

Sistemet Wireless Profesionale MikroTik

dhe CAPsMAN

Pershendetje!

Quhem: Erion DEMIRI

BIO:

- © 1999 – Pergjegjes per rrjetet LAN, Infosoft.
- © 2001 – IBM Netfinity Servers
- © 2001 – Omega Networking and Service
- © 2006 – ENS, Easy Network Solutions
- © 2007 – MUM Egypt, MTCNA
- © 2011 – MUM Budapest, MTCRE

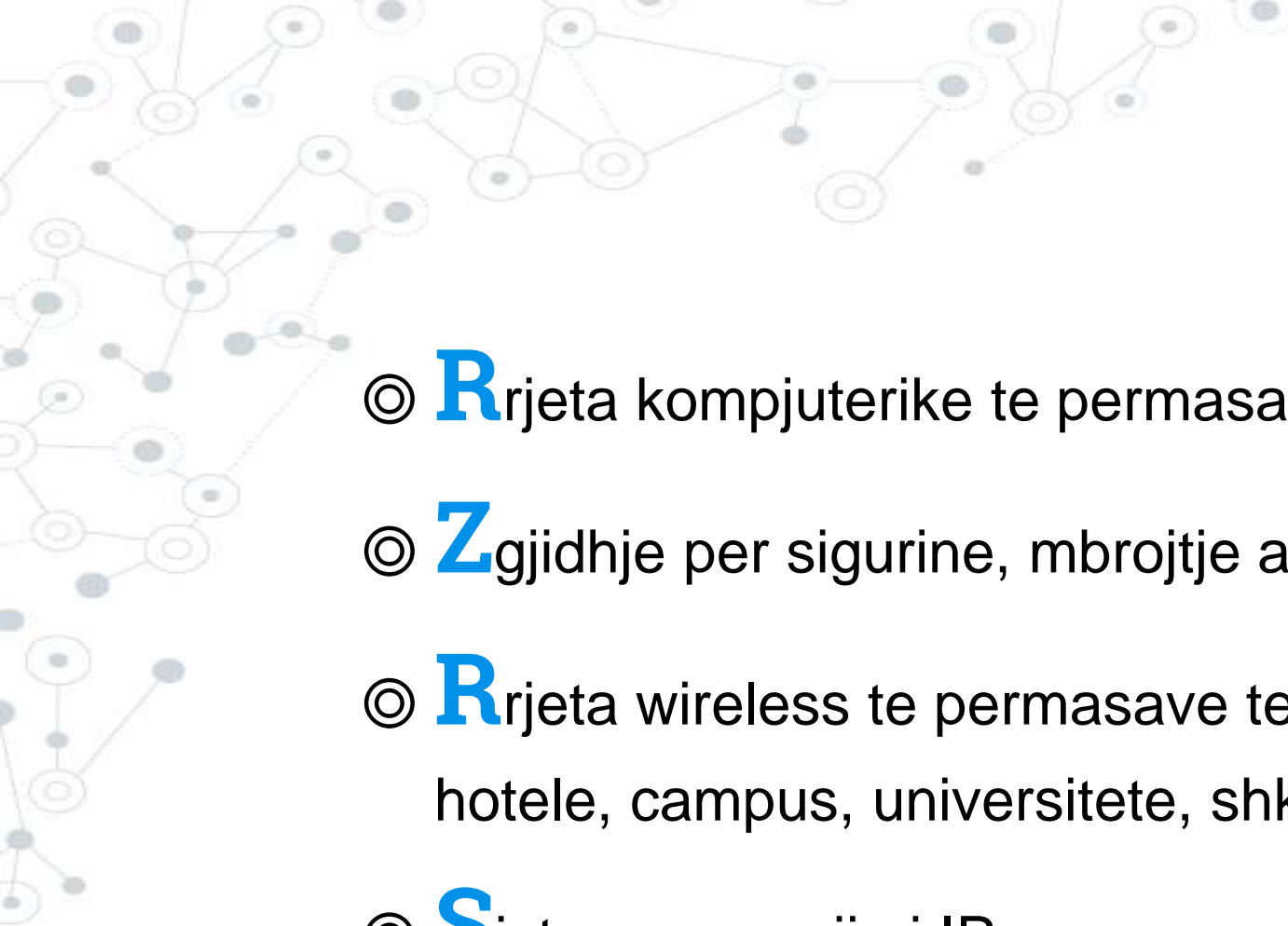


Ekspertize ne:

Windows Servers, Domain Controller AD, Linux Servers dhe Networking. Konsulent ne rrjete kompjuterike, rutera, switche dhe wireless, specifikisht MikroTik por dhe brand te tjera. Diplomuar ne Inxhinieri elektrike, Eksperience ne Automatizim Industrie.

Easy Network Solutions

- © **R**rjeta kompjuterike te permasave te ndryshme
- © **Z**gjidhje per sigurine, mbrojtje antivirale
- © **R**rjeta wireless te permasave te medha, kompani, hotele, campus, universitete, shkolla.
- © **S**isteme survejimi IP.
- © **S**isteme VPN.
- © **E**tj...



© '2000 - sistem testimi I levizshem ☺



© 2007 – Linku yne i pare prej 31km ne 5GHZ



© '2015 – Ndertim I sistemit te Survejimit

dhe komunikimit me wifi ne Terminalin e Konteinereve, Porti Durrës.

Projekte



A background network diagram consisting of various nodes (circles) connected by lines, representing a network topology. The nodes are in shades of gray and blue, and the lines are thin and light gray.

1.a

Sistemet WiFi MikroTik

Mjaft me fjale te pergjithshme!

Pse?

“

MikroTik ofron nje game te gjere produktesh, me nje software te njejte, qe I hap perdoruesit horizonte shume te gjera ne mundesite e konfigurimeve dhe fushat e perdorimit.

Pse nevojiten sistemet Wireless?

- ⦿ Perdoren sot gjeresisht ne shkolla, universitete, hotele, kompani, ambiente sportive, ambiente rekreative.
- ⦿ Kerkesa per te tilla sisteme shtohet dite pas dite
- ⦿ Megjithese mund te ndertohet nje sistem, ai do te kerkoje upgrade te mevonshme

...“Produkti” me I kerkuar ne bare, restorante, hotele, nga klientet??

Sa eshte
password i wirelessit?



Pse nevojiten sistemet Wireless?

“The 2015 TripAdvisor TripBarometer further reveals that Wi-Fi is the most important in-room amenity for today’s travelers”

Check In / -

Check Out - / - / -

Guests 1 room, 2 adults, 0 children



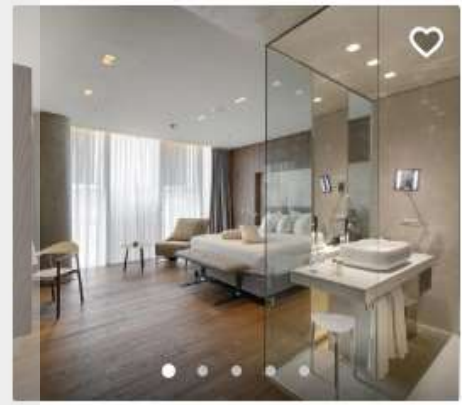
Price per night ALL 10,400

- Amenities
- Free Wifi
 - Breakfast included
 - Pool
 - Free Parking
- More ▾

Special offers Only properties with special offers

Distance from 1 mi ▾

- Property type
- Hotels
 - B&B and Inns



The Plaza Tirana

Booking.com ↗

ALL 18,443

[View Deal](#)

- Expedia.com ↗ **ALL 15,743**
- Agoda.com ↗ **ALL 16,956**
- Hotel Website ↗ **ALL 18,429**

View all 6 deals from ALL 15,743 ▾

●●●●● 268 reviews
 #1 Best Value of 334 places to stay in Tirana

- Free Wifi
- Free Parking



Hotel Mondial

Booking.com ↗

ALL 10,640

[View Deal](#)

- Expedia.com ↗ **ALL 9,590**
- HotelsClick ↗ **ALL 10,603**
- TripAdvisor **ALL 9,570**

●●●●● 259 reviews
 #2 Best Value of 334 places to stay in Tirana

- Free Wifi
- Free Parking



Theranda Hotel

Booking.com ↗

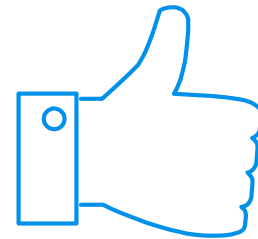
~~ALL 6,660~~
ALL 5,864

- Expedia.com ↗ **ALL 6,660**
- TripAdvisor **ALL 5,864**
- Hotels.com

●●●●● 322 reviews
 #3 Best Value of 334 places to stay in Tirana

- Free Wifi
- Free Parking

Rrjet LAN



Asnje sistem wireless nuk mund te funksionoje pa nje baze te shendoshe. Nevojitet nje **rrjet lokal robust**, mbi te cilin do te ndertohet sistemi wifi.

Endrra të këqia!



LAN tek klienti

- ⦿ Kembengul per krijimin e nje rrjeti te rregullt!
- ⦿ Mos mer persiper ndertimin e wifi pa kerkesen e mesiperme!
- ⦿ Maksimumi vendos 1 ose 2 wifi per te kaluar situaten kritike te klientit dhe kerko nje kohe te dyte per ndertimin e gjithe rrjetit!

Pajisjet per LAN

◎ Rack (sa me l madh, aq me mire) ☺

◎ Core Router: RB1xxx, RB3xxx, **RB4xxx**,
CCR

◎ Switch: CRS1xx, CRS-3xx

Core Router



- ◎ RB3011
ARM 32bit, 1.4GHZ Dual Core, 1GB Ram, 128MB NAND, 10 Gigabit Ethernet, 1 SFP



- ◎ RB1100AHx4
ARM 32bit, 1.4GHZ 4 Core, 1GB Ram, 128MB NAND, 13 Gigabit Ethernet



- ◎ CCR-1009
TILE, 1GHZ 9 Core, 2GB Ram, 128MB NAND, 7 Gigabit Ethernet, 1 Combo, 1 SFP+



- ◎ RB4011iGS+RM
ARM 32bit, 1.4GHZ 4 Core, 1GB Ram, 512MB NAND, 10 Gigabit Ethernet, 1 SFP+

Switch



© CRS112-8P-4S-IN
8PoE Gigabit, 4SFP

© CRS328-24P-4S+RM
24PoE Gigabit, 4SFP+



A background network diagram consisting of various nodes (circles) connected by lines, representing a network structure. The nodes are in shades of grey and blue, and the lines are thin and light grey.

1.b

Pajisjet per wifi

Tani qe rrjetin e kemi te rregullt,
fillojme te mendojme per WiFi!



Frekuenca

2.4GHZ

- + Suportohet nga shumica e pajisjeve
- + Perthyhet me shume
- + Shkon me larg

- Vetem 3 kanale (1/6/11)
- Shume interferenca
- Shume pajisje jo 802.11

5GHZ

- + Shume me teper kanale qe nuk shkelin njeri-tjetrin
- + Shume me pak interferenca
- + Pak pajisje jo 802.11 qe transmetojne ne 5GHZ

- Me pak pajisje klienti me karte wifi 5GHZ

Frekuensi

802.11 Wireless Standards

IEEE Standard	802.11a	802.11b	802.11g	802.11n	802.11ac
Year Adopted	1999	1999	2003	2009	2014
Frequency	5 GHz	2.4 GHz	2.4 GHz	2.4/5 GHz	5 GHz
Max. Data Rate	54 Mbps	11 Mbps	54 Mbps	600 Mbps	1 Gbps

Ambienti i Montimit

Brendshem

- ☉ Mund te perdoren pajisje edhe weatherproof edhe pajisje te thjeshta.
- ☉ Ne pishina, kuzhina, SPA, ku nivelet e lageshtires jane te larta, [rekomandohen](#) pajisje weatherproof.

Jashtem

- ☉ Duhet perdorur gjithmone pajisje [weatherproof](#). Perdorimi i pajisjeve te tjera nuk garanton nje jetegjatesi te tyre.

Ambienti i Montimit

Jashtem



© SXT2 & SXT SA5



© Basebox 2 & 5



© OmniTik 5ac



© wAP ac Dual Band

Ambienti i Montimit

Brendshem



⦿ wsAP ac lite(Dual Band)



⦿ cAP Lite (2.4)



⦿ cAP ac (Dual Band)



⦿ wAP / BE (2.4)



⦿ wAP ac (Dual Band)

Pozizioni i Montimit



Pozicioni i Montimit

- © Vende tipike qe duhen shmangur

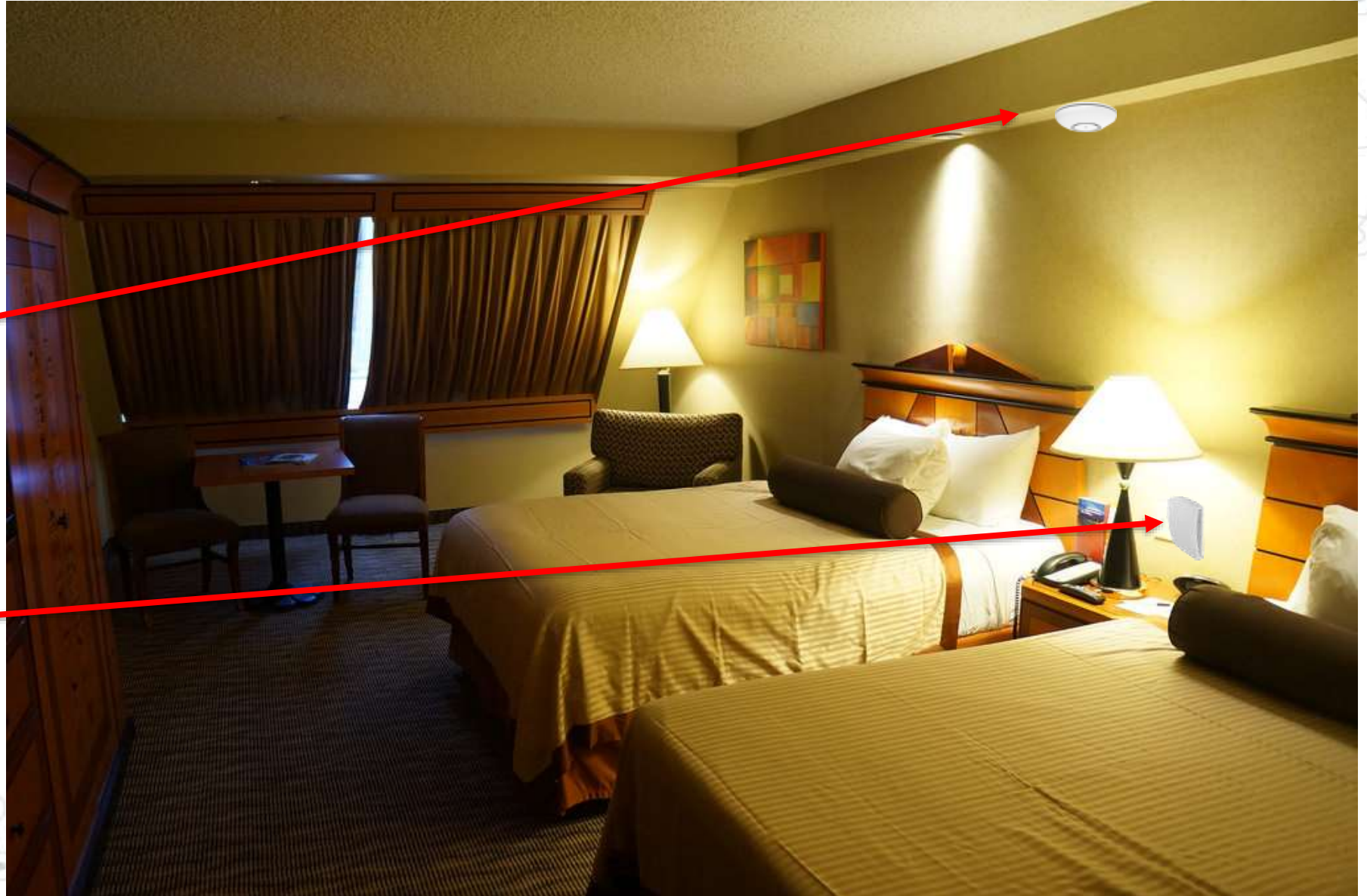


Pozicioni i Montimit

⊙ Vende me te pershtatshme

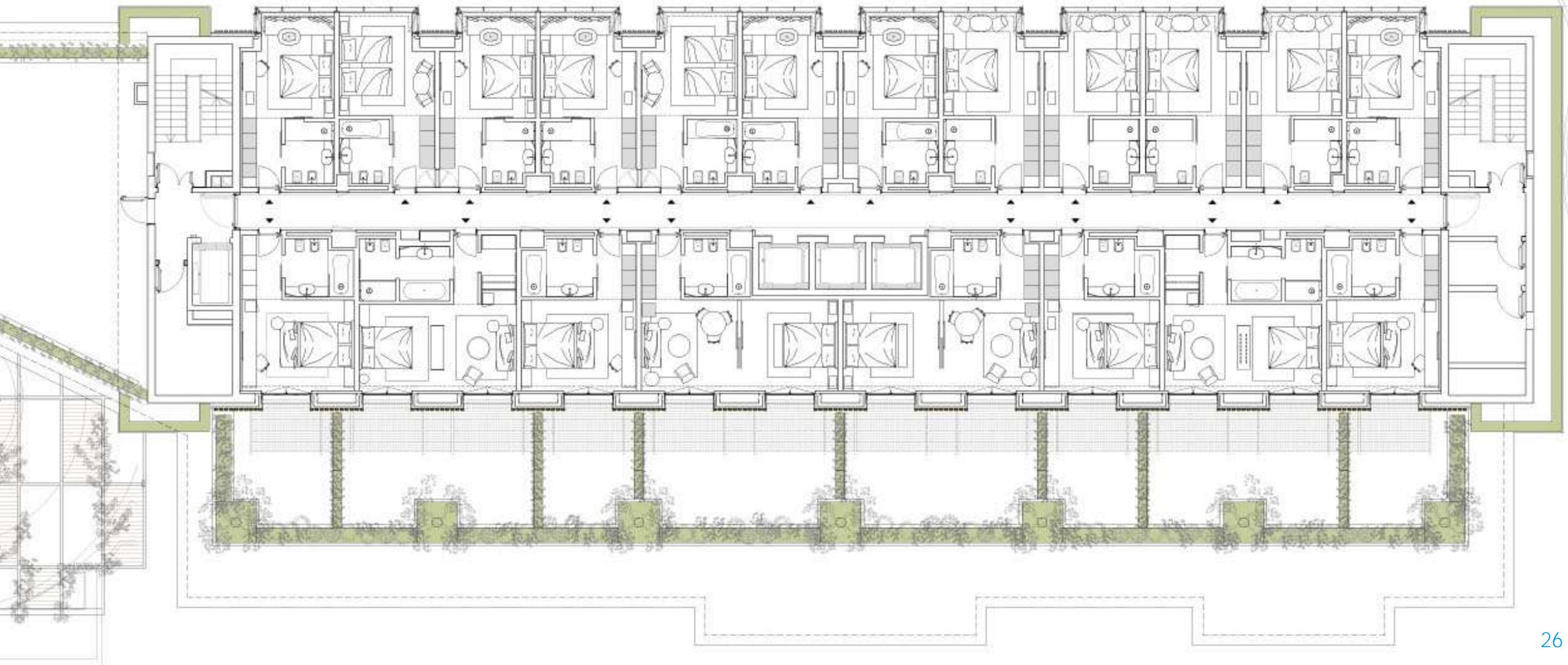
⊙ cAP ac

⊙ wsAP ac



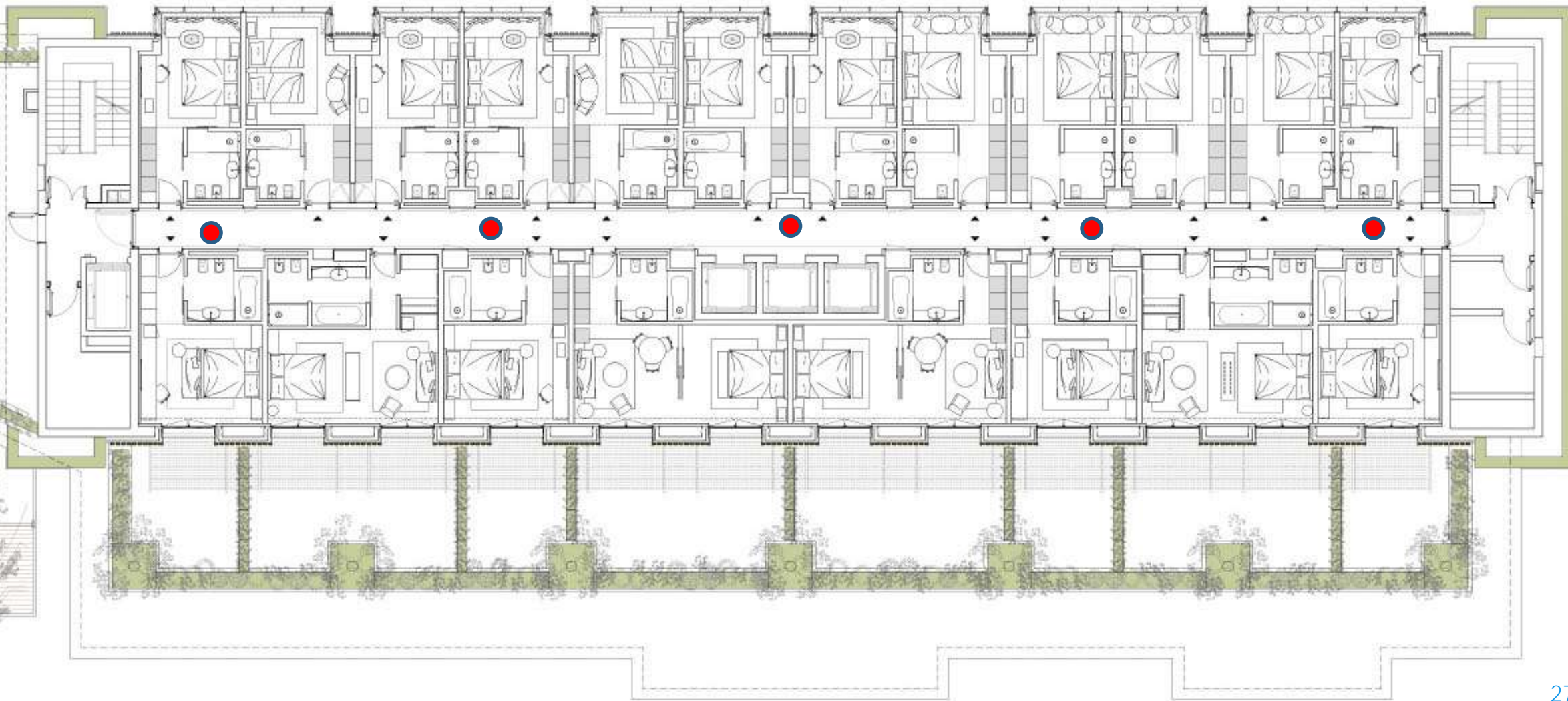
Pozicioni i Montimit

Nje kat hoteli me 20 dhoma



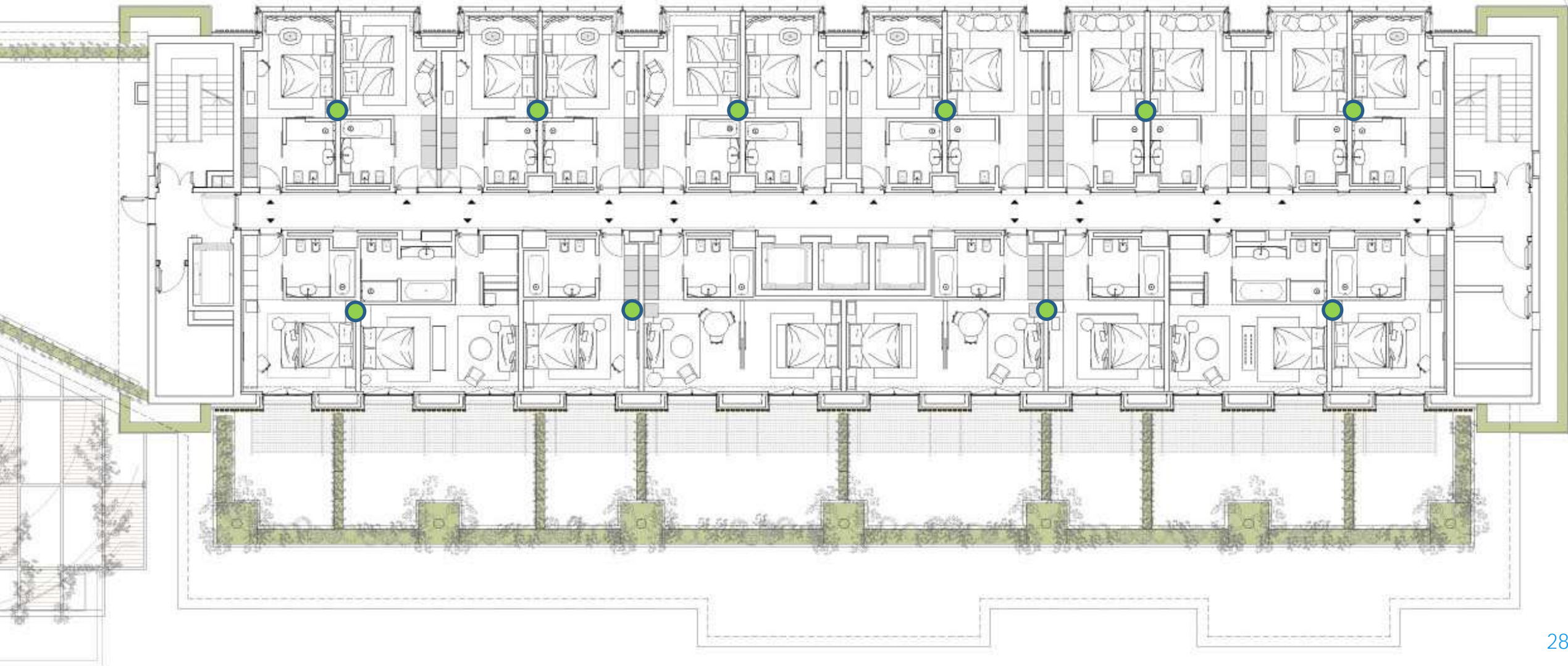
Pozizioni i Montimit

5 x Basebox2 Omni(2.4)



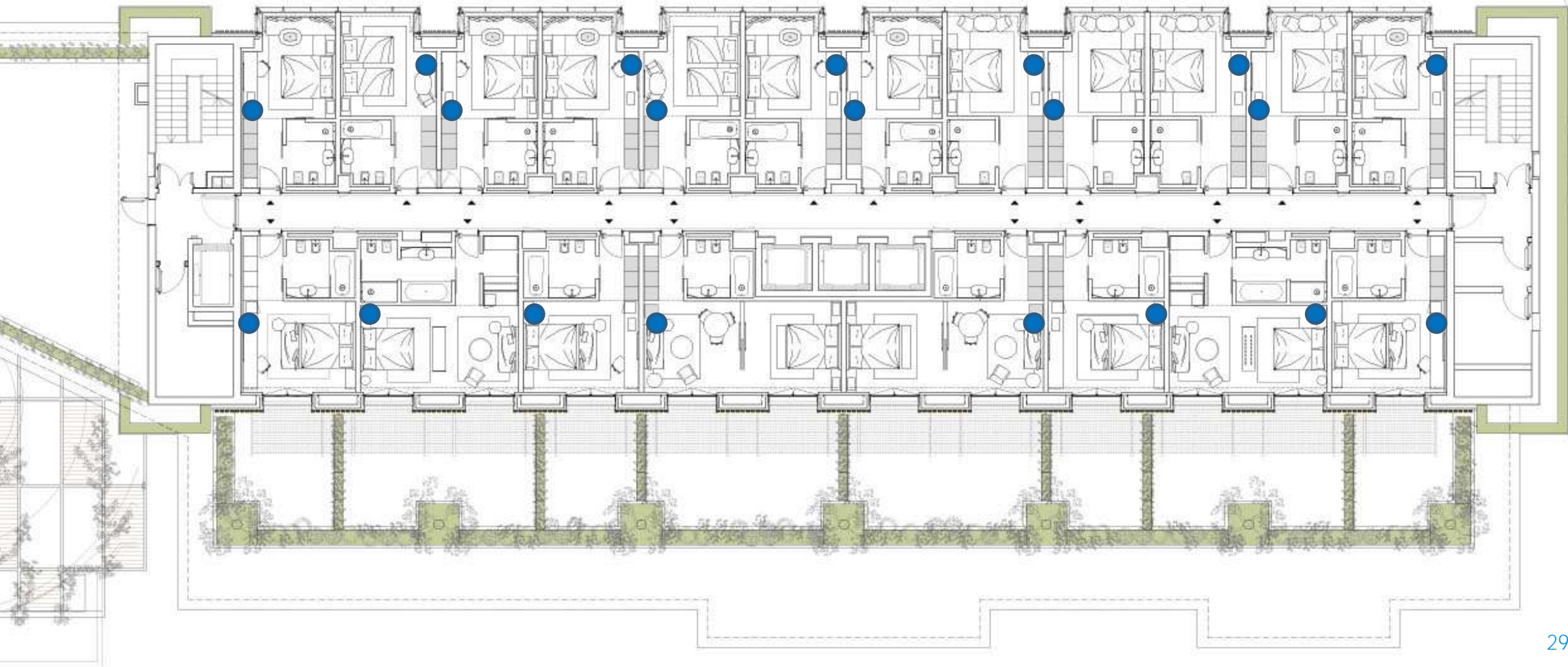
Pozizioni i Montimit

10 x cAP ac ose wsAP ac lite(2.4+5)



Pozizioni i Montimit

20 x wsAP ac lite(2.4+5)



A background network diagram consisting of various nodes (circles) connected by lines, some solid and some dashed, representing a network topology. The nodes are scattered across the slide, with a higher density on the left and right sides.

1.c

Gabimet qe bejme me shpesh

Kush nuk gabon kurre, nuk meson kurre!



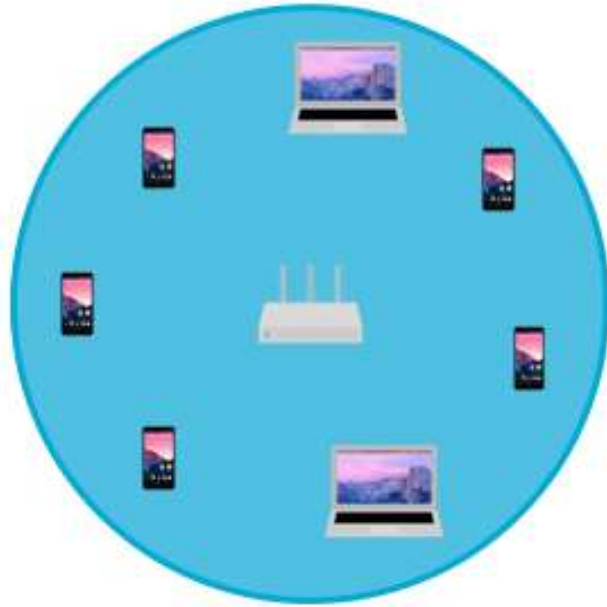
© Numer i vogel AP!

© Numer shume i madh AP!

© Perdorimi i AP te fuqishme (edhe antena te medha)!

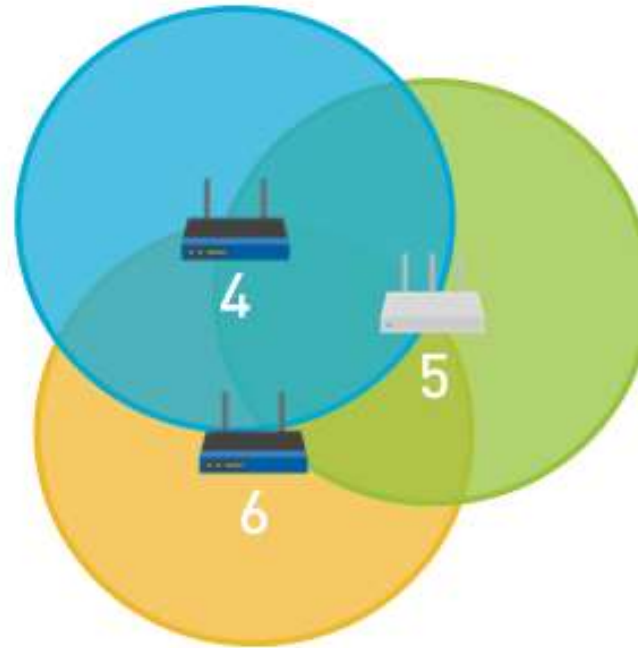
Interferencat

Co-Channel



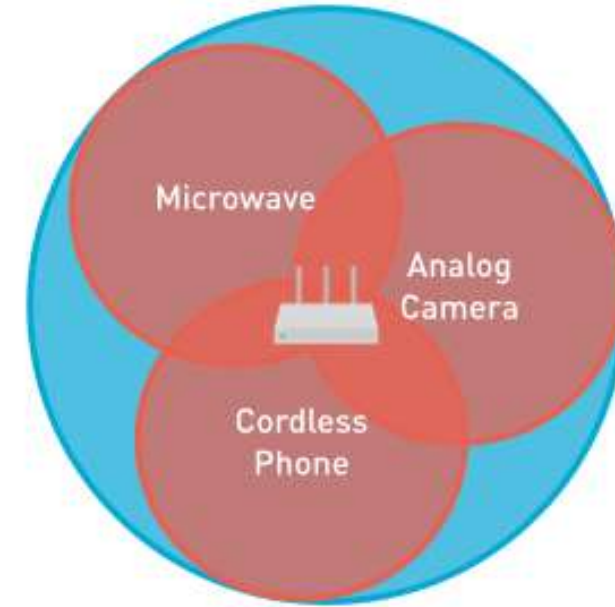
Every client and access point on the same channel competes for time to talk.

Adjacent-Channel



Every client and access point on overlapping channels talk over each other.

Non-Wi-Fi



Non-802.11 devices compete for medium access.

Interferencat/zhurmat

Eleminimi

- ⦿ Perdor vetem kanalet 1/6/11 per 2.4 GHZ (2412/2437/2462 MHZ)

Kur antenat jane ne “overlapping channels” kanale te mbivendosura, ato do te shohin sinjalin e antenave te tjera si “zhurme”. Kjo gje do beje qe ato te kerkojne gjithë kohes te transmetojne.

- ⦿ Zvogelo numrin e SSID.

Meqenese AP leshon ato qe quhen “beacon” fener zinjalizimi. Ai mban brenda SSID, RadioName, rate etj. Sa me shume SSID qe kemi, aq me shume vonohet AP.

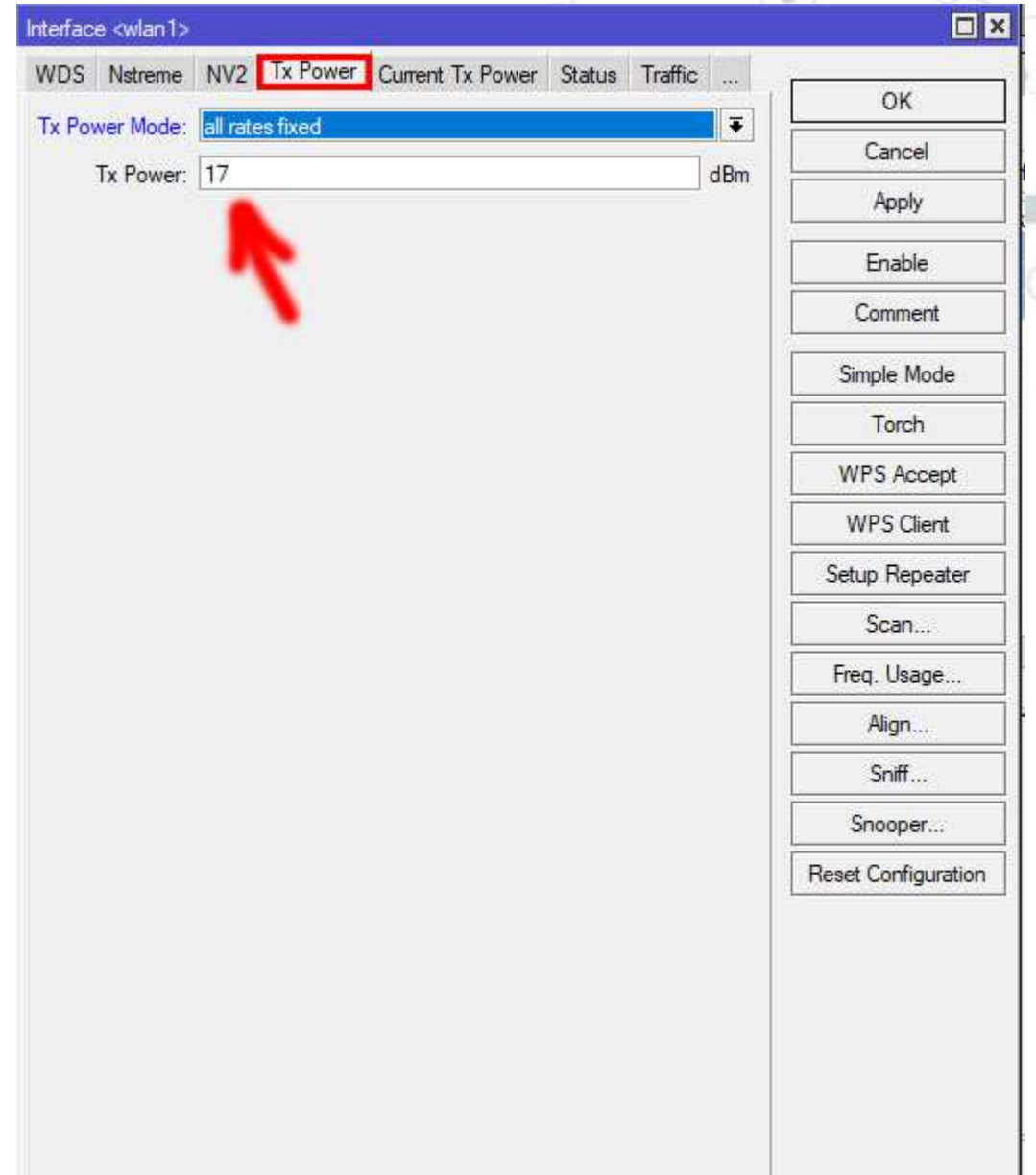
Interferencat/zhurmat

Eleminimi

⦿ UI fuqine e 2.4 GHZ me 6-9 dB

Tek Interface/Advanced Mode/Tx Power-All Rates

Fixed ose CapsMAN/Interface/Channel/TxPower



Interferencat/zhurmat

The screenshot displays the Mikrotik WinBox interface. On the left is a vertical menu with categories like Quick Set, CAPsMAN, Interfaces, Wireless, Bridge, PPP, Switch, Mesh, IP, MPLS, Routing, System, Queues, Files, Log, Radius, Tools, New Terminal, MetaROUTER, Partition, Make Supout.rf, Manual, New WinBox, and Exit. The main area is divided into several panes. The top pane shows 'CAPsMAN' with sub-tabs for CAP Interface, Provisioning, Configurations, Channels, and D. Below this is a table of CAP interfaces:

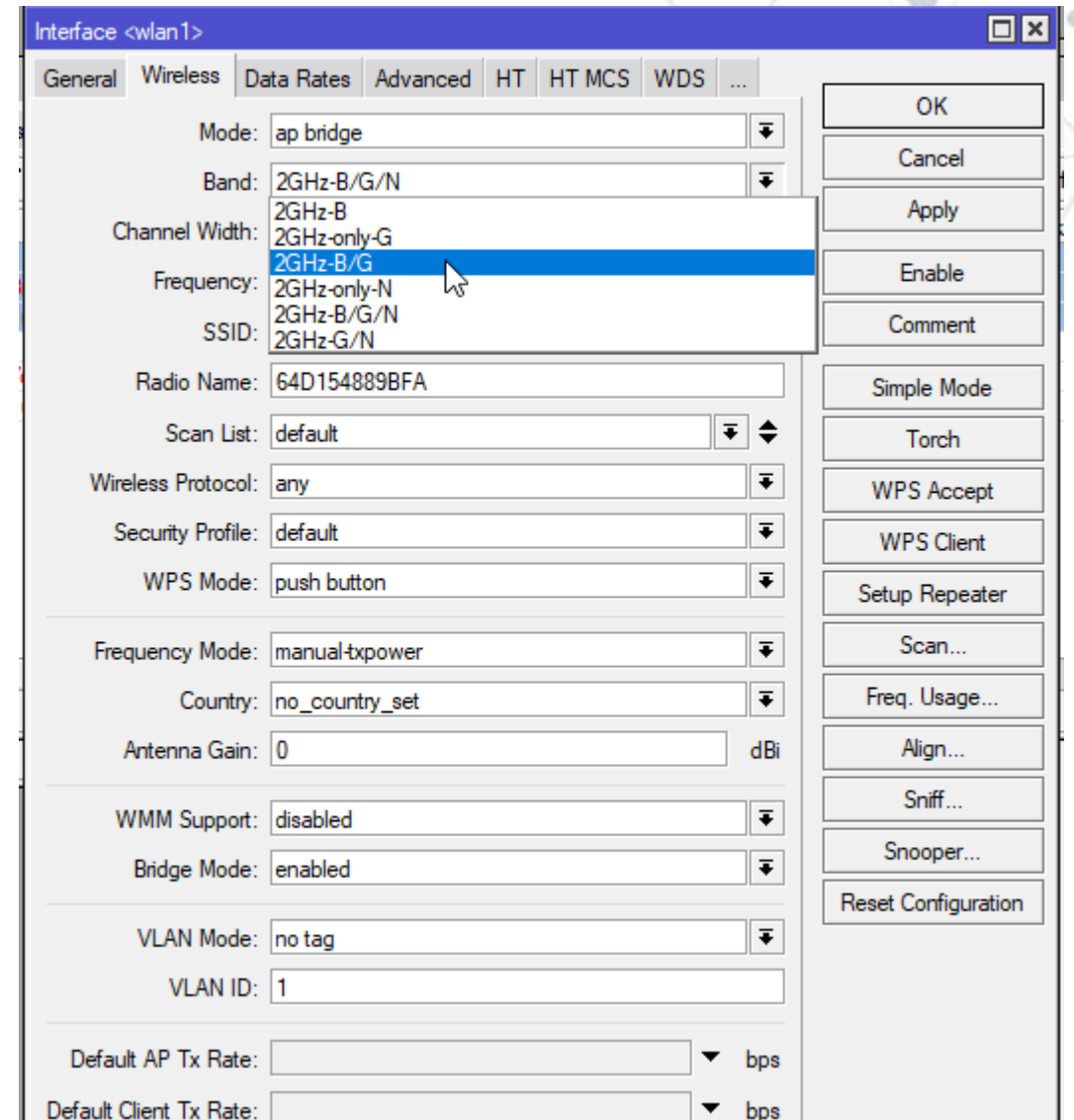
	Name	Type	MTU
RSMB	HoTi-1	CAP Interface	1
RSMB	HoTi-2	CAP Interface	1
SMB	HotiNew-1	CAP Interface	1
SMB	HotiNew-2	CAP Interface	1

The 'HotiNew-2' interface is selected. A red arrow points from the 'HotiNew-2' row in the table to the 'Interface <HotiNew-2>' configuration window. This window has tabs for General, Wireless, Channel, Rates, Datapath, Security, Status, and Traffic. The 'Channel' tab is active, showing fields for Channel, Frequency, Control Channel Width, Band, Extension Channel, Tx Power, Save Selected, Reselect Interval, and Skip DFS Channels. A red arrow points to the 'Tx Power' field. On the right side of the configuration window are buttons for OK, Cancel, Apply, Disable, Comment, Copy, Remove, Torch, and Scan... At the bottom of the configuration window, there are status indicators: enabled, running, slave, master, bound, and inactive.

Interferencat/zhurmat

Eleminimi

- Hiq mundesine e perdorimit te 802.11b
Tek Interface/Wireless ose
CapsMAN/Configuration/Channel



The screenshot shows the Mikrotik WinBox configuration window for an interface named 'wlan1'. The 'Wireless' tab is active, and a dropdown menu is open for the 'Channel Width' field. The menu options are: 2GHz-B, 2GHz-only-G (highlighted), 2GHz-B/G, 2GHz-only-N, 2GHz-B/G/N, and 2GHz-G/N. Other configuration fields include: Mode: ap bridge; Band: 2GHz-B/G/N; Frequency: 2GHz-B/G/N; SSID: (empty); Radio Name: 64D154889BFA; Scan List: default; Wireless Protocol: any; Security Profile: default; WPS Mode: push button; Frequency Mode: manual-txpower; Country: no_country_set; Antenna Gain: 0 dBi; WMM Support: disabled; Bridge Mode: enabled; VLAN Mode: no tag; VLAN ID: 1; Default AP Tx Rate: (empty) bps; Default Client Tx Rate: (empty) bps. The right sidebar contains buttons for OK, Cancel, Apply, Enable, Comment, Simple Mode, Torch, WPS Accept, WPS Client, Setup Repeater, Scan..., Freq. Usage..., Align..., Sniff..., Snooper..., and Reset Configuration.

Interferencat/zhurmat

Safe Mode Session: [REDACTED]

Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.tif
Manual
New WinBox
Exit

Provisioning Configurations Char

Name	SSID
cfg1	Ho Ti
cfg2	Ho Ti (5GHZ)

2 items (1 selected)

channel: 5180/20-Cee
XS wlan2

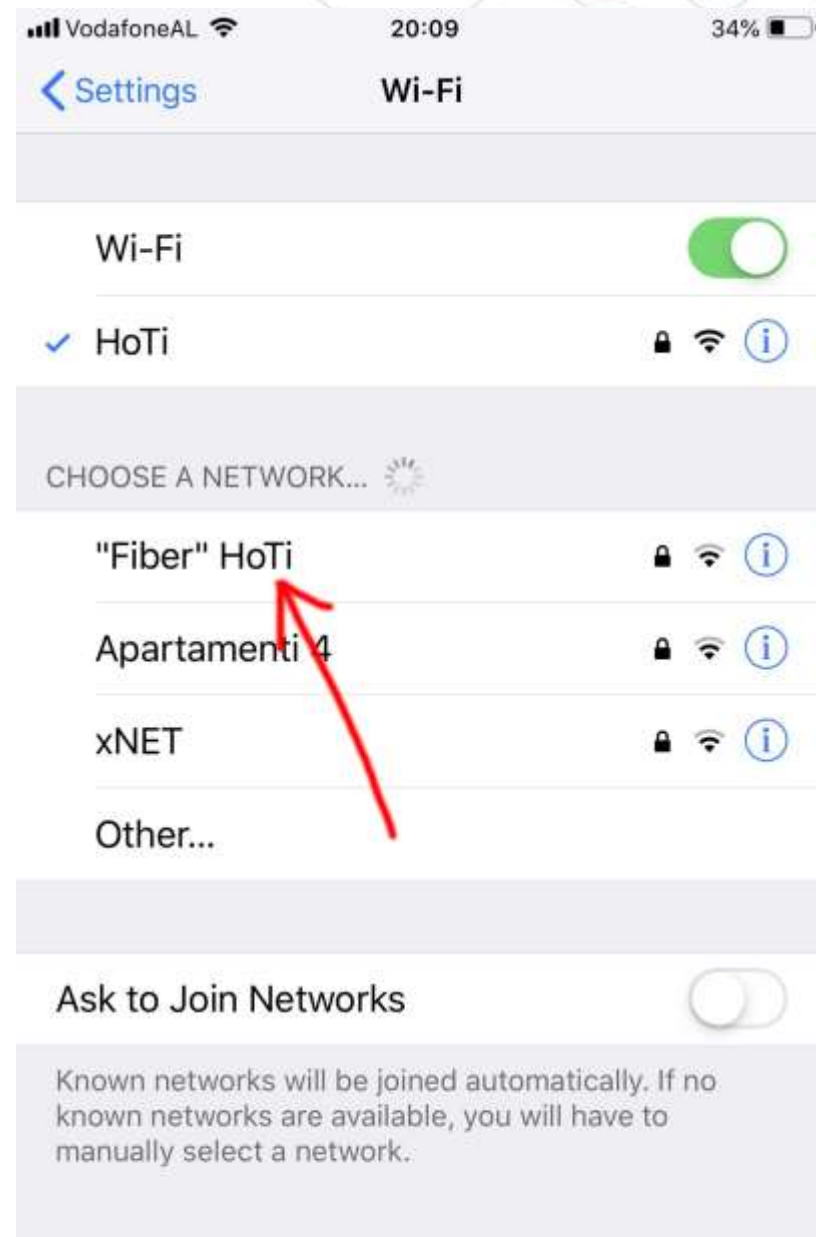
CAPs Configuration <cfg2>

Wireless Channel Rates Datapath Security

Channel: []
Frequency: []
Control Channel Width: []
Band: 2ghz-b
Extension Channel: 2ghz-b/g
Tx Power: 2ghz-b/g/n
Save Selected: 2ghz-g/n
Reselect Interval: 2ghz-onlyg
Skip DFS Channels: 2ghz-onlyn
5ghz-a
5ghz-a/n
5ghz-a/n/ac
5ghz-onlyac
5ghz-onlyn

OK
Cancel
Apply
Comment
Copy
Remove

⦿ Perdor SSID te ndryshme per 2.4GHZ dhe per 5GHZ



Interferencat/zhurmat

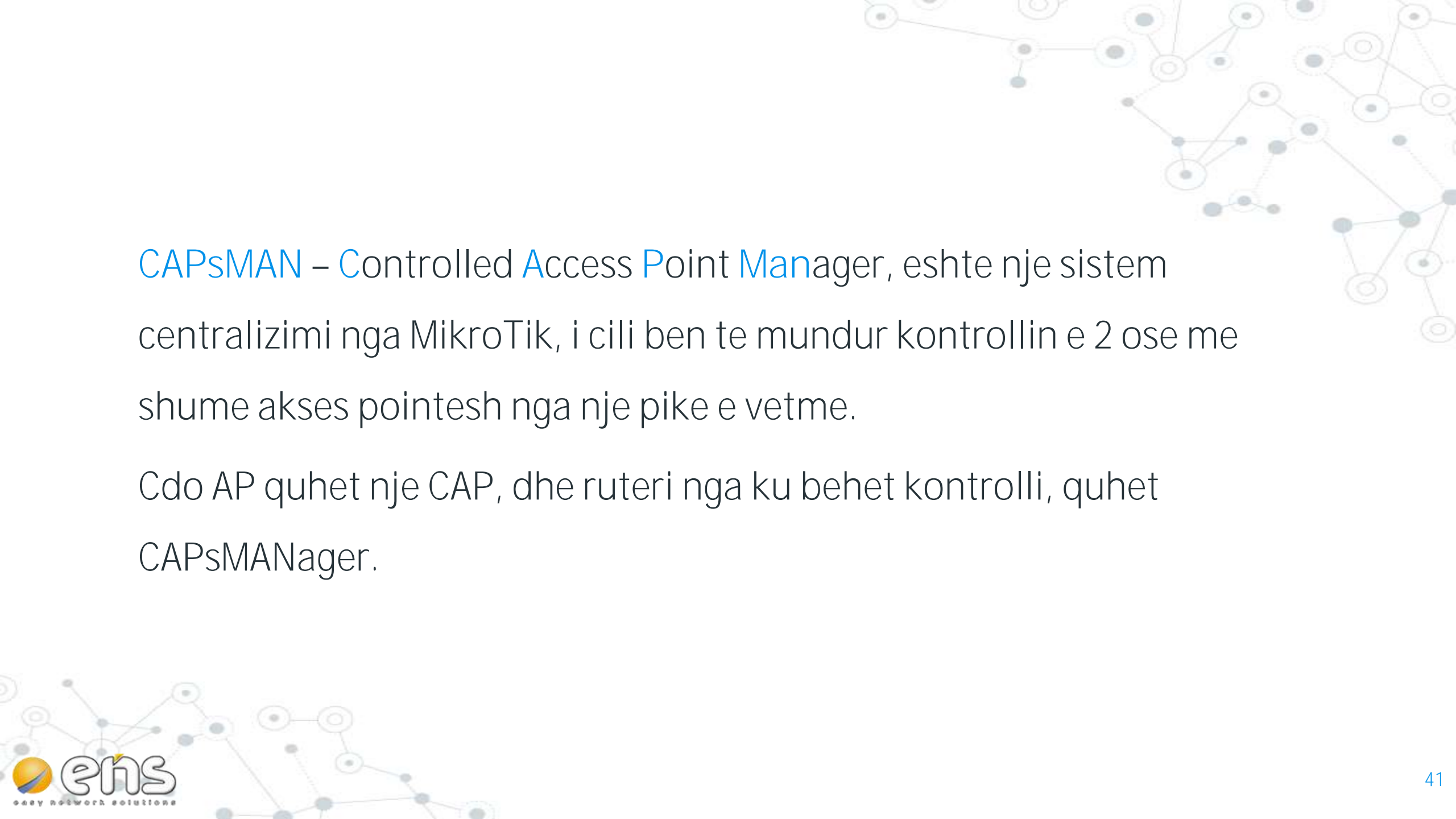
Eleminimi

- ⦿ Mundohu te vendosesh izolim midis antenave (mure, trare, etj)
- ⦿ Zgjidh antenat e AP, mos perdor vetem omni.
- ⦿ Perdor gjithmone “Scan”, per te pasur te qarte se cfare AP te tjera degjohen nga AP ne fjale.

A background network diagram consisting of various nodes (circles) connected by lines, representing a network topology. The nodes are of different sizes and some are highlighted with a blue glow. The diagram is positioned in the top-left and bottom-right corners of the slide.

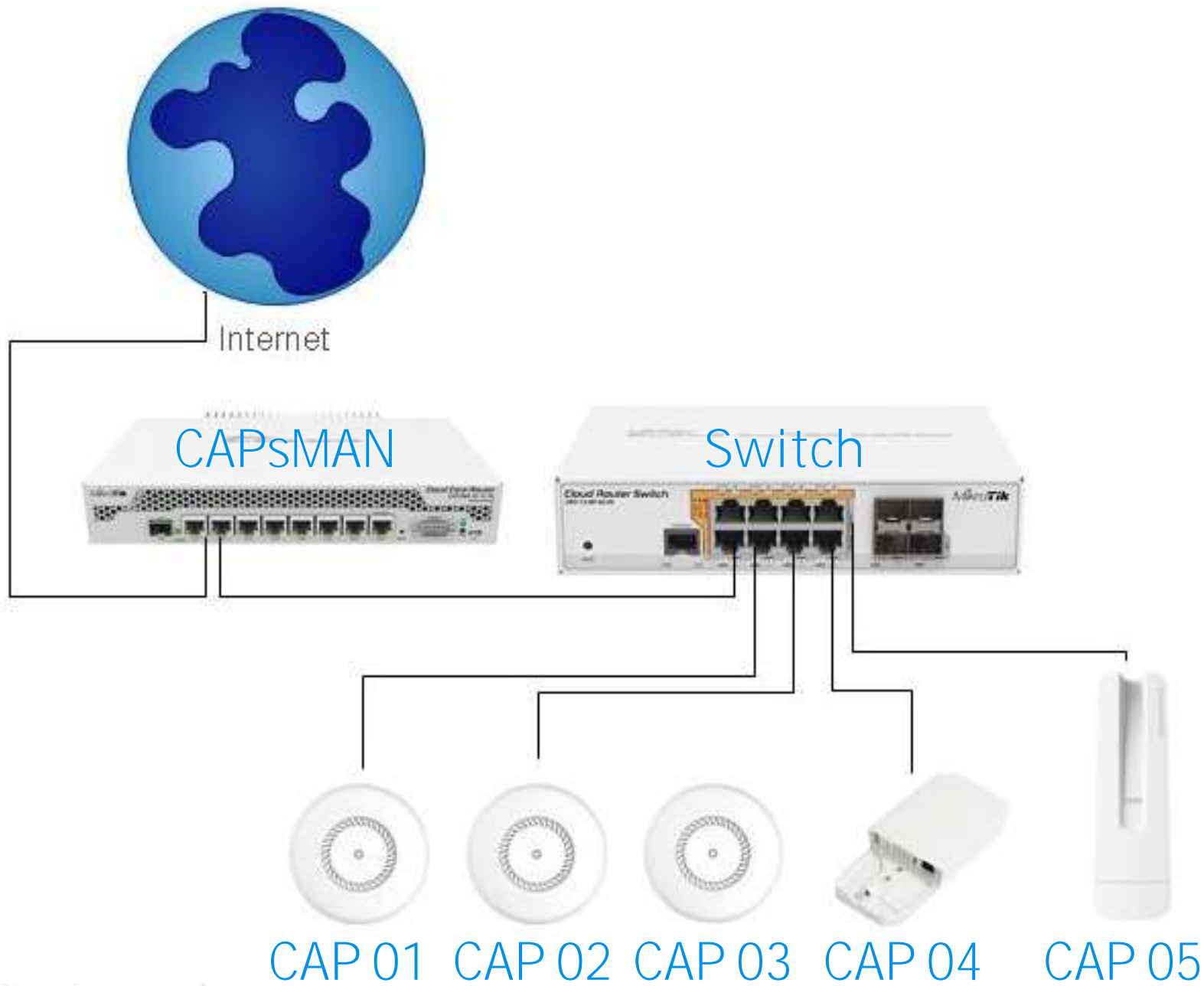
2.

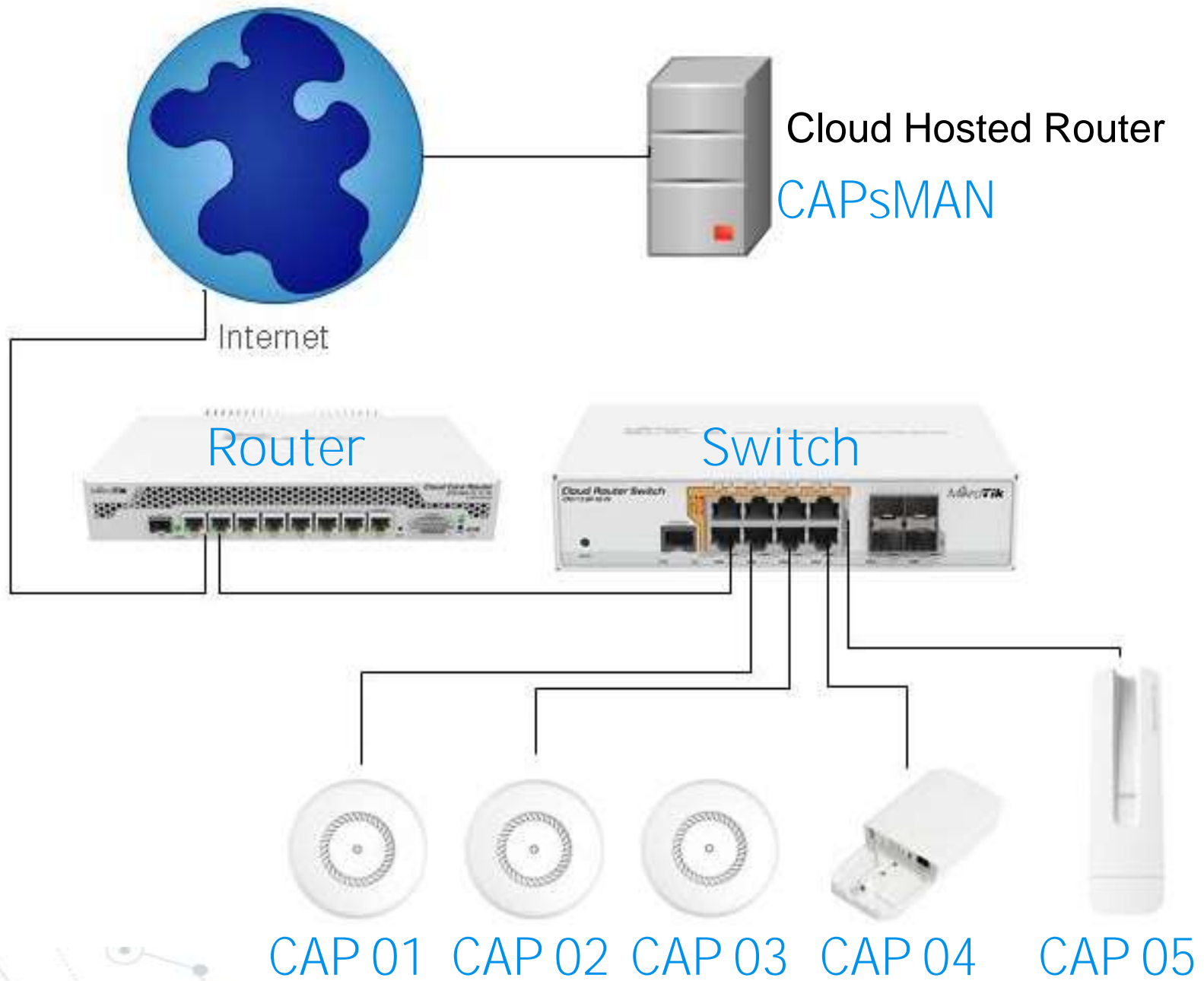
Konfigurimi i CAPsMAN

A decorative background consisting of a network diagram with various nodes and connecting lines, primarily located in the top right and bottom left corners.

CAPsMAN – Controlled Access Point Manager, është një sistem centralizimi nga MikroTik, i cili ben te mundur kontrollin e 2 ose me shume akses pointesh nga nje pike e vetme.

Cdo AP quhet nje CAP, dhe ruteri nga ku behet kontrolli, quhet CAPsMANager.





CAPsMAN – Per 5 minuta

- ⦿ Ruteri qe do perdorim pretendohet qe ka konfigurimin minimal si akses ne internet dhe masquerade.
- ⦿ Krijohet nje “bridge” qe do te sherbeje si interface ku do te futen kartat wireless te CAPs. E riemertojme p.sh: BridgeCAPS.
- ⦿ I vendoset ketij “bridge” nje IP e cila do te sherbeje si gateway per klientet e rrjetit wifi.
- ⦿ Ngrihet nje server DHCP tek interface “BridgeCAPS”

min@ (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session:

RouterOS WinBox

- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- IPv6
- MPLS
- OpenFlow
- Routing
- System
- Queues
- Files
- Log
- Radius
- Tools
- New Terminal
- TR069
- MetaROUTER
- Partition
- Make Supout.rtf
- Manual
- New WinBox
- Exit

Bridge Ports VLANs MSTIs

Name	Type
bridge1	Bridge

1 item out of 8

New Interface

General STP VLAN Status Traffic

Name: bridgeCAPS

Type: Bridge

MTU:

Actual MTU:

L2 MTU:

MAC Address:

ARP: enabled

ARP Timeout:

Admin. MAC Address:

Ageing Time: 00:05:00

IGMP Snooping

DHCP Snooping

Fast Forward

OK Cancel Apply Disable Comment Copy Remove Torch

enabled running slave

RouterOS WinBox (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh

IP
IPv6
MPLS
OpenFlow
Routing 1
System
Queues
Files
Log
Radius
Tools
New Terminal
TR069
MetaROUTER
Partition
Make Supout.rtf
Manual
New WinBox
Exit

ARP
Accounting
Addresses 2
Cloud
DHCP Client
DHCP Relay
DHCP Server
DNS
Firewall
Hotspot
IPsec
Kid Control
Neighbors
Packing
Pool
Routes
SMB
SNMP
Services

Bridge

Bridge	Ports	VLANs	MSTIs	Port MST Overrides	Filters
+	-	✓	✗	📄	🔍
Settings					
Name	Type	L2 MTU	Type		
R bridge1	Bridge	1598			
R bridgeCAPS	Bridge	65535			

New Address

Address: 192.168.8.1/23 3
Network: [Dropdown]
Interface: bridgeCAPS 4
OK 5
Cancel
Apply
Disable
Comment
Copy
Remove

Address List

Address	Network	Interface
D 192.168.2.42/... 1	192.168.2.0	bridge1

enabled

1 item

WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [redacted]

RouterOS WinBox

- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- IPv6
- MPLS
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- New Terminal
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- Manual
- New WinBox
- Exit

DHCP Server

DHCP Networks Leases Options Option Sets Alerts

DHCP Config DHCP Setup

Name	Interface	Relay	Lease Time	Address Pool	Add AR...
2 items					

DHCP Setup

Select interface to run DHCP server on

DHCP Server Interface: bridgeCAPS

Back Next Cancel

1

2

3

4

5

CAPsMAN – Per 5 minuta

- ◎ Shkojme tek Capsman, dhe tek Tab “Security”, vendosim te dhenat e tipit te enkriptimit dhe passwordin qe do te perdorin klientet.
- ◎ Tek Tab “Datapath”, vendosim cila do jete rruga qe do perdorin te dhenat tona. Zgjedhim bridge: BridgeCAPS.
- ◎ Tek Tab “Configurations”, shtojme nje konfigurim te ri, dhe fusim opsionet: AP, SSID. Nuk i japim OK.
- ◎ Tek Tab “Datapath” I dritares “new CAPs Configuration”, zgjedhim “bridgeCAPS”, dhe tek “Security” zgjedhim profilin “security1”. Japim “OK”.

WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

1 CAPsMAN

2 Security Cfg.

3 Authentication Type: WPA PSK WPA2 PSK

4 Passphrase: 12345678

5 OK

WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

Quick Set
CAPsMAN
Interfaces
Wireless
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Manual
New WinBox

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. A

+ - [Filter] [Refresh]

Name	Bridge	OpenFlow Sw...	Local For...	Client To ...	VLAN M...
0 items					

New CAPs Datapath Configuration

3 Name: datapath1 [OK] [Cancel] [Apply] [Comment] [Copy] [Remove]

MTU: []

L2 MTU: []

ARP: []

Bridge: bridge1 []

Bridge Cost: bridge1

Bridge Horizon: [] 4

OpenFlow Switch: []

Local Forwarding: []

Client To Client Forwarding: []

VLAN Mode: []

VLAN ID: []

Interface List: []

1

2

5

RouterOS WinBox (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
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Partition
Make Supout.rtf
Manual
New WinBox
Exit

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access

Name	SSID	Hide SSID	Load Bal...	Country	Channel
0 items					

New CAPs Configuration

Wireless Channel Rates Datapath ...

Name:

Mode:

SSID:

Hide SSID:

Load Balancing Group:

Distance:

Hw. Retries:

Hw. Protection Mode:

Frame Lifetime:

Disconnect Timeout:

Keepalive Frames:

Country:

Max Station Count:

Multicast Helper:

HT Tx Chains:

HT Rx Chains:

HT Guard Interval:

OK
Cancel
Apply
Comment
Copy
Remove

- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- IPv6
- MPLS
- OpenFlow
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- New Terminal
- TR069
- MetaROUTER
- Partition
- Make Supout.rif
- Manual
- New WinBox
- Exit

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access

Name	SSID	Hide SSID	Load Bal...	Country	Channel
0 items					

New CAPs Configuration

Channel Rates Datapath Security ...

1 Datapath: datapath1

MTU: []

L2 MTU: []

ARP: []

Bridge: []

Bridge Cost: []

Bridge Horizon: []

OpenFlow Switch: []

2 Local Forwarding:

Client To Client Forwarding:

VLAN Mode: []

VLAN ID: []

Interface List: []

OK Cancel Apply Comment Copy Remove

3

1

2

RouterOS WinBox (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

Quick Set
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Tools
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TR069
MetaROUTER
Partition
Make Supout.rif
Manual
New WinBox
Exit

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access

Name	SSID	Hide SSID	Load Bal...	Country	Channel
0 items					

New CAPs Configuration

Channel Rates Datapath Security ...

Security: security1

Authentication Type: [Dropdown]
Encryption: [Dropdown]
Group Encryption: [Dropdown]
Group Key Update: [Dropdown]
Passphrase: [Dropdown]
Disable PMKID: [Dropdown]
EAP Methods: [Dropdown]
EAP Radius Accounting: [Dropdown]
TLS Mode: [Dropdown]
TLS Certificate: [Dropdown]

OK
Cancel
Apply
Comment
Copy
Remove

CAPsMAN – Per 5 minuta

- ⦿ Ne dritaren kryesore “Capsman” shkojme tek **tab “Provisioning”**, dhe vendosim te dhenat: Action: create enabled, Master configuration: cfg1
- ⦿ Tek tab “Cap Interface”, klikojme “Manager”:Enabled, dhe japim OK.

- Quick Set
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- Partition
- Make Supout.rtf
- Manual
- New WinBox
- Fvit

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access List Rates Remote CAP Radio Registration Table

Radio MAC Identity Regexp Comm

0 items

New CAPs Provisioning

Radio MAC: 00:00:00:00:00:00

Hw. Supported Modes:

Identity Regexp:

Common Name Regexp:

IP Address Ranges:

Action: create enabled

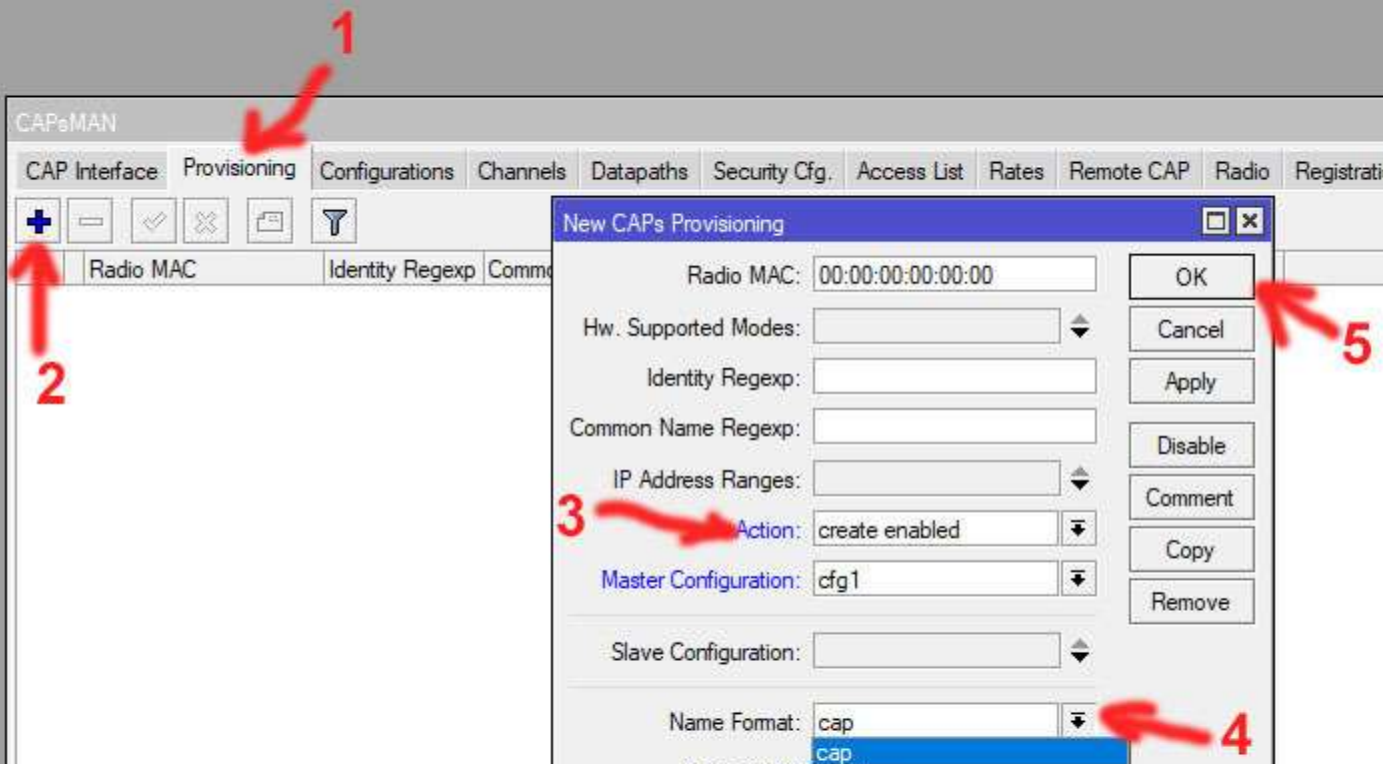
Master Configuration: cfg1

Slave Configuration:

Name Format: cap

Name Prefix: identity, prefix, prefix identity

OK, Cancel, Apply, Disable, Comment, Copy, Remove



RouterOS WinBox (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

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CAPsMAN

CAP Interface Provisioning Configurations Channels Datapath Security Cfg. Access List Rates Remote CAP Radio Registration Table

+ - [Icons] Reselect Channel Manager AAA Find

Name	Type	Tx Packet (p/s)
0 items out of 9		

CAPs Manager

3 → Enabled

Certificate: [Dropdown]

CA Certificate: [Dropdown]

Require Peer Certificate

Generated Certificate: [Text]

Generated CA Certificate: [Text]

Package Path: [Text]

Upgrade Policy: none [Dropdown]

OK Cancel Apply Interfaces

4 →

CAPsMAN – Per 5 minuta

- ⦿ Nese ruteri ku po konfigurojme CAPsMAN ka karta wireless, atehere edhe keto karta mund te futen ne konfigurimin CAPsMAN.
- ⦿ Ne kete rast, shkojme tek Wireless, dhe shtypim butonin CAP. Vendosim opsionet si ne figure.
- ⦿ Pamja perfundimtare do te jete si ne figuren ne faqen nr.59
- ⦿ Bejme dy hapat e fundit tek te gjitha CAP.

RouterOS WinBox (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

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Wireless Tables

WiFi Interfaces W60G Station Nstreme Du Access List Registration Connect List Security Profiles Channels

+ - [] [] [] [] CAP WPS Client Setup Repeater Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper Find

Name	Type	Actual MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	
XS					0 bps	0	0	0 bps
XS					0 bps	0	0	0 bps

CAP

Enabled

Interfaces: wlan1
wlan2

Certificate: none

Discovery Interfaces: ether2

Lock To CAPsMAN

CAPsMAN Addresses: []

CAPsMAN Names: []

CAPsMAN Certificate Common Names: []

Bridge: none

Static Virtual

Requested Certificate: []

Locked CAPsMAN Common Name: []

OK Cancel Apply

RouterOS WinBox

Session Settings Dashboard

Safe Mode Session: [REDACTED]

Quick Set
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Exit

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access List Rates Remote CAP Radio Registration Table

+ - [Icons] Reselect Channel Manager AAA Find

	Name	Type	MTU	Actual MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)
SMB	MUM_CAPsMAN-1	CAP Interface	1500	1500	1600		0 bps	0 bps
SMB	MUM_CAPsMAN-2	CAP Interface	1500	1500	1600		0 bps	0 bps

Wireless Tables

WiFi Interfaces W60G Station Nstreme Dual Access List Registration Connect List Security Profiles Channels

+ - [Icons] CAP WPS Client Setup Repeater Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper Find

	Name	Type	Actual MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	
	-- managed by CAPsMAN								
	-- channel: 2447/20-eC/gn(30dBm), SSID: MUM_ens, CAPsMAN forwarding								
XS	wlan1	Wireless (Atheros AR9...	1500		0 bps	0 bps	0	0	
	-- managed by CAPsMAN								
	-- channel: 5785/20-eeCe/ac(30dBm), SSID: MUM_ens, CAPsMAN forwarding								
XS	wlan2	Wireless (Atheros AR9...	1500		0 bps	0 bps	0	0	

2 items out of 11

Me shume

- Shkeputja automatike e klienteve me sinjal te ulet
/caps-man access-list

```
add action=accept interface=all signal-range=-80..120
```

```
add action=reject interface=all signal-range=-120..-81
```

#	MAC Address	MAC Mask	Interface	Signal Range	Action	Client To Clie...	VLAN Mo...	VLAN ID
0			all	-80..120	accept			
1			all	-120..-81	reject			

⊙ Vendosja e kanaleve

Session Settings Dashboard

Safe Mode Session: [REDACTED]

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CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access List Rates Remote CAP Radio Registration Table

+ - [REDACTED] Find

Name	Frequency	Control Channel ...	Band	Extension Channel	Tx Power
Kanali 01	2412		2ghz-g/n		
Kanali 06	2437		2ghz-g/n		
Kanali 11	2462		2ghz-g/n		

CAPs Channel <Kanali 01>

Name: Kanali 01 OK
Frequency: 2412 Cancel
Control Channel Width: Apply
Band: 2ghz-g/n Comment
Extension Channel: Copy
Tx Power: Remove
Save Selected:
Reselect Interval:
Skip DFS Channels:

CAPs Channel <Kanali 06>

Name: Kanali 06 OK
Frequency: 2437 Cancel
Control Channel Width: Apply
Band: 2ghz-g/n Comment
Extension Channel: Copy
Tx Power: Remove
Save Selected:
Reselect Interval:
Skip DFS Channels:

CAPs Channel <Kanali 11>

Name: Kanali 11 OK
Frequency: 2462 Cancel
Control Channel Width: Apply
Band: 2ghz-g/n Comment
Extension Channel: Copy
Tx Power: Remove
Save Selected:
Reselect Interval:
Skip DFS Channels:

iterOS WinBox

h@ (MUM_CAPsMAN) - WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

RouterOS WinBox

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CAPsMAN

CAP Interface Provisioning Configurations

Name	Type
MUM_CAPsMAN-1	CAP Interf
MUM_CAPsMAN-2	CAP Interf

2 items out of 11 (1 selected)

Interface <MUM_CAPsMAN-1>

General Wireless Channel Rates Datapath Security Status Traffic

Channel: Kanali 01
Kanali 01
Kanali 06
Kanali 11

Frequency:

Control Channel Width:

Band:

Extension Channel:

Tx Power:

Save Selected:

Reselect Interval:

Skip DFS Channels:

OK
Cancel
Apply
Disable
Comment
Copy
Remove
Torch
Scan...
Reselect Channel

et (p/s)	Rx Pack
0	0

enabled running slave master bound inactive

© Vendorsja e disa konfigurimeve

WinBox v6.43.2 on hAP ac lite (mipsbe)

Session Settings Dashboard

Safe Mode Session: [REDACTED]

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CAPsMAN

Provisioning Configurations

Name	SSID
cfg1	MUM_er
cfg2	HIGH SP

2 items (1 selected)

CAPs Configuration <cfg2>

Wireless Channel Rates Datapath Security

Name:

Mode:

SSID:

Hide SSID:

Load Balancing Group:

Distance:

Hw. Retries:

Hw. Protection Mode:

Frame Lifetime:

Disconnect Timeout:

Keepalive Frames:

Country:

Max Station Count:

Multicast Helper:

HT Tx Chains:

HT Rx Chains:

HT Guard Interval:

OK
Cancel
Apply
Comment
Copy
Remove

© Vendorsja e disa konfigurimeve

The screenshot displays the Mikrotik WinBox v6.43.2 interface. The main window is titled "Interface <MUM_CAPsMAN-1>". The left sidebar shows a navigation tree with "CAPsMAN" selected. The main panel is divided into "CAP Interface", "Provisioning", and "Configurations" tabs. The "Configurations" tab shows a table with two entries: "MUM_CAPsMAN-1" and "MUM_CAPsMAN-2". A red arrow labeled "1" points to the "MUM_CAPsMAN-1" entry. The "General" tab of the configuration window is active, showing a dropdown menu for "Configuration" with "cfg2" selected. A red arrow labeled "2" points to this dropdown. Another red arrow labeled "3" points to the "Apply" button on the right side of the configuration window. The "Wireless" tab is also visible, showing fields for "Mode" (set to "ap"), "SSID" (set to "HIGH SPEED_MUM_ens"), and "Country".

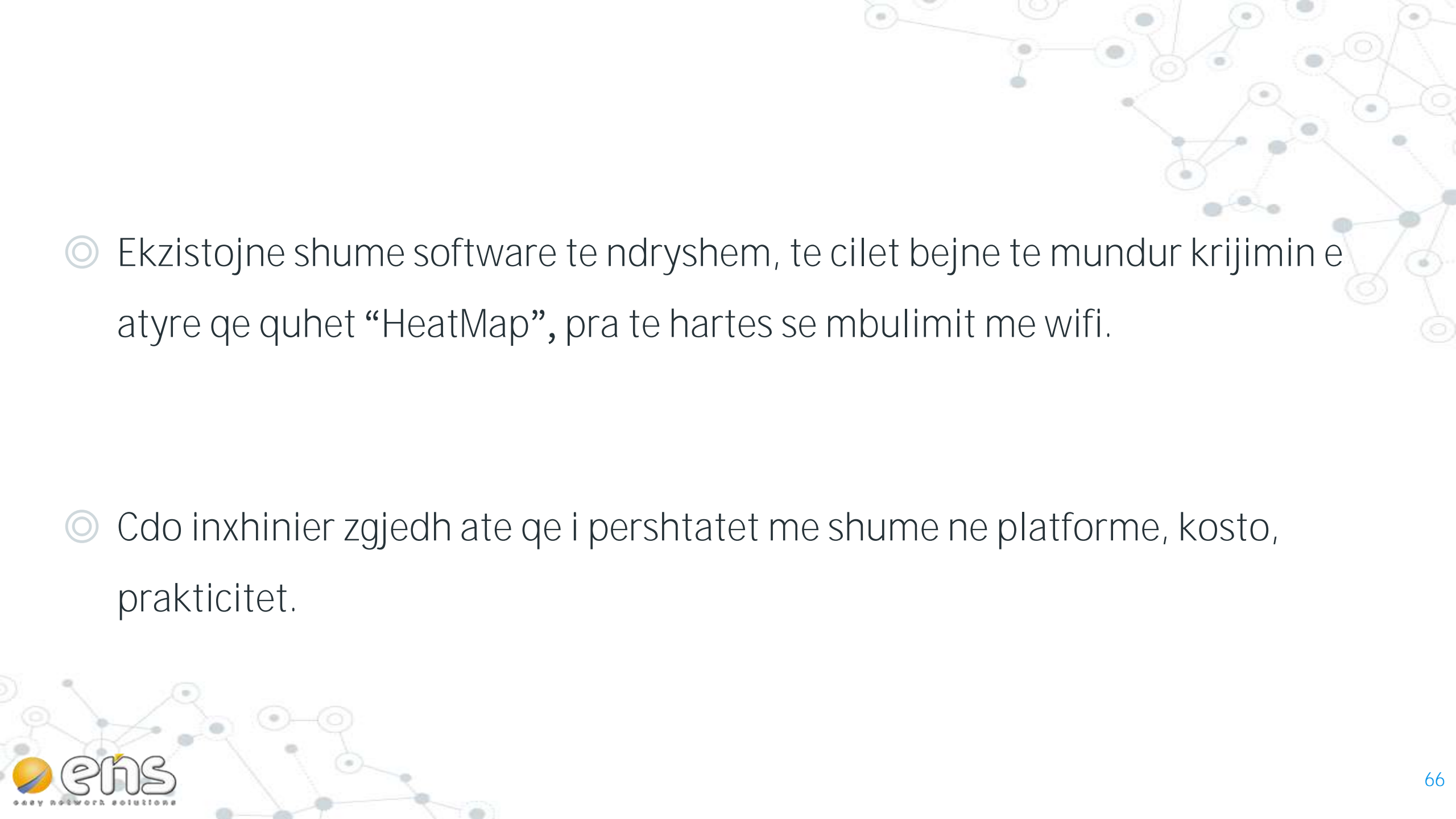
Name	Type
MUM_CAPsMAN-1	CAP Interface
MUM_CAPsMAN-2	CAP Interface

Configuration
cfg2
cfg1
cfg2
ap

A person wearing a blue and white plaid shirt is sitting at a desk, looking at several sheets of architectural blueprints. Their right hand is pointing at a specific area on the plans. In the background, another person's hands are visible typing on a laptop. The scene is brightly lit, suggesting an office or design studio environment.

3.

Monitorimi i mbulimit.

- 
- A decorative background consisting of a network diagram with various nodes and connecting lines, primarily located in the top right and bottom left corners.
- © Ekzistojne shume software te ndryshem, te cilet bejne te mundur krijimin e atyre qe quhet “HeatMap”, pra te hartes se mbulimit me wifi.
 - © Cdo inxhinier zgjedh ate qe i pershtatet me shume ne platforme, kosto, prakticitet.



© Mobile Testing Station

Laptop (Win ose MAC).
(Une perdor nje Lenovo Yoga 2 Pro)

Kootek AC 600Mbps USB Wireless
Dual Band - \$17.99

Premiertek 802.11a/b/g/n/ac Dual
Band - \$26.99

Kebidu 2.4+5 Ghz Wireless USB WiFi
Adapter 600Mbps - \$6.96

© NetSPOT (macOS 10.10+ ose Windows 7/8/10)

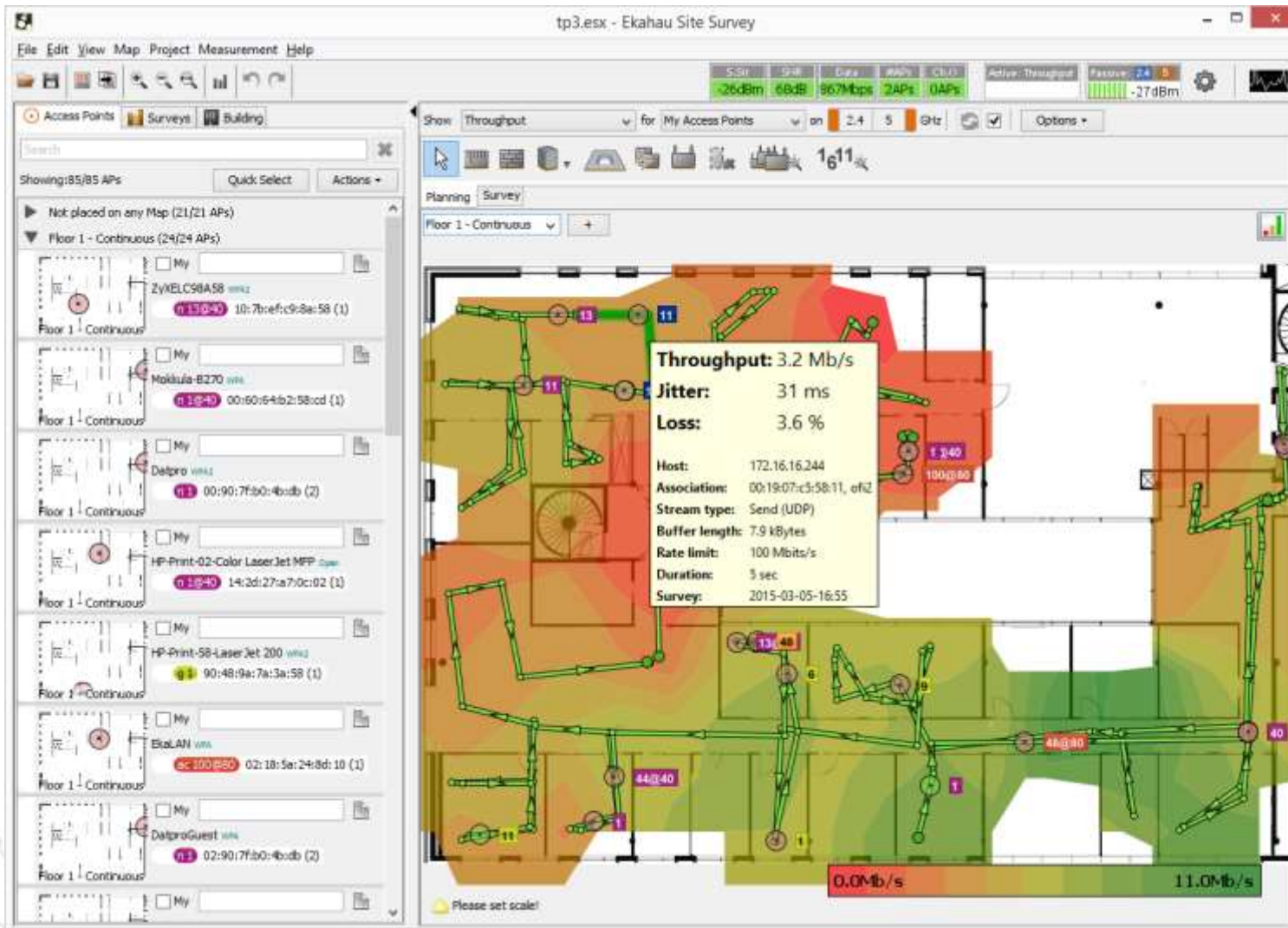


Versioni Home
49USD, 2 zona

Versioni PRO
149USD, 50 zona

Versioni Ent.
499USD, zona pa
limit

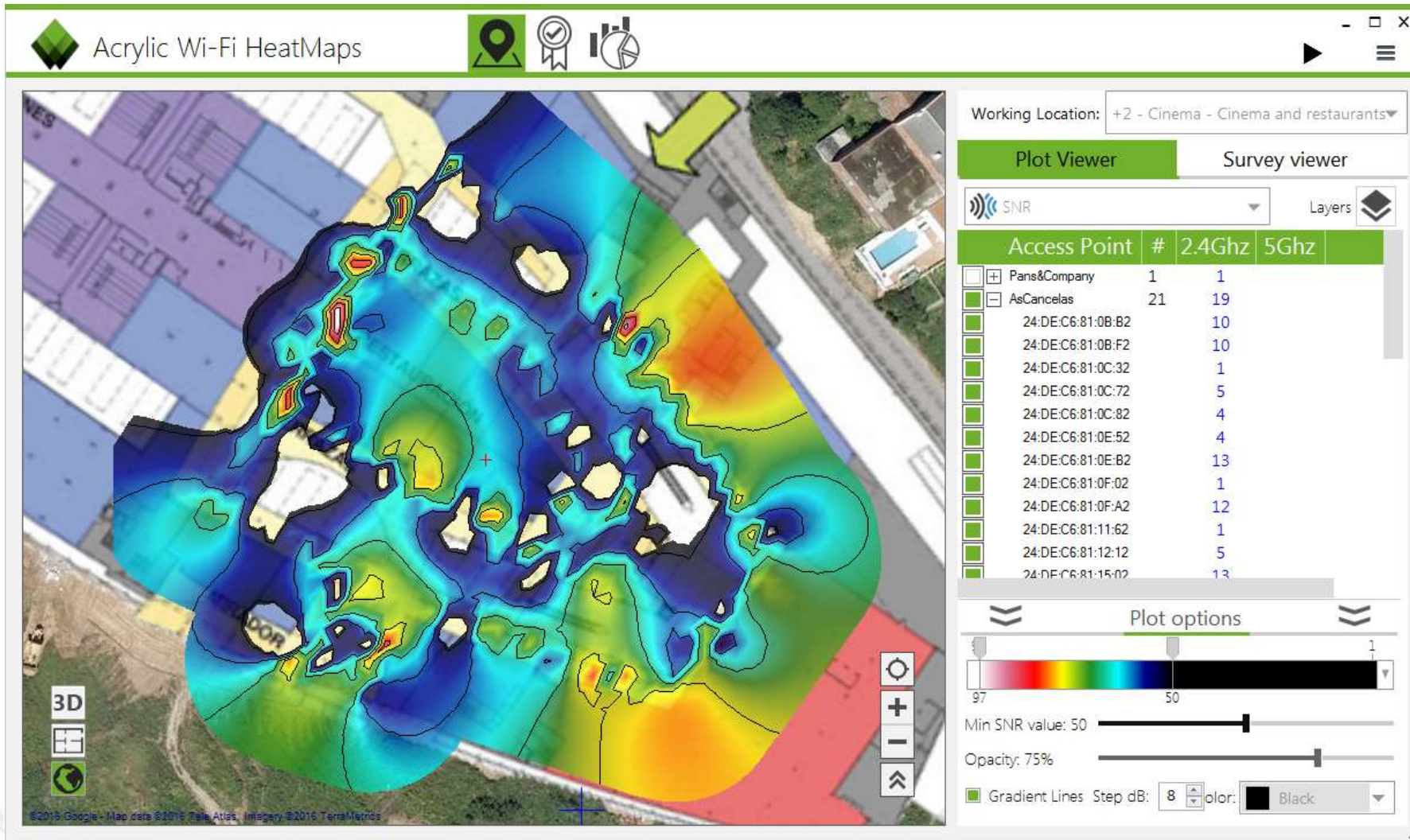
Ekahau HeatMapper (Windows 7/8/10)



Version i
shkarkueshem

FALAS

© Acrylic Wi-Fi Heatmaps (Windows 7/8/10)

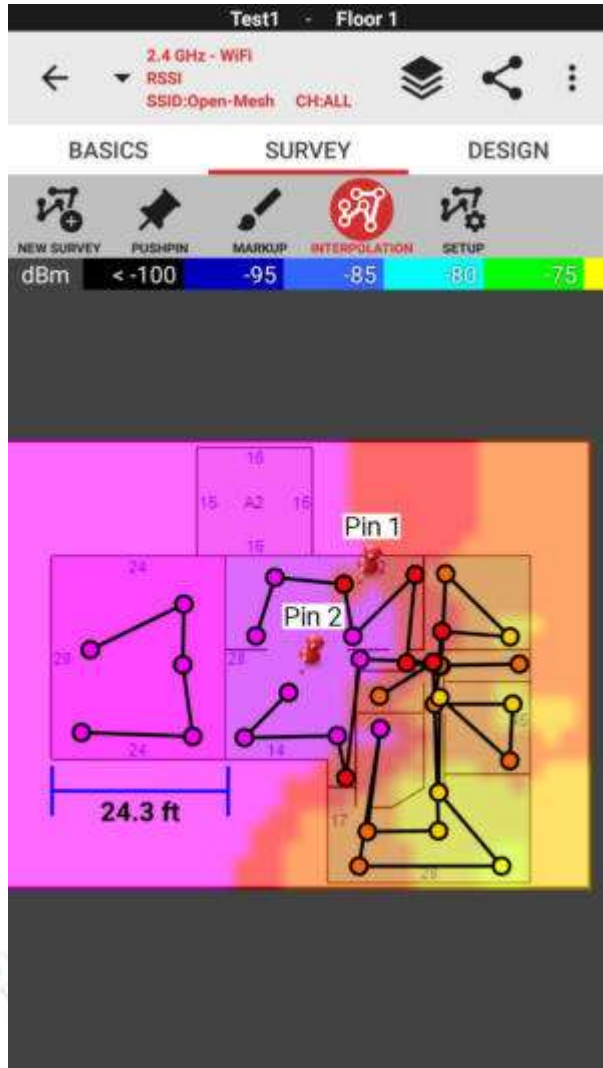


1 Muaj
129USD

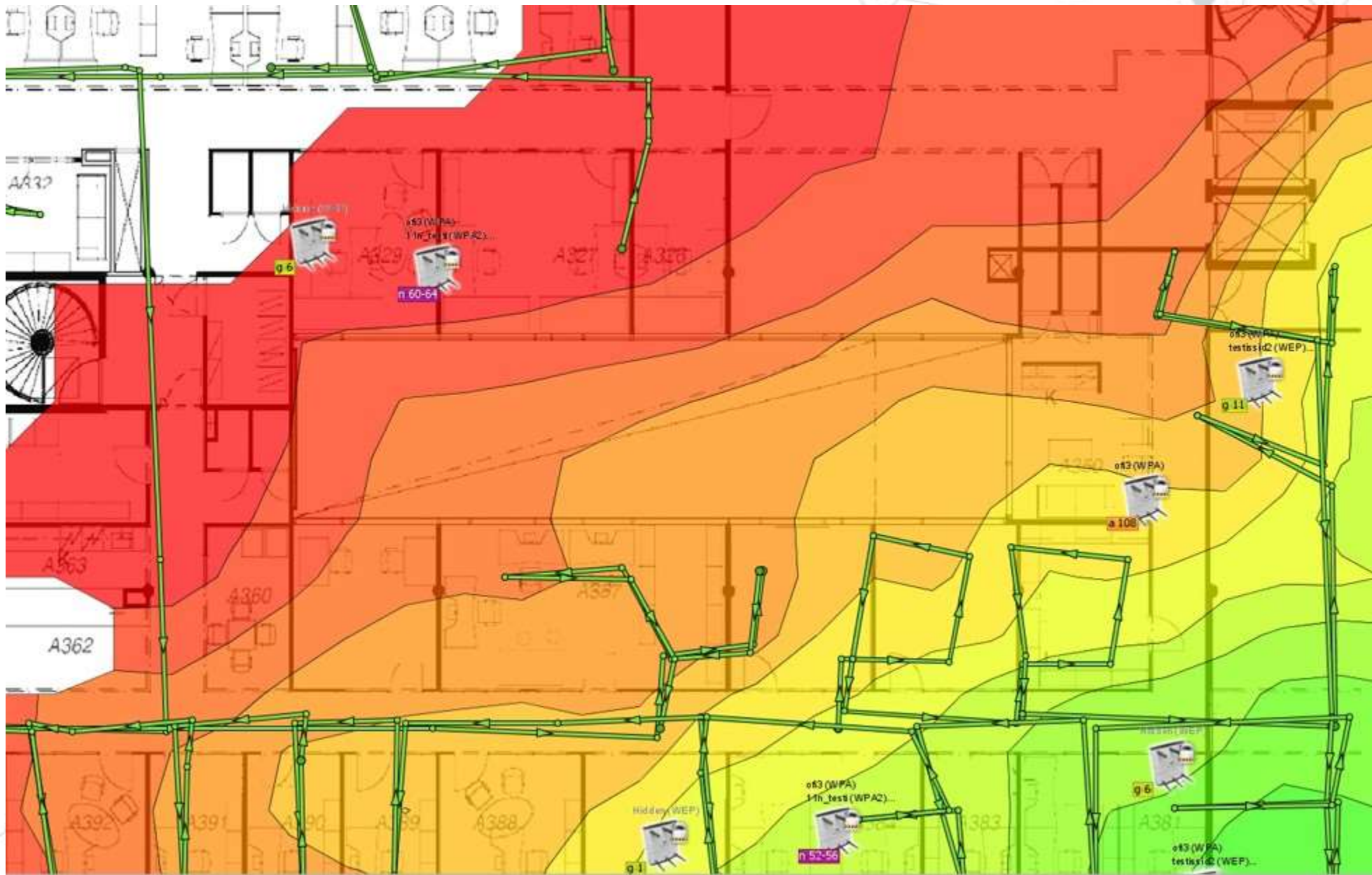
3 Muaj
325USD

Pergjithmone
2199USD

© iBwave Wi-Fi Mobile (android)
(625USD/3muaj)



© iMapper Wifi Pro (android)
(8USD)



Perfundimi?!?

Pas te gjitha ketyre shpresojme te kemi:

- © Rrjet LAN stabel, duke minimizuar defektet.
- © Rrjet Wireless homogjen dhe te shpejte.
- © Fatura te paguara.
- © Feedback te mire.

That's All Folks!

Pyetje?

Per cdo diskutim:
erioni@gmail.com

