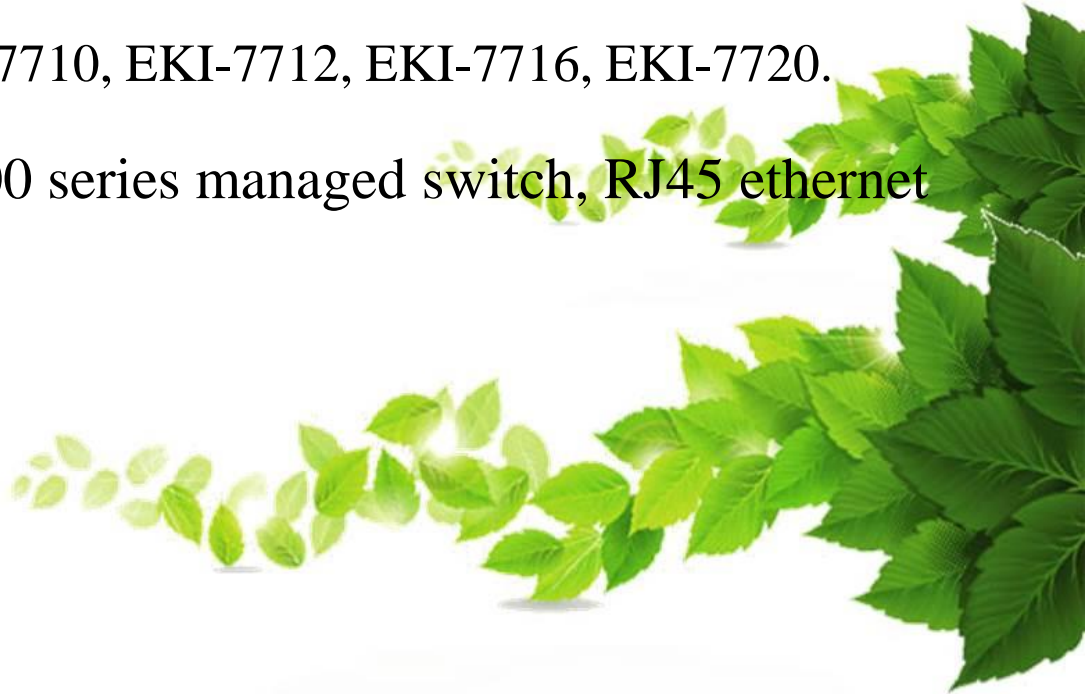


EKI-7700 Series QoS Configuration SOP

Revision Date	Revision	Description	Author
May/2018	V1.0	Initial release	ICG AE Eddie.Wei / Raimen Liu

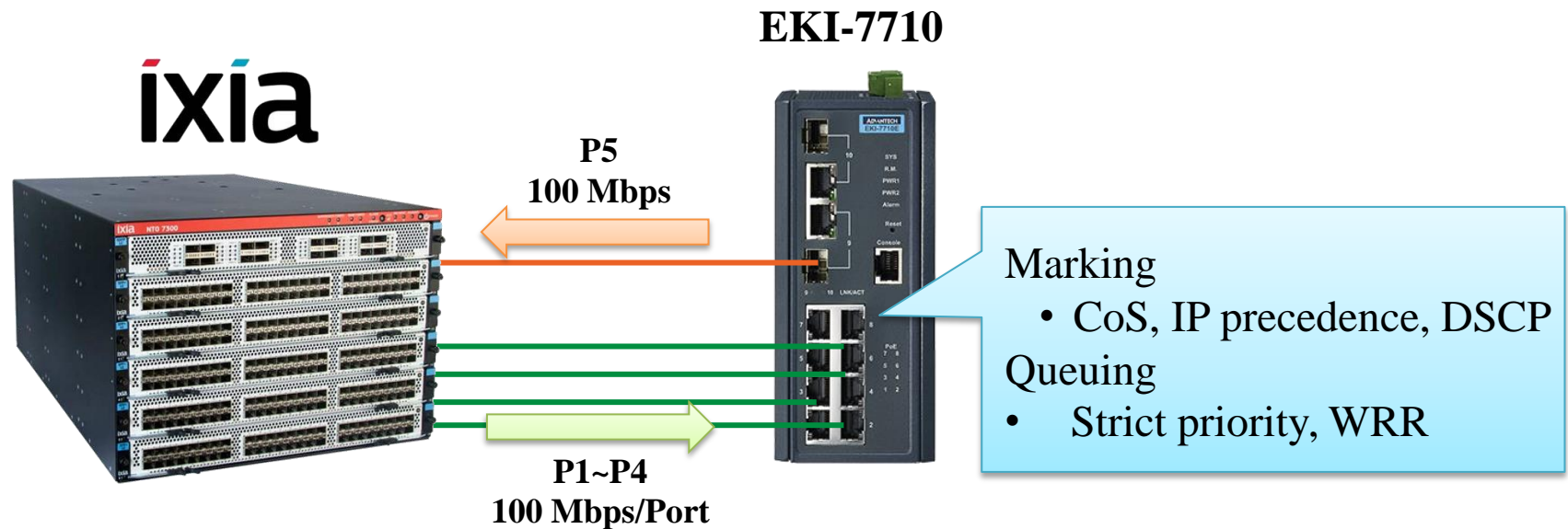
Abstract

- ❖ **This SOP explains how to configure QoS on Advantech EKI-7700 series industrial managed switch and verify it by IXIA.**
- ❖ **Users just need to focus on the configuration of different QoS queuing and scheduling methods.**
- ❖ **Related products:**
EKI-7428, EKI-7706, EKI-7708, EKI-7710, EKI-7712, EKI-7716, EKI-7720.
- ❖ **Requirement:** Advantech EKI-7700 series managed switch, RJ45 ethernet cable, PC



IXIA Verify QoS Topology

- ❖ The following IXIA verified QoS function included three different marking method IEEE 802.1p CoS, IP precedence and DSCP. And the queuing algorithm are strict priority queue & WRR.
- ❖ **Scenario:** IXIA send packets to P1 ~ P4 with 100Mbps and P5 is receiving port. In this condition P5 must happen congestion issue. So we are able to determine what kind of packets can be forwarded first through configuring QoS on EKI-7710.



CoS & WRR

QoS Configuration (1/4)

- Configure for the CoS Value
- GE1 is 0, GE2 is 1, GE3 is 2, GE4 is 4

Port	CoS Value	Queue & Weight
P1	0	Queue 1 (W8)
P2	1	Queue 2 (W4)
P3	2	Queue 3 (W2)
P4	3	Queue 4 (W1)

Switch / QoS / General / QoS Settings

QoS Settings

Port: Select Port

CoS Value: 0

Remark CoS: Disabled Enabled

Remark DSCP: Disabled Enabled

Remark IP Precedence: Disabled Enabled

Apply

QoS Status

Port	CoS Value	Remark CoS	Remark DSCP	Remark IP Precedence
GE1	0	Disabled	Disabled	Disabled
GE2	1	Disabled	Disabled	Disabled
GE3	2	Disabled	Disabled	Disabled
GE4	3	Disabled	Disabled	Disabled
GE5	0	Disabled	Disabled	Disabled
GE6	0	Disabled	Disabled	Disabled
GE7	0	Disabled	Disabled	Disabled

QoS Configuration (2/4)

- Configure WRR to 8:4:2:1 ratio
- Now the sample here will use 4 queues only

EKI-7710 QoS Rule		
Port	CoS Value	Queue & Weight
P1	0	Queue 1 (W8)
P2	1	Queue 2 (W4)
P3	2	Queue 3 (W2)
P4	3	Queue 4 (W1)

The screenshot displays the QoS configuration interface. The left sidebar shows the navigation menu with 'QoS' selected. The main content area is titled 'Queue Table' and shows a table with columns: Queue, Strict, WRR, Weight, and % of WRR Bandwidth. The 'WRR' column has radio buttons, and the 'Weight' column has input fields. A red box highlights the configuration for queues 1-4, where WRR is selected and weights are 8, 4, 2, and 1. Below the table is an 'Apply' button. At the bottom, the 'Queue Information' table shows the following data:

Information Name	Information Value
Strict Priority Queue Number	4
Queue 1 Weight	8
Queue 2 Weight	4
Queue 3 Weight	2
Queue 4 Weight	1

QoS Configuration (3/4)

- Now CoS Value 0 mapping to Queue 1 and ratio is 8
- Now CoS Value 1 mapping to Queue 2 and ratio is 4
- Now CoS Value 2 mapping to Queue 3 and ratio is 2
- Now CoS Value 3 mapping to Queue 4 and ratio is 1

Port	CoS Value	Queue & Weight
P1	0	Queue 1 (W8)
P2	1	Queue 2 (W4)
P3	2	Queue 3 (W2)
P4	3	Queue 4 (W1)

The screenshot displays the 'CoS Mapping' configuration page in a web interface. The left sidebar shows navigation options like Monitoring, System, L2 Switching, MAC Address Table, Security, QoS, and Management. The main content area is titled 'CoS Mapping' and contains two sections: 'CoS to Queue Mapping' and 'Queue to CoS Mapping'. The 'CoS to Queue Mapping' section is highlighted with a red box and shows a table where Class of Service values (0, 2, 4, 6) are mapped to Queue numbers (1, 3, 5, 7). The 'Queue to CoS Mapping' section shows a table where Queue numbers (1, 3, 5, 7) are mapped to Class of Service values (0, 2, 4, 6). An 'Apply' button is located at the bottom of the configuration area.

Class of Service	Queue	Class of Service	Queue
0	1	1	2
2	3	3	4
4	5	5	6
6	7	7	8

Queue	Class of Service	Queue	Class of Service
1	0	2	1
3	2	4	3
5	4	6	5
7	6	8	7

QoS Configuration (4/4)

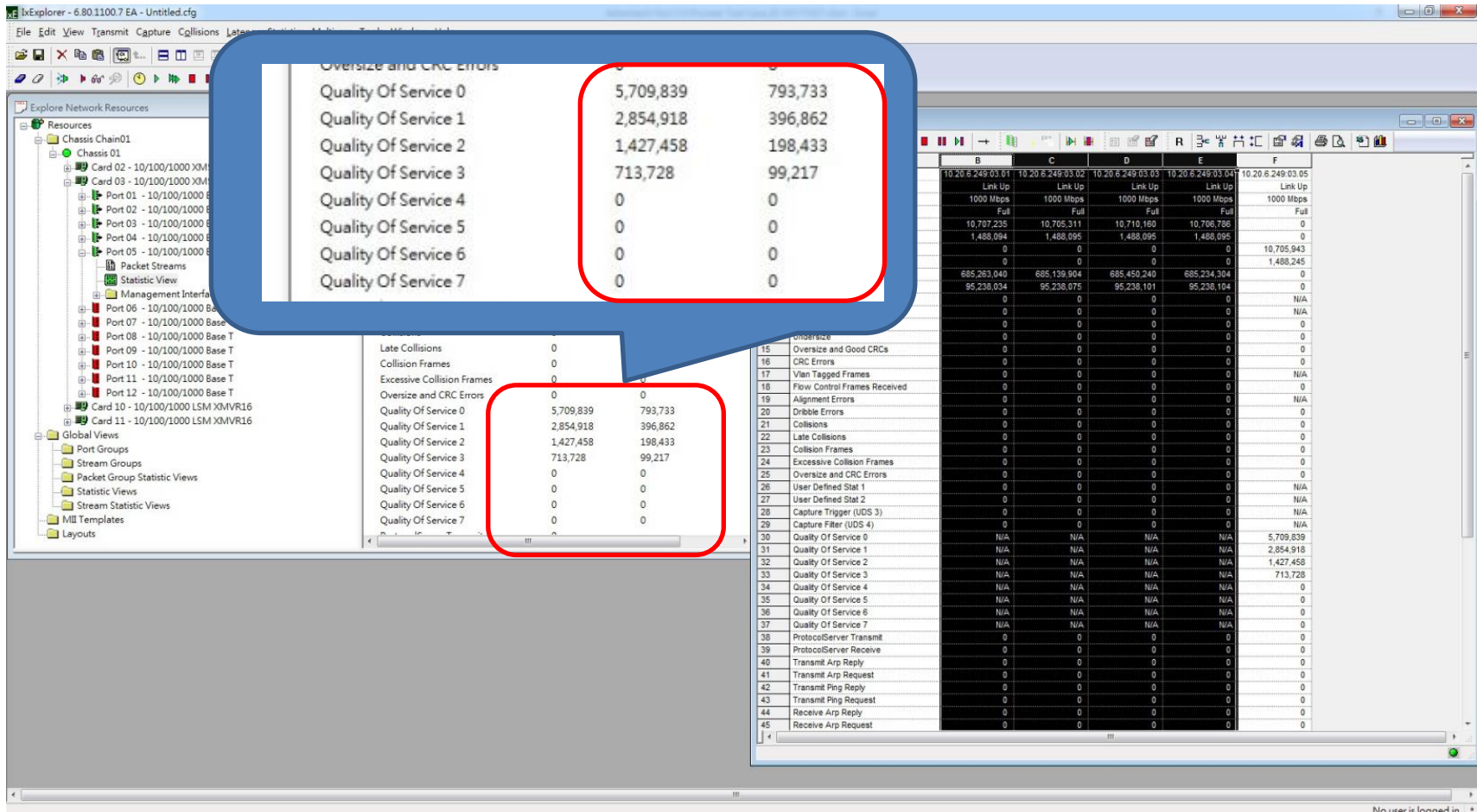
- Change the Trust Mode to CoS/802.1p

The screenshot displays the network management interface for QoS configuration. The left sidebar shows the navigation menu with 'QoS' selected. The main content area is titled 'Switch / QoS / QoS Basic Mode / Global Settings'. Under 'Basic Mode Global Settings', the 'Trust Mode' dropdown menu is set to 'CoS/802.1p' and is highlighted with a red box. An 'Apply' button is located below the dropdown. Below this, the 'Basic Mode Global Information' table shows the current configuration.

Information Name	Information Value
Trust Mode	CoS/802.1p

IXIA Results for CoS

- Apply L2 Cost of Service(CoS)
- Port 5 received packets from Port1~port4, we monitoring port5 received packets ratio as below:



DSCP & WRR

QoS Configuration (1/2)

- Now DSCP Value 8 mapping to Queue 1 and ratio is 4
- Now DSCP Value 16 mapping to Queue 2 and ratio is 3
- Now DSCP Value 24 mapping to Queue 3 and ratio is 2
- Now DSCP Value 32 mapping to Queue 4 and ratio is 1

Port	DSCP Value	Queue & Weight
P1	8	Queue 1 (W4)
P2	16	Queue 2 (W3)
P3	24	Queue 3 (W2)
P4	32	Queue 4 (W1)

ADVANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

Switch / QoS / General / DSCP Mapping

DSCP Mapping

DSCP to Queue Mapping

DSCP	<input type="text" value="8"/>	Queue	<input type="text" value="1"/>
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Queue to DSCP Mapping

Queue	DSCP	Queue	DSCP
1	<input type="text" value="0"/>	2	<input type="text" value="8"/>
3	<input type="text" value="16"/>	4	<input type="text" value="24"/>
5	<input type="text" value="32"/>	6	<input type="text" value="40"/>
7	<input type="text" value="48"/>	8	<input type="text" value="56"/>

Apply

QoS Configuration (2/2)

- Change the Trust Mode to DSCP

<i>EKI-7710 QoS Rule</i>		
Port	DSCP Value	Queue & Weight
P1	8	Queue 1 (W4)
P2	16	Queue 2 (W3)
P3	24	Queue 3 (W2)
P4	32	Queue 4 (W1)

The screenshot shows the Advantech web interface for an EKI-7710E-2C-AE Intelligent Industrial Switch. The navigation menu on the left includes Monitoring, System, L2 Switching, MAC Address Table, Security, QoS, General, QoS Basic Mode, Global Settings, and Port Settings. The main content area is titled 'Switch / QoS / QoS Basic Mode / Global Settings'. Under 'Basic Mode Global Settings', the 'Trust Mode' is set to 'DSCP' and is highlighted with a red box. An 'Apply' button is located below the dropdown. Below this, the 'Basic Mode Global Information' table shows the current 'Trust Mode' as 'CoS/802.1p'.

Information Name	Information Value
Trust Mode	CoS/802.1p

IXIA Results for DSCP

- Apply L3 DSCP
- Port 5 received packets from Port1~port4, we monitoring port5 received packets ratio as below:

Stats For 10.0.0.1:03.05	Count	Rate	Logging	Alert
CRC Errors	0	0		
Flow Control Frames Received	0	0		
Dribble Errors	0	0		
Collisions	0	0		
Late Collisions	0	0		
Collision Frames	0	0		
Excessive Collision Frames	0	0		
Oversize and CRC Errors	0	0		
Quality Of Service 0	6	0		
Quality Of Service 1	1,270,987	59,528		
Quality Of Service 2	953,246	44,651		
Quality Of Service 3	635,496	29,763		
Quality Of Service 4	317,748	14,882		
Quality Of Service 5	0	0		
Quality Of Service 6	0	0		
Quality Of Service 7	0	0		
ProtocolServer Transmit	0			
ProtocolServer Receive	0			
Transmit Arn Renlv	0			

4:3:2:1

IP Precedence & WRR

QoS Configuration (1/2)

- Now IP Precedence Value 4 mapping to Queue 1 and ratio is 1
- Now IP Precedence Value 3 mapping to Queue 2 and ratio is 2
- Now IP Precedence Value 2 mapping to Queue 3 and ratio is 3
- Now IP Precedence Value 1 mapping to Queue 4 and ratio is 4

EKI-7710 QoS Rule		
Port	IP Precedence	Queue & Weight
P1	4	Queue 1 (W1)
P2	3	Queue 2 (W2)
P3	2	Queue 3 (W3)
P4	1	Queue 4 (W4)

ADANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

Switch / QoS / General / IP Precedence Mapping

IP Precedence Mapping

IP Precedence to Queue Mapping

IP Precedence	Queue	IP Precedence	Queue
0	1	1	4
2	3	3	2
4	1	5	6
6	7	7	8

Queue to IP Precedence Mapping

Queue	IP Precedence	Queue	IP Precedence
1	0	2	1
3	2	4	3
5	4	6	5
7	6	8	7

Apply

QoS Configuration (2/2)

- Change the Trust Mode to IP Precedence

Port	IP Precedence	Queue & Weight
P1	4	Queue 1 (W1)
P2	3	Queue 2 (W2)
P3	2	Queue 3 (W3)
P4	1	Queue 4 (W4)

EKI-7710E-2C-AE
Intelligent Industrial Switch

Switch / QoS / QoS Basic Mode / Global Settings

Basic Mode Global Settings

Trust Mode: IP Precedence

Apply

Basic Mode Global Information

Information Name	Information Value
Trust Mode	CoS/802.1p

IXIA Results for IP Precedence

- Apply L3 IP Precedence
- Port 5 received packets from Port1~Port4, we monitoring port5 received packets ratio as below:

Stats For 10.0.0.1:03.05	Count	Rate	Logging	Alert
Fragments	0	0		
Undersize	0	0		
Oversize and Good CRCs	0	0		
CRC Errors	0	0		
Flow Control Frames Received	0	0		
Dribble Errors	0	0		
Collisions	0	0		
Late Collisions	0	0		
Collision Frames	0	0		
Excessive Collision Frames	0	0		
Oversize and CRC Errors	0	0		
Quality Of Service 0	0	0		
Quality Of Service 1	98,116	14,882		
Quality Of Service 2	196,234	29,767		
Quality Of Service 3	294,350	44,647		
Quality Of Service 4	392,466	59,529		
Quality Of Service 5	0	0		
Quality Of Service 6	0	0		
Quality Of Service 7	0	0		

1:2:3:4

CoS & Strict Priority Queue

IXIA Results for CoS and Strict Priority Queue (1/2)

ADVANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

Switch / QoS / General / QoS Scheduling

Queue Table

Queue	Strict	WRR	Weight	%% of WRR Bandwidth
1	<input type="radio"/>	<input type="radio"/>	8	
2	<input type="radio"/>	<input type="radio"/>		
3	<input type="radio"/>	<input type="radio"/>		
4	<input type="radio"/>	<input type="radio"/>		
5	<input type="radio"/>	<input type="radio"/>		
6	<input type="radio"/>	<input type="radio"/>		
7	<input type="radio"/>	<input type="radio"/>		
8	<input type="radio"/>	<input type="radio"/>		

Apply

Queue Information

Information Name
Strict Priority Queue Number

EKI-7710 QoS Rule

Port	CoS Value	Strict Priority Queue
P1	0	Queue 1 (Lowest)
P2	1	Queue 2 (Low)
P3	2	Queue 3 (Middle)
P4	3	Queue 4 (High)

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IXIA Results for CoS and Strict Priority Queue (2/2)

Stats For 10.0.0.1:03.05	Count	Rate	Logging
Undersize	0	0	
Oversize and Good CRCs	0	0	
CRC Errors	0	0	
Flow Control Frames Received	0	0	
Dribble Errors	0	0	
Collisions	0	0	
Late Collisions	0	0	
Collision Frames	0	0	
Excessive Collision Frames	0	0	
Oversize and CRC Errors	0	0	
Quality Of Service 0	2	0	
Quality Of Service 1	3	0	
Quality Of Service 2	2,714	14	
Quality Of Service 3	29,562,223	142,044	
Quality Of Service 4	0	0	
Quality Of Service 5	0	0	
Quality Of Service 6	0	0	
Quality Of Service 7	0	0	

<i>EKI-7710 QoS Rule</i>		
Port	CoS Value	Strict Priority Queue
P1	0	Queue 1 (Lowest)
P2	1	Queue 2 (Low)
P3	2	Queue 3 (Middle)
P4	3	Queue 4 (High)



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