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

Georgios Argyrides

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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


CAPsMAN

• Controlled Access Point system Manager

CAP

• Controlled Access Point

➢ 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

Georgios Argyrides - george@argyrides.gr
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 itself (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
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

Image of CAPsMAN interface showing configurations for wireless and datapath settings.
CAPsMAN VirtualAP Setup

- **Provisioning**
  - **Radio MAC:** 00:00:00:00:00:00
  - **Action:** create dynamic enabled
  - **Master Configuration:** OfficeNet
  - **Save Configuration:** GuestNet

- **Interfaces**
  - **Name:** OfficeAP
  - **Type:** Interfaces
  - **MTU:** 1500

- **Provision**
  - **Radio MAC:**
    - Room4: OfficeAP1
    - Room3: OfficeAP2
    - Room2: OfficeAP3
    - Room1: OfficeAP4
    - Room5: Room5AP
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

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

✓ Today 17\textsuperscript{th} 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)

- It's 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!
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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?
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➢ Available in English and Greek languages

Just Contact me 😊

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