Unlocking Digital Business: Manage and Monetizing Your MikroTik cAP

19 October 2019, Shenzhen
MikroTik User Meeting China 2019
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Presentation Agenda

- The Opportunity that be the Presentation Background
- Why MikroTik?
- Introduction to CAPsMAN a.k.a. cAP's Manager
  - Why CAPsMAN?
  - CAPsMAN Feature
  - CAPsMAN Basic Setup
  - CAPsMAN Result
- Monetizing!
- Study Case

Presentation Background

- Indonesia with 264 Million citizen, around 64.8% of it was using the Internet or we can say 171 Million in Number are Internet users
  Source: https://www.thejakartapost.com/life/2019/05/18/indonesia-has-171-million-internet-users-study.html
- With 171 Million Internet users, they can give us more opportunity in Business
- Imagine if we can do the same thing in China with the Biggest Population in the World
- Or from China **expand** the Business to Indonesia ☺

Why MikroTik?

- MikroTik Everywhere, Easy to Buy

https://mikrotik.com/buy/asia

- Rich of Feature

https://wiki.mikrotik.com/wiki/Manual:RouterOS_features

- And the PRICE! is really Affordable

https://mikrotik.com/products

Starting from $19.95 (hAP-mini Price in October, 2019 from mikrotik.com)

And You Can Run All of MikroTik RouterOS Feature!

Introduction to CAPsMAN

- **Controlled Access Point system Manager (CAPsMAN)** allows **centralization** of wireless network **management** and if necessary, data processing. When using the CAPsMAN feature, the network will consist of a number of '**Controlled** Access Points' (CAP) that provide wireless connectivity and a 'system Manager' (CAPsMAN) that manages the configuration of the APs, it also takes care of client authentication and optionally, data forwarding.
- When a **CAP** is **controlled** by CAPsMAN it only requires the **minimum configuration** required to allow it to establish connection with CAPsMAN. Functions that were conventionally executed by an AP (like access control, client authentication) are now executed by CAPsMAN. The CAP device now only has to provide the wireless link layer encryption/decryption.

Introduction to CAPsMAN

CAPsMAN = Controlled Access Point system Manager!

Why CAPsMAN?

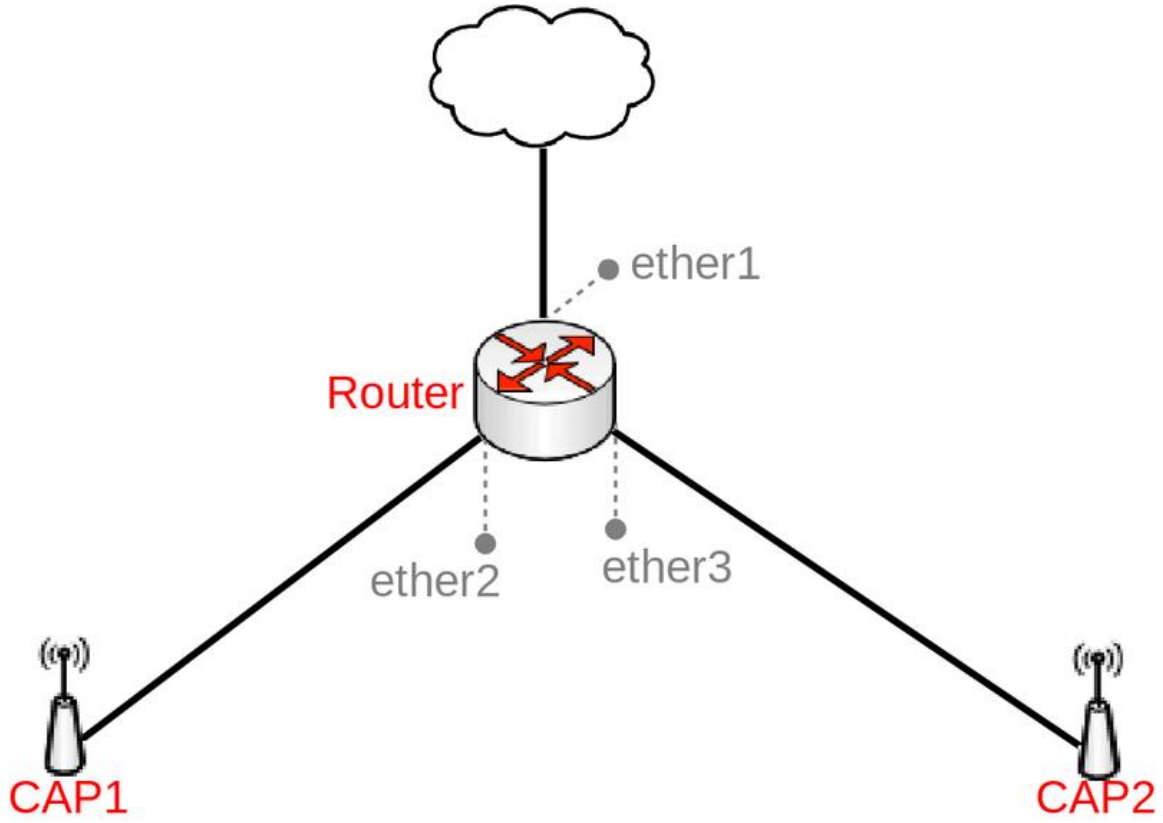
- Data Processing (if necessary), usually used for Centralized DHCP and Hotspot
- Can Controlling All Type of MikroTik with at Least 1 Wireless Interfaces
- Auto Discovery (Layer 2 MAC Connection)
- No Additional Hardware Required
- Centralized Management
- Can Be Placed Anywhere
- Built-in with RouterOS
- No Additional License
- No Additional Cost

CAPsMAN Feature

- VLAN
- Bridging
- Roaming
- Access List
- Data Processing
- Auto Provisioning
- Load Balancing AP
- Security Properties
- Channel Properties

CAPsMAN Basic Setup

- In this setup, i have a simple topology that I took from https://wiki.mikrotik.com/wiki/File:Simple_capsman_topology.png



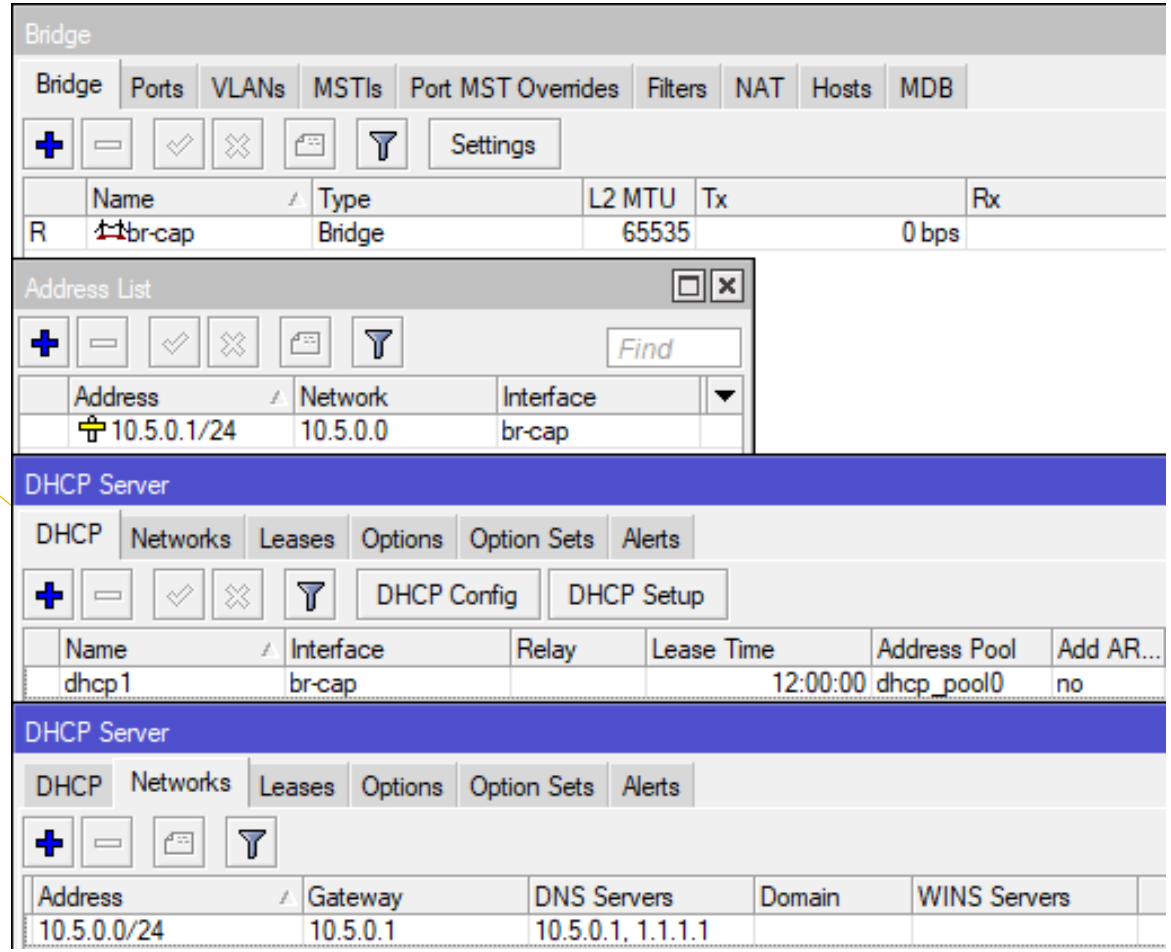
CAPsMAN Basic Setup (CAPsMAN)

- In first step, we need to configure the IP Address and DHCP Server for our users

```
/interface bridge add name=br-cap
/ip address add address=10.5.0.1/24 interface=br-cap
/ip pool add name=dhcp_pool0 ranges=10.5.0.2-10.5.0.254
/ip dhcp-server add address-pool=dhcp_pool0 disabled=no
interface=br-cap lease-time=12h name=dhcp1
/ip dhcp-server network add address=10.5.0.0/24
dns-server=10.5.0.1,1.1.1.1 gateway=10.5.0.1
```

- There is no any special configuration here, we set the IP Address on bridge because when a cAP join to CAPsMAN, there will be a new interfaces and we will set that new interfaces to join in one bridge interfaces

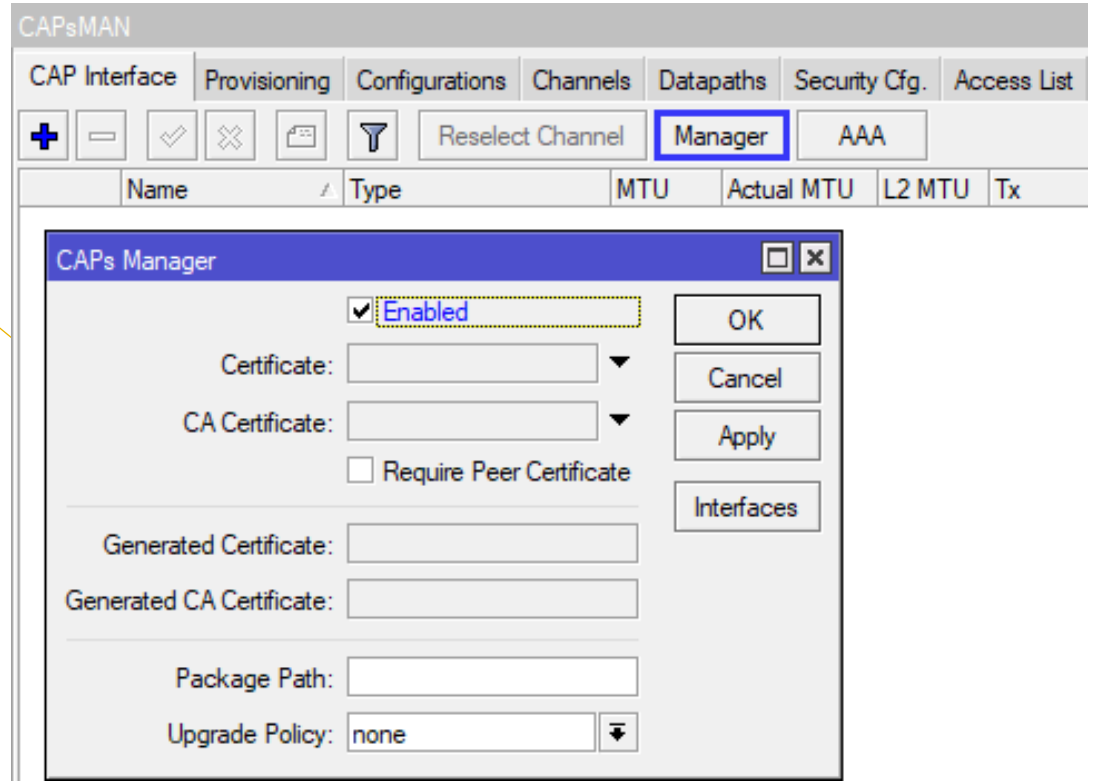
CAPsMAN Basic Setup (CAPsMAN)



CAPsMAN Basic Setup (CAPsMAN)

```
/caps-man manager set enabled=yes
```

- enabled : Disable or Enable CAPsMAN Feature

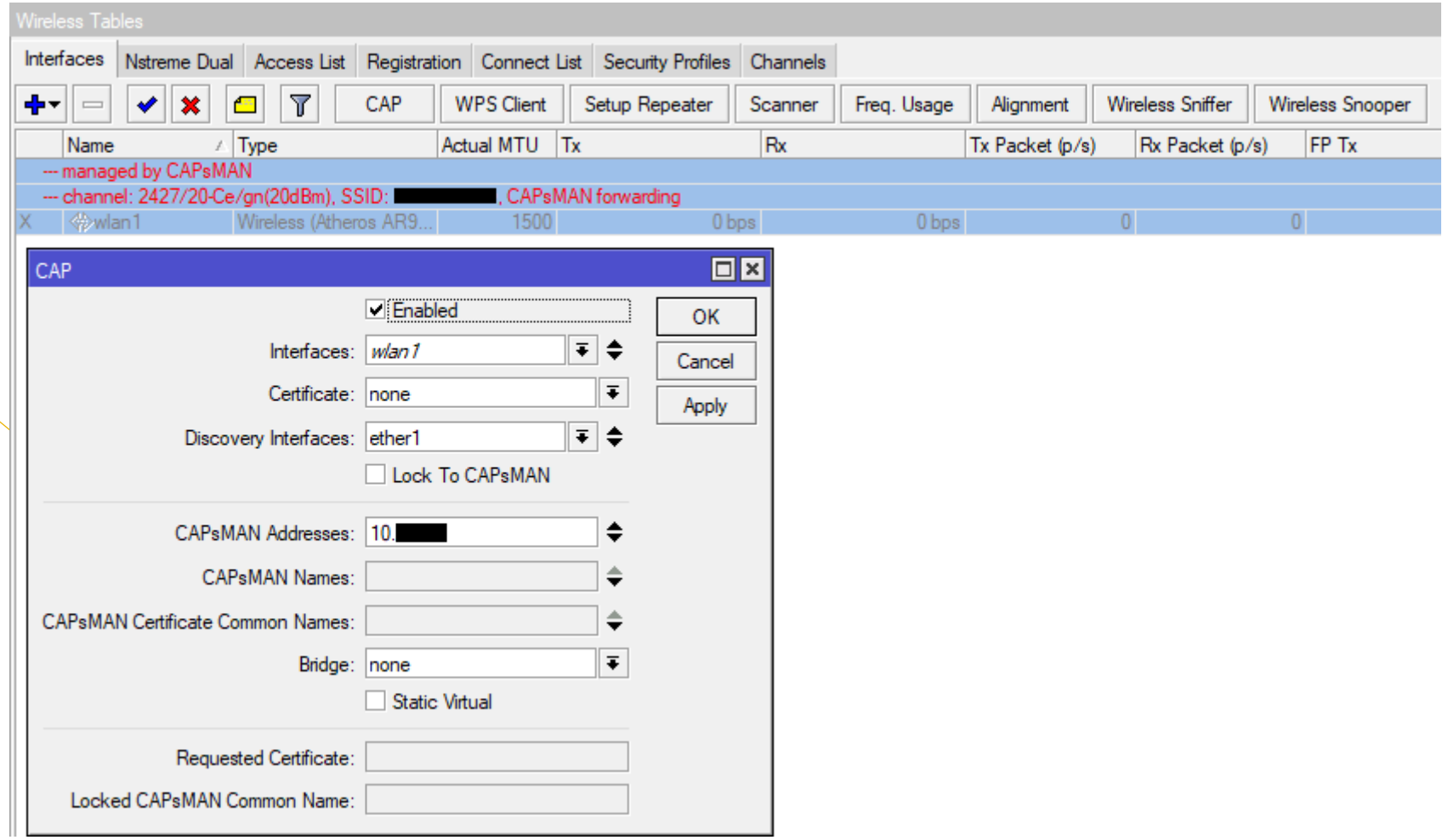


CAPsMAN Basic Setup (cAP)

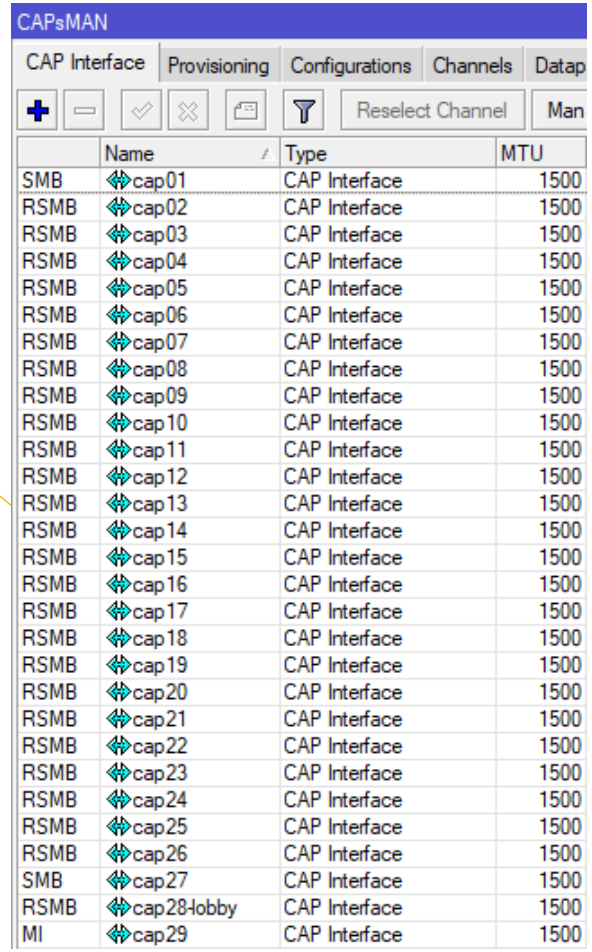
```
/interface wireless cap set caps-man-addresses="x.x.x.x"
discovery-interfaces=ether1 enabled=yes interfaces=wlan1
```

- caps-man-address : The IP Address of Your CAPsMAN
- discovery-interfaces : You can discovery your CAPsMAN automatically with Layer2 connectivity
- enabled : Disable or Enable CAP Feature
- interfaces : List of Wireless Interfaces to be Controlled by CAPsMAN

CAPsMAN Basic Setup (cAP)



CAPsMAN Basic Setup (CAPsMAN)



- When your cAP was set, they will appear to CAPsMAN Interfaces
- You can configure them directly from your CAPsMAN manually or;
- You can automatically deploy the configuration using Provisioning feature

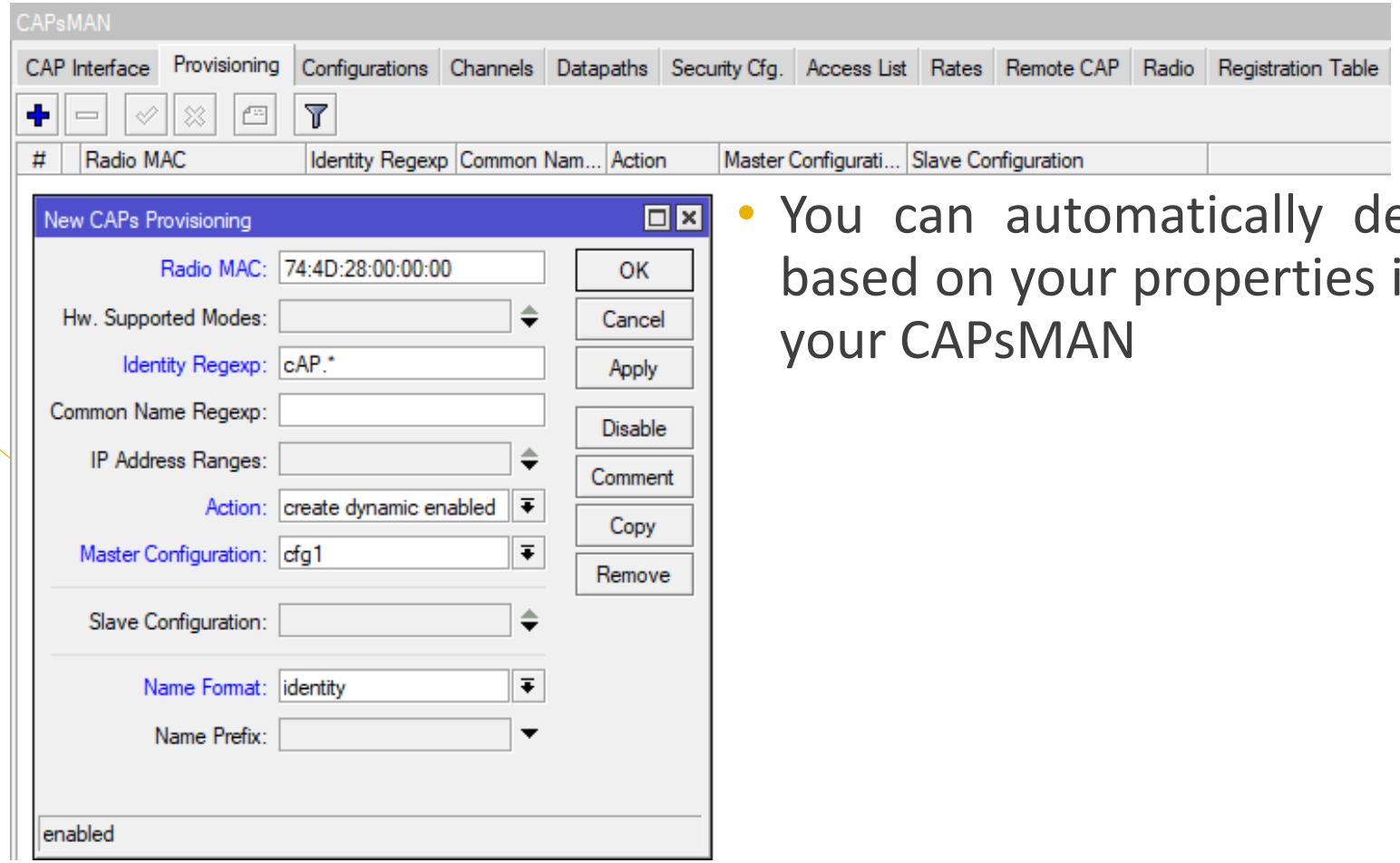
CAPsMAN Manual Config

```
/caps-man configuration add channel.band=2ghz-b/g/n
channel.control-channel-width=20mhz channel.frequency=2427
country=indonesia datapath.bridge=br-cap mode=ap name=cfg1
ssid="Your SSID Name"
```

- channel.band : Channel band for your cAP
- channel.frequency : Channel frequency for your cAP
- country : Country regulations
- datapath.bridge : Bridge to which particular interface should be automatically added as port
- mode : Set operational mode. Only ap currently supported.
- name : Descriptive name for the Configuration Profile
- ssid : Your cAP SSID Name

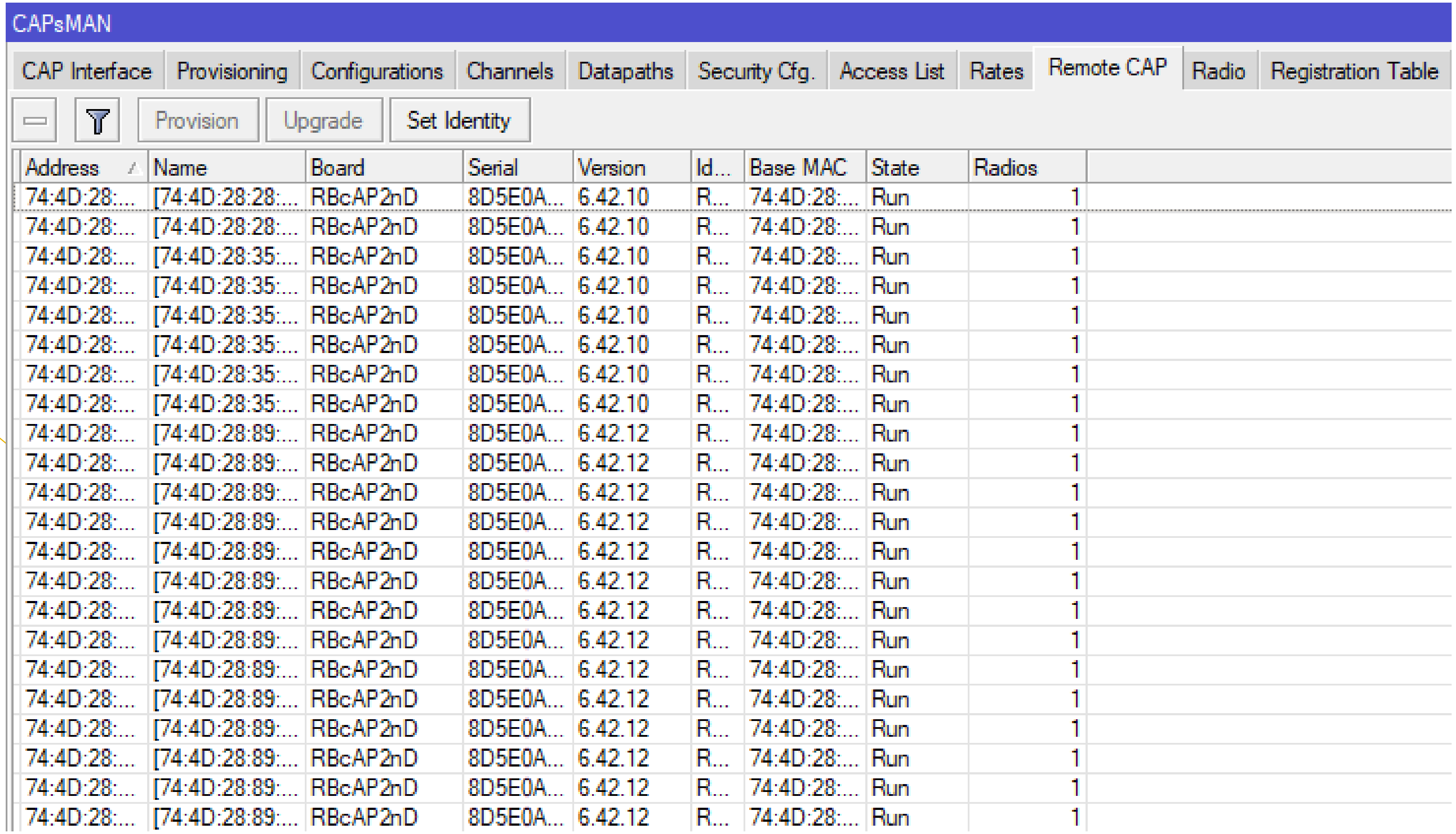
```
/caps-man interface set configuration=cfg1 [find]
```

CAPsMAN Auto Provisioning



- You can automatically deploy your config to cAP based on your properties in Provisioning menu from your CAPsMAN

CAPsMAN Result (Remote cAP)



Address	Name	Board	Serial	Version	Id...	Base MAC	State	Radios
74:4D:28:...	[74:4D:28:28:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:28:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:35:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:35:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:35:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:35:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:35:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:35:...	RBcAP2nD	8D5E0A...	6.42.10	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1
74:4D:28:...	[74:4D:28:89:...	RBcAP2nD	8D5E0A...	6.42.12	R...	74:4D:28:...	Run	1

CAPsMAN Result (Users)

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 Signal	Rx Signal	Uptime	Tx/Rx Packets	Tx/Rx Bytes
cap02	[redacted]	C0:87:EB:[redacted]		72.2Mbps-20MHz/1S/SGI	135Mbps-40MHz/1S	0	-54	01:44:42.37	1 178/1 835	129.0 KiB/282.7 KiB
cap02		C0:87:EB:[redacted]		72.2Mbps-20MHz/1S/SGI	43.3Mbps-20MHz/1S/SGI	0	-69	03:44:12.26	310 561/81 563	405.7 MiB/10.2 MiB
cap02		48:A0:F8:[redacted]		120Mbps-40MHz/1S/SGI	81Mbps-40MHz/1S	0	-56	15:02:49.78	83 432/84 489	7.3 MiB/7.3 MiB
cap03		88:E8:7F:[redacted]		13Mbps-20MHz/1S	1Mbps	0	-91	01:13:26.94	3 062/4 502	243.7 KiB/598.8 KiB
cap03		48:A0:F8:[redacted]		108Mbps-40MHz/1S	108Mbps-40MHz/1S	0	-55	06:26:08.75	1 712 217/956 280	2379.0 MiB/64.1 MiB
cap04		74:12:BB:[redacted]		19.5Mbps-20MHz/1S	81Mbps-40MHz/1S	0	-54	01:28:12.48	454 658/244 427	650.8 MiB/16.6 MiB
cap04		0C:98:38:[redacted]		39Mbps-20MHz/1S	1Mbps	0	-75	06:17:56.34	209/231	17.8 KiB/25.6 KiB
cap05		74:12:BB:[redacted]		60Mbps-40MHz/1S/SGI	121.5Mbps-40MHz/1S	0	-54	23:47:05.94	12 371 029/6 140 325	16.9 GiB/439.7 MiB
cap06		88:5A:06:[redacted]		65Mbps-20MHz/1S	52Mbps-20MHz/1S	0	-46	06:03:15.15	108 150/18 954	129.9 MiB/3054.2 KiB
cap06		74:12:BB:[redacted]		30Mbps-40MHz/1S/SGI	1Mbps	0	-62	17:43:49.48	2 955 685/1 758 127	4120.0 MiB/150.2 MiB
cap07		F0:18:98:[redacted]		117Mbps-20MHz/2S	52Mbps-20MHz/2S	0	-62	07:37:44.30	87 292/82 251	67.7 MiB/16.3 MiB
cap07		84:20:96:[redacted]		120Mbps-40MHz/1S/SGI	40.5Mbps-40MHz/1S	0	-62	20:31:58.02	302 272/247 460	68.7 MiB/58.2 MiB
cap07		74:12:BB:[redacted]		40.5Mbps-40MHz/1S	81Mbps-40MHz/1S	0	-58	08:10:17.37	4 604/5 183	2473.2 KiB/746.7 KiB
cap08		F0:79:E8:[redacted]		28.8Mbps-20MHz/1S/SGI	11Mbps	0	-63	02:06:37.36	348 567/153 642	439.0 MiB/25.3 MiB
cap08		74:12:BB:[redacted]		54Mbps-40MHz/1S	81Mbps-40MHz/1S	0	-64	01:22:55.70	2 112/2 176	283.6 KiB/242.2 KiB
cap08		00:2F:D9:[redacted]		150Mbps-40MHz/1S/SGI	13.5Mbps-40MHz/1S	0	-62	00:19:02.25	1 924/2 029	1343.3 KiB/333.5 KiB
cap08		00:2F:D9:[redacted]		120Mbps-40MHz/1S/SGI	13.5Mbps-40MHz/1S	0	-67	06:52:36.98	803 140/378 734	1153.5 MiB/25.2 MiB
cap09		CC:79:CF:[redacted]		60Mbps-40MHz/1S/SGI	1Mbps	0	-60	04:52:30.29	49 782/116 200	8.9 MiB/45.8 MiB
cap09		9C:4F:DA:[redacted]		11Mbps	13Mbps-20MHz/1S	0	-66	00:02:42.87	125/178	40.0 KiB/28.0 KiB
cap09		70:EC:E4:[redacted]		43.3Mbps-20MHz/1S/SGI	6.5Mbps-20MHz/1S	0	-74	01:36:59.33	66 637/38 380	88.6 MiB/3790.7 KiB
cap09		48:A0:F8:[redacted]		54Mbps-40MHz/1S	13.5Mbps-40MHz/1S	0	-60	06:35:10.81	26 732/26 388	30.2 MiB/2622.2 KiB
cap09		48:A0:F8:[redacted]		54Mbps-40MHz/1S	54Mbps-40MHz/1S	0	-60	08:24:21	1 612 536/713 569	2315.6 MiB/42.4 MiB
cap09		38:A2:8C:[redacted]		108Mbps-40MHz/1S	27Mbps-40MHz/1S	0	-55	20:01:32.27	3 636/3 147	748.9 KiB/529.2 KiB
cap10		88:5A:06:[redacted]		72.2Mbps-20MHz/1S/SGI	1Mbps	0	-57	02:02:18.76	102 896/60 402	137.5 MiB/5.4 MiB
cap10		0C:98:38:[redacted]		65Mbps-20MHz/1S/SGI	2Mbps	0	-67	01:52:23.98	2 614/2 715	230.1 KiB/317.7 KiB
cap10		0C:98:38:[redacted]		58.5Mbps-20MHz/1S	9Mbps	0	-71	01:52:23.64	23 722/18 540	25.2 MiB/3021.9 KiB
cap10		00:2F:D9:[redacted]		121.5Mbps-40MHz/1S	1Mbps	0	-64	07:05:28.58	3 564/4 020	1975.1 KiB/522.3 KiB
cap10		00:08:22:[redacted]		72.2Mbps-20MHz/1S/SGI	1Mbps	0	-58	02:10:33.97	5 105/4 017	2971.8 KiB/618.4 KiB

Monetizing!

- After you can manage your cAP easier..
- Now the Questions is, how we can monetize our Wi-Fi?
  - You can place an ads in your Wi-Fi
  - You can create some survey in your Wi-Fi
    - From survey, you can gain some data that can be used for targeted ads
- Another Questions, how we can do that?

MikroTik Hotspot!

- And design your **business** model ☺

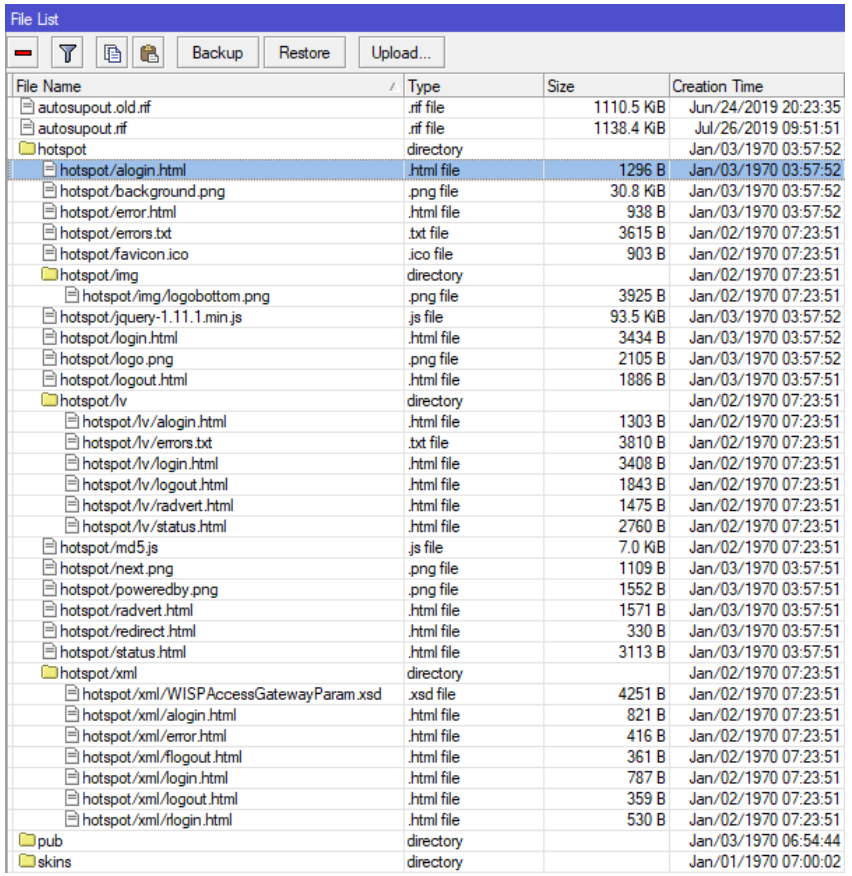
Simple Hotspot Setup

1. Setup

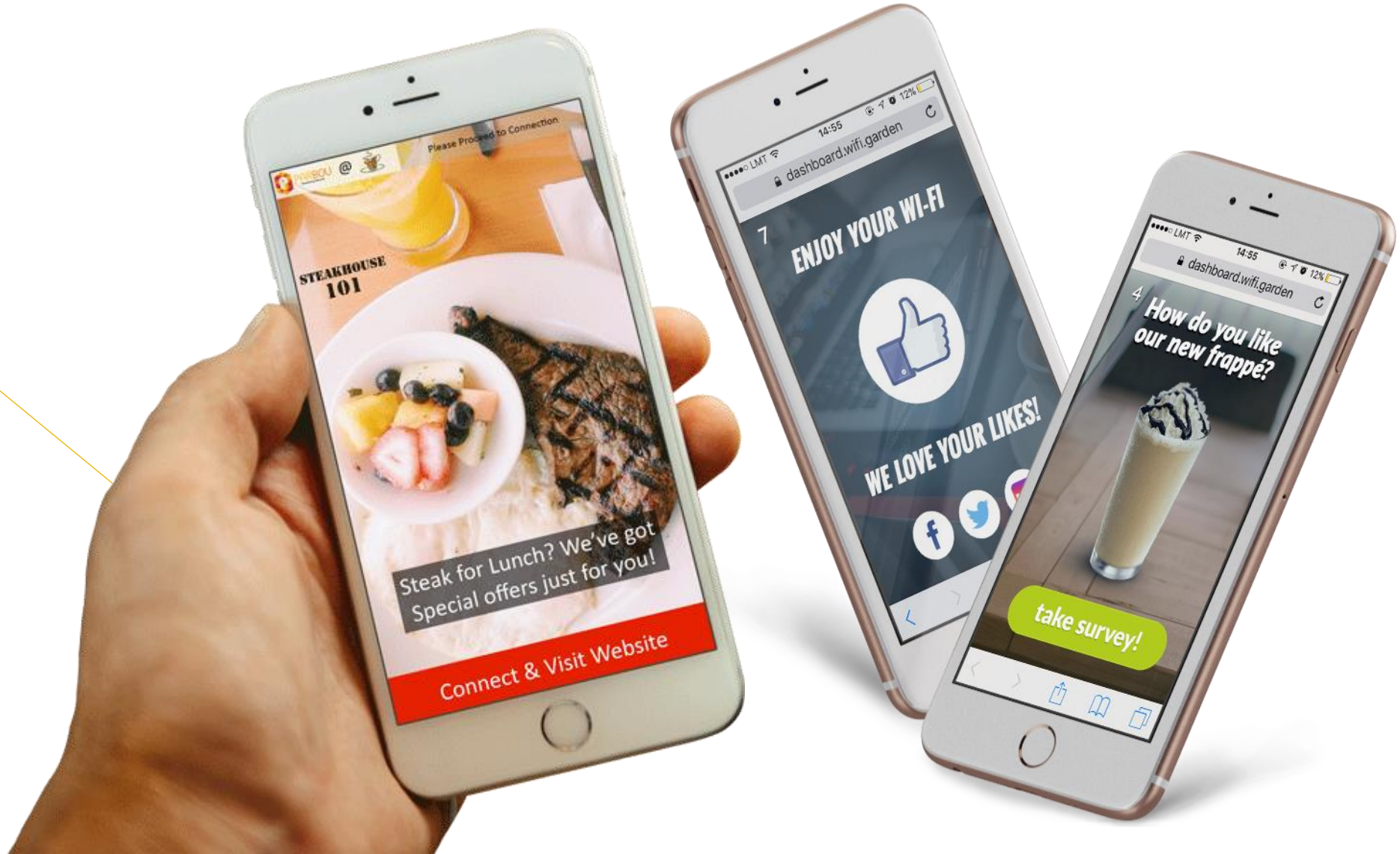
Terminal

```
[admin@MikroTik] > ip hotspot setup
Select interface to run HotSpot on

hotspot interface: br-cap
Set HotSpot address for interface

local address of network: 10.5.0.1/24
masquerade network: yes
Set pool for HotSpot addresses

address pool of network: 10.5.0.2-10.5.0.254
Select hotspot SSL certificate

select certificate: none
Select SMTP server

ip address of smtp server: 0.0.0.0
Setup DNS configuration

dns servers: 10.5.0.1,1.1.1.1
DNS name of local hotspot server

dns name: hotspot.ads.id
Create local hotspot user

name of local hotspot user: admin
password for the user:
[admin@MikroTik] >
```

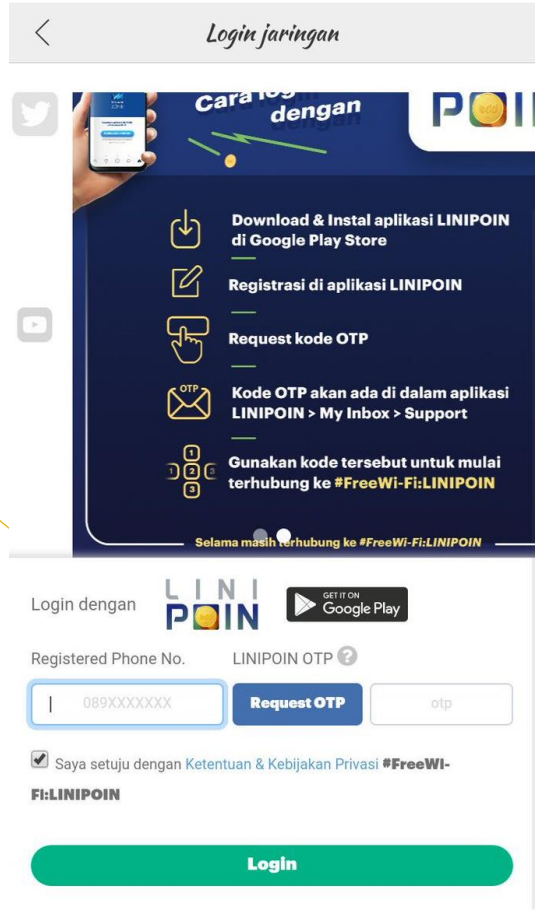
2. Customize



Monetizing!


Please Proceed to Connection
STEAKHOUSE 101
Steak for Lunch? We've got Special offers just for you!
Connect & Visit Website
dashboard.wifi.garden
ENJOY YOUR WI-FI
WE LOVE YOUR LIKES!
How do you like our new frappé?
take survey!

Study Case



- **Network Data Sistem, PT** as a System Integrator has work with **MacroAd** to Deploy FreeWiFi services in JaBoDeTaBek (Jakarta, Bogor, Depok, Tangerang & Bekasi) **KRL Commuter Line**
- KRL Commuter Line is The rail system that uses metro/rapid transit rolling stock standard and operates at high frequency with a minimum headway of five minutes. As of June 2018, the average number of KRL users per day reaches **1,001,438 users** on weekdays, with a record of the highest number of users served in one day is **1,154,080**. The number is targeted to reach **1.2 million passengers** per day by 2019.

Study Case

DEMONSTRATION

References

- https://mum.mikrotik.com/archive
- https://wiki.mikrotik.com/wiki/Manual:CAPsMAN
- https://wiki.mikrotik.com/wiki/Manual:Simple_CAPsMAN_setup
- https://wiki.mikrotik.com/wiki/Manual:Hotspot_Introduction
- https://wiki.mikrotik.com/wiki/Manual:IP/Hotspot

Interesting? Questions?

Leave us a messages on info@nds.id ☺

Thank You

NETDATA Team