



MS

Managed Service

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About :

Správa užívateľov je hlavným trápením ISP-čkárov.

- ✓ Aktuálne zariadenia už dávno umožňujú aj nám malým ISP-čkárom používať vymoženosti veľkých firiem.
 - ✓ Plus postupom času pribúdajú aj do MikroTiku ďalšie skvelé funkcie pre automatickú správu a inštaláciu zariadení.
-

About :

Veľa z vás už používa vlastné riešenia ovládania koncových zariadení, jedná sa ale väčšinou o prorpetárne riešenia ktoré sa nedajú použiť na celkovú sieť či už z pohľadu nehomogenity koncových zariadení alebo sú jednoducho postavené iba na jeden konkrétny prípad pripojenia. (väčšinou t.z.v. WISP).

A práve niektoré z nových MikroTik funkcií ~~nám dokážu omnoho zjednodušiť našu~~ prácu.



MikroTik Features

MikroTik deployment Features

- ✓ NetInstall
- ✓ FlashFig

MikroTik remote configurator Feature

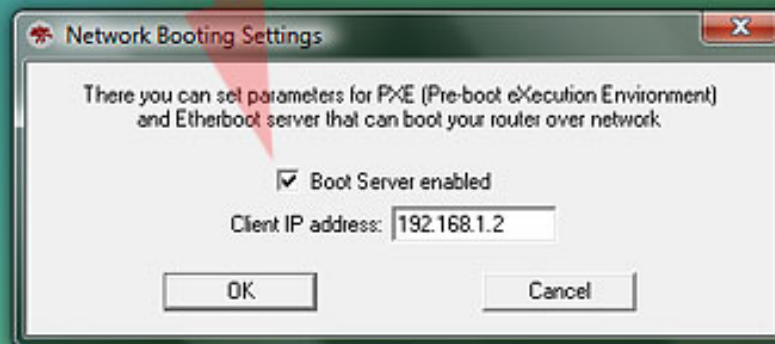
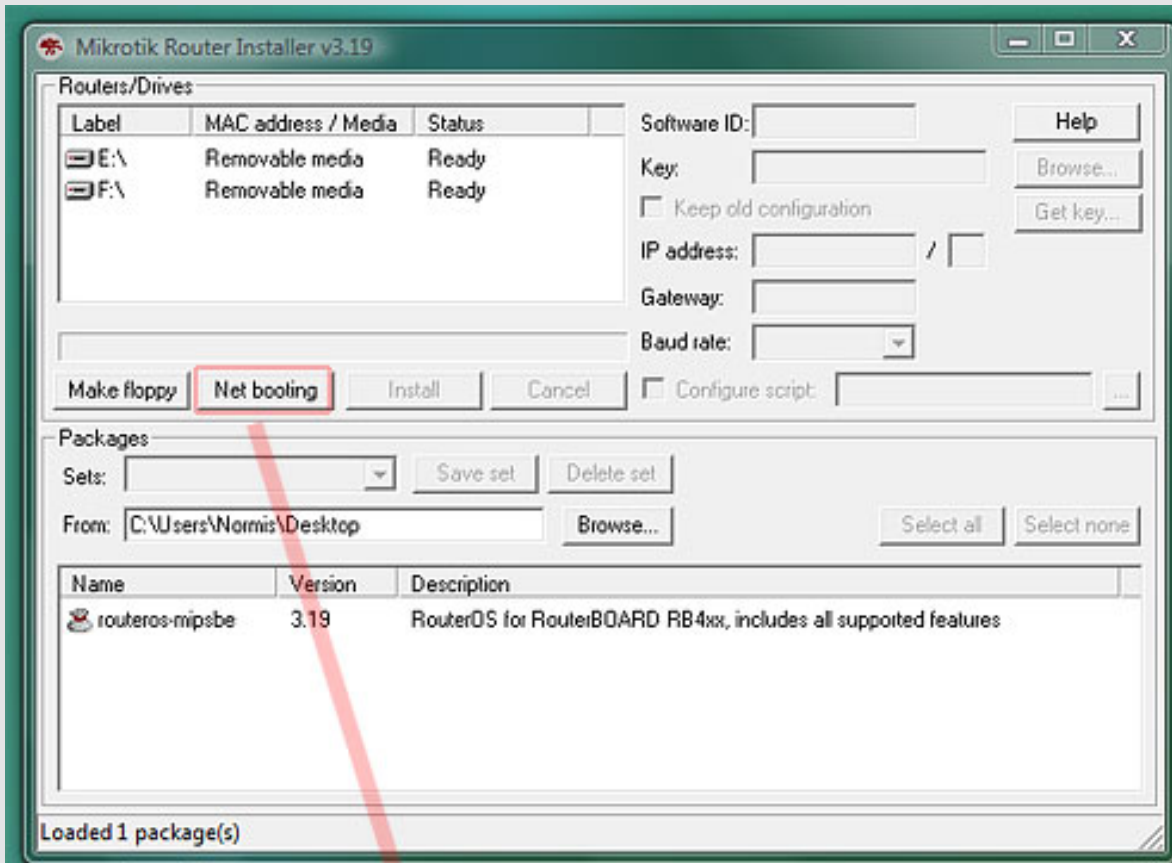
- ✓ RoMON
 - ✓ CAPsMAN
 - ✓ extra ?
-



NETINSTALL

NETINSTALL Features

- ✓ obnova routra po katastrofe
 - ✓ umožňuje nainštalovať permanentný
 - ✓ vlastný default config
 - ✓ vlastný branding
-



[Back To Main Menu]

Branding Package Maker

RouterOS version

6.29

Router name

FutureGate

Company URL

<http://www.mikrotik.cool>

Manual URL


<http://wiki.mikrotik.com/wiki/Manual:TOC>

Telnet ASCII Logo



LCD Logo



Upload 

Vybrať súbor **nie je vybraný žiadny súbor**

Category:

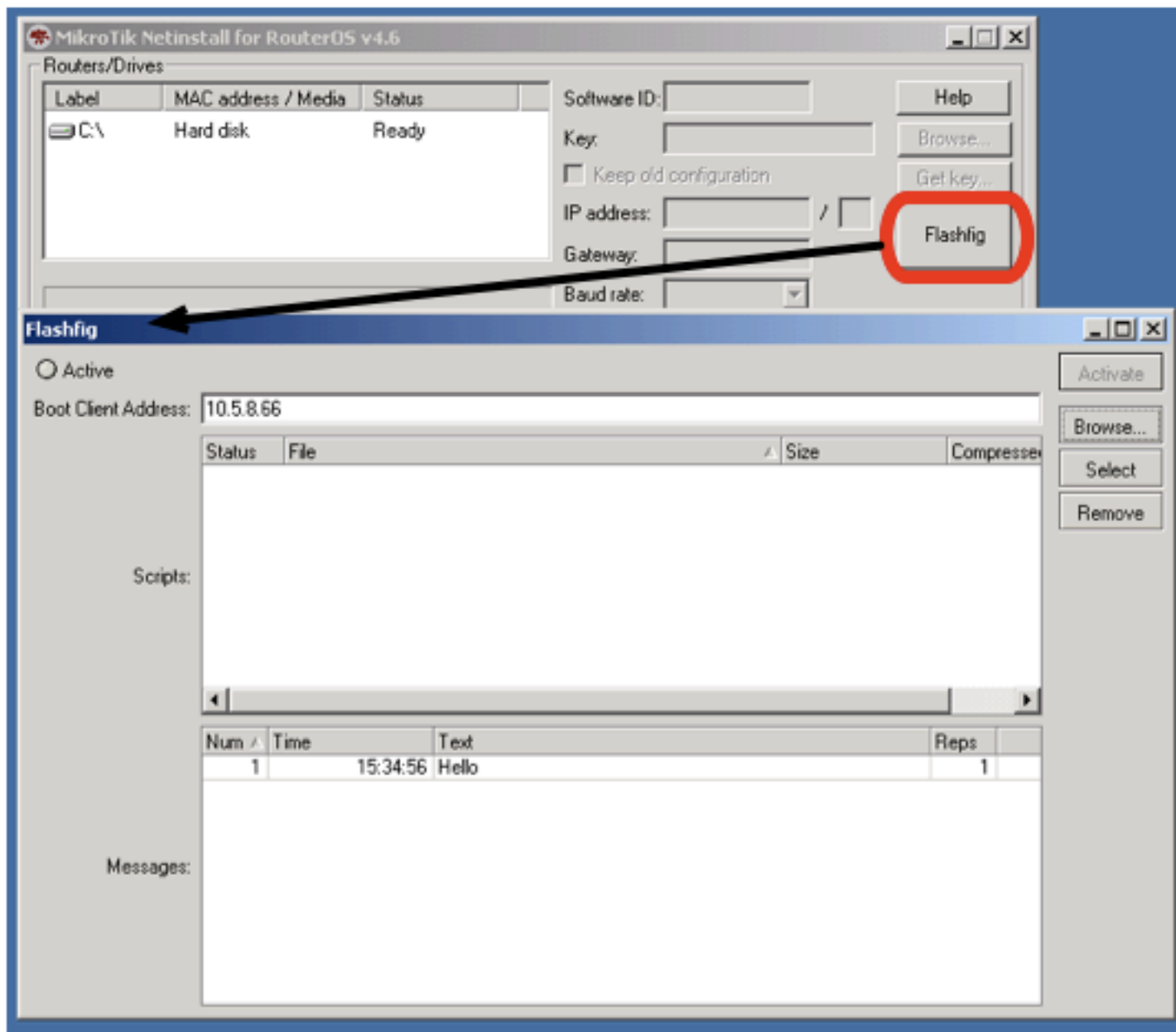
- default
- \hotspot
- \skins
- default configuration
- lcd logo

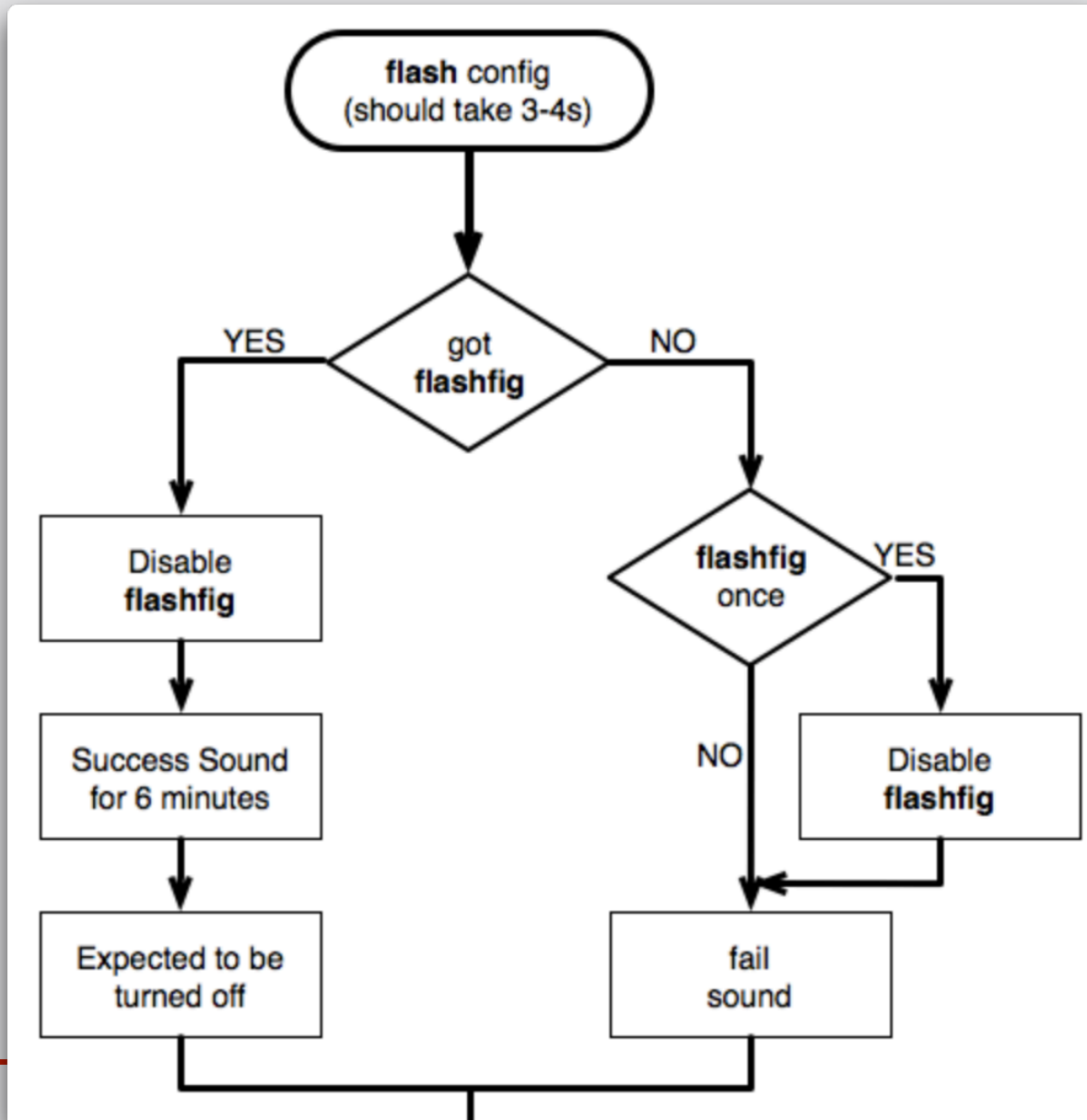


FLASHFIG

FLASHFIG Features

- ✓ je súčasťou NetInstall-u
 - ✓ umožňuje masívne nainštalovať na router skript `xxy.rsc` a zmeniť jeho defaultné parametre
 - ✓ extrémne rýchla a masívna inštalácia cca 15s / router
-







RoMON

RoMON Features

- ✓ funkcia a protokol umožňujúci prenos prístupových protokolov cez RoMON sieť zariadení (MikroTik routrov)
 - ✓ romon MAC ping
 - ✓ romon MAC ssh
 - ✓ winbox MAC over RoMON Server(IP/MAC)
-

Requirements

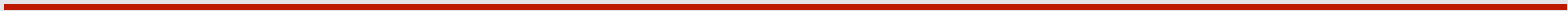
✓ stačí na zariadeniach zapnúť RoMON funkciu

The screenshot displays the MikroTik WinBox interface. On the left, the 'Tools' menu is open, with 'RoMON' highlighted at the bottom. The main window shows a 'Discovery (Running)' table with the following data:

Address	Cost	Hops	Path	L2MTU	Identity	Version
E4:8D:8C:38:5C:78	200	1	E4:8D:8C:38:5C:78	1500	Main1	6.37.1

Below the table, the 'RoMON Settings' dialog is open, showing the 'Enabled' checkbox checked. The 'Current ID' field displays '6C:3B:6B:48:78:49'. The 'Tools' menu and the 'RoMON' option in the dialog are circled in red.

Live ukážka :





CAPsMAN

CAPsMAN Features

- ✓ Campus Centralized management pre RouterOS APs
 - ✓ Dual Band AP podpora
 - ✓ Provisioning (konfigurácia) APčiek
 - ✓ MAC alebo IP komunikácia s AP
 - ✓ Podpora certifikátu
 - ✓ Data forwarding konfigurácia
 - ✓ RADIUS MAC autentifikácia
 - ✓ Viacej rôznorodých konfigurácií na MANe distribuované podľa lokalít
-

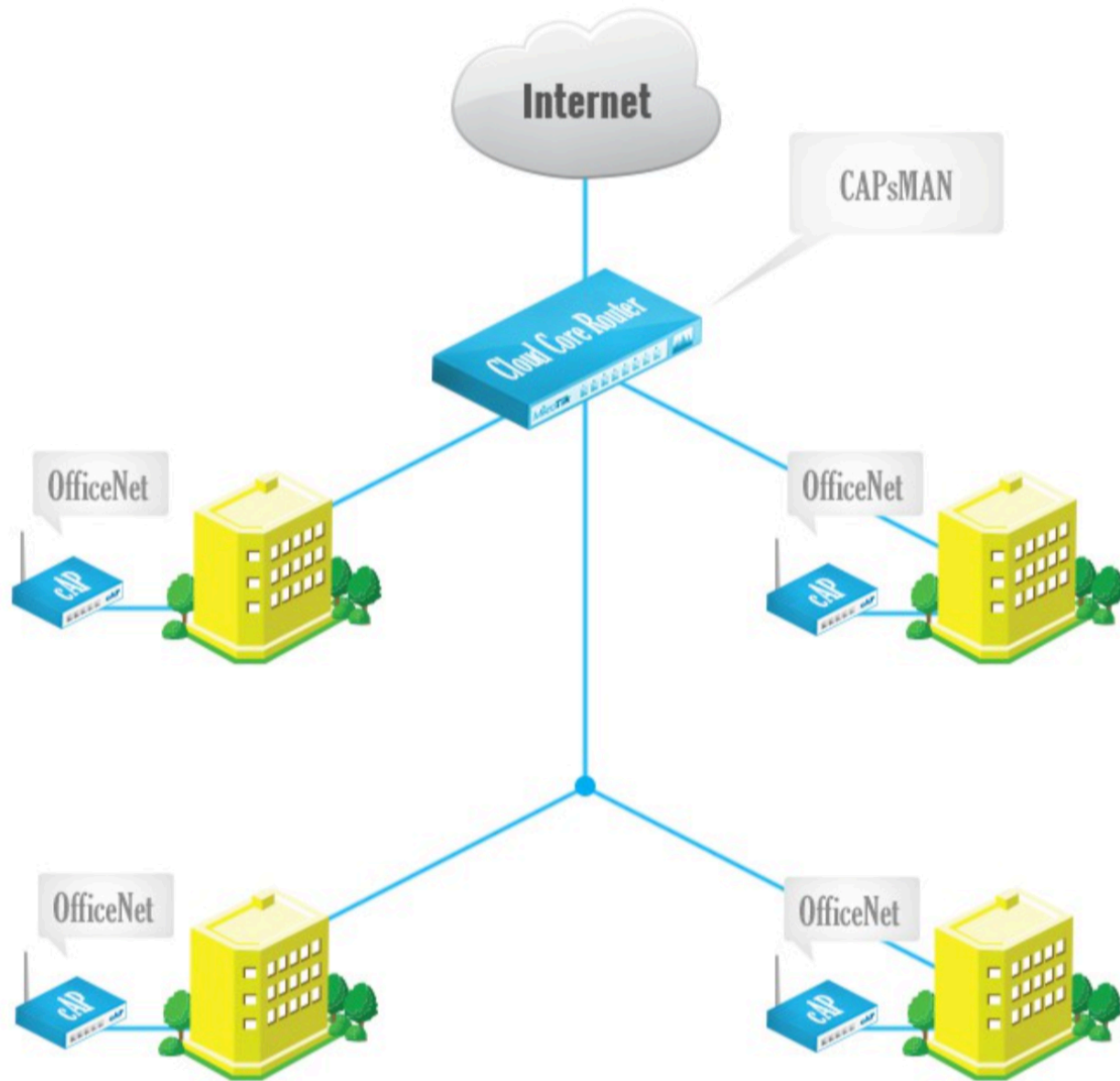
Requirements

CAPsMAN

- ✓ x86 alebo RouterBOARD
- ✓ Najnovšia RouterOS v6
- ✓ Wireless-fp balíček nainštalovaný a zapnutý

CAP

- ✓ X86 alebo RouterBOARD
 - ✓ Najnovšia RouterOS v6
 - ✓ Wireless-fp balíček nainštalovaný a zapnutý
 - ✓ Atheros chipset (a/b/g/n/ac)
 - ✓ Minimálne Level4 RouterOS licencia
-





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
-

Enable the CAPsMAN service

The screenshot displays the MikroTik WinBox interface. On the left sidebar, the 'CAPsMAN' menu item is highlighted with a red rectangle. The main window shows the 'CAPsMAN' configuration page with tabs for 'Interfaces', 'Provisioning', 'Configurations', 'Channels', 'Datapaths', and 'Security'. The 'Manager' button is highlighted with a red rectangle. Below the main window, a 'CAPs Manager' dialog box is open, showing the 'Enabled' checkbox checked, with a red arrow pointing to it. The dialog also includes fields for 'Certificate', 'CA Certificate', and 'Require Peer Certificate', along with 'OK', 'Cancel', and 'Apply' buttons.

Quick Set

CAPsMAN

Interfaces

Wireless

Bridge

PPP

Mesh

IP

MPLS

Routing

System

Queues

Files

CAPsMAN

Interfaces Provisioning Configurations Channels Datapaths Security

+ - ✓ ✗ [Icon] [Icon] Manager AAA

Name	Type	MTU	L2 MTU
CAPs Manager			

Enabled

Certificate: [Text Box]

CA Certificate: [Text Box]

Require Peer Certificate

Generated Certificate: [Text Box]

Generated CA Certificate: [Text Box]

OK

Cancel

Apply

Create Bridge Interface

The screenshot displays the MikroTik WinBox interface. On the left sidebar, the 'Bridge' option is highlighted with a red box. The main window shows the 'Bridge' configuration page with the 'New Interface' dialog box open. The 'Name' field is set to 'OfficeNet', and the 'Type' is set to 'Bridge'. A red arrow points to the 'Name' field. The 'MTU' is set to 1500, and 'ARP' is set to 'enabled'. The 'Admin. MAC Address' field is empty. The 'New Interface' dialog box has several buttons on the right: OK, Cancel, Apply, Disable, Comment, Copy, Remove, and Torch.

Bridge

Bridge Ports Filters NAT Hosts

+ - ✓ ✗ [icon] [icon] Settings

Name	Type	L2 MTU	Tx
------	------	--------	----

New Interface

General STP Status Traffic

Name: OfficeNet

Type: Bridge

MTU: 1500

L2 MTU:

MAC Address:

ARP: enabled

Admin. MAC Address:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Torch

The screenshot displays the MikroTik WinBox interface with three configuration windows open, each marked with a red box and a number:

- 1:** The 'Address List' window shows a 'New Address' dialog with 'Address: 10.10.10.1/24' and 'Interface: OfficeNet'.
- 2:** The 'DHCP Server' window shows the 'DHCP Setup' dialog with 'DHCP Server Interface: OfficeNet' and the 'Next' button highlighted.
- 3:** The 'Firewall' window shows the 'NAT' tab with a 'New NAT Rule' dialog where 'Chain: srcnat' and 'Action: masquerade' are selected.

The left sidebar shows the 'IP' menu item highlighted. A legend in the bottom left corner summarizes the steps:

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

Add New CAPsMAN Configuration

CAPsMAN

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

+ - [] [] Find

Name	SSID	Hide SSID	Load Bal...	Country	Channel	Frequency	Band	Datapat
------	------	-----------	-------------	---------	---------	-----------	------	---------

New CAPs Configuration

Wireless Channel Datapath Security

Name: OfficeNet
Mode:
SSID: Office
Hide SSID:
Load Balancing Group:
Country: united states
Max Station Count:
Multicast Helper:
HT Tx Chains:
HT Rx Chains:
HT Guard Interval:

New CAPs Configuration

Wireless Channel **Datapath** Security

Datapath:
Bridge: OfficeNet
Bridge Cost:
Bridge Horizon:
Local Forwarding:
Client To Client Forwarding:
VLAN Mode:
VLAN ID:

New CAPs Configuration

Wireless Channel Datapath **Security**

Security:

Authentication Type: WPA PSK WPA2 PSK WPA EAP WPA2 EAP
Encryption: aes ccm tkip
Group Encryption: aes ccm
Passphrase: OfficeNet
EAP Methods:

Add new Provisioning rule

CAPsMAN

Interfaces **Provisioning** Configurations Channels Datapaths Sec

+ - ✓ ✗ 📄 🗑️

#	Radio MAC	Action	Master Configurati...	Slave C
---	-----------	--------	-----------------------	---------

New CAPs Provisioning [] [X]

Radio MAC:

Action: ▼

Master Configuration: ▼

Slave Configuration: ▲▼

Name Prefix: ▲

OK

Cancel

Apply

Disable

Comment

Copy

Remove

enabled



Configure the AP

Configure the AP to use CAP mode

The screenshot shows the MikroTik WinBox interface. On the left sidebar, the 'Wireless' menu item is highlighted with a red box. The main window displays the 'Wireless Tables' configuration for a 'CAP' table. The 'CAP' table is selected, and its configuration is shown in a dialog box. The 'Enabled' checkbox is checked, and the 'Interfaces' field is set to 'wlan1'. The 'Discovery Interfaces' field is set to 'ether1'. The 'Lock To CAPsMAN' checkbox is unchecked. The 'CAPsMAN Addresses', 'CAPsMAN Names', and 'CAPsMAN Certificate Common Names' fields are empty. The 'Bridge' field is set to 'none'. The 'Requested Certificate' and 'Locked CAPsMAN Common Name' fields are also empty. Red arrows point to the 'Enabled' checkbox, the 'Interfaces' field, and the 'Discovery Interfaces' field. The 'CAP' button in the top toolbar is also highlighted with a red box.

Name	Type	L2 MTU	Tx
CAP			

Configuration for CAP table:

- Enabled:
- Interfaces: wlan1
- Certificate: none
- Discovery Interfaces: ether1
- Lock To CAPsMAN:
- CAPsMAN Addresses:
- CAPsMAN Names:
- CAPsMAN Certificate Common Names:
- Bridge: none
- Requested Certificate:
- Locked CAPsMAN Common Name:

- 1) Enable wireless-fp package
- 2) Enable CAP mode
 - By CAP mode button on some boards
 - By configuration in Wireless CAP menu

Check the Status of the CAPsMAN CAP interface

CAPsMAN

CAPsMAN

Interfaces Provisioning Configurations Channels Datapaths Security

+ - ✓ ✗ 📄 🗑️ Manager AAA

Name	Type	MTU	L2 MTU
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

+ - ✓ ✗ 📄 🗑️ CAP Scanner Freq. Usage

Name	Type	L2 MTU	Tx
wlan1	Wireless (Atheros AR9...)	1600	

--- managed by CAPsMAN

--- channel: 2427/20-Ce/gn(30dBm), SSID: Office, CAPsMAN forwarding

CAPsMAN Registration table

CAPsMAN

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

[-] [Filter]

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

1 item

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

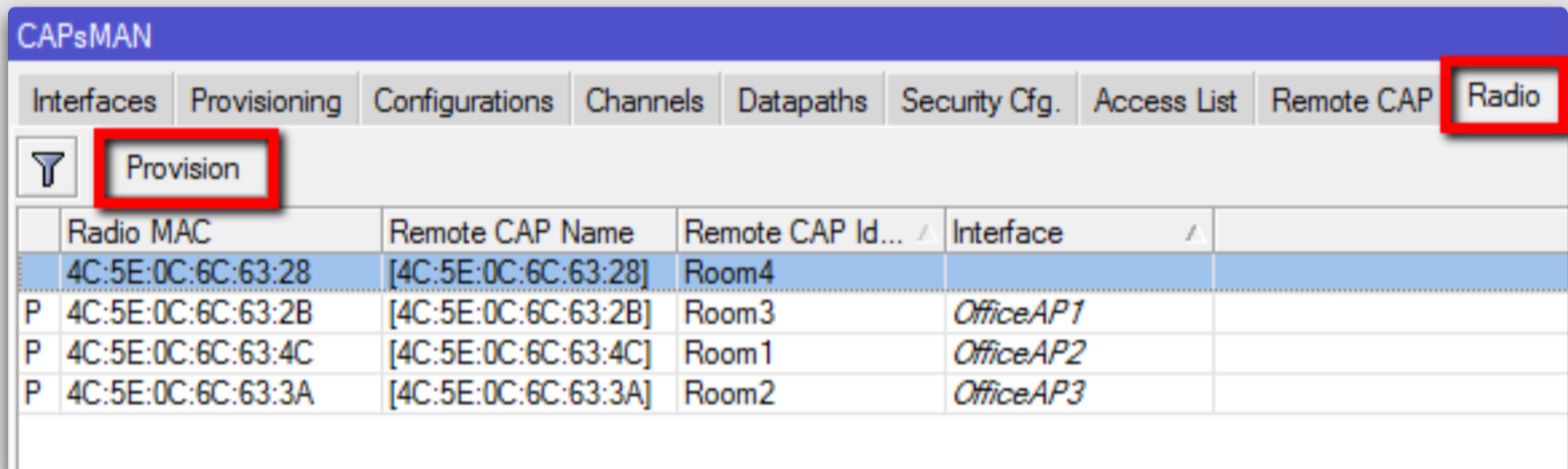
OK

Remove

Copy to Access List

Manual Provisioning

- Changing Provisioning rules doesn't effect already configured CAPs, manual Provisioning is required:
 - to remove CAP interface
 - to initiate Provision command on the CAP



	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 to CAPsMAN Connection

CAP to CAPsMAN Connection

MAC Layer2:

NO IP configuration is req.
CAP and CAPsMAN must
be in the same L2 network

IP (UDP) Layer3:

CAP must reach the
CAPsMAN using IP protocol
Can traverse NAT if necessary

- Management connection between CAP and CAPsMAN is secured using DTLS
 - CAP client data traffic is not secured – if necessary additional encryption by using IPSec or encrypted tunnels is needed
-

CAPsMAN Selection on CAP

CAP attempts to contact CAPsMAN and build available CAPsMAN list:

- List of CAPsMAN IPs
- List of CAPsMAN IPs obtained from DHCP
- Broadcasting on configured interfaces using IP and MAC Layer

CAP selects the CAPsMAN based on such rules:

- If CAPsMAN names setting is matched it will prefer that CAPsMAN earlier in the list
 - MAC layer connectivity to CAPsMAN is preferred over IP connectivity
-

CAPsMAN with Layer3

On the CAP specify the IP address of the CAPsMAN

Wireless Tables

Name	Type	L2 MTU	Tx	Rx
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

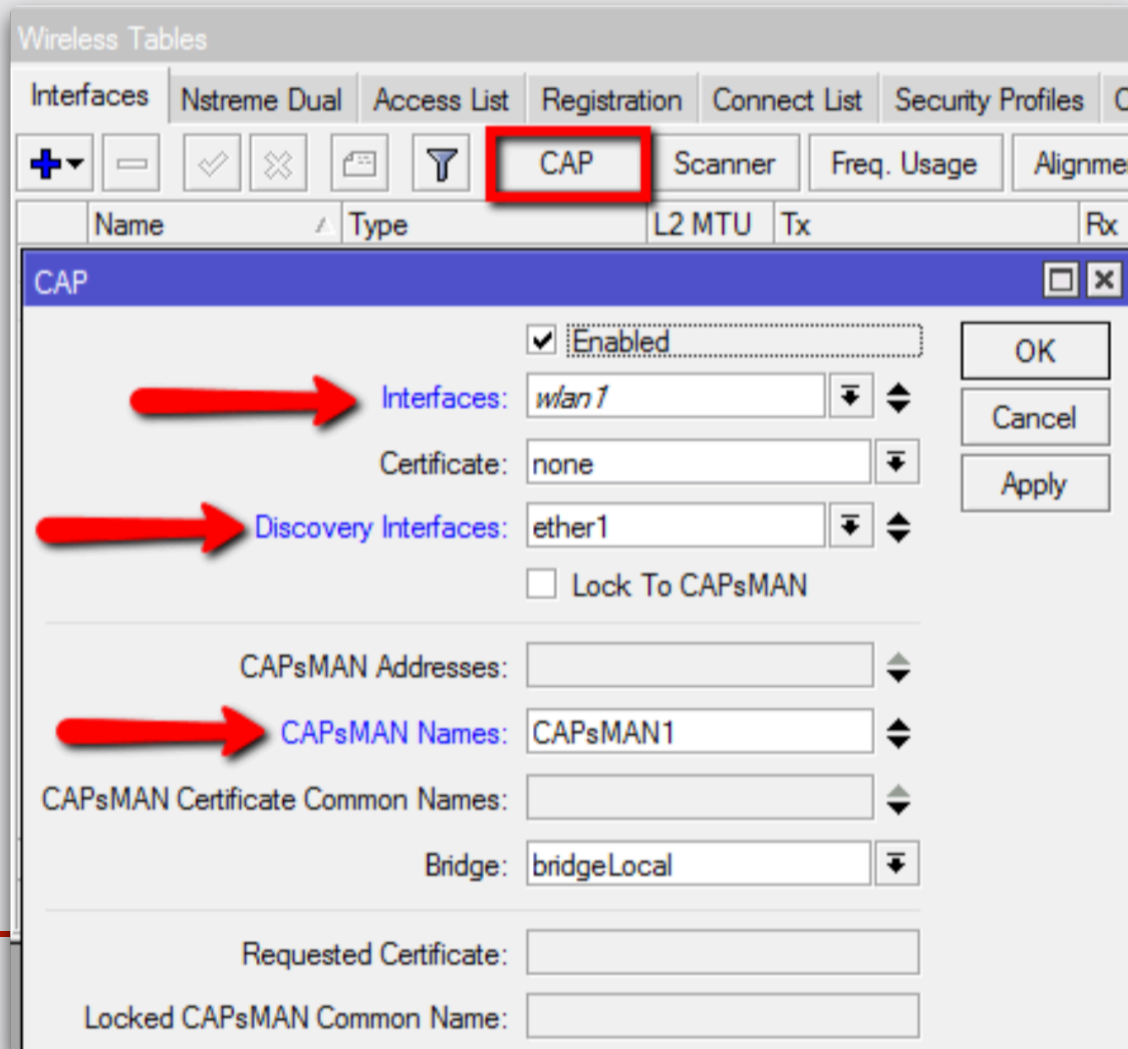
Requested Certificate:

Locked CAPsMAN Common Name:

OK
Cancel
Apply

CAPsMAN selection using Name

On the CAP specify the CAPsMAN identity name



The screenshot shows the 'Wireless Tables' configuration window in MikroTik WinBox. The 'CAP' tab is selected and highlighted with a red box. The configuration fields are as follows:

Name	Type	L2 MTU	Tx	Rx
CAP				

Configuration details for the CAP:

- Enabled
- Interfaces: wlan1 (indicated by a red arrow)
- Certificate: none
- Discovery Interfaces: ether1 (indicated by a red arrow)
- Lock To CAPsMAN
- CAPsMAN Addresses: [empty]
- CAPsMAN Names: CAPsMAN1 (indicated by a red arrow)
- CAPsMAN Certificate Common Names: [empty]
- Bridge: bridgeLocal
- Requested Certificate: [empty]
- Locked CAPsMAN Common Name: [empty]

Buttons: OK, Cancel, Apply

CAP Identification

MAC/IP address

Serial Number of the Board

System Identity

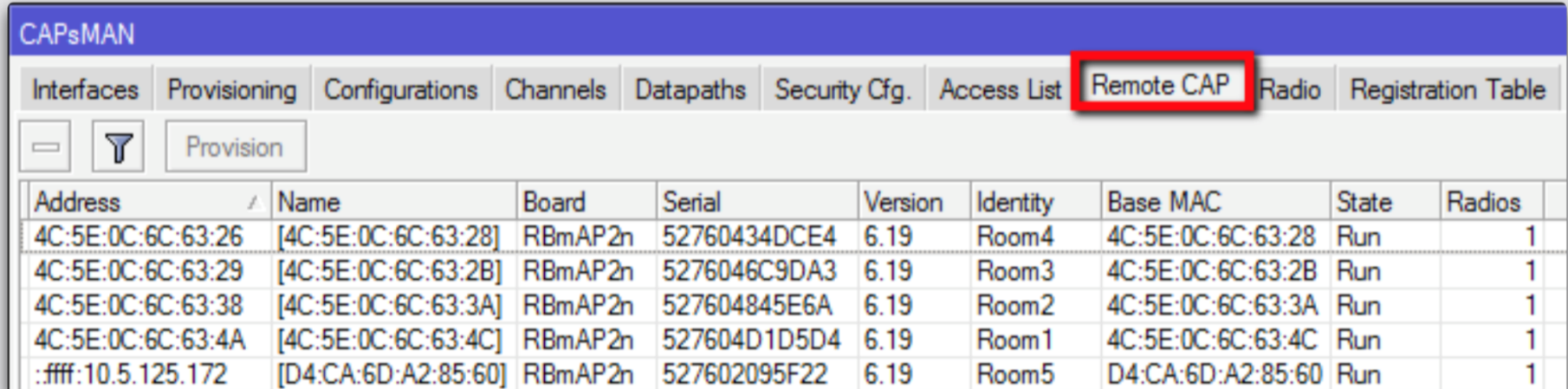
State of the CAP

RouterBoard model

RouterOS version

Main wireless MAC

Provided 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
:fff: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

- No interface name change or setting change after the reboot
- Additional manual setting override
Copy dynamic interface to make static interface

The screenshot displays the CAPsMAN configuration window in WinBox. The main window shows a table of interfaces with 'OfficeAP5' selected. A secondary window, 'Interface <OfficeAP5>', is open, showing the configuration for the selected interface. A red box highlights the 'Copy' button in this window. A red arrow points from the 'Copy' button to the 'New Interface' window, which is also open. The 'New Interface' window shows the configuration for a new interface named 'Room5AP', with the 'Name' field highlighted in red. The 'OK' button in the 'New Interface' window is also highlighted in red.

Name	Type	MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	SSID	Hide SSID
OfficeAP5	Interfaces	1500	1600	0 bps	0 bps	0	0	Office	

Interface <OfficeAP5> Configuration:

- Name: OfficeAP5
- Type: Interfaces
- MTU: 1500
- L2 MTU: 1600
- MAC Address: D4:CA:6D:A2:85:60
- ARP: enabled
- Radio MAC: D4:CA:6D:A2:85:60
- Master Interface: none

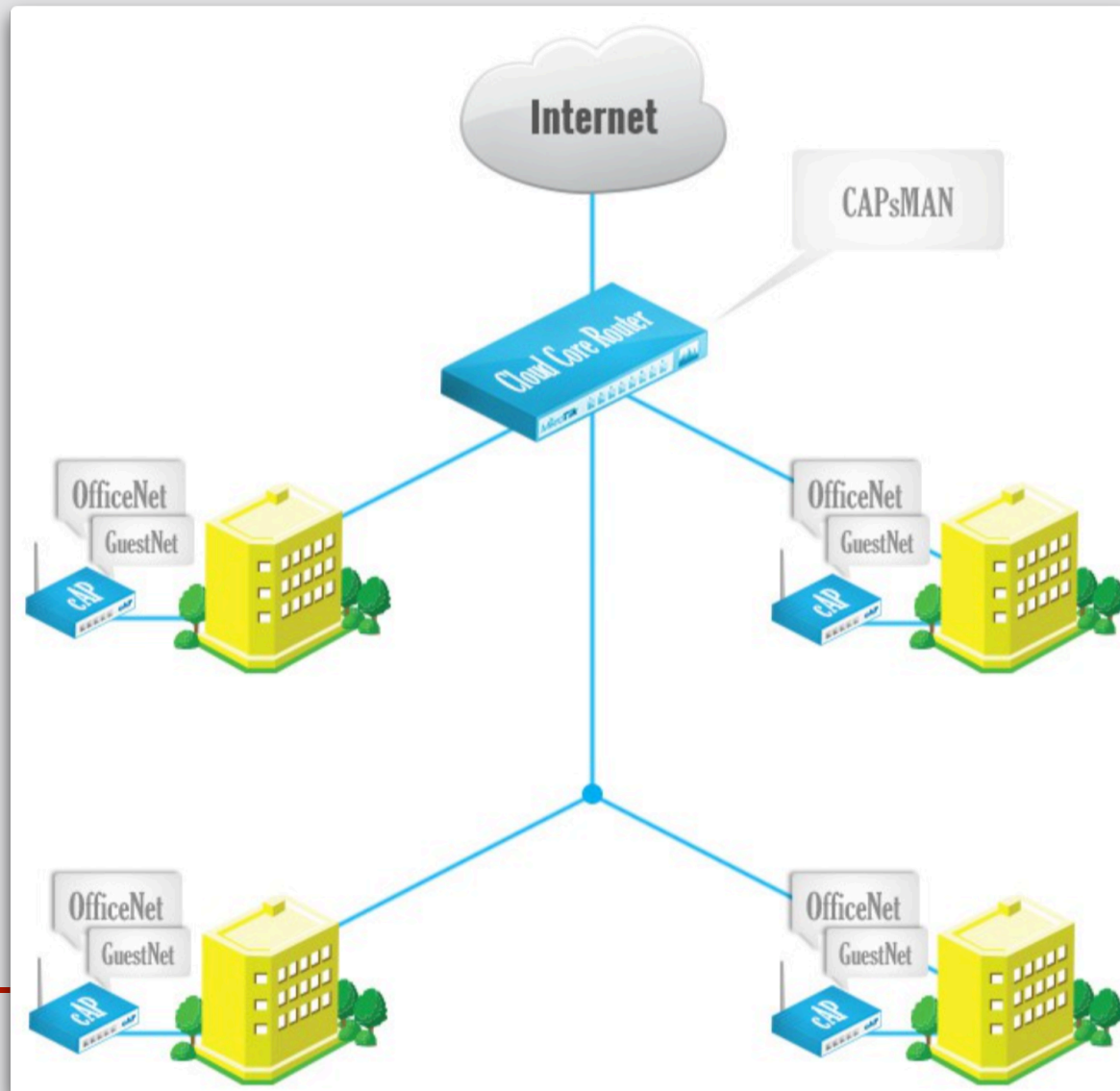
New Interface Configuration:

- Name: Room5AP
- Type: Interfaces
- MTU: 1500
- L2 MTU: 1600
- MAC Address: D4:CA:6D:A2:85:60
- ARP: enabled
- Radio MAC: D4:CA:6D:A2:85:60
- Master Interface: none



CAPsMAN VirtualAP

CAPsMAN VirtualAP



CAPsMAN VirtualAP Configuration

- Create new Bridge interface and IP configuration for the VirtualAPs or use the same bridge interface as 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 C
0	00:00:00:00:00:00	create dy...	OfficeNet	

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

Radio MAC:

Action:

Master Configuration:

Slave Configuration:

Name Prefix:

enabled

CAPsMAN

Interfaces Provisioning Configurations Channels Datapaths

	Name	Type	MTU
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**

	Radio MAC	Remote CAP Name	Remote CAP Iden...	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:A2:85:60	[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	L2 MTU	Tx Packet (p/s)	Rx Packet (p/s)
DSMB OfficeAP1	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSB OfficeAP1-1	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSMB OfficeAP2	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSB OfficeAP2-1	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSMB OfficeAP3	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSB OfficeAP3-1	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSMB OfficeAP4	Interfaces	1500	1600	0 bps	0 bps	0	0	0
DSB OfficeAP4-1	Interfaces	1500	1600	0 bps	0 bps	0	0	0
SMB Room5AP	Interfaces	1500	1600	0 bps	0 bps	0	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



Home Managed service

Howto create Home Management

- ✓ Použijeme buď Netinstal zo svojím vlastným default balíčkom alebo FlashFig
 - ✓ **automaticný skript si z FPT servera pri štarte routera stiahne súbor “update.auto.rsc”**
 - ✓ ktorý obsahuje prípadné zmeny v konfigurácii
-

Howto create Home Management

- ✓ FTP server beží napr na Hlavnom routri na ktorý má prístup z lokálu každý router
 - ✓ súbor sa stiahne a následne spustí
 - ✓ a je to
 - ✓ Live ukážka ???
-



Home User Managed router

END USER as a MANAGER ?!!

- ✓ Koncový užívateľ je nebezpečný pre seba a svoje okolie akonáhle sa dostane k heslu 😊
 - ✓ prihláste sa na wifi MikroTik
 - ✓ spustite prehliadač 192.168.188.1
 - ✓ dajte meno / heslo ako meno / heslo
-

Thank you !

contact info:

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