

The real story

A hidden security audit of a
misconfigured public Wi-Fi network

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Certified network engineer
MikroTik PRO, Russia 

MTCNA 90%

MTCRE 93%

MTCWE 84%

MTCTCE 76%

MTCUME 90%

Outsourcing MikroTik network engineering

1. Designing enterprise class networks
2. Building high-performance, reliable, hacker-proof networks
3. Security and performance audit of existing networks
4. Monitoring and maintaining critical infrastructure
5. Troubleshooting and consulting
6. Remote support 24/7/365

MTCNA 90%

MTCRE 93%

MTCWE 84%

MTCTCE 76%

MTCUME 90%

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Introduction

Introduction

— — —

Location:

Summer vacation. Somewhere very far away from civilization. Rented private house somewhere on the seaside.

Time: Summer 2017

Connectivity:

- Broadband cable not available
- 3G/LTE signal is completely unavailable
- 2G/EDGE signal is available

Issue: SOS! We are offline!



Mama, we are offline!!!!1

Mama,
we are F%CKN offline!!!!

Googling hard ...

A few kilometers from our house we found a country club house with available Wi-Fi facilities* .

** Wi-Fi availability is mentioned on the booking website*



[Round 1]

Explore

Came with laptop to check email ...



Reserved a private table in
restaurant:

- Do you have a Wi-Fi here?
- Yes, sure! Would you like to order something? The wifi password will be at the end of your bill.
- Mineral water please.



Came to check ~~email~~ Wi-Fi speed



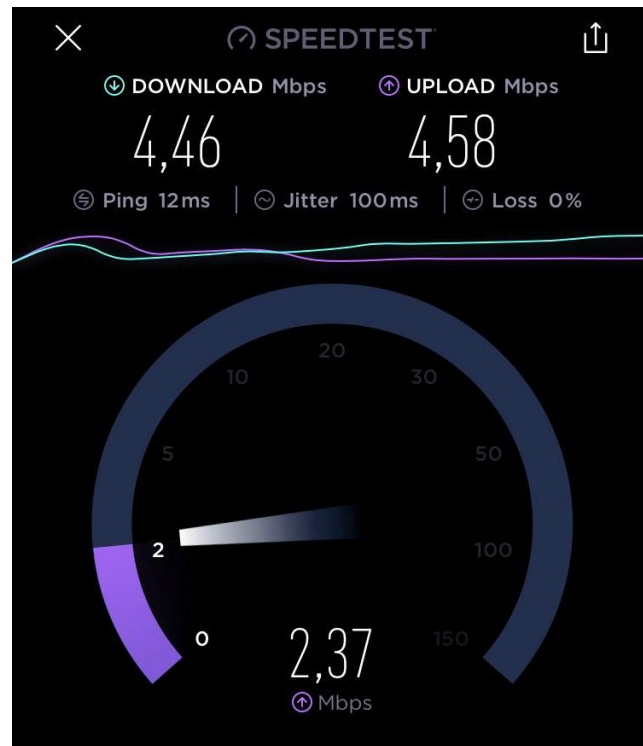
Speedtest:

Download: 4.46Mbit/sec

Upload: 4.58Mbit/sec

Ping: 12ms

Jitter: 100ms



4.5 Mbit/sec

Yeaaahooo!

Mama, we are back online!

4.5 Mbit/sec

4.5 Mbit/sec - already better than our 2G, but still.. We need a bit more :)

- Lady, why is your Internet connectivity so slow?
- Slow? Nobody's complained about it before..



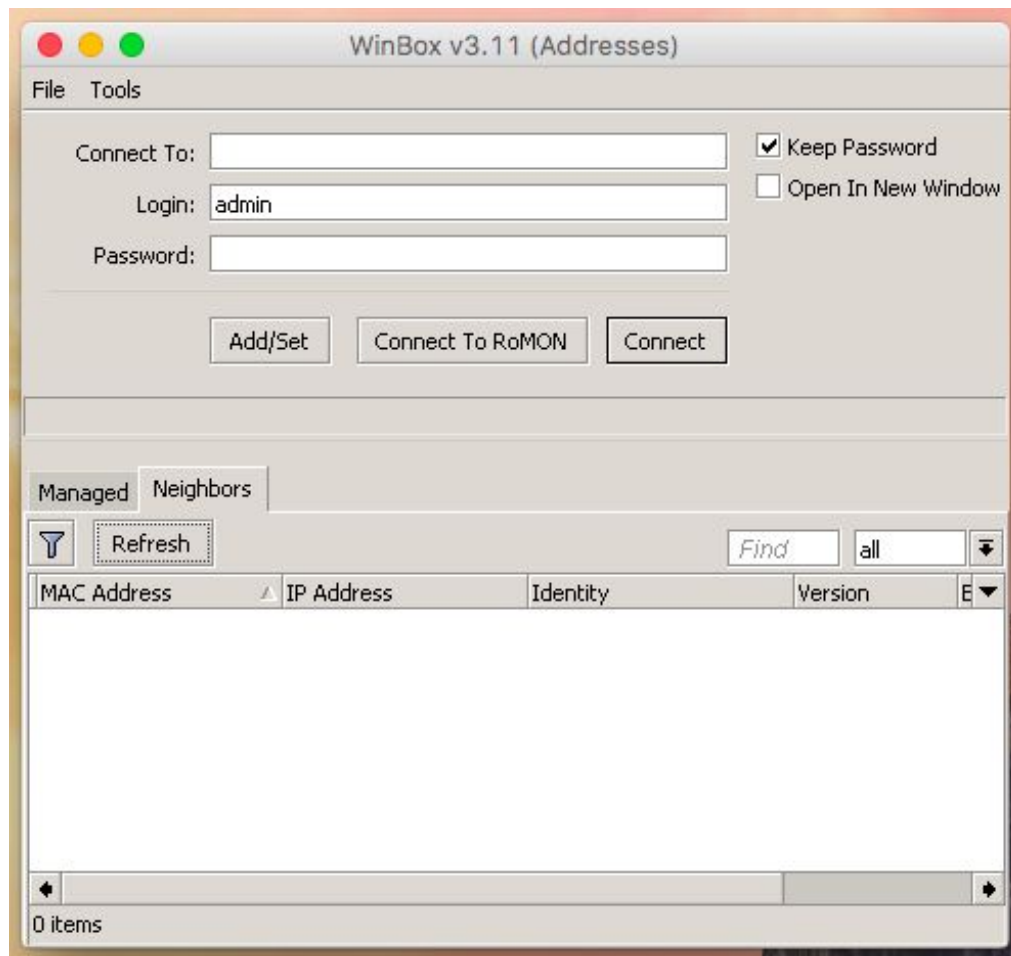
RouterBoard ?

```
arp -a
```

```
gw: 10.0.2.1
```

```
mac: 00:19:5B:0B:17:A2
```

D-Link.



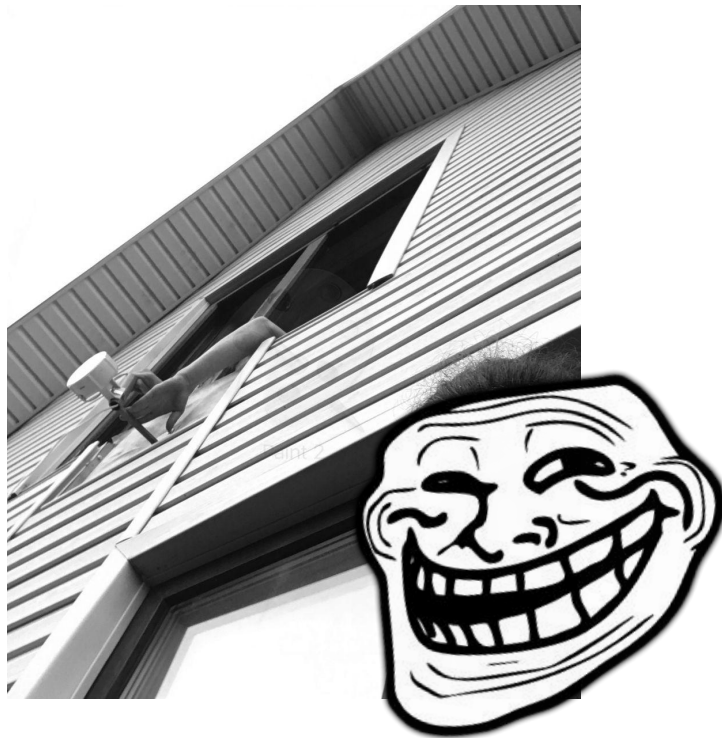
[Round 2]

Aiming the target

Always on WiFi enabled: false

Always on WiFi enabled: **connecting ...**

— — —
MikroTik SXT Lite2. I always
keep it in my backpack.



Always on WiFi enabled: CONNECTED!

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Profiles Channels

00 Reset

Radio Name	MAC Address	Interface	Uptime	AP	...	Last Activi...	Tx/Rx Signal ...	Tx Rate	Rx Rate
E48D8C 13	E4:8D:8C: :13	wlan1	00:02:25	yes	no	0.170	-91/-82	5.5Mbps	1Mbps

1 item (1 selected)

AP Client <E4:8D:8C: :13>

General 802.1x Signal Nstreme NV2 Statistics

Last Activity: 0.170 s

Tx/Rx Signal Strength: -91/-82 dBm

Tx/Rx Signal Strength Ch0: -91/-85 dBm

Tx/Rx Signal Strength Ch1: -86 dBm

Tx/Rx Signal Strength Ch2:

Signal To Noise: 23 dB

Tx/Rx CCQ: 73/78 %

P Throughput: 3417 kbps

- Signal Strengths

Rate	Strength	Last Measured
2Mbps	-83	00:00:11.22
1Mbps	-82	00:00:00.04
5.5M...	-82	00:00:11.02
11Mbps	-82	00:00:00.46
6Mbps	-81	00:00:00.99

OK

Remove

Reset

Copy to Access List

Copy to Connect List

Ping

MAC Ping

Telnet

MAC Telnet

Torch

AP Client <E4:8D:8C: :13>

General 802.1x Signal Nstreme NV2 Stati

Last Activity: 0.170 s

Tx/Rx Signal Strength: -91/-82 dBm

Tx/Rx Signal Strength Ch0: -91/-85 dBm

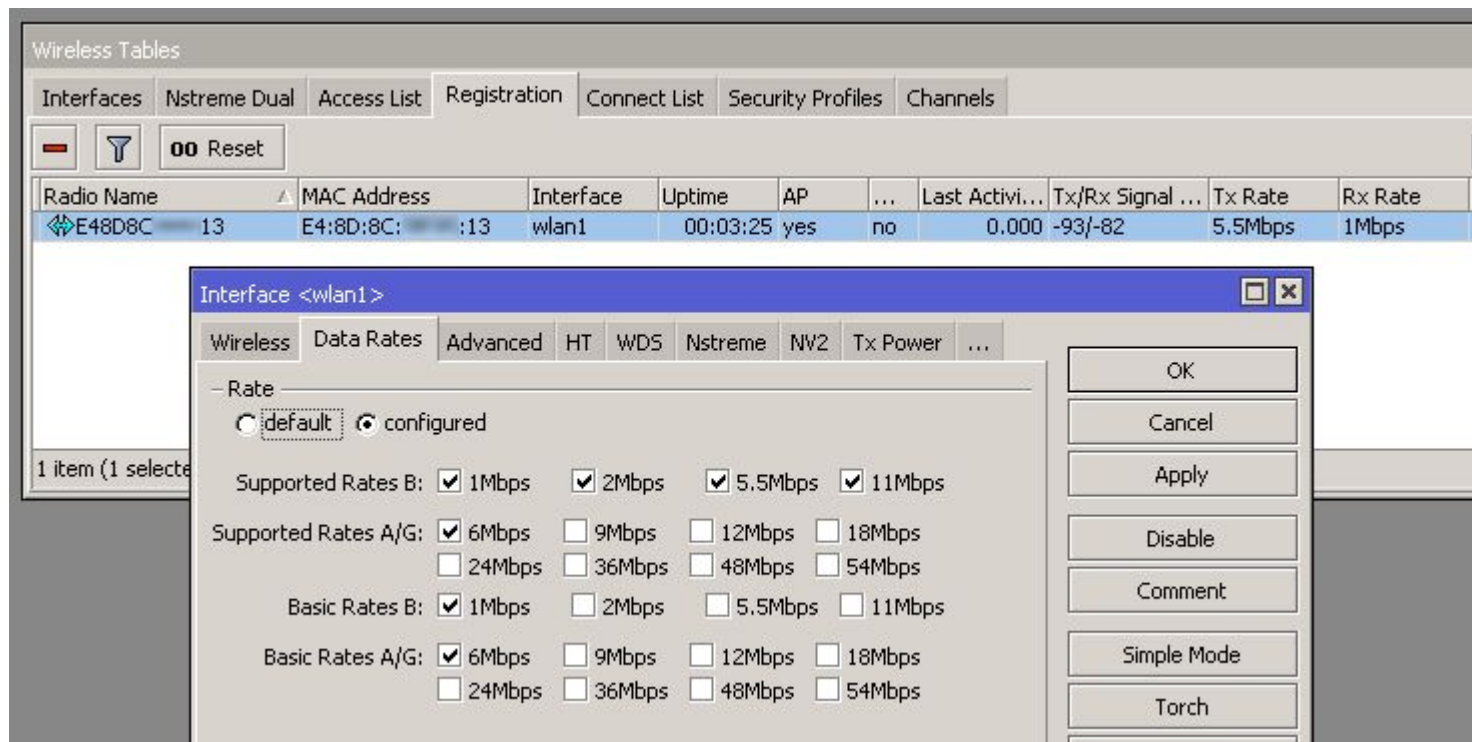
Tx/Rx Signal Strength Ch1: -86 dBm

Tx/Rx Signal Strength Ch2:

Signal To Noise: 23 dB

Tx/Rx CCQ: 73/78 %

Always on WiFi enabled: CONNECTED!



Always on WiFi enabled: CONNECTED!

Disable all unnecessary **wireless modulation** in this case for more **stable connectivity** on long distance
#MTCWE

— Rate —

☐ default ☒ configured

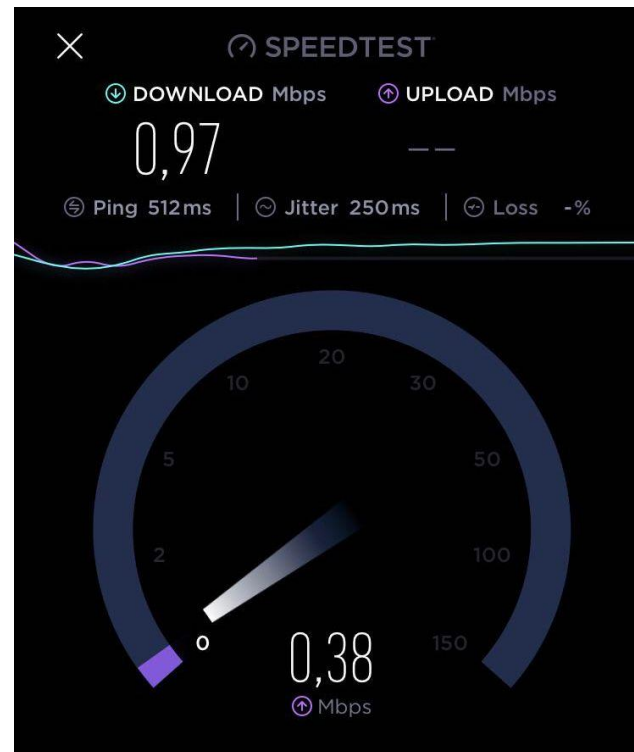
Supported Rates B:	☒ 1Mbps	☒ 2Mbps	☒ 5.5Mbps	☒ 11Mbps
Supported Rates A/G:	☒ 6Mbps	☐ 9Mbps	☐ 12Mbps	☐ 18Mbps
	☐ 24Mbps	☐ 36Mbps	☐ 48Mbps	☐ 54Mbps
Basic Rates B:	☒ 1Mbps	☐ 2Mbps	☐ 5.5Mbps	☐ 11Mbps
Basic Rates A/G:	☒ 6Mbps	☐ 9Mbps	☐ 12Mbps	☐ 18Mbps
	☐ 24Mbps	☐ 36Mbps	☐ 48Mbps	☐ 54Mbps

Always on WiFi enabled: TRUE!

FREE Wi-Fi is better than FREE beer!

Speedtest measured 1 Mbit/sec!

```
Request timeout for icmp_seq 8
64 bytes from 8.8.8.8: icmp_seq=9 ttl=57 time=65.080 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=57 time=130.025 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=57 time=60.378 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=57 time=78.101 ms
Request timeout for icmp_seq 13
Request timeout for icmp_seq 14
```



Always on WiFi enabled: TRUE



Nikita Tarikin

MikroTik Certified
Wireless Engineer
86 level



[Round 3]

Boosting the signal

Always on WiFi enabled: ... but too slow!



VS



Always on WiFi enabled: ... but too slow!



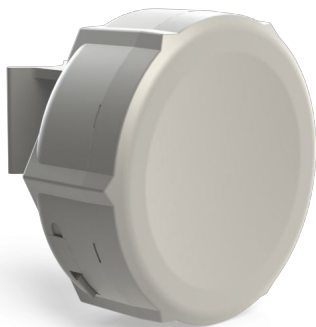
SXT Lite2

VS



QRT 2

Always on WiFi enabled: ... but too slow!



SXT Lite2

Tx-power: 27 dBm (500mW)
Antenna gain: 10 dBi
Beam: 60 degree

VS



QRT 2

Tx-power: 35 dBm (3200mW)
Antenna gain: 17 dBi
Beam: 22 degree

Always on WiFi enabled: 2 Mbit/s

Wireless Tables

Interfaces Nstream Dual Access List Registration Connect List Security Profiles Channels

100 Reset

Radio Name	MAC Address	Interface	Uptime	AP	...	Last Activi...	Tx/Rx Signal ...	Tx Rate	Rx Rate
E48D8C13	E4:8D:8C:13	wlan1	00:01:31	yes	no	0.000	-81/-77	24Mbps	24Mbps

1 item (1 selected)

AP Client <E4:8D:8C:13>

General 802.1x Signal Nstream NV2 Statistics

Last Activity: 0.000 s

Tx/Rx Signal Strength: -81/-77 dBm

Tx/Rx Signal Strength Ch0: -81/-81 dBm

Tx/Rx Signal Strength Ch1: -81 dBm

Tx/Rx Signal Strength Ch2:

Signal To Noise: 32 dB

Tx/Rx CCQ: 88/86 %

P Throughput: 17713 kbps

- Signal Strengths

Rate	Strength	Last Measured
1Mbps	-77	00:00:00.03
2Mbps	-77	00:01:20.68
11Mbps	-76	00:01:07.25
6Mbps	-76	00:01:25.02
24Mbps	-76	00:00:00.59
5.5M...	-75	00:01:08.16
12Mbps	-74	00:01:07.55
9Mbps	-73	00:01:08.39
18Mbps	-73	00:01:07.34

OK Remove Reset Copy to Access List Copy to Connect List Ping MAC Ping Telnet MAC Telnet Torch

AP Client <E4:8D:8C:13>

General 802.1x Signal Nstream NV2 Statistics

Last Activity: 0.000 s

Tx/Rx Signal Strength: -81/-77 dBm

Tx/Rx Signal Strength Ch0: -81/-81 dBm

Tx/Rx Signal Strength Ch1: -81 dBm

Tx/Rx Signal Strength Ch2:

Signal To Noise: 32 dB

Tx/Rx CCQ: 88/86 %

P Throughput: 17713 kbps

- Signal Strengths

Rate	Strength	Last Measured
1Mbps	-77	00:00:00.03
2Mbps	-77	00:01:20.68
11Mbps	-76	00:01:07.25
6Mbps	-76	00:01:25.02
24Mbps	-76	00:00:00.59
5.5M...	-75	00:01:08.16
12Mbps	-74	00:01:07.55
9Mbps	-73	00:01:08.39
18Mbps	-73	00:01:07.34

4.5 Mbit/sec

Speedtest:

Download: 4.46Mbit/sec

Upload: 4.58Mbit/sec

Ping: 12ms

Jitter: 100ms



[Round 4]

Audit

Let's see
what's under
the hood ...

Scanner (Running)

Interface: wlan1

☐ Background Scan

Start

Stop

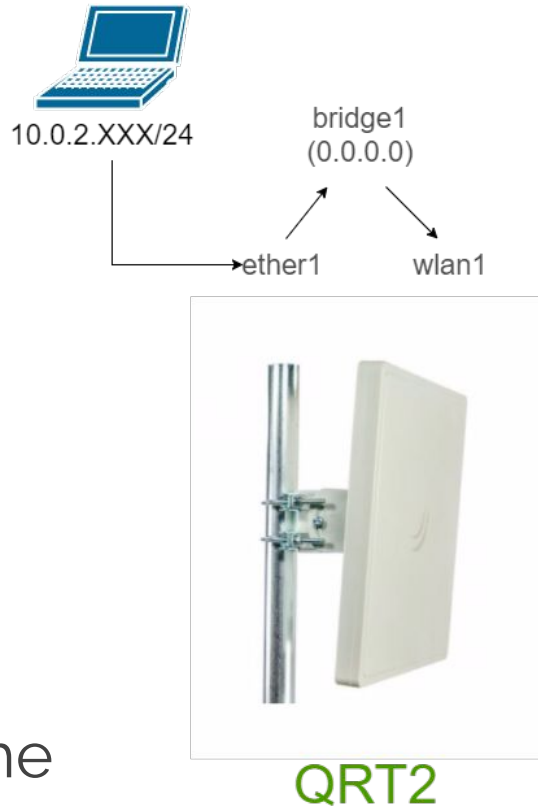
Close

Connect

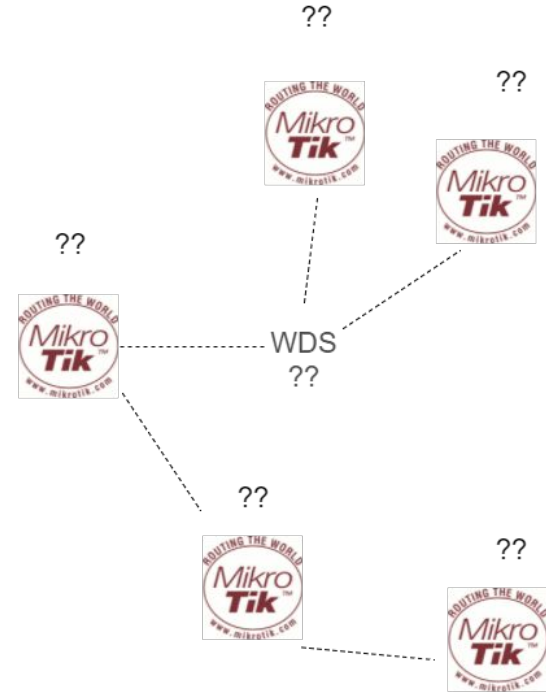
New Window

	Address	SSID	Channel	Signal...	Noise ...	Signal To...	Radio Na...	Router...	
APRB	E4:8D:8C: :13	M a_WiFi_Free	2412/20/g	-78	-110	32	E48D8C...	6.36.4	
APRB	E4:8D:8C: :AD	M a_WiFi_Free	2412/20/g	-80	-110	30	E48D8C...	6.36.4	
APRB	E4:8D:8C: :26	M a_WiFi_Free	2412/20/g	-81	-110	29	E48D8C...	6.36.4	
AP	00:0E:8F: :8A		2412/20/gn	-84	-110	26			
APRB	E4:8D:8C: :3B	M a_WiFi_Free	2412/20/g	-88	-110	22	E48D8C...	6.36.4	
AP	10:FE:ED: :41		2437/20/gn	-91	-115	24			
AP	C4:A8:1D: :18		2422/20/gn	-92	-114	22			
APRB	E4:8D:8C: :45	M a_WiFi_Free	2412/20/g	-94	-110	16	E48D8C...	6.36.4	

8 items



~4 KM



Under the
hood ...

Under the
hood ...

Connect To:

Login:

Password:

Session:

Note:

Group:

RoMON Agent:

☒ Keep Password
☒ Secure Mode
☒ Autosave Session
☐ Open In New Window

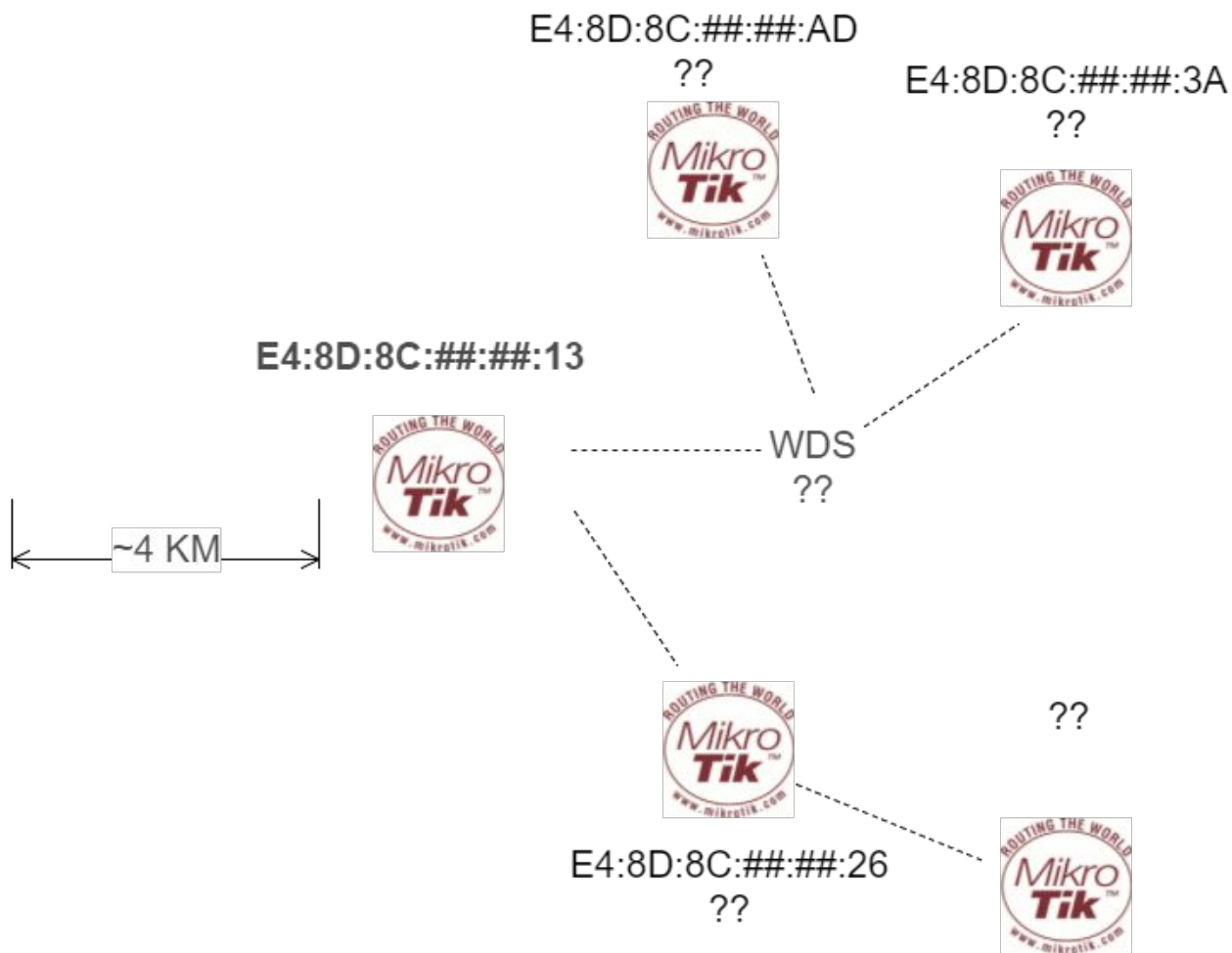
Managed Neighbors

MAC Address	IP Address	Identity	Version	Board
6C:3B:6B: :99	0.0.0.0	MikroTik	6.39.2 (stable)	RBQRTG-25...

File Edit View Insert Format Data		
100% £ % .0		
fx	10.0.2.118	
	A	B
1	00:19:5B: :A2	10.0.2.1
2	E4:8D:8C: :13	10.0.2.118
3	E4:8D:8C: :AD	10.0.2.131
4	E4:8D:8C: :26	10.0.2.94
5	E4:8D:8C: :3A	10.0.2.68
6		



QRT2





10.0.2.XXX/24



QRT2

NO ping
NO webfig
NO discovery
NO winbox

10.0.2.118
E4:8D:8C:5F:E9:13



E4:8D:8C:5F:EE:AD
??



E4:8D:8C:5F:D2:3A
??



WDS
??

```
1. ping 10.0.2.118 (ping)
→ ~ ping 10.0.2.118
PING 10.0.2.118 (10.0.2.118): 56 data bytes
Request timeout for icmp_seq 0
Request timeout for icmp_seq 1
Request timeout for icmp_seq 2
Request timeout for icmp_seq 3
Request timeout for icmp_seq 4
Request timeout for icmp_seq 5
Request timeout for icmp_seq 6
Request timeout for icmp_seq 7
Request timeout for icmp_seq 8
Request timeout for icmp_seq 9
Request timeout for icmp_seq 10
Request timeout for icmp_seq 11
```

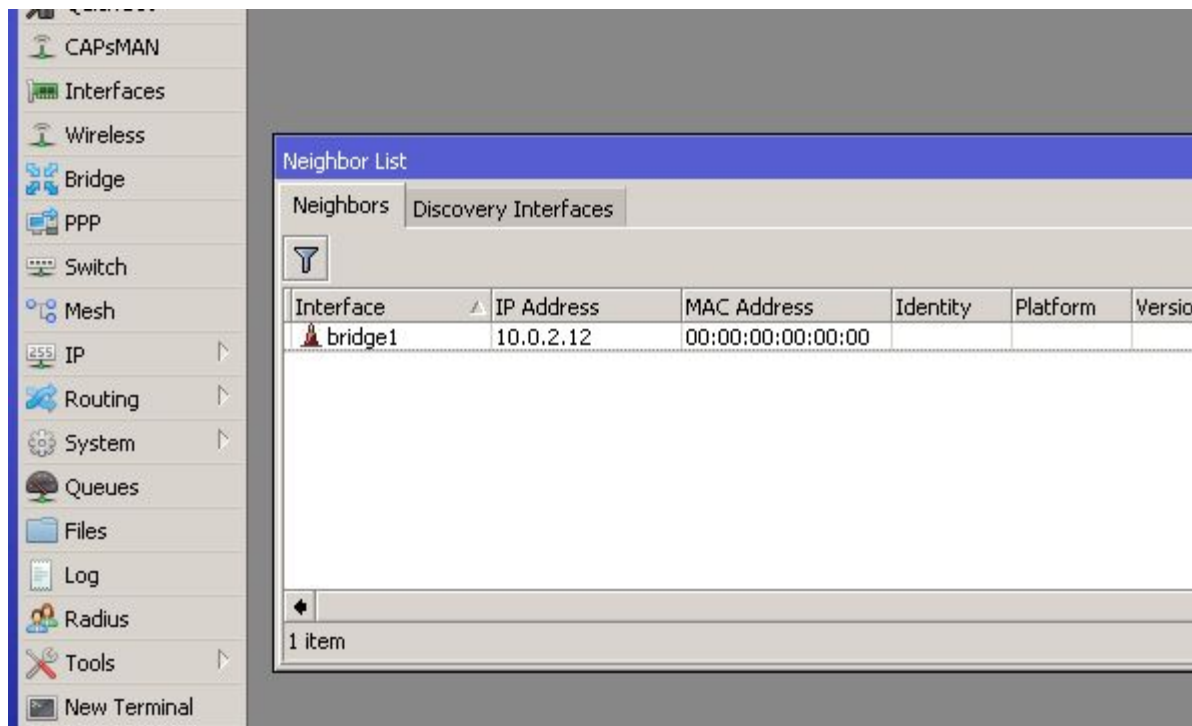
10.0.2.118

QRT

2

**NO
DISCOVERY**

10.0.2.118



RouterOS MAC PING

E4:8D:8C:##:##:13

10.0.2.118

E4:8D:8C:##:##:13
10.0.2.118

Neighbors Discovery Interfaces

Interface IP Address MAC Address Identity Platform Version

bridge1	10.0.2.12	00:00:00:00:00:00			
---------	-----------	-------------------	--	--	--

Ping

General Advanced

Ping To: E4:8D:8C:##:##:13

Interface:

☐ ARP Ping

Packet Count:

Timeout: 1000 ms

Seq # Host Time Reply Size TTL Status

0	E4:8D:8C:##:##:13	3ms	64		
1	E4:8D:8C:##:##:13	2ms	64		
2	E4:8D:8C:##:##:13	4ms	64		
3	E4:8D:8C:##:##:13	2ms	64		
4	E4:8D:8C:##:##:13	344ms	64		
5	E4:8D:8C:##:##:13	2ms	64		
6	E4:8D:8C:##:##:13	4ms	64		
7	E4:8D:8C:##:##:13	3ms	64		
8	E4:8D:8C:##:##:13	5ms	64		
9	E4:8D:8C:##:##:13	5ms	64		
10	E4:8D:8C:##:##:13	7ms	64		



10.0.2.XXX/24

NO ping
NO webfig
NO discovery
NO winbox



QRT2

E4:8D:8C:##:##:13

10.0.2.118

mac-ping OK

10.0.2.118
E4:8D:8C:##:##:13



E4:8D:8C:##:##:AD
??



E4:8D:8C:##:##:3A
??



WDS
??



E4:8D:8C:##:##:26
??



```
Terminal
MMM      MMM  III  KKK  KKK  RRR  RRR  000000  TTT

MikroTik RouterOS 6.39.2 (c) 1999-2017      http://www.mikrotik.com

[?]      Gives the list of available commands
command [?]  Gives help on the command and list of arguments

[Tab]     Completes the command/word. If the input is a second [Tab] gives possible options

/         Move up to base level
..        Move up one level
/command   Use command at the base level

[admin@MikroTik] > /tool mac-telnet E4:8D:8C: :13
Login: admin
Password: 
```

E4:8D:8C:##:##:13

10.0.2.118

User: admin

Password: Admin@123

E4:8D:8C:##:##:13

10.0.2.118



```
Terminal
MMM      MMM  III  KKK  KKK  RRR  RRR  000000  TTT
```

```
MikroTik RouterOS 6.39.2 (c) 1999-2017      http://www.i
```

```
[?]          Gives the list of available commands
command [?]  Gives help on the command
```

```
[Tab]        Completes the command/word. If the
              a second [Tab] gives possible options
```

```
/           Move up to base level
..          Move up one level
```

```
/command     Use command at the base level
```

```
[admin@MikroTik] > /tool mac-telnet E4
```

```
Login: admin
```

```
Password: █
```

```
Terminal
```

```
MikroTik RouterOS 6.36.4 (c) 1999-2016      http://www.mikrotik.com
```

```
[?]          Gives the list of available commands
command [?]  Gives help on the command and list of available commands
```

```
[Tab]        Completes the command/word. If the
              a second [Tab] gives possible options
```

```
/           Move up to base level
```

```
..          Move up one level
```

```
/command     Use command at the base level
```

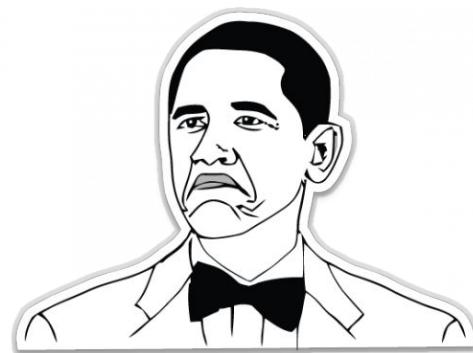
```
[admin@MikroTik] > /user set admin password=123
```

```
not enough permissions (9)
```

```
[admin@MikroTik] > █
```

E4:8D:8C:##:##:13

10.0.2.118




```
Terminal
[admin@MikroTik] > /system routerboard print
    routerboard: yes
    model: RouterBOARD Metal 2SHPn
    serial-number: E4:8D:8C:##:##:13
    firmware-type: 1.10
    factory-firmware: 1.10
    current-firmware: 1.10
    upgrade-firmware: 1.10
[admin@MikroTik] > /user print
Flags: X - disabled
#  NAME                GROUP                ADDRESS                LAST-LOGGED-IN
0  ;;: system default user
   admin                test
1  zabbix                full
[admin@MikroTik] > /user active print
Flags: R - radius, M - by-romon
#  WHEN                NAME                ADDRESS                VIA
0  10.0.2.118          admin               6C:3B:6B:##:##:99    mac-telnet
[admin@MikroTik] >
```

E4:8D:8C:##:##:13

10.0.2.118

RouterBoard
Metal 2SHPn

RouterBoard

RBMetal2SHPn



E4:8D:8C:##:##:13

10.0.2.118

Tx-power:	32 dBm (3200mW)
Antenna gain:	6 dBi
Beam:	omni-directional
Chains:	1


```
Terminal
[admin@MikroTik] > /system routerboard print
    routerboard: yes
    model: RouterBOARD Metal 2SHPn
    serial-number:
    firmware-type:
    factory-firmware:
    current-firmware:
    upgrade-firmware:
[admin@MikroTik] > /user print
Flags: X - disabled
#  NAME                GROUP                ADDRESS                LAST-LOGGED-IN
0  ;;: system default user
   admin                test
1  zabbix                full
[admin@MikroTik] > /user active print
Flags: R - radius, M - by-romon
#  WHEN                NAME                ADDRESS                VIA
0  admin                6C:3B:6B:          :99                mac-telnet
[admin@MikroTik] >
```

E4:8D:8C:##:##:13

10.0.2.118

User: admin
Group: test ??

```
Terminal
[admin@MikroTik] > /system routerboard print
    routerboard: yes
    model: RouterBOARD Metal 2SHPn
    serial-number:
    firmware-type:
    factory-firmware:
    current-firmware:
    upgrade-firmware:
[admin@MikroTik] > /user print
Flags: X - disabled
#  NAME                GROUP                ADDRESS                LAST-LOGGED-IN
0  ;;: system default user
   admin                test
1  zabbix                full
[admin@MikroTik] > /user active print
Flags: R - radius, M - by-romon
#  WHEN                NAME                ADDRESS                VIA
0  admin                6C:3B:6B:          :99                mac-telnet
[admin@MikroTik] >
```

E4:8D:8C:##:##:13

10.0.2.118

User: zabbix
Group: full

```
Terminal
[admin@MikroTik] > /user group print
0 name="read" policy=local,telnet,ssh,reboot,read,test,winbox,password,web,sniff,sensitive,
  api,romon,!ftp,!write,!policy,!dude
  skin=default

1 name="write" policy=local,telnet,ssh,reboot,read,write,test,winbox,password,web,sniff,
  sensitive,api,romon,!ftp,!policy,!dude
  skin=default

2 name="full" policy=local,telnet,ssh,ftp,reboot,read,write,policy,test,winbox,password,web,
  sniff,sensitive,api,romon,dude
  skin=default

3 name="test" policy=telnet,read,test,winbox,!local,!ssh,!ftp,!reboot,!write,!policy,
  !password,!web,!sniff,!sensitive,!api,!romon,!dude
  skin=default
[admin@MikroTik] >
```

E4:8D:8C:##:##:13

10.0.2.118

winbox

Terminal

[admin@MikroTik] > /user group print

```
0 name="read" policy=local,telnet,ssh,reboot,read,test,winbox,password,web,sniff,sensitive,api,romon,!ftp,!write,!poll
  skin=default
```

```
1 name="write" policy=local,telnet,sensitive,api,romon,!ftp,
  skin=default
```

```
2 name="full" policy=local,telnet,sniff,sensitive,api,romon,
  skin=default
```

```
3 name="test" policy=telnet,read,!password,!web,!sniff,!ser
  skin=default
```

[admin@MikroTik] >

Terminal

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

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[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] >

[admin@MikroTik] > /tool mac-server print

Flags: X - disabled, * - default

INTERFACE

0 * all

[admin@MikroTik] > /tool mac-server

mac-winbox ping sessions add disable edit enable

[admin@MikroTik] > /tool mac-server mac-winbox print

Flags: X - disabled, * - default

INTERFACE

0 * all

[admin@MikroTik] >

E4:8D:8C:##:##:13

10.0.2.118

mac-winbox: * all

Continue to Winbox

File Tools

Connect To: E4:8D:8C: :13

Login: admin

Password:

Session: <own> Browse...

Note:

Group:

RoMON Agent:

☒ Keep Password
☒ Secure Mode
☒ Autosave Session
☐ Open In New Window

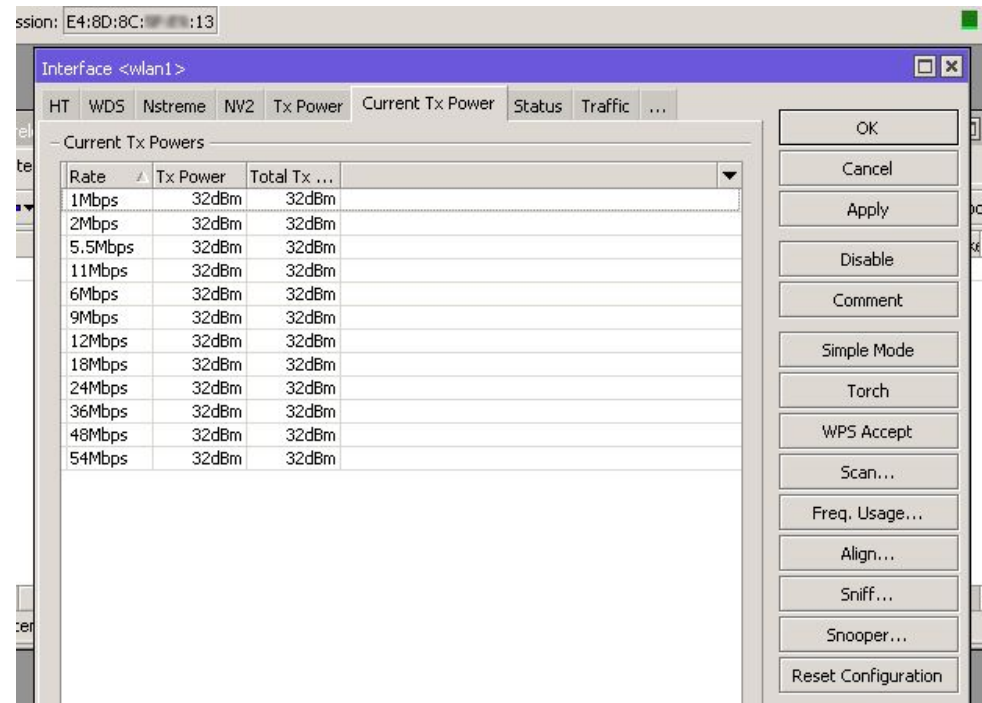
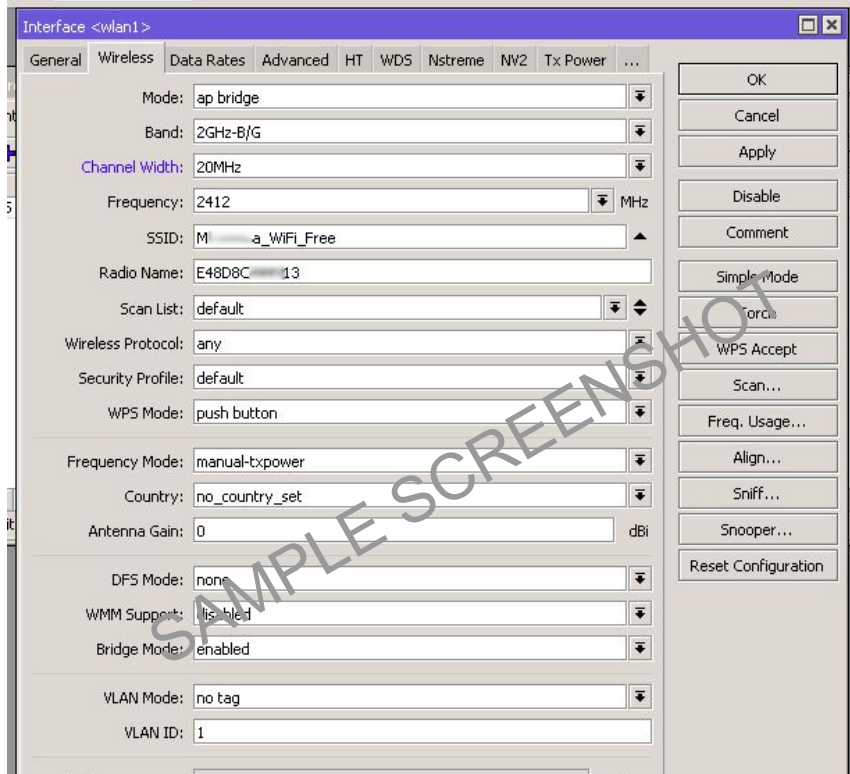
Cancel

Logging in...

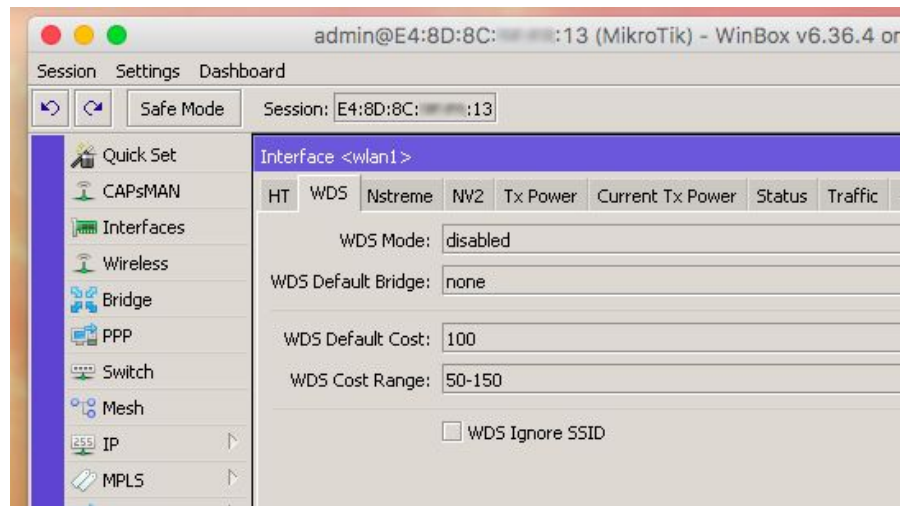
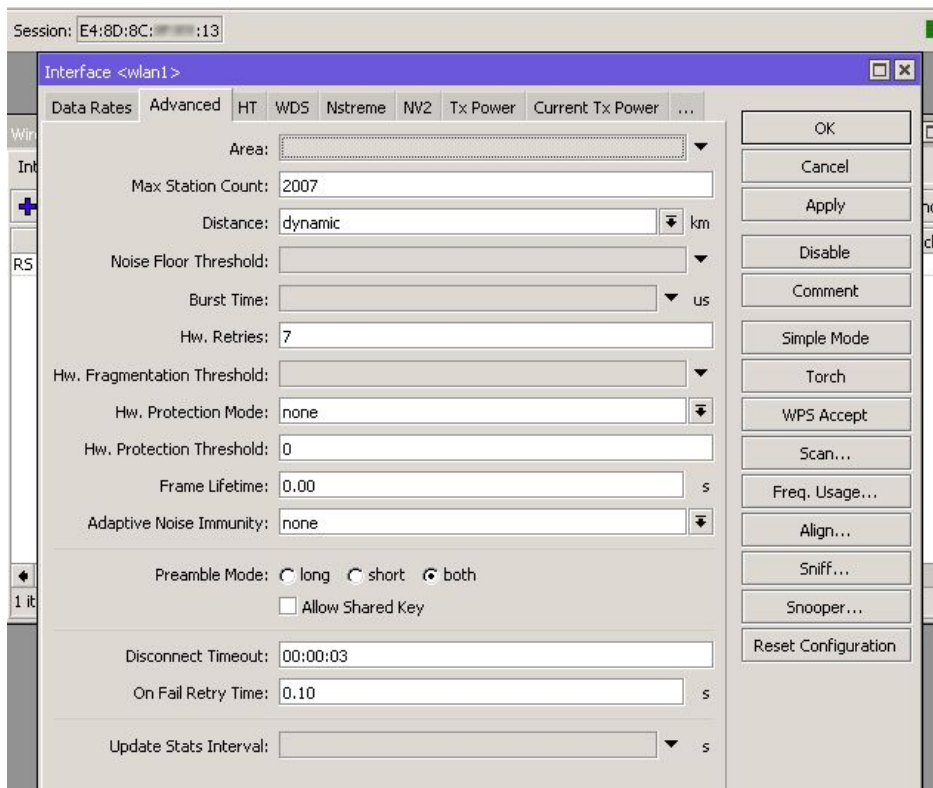
E4:8D:8C:##:##:13

10.0.2.118

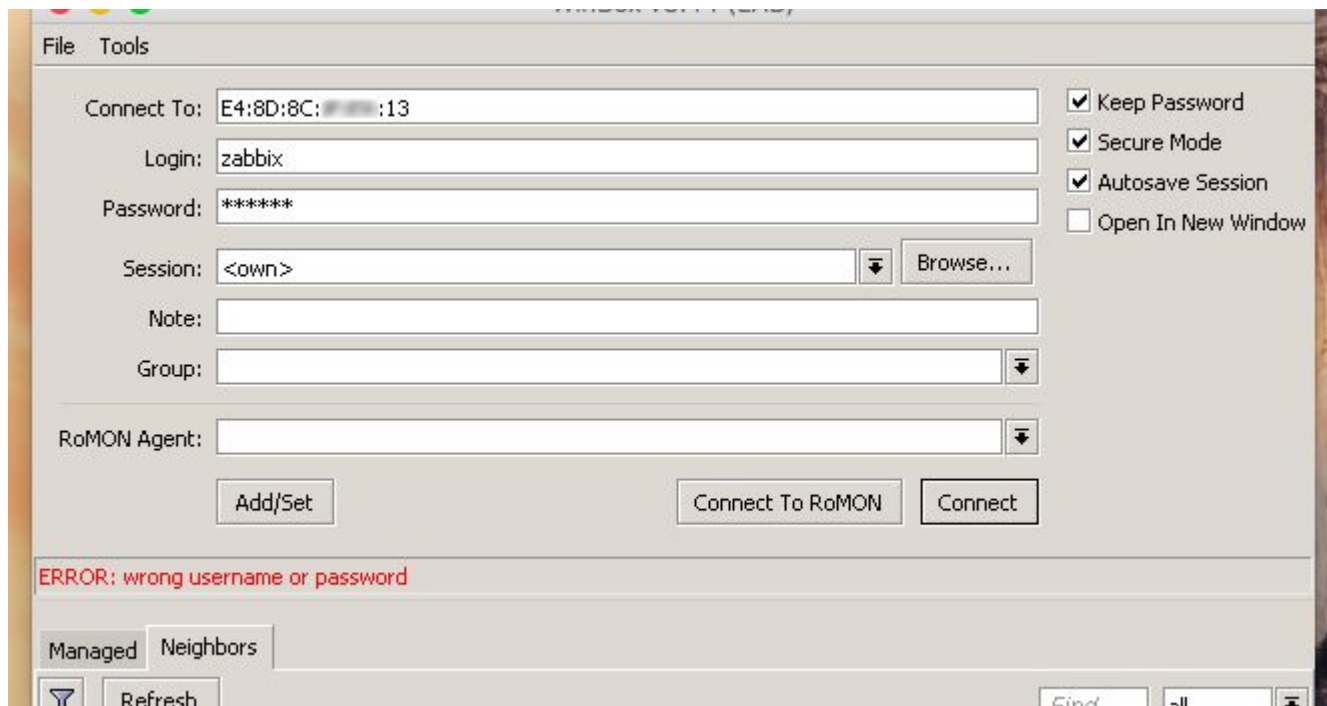
Always on WiFi enabled: ... but too slow!



Always on WiFi enabled: ... but too slow!

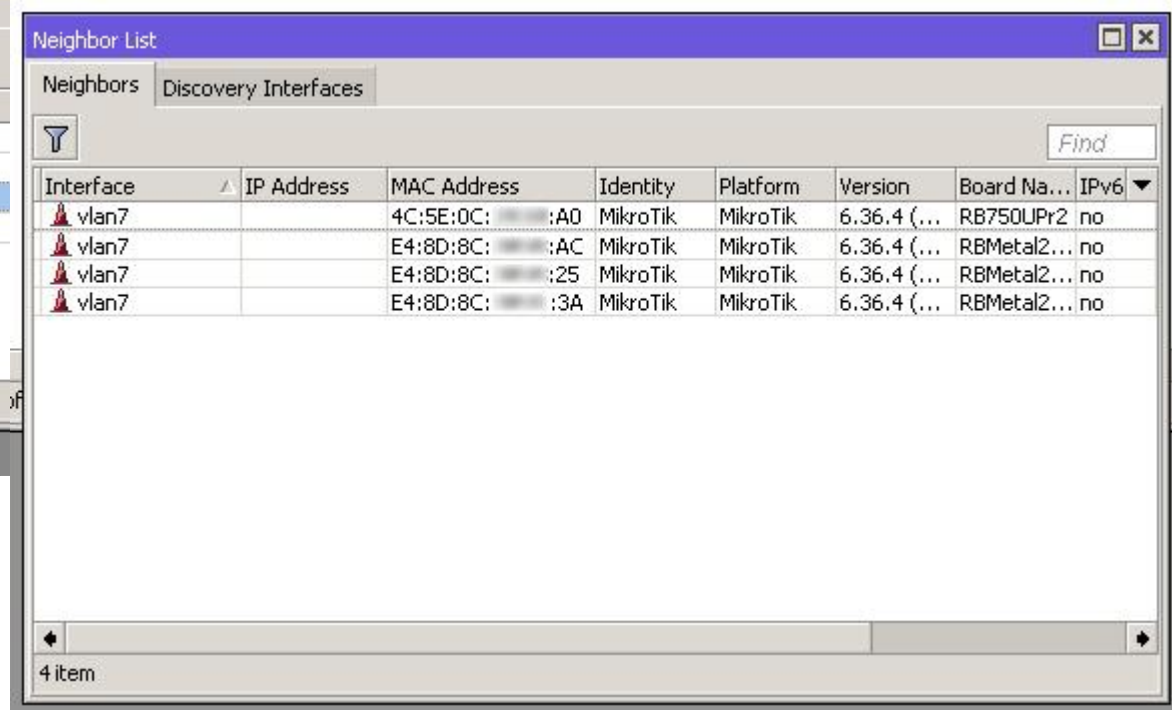
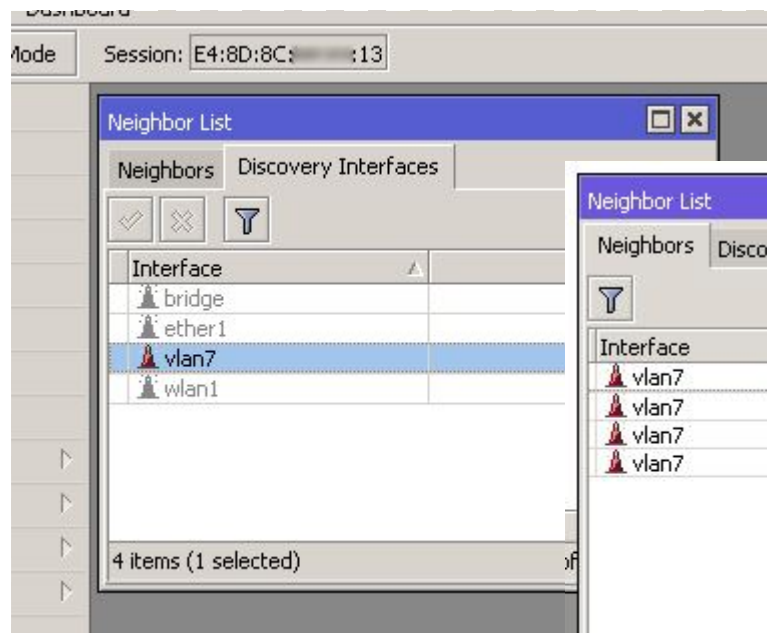


WDS: disabled



E4:8D:8C:####:13

10.0.2.118



E4:8D:8C:###:13

10.0.2.118



10.0.2.118
E4:8D:8C:##:##:13



Metal

vlan7

discovery
OK

NO
discovery

10.0.2.131
E4:8D:8C:##:##:AD



Metal

vlan7

10.0.2.68
E4:8D:8C:##:##:3A



Metal

vlan7



hEX PoE lite

vlan7



Metal

10.0.2.94
E4:8D:8C:##:##:26



Metal

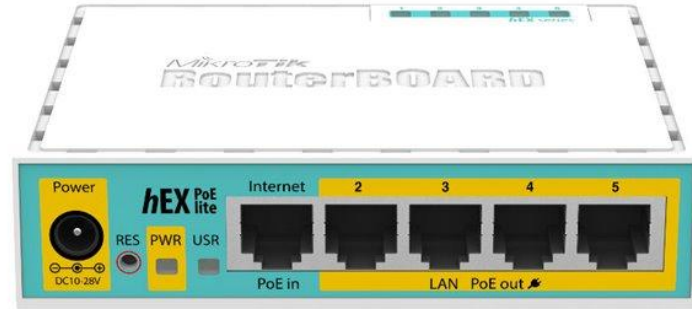
??

E4:8D:8C:##:##:13

10.0.2.118

RouterBoard

RB750UPr2



CPU:

650MHz

RAM:

64MB

PoE-out:

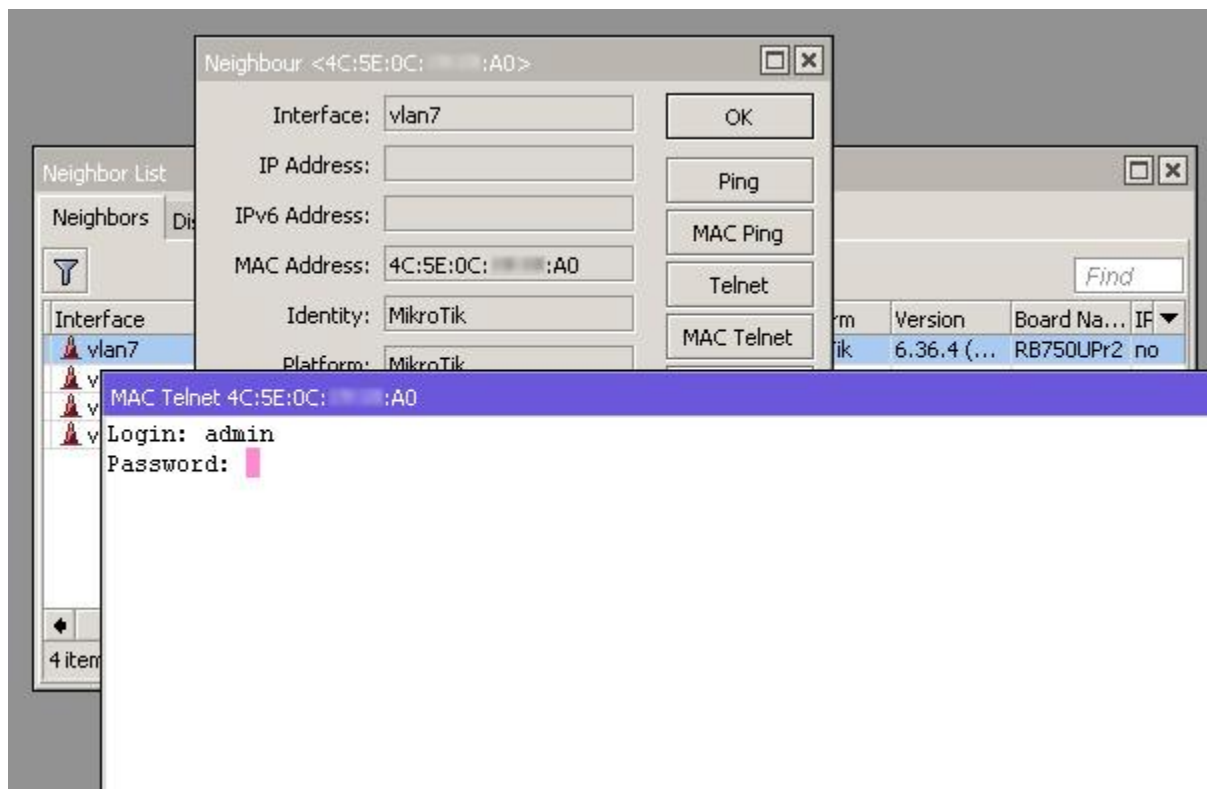
2-5 ports (2A max total)

PoE-in:

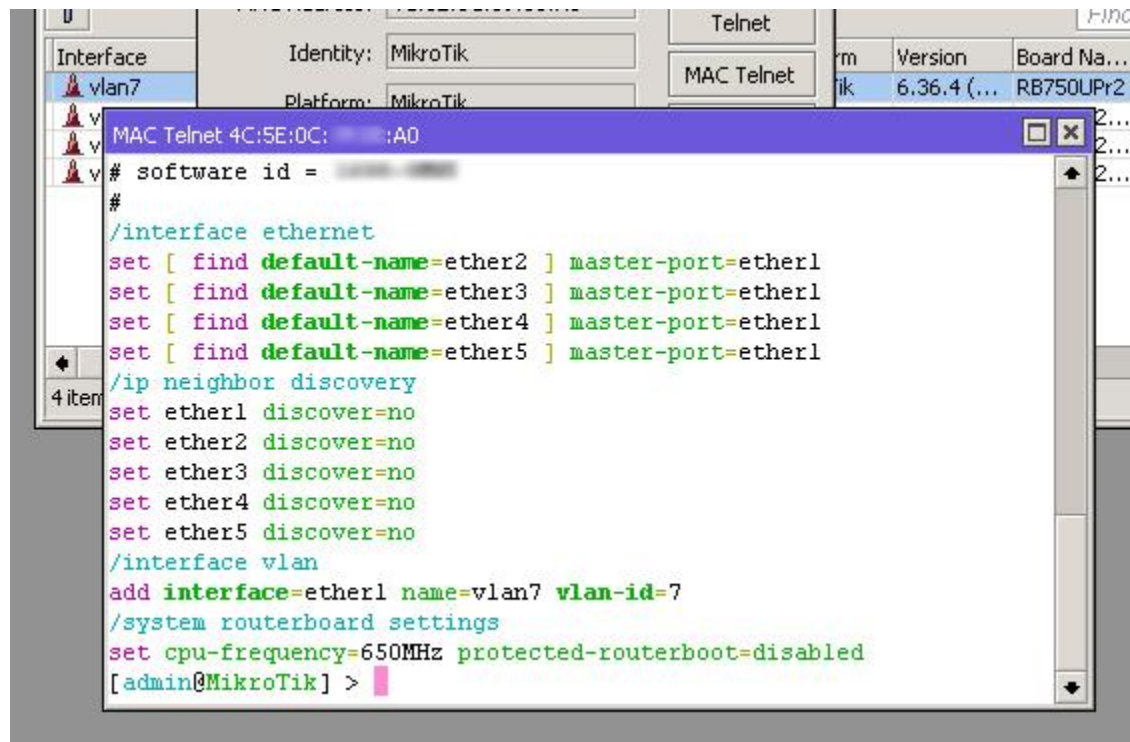
ether1

Trying to ~~hack~~ hug the hEX PoE lite

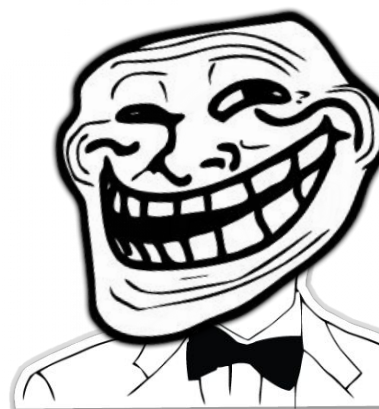
4C:E5:0C:##:##:Ao



4C:E5:0C:##:##:A0



4C:E5:0C:##:##:Ao



```
MAC Telnet 4C:5E:0C: :A0
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] > /ip neighbor print
# INTERFACE ADDRESS MAC-ADDRESS IDENTITY VERSION
0 vlan7 E4:8D:8C: :12 MikroTik 6.36.4 ...
1 vlan7 E4:8D:8C: :AC MikroTik 6.36.4 ...
2 vlan7 E4:8D:8C: :25 MikroTik 6.36.4 ...
3 vlan7 E4:8D:8C: :3A MikroTik 6.36.4 ...
[admin@MikroTik] >
```

4C:E5:0C:##:##:AO


```
MAC Telnet 4C:5E:0C:###:###:AO
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] > /file print
# NAME                TYPE                SIZE  CREATION-TIME
0 flash                disk                1024  2017-01-01 00:00:00
1 pub                  directory           4096  2017-01-01 00:00:00
2 MikroTik-2017...     backup              1024  2017-01-01 00:00:00
3 MikroTik-2017...     backup              1024  2017-01-01 00:00:00
4 MikroTik-2017...     backup              1024  2017-01-01 00:00:00
5 MikroTik-2017...     backup              1024  2017-01-01 00:00:00
6 l.rsc                script              1024  2017-01-01 00:00:00
7 zabbix.rsc           script              1024  2017-01-01 00:00:00
8 flash/skins          directory           4096  2017-01-01 00:00:00
[admin@MikroTik] >
```

4C:E5:0C:##:##:AO

The screenshot shows the MikroTik WinBox interface. In the background, the 'Interface' list on the left includes 'vlan7'. The top right shows 'Identity: MikroTik' and 'Platform: MikroTik'. A 'MAC Telnet' window is open, displaying a terminal session with the following content:

```
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] > /interface print
Flags: D - dynamic, X - disabled, R - running,
S - slave
#    NAME            TYPE
0   R ether1         ether
1   RS ether2        ether
2   RS ether3        ether
3   RS ether4        ether
4   RS ether5        ether
5   R vlan7         vlan

[admin@MikroTik] > /ip address print
Flags: X - disabled, I - invalid, D - dynamic
#    ADDRESS          NETWORK    INTERFACE
[admin@MikroTik] >
```

4C:E5:0C:##:##:Ao

```
MAC Telnet 4C:5E:0C:##:##:AO
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] > /ip dhcp-client add interface=ether1 disabled=no
[admin@MikroTik] > /ip dhcp-client print
Flags: X - disabled, I - invalid
#  INTERFACE      USE ADD-DEFAULT-ROUTE STATUS      ADDRESS
0  ether1         yes yes                bound      10.0.2.54/24
[admin@MikroTik] > ping 8.8.8.8
SEQ HOST          SIZE TTL TIME  STATUS
0 8.8.8.8          56  55 23ms
1 8.8.8.8          56  55 23ms
2 8.8.8.8          56  55 23ms
3 8.8.8.8          56  55 23ms
4 8.8.8.8          56  55 23ms
5 8.8.8.8          56  55 23ms
```

4C:E5:0C:##:##:AO

You have new mail...

```
15 /user
16 add name=zabbix password=4W1WBQS4mJob group=full disabled=no
```



Interface:

IP Address:

IPv6

MAC

File Tools

Connect To:

Login:

Password:

Session:

Note:

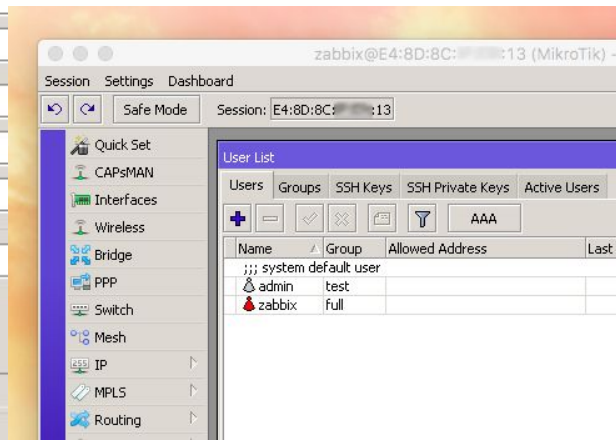
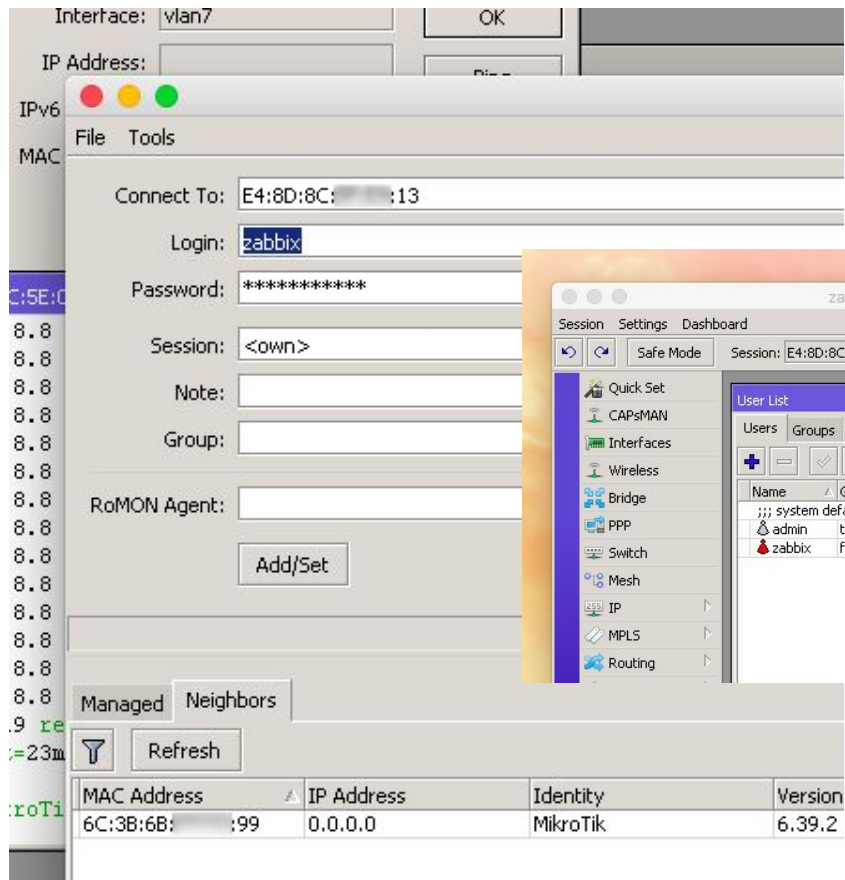
Group:

RoMON Agent:

Managed Neighbors

MAC Address	IP Address	Identity	Version
6C:3B:6B:##:##:99	0.0.0.0	MikroTik	6.39.2

E4:8D:8C:##:##:13



E4:8D:8C:##:##:13

QRT2 wireless scanner (Running)

Scanner (Running)

Interface: wlan1

☐ Background Scan

Start

Stop

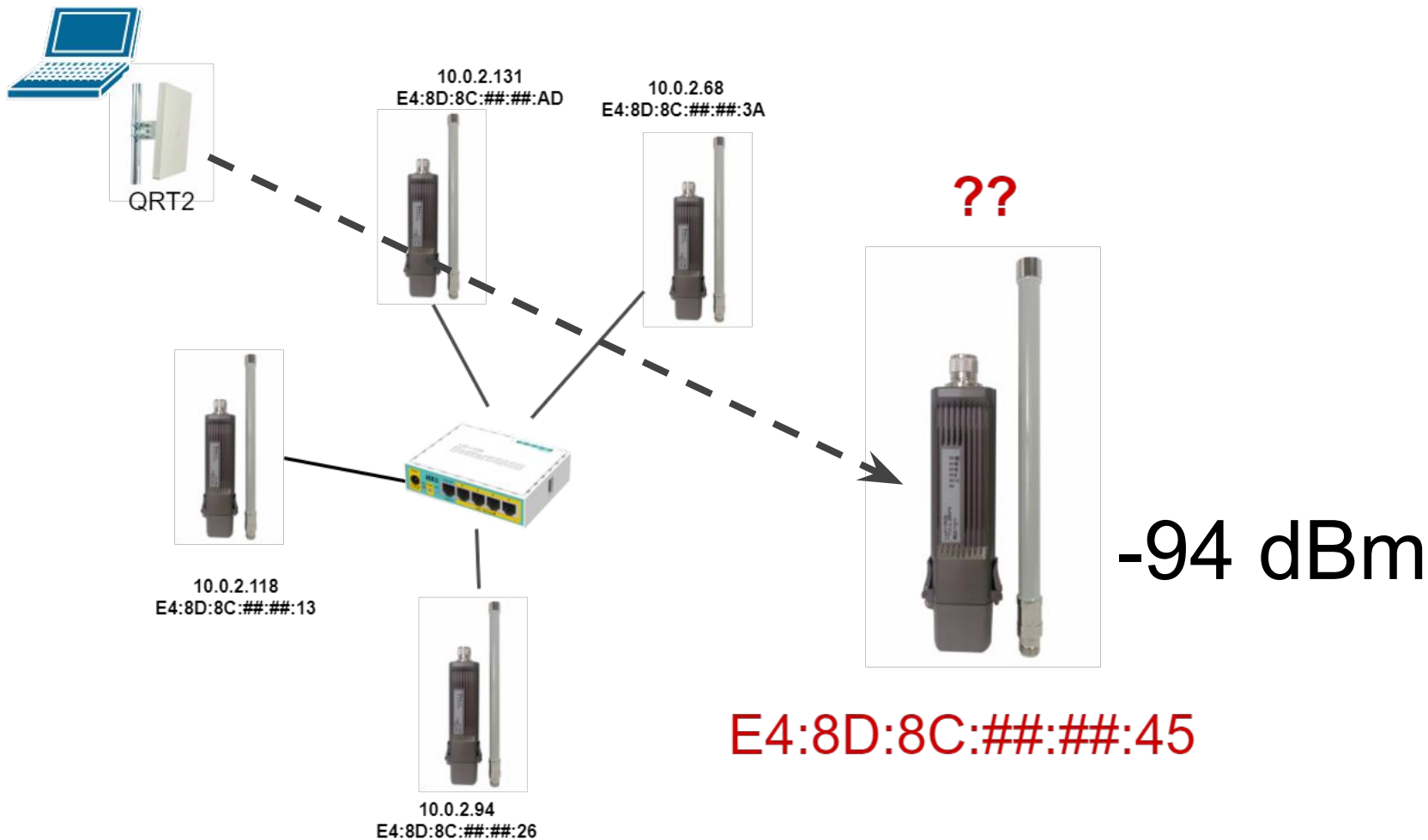
Close

Connect

New Window

	Address	SSID	Channel	Signal...	Noise ...	Signal To...	Radio Na...	Router...	
APRB	E4:8D:8C: :13	M a_WiFi_Free	2412/20/g	-78	-110	32	E48D8C...	6.36.4	
APRB	E4:8D:8C: :AD	M a_WiFi_Free	2412/20/g	-80	-110	30	E48D8C...	6.36.4	
APRB	E4:8D:8C: :26	M a_WiFi_Free	2412/20/g	-81	-110	29	E48D8C...	6.36.4	
AP	00:0E:8F: :8A		2412/20/gn	-84	-110	26			
APRB	E4:8D:8C: :3B	M a_WiFi_Free	2412/20/g	-88	-110	22	E48D8C...	6.36.4	
AP	10:FE:ED: :41		2437/20/gn	-91	-115	24			
AP	C4:A8:1D: :18		2422/20/gn	-92	-114	22			
APRB	E4:8D:8C: :45	M a_WiFi_Free	2412/20/g	-94	-110	16	E48D8C...	6.36.4	

8 items

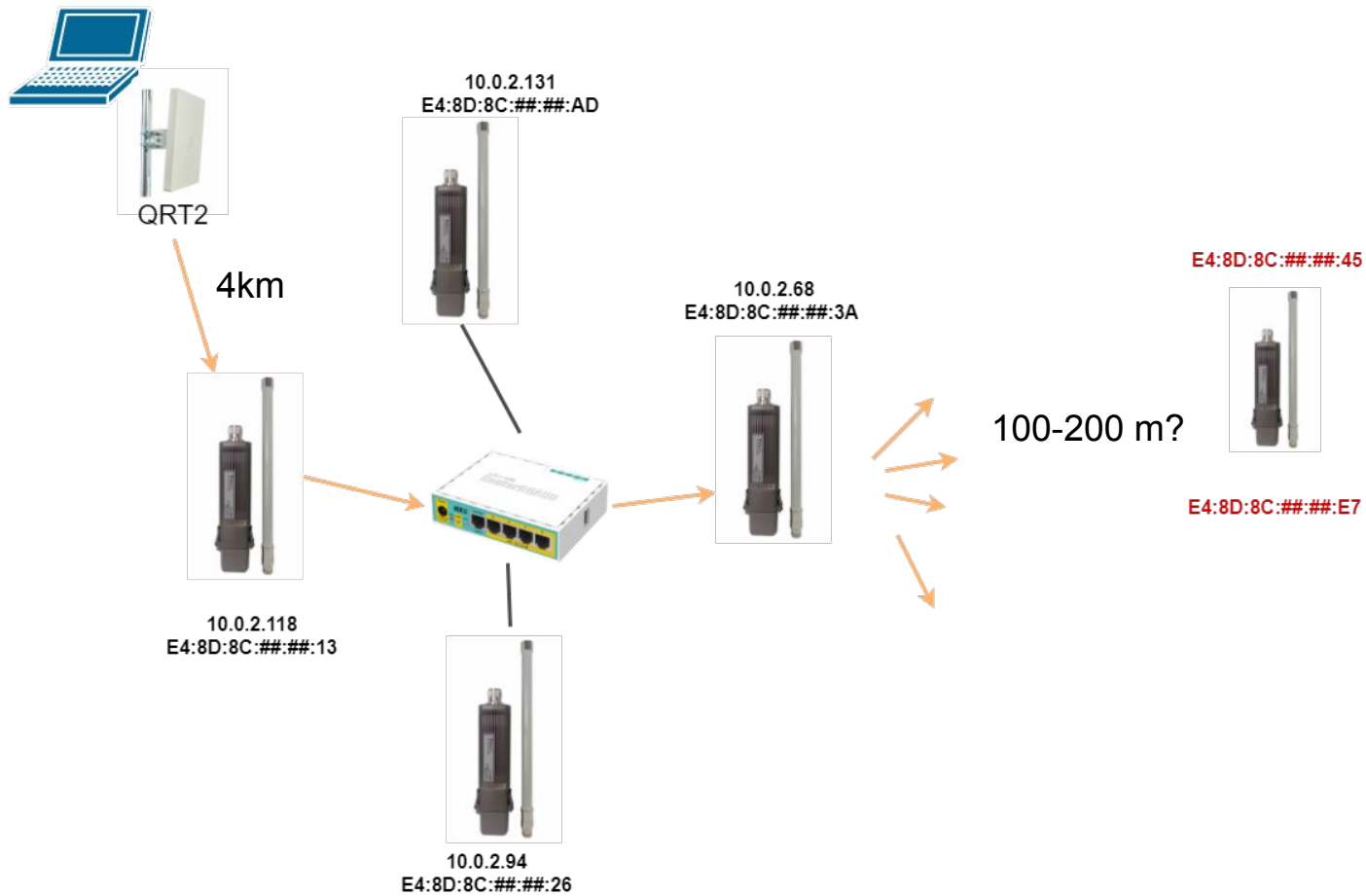


[Round 5]

Looking for the **missing**
RouterBoard access point

E4:8D:8C::#:45





Scanner (Running)

Interface: wlan1

Start

Stop

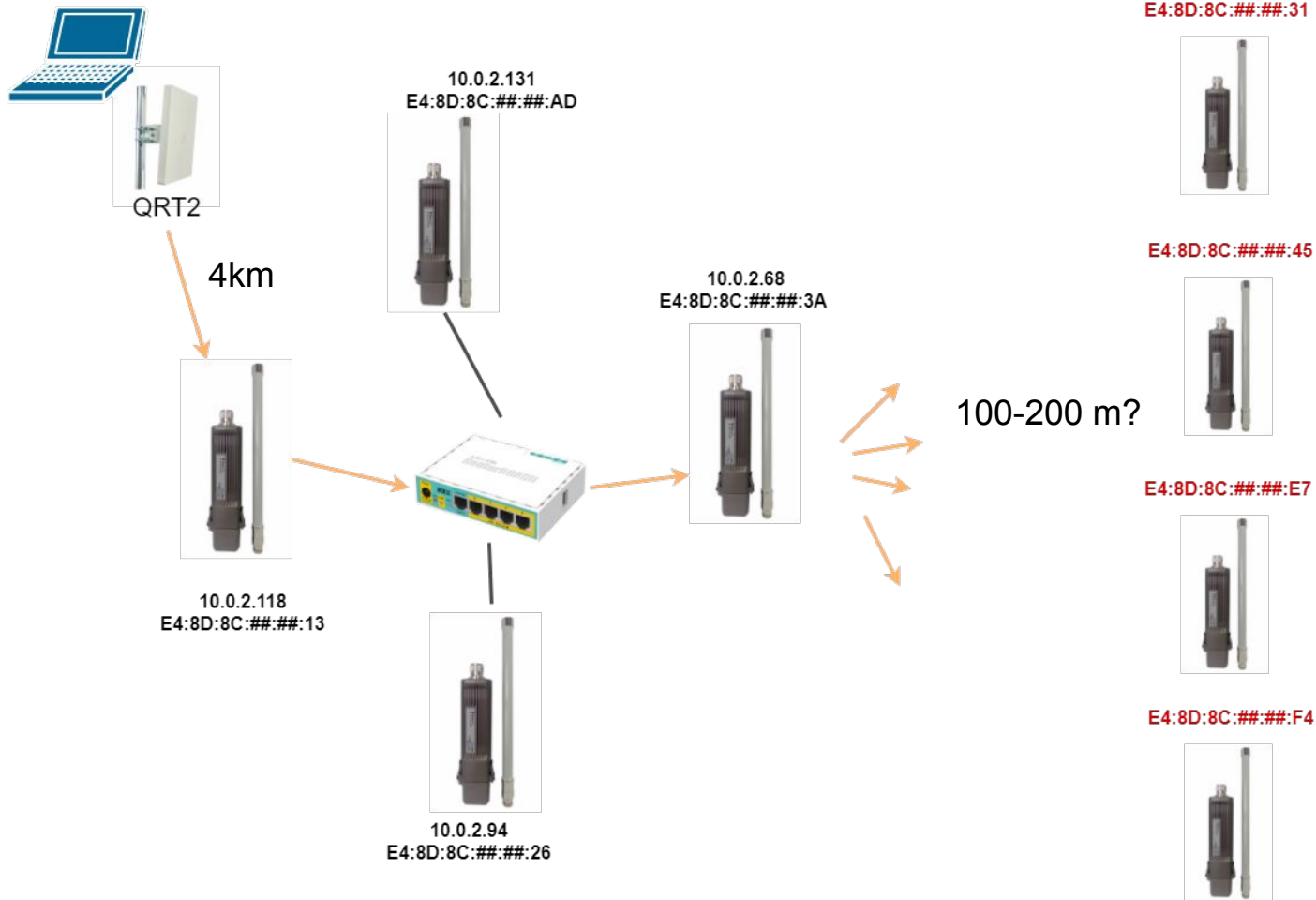
Close

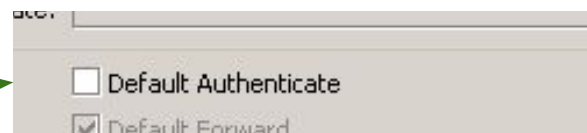
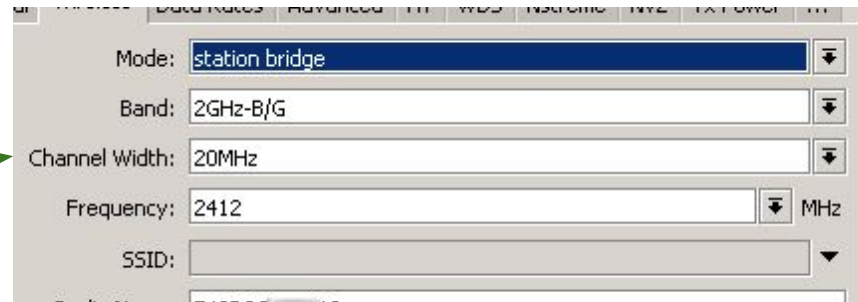
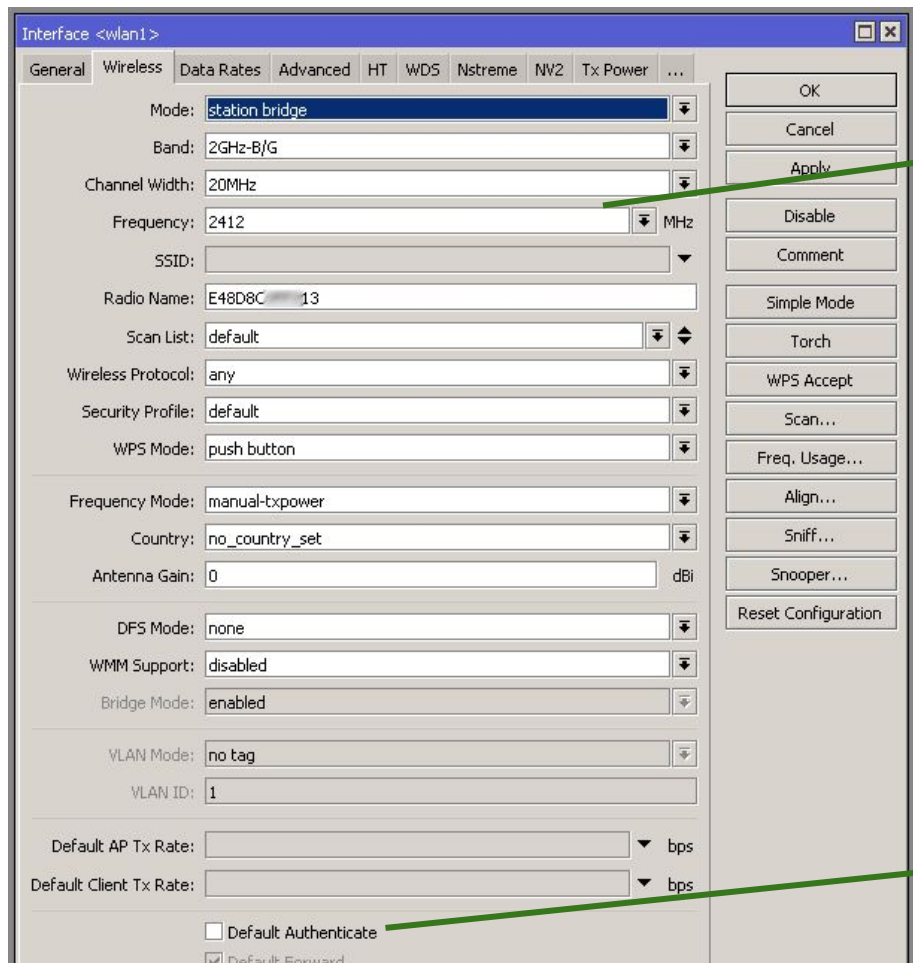
Connect

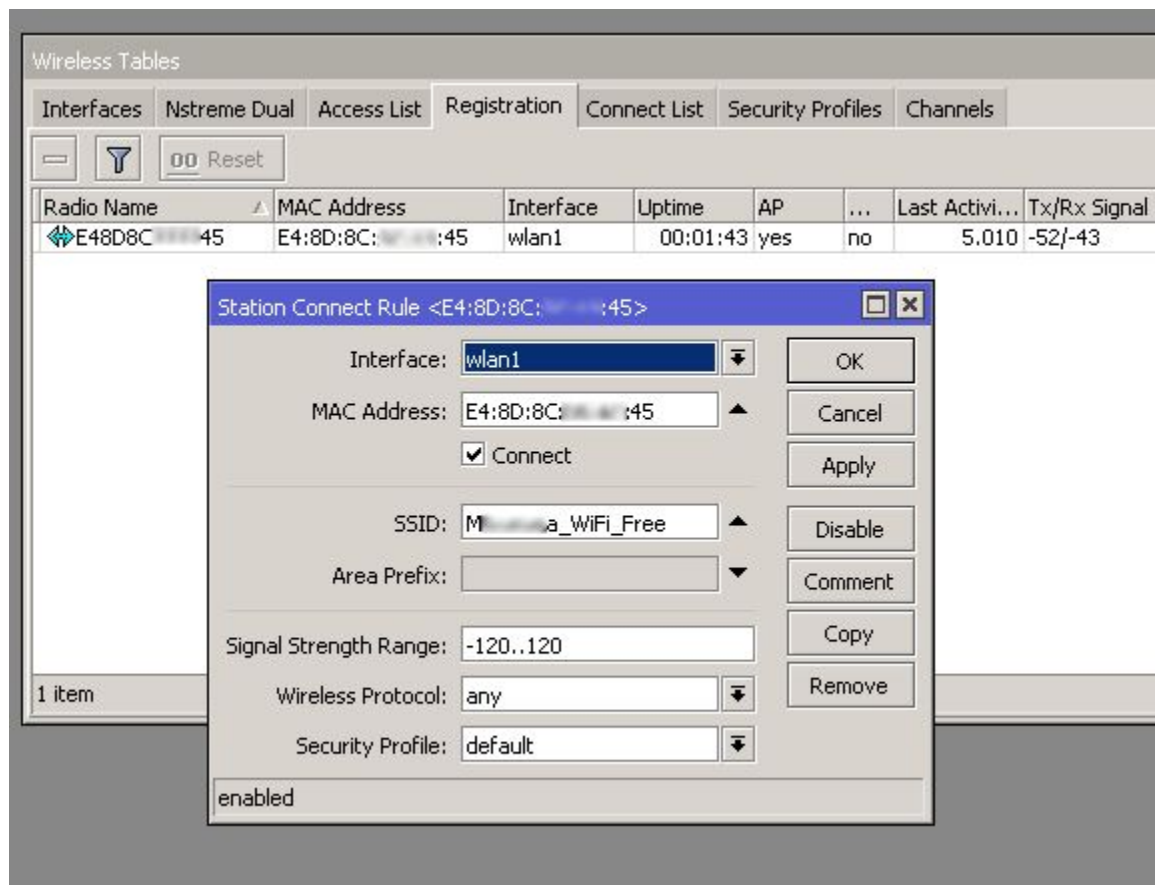
New Window

	Address	SSID	Channel	Signal Stren...	Nois...	Sign...	Radio Name	Router...
APRB	E4:8D:8C: :AD	M a_WiFi_Free	2412/20/g	-34	-106	72	E48D8C AD	6.36.4
APRB	E4:8D:8C: :26	M a_WiFi_Free	2412/20/g	-41	-106	65	E48D8C 26	6.36.4
APRB	E4:8D:8C: :3B	M a_WiFi_Free	2412/20/g	-48	-106	58	E48D8C 3B	6.36.4
APRB	E4:8D:8C: :45	M a_WiFi_Free	2412/20/g	-57	-106	49	E48D8C 45	6.36.4
APRB	E4:8D:8C: :31	M a_WiFi_Free	2412/20/g	-64	-106	42	E48D8C 31	6.36.4
APRB	E4:8D:8C: :E7	M a_WiFi_Free	2412/20/g	-68	-106	38	E48D8C E7	6.36.4
APRB	E4:8D:8C: :F4	M a_WiFi_Free	2412/20/g	-70	-106	36	E48D8C F4	6.36.4
AP	00:0E:8F: :8A		2412/20/gn	-84	-106	22		
AP	10:FE:ED: :41		2437/20/gn	-90	-111	21		
AP	00:D2:AD: :AA		2422/20/gn	-91	-108	17		
AP	C4:A8:1D: :18		2422/20/gn	-92	-108	16		

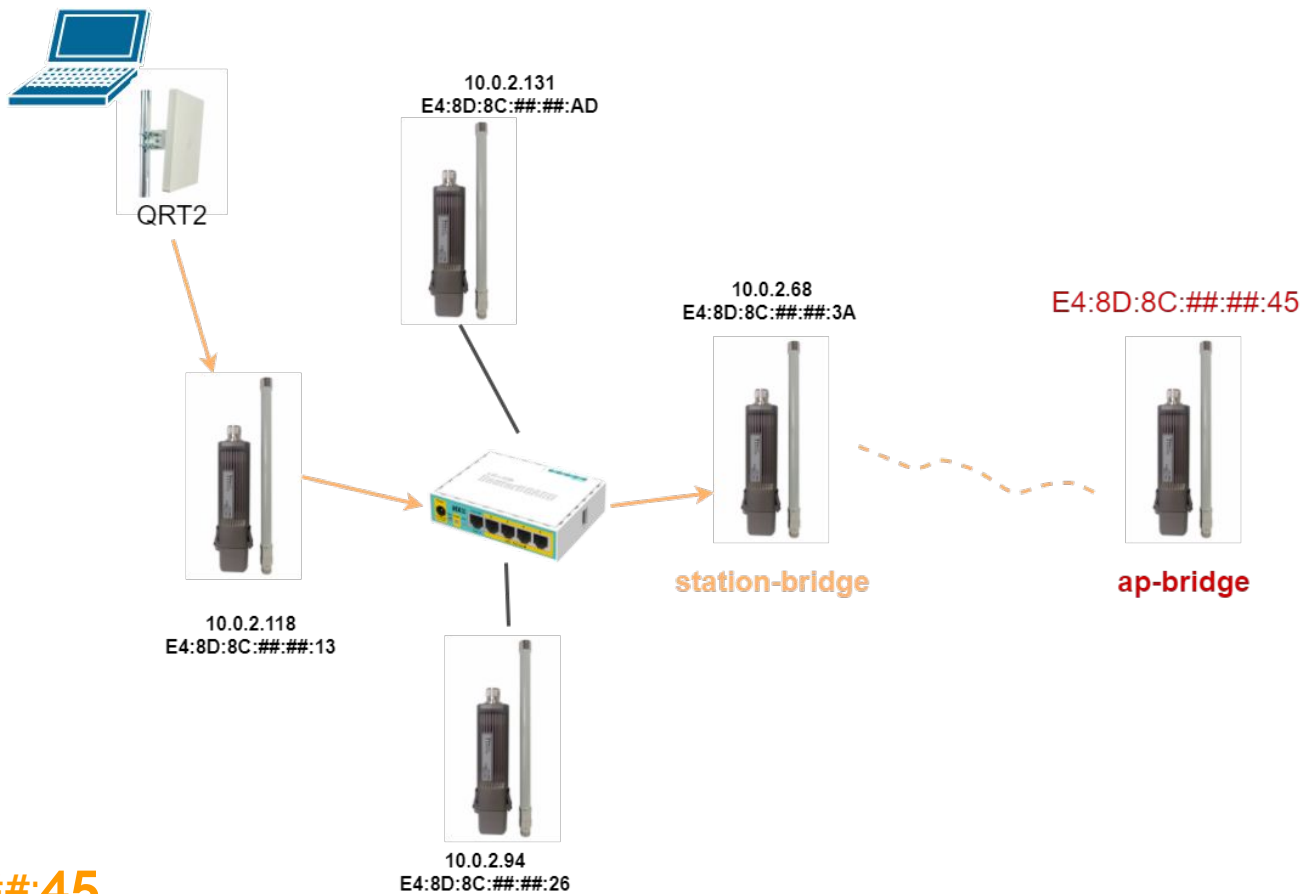
11 items







E4:8D:8C:####:45



E4:8D:8C:##:##:45

Radio Name MAC Address Interface Uptime AP ... Last

E48D8C	45	E4:8D:8C: :45	wlan1	00:11:15	yes	no	
--------	----	---------------	-------	----------	-----	----	--

Terminal

```
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] >
[zabbix@MikroTik] > /to
Login: zabbix
Password:
Trying E4:8D:8C: :4
Welcome back!
[zabbix@MikroTik] >
```

1 item

Terminal

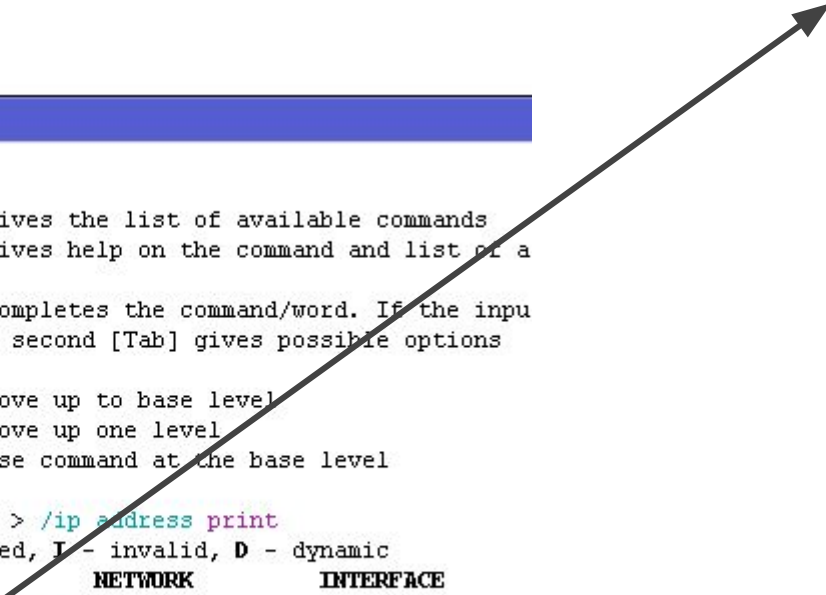
```
[?] Gives the list of available commands
command [?] Gives help on the command and list of a

[Tab] Completes the command/word. If the input
a second [Tab] gives possible options

/ Move up to base level
.. Move up one level
/command Use command at the base level

[zabbix@MikroTik] > /ip address print
Flags: X - disabled, I - invalid, D - dynamic
# ADDRESS NETWORK INTERFACE
0 D 10.0.1.50/24 10.0.1.0 bridge
[zabbix@MikroTik] >
```

10.0.1.0/24



E4:8D:8C:##:##:45



QRT2

10.0.2.131
E4:8D:8C:##:##:AD



10.0.2.68
E4:8D:8C:##:##:3A



station-bridge



10.0.2.118
E4:8D:8C:##:##:13



10.0.2.94
E4:8D:8C:##:##:26



10.0.2.0/24

E4:8D:8C:##:##:44
10.0.1.54



ap-bridge

E4:8D:8C:##:##:30
10.0.1.78



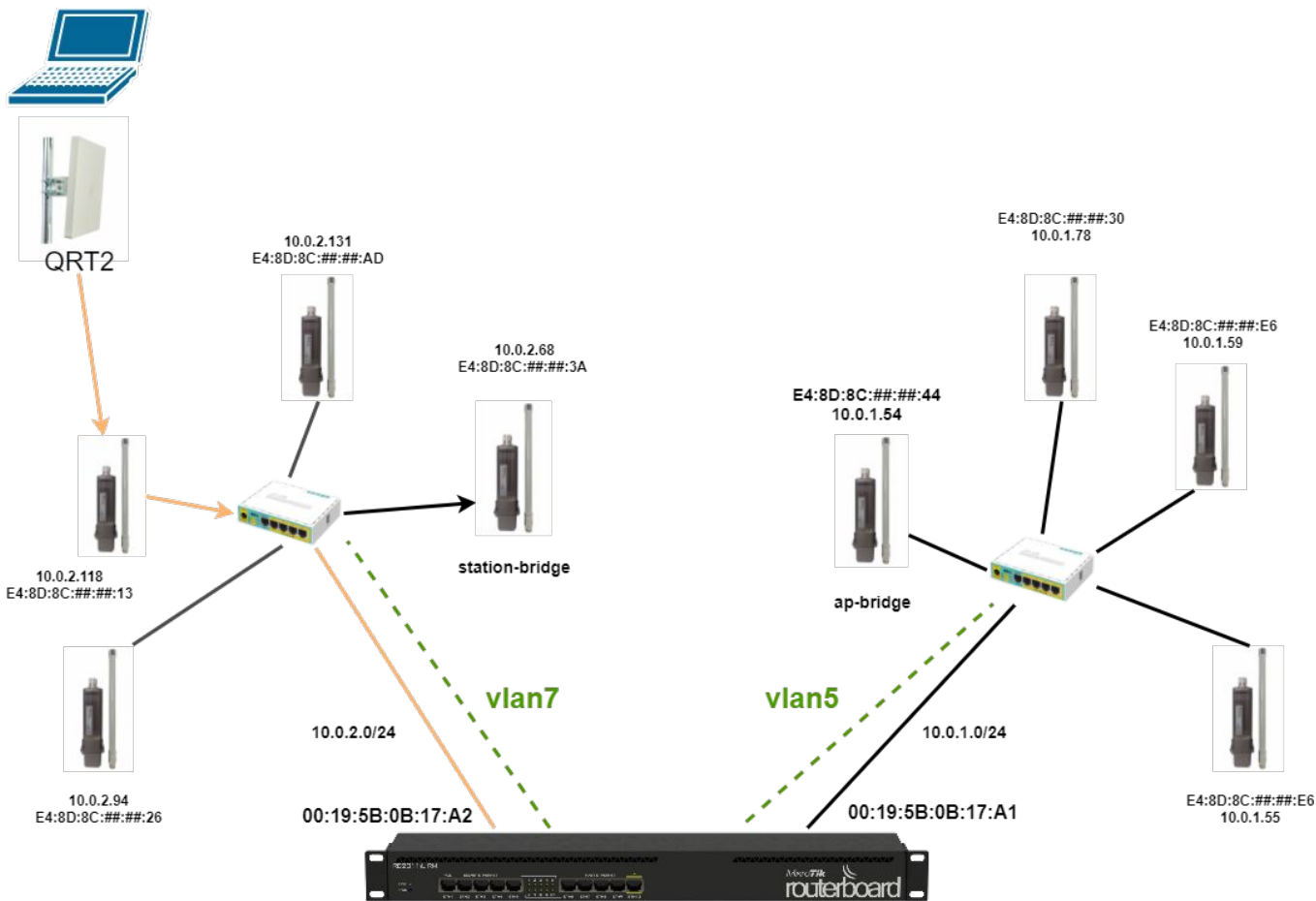
E4:8D:8C:##:##:E6
10.0.1.59



10.0.1.0/24



E4:8D:8C:##:##:E6
10.0.1.55



D-Link DIR-2011

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