

# CSPE



## **CAPsMAN**

### **Real-life scenarios**

Markham, ON, Canada

September 2019

# ***First and foremost!***

***More bla bla bla before raffle and drinks; let's have fun!***



# About Alain Casault (*That's me!*)

- Electrical Engineering
- Over 25 years of experience
  - MikroTik (MTCNA, MTCRE, MTCWE)
  - Cisco (CCNA, CCDA)
  - Microsoft & Linux / UNIX
- Author of MikroTik's latest update of **MTCNA** course material (*about 2011*)
- **CSPE's** CTO (*and maintenance engineer, i.e. janitor, handyman*)

# About CSPE (*That's my company!*)

- **Centre de Services Professionnels en Éducation**
  - Operating since 2014
  - *Learning centre*
- **“*Young ones*”** division (<https://educationhmo.com>)
  - Helping kids and adults with learning disabilities
- ***Telecommunications*** division (<https://alaincasault.com>)
  - MikroTik and general telco training
  - MikroTik consulting

# Presentation objective

- Demonstrate three CAPsMAN (*Controlled Access Points System Manager*) configurations

***Quick and dirty definition*** : Centralized controller that manages the APs that are attached to it

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Let's begin somewhere!

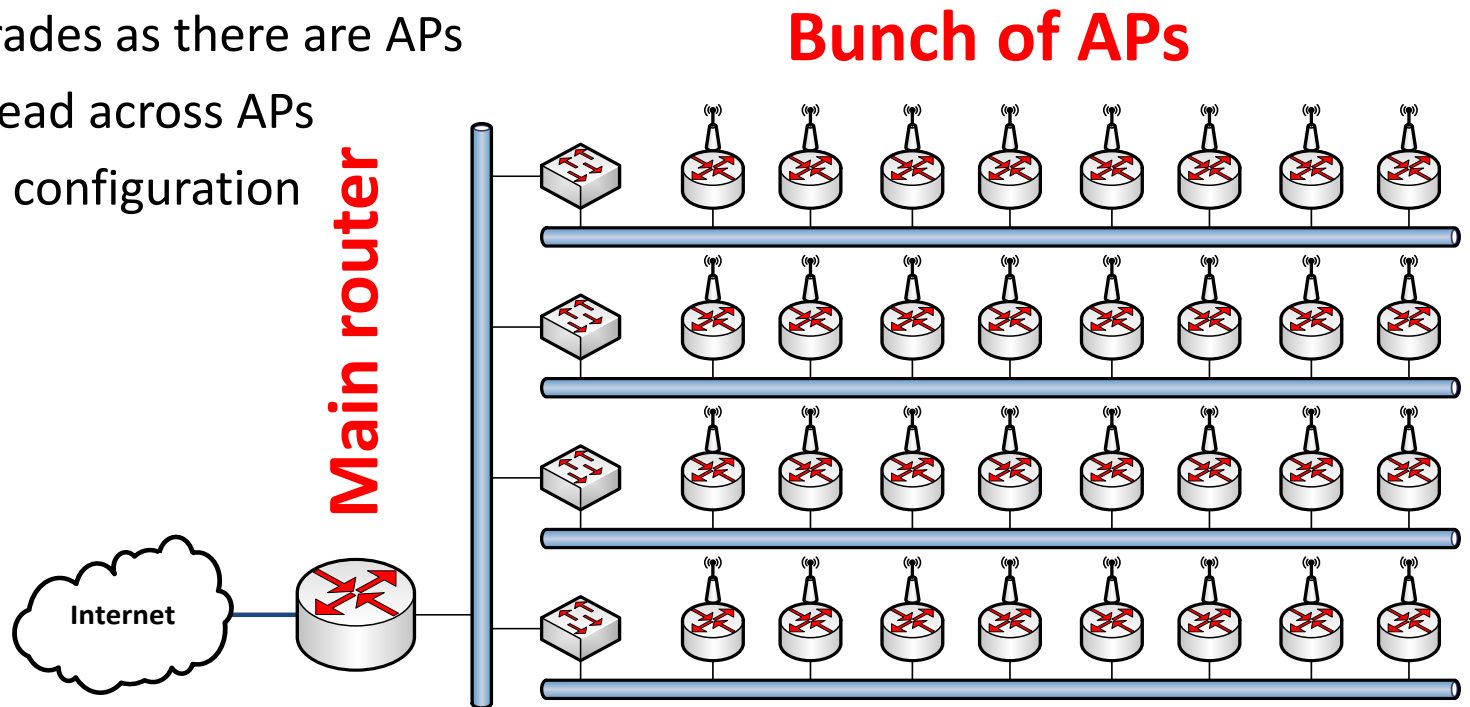
# INTRODUCTION



# Why CAPsMAN?

- **In the old days**

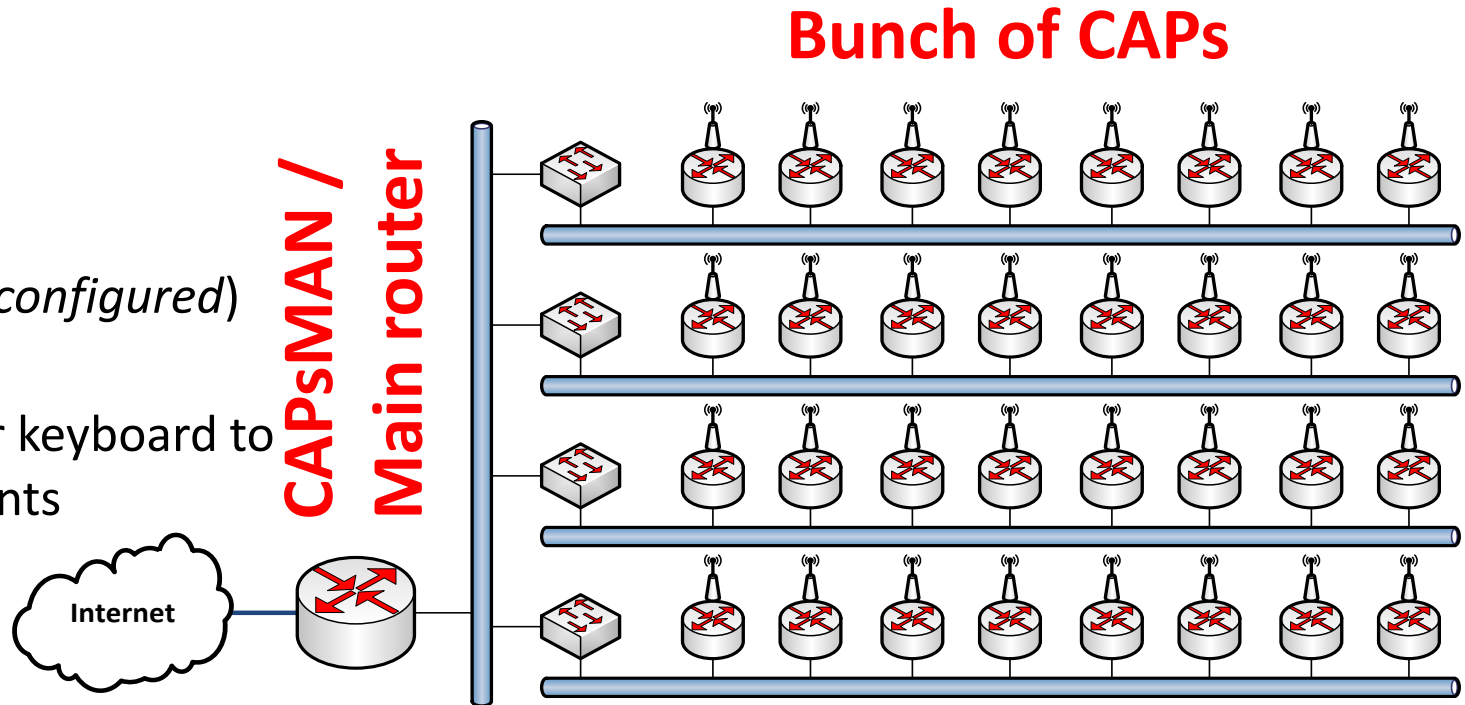
- As many configurations to maintain as there are APs
- As many (ROS / Firmware) upgrades as there are APs
- Clients management / stats spread across APs
- Maybe walk around the site for configuration changes



# Why CAPsMAN?

- **In the modern days**

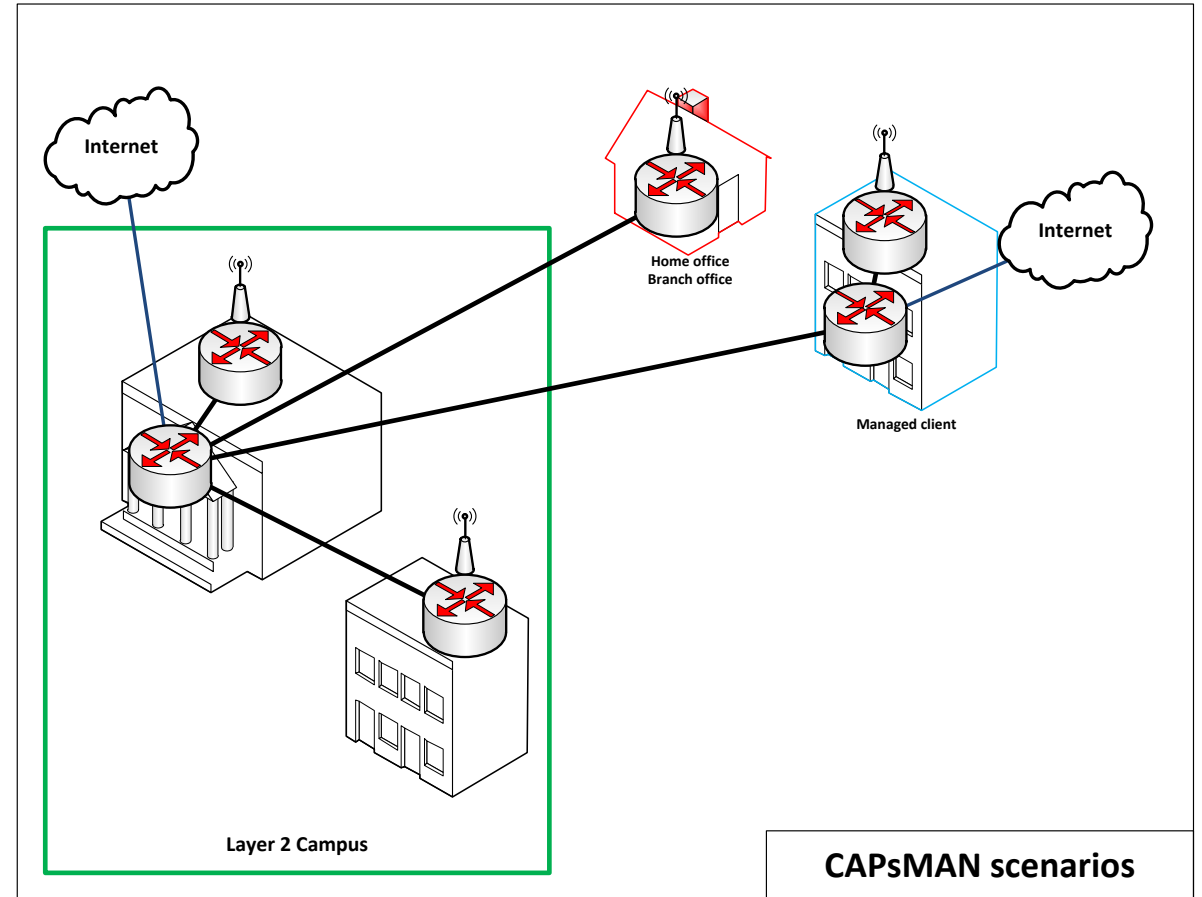
- Centralized configuration, amount of APs is irrelevant
  - Everything is on the CAPsMAN!
  - Template style configuration
- Centralized client management
- Automatic ROS upgrades (*If so configured*)
  - Nothing (*so far*) for firmware
- Fast & simple: Stay behind your keyboard to make changes and manage clients
  - (*Efficient=pay raise... maybe*)



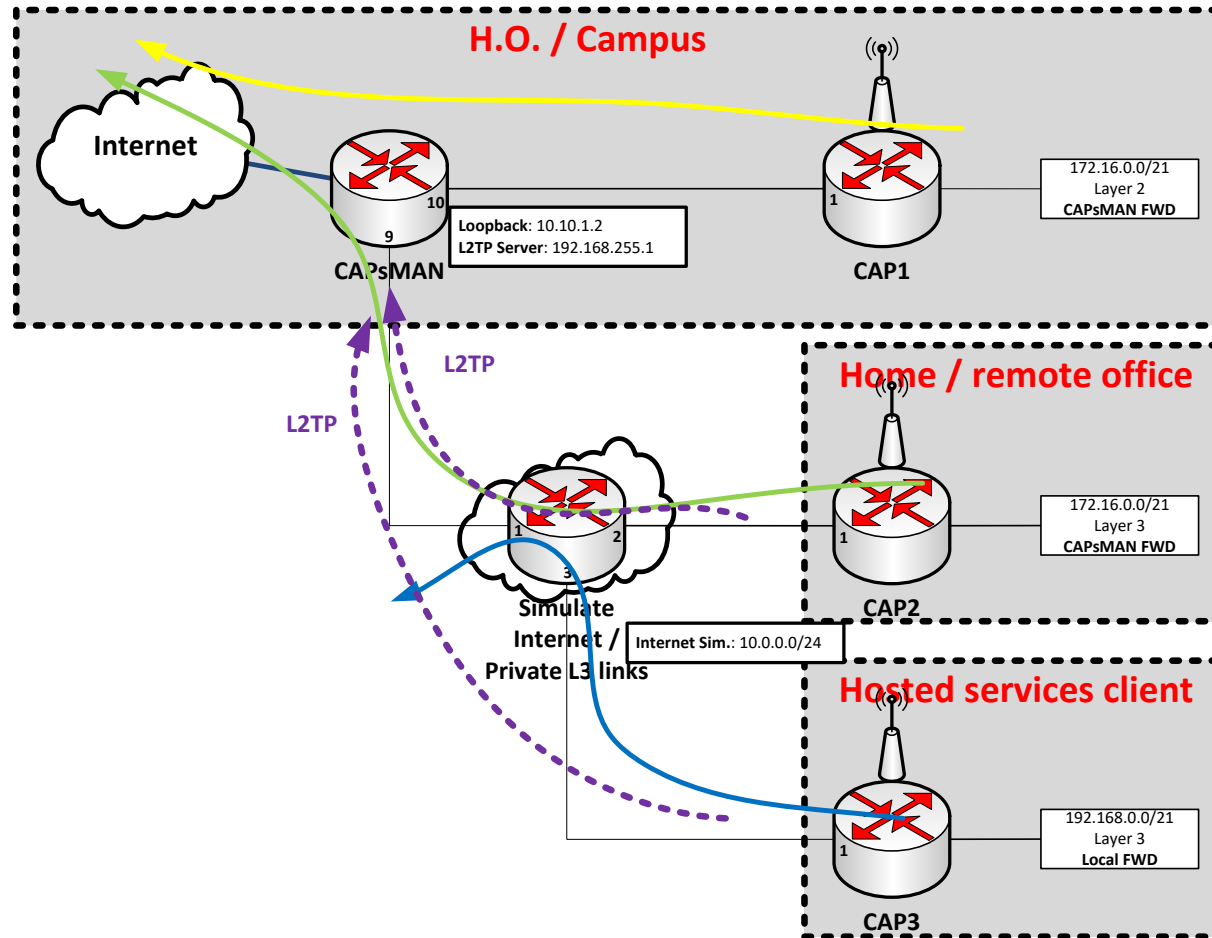


# Three scenarios

- Layer 2 campus
  - *L2, CAPsMAN forwarding*
- Home / Branch office
  - *L3, CAPsMAN forwarding*
- Managed clients
  - *Local forwarding (L3)*



# Demonstration setup



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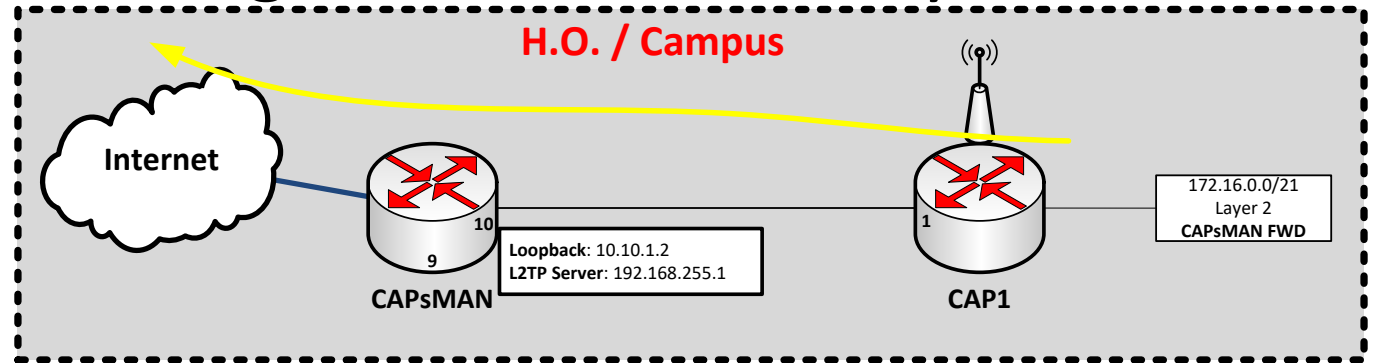
First scenario

# LAYER 2, CAPSMAN FORWARDING



# Layer 2, CAPsMAN forwarding

- Most standard setup
- Same building or campus, as long as it's the same layer 2 network

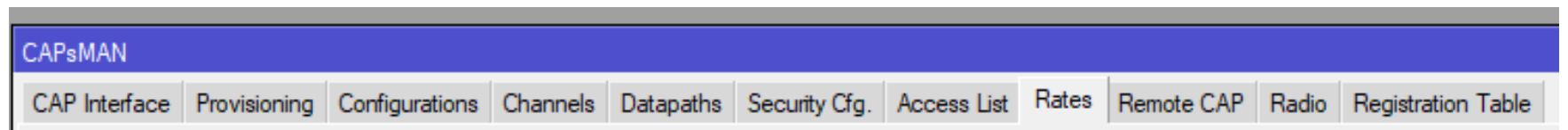


- **Notes**

- No IP configuration on the CAP
- Port on CAPsMAN can be blank (*no IP or bridge*)

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN
  - Rates
  - Access-list (*optional*)
  - Security
  - Channels
  - Configuration
  - Provisioning
  - Manager



# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates

- Access-list (*optional*)

- Security

- Channels

- Configuration

- Provisioning

- Manager

The allowed “basic” and “supported” rates.

*“Suggestion, consult [CWNP.COM](http://CWNP.COM) for tips on basic / supported rates”*

# CAPsMAN (Rates)

CAPsMAN

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

+ - [Folder Icon] [Filter Icon]

Name	Basic Rates	Supported Rates	HT Basic MCS	HT Supported MCS	VHT
Rates-CSPE	24Mbps	24Mbps 36Mbps 48M...	3	3 4 5 6 7 8 9 10 11 12...	

CAPs Rate <Rates-CSPE>

Name: Rates-CSPE

Basic Rates

Basic Rates:  1Mbps  2Mbps  5.5Mbps  11Mbps  6Mbps  9Mbps  
 12Mbps  18Mbps  24Mbps  36Mbps  48Mbps  54Mbps

Supported Rates

Supported Rates:  1Mbps  2Mbps  5.5Mbps  11Mbps  6Mbps  9Mbps  
 12Mbps  18Mbps  24Mbps  36Mbps  48Mbps  54Mbps

HT Basic MCS

HT Basic MCS:  0  1  2  3  4  5  
 6  7  8  9  10  11  
 12  13  14  15  16  17  
 18  19  20  21  22  23

HT Supported MCS

HT Supported MCS:  0  1  2  3  4  5  
 6  7  8  9  10  11  
 12  13  14  15  16  17  
 18  19  20  21  22  23

VHT Basic MCS

VHT Basic MCS: [Dropdown]

VHT Supported MCS

VHT Supported MCS: [Dropdown]

OK Cancel Apply Comment Copy Remove

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates

- Access-list (*optional*)

- Security

- Channels

- Configuration

- Provisioning

- Manager

Rules by which wireless clients are accepted.

*“I use it to quickly identify clients”*



# CAPsMAN (Access-list (*optional*))

CAPsMAN

CAP Interface Provisioning Configurations Channels Datapaths Security Cfg. Access List Rates F

+ - ✓ ✕ ☰ 🔍

#	MAC Address	MAC Mask	Interface	Signal Ra...	Action	Client To
::: ===Alain cell phone===						
0	00:57:C1:CF:6D:E2					
::: ***Default action***						
1				-75.0	accept	

CAPsMAN

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

- 🔍 CAPs Scanner

Interface	SSID	MAC Address	EAP Identity	Tx Rate	Rx Rate	Tx Sign
::: ===Alain cell phone===						
CAP1-1	CSPE	00:57:C1:CF:6D:E2		130Mbps-20MHz/2S...	144.4Mbps-20MHz/2S/SGI	

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates

- Access-list (*optional*)

- Security

- Channels

- Configuration

- Provisioning

- Manager

Authentication, encryption,  
PSKs, etc.

# CAPsMAN (Security)

CAPsMAN

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

+ - [Folder Icon] [Filter Icon]

Name	Authentication Type	Encryption	Group Encryption	Group Key Update	Passphrase
CSPE-Guest	WPA2 PSK	aes ccm	aes ccm		wpa2-guest
CSPE-Home	WPA2 PSK	aes ccm	aes ccm		wpa2-home
Nothing	WPA2 PSK	aes ccm	aes ccm		ydyatDDE!12FVF!!zxZX

CAPs Security Configuration <Nothing>

Name:

Authentication Type:  WPA PSK  WPA2 PSK  WPA EAP  WPA2 EAP ▲

Encryption:  aes ccm  tkip ▲

Group Encryption:  ▼ ▲

Group Key Update:  ▼

Passphrase:  ▲

Disable PMKID:  ▼

EAP Methods:  ▲▼

EAP Radius Accounting:  ▼

TLS Mode:  ▼

TLS Certificate:  ▼

OK  
Cancel  
Apply  
Comment  
Copy  
Remove

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN
  - Rates
  - Access-list (*optional*)
  - Security
  - Channels
  - Configuration
  - Provisioning
  - Manager

The channels to use. For 802.11n in North America, stick with 1,6 and 11



# CAPsMAN (Channels)

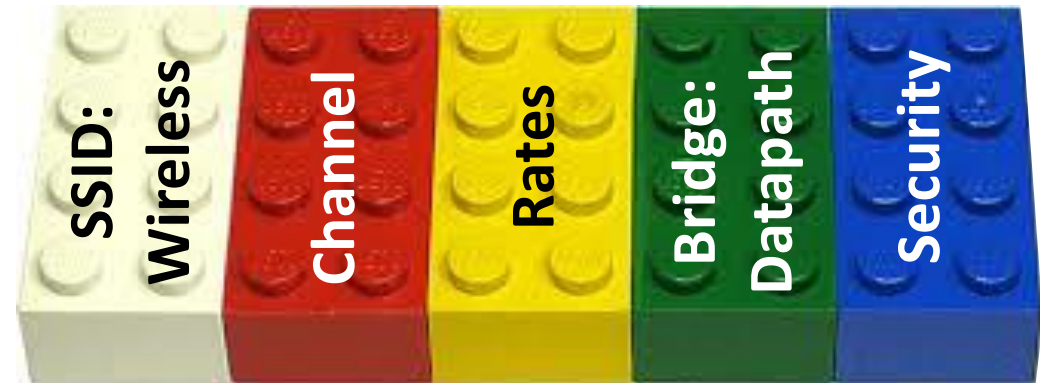
CAPsMAN											
CAP Interface	Provisioning	Configurations	Channels	Datapaths	Security Cfg.	Access List	Rates	Remote CAP	Radio	Registration Tab	
Name	Frequency	Secondary Frequency	Control Channel Width	Band	Extension Channel	Tx Power					
channel-1	2412		20Mhz	2ghz-onlyn	disabled	11					
channel-6	2437		20Mhz	2ghz-onlyn	disabled	11					
channel-11	2462		20Mhz	2ghz-onlyn	disabled	11					
channel-36	5180		20Mhz	5ghz-onlyac	Ce	15					
channel-40	5220		20Mhz	5ghz-onlyac	Ce	15					
channel-44	5220		20Mhz	5ghz-onlyac	Ce	15					
channel-149	5745		20Mhz	5ghz-onlyac	Ce	15					
::: =====NEW=====											
channels-tous-ac	5180, 5200, 5220, 5745		20Mhz	5ghz-onlyac	disabled	0					
channels-tous-n	2412, 2437, 2462		20Mhz	2ghz-onlyn	disabled	0					

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates
- Access-list (*optional*)
- Security
- Channels
- Configuration
- Provisioning
- Manager

A “configuration” object holds the parameters that can be assigned to CAPs (*Kinda like a BSS’s template*).



# CAPsMAN (Configuration)

CAPsMAN															
CAP Interface		Provisioning	Configurations	Channels	Datapaths	Security Cfg.	Access List	Rates	Remote CAP	Radio	Registration Table				
Name	SSID	Country	Install...	Channel	Frequency	Secondary Freque...	Band	Tx Power	Rate	Datapath	Bridge	VLAN Mo...	VLAN ID	Security	
::: =====BOGUS=====															
Bidon-Corpo-ac.cfg	CSPE-blank	united states3		channels-tous-ac					Rates-CSPE					Nothing	
Bidon-Corpo-n.cfg	CSPE-blank	united states3		channels-tous-n					Rates-CSPE					Nothing	
::: =====Local CSPE (EMPLOYE)=====															
CSPE-empl-1.cfg	CSPE	united states3		channel-1					Rates-CSPE		BR-VLAN102			CSPE-Home	
CSPE-empl-6.cfg	CSPE	united states3		channel-6					Rates-CSPE		BR-VLAN102			CSPE-Home	
CSPE-empl-11.cfg	CSPE	united states3		channel-11					Rates-CSPE		BR-VLAN102			CSPE-Home	
CSPE-empl-36.cfg	CSPE	united states3		channel-36					Rates-CSPE		BR-VLAN102			CSPE-Home	
CSPE-empl-40.cfg	CSPE	united states3		channel-40					Rates-CSPE		BR-VLAN102			CSPE-Home	
CSPE-empl-44.cfg	CSPE	united states3		channel-44					Rates-CSPE		BR-VLAN102			CSPE-Home	
CSPE-empl-149.cfg	CSPE	united states3		channel-149					Rates-CSPE		BR-VLAN102			CSPE-Home	
::: =====Local CSPE (GUEST)=====															
CSPE-guest-1.cfg	CSPE-guest	united states3		channel-1					Rates-CSPE		BR-VLAN107			CSPE-Guest	
CSPE-guest-6.cfg	CSPE-guest	united states3		channel-6					Rates-CSPE		BR-VLAN107			CSPE-Guest	
CSPE-guest-11.cfg	CSPE-guest	united states3		channel-11					Rates-CSPE		BR-VLAN107			CSPE-Guest	
::: =====Remote HOME (Family)=====															
Maison-fam-1.cfg	DSWLANr	united states3		channel-1					Rates-CSPE		use tag		102	CSPE-Home	
Maison-fam-6.cfg	DSWLANr	united states3		channel-6					Rates-CSPE		use tag		102	CSPE-Home	
Maison-fam-11.cfg	DSWLANr	united states3		channel-11					Rates-CSPE		use tag		102	CSPE-Home	
Maison-fam-36.cfg	DSWLANr	united states3		channel-36					Rates-CSPE		use tag		102	CSPE-Home	
Maison-fam-40.cfg	DSWLANr	united states3		channel-40					Rates-CSPE		use tag		102	CSPE-Home	
Maison-fam-44.cfg	DSWLANr	united states3		channel-44					Rates-CSPE		use tag		102	CSPE-Home	
Maison-fam-149.cfg	DSWLANr	united states3		channel-149					Rates-CSPE		use tag		102	CSPE-Home	
::: =====Remote HOME (guest)=====															
Maison-guest-1.cfg	gustr	united states3		channel-1					Rates-CSPE		use tag		107	CSPE-Guest	
Maison-guest-6.cfg	gustr	united states3		channel-6					Rates-CSPE		use tag		107	CSPE-Guest	
Maison-guest-11.cfg	gustr	united states3		channel-11					Rates-CSPE		use tag		107	CSPE-Guest	
Maison-guest-36.cfg	gustr	united states3		channel-36					Rates-CSPE		use tag		107	CSPE-Guest	
Maison-guest-40.cfg	gustr	united states3		channel-40					Rates-CSPE		use tag		107	CSPE-Guest	
Maison-guest-44.cfg	gustr	united states3		channel-44					Rates-CSPE		use tag		107	CSPE-Guest	
Maison-guest-149.cfg	gustr	united states3		channel-149					Rates-CSPE		use tag		107	CSPE-Guest	

26 items (1 selected)

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates
- Access-list (*optional*)
- Security
- Channels
- Configuration
- Provisioning
- Manager

A rule containing 1 or many “configurations” that is assigned to a CAP’s **interface** (*identified by its MAC*). The CAP’s interface will also be dynamically assigned a local identifier. A provisioning rule is a **fully configured** Wi-Fi interface.



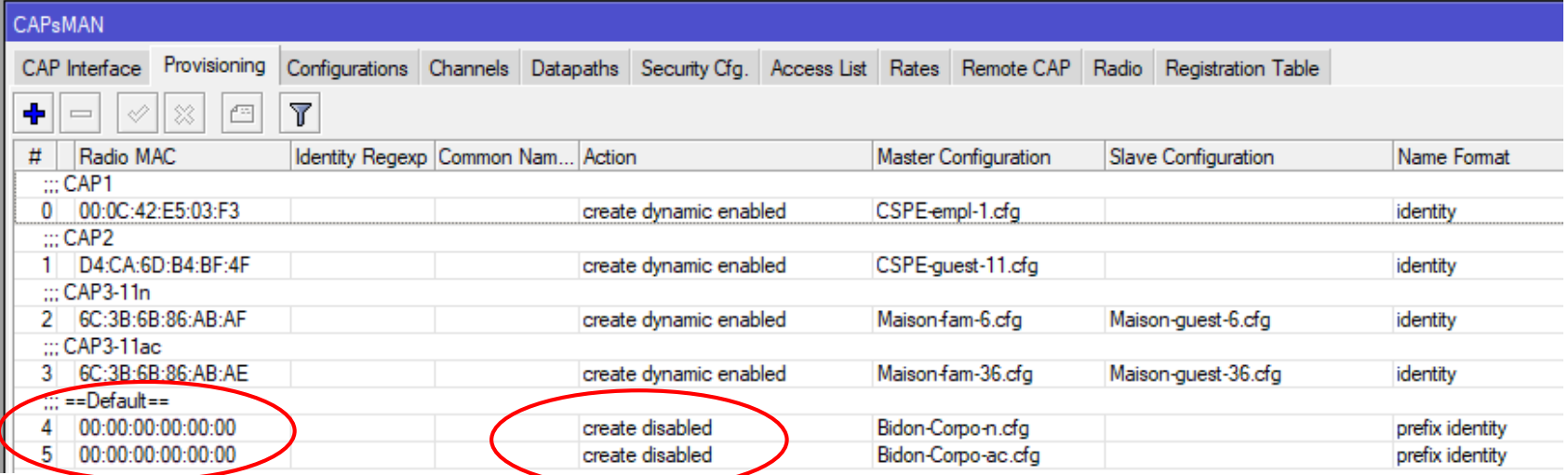


# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

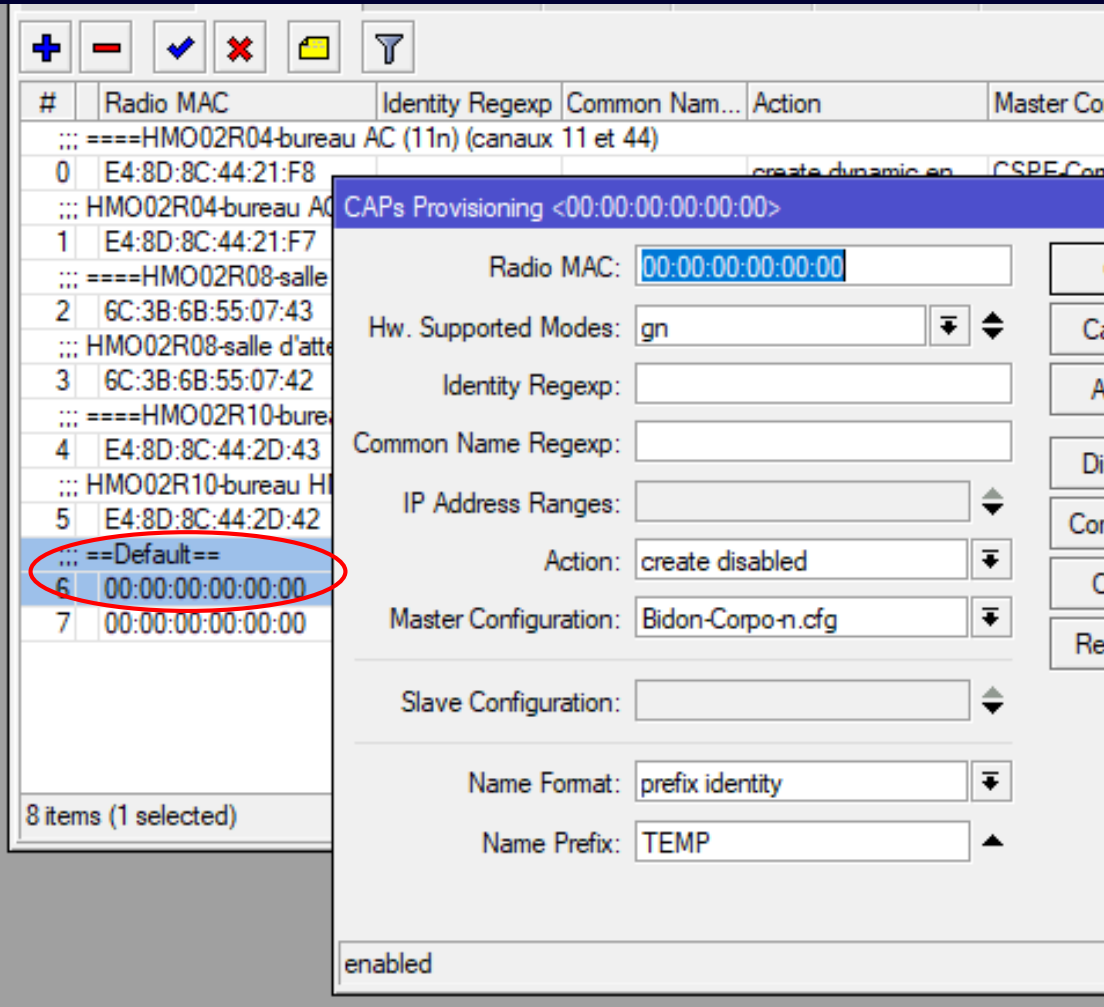
- Rates
- Access-list (optional)
- Security
- Channels
- Configuration
- Provisioning
- Manager

**Suggestion** : Always end this list with provisioning rules that will assign a new CAP a bogus (and non-dangerous) configuration



#	Radio MAC	Identity Regexp	Common Nam...	Action	Master Configuration	Slave Configuration	Name Format
...	CAP1						
0	00:0C:42:E5:03:F3			create dynamic enabled	CSPE-empl-1.cfg		identity
...	CAP2						
1	D4:CA:6D:B4:BF:4F			create dynamic enabled	CSPE-guest-11.cfg		identity
...	CAP3-11n						
2	6C:3B:6B:86:AB:AF			create dynamic enabled	Maison-fam-6.cfg	Maison-guest-6.cfg	identity
...	CAP3-11ac						
3	6C:3B:6B:86:AB:AE			create dynamic enabled	Maison-fam-36.cfg	Maison-guest-36.cfg	identity
...	==Default==						
4	00:00:00:00:00:00			create disabled	Bidon-Corpo-n.cfg		prefix identity
5	00:00:00:00:00:00			create disabled	Bidon-Corpo-ac.cfg		prefix identity

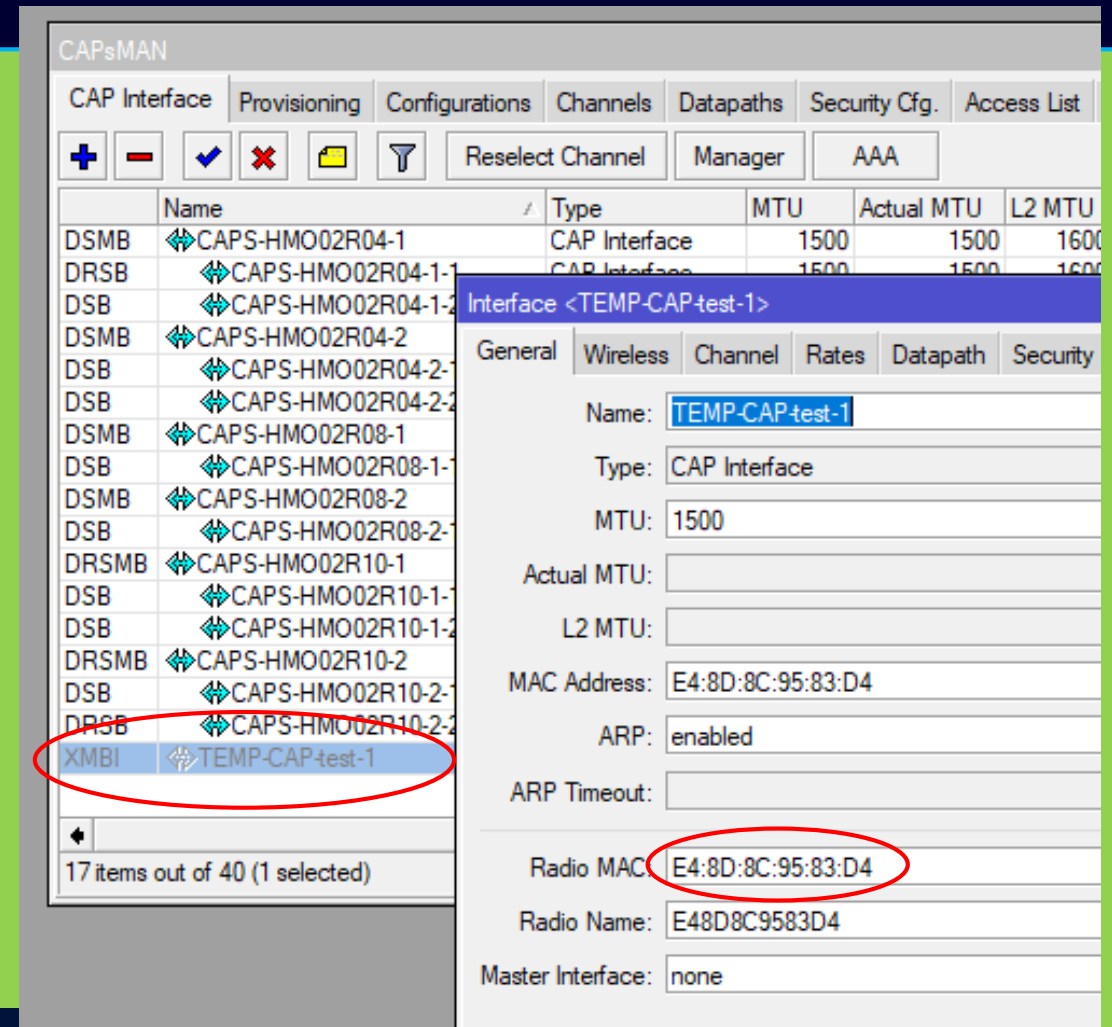
# CAPsMAN (Provisioning)



WinBox CAPsMAN provisioning dialog. The dialog is titled "CAPs Provisioning <00:00:00:00:00:00>". It contains the following fields:

- Radio MAC: 00:00:00:00:00:00
- Hw. Supported Modes: gn
- Identity Regexp: (empty)
- Common Name Regexp: (empty)
- IP Address Ranges: (empty)
- Action: create disabled
- Master Configuration: Bidon-Corpo-n.cfg
- Slave Configuration: (empty)
- Name Format: prefix identity
- Name Prefix: TEMP

The "Radio MAC" field is highlighted with a red circle. The "Action" dropdown is set to "create disabled".



WinBox CAPsMAN interface configuration window. The window shows a list of CAP interfaces and a detailed configuration for "TEMP-CAP-test-1".

Name	Type	MTU	Actual MTU	L2 MTU
DSMB CAPS-HMO02R04-1	CAP Interface	1500	1500	1600
DRSB CAPS-HMO02R04-1-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R04-1-2	CAP Interface	1500	1500	1600
DSMB CAPS-HMO02R04-2	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R04-2-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R04-2-2	CAP Interface	1500	1500	1600
DSMB CAPS-HMO02R08-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R08-1-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R08-1-2	CAP Interface	1500	1500	1600
DSMB CAPS-HMO02R08-2	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R08-2-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R08-2-2	CAP Interface	1500	1500	1600
DRSMB CAPS-HMO02R10-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R10-1-1	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R10-1-2	CAP Interface	1500	1500	1600
DRSMB CAPS-HMO02R10-2	CAP Interface	1500	1500	1600
DSB CAPS-HMO02R10-2-1	CAP Interface	1500	1500	1600
DRSB CAPS-HMO02R10-2-2	CAP Interface	1500	1500	1600
XMBI TEMP-CAP-test-1	CAP Interface	1500	1500	1600

The "TEMP-CAP-test-1" interface configuration is shown in the "General" tab:

- Name: TEMP-CAP-test-1
- Type: CAP Interface
- MTU: 1500
- Actual MTU: (empty)
- L2 MTU: (empty)
- MAC Address: E4:8D:8C:95:83:D4
- ARP: enabled
- ARP Timeout: (empty)
- Radio MAC: E4:8D:8C:95:83:D4
- Radio Name: E48D8C9583D4
- Master Interface: none

The "XMBI TEMP-CAP-test-1" entry in the list and the "Radio MAC" field in the configuration are highlighted with red circles.

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates

Why bogus configurations?

- Access-list (*optional*)

With bogus CAP interfaces, you can do an exit survey if you enable them. With the weird and hard to guess password (*and no bridge attached*), it's not a security issue!

- Security

- Channels

- Configuration

- Provisioning

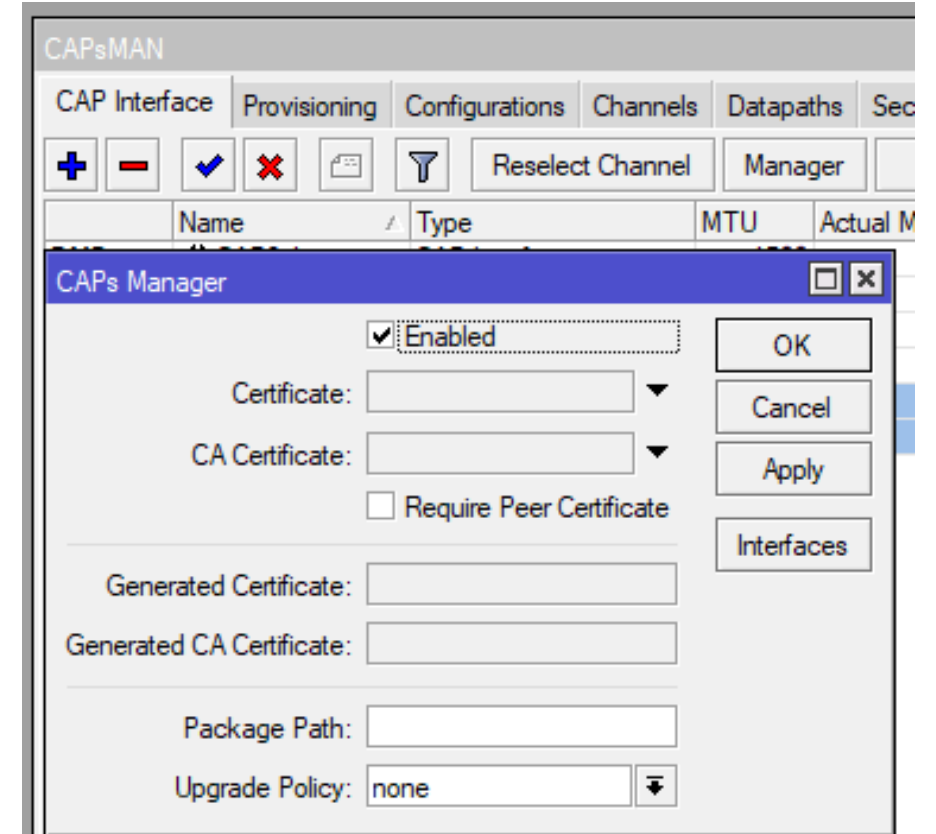
- Manager

# Layer 2, CAPsMAN forwarding

- Configuration steps – CAPsMAN

- Rates
- Access-list (*optional*)
- Security
- Channels
- Configuration
- Provisioning
- Manager

Enable CAPsMAN



# Layer 2, CAPsMAN forwarding

- Configuration steps – **CAP**
  - Give it a name (*system identity*) and **Ptouch it!**
  - CAP setup
    - Enable it
    - Specify the wireless interfaces that will be used on the CAPs
    - Specify discovery interface
  - RoMON (*with password*) would be a good idea in case of problems

# CAP

The screenshot shows the WinBox interface for configuring CAP (Certificate Authentication Protocol) settings. The main window is titled "Wireless Tables" and has several tabs: "WiFi Interfaces", "W60G Station", "Nstreme Dual", "Access List", "Registration", and "Conn". The "CAP" tab is selected, and a "CAP" configuration dialog box is open. The dialog box has a red circle around the "Enabled" checkbox, which is checked. Below this, the "Interfaces" field is set to "wlan1", the "Certificate" field is set to "none", and the "Discovery Interfaces" field is set to "ether1". There are also fields for "Lock To CAPsMAN", "CAPsMAN Addresses", "CAPsMAN Names", "CAPsMAN Certificate Common Names", "Bridge" (set to "none"), "Static Virtual", "Requested Certificate", and "Locked CAPsMAN Common Name".

alain@00:0C:42:E5:03:EE (CAP1) via 10.10.1.2 - WinBox v6.44.3 on RB751U-2HnD (mipsbe)

Session Settings Dashboard

Safe Mode Session: 00:0C:42:E5:03:EE

Wireless Tables

WiFi Interfaces W60G Station Nstreme Dual Access List Registration Conn

+ - ✓ ✗ [icon] [icon] CAP WPS Client Setup Repeat

CAP

Enabled

Interfaces: wlan1

Certificate: none

Discovery Interfaces: ether1

Lock To CAPsMAN

CAPsMAN Addresses: [text box]

CAPsMAN Names: [text box]

CAPsMAN Certificate Common Names: [text box]

Bridge: none

Static Virtual

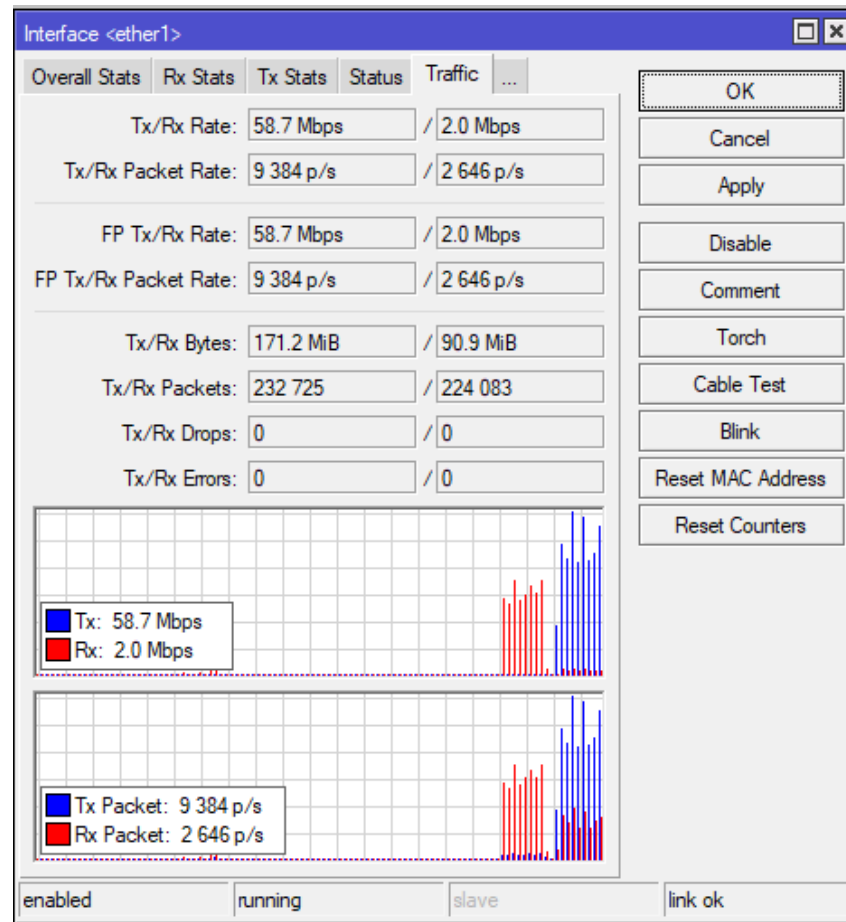
Requested Certificate: [text box]

Locked CAPsMAN Common Name: [text box]

OK Cancel Apply

# Layer 2, CAPsMAN forwarding

## Speedtest CAP interfaces



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Second scenario

# **LAYER 3, CAPSMAN FORWARDING (REMOTE CAP)**

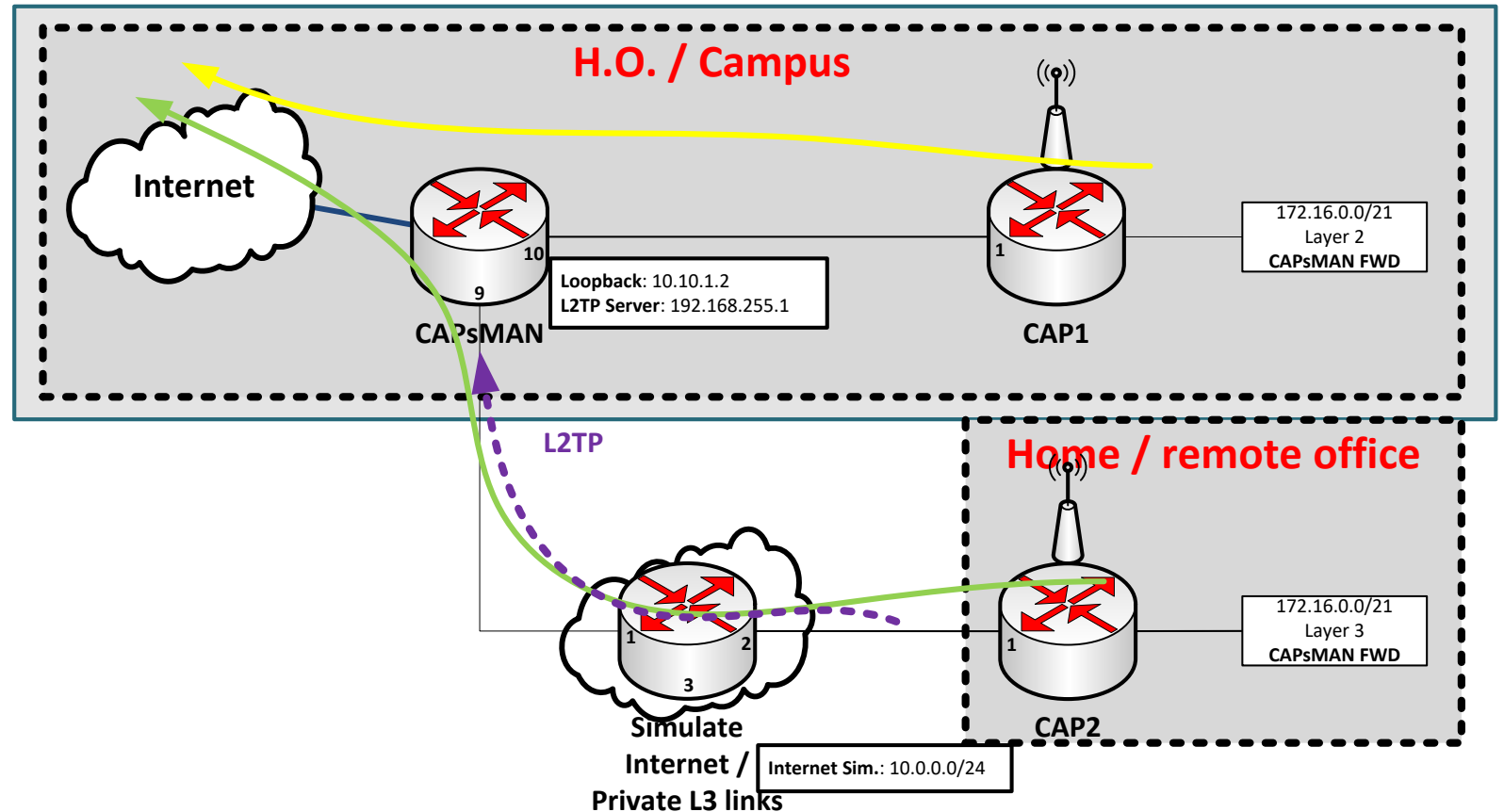


# Layer 3, CAPsMAN forwarding (remote CAP)

- Same setup, minor differences
- Remote CAPs use **an IP address instead of multicast traffic to reach CAPsMAN**
- Home workers and remote office workers use the same parameters for their wireless devices for true mobility
- Same corporate network access rules are applied to all as if they were located in the H.O.

# Layer 3, CAPsMAN forwarding (remote CAP)

- CAP is on different subnet



# Layer 3, CAPsMAN forwarding (remote CAP)

- CAPsMAN
  - Provisioning rule for the remote CAP, **THAT'S IT!**

# Layer 3, CAPsMAN forwarding (remote CAP)

- Configuration steps – CAP
  - Give it a name (*system identity*) and **Ptouch it!**
  - CAP
    - Enable CAP
    - Specify the wireless interfaces that will be CAPs
    - Specify **CAPsMAN IP address instead of discovery interface**
  - RoMON (*with password*) would be a good idea in case of problems
  - DHCP-client on an Ethernet interface
    - With default route
  - Create L2TP tunnel to H.O.

# CAP

The screenshot shows the Mikrotik WinBox interface for configuring CAP (Certificate Authentication Protocol). The main window is titled "alain@D4:CA:6D:B4:BF:4A (CAP2) via 10.10.1.2 - WinBox v6.44.3 on RB951-2n (mipsbe)". The session is identified as "D4:CA:6D:B4:BF:4A".

The CAP configuration window is open, showing the following settings:

- Enabled
- Interfaces: wlan1
- Certificate: none
- Discovery Interfaces: (empty)
- Lock To CAPsMAN
- CAPsMAN Addresses: 192.168.255.1
- CAPsMAN Names: (empty)
- CAPsMAN Certificate Common Names: (empty)
- Bridge: none
- Static Virtual
- Requested Certificate: (empty)
- Locked CAPsMAN Common Name: (empty)

The Address List window is also open, showing two entries:

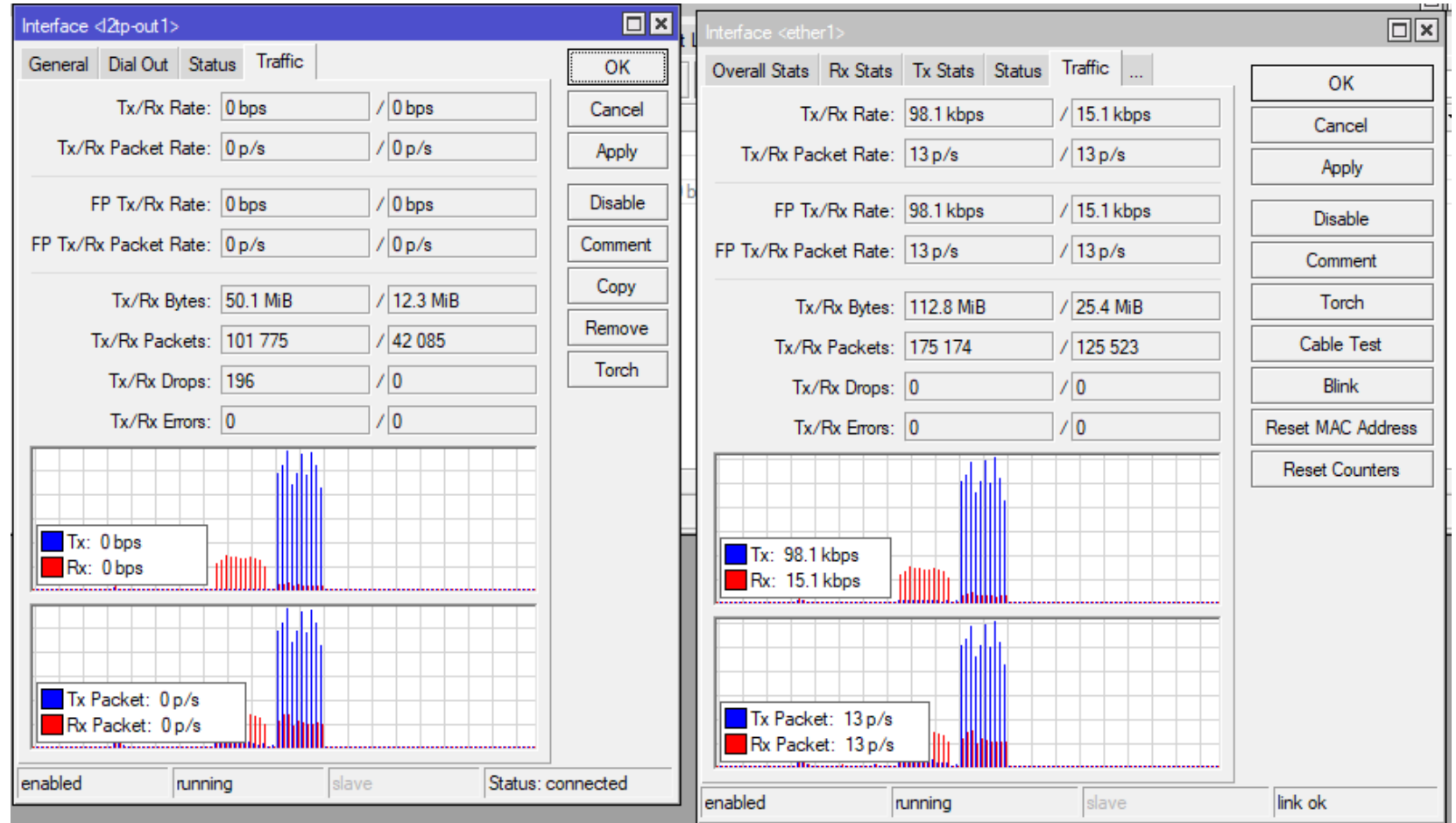
	Address	Network	Interface
D	10.0.0.254/24	10.0.0.0	ether1
D	192.168.255.254	192.168.255.1	l2tp-out1

The L2TP Secrets window is also open, showing one entry:

Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Pack
R	l2tp-out1	L2TP Client	1450		0 bps	0 bps	0

# Layer 3, CAPsMAN forwarding (remote CAP)

## Speedtest CAP interfaces



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Third scenario

# **LAYER 3, LOCAL FORWARDING (REMOTE CAP)**

# Layer 3, Local forwarding (remote CAP)

- More elaborate setup
- Remote CAPs use **an IP address to reach CAPsMAN**

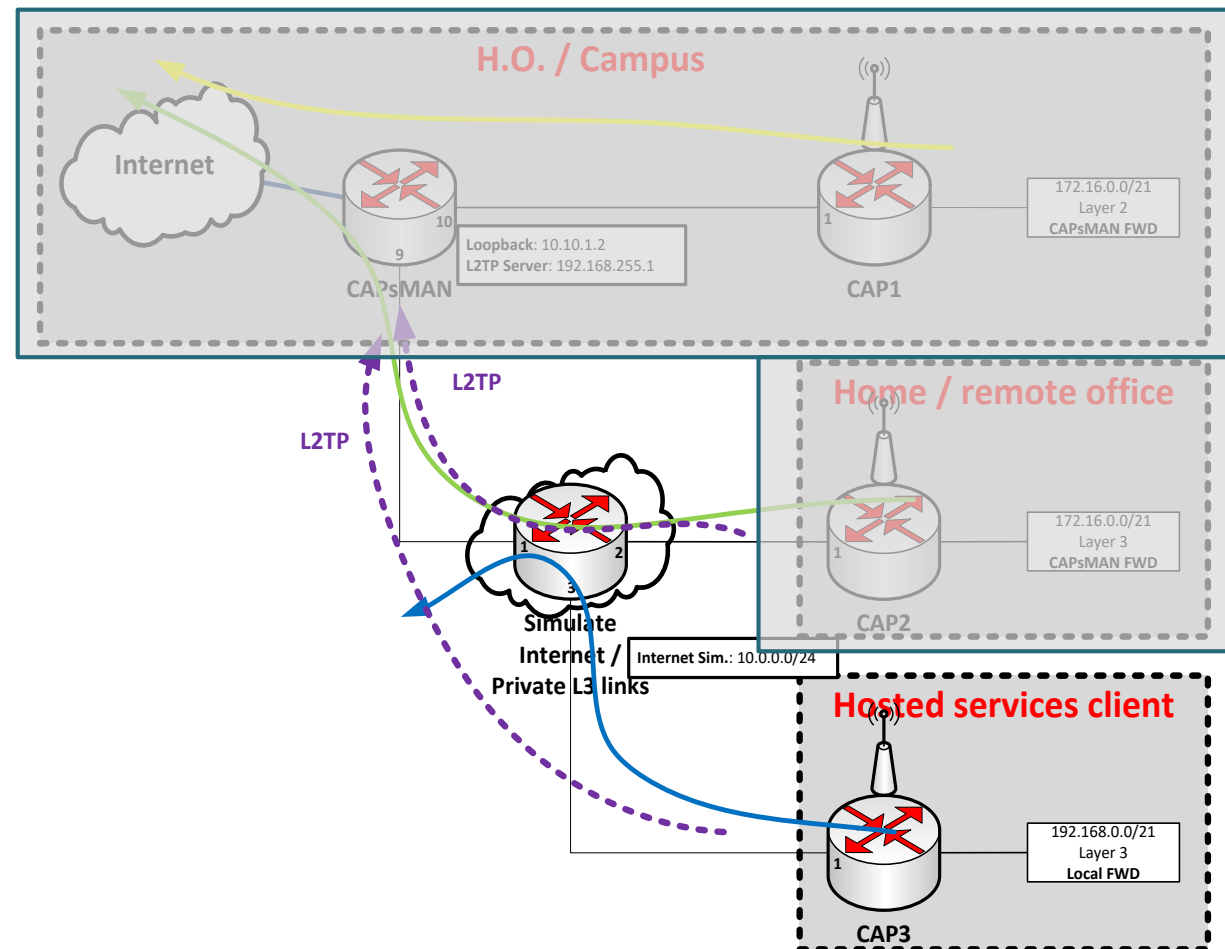


# Layer 3, Local forwarding (remote CAP)

- Good setup for managed services but :
  - Wireless parameters must vary per client (*SSID & Security*)
- Client traffic is left on the **LOCAL** network
  - CAPsMAN **never** sees client traffic

# Layer 3, Local forwarding (remote CAP)

- CAP is on different subnet



# Layer 3, Local forwarding (remote CAP)

- **Keep in mind** that this router is your client's home router, not just a CAP
- Configuration steps – CAP
  - Full layer 3 configuration, including :
    - All bridges and VLANs (*I use software VLANs*)
    - IP addresses (bridges & WAN port)
    - A default gateway for Internet access
    - Firewall filters

# Layer 3, Local forwarding (remote CAP)

- CAPsMAN
  - “Configuration” rules and one “Security” profile for each client
    - Config rules : Channels (*up to 3 x 802.11n, 4 x 802.11ac*) + SSID
    - Copy and modify existing ones
  - One “Provisioning” rule per client CAP
  - **THAT’S IT!**

# CAPsMAN (Configuration)

Name	SSID	Country	Instal...	Channel	Frequency	Secondary Freque...	Band	Tx Power	Rate	Datapath	Bridge	VLAN Mo...	VLAN ID	Security
::: =====Local CSPE (EMPLOYE)=====														
CSPE-empl-1.cfg	CSPE	united states3		channel-1					Rates-CSPE		BR-VLAN102			CSPE-Home
CSPE-empl-6.cfg	CSPE	united states3		channel-6					Rates-CSPE		BR-VLAN102			CSPE-Home
CSPE-empl-11.cfg	CSPE	united states3		channel-11					Rates-CSPE		BR-VLAN102			CSPE-Home
CSPE-empl-36.cfg	CSPE	united states3		channel-36					Rates-CSPE		BR-VLAN102			CSPE-Home
CSPE-empl-40.cfg	CSPE	united states3		channel-40					Rates-CSPE		BR-VLAN102			CSPE-Home
CSPE-empl-44.cfg	CSPE	united states3		channel-44					Rates-CSPE		BR-VLAN102			CSPE-Home
CSPE-empl-149.cfg	CSPE	united states3		channel-149					Rates-CSPE		BR-VLAN102			CSPE-Home
::: =====Local CSPE (GUEST)=====														
CSPE-guest-1.cfg	CSPE-guest	united states3		channel-1					Rates-CSPE		BR-VLAN107			CSPE-Guest
CSPE-guest-6.cfg	CSPE-guest	united states3		channel-6					Rates-CSPE		BR-VLAN107			CSPE-Guest
CSPE-guest-11.cfg	CSPE-guest	united states3		channel-11					Rates-CSPE		BR-VLAN107			CSPE-Guest
::: =====Remote HOME (Family)=====														
Maison-fam-1.cfg	DSWLANr	united states3		channel-1					Rates-CSPE			use tag	102	CSPE-Home
Maison-fam-6.cfg	DSWLANr	united states3		channel-6					Rates-CSPE			use tag	102	CSPE-Home
Maison-fam-11.cfg	DSWLANr	united states3		channel-11					Rates-CSPE			use tag	102	CSPE-Home
Maison-fam-36.cfg	DSWLANr	united states3		channel-36					Rates-CSPE			use tag	102	CSPE-Home
Maison-fam-40.cfg	DSWLANr	united states3		channel-40					Rates-CSPE			use tag	102	CSPE-Home
Maison-fam-44.cfg	DSWLANr	united states3		channel-44					Rates-CSPE			use tag	102	CSPE-Home
Maison-fam-149.cfg	DSWLANr	united states3		channel-149					Rates-CSPE			use tag	102	CSPE-Home
::: =====Remote HOME (guest)=====														
Maison-guest-1.cfg	gustr	united states3		channel-1					Rates-CSPE			use tag	107	CSPE-Guest
Maison-guest-6.cfg	gustr	united states3		channel-6					Rates-CSPE			use tag	107	CSPE-Guest
Maison-guest-11.cfg	gustr	united states3		channel-11					Rates-CSPE			use tag	107	CSPE-Guest
Maison-guest-36.cfg	gustr	united states3		channel-36					Rates-CSPE			use tag	107	CSPE-Guest
Maison-guest-40.cfg	gustr	united states3		channel-40					Rates-CSPE			use tag	107	CSPE-Guest
Maison-guest-44.cfg	gustr	united states3		channel-44					Rates-CSPE			use tag	107	CSPE-Guest
Maison-guest-149.cfg	gustr	united states3		channel-149					Rates-CSPE			use tag	107	CSPE-Guest

CAPs Configuration <Maison-fam-1.cfg>

Wireless Channel Rates Datapath Security

Datapath:

MTU:

L2 MTU:

ARP:

Bridge:

Bridge Cost:

Bridge Horizon:

Local Forwarding:

Client To Client Forwarding:

VLAN Mode:

VLAN ID:

Interface List:

# Layer 3, Local forwarding (remote CAP)

- Configuration steps – CAP
  - Enable it
  - Specify the wireless interfaces that will be CAPs
  - Specify **CAPsMAN IP address instead of discovery interface**
  - Specify the bridge into which CAP interfaces will be assigned

# CAP (Local forwarding)

The screenshot displays the WinBox configuration interface for CAP (Local forwarding). The main configuration window is titled "CAP" and includes the following settings:

- Enabled
- Interfaces: wlan1, wlan2
- Certificate: none
- Discovery Interfaces: (empty)
- Lock To CAPsMAN
- CAPsMAN Addresses: 192.168.255.1
- CAPsMAN Names: (empty)
- CAPsMAN Certificate Common Names: (empty)
- Bridge: BR-TRUNK (circled in red)
- Static Virtual
- Requested Certificate: (empty)
- Locked CAPsMAN Common Name: (empty)

An "Address List" window is open, showing a list of IP addresses and their corresponding interfaces:

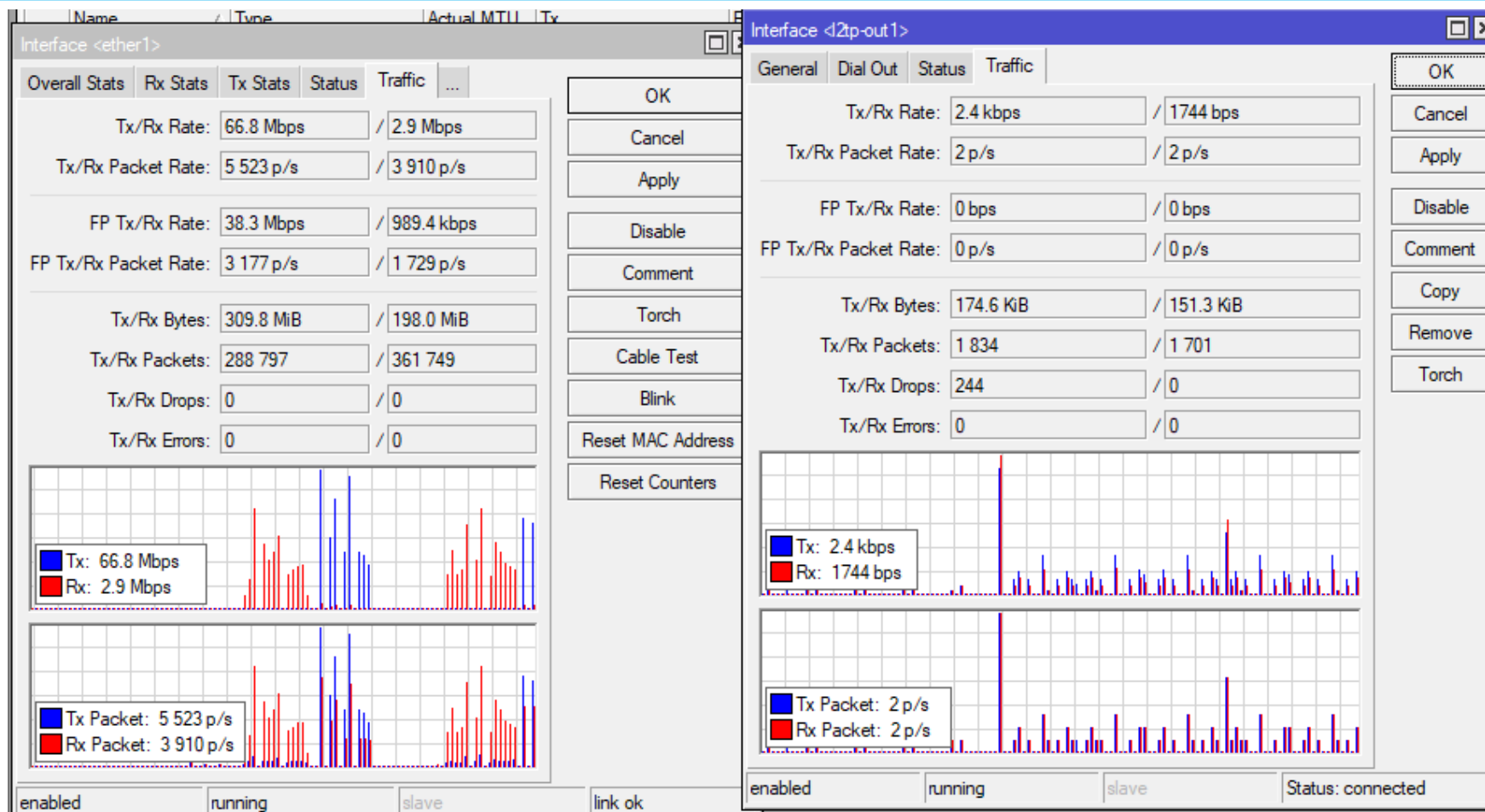
Address	Network	Interface
10.0.0.253/24	10.0.0.0	ether1
192.168.0.1/24	192.168.0.0	BR-VLAN100
192.168.1.1/24	192.168.1.0	BR-VLAN101
192.168.2.1/24	192.168.2.0	BR-VLAN102
192.168.3.1/24	192.168.3.0	BR-VLAN103
192.168.4.1/24	192.168.4.0	BR-VLAN104
192.168.5.1/24	192.168.5.0	BR-VLAN105
192.168.6.1/24	192.168.6.0	BR-VLAN106
192.168.7.1/24	192.168.7.0	BR-VLAN107
192.168.255.255	192.168.255.1	l2tp-out1

A "Bridge" window is also open, showing a table of bridge configurations:

#	Interface	Bridge	Horizon	Trusted	Priorit...	Path Cost	Role	Root Pat...
0	vlan100	BR-VLAN100		no	80	10	designated port	
1	vlan101	BR-VLAN101		no	80	10	designated port	
2	vlan102	BR-VLAN102		no	80	10	designated port	
3	vlan103	BR-VLAN103		no	80	10	designated port	
4	vlan104	BR-VLAN104		no	80	10	designated port	
5	vlan105	BR-VLAN105		no	80	10	designated port	
6	vlan106	BR-VLAN106		no	80	10	designated port	
7	vlan107	BR-VLAN107		no	80	10	designated port	
8 D	wlan1	BR-TRUNK		no	80	10	designated port	
9 D	wlan11	BR-TRUNK		no	80	10	designated port	
10 D	wlan2	BR-TRUNK		no	80	10	designated port	
11 D	wlan12	BR-TRUNK		no	80	10	designated port	

# Layer 3, Local forwarding (remote CAP)

## Speedtest CAP interfaces





# Conclusion

CAPsMAN offers all the options to address most if not all of our needs

# Remember me for your training needs



OK, maybe not for him.  
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<http://alaincasault.com>  
[casault.alain@educationhmo.com](mailto:casault.alain@educationhmo.com)

# Thank you!

## Questions, eh?



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professionnels  
en éducation

# END OF THE “CAPSMAN” PRESENTATION

