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

Georgios Argyrides

MUM Middle East - Dubai

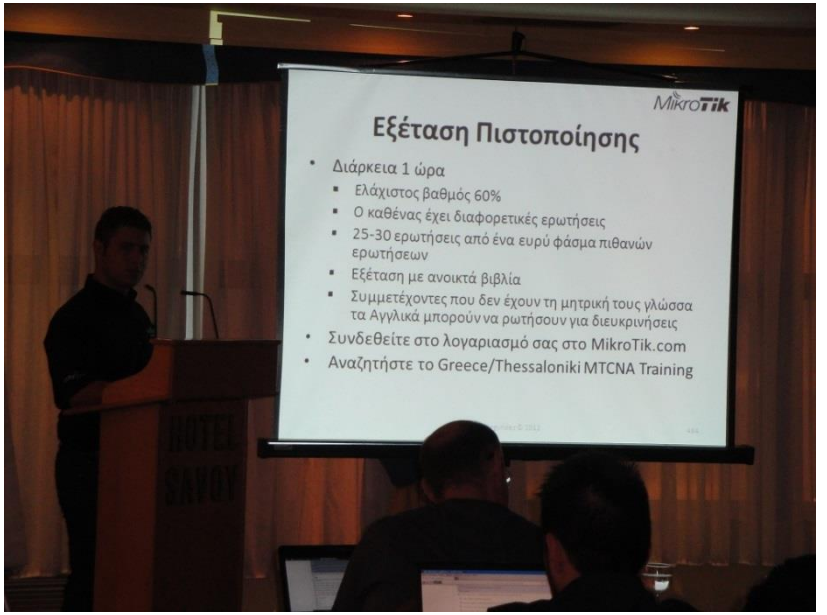
17th October 2016

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)

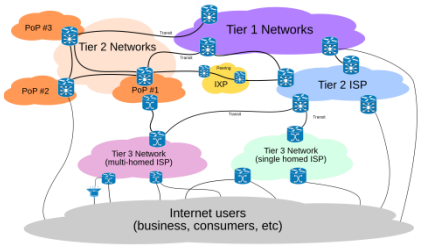
- All MikroTik Certificates
  - MTCNA,MTCRE,MTCWE,MTCTCE,MTCUME,MTCINE
- MikroTik Certified Trainer

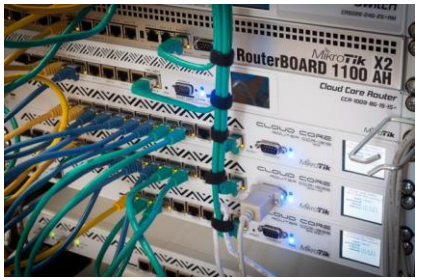
- Cyberoam Certified Network & Security Professional (CCNSP)
- RIPE Database Expert Course

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

- **C**ontrolled **A**ccess **P**oint **s**ystem **M**anager

CAP

- **C**ontrolled **A**ccess **P**oint

- **CAPsMAN** = a MikroTik router

- **CAP** = a MikroTik router
- **CAPs** = many Mikrotik routers

Requirements

CAPsMAN

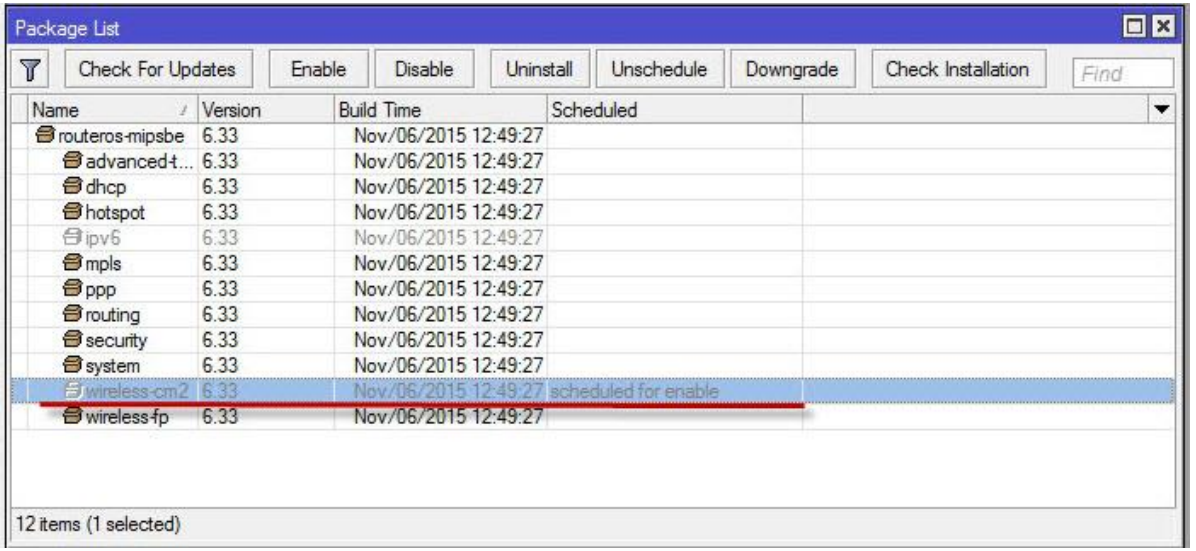
1. x86 or RouterBOARD based device
2. RouterOS v6.11+ version (Use Latest!)
3. Wireless-fp package installed and enabled

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



- ❖ 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

Today 17th October 2016

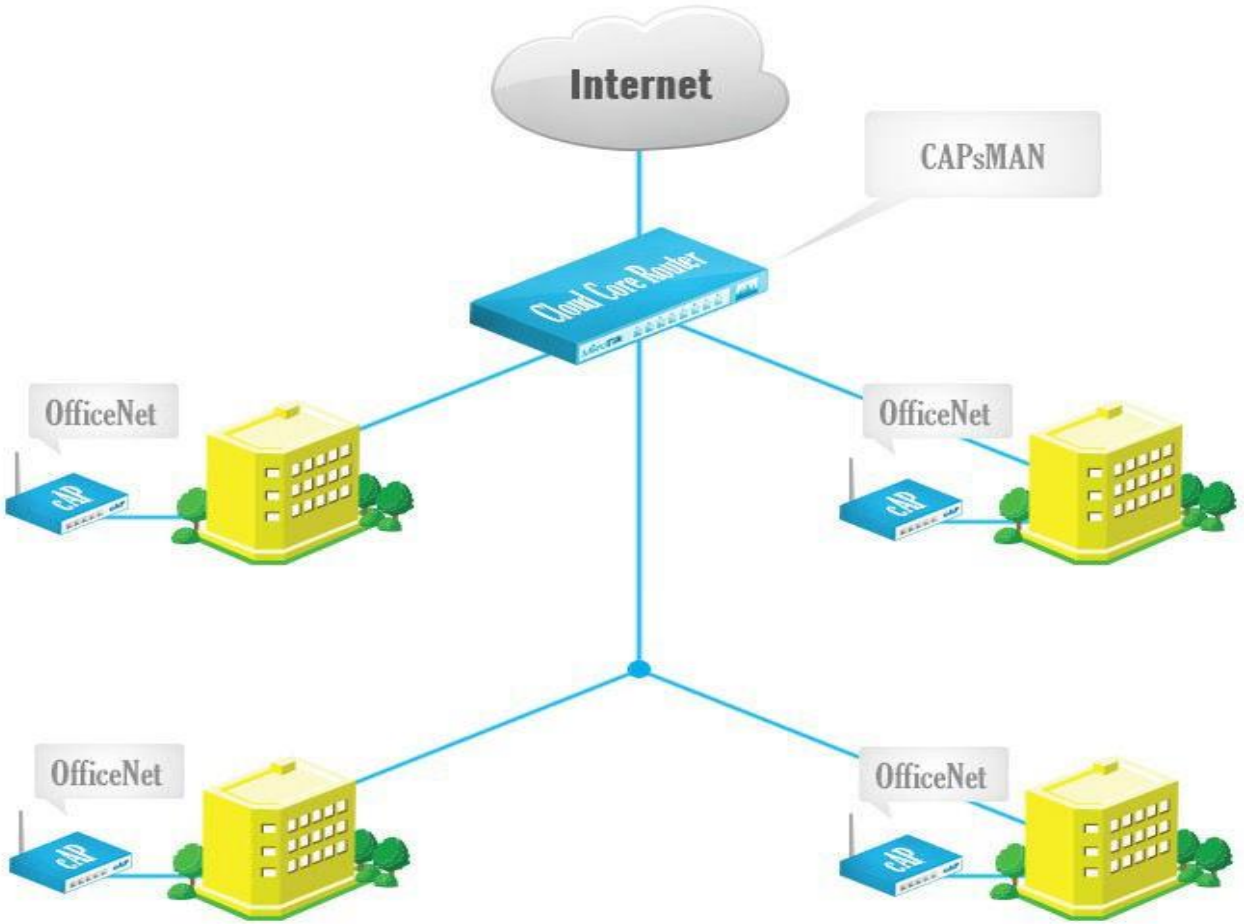
❖ Wireless package for RouterOS 6.37:

- Removes **all** existing wireless packages
- Installs **wireless-rep**
- **Wireless-rep** is renamed to **wireless**

❖ Using 6.37+ is strongly suggested for CAPsMAN

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

CAPsMAN Simple Setup

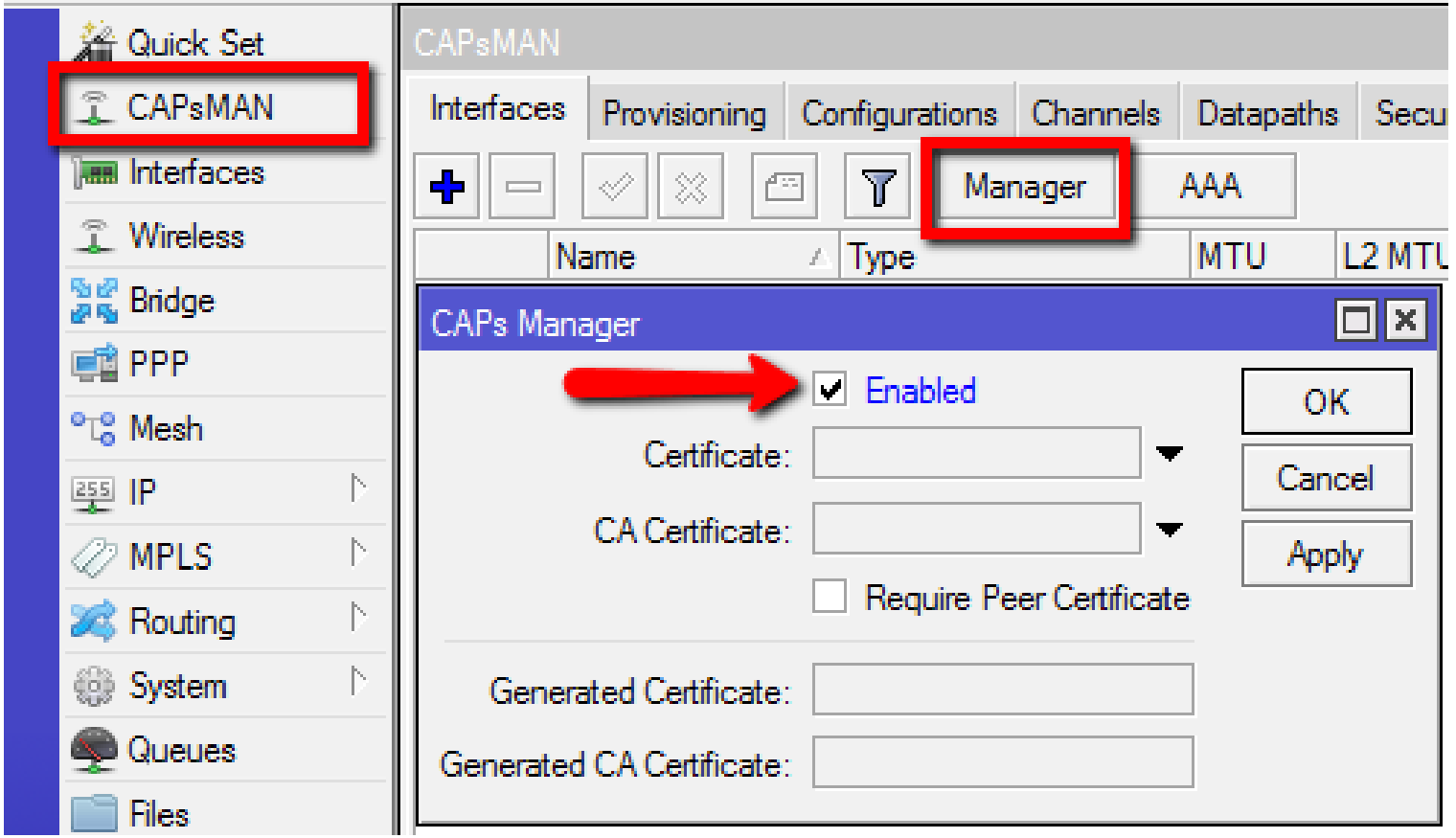


CAPsMAN Simple Setup

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

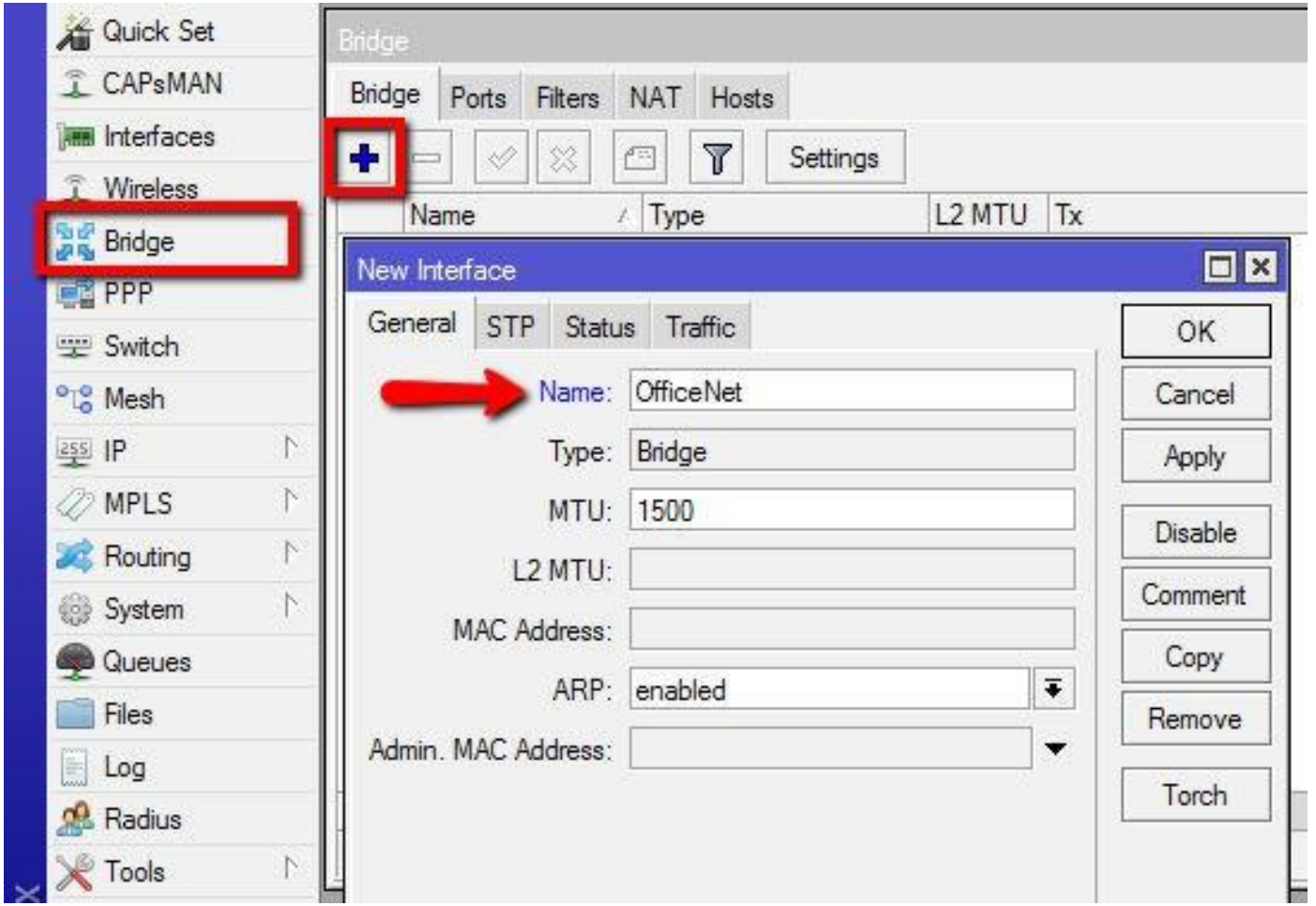
CAPsMAN Simple Setup

- Enable the CAPsMAN service



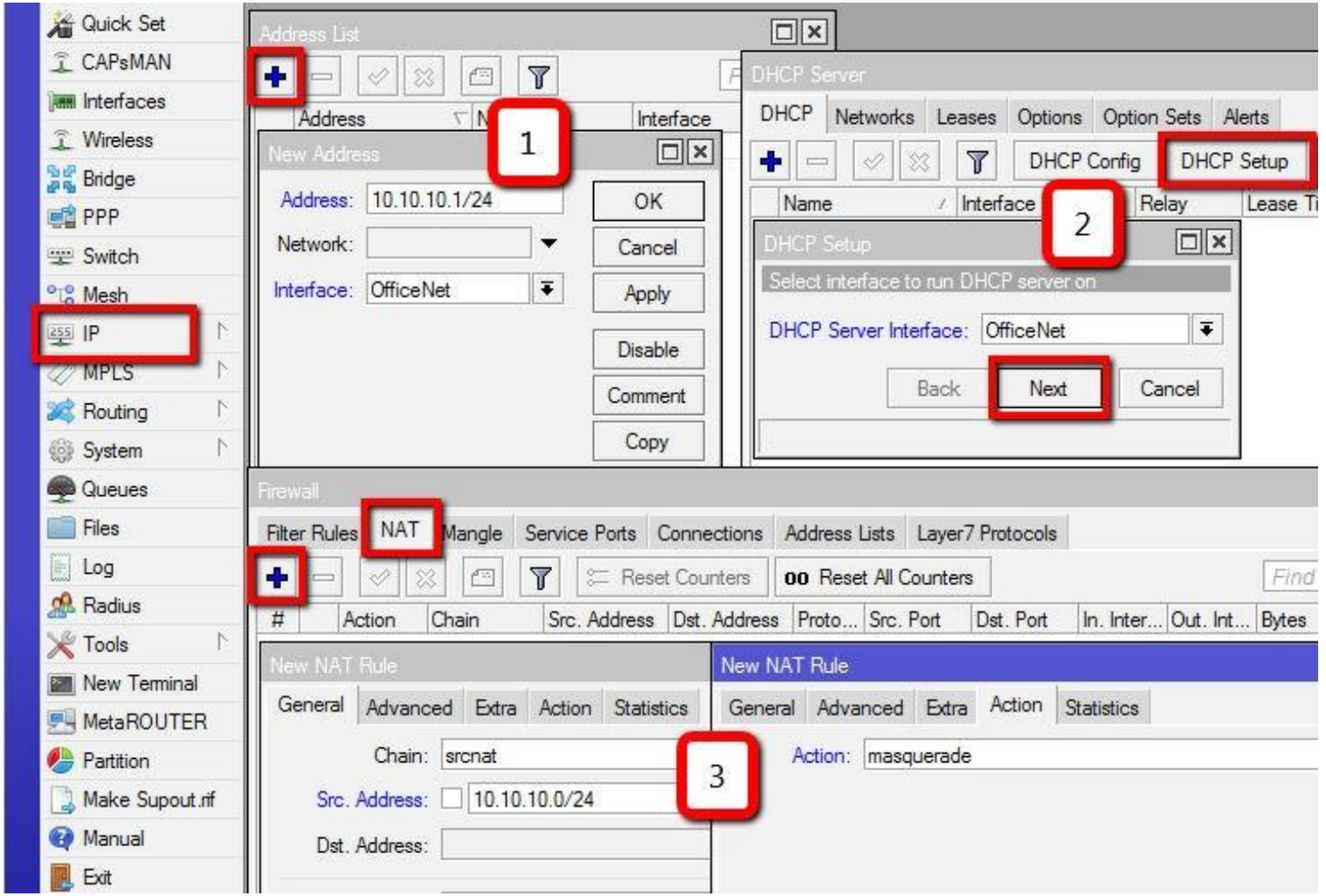
CAPsMAN Simple Setup

- Create Bridge Interface



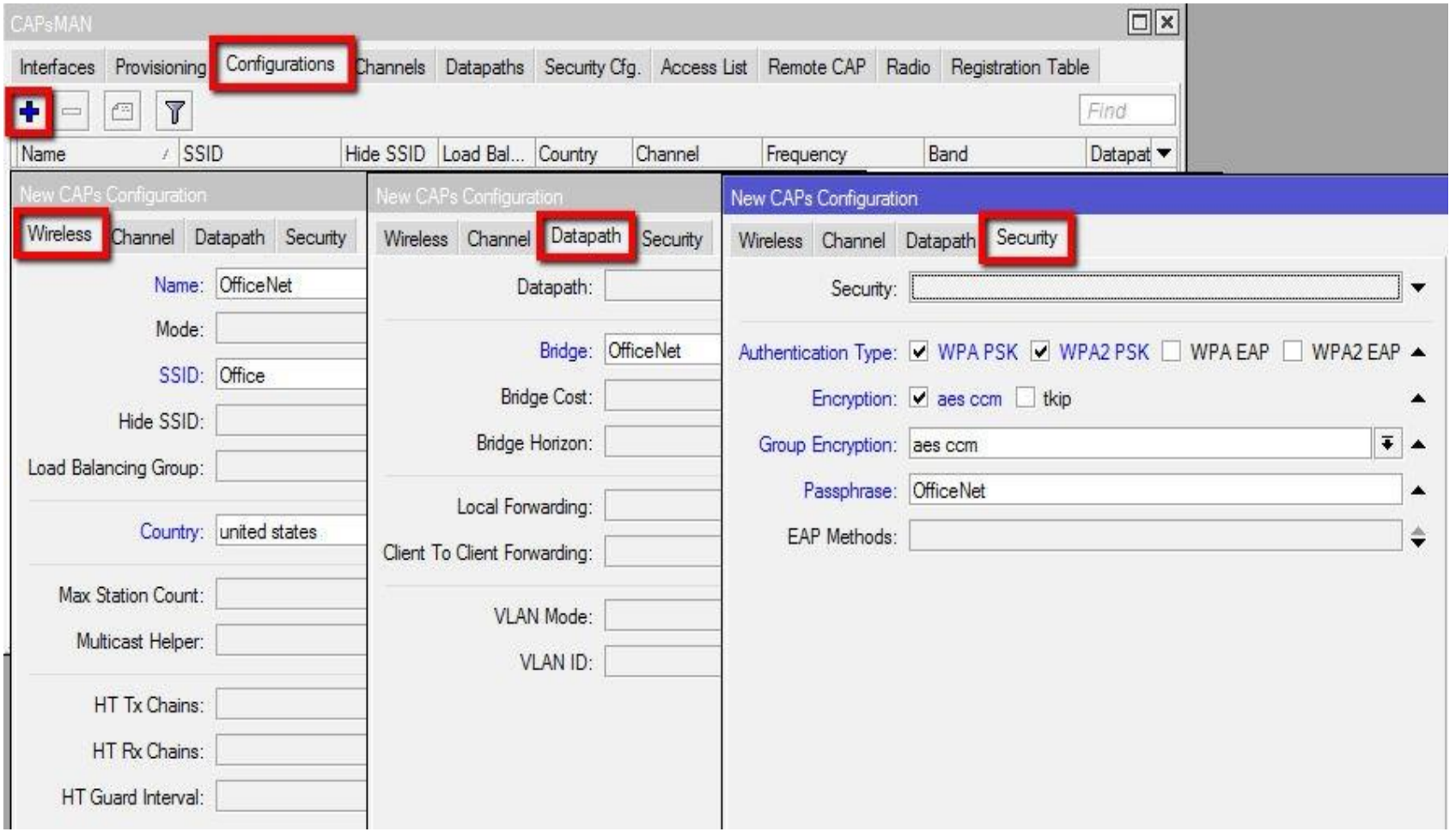
CAPsMAN Simple Setup

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



CAPsMAN Simple Setup

- Add new CAPsMAN Configuration

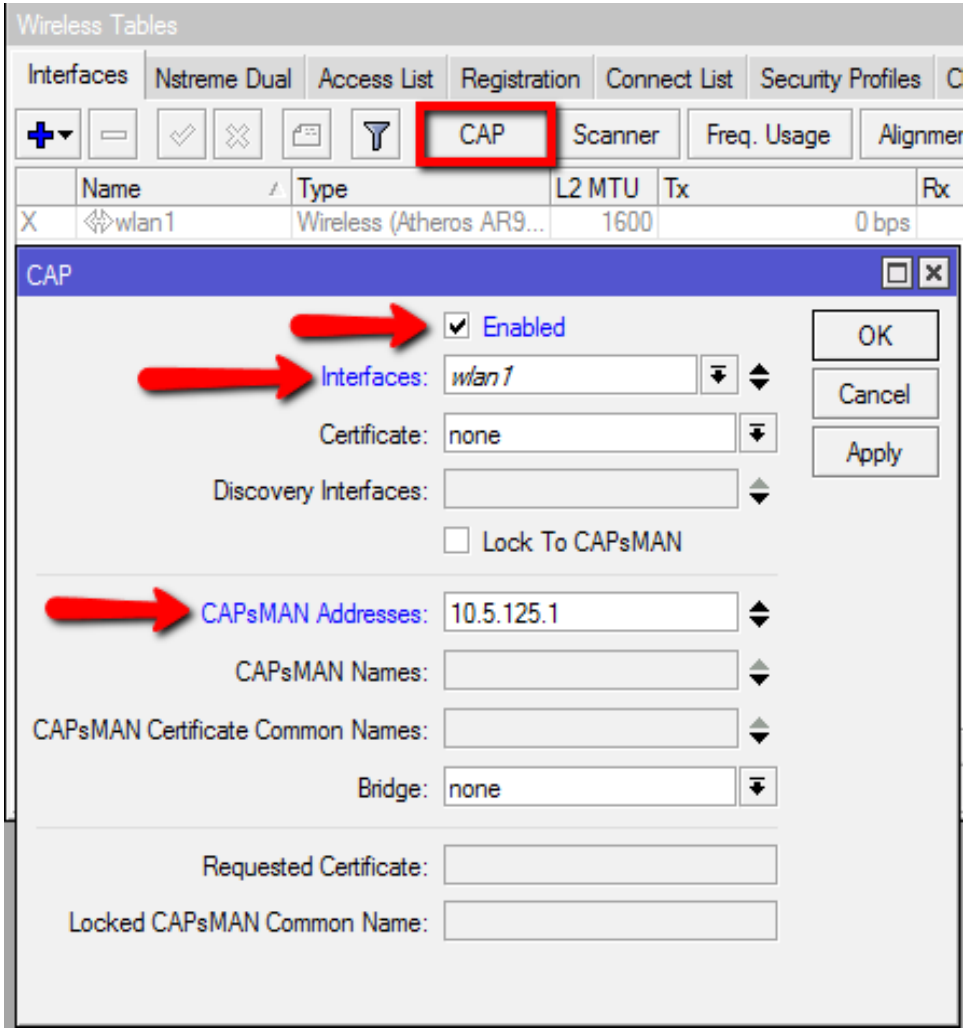


CAP to CAPsMAN IP Based Connection

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

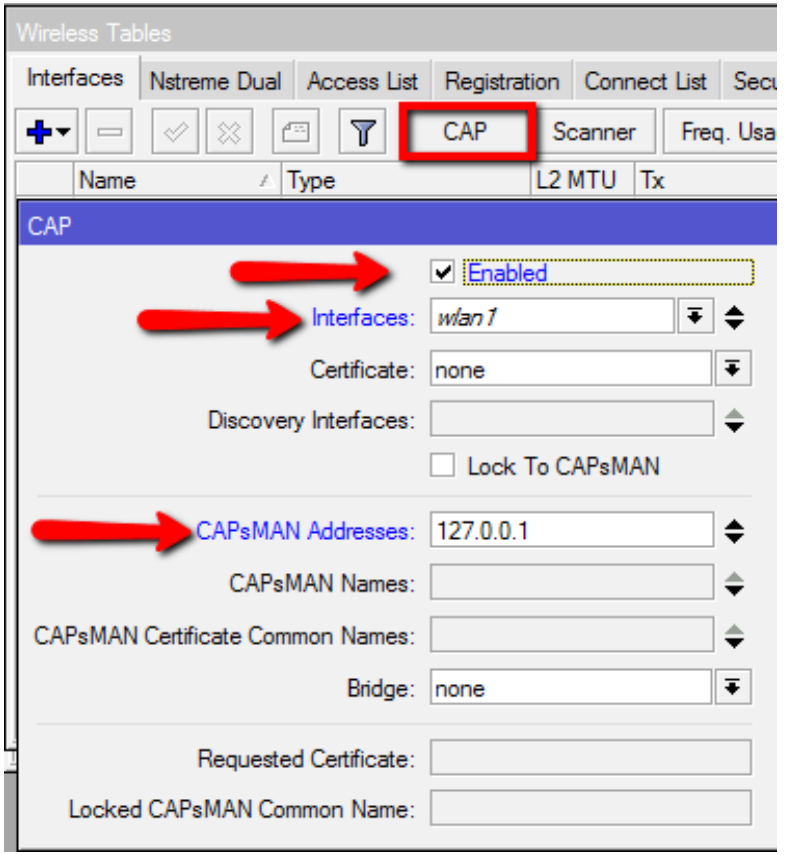
Specify IP on The CAP



CAPsMAN and CAP in one board

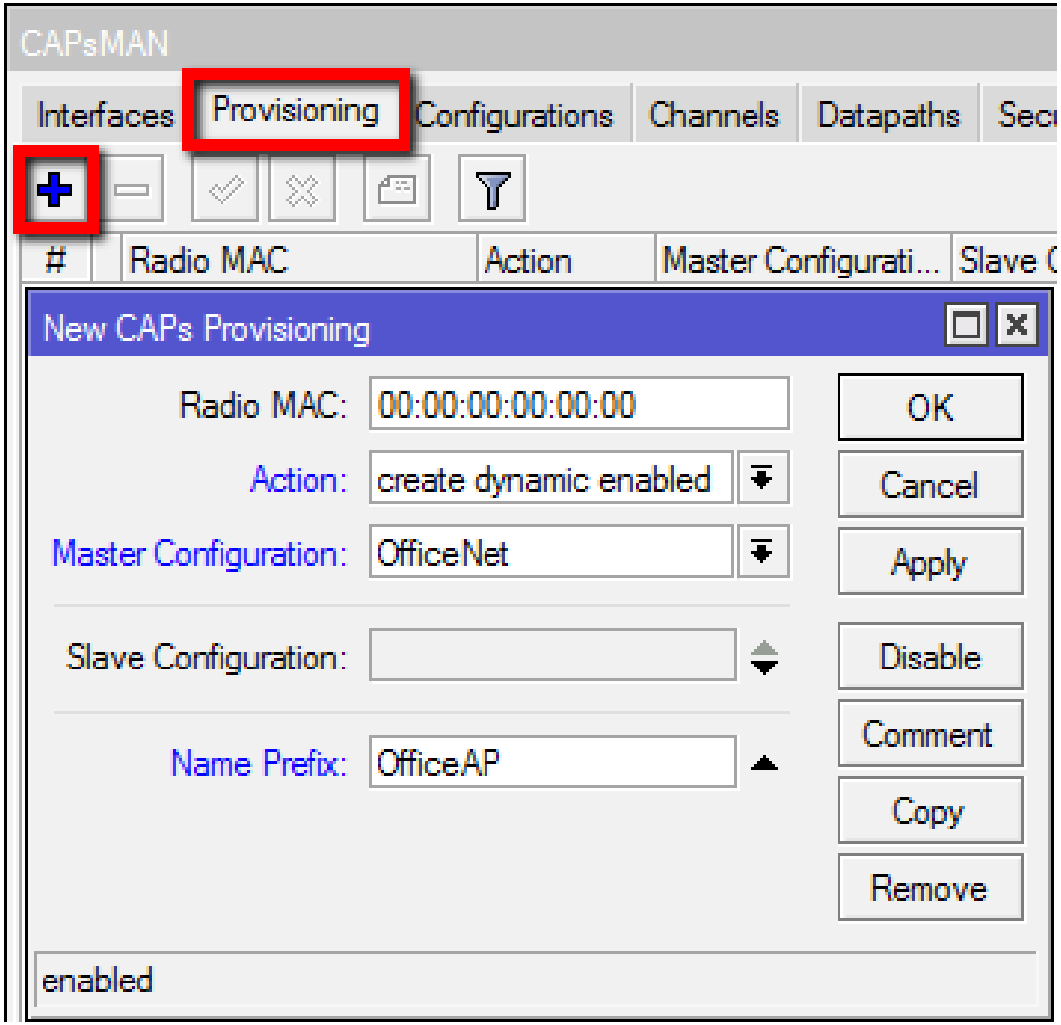
- Does your CAPsMAN router has a wireless interface too?

✓ Enable CAP & Connect it to it self (127.0.0.1) for central management



CAPsMAN Simple Setup

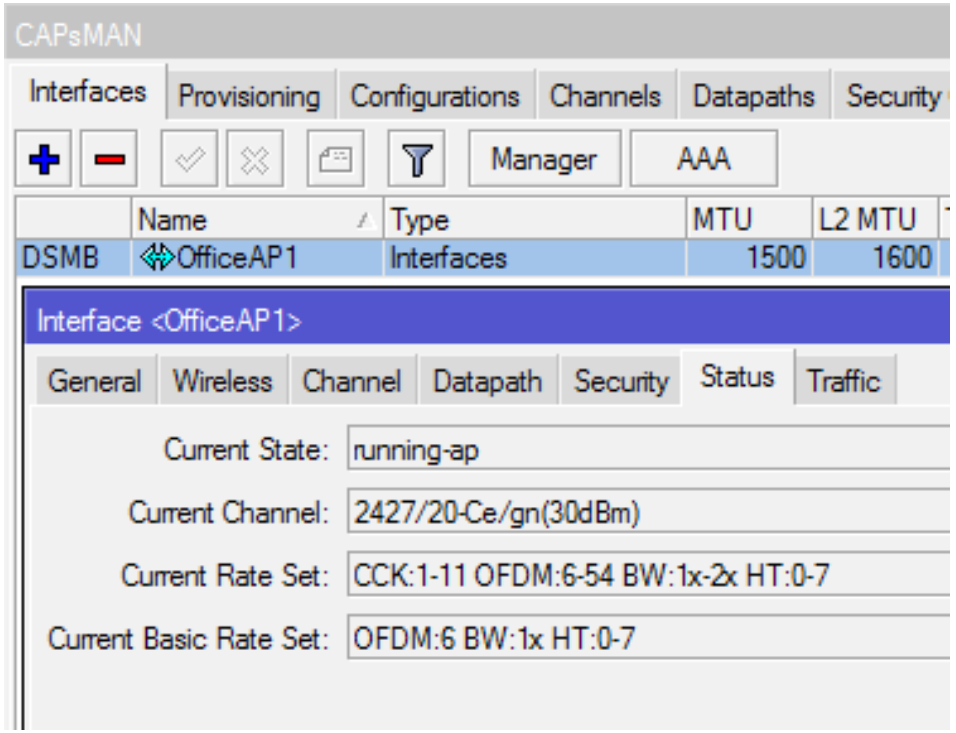
- Add new Provisioning rule



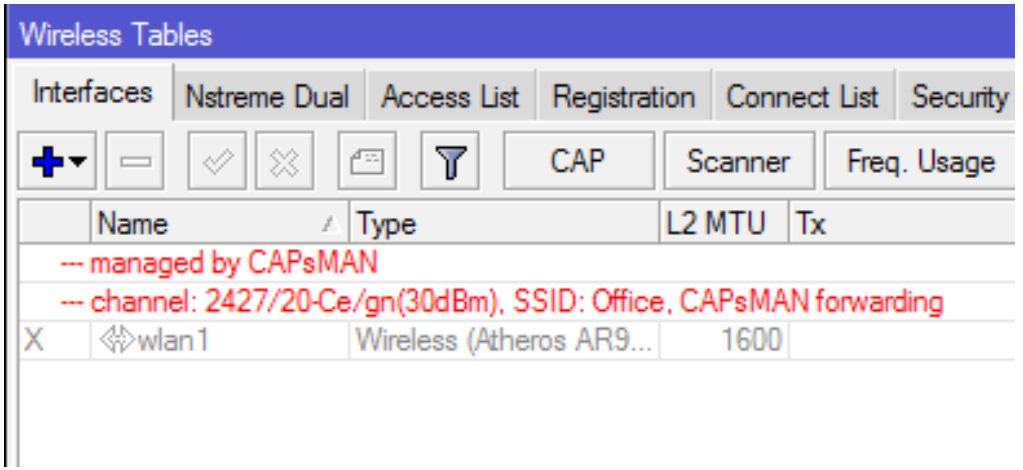
CAPsMAN Simple Setup

- Check the “Interface” status on:

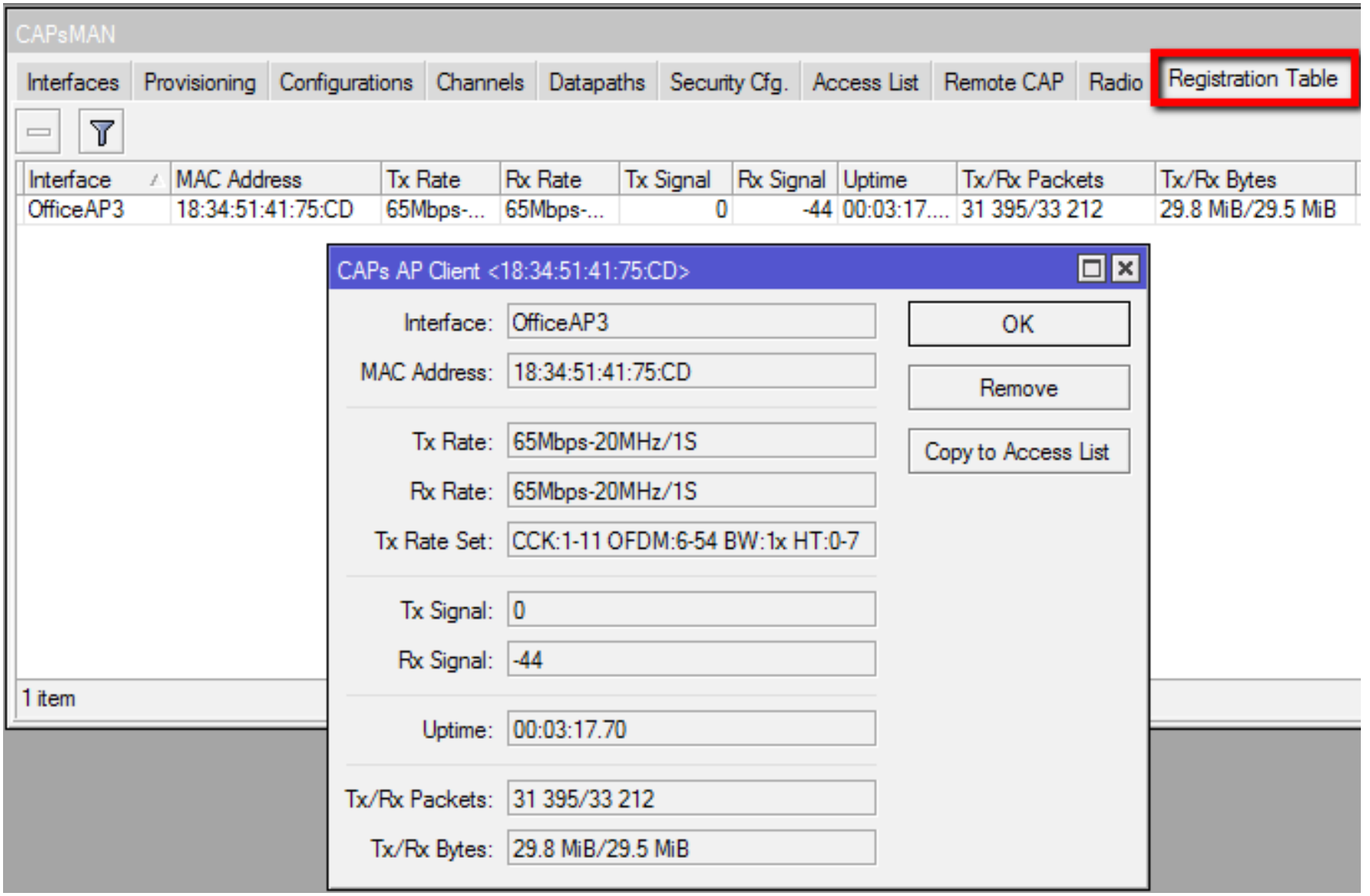
CAPsMAN



CAP

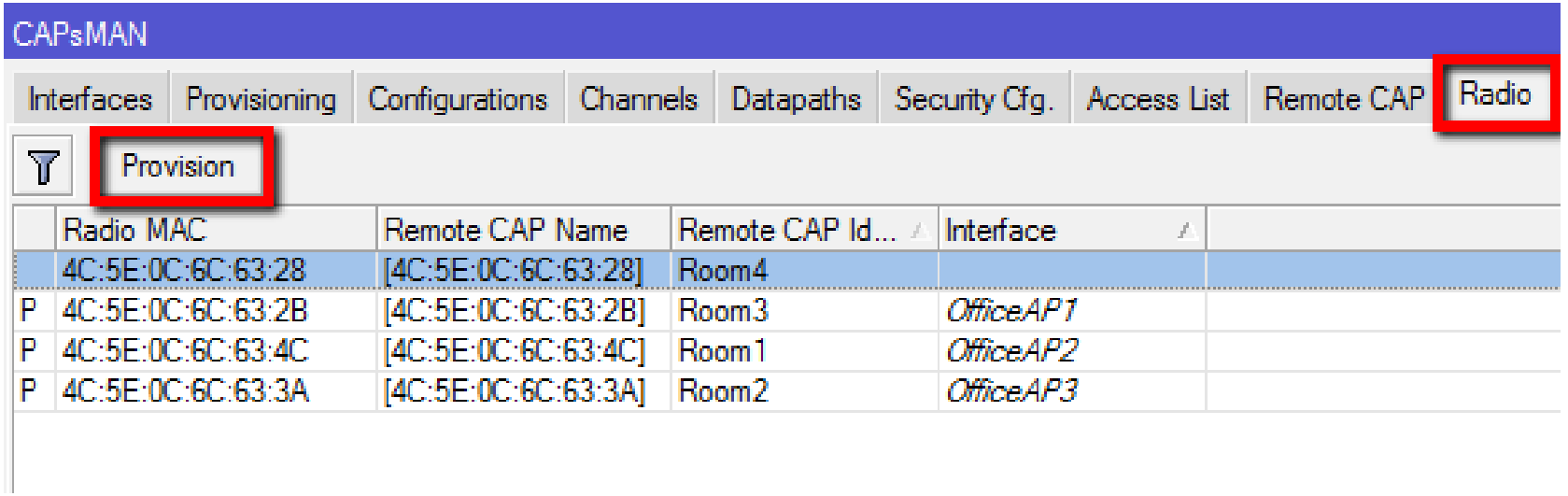


CAPsMAN Registration table



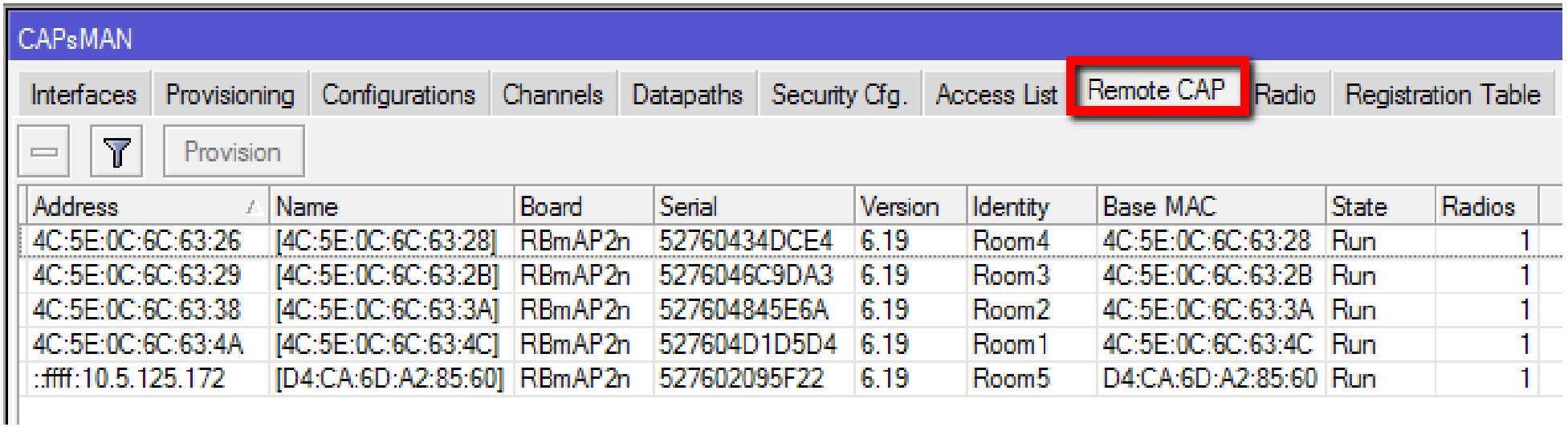
Manual Provisioning

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



CAP Identification

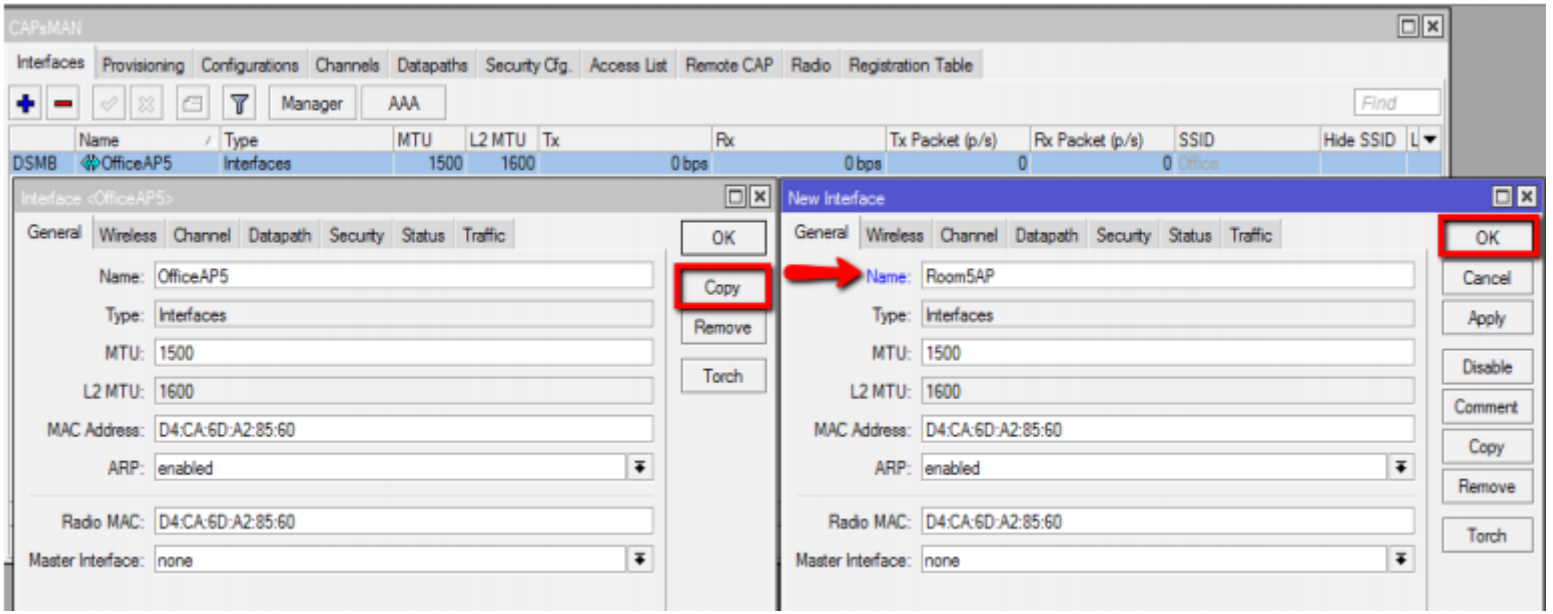
- MAC/IP address
- RouterBoard model
- Serial Number of the Board
- RouterOS version
- System Identity
- Main wireless MAC
- State of the CAP
- Radio count



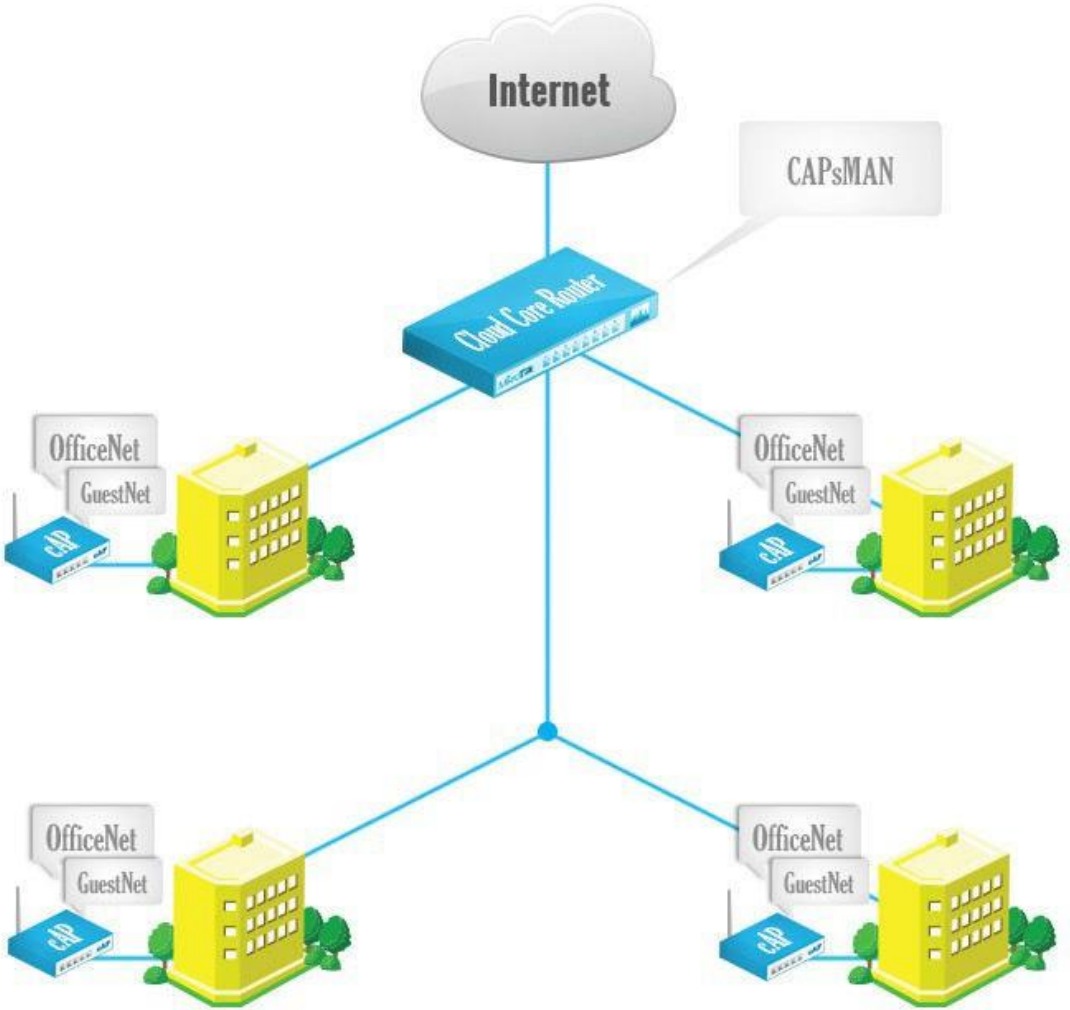
Address	Name	Board	Serial	Version	Identity	Base MAC	State	Radios
4C:5E:0C:6C:63:26	[4C:5E:0C:6C:63:28]	RBmAP2n	52760434DCE4	6.19	Room4	4C:5E:0C:6C:63:28	Run	1
4C:5E:0C:6C:63:29	[4C:5E:0C:6C:63:2B]	RBmAP2n	5276046C9DA3	6.19	Room3	4C:5E:0C:6C:63:2B	Run	1
4C:5E:0C:6C:63:38	[4C:5E:0C:6C:63:3A]	RBmAP2n	527604845E6A	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



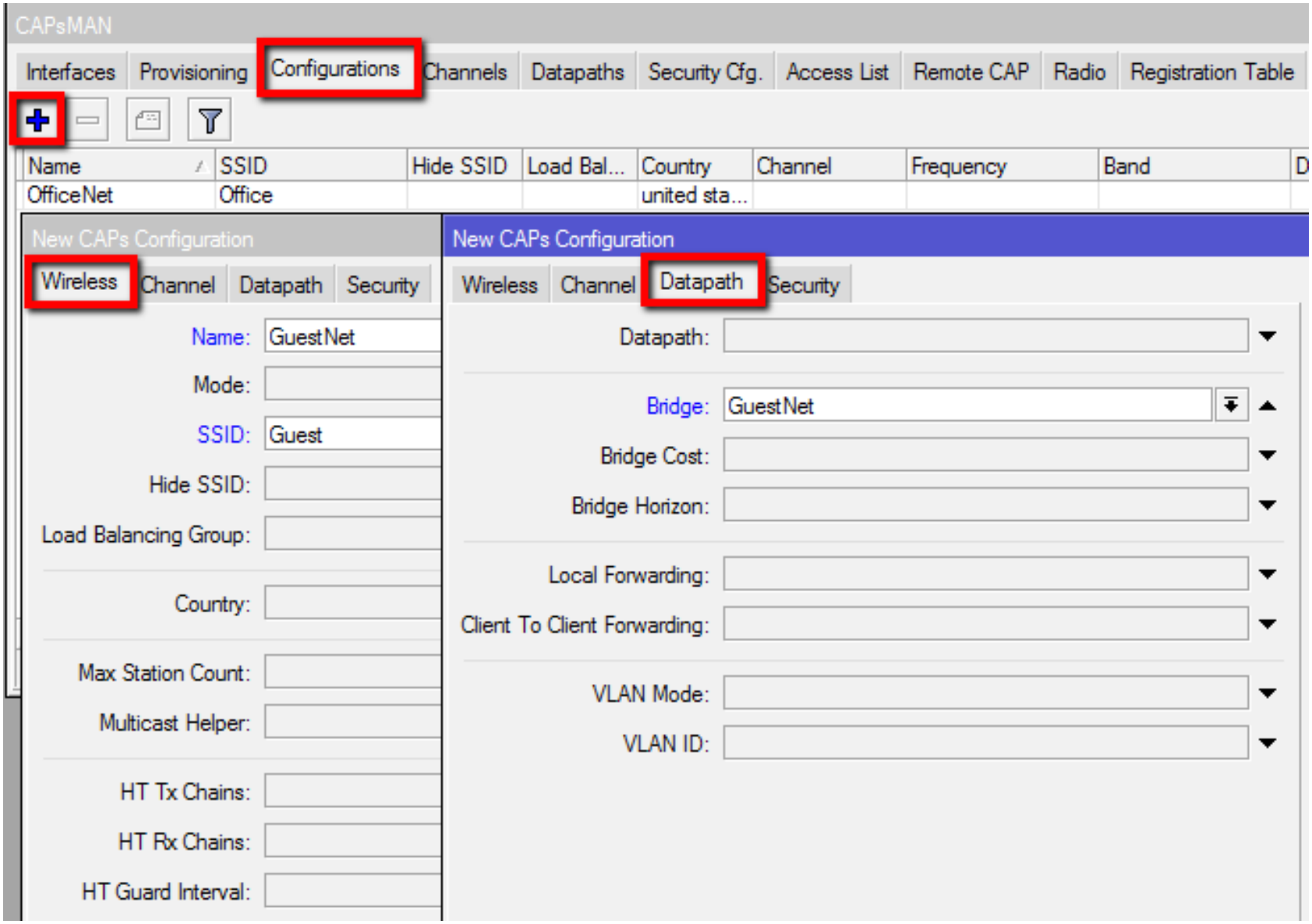
CAPsMAN Virtual AP



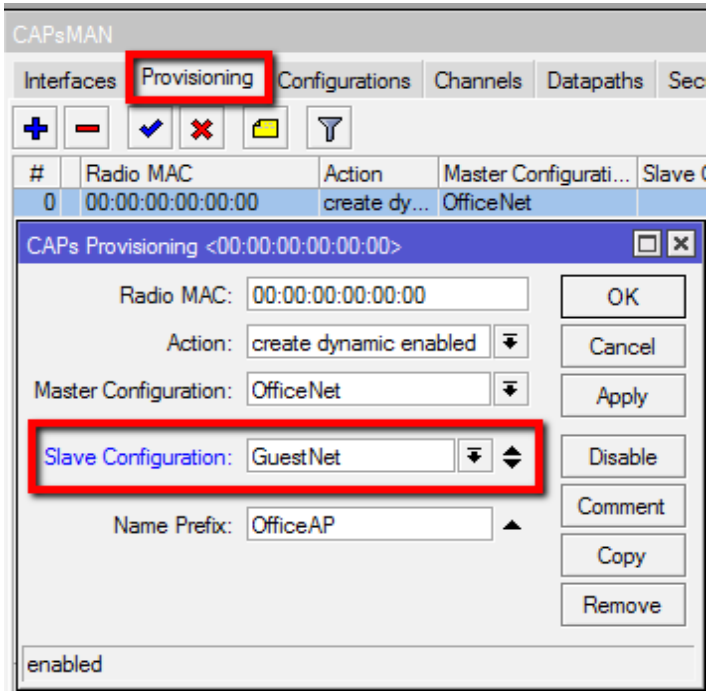
CAPsMAN VirtualAP Configuration

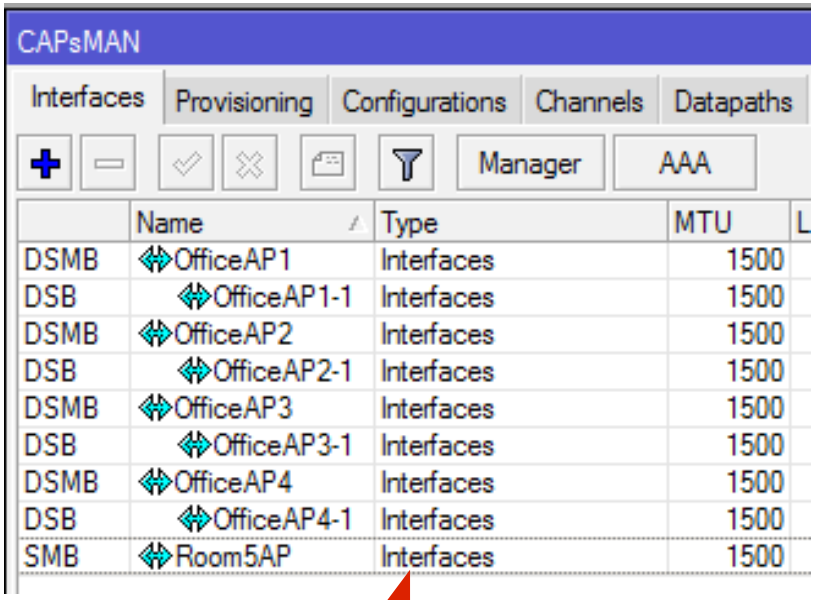
- Create new Bridge interface and IP configuration for the VirtualAPs
  - Or use the same bridge interface used for Master AP
- Create a new configuration for the VirtualAP
- Specify the new configuration in Provisioning rule as Slave Configuration
- Remove all CAP interfaces
- Initiate Manual Provisioning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

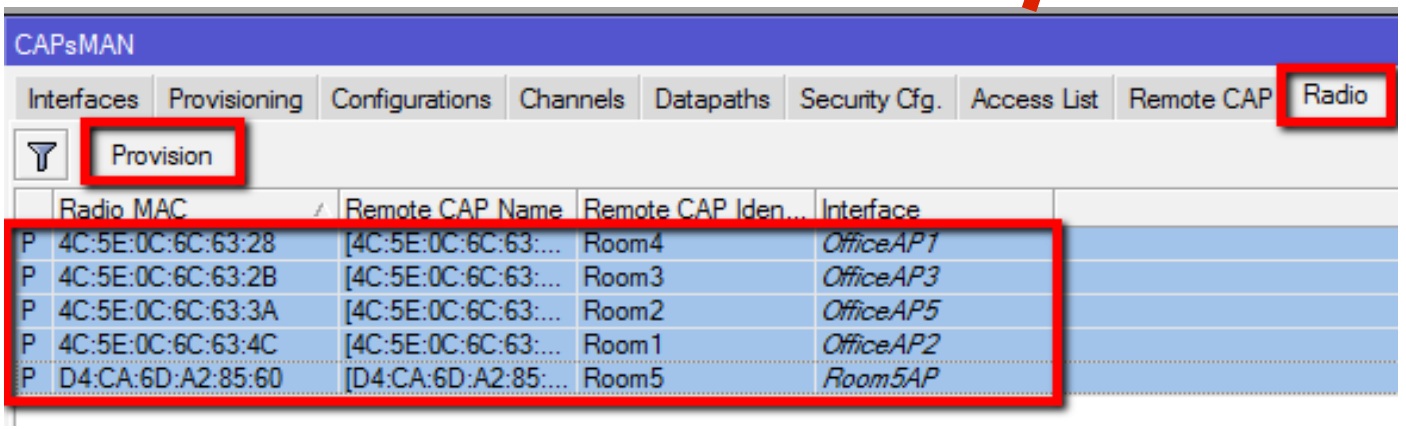
CAPsMAN VirtualAP Setup



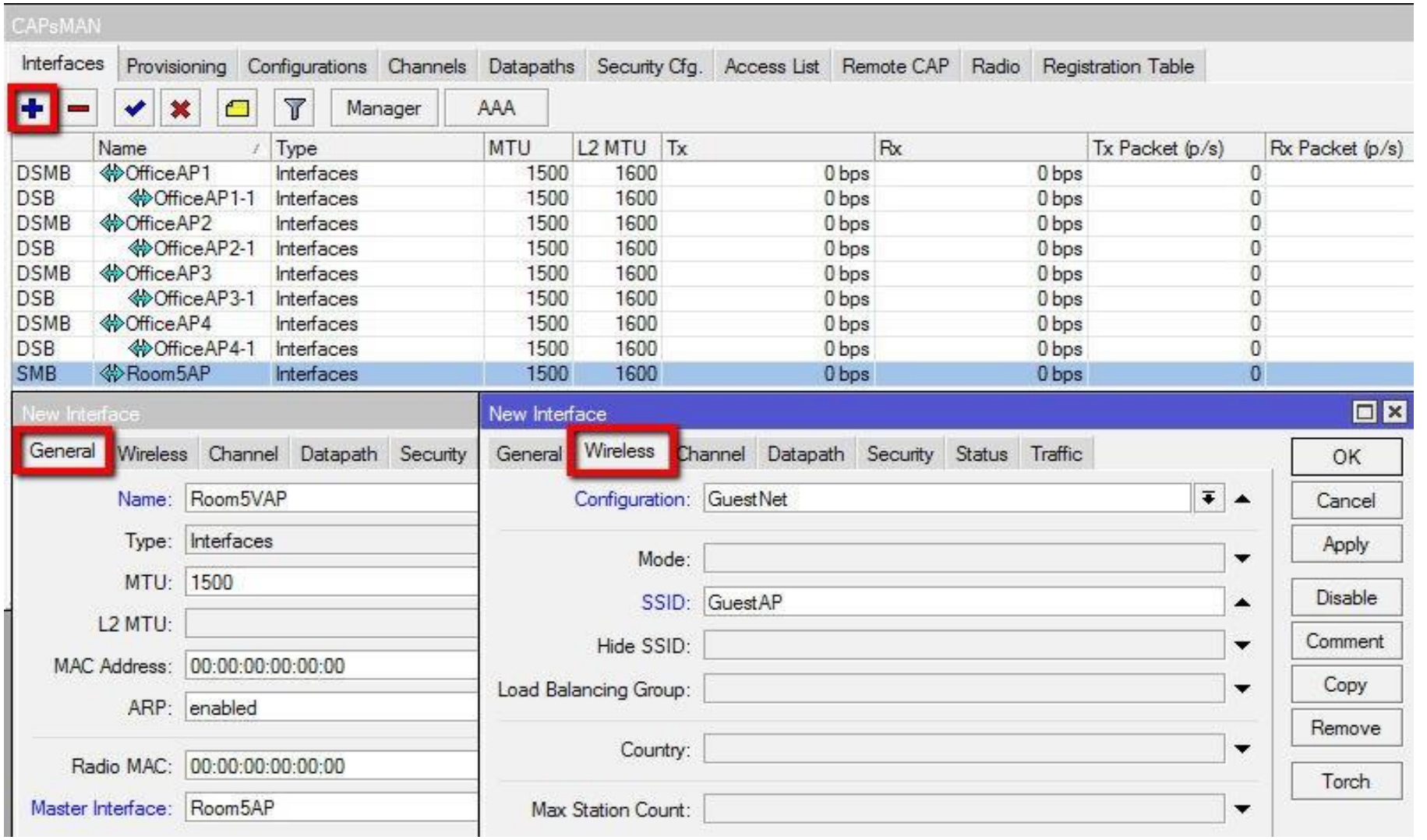
CAPsMAN VirtualAP Setup







CAPsMAN static VirtualAP

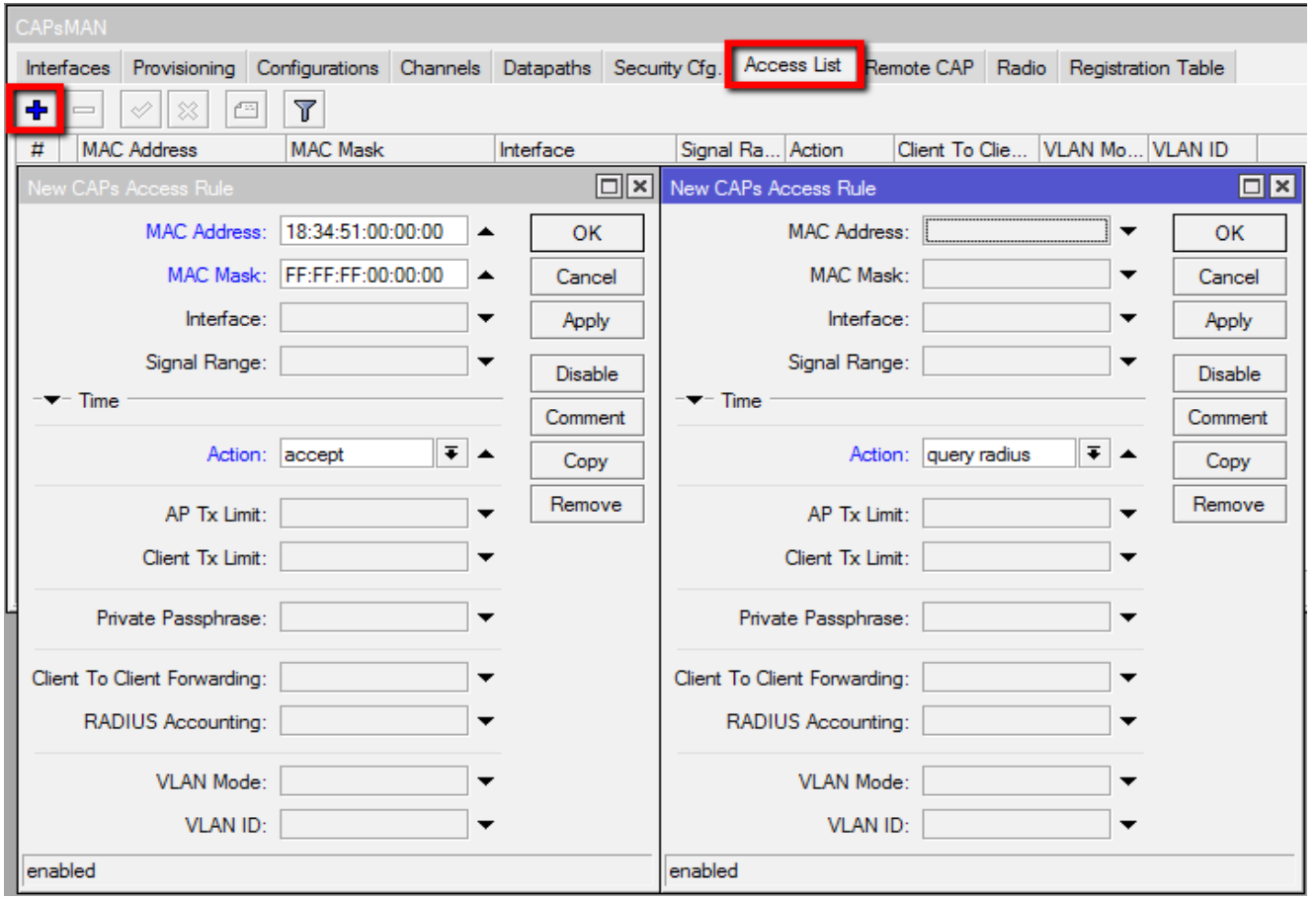


CAPsMAN Access List Features

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

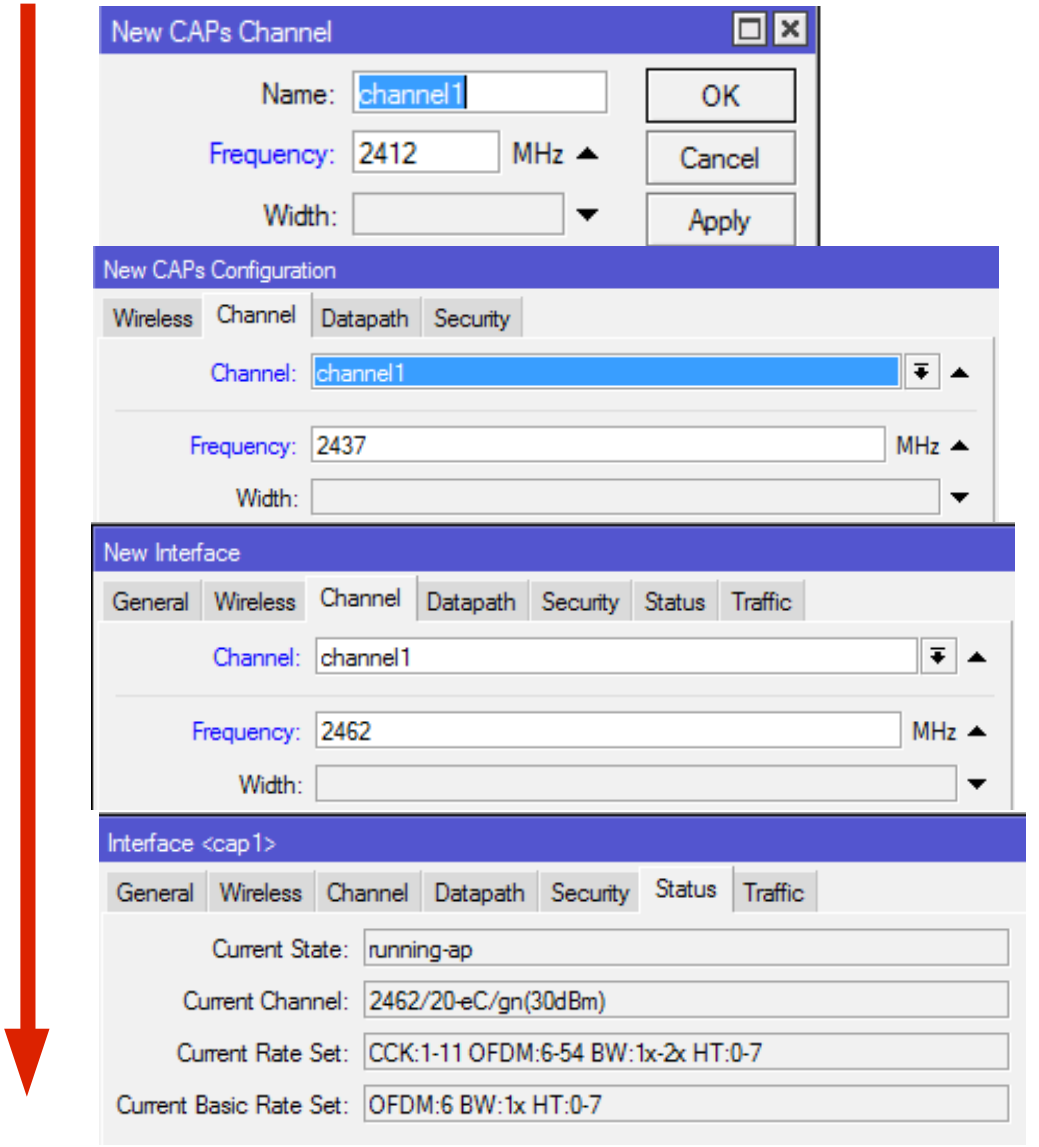
CAPsMAN Access List

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



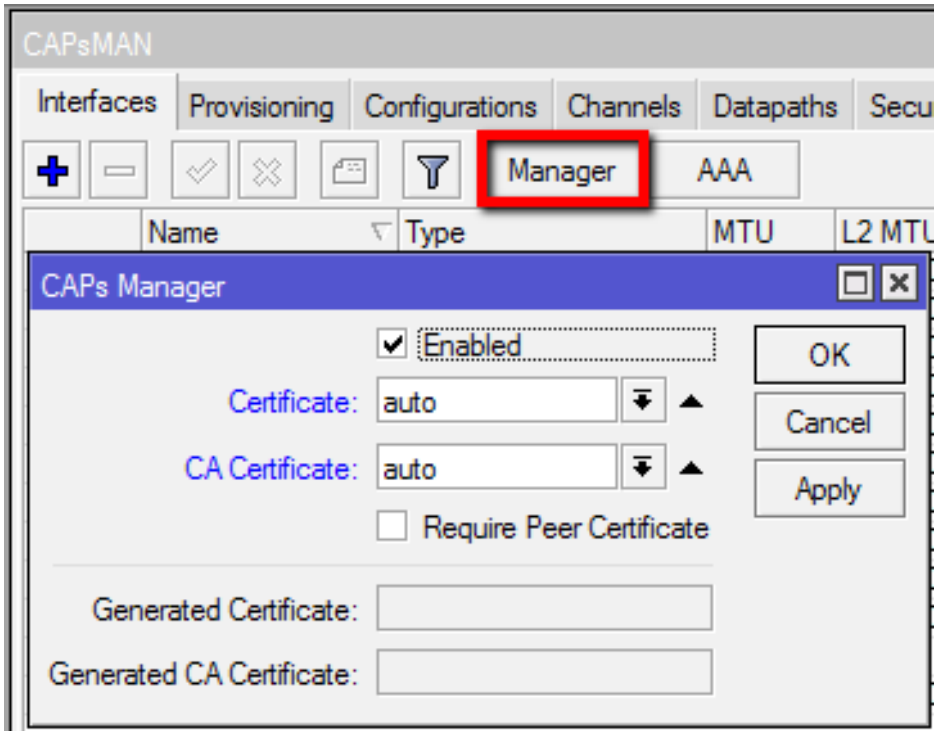
CAPsMAN Configuration override

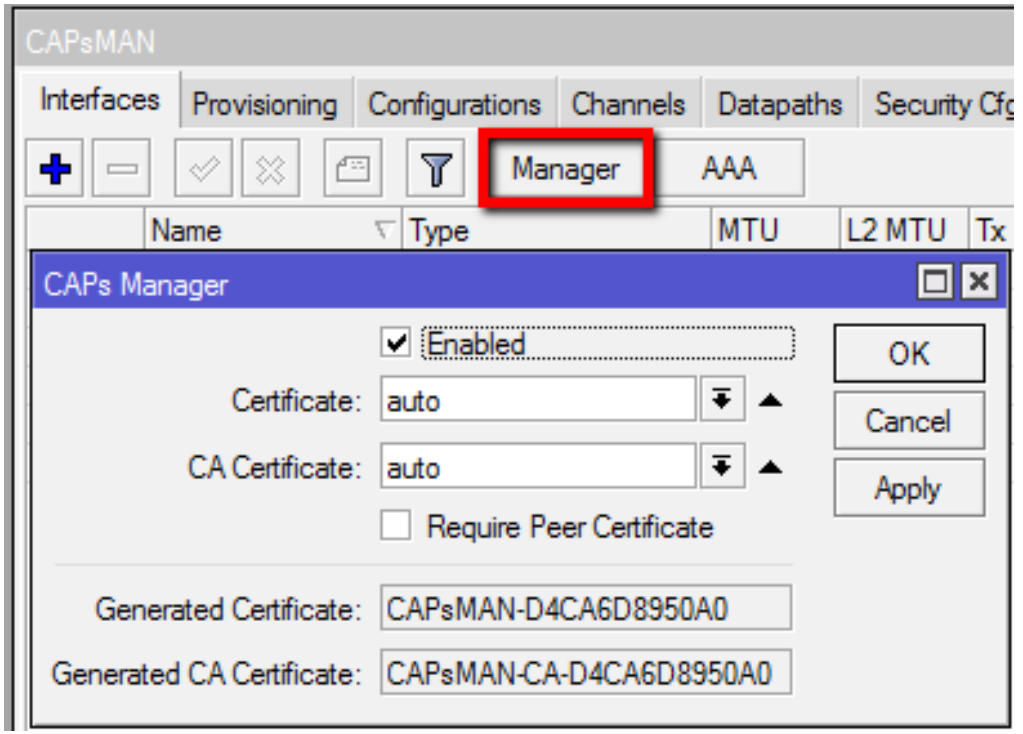
- Configuration overrides Channel setting
- Interface overrides Channel and Configuration setting



CAPsMAN Auto Certificate

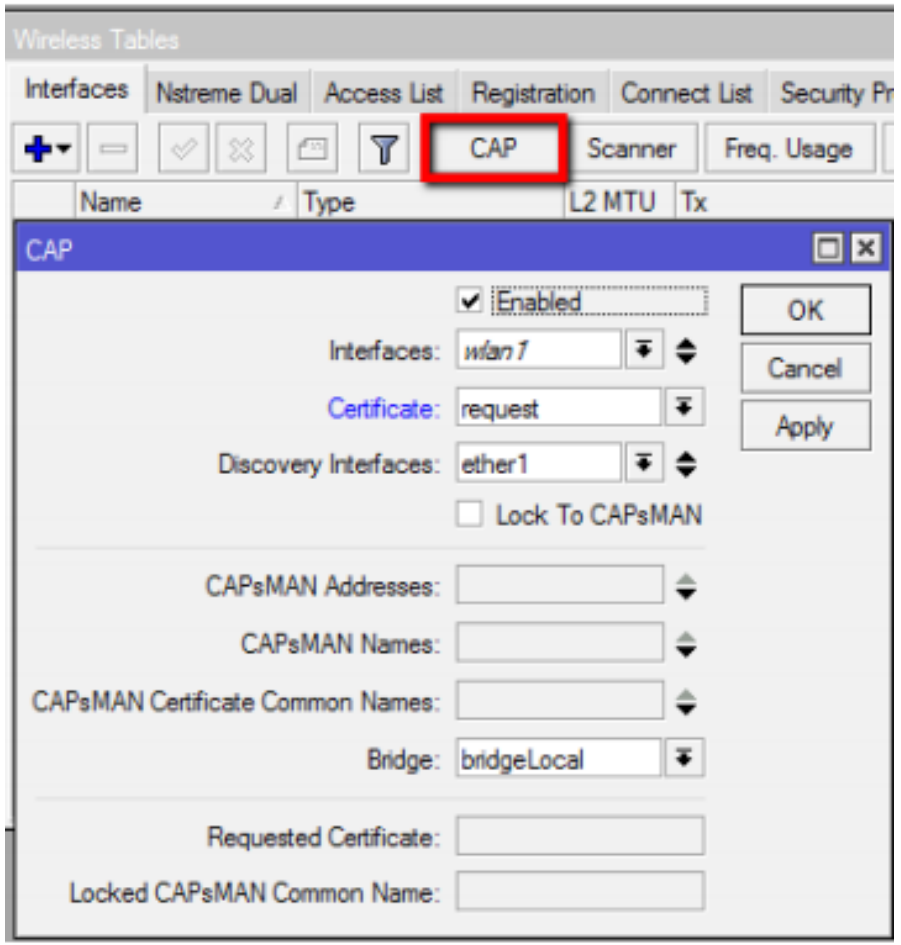
- Enable Certificate and CA Certificate on CAPsMAN

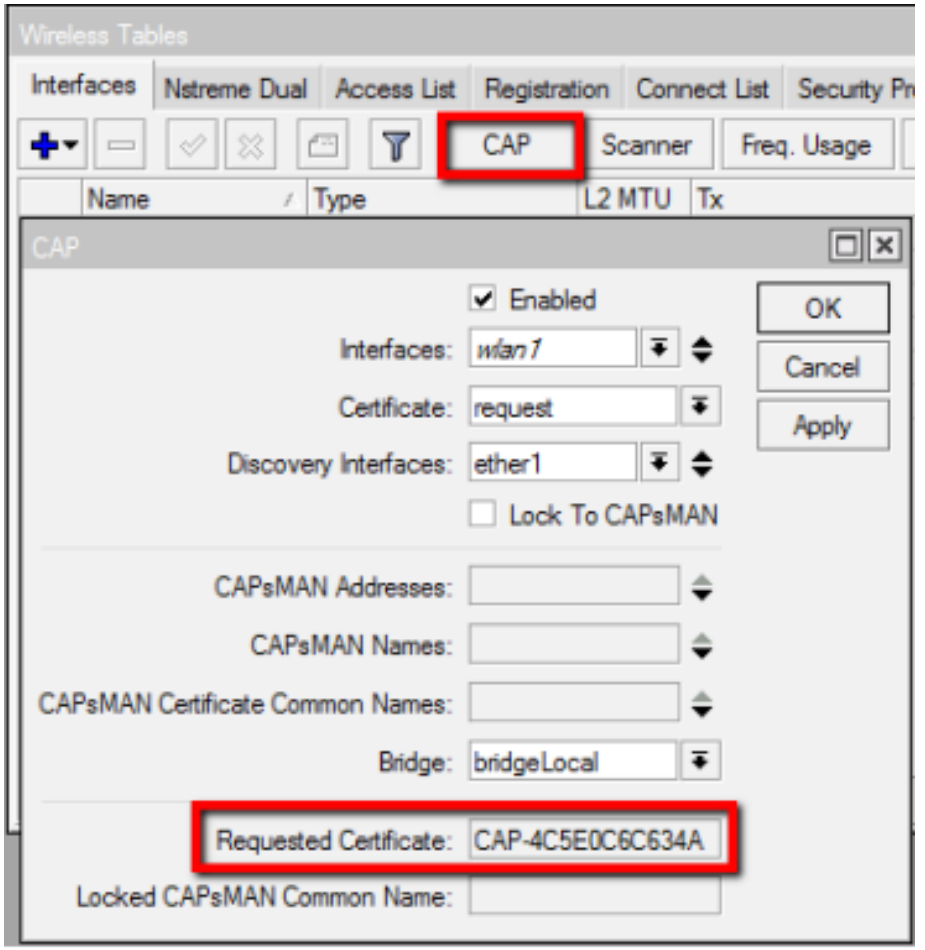




CAPsMAN Auto Certificate

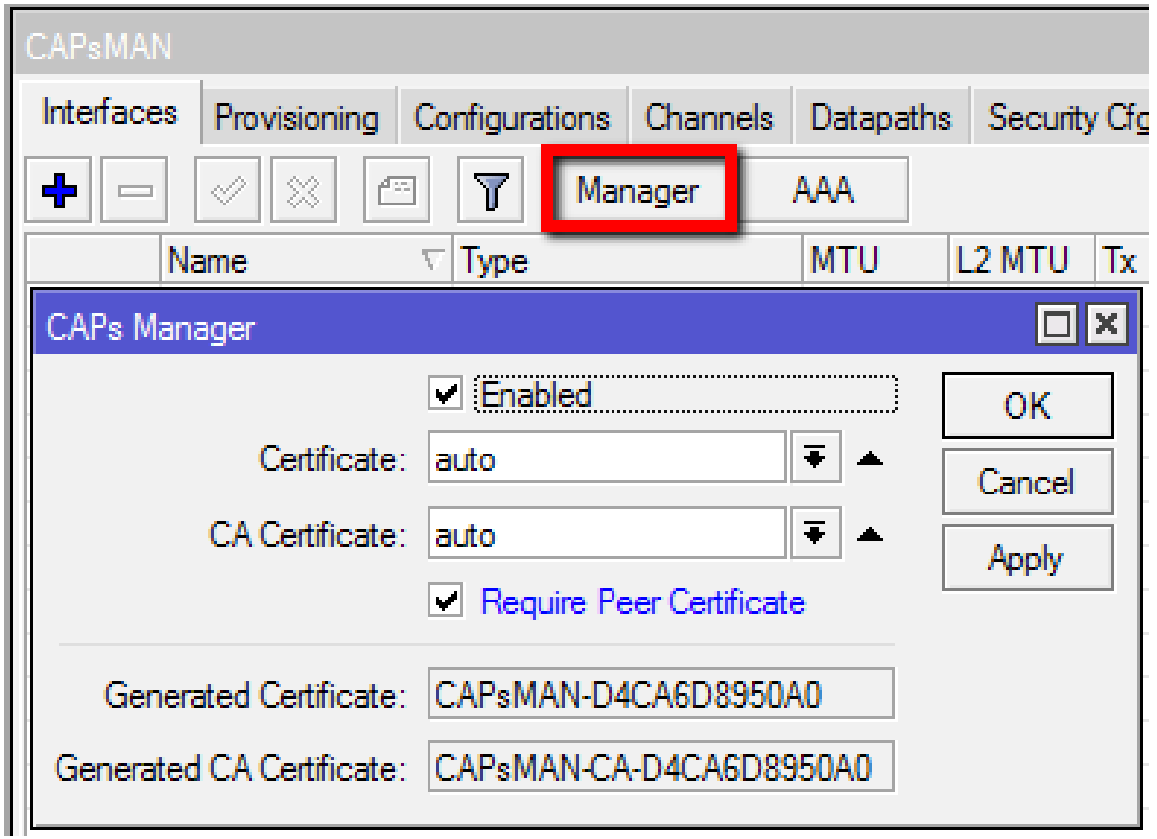
- Enable “Request” Certificate on CAP





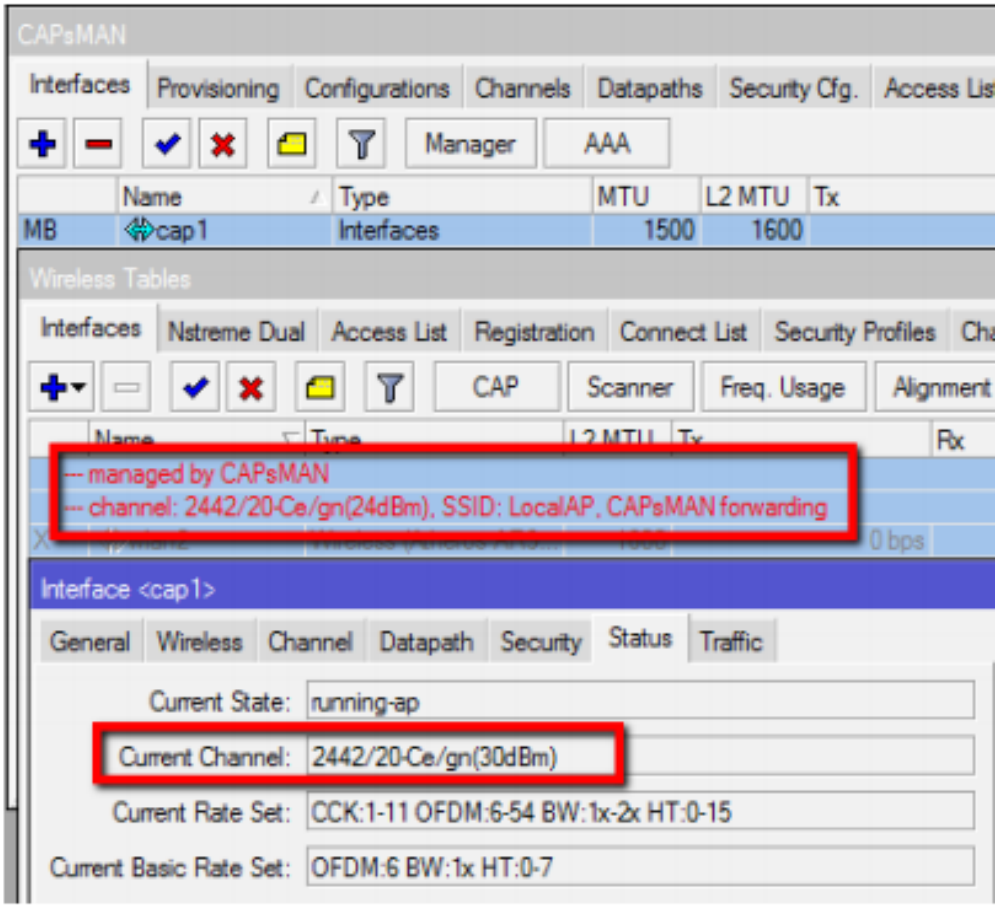
CAPsMAN Auto Certificate

- 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

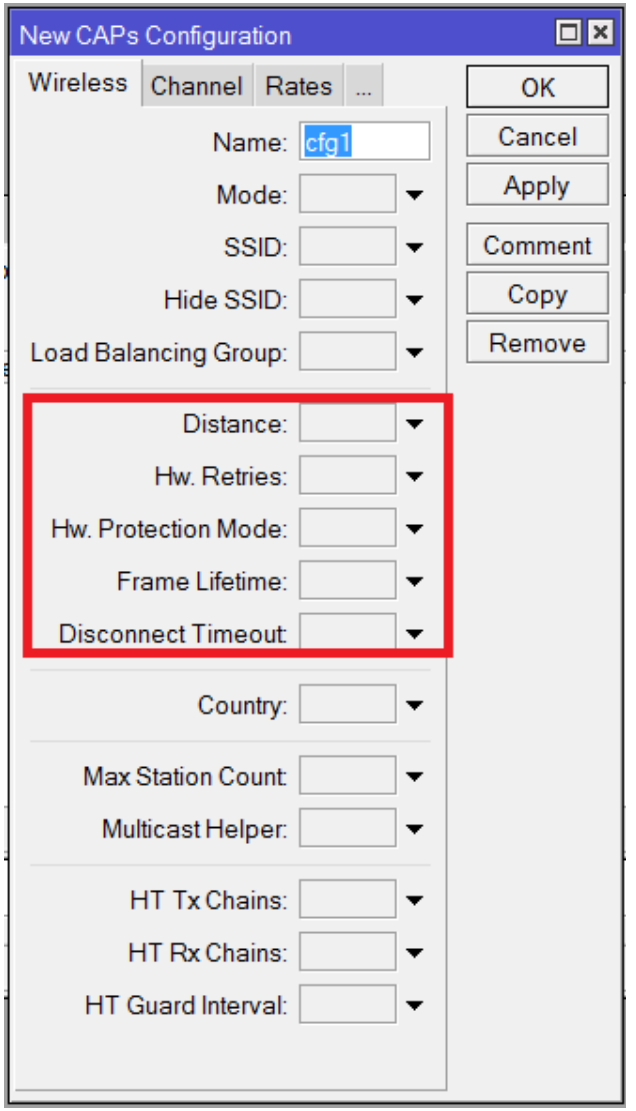
- Antenna-gain: 6dBi
- EIRP: 30dB

CAPsMAN Latest version new features in configuration - wireless

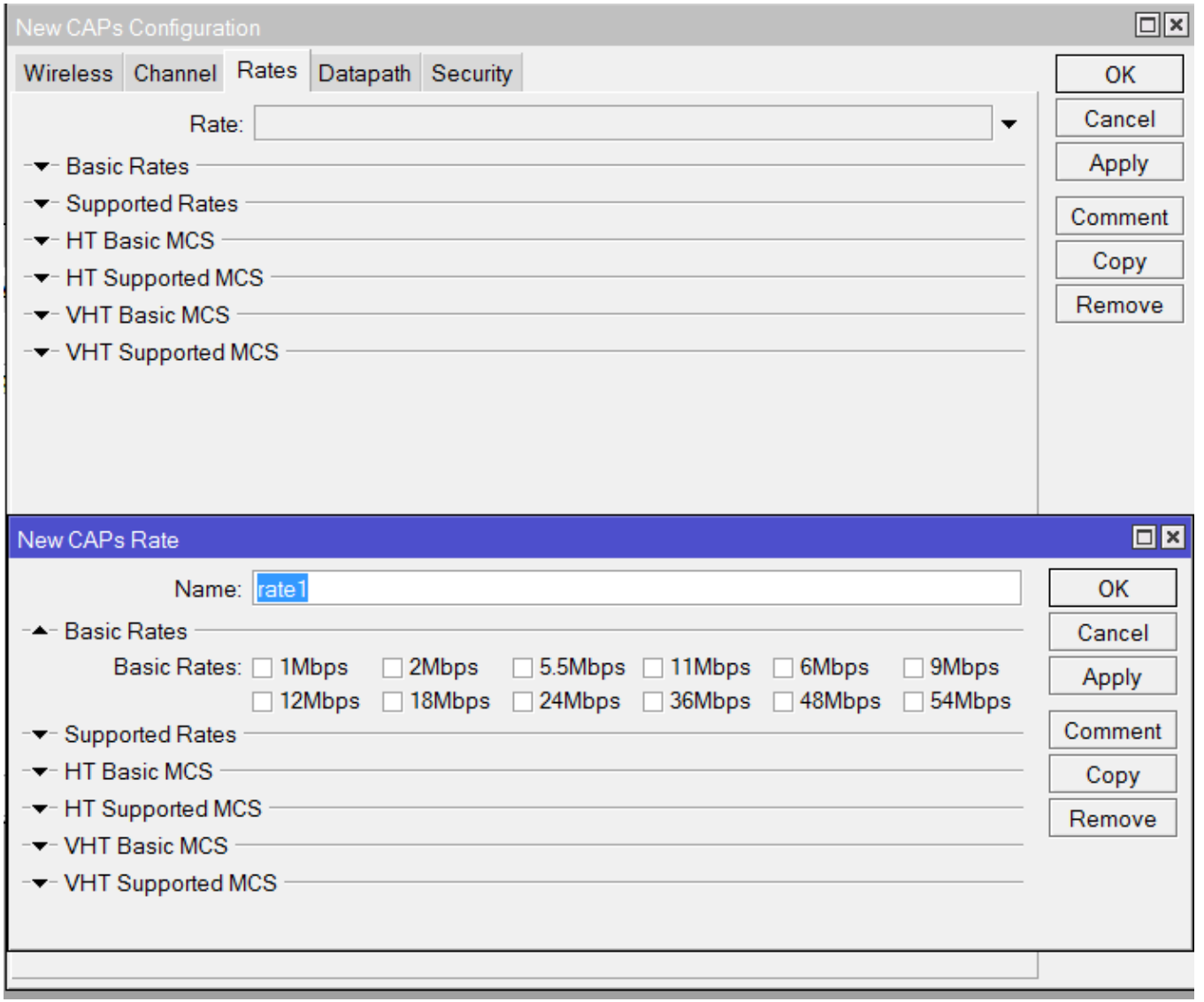
- 16th October 2014 i have advised MikroTik to include **wireless tuning parameters** also in CAPsMAN:
  - Configurable Basic and Supported Data-Rates
  - hw-retries,
  - disconnect-timeout
  - rts/cts
  - Etc..

✓ Today 17th October i am glad that everything is there! ☺ Thanks!

➢ Full CAPs control



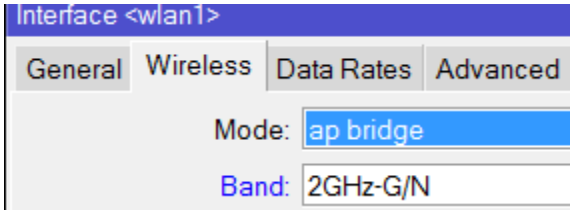
CAPsMAN Latest version new features in configuration - RATES

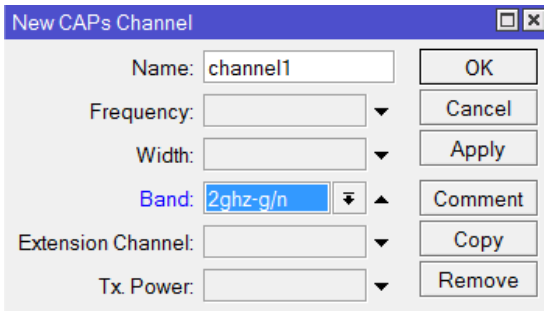


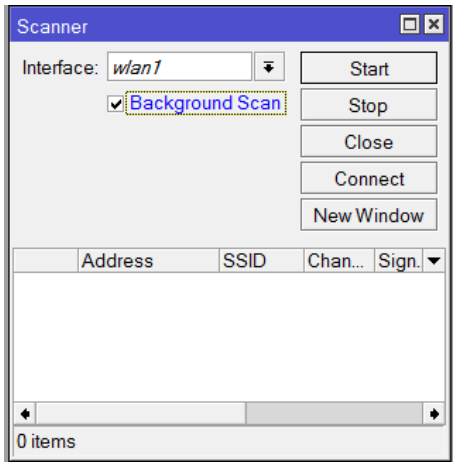
Wireless-rep package – Other new features useful for CAPsMAN

- 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

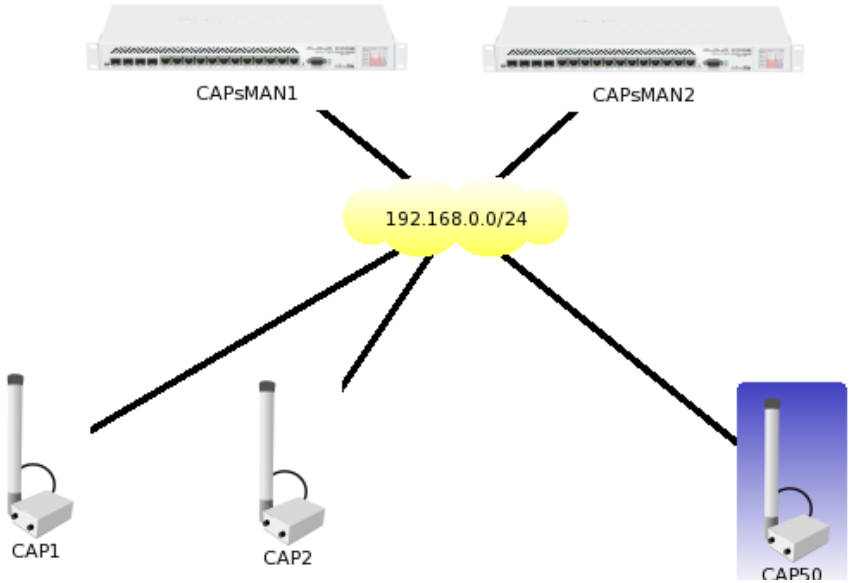






Maintain a failover controller (CAPsMAN)

- In big networks you have
  - Many CAPs
  - Many active users

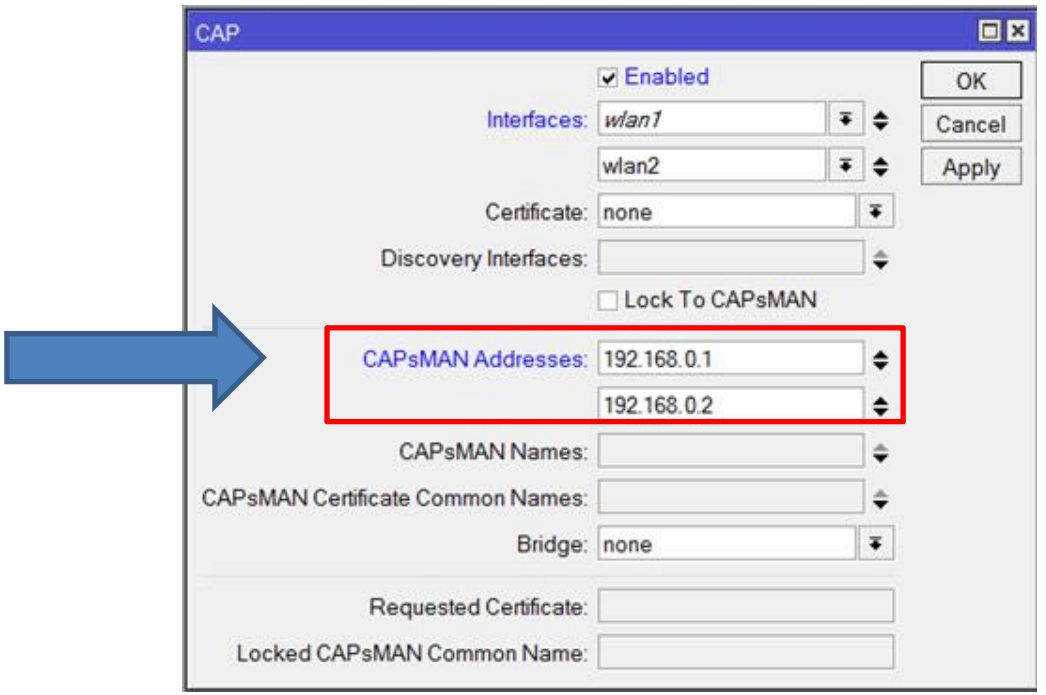


- Most times your customer will require redundancy
  - A bad power supply can take down whole network

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

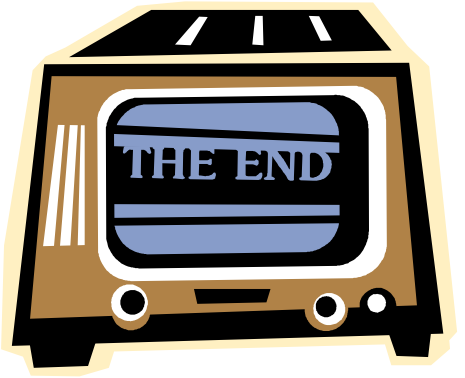
➢ Just configure multiple CAPsMAN addresses on **every** CAP



Comments? Questions?

Thank You!

Enjoy the Rest of the MUM

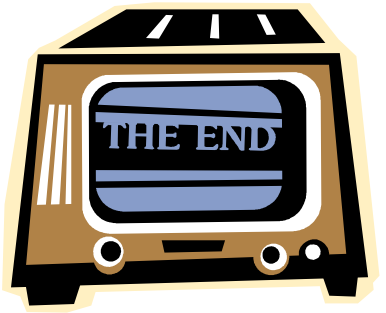


Need Help? A reliable partner? Contact me for:

- 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

Georgios Argyrides
☎ +357-22-030212
☎ +1-561-853-0199
✉ george@argyrides.gr

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?

- **Available in English and Greek languages**

Just Contact me ☺

Georgios Argyrides
☎ +357-22-030212
☎ +1-561-853-0199
✉ george@argyrides.gr