlighted in this table:

Switch Type	**3750**	**3850**
Basic structure	MLS	MQC
QoS default	Disabled	Enabled
Global config	Support MLS QoS Support some of MQC at ingress	Does not support MLS QoS Support MQC [class-map, policy-map]
Interface config	Support MLS QoS config and some of MQC CLI at ingress	Attach the policy to the interface
Port trust default	Disabled	Enabled
Port Ingress	Classification/Policing/Marking/ Queuing	Classification/Policing/marking [NO Ingress Queuing !]
Port Egress	Queuing	Classification/Policing/marking/queuing
Switch Virtual Interface (SVI)	Classification/Policing/Marking	Classification/Marking

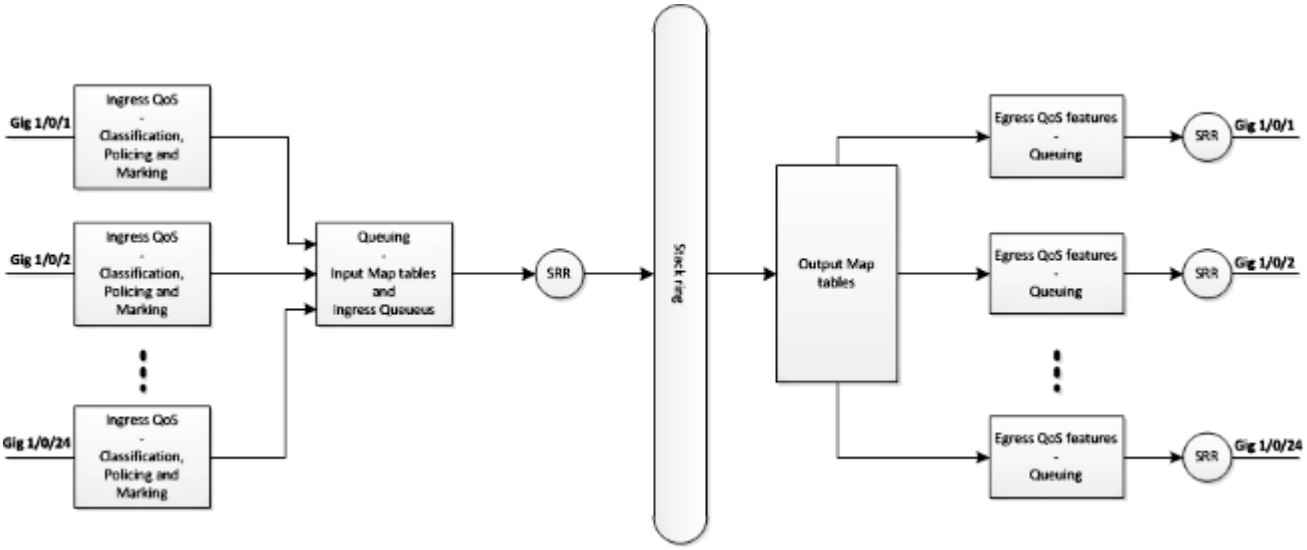
Ingress		
SVI Egress	None	Classification/Marking

It is important to recognize the main fundamental change in the QoS approach.

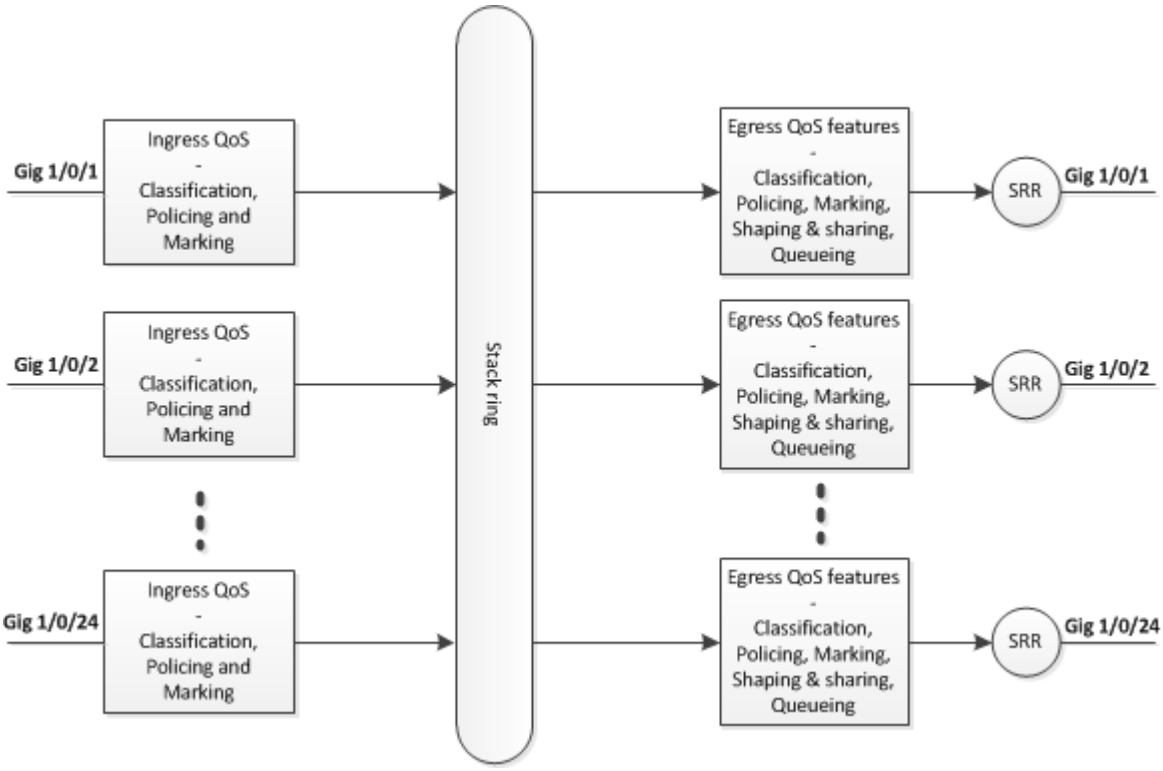
On the 3750, by default the QoS is disabled whereas on the 3850, it is enabled. Also in order to preserve Layer 2 (L2)/Layer 3 (L3) QoS marking on the 3750 platform, a trust configuration must be applied.

In the case of the 3850, all packets by default are trusted (the L2/L3 QoS marking is preserved), unless you change it with an application of a specific policy map on the ingress or egress interface.

3750 QoS Model



3850 QoS Model



Feature Detail Comparison Table

Ingress

Feature	**3750**	**3850**
Classification	Class-map match Differentiated Services Code Point (DSCP), Precedence (Prec), Access Control List (ACL) Supports both match-all and match-any	Class-map Class of Service (CoS), Prec, DSCP, ACL And VLAN Supports match-any only
Marking **[unconditional set]**	Set DSCP and Prec	Set CoS, Prec, DSCP and QoS-group
Marking **[conditional marking]**	DSCP mutation	Class-default table-map
Policing	1r2c	1r2c and 2r3c
Policing	Policing exceeds mark-down	Policing exceeds and

markdown	[Only supports DSCP]	violates mark-down [Supports CoS, DSCP, Prec]
Aggregate Policing	Supports	Agg-policing [one type of HQoS]
Ingress Queuing	Supports only on 3750 but does not support on 3750x	Does not support
Hierarchical QoS (HQoS)	VLAN based HQoS only	Port-based Agg-policing and Per-VLAN (PV)

Egress

Feature	**3750**	**3850**
Classification support for none queuing action	Does not support	CoS, Prec, DSCP, QoS-group, ACL and VLAN
Classification support for queuing action	CoS and DSCP	CoS, Prec, DSCP and QoS-group
Marking	Does not support	Set CoS, Prec, and DSCP
Policing	Does not support	1r2c , 2r3c with exceed/violate mark down through table-map
Max number of queues and queue types	1P3Q3T [4 queues] Expedite queue-> Priority queue	2P6Q3T [up to 8 queues]
Egress Queuing	Share mode, shape mode, queue-limit, priority and queue-buffer	Bandwidth, bandwidth remaining, shaping, queue-limit, priority and queue-buffer
HQoS	Does not support	HQoS: Agg-policing, PV, Port-shaper and Parent user shaper with child non-queuing

		action

Common QoS Show Commands

3750

Input show commands:

<#root>

show run class-map [name_of_class-map]

show run policy-map [name of policy-map]

show policy-map interface [interface_name]

General show commands:

<#root>

show mls qos maps

show mls qos maps <options>

show mls qos queue-set

show mls qos interface [interface_name] queuing

show platform port-asic stats drop [interface_name] statistics

show mls qos aggregate-policer

3850

<#root>

show run class-map [name_of_class-map]

show run policy-map [name of policy-map]

```
show table-map [name_of_table-map]

show run policy-map [name_of_policy-map]

show policy-map interface [interface_name]

show platform qos policies port sw [sw#]

show platform qos queue config interface_type [interface_name]

show platform qos queue stats interface_type [interface_name]
```

3750 to 3850 QoS Conversion Sample

QoS Config	3750 [Global]	3750 [Interface]	3850 *	Sample Link
QoS disable	No MLS QoS	Two queues Control-> queue (2) Data -> queue (4)	Egress with no policy Control -> queue(1) Data -> queue(2)	
Trust or set at ingress and egress **Queuing action based on the ingress** **Trust or set**	MLS QoS	**a)** MLS QoS trust CoS	Egress queuing policy classify on CoS [ingress need config trust CoS]	
		b) MLS QoS trust DSCP	egress queuing policy classify on DSCP	
		c) Input policy with set action to mark the DSCP value	Egress queuing policy classify on DSCP	

		d) No MLS QoS trust config [both CoS/DSCP can be set zero]	Input policy with class-default Set CoS/DSCP 0	
CoS/DSCP queue mapping	MLS QoS Shared Round Robin (SRR)-queue output [CoS-map/ DSCP-map]	A, b, c and d can use the corresponding new mapping	Output explicit classification [CoS/DSCP] with queuing action	
DSCP mutation	MLS QoS DSCP mutation	Interface need configuration MLS QoS trust DSCP MLS QoS DSCP-mutation [name]	Interface input policy with table-map	
Agg-policing	MLS QoS aggregatepolicing	Need interface-level configuration	Agg-policing [one type of HQoS]	
Police-markdown	MLS QoS map policed-DSCP [10] [11] to [63]	Policing policy attaching to interface, exceed not drop, the global policed-DSCP can take effect [Input]	One table-map for exceed and one table-map forviolate action of policing [Input and output]	
Queue-limit	MLS QoS queue-set output **[1]** threshold **[1] [100] [100] [50] [200]** **1-> queue-set 1** <**1-> queue 1** **Threshold 1** **Threshold 2** **Reserved buffer** **Max threshold**	Config queue-set [2] [Default queue-set 1]	Egress queuing policy with queuing action and queue-limit configuration	
Queue-buffers	MLS QoS queue-set output [1] buffers	Interface config queue-set	Policy-map with queuing action and queue-buffers ratio	

	[15] [25] [40] [20]		[0-100]	
Share/bandwidth	MLS QoS	Interface level config â€œSRR-queue bandwidth share 1 30 35 5â€ [Share mode]	Bandwidth in policy-map	
priority queue [Expedite queue]	MLS QoS	Interface level config â€œpriority-queue outâ€, this can make corresponding queue-setâ€™s 1st queue as priority queue	Priority level 1 in the policy-map	
Shaper	MLS QoS	SRR-queue bandwidth shape [shape mode]	Shape average in policy-map	
Port-shaper	MLS QoS	SRR-queue bandwidth limit	Port-shaper	
HQoS	MLS QoS	SVI [attach policy to SVI] and interface needs configuration â€œMLS QoS VLAN_basedâ€™	PV policy And attach policy to the port at input direction	

Example 1: QoS Disabled

3750 (Global config)	**3750 (interface)**	**3850**
No MLS QoS	Two queue [control one queue 2, data one queue 4]	Egress with no policy [Control pkts in queue 1 and data packets in queue 2]

3750

<#root>

3750#

show mls qos

QoS is disabled

<- disable

QoS ip packet dscp rewrite is enabled

3750#

show mls qos interface gig1/0/1 statistics | b output queues enqueued

```
  output queues enqueued:
 queue:    threshold1   threshold2   threshold3
-----------------------------------------------
 queue 0:           4           0           0
 queue 1:           0           0           0
```

<- control

```
 queue 2:           0           0           0
 queue 3:           0           0           0
```

<- data

```
  output queues dropped:
 queue:    threshold1   threshold2   threshold3
-----------------------------------------------
 queue 0:           0           0           0
 queue 1:           0           0           0
```

<- control

```
 queue 2:           0           0           0
 queue 3:           0           0           0
```

<- data

```
Policer: Inprofile:            0 OutofProfile:            0
```

3850

<#root>

3850#

show run interface gig1/0/1

```
interface GigabitEthernet1/0/1
end
```

3850#

show platform qos queue config gigabitEthernet 1/0/1 sw 1

```
DATA Port:21 GPN:1 AFD:Disabled QoSMap:0 HW Queues: 168 - 175
  DrainFast:Disabled PortSoftStart:1 - 600
------------------------------------------------------------
  DTS Hardmax   Softmax  PortSMin GlblSMin  PortStEnd
  --- --------  -------- -------- --------- ---------
 0   1  5   120  6   480  0     0   0     0   0   800
```

<- control

```
 1   1  4     0  7   720  2   480   2   180   2   800
```

<- data

```
 2   1  4     0  5     0  0     0   0     0   0   800
 3   1  4     0  5     0  0     0   0     0   0   800
 4   1  4     0  5     0  0     0   0     0   0   800
 5   1  4     0  5     0  0     0   0     0   0   800
 6   1  4     0  5     0  0     0   0     0   0   800
 7   1  4     0  5     0  0     0   0     0   0   800
 Priority   Shaped/shared   weight  shaping_step
 --------   ------------   ------  ------------
 0      0     Shared            50           0
 1      0     Shared            75           0
 2      0     Shared         10000         179
 3      0     Shared         10000           0
 4      0     Shared         10000           0
 5      0     Shared         10000           0
 6      0     Shared         10000         192
 7      0     Shared         10000           0

   Weight0 Max_Th0 Min_Th0 Weigth1 Max_Th1 Min_Th1 Weight2 Max_Th2 Min_Th2
   ------- -------  ------  ------  ------  ------  ------  ------ ------
 0      0     478       0       0     534       0       0     600       0
 1      0     573       0       0     641       0       0     720       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
```

Example 2 : QoS Enabled Trust COS

3750 (Global)	**3750 (interface)**	**3850**
MLS QoS	Interface â€œMLS QoS trust CoSâ€ (based on the default CoS-mapping to the queue-set 1)	Egress queuing policy based on CoS (ingress need config trust CoS)

3750

<#root>

```
Global config:
3750(config)#
```

mls qos

Interface config:

```
interface GigabitEthernet1/0/1
 mls qos trust cos

Related show cli:

3750#
```

show mls qos

```
QoS is enabled
QoS ip packet dscp rewrite is enabled

3750#
```

show mls qos interface gig1/0/1

```
GigabitEthernet1/0/1
trust state: trust cos
trust mode: trust cos
trust enabled flag: ena
COS override: dis
default COS: 0
DSCP Mutation Map: Default DSCP Mutation Map
Trust device: none
qos mode: port-based

3750 #
```

show mls qos maps cos-output-q

```
Cos-outputq-threshold map:
cos:              0   1   2   3   4   6     7
------------------------------------------------------------
queue-threshold: 2-1 2-1 3-1 3-1 4-1 1-1 4-1 4-1

Note: cos value 0 maps to 2-1 [queue-set1 : queue2 threshold 1]
```

3850

<#root>

```
Ingress: apply policy-map trust-cos
Egress: create class based on cos and have queuing action for each class

Ingress policy:
```

```
3850#
```

show run policy-map trust-cos

```
class class-default
   set cos cos table default

3850#
```

show table-map default

```
 Table Map default
    default copy

Egress policy:
3850#
```

show run policy-map example2

```
class cos5
    bandwidth percent 15
 class cos0_1
    bandwidth percent 25
 class cos2_3
    bandwidth percent 40
 class cos4_6_7
    bandwidth percent 20

3850#
```

show run class-map cos5

```
class-map match-any cos5
  match cos  5

3850#
```

show run class-map cos0_1

```
class-map match-any cos0_1
  match cos  0
  match cos  1

3850#
```

show run class-map cos2_3

```
class-map match-any cos2_3
  match cos  2
  match cos  3

3850#
```

show run class-map cos4_6_7

```
class-map match-any cos4_6_7
  match cos  4
  match cos  6
  match cos  7
```

Example 3: QoS Enabled Trust DSCP

3750 (Global)	**3750 (interface)**	**3850**
MLS QoS	Interface â€œMLS QoS trust DSCPâ€ [based on the default DSCP-mapping to the queue-set 1]	**Input default trust DSCP** Egress queuing policy based on DSCP

3750

<#root>

```
config
3750(config)#
```

mls qos

<- Global

```
interface GigabitEthernet1/0/1
```

<- Interface

```
 mls qos trust dscp

3750#
```

sh mls qos interface gig1/0/1

```
GigabitEthernet1/0/1
trust state:
```

trust dscp

```
trust mode: trust dscp
trust enabled flag: ena
COS override: dis
default COS: 0
DSCP Mutation Map: Default DSCP Mutation Map
Trust device: none
qos mode: port-based

3750#
```

show mls qos maps dscp-output-q

```
Dscp-outputq-threshold map:
d1 :d2 0    1     2     3     4     5     6     7     8     9
------------------------------------------------------------
0 : 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01 02-01
1 : 02-01 02-01 02-01 02-01 02-01 02-01 03-01 03-01 03-01 03-01
2 : 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01 03-01
3 : 03-01 03-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01
4 : 01-01 01-01 01-01 01-01 01-01 01-01 01-01 01-01 04-01 04-01
5 : 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01 04-01
6 : 04-01 04-01 04-01 04-01
```

3850

<#root>

Ingress: default trust dscp, no policy needed

Egress: use dscp as classification and add queuing action based on customer need

One Sample config:
Plolicy-map:
3850#

show run policy-map dscp-shape

```
class dscp56
    shape average percent 10
 class dscp48
    shape average percent 11
 class dscp40
    shape average percent 12
 class dscp32
    shape average percent 13
```

Class-map:
3850#

show run class-map dscp56

```
class-map match-any dscp56
  match  dscp cs7

3850#
```

show run class-map dscp48

```
class-map match-any dscp48
  match  dscp cs6

3850#
```

show run class-map dscp40

```
class-map match-any dscp40
  match  dscp cs5

3850#
```

show run class-map dscp32

```
class-map match-any dscp32
  match  dscp cs4
```

Example 4: QoS Enabled with an Interface that Has a Set Policy

3750 (global)	**3750 (interface)**	**3850**
MLS QoS	Interface input policy with set action to mark the CoS/DSCP value **[Marked value is used for egress mapping]**	Need explicit egress policy to do queuing mapping

3750

<#root>

```
3750#
```

show run class-map dscp-1

```
class-map match-any dscp-1
match ip dscp 1

c3750#
```

show run policy-map set-dscp-63

```
class dscp-1
set dscp 63

3750#
```

show run interface f7/0/2

```
interface FastEthernet7/0/2
```

mls qos trust dscp

service-policy input set-dscp-63

3750#

show policy-map interface f7/0/2

FastEthernet7/0/2

Service-policy input: set-dscp-63

Class-map: dscp-1 (match-any)
0 packets, 0 bytes
5 minute offered rate 0 bps, drop rate 0 bps
Match: ip dscp 1

Class-map: class-default (match-any)
0 packets, 0 bytes
5 minute offered rate 0 bps, drop rate 0 bps
Match: any
0 packets, 0 bytes
5 minute rate 0 bps

Note: Pkts come in interface fa7/0/2, dscp1 can be marked to dscp63 which mapping based on the existing mapping table, other pkts can retain original dscp value mapping accordingly

3850

<#root>

Input can be same as 3750 config

Egress: can add queuing action under class dscp-63

One sample config:

3850#

show run policy-map dscp63-queuing

class dscp63
    bandwidth percent 50

3850#

show class-map dscp63

 Class Map match-any dscp63

   Match   dscp 63

Example 5: QoS Enabled with No MLS QoS Trust on Interface

3750 (global)	**3750 (interface)**	**3850**
MLS QoS	Interface not config MLS QoS trust CoS/DSCP **[CoS/DSCP can be set to 0]**	Interface input policy with class-default Set DSCP 0, output policy with class DSCP0 with queuing action

3750

<#root>

```
Global:
c3750(config)#
```

mls qos

```
Interface:
interface GigabitEthernet2/0/45
!
```

3850

<#root>

Input policy:

```
c3850#
```

show run policy-map example5-input

```
class class-default
   set dscp default

Output policy:
c3850#
```

show run policy-map example5-output

```
class dscp0
    shape average percent 10
```

<- queuing action based on customer need

```
Attach to the ingress port:
```

```
c3850#
```

show run interface gig1/0/1

```
interface GigabitEthernet1/0/1
 service-policy input example5-input

Attach to the egress port:
c3850#
```

show run interface gig1/0/2

```
interface GigabitEthernet1/0/2
 service-policy output example5-output
```

Example 6: QoS Enabled with Change CoS/DSCP Queue Mapping

3750 (global)	3750 (interface)	3850
MLS QoS SRR-queue mapping config **(MLS QoS SRR-queue output [CoS-map queue [1] threshold [3] [4 5])**	A, b, c and d can use the new mapping table [CoS 4 and 5 can be map to queue 1 threshold 3]	Egress explicit classification with queuing action

3750

<#root>

```
Before config:
3750#
```

show mls qos maps cos-output-q

```
Cos-outputq-threshold map:
cos:
```

0

```
   1   2   3   4   5   6   7
------------------------------------------------
queue-threshold:
```

2-1

```
 2-1 3-1 3-1 4-1 1-1 4-1 4-1

User config mapping:
3750(config)#
```

mls qos srr-queue output cos-map queue 3 threshold 3 0

```
New mapping table after config
3750#
```

show mls qos maps cos-output-q

```
Cos-outputq-threshold map:
cos:
```

0

```
   1   2   3   4   5   6   7
------------------------------------------------
queue-threshold:
```

3-3

```
 2-1 3-1 3-1 4-1 1-1 4-1 4-1
```

3850

<#root>

Input : need apply trust-cos policy:

```
3850#
```

show run policy-map trust-cos

```
class class-default
   set cos cos table default

3850#
```

show table-map default

```
 Table Map default
    default copy
```

Egress policy:

```
Before changing mapping:
Sample config:
3850#
```

show run policy-map example2

```
class cos5
    bandwidth percent 15
 class cos0_1
    bandwidth percent 25
 class cos2_3
    bandwidth percent 40
```

```
 class cos4_6_7
    bandwidth percent 20

3850#
```

show run class-map cos5

```
class-map match-any cos5
  match cos  5

3850#
```

show run class-map cos0_1

```
class-map match-any cos0_1
  match cos  0
  match cos  1

3850#
```

show run class-map cos2_3

```
class-map match-any cos2_3
  match cos  2
  match cos  3

3850#
```

show run class-map cos4_6_7

```
!
class-map match-any cos4_6_7
  match cos  4
  match cos  6
  match cos  7
```

After mapping changing , corresponding sample config:

```
3850#
```

show run policy-map example6

```
class cos5
    bandwidth percent 15
 class cos1
    bandwidth percent 25
 class cos0_2_3
    bandwidth percent 40
 class cos4_6_7
    bandwidth percent 20

3850#
```

show class-map cos5

```
 Class Map match-any cos5 (id 25)
   Match cos  5
```

```
3850#
```

show run class-map cos1

```
class-map match-any cos1
  match cos  1

3850#
```

show run class-map cos0_2_3

```
class-map match-any cos0_2_3
  match cos  0
  match cos  2
  match cos  3

3850#
```

show run class-map cos4_6_7

```
class-map match-any cos4_6_7
  match cos  4
  match cos  6
  match cos  7
```

Example 7: MLS Enabled with DSCP Mutation

3750 (global)	3750 (interface)	3850
MLS QoS DSCP mutation	Interface need config MLS QoS trust DSCP MLS QoS DSCP-mutation name [name is defined in global]	Interface input policy with table-map mapping different DSCP.

3750

<#root>

Global config :

```
3750(config)#
```

mls qos map dscp-mutation dscp-mutation 0 1 to 63

```
3750(config)#
```

mls qos map dscp-mutation dscp-mutation 2 3 to 62

Global show cli:
c3750#

show mls qos maps dscp-mutation

Dscp-dscp mutation map:
dscp-mutation:
d1 : d2 0 1 2 3 4 5 6 7 8 9
---
0 :

63 63 62

 62 04 05 06 07 08 09
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
Dscp-dscp mutation map:
Default DSCP Mutation Map:
d1 : d2 0 1 2 3 4 5 6 7 8 9
---
0 : 00 01 02 03 04 05 06 07 08 09
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

Interface config:

interface FastEthernet7/0/3
 description trust dscp
 mls qos trust dscp
 mls qos dscp-mutation dscp-mutation

c3750#

show mls qos interface f7/0/3

FastEthernet7/0/3
trust state: trust dscp
trust mode: trust dscp
trust enabled flag: ena
COS override: dis
default COS: 0
DSCP Mutation Map:

dscp-mutation

Trust device: none
qos mode: port-based

Interface using default dscp-table:

```
c3750#
```

show mls qos interface g3/0/1

```
GigabitEthernet3/0/1
trust state: not trusted
trust mode: not trusted
trust enabled flag: ena
COS override: dis
default COS: 0
DSCP Mutation Map:
```

Default DSCP Mutation Map

```
Trust device: none
qos mode: port-based
```

3850

<#root>

Ingress : apply policy with dscp table-map
Egress: classify on new dscp value with queuing action

```
Ingress:
3850#
```

show table-map dscp-2-dscp

```
 Table Map dscp-2-dscp
 from 0 to 63
 from 1 to 63
 from 2 to 62
 from 3 to 62
 default copy
3850#
```

show run policy-map example7-input

```
class class-default
 set dscp dscp table dscp-2-dscp

Egress:
3850#
```

show run policy-map example7-output

```
class dscp63
 shape average percent 20 [ queuing action based on the user need]
 class dscp62
 shape average percent 30 [queuing action based on user need]
```

Example 8: MLS QoS Enabled with Aggregate Policing

3750 (global)	3750 (interface)	3850
MLS QoS aggregate policing [All classes use the agg-policing can share the policing rate.]	Need interface level config	Agg-policing (HQoS)
MLS QoS aggregate-policer **agg_traffic** 8000 8000 exceed-action drop	Interface has policy which has agg_traffic as agg policer name.	

3750

<#root>

```
Global:
```

mls qos aggregate-policer agg_traffic 8000 8000 exceed-action drop

```
Access-list:
access-list 1 permit 192.168.0.0 0.0.0.255
access-list 2 permit 10.0.0.0 0.0.0.255

Class-map:
class-map match-all agg1
 match access-group 1
class-map match-all agg2
 match access-group 2

Policy-map:
policy-map agg_policer
 class agg1
 set dscp 40
 police aggregate agg_traffic
 class agg2
 set dscp 55
 police aggregate agg_traffic

Note: class agg1 and agg2 can share the same policing rate
```

3850

```
policy-map agg_police
class class-default
police cir  8000
service-policy child
```

```
policy-map child
 class agg1
  set dscp 40
 class agg2
  set dscp 55
```

Example 9: MLS Enabled with Policing Mark Down

3750 (Global config)	3750 (interface)	3850
MLS QoS map policed-DSCP x to y	As long as interface has policing policy, exceed is transmit, the global CLI can take effect [input only].	**One table-map for exceed and one for violate action of policing, input, and output**.

3750

<#root>

Default policed-dscp map:

3750#

show mls qos map policed-dscp

```
Policed-dscp map:
d1 : d2 0 1 2 3 4 5 6 7 8 9
---------------------------------------
0 : 00 01 02 03 04 05 06 07 08 09
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
```

User define policed-dscp map:

3750(config)#

mls qos map policed-dscp 0 10 18 24 46 to 8

3750#

show mls qos map policed-dscp

```
Policed-dscp map:
d1 : d2 0 1 2 3 4 5 6 7 8 9
---------------------------------------
```

```
0 : 08 01 02 03 04 05 06 07 08 09
1 : 08 11 12 13 14 15 16 17 08 19
2 : 20 21 22 23 08 25 26 27 28 29
3 : 30 31 32 33 34 35 36 37 38 39
4 : 40 41 42 43 44 45 08 47 48 49
5 : 50 51 52 53 54 55 56 57 58 59
6 : 60 61 62 63

Policy config:
class-map match-all policed-dscp
match access-group 2
class policed-dscp
police 8000 8000 exceed-action policed-dscp-transmit
```

Attach the above policy at ingress:

Note : Mark down table can be used by policing and interface policing as long as exceed action is transmit

3850

<#root>

```
3850(config)#table-map policed-dscp
3850(config-tablemap)#map from 0 to 8
3850(config-tablemap)#map from 10 to 8
3850(config-tablemap)#map from 18 to 8
3850(config-tablemap)#map from 24 to 8
3850(config-tablemap)#map from 46 to 8
3850#
```

show table-map policed-dscp

```
 Table Map policed-dscp
    from 0 to 8
    from 10 to 8
    from 18 to 8
    from 24 to 8
    from 46 to 8
    default copy

3850#
```

show policy-map policed-dscp

```
  Policy Map policed-dscp
    Class class-default
     police cir percent 10
       conform-action transmit
       exceed-action set-dscp-transmit dscp table policed-dscp
```

Example 10: MLS QoS Enabled with Queue-Limit Configuration

3750 (global)	3750 (interface)	3850
MLS QoS queue-set output 1 threshold 1100 100 50 200 (queue-limit) [**1** ->queue-set 1, **1->first queue**, **100 ->threshold 1**, **100 ->threshold 2**, **50 -> reserved buffer**, **200 -> max threshold**]	Interface config queue-set [Default is queue-set 1]	Egress queuing policy with queuing action and q-limit config.

3750

<#root>

Global config:

```
mls qos srr-queue output cos-map queue 2 threshold 1 2
mls qos srr-queue output cos-map queue 2 threshold 2 3
mls qos srr-queue output cos-map queue 2 threshold 3 6 7
```

If no interface config, the queue-set 1 can be used:

```
3750#
show mls qos queue-set 1

Queueset: 1
Queue     :       1       2       3       4
----------------------------------------------
buffers   :      15      25      40      20
threshold1:     100     125     100      60
threshold2:     100     125     100     150
reserved  :      50     100     100      50
maximum   :     200     400     400     200
```

For interface config queue-set 2 explicitly:

```
3750#
show mls qos queue-set 2
```

```
Queueset: 2
Queue     :       1       2       3       4
----------------------------------------------
buffers   :      25      25      25      25
threshold1:     100     200     100     100
threshold2:     100     200     100     100
reserved  :      50      50      50      50
maximum   :     400     400     400     400
```

3850

<#root>

(multiple class with queue-limit turn on)

3850#

show policy-map q-limit

```
  Policy Map q-limit
    Class users-class
      Queuing action ( shaper, bandwidth and bandwidth remaining)
      queue-limit cos  2 percent 50
      queue-limit cos  3 percent 50
      queue-limit cos  6 percent 70
      queue-limit cos  7 percent 70
```

Note: using the above config, cos 2 and cos 3 can be dropped earlier then cos 6 and 7

Example 11: MLS QoS Enabled with Queue-Buffer Configuration

3750 (global)	3750 (interface)	3850
MLS QoS queue-set output [1] buffers [15 25 40 20]	Interface config queue-set [default queue-set 1]	Policy-map with queuing action and queue-buffers ratio [0-100].

3750

<#root>

Default queue-buffer :

3750#

show mls qos queue-set 1

```
Queueset: 1
Queue     :       1       2       3       4
-------------------------------------------
buffers   :      25      25      25      25
threshold1:     100     200     100     100
threshold2:     100     200     100     100
reserved  :      50      50      50      50
maximum   :     400     400     400     400
```

User define queue-buffer:

```
mls qos queue-set output 1 buffers 15 25 40 20

3750#
```

show mls qos queue-set 1

```
Queueset: 1
Queue     :       1       2       3       4
-------------------------------------------
buffers   :      15      25      40      20
threshold1:     100     125     100      60
threshold2:     100     125     100     150
reserved  :      50     100     100      50
maximum   :     200     400     400     200
```

3850

<#root>

```
3850#
```

show policy-map queue-buffer

```
  Policy Map queue-buffer
    Class cos7
      bandwidth percent 10
      queue-buffers ratio 15
    Class cos1
      bandwidth percent 30
      queue-buffers ratio 25

class-map:
========
3850#
```

show class-map cos7

```
 Class Map match-any cos7 (id 22)

   Match cos  7

3850#
```

show class-map cos1

```
 Class Map match-any cos1 (id 28)

   Match cos  1
```

Attach to the interface at egress direction:

Example 12: MLS QoS Enabled with Bandwidth Configuration

3750 (global)	3750 (interface)	3850
MLS QoS (share mode)	Interface level config **SRR-queue bandwidth share 1 30 35 5**	Bandwith in policy-map

3750

<#root>

Default share and shape mode:

```
3750-3stack#
```

show mls qos interface gig 1/0/1 queueing

```
GigabitEthernet1/0/1
Egress Priority Queue : disabled
Shaped queue weights (absolute) :  25 0 0 0
Shared queue weights  :  25 25 25 25
The port bandwidth limit : 100  (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

User config share mode under interface:

```
interface GigabitEthernet1/0/1
 srr-queue bandwidth share 40 30 20 10
 srr-queue bandwidth shape 0 0 0 0
```

```
3750#
```

show mls qos interface gig1/0/1 queueing

```
GigabitEthernet1/0/1
Egress Priority Queue : disabled
Shaped queue weights (absolute) :  0 0 0 0
Shared queue weights  :  40 30 20 10
The port bandwidth limit : 100  (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

3850

<#root>

```
3850#
```

show policy-map bandwidth

```
  Policy Map bandwidth
    Class cos1
      bandwidth percent 40
    Class cos2
      bandwidth percent 30
    Class cos3
      bandwidth percent 20
    Class class-default
      bandwidth percent 10
3850#
```

show class-map cos1

```
 Class Map match-any cos1

   Match cos  1

3850#
```

show class-map cos2

```
 Class Map match-any cos2

   Match cos  2

3850#
```

show class-map cos3

```
 Class Map match-any cos3 (id 26)

   Match cos  3

3850#
```

show class-map cos4

```
 Class Map match-any cos4 (id 25)

   Match cos  4
```

Example 13: MLS QoS Enabled with Priority

3750 (Global)	3750 (Interface)	3850

MLS QoS [expedite queue] **Note: expedite queue same as priority queue**	Interface level config **priority-queue out** [make corresponding queue-setâ€™s 1st queue as strict priority queue]	Prioriy level 1 in the policy-map

3750

<#root>

```
interface GigabitEthernet1/0/2
 priority-queue out
end

3750#
```

show mls qos interface gig1/0/2 queueing

```
GigabitEthernet1/0/2
Egress Priority Queue : enabled
Shaped queue weights (absolute) :  25 0 0 0
Shared queue weights  :  25 25 25 25
The port bandwidth limit : 100  (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

3850

<#root>

```
3850#
```

show run policy-map priority-queue

```
class cos7
    priority level 1 ? strict priority
 class cos1
    shape average percent 10
Attach the above policy to interface at egress side:
```

Example 14: MLS QoS Enabled with Shaper Configuration

3750

<#root>

```
Default shape mode:
GigabitEthernet1/0/3
Egress Priority Queue : disabled
Shaped queue weights (absolute) :  25 0 0 0
```

```
Shared queue weights  :  25 25 25 25
The port bandwidth limit : 100  (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

User define shape mode:

```
interface GigabitEthernet1/0/3
 srr-queue bandwidth shape 4 4 4 4
```

```
3750-3stack#
```

show mls qos interface gigabitEthernet 1/0/3 queueing

```
GigabitEthernet1/0/3
Egress Priority Queue : disabled
Shaped queue weights (absolute) :
```

4 4 4 4

```
Shared queue weights  :  25 25 25 25
The port bandwidth limit : 100  (Operational Bandwidth:100.0)
The port is mapped to qset : 1
```

3850

<#root>

```
3850#
```

show policy-map shape

```
  Policy Map shape
    Class cos1
      Average Rate Traffic Shaping
```

cir 25%

```
    Class cos2
      Average Rate Traffic Shaping
```

cir 25%

```
    Class cos3
      Average Rate Traffic Shaping
```

cir 25%

```
    Class cos4
```

```
      Average Rate Traffic Shaping
```

```
 cir 25%
```

Example 15 : MLS QoS Enabled with Bandwith

3750 (Global)	3750 (Interface)	3850
MLS QoS	SRR-queue bandwidth limit	Speed, bandwidth

3750

<#root>

```
interface GigabitEthernet1/0/4
 srr-queue bandwidth limit 50
```

```
3750-3stack#
```

```
show mls qos interface g1/0/4 queueing
```

```
GigabitEthernet1/0/4
Egress Priority Queue : disabled
Shaped queue weights (absolute) :  25 0 0 0
Shared queue weights  :  25 25 25 25
The port bandwidth limit : 50  (Operational Bandwidth:50.0)
The port is mapped to qset : 1
```

3850

<#root>

```
3850#
```

```
show policy-map default-shape
```

```
  Policy Map default-shape
    Class class-default
      Average Rate Traffic Shaping
      cir 50%
service-policy child
```

```
[ queuing based on customer need]
```

Example 16: HQoS

3750 (Global configuration)	3750 (Interface)	3850
Class-map, Policy-map	Attach policy to SVI Interface needs configuration **MLS QoS vlan_based**	PV ingress policy

3750

<#root>

Note:
SVI: Parent [class acl based class-map->policing]

Child [class interface range class-map->marking]

Child class-map:

```
3750(config)#class-map cm-interface-1
3750(config-cmap)#match input gigabitethernet3/0/1 - gigabitethernet3/0/2
```

Child policy-map:

```
3750(config)#policy-map port-plcmap-1
3750(config-pmap)#class cm-interface-1
3750(config-pmap-c)#police 900000 9000 drop
```

Parent class-map matching acl:

```
3750(config)#access-list 101 permit ip any any

Parent class-map:
3750(config)#class-map cm-1
3750(config-cmap)#match access 101

3750(config)#policy-map vlan-plcmap
3750(config-pmap)#class cm-1
3750(config-pmap-c)#set dscp 7
3750(config-pmap-c)#service-policy port-plcmap-1
3750(config-pmap-c)#exit
3750(config-pmap)#class cm-2
3750(config-pmap-c)#service-policy port-plcmap-1
3750(config-pmap-c)#set dscp 10
```

Attach the policy to the interface:

```
3750(config)#interface vlan 10
```

```
3750(config-if)#service-policy input vlan-plcmap
```

3850

<#root>

Note: Due to target change, this canâ€™t be one to one mapping, need config based on customer requirement.

Target is at port level
Parent classify on vlan
Child: none vlan classification [for example cos/dscp]

```
3850#
```

show run policy-map PV_parent_marking_child_policing

```
class vlan10
   set dscp 63
   service-policy child_class_dscp_policing
 class vlan11
   set cos 5
   service-policy child_class_dscp_policing
 class vlan12
   set precedence 6
   service-policy child_class_dscp_policing

3850#
```

show run policy-map child_class_dscp_policing

```
class dscp1
    police cir percent 12
 class dscp2
    police cir percent 15
 class dscp3
    police cir percent 20
 class class-default
    police cir percent 22

3850#
```

show run class-map vlan10

```
class-map match-any vlan10
  match vlan  10

3850#
```

show run class-map vlan11

```
class-map match-any vlan11
  match vlan  11
```

```
3850#
```

show run class-map vlan12

```
class-map match-any vlan12
  match vlan  12

3850#
```

show run class-map dscp1

```
class-map match-any dscp1
  match  dscp 1

3850#
```

show run class-map dscp2

```
class-map match-any dscp2
  match  dscp 2

3850#
```

show run class-map dscp3

```
class-map match-any dscp3
  match  dscp 3
```

Related Information

- **Cisco Technical Support & Downloads**