MikroTik

User Meeting

Yogyakarta, Indonesia

October 2015

More than 100 MUM events

MikroTik

- MikroTik is located in Latvia (Europe)
- More than 160 employees
- Established 1996
- RouterOS created in 1997
- RouterBOARD created in 2002
- First MUM in Prague 2006
- The biggest MUM in 2014, Indonesia - 2000 people **(or 2015???)**

Iceland
Finland
Sweden
Norway
Russia
Estonia
Den-
mark
Lithuania
Ireland
United
Kingdom
Belarus
Kazak
Nether-
lands
Poland
Belgium
Germany
Ukraine
Luxembourg
Czech Republic
Slovakia
Mol-
dova
France
Switzer-
land
Liecht.
Austria
Hungary
Slove-
nia
Croatia
Romania
Georgia
Azerb
Armenia
Monaco
San
Marino
Bosnia and
Herzego-
vina
Serbia
Andorra
Monte-
negro
Bulgaria
Portugal
Italy
Spain
Mace-
donia
Al-
ba-
nia
Vatican City
Turkey
Greece
Syria
Iraq

MikroTik at the MUM

- Arnis Riekstins (CTO)
- Edmunds Aperans (Sales, Training, Academy)
- Martins Strods (Support, Hardware, Scripting, Tunnels)
- Janis Megis (Support, Training, Packet Flow, Fast Path, Queues, Firewall)

Why us?

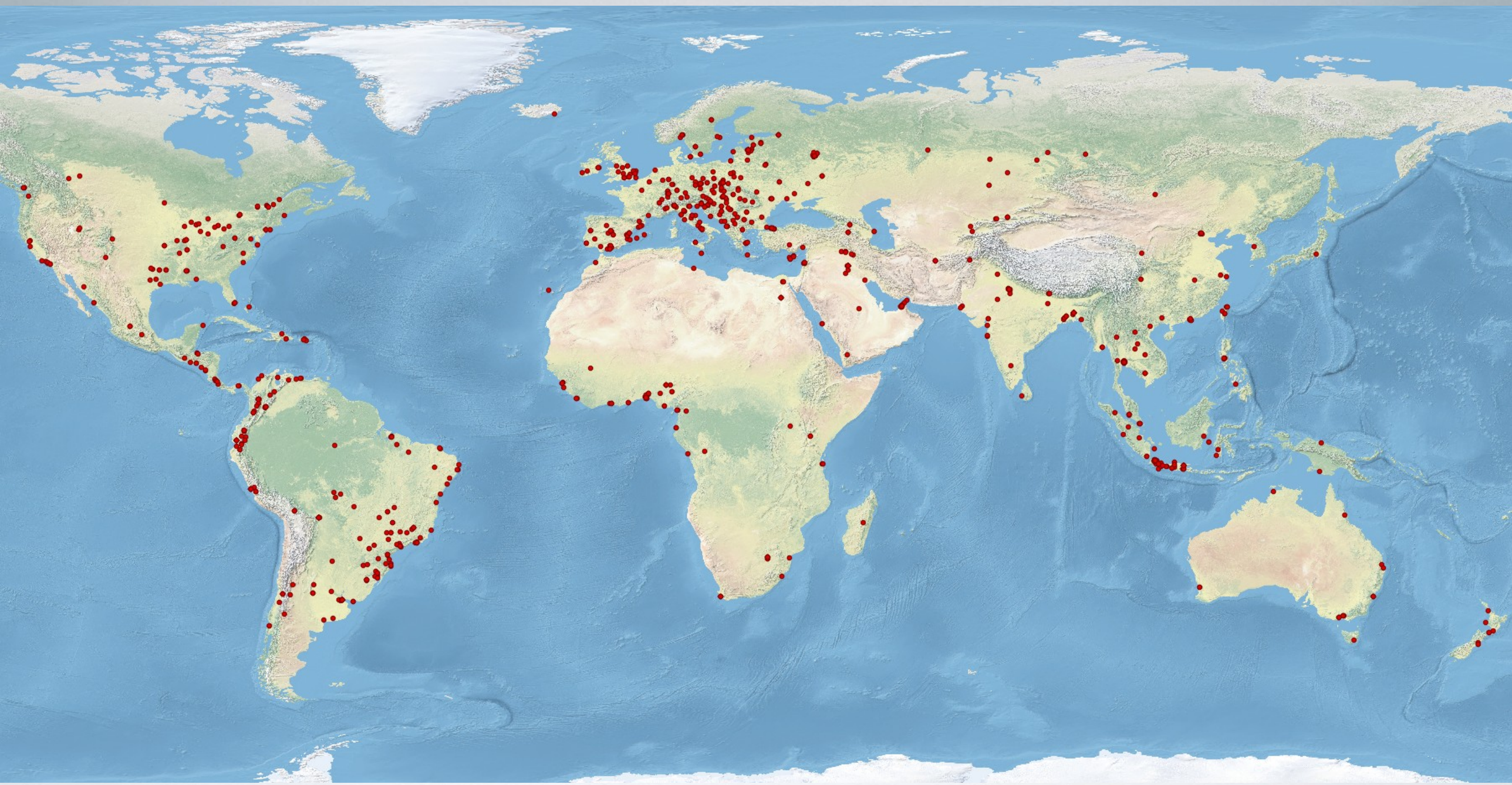
- **19 years** experience of developing networking software and hardware
- **Millions** of RouterOS powered devices currently routing the world
- Over **22’000** RouterOS trained and certified network engineers around the world

Hardware and Software

- More than **200** different hardware products available now
- Our products cover all possible networking needs
- Almost identical operating system across all products – **MikroTik RouterOS**
- Learn how to use one MikroTik product and you will know how to ~~rule~~ use them all

Learn MikroTik

- Thousands of pages of documentation, examples, application notes and guides
- Helpful and active **user forum**
- Worldwide network of certified consultants, trainers and training centers
- More than **1600 training classes** last year
- More than **250 MikroTik Academies (~100 here in Indonesia)**



MikroTik Academy

Who can apply?

- Universities
- Technical schools
- Colleges
- Vocational schools
- Other institutions which offer semester based courses

MikroTik Academy

Requirements:

- Motivation
- Space and all the equipment needed for the labs
- Appropriate Internet access
- **MikoTik Academy Trainer**
- Approved training materials

Academy Trainer

Requirements:

- Must be a lecturer at the educational institution
- MTCNA certificate (score at least 75%)
- Any MikroTik engineer level certificate (score at least 75%)
- Appropriate teaching skills

After the MUM

- Presentation slides on mum.mikrotik.com
- Videos - youtube.com/mikrotik
- License will be emailed

Special thanks

CITRAWEB

NUSAINFOMEDIA

www.mikrotik.id

cttranet

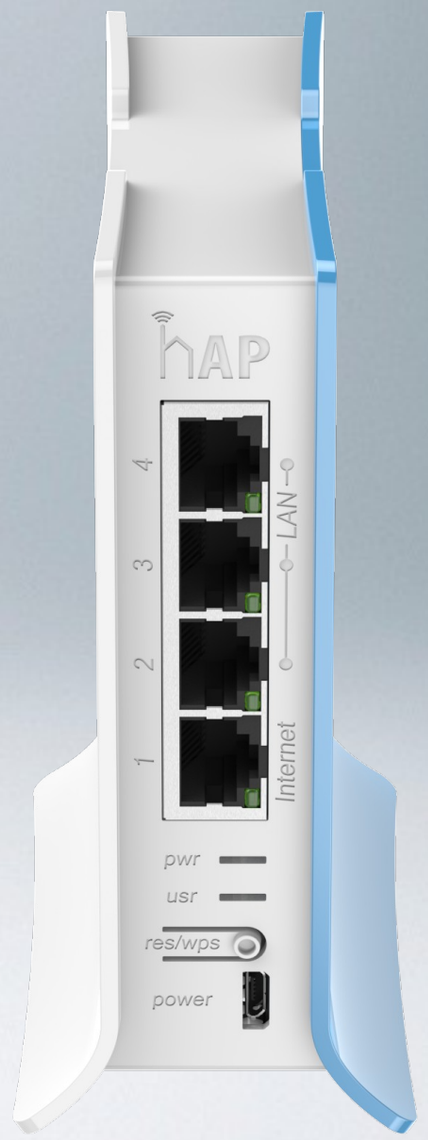
RECENTLY INTRODUCED

hAP lite

$21.95

hAP lite

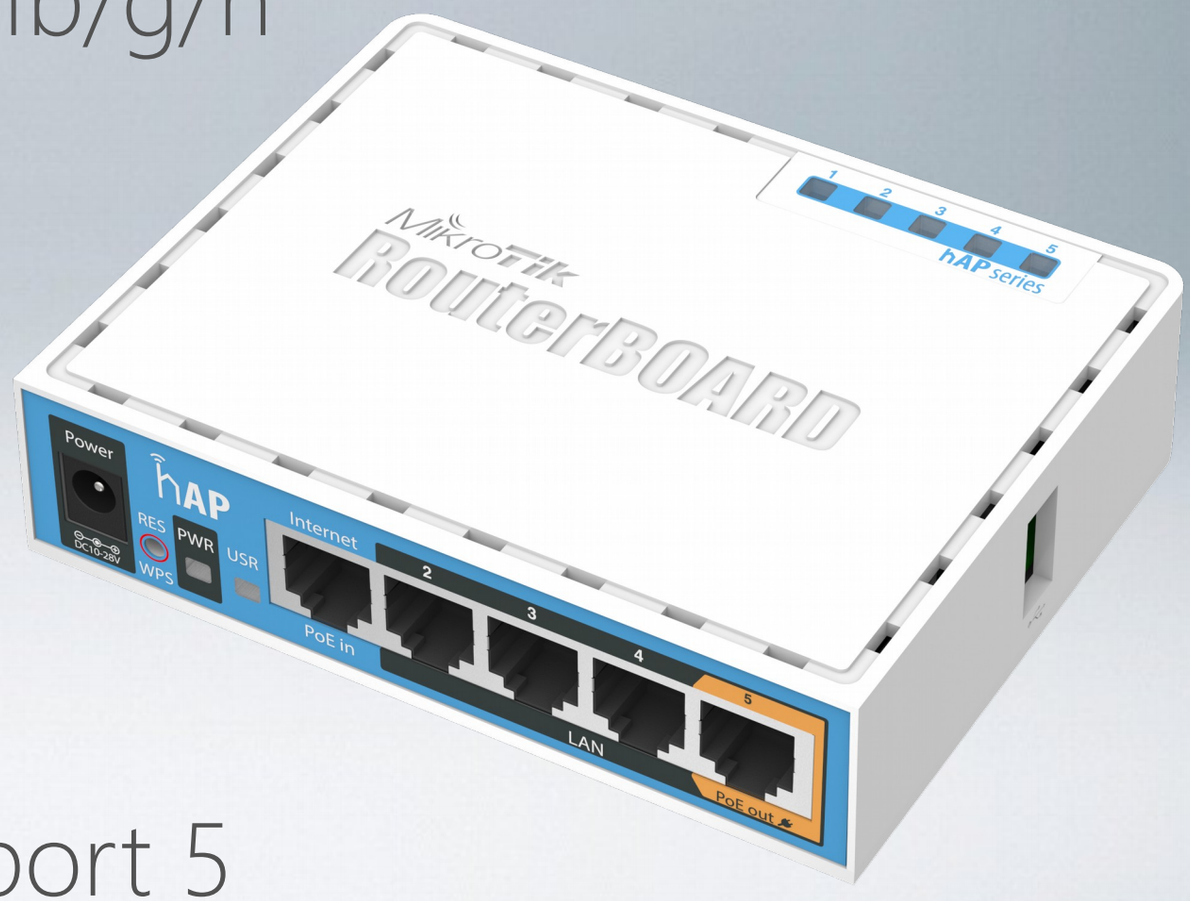
- Very affordable **h**ome **A**ccess **P**oint
- Full RouterOS functionality
- 2.4GHz dual chain 802.11b/g/n
- 4 Fast Ethernet ports
- 650MHz CPU
- Powered by 5V (microUSB)



$21.95

hAP

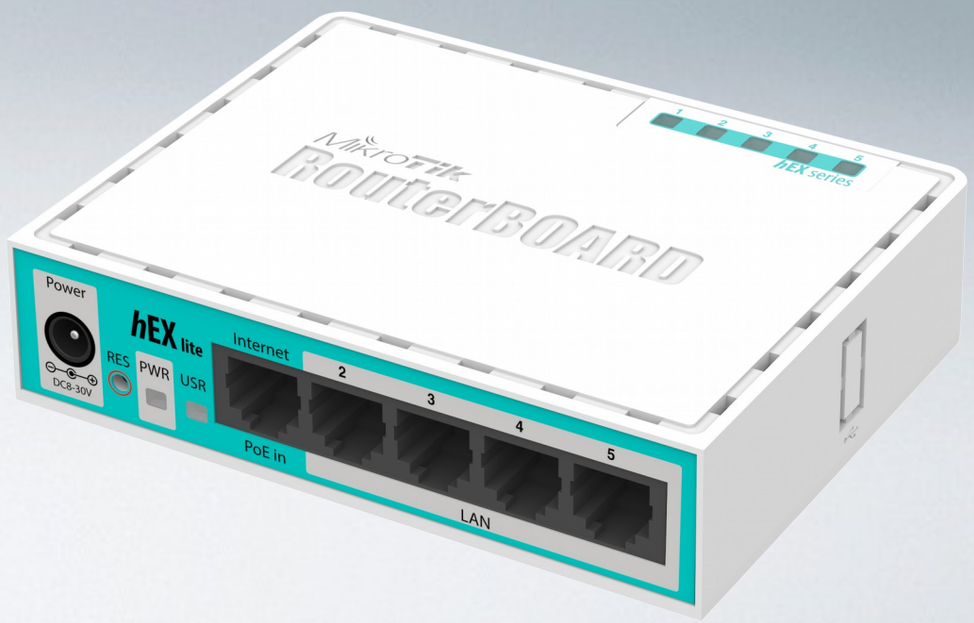
- Improved popular RB951-2n
- 2.4GHz dual chain 802.11b/g/n
- 5 Fast Ethernet ports
- 650Mhz CPU
- 300MHz DDR2 RAM
- USB port
- PoE-in and PoE-out on port 5



$45

hEX lite

- Very affordable **h**ome **E**thernet E**X**change router
- 850MHz CPU (o/c up to 1GHz)
- 300MHz DDR2 RAM
- Improved popular RB750
- 5 Fast Ethernet ports



$39.95

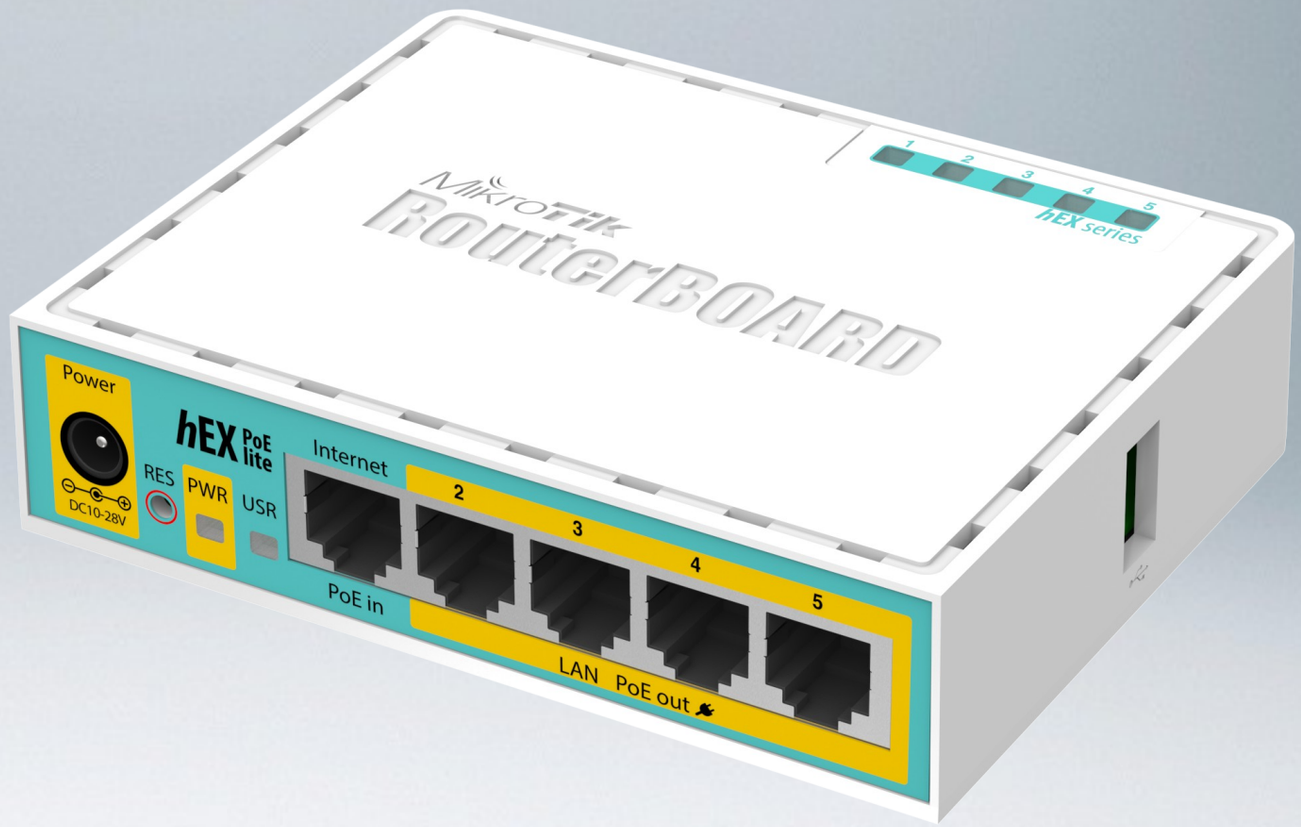
hEX

- Improved popular RB750GL
- 720MHz CPU
- 300MHz DDR2 RAM
- 5 Gigabit Ethernet ports

$59.95

hEX PoE lite

- Improved popular RB750UP
- 5 Fast Ethernet ports
- 650Mhz CPU
- 300Mhz DDR2 RAM
- USB port
- PoE-in
- 4 PoE-out ports with max PoE-out current – 1A per port, or 2A total



$59.95

PowerBox

- RB750P Series in outdoor box
- 5 Fast Ethernet ports
- 4 PoE-out ports
- 650Mhz CPU
- 300MHz DDR2 RAM
- Weatherproof
- Pole mountable

$69

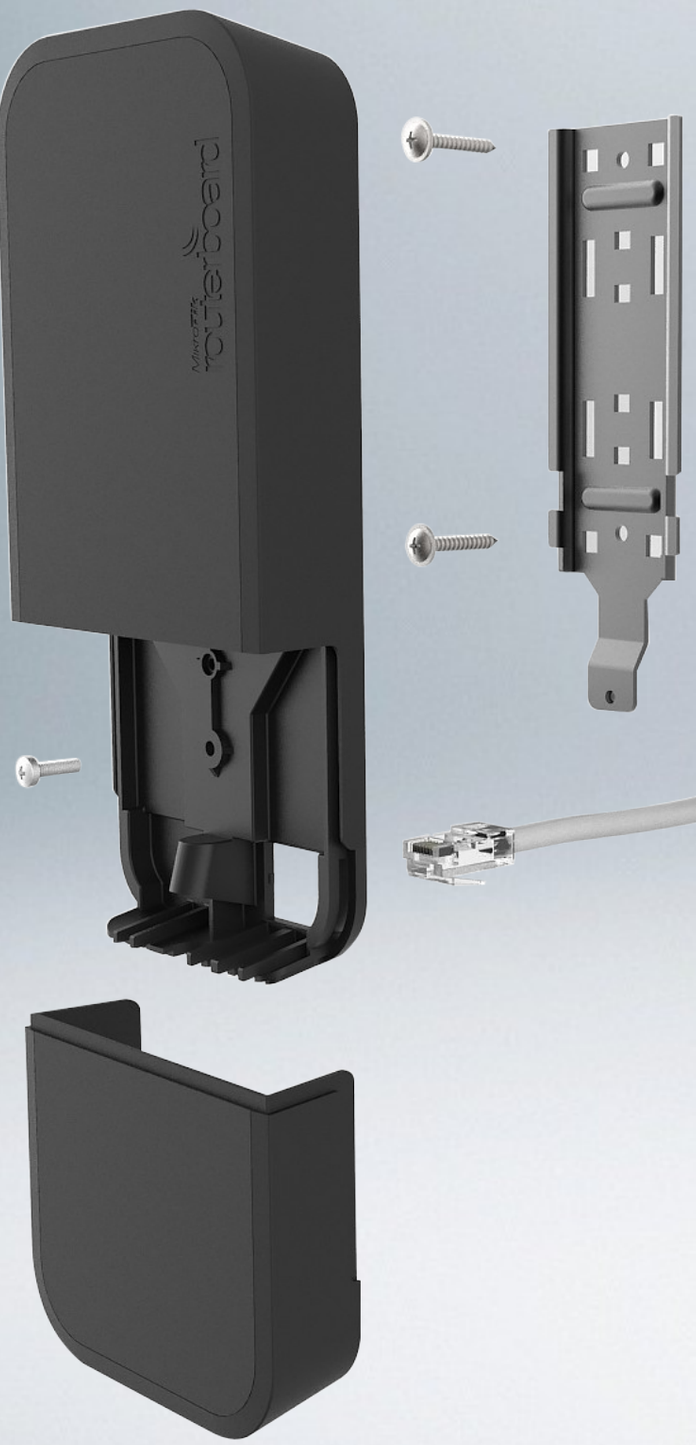
NEW

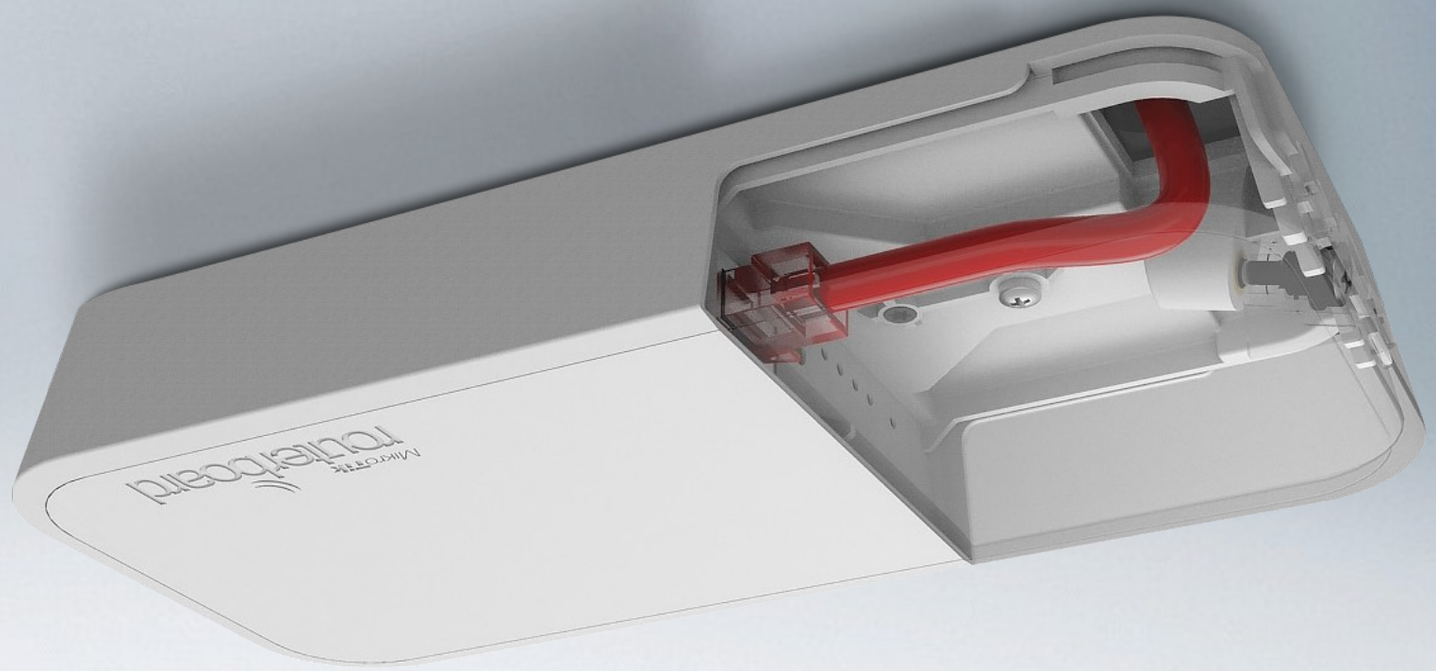
wAP

- Small weatherproof **w**all **A**ccess **P**oint
- 360 degree antenna
- 1x 100Mbps port
- 2,4GHz dual chain 802.11 b/g/n
- Black and white version

NEW

wAP

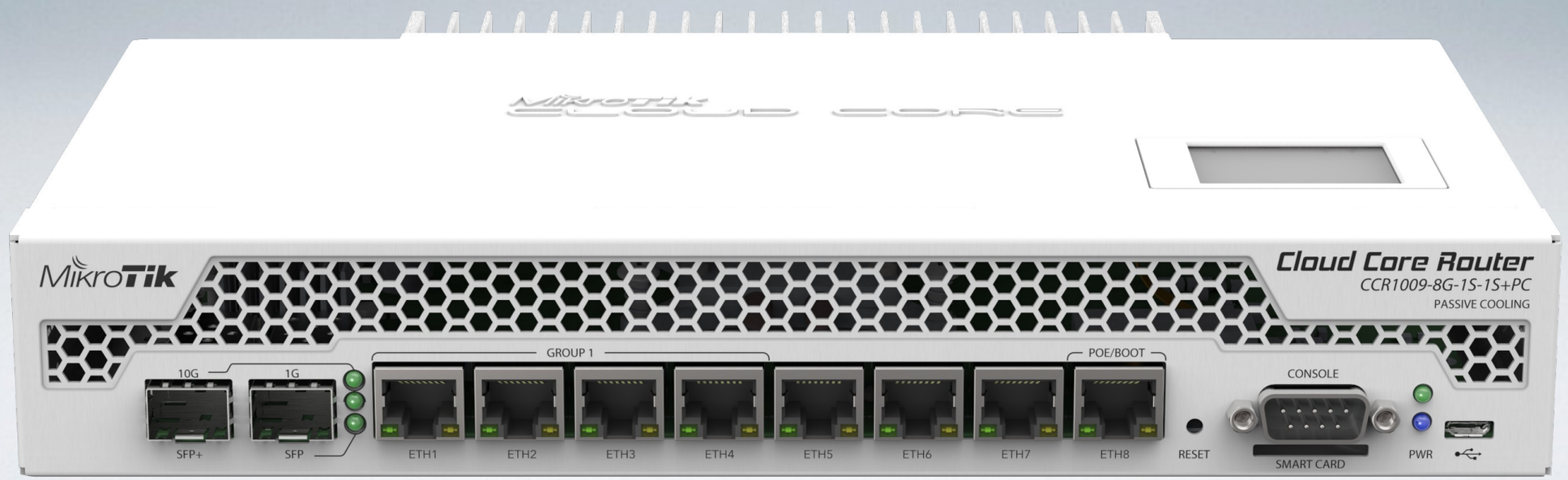




$45

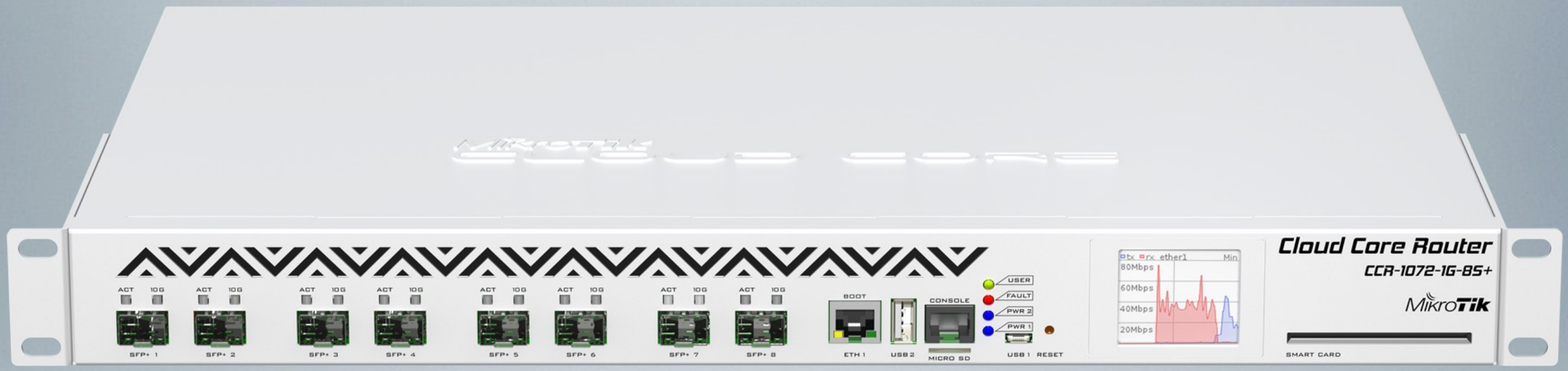
CCR1009 PC

- 9 core 1GHz TILERA CPU (o/c up to 1.2GHz)
- Silent, passive cooling case
- 8 Gigabit Ethernet ports, 1 SFP and 1 SFP+ cage



$495

CCR1072



- 72 core 1GHz TILERA CPU (o/c up to 1.2GHz)
- Dual redundant hot-swap PSU
- 8 SFP+ cages and 1 Gigabit Ethernet port
- 16GB ECC RAM

$3050

CCR1072

CCR1072-1G-8S+		Tile 72 Core (1200Mhz, DDR1600) Max possible throughput					
Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Bridging	none (fast path)	6,502.0	78,960.3	18,790.0	76,963.8	119,047.6	60,952.4
Bridging	25 bridge filter rules	6,502.0	78,960.3	9,099.2	37,270.3	10,432.3	5,341.3
Routing	none (fast path)	6,502.0	78,960.3	18,790.0	76,963.8	94,668.4	48,470.2
Routing	25 simple queues	6,502.0	78,960.3	13,500.0	55,296.0	13,683.5	7,006.0
Routing	25 ip filter rules	5,247.6	63,726.9	6,125.5	25,090.0	6,104.0	3,125.2

CCR1072-1G-8S+		Tile 72 Core (1000Mhz, DDR1600) Max possible throughput					
Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Bridging	none (fast path)	6,502.0	78,960.3	18,790.0	76,963.8	98,873.5	50,623.2
Bridging	25 bridge filter rules	5,764.8	70,007.7	8,240.2	33,751.9	8,866.3	4,539.5
Routing	none (fast path)	6,502.0	78,960.3	18,790.0	76,963.8	76,201.0	39,014.9
Routing	25 simple queues	6,502.0	78,960.3	11,073.5	45,357.1	11,444.4	5,859.5
Routing	25 ip filter rules	4,664.7	56,648.1	5,200.3	21,300.4	5,321.0	2,724.4

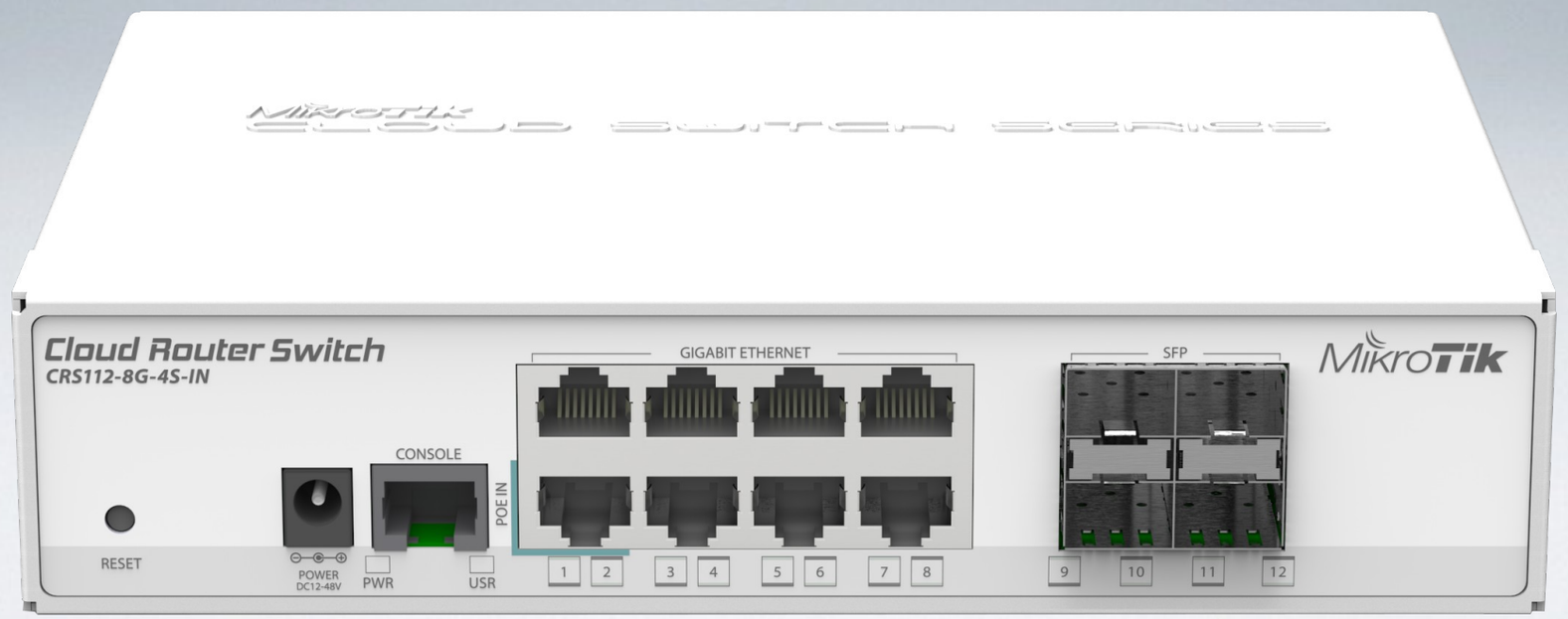
S+2332LC10D

- Bidirectional SFP+ 10G module kit
- Two SFP+ modules
- Up to 10KM distance

$349

CRS112-8G-4S-IN

- Small size desktop switch
- 4 SFP cages and 8 Gigabit Ethernet ports



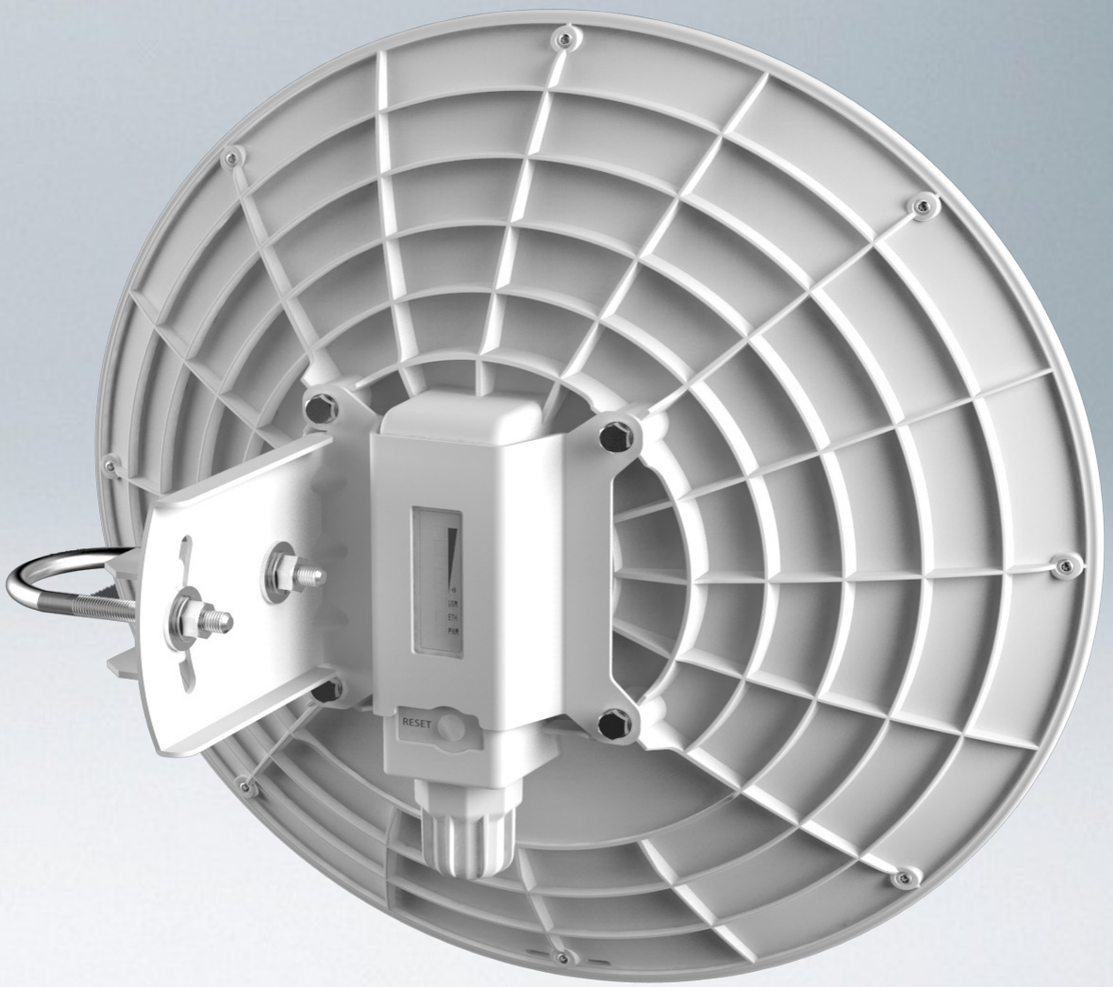
$139

QRT 5 ac

- 802.11ac upgrade for QRT 5
- Same robust design and antenna with upgraded internals for 802.11ac
- 720MHz CPU
- 300MHz DDR2 RAM

$199

DynaDish 5



$179

DynaDish 5

- New 802.11ac outdoor device
- Ideal for long distance point-to-point links
- 5GHz dual chain board integrated into 25dBi dish antenna with 8 degree beam width
- 720Mhz CPU
- 300MHz DDR2 RAM
- One Gigabit Ethernet port

$179

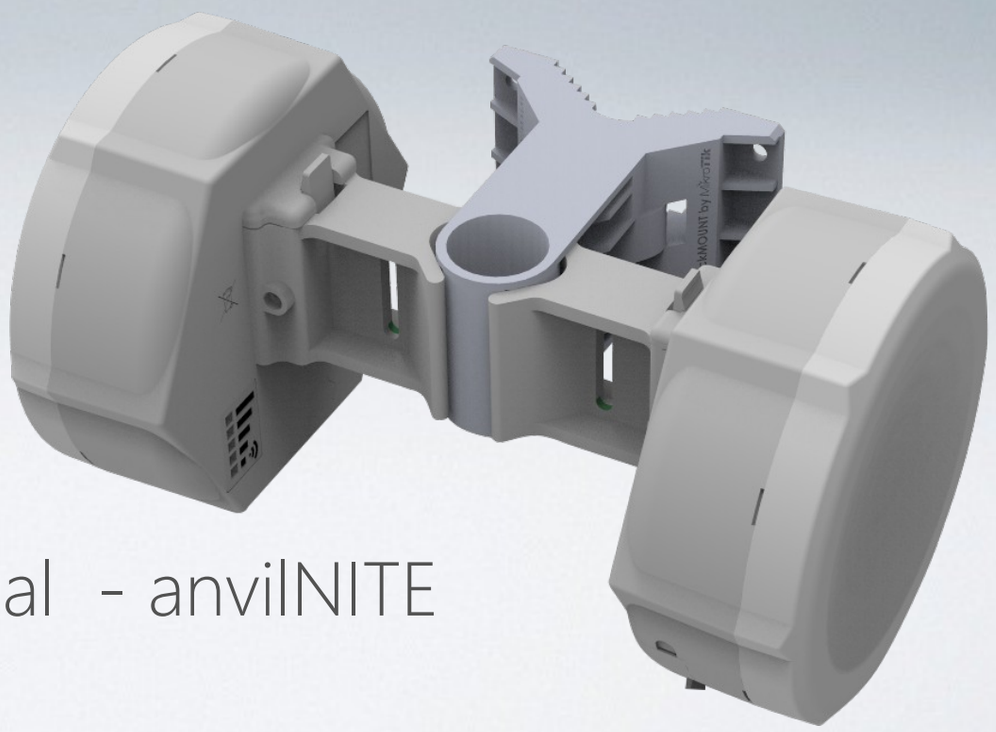
SXT HG5 AC

- 802.11ac upgrade for SXT HG5
- 720Mhz CPU
- DDR2 RAM
- 17dBi

$119

quickMOUNT

- Basic wall/pole mount adapter for small point-to-point and sector antennas
- Ideal for mounting two SXT units in repeater setup

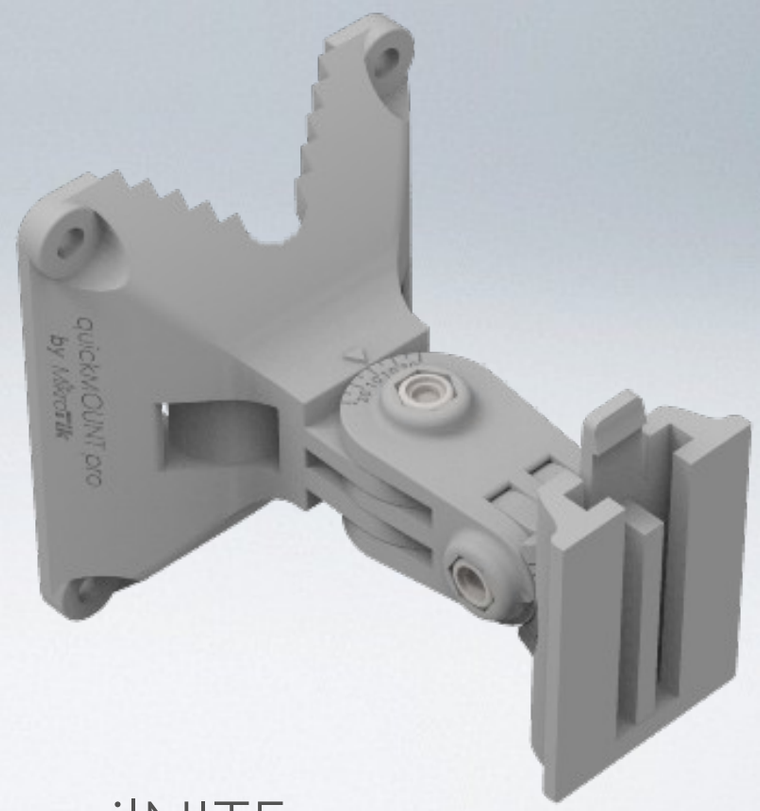


- special composite material - anvilNITE

$5.50

quickMOUNT PRO

- Advanced wall/pole mount adapter for small point-to-point and sector antennas
- Precise alignment



- special composite material - anvilNITE

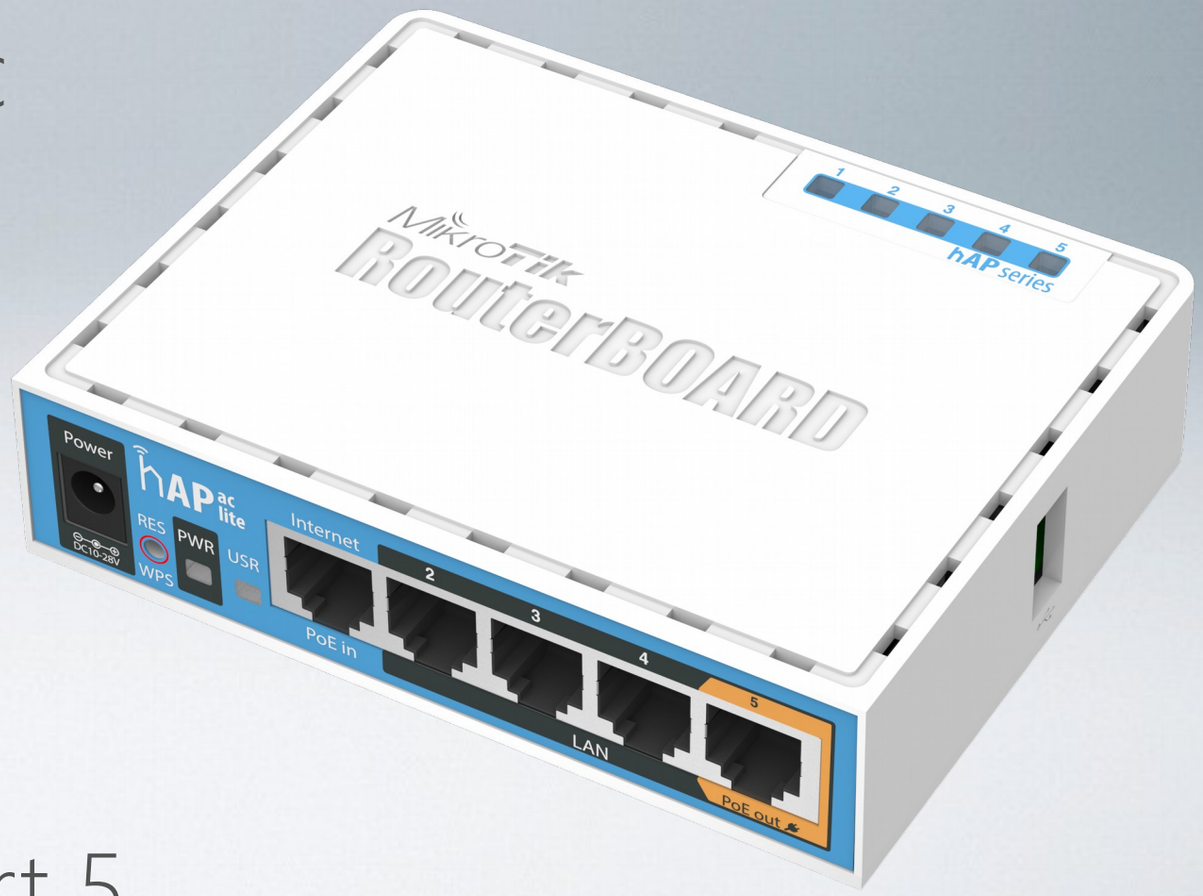
$9.50

NEW PRODUCTS

Q4

hAP ac lite

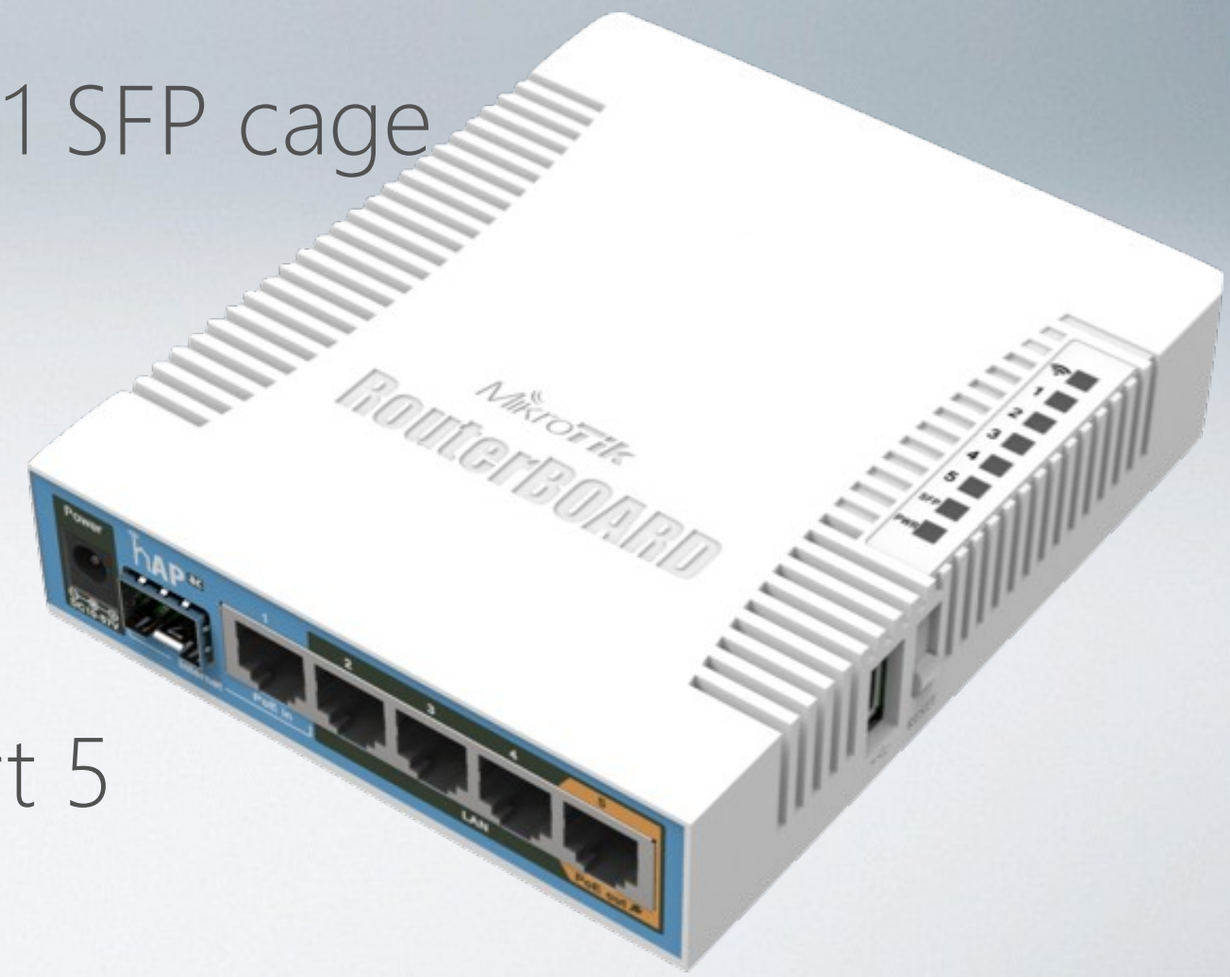
- Our first **dual-band** home AP
- 2.4GHz dual chain 802.11b/g/n
- 5GHz single chain 802.11ac
- 5 Fast Ethernet ports
- 650MHz CPU
- 300MHz DDR2 RAM
- USB port
- PoE-in and PoE-out on port 5



Q4

hAP ac

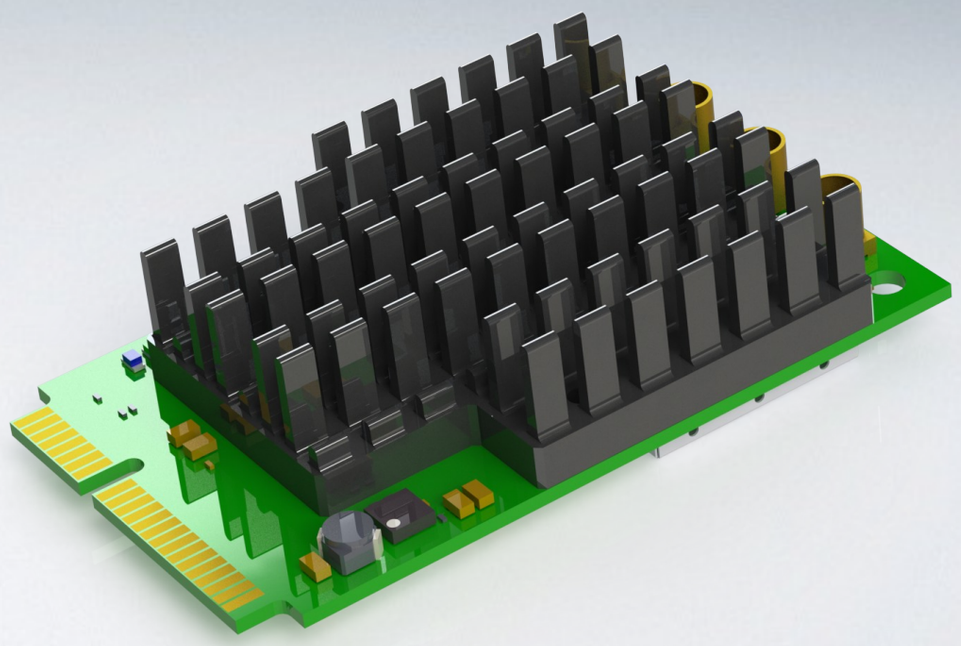
- Our first Gigabit **dual-band** home AP
- 2.4GHz high power 3 chain 802.11b/g/n
- 5GHz high power 3 chain 802.11ac
- 5 Gigabit Ethernet ports & 1 SFP cage
- 720MHz CPU
- 300MHz DDR2 RAM
- USB port
- PoE-in and PoE-out on port 5



Q4

R11e-5HacT

- miniPCIe card with 5GHz 3 chain 802.11ac
- Upgrade your existing devices to 802.11ac standard
- MMCX connectors



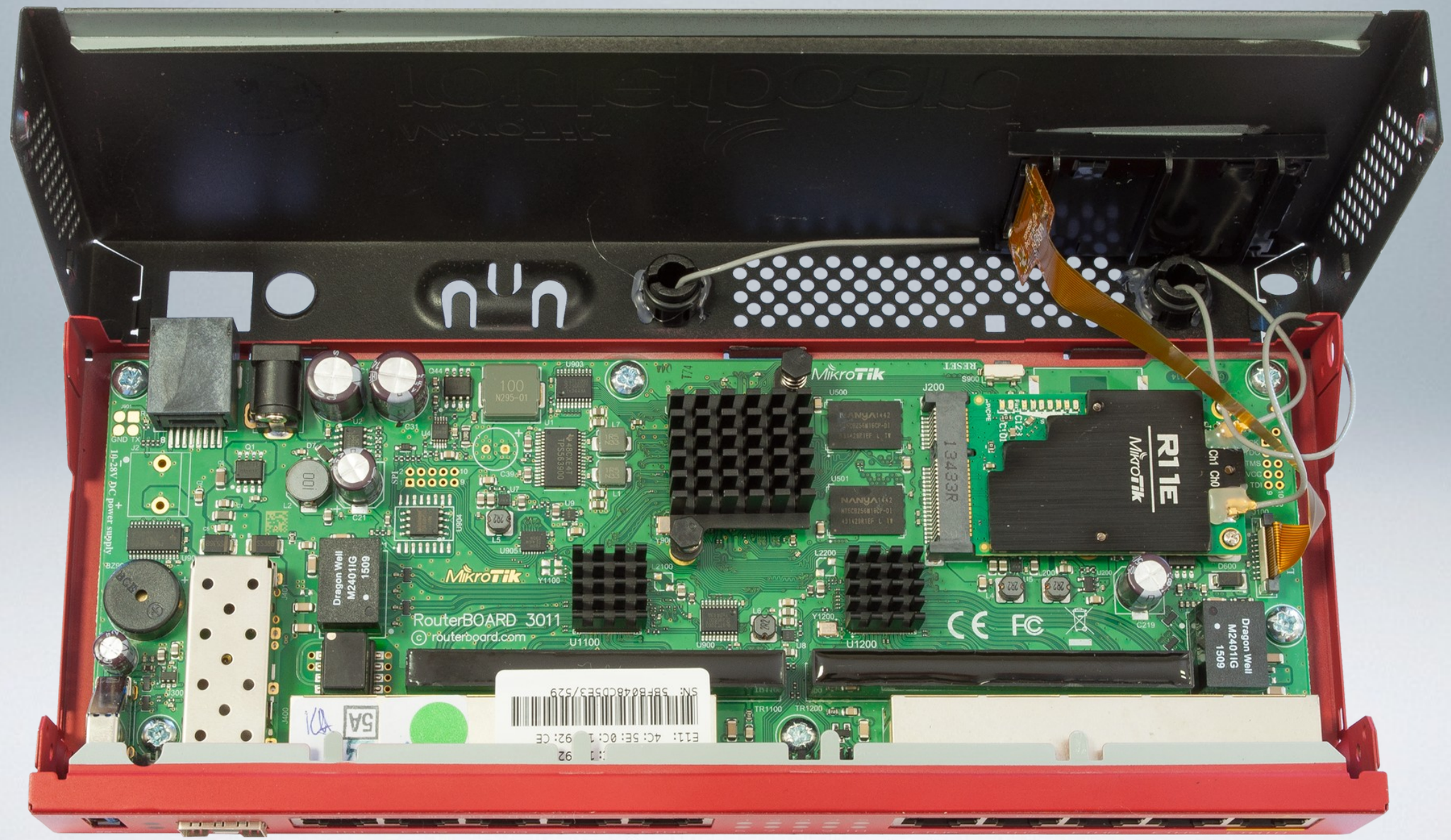
Q4

RB3011 Series

- Upgrade for RB2011 Series
- Dual core 1.4GHz ARM CPU
- 10x Gigabit Ethernet ports and 1 SFP cage
- miniPCIe slot (replacing built-in wireless card)
- More than 2x performance
- PoE-Out (up to 0,7A) on ether10
- Regular size USB3

Q4

RB3011 Series



Q4

RB3011 Series

- RB3011UiAS-RM: $179
- RB3011UiAS-2HnD-IN: $199

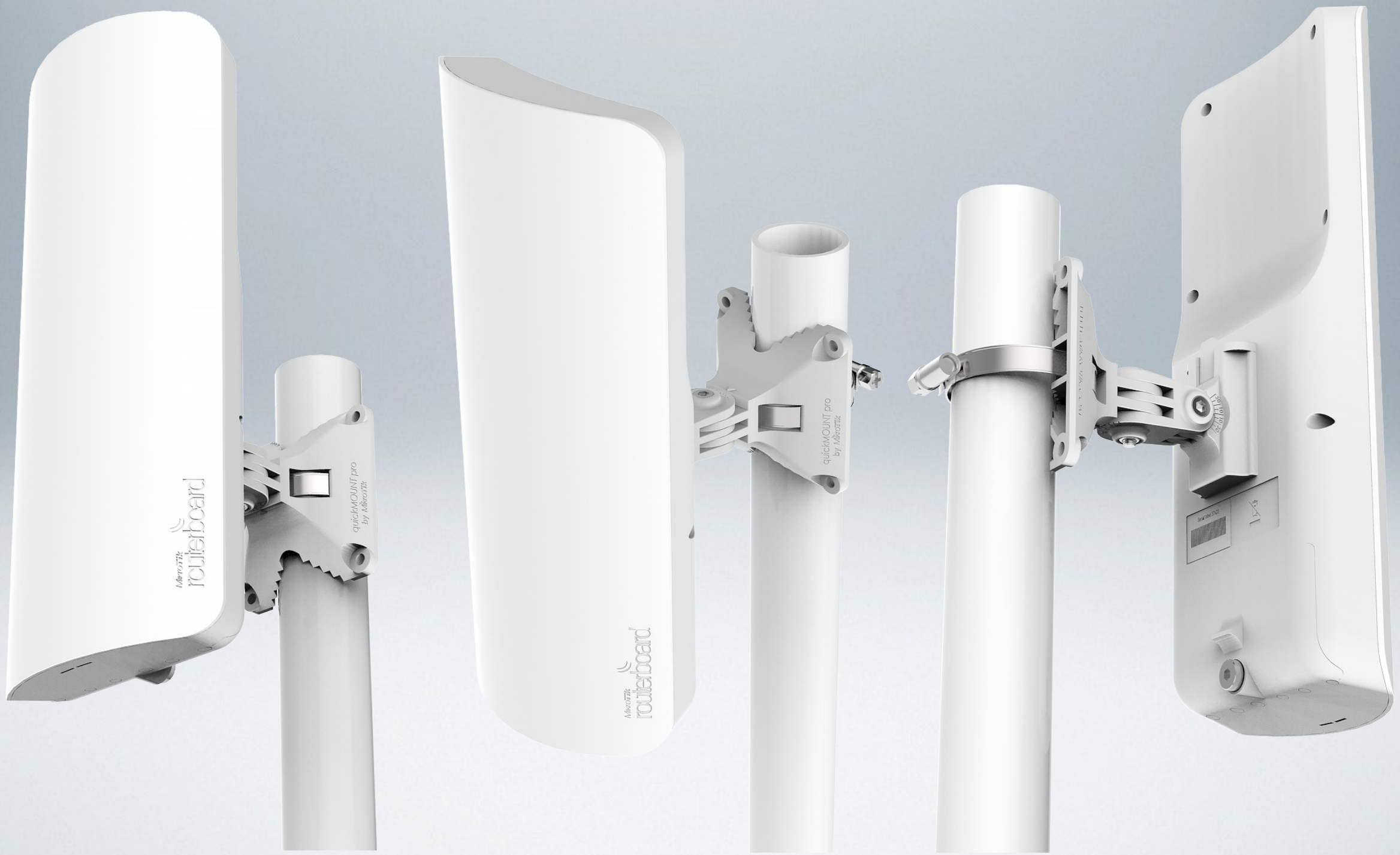
NEW

MikroTik Sector Antennas

- 19dBi and 15dBi
- Dual Polarization
- 2x RP-SMA connectors
- Frequency Range
  5.170-5.825 GHz
- 120 degree

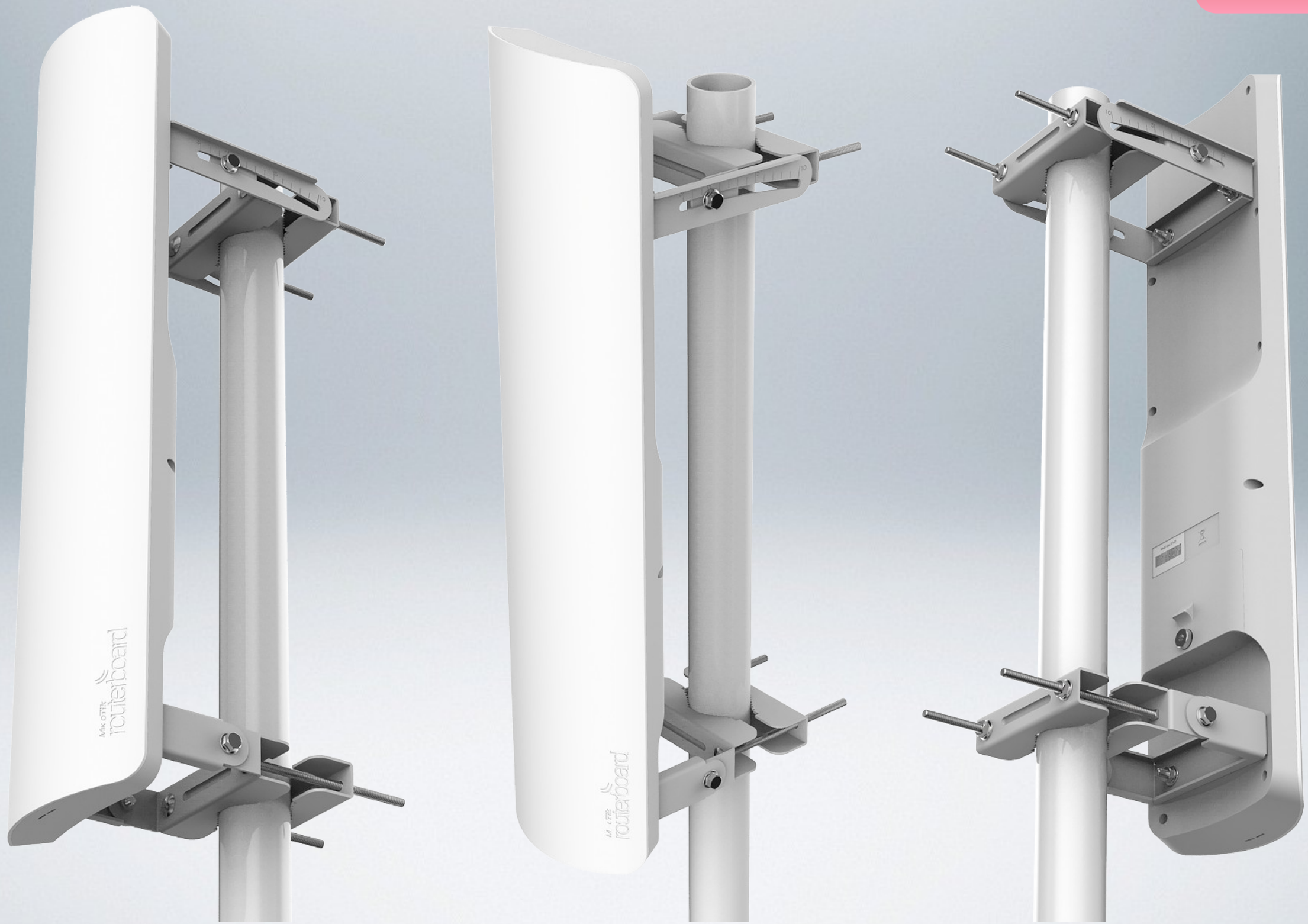
mANT 15s

NEW



mANT 19s

NEW



All products

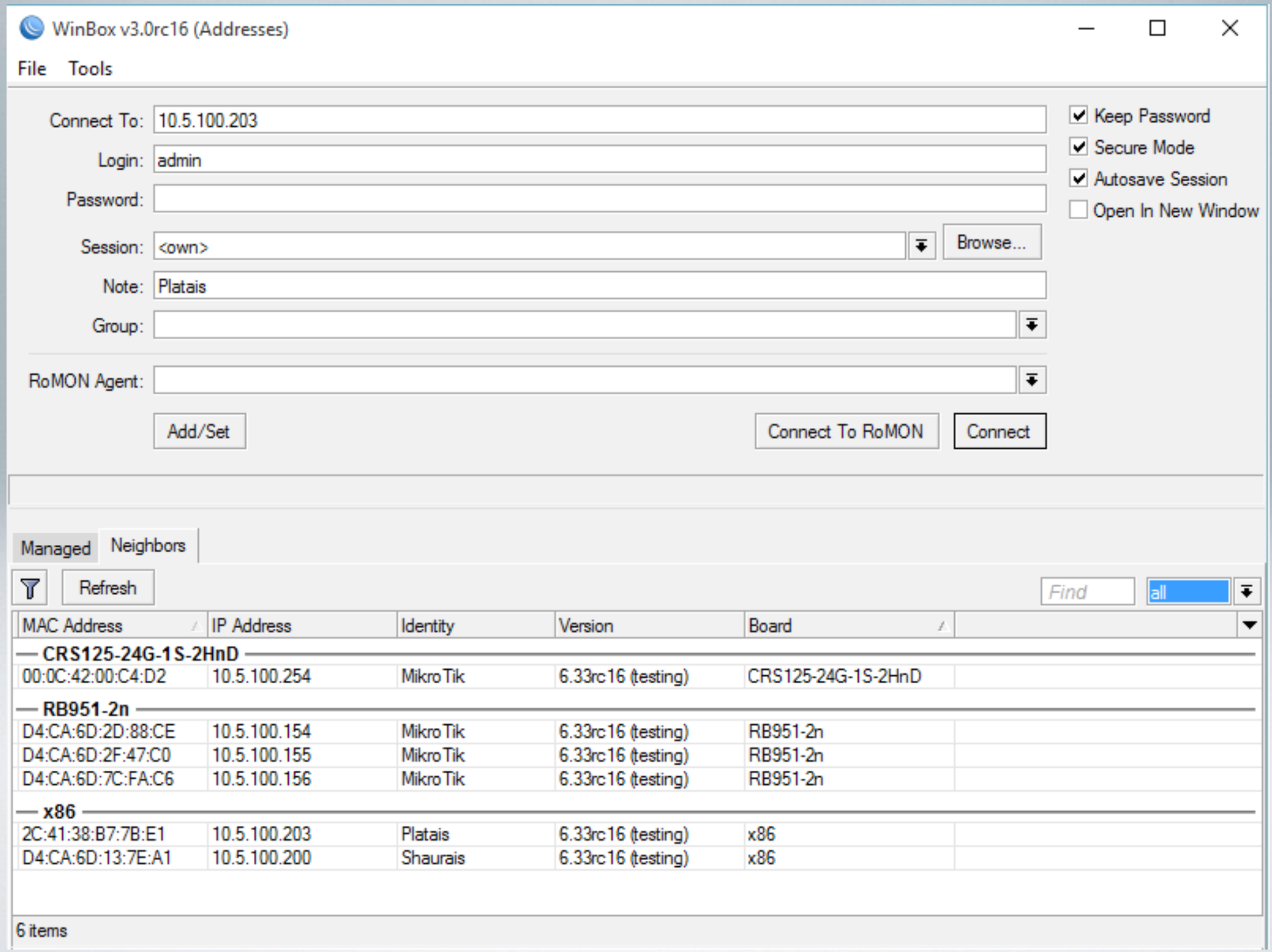
- Include free software upgrades for life
- Run the same MikroTik RouterOS software
- Can be purchased from our worldwide distributor network

Software features

RoMON

- Router Management Overlay Network
- Secure Layer 2 style access to all MikroTik RouterOS devices
- Works similar to neighbor discovery only over multiple hops
- Discover, manage and upgrade your entire remote network with an easy to use tool
- More info in our manual: http://wiki.mikrotik.com/wiki/Manual:RoMON

WinBox 3

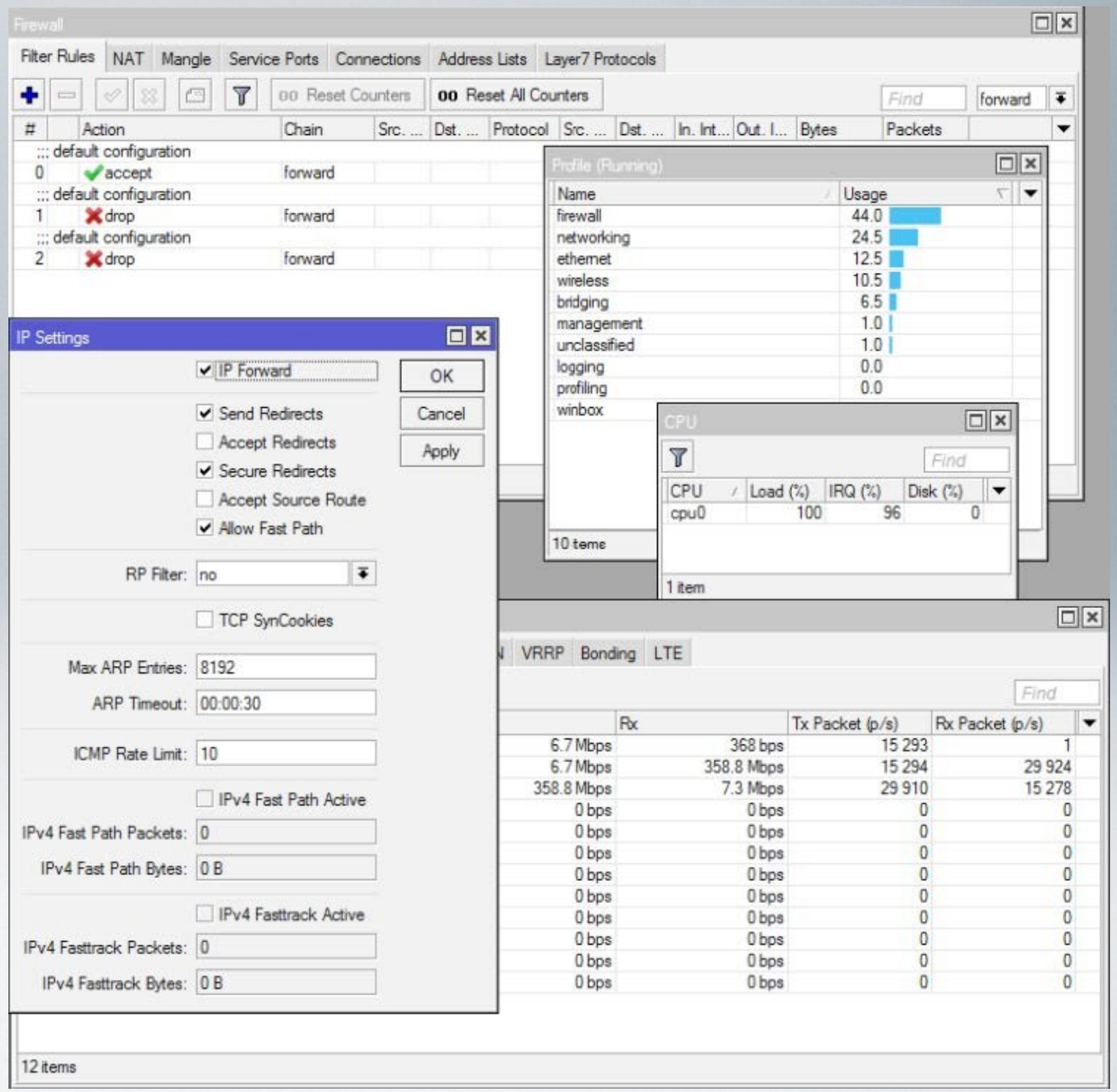

WinBox v3.0rc16 (Addresses)
File
Tools
Connect To: 10.5.100.203
Login: admin
Password:
Session: <own>
Browse...
Note: Platais
Group:
RoMON Agent:
Keep Password
Secure Mode
Autosave Session
Open In New Window
Add/Set
Connect To RoMON
Connect
Managed
Neighbors
Refresh
Find
all
MAC Address
IP Address
Identity
Version
Board
CRS125-24G-1S-2HnD
00:0C:42:00:C4:D2 10.5.100.254 MikroTik 6.33rc16 (testing) CRS125-24G-1S-2HnD
RB951-2n
D4:CA:6D:2D:88:CE 10.5.100.154 MikroTik 6.33rc16 (testing) RB951-2n
D4:CA:6D:2F:47:C0 10.5.100.155 MikroTik 6.33rc16 (testing) RB951-2n
D4:CA:6D:7C:FA:C6 10.5.100.156 MikroTik 6.33rc16 (testing) RB951-2n
x86
2C:41:38:B7:7B:E1 10.5.100.203 Platais 6.33rc16 (testing) x86
D4:CA:6D:13:7E:A1 10.5.100.200 Shaurais 6.33rc16 (testing) x86
6 items

WinBox 3

- Open, Save, Import, Export and Protect (set password) to your device lists
- Load, Save and Manage your session layout preferences
- Use any MikroTik RouterOS device as RoMON agent
- Discover all RoMON enabled devices in the RoMON agent's connected network
- Connect to internal RoMON enabled devices via WinBox

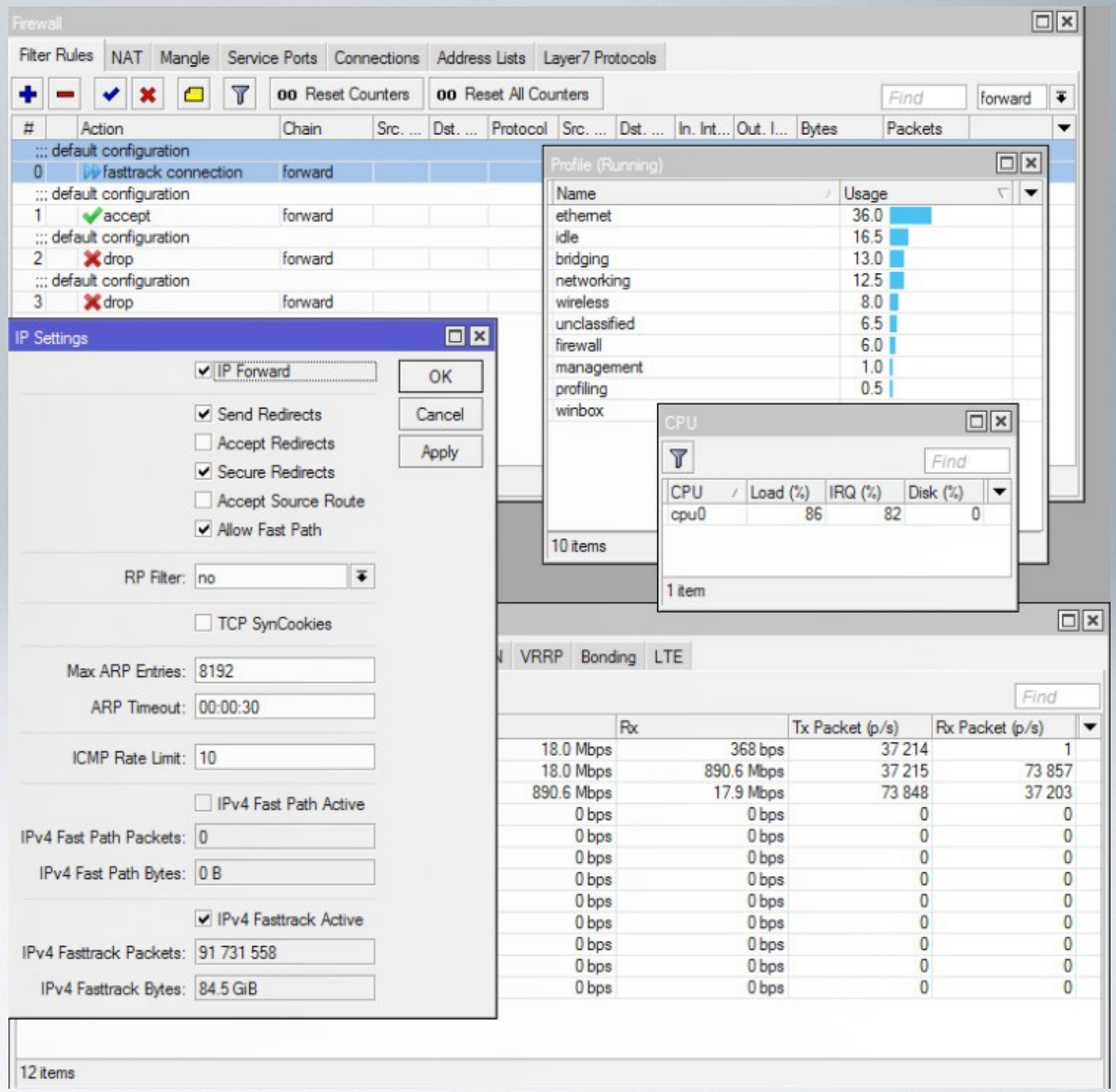
Without FastTrack

- Board:
  RB2011UiAS-2HnD
- Configuration:
  default Home AP
- Throughput:
  358Mbps
  (one TCP stream)
- CPU load:
  100%
- Firewall CPU load:
  44%



With FastTrack

- Board:
  RB2011UiAS-2HnD
- Configuration:
  default Home AP
- Throughput:
  890Mbps
  (one TCP stream)
- CPU load:
  86%
- Firewall CPU load:
  6%



FastPath + Conntrack = FastTrack

- Implemented as action for firewall filter/mangle
- Flags connection tracking entries as “FastTracked”
- Works with IPv4/TCP and IPv4/UDP
- Some packets still will go the regular path to maintain connection tracking table

FastTrack

IF Settings

IP Forward

OK

Firewall

Filter Rules | NAT | Mangle | Service Ports | Connections | Address Lists | Layer7 Protocols

Reset Counters | Reset All Counters | Find | forward

#	Action	Chain	Src...	Dst....	Prot...	Src. Port	Dst. Port	In. I...	Out....	Bytes	Packets
;;; Drop new connections from internet that is not dst-natted											
52	drop	forward						eth...		0 B	0
;;; fasttrack connections that have related and established packets											
53	fasttrack connection	forward								240.2 MiB	319 850
;;; accept related and established packets											
54	accept	forward								240.2 MiB	319 850
;;; drop invalid packets											
55	drop	forward								40.9 KiB	765
;;; drop data to bogon IP's											
56	drop	forward						brid...		43.0 KiB	2 398
;;; Drop all other local subnets											
57	drop	forward	!19...					brid...		0 B	0
;;; drop data from bogon IP's											
58	drop	forward						eth...		0 B	0
;;; jump to viruses chain											

9 items out of 335 (1 selected)

IPv4 Fasttrack Active

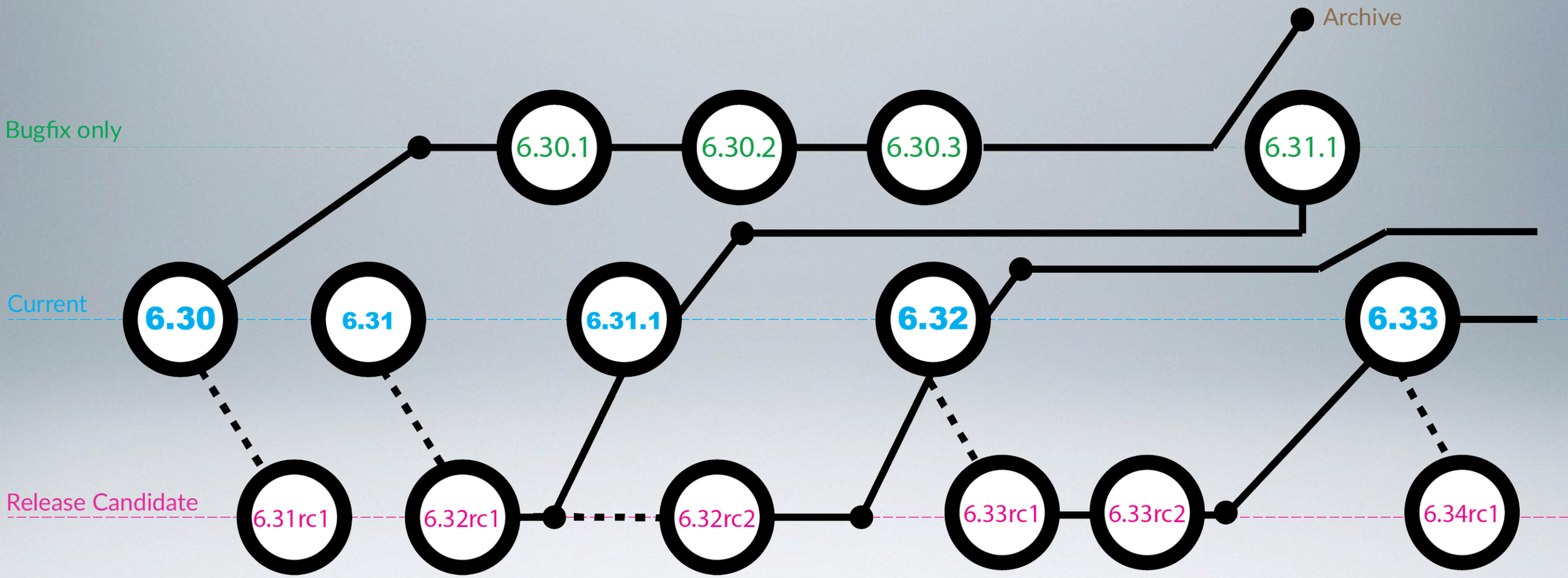
IPv4 Fasttrack Packets: 19 773 551

IPv4 Fasttrack Bytes: 15.1 GiB

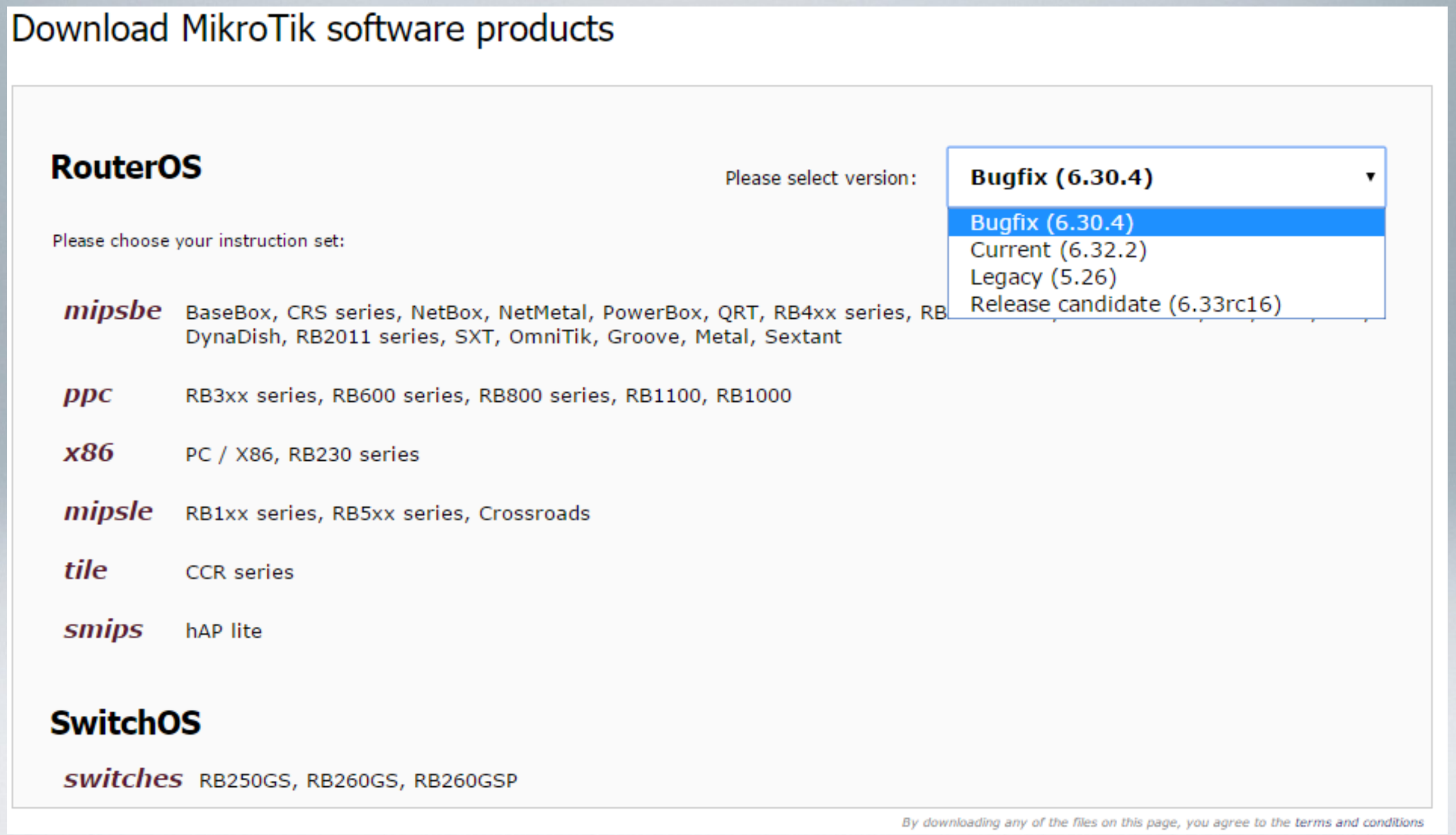
RouterOS version types

- ***Bugfix*** – stable RouterOS v6 version with all known bugfixes included
- ***Current*** – RouterOS v6 version with the latest set of tested features and fixes
- ***Release candidate*** – RouterOS v6 version to try-out and test fresh features and fixes
- ***Development*** – RouterOS v7 beta versions (not available yet)
- ***Legacy*** – RouterOS v5 latest version

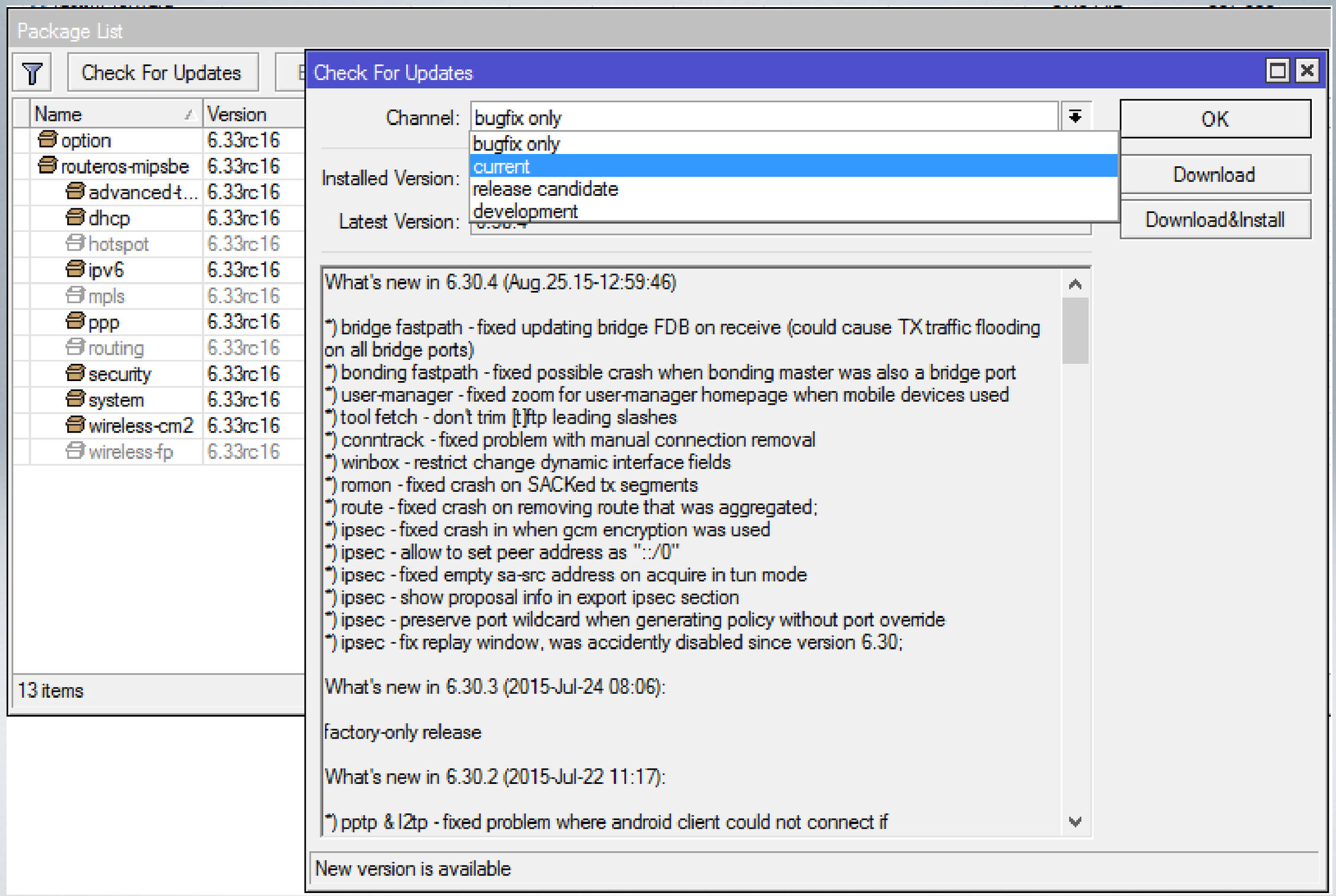
Life cycle


Archive
Bugfix only
6.30.1
6.30.2
6.30.3
6.31.1
Current
6.30
6.31
6.31.1
6.32
6.33
Release Candidate
6.31rc1
6.32rc1
6.32rc2
6.33rc1
6.33rc2
6.34rc1

New RouterOS version release system



Check for Updates



CHR

Cloud Hosted Router

- Special virtual machine image for VMware, VirtualBox, HyperV, Qemu and more
- No traditional license key
- 1Mbit limit per interface = free use
- Unlimited subscriptions coming soon
- All info @ http://forum.mikrotik.com

Newest Features

- FastPath support for MAC-winbox, MAC-telnet, Traffic Flow
- CoA support for PPP
- PPPoE support for MTU > 1492
- All Tunnels support DNS name as remote address
- Improvements for 802.11ac chip-set single connection TCP performance (802.11)

Need help?

- Ask a local **distributor**
- Read the manual **wiki.mikrotik.com**
- Look/ask on the **forum.mikrotik.com**
- Email **support@mikrotik.com**
- Hire a **consultant**
- Attend a training class or join an Academy class in a University

Enjoy the MUM!