

QoS

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QoS (Quality of Service) – QoS , .

QoS

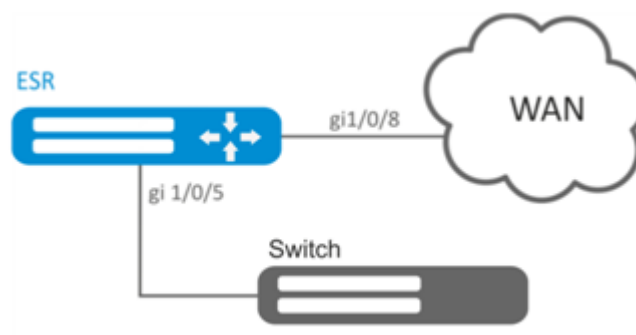
ESR () (QoS)

1	QoS // . QoS, BasicQoS.	esr(config-if-gi)# qos enable	
2	802.1p DSCP .()	esr(config)# qos trust <MODE>	<MODE> – 802.1p DSCP, : <ul style="list-style-type: none">• dscp – DSCP IP-. IP- .• cos – 802.1p 802.1q. .• cos - dscp – DSCP IP- 802.1p .
3	DSCP //, QOS().	esr(config)# qos map dscp-queue <DSCP> to <QUEUE>	<DSCP> – IP-, [0..63]; <QUEUE> – , [1..8]. : <ul style="list-style-type: none">• DSCP: (0-7), 1• DSCP: (8-15), 2• DSCP: (16-23), 3• DSCP: (24-31), 4• DSCP: (32-39), 5• DSCP: (40-47), 6• DSCP: (48-55), 7• DSCP: (56-63), 8
4	802.1p . //, QOS.()	esr(config)# qos map cos-queue <COS> to <QUEUE>	<COS> – 802.1q, [0..7]; <QUEUE> – , [1..8]. : <ul style="list-style-type: none">• CoS: (0), 1• CoS: (1), 2• CoS: (2), 3• CoS: (3), 4• CoS: (4), 5• CoS: (5), 6• CoS: (6), 7• CoS: (7), 8
5	DSCP DSCP .() //, QOS.	esr(config)# qos map dscp-queue <DSCP> to <DSCP>	<DSCP> – IP-, [0..63].
6	DSCP DSCP-Mutation.()	esr(config)# qos dscp mutation	
7	, IP DSCP-.	esr(config)# qos queue default <QUEUE>	<QUEUE> – , [1..8].
8	. .()	esr(config)# priority-queue out num-of-queues <VALUE>	<VALUE> – , [0..8].: <ul style="list-style-type: none">• 0 – WRR (WRR –);• 8 – «strictpriority» (strictpriority – ,). , 8-, . :8

9	.	esr(config)# qos wrr-queue <QUEUE> bandwidth <WEIGHT>	<QUEUE> - , [1..8]; <WEIGHT> - , [1..255]. : 1 .
10	BasicQoS . QoS, .()	esr(config-if-gi)# traffic-shape { <BANDWIDTH> [BURST] queue <QUEUE><BANDWIDTH> [BURST] }	<QUEUE> - , [1..8]; <BANDWIDTH> - /, [3000..10000000] TengigabitEthernet [64..1000000] ; <BURST> - , [4..16000]. 128 . :.
11	.()	esr(config-if-gi)# rate-limit <BANDWIDTH> [BURST]	<BANDWIDTH> - /, [3000..10000000] TengigabitEthernet [64..1000000] ; <BURST> - , [4..16000]. 128 . :.

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gigabitethernet 1/0/8: DSCP 22 , DSCP 14 , 60 / .



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esr(config)# priority-queue out num-of-queues 1
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DSCP 22 :

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esr(config)# qos map dscp-queue 22 to 1
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DSCP 14 :

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esr(config)# qos map dscp-queue 14 to 7
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QoS LAN:

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esr(config)# interface gigabitethernet 1/0/5
esr(config-if-gi)# qos enable
esr(config-if-gi)# exit
```

QoS WAN :

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esr(config)# interface gigabitethernet 1/0/8
esr(config-if-gi)# qos enable
```

60/ :

```
esr(config-if)# traffic-shape queue 7 60000
esr(config-if)# exit
```

QoS :

```
esr# show qos statistics gigabitethernet 1/0/8
```

QoS

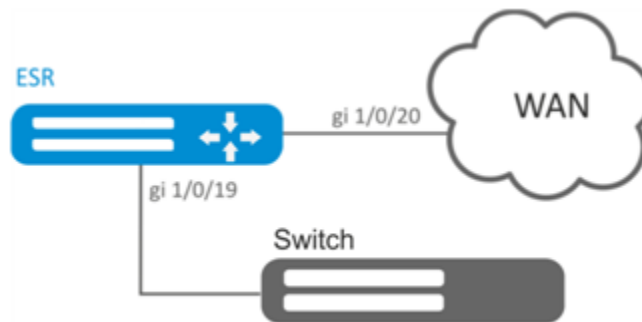
ESR .

1	, QoS.		. (ACL).
2	QoS .	esr(config)# class-map <NAME>	<NAME> – , 31 .
3	QoS.()	esr(config-class-map)# description <description>	<description> – 255 .
4	(ACL).	esr(config-class-map)# match access-group <NAME>	<NAME> – , 31 .
5	DSCP, IP-, (IP Precedence CoS).()	esr(config-class-map)# set dscp <DSCP>	<DSCP> – DSCP, [0..63].
6	IP Precedence, IP-, (DSCP CoS). ()	esr(config-class-map)# set ip-precedence <IPP>	<IPP> – IP Precedence, [0..7].
7	802.1p, , (DSCP IP Precedence). ()	esr(config-class-map)# set cos <COS>	<COS> – 802.1p, [0..7].
8	QoS .	esr(config)# policy-map <NAME> esr(config-policy-map)#	<NAME> – , 31 .
9	QoS.()	esr(config-policy-map)# description <description>	<description> – 255 .
10	.	esr(config-policy-map)# shape average <BANDWIDTH> [BURST]	<BANDWIDTH> – /, [64.. 10000000]; <BURST> – , [4..16000]. 128 .
11	, , .()	esr(config-policy-map)# shape auto-distribution	
12	QoS- .	esr(config-policy-map)# class <NAME> esr(config-class-policy-map)#	<NAME> – , 31 . «class-default» .
13	QoS QoS QoS.	esr(config-class-policy-map)# service-policy <NAME>	<NAME> – , 31 . .
14	.()	esr(config-class-policy-map)# shape average <BANDWIDTH> [BURST]	<BANDWIDTH> – /, [64.. 10000000]; <BURST> – , [4..16000]. 128 .
15	. , .()	esr(config-class-policy-map)# shape peak <BANDWIDTH> [BURST]	
16	.()	esr(config-class-policy-map)# mode <MODE>	<MODE> – : <ul style="list-style-type: none">• fifo – FIFO (First In, First Out);• gred – GRED (Generalized RED);• red – RED (Random Early Detection);• sfq – SFQ (SFQ). : FIFO.

17	WRR-. ()	esr(config-class-policy-map)# priority class <PRIORITY>	<PRIORITY>- WRR-, [1..8]. .
18	StrictPriority . ()	esr(config-class-policy-map)# priority level <PRIORITY>	<PRIORITY>- StrictPriority-, [1..8]. . : WRR, .
19	. ()	esr(config-class-policy-map)# fair-queue <QUEUE-LIMIT>	<QUEUE-LIMIT>- , [16..4096]. : 16.
20	. ()	esr(config-class-policy-map)# queue-limit <QUEUE-LIMIT>	<QUEUE-LIMIT>- , [2..4096]. : 127.
21	RED (Random Early Detection). ()	esr(config-class-policy-map)# random-detect <LIMIT> <MAX> <MIN> <PROBABILITY>	<LIMIT>- , [1..1000000]; <MAX>- , [1..1000000]; <MIN>- , [1..1000000]; <PROBABILITY>- , [0..100]. : • <MAX>> 2 * <MIN> • <LIMIT>> 3 * <MAX>
22	GRED (Generalized Random Early Detection). ()	esr(config-class-policy-map)# random-detect precedence <PRECEDENCE><LIMIT><MAX><MIN><PROBABILITY>	<PRECEDENCE>- IPPPrecedence [0..7]; <LIMIT>- , [1..1000000]; <MAX>- , [1..1000000]; <MIN>- , [1..1000000]; <PROBABILITY>- , [0..100]. : • <MAX>> 2 * <MIN> • <LIMIT>> 3 * <MAX>
23	tcp . ()	esr(config-class-policy-map)# compression header ip tcp	
24	QoS // .	esr(config-if-gi)# qos enable	
25	QoS // (input) (output).	esr(config-if-gi)# service-policy { input output } <NAME>	<NAME>- QoS-, 31 .

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(10.0.11.0/24, 10.0.12.0/24), DSCP (38 42) (40 /
60 /), 250 /, SFQ.



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esr(config)# ip access-list extended fl1
esr(config-acl)# rule 1
esr(config-acl-rule)# action permit
esr(config-acl-rule)# match protocol any
esr(config-acl-rule)# match source-address 10.0.11.0 255.255.255.0
esr(config-acl-rule)# match destination-address any
esr(config-acl-rule)# enable
esr(config-acl-rule)# exit
esr(config-acl)# exit
esr(config)# ip access-list extended fl2
esr(config-acl)# rule 1
esr(config-acl-rule)# action permit
esr(config-acl-rule)# match protocol any
esr(config-acl-rule)# match source-address 10.0.12.0 255.255.255.0
esr(config-acl-rule)# match destination-address any
esr(config-acl-rule)# enable
esr(config-acl-rule)# exit
esr(config-acl)# exit

```

fl1 fl2, , :

```

esr(config)# class-map fl1
esr(config-class-map)# set dscp 38
esr(config-class-map)# match access-group fl1
esr(config-class-map)# exit
esr(config)# class-map fl2
esr(config-class-map)# set dscp 42
esr(config-class-map)# match access-group fl2
esr(config-class-map)# exit

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esr(config)# policy-map fl
esr(config-policy-map)# shape average 250000

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esr(config-policy-map)# class fl1
esr(config-class-policy-map)# shape average 40000
esr(config-class-policy-map)# exit
esr(config-policy-map)# class fl2
esr(config-class-policy-map)# shape average 60000
esr(config-class-policy-map)# exit

```

SFQ:

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esr(config-policy-map)# class class-default
esr(config-class-policy-map)# mode sfq
esr(config-class-policy-map)# fair-queue 800
esr(config-class-policy-map)# exit
esr(config-policy-map)# exit

```

QoS , gi 1/0/19 gi1/0/20 SFQ :

```
esr(config)# interface gigabitethernet 1/0/19
esr(config-if-gi)# qos enable
esr(config-if-gi)# service-policy input fl
esr(config-if-gi)# exit
esr(config)# interface gigabitethernet 1/0/20
esr(config-if-gi)# qos enable
esr(config-if-gi)# service-policy output fl
esr(config-if-gi)# exit
```

:

```
esr# do show qos policy statistics gigabitethernet 1/0/20
```