# Routing statis dan jaringan point-to-point pakai wifi

# A. Teori

Routing static adalah menambahkan jalur routing tertentu secara manual. Mikrotik secara default akan membuat jalur routing otomatis (dynamic route) ketika kita menambahkan ip address pada interface

# **B.** Pratik

- 1. Instlasi Jaringan
  - Pasang 2 Router R951Ui-2HND, 2 kabel UTP
  - Hubungkan masing-masing **ethernet1** ke jaringan lokal atau ke PC, seperti pada gambar berikut:



# ROUTER 1

# 1. Reset System

• Sebelum melakukan konfigurasi lakukan Reset System, seperti pada gambar di bawah ini:

	History	
Queues	Identity	Reset Configuration
Files	LEDs	Keep User Configuration Reset Configuration
📄 Log	License	CAPS Mode Cancel
🧟 RADIUS	Logging	No Default Configuration
🎇 Tools 🛛 🗅	Packages	Bun After Reset:
New Terminal	Ports	num nie neset.
Dot 1X	Reboot	
MetaROUTER	Reset Configuration	1

• Atau dengan *command line* 

[admin@MikroTik] > system reset-configuration

# 2. Hapus wlan1 dan ether2 dari bagian Brige

- Klik Bridge
- Klik tab Ports
- Klik ether2
- Klik X dan 💻
- Klik wlan1
- Klik 🗶 dan 💻 , seperti pada gambar berikut:



# 3. Konfigurasi WLAN di Router 1

Tambahkan IP address pada wlan1 dengan langkah berikut:

• Klik IP

- Klik Address
- Klik Add (+)
- Address : **192.168.1.1/24**
- Network **192.168.1.0**
- Interface : wlan1
- Klik OK
- Seperti pada gambar berikut:

1 CAPsMAN			
🔚 Interfaces	Wireless Tables	A 11	
1 Wireless	Interface List		
📲 Bridge	Interface Interface List		Find Bonding
📑 PPP	+ <b>*</b> ×	Address < 192. 168. 1. 1/24>	Find
📟 Switch	Name 🛆	Address: 192.168.1.1/24	OK Rx V
■T <mark>=</mark> Mesh	;;; defconf	Network: 192.168.1.0	Cancel
255 IP 🗅	R 1=1bridge	Interface: w/an 1 ∓	Apply 0 bos
🖉 MPLS 🛛 🗅	RS <>ether2		kbps
😹 Routing 🛛 🗅	S <>ether3		Disable 0 bps
60≱ Svstem ►	S 4;>ether5		Comment O bps
Queues	S 🚸wlan1		Copy 0 bps
Files			Remove
E Log			
🥵 RADIUS		enabled	
🎇 Tools 🛛 🗅		<b>2 1 1 1 1</b>	
New Terminal		Z items (1 selected)	
🛃 MetaROUTER	A     Theme (1 colorida)		•
🕒 Partition	/ items (1 selected)		

# 4. Seting accses point bridge ap-bridge

Untuk mengkonfigurasi access point brige seperti pada langkah berikut:

- Klik Wireless
- Pada Wireless tables
- Double klik wlan1
- Interface <wlan1> pilih tab Wireless

Isikan:

- Mode:ap bridge
- Frequency: 1412 Mhz. (bedakan dengan kelompok lain jika berdekatan)
- **SSID**: WLAN BADI (bisa diisi sendiri sesuai yang diinginkan)

Seperti pada gambar berikut:

	Interface <wlan1></wlan1>		
	General Wireless H	T HT MCS WDS Nstreme	ОК
	Mode:	ap bridge 🛛 🔻	Cancel
	Band:	2GHz-B/G/N ₹	Apply
	Channel Width:	20/40MHz XX 🗧	Disable
	Frequency:	2412 <b>T</b> MHz	Comment
	SSID:	WLAN_BADI	Torch
	Frequency Mode:	regulatory-domain 🗧	WPS Accent
e	Country:	indonesia3 Ŧ	WPS Client
	Installation:	any	Setup Repeater
1	Antenna Gain:	0 dBi	Serup Nepearer
	Default AP Tx Limit:	▼ bps	Scan
	Default Client Tx Limit:	▼ bps	Freq. Usage
		Default Authenticate	Align
		<ul> <li>Default Forward</li> </ul>	Sniff
			Snooper
			Reset Configuration
			Advanced Mode

# 5. Menambahkan IP address pada ether1

Untuk menambahkan ip address pada port ether1 seperti pada lanngkah berikut:

- Pilih menu IP
- Klik Addresss
- Klik Add(+)
- Isikan Address : 2.2.2.1/24
- Mask : 2.2.2.0
- Interface : ether1,
- Klik **OK**, seperti pada gambar berikut:

encye PPP	ARP	/468	48 1.5M			
25 Swtch	Accounting	+		¥ 🖪 🛛		-
(8 Mesh	Addresses	1	Address <2	2.2.1/245		
HIP I	Cloud		Address:	2.2.2.1/24		OK
MPLS 1	DHCP Client		Network:	2220		Cancel
📽 Routing 👘	DHCP Relay		Interface:	ether1	Ŧ	Apply
Svstem 1	DHCP Server					Disable
						Comment
						Сору
						Remove
						righte

# ROUTER 2

#### 1. Reset System

• Sebelum melakukan konfigurasi lakukan **Reset System**, seperti pada gambar di bawah ini:



• Atau dengan *command line* 

[admin@MikroTik] > system reset-configuration

- 2. Hapus wlan1 dan ether2 dari bagian Brige
- Klik Bridge
- Klik tab Ports
- Klik ether1
- Klik X dan 💻
- Klik wlan1
- Klik 💌 dan 💻 , seperti pada gambar berikut:

_	blidge				
📜 Wireless	Bridge	Ports VLA	Ns MSTIs	Port MST Overrid	des Filte
📲 🖁 Bridge				2	
🚅 PPP					
💬 Switch	#	Interface	Br	idge	Horizon
	::: defo	conf			
°t¦8 Mesh	0 IH	44 ether2	br	idge	
255 IP	;;; defo	conf			
	1 IH	44ether3	br	idge	
🖉 MPLS 💦 🗅	;;; defo	conf		-	
😹 Routing 💦 👌	2 IH	11 ether4	br	idge	
- Housing	::: defo	conf			
🎲 System 🗈	3 IH	4-ther5	br	idge	
🙊 Queues					
📄 Files					
E Log	4 items				

# 3. Konfigurasi WLAN di Router 2

Tambahkan IP address pada wlan1 dengan langkah berikut:

- Klik IP
- Klik Address
- Klik Add (+)
- Address : 192.168.1.2/24
- Network **192.168.1.0**
- Interface : wlan1
- Klik OK
- Seperti pada gambar berikut:

anuge		
PPP	ARP	Address List
🕎 Switch	Accounting	
C Mesh	Addresses —	
	Cloud	Address (192,168,1,2/24)
	DHCP Client	
Deution N	DHCP Relay	Address: 192.168.1.2/24 OK
	DHCP Server	Network: 192.168.1.0  Cancel
System 1	DNS	Interface: wlan1 F Apply
🕎 Queues	Finewall	
Files	Hatenat	Disable
Log	IDaaa	Comment
ADIUS	Irsec	Conv
🄀 Tools 🔹 🗈	Kid Control	Сору
New Terminal	Neighbors	Remove
Dot 1X	Packing	a number

#### 4. Seting accses point station

Untuk mengkonfigurasi access point brige seperti pada langkah berikut:

- Klik Wireless
- Pada Wireless tables
- Double klik wlan1
- Interface <wlan1> pilih tab Wireless

Isikan:

- Mode:station
- Frequency: 1412 Mhz. (bedakan dengan kelompok lain jika berdekatan)
- **SSID**: WLAN BADI (bisa diisi sendiri sesuai yang diinginkan)

Seperti pada gambar berikut:

Interface <wlan1></wlan1>							
General Wireless D	ata Rates	Advanced	HT	HT MCS	WDS		
Mode:	station					₹	ОК
Bandt	2GHz-B/G	E/N				ī	Cancel
Characterite	20112-0/0						Apply
Channel Width:	20/40MH	2					Disable
Frequency:	2412				Ŧ	MHz	Disable
SSID:	WLAN_B	ADI				_ ▲	Comment
Radio Name:	744D28E	D23E9					Simple Mode
Scan List:	default					∓ \$	Torch
Wireless Protocol:	802.11					₹	WPS Accept
Security Profile:	default					₹	WPS Client
Frequency Mode:	manual-txp	oower				∓	Setup Repeater
Country:	no_countr	y_set				₹	Scan
Installation:	indoor					₹	Freq. Usage
Antenna Gain:	0					dBi	Align
WMM Support:	disabled					Ŧ	Sniff
Station Roaming:	enabled					<b>T</b>	Snooper
							Reset Configuration

# 5. Menambahkan IP address pada ether1

Untuk menambahkan ip address pada port **ether1** seperti pada lanngkah berikut:

- Pilih menu IP
- Klik Addresss
- Klik Add(+)
- Isikan Address : **3.3.3.1/24**
- Mask : **3.3.3.0**
- Interface : ether1,
- Klik **OK**, seperti pada gambar berikut:

PPP	ARP	Adder	1000				
witch	Accounting		_	* 0 7	1	100	_
Mesh	Addresses				1	[ FIDG	) 
IS IP	Cloud	- 3	odiess	7 Invetwork	_	Interface	
2 MPIS	DHCP Client		NULL GES VI	1	1		
Renting 1	DHCP Relay		Address.	3.3.3.1/24		ОК	
S Rodang	DHCP Server		Network:	3.3.3.0	•	Cancel	Ľ
System (	DNS		Interface:	ether1	Ŧ	Apply	
- vueues	Firewall						
- hies	Hotspot					Disable	
Log	IPsec					Comment	
RADIUS	Kid Control					Сору	
🗙 Tools 👘	Mainhham					Damoura	
New Terminal	negroots 0					rveinove	
Dot1X	Packing	3 item	enabled				
and a source	Pool	-					-

# **Melakukan Routing**

# 1. Routing Static di ROUTER 1

Agar supaya jaringan bisa saling koneksi buatlah routing Router 1 ke Router 2 seperi langkah berikut:

- Klik IP
- Klik Routers
- Klik Add (+)
- New Rule pilih Tab General
- Dst Address : 3.3.3.0/24 (alamat jaringan tujuan)
- Gateway : 192.168.1.2 (lewat port vlan1 ROUTER1),
- Klik **OK** seperti gambar berkut:

C Mesh	Ac	scountin	9			©-
UP IP	r Ac	dresses				
@ MPLS	1 0	OL Routes	Nexthops Rules VRF.	With the last		121
Routing	1 0	+	T	General Initial	401	
G System	1 0	V	Det. Address / Gatewo	ALLOW ALLOW	0.000	
Queues	D	DAC	▶ 2.2.2.6/24 ether11 ▶ 192.168.1.6/24 bridge in	Die Address	3.3.3.0/24	
Files	D	DAC	▶ 192,168,88.0/. bridge r	Garway	132.150.1.2	1.41
Log	Fi			Check Gateway		
RADIUS	н	0		Type:	unicest	
Tools	r IP	se.		Distance:		
New Termina	ю	4		Scope:	30	
MetaBOLITER	- N	-		Target Scope	10	
Dadžina	Fe	20		Routing Mark:		
	1 po			Pref. Source:	[	
Make Supout	R	a l Rema				
Manual 😡		-0		-		-0
Est.	51	NMP				

# 2. Routing Static di ROUTER 2

Agar supaya jaringan bisa saling koneksi buatlah routing Router 2 ke Router 1 seperi langkah berikut:

- Klik IP
- Klik Routers
- Klik Add (+)
- New Rule pilih Tab General
- Dst Address : 2.2.2.0/24 (alamat jaringan tujuan)
- Gateway : 192.168.1.1 (lewat port vlan1 ROUTER1),
- Klik **OK** seperti gambar berkut:

PPP	ADE	
🕎 Switch	Accounting	Routes Nexthops Rules VRF Boute (22.2.0/24)
°te Mesh	Addresses	🔹 🗕 🖌 🗶 🗂 🍸 General Attributes
ESS IP	Cloud	Dst. Address / Gatew Dst. Address: 2.2.2.0/24
MPLS N	DHCP Cliert	S         F 2 2 2 0/24         ISC 1           DC         ▶ 3.3.30/24         ether1         Gateway: 192.168.1.1         ▼
Routing	DHCP Relay	DAC ▶ 192.168.10/24 bnoge DAC ▶ 192.168.88.0/ bridge Check Gateway:
all System	DHCP Server	Type: unicast
Cueues	DNS	Distance: 1
Files	Firewall	Scope: 30
	Hotspot	Target Scope: 10
	IPsec	Routing Mark:
Y Toole	Kid Control	4 items (1 selected) Pref. Source:
New Terminal	Neighbors	
New Terminal	Packing	
	Pool	enabled
Partition	Routes	

# 3. Setting IP address PC di Router 1

Tambahkan alamat IP secara menual (statik) seperti pada gambar beriut:

Internet Protocol Version 4 (TCP/IPv4) Properties	×
General	
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	
ODtain an IP address automatically	
Use the following IP address:	
<u>I</u> P address: 2 . 2 . 2 . 2	
Subnet mask: 255 . 255 . 255 . 0	
Default gateway: 2 . 2 . 2 . 1	
Obtain DNS server address automatically	
• Use the following DNS server addresses:	
Preferred DNS server:	
Alternate DNS server:	
Validate settings upon exit Advanced	
OK Cancel	

# 4. Setting IP address PC di Router 2

Tambahkan alamat IP secara menual (statis) seperti pada gambar beriut:

Internet Protocol Version 4 (TCP/IPv4)	Properties	$\times$			
General					
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	atically if your network supports ask your network administrator	1			
Obtain an IP address automatical	у				
• Use the following IP address:					
IP address:	3.3.3.2				
Subnet mask:	255.255.255.0				
Default gateway:	3.3.3.1				
Obtain DNS server address autom	atically				
Use the following DNS server add	'esses:				
Preferred DNS server:	0.0.0.0				
<u>A</u> lternate DNS server:					
Valjdate settings upon exit Advanced					
	OK Cano	el			

• Pengunjian dari ping PC IP 3.3.3.2 ke 2.2.2.2

```
Select Command Prompt
                                                               ×
C:\Users\Badi>ping 2.2.2.1
                                                *
Pinging 2.2.2.1 with 32 bytes of data:
Reply from 2.2.2.1: bytes=32 time=15ms TTL=63
Reply from 2.2.2.1: bytes=32 time=17ms TTL=63
Ping statistics for 2.2.2.1:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
   Minimum = 15ms, Maximum = 17ms, Average = 16ms
Control-C
^C
C:\Users\Badi>ping 2.2.2.2
Pinging 2.2.2.2 with 32 bytes of data:
Reply from 2.2.2.2: bytes=32 time=23ms TTL=126
Reply from 2.2.2.2: bytes=32 time=18ms TTL=126
Reply from 2.2.2.2: bytes=32 time=3ms TTL=126
Reply from 2.2.2.2: bytes=32 time=2ms TTL=126
Ping statistics for 2.2.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
   Minimum = 2ms, Maximum = 23ms, Average = 11ms
C:\Users\Badi>
```

5. Melihat Routing tabel di Router 1

```
[admin@MikroTik] > ip route print
Flags: X - disabled, A - active, D - dynamic,
```

```
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
       DST-ADDRESS
#
                         PREF-SRC
                                                            DISTANCE
                                          GATEWAY
0 A S 2.2.2.0/24
                                          192.168.1.1
                                                                   1
1 ADC 3.3.3.0/24
                                          ether1
                                                                   0
                          3.3.3.1
2 ADC 192.168.1.0/24
                                                                   0
                          192.168.1.2
                                          wlan1
 3 ADC 192.168.88.0/24
                          192.168.88.1
                                          bridge
                                                                   0
```

6. Melihat Routing tabel di Router 2

[admin@MikroTik] > <b>ip route print</b>				
Flags: X - disabled, A - active, D - dynamic,				
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,				
B - blackhole, U - unreachable, P - prohibit				
#	DST-ADDRESS	PREF-SRC	GATEWAY	DISTANCE
0 ADC	2.2.2.0/24	2.2.2.1	ether1	0
1 A S	3.3.3.0/24		192.168.1.2	1
2 ADC	192.168.1.0/24	192.168.1.1	wlan1	0
3 ADC	192.168.88.0/24	192.168.88.1	bridge	0