

3750 MLS to 3850 MQC Conversion of QoS Configuration



Document ID: 118629

Contributed by Jaroslaw Gawron and Vivek Sharma, Cisco TAC Engineers.

Jan 23, 2015

Contents

Introduction

Prerequisites

- Requirements

- Components Used

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

- 3750 QoS Model

- 3850 QoS Model

Feature Detail Comparison Table

- Ingress

- Egress

Common QoS Show Commands

- 3750

- 3850

3750 to 3850 QoS Conversion Sample

- Example 1: QoS Disable

 - 3750

 - 3850

- Example 2 : QoS Enable Trust COS

 - 3750

 - 3850

- Example 3: QoS Enable Trust DSCP

 - 3750

 - 3850

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

 - 3750

 - 3850

- Example 5: QoS Enable with No MLS QoS Trust on Interface

 - 3750

 - 3850

- Example 6: QoS Enable with Change CoS/DSCP Queue Mapping

 - 3750

 - 3850

- Example 7: MLS Enable with DSCP Mutation

 - 3750

 - 3850

- Example 8: MLS QoS Enable with Aggregate Policing

 - 3750

 - 3850

- Example 9: MLS Enable with Policing Mark Down

 - 3750

 - 3850

Example 10: MLS QoS Enable with Queue-Limit Configuration

3750

3850

Example 11: MLS QoS Enable with Queue-Buffer Configuration

3750

3850

Example 12: MLS QoS Enable with Bandwidth Configuration

3750

3850

Example 13: MLS QoS Enable with Priority

3750

3850

Example 14: MLS QoS Enable with Shaper Configuration

3750

3850

Example 15 : MLS QoS Enable with Bandwidth

3750

3850

Example 16: HQoS

3750

3850

Introduction

The document describes the basic difference between 3750 Multilayer Switching (MLS) Quality of Service (QoS) and Cisco Catalyst 3850 Switches Modular QoS CLI (MQC) QoS. It also provides 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.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco IOS® Software
- Concepts and terminology of MLS and MQC QoS

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, make sure that you understand the potential impact of any command.

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:

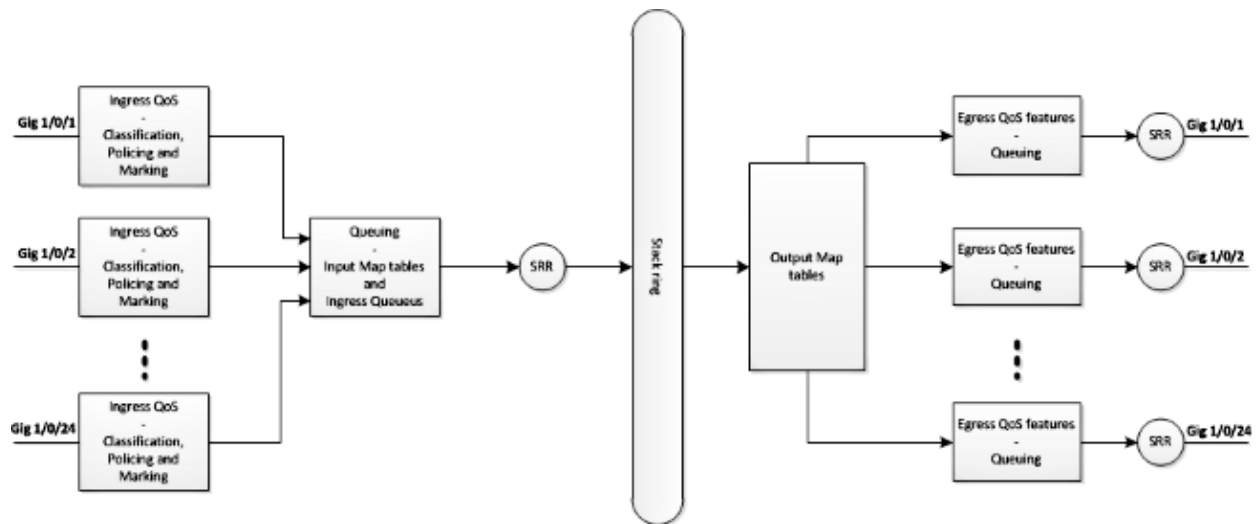
<i>Switch Type</i>	3750	3850
<i>Basic structure</i>	MLS	MQC
<i>QoS default</i>	Disabled	Enabled
<i>Global config</i>	Support MLS QoS	Does not support MLS QoS
<i>Interface config</i>	Support some of MQC at ingress Support MLS QoS config and some of MQC CLI at ingress	Support MQC [class–map, policy–map] Attach the policy to the interface
<i>Port trust default</i>	Disabled	Enabled
<i>Port Ingress</i>	Classification/Policing/Marking/ Queuing	Classification/Policing/marketing [NO Ingress Queuing !]
<i>Port Egress</i>	Queuing	Classification/Policing/marketing/queuing
<i>Switch Virtual Interface (SVI) Ingress</i>	Classification/Policing/Marking	Classification/Marking
<i>SVI Egress</i>	None	Classification/Marking

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

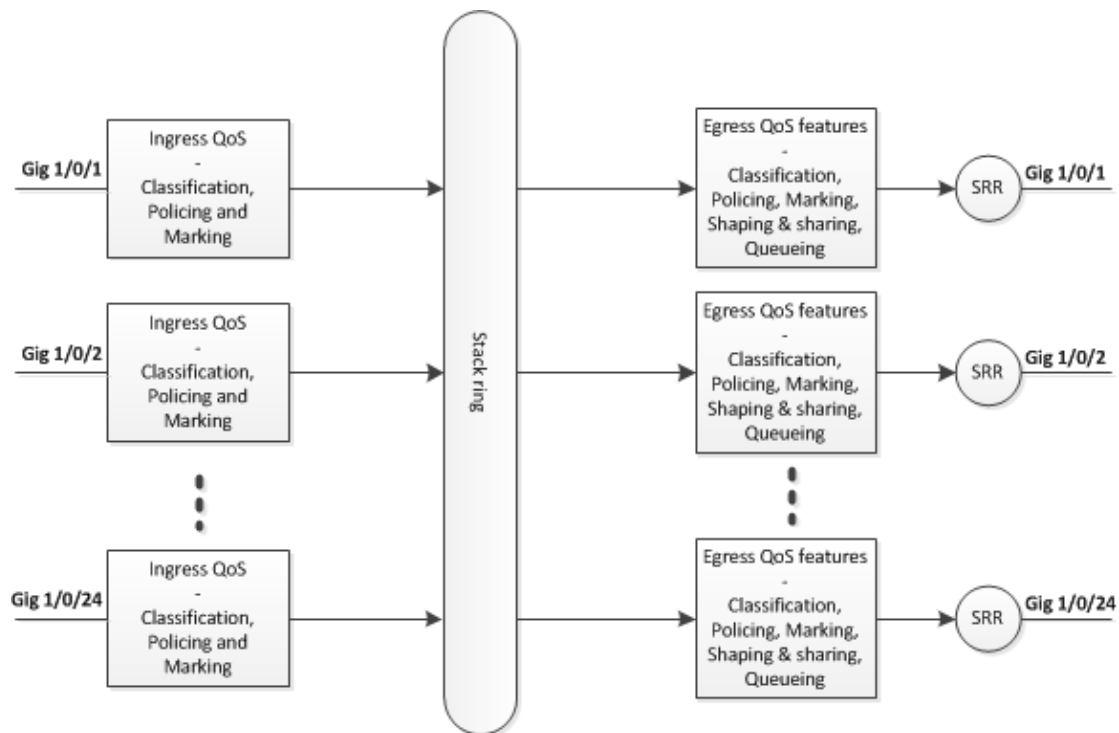
On the 3750, by default the QoS is disabled whereas on the 3850, it is enabled. Also in order to preserve Layer 2 (L2)/Layer 3 (L3) QoS marking on the 3750 platform, a trust configuration must be applied.

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 (DSCP), Precedence (Prec), Access Control List (ACL)	Class-map Class of Service (CoS), Prec, DSCP, ACL And VLAN
Marking	Set DSCP and Prec	Supports match-any only Set CoS, Prec, DSCP and QoS-group

[unconditional set]

Marking

<i>[conditional marking]</i>	DSCP mutation	Class-default table-map
Policing	1r2c	1r2c and 2r3c
Policing markdown	Policing exceeds mark-down [Only supports DSCP]	Policing exceeds and 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

<i>Feature</i>	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:

```
show run class-map [name_of_class-map]
show run policy-map [name of policy-map]
show policy-map int [interface_name]
```

General show commands:

```
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

```

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 int [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

	3750	3750	3850 *	Sample Link
QoS Config	[Global]	[Interface]		
		Two queues	Egress with no policy	
QoS disable	No MLS QoS	Control-> queue (2)	Control -> queue(1)	Example 1
		Data -> queue (4)	Data -> queue(2)	
		a)	Egress queuing policy	
		MLS QoS trust CoS	classify on CoS [ingress need config trust CoS]	Example 2
Trust or set at ingress and egress		b)	egress queuing policy	Example 3
		MLS QoS trust DSCP	classify on DSCP	
Queuing action based on the ingress	MLS QoS	c)	Egress queuing policy	Example 4
		Input policy with set action to mark the DSCP value	classify on DSCP	
Trust or set		d)	Input policy with class-default	Example 5
		No MLS QoS trust config [both CoS/DSCP will be set zero]	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 will use the corresponding new mapping	Output explicit classification [CoS/DSCP] with queuing action	Example 6
		Interface need configuration		
DSCP mutation	MLS QoS DSCP mutation	MLS QoS trust DSCP	Interface input policy with table-map	Example 7
		MLS QoS DSCP-mutation [name]		
Agg-policing	MLS QoS	Need interface-level	Agg-policing [one	Example

	aggregatepolicing	configuration	type of HQoS]	8
Police-markdown	MLS QoS map policed-DSCP [10] [11] to [63]	Policing policy attaching to interface, exceed not drop, the global policed-DSCP will take effect	One table-map for exceed and one table-map for violate action of policing	Example 9
		[Input]	[Input and output]	
	MLS QoS queue-set output [1] threshold [1] [100] [100] [50] [200]			
	1-> queue-set 1			
Queue-limit	<1-> queue 1	Config queue-set [2]	Egress queuing policy with queuing action and queue-limit configuration	Example 10
	Threshold 1	[Default queue-set 1]		
	Threshold 2			
	Reserved buffer			
	Max threshold			
Queue-buffers	MLS QoS queue-set output [1] buffers [15] [25] [40] [20]	Interface config queue-set	Policy-map with queuing action and queue-buffers ratio [0-100]	Example 11
		Interface level config		
Share/bandwidth	MLS QoS	"SRR-queue bandwidth share 1 30 35 5" [Share mode]	Bandwidth in policy-map	Example 12
priority queue	MLS QoS	Interface level config "priority-queue out", this will make corresponding queue-set's 1 st queue as priority queue	Priority level 1 in the policy-map	Example 13
[Expedite queue]				
Shaper	MLS QoS	SRR-queue bandwidth shape [shape mode]	Shape average in policy-map	Example 14
Port-shaper	MLS QoS	SRR-queue bandwidth limit	Port-shaper	Example 15
HQoS	MLS QoS	SVI [attach policy to SVI] and interface needs configuration "MLS QoS VLAN_based"	PV policy And attach policy to the port at input direction	Example 16

Example 1: QoS Disable

3750 (Global config)

No MLS QoS

3750 (interface)

Two queue [control one queue 2, data one

3850

Egress with no policy

queue 4]

[Control pkts in queue 1 and data packets in queue 2]

3750

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 <- <i>control</i>
queue 2:	0	0	0
queue 3:	0	0	0 <- <i>data</i>

output queues dropped:

queue:	threshold1	threshold2	threshold3
queue 0:	0	0	0
queue 1:	0	0	0 <- <i>control</i>
queue 2:	0	0	0
queue 3:	0	0	0 <- <i>data</i>

Policer: Inprofile: 0 OutofProfile: 0

3850

3850#*show ru int 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 0	800 <- <i>control</i>
1	1 4	0 7 720	2 480	2 180	2 800	<- <i>data</i>
2	1 4	0 5 0	0 0	0 0	0 0	800
3	1 4	0 5 0	0 0	0 0	0 0	800
4	1 4	0 5 0	0 0	0 0	0 0	800
5	1 4	0 5 0	0 0	0 0	0 0	800
6	1 4	0 5 0	0 0	0 0	0 0	800
7	1 4	0 5 0	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	Weight1	Max_Th1	Min_Th1	Weight2	Max_Th2	Min_Th2
0	0	478	0	0	534	0	0	600
1	0	573	0	0	641	0	0	720

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 Enable Trust COS

3750 (Global) 3750 (interface)

MLS QoS Interface "MLS QoS trust CoS" (based on the default CoS-mapping to the queue-set 1)

3850

Egress queuing policy based on CoS (ingress need config trust CoS)

3750

Global config:

```
3750(config)#mls qos
```

Interface config:

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

Related show cli:

```
3750#sh mls qos
```

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

```
3750#sh mls qos int 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

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 Enable Trust DSCP

3750

(Global)

3750 (interface)

MLS QoS

Interface "MLS QoS trust DSCP" [based on the default DSCP-mapping to the queue-set 1]

3850

Input default trust DSCP

Egress queuing policy based on DSCP

3750

```
config
3750(config)#mls qos <- Global
interface GigabitEthernet1/0/1 <- Interface
  mls qos trust dscp
```

```
3750#sh mls qos int 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 01-01 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

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 Enable 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

Need explicit egress policy to do queuing mapping

[Marked value will be used for egress mapping]

3750

```
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 int f7/0/2
interface FastEthernet7/0/2
  mls qos trust dscp
  service-policy input set-dscp-63

3750#show policy-map int 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 will be marked to dscp63 which mapping based on the existing mapping table, other pkts will retain original dscp value mapping accordingly

3850

Input will be same as 3750 config

Egress: will 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 Enable with No MLS QoS Trust on Interface

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

3750

```

Global:
c3750(config)#mls qos

Interface:
interface GigabitEthernet2/0/45

```

!

3850

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 int gig1/0/1
interface GigabitEthernet1/0/1
  service-policy input example5-input
```

Attach to the egress port:

```
c3850#show ru int gig1/0/2
interface GigabitEthernet1/0/2
  service-policy output example5-output
```

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

3750 (global)

MLS QoS SRR-queue mapping config

(MLS QoS SRR-queue output [CoS-map queue [1] threshold [3] [4 5])

3750 (interface)

A, b, c and d will use the new mapping table

[CoS 4 and 5 will be map to queue 1 threshold 3]

3850

Egress explicit classification with queuing action

3750

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

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 Enable 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

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 int 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 int 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

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 Enable with Aggregate Policing

3750 (global)

MLS QoS aggregate policing

[All classes using the agg-policing will share the policing rate]

MLS QoS aggregate-policer **agg_traffic** 8000 8000 exceed-action drop

3750 (interface)

Need interface level config

Interface having policy which has **agg_traffic** as agg policer name

3850

Agg-policing (HQoS)

3750

```
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 will 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 Enable with Policing Mark Down

3750 (Global config)

***MLS QoS map
policed-DSCP x to y***

3750 (interface)

As long as interface has policing policy, exceed is transmit, the global CLI will take effect [input only]

3850

***One table-map for exceed
and one for violate action of
policing, input, and output***

3750

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

```
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 Enable with Queue-Limit Configuration

```
3750 (global)                   3750 (interface)  3850
MLS QoS queue-set output 1 threshold 1100
100 50 200 (queue-limit)
```

[I ->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

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 will 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

(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 will be dropped earlier than cos 6 and 7

Example 11: MLS QoS Enable with Queue-Buffer Configuration

3750 (global)

**MLS QoS queue-set output [1]
buffers [15 25 40 20]**

3750 (interface)

**Interface config queue-set
[default queue-set 1]**

3850

**Policy-map with queuing action and
queue-buffers ratio [0-100]**

3750

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

```
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 Enable with Bandwidth Configuration

3750 (global)

3750 (interface)

3850

MLS QoS (share mode)

Interface level config

Bandwidth in policy-map

"SRR-queue bandwidth share 1 30 35 5"

3750

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

```
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 Enable with Priority

3750 (Global)

MLS QoS [expedite queue]

Note: expedite queue same as priority queue

3750 (Interface)

Interface level config "priority-queue out" [make corresponding queue-set's 1st queue as strict priority queue]

3850

Priority level 1 in the policy-map

3750

```
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

```
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 Enable with Shaper Configuration

3750

```
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

```
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 Enable with Bandwidth

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

3750

```
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

```
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,	Attach policy to SVI	
Policy-map	Interface needs configuration "MLS QoS vlan_based"	PV ingress policy

3750

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

Note: Due to target change, this can'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#sh 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#sh 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#sh run class-map vlan10
class-map match-any vlan10
  match vlan 10
```

```
3850#sh run class-map vlan11
class-map match-any vlan11
  match vlan 11
```

```
3850#sh run class-map vlan12
class-map match-any vlan12
  match vlan 12
```

```
3850#sh run class-map dscp1
class-map match-any dscp1
  match dscp 1
```

```
3850#sh run class-map dscp2
class-map match-any dscp2
  match dscp 2
```

```
3850#sh run class-map dscp3
class-map match-any dscp3
  match dscp 3
```