

m.it.sco

Morvarid. IT. Solutions Co.

**5 years
RoMON**

**training statistics
deep technical review**

MikroTik

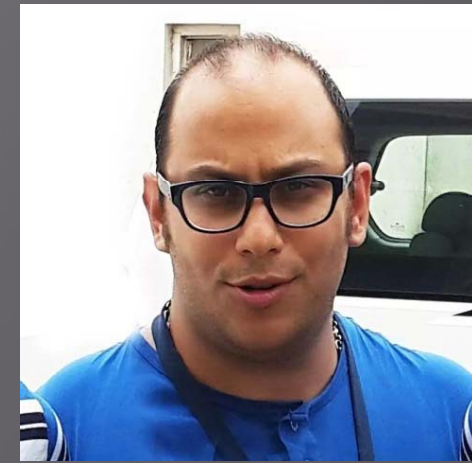
**By
Mani Raisdana**

Oct 6th 2015

ISTANBUL

Mani Raisdana

M.IT.S Co. CTO & Co. Founder
MikroTik Certified Trainer
Ubiquiti Certified Trainer
elastiX Certified Trainer



Being in IT technology business roughly around 14 years

Support & instruct Engineers more than 8 years all over the globe



Wireless, Routing, QoS, Firewall, The Dude

Mani Raissdana



- ▣ MikroTik Certified Trainers

<http://www.mikrotik.com/training/partners/europe/turkey>

- ▣ MikroTik Certified Consultants

<http://www.mikrotik.com/consultants/europe/turkey>

- ▣ Mani Raissdana Certifications

<http://www.mikrotik.com/certificateSearch> Check Mani Raissdana

<http://www.mits-co.com/content/certificates>

- ▣ Ubiquiti Certified Trainers

<https://www.ubnt.com/training/partners/> Check Europe

- ▣ elastiX Certified Trainers

<http://www.elastix.com/en/instructores/> Check Turkey

- ▣ elastiX Official Resellers

<http://www.elastix.com/en/resellers-elastix/> Check Europe

- ▣ Mani Raissdana Resume

www.mits-co.com/sites/default/files/Mani%20Raissdana%20Resume.pdf



Training Schedule

<http://www.mikrotik.com/training/> Check M.IT.S Co
<https://www.ubnt.com/training/calendar/> Check M.IT.S Co
<http://www.elastix.com/en/events-3/> Check M.IT.S Co

http://www.mits-co.com/training_mikrotik%20
http://www.mits-co.com/training_ubiquiti
http://www.mits-co.com/training_elastix

GALLERY



MIT S & MICROT IK



Table of contents

▣ 5 years MikroTik training statistics

All about what we have done in last 5 years

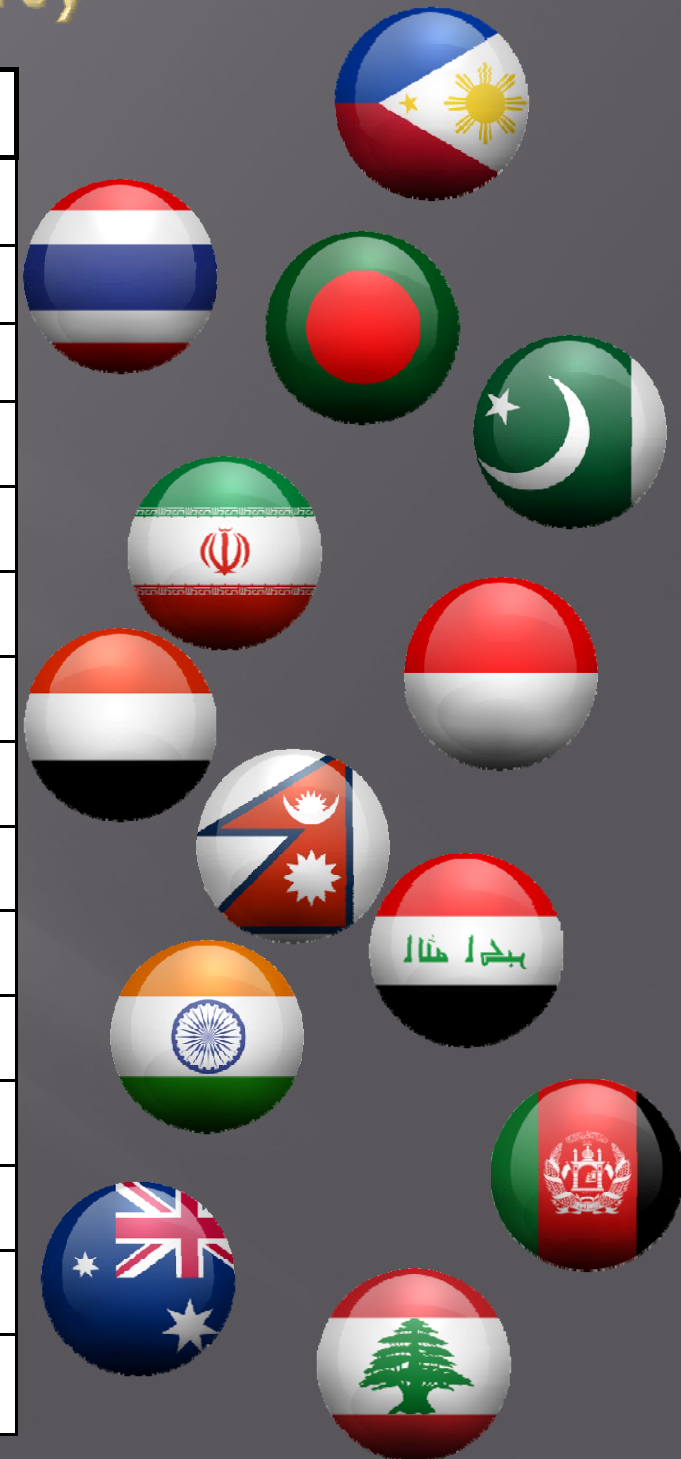
▣ RoMON deep technical review

Useful new feature of MikroTik which needs to be introduced



Trainees per nationality

Country	Country	Continent
Philippines		Asia
Persia (Iran)		Asia
Indonesia		Asia
Lebanon		Asia
India		Asia
Pakistan		Asia
Afghanistan		Asia
Libya		Asia
Yemen		Asia
Nepal		Asia
Bangladesh		Asia
Iraq		Asia
Thailand		Asia
Myanmar		Asia
Australia		Asia Pacific



Trainees per nationality



Country	Country	Continent
Burkina Faso	Ouagadougou	Africa
Congo		Africa
Morocco	Casablanca	Africa
Sierra Leone	Free Town	Africa
Ivory Coast		Africa
Guinea	Conakry	Africa
Liberia	Monrovia	Africa
Nigeria	Kano	Africa
Benin		Africa

Country	Country	Continent
USA	New York	North America

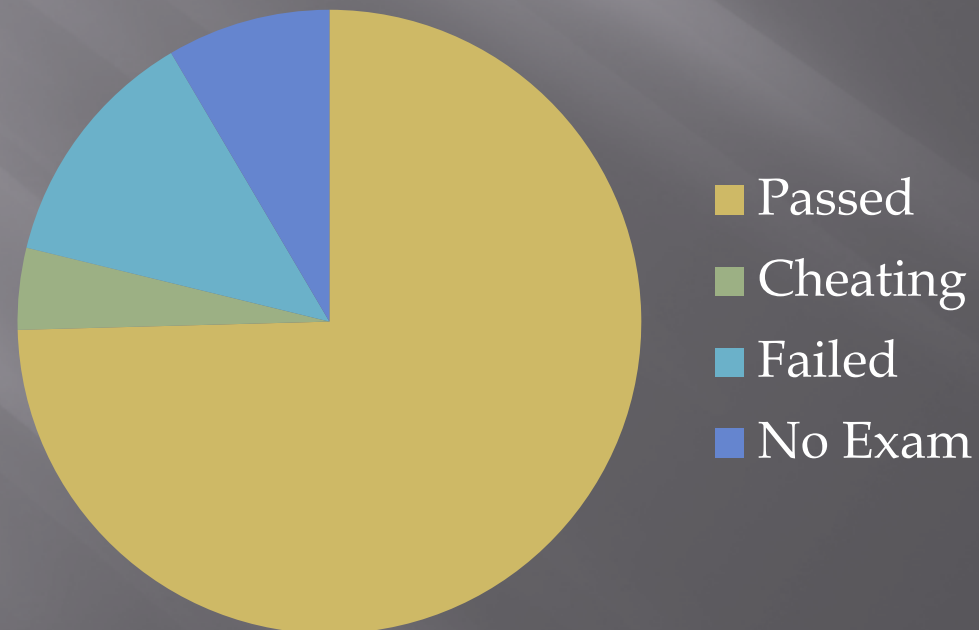
Trainees per nationality

Country	Country	Continent
Cyprus		Europe
Romania		Europe
Croatia		Europe
Austria		Europe
Czech Republic		Europe
Germany		Europe
Denmark		Europe
Belgium		Europe
UK-Wales		Europe
UK		Europe
Turkey		Europe
Bulgaria		Europe
Kosovo		Europe
Italy		Europe
Azerbaijan	Baku	Europe



Total Sessions and trainees

Session	Total	Total Person Per Session	Passed	Failed	No Exam	cheating
NA	80	338	296	34	7	1
WE	27	69	59	9	1	
RE	36	119	115	2	2	
INE	19	43	41	1	1	
TCE	23	58	51	5	2	
UME	5	11	11	0	0	
	190	638	573	51	13	1



Host Countries

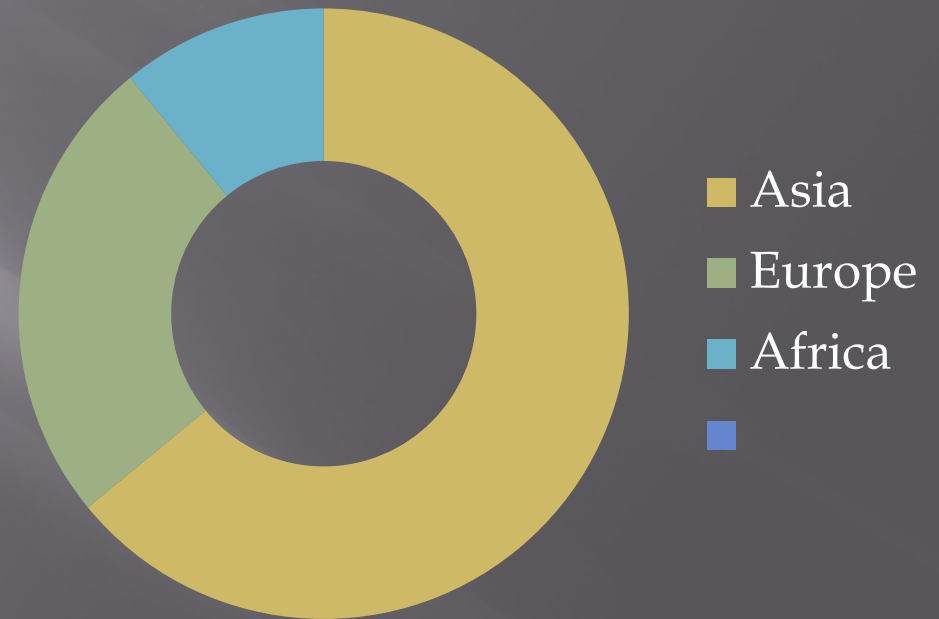
Country	City	Continent
Persia (Iran)	Tehran-Isfahan-Gorgan-Kerman-Kish-Urmie	Asia
UAE	Dubai	Asia
Nepal	Kathmandu	Asia
Philippines	Manila	Asia
Thailand	Bangkok	Asia
Turkey	Istanbul	Europe
Azerbaijan	Baku	Europe
Sierra Leone	Free Town	Africa
Guinea	Conakry	Africa
Liberia	Monrovia	Africa
Nigeria	Kano	Africa
Burkina Faso	Ouagadougou	Africa

Sessions per countries

Country	NA	WE	RE	INE	TCE	UME
Iran	42	10	12	3	7	0
Istanbul	16	7	9	6	6	3
Baku	1	0	1	0	0	0
Dubai	1	0	1	1	0	0
Manila	5	4	4	5	4	2
Kathmandu	2	2	1	1	0	0
Bangkok	2	1	3	2	1	0
Kano	4	1	1	1	2	0
Liberia	4	1	1	0	1	0
Guinea	1	0	1	0	1	0
Freetown	2	1	2	0	1	0
	80	27	36	19	23	5

Sessions per continent

Africa		Asia		Europ	
NA	11	NA	53	NA	16
WE	3	WE	17	WE	7
RE	5	RE	22	RE	9
INE	1	INE	12	INE	6
TCE	5	TCE	12	TCE	6
UME	0	UME	2	UME	3
	25		118		47

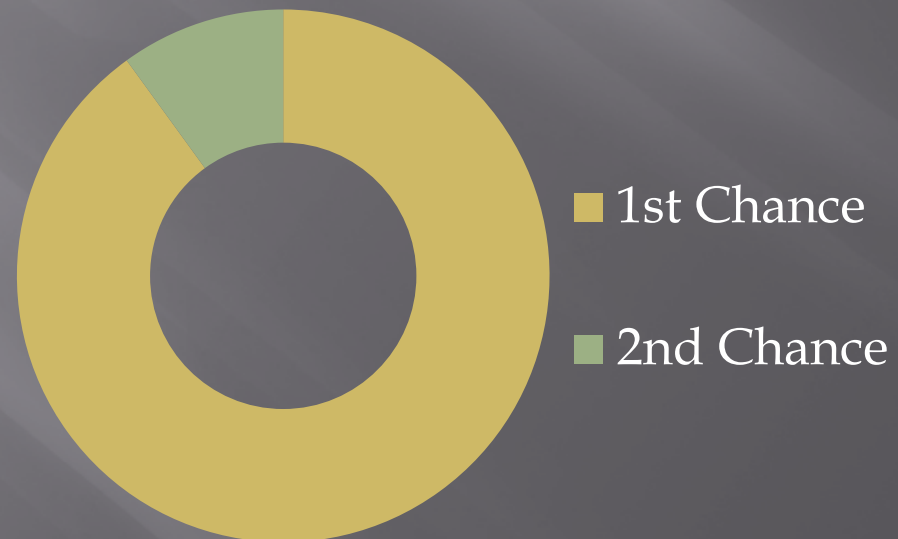


Sessions Per year

2015					
NA	WE	RE	INE	TCE	UME
23	11	12	4	8	4
2014					
26	8	14	12	10	1
2013					
16	3	7	3	4	0
2012					
13	5	3	0	1	0
2011					
2	0	0	0	0	0
NA	WE	RE	INE	TCE	UME
80	27	36	19	23	5

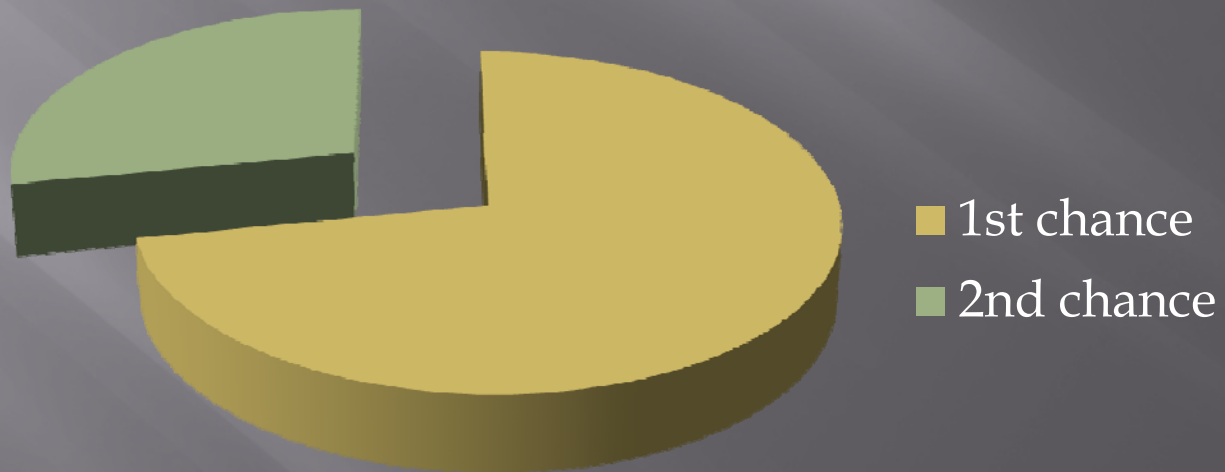
Exam

Passed			
1st Chance		2nd Chance	
NA	275	NA	21
WE	50	WE	9
RE	111	RE	4
INE	35	INE	6
TCE	42	TCE	9
UME	10	UME	1
523		50	



Exam

Failed			
1st Chance		2nd Chance	
NA	29	NA	5
WE	5	WE	4
RE	1	RE	1
INE	1	INE	0
TCE	5	TCE	0
UME	0	UME	0
41		10	



Average Score

Average Per Session	
NA	$6163/80=77$
WE	$1966/27=73$
RE	$2808/36=78$
INE	$1379/19=72/5$
TCE	$1710/23=74$
UME	$386/5=77$

Total Average	
NA	6163
WE	1966
RE	2808
INE	1379
TCE	1710
UME	386
	14412
	190 =76

Technical Presentations

Country	City	Continent
Turkey	Istanbul	Europe
Philippines	Manila	Asia
India	Delhi	Asia
Morocco	Casablanca	Africa

Our Projects

Country	City	Continent
Persia (Iran)	Tehran- Yazd--ghom-Kashan-Urmie	Asia
Philippines	Manila - Legaspi	Asia
Turkimanestan	Ashghabad	Asia
Turkey	Istanbul	Europe
Guinea	Conakry	Africa
Sierra Leone	Free Town	Africa
Liberia	Monrovia	Africa
Nigeria	Kano	Africa
Burkina Faso	Ouagadougou	Africa

Now
Let's back to the class
And talk a bit technical



RoMON

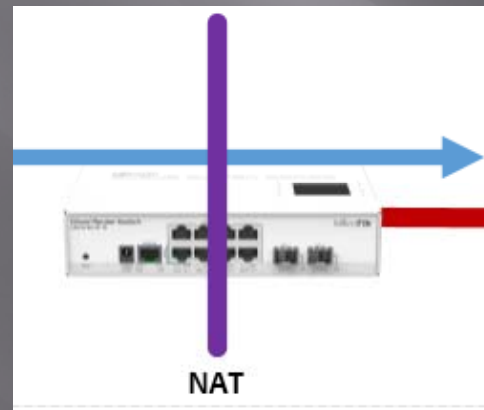
▣ Router Management overlay Network

Basically It's an independent MAC layer peer discovery

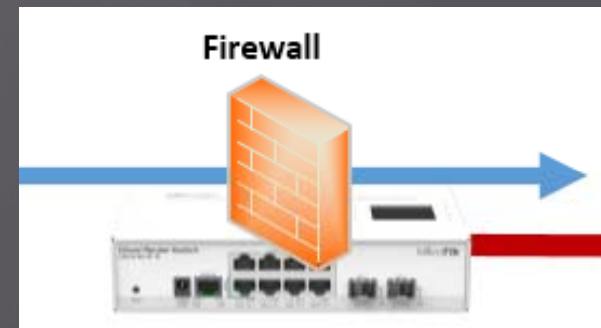
▣ Operates independently from L2 or L3 forwarding config

Means:

1. It's Nat Traversal



2. Firewall Traversal



RoMON

- ▣ L2 based Discovery over multiple hops
- ▣ Winbox and SSH are available for configuration
- ▣ Ping is available to diagnose
- ▣ Supports only Ethernet like and Wireless interfaces

Don't Forget...

MikroTik Proprietary protocol (Optimized for RouterOS)

MikroTik RoMON support history

By Checking the change logs:

If you are already running RouterOS, upgrading to the latest version is simple. Just one click, and RouterOS will find the latest version, show you the changelog, and offer to upgrade. You can do this from Winbox, console, Webfig or QuickSet.

Simply click "Check for updates" menu.

Download MikroTik software

RouterOS

Please choose your instruction set:

- mipsbe** BaseBox, CRS series, NetBox, DynaDish, RB2011 series, S...
- ppc** RB3xx series, RB600 series

v6.32.2 2015-Sep-21

- Main package
- Extra packages
- Netinstall
- Changelog
- MD5

Changelog

- *) fixed asy...
- *) sstp - fixed router lockup;
- *) queue tree: some queues would stop working after some configuration changes;
- *) fixed CRS226 10G ports could lose link (introduced in 6.28);
- *) fixed FREAK vulnerability in SSL & TLS;
- *) firewall - fixed sector writes rising starting since 6.28;
- *) improved support for new hEX lite;

What's new in 6.28 (2015-Apr-15 15:18):

- *) email - increase server greeting timeout to 60s;
- *) lte - ZTE MF823 may loose configuration;
- *) userman - update paypal root certificate;
- *) timezone - updated timezone information to 2015b release;
- *) cm2 - fixed capsman v2 100% CPU and other stability improvements;
- *) route - using ldp could cause connected routes with invalid interface nexthop;
- *) added support for SIS 190/191 PCI Ethernet adapter;
- *) made metarouter work on boards with 802.11ac support or usb LTE;
- *) sstp server - allow ADH only when no certificate set;
- *) make fat32 disk formatting support disks bigger than 134GiB;
- *) fixed tunnels - could crash when clamp-tcp-mss was enabled;
- *) added basic counters for ipv4/bridge fast path, also show status whether fast path is active at all;
- *) trafflow: - fixed crash on disable;
- *) pppoe over eoip - fixed crash with large packets;
- *) tilegx - fixed memory leak when queue settings are changed;
- *) ar9888 - fixed crash when hw reports invalid rate;
- *) console - fixed "in" operator in console;
- *) console - make "/system package update print" work again.
- *) tile - rare situation when CCR devices failed to auto-negotiate ethernet link (introduced in ...)
- *) dhcpv4 client - it is now possible to unset default clientid and hostname options
- *) initial RoMon (Router Management Overlay Network) support added.

Ok

MikroTik RoMON support history

By Checking the change logs:

6.32.2 (2015-Sep-17 15:20):

*) romon - fixed default configuration export

6.31 (2015-Aug-14 15:42):

*) romon - fixed crash on SACKed tx segments

6.29 (2015-May-27 11:19):

*) romon - fixed 100% CPU usage

*) romon - moved under tools menu in console

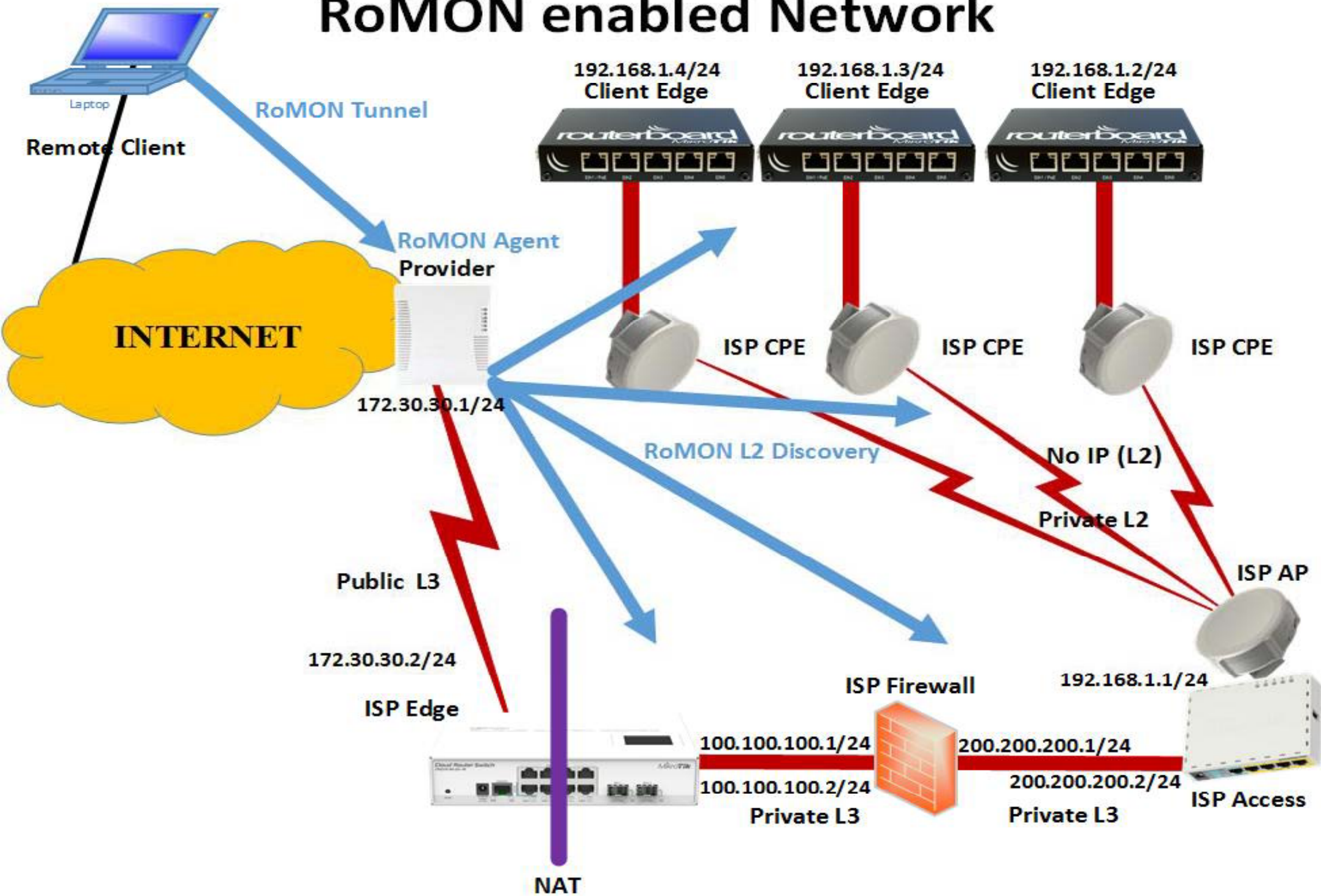
6.28 (2015-Apr-15 15:18):

*) initial romon (Router Management Overlay Network) support added

RoMON

- ▣ The idea is about having L2 configuration session from remote locations through a RoMON Agents
- ▣ Based on RoMON IDs
- ▣ Also needs to configure interfaces (ports) to listen to, and support RoMON

RoMON enabled Network





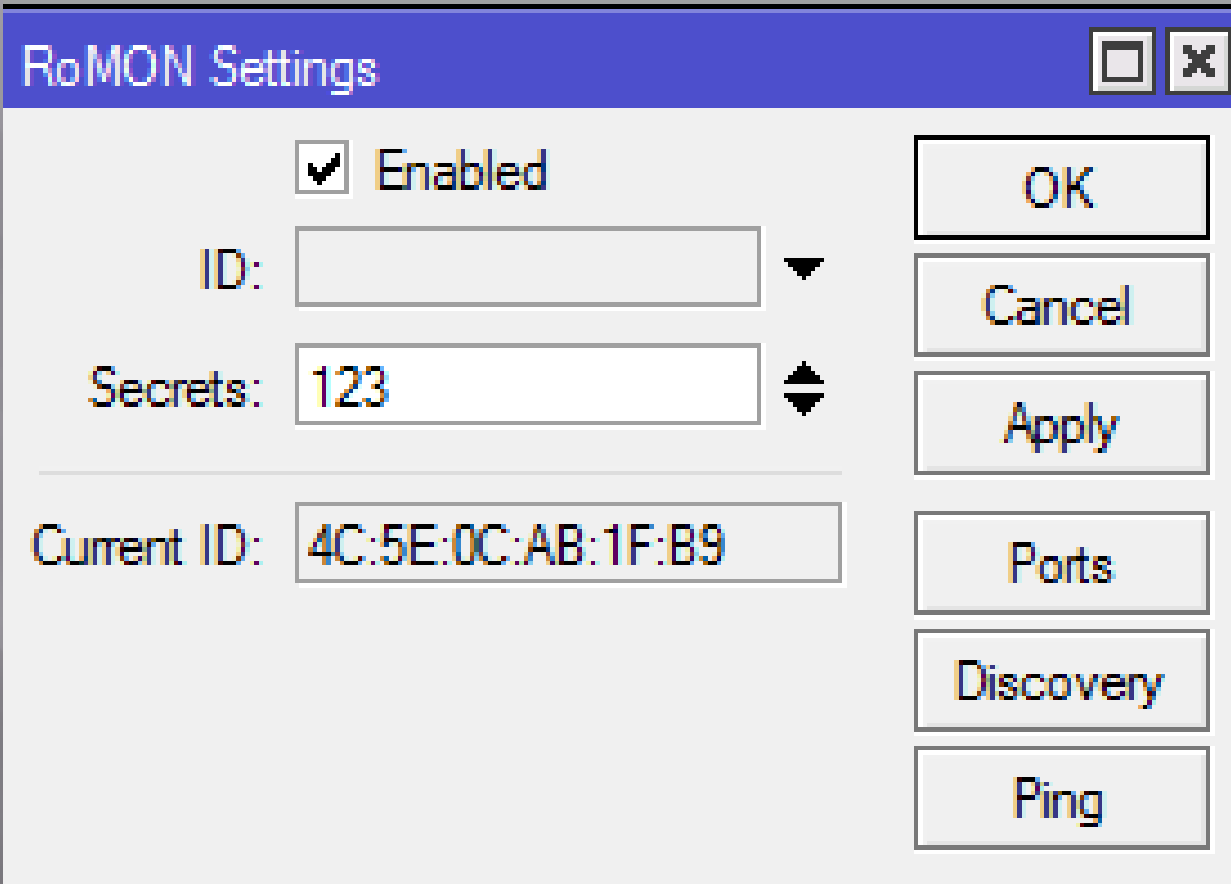
Configuration scripts

- ▣ Download the configuration of all routers in this simulation by the link below

www.mits-co.com/sites/default/files/RoMON-Scenario-Scripts.rar

Configuration

- ▣ First enable the service under tools/romon



The image shows a Windows-style dialog box titled "RoMON Settings". The dialog has a blue title bar with standard window controls (minimize, maximize, close). The main content area is white and contains several controls:

- A checked checkbox labeled "Enabled".
- An "ID:" label followed by an empty text input field and a downward-pointing arrow.
- A "Secrets:" label followed by a text input field containing the value "123" and a double-headed vertical arrow.
- A horizontal separator line.
- A "Current ID:" label followed by a text input field containing the MAC address "4C:5E:0C:AB:1F:B9".

On the right side of the dialog, there is a vertical stack of buttons: "OK", "Cancel", "Apply", "Ports", "Discovery", and "Ping".

Configuration

▣ Configure ports

Means which interfaces are allowed to be discovered

The image displays three overlapping windows from a network management interface:

- RoMON Settings:** Shows the main configuration options. The **Enabled** checkbox is checked. The **ID** field is empty, and the **Secrets** field contains the value **123**. The **Current ID** is **4C:5E:0C:AB:1F:B9**. Buttons for **OK**, **Cancel**, **Apply**, **Ports**, **Discovery**, and **Ping** are visible.
- RoMON Ports:** A table listing configured ports. The table has columns for **#**, **Interface**, **Forbid**, and **Cost**.

#	Interface	Forbid	Cost
0	ether1	yes	100
1	all	no	100
- RoMON Port <ether1>:** A detailed configuration window for the 'ether1' port. The **Interface** is set to 'ether1', **Forbid** is checked, and **Cost** is 100. It includes buttons for **OK**, **Cancel**, **Apply**, **Disable**, **Comment**, **Copy**, and **Remove**.
- RoMON Port <all>:** A detailed configuration window for the 'all' port. The **Interface** is set to 'all', **Forbid** is unchecked, and **Cost** is 100. It includes buttons for **OK**, **Cancel**, **Apply**, **Disable**, **Comment**, **Copy**, and **Remove**.

Configuration

- Possibility to override secrets per interfaces

The screenshot displays the RoMON configuration interface, illustrating the ability to override secrets per interface. It consists of three main windows:

- RoMON Settings:** A dialog box where the 'Enabled' checkbox is checked. The 'Secrets' field is highlighted with a red box and contains the value '123'. Other fields include 'ID', 'Current ID' (4C:5E:0C:AB:1F:B9), and buttons for 'OK', 'Cancel', 'Apply', 'Ports', 'Discovery', and 'Ping'.
- RoMON Ports:** A table listing configured ports. The table has columns for '#', 'Interface', 'Forbid', and 'Cost'.

#	Interface	Forbid	Cost
0	ether1	yes	100
1	all	no	100
- RoMON Port <ether1>:** A configuration dialog for the 'ether1' interface. The 'Interface' dropdown is set to 'ether1', 'Forbid' is checked, and 'Cost' is 100. The 'Secrets' field is highlighted with a red box and is currently empty. Buttons include 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'.
- RoMON Port <all>:** A configuration dialog for the 'all' interface. The 'Interface' dropdown is set to 'all', 'Forbid' is unchecked, and 'Cost' is 100. The 'Secrets' field is highlighted with a red box and is currently empty. Buttons include 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'.

At the bottom of each port configuration window, the status 'enabled' is displayed.

Configuration

- Then you can discover all romon enabled router through the agent

RoMON Settings

Enabled

ID:

Secrets:

Current ID:

OK

Cancel

Apply

Ports

Discovery

Ping

RoMON Discovery (Running)

Address	Cost	Hops	Path	L2MTU	Identity	Version
4C:5E:0C:9E:89:5E	200	1	4C:5E:0C:9E:89:5E	1500	ISP-Edge	6.32.2
4C:5E:0C:F9:E8:23	1200	6	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6, D4:CA:6D:06:38:6C, D4:CA:6D:06:38:72, 4C:5E:0C:F9:E8:23	1500	Client-Core	6.32.2
D4:CA:6D:06:38:6C	800	4	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6, D4:CA:6D:06:38:6C	1500	ISP-AP	6.32.2
D4:CA:6D:06:38:72	1000	5	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6, D4:CA:6D:06:38:6C, D4:CA:6D:06:38:72	1500	ISP-CPE	6.32.2
D4:CA:6D:23:F9:18	400	2	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18	1500	ISP-Firewall	6.32.2
D4:CA:6D:96:15:F6	600	3	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6	1500	ISP-Access	6.32.2

Remote Connection

- Winbox 3.rc9 and after, supports RoMON
- First need to connect to agent through RoMON Secured tunnel

The screenshot shows the WinBox v3.0rc12 (Addresses) interface. The 'Connect To' field is set to 172.30.30.1, Login is admin, and Password is masked. The 'Connect To RoMON' button is highlighted with a red box. Below the connection fields, the 'Neighbors' tab is selected and highlighted with a red box. A table of neighbors is displayed, with the second row selected and highlighted with a red box.

MAC Address	IP Address	Identity	Version	Board
4C:5E:0C:9E:89:67	172.30.30.234	ISP-Edge	6.32.2	CRS109-8G-1S-2...
4C:5E:0C:AB:1F:BD	172.30.30.1	Provider	6.32.2	RB951Ui-2HnD

2 items (1 selected)

Remote Connection

- Neighbor discovery table, is exactly the same as RoMON menu

The screenshot shows the WinBox v3.0rc12 (Addresses) interface. The top section contains configuration fields for a remote connection:

- Connect To: 172.30.30.1
- Login: admin
- Password: *****
- RoMON Agent: 172.30.30.1

Buttons include "Add/Set", "Disconnect From RoMON", and "Connect". Checkboxes for "Keep Password" (checked) and "Open In New Window" (unchecked) are also present.

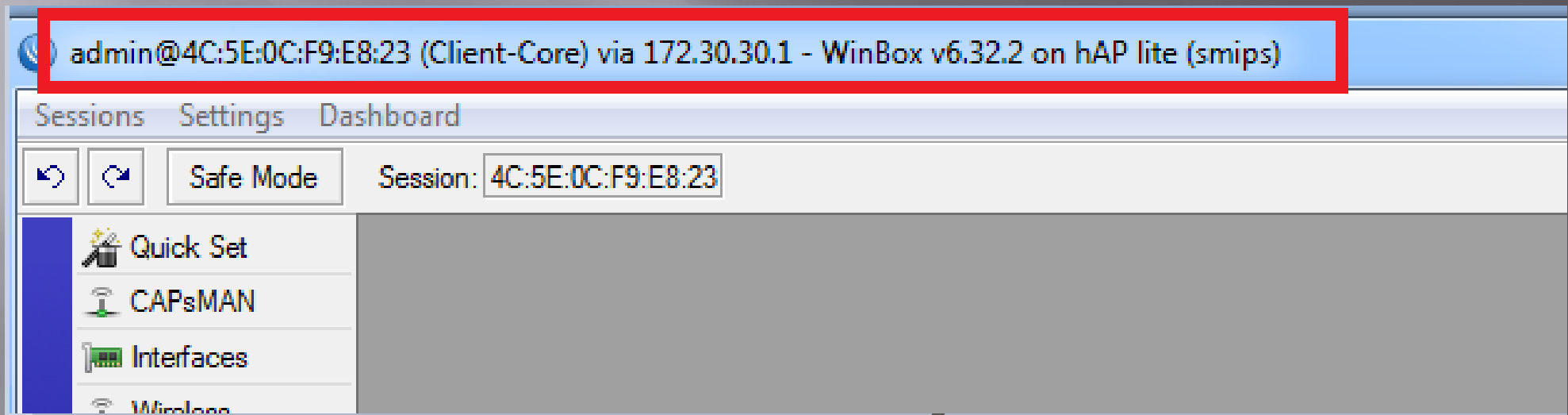
The bottom section, titled "Managed RoMON Neighbors", displays a table of neighbor discovery information. The table is highlighted with a red border and contains the following data:

Address	Cost	Hops	Path	L2MTU	Identity	Version
4C:5E:0C:9E:89:5E	200	1	4C:5E:0C:9E:89:5E	1500	ISP-Edge	6.32.2
4C:5E:0C:F9:E8:23	1200	6	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6, D4:CA:6D:06:38:6C, D4:CA:6D:06:38:72, 4C:5E:0C:F9:E8:23	1500	Client-Core	6.32.2
D4:CA:6D:06:38:6C	800	4	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6, D4:CA:6D:06:38:6C	1500	ISP-AP	6.32.2
D4:CA:6D:06:38:72	1000	5	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6, D4:CA:6D:06:38:6C, D4:CA:6D:06:38:72	1500	ISP-CPE	6.32.2
D4:CA:6D:23:F9:18	400	2	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18	1500	ISP-Firewall	6.32.2
D4:CA:6D:96:15:F6	600	3	4C:5E:0C:9E:89:5E, D4:CA:6D:23:F9:18, D4:CA:6D:96:15:F6	1500	ISP-Access	6.32.2

6 items

Remote Connection

- ❑ After having connection to any router through romon agent
- ❑ Should check out this at the top of winbox



Few tips and suggestions

- ▣ This service is disabled by default
- ▣ This is layer 2 (low level) discovery protocol

So you cannot block it by firewall

- ▣ Security wise, DO NOT enable it in provider side
- ▣ Needs security package in case SSH needed

ANY

questions?

CONTACT DETAILS

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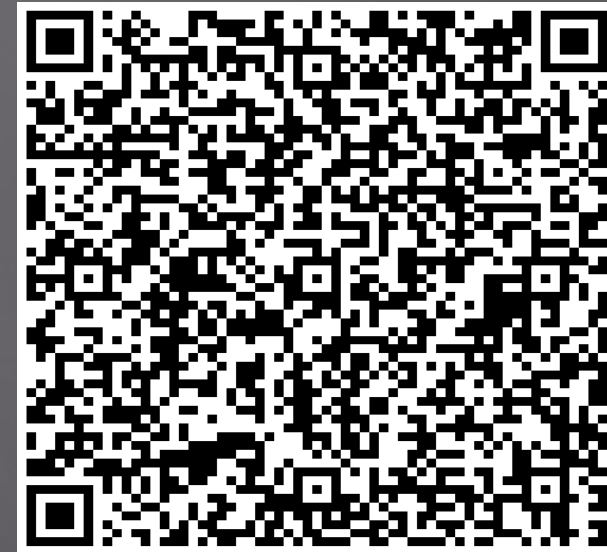
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Mani Raissdana

KONUŞUYO

“HOPE TO SEE YOU BACK IN İSTANBUL SOON”

AKBANK

← Change - Exchange

← WC
Toilets

UTLET
noire