



Basic Config MikroTik Captive Portal (HotSpot)

Teddy Yuliswar #TR0442

Phnom Penh, Cambodia January 21, 2019





About Presenter

Teddy Yuliswar

- Used MikroTik since RouterOS 2.97 (Since 2008)
- **MikroTik Certified MTC [All] E (2014 – 2016)**
- **Mikrotik Certified Trainer (UEA, TTT Dubai 2016)**
- **MikroTiK Consultants Asia (Since 2016)**
- **Mikrotik Academy Coordinator in Indonesia (Since 2017)**
- **Founder Indonetworkers.com Training Center**
- **MikroTik User Meeting Presenter (2015 – 2019)**
 - Yogyakarta , Jakarta -Indonesia (2015-2018)
 - Phnom Penh – Kamboja (2017)
 - Vientiane - Laos (2017)
 - Phnom Penh – Kamboja (2019 - **NOW**)

Find Me on **You** 

Indonetworkers.com Training Center

Jl. S. Parman No. 189 B , Ulak Karang , Padang – Indonesia
(Just 50 minutes from Kuala Lumpur with flight and ticket less than 200.000 Riel from phnom penh)



Indonetworkers.com Training Center

Jl. S. Parman No. 189 B , Ulak Karang , Padang – Indonesia
(Just 50 minutes from Kuala Lumpur with flight and ticket less than 200.000 Riel from phnom penh)



Indonetworkers.com Training Center Jl. S. Parman No. 189 B , Ulak Karang , Padang



Mikrotik Training Class



Banjarmasin – borneo island , 2017

Mikrotik Training Class



Jakarta , 2017

Mikrotik Seminar



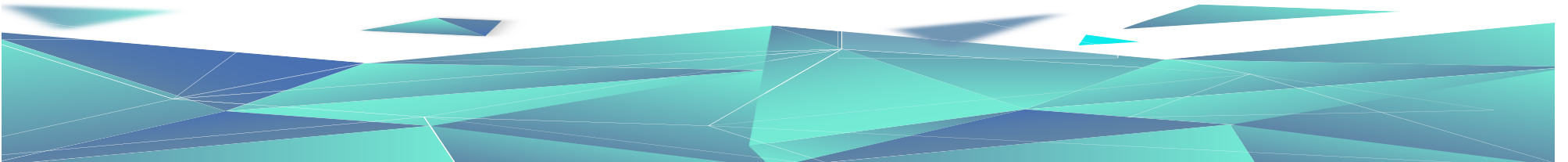
With hotspotsystem - Malaysia

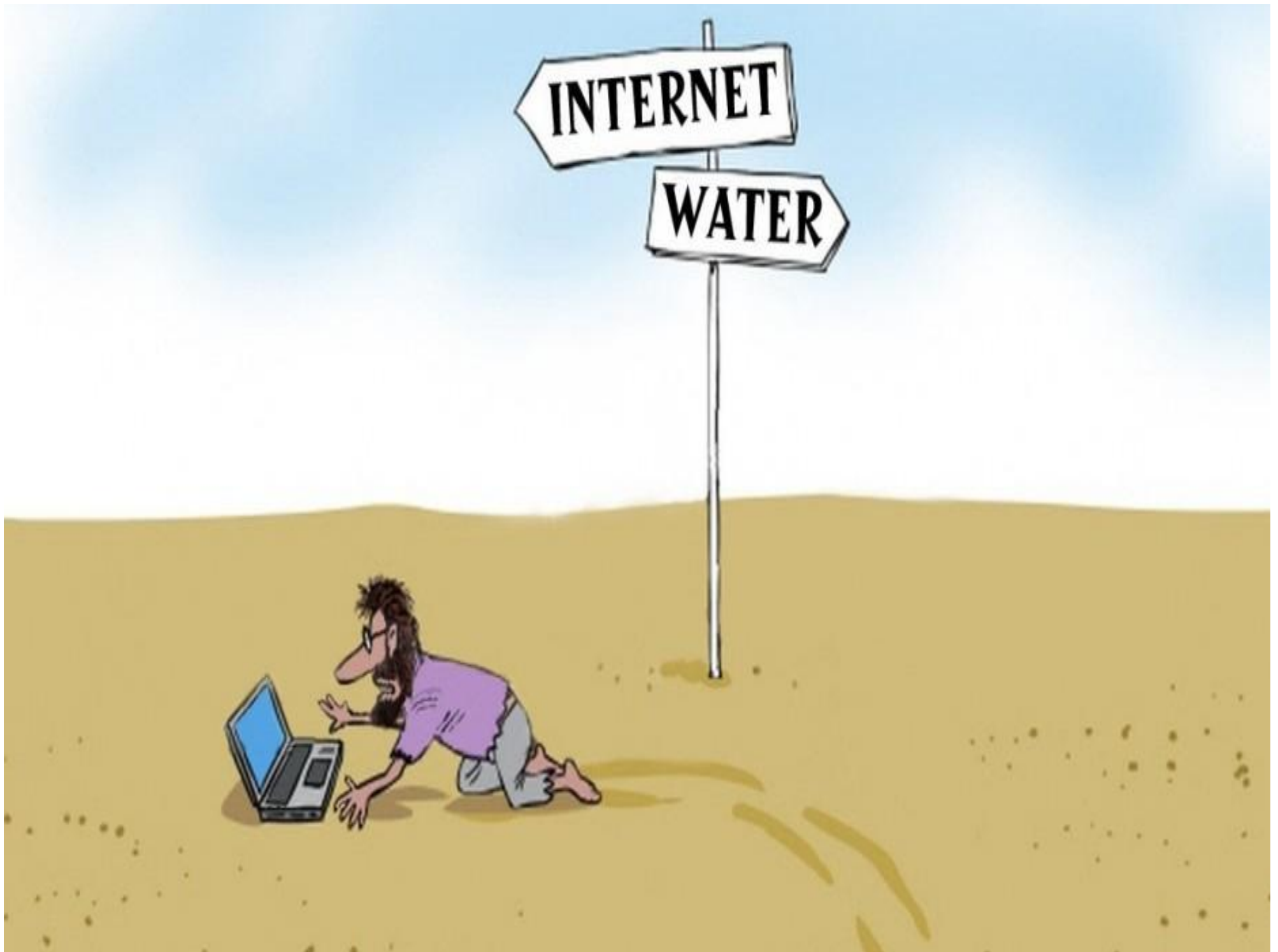
Kuala Lumpur, Malaysia - 2019

MikroTiK Train-the-Trainer

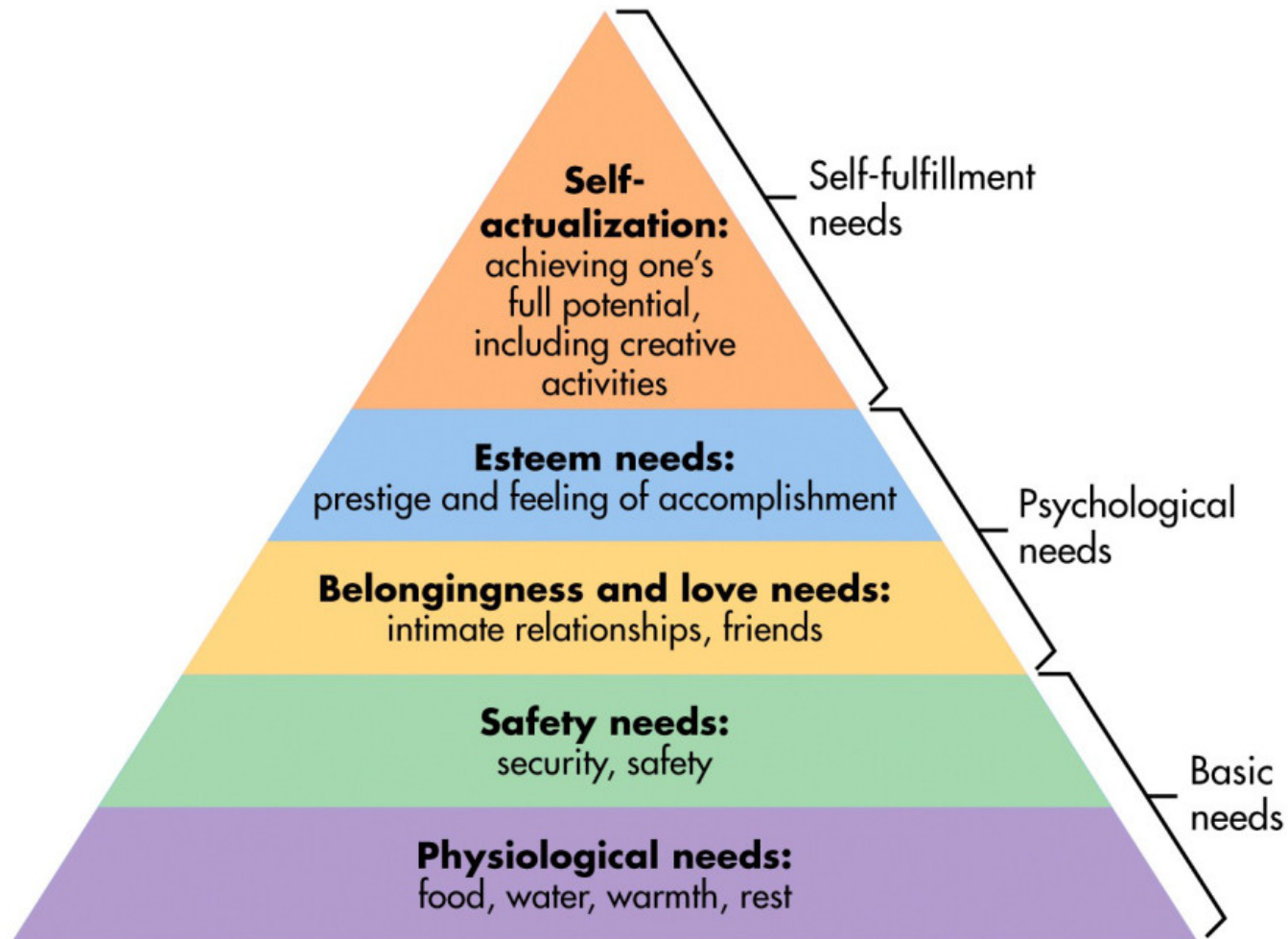


**How long you can survive
without the internet now?**

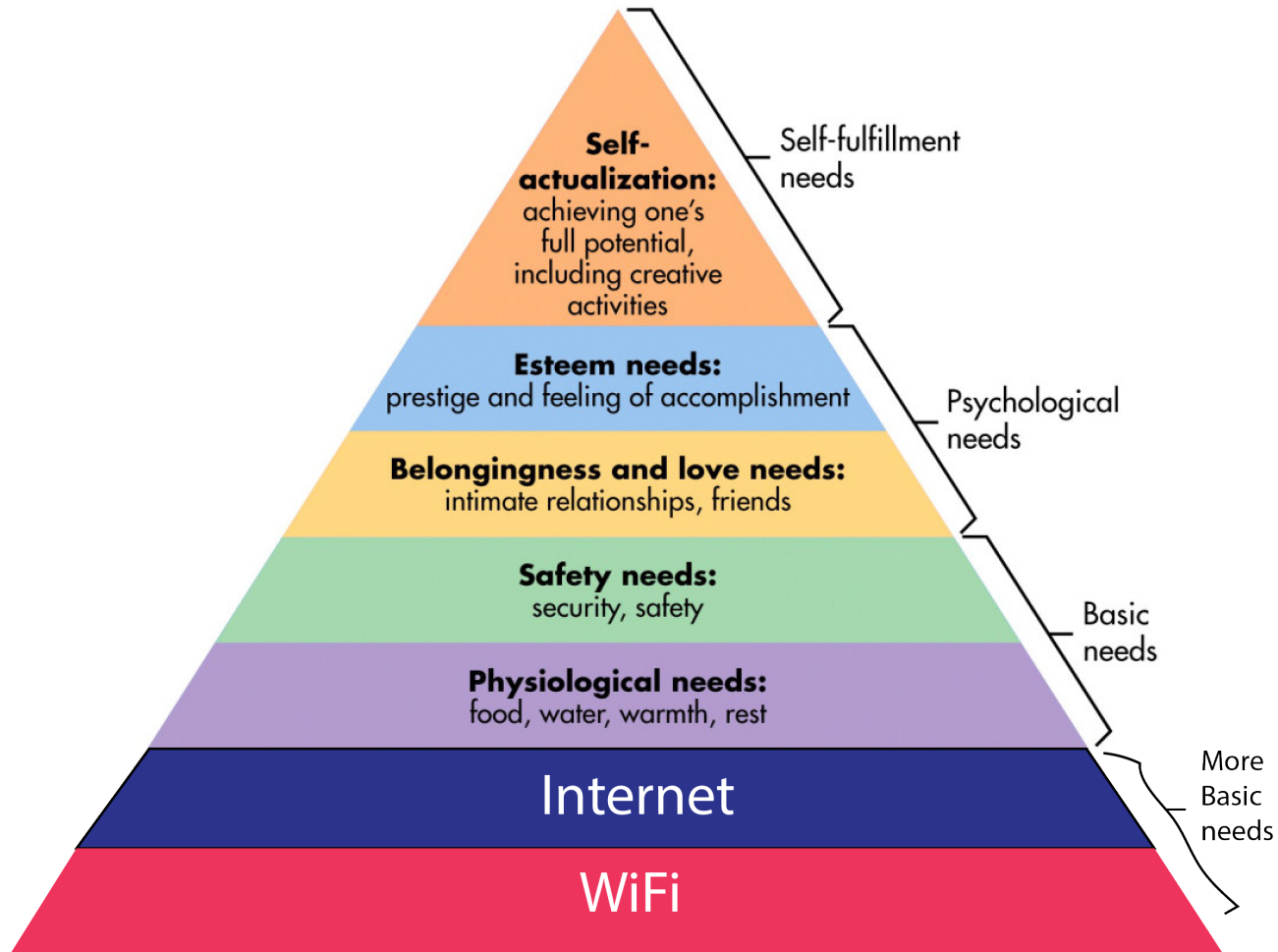




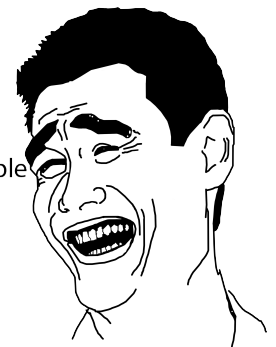
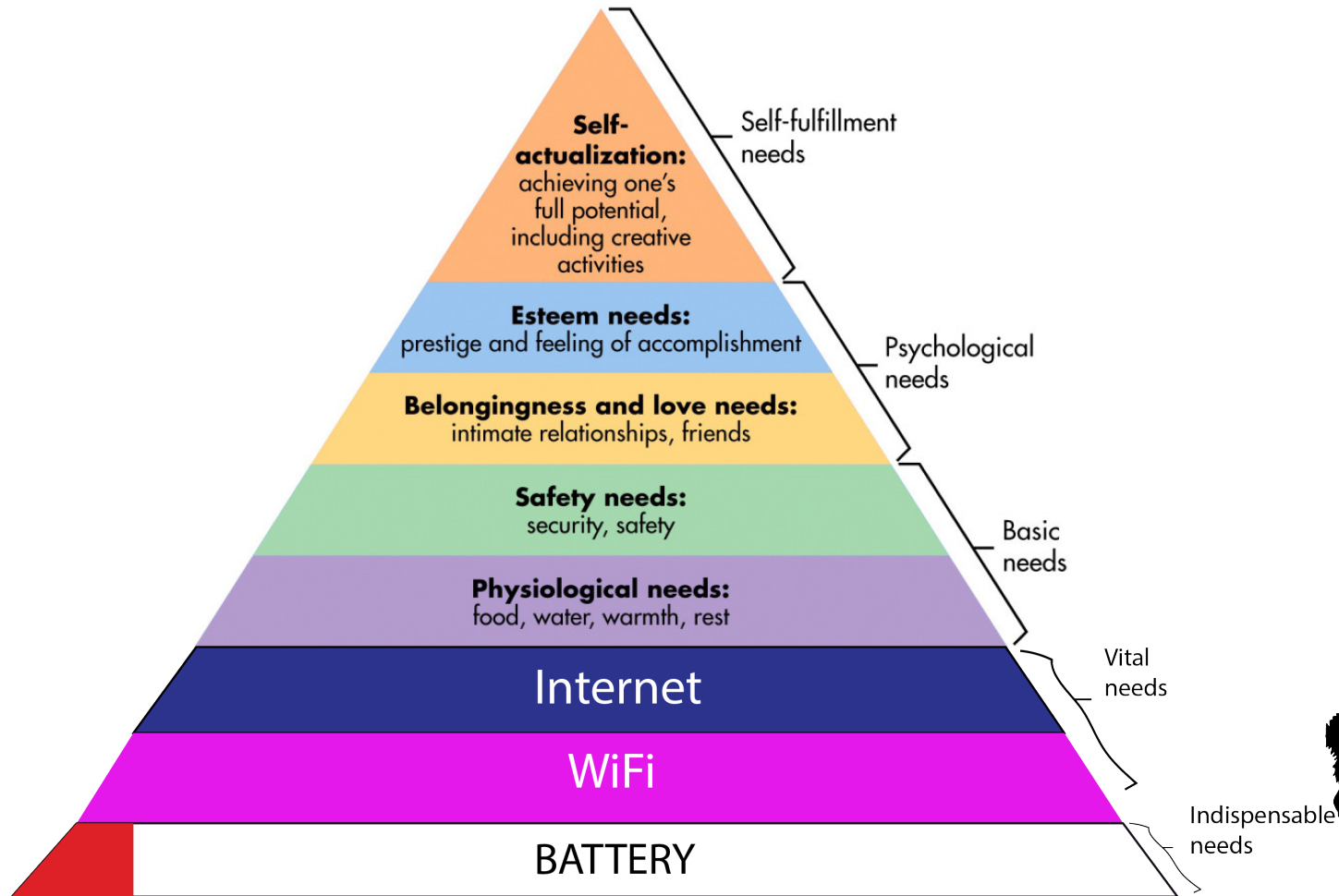
Past..



Now..



Now..



BASIC NEEDS FOR SURVIVAL

THEN



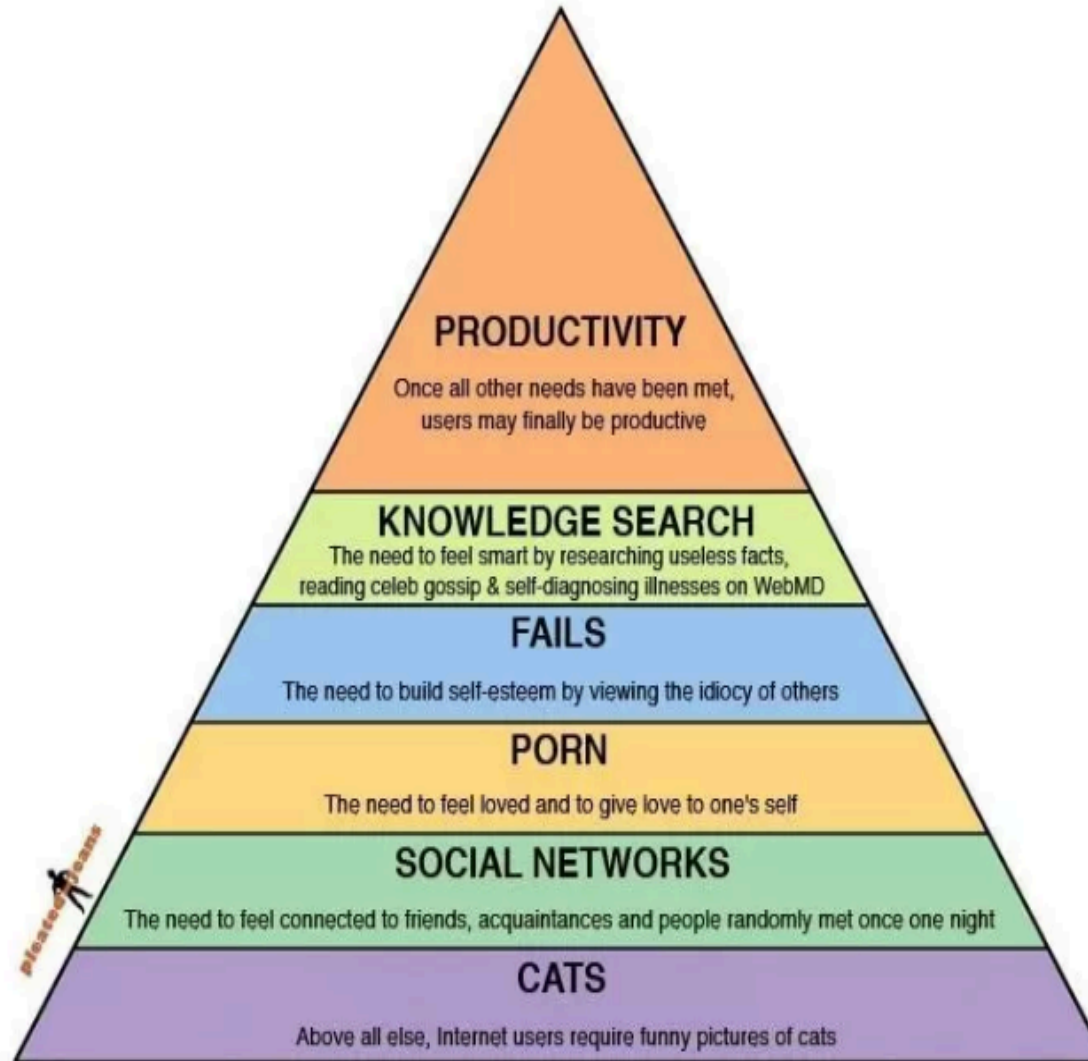
- FOOD
- WATER
- SHELTER
- CLOTHING

NOW

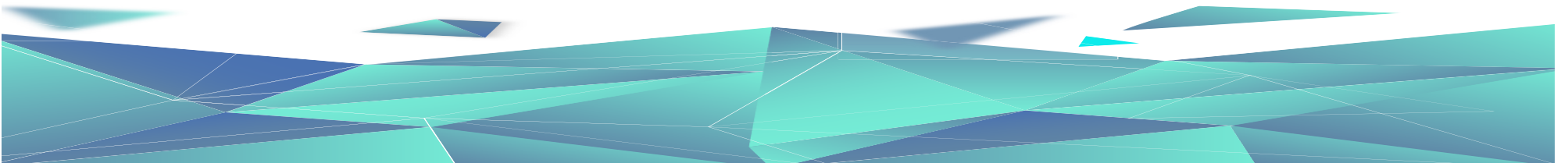


- INTERNET
- FOOD, SHELTER, WATER (OPTIONAL)

Maslow's Hierarchy of Internet Needs



Which jobs that don't need the
internet now?



Where we can get internet source?

- Subscribe to the internet from Internet Service Provider (ISP) at home (Paid every month)
- Buy data packages for mobile connections (Limited Data Quota)
- Buy HotSpot Voucher (Paid Hourly)
- Or

Get Free Wifi 😊

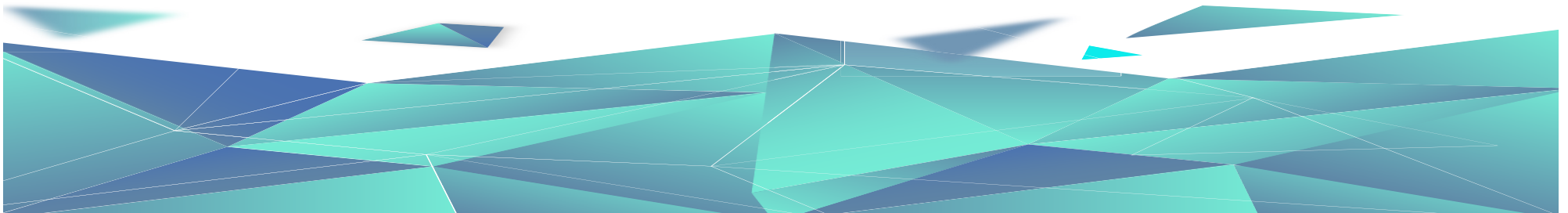




MikroTik
Login Hotspot



Hotspot is a physical location where people may obtain Internet access, typically using **Wi-Fi technology**, via a wireless local area network (WLAN) using a router connected to an internet service provider.



MikroTik

Login Hotspot

Gateway provides authentication for clients before access to public networks Commonly called “captive portal” can running in **wireless networks** or **wire networks** even **Virtual Interface** like VLAN, Virtual AP , Tunnel and etc.



Overview

- Plug-and-Play Internet Access
- Users authentication before access to the Internet
- Walled-garden to allow resources **without authentication**
- User Accounting
- Transparent proxy



Usage

Airports



Usage

University / Campus



Usage

Student Dormitories / Leased Housing



Usage

Restaurant or Café's



Usage

- Open Access Point
- Anywhere Authorization or Accounting are Required

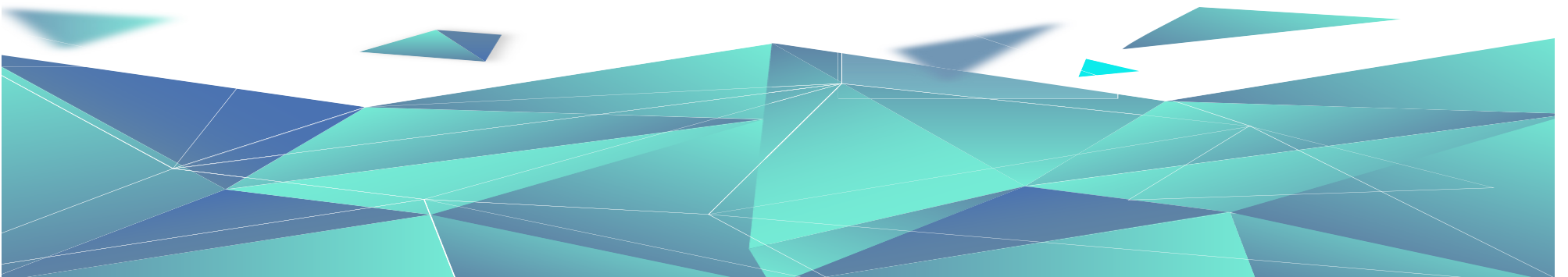
Operation

- User can use wrong network configuration settings, Hotspot server **translates them** to correct ones
- No Internet Available **before** Hotspot **Authorization**
- **Exceptions** are added to walled-garden and / ip hotspot ip-binding



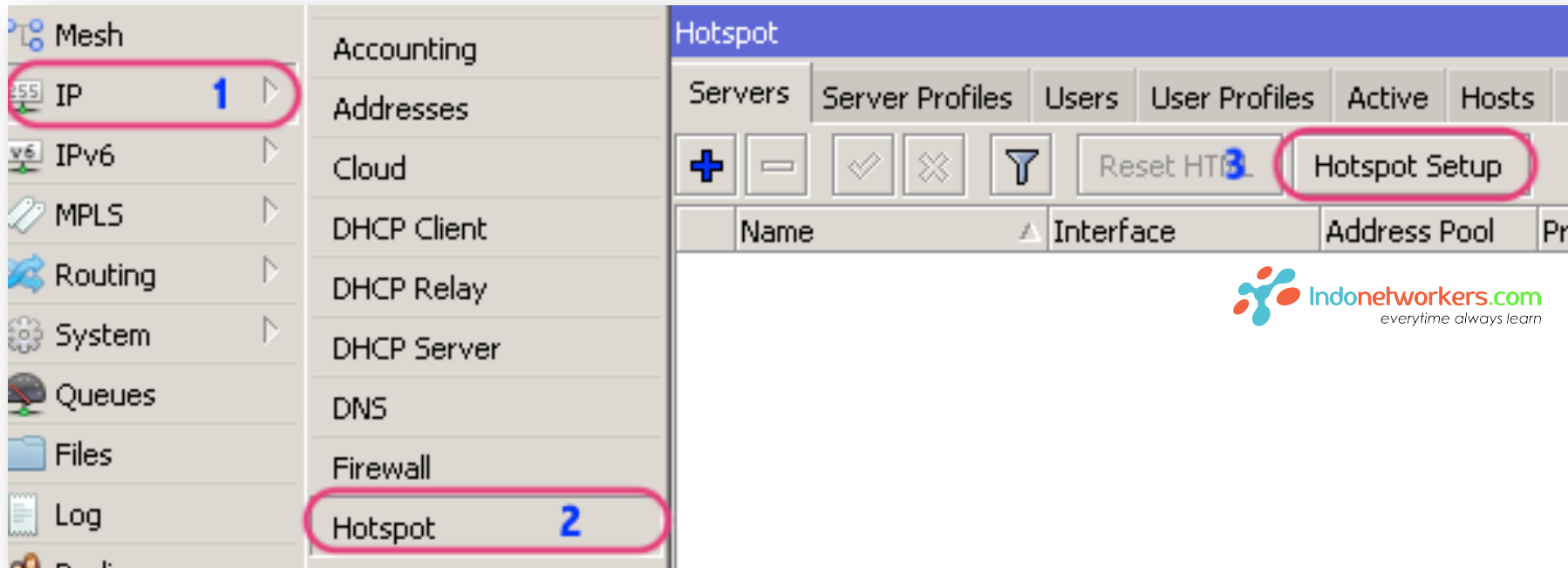
Operation

- Enter username/password in Hotspot Login page to get the **Internet (Authentication)**
- Other login **methods** available
- Different **accounting** options
 - Measures the resources a user consumes during access

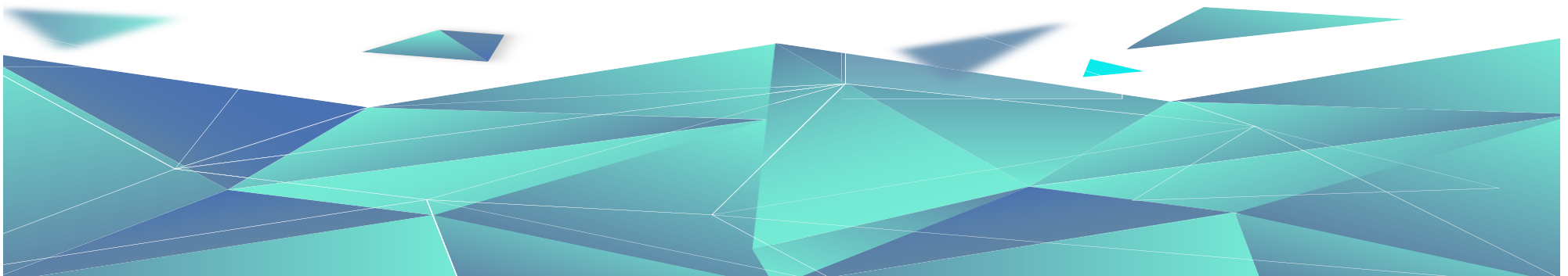


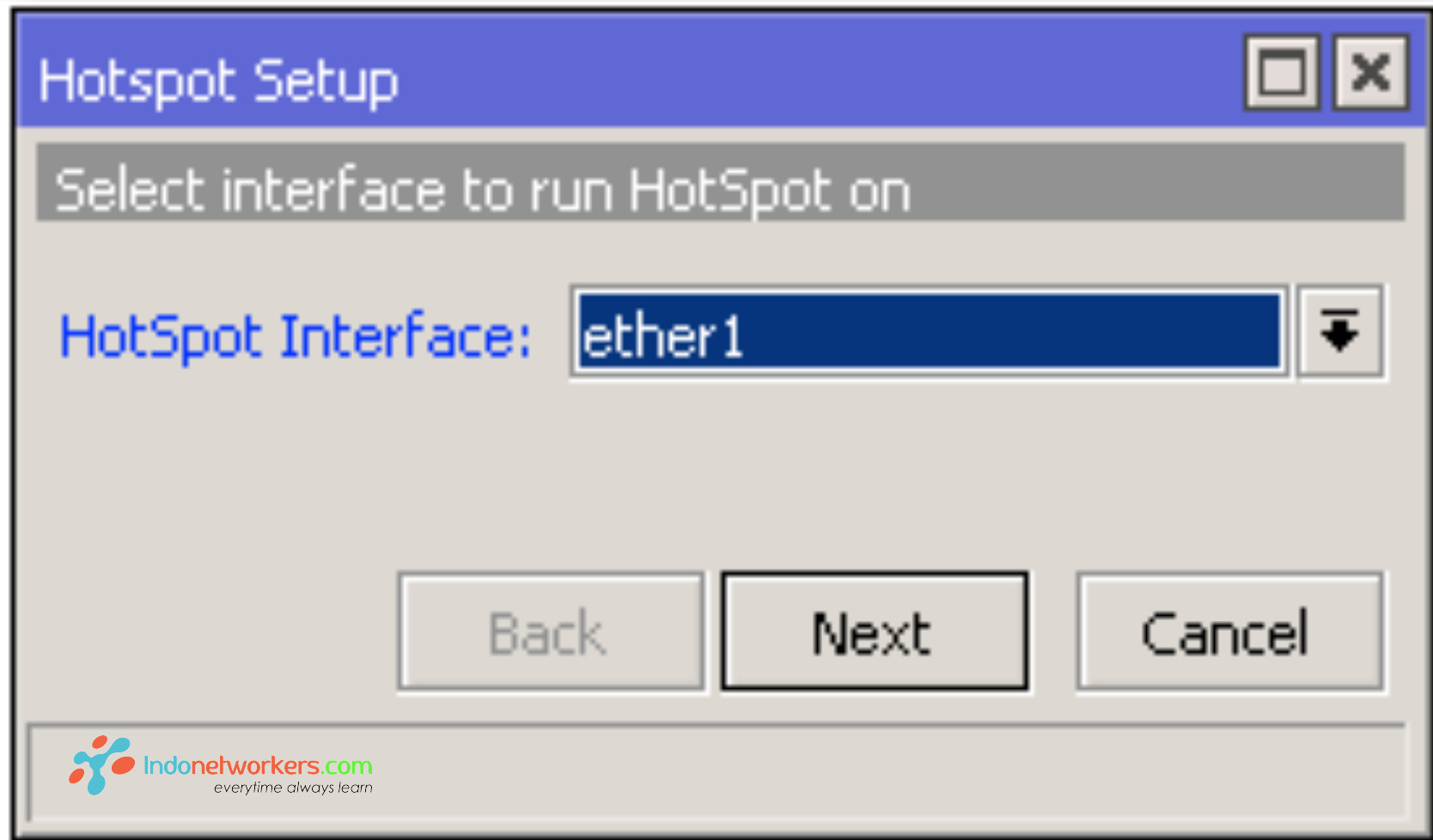
HotSpot Setup



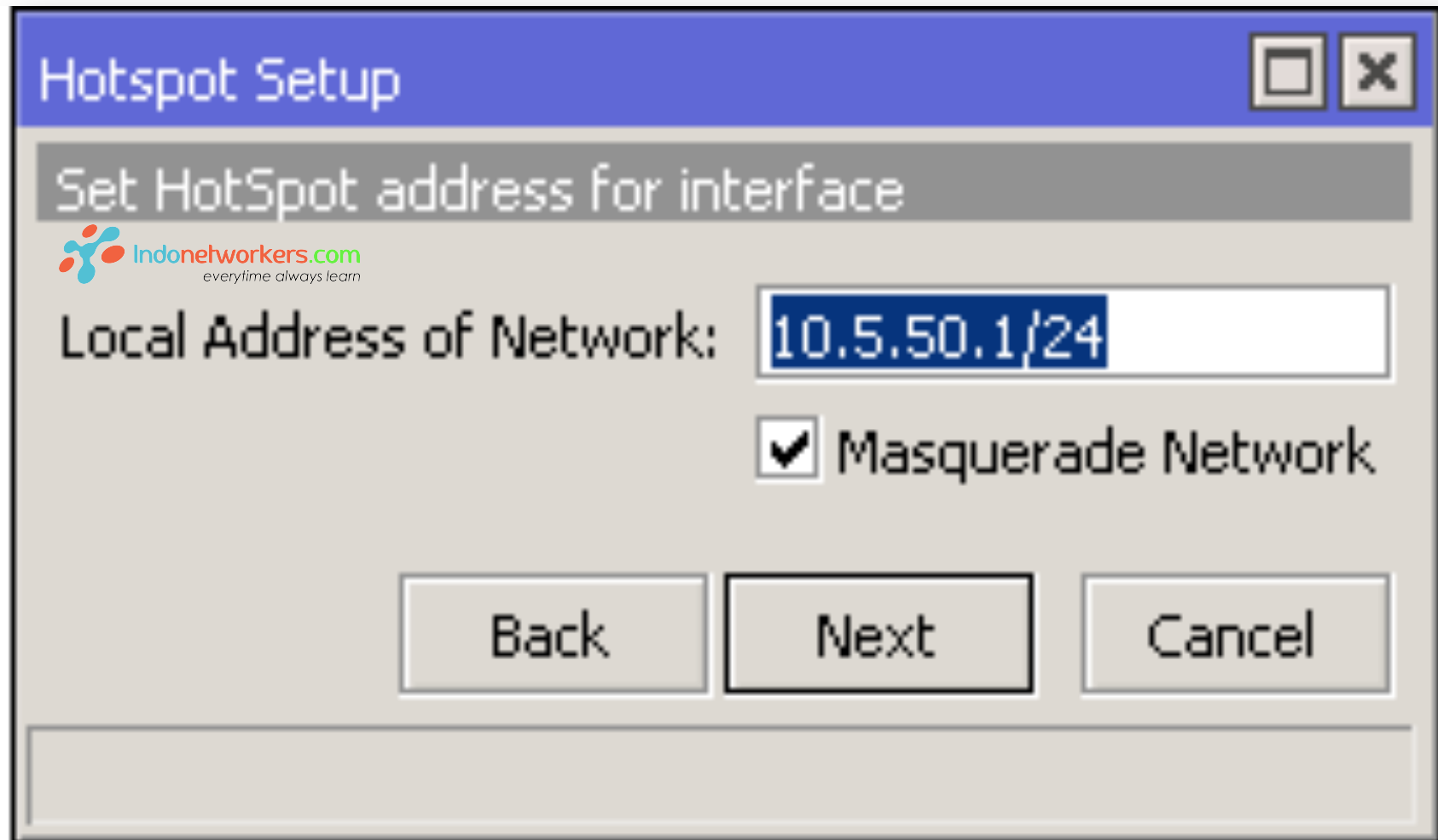


Select IP → Hotspot → Hotspot Setup in WinBox
or if with CLI/Terminal use command :
/ip hotspot setup

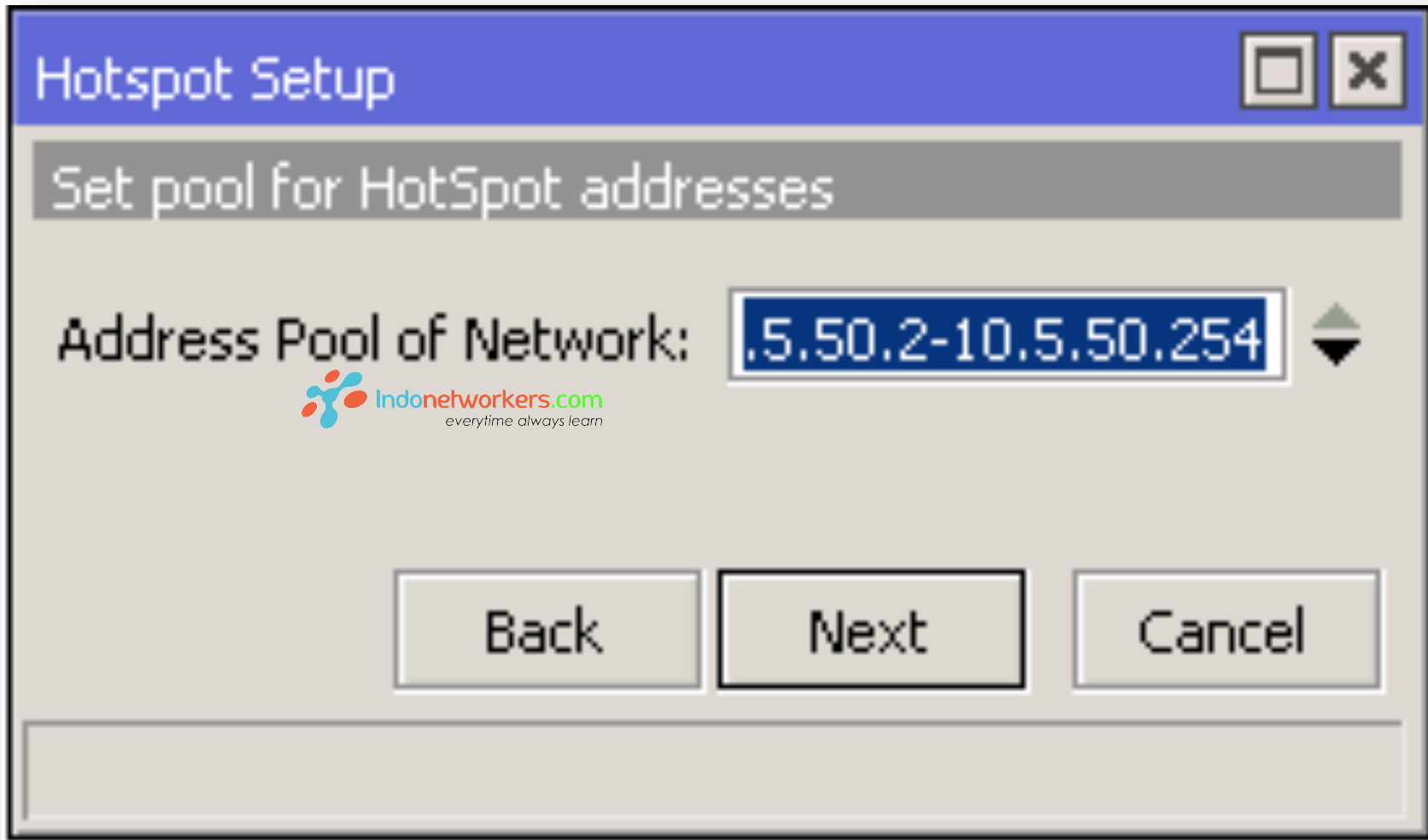




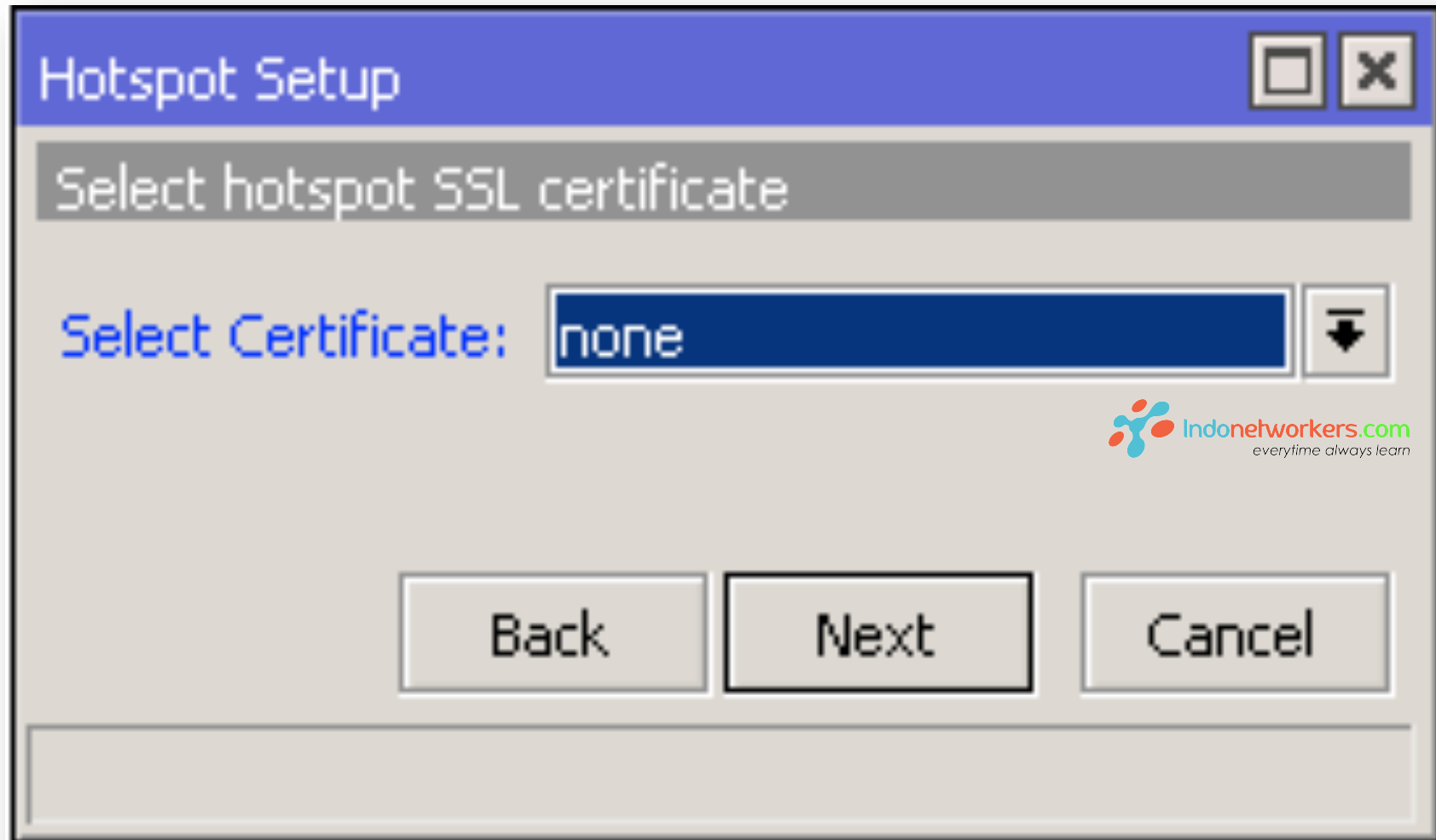
Select Interface then Click “Next”



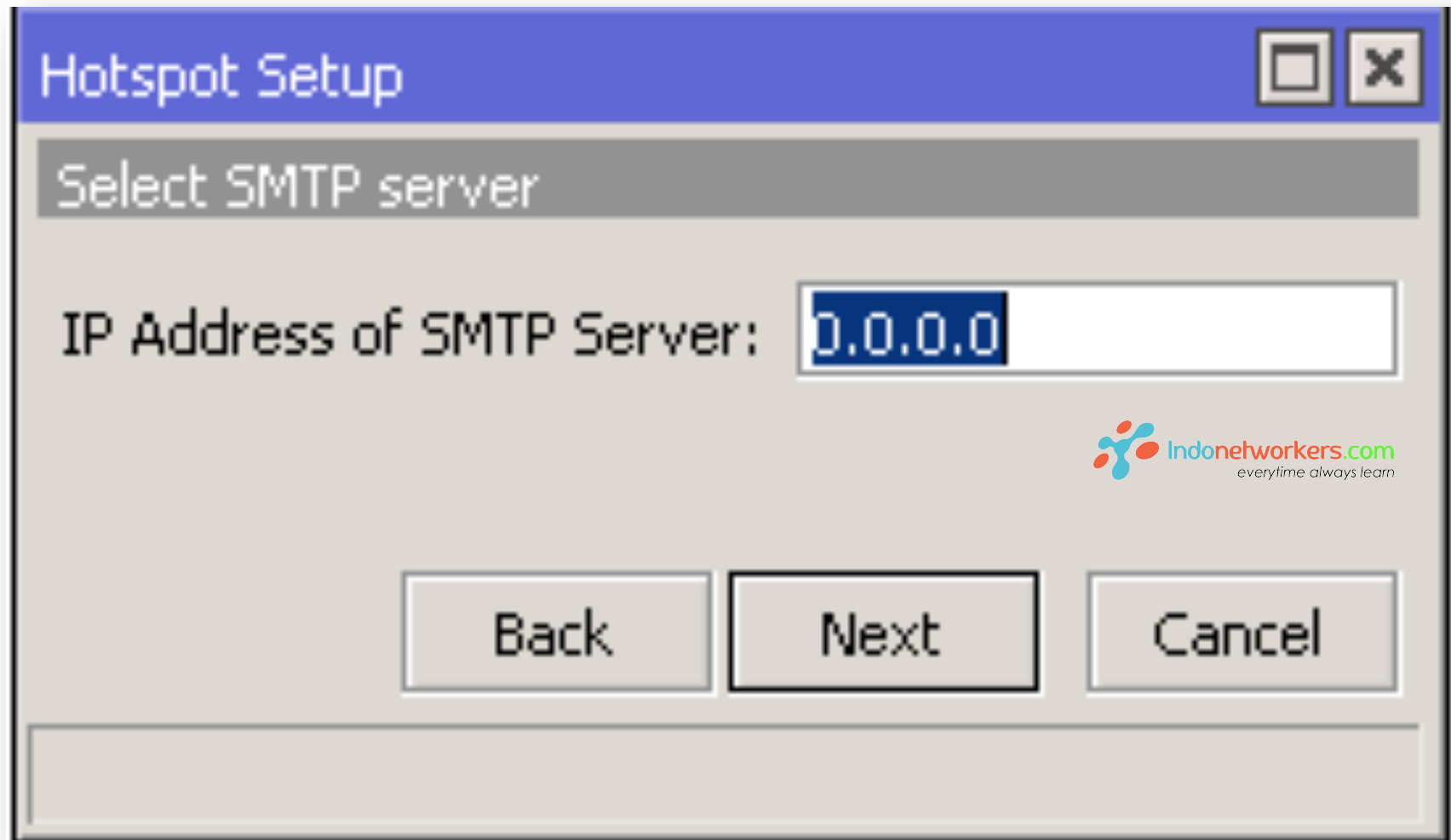
- Set HotSpot Address, offered automatically, if no IP Address in interface for HotSpot, MikroTik RouterOS will be give 10.5.50.1/24
- Masquerade Network or not



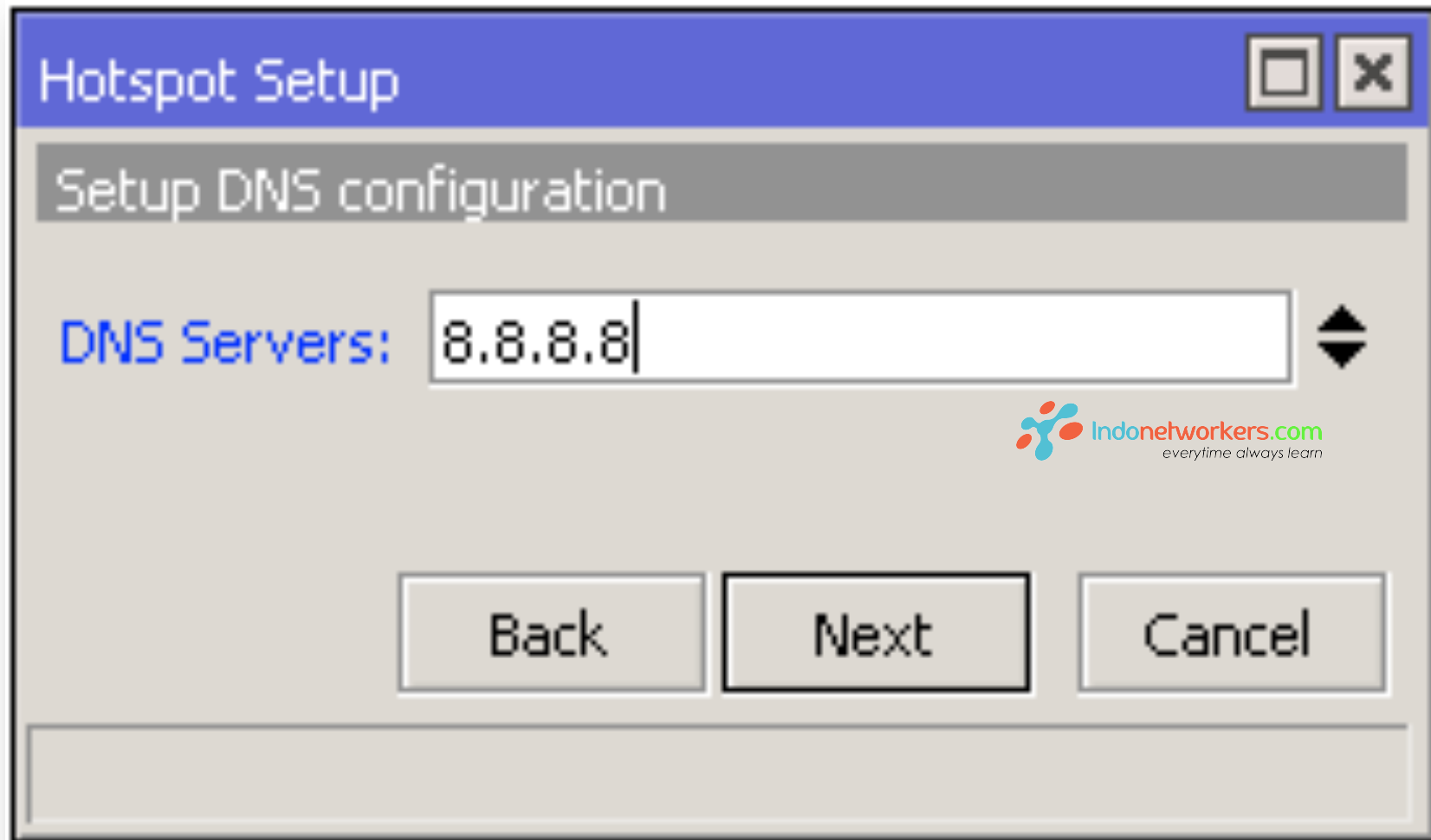
- **Address-range** to use for clients



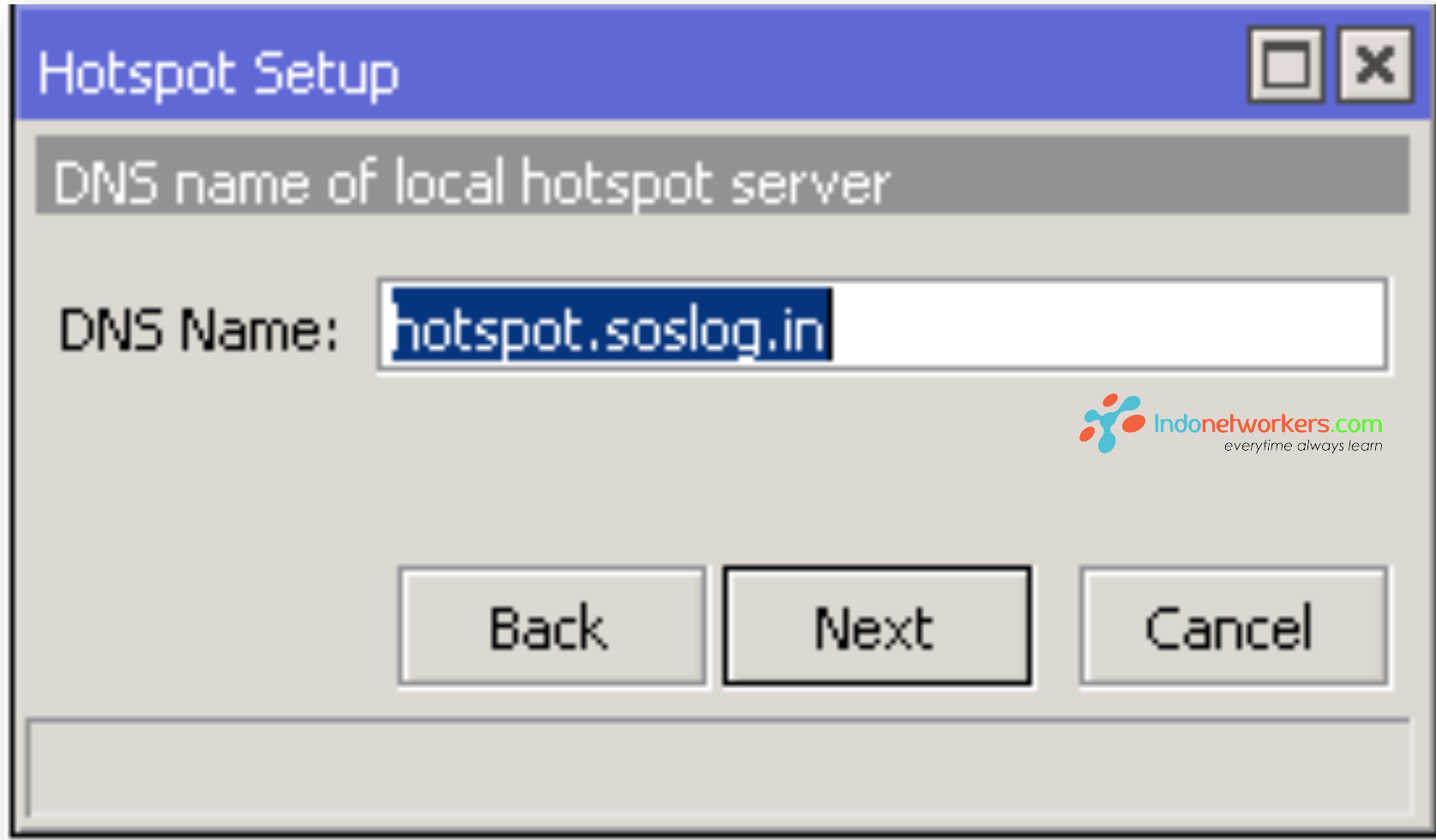
- **SSL certificate**, used for HTTPS login



- **SMTP Server** address, to redirect all HotSpot users to



- **DNS Server** for HotSpot users, taken from /ip dns




- **HotSpot DNS name** for access login page, **FQDN** required (www.example.com)

Hotspot Setup

Create local HotSpot user

Name of Local HotSpot User:

Password for the User:

 Indonetworkers.com
everytime always learn

- Create first HotSpot **user**

Hotspot Setup

Setup has completed successfully



OK

HotSpot setup is **completed** successfully

Hotspot

Servers Server Profiles Users User Profiles Active Hosts IP Bindings Service Ports Walled Garden Walled Garden IP List ...

+ - ✓ ✕ ⌵ Reset HTML Hotspot Setup Find

Name	Interface	Address Pool	Profile	Adresse...
👤 hotspot1	ether1	hs-pool-3	hsprof2	2


Indonetworkers.com
everytime always learn

1 item

Check /ip hotspot menu

HotSpot Default Login Page

Latviski

 **Indonetworkers.com**
everytime always learn

Please log on to use the internet hotspot service

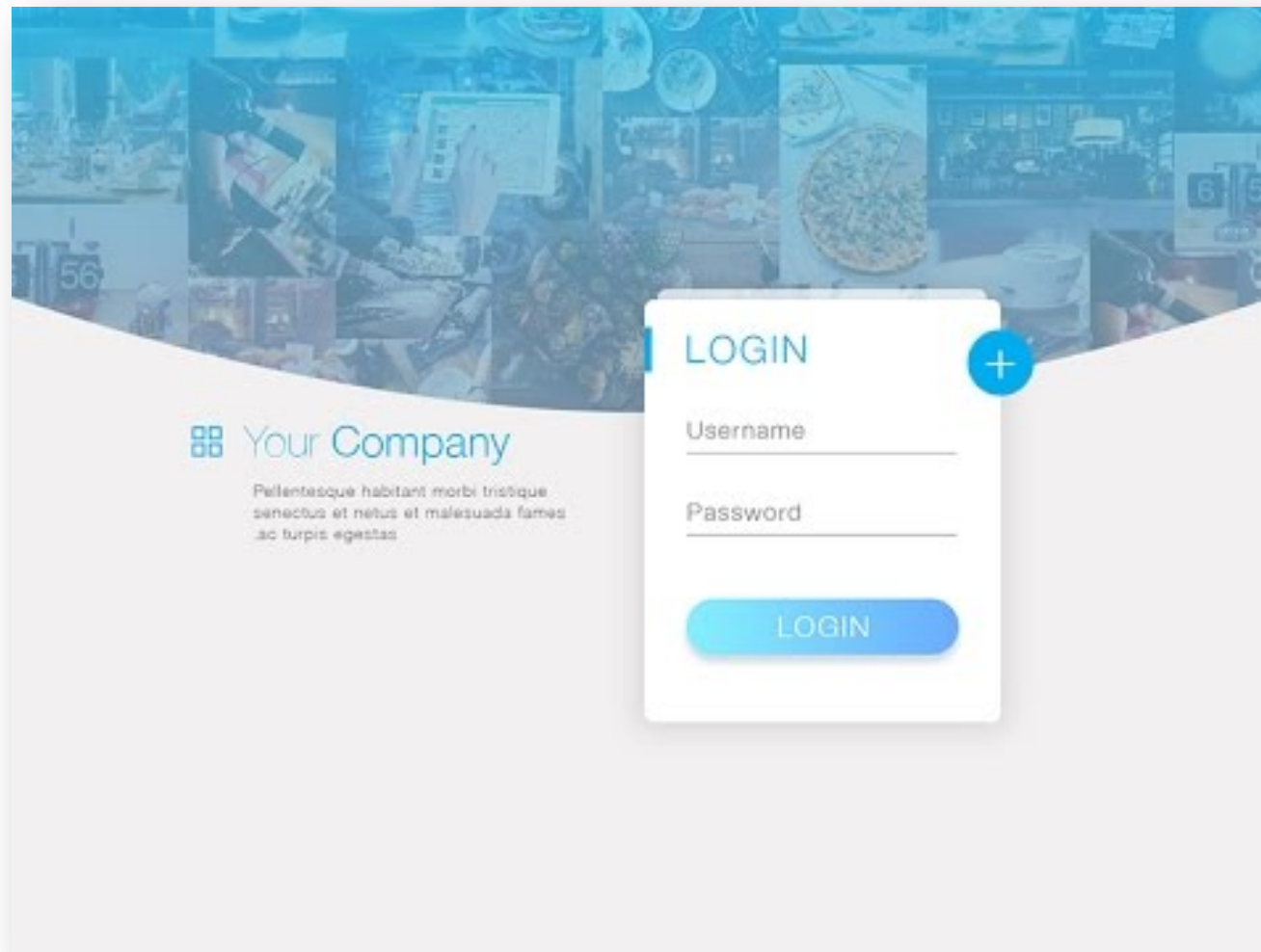
login

password

HOTSPOT GATEWAY
powered by *MikroTik*

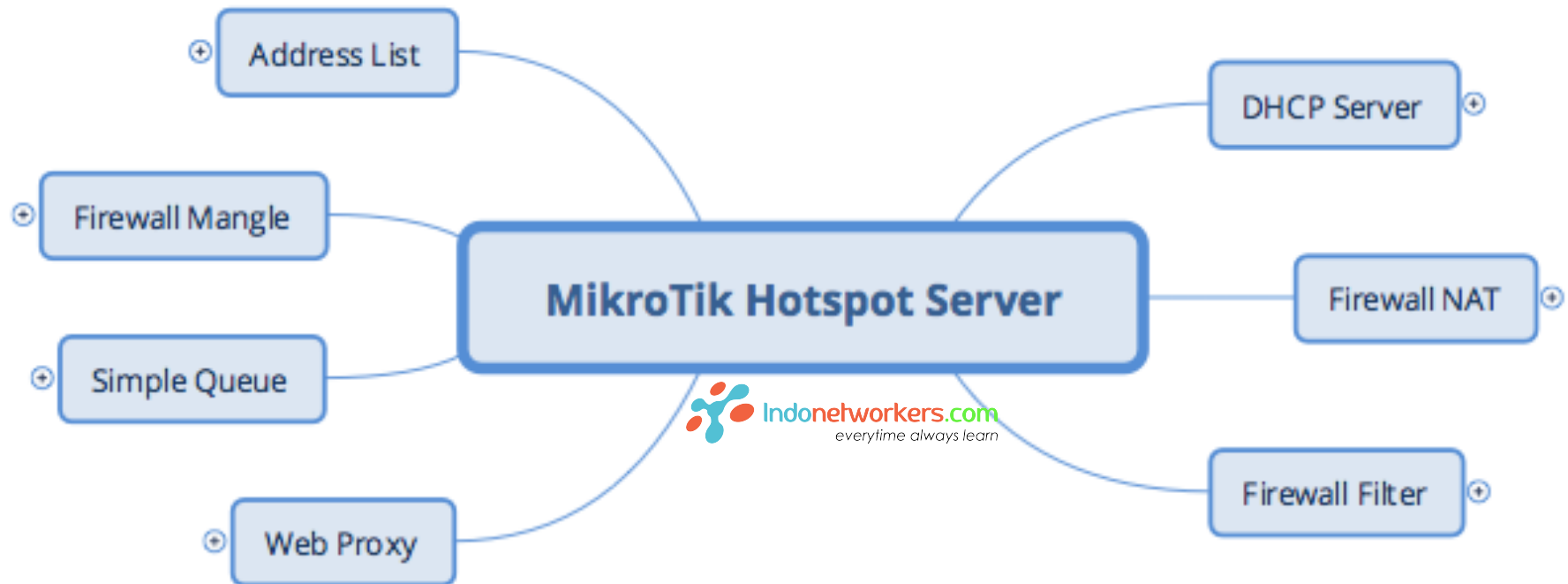
Powered by MikroTik RouterOS

HotSpot Custom Login Page

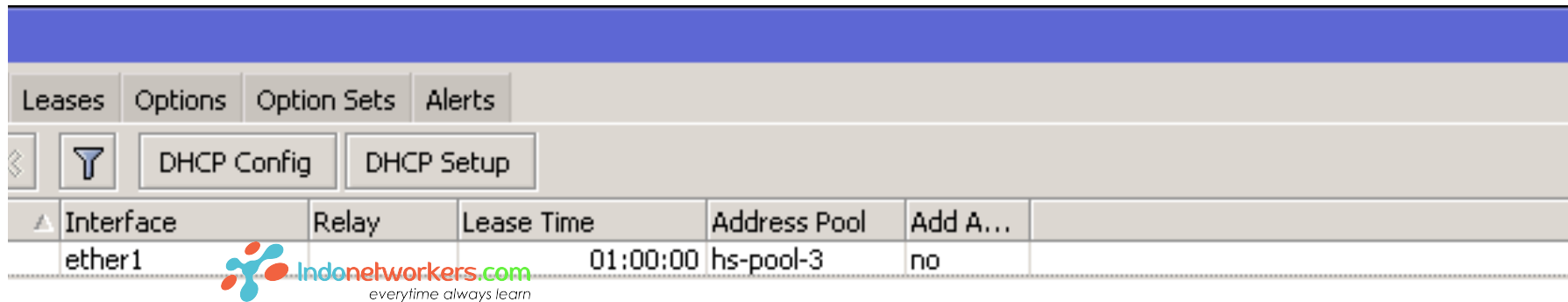


Required : web programming knowledge (html or php)

HotSpot Dynamic Rule




Configuration created



Leases Options Option Sets Alerts

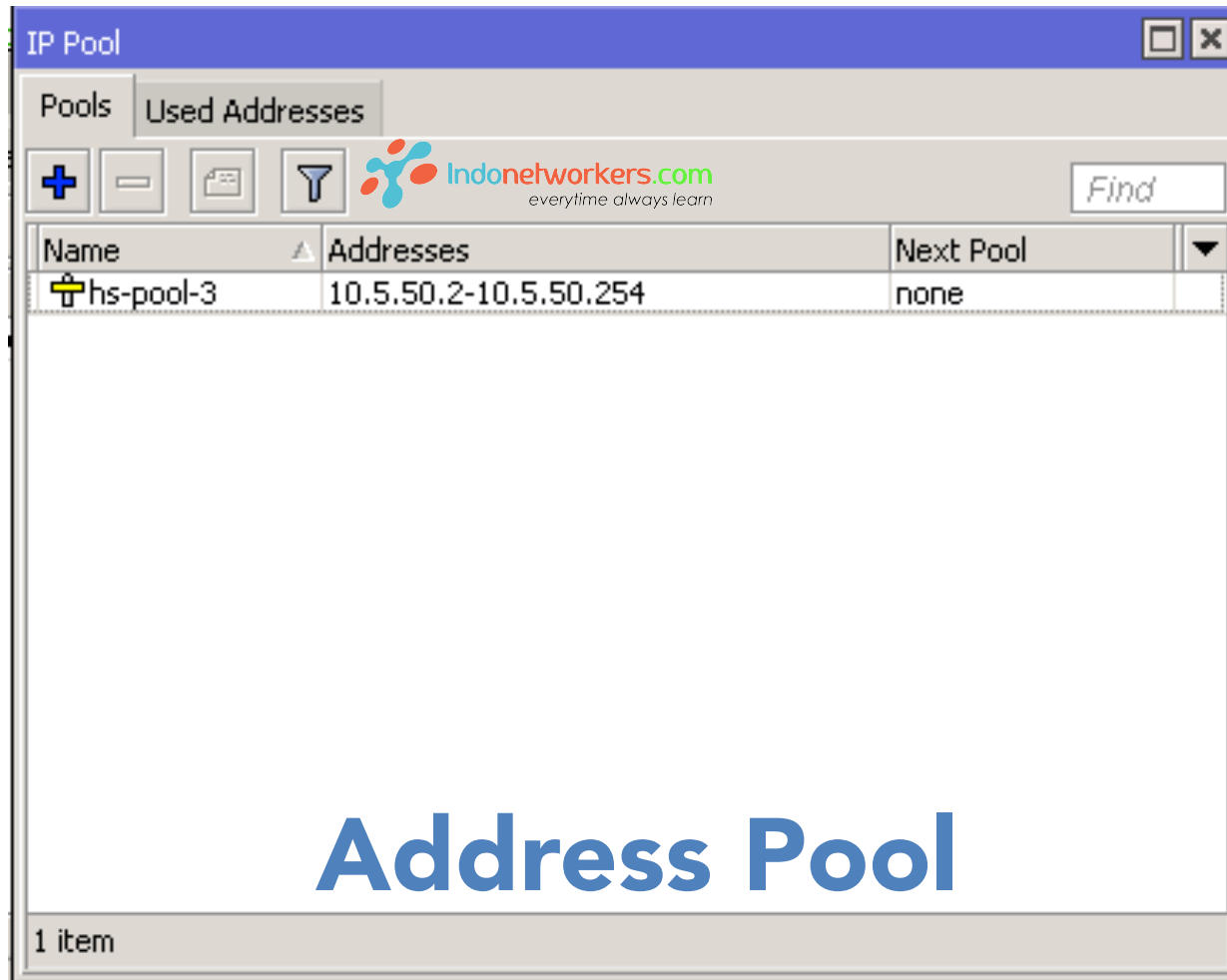
DHCP Config DHCP Setup

Interface	Relay	Lease Time	Address Pool	Add A...
ether1		01:00:00	hs-pool-3	no

 Indonetworkers.com
everytime always learn

DHCP Server

Configuration created



The screenshot shows a window titled "IP Pool" with two tabs: "Pools" and "Used Addresses". The "Pools" tab is active. The window contains a toolbar with icons for adding (+), removing (-), refreshing, and filtering, along with a search box labeled "Find". A table below the toolbar lists the IP pools. The table has three columns: "Name", "Addresses", and "Next Pool". There is one entry in the table: "hs-pool-3" with the address range "10.5.50.2-10.5.50.254" and "none" as the next pool. A large blue text "Address Pool" is overlaid on the bottom half of the window. At the bottom left, it says "1 item".

Name	Addresses	Next Pool
hs-pool-3	10.5.50.2-10.5.50.254	none

Address Pool

1 item

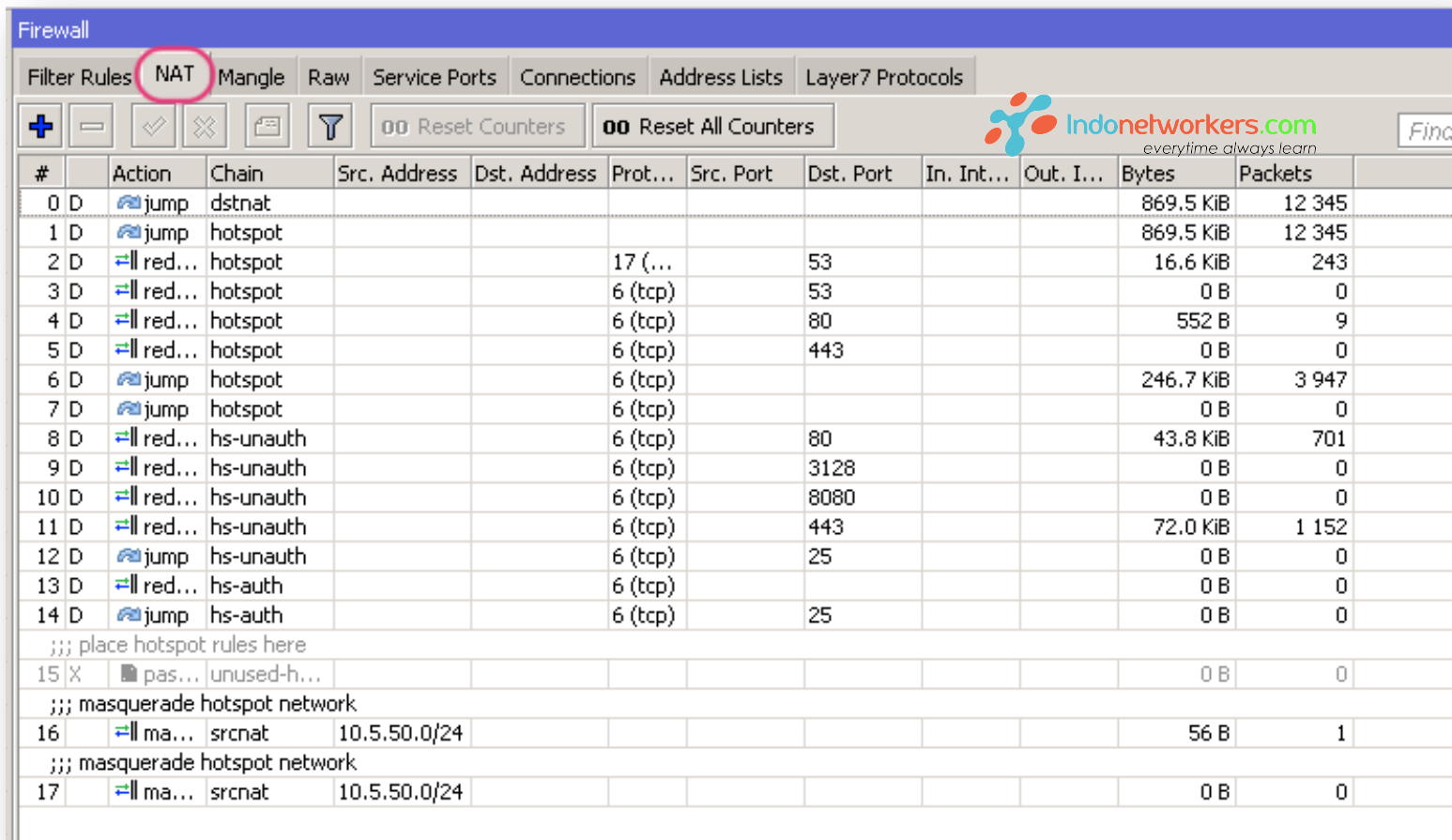
Configuration created

#	Action	Chain	Src. Address	Dst. Address	Prot...	Src. Port	Dst. Port	In. Int...	Out. I...	Bytes	Packets
0	D	jump	forward							174.2 KiB	2 629
1	D	jump	forward							0 B	0
2	D	jump	input							1918.8 KiB	18 773
3	D	drop	input		6 (tcp)		64872-6...			0 B	0
4	D	jump	hs-input							1918.8 KiB	18 773
5	D	acc...	hs-input		17 (...)		64872			16.7 KiB	245
6	D	acc...	hs-input		6 (tcp)		64872-6...			1345.2 KiB	10 845
7	D	jump	hs-input							556.8 KiB	7 683
8	D	reject	hs-unauth		6 (tcp)					132.4 KiB	2 118
9	D	reject	hs-unauth							598.6 KiB	8 194
10	D	reject	hs-unaut...							0 B	0
;;; place hotspot rules here											
11	X	pas...	unused-h...							0 B	0

- /ip firewall filter print dynamic

Dynamic **Firewall** and **NAT** rules

Configuration created



Firewall

Filter Rules **NAT** Mangle Raw Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [Filter Icon] 00 Reset Counters 00 Reset All Counters Indonetworkers.com everytime always learn Find

#	Action	Chain	Src. Address	Dst. Address	Prot...	Src. Port	Dst. Port	In. Int...	Out. I...	Bytes	Packets
0 D	jump	dstnat								869.5 KIB	12 345
1 D	jump	hotspot								869.5 KIB	12 345
2 D	red...	hotspot			17 (...)		53			16.6 KIB	243
3 D	red...	hotspot			6 (tcp)		53			0 B	0
4 D	red...	hotspot			6 (tcp)		80			552 B	9
5 D	red...	hotspot			6 (tcp)		443			0 B	0
6 D	jump	hotspot			6 (tcp)					246.7 KIB	3 947
7 D	jump	hotspot			6 (tcp)					0 B	0
8 D	red...	hs-unauth			6 (tcp)		80			43.8 KIB	701
9 D	red...	hs-unauth			6 (tcp)		3128			0 B	0
10 D	red...	hs-unauth			6 (tcp)		8080			0 B	0
11 D	red...	hs-unauth			6 (tcp)		443			72.0 KIB	1 152
12 D	jump	hs-unauth			6 (tcp)		25			0 B	0
13 D	red...	hs-auth			6 (tcp)					0 B	0
14 D	jump	hs-auth			6 (tcp)		25			0 B	0
;;; place hotspot rules here											
15 X	pas...	unused-h...								0 B	0
;;; masquerade hotspot network											
16	ma...	srcnat	10.5.50.0/24							56 B	1
;;; masquerade hotspot network											
17	ma...	srcnat	10.5.50.0/24							0 B	0

- /ip firewall nat print dynamic

Dynamic **Firewall** and **NAT** rules

MikroTik Login HotSpot Featured

- 1. Bandwidth Limitation (Rate Limit or Quota)**
- 2. HotSpot server login method**
- 3. Exception or Bypass HotSpot connection**
- 4. Custom Landing Pages**
- 5. Advertisement System**
- 6. Integrated with Social Media Login with API**

Case Study – Bandwidth Limitation



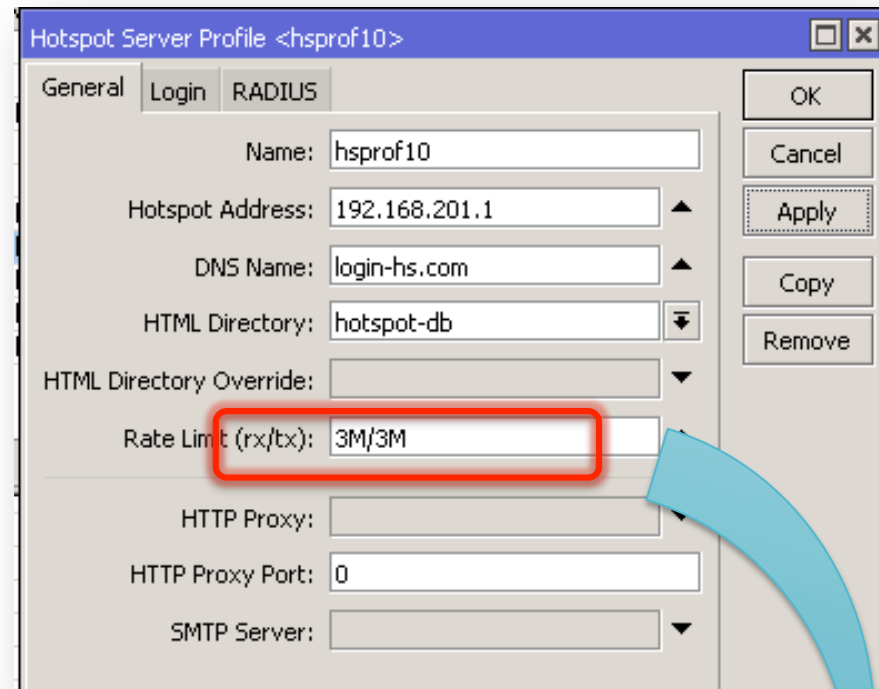
Limit Bandwidth on MikroTik Hotspots is very necessary

Method of MikroTik Hotspot Bandwidth limitation is :

- 1. built-in limiter** is the MikroTik Hotspot Limit Bandwidth method that uses a **rate-limit** parameter on the **hotspot servers profile** to protect the total traffic from a hotspot network while if you want a limit **per user** you can use the rate-limit in the **hotspot user profile**. Built-in Limitation is done automatically and easily but it is not possible to implement HTB.

Rate Limit on Profile Hotspot Server

built-in limiter



Hotspot Server Profile <hsprof10>

General Login RADIUS

Name: hsprof10

Hotspot Address: 192.168.201.1

DNS Name: login-hs.com

HTML Directory: hotspot-db

HTML Directory Override:

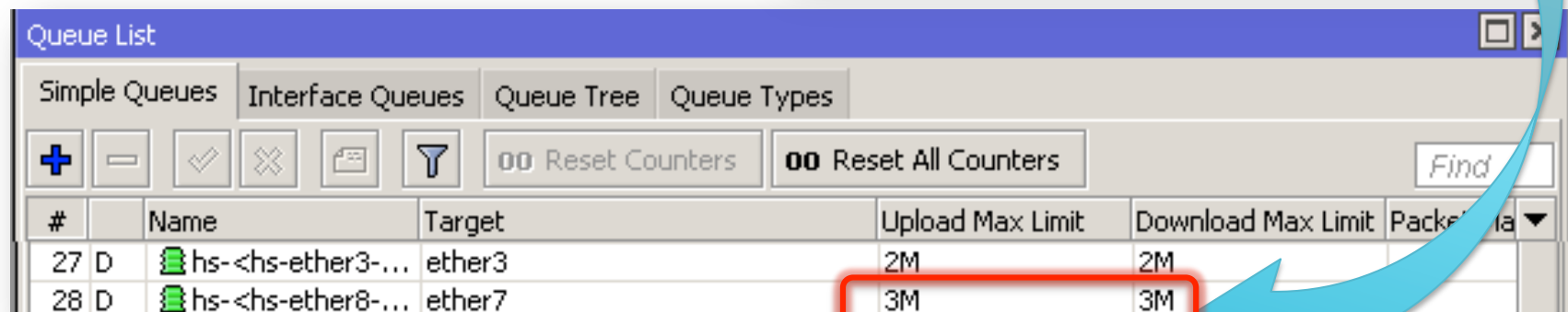
Rate Limit (rx/tx): 3M/3M

HTTP Proxy:

HTTP Proxy Port: 0

SMTP Server:

OK Cancel Apply Copy Remove



Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ [Filter Icon] [Reset Counters] [Reset All Counters] Find

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Size
27	D hs-<hs-ether3-...	ether3	2M	2M	
28	D hs-<hs-ether8-...	ether7	3M	3M	

Rate Limit on Hotspots User Profile

Hotspot User Profile <default>

General Queue Scripts

Name: default

Address Pool: none

Session Timeout:

Idle Timeout: none

Keepalive Timeout: 00:02:00

Status Autorefresh: 00:01:00

Shared Users: 1|00

Rate Limit (rx/tx): 1M/1M

OK Cancel Apply Copy Remove

built-in limiter

Hotspot

Server Profiles Users User Profiles Active Hosts IP Bindings Service Ports W

Name	Session Time...	Idle Timeout	Shared U...	Rate Limit (rx/tx)
default		none	100	1M/1M

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ [icon] [icon] 00 Reset Counters 00 Reset All Counters Find

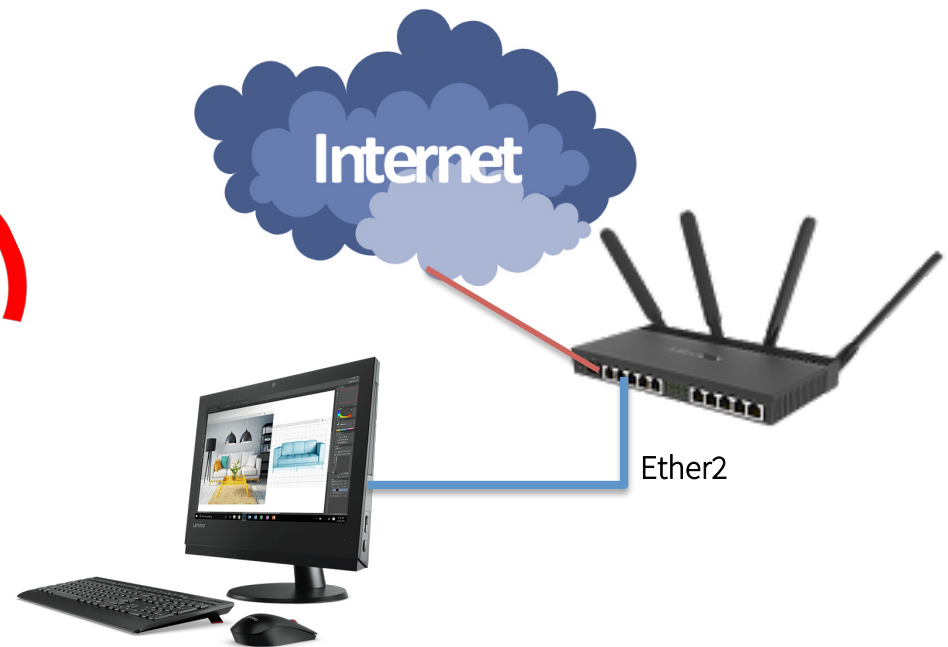
#	Name	Target	Upload Max Limit	Download Max Limit	Packet
0 D	<hotspot-user1>	192.168.202.61	1M	1M	

Case Study – Bandwidth Limitation

The Other Method of MikroTik Hotspot Bandwidth limitation is :

- 2. Custom limitation** is the MikroTik Hotspot Limit Bandwidth method that uses the **Incoming-packet-mark** and **outgoing-packet-mark** parameters In the **user-profile**. By using Custom Limitation you can implement HTB and make limitations based on more diverse connection criteria.

User Profile : Premium
Share bandwidth upload/download : 10M/5M



Case Study – Bandwidth Limitation

Bridge

Bridge Ports VLANs MSTIs Port MST Overrides Filters NAT Hosts MDB

+ - ✓ ✗ [icon] Settings

	Name	Type	L2 MTU	Tx	Rx
R	bridge1	Bridge	1598	776 bps	14.0 kbps

1

Bridge

Bridge Ports VLANs MSTIs Port MST Overrides Filters NAT Hosts MDB

+ - ✓ ✗ [icon] [icon]

#	Interface	Bridge	Horizon	Trusted	Priority (...)	Path Cost	Role	Root Pat...
1	ether2	bridge1		no	80	10	designated port	
0	wlan1	bridge1		no	80	10	designated port	

2

Hotspot

Servers Server Profiles Users User Profiles Active Hosts IP Bindin... ce Ports ...

+ - ✓ ✗ [icon] Reset HTML Hotspot Setup Find

Name	Interface	Address Pool	Profile	Adresse...
hotspot1	bridge1	hs-pool-4	hsprof1	2

3

- Case Study - Bandwidth Limitation

Hotspot User Profile <premium>

General Queue Advertise Scripts

4

Name: premium

Address Pool: none

Session Timeout: [dropdown]

Idle Timeout: none

Keepalive Timeout: 00:02:00

Status Autorefresh: 00:01:00

Shared Users: 10

Rate Limit (rx/tx): [dropdown]

Add MAC Cookie

MAC Cookie Timeout: 3d 00:00:00

Address List: [dropdown]

Incoming Filter: [dropdown]

Outgoing Filter: [dropdown]

Incoming Packet Mark: premium-incoming-packet

Outgoing Packet Mark: premium-outgoing-packet

Open Status Page: always

Transparent Proxy

OK Cancel Apply Copy Remove

New Hotspot User

General Limits Statistics

Server: all

Name: teddy

Password: teddy

Address: [dropdown]

MAC Address: [dropdown]

Profile: premium

Routes: [dropdown]

Email: [dropdown]

5

enabled

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

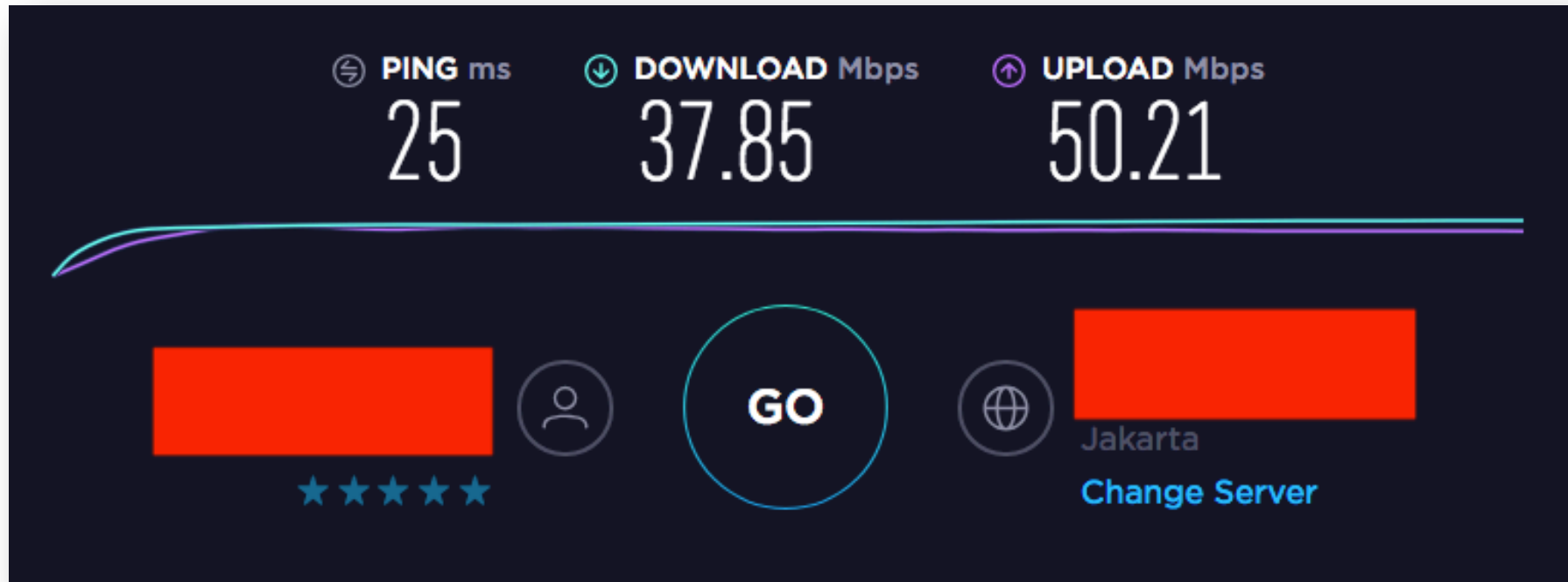
Firewall

Filter Rules NAT Mangle Raw Service Ports Connections Address Lists Layer7 Protocols

+ - [check] [x] [filter] [reset] [reset all]

#	Action	Chain	Src. Address	Dst. Address	Prot...	Src. Port	Dst. Port	In. Int...	Out. I...	Bytes	Packets
0	D mark packet	hotspot	10.5.50.251							0 B	0
1	D mark packet	hotspot		10.5.50.251						0 B	0
2	D mark packet	hotspot	10.5.50.254							0 B	0
3	D mark packet	hotspot		10.5.50.254						0 B	0

Case Study – Bandwidth Limitation



Unmetered & Unlimited Bandwidth

Case Study – Bandwidth Limitation



Important..!

Firewall

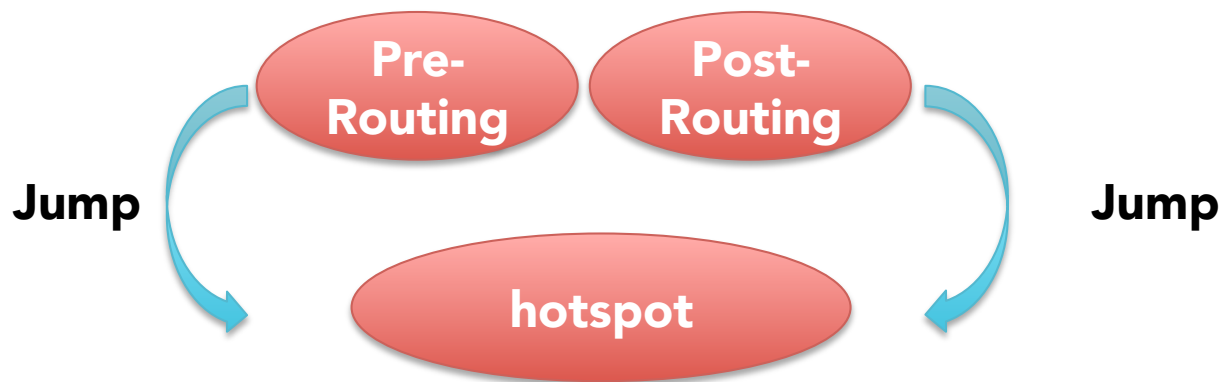
Filter Rules NAT Mangle Raw Service Ports Connections Address Lists Layer7 Protocols

6

+ - ✓ ✗ 📄 🗑️ ∞ Reset Counters ∞ Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Prot...	Src. Port	Dst. Port	In. Int...	Out. I...	Bytes	Packets
0	jump	prerouting						bridge1		375.4 MiB	478 115
1	jump	postrouting							bridge1	274.1 MiB	351 879

```
/ip firewall mangle
add action=jump chain=prerouting in-interface=bridge1 jump-target=hotspot
add action=jump chain=postrouting jump-target=hotspot out-interface=bridge1
```



Case Study – Bandwidth Limitation

The image displays two side-by-side screenshots of network queue configuration windows. The left window is titled "Queue <UPLOAD>" and the right window is titled "Queue <DOWNLOAD>". Both windows have a "General" tab selected and show the following configuration options:

- Name: UPLOAD (left) / DOWNLOAD (right)
- Parent: global
- Packet Marks: (empty)
- Queue Type: default
- Priority: 8
- Bucket Size: 0.100
- Limit At: (empty) bits/s
- Max Limit: 50M bits/s
- Burst Limit: (empty) bits/s
- Burst Threshold: (empty) bits/s
- Burst Time: (empty) s

Both windows include a set of control buttons on the right side: OK, Cancel, Apply, Disable, Comment, Copy, Remove, Reset Counters, and Reset All Counters. The status at the bottom of each window is "enabled". A blue circle with the number 7 is overlaid on the bottom right of the left window, and a blue circle with the number 8 is overlaid on the bottom right of the right window.

Case Study – Bandwidth Limitation

The image displays two screenshots of the Mikrotik WinBox interface, showing the configuration of two different queues. Both windows are titled 'New Queue' and have a 'General' tab selected.

Window 9: Upload-Premium-user

- Name: Upload-Premium-user
- Parent: UPLOAD
- Packet Marks: premium-incoming-packet
- Queue Type: default
- Priority: 8
- Bucket Size: 0.100
- Limit At: (empty) bits/s
- Max Limit: 10M bits/s
- Burst Limit: (empty) bits/s
- Burst Threshold: (empty) bits/s
- Burst Time: (empty) s

Window 10: Download-Premium-user

- Name: Download-Premium-user
- Parent: DOWNLOAD
- Packet Marks: premium-outgoing-packet
- Queue Type: default
- Priority: 8
- Bucket Size: 0.100
- Limit At: (empty) bits/s
- Max Limit: 5M bits/s
- Burst Limit: (empty) bits/s
- Burst Threshold: (empty) bits/s
- Burst Time: (empty) s

Both windows have a status bar at the bottom indicating 'enabled'. The 'Max Limit' field in both windows is highlighted in blue. A large blue circle with the number '9' is overlaid on the bottom right of the first window, and a similar circle with the number '10' is overlaid on the bottom right of the second window.

Result- Bandwidth Limitation

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ 📄 🏠

Name	Parent	Packet Marks	Limit At (...)	Max Limit...	Avg. Rate	Bytes	Packets	
DOWNLOAD	global			50M	229.7 k...	231.2 ...	287 811	
Download-Premium-user	DOWNLOAD	premium-outgoing-packet		5M	229.7 k...	231.2 ...	287 774	
UPLOAD	global			50M	10.0 Mbps	206.0 ...	537 702	
Upload-Premium-user	UPLOAD	premium-incoming-packet		10M	10.0 Mbps	204.9 ...	536 849	

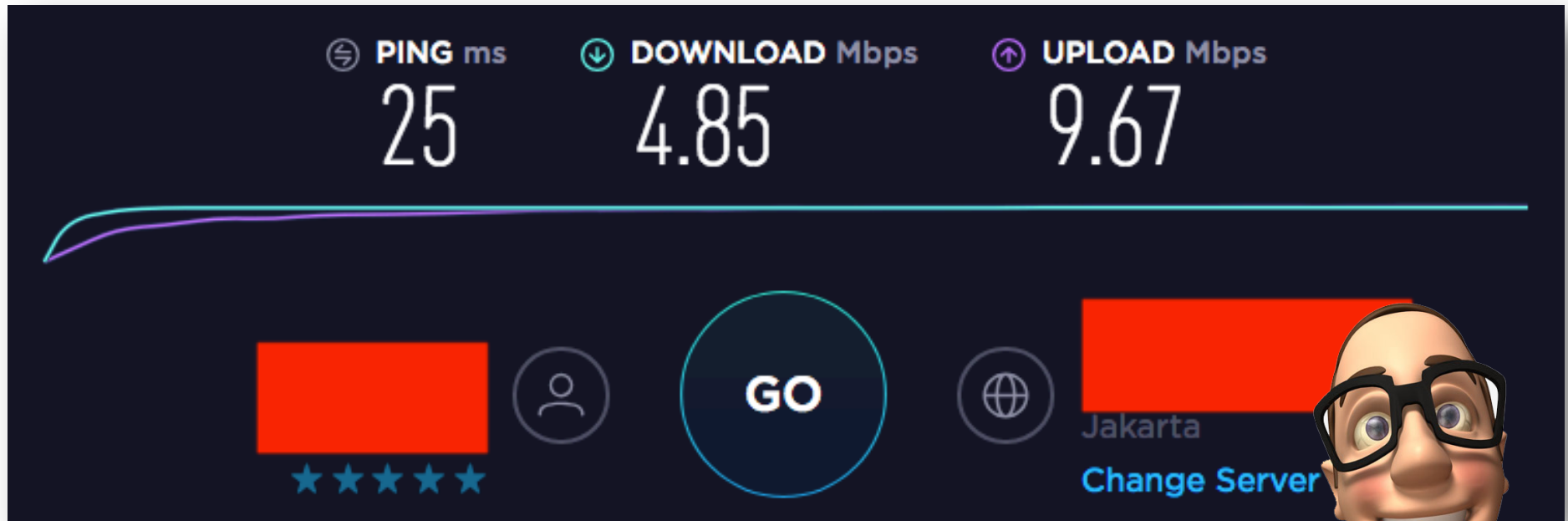
Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ 📄 🏠

Name	Parent	Packet Marks	Limit At (...)	Max Limit...	Avg. Rate	Bytes	Packets	
DOWNLOAD	global			50M	5.0 Mbps	210.3 ...	268 581	
Download-Premium-user	DOWNLOAD	premium-outgoing-packet		5M	5.0 Mbps	210.3 ...	268 551	
UPLOAD	global			50M	174.2 k...	194.9 ...	514 856	
Upload-Premium-user	UPLOAD	premium-incoming-packet		10M	120.5 k...	194.9 ...	514 474	

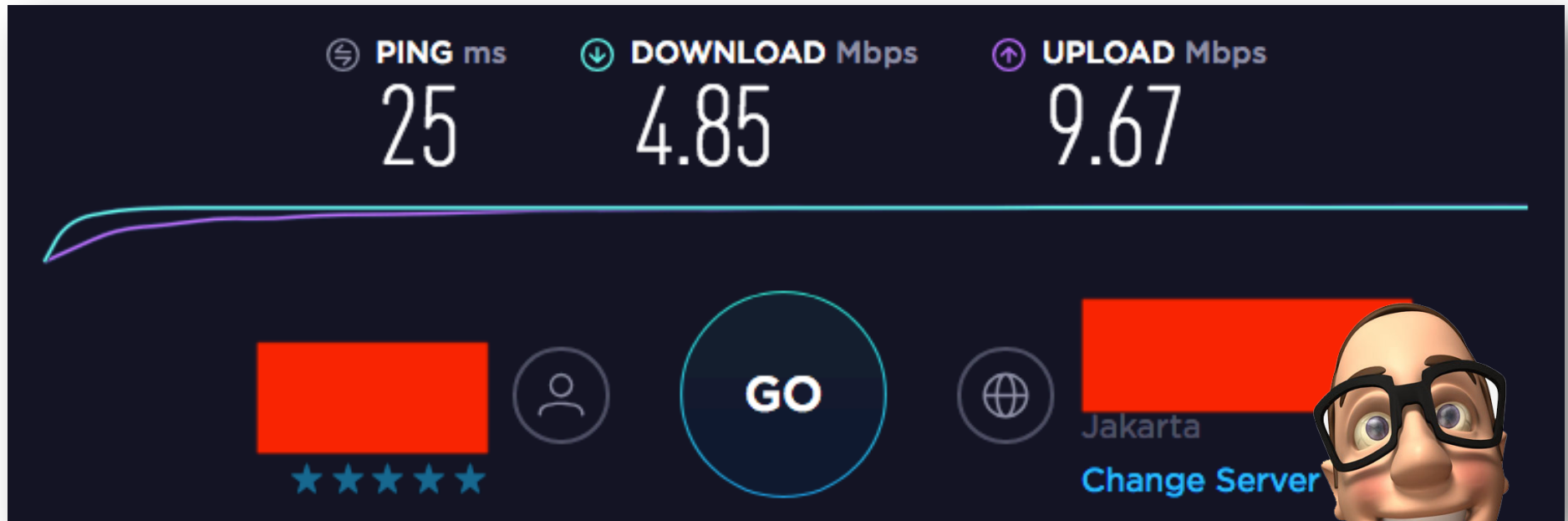
Result– Bandwidth Limitation



Testing result with just 1 user active, will be Shared bandwidth if more than 1 user active



Result– Bandwidth Limitation



Testing result with just 1 user active, will be Shared bandwidth if more than 1 user active





1. If Hotspot on Bridge, configure server on **bridge interface** not on the **bridge port**
2. Make correct **DNS name** for HotSpot server
3. **arp=enabled** for the interface

Get Presentation material and source code in :
<https://github.com/teddyuliswar/>

