

НОВЫЕ ВОЗМОЖНОСТИ CRS

Евгений Коржиков

Новосибирск, МУМ 2017

Обо мне

Евгений Коржиков

Опыт работы с сетями более 3 лет

Сертификаты:

Mikrotik: МТСНА, МТСРЕ, МТСВЕ, МТСТСЕ

Asterisk: dCAP

Цель презентации

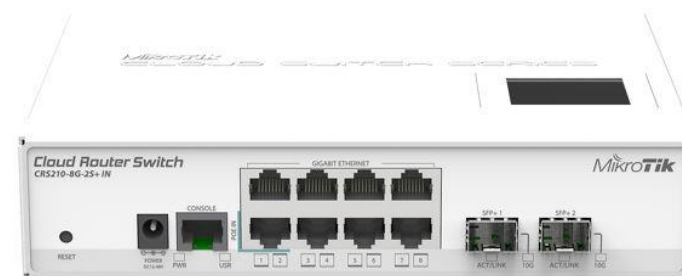
Обзор модельного ряда коммутаторов Mikrotik.

Примеры применения ACL в CRS коммутаторах.

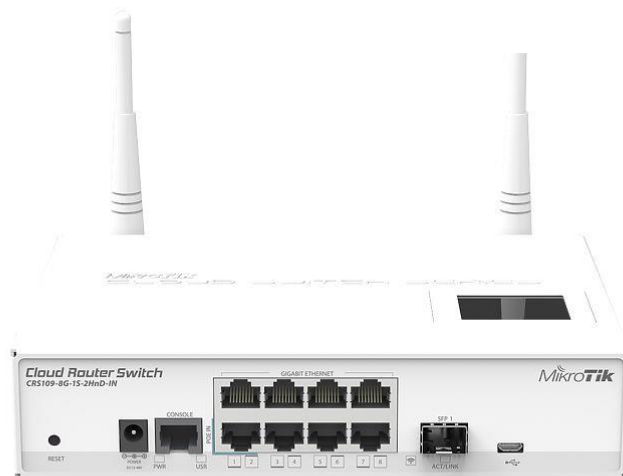
CRS 8 портов Ethernet



CRS112-8G-4S-IN



CRS210-8G-2S+IN



CRS109-8G-1S-2HnD-IN



Cloud Router Switch

CRS109-8G-1S-2HnD-IN

CRS109 has eight Gigabit ports and one SFP port, it also has a built in Wireless Access Point. Our CRS series combines the best features of a fully functional router and a Layer 3 switch, is powered by the familiar RouterOS. All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes

- Full wire speed switching
- Configure ports as switch, or for routing
- If required, full RouterOS routing power right there
- Built in 802.11b/g/n Wireless AP 1000mW
- Desktop case
- Color touchscreen LCD

CPU	Qualcomm Atheros AR9344 600MHz
Memory	128MB
Ethernet	8x 10/100/1000 Mbit/s Gigabit Ethernet with Auto-MDI/X
SFP	One 1G Ethernet SFP cage (Mini-GBIC; SFP module not included), DDMI support.
Storage	128MB Onboard NAND with multiple OS partition support
Serial port	One RJ45 serial port
Extras	Reset switch; beeper; voltage and temperature monitoring, touchscreen LCD
Power options	8-57V, 24V 0.8A PSU included, PoE in: 10-57V on Ether1 (802.3af/at or passive PoE)
Case dimensions	200x145x45mm
Temperature	-35C to +65C tested
OS	MikroTik RouterOS v6, Level 5 license, free product lifetime upgrades
Included	CRS switch, power adapter, microUSB type B to USB type A adapter

Datarate	TX power dBm	RX sensitivity
1MBit/s	29	-97
11MBit/s	28	-90
6MBit/s	30	-96
54MBit/s	25	-76
MCS0	30	-96
MCS7	23	-73

CRS112-8G-4S-IN

Cloud Router Switch 112-8G-4S-IN is a "small size low cost" member of our CRS series. It comes with eight Gigabit Ethernet ports and four SFP cages.

Our CRS series combines the best features of a fully functional router and a Layer 3 switch, is powered by the familiar RouterOS.

All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes.



Included



24V 0.8A power adapter



Specifications

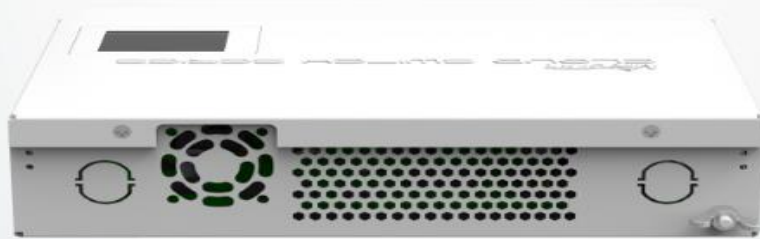
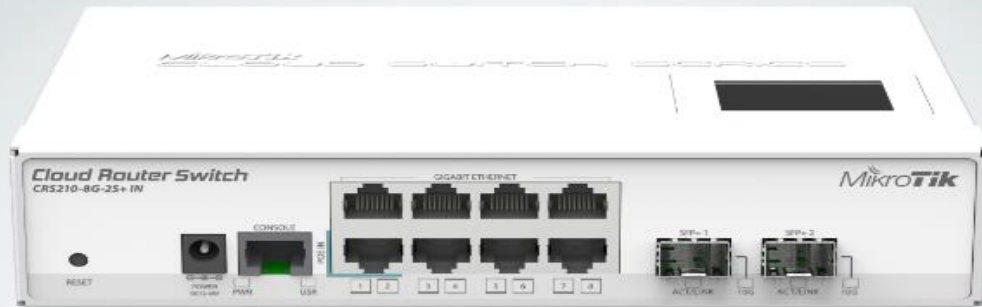
Product code	CRS112-8G-4S-IN
CPU nominal frequency	400 MHz
CPU core count	1
Size of RAM	128 MB
Size of FLASH	16 MB
10/100/1000 Ethernet ports	8
SFP cages	4
Switch chip model	QCA8511-AL1C
Max Power consumption	13.5W
Supported input voltage	10V - 57V
Voltage Monitor	Yes
PCB temperature monitor	Yes
Voltage monitor	Yes
CPU Heat sink	Yes
Switch chip heatsinks	Yes
PoE-in	Yes
COM port	RJ45
Dimensions	200x143x44mm
Operating System	RouterOS
Operating temperature range	-30C to +60C
License level	5
CPU	QCA8511-AL1C
Suggested price	\$139

Cloud Router Switch

CRS210-8G-2S+IN

Cloud Router Switch 210-8G-2S+IN is new "small size low cost" member of our CRS series. It comes with eight Gigabit Ethernet ports and two SFP+ cages for 10G connectivity (first port supports 1.25G/10G modules, second port only 10G modules). Product supports 10-57V DC.

Our CRS series combines the best features of a fully functional router and a Layer 3 switch, is powered by the familiar RouterOS. All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes.



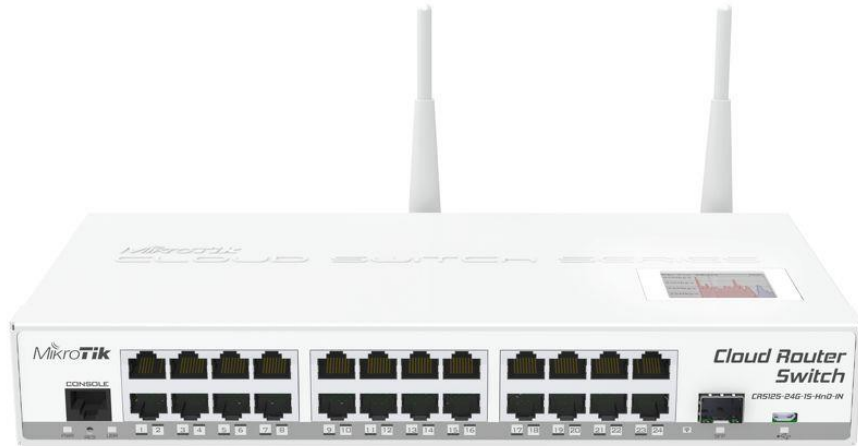
24V 0.8A Adapter



Rackmount ears

CPU	Qualcomm Atheros 8519 400MHz
Memory	DDR2 64MB
Ethernet	8x 10/100/1000 Mbit/s Gigabit Ethernet with Auto-MDI/X
SFP	2x 10G SFP+ cage (Mini-GBIC; SFP+ module not included), DDMI support.
Storage	128MB Onboard NAND with multiple OS partition support
Serial port	One RJ45 serial port
Extras	Reset switch; beeper; voltage and temperature monitoring, touchscreen LCD
Power options	10-57V, 24V 0.8A PSU included, PoE in: 10-57V on Ether1 (802.3af/at or passive PoE)
Power consumption	13W
Case dimensions	200x144x47mm
Temperature	-35C to +65C tested
OS	MikroTik RouterOS v6, Level 5 license
Included	CRS switch, power adapter, rackmount ears

CRS 24 портов Ethernet



CRS125-24G-1S-2HnD-IN



CRS125-24G-1S-RM



CRS125-24G-1S-IN



CRS226-24G-2S+RM

Cloud Router Switch

CRS125_{-24G-1S}

Perfect SOHO gateway router and switch

- Ethernet, Fiber, or 4G (with optional USB modem) gateway connection to Internet
- RouterOS gateway/firewall/VPN router
- up to twenty-five gigabit switch ports (1xSFP and 24xRJ45)

Cloud Router Switch is our new Smart Switch series. It is a fully functional Layer 3 switch, and is powered by the familiar RouterOS. All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes

Two models are available:

1. CRS125-24G-1S-IN - desktop enclosure
2. CRS125-24G-1S-RM - 1U rackmount enclosure

- Fully manageable L3 switch, full wire speed switching
- Configure ports as switch, or for routing
- If required, full RouterOS power right there

CPU	Qualcomm Atheros AR9344 600 MHz
Memory	128MB
Ethernet	24x 10/100/1000 Mbit/s Gigabit Ethernet with Auto-MDI/X
Expansion	microUSB port
Storage	128MB Onboard NAND with multiple OS partition support
Serial port	One RJ45 serial port
Extras	Reset switch; beeper; voltage and temperature monitoring, touchscreen LCD
Power options	8-28V, 24V 0.8A PSU included
Case dimensions	285x145x45mm
Temperature	-35C to +65C tested
OS	MikroTik RouterOS v6, Level 5 license
Included	CRS switch, power adapter, and USB OTG cable (for 4G dongle or USB drive)



CRS125-24G-1S-RM



CRS125-24G-1S-IN

Cloud Router Switch

CRS125

-24G-1S-2HnD-IN

Perfect SOHO gateway router, switch, 11n AP all in one box

- Ethernet, Fiber, or 4G (with optional USB modem) gateway connection to Internet
- RouterOS gateway/firewall/VPN router
- up to twenty-five gigabit switch ports (1xSFP and 24xRJ45)
- 1000mW high power 2.4GHz 11n wireless AP



Cloud Router Switch is our new Smart Switch series. It is a fully functional Layer 3 switch, and is powered by the familiar RouterOS.

All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes.

What's more - this device has a built in 2.4GHz wireless access point, this means you can have an AP, a router with any number of ports, and a full wire speed smart switch, all in one device - ideal for medium/small businesses and offices. It has 24 Gigabit ports, one SFP cage, a microUSB port and a built in Wireless AP.

- Fully manageable L3 switch, full wire speed switching
- Wireless AP built in
- Configure ports as switch, or for routing
- If required, full RouterOS power right there

CPU	Qualcomm Atheros AR9344 600 MHz
Memory	128MB
Ethernet	24x 10/100/1000 Mbit/s Gigabit Ethernet with Auto-MDI/X
Expansion	microUSB port
Storage	128MB Onboard NAND with multiple OS partition support
Serial port	One RJ45 serial port
Extras	Reset switch; beeper; voltage and temperature monitoring, touchscreen LCD
Power options	8-28V, 24V 1.2A PSU included
Case dimensions	285x145x45mm
Temperature	-35C to +65C tested
OS	MikroTik RouterOS v6, Level 5 license
Included	CRS switch, power adapter, and USB OTG cable (for 4G dongle or USB drive)

Antennas	2x built in 4dBi swivel antennas
RX sensitivity	802.11g: -96dBm @ 6Mbit/s to -80dBm @ 54Mbit/s 802.11n: -96dBm @ MCS0 to -78dBm @ MCS7
TX power	802.11g: 30dBm @ 6Mbps to 25dBm @ 54 Mbps 802.11n: 30dBm @ MCS0 to 23dBm @ MCS7
Modulations	OFDM: BPSK, QPSK, 16 QAM, 64QAM DSSS: DBPSK, DQPSK, CCK

Cloud Router Switch

CRS226-24G-2S+

Cloud Router Switch is our new member of our Smart Switch series. It combines the best features of a fully functional router and a Layer 3 switch, is powered by the familiar RouterOS. All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes

The CRS226 uses a new class of switch chips, which allows us to have two SFP+ ports for 10G connectivity.

- Fully manageable L3 switch, full wire speed switching
- Configure ports as switch, or for routing
- If required, full RouterOS power right there
- SFP+ ports for 10G connectivity

Two models are available:

- CRS226-24G-2S+IN - desktop enclosure
- CRS226-24G-2S+RM - 1U rackmount enclosure



CRS226-24G-2S+IN



CRS226-24G-2S+RM

CPU	Qualcomm Atheros QCA8519 400 MHz
Memory	64MB
Ethernet	24x 10/100/1000 Mbit/s Gigabit Ethernet with Auto-MDI/X
SFP	Two 10G Ethernet SFP+ cages (Mini-GBIC; SFP module not included), DDMI support. First port supports 1.25G/10G modules, second port only 10G modules.
Storage	128MB Onboard NAND with multiple OS partition support
Serial port	One RJ45 serial port
Extras	Reset switch; beeper; voltage and temperature monitoring, touchscreen LCD
Power options	8-28V, 24V 1.2A PSU included, PoE in: 8-30V on Ether1
Case dimensions	285x145x45mm (-IN model), 443x145x45mm (-RM model)
Temperature	-35C to +65C tested
OS	MikroTik RouterOS v6, Level 5 license
Included	CRS switch, power adapter

RB260GS series

The RB260GS is a small SOHO switch. Two models are available, the RB260GS, and the RB260GSP, which features power output on it's ethernet ports. Ports 2-5 can power other PoE capable devices with the same voltage as applied to the unit.

Both devices have five Gigabit Ethernet ports and one SFP cage, switching is done by an Atheros Switch Chip.

The devices are running an operating system designed specifically for MikroTik Switch products - SwOS.

SwOS is configurable from your web browser. It gives you all the basic functionality for a managed switch, plus more: Allows to manage port-to-port forwarding, apply MAC filter, configure VLANs, mirror traffic, apply bandwidth limitation and even adjust some MAC and IP header fields.

Tested and recommended to use with MikroTik SFP modules: S-85DLC05D, S-31DLC20D and S-35/53LC20D (not included)



CPU	Taifatech TF470
Memory	Embedded 96K SRAM
Ethernet	Five 10/100/1000 Ethernet ports, Atheros switch AR8327
PoE output	RB260GSP only: Passive PoE output on ports 2-5. Max current 1A per port
SFP	One fixed Gigabit Ethernet SFP cage with DDMI support (Mini-GBIC; SFP module not included)
Serial port	No serial port
LEDs	Power, NAND activity, 5 Ethernet activity LEDs
Extras	Hardware watchdog
Power options	PoE: 8-30V DC on Ether1 (Non 802.3af). Jack: 8-30V DC
Dimensions	113x138x29mm. Without packaging and PSU: 212g
Power consumption	Up to 6W
Operating Temperature	-25C .. +65C
Operating System	MikroTik SwOS

Cloud Router Switch CRS212-1G-10S-1S+IN

Cloud Router Switch 212-1G-10S-1S+IN is new “small size low cost” member of our CRS series. It comes with one Gigabit Ethernet RJ45 port, ten SFP cages and one 10G SFP+ cage, as well as LCD panel and serial port (RJ45). Product includes indoor desktop case and power supply.

Our CRS series combines the best features of a fully functional router and a Layer 3 switch, is powered by the familiar RouterOS. All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes.



24V 12A Adapter

CPU	Qualcomm Atheros 8519 400MHz
Memory	DDR2 64MB
Ethernet	1x 10/100/1000 Mbit/s Gigabit Ethernet with Auto-MDI/X
SFP	1x 10G SFP+ cage, 10x SFP cages (Mini-GBIC; SFP+ module not included), DDMI support.
Storage	128MB Onboard NAND with multiple OS partition support
Serial port	One RJ45 serial port
Extras	Reset switch; beeper; voltage and temperature monitoring, touchscreen LCD
Power options	8-30V, 24V 1.2A PSU included
Power consumption	20W
Case dimensions	200x144x47mm
Temperature	-35C to +65C tested
OS	MikroTik RouterOS v6, Level 5 license
Included	CRS switch, power adapter

CSS326-24G-2S+RM

SwOS powered 24 port Gigabit Ethernet switch with two SFP+ ports, wire speed connectivity with several new switching features.

The device is powered by a Marvell DX switch chip. The device is running an operating system designed specifically for MikroTik switch products - SwOS. SwOS is configurable from your web browser. It gives you all the basic functionality for a managed switch, plus more: allows to manage port-to-port forwarding, apply MAC filter, configure VLANs, mirror traffic, apply bandwidth limitation and even adjust some MAC and IP header fields. SFP cage supports both 1.25 Gb SFP and 10 Gb SFP+ modules.

Specifications

Product code	CSS326-24G-2S+RM
Switch chip model	98DX3216A1
Storage type	Flash
Storage size	2 MB
10/100/1000 Ethernet ports	24
SFP+ cages	2
Operating system	SwOS
Supported input voltage	12 - 30 V (jack or passive PoE)
Dimensions	440 x 144 x 44 mm
Operating temperature	-40°C .. +70°C tested
Max power consumption	19 W

Features

- Non-blocking Layer 2 switching capacity
- 16K host table
- IEEE 802.1Q VLAN
- Supports up to 4K simultaneous VLANs
- Port isolation
- Port security
- Broadcast storm control
- Port mirroring of ingress/egress traffic
- Rapid Spanning Tree Protocol
- Access Control List
- MikroTik neighbor discovery
- SNMP v1
- Web-based GUI

Included



CRS106-1C-5S

The Cloud Router Switch 106-1C-5S is a desktop size smart switch, equipped with one Gigabit Ethernet / SFP combo port and five 1.25Gbps SFP cages. The package includes a power supply. Powered by a 400MHz CPU and 128MB RAM, it runs RouterOS with a L5 license and supports 11-30V power.

At \$59 price range this product provides a market leading solution for connecting up to six SFP devices.

Specifications

Product code	CRS106-1C-5S
CPU	QCA8511 400 MHz
Size of RAM	128 MB
Storage type	Flash
Storage size	16 MB
SFP	5x 1.25G Ethernet SFP cage (Mini-GBIC; SFP module not included), DDML support
Combo port	1 (Gigabit Ethernet / SFP)
PoE In	Yes
Dimensions	114 x 137 x 29mm
License level	5
Operating System	RouterOS
Max Power consumption	11 W
LEDs	9x LEDs (1x user LED)
Serial port	RJ45
Suggested price	\$59



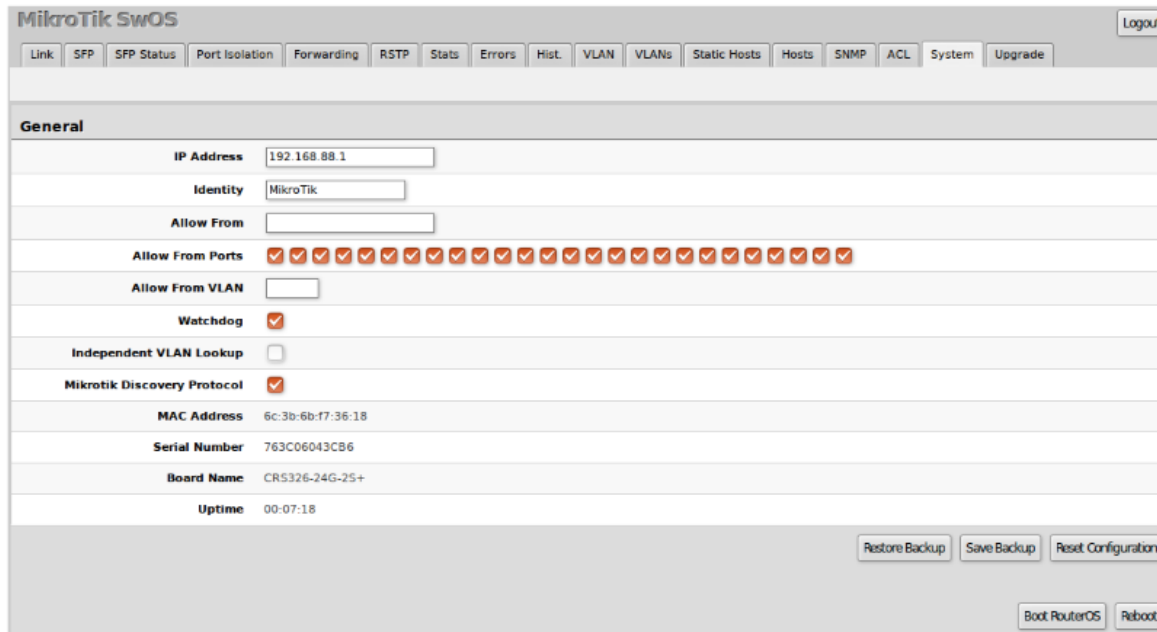
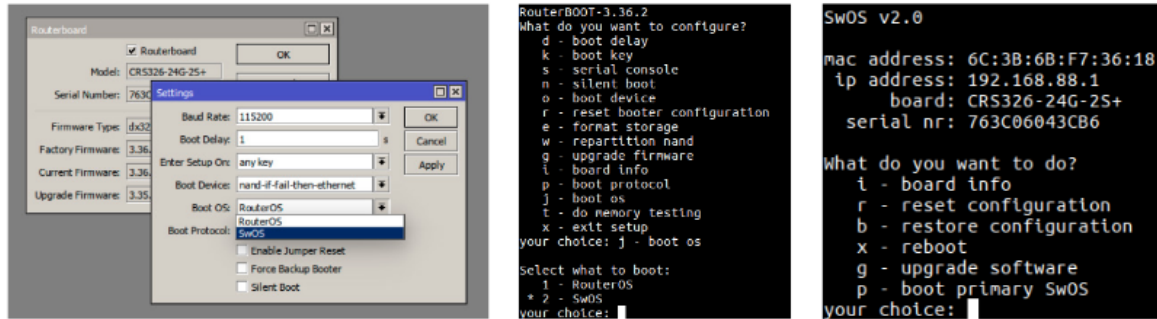
CRS317-1G-16S+RM (coming in 2017/Q2)

The new CRS317 is a rack-mountable Layer 3 switch that features 16 SFP+ ports for high performance 10GbE connectivity and a 1GbE copper port for management. CRS317 is powered by a next generation switching chip, giving you wire speed performance for all sixteen 10GbE ports. New features such as hardware-based Spanning Tree Protocol provide loop protection and true professional performance for your demanding network. Both SwOS and RouterOS are supported - selectable as a boot option.



Dual boot lets you choose between SwOS and RouterOS

We are glad to introduce a new feature for our switch devices - dual boot! Beginning with our CRS3xx series due this summer, you will have the opportunity to choose which operating system you prefer to use, RouterOS or SwOS. If you prefer to have a simplified switch only OS with more switch specific features, use SwOS. If you are used to Winbox and would like the ability to use routing and other Layer 3 features on some ports in your CRS, you can boot RouterOS. You will be able to select the desired operating system from RouterOS, from SwOS or from the RouterBOOT loader settings.



TR-069 improvements in 6.39RC

We are also continuing our work to improve TR-069 support, and have now updated the list of tested platforms with one more (AVSystem, Axiros, Friendly Tech). Several improvements have been added in the latest RouterOS release v6.39RC:

- added Parameters for DNS client management
- added /tr069-client connection-request-username/password settings
- regenerate Connection Request URL on each tr069-client restart for extra security as recommended by standard
- added support for Connection Request Digest Access Authentication (this is required by standard but didn't make into previous version)

Начиная с релиза «Release 6.38» от 2017.01.02

!) switch - added hardware STP functionality for CRS devices and small Atheros switch chips;
STP (Spanning Tree Protocol) — сетевой протокол (или семейство сетевых протоколов) предназначенный для автоматического удаления циклов (петель коммутации) из топологии сети на канальном уровне в Ethernet-сетях.

Spanning Tree Protocol

Starting from RouterOS v6.38rc2 Cloud Router Switches support Spanning Tree Protocols on ports configured for switching by hardware switch chip. To enable this feature create RouterOS bridge interface and add the master-port to it.

- Create a group of switched ports

```
/interface ethernet
set ether2 master-port=ether1
set ether3 master-port=ether1
set ether4 master-port=ether1
```

- Create a bridge interface and add the master-port to it

```
/interface bridge add name=bridge1 protocol=rstp
/interface bridge port add bridge=bridge1 interface=ether1
```

- Slave ports are dynamically added to the bridge only to show STP status. Forwarding through switched ports still are handled by hardware switch chip.

```
[admin@MikroTik] > /interface bridge port print
Flags: X - disabled, I - inactive, D - dynamic
#  INTERFACE      BRIDGE      PRIORITY  PATH-COST  HORIZON
0  ether1          bridge1     0x80      10         none
1  ID ether2          bridge1     0x80      10         none
2  D ether3          bridge1     0x80      10         none
3  D ether4          bridge1     0x80      10         none
```

```
[admin@MikroTik] > /interface bridge port monitor [find]
status: in-bridge      in-bridge      in-bridge      in-bridge
port-number: 1         2               3               4
role: designated-port disabled-port designated-port backup-port
edge-port: yes         no              no              no
edge-port-discovery: yes yes             yes             yes
point-to-point-port: no no              no              no
external-fdb: no       no              no              no
sending-rstp: yes      yes            yes            yes
learning: yes         no             yes            no
forwarding: yes       no             yes            no
root-path-cost:                10
designated-bridge:                0x8000.D4:CA:6D:1E:66:9A
designated-cost:                  0
designated-port-number:           3
```

ACL policer в коммутаторах CRS

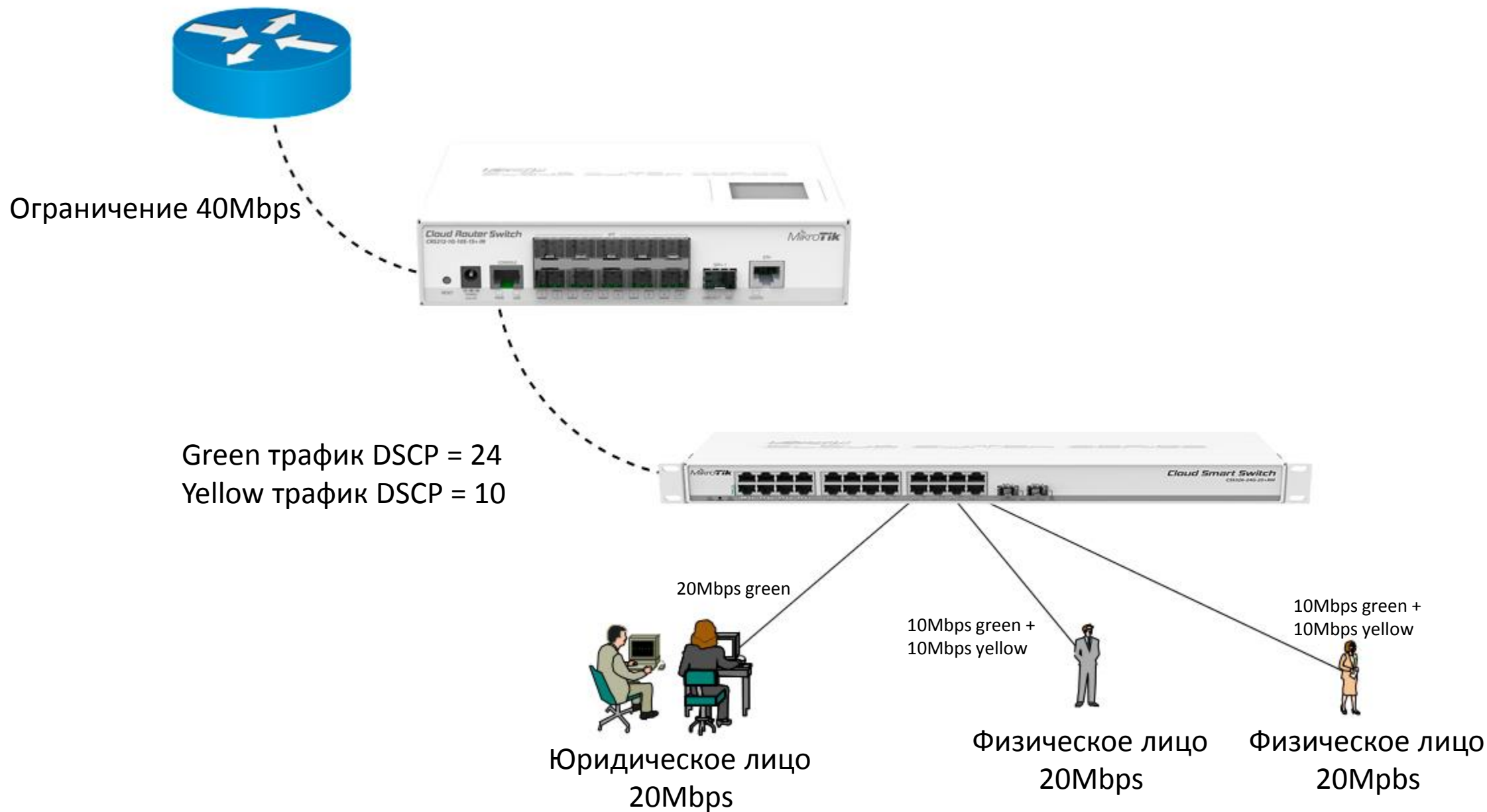
- Это продвинутый инструмент для фильтрации, пересылки и модификации пакетов, на основе скорости передачи данных;
- Правила policer можно применять на основе условий полей заголовков пакетов Layer2, Layer3 и Layer4;
- Можно использовать до 512 правил policer;
- Одно и то же правило policer можно применить только к ingress или только к egress;
- Можно посчитать количество трафика каждого цвета (green, yellow, red);
- Счетчики правил Policer сбрасываются при перезагрузке оборудования;

Какие коммутаторы поддерживают ACL Policing

Cloud Router Switch models

This table clarifies main differences between Cloud Router Switch models.

<u>Model</u>	Switch Chip	CPU	Wireless	SFP+ port	Access Control List	Jumbo Frame (Bytes)
CRS106-1C-5S	QCA-8511	400MHz	-	-	+	9204
CRS112-8G-4S	QCA-8511	400MHz	-	-	+	9204
CRS210-8G-2S+	QCA-8519	400MHz	-	+	+	9204
CRS212-1G-10S-1S+	QCA-8519	400MHz	-	+	+	9204
CRS226-24G-2S+	QCA-8519	400MHz	-	+	+	9204
CRS125-24G-1S	QCA-8513L	600MHz	-	-	-	4064
CRS125-24G-1S-2HnD	QCA-8513L	600MHz	+	-	-	4064
CRS109-8G-1S-2HnD	QCA-8513L	600MHz	+	-	-	4064



ACL policer в коммутаторах CRS

Switch Policer <f1>

Name:

Yellow Rate:

Yellow Burst:

Red Rate:

Red Burst:

Meter Unit: bit packet

Meter Length: layer 1 layer 2 layer 3

Color Awareness

Bucket Coupling

Yellow Action:

New DEI For Yellow:

New PCP For Yellow:

New DSCP For Yellow:

Red Action:

New DEI For Red:

New PCP For Red:

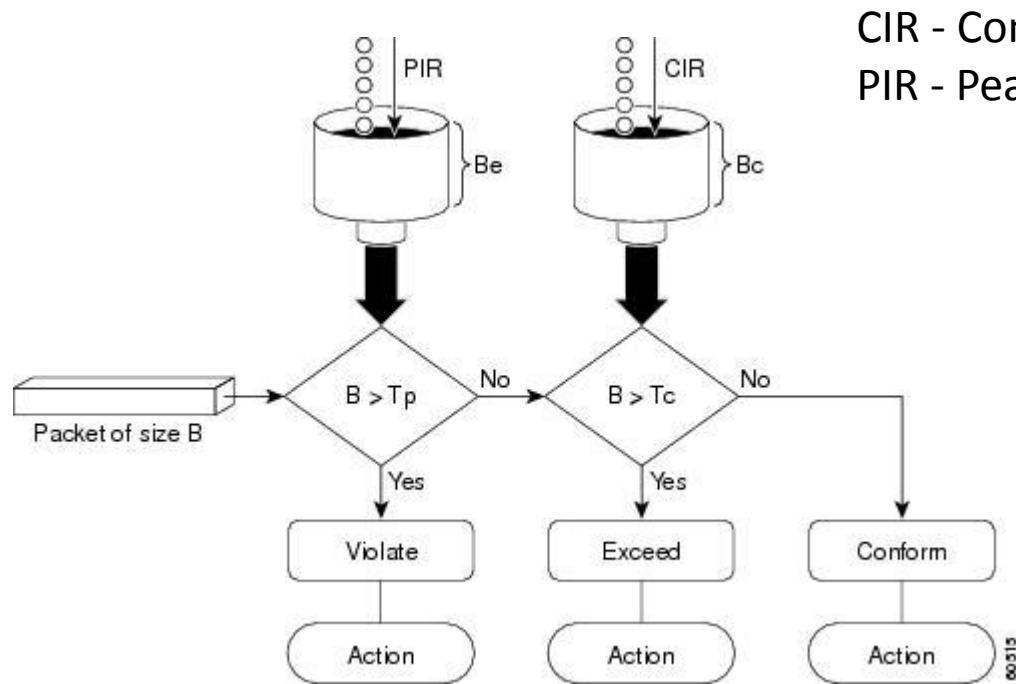
New DSCP For Red:

Green Counter:

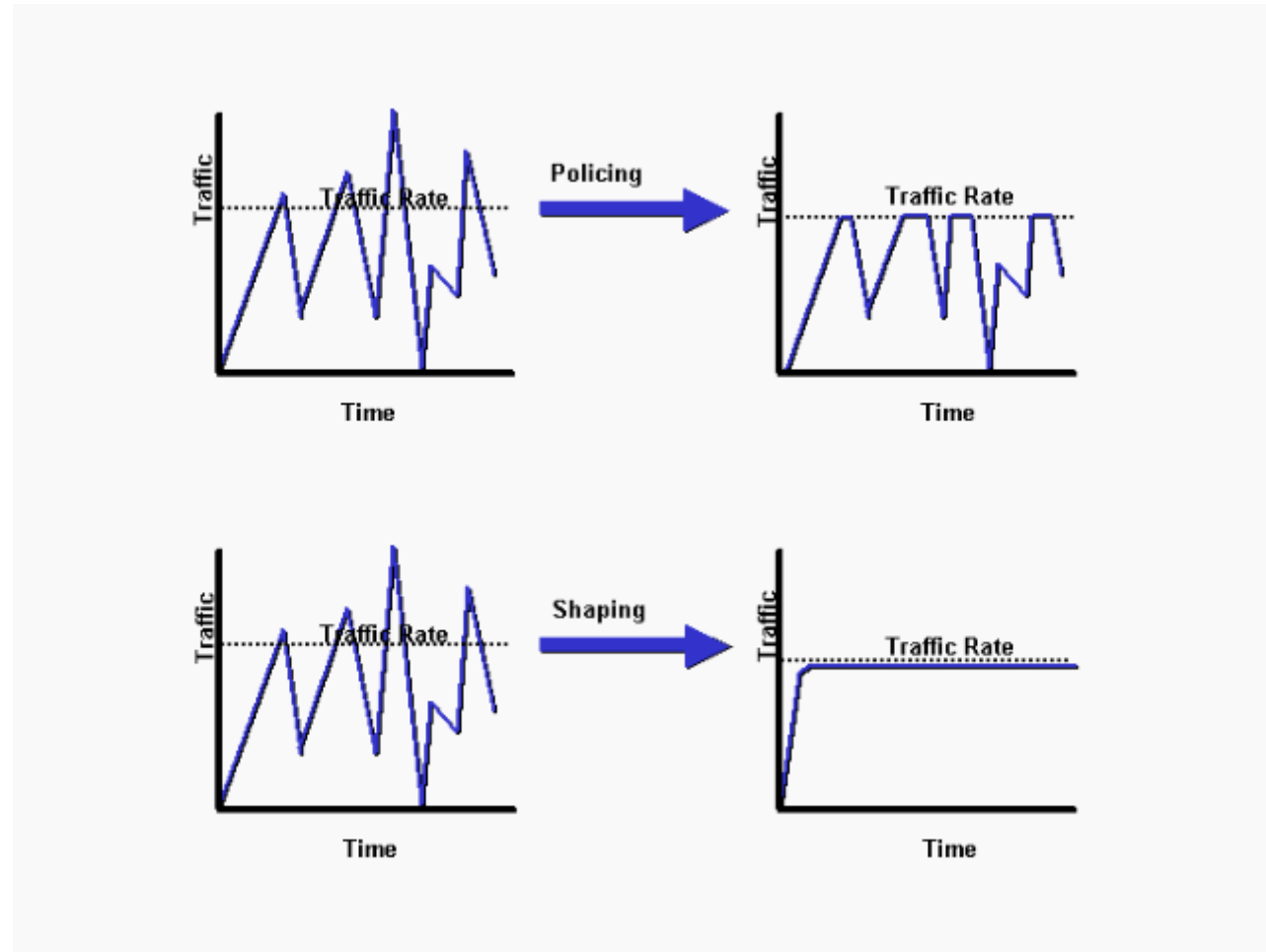
Yellow Counter:

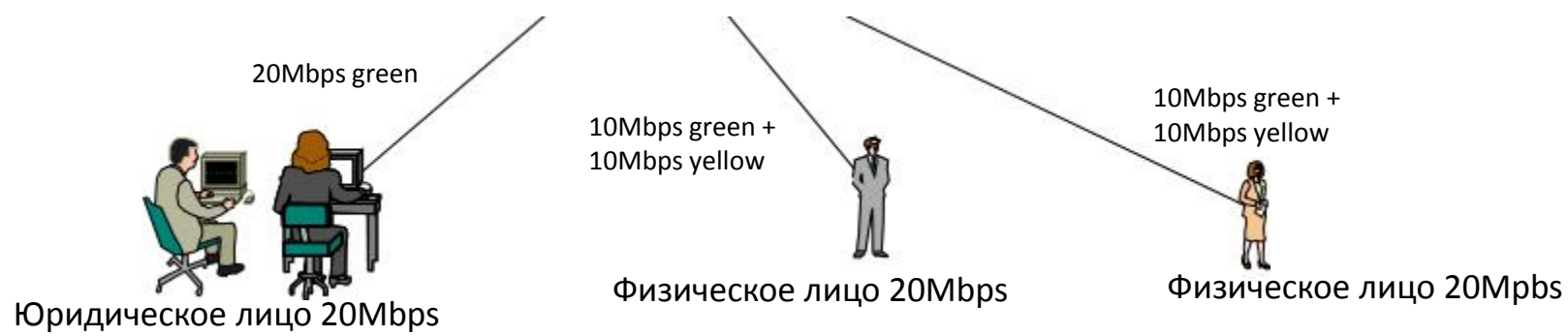
Red Counter:

OK Cancel Apply Copy Remove



Разница между policing и shaping





Switch Policer <business>	Switch Policer <f1>	Switch Policer <f2>
Name: <input type="text" value="business"/>	Name: <input type="text" value="f1"/>	Name: <input type="text" value="f2"/>
Yellow Rate: <input type="text" value="20M"/>	Yellow Rate: <input type="text" value="10M"/>	Yellow Rate: <input type="text" value="10M"/>
Yellow Burst: <input type="text" value="4M"/>	Yellow Burst: <input type="text" value="2M"/>	Yellow Burst: <input type="text" value="2M"/>
Red Rate: <input type="text" value="0"/>	Red Rate: <input type="text" value="10100k"/>	Red Rate: <input type="text" value="10100k"/>
Red Burst: <input type="text" value="0"/>	Red Burst: <input type="text" value="2M"/>	Red Burst: <input type="text" value="2M"/>
Meter Unit: <input checked="" type="radio"/> bit <input type="radio"/> packet	Meter Unit: <input checked="" type="radio"/> bit <input type="radio"/> packet	Meter Unit: <input checked="" type="radio"/> bit <input type="radio"/> packet
Meter Length: <input type="radio"/> layer 1 <input checked="" type="radio"/> layer 2 <input type="radio"/> layer 3	Meter Length: <input type="radio"/> layer 1 <input checked="" type="radio"/> layer 2 <input type="radio"/> layer 3	Meter Length: <input type="radio"/> layer 1 <input checked="" type="radio"/> layer 2 <input type="radio"/> layer 3
<input type="checkbox"/> Color Awareness	<input type="checkbox"/> Color Awareness	<input type="checkbox"/> Color Awareness
<input type="checkbox"/> Bucket Coupling	<input type="checkbox"/> Bucket Coupling	<input type="checkbox"/> Bucket Coupling
Yellow Action: <input type="text" value="drop"/>	Yellow Action: <input type="text" value="forward"/>	Yellow Action: <input type="text" value="forward"/>
New DEI For Yellow: <input type="text"/>	New DEI For Yellow: <input type="text"/>	New DEI For Yellow: <input type="text"/>
New PCP For Yellow: <input type="text"/>	New PCP For Yellow: <input type="text"/>	New PCP For Yellow: <input type="text"/>
New DSCP For Yellow: <input type="text"/>	New DSCP For Yellow: <input type="text"/>	New DSCP For Yellow: <input type="text"/>
Red Action: <input type="text" value="drop"/>	Red Action: <input type="text" value="drop"/>	Red Action: <input type="text" value="drop"/>
New DEI For Red: <input type="text"/>	New DEI For Red: <input type="text"/>	New DEI For Red: <input type="text"/>
New PCP For Red: <input type="text"/>	New PCP For Red: <input type="text"/>	New PCP For Red: <input type="text"/>
New DSCP For Red: <input type="text"/>	New DSCP For Red: <input type="text"/>	New DSCP For Red: <input type="text"/>
Green Counter: <input type="text" value="0"/>	Green Counter: <input type="text" value="0"/>	Green Counter: <input type="text" value="0"/>
Yellow Counter: <input type="text" value="0"/>	Yellow Counter: <input type="text" value="0"/>	Yellow Counter: <input type="text" value="0"/>
Red Counter: <input type="text" value="0"/>	Red Counter: <input type="text" value="0"/>	Red Counter: <input type="text" value="0"/>

ACL Policer

Switch ACL

ACL Policer

+ - Filter Find

Name	Yellow Rate	Yellow Burst	Red Rate	Red Burst	Meter ...	Yellow Action	Red Action	Green Counter	Yellow Counter	Red Counter
business-egress	20M	4M	0	0	0 bit	drop	drop	0	0	0
business-ingress	20M	4M	0	0	0 bit	drop	drop	0	0	0
f1-egress	10M	2M	10100k	2M	2M bit	forward	drop	0	0	0
f1-ingress	10M	2M	10100k	2M	2M bit	forward	drop	0	0	0
f2-egress	10M	2M	10100k	2M	2M bit	forward	drop	0	0	0
f2-ingress	10M	2M	10100k	2M	2M bit	forward	drop	0	0	0

6 items

ACL Policer

The image displays two side-by-side screenshots of the 'Switch ACL Rule' configuration window. Both windows have tabs for 'MAC', 'VLAN', 'IP', 'Action', and 'Bypass'. The left window shows the 'Action' dropdown set to 'ingress'. The right window shows the 'Action' dropdown set to 'forward' and the 'New DSCP' field set to '24'. Other fields like 'Src. MAC Address', 'Dst. MAC Address', and 'Drop Precedence' are visible in both windows. The status at the bottom of each window is 'enabled'.

Меняется DSCP
только у green Трафика

ACL Policer

The image displays two side-by-side screenshots of the 'Switch ACL Rule' configuration window. The left window is in the 'MAC' tab, showing fields for 'Table' (egress), 'Src. MAC Address' (BC:EE:7B:01:22:86), 'Src. MAC Mask' (FF:FF:FF:FF:FF:FF), and 'Drop Precedence' (yellow). The right window is in the 'Action' tab, showing 'Action' (forward) and 'New DSCP' (10). Both windows have a status bar at the bottom indicating 'enabled'.

Меняем DSCP
Для yellow Трафика

ACL Policer

Switch ACL

ACL Policer

Find

#	Table	Invert...	Src. Ports	Dst. Ports	Src. MAC Address...	Dst. MAC Address...	Drop Precedence	Action	Policer	New DSCP
0	ingress	no			54:53:ED:AF:68:84			forward	f1-ingress	24
1	ingress	no			BC:EE:7B:01:22:86			forward	business-ingress	24
2	ingress	no			D4:CA:6D:F3:4C:70			forward	f2-ingress	24
3	egress	no			BC:EE:7B:01:22:86		yellow	forward		10
4	egress	no			54:53:ED:AF:68:84		yellow	forward		10
5	egress	no			D4:CA:6D:F3:4C:70		yellow	forward		10
6	egress	no			54:53:ED:AF:68:84		red	drop		0
7	egress	no			BC:EE:7B:01:22:86		red	drop		0
8	egress	no			D4:CA:6D:F3:4C:70		red	drop		0

9 items

ACL Policer

```
Terminal
[admin@MikroTik] /interface ethernet switch acl policer> print stats
Flags: I - invalid
#  NAME                GREEN-COUNTER  YELLOW-COUNTER  RED-COUNTER
0  f1-ingress           0              0                0
1  business-ingress    295 321 013    0                33 612 548
2  f2-ingress          977 465 944    897 199 617     555 860 066
3  business-egress     0              0                0
4  f1-egress           0              0                0
5  f2-egress           0              0                0
[admin@MikroTik] /interface ethernet switch acl policer>
```

Гарантированный и негарантированный каналы до интернета



Дополнительная информация:

- https://wiki.mikrotik.com/wiki/Manual:CRS_features
- https://wiki.mikrotik.com/wiki/Manual:CRS_examples

Спасибо за Внимание.