

Mikrotik User Meeting in Jakarta, Indonesia

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October 14, 2016

Profile

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MTCNA, MTCRE, MTCINE, MTCUME,
MTCTCE, MTCWE

Mikrotik Since 2005 V 2.97

Activity

Bina Techindo Solution

<http://www.bitech.net.id/>

Ponpes Daar El-Qolam

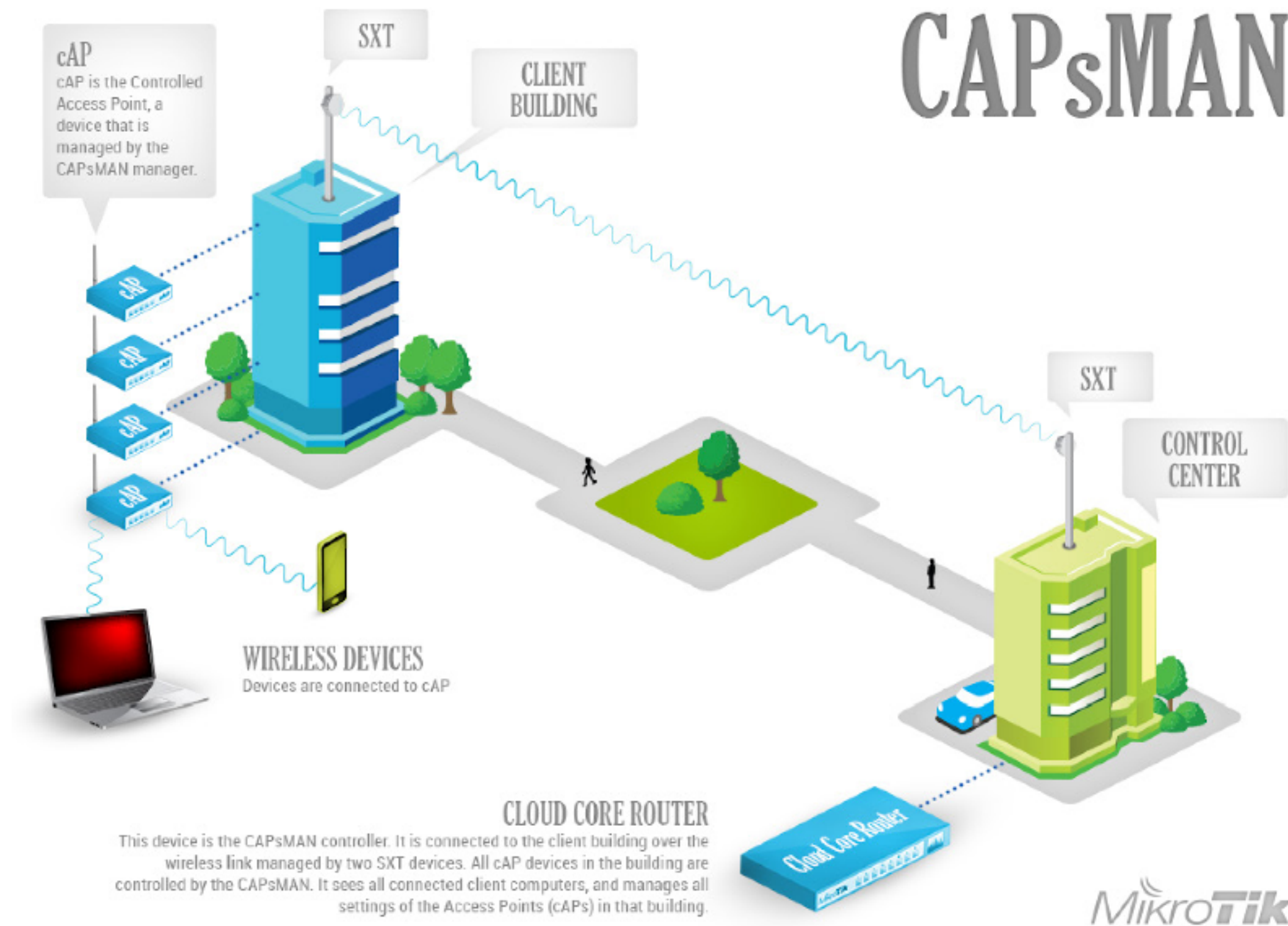
<http://www.daarelqolam3.sch.id/>

Ponpes Ar-Rahman

<http://www.arahmancidadap.com/>



CAPsMAN



Implementasi CAPsMAN di Sekolah

CAPsMAN overview

Apa itu CAPsMAN



CAPsMAN Definitions

- CAP (Controlled Access Point) yaitu Perangkat Akses Point yang konfigurasi nya di menej oleh CAPsMAN
- CAPsMAN (Controlled Access Point system Manager) yaitu Perangkat yang Mengatur CAP cofigurasi secara terpusat

CAPsMAN Features

- Central Management Access Points
- Radius MAC Authentication
- Manage Client Authentication
- Grouping Configuration
- Datapath Configuration
- Rate Configuration

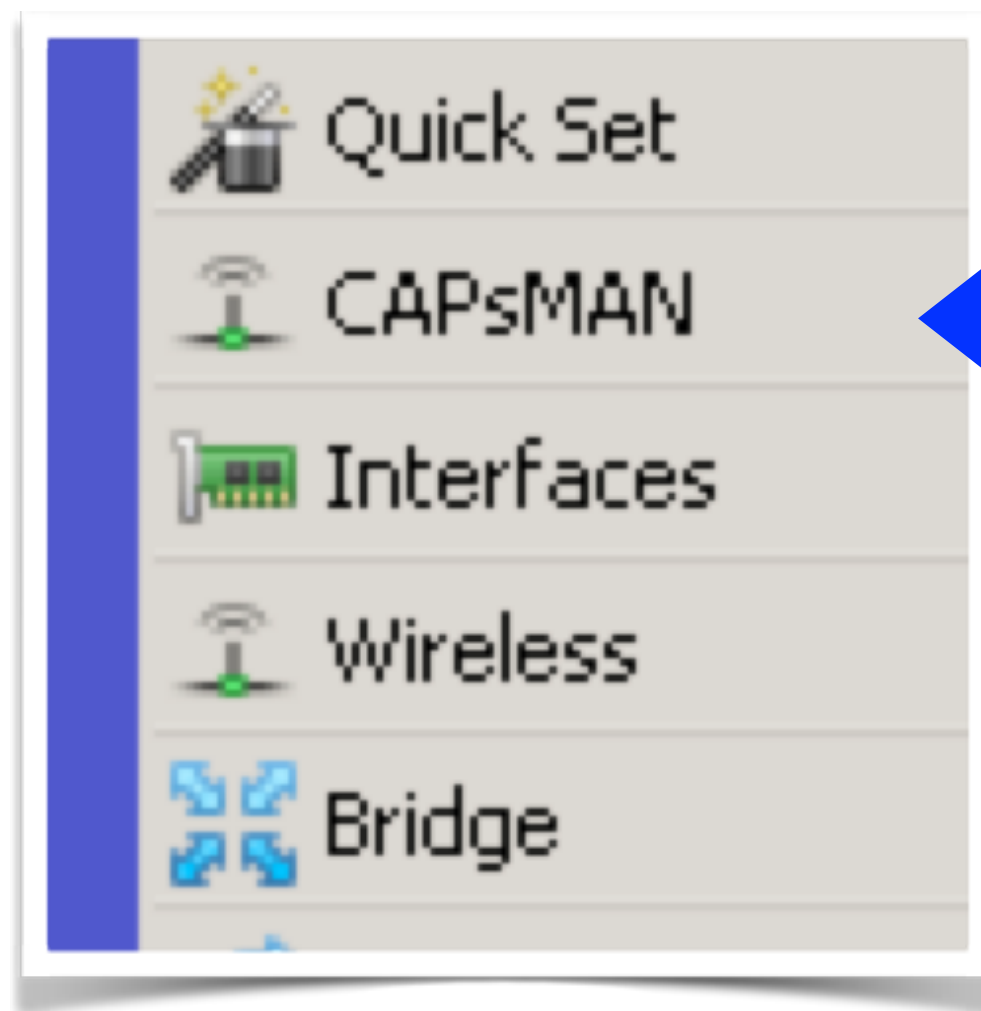
Missing CAPsMAN Features

- Nstream AP Support
- Nv2 AP Support

CAP to CAPsMAN Connection

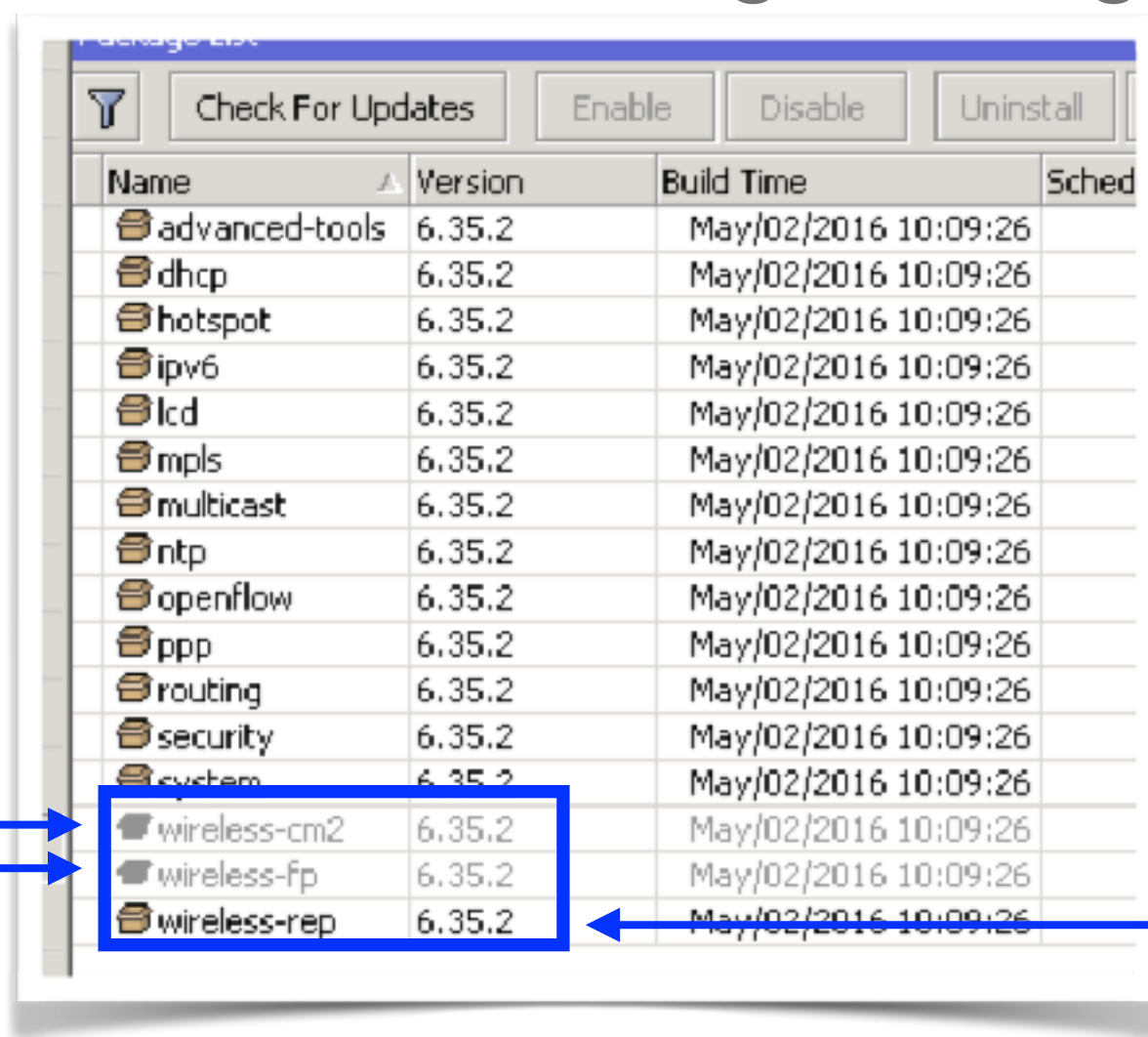
- Establish using 2 Transport Protocols
- Management Connection between CAP and CAPsMAN is secured using DTLS

CAPsMAN



CAPsMAN Requirement

- **CAPsMAN v2** working starting from **v6.23**



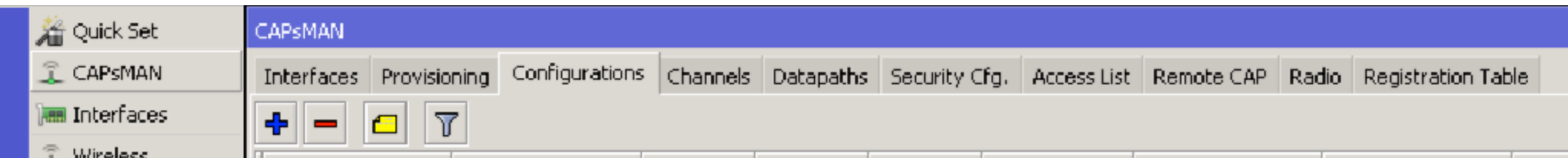
Name	Version	Build Time	Sched
advanced-tools	6.35.2	May/02/2016 10:09:26	
dhcp	6.35.2	May/02/2016 10:09:26	
hotspot	6.35.2	May/02/2016 10:09:26	
ipv6	6.35.2	May/02/2016 10:09:26	
lcd	6.35.2	May/02/2016 10:09:26	
mpls	6.35.2	May/02/2016 10:09:26	
multicast	6.35.2	May/02/2016 10:09:26	
ntp	6.35.2	May/02/2016 10:09:26	
openflow	6.35.2	May/02/2016 10:09:26	
ppp	6.35.2	May/02/2016 10:09:26	
routing	6.35.2	May/02/2016 10:09:26	
security	6.35.2	May/02/2016 10:09:26	
system	6.35.2	May/02/2016 10:09:26	
wireless-cm2	6.35.2	May/02/2016 10:09:26	
wireless-fp	6.35.2	May/02/2016 10:09:26	
wireless-rep	6.35.2	May/02/2016 10:09:26	

- **CAPsMAN v2** working starting from **v6.35**

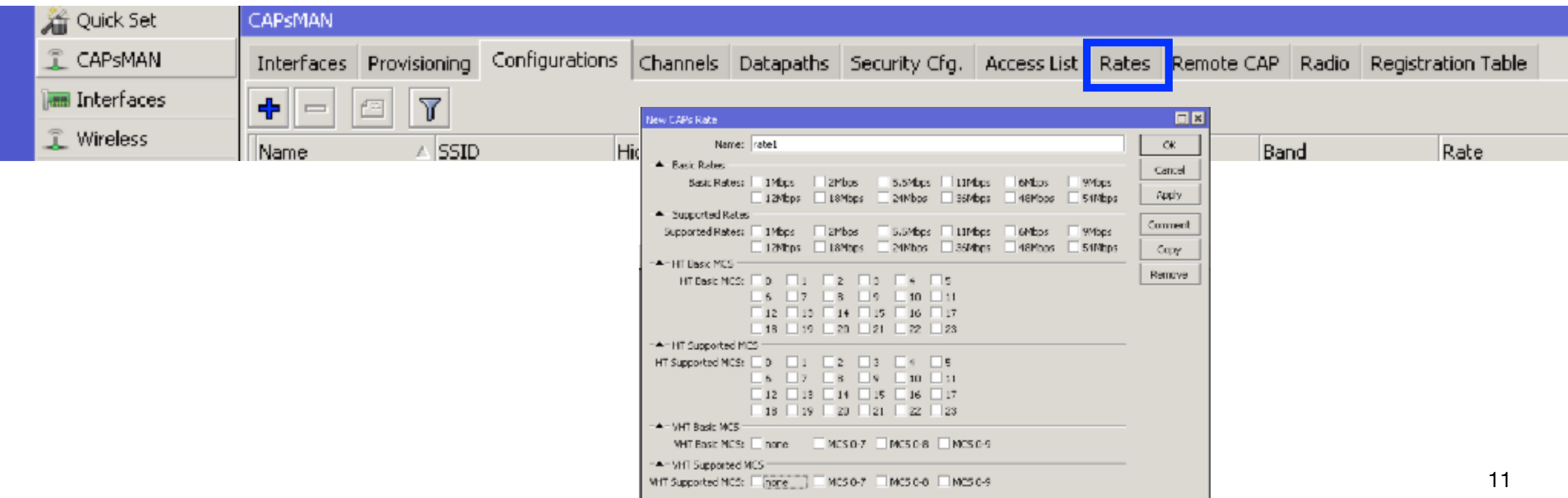
- **CAPsMAN** work on RouterOS **v6.11**

CAPsMAN v2

- wireless-cm2

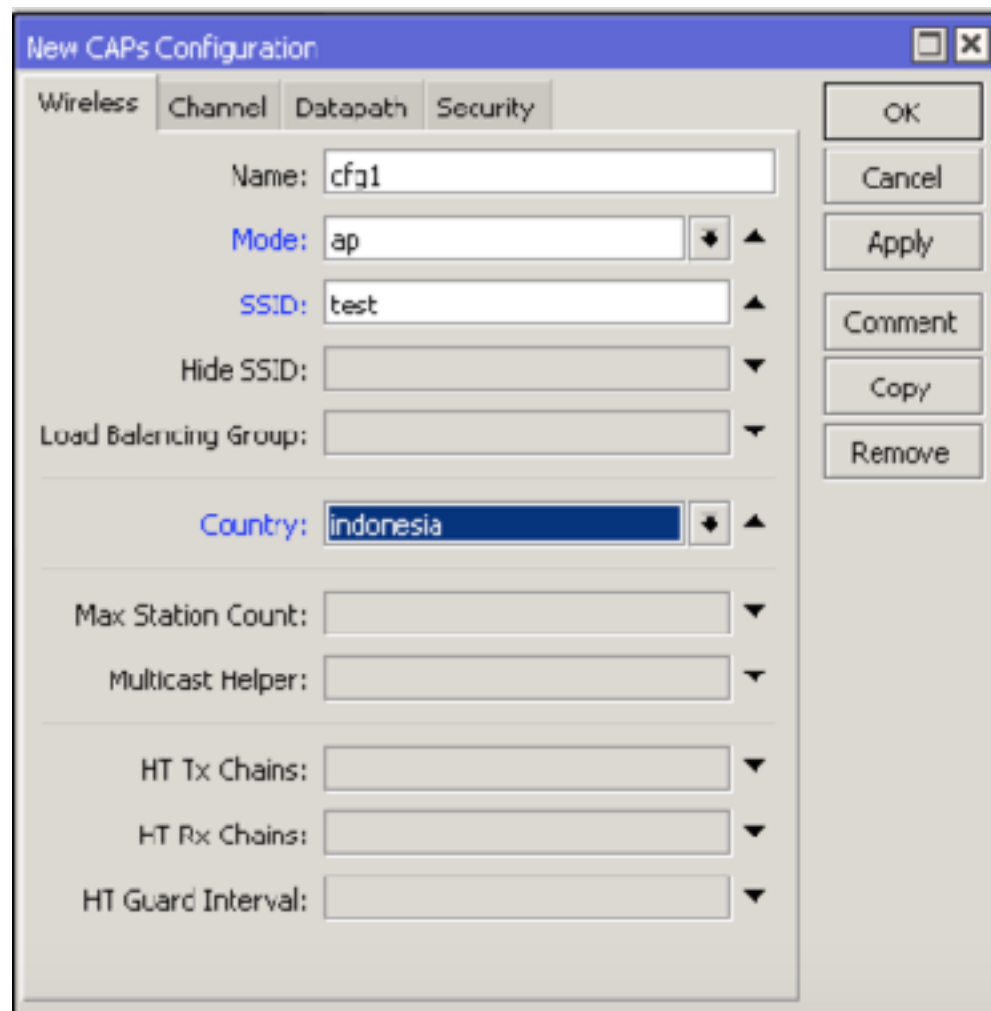


- wireless-rep



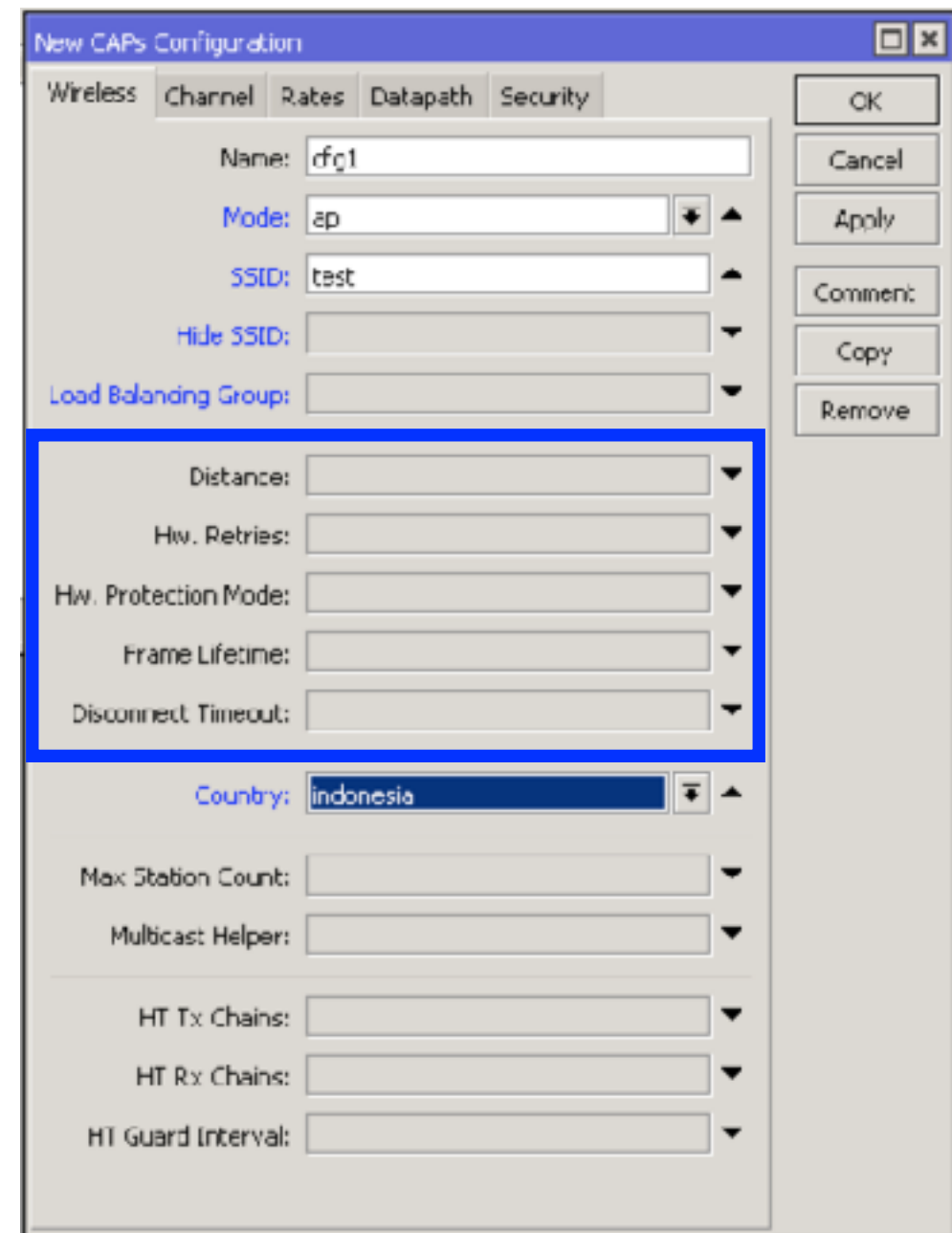
CAPsMAN v2

- wireless-cm2



The 'New CAPs Configuration' dialog box for the 'wireless-cm2' profile. It features a 'Wireless' tab and a 'Channel' sub-tab. The configuration fields include: Name (cfg1), Mode (ap), SSID (test), Hide SSID (unchecked), Load Balancing Group (empty), Country (Indonesia), Max Station Count (empty), Multicast Helper (unchecked), HT Tx Chains (empty), HT Rx Chains (empty), and HT Guard Interval (empty). A vertical column of buttons on the right includes OK, Cancel, Apply, Comment, Copy, and Remove.

- wireless-rep



The 'New CAPs Configuration' dialog box for the 'wireless-rep' profile. It features a 'Wireless' tab and a 'Rates' sub-tab. The configuration fields include: Name (cfg1), Mode (ap), SSID (test), Hide SSID (unchecked), Load Balancing Group (empty), Distance (empty), Hw. Retries (empty), Hw. Protection Mode (empty), Frame Lifetime (empty), Disconnect Timeout (empty), Country (Indonesia), Max Station Count (empty), Multicast Helper (unchecked), HT Tx Chains (empty), HT Rx Chains (empty), and HT Guard Interval (empty). A blue rectangular box highlights the 'Distance', 'Hw. Retries', 'Hw. Protection Mode', 'Frame Lifetime', and 'Disconnect Timeout' fields. A vertical column of buttons on the right includes OK, Cancel, Apply, Comment, Copy, and Remove.

CAPsMAN v2

- wireless-cm2

New CAPs Channel

Name:

Frequency: MHz ▲

Width:

Band: ▼ ▲

Extension Channel:

Tx. Power:

- 2ghz-b
- 2ghz-b/g
- 2ghz-b/g/n
- 2ghz-onlyg
- 2ghz-onlyn
- 5ghz-a
- 5ghz-a/n
- 5ghz-a/n/ac
- 5ghz-onlyac
- 5ghz-onlyn

- wireless-rep

CAPs Channel <channel1>

Name:

Frequency: MHz ▲

Width:

Band: ▼ ▲

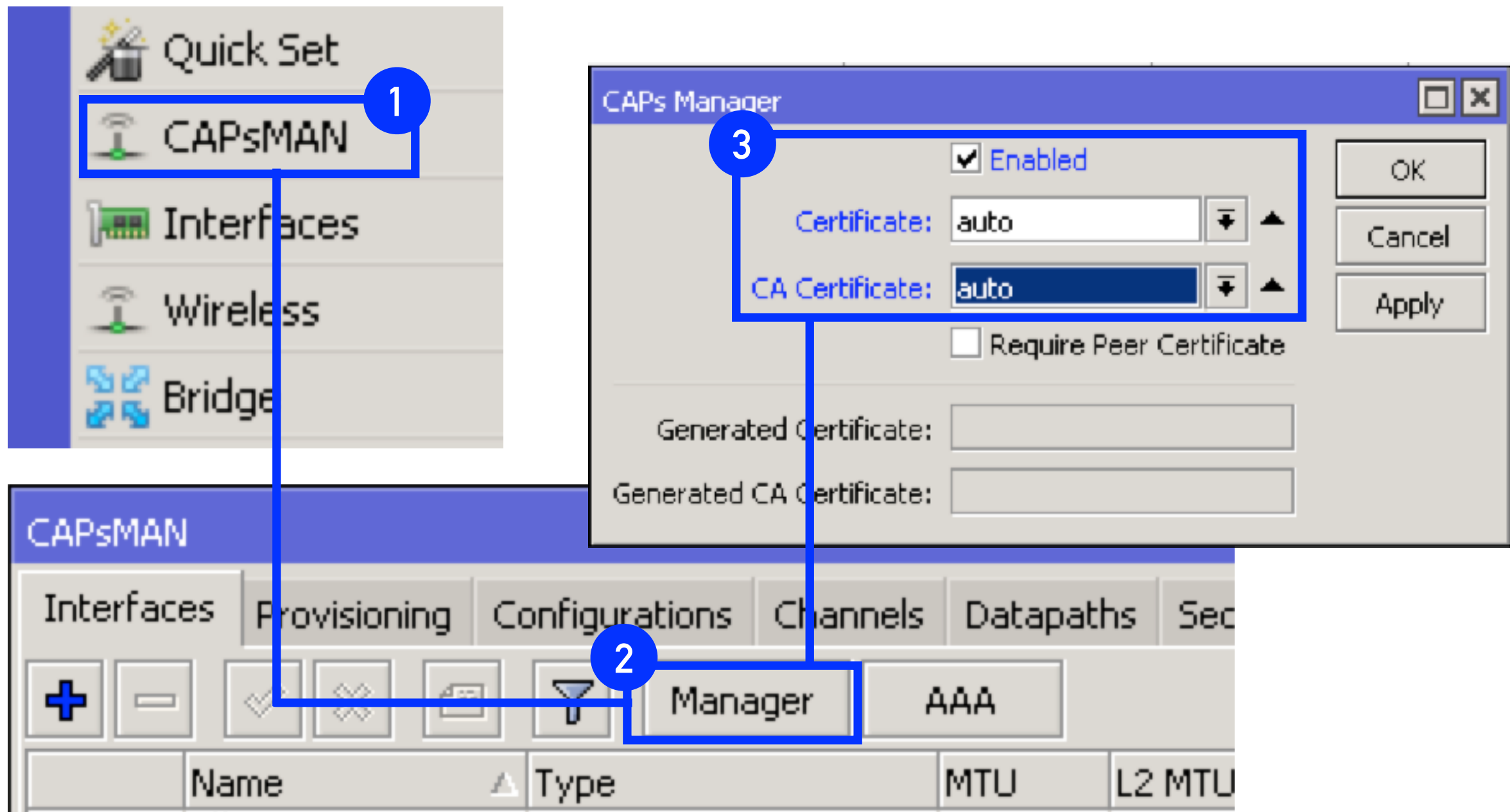
Extension Channel:

Tx. Power:

- 2ghz-b
- 2ghz-b/g
- 2ghz-b/g/n
- 2ghz-g/n
- 2ghz-onlyg
- 2ghz-onlyn
- 5ghz-a
- 5ghz-a/n
- 5ghz-a/n/ac
- 5ghz-onlyac
- 5ghz-onlyn

CAPsMAN Service

- Certificate auto generate



CAPsMAN Security Config

The screenshot shows a window titled "CAPs Security Configuration <security1>". At the top, there are tabs: "Channels", "Datapaths", "Security Cfg.", "Access List", "Remote CAP", "Radio", and "Registration Table". The "Security Cfg." tab is selected. The window contains the following fields and controls:

- Name:** A text field containing "security1".
- Authentication Type:** Four checkboxes: "WPA PSK", "WPA2 PSK", "WPA EAP", and "WPA2 EAP". A small upward arrow is to the right of the last checkbox.
- Encryption:** Two checkboxes: "aes ccm" and "tkip". A small upward arrow is to the right of the second checkbox.
- Group Encryption:** A dropdown menu.
- Passphrase:** A text field.
- EAP Methods:** A dropdown menu.
- EAP Radius Accounting:** A dropdown menu.
- TLS Mode:** A dropdown menu.
- TLS Certificate:** A dropdown menu.

On the right side of the window, there is a vertical stack of buttons: "OK", "Cancel", "Apply", "Comment", "Copy", and "Remove".

CAPsMAN Datapaths

- ROS V 6.37.1
- ROS V 6.38rc12

The screenshot shows the 'CAPs Datapath Configuration <datapath1>' window in ROS V 6.37.1. The window has a title bar with a close button. Below the title bar, there are tabs: 'Configurations', 'Channels', 'Datapaths', 'Security Cfg.', and 'Access'. The 'Datapaths' tab is selected. The main area contains the following fields and buttons:

- Name: (with an OK button next to it)
- Bridge: (with a dropdown arrow and an up arrow button)
- Bridge Cost:
- Bridge Horizon:
- Local Forwarding:
- Client To Client Forwarding:
- VLAN Mode:
- VLAN ID:

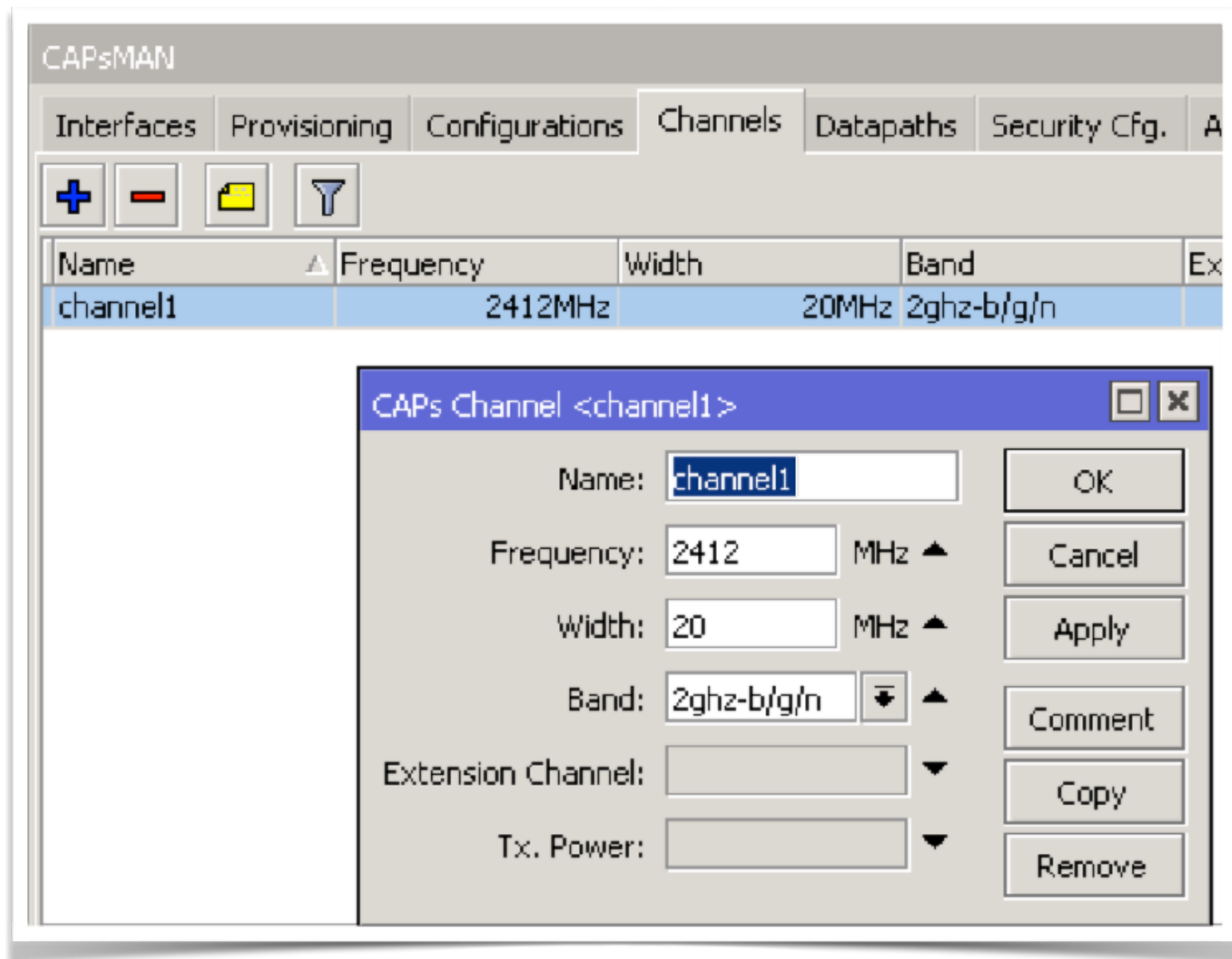
On the right side of the window, there are buttons: OK, Cancel, Apply, Comment, Copy, and Remove.

The screenshot shows the 'New CAPs Datapath Configuration' window in ROS V 6.38rc12. The window has a title bar with a close button. The main area contains the following fields and buttons:

- Name: (with an OK button next to it)
- MTU:
- L2 MTU:
- ARP:
- Bridge:
- Bridge Cost:
- Bridge Horizon:
- Local Forwarding:
- Client To Client Forwarding:
- VLAN Mode:
- VLAN ID:

On the right side of the window, there are buttons: OK, Cancel, Apply, Comment, Copy, and Remove.

CAPsMAN Channels



CAPsMAN Config

The screenshot displays the CAPsMAN configuration interface. A blue box labeled '1' highlights the 'CAPsMAN' tab in the top navigation bar. A blue box labeled '2' highlights the 'Configurations' sub-tab within the 'CAPsMAN' section. Below the navigation bar, four panels are visible, each titled 'New CAPs Configuration'. The first panel is on the 'Wireless' tab, showing fields for Name (rfc1), Mode (ap), SSID (test), Hide SSID, Load Balancing Group, Distance, Hw. Retries, Hw. Protection Mode, Frame Lifetime, Disconnect Timeout, Country (Indonesia), Max Station Count, Multicast Helper, HT Tx Chains, HT Rx Chains, and HT Guard Interval. The second panel is on the 'Channel' tab, showing fields for Channel (channel1), Frequency, Width, Band, Extension Channel, and Tx. Power. The third panel is on the 'Datapath' tab, showing fields for Datapath (datapath1), Bridge, Bridge Cost, Bridge Horizon, Local Forwarding, Client To Client Forwarding, VLAN Mode, and VLAN ID. The fourth panel is on the 'Security' tab, showing fields for Security (security1), Authentication Type, Encryption, Group Encryption, Passphrase, EAP Methods, CAP Radius Accounting, TLS Mode, and TLS Certificate.

CAPsMAN Interfaces

The screenshot displays the CAPsMAN configuration tool with two overlapping windows for configuring the 'cap1' interface.

Left Window (General Tab):

- Name: cap1
- Type: Interfaces
- MTU: 1500
- L2 MTU: 1600
- MAC Address: E4:8D:8C:E7:XX:XX
- ARP: enabled
- Radio MAC: E4:8D:8C:E7:XX:XX
- Master Interface: none

Right Window (Wireless Tab):

- Configuration: @wifi.bitech
- Mode: ap
- SSID: @wifi.bitech
- Hide SSID: (empty)
- Load Balancing Group: (empty)
- Distance: (empty)
- Hw. Retries: (empty)
- Hw. Protection Mode: (empty)
- Frame Lifetime: (empty)
- Disconnect Timeout: (empty)
- Country: indonesia
- Max Station Count: (empty)
- Multicast Helper: (empty)
- HT Tx Chains: (empty)
- HT Rx Chains: (empty)
- HT Guard Interval: (empty)

Both windows have a status bar at the bottom with buttons: enabled, running, slave, master, bound. The right window also includes a 'native' button.

CAPsMAN Interfaces

CAPsMAN													
Interfaces Provisioning Configurations Channels Datapaths Security Cfg. Access List Rates Remote CAP Radio Registration Table													
+ - < > [Filter] Manager AAA													
	Name	Type	MTU	Actual MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	FP Rx		
DRMB	cap30	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap31	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DMD	cap32	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap33	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap34	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap35	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap36	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap37	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap38	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap39	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap40	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap41	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DMD	cap42	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap43	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap44	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap45	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap46	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap47	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap48	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap49	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap50	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap51	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap52	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap53	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap54	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap55	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DRMD	cap56	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap57	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap58	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap59	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap60	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap61	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DRMB	cap62	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DB	cap63	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
DME	cap64	Interfaces	1500	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps		
36 items out of 51													

CAPsMAN Registration Table

RouterOS WinBox

Quick Set

CAPsMAN

Interfaces

Wireless

Bridge

VPP

Switch

Mesh

IP

IPv6

MPLS

OpenFlow

Routing

System

Queues

Files

Log

Radius

Tools

New Terminal

LCD

NetRouter

Partition

Make Supout.rtf

Manual

New WinBox

Exit

CAPsMAN

Interfaces

Provisioning

Configurations

Channels

Datapaths

Security Cfg

Access List

Rates

Remote CAP

Radio

Registration Table

Find

Interface	SSID	MAC Address	Tx Rate	Rx Rate	Tx Signal	Rx Signal	Uptime	Tx/Rx Packets	Tx/Rx Bytes	
cap1	HotSpot Data Izza	F0:1A:07:32:04:90	105Mbps...	105Mbps...	0	-52	01:00:2...	0 156/0 559	1769.0 KB/791.1...	
cap1	HotSpot Data Izza	A8:18:5A:4E:0B:E7	81Mbps...	6Mbps...	0	-69	00:34:1...	2 131/2 191	327.1 KB/258.5 KB	
cap12	HotSpot Data Izza	F0:79:59:10:84:05	26Mbps...	35Mbps...	0	-66	00:29:1...	5 549/5 936	1042.1 KB/1222....	
cap12	HotSpot Data Izza	10:2A:B3:AC:5C:FE	24Mbps...	13.5Mbps...	0	-80	00:06:1...	2 737/2 356	3715.4 KB/189.6...	
cap13	HotSpot Data Izza	D0:37:42:AF:F1:4F	6Mbps...	1Mbps...	0	-82	00:01:1...	4/57	34.3/4434.3	
cap15	HotSpot Data Izza	A4:D8:30:8E:37:5F	54Mbps...	81Mbps...	0	-80	01:02:5...	39 122/30 021	56.7 MB/7.5 MB	
cap15	HotSpot Data Izza	40:E2:3D:E3:94:4A	39Mbps...	27Mbps...	0	-81	00:57:2...	43 495/34 258	44.6 MB/5.3 MB	
cap15	HotSpot Data Izza	7C:C7:D9:5A:10:FE	54Mbps...	81Mbps...	0	-74	00:57:2...	38 805/38 083	30.1 MB/6.9 MB	
cap15	HotSpot Data Izza	6C:81:12:04:47:3E	52Mbps...	65Mbps...	0	-70	00:55:2...	54 808/55 116	39.1 MB/8.7 MB	
cap15	HotSpot Data Izza	54:D8:C9:A2:6C:B4	65Mbps...	40.5Mbps...	0	-84	00:46:0...	39 374/55 119	52.9 MB/6.5 MB	
cap15	HotSpot Data Izza	74:29:AF:D5:C0:DD	19.5Mbps...	65Mbps...	0	-74	00:43:2...	60 269/55 985	47.9 MB/7.1 MB	
cap15	HotSpot Data Izza	9C:B7:0D:E1:9B:DE	54Mbps...	1Mbps...	0	-84	00:40:3...	21 211/21 409	14.7 MB/6.2 MB	
cap15	HotSpot Data Izza	E0:CA:31:EA:5A:B1	108Mbps...	121.5Mbps...	0	-60	00:38:1...	51 161/55 076	10.3 MB/26.7 MB	
cap15	HotSpot Data Izza	CC:79:CF:D7:39:1A	108Mbps...	121.5Mbps...	0	-77	00:11:1...	7 351/7 137	7.0 MB/925.1 KB	
cap15	HotSpot Data Izza	E8:76:3F:1F:M:18D	108Mbps...	81Mbps...	0	-82	00:10:0...	5 155/5 193	2613.0 KB/285.4...	
cap15	HotSpot Data Izza	58:01:A7:88:00:ED	11.7Mbps...	65Mbps...	0	-71	00:09:1...	17 107/16 749	20.3 MB/1625.7...	
cap15	HotSpot Data Izza	00:4C:85:A9:C1:48	216Mbps...	81Mbps...	0	-80	00:00:5...	3 803/3 837	2933.2 KB/158.3...	
cap15	HotSpot Data Izza	00:1F:6A:33:0A:C8	50Mbps...	25Mbps...	0	-83	00:00:1...	13 608/14 910	10.8 MB/1692.0...	
cap16	HotSpot Data Izza	14:CD:21:D1:A2:77	54Mbps...	108Mbps...	0	-71	01:27:2...	5 004/6 514	3163.1 KB/3001.2...	
cap16	HotSpot Data Izza	4C:1B:7D:06:F4:95	11Mbps...	121.5Mbps...	0	-71	01:10:3...	5 900/7 891	1002.2 KB/362.1...	
cap16	HotSpot Data Izza	44:1C:A0:4B:C0:61	24Mbps...	27Mbps...	0	-79	01:15:2...	176 265/121 906	200.5 MB/0.9 MB	
cap16	HotSpot Data Izza	CC:79:CF:0B:40:E2	20Mbps...	54Mbps...	0	-02	01:14:1...	76 702/54 949	51.0 MB/6.5 MB	
cap16	HotSpot Data Izza	40:E2:44:01:00:05	54Mbps...	54Mbps...	0	-03	01:07:0...	36 462/75 309	50.7 MB/7.5 MB	
cap16	HotSpot Data Izza	74:C5:3D:7F:D5:4F	01Mbps...	01Mbps...	0	-00	00:50:5...	76 930/50 002	55.0 MB/7.2 MB	
cap16	HotSpot Data Izza	F0:7E:CB:22:14:9B	36Mbps...	24Mbps...	0	-84	00:52:4...	54 078/44 737	59.0 MB/4872.3...	
cap16	HotSpot Data Izza	18:A5:F7:9F:94:0A	108Mbps...	121.5Mbps...	0	-65	00:31:2...	190/479	17.2 KB/57.5 KB	
cap16	HotSpot Data Izza	E0:D2:1D:09:B2:E7	26Mbps...	19.5Mbps...	0	-85	00:30:5...	54 361/53 996	58.3 MB/8.0 MB	
cap16	HotSpot Data Izza	9C:99:A0:03:75:D3	36Mbps...	13Mbps...	0	-77	00:26:1...	25 149/23 093	28.9 MB/4265.6...	
cap16	HotSpot Data Izza	74:2F:63:6F:DE:3E	56.5Mbps...	25Mbps...	0	-85	00:21:1...	19 574/16 707	19.9 MB/2207.1...	
cap16	HotSpot Data Izza	10:06:B1:EE:02:91	26Mbps...	35Mbps...	0	-85	00:07:4...	10 557/9 375	11.1 MB/1215.8...	
cap16	HotSpot Data Izza	40:FC:2F:68:6F:25	39Mbps...	52Mbps...	0	-75	00:05:1...	10 010/9 522	5.7 MB/1385.4 KB	
cap16	HotSpot Data Izza	4C:88:58:8B:65:11	26Mbps...	6.5Mbps...	0	-81	00:03:3...	58 069/53 028	58.8 MB/8.2 MB	
cap16	HotSpot Data Izza	D8:5D:E2:A1:5A:39	39Mbps...	52Mbps...	0	-75	00:02:0...	1 950/1 577	2094.7 KB/235.6...	
cap16	HotSpot Data Izza	E0:A5:89:71:45:D9	19.5Mbps...	54Mbps...	0	-85	00:01:2...	1 179/1 154	1485.5 KB/129.6...	
cap17	HotSpot Data Izza	E0:A5:89:30:6D:E9	81Mbps...	121.5Mbps...	0	-72	01:04:3...	205 719/149 197	252.5 MB/14.3 MB	
cap17	HotSpot Data Izza	48:ED:60:A3:61:13	13.5Mbps...	5Mbps...	0	-75	01:03:4...	27 815/24 357	34.7 MB/7.5 MB	

44 items

CAPsMAN Access List

#	MAC Address	MAC Mask	Interface	Signal Ra...	Action	Client To Clie...	VLAN Mode	VLAN ID
0			all	-120..-75	reject			

CAPs Access Rule <>

MAC Address:

MAC Mask:

Interface: all 

SSID Regexp:

Signal Range: -120..-75 

Time: 

Action: reject 

AP Tx Limit:

Client Tx Limit:

Private Passphrase:

Client To Client Forwarding:

RADIUS Accounting:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

CAP

1

2

Wireless Tables

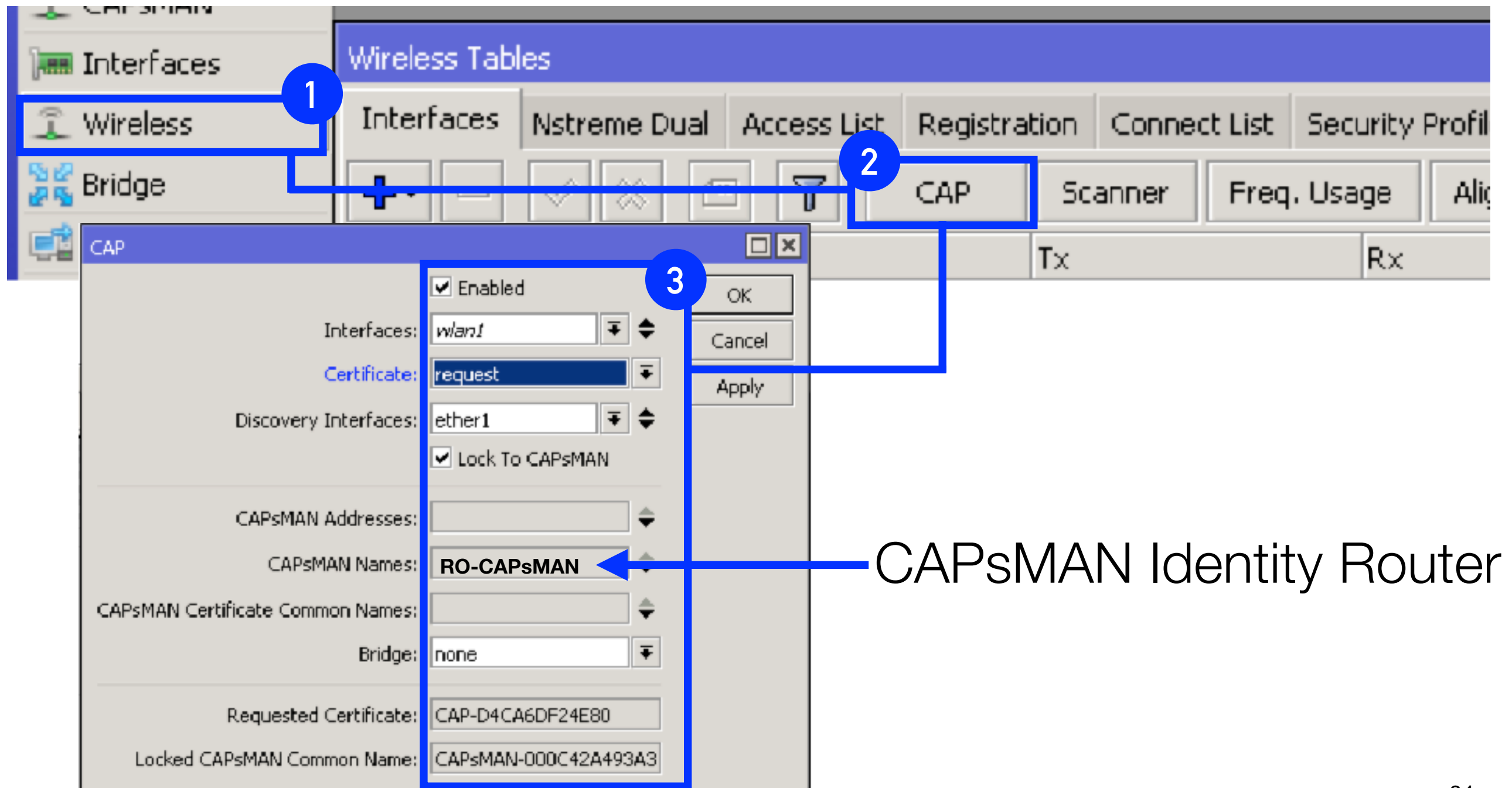
Interfaces Nstreme Dual Access List Reg. Action Connect List Security Profiles Channels

+ - ✓ ✕ [Icon] [Icon] CAP Scanner Freq. Usage Alignment Wirel

	Name	Type	Tx	Rx	T
	--- managed by CAPsMAN				
	--- channel: 2412/20-Ce/gn(20dBm), SSID: @wifi.bitech, CAPsMAN forwarding				
X	wlan1	Wireless (Atheros AR...	409.5 kbps	11.9 kbps	

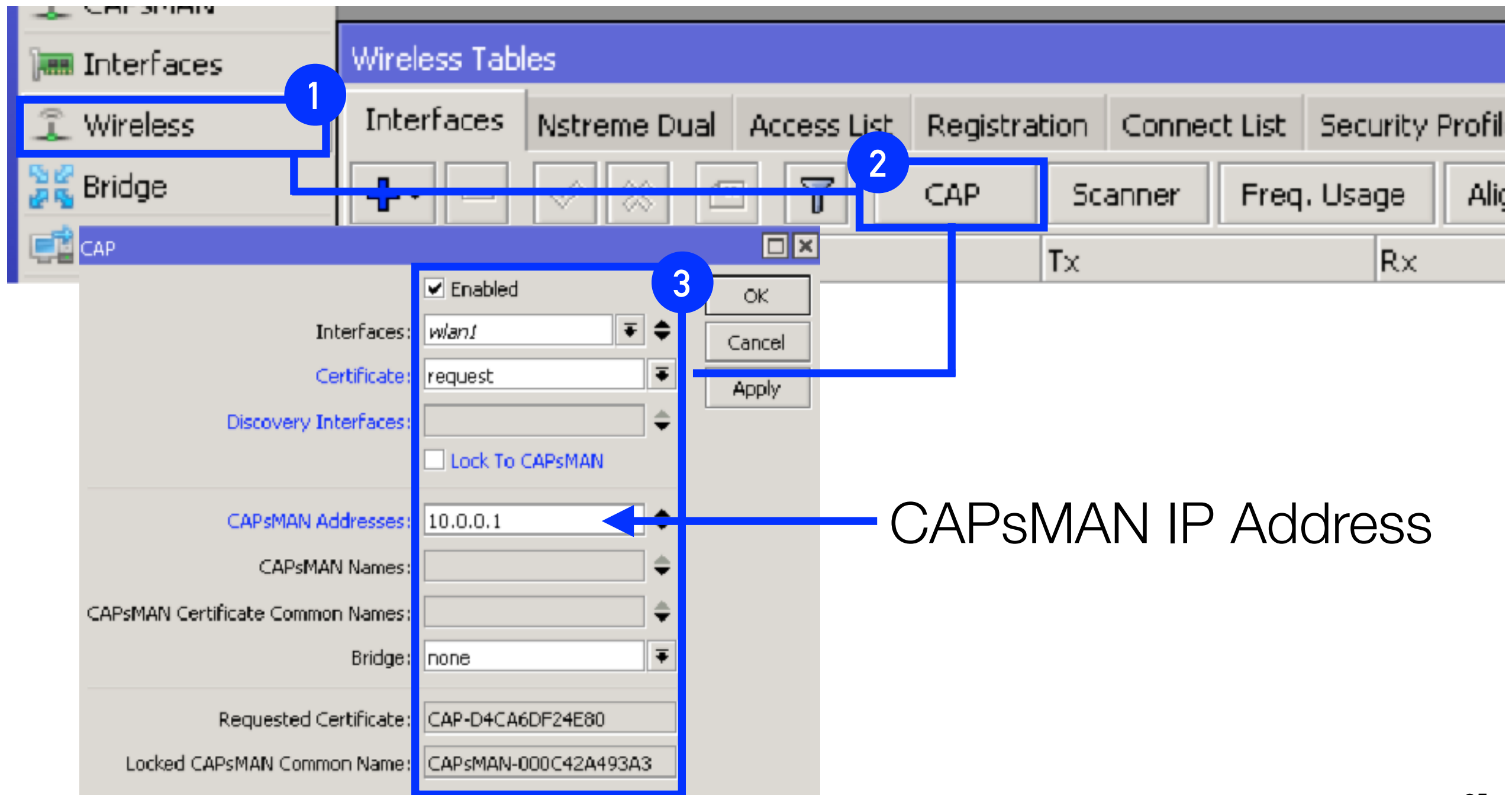
CAP Service

- L2 Connection



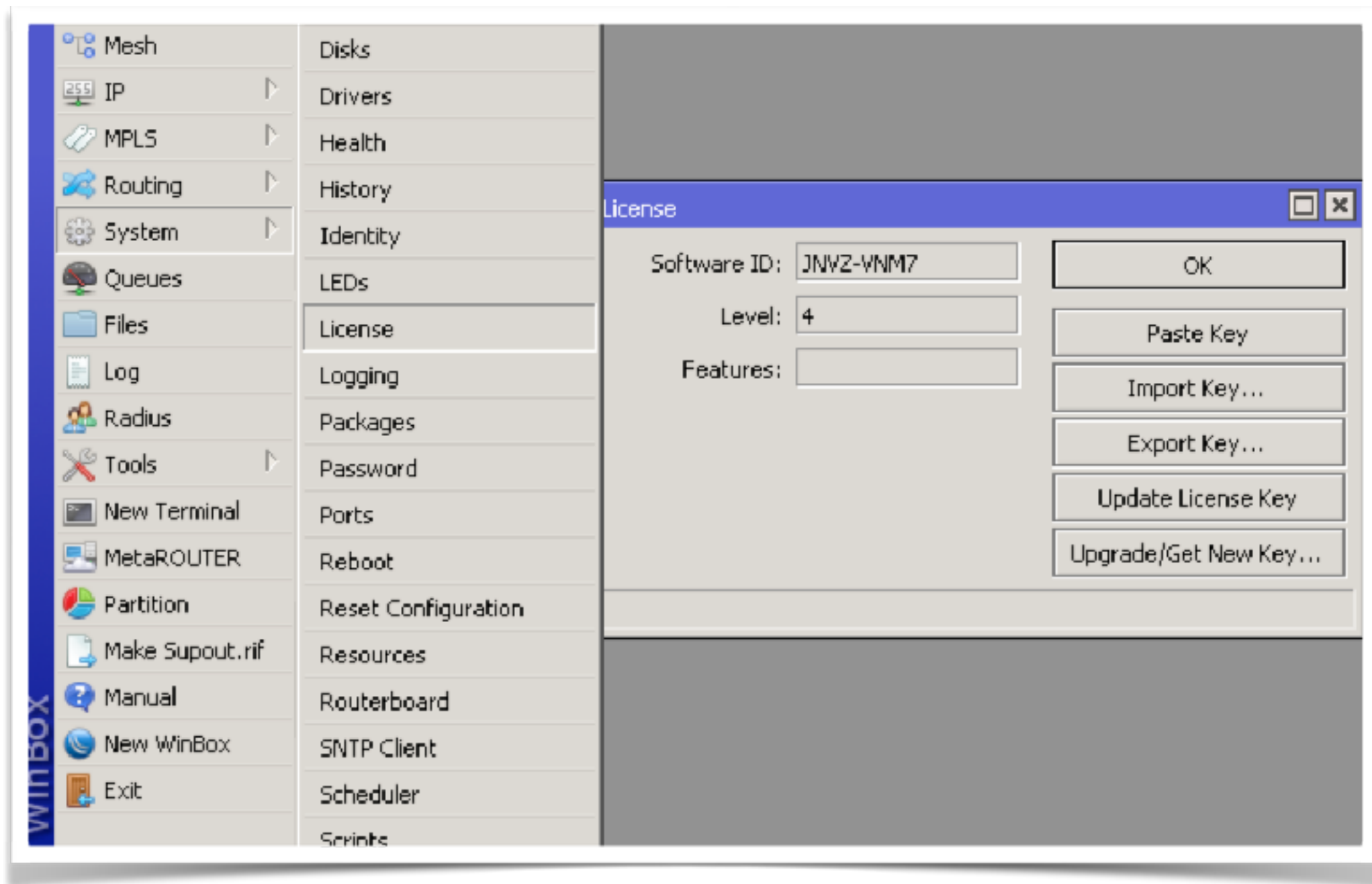
CAP Service

- L3 Connection



CAP Requirement

- CAP Device **Level 4** RouterOS license

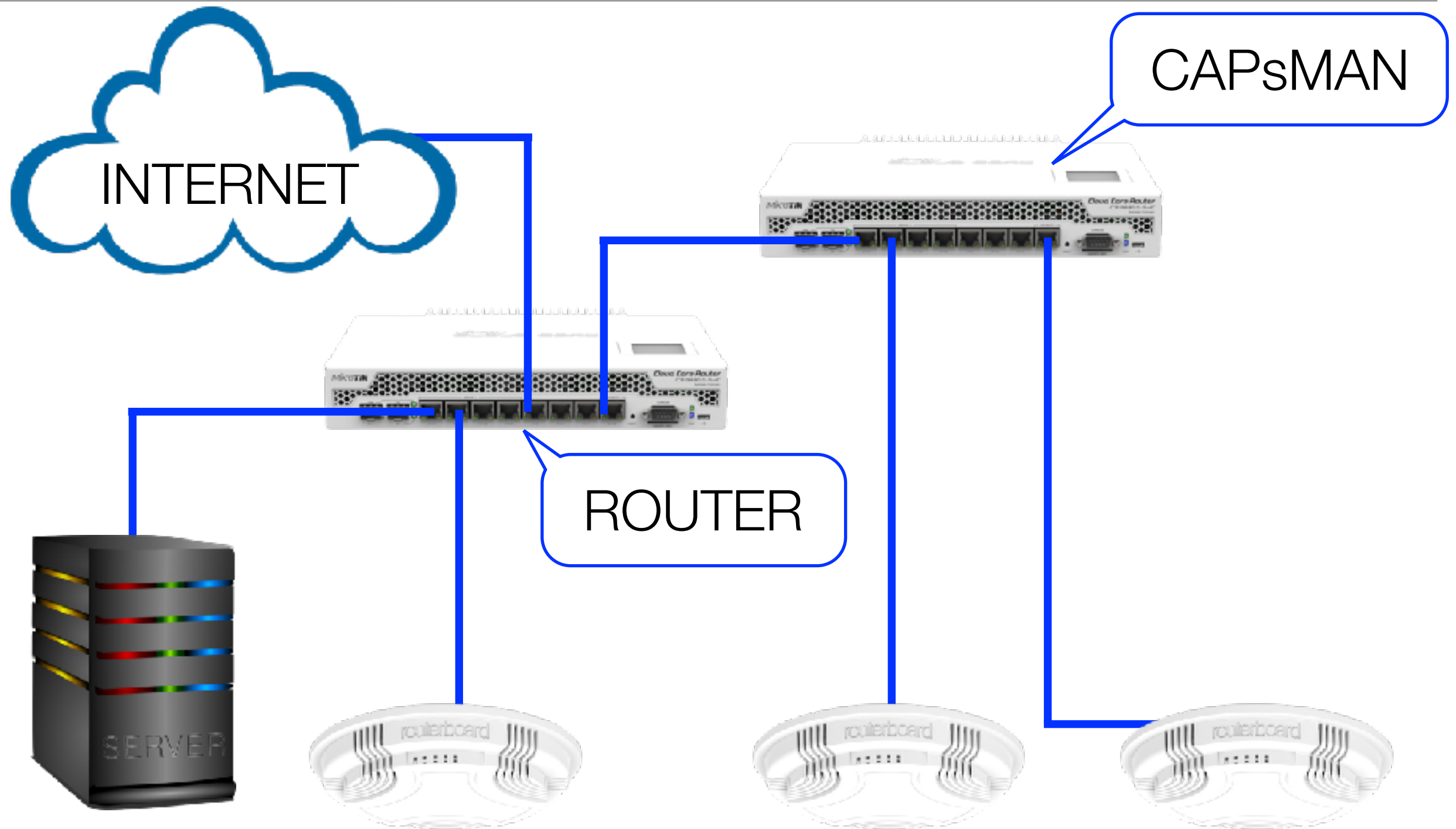


CAPs Connection

- Result CAP Connection in CAPsMAN

Interfaces Provisioning Configurations Channels Detachments Security Cfg. Access List Rates Remote CAP Radio Registration Table				
Find				
Radio MAC	Remote CAP Name	Remote CAP I...	Interface	
P E4:8D:8C:4F:AA:D0	CAP-E48D8C4FA...	CAP A-Qahirah2-1	cap44	
P E4:8D:8C:4F:AA:F5	CAP-E48D8C4FA...	CAP A-Qahirah2-2	cap48	
P E4:8D:8C:4D:B5:F3	CAP-E48D8C4DB...	CAP A-Qahirah2-3	cap40	
P E4:8D:8C:1B:AD:E3	CAP-E18D8C18A...	CAP A-Qahirah2-4	cap32	
P E4:8D:8C:CE:6D:60	CAP-E48D8CCE6...	CAP A-Qahirah2-5	cap42	
P E4:8D:8C:CE:6C:AC	CAP-E18D8CCE6...	CAP A-Qahirah2-6	cap34	
P E4:8D:8C:55:A5:01	CAP-E48D8C56A...	CAP A-Qahirah3-1	cap45	
P E4:0D:0C:4A:C2:0D	CAP-E48D8C4AC...	CAP A-Qahirah3-2	cap39	
P E4:8D:8C:4D:DA:45	CAP-E48D8C40D...	CAP A-Qahirah3-3	cap35	
P E4:8D:8C:CE:6D:62	CAP-E48D8CCE6...	CAP A-Qahirah3-4	cap54	
P 4C:5E:0C:3F:79:BD	CAP-4CE8C3F7...	CAP MT Area	cap54	
P E4:8D:8C:4D:D9:DF	CAP-E48D8C40D...	CAP Mesroh-1	cap52	
P E4:8D:8C:CE:6C:D1	CAP-E18D8CCE6...	CAP Mesroh-2	cap50	
P E4:8D:8C:CE:6C:D5	CAP-E48D8CCE6...	CAP Rnm Server	cap56	
P 4C:5E:0C:CE:CF:7D	CAP-4CE8CCEC...	CAP MSU1-1	cap50	
P E4:8D:8C:4B:AD:23	CAP-E48D8C48A...	CAP-MSU1-2	cap62	
P E4:0D:0C:5F:42:4F	CAP-E48D8C5F4...	CAP-MSU1-3	cap58	
P 00:0C:42:8C:7D:28	CAPsMAN-CA-00...	CAPsMAN D2a122a	cap30	

Implementation



Implementation

1. Enable or Install CAP and CAPsMAN

The screenshot shows the MikroTik WinBox interface. The left sidebar contains a list of menu items: Bridge, PPP, Switch, Mesh, IP, IPv6, MPLS, OpenFlow, Routing, System, Queues, Files, Log, Radius, Tools, New Terminal, LCD, and MetaROUTER. The 'System' menu item is highlighted with a blue box and a blue circle with the number 1. The 'Packages' option under the 'System' menu is highlighted with a blue box and a blue circle with the number 2. The 'wireless-rep' package is highlighted with a blue box and a blue circle with the number 3. The 'Enable' button is highlighted with a blue box and a blue circle with the number 4.

Name	Version	Build	Time	Schedule
advanced-tools	6.35.2		May/02/2016 10:09:26	
dhcp	6.35.2		May/02/2016 10:09:26	
hotspot	6.35.2		May/02/2016 10:09:26	
ipv6	6.35.2		May/02/2016 10:09:26	
lcd	6.35.2		May/02/2016 10:09:26	
mpls	6.35.2		May/02/2016 10:09:26	
multicast	6.35.2		May/02/2016 10:09:26	
ntp	6.35.2		May/02/2016 10:09:26	
openflow	6.35.2		May/02/2016 10:09:26	
ppp	6.35.2		May/02/2016 10:09:26	
routing	6.35.2		May/02/2016 10:09:26	
security	6.35.2		May/02/2016 10:09:26	
system	6.35.2		May/02/2016 10:09:26	
wireless-cm2	6.35.2		May/02/2016 10:09:26	
wireless-fp	6.35.2		May/02/2016 10:09:26	
wireless-rep	6.35.2		May/02/2016 10:09:26	

Implementation

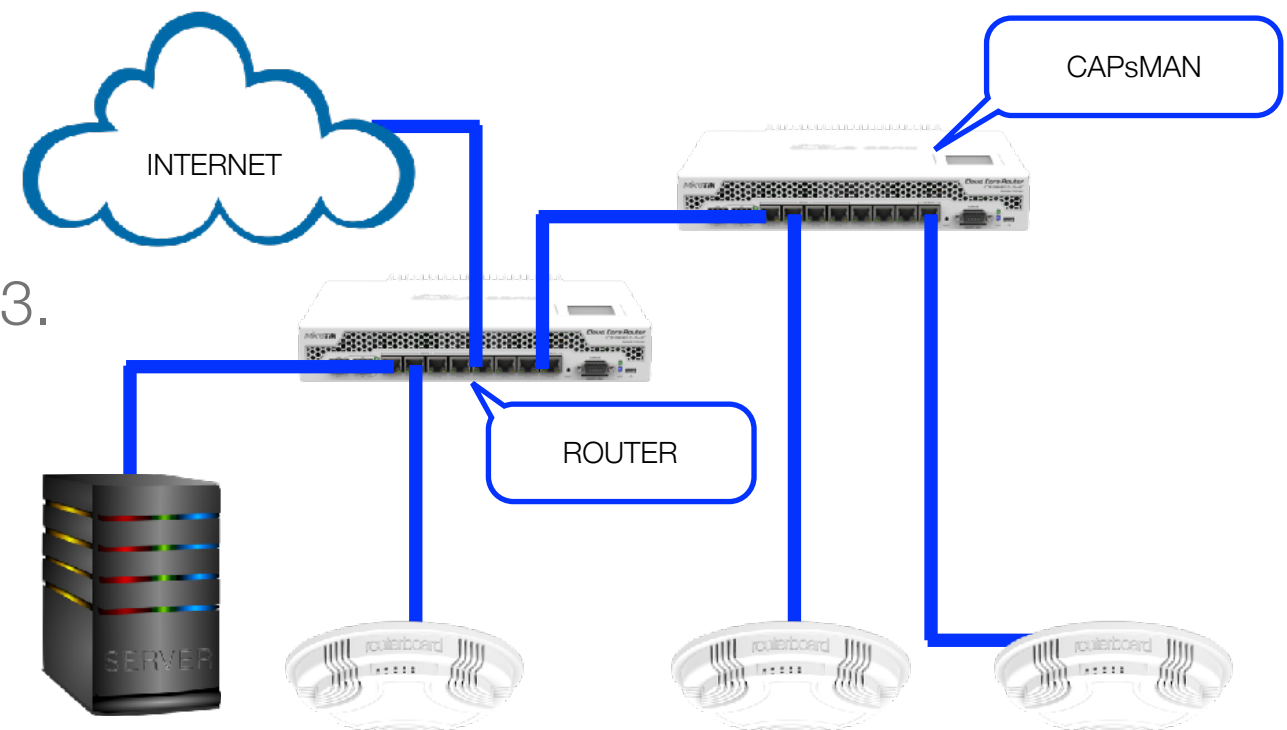
1. Interface WAN to Internet

2. Interface Lan

- create vlan
 - ether1 : vlan101, vlan102, and vlan103.
- ether1 CAPsMAN = 192.168.1.1/30
- ether2 CAP = 192.168.2.1/30
- vlan101 = 172.16.1.1/24
- vlan102 = 172.16.2.1/24

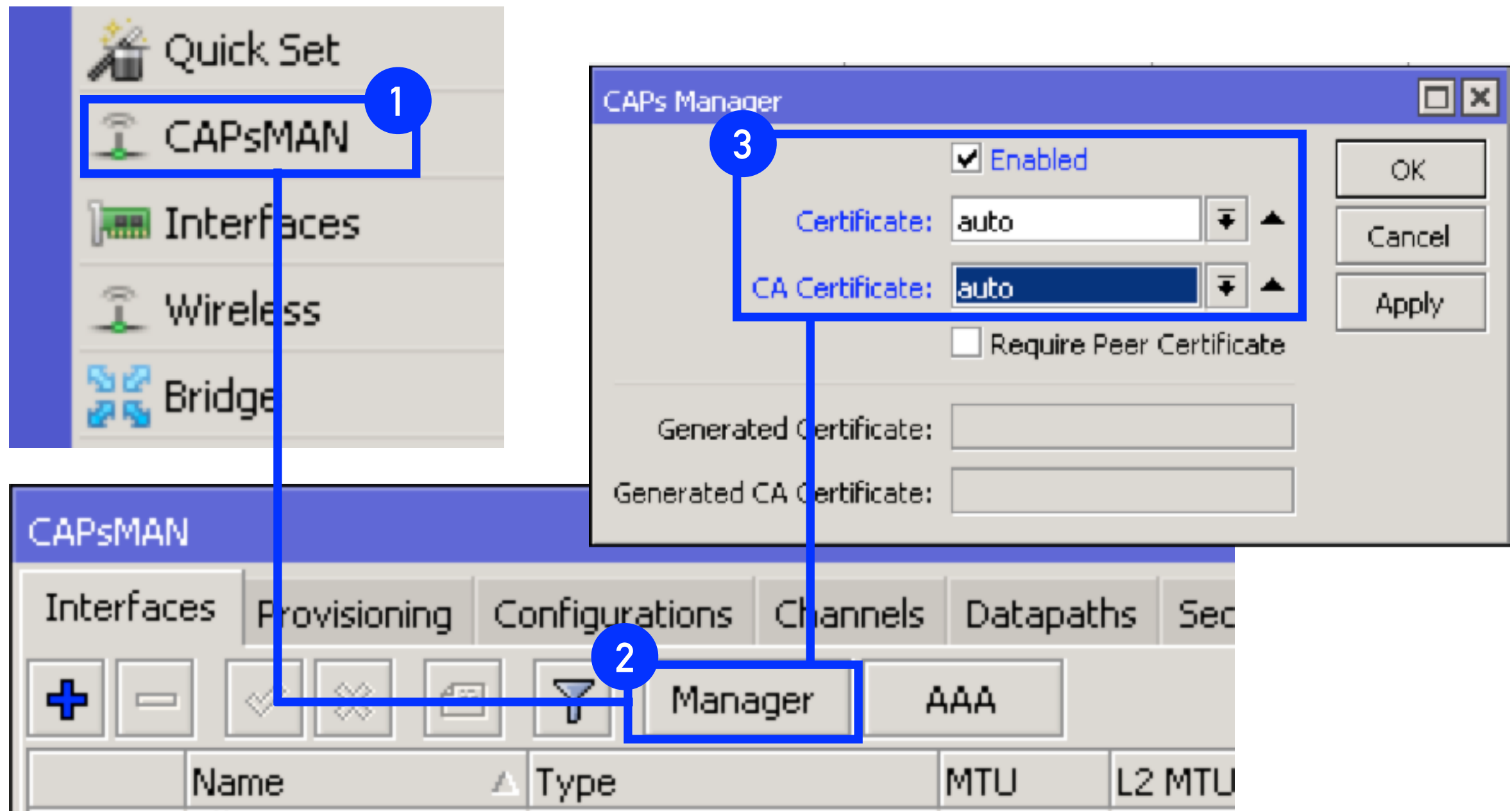
3. Interface Bridge

- create br-hs = 172.16.3.1/24 and add port interface vlan103 to br-hs



Implementation

4. CAPsMAN Configuration



Implementation

5. CAP1 Configuration

The image shows the MikroTik WinBox interface for configuring a CAP (Client Access Point) and a corresponding network diagram.

WinBox Configuration:

- Wireless Tables:** The 'CAP' tab is selected.
- Configuration Fields:**
 - Enabled:** ☒
 - Interfaces:** wlan1
 - Certificate:** request
 - Discovery Interfaces:** (empty)
 - Lock To CAPsMAN:** ☒
 - CAPsMAN Addresses:** 192.168.1.2
 - CAPsMAN Names:** RO-CAPsMAN
 - CAPsMAN Certificate Common Names:** (empty)
 - Bridge:** none
 - Requested Certificate:** CAP-D4CA6DF24E80
 - Locked CAPsMAN Common Name:** CAPsMAN-000C42A493A3
- Buttons:** OK, Cancel, Apply

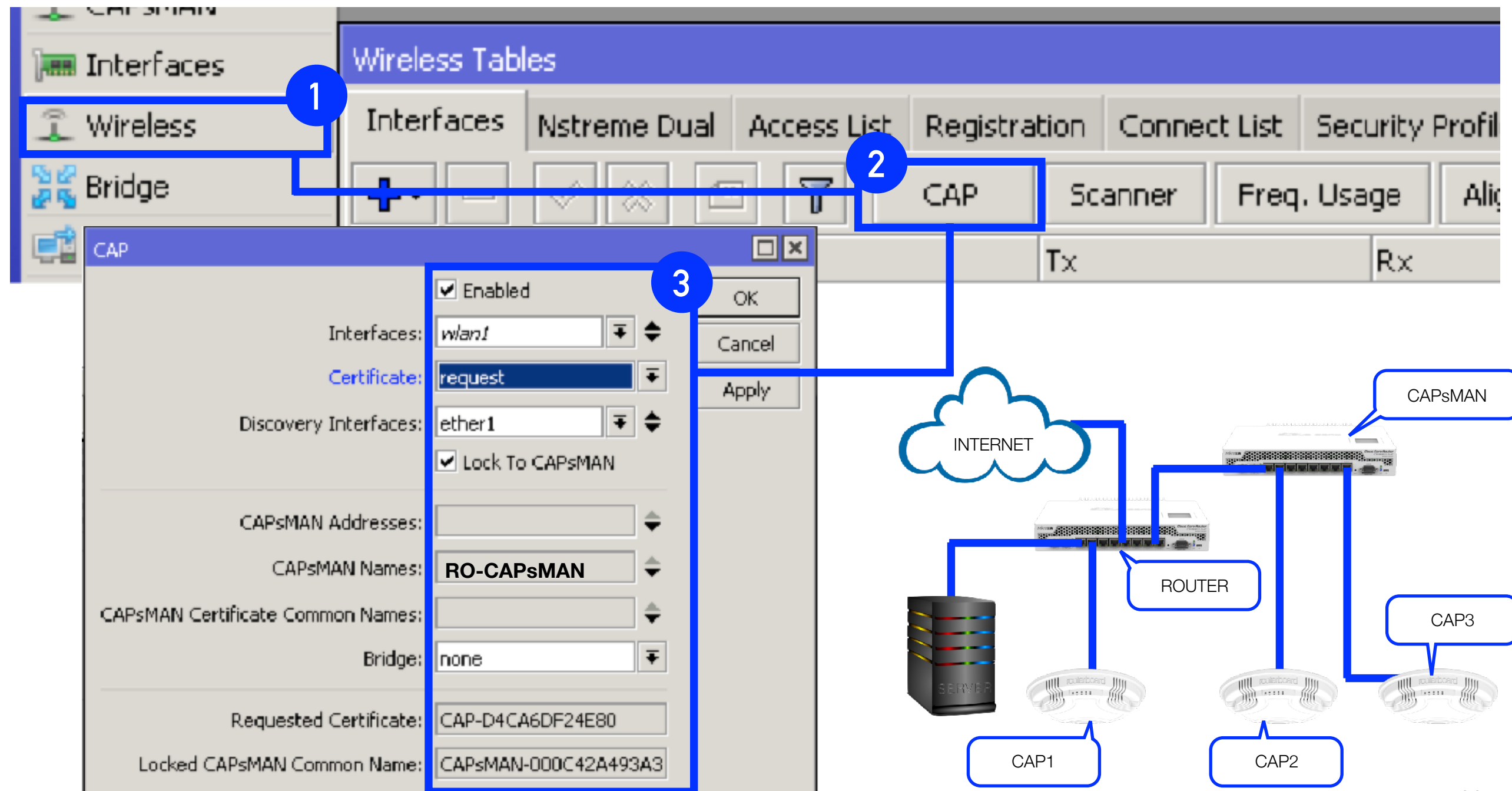
Network Diagram:

- INTERNET:** Represented by a cloud icon.
- ROUTER:** A central network device.
- SERVER:** A server icon connected to the ROUTER.
- CAPsMAN:** A central management device connected to the ROUTER.
- CAP1, CAP2, CAP3:** Three Client Access Points connected to the ROUTER.

Blue lines and numbers (1, 2, 3) indicate the configuration steps: 1 points to the 'Wireless' menu, 2 points to the 'CAP' tab, and 3 points to the configuration fields.

Implementation

6. CAP2 dan CAP3 Configuration



Implementation

10. CAPsMAN Security

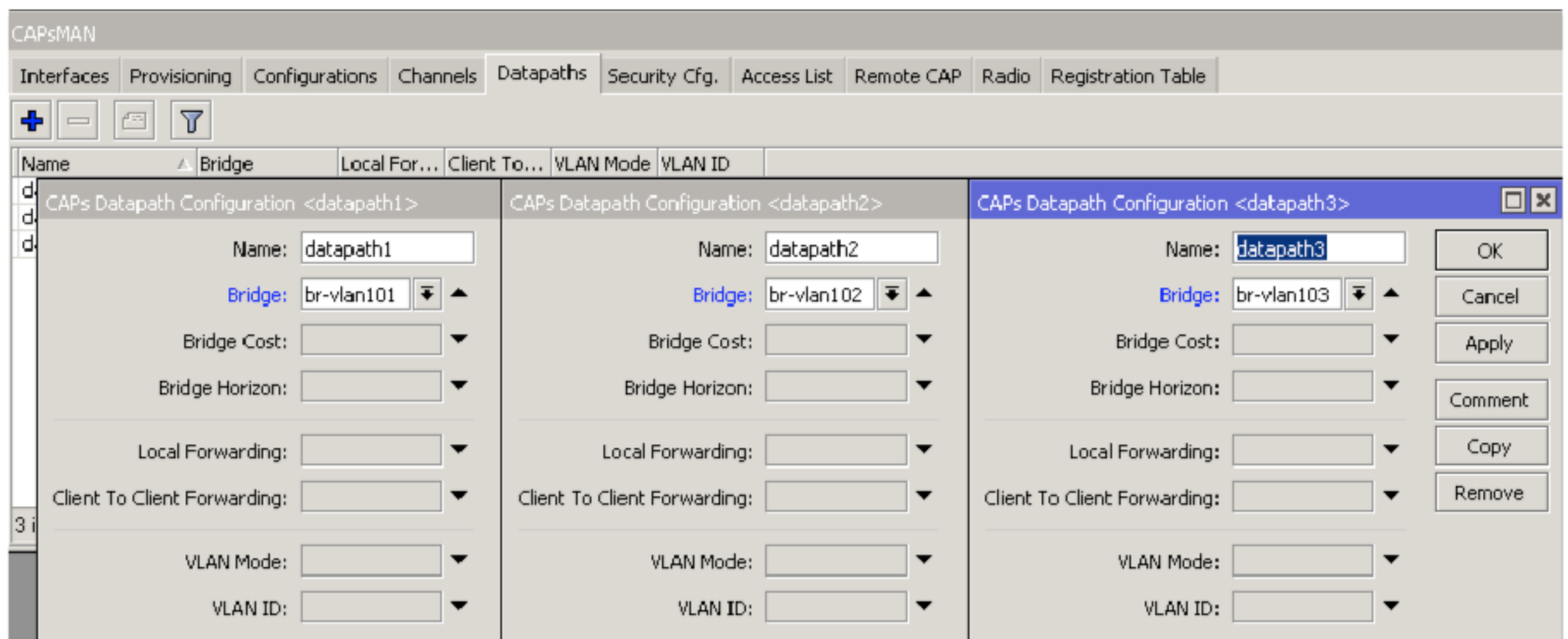
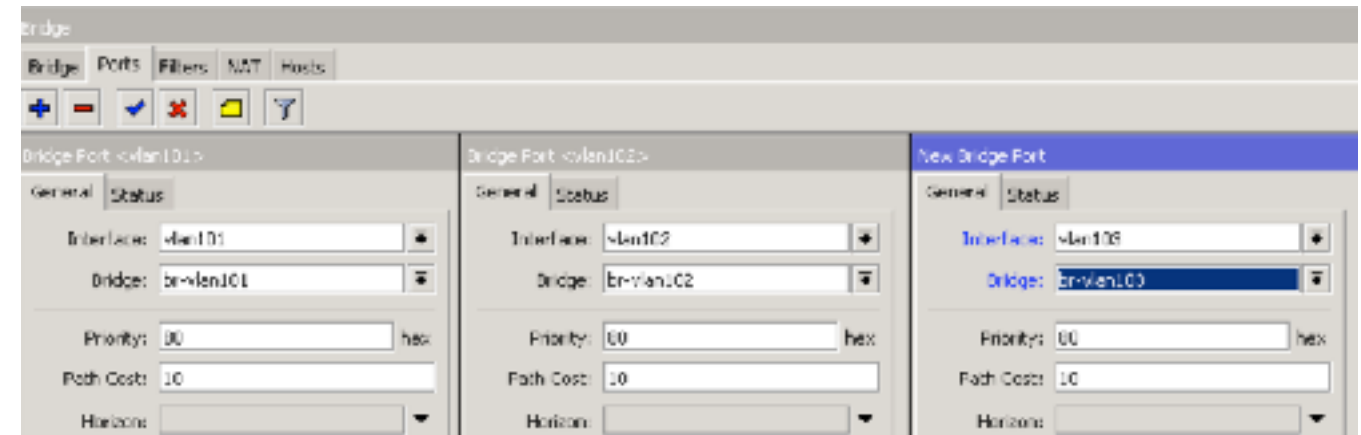
The screenshot displays the CAPsMAN Security Configuration window for a configuration named 'security1'. The window is titled 'CAPsMAN' and has a tabbed interface with the following tabs: Interfaces, Provisioning, Configurations, Channels, Datapaths, Security Cfg. (selected), Access List, Remote CAP, Radio, and Registration Table. Below the tabs are four icons: a blue plus sign, a red minus sign, a yellow folder, and a blue funnel. The main area shows a table with columns: Name, Authentication Type, Encryption, Group Encryption, Passphrase, and EAP Methods. The table contains one row for 'security1' with the following values: WPA PSK WPA2 ..., aes ccm tkip, and *****. Below the table, a status bar indicates '1 item (1 selected)'. The configuration details for 'security1' are shown in a separate window titled 'CAPs Security Configuration <security1>'. This window contains the following fields and options:

- Name: security1
- Authentication Type: ☒ WPA PSK ☒ WPA2 PSK ☐ WPA EAP ☐ WPA2 EAP
- Encryption: ☒ aes ccm ☒ tkip
- Group Encryption: (empty field)
- Passphrase: *****
- EAP Methods: (empty field)
- EAP Radius Accounting: (empty field)
- TLS Mode: (empty field)
- TLS Certificate: (empty field)

On the right side of the configuration window, there are buttons for OK, Cancel, Apply, Comment, Copy, and Remove.

Implementation

9. CAPsMAN Datapaths



Implementation

8. CAPsMAN Configuration

CAPsMAN

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

+ - [Folder Icon] [Filter Icon]

Name	Frequency	Width	Band	Extension Channel	Tx. Power
channel1	2412MHz	20MHz	2ghz-b/g/n		
channel6	2437MHz	20MHz	2ghz-b/g/n		
channel12	2462MHz	20MHz	2ghz-b/g/n		

CAPs Channel <channel1>

Name:

Frequency: MHz ▲

Width: MHz ▲

Band: ▼ ▲

Extension Channel: ▼

Tx. Power: ▼

CAPs Channel <channel6>

Name:

Frequency: MHz ▲

Width: MHz ▲

Band: ▼ ▲

Extension Channel: ▼

Tx. Power: ▼

CAPs Channel <channel12>

Name:

Frequency: MHz ▲

Width: MHz ▲

Band: ▼ ▲

Extension Channel: ▼

Tx. Power: ▼

OK

Cancel

Apply

Comment

Copy

Remove

Implementation

7. CAPsMAN Configuration

The image displays a series of screenshots from the Mikrotik WinBox interface, specifically the 'New CAPs Configuration' dialog box, illustrating the step-by-step configuration of a CAPsMAN profile. The dialog box has four tabs: Wireless, Channel, Datapath, and Security.

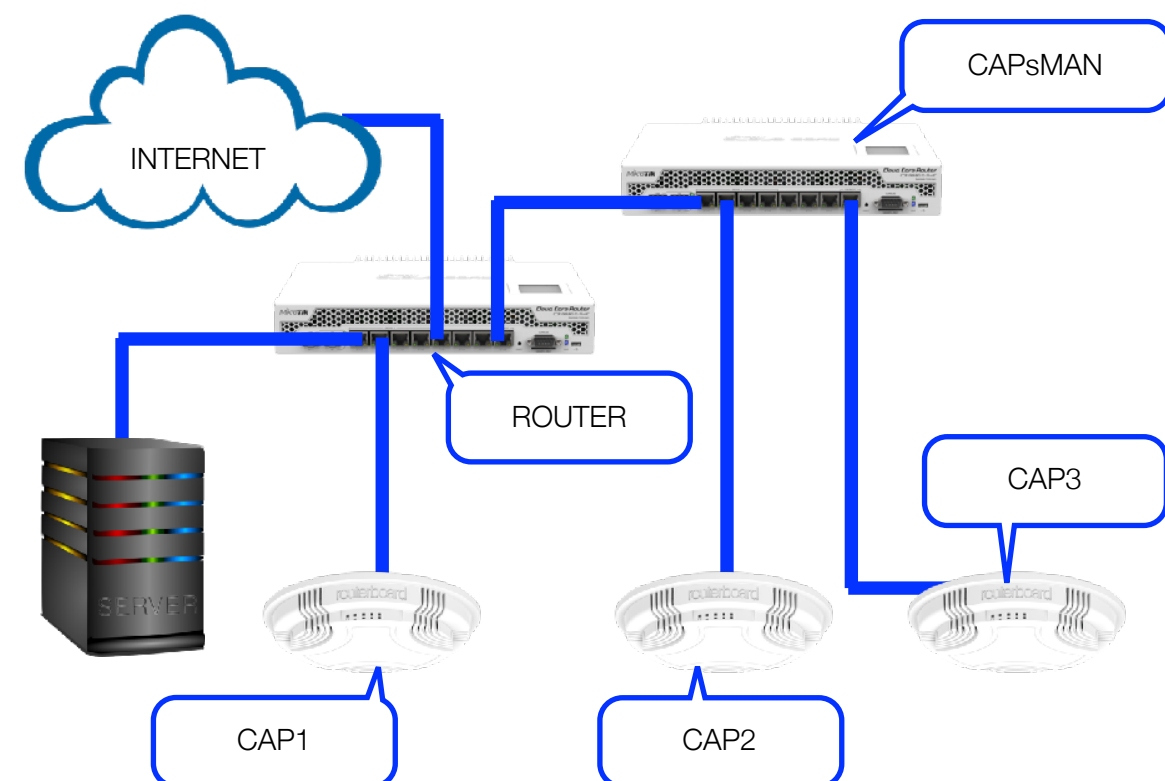
- Wireless Tab:** Contains fields for Name, Mode, SSID, Hide SSID, Load Balancing Group, and Country. The first three screenshots show the configuration of these fields for three different profiles (cfg1, cfg2, and cfg3).
- Channel Tab:** Contains a field for Channel. The next three screenshots show the configuration of the Channel field for three different profiles (channel1, channel6, and channel12).
- Datapath Tab:** Contains a field for Datapath. The next three screenshots show the configuration of the Datapath field for three different profiles (datapath1, datapath2, and datapath3).
- Security Tab:** Contains a field for Security. The final screenshot shows the configuration of the Security field for a profile (security1).

The dialog box also includes buttons for OK, Cancel, Apply, Comment, Copy, and Remove.

Implementation

11. CAPsMAN Interfaces

- CAP1 = Office and Student
- CAP2 = Guest, Office and Student
- CAP3 = Guest and Office



Kesimpulan

- ▶ CAPsMAN mempermudah administrator memonitor Akses Point secara terpusat
- ▶ CAPsMAN memungkinkan untuk dapat menentukan lewat mana trafik data yang akan dilewatkan user

Further Reading

- ▶ <http://wiki.mikrotik.com/wiki/Manual:CAPsMAN>
- ▶ <http://download2.mikrotik.com/news/mikrotik-news-59-JUN2014.pdf>



“Sekian dan Terimakasih”

– Rivan Firman Maulana



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