

CAPsMAN Quick Setup Guide, Latest version new features , How to maintain a failover controller(CAPsMAN)



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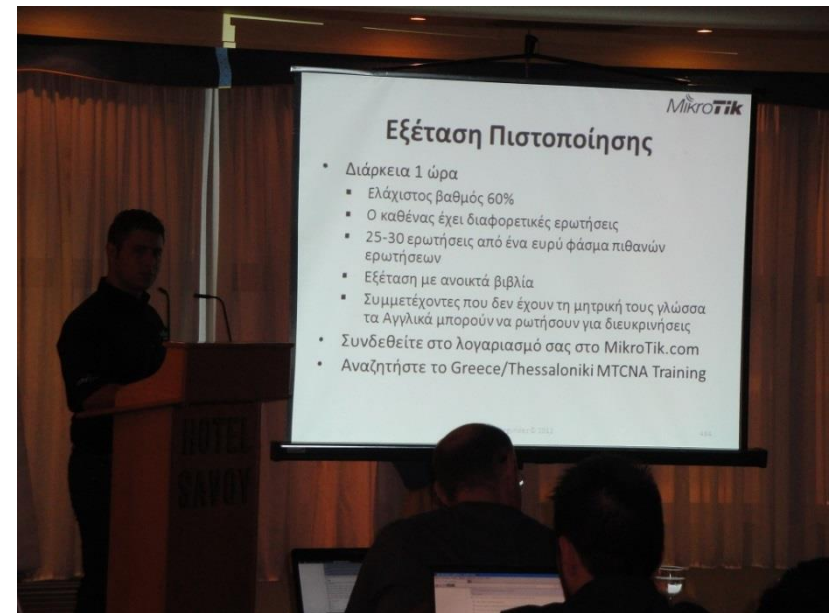
20th January 2017

About Me

My Name:

Georgios Argyrides

➤ You can call me “George”
(its easier)



About Me

- Born in Cyprus
(Europe, Near Greece)
 - Can Speak English & Greek

Experience:

- Computer Technician
 - Satellite TV & Aerial Engineer
 - VoIP Consultant / Voice Engineer
 - Systems / Network Administrator
 - Server Infrastructure Engineer
 - Internet Security Consultant
 - ISP / WISP Consultant
- 1st MikroTik Certified Consultant in Greece since 2011
 - 1st MikroTik Certified Trainer in Greece since 2012



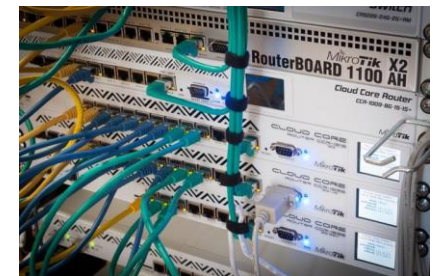
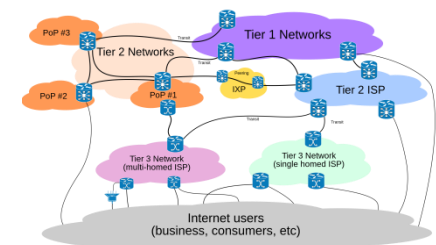
About Me

Education: Academic & Professional Qualifications

- BSc (Hon) Applied Computing (UK)
- All MikroTik Certifications
 - MTCNA,MTCRE,MTCWE,MTCTCE,MTCUME,MTCINE, MTCIPv6E
- MikroTik Certified Trainer
- Cyberoam Certified Network & Security Professional (CCNSP)
- RIPE Database Expert Course
- Digium Certified Asterisk Administrator (dCAA)

About Me

- Providing MikroTik Training (On-Site)
 - Providing On-Demand/Long Term worldwide:
 - Consultancy Services
 - Network Architecture Services
 - Project Management Services
- My contact details at the end of this Presentation



This Presentation Objective

- CAPsMAN Quick Setup
- Latest CAPsMAN new features
- Some Wireless-rep new features
- How to maintain a failover controller (CAPsMAN)

CAPsMAN Features

- Centralized management of RouterOS APs
- Dual Band AP support
- Provisioning of APs
- MAC and IP Layer communication with APs
- Certificate support for AP communication
- Full and Local data forwarding mode
- RADIUS MAC authentication
- Custom configuration support

Definitions

?CAP?? CAPs? CAPsMAN? AP? Router?

CAPsMAN

- Controlled **A**ccess **P**oint
system **M**anager

➤ **CAPsMAN** = a MikroTik router

CAP

- Controlled **A**ccess **P**oint

➤ **CAP** = a MikroTik router

➤ **CAPs** = many Mikrotik routers

Requirements

CAPsMAN

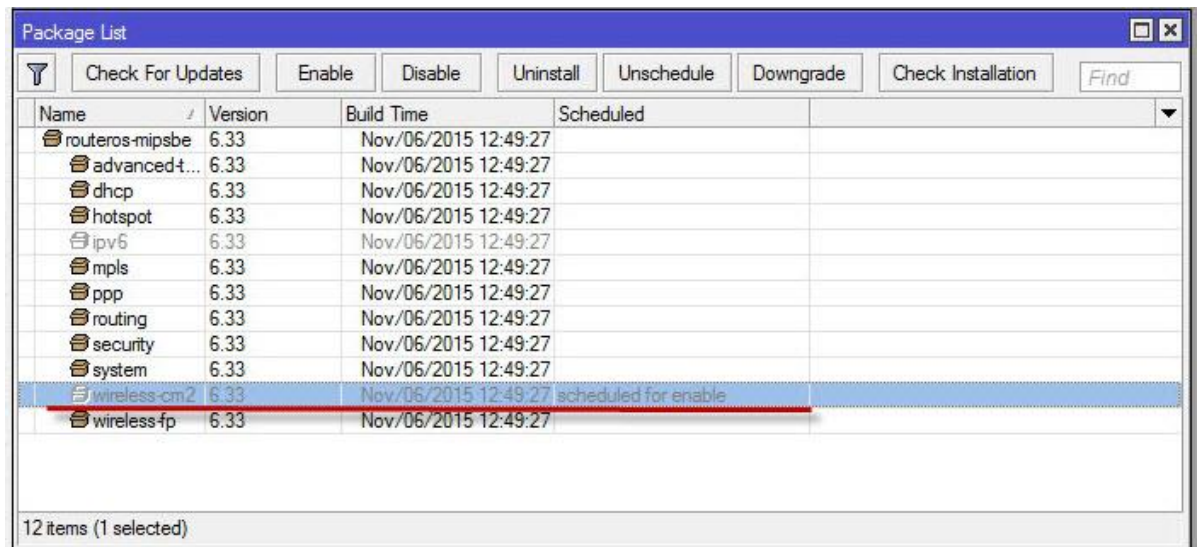
1. x86 or RouterBOARD based device
2. RouterOS v6.11+ version (Use Latest!)
3. Wireless-fp package installed and enabled

CAPs

1. X86 or RouterBOARD based device
2. RouterOS v6.11+ version(Use Latest!)
3. Atheros chipset (a/b/g/n/ac) wireless card
4. Wireless-fp package installed and enabled
5. At least Level4 RouterOS license

CAPsMAN v1 & v2

- ❖ Wireless-fp package introduces CAPsMAN v1 (2014 ROS v6.11+)
- ❖ Wireless-cm2 package introduces CAPsMAN v2 (2015 ROS 6.23+)
 - Improvements
 - Some new features



Name	Version	Build Time	Scheduled
routeros-mipsbe	6.33	Nov/06/2015 12:49:27	
advanced+	6.33	Nov/06/2015 12:49:27	
dhcp	6.33	Nov/06/2015 12:49:27	
hotspot	6.33	Nov/06/2015 12:49:27	
ipv6	6.33	Nov/06/2015 12:49:27	
mpls	6.33	Nov/06/2015 12:49:27	
ppp	6.33	Nov/06/2015 12:49:27	
routing	6.33	Nov/06/2015 12:49:27	
security	6.33	Nov/06/2015 12:49:27	
system	6.33	Nov/06/2015 12:49:27	
wireless-cm2	6.33	Nov/06/2015 12:49:27	scheduled for enable
wireless-fp	6.33	Nov/06/2015 12:49:27	

12 items (1 selected)

- ❖ CAPsMAN v2 is already stable and is widely used
- ⊗ Warning: CAPsMAN/CAP v1 is not compatible with v2!
 - Upgrade or downgrade everything in the network

CAPsMAN v2 New features

- CAPsMAN automatic upgrade of all CAP clients (configurable)
- Improved CAP<->CAPsMAN data connection protocol
- Added "Name Format, Name Prefix Identity/CommonName Regexp, IP Address Ranges" setting for Provision rules
- Improved logging entries when client roams between the CAPs
- Added L2 Path MTU discovery

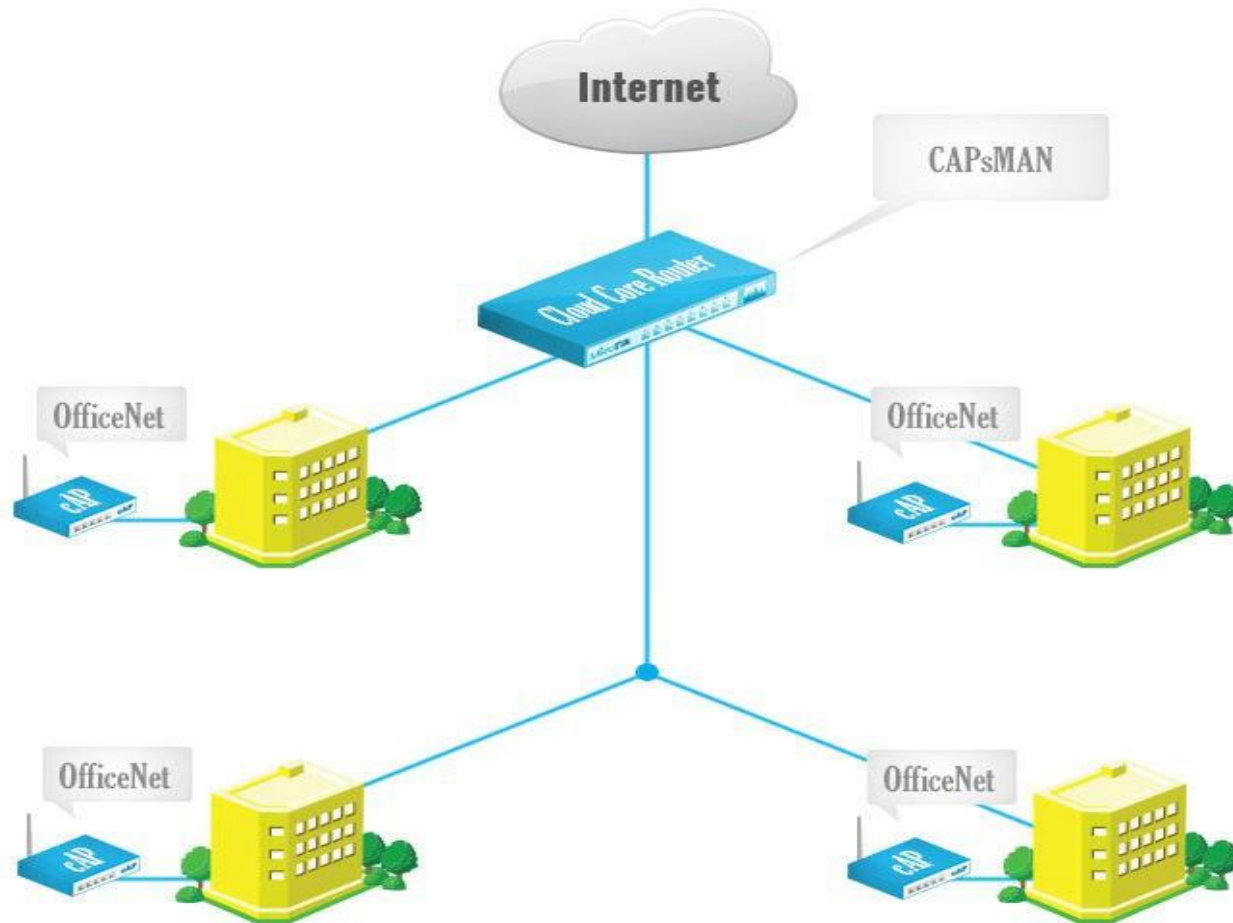
RouterOS 6.37 wireless-rep

- ❖ Wireless package for RouterOS 6.37:
 - Removes **all** existing wireless packages
 - Installs **wireless-rep**
 - **Wireless-rep** is renamed to **wireless**

- ❖ Using 6.37+ is strongly suggested for CAPsMAN
 - ❖ Today 6.38.1 is a good version

- Lets see CAPsMAN Quick Guide ,later we will discuss wireless-rep new features

CAPsMAN Simple Setup

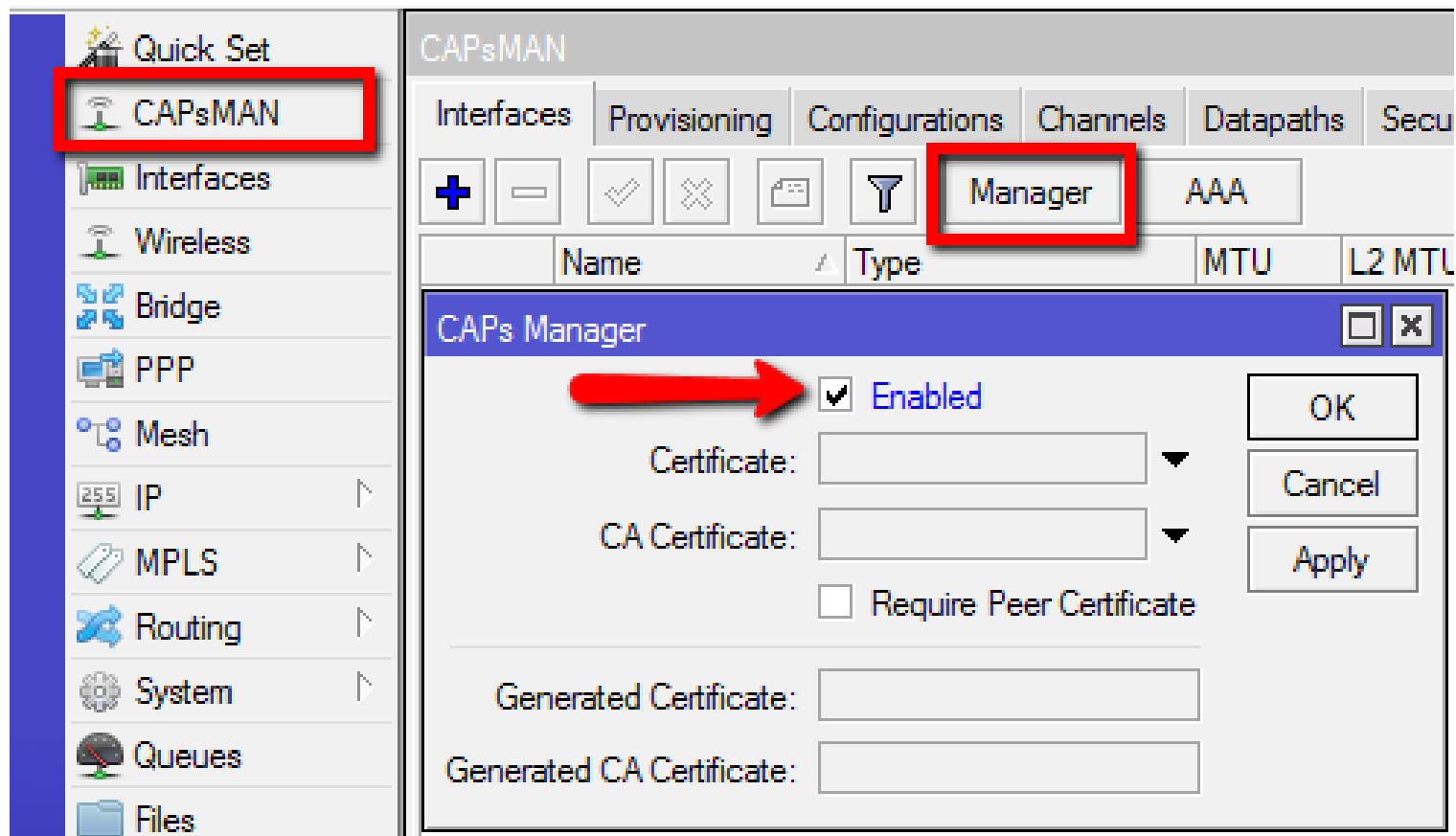


CAPsMAN Simple Setup

- Enable CAPsMAN service
- Create Bridge interface
- Add IP configuration to Bridge interface
- Create CAPsMAN Configuration
- Create Provisioning rule
- Enable CAP mode on the APs

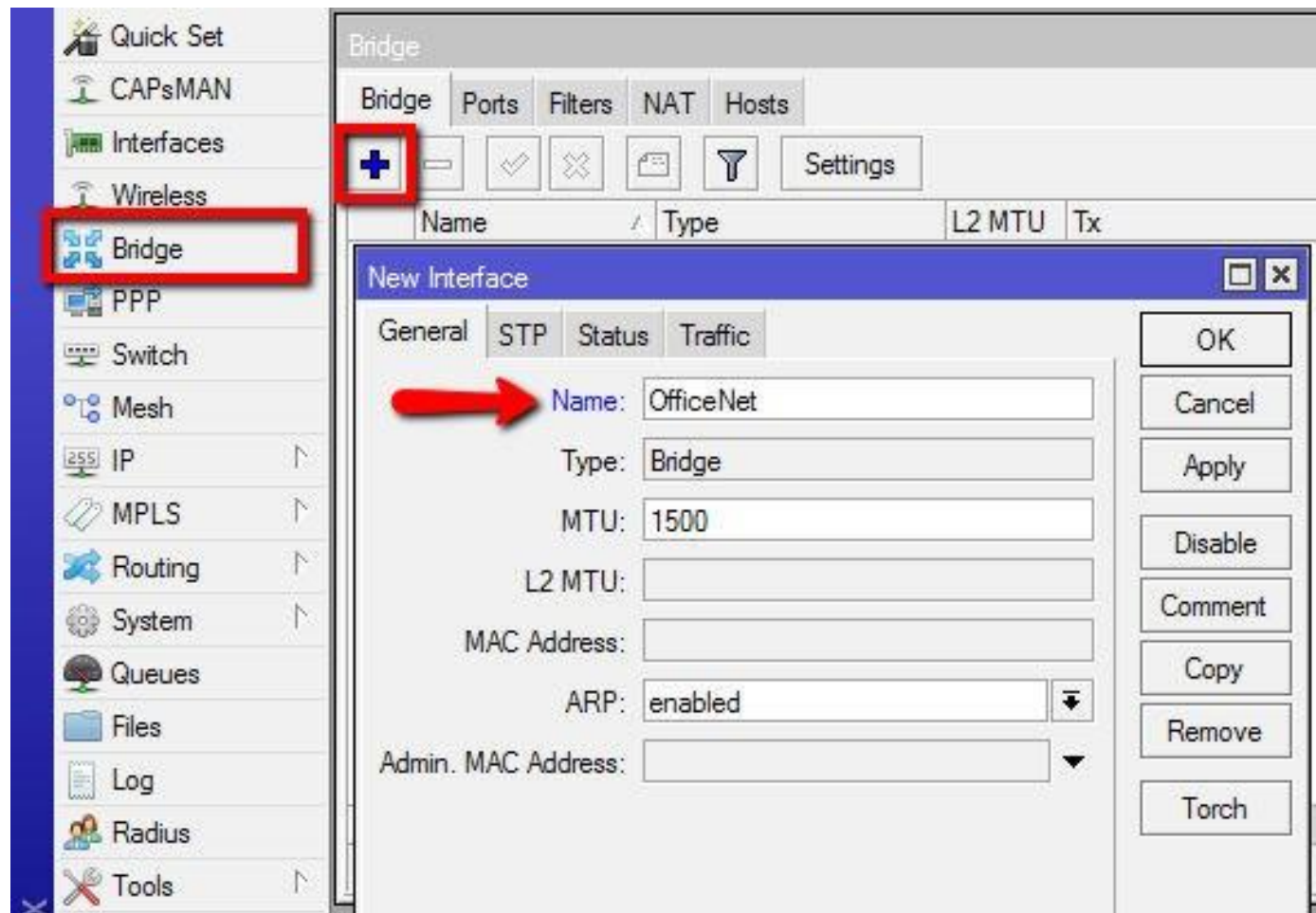
CAPsMAN Simple Setup

- Enable the CAPsMAN service



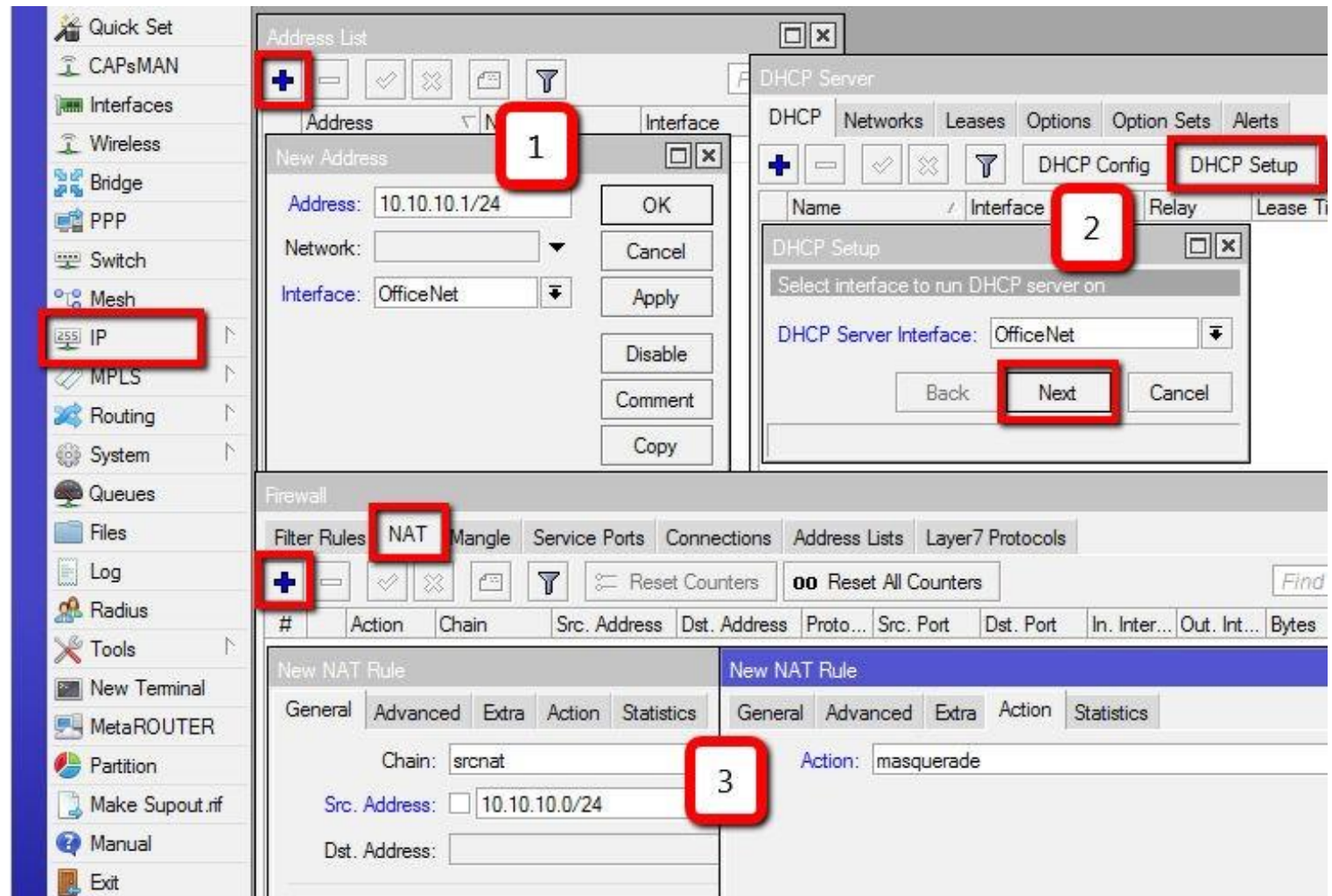
CAPsMAN Simple Setup

- Create Bridge Interface



CAPsMAN Simple Setup

1. Add IP address
2. Add DHCP Server
3. Add NAT rule



CAPsMAN Simple Setup

- Add new CAPsMAN Configuration

The screenshot displays the CAPsMAN web interface. At the top, the 'Configurations' tab is selected in the main menu. Below this, a table lists existing configurations. A red box highlights the '+' button used to add a new configuration. The 'New CAPs Configuration' dialog is open, showing three tabs: 'Wireless', 'Datapath', and 'Security'. The 'Wireless' tab is active, showing fields for Name (OfficeNet), Mode, SSID (Office), Hide SSID, Load Balancing Group, Country (united states), Max Station Count, Multicast Helper, HT Tx Chains, HT Rx Chains, and HT Guard Interval. The 'Datapath' tab is also visible, showing fields for Bridge (OfficeNet), Bridge Cost, Bridge Horizon, Local Forwarding, Client To Client Forwarding, VLAN Mode, and VLAN ID. The 'Security' tab is partially visible, showing fields for Authentication Type (WPA PSK, WPA2 PSK), Encryption (aes ccm), Group Encryption (aes ccm), Passphrase (OfficeNet), and EAP Methods.

CAP to CAPsMAN IP Based Connection

IP (UDP) Layer3

- CAP communicates CAPsMAN using IP protocol
- ✓ Can traverse NAT when required
- Management connection between CAP and CAPsMAN is secured using DTLS
- CAP client data traffic is not secured
 - If encryption is required IPsec or encrypted tunnels can be used

Specify IP on The CAP

Wireless Tables

Interfaces	Nstreme Dual	Access List	Registration	Connect List	Security Profiles	C
+	-	✓	✗	📁	🔍	CAP
					Scanner	Freq. Usage
						Alignmer
Name	Type	L2 MTU	Tx	Rx		
X wlan1	Wireless (Atheros AR9...	1600		0 bps		

CAP

☒ Enabled

Interfaces: wlan1

Certificate: none

Discovery Interfaces:

☐ Lock To CAPsMAN

CAPsMAN Addresses: 10.5.125.1

CAPsMAN Names:

CAPsMAN Certificate Common Names:

Bridge: none

Requested Certificate:

Locked CAPsMAN Common Name:

OK Cancel Apply

CAPsMAN and CAP in one board

- Does your CAPsMAN router has a wireless interface too?
- ✓ Enable CAP & Connect it to it self (127.0.0.1) for central management



Wireless Tables

Interfaces Nstream Dual Access List Registration Connect List Sec

+ - ✓ ✗ [CAP] Scanner Freq. Usa

Name	Type	L2 MTU	Tx
CAP			
☒ Enabled			
Interfaces: wlan1			
Certificate: none			
Discovery Interfaces:			
☐ Lock To CAPsMAN			
CAPsMAN Addresses: 127.0.0.1			
CAPsMAN Names:			
CAPsMAN Certificate Common Names:			
Bridge: none			
Requested Certificate:			
Locked CAPsMAN Common Name:			

CAPsMAN Simple Setup

- Add new Provisioning rule

The screenshot shows the CAPsMAN application window with the 'Provisioning' tab selected. A red box highlights the '+' button in the toolbar, which is used to add new provisioning rules. Another red box highlights the 'Provisioning' tab itself. Below the toolbar, a table lists existing provisioning rules. The 'New CAPs Provisioning' dialog is open, showing fields for Radio MAC, Action, Master Configuration, Slave Configuration, and Name Prefix. The 'Radio MAC' field is set to '00:00:00:00:00:00', 'Action' is 'create dynamic enabled', 'Master Configuration' is 'OfficeNet', and 'Name Prefix' is 'OfficeAP'. The 'enabled' checkbox is checked. Buttons for OK, Cancel, Apply, Disable, Comment, Copy, and Remove are visible on the right side of the dialog.

#	Radio MAC	Action	Master Configurati...	Slave C
	00:00:00:00:00:00	create dynamic enabled	OfficeNet	

New CAPs Provisioning

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

Action: create dynamic enabled

Master Configuration: OfficeNet

Slave Configuration:

Name Prefix: OfficeAP

enabled

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

CAPsMAN Simple Setup

- Check the “Interface” status on:

CAPsMAN

CAPsMAN

Interfaces Provisioning Configurations Channels Datapaths Security

+ - ✓ ✗ [Icon] [Icon] Manager AAA

	Name	Type	MTU	L2 MTU
DSMB	OfficeAP1	Interfaces	1500	1600

Interface <OfficeAP1>

General Wireless Channel Datapath Security Status Traffic

Current State: running-ap

Current Channel: 2427/20-Ce/gn(30dBm)

Current Rate Set: CCK:1-11 OFDM:6-54 BW:1x-2x HT:0-7

Current Basic Rate Set: OFDM:6 BW:1x HT:0-7

CAP

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security

+ - ✓ ✗ [Icon] [Icon] CAP Scanner Freq. Usage

	Name	Type	L2 MTU	Tx
	--- managed by CAPsMAN			
	--- channel: 2427/20-Ce/gn(30dBm), SSID: Office, CAPsMAN forwarding			
X	wlan1	Wireless (Atheros AR9...	1600	

CAPsMAN Registration table

CAPsMAN

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

1 item

Interface	MAC Address	Tx Rate	Rx Rate	Tx Signal	Rx Signal	Uptime	Tx/Rx Packets	Tx/Rx Bytes
OfficeAP3	18:34:51:41:75:CD	65Mbps-...	65Mbps-...	0	-44	00:03:17...	31 395/33 212	29.8 MiB/29.5 MiB

CAPs AP Client <18:34:51:41:75:CD>

Interface: OfficeAP3

MAC Address: 18:34:51:41:75:CD

Tx Rate: 65Mbps-20MHz/1S

Rx Rate: 65Mbps-20MHz/1S

Tx Rate Set: CCK:1-11 OFDM:6-54 BW:1x HT:0-7

Tx Signal: 0

Rx Signal: -44

Uptime: 00:03:17.70

Tx/Rx Packets: 31 395/33 212

Tx/Rx Bytes: 29.8 MiB/29.5 MiB

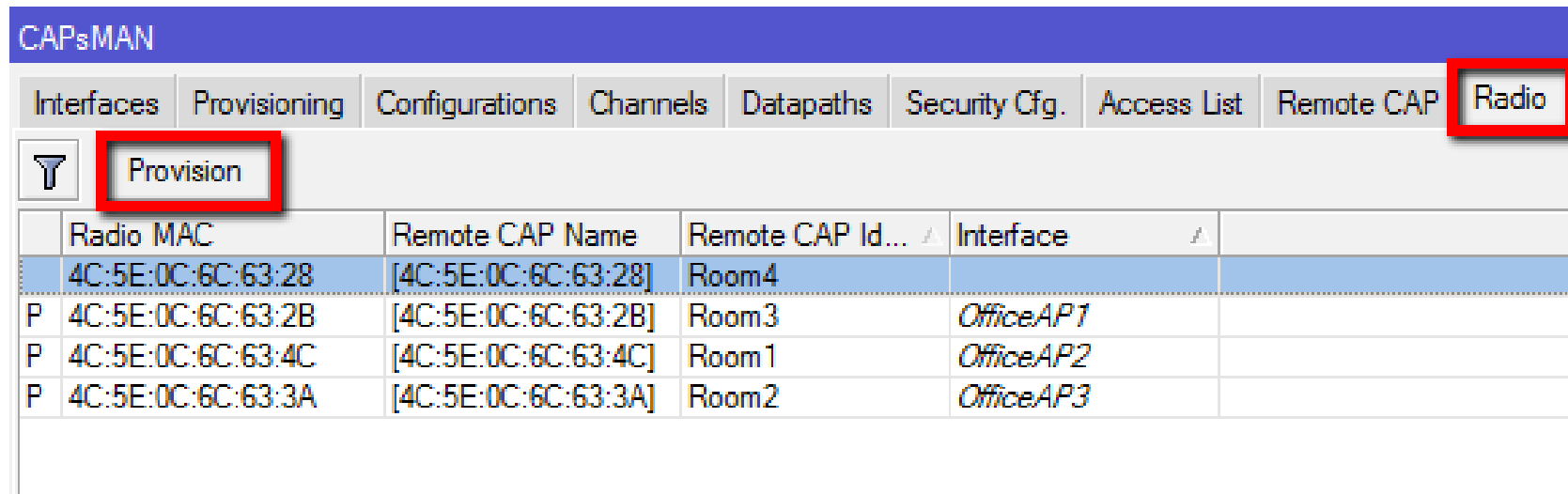
OK

Remove

Copy to Access List

Manual Provisioning

- Changing Provisioning rules doesn't effect already configured CAPs, manual Provisioning required:
 - Remove CAP interface
 - Initiate Provision command on the CAP



The screenshot shows the CAPsMAN web interface. At the top, there is a blue header bar with the text "CAPsMAN". Below the header, there is a navigation menu with several tabs: "Interfaces", "Provisioning", "Configurations", "Channels", "Datapaths", "Security Cfg.", "Access List", "Remote CAP", and "Radio". The "Radio" tab is highlighted with a red box. Below the navigation menu, there is a sub-menu with a filter icon and a "Provision" button, which is also highlighted with a red box. Below the sub-menu, there is a table with the following columns: "Radio MAC", "Remote CAP Name", "Remote CAP Id...", "Interface", and an empty column. The table contains four rows of data. The first row is highlighted in blue. The second row has a "P" in the first column. The third and fourth rows also have "P" in the first column.

	Radio MAC	Remote CAP Name	Remote CAP Id...	Interface	
	4C:5E:0C:6C:63:28	[4C:5E:0C:6C:63:28]	Room4		
P	4C:5E:0C:6C:63:2B	[4C:5E:0C:6C:63:2B]	Room3	OfficeAP1	
P	4C:5E:0C:6C:63:4C	[4C:5E:0C:6C:63:4C]	Room1	OfficeAP2	
P	4C:5E:0C:6C:63:3A	[4C:5E:0C:6C:63:3A]	Room2	OfficeAP3	

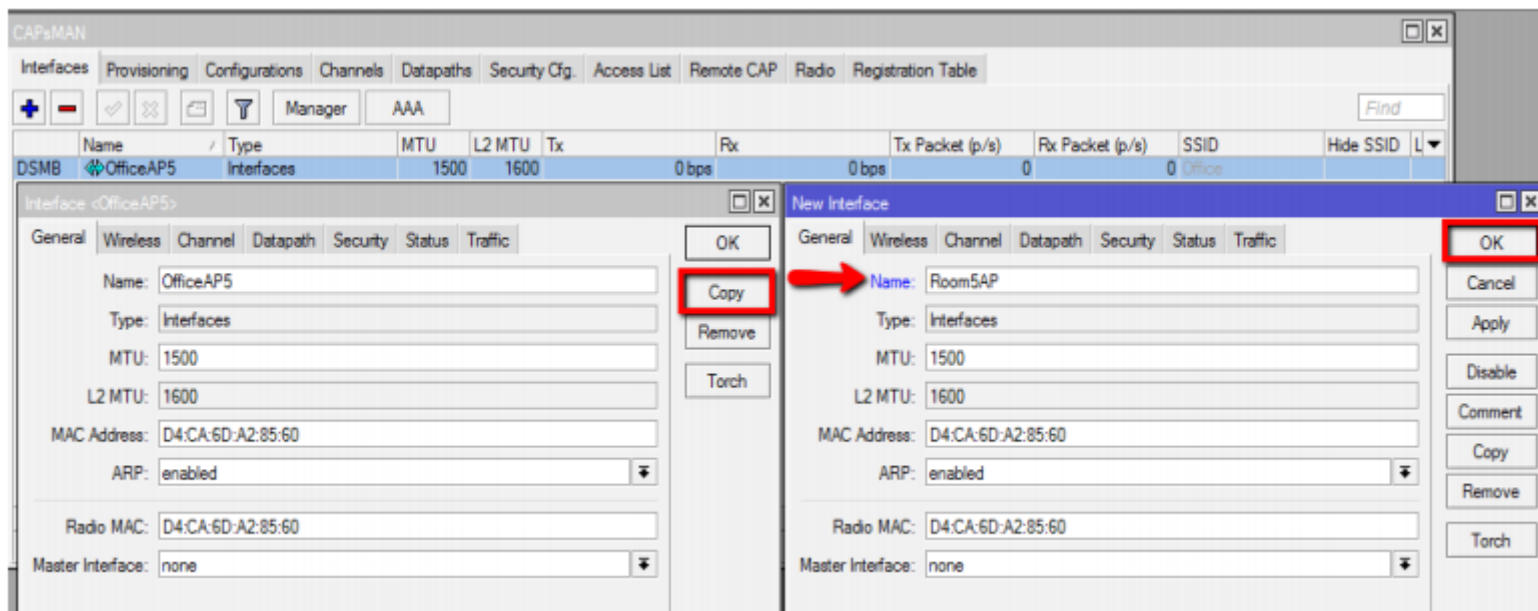
CAP Identification

- MAC/IP address
- RouterBoard model
- Serial Number of the Board
- RouterOS version
- System Identity
- Main wireless MAC
- State of the CAP
- Radio count

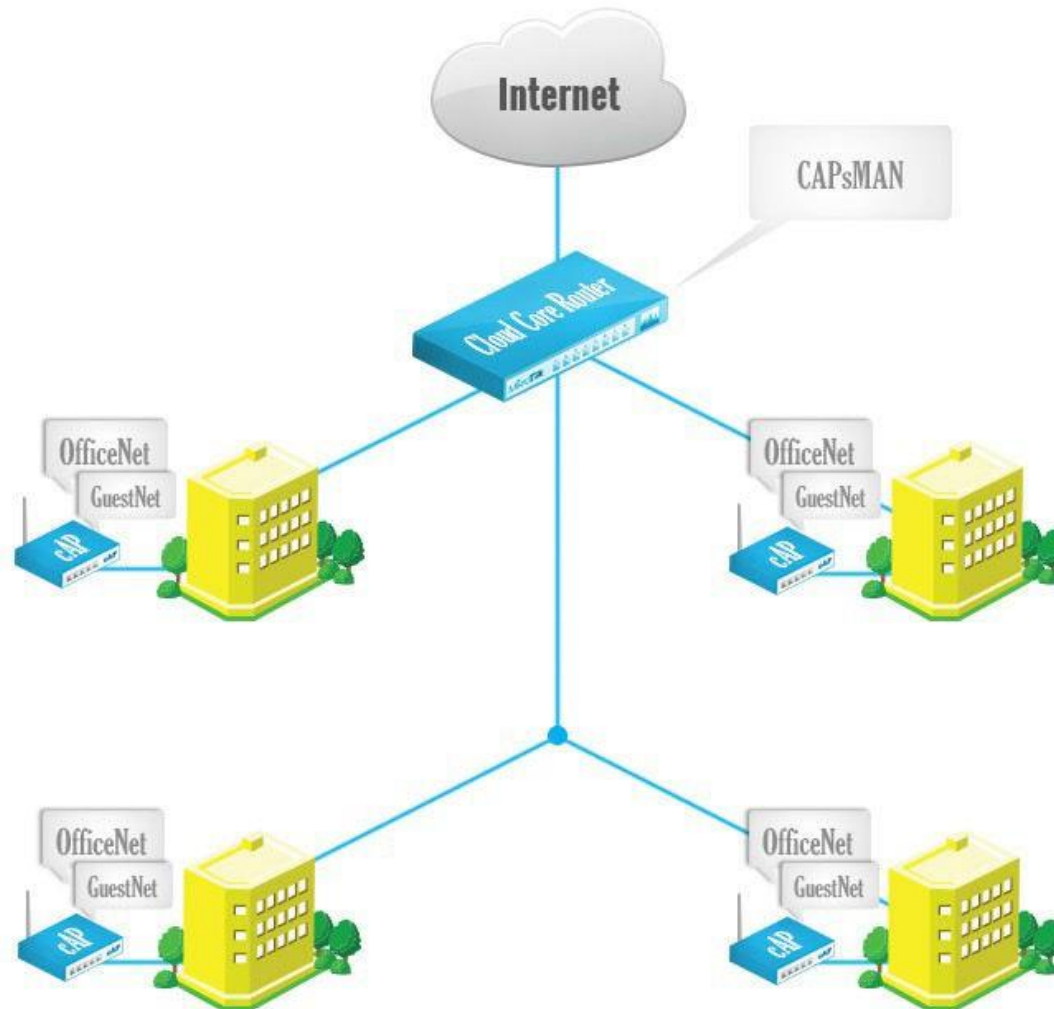
CAPsMAN									
Interfaces	Provisioning	Configurations	Channels	Datapaths	Security Cfg.	Access List	Remote CAP	Radio	Registration Table
		Provision							
Address	Name	Board	Serial	Version	Identity	Base MAC	State	Radios	
4C:5E:0C:6C:63:26	[4C:5E:0C:6C:63:28]	RBmAP2n	52760434DCE4	6.19	Room4	4C:5E:0C:6C:63:28	Run	1	
4C:5E:0C:6C:63:29	[4C:5E:0C:6C:63:2B]	RBmAP2n	5276046C9DA3	6.19	Room3	4C:5E:0C:6C:63:2B	Run	1	
4C:5E:0C:6C:63:38	[4C:5E:0C:6C:63:3A]	RBmAP2n	527604845E6A	6.19	Room2	4C:5E:0C:6C:63:3A	Run	1	
4C:5E:0C:6C:63:4A	[4C:5E:0C:6C:63:4C]	RBmAP2n	527604D1D5D4	6.19	Room1	4C:5E:0C:6C:63:4C	Run	1	
:ffff:10.5.125.172	[D4:CA:6D:A2:85:60]	RBmAP2n	527602095F22	6.19	Room5	D4:CA:6D:A2:85:60	Run	1	

CAPsMAN static CAP interface

- Interface name or setting does not change after a reboot
- Additional manual setting override
- Copy dynamic interface to make static interface



CAPsMAN Virtual AP



CAPsMAN VirtualAP Configuration

- Create new Bridge interface and IP configuration for the VirtualAP
 - Or use the same bridge interface used for Master AP
- Create a new configuration for the VirtualAP
- Specify the new configuration in Provisioning rule as Slave Configuration
- Remove all CAP interfaces
- Initiate Manual Provisioning on all the CAPs

CAPsMAN VirtualAP Setup

CAPsMAN

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

+

Name	SSID	Hide SSID	Load Bal...	Country	Channel	Frequency	Band	D
OfficeNet	Office			united sta...				

New CAPs Configuration

Wireless Channel Datapath Security

Name: GuestNet

Mode:

SSID: Guest

Hide SSID:

Load Balancing Group:

Country:

Max Station Count:

Multicast Helper:

HT Tx Chains:

HT Rx Chains:

HT Guard Interval:

New CAPs Configuration

Wireless Channel **Datapath** Security

Datapath:

Bridge: GuestNet

Bridge Cost:

Bridge Horizon:

Local Forwarding:

Client To Client Forwarding:

VLAN Mode:

VLAN ID:

CAPsMAN VirtualAP Setup

CAPsMAN

Interfaces **Provisioning** Configurations Channels Datapaths Sec

+ - ✓ ✗ 📁 🔍

#	Radio MAC	Action	Master Configurati...	Slave
0	00:00:00:00:00:00	create dy...	OfficeNet	

CAPs Provisioning <00:00:00:00:00:00>

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

Action: create dynamic enabled Cancel

Master Configuration: OfficeNet Apply

Slave Configuration: GuestNet Disable

Name Prefix: OfficeAP Comment

Copy

Remove

enabled

CAPsMAN

Interfaces Provisioning Configurations Channels Datapaths

+ - ✓ ✗ 📁 🔍 Manager AAA

	Name	Type	MTU	L
DSMB	OfficeAP1	Interfaces	1500	
DSB	OfficeAP1-1	Interfaces	1500	
DSMB	OfficeAP2	Interfaces	1500	
DSB	OfficeAP2-1	Interfaces	1500	
DSMB	OfficeAP3	Interfaces	1500	
DSB	OfficeAP3-1	Interfaces	1500	
DSMB	OfficeAP4	Interfaces	1500	
DSB	OfficeAP4-1	Interfaces	1500	
SMB	Room5AP	Interfaces	1500	

CAPsMAN

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

🔍 **Provision**

	Radio MAC	Remote CAP Name	Remote CAP Identi...	Interface
P	4C:5E:0C:6C:63:28	[4C:5E:0C:6C:63:...	Room4	OfficeAP1
P	4C:5E:0C:6C:63:2B	[4C:5E:0C:6C:63:...	Room3	OfficeAP3
P	4C:5E:0C:6C:63:3A	[4C:5E:0C:6C:63:...	Room2	OfficeAP5
P	4C:5E:0C:6C:63:4C	[4C:5E:0C:6C:63:...	Room1	OfficeAP2
P	D4:CA:6D:A2:85:6D	[D4:CA:6D:A2:85:...	Room5	Room5AP

CAPsMAN static VirtualAP

CAPsMAN

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

+ - ✓ ✗ 📁 🔍 Manager AAA

Name	Type	MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
DSMB ↔ OfficeAP1	Interfaces	1500	1600	0 bps	0 bps	0	0
DSB ↔ OfficeAP1-1	Interfaces	1500	1600	0 bps	0 bps	0	0
DSMB ↔ OfficeAP2	Interfaces	1500	1600	0 bps	0 bps	0	0
DSB ↔ OfficeAP2-1	Interfaces	1500	1600	0 bps	0 bps	0	0
DSMB ↔ OfficeAP3	Interfaces	1500	1600	0 bps	0 bps	0	0
DSB ↔ OfficeAP3-1	Interfaces	1500	1600	0 bps	0 bps	0	0
DSMB ↔ OfficeAP4	Interfaces	1500	1600	0 bps	0 bps	0	0
DSB ↔ OfficeAP4-1	Interfaces	1500	1600	0 bps	0 bps	0	0
SMB ↔ Room5AP	Interfaces	1500	1600	0 bps	0 bps	0	0

New Interface

General Wireless Channel Datapath Security

Name: Room5VAP
Type: Interfaces
MTU: 1500
L2 MTU:
MAC Address: 00:00:00:00:00:00
ARP: enabled
Radio MAC: 00:00:00:00:00:00
Master Interface: Room5AP

New Interface

General Wireless Channel Datapath Security Status Traffic

Configuration: GuestNet
Mode:
SSID: GuestAP
Hide SSID:
Load Balancing Group:
Country:
Max Station Count:

OK
Cancel
Apply
Disable
Comment
Copy
Remove
Torch

CAPsMAN Access List Features

- MAC Authentication
- Radius Query support
- MAC Mask support
- Signal Range
- Time
- Private Passphrase
- VLAN ID assignment

CAPsMAN Access List

- Allow Apple devices to connect
- Let RADIUS server decide for the rest of devices

The screenshot displays the CAPsMAN configuration interface. The 'Access List' tab is selected and highlighted with a red box. Below the tab, a toolbar contains a '+' icon, also highlighted with a red box. The main area shows a table with columns: #, MAC Address, MAC Mask, Interface, Signal Ra..., Action, Client To Clie..., VLAN Mo..., and VLAN ID. Two 'New CAPs Access Rule' dialog boxes are open. The left dialog box has the following fields: MAC Address (18:34:51:00:00:00), MAC Mask (FF:FF:FF:00:00:00), Interface (empty), Signal Range (empty), Time (dropdown), Action (accept), AP Tx Limit (empty), Client Tx Limit (empty), Private Passphrase (empty), Client To Client Forwarding (empty), RADIUS Accounting (empty), VLAN Mode (empty), and VLAN ID (empty). The right dialog box has the following fields: MAC Address (empty), MAC Mask (empty), Interface (empty), Signal Range (empty), Time (dropdown), Action (query radius), AP Tx Limit (empty), Client Tx Limit (empty), Private Passphrase (empty), Client To Client Forwarding (empty), RADIUS Accounting (empty), VLAN Mode (empty), and VLAN ID (empty). Both dialog boxes have OK, Cancel, Apply, Disable, Comment, Copy, and Remove buttons. The status 'enabled' is shown at the bottom of each dialog box.

CAPsMAN Configuration override

- Configuration overrides Channel setting
- Interface overrides Channel and Configuration setting

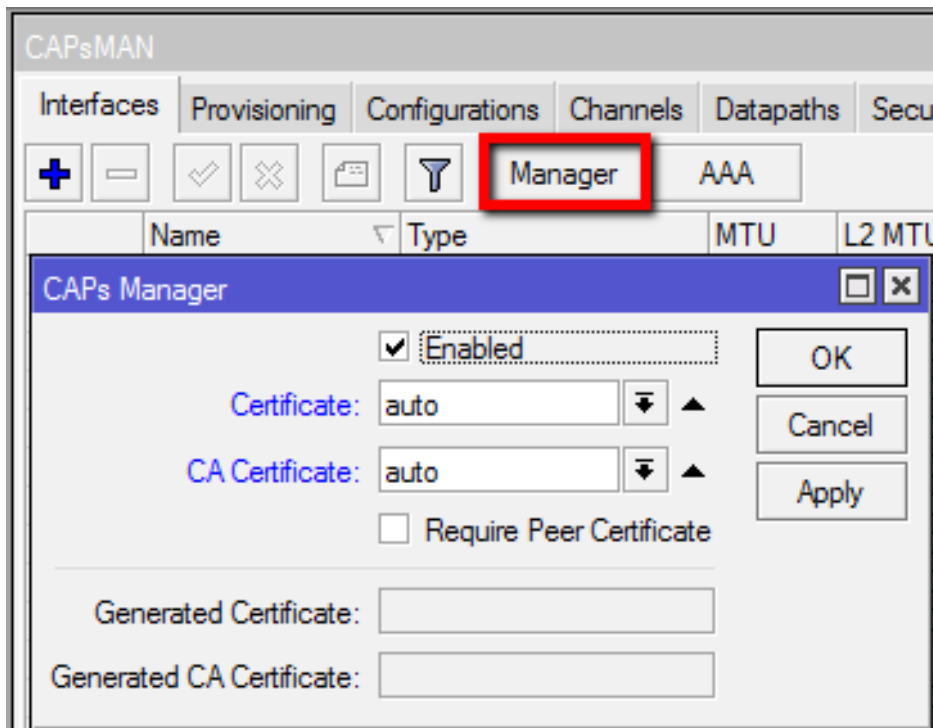


The image displays four screenshots of CAPsMAN configuration windows, illustrating the hierarchy of settings:

- New CAPs Channel:** Shows a channel named 'channel1' with a frequency of 2412 MHz.
- New CAPs Configuration:** Shows the 'Channel' tab with 'channel1' selected, a frequency of 2437 MHz, and a width setting.
- New Interface:** Shows the 'Channel' tab with 'channel1' selected, a frequency of 2462 MHz, and a width setting.
- Interface <cap1>:** Shows the 'Channel' tab with the current state as 'running-ap', current channel as '2462/20-eC/gn(30dBm)', current rate set as 'CCK:1-11 OFDM:6-54 BW:1x-2x HT:0-7', and current basic rate set as 'OFDM:6 BW:1x HT:0-7'.

CAPsMAN Auto Certificate

- Enable Certificate and CA Certificate on CAPsMAN



The screenshot shows the CAPsMAN Manager configuration window. The 'Manager' tab is selected and highlighted with a red box. The 'Enabled' checkbox is checked. The 'Certificate' and 'CA Certificate' fields are both set to 'auto'. The 'Require Peer Certificate' checkbox is unchecked. The 'Generated Certificate' and 'Generated CA Certificate' fields are empty.

Name	Type	MTU	L2 MTU
CAPs Manager			

☒ Enabled

Certificate: auto

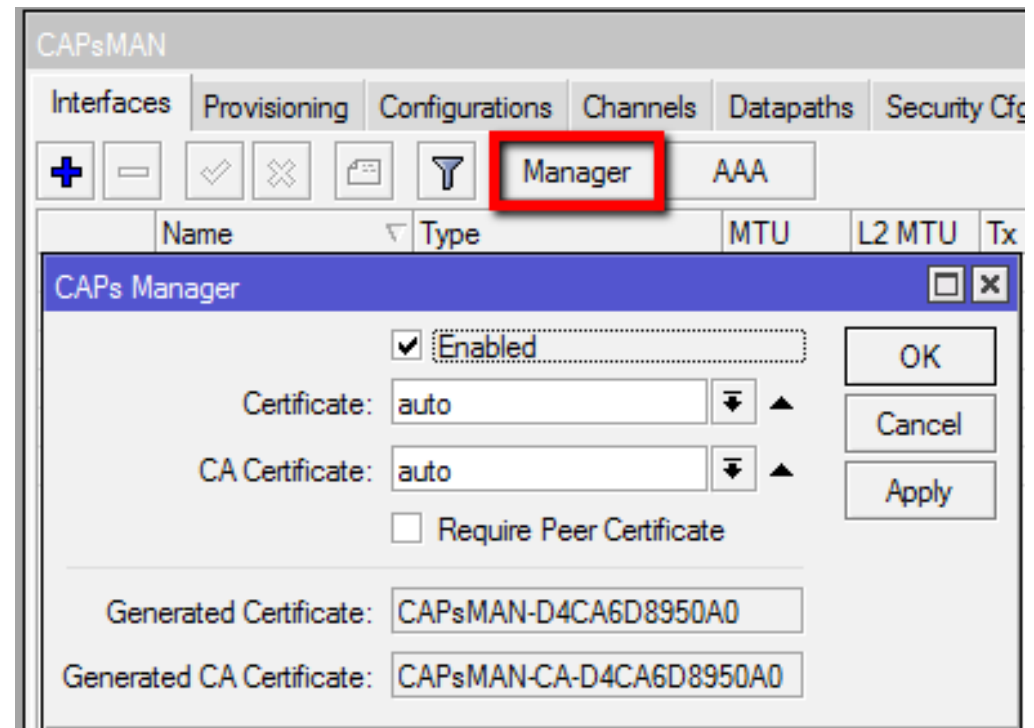
CA Certificate: auto

☐ Require Peer Certificate

Generated Certificate:

Generated CA Certificate:

OK Cancel Apply



The screenshot shows the CAPsMAN Manager configuration window after the certificates have been generated. The 'Manager' tab is selected and highlighted with a red box. The 'Enabled' checkbox is checked. The 'Certificate' and 'CA Certificate' fields are both set to 'auto'. The 'Require Peer Certificate' checkbox is unchecked. The 'Generated Certificate' field is populated with 'CAPsMAN-D4CA6D8950A0' and the 'Generated CA Certificate' field is populated with 'CAPsMAN-CA-D4CA6D8950A0'.

Name	Type	MTU	L2 MTU	Tx
CAPs Manager				

☒ Enabled

Certificate: auto

CA Certificate: auto

☐ Require Peer Certificate

Generated Certificate: CAPsMAN-D4CA6D8950A0

Generated CA Certificate: CAPsMAN-CA-D4CA6D8950A0

OK Cancel Apply

CAPsMAN Auto Certificate

- Enable “Request” Certificate on CAP

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Pr

+ - ✓ ✗ CAP Scanner Freq. Usage

Name	Type	L2 MTU	Tx
CAP			

CAP

☒ Enabled

Interfaces: wlan1

Certificate: request

Discovery Interfaces: ether1

☐ Lock To CAPsMAN

CAPsMAN Addresses:

CAPsMAN Names:

CAPsMAN Certificate Common Names:

Bridge: bridgeLocal

Requested Certificate:

Locked CAPsMAN Common Name:

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Pr

+ - ✓ ✗ CAP Scanner Freq. Usage

Name	Type	L2 MTU	Tx
CAP			

CAP

☒ Enabled

Interfaces: wlan1

Certificate: request

Discovery Interfaces: ether1

☐ Lock To CAPsMAN

CAPsMAN Addresses:

CAPsMAN Names:

CAPsMAN Certificate Common Names:

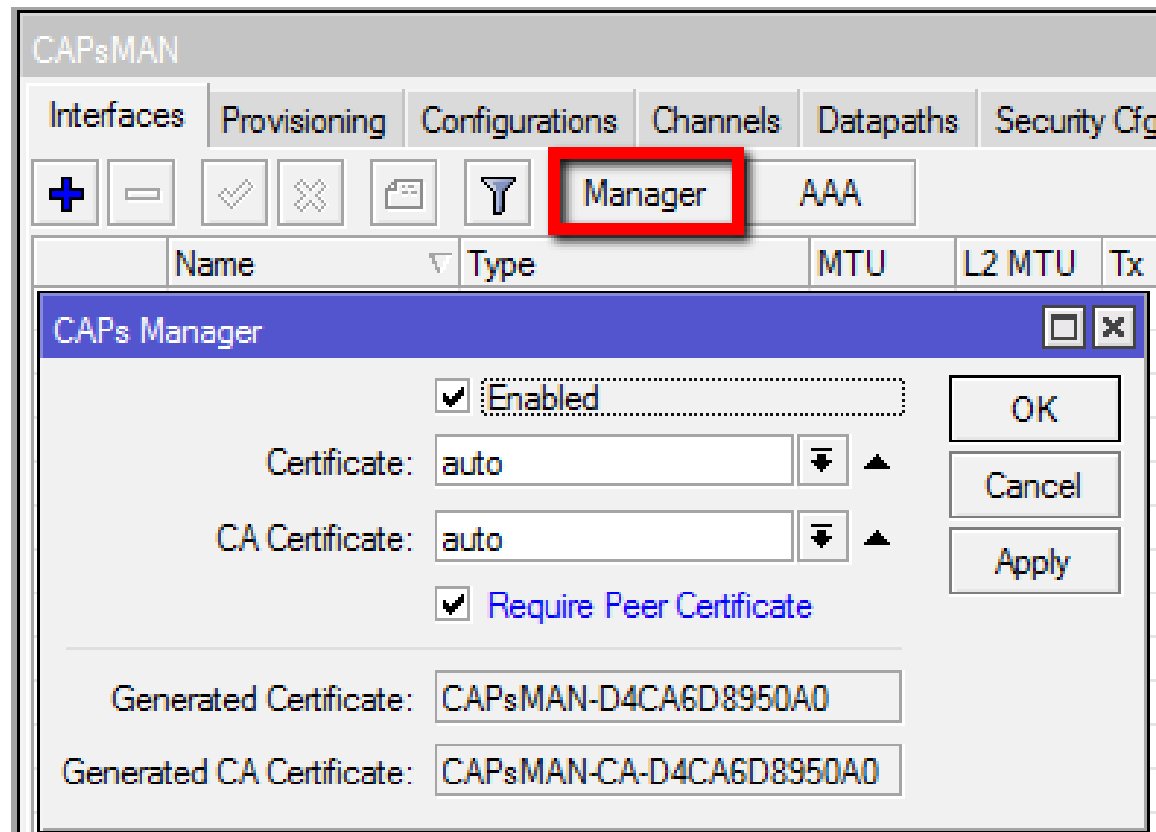
Bridge: bridgeLocal

Requested Certificate: CAP-4C5E0C6C634A

Locked CAPsMAN Common Name:

CAPsMAN Auto Certificate

- Accept connections only from CAPs with valid certificate

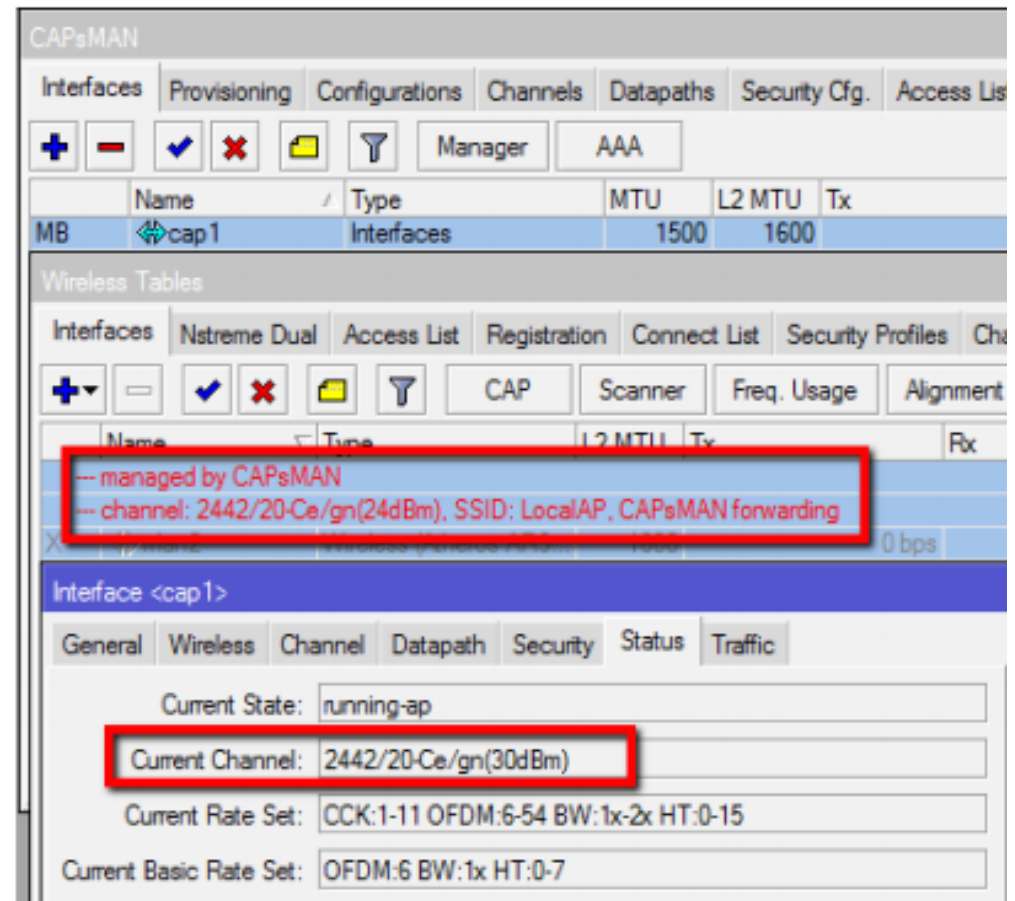


CAPsMAN Antenna Gain (Country Regulations)

- Antenna-gain value is taken from the CAP interface
- Must be configured on AP before you enable radio in CAP mode

Example

- Antenna-gain: 6dBi
- EIRP: 30dB



CAPsMAN Latest version new features in configuration - wireless

- 16th October 2014 i have advised MikroTik to include **wireless tuning parameters** also in CAPsMAN:
 - Configurable Basic and Supported Data-Rates
 - hw-retries,
 - disconnect-timeout
 - rts/cts
 - Etc..
- ✓ As of 17th October(In Middle East MUM 2016 I had realized that everything was there)! 😊 Thanks!
 - Full CAPs control

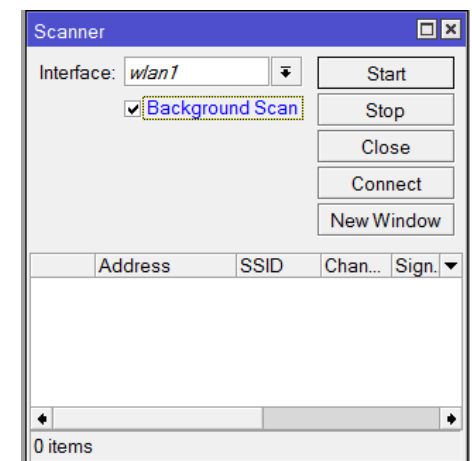
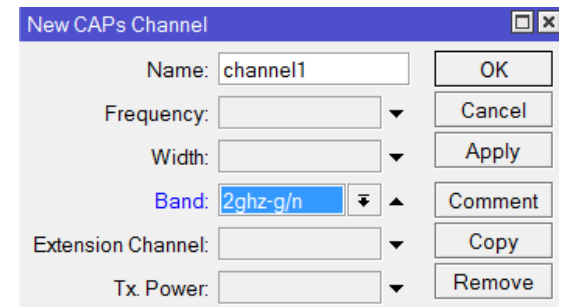
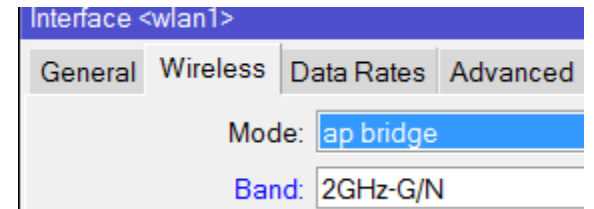
The screenshot shows the 'New CAPs Configuration' window with the 'Wireless' tab active. A red rectangle highlights the following fields: Distance, Hw. Retries, Hw. Protection Mode, Frame Lifetime, and Disconnect Timeout. Other visible fields include Name (cfg1), Mode, SSID, Hide SSID, Load Balancing Group, Country, Max Station Count, Multicast Helper, HT Tx Chains, HT Rx Chains, and HT Guard Interval. Action buttons on the right include OK, Cancel, Apply, Comment, Copy, and Remove.

CAPsMAN Latest version new features in configuration - RATES

The image shows two overlapping windows from the CAPsMAN configuration tool. The top window, titled 'New CAPs Configuration', has tabs for 'Wireless', 'Channel', 'Rates', 'Datapath', and 'Security'. The 'Rates' tab is active, showing a 'Rate:' dropdown menu and several expandable sections: 'Basic Rates', 'Supported Rates', 'HT Basic MCS', 'HT Supported MCS', 'VHT Basic MCS', and 'VHT Supported MCS'. To the right of these sections are buttons for 'OK', 'Cancel', 'Apply', 'Comment', 'Copy', and 'Remove'. The bottom window, titled 'New CAPs Rate', has a 'Name:' field containing 'rate1'. It also features expandable sections for 'Basic Rates', 'Supported Rates', 'HT Basic MCS', 'HT Supported MCS', 'VHT Basic MCS', and 'VHT Supported MCS'. The 'Basic Rates' section is expanded, showing a grid of checkboxes for various rates: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps, 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, and 54Mbps. Similar buttons for 'OK', 'Cancel', 'Apply', 'Comment', 'Copy', and 'Remove' are on the right.

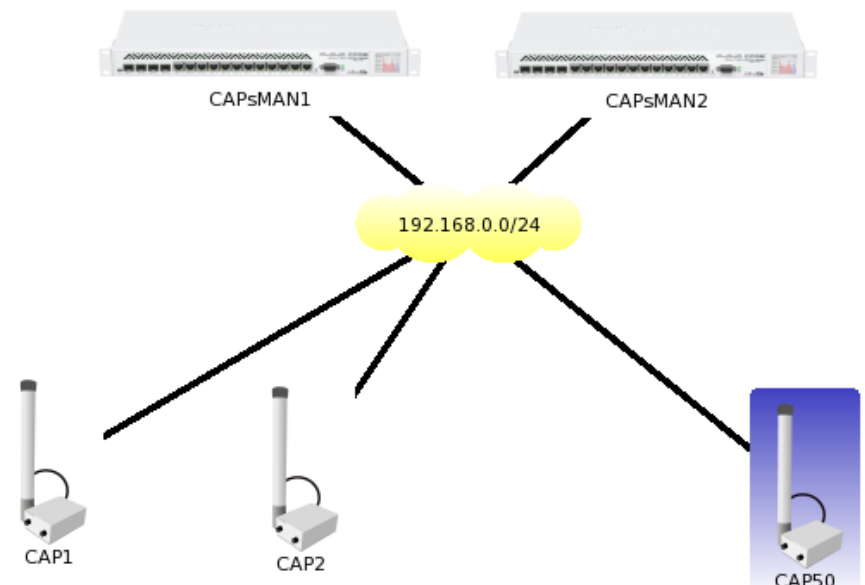
Wireless-rep package – Other new features useful for CAPsMAN

- Regular Wireless Interface and CAPsMAN support '2ghz-g/n' band setting
 - basic-rates – 6-54Mbps
 - supported – 6-54Mbps
 - ht-basic-mcs – None
 - ht-supported-mcs – 0-23
- Background scan
 - Not included in CAPsMAN but it can be used on CAPs



Maintain a failover controller (CAPsMAN)

- In big networks you have
 - Many CAPs
 - Many active users
- Most times your customer will require redundancy
 - A bad power supply can take down whole network



Maintain a failover controller (CAPsMAN)

- Its possible to create the same configuration on a second or maybe third router to act as a backup CAPsMAN

➤ Just configure multiple CAPsMAN addresses on **every** CAP

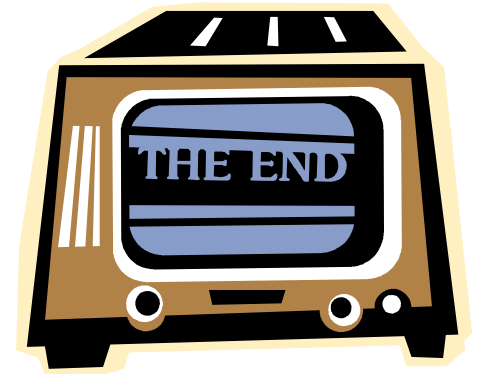


CAP configuration window showing the following fields:

- ☒ Enabled
- Interfaces: wlan1, wlan2
- Certificate: none
- Discovery Interfaces:
- ☐ Lock To CAPsMAN
- CAPsMAN Addresses: 192.168.0.1, 192.168.0.2**
- CAPsMAN Names:
- CAPsMAN Certificate Common Names:
- Bridge: none
- Requested Certificate:
- Locked CAPsMAN Common Name:

Comments? Questions?

Thank You!
Enjoy the Rest of the MUM



Need Help? A reliable partner? Contact me for:

- Consultancy & Solutions for New or Existing ISP/WISP
- Telephony-VoIP Solutions (Wholesale or Retail/CallingCard)
- A custom Network/Telecom service or solution
- Long term cooperation for your projects

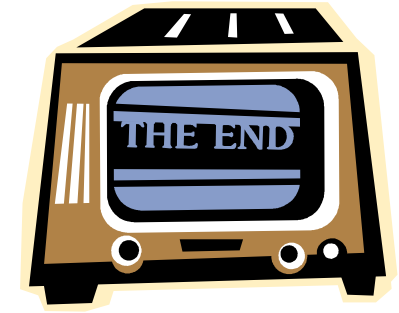
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More Comments? Questions?



Thank You!

Enjoy the Rest of the MUM

Do you like MikroTik? Need to know more?

**...Need to organize a Training at your Place?
Different Dates? Private Trainings for your company?**

Just Contact me ☺

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