

#### Lunch at Viceroy ballroom

We will be back at 14:30

MUM India

September 2016



MUM India September, 2016

# More than 130 MUMs all Around the World



#### MUM INDIA #5

- 82 Mumbai 2008
- 162 New Delhi 2012
- 220 New Delhi 2014
- 411 New Delhi 2015



- Established 1996
- RouterOS created in 1997
- RouterBOARD created in 2002
- First MUM event in Prague 2006
- Biggest MUM in 2015, Indonesia 2500+ people
- More than 180 employees



# MikroTik at the MUM

- Janis Jankovskis (sales)
- Uldis Cernevskis (support)
- Sergejs Boginskis (support, training)



#### Schedule

#### mt.lv/agenda

1200

13:00	Lunch				
17:45	Lottery				
18:00	Free drinks and socializing				

Exhibitors and coffee in the hall

# MUM Live

www.youtube.com/mikrotik

#### After the MUM

Presentation slides - <u>mum.mikrotik.com</u>

Previous MUM India slides http://mum.mikrotik.com/2015/IN/agenda

Videos - youtube.com/mikrotik

Licenses will be emailed.

# Special Thanks

JRS Communication Pvt. Ltd.

Krauss Communication



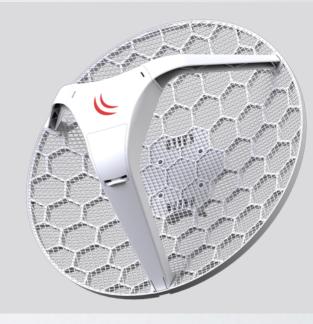
**Ethernet Routers** 



Wireless for Home & Office











Switches









RouterBOARDs

#### What we do

- MikroTik provides routing and wireless equipment for all possible uses: wireless, ethernet routing, switches
- Our RouterOS software supports most common and also many custom made features

#### RouterOS

- MikroTik RouterOS is the operating system of RouterBOARD hardware
- Stand-alone operating system based on the Linux kernel
- Routing, firewall, bandwidth management, wireless access point, wireless link, hotspot gateway, VPN server and more

# Why us

- Millions of RouterOS powered devices currently routing the world
- 20 years of experience developing networking software and hardware
- Over 40'000 RouterOS trained and certified network engineers

#### PRODUCT SERIES

#### ETHERNET ROUTERS

From small to big, for every need.
RouterBOARD and CCR series.
Desktop and rack mount.

# hEX lite

- Small Ethernet device
- Five ports
- Power output version (hEX PoE lite)



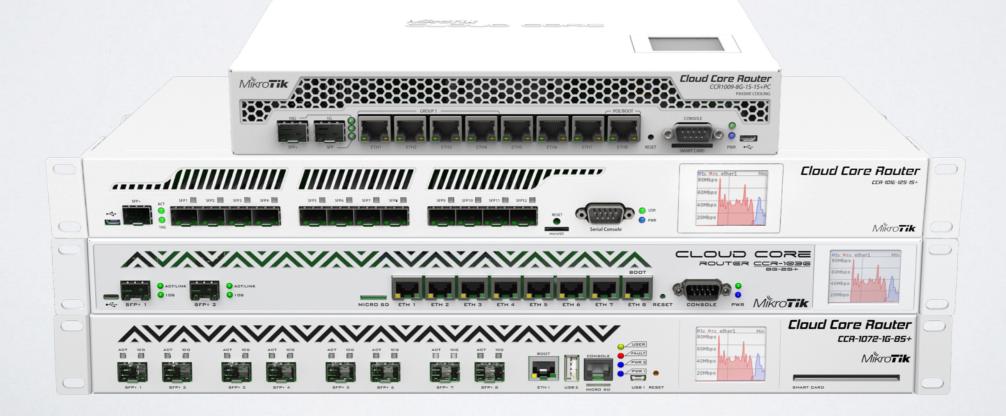
# RB2011 and RB3011

- Rack mount and desktop case
- 10 Ethernet ports
- I SFP (fiber optic)
- RB3011 dual core ARM CPU



# CCR series

- 9, 16, 36 and 72 cores
- Extreme performance
- Hardware accelerated encryption
- I Gbps Ethernet, SFP and SFP+ ports



# CCR series

CCR1072-1G-	8S+	Tile 72 Core	Tile 72 Core (1000Mhz, DDR1600) Max possible throughput						
Mode	Configuration	1518 byte	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		

CCR1036-8G-2S+EM		Tile 36 core max possible throughput test						
Mode Configu	Configuration	1518 byte	1518 byte		512 byte		64 byte	
	Comiguration	kpps	Mbps	kpps	Mbps	kpps	Mbps	
Bridging	none (fast path)	2275.7	27636.1	6578.9	26947.2	41666.7	21333.4	
Bridging	25 bridge filter rules	2275.7	27636.1	5179.7	21216.1	5163.5	2643.7	
Routing	none (fast path)	2275.7	27636.1	6578.9	26947.2	41666.7	21333.4	
Routing	25 simple queues	2275.7	27636.1	6553.3	26842.3	7643.1	3913.3	
Routing	25 ip filter rules	1825.7	22171.3	3033.9	12426.9	3049.7	1561.4	

# WIRELESS FOR HOME & OFFICE

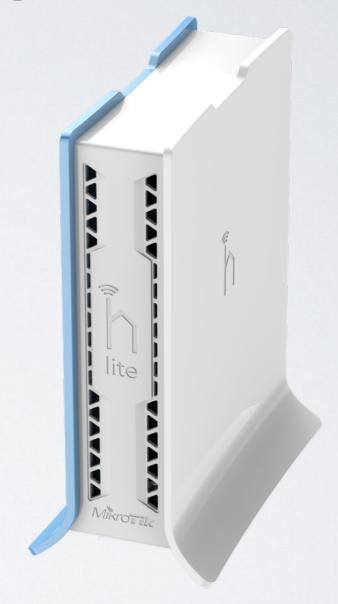
# mAP lite



Tiny size 2.4GHz Dual Chain personal access point with a 650MHz CPU, 64MB RAM and one Ethernet

# hAP lite





Small and nice design. Low cost, for home or office

#### WIRELESS SYSTEMS

# NetMetal

- Waterproof metal enclosure
- Gigabit Ethernet, SFP
- 3 chains (antennas)
- 802. Hac technology
- 4 different models



# SXT

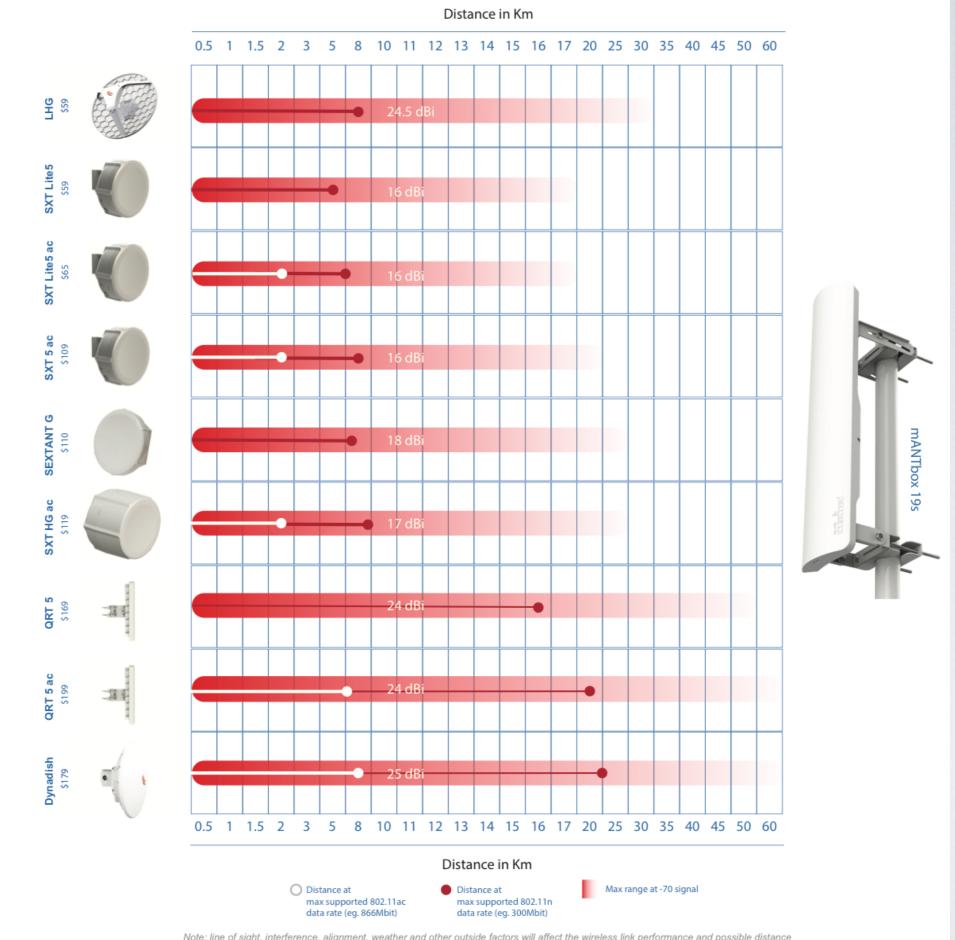
- Compact AP/CPE
- 24-90 degree antenna
- Different models available (2GHz, 5GHz, 802.11ac)
- Low cost
- Mid-range wireless links



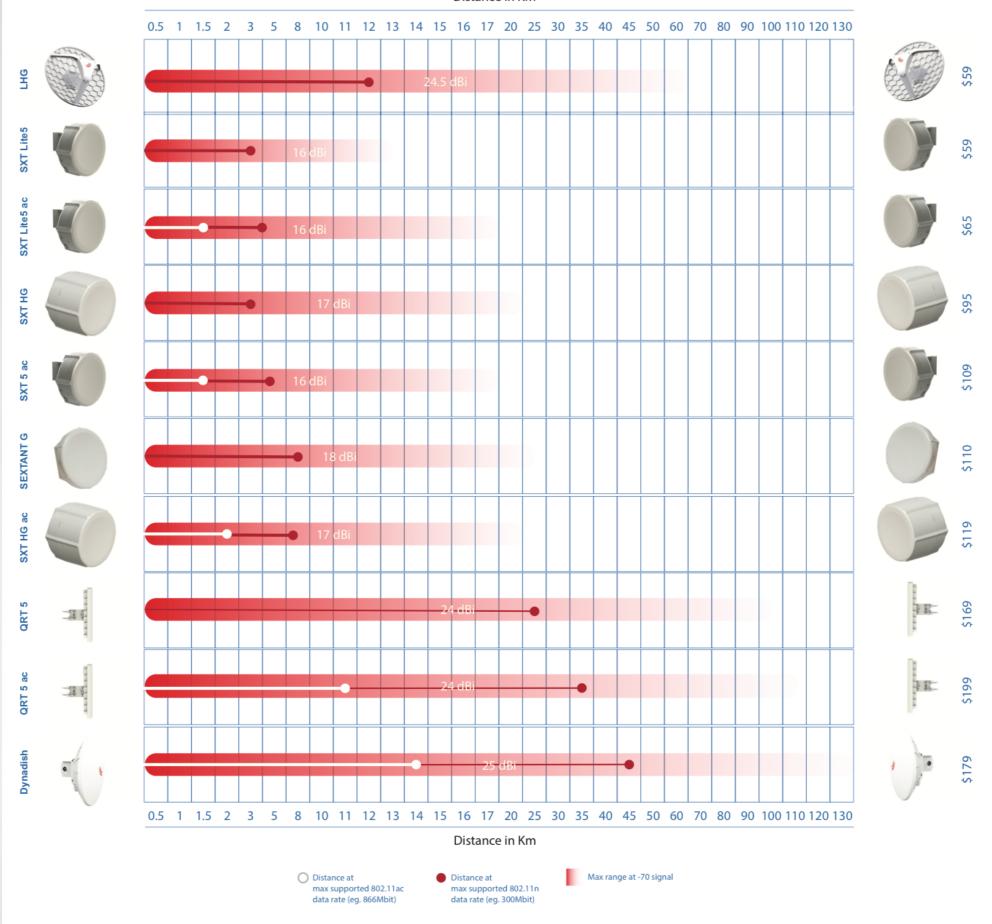
# DynaDish

- Dual-chain 802.11ac
- 8 degree, 25dBi antenna
- I Gbit Ethernet
- Long range point-to-point links





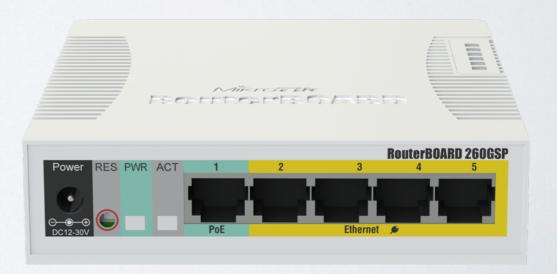
#### Distance in Km



#### SWITCHES

## RB260GSP

- Small switch
- Runs SwOS software
- Powers other devices over PoE



# CRS Series

- Layer 3 switches
- Run MikroTik RouterOS
- From 8 to 24 ports
- Gbit Ethernet
- SFP/SFP+
- Wireless



#### ROUTERBOARD

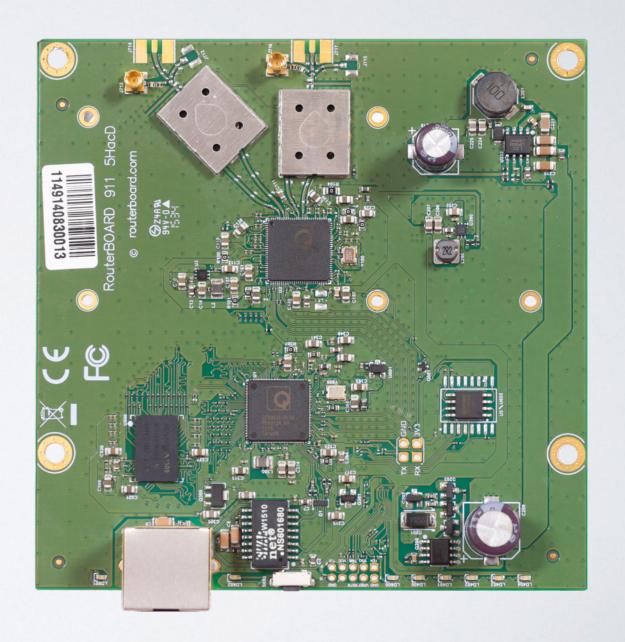
# RouterBOARD

- Use custom case
- Upgrade or expand with ease
- Choose model based on ports, features and speed



# RB911 ac

- 802. I lac support
- 10/100 Mbit port
- Affordable cost



### INTERFACES AND MORE

# SFP modules

- 1.25Gbps and 10Gbps
- Single, Multi modes
- Different distances
- GPON



# Wireless Cards

- 802.11 a/b/g/n/ac
- 2GHz, 5GHz
- miniPCI-e, miniPCI



Antennas

- mANT30
- Parabolic dish
- Regular or precise alignment
- Radome cover



### NEW PRODUCTS



# LHG 5 Light Head Grid

• 24.5 dBi antenna

Antenna is built into wireless unit

• 802. I la/n dual chain

Very affordable





# LHG 5

Light Head Grid

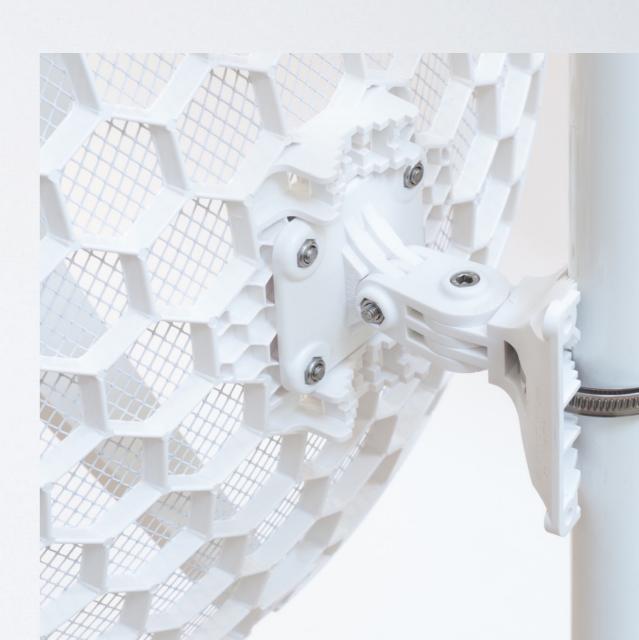






## quickMOUNT pro LHG

- Wall or pole mount adapter
- ±70° horizontal adjustment
- ±30° vertical adjustment
- Special plastic composite material - anvilNITE (TM)



#### now

### SXT LTE

- LTE 3 category modem
- 100Mbps download and 50 Mbps upload
- LTE FDD bands 3 (1800MHz)
- miniSIM slot

### WAP LTE kit

- 2GHz wireless
- LTE antennas
- LTE modem within minipci-e
- weatherproof case
- indoor, outdoor, mobile operation
- more information at Uldis presentation





### mANTBox 15s

- 15 dBi 120 degree antenna
- RB921 inside
- 720MHz CPU power
- 802.11 ac/a/n wireless with 31dBm output power



#### mANTBox 19s

- 19 dBi 120 degree antenna
- RB921 inside
- 720MHz CPU power
- 802.11 ac/a/n wireless with 31dBm output power





### Groove 52 ac



• ac update for the popular Groove model



### Metal 52 ac



- Waterproof, rugged with a super high output power
- 802.11 b/g/n and 802.11 a/n/ac, 1xGigabit Ethernet



### mAP



- update for small AP, dual chain 2.4GHz wireless
- 802.3 af/at support, PoE out!



#### wAP ac

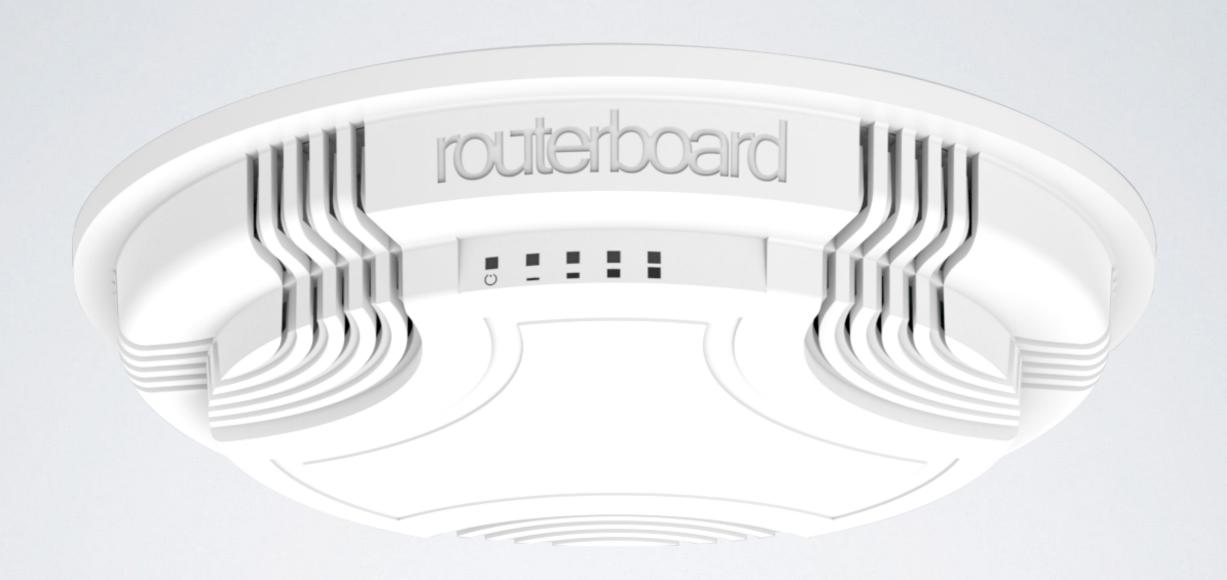




- Wall or ceiling mountable
- Use for hotel, office, etc.
- Gigabit and 802.11ac
- Dual band (simultaneous 2.4GHz and 5GHz)



#### cAP



- ceiling AP, dual chain 2.4GHz wireless
- 802.3 af/at support



#### hAP ac lite

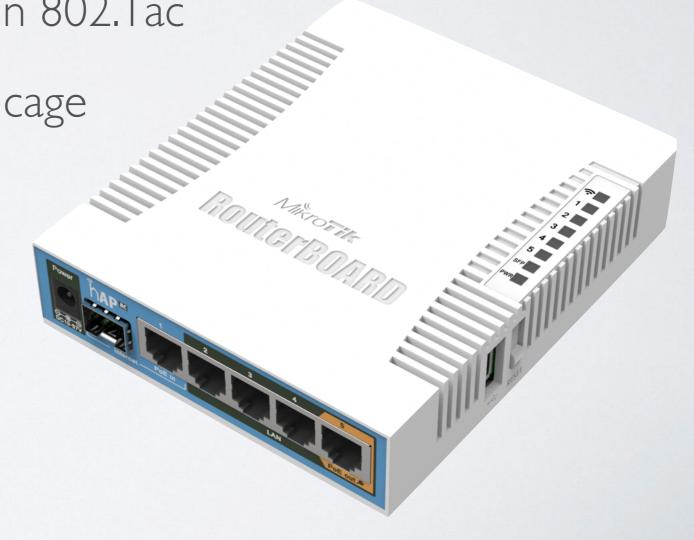
- Dual concurrent home AP
- 2.4GHz high power 2 chain 802.11n
- 5GHz high power I chain 802. I ac
- 100Mbps port
- 650MHz CPU
- PoE-out on port 5





### hAP ac

- Gigabit dual concurrent home AP
- 2.4GHz high power 3 chain 802.11n
- 5GHz high power 3 chain 802. I ac
- 5x1Gbps ports & 1 SFP cage
- 720MHz CPU
- PoE-out on port 5





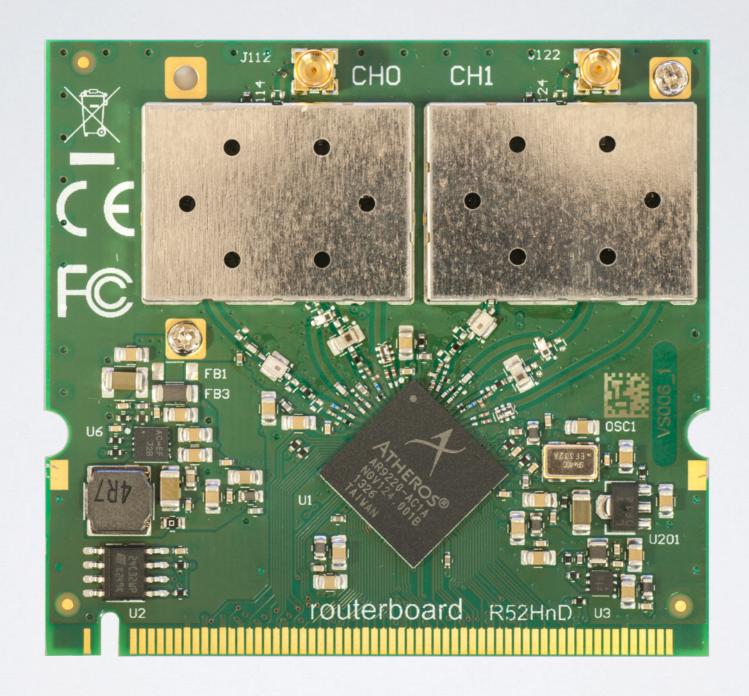
#### SXT 6GHz



- 5940-6500 MHz range
- 802.11 a/n
- Antenna gain I 6dBi
- Antena beam width 28



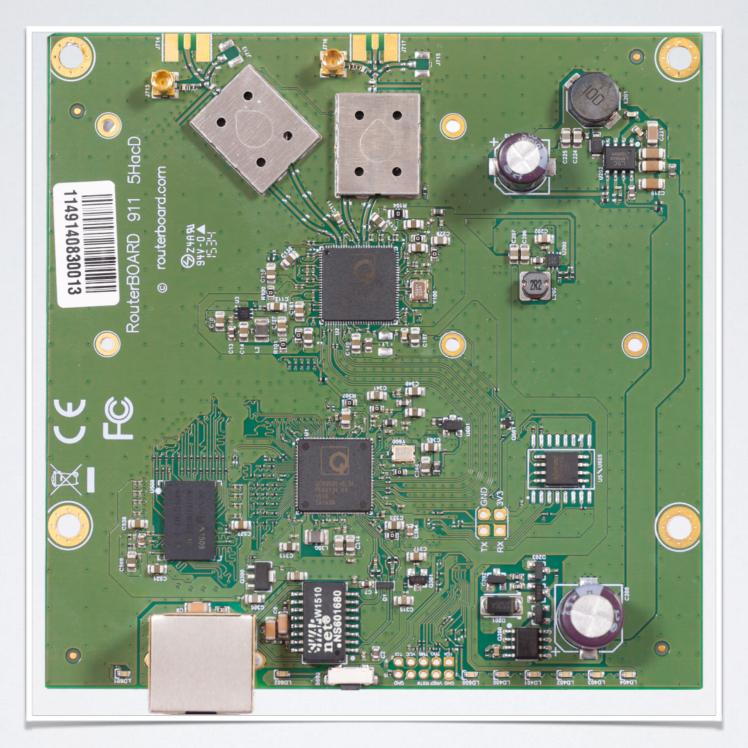
### R52HnD



tx-power 26 dbm, R52H replacement



### 911 Lite 5ac



ac update for extremely affordable board

#### hEX PoE

- Small Ethernet device
- Five Gbps ports
- Power over Ethernet out on ports 2-5



### OmniTIK 5 ac

- 802.11ac, 2 chains
- 5x | Gbit Ethernet ports
- 7.5 dBi
- PoE in





#### OmniTIK 5 PoE ac

- 802.11ac, 2 chains
- 5x | Gbit Ethernet ports
- 7.5 dBi
- PoE in
- PoE out (ports 2-5)



## All Products

- Include free software upgrades for life
- Run the same RouterOS software\*
- For more info see routerboard.com

### ROUTEROS FEATURES

# CHR Cloud Hosted Router

- RouterOS version tailored for running in virtual environments
- Runs on VMware Workstation and ESXi,
   VirtualBox, HyperV, KVM, XenServer, etc.
- Cloud services Amazon, Azure and others



1. Choose AMI

Choose Instance Type

Configure Instance

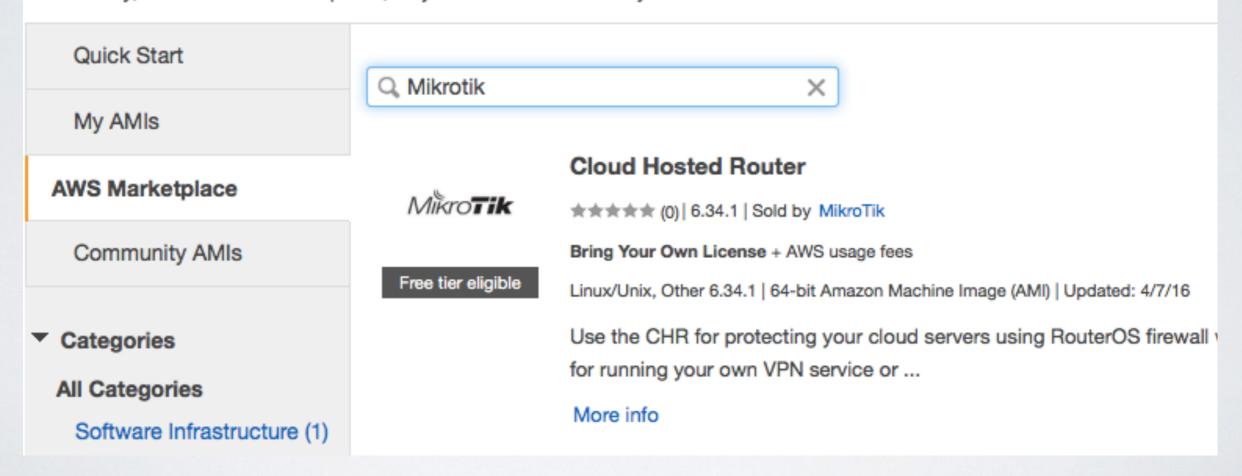
Add Storage

Tag Instance

6. Configure Security

#### Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required community, or the AWS Marketplace; or you can select one of your own AMIs.





- Firewall for your cloud services
- VPN server in the cloud
- The Dude monitoring server
- Simulate networks for learning or training
- And much more



License	Speed limit	Price
Free	IMbit	FREE
PI	I Gbit	\$45
PIO	IOGbit	\$95
P-Unlimited	Unlimited	\$250

- 60 day trial available
- Purchased license can be transferred



Licence				
System ID:	6lR1ZP/utu3		OK	
Level:	free		Generate N	lew I
Next Renewal At:			Renew Lic	ence
Deadline At:				
	Limited Upgrades			
Renew Licence			×	
Account: mymik	rotikcomaccount	Start		
Password: *****	*****	Stop		
Level: P1	Ŧ	Close	=	

2			
	Licence		□×
	System ID:	6lR1ZP/utu3	OK
	Level:	P1	Generate New ID
	Next Renewal At:	Jan/10/2016 21:59:59	Renew Licence
	Deadline At:	Feb/09/2016 21:59:59	
		Limited Upgrades	

WinBox → System → License



#### **Routers & Wireless**

home

software

hardware

support

downloads

purchase

training

account

Logout

Search...

Overview Support

#### Account Notices



You must approve your account for creditcard purchases.

Account authorisation procedure \*\*\*

Current account balance is \$0 Prepaid keys available: 0

#### Generate a NEW software KEY

- purchase a key
- make a demo key

#### For already created software keys

- all keys or try search
- replacement key (0)
- request key from another account

#### Cloud Hosted Router (CHR)

- all keys
- orders and invoices

#### Account information

- balance
- change user information
- hardware orders

#### Training

- my training sessions(0) my certificates(0)
- MikroTik User Meeting

#### Support

- support contact form
- supout.rif viewer

#### Other

lockpack creator

www.mikrotik.com





[Back To Main Menu]

#### **User Keys**

Show 10 + entries Search:

System ID	Key	Issued	Expires	Level	Transfer	Action	Note
6IR1ZP/utuJ	BEGIN MERROTEK SOFTWARE KEY	2015-12-09	2016-02-09	P1-Perpetual (Trial version)		Upgrade	) 🖗

Previous 1 Next

### CHR Licensing



**Upgrade system license**  ②

System ID

Level

6lR1ZP/utuJ

√ Select level

P1-Perpetual (\$ 45.00 )

P10-Perpetual (\$ 95.00 )

P-Unlimited (\$ 250.00 )

System 6IR1ZP/ut
Perpetual Trial version

You have following prepaid balance keys available to purchase a CHR license:

P1-Perpetual - 4 keys

Back



#### Payment <sup>(1)</sup>

You have selected: P1-Perpetual
System ID 6IR1ZP/utuJ

Total price: \$ 54.45

Pay using deposit (left: \$ 73.51)

Pay using CC

Pay using PayPal

Pay using Balance key (4)

**Note:** Price includes VAT 21% because you have specified EU country as your residence. To avoid this you have to enter your VAT registration number in your account settings.

Back

# CHR Cloud Hosted Router

- For more info, see the CHR page on our wiki: <a href="http://wiki.mikrotik.com/wiki/Manual:CHR">http://wiki.mikrotik.com/wiki/Manual:CHR</a>
- Available on the download page: http://mikrotik.com/download#chr

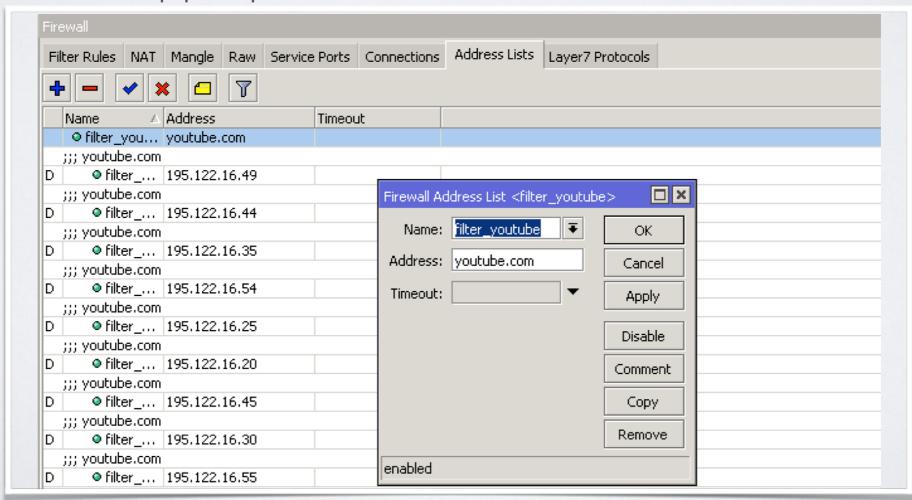
# RouterOS v6.36 changelog 146 line

# Wireless in v6.37

- New wireless package 'wireless'
- Read changelog before upgrade!
- DFS mode changed, all devices will be with dfs=radar-detect
- Improved driver and more come to Uldis presentation

# DNS at address-list

- add DNS name to address-list, router will find addresses automatically
- set appropriate rules at firewall



## The Dude v6.x

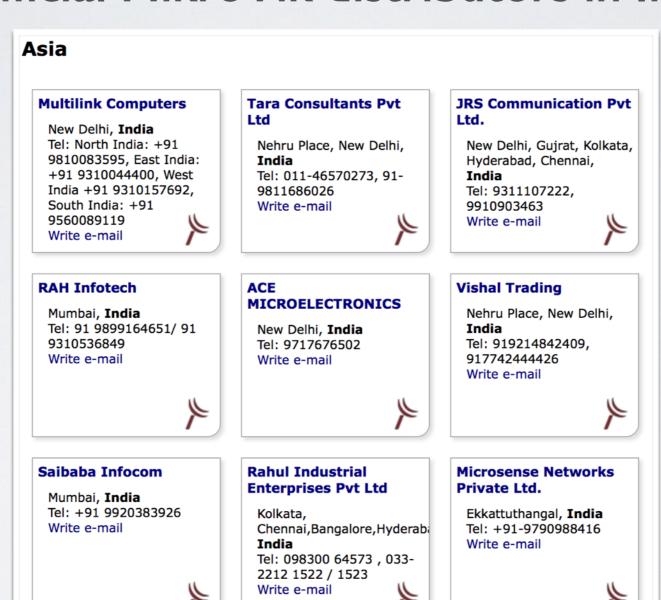
- Dude is back
- v6. server support at CCR/x86 and RB3011
- fixes and new features development
- more information at 13:45 workshop

# Need Help?

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

# Need Help?

#### Official MikroTik distributors in India:



# Need Help?

#### Official MikroTik consultants in India:

#### Muralikrishna Kema

#### MTCINE, MTCNA, MTCRE, MTCTCE, MTCWE

Hyderabad, Bangalore, Tamil Nadu, India

ISP / Carrier networks design, Hotspot,QoS,OSPF, BGP,MPLS,Traffic Engineering. Wireless PtP and PtMP,Campus Wifi,Network Security Other advanced configurations Configure & Manage NMS, Gpon /Epon/ Switching L2 & L3 Mikrotik/Huawei Infrastructure ISP-VOIP Implementation, Billing, DID ,Trunking ,LCR, PBX, Load balance, large Scale Deployments. IPTV Implementation, Live Streaming, Video on Demand, Scalability for Any Size Audience

Tel: 09346732544 Write e-mail

Web: www.ctrltik.com

#### Manoj Kumar MUM

#### MTCNA, MTCRE, MTCTCE, MTCWE

Faridabad, India

Wireless Networks: desing, implementation, analysis & troubleshooting of WLAN, PtP and PtMP. High-Speed Wireless Links. Tunnel and VPN (IPSec, PPtP, L2TP) Bridging & Routing (Dymamic and Static). Firewall (Filtering Policies) . Hotspot, PPPoE, Queueing, Bandwidth Management, Firewall, Security. Hotspot, WISP administration experience, Load balancing, Advanced Wireless Security, > Bridging, STP RSTP, WDS, Mesh, Network Monitoring, Caching and WebProxy,Remote Assistance and on-site Support.

Tel: +919818763764

Write e-mail

#### **Dawinder Singh**

MTCNA, MTCRE, MTCTCE

Amritsar, **India** Tel: 91-9814138141

Write e-mail

Web: www.webtecz.com

## PARTNERSHIP

# How to Participate

- Become a distributor
- Take classes and become a certified trainer
- Start offering consulting services
- Coordinate a new MikroTik academy in a local University
- Create accessories and enclosures with the MFM program

### PARTNERSHIP PROGRAMS

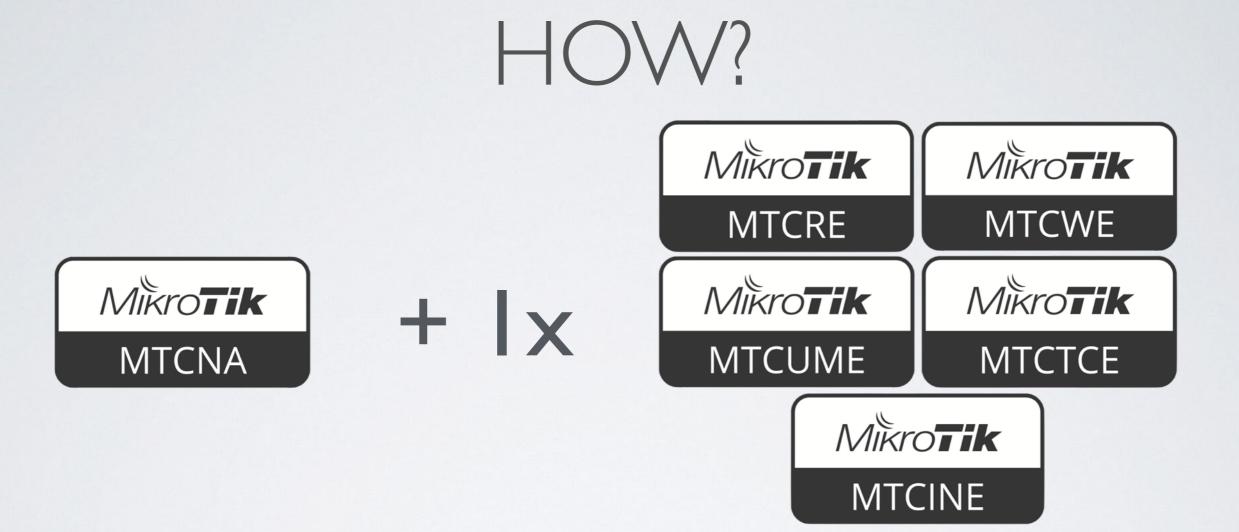




Accessories, integrators, software

## WHO?

- Experienced network engineers
- Profound RouterOS and RouterBOARD knowledge



Result: 75%+
sales@mikrotik.com

#### WHERE?



mikrotik.com/consultants



MikroTik Train the Trainer



Training courses developed by MikroTik

# Training center

## WHO?

- MikroTik certified trainers
- Training according to official outline
- Develop their own training materials

# Training center

### HOW?

- Motivation to teach!
- At least 2 MikroTik certificates, 75%+
- Pass Train the Trainer course

# Training center

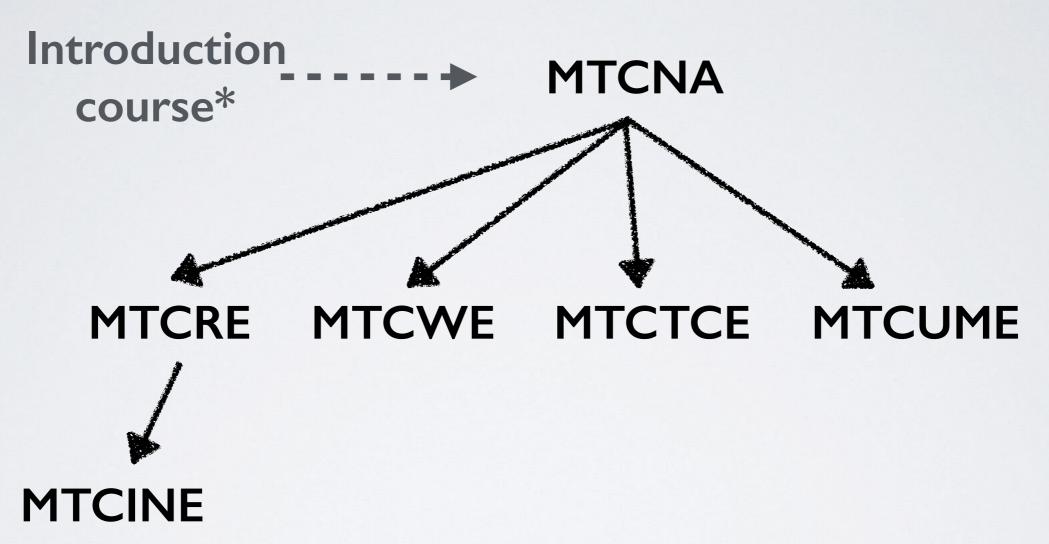


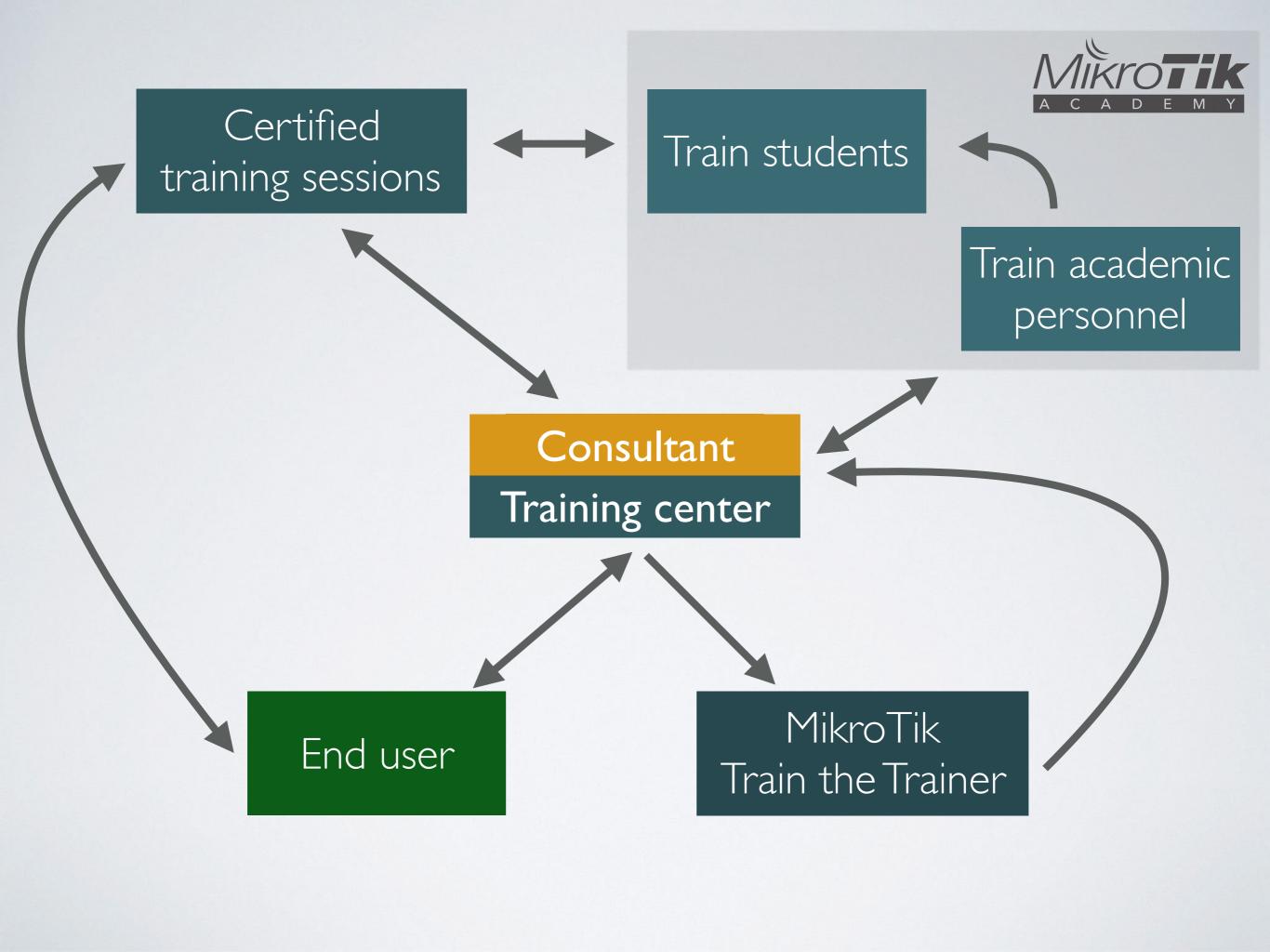
- Courses developed by MikroTik
- We offer certification tests
- Publish training schedule on our website

## MIKROTIK COURSES

MTCNA	Network Associate
MTCRE	Routing Engineer
MTCWE	Wireless Engineer
MTCTCE	Traffic Control Engineer
MTCUME	User Management Engineer
MTCINE	Inter-networking Engineer

## MIKROTIK COURSES





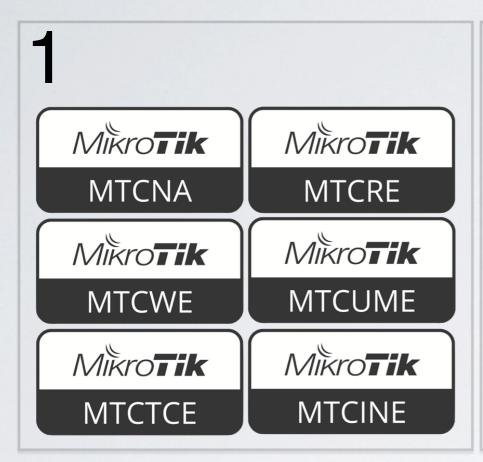
### PARTNERSHIP PROGRAMS





Accessories, integrators, software

#### Distributor







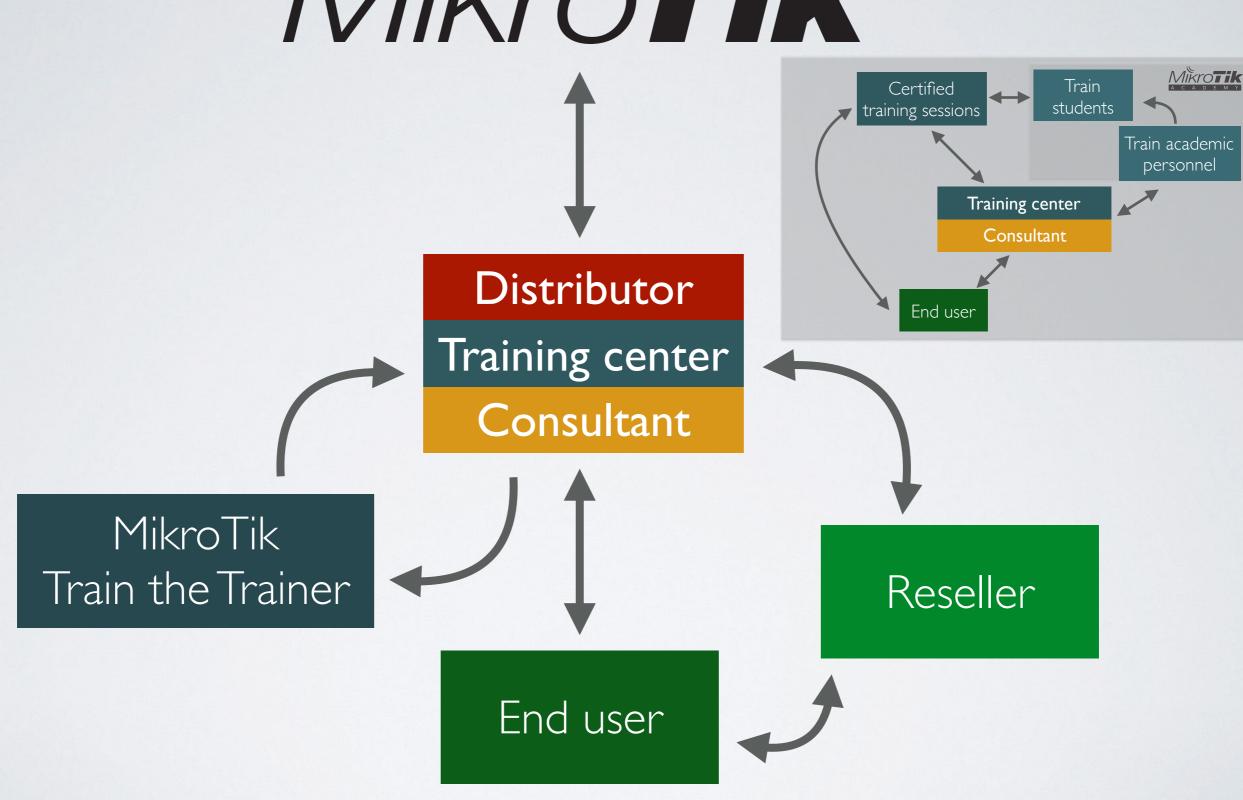
At least 1 certificate

Web page

Purchase volumes

sales@mikrotik.com





#### Distributor

## BENEFITS

- The more you learn, the better you can help your customers
- Happier customers > better sales

## PARTNERSHIP PROGRAMS





Accessories, integrators, software





mikrotik.com/mfm

#### Made for Mikrotik

The Made for Mikrotik program consists of two parts: "Mikrotik certified Integrators" and "Mikrotik certified Accessories".

MikroTik Certified Accessories are made by Mikrotik approved companies, who make accessories specifically for MikroTik products. This includes RouterBOARD compatible cases, outdoor antennas and other products

MikroTik Certified Integrators are companies who make turnkey solutions based on Mikrotik RouterBOARD and RouterOS, their products include assembled CPE/AP devices, preinstalled Integrated antennas and Rackmount solutions assembled for and with RouterOS



Click here to apply to the "MFM" program

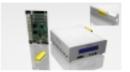
Below is a list of our 173 Certified Mikrotik Integrators and Accessory makers in Random order:

Accessories Integrators Software CPE Textbooks

#### Netkrom solution

http://netkromsolution.com

NetMedic is one product design to the hospital. Powered by MikroTik RouterOS NetMedic bundle with Monitor temperature, date and uptime of MikroTik. New Design Casing spesific for Hospital.



Choice NetMedic for improving performance Your Network Hospital

#### Pro-Cell Co., Ltd.

http://www.antenna.com.tw/

PRO-CELL is a professional antenna manufacturer in Taiwan. PRO-CELL product range includes an outdoor APA enclosure which can be combined with RouterBoards inside and antennas both inside or outside.



#### mikrotik.com/mfm

## HOWTO APPLY?

Description

sales@mikrotik.com





## WE OFFER

- Certification program for educational institutions
- Course is based on MTCNA
- Taught by Academy trainers
- Includes free MTCNA exam

## MIKROTIK OFFERS

 75% compensation to Training Centers for training Academy staff

## MIKROTIK OFFERS

- Training outline
- MTCNA course materials
- 20x RouterBOARDs

# FREE

## MIKROTIK OFFERS

- MTCNA certificates & RouterOS licenses to students
- Academy trainer shirts

# FREE

# HOWTO BECOME ACADEMY

- 1. Fill out application mikrotikacademy.com
- 2. Sign MikroTik Academy agreement

## HOWTO BECOME ACADEMY

- 3. Attend preparatory training (conducted by partners)
- 4. Pass MTCNA + 1x engineer level certificate test (result 75%+)

## HOWTO BECOME ACADEMY

- 5. Receive MikroTik Academy trainer certificate
- 6. Receive Academy package
- 7. Start giving MikroTik Academy classes



## ACADEMY NUMBERS

- 200+ MikroTik Academies around the world
- 350+ Academy trainers

mikrotikacademy.com training@mikrotik.com



mikrotikacademy.com

# Enjoy the MUM!

# 1 Alkrofik