

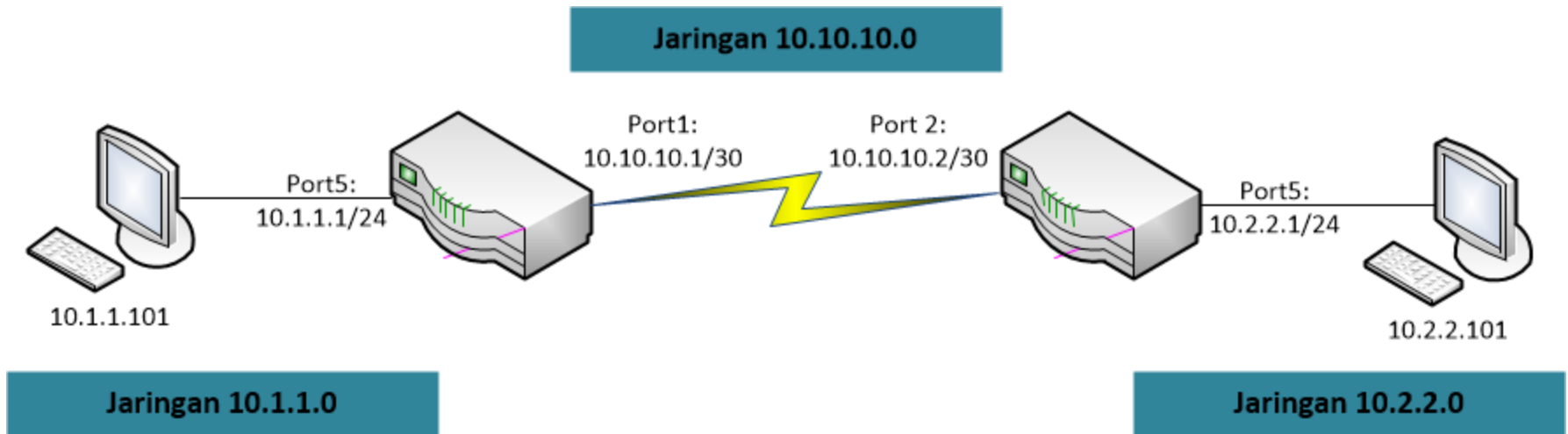
Praktek Mikrotik (*Routing & Access Point*)

husni

Jumat, 19 Desember 2014



Scenario 1: Dasar Routing



Konfigurasi IP di PC 01

- Berikan IP Address sesuai gambar Ethernet (LAN) Card untuk PC

Internet Protocol Version 4 (TCP/IPv4) Properties ? [X]

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.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 10 . 1 . 1 . 101

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 10 . 1 . 1 . 1

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: 202 . 134 . 0 . 155

Alternate DNS server: . . .

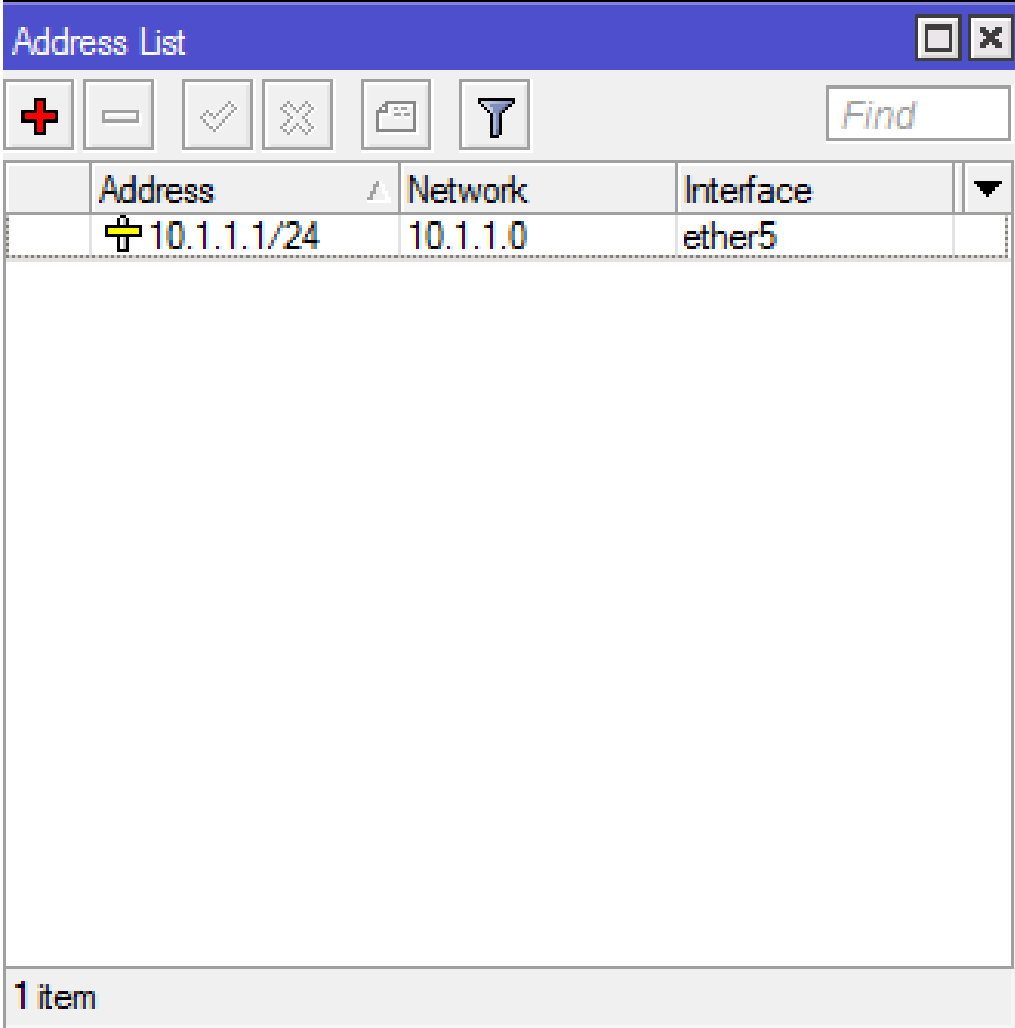
☐ Validate settings upon exit

Advanced...

OK Cancel

Router 1: IP Address Ether 5

- Klik IP >> Address
- Klik tanda +
- Berikan IP Address 10.1.1.1/24 untuk interface Ether5



Address	Network	Interface
+ 10.1.1.1/24	10.1.1.0	ether5

1 item

Test Koneksi PC ke Router 1

- Buka console dan gunakan perintah ping

```
C:\Users\husni>ping 10.1.1.1
```

Pinging 10.1.1.1 with 32 bytes of data:

Reply from 10.1.1.1: bytes=32 time<1ms TTL=64

Reply from 10.1.1.1: bytes=32 time<1ms TTL=64

Reply from 10.1.1.1: bytes=32 time<1ms TTL=64

Reply from 10.1.1.1: bytes=32 time<1ms TTL=64

Ping statistics for 10.1.1.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

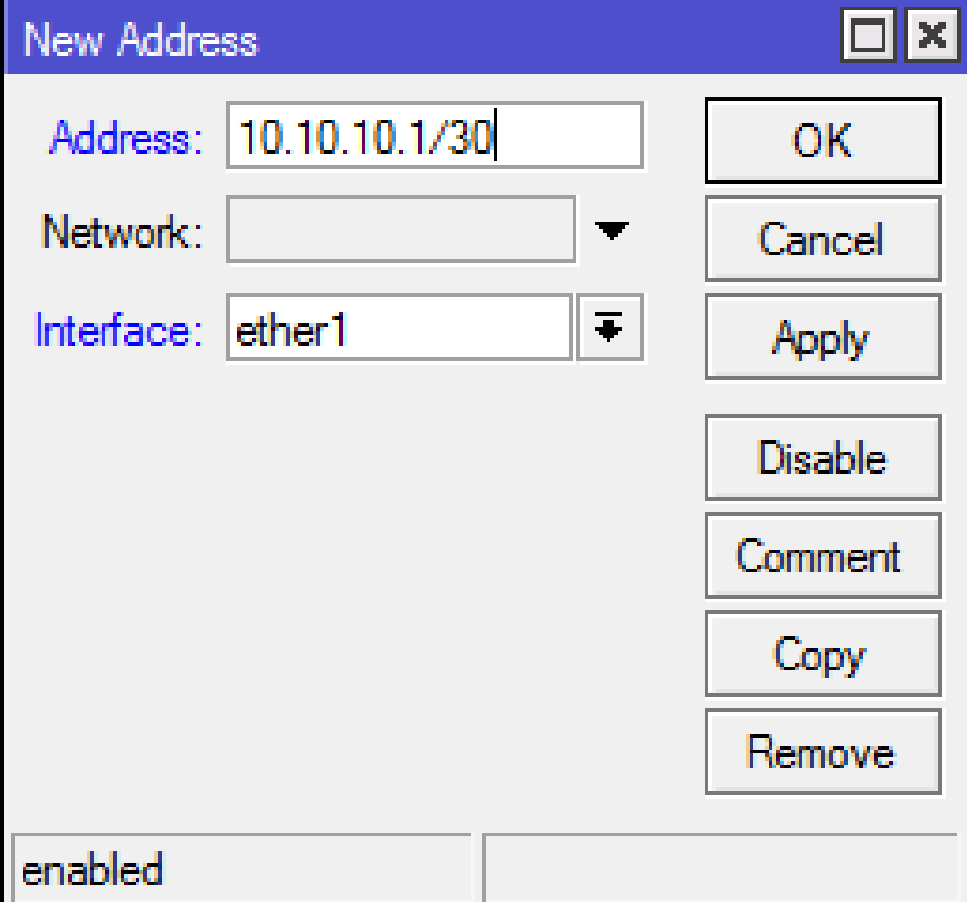
Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms



Router 1: IP Address Ether 1

- IP >> Address
- Klik +
- Berikan IP Address 10.10.10.1/30 untuk interface Ether1

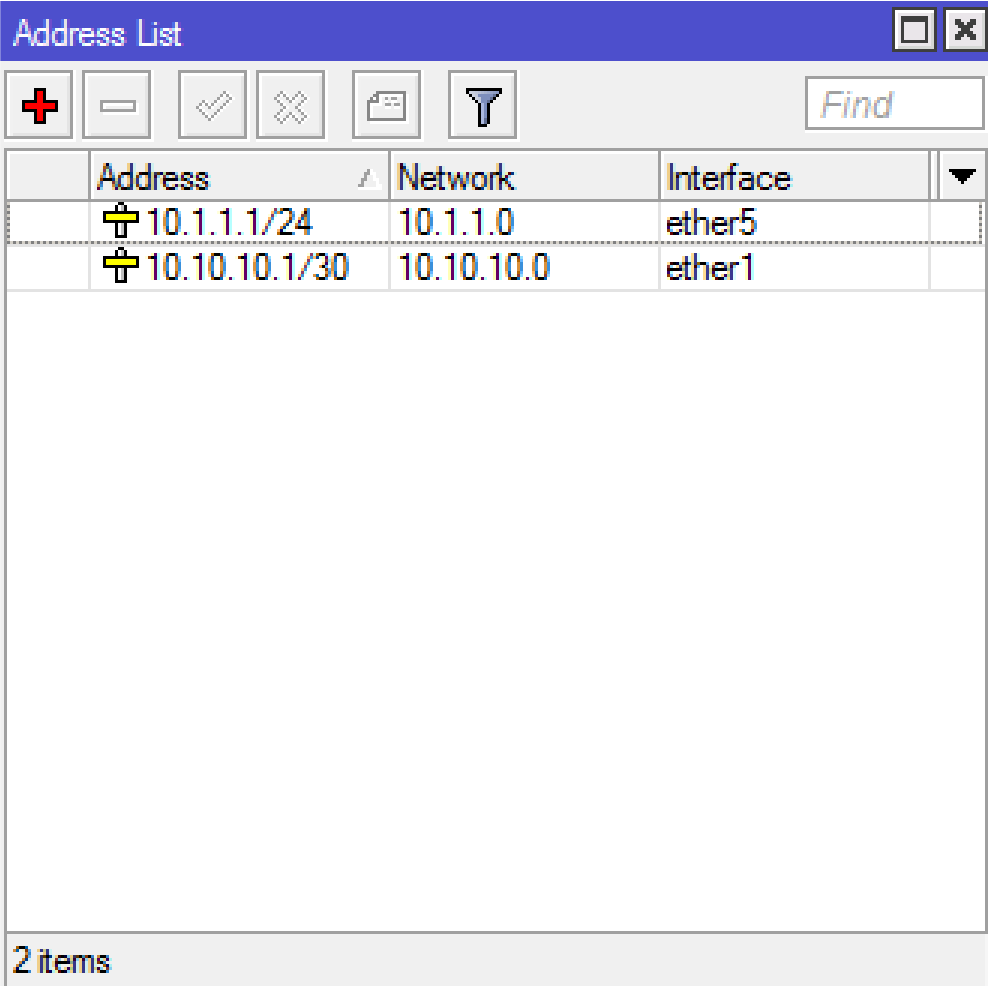


A screenshot of a 'New Address' dialog box from a network configuration tool. The dialog has a blue title bar with the text 'New Address' and standard window controls. It contains three input fields: 'Address' with the value '10.10.10.1/30', 'Network' which is empty, and 'Interface' with the value 'ether1'. To the right of these fields are several buttons: 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'. At the bottom left, there is a checkbox labeled 'enabled' which is currently checked.

New Address	
Address:	10.10.10.1/30
Network:	
Interface:	ether1
OK	
Cancel	
Apply	
Disable	
Comment	
Copy	
Remove	
enabled	

Ether1 dan Ether5 di Router 1

- Dua interface Ether1 dan Ether5 sudah diberikan IP Address, sesuai scenario.



	Address	Network	Interface	
	10.1.1.1/24	10.1.1.0	ether5	
	10.10.10.1/30	10.10.10.0	ether1	

2 items

Uji Koneksi ke Ether1 dari Router 1

- C:\Users\husni>**ping 10.10.10.1**

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time<1ms TTL=64

Reply from 10.10.10.1: bytes=32 time<1ms TTL=64

Reply from 10.10.10.1: bytes=32 time<1ms TTL=64

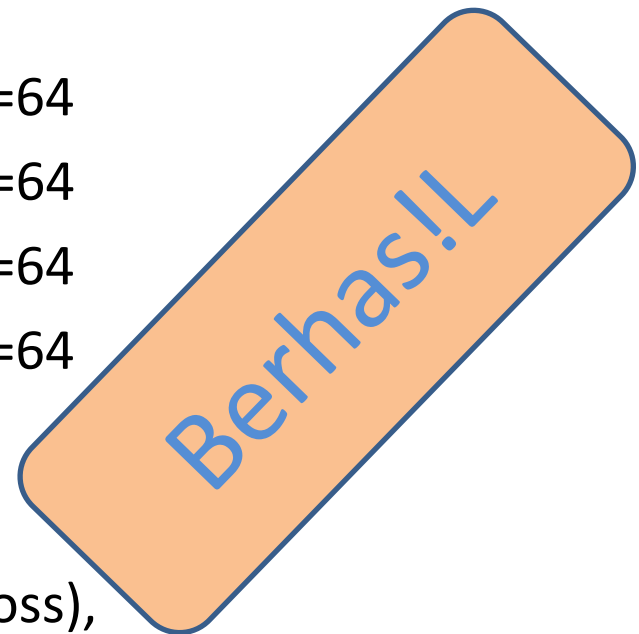
Reply from 10.10.10.1: bytes=32 time<1ms TTL=64

Ping statistics for 10.10.10.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

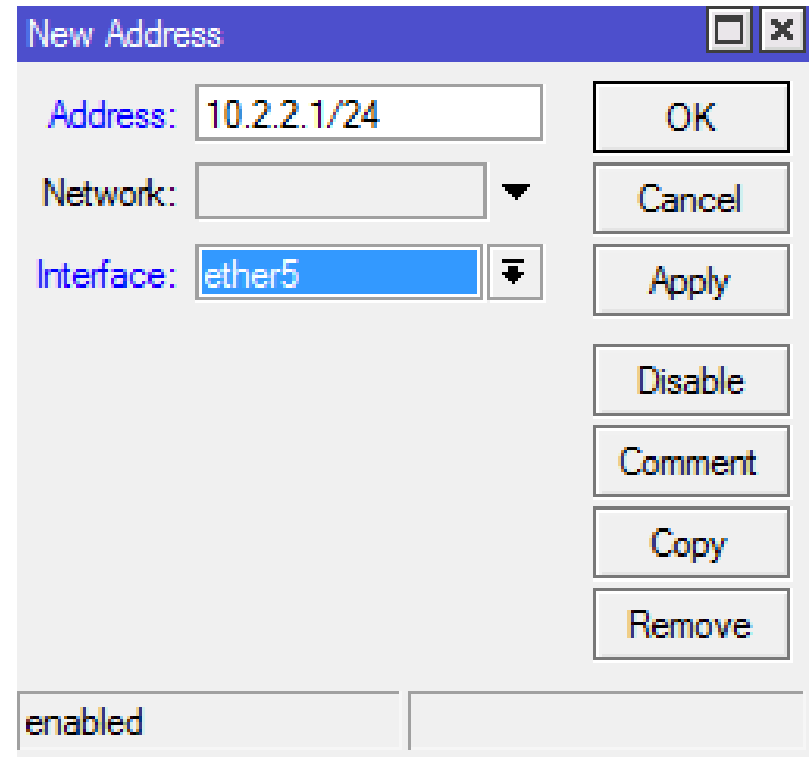
Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms



Router 2: IP Address Ether 5

- Ether5 pada Router 2 terhubung ke PC (10.2.2.101). Jadi berikan IP Address untuk PC sebelum Ether5 ini.



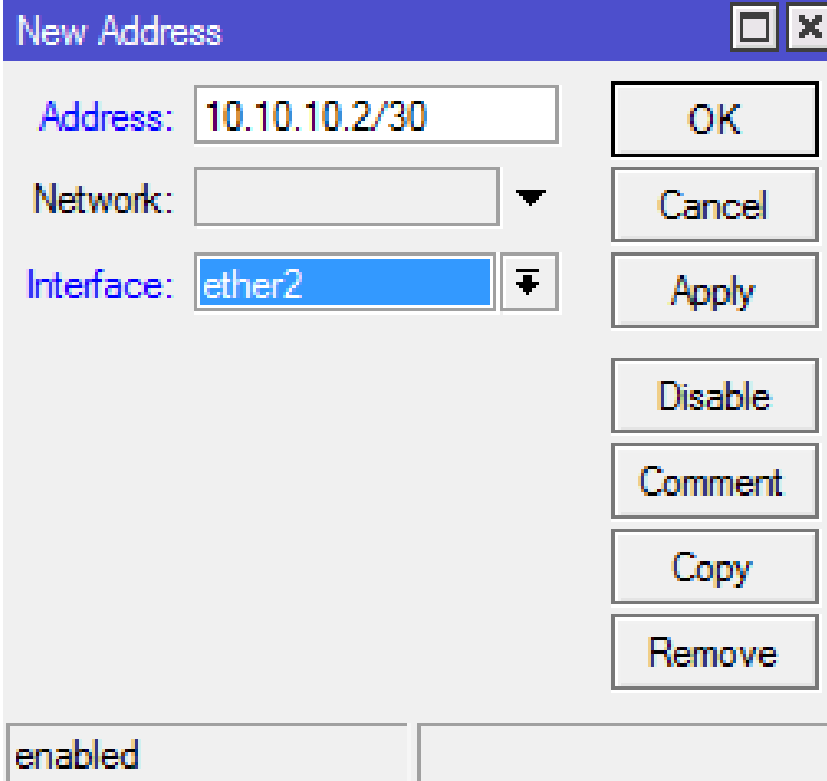
A screenshot of a 'New Address' dialog box. The dialog has a title bar with a blue gradient and standard window controls. It contains three input fields: 'Address' with the value '10.2.2.1/24', 'Network' which is empty, and 'Interface' with the value 'ether5'. To the right of these fields are several buttons: 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'. At the bottom left, there is a checkbox labeled 'enabled' which is currently checked.

Address:	10.2.2.1/24
Network:	
Interface:	ether5

enabled

Router 2: IP Address Ether 2

- Ether2 adalah interface yang terhubung ke Ether1 pada Router 1 (10.10.10.1/30).



A screenshot of a 'New Address' configuration window. The window has a blue title bar with the text 'New Address' and standard window control buttons (minimize, maximize, close). The main area contains three input fields: 'Address:' with the value '10.10.10.2/30', 'Network:' which is empty, and 'Interface:' with the value 'ether2'. To the right of these fields are several buttons: 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'. At the bottom left, there is a checkbox labeled 'enabled' which is currently checked.

Address:	10.10.10.2/30
Network:	
Interface:	ether2
<input checked="" type="checkbox"/> enabled	

Router 1: Test ping ke Router 2

- Pada Router 1, klik Tools >> Ping.

Router 1
berhasil terhubung ke
Router 2...

Ping (Running)

General Advanced

Ping To: 10.10.10.2

Interface: ▼

☐ ARP Ping

Packet Count: ▼

Timeout: 1000 ms

Start Stop Close New Window

Seq # /	Host	Time	Reply Size	TTL	Status
2	10.10.10.2	0ms	50	64	
3	10.10.10.2	0ms	50	64	
4	10.10.10.2	0ms	50	64	
5	10.10.10.2	0ms	50	64	
6	10.10.10.2	0ms	50	64	
7	10.10.10.2	0ms	50	64	
8	10.10.10.2	0ms	50	64	
9	10.10.10.2	0ms	50	64	
10	10.10.10.2	0ms	50	64	
11	10.10.10.2	0ms	50	64	
12	10.10.10.2	0ms	50	64	
13	10.10.10.2	0ms	50	64	
14	10.10.10.2	0ms	50	64	
15	10.10.10.2	0ms	50	64	
16	10.10.10.2	0ms	50	64	

17 items 17 of 17 packets received 0% packet loss Min: 0 ms Avg: 0 ms Max: 10 ms

Uji koneksi PC ke Router 2

- Gunakan ping untuk melihat apakah IP Address 10.2.2.1 dan 10.10.10.2 dapat dihubungi.
- Ping 10.2.2.1
- Ping 10.10.10.2
- Coba ping 10.10.10.1 dan 10.1.1.1. Berhasil?

Router 1: Pengaturan Routing

New Route

General Attributes

Dst. Address: 10.2.2.0/24

Gateway: 10.10.10.2

Check Gateway:

Type: unicast

Distance:

Scope: 30

Target Scope: 10

Routing Mark:

Pref. Source:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

enabled active

- Klik IP >> Routes. Klik +
- Masukkan rute untuk mencapai jaringan 10.2.2.0/24

Router 2: Pengaturan Routing

- Tentukan rute untuk menuju jaringan 10.1.1.0/24

New Route

General Attributes

Dst. Address: 10.1.1.0/24

Gateway: 10.10.10.1

Check Gateway: ☐

Type: unicast

Distance:

Scope: 30

Target Scope: 10

Routing Mark:

Pref. Source:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

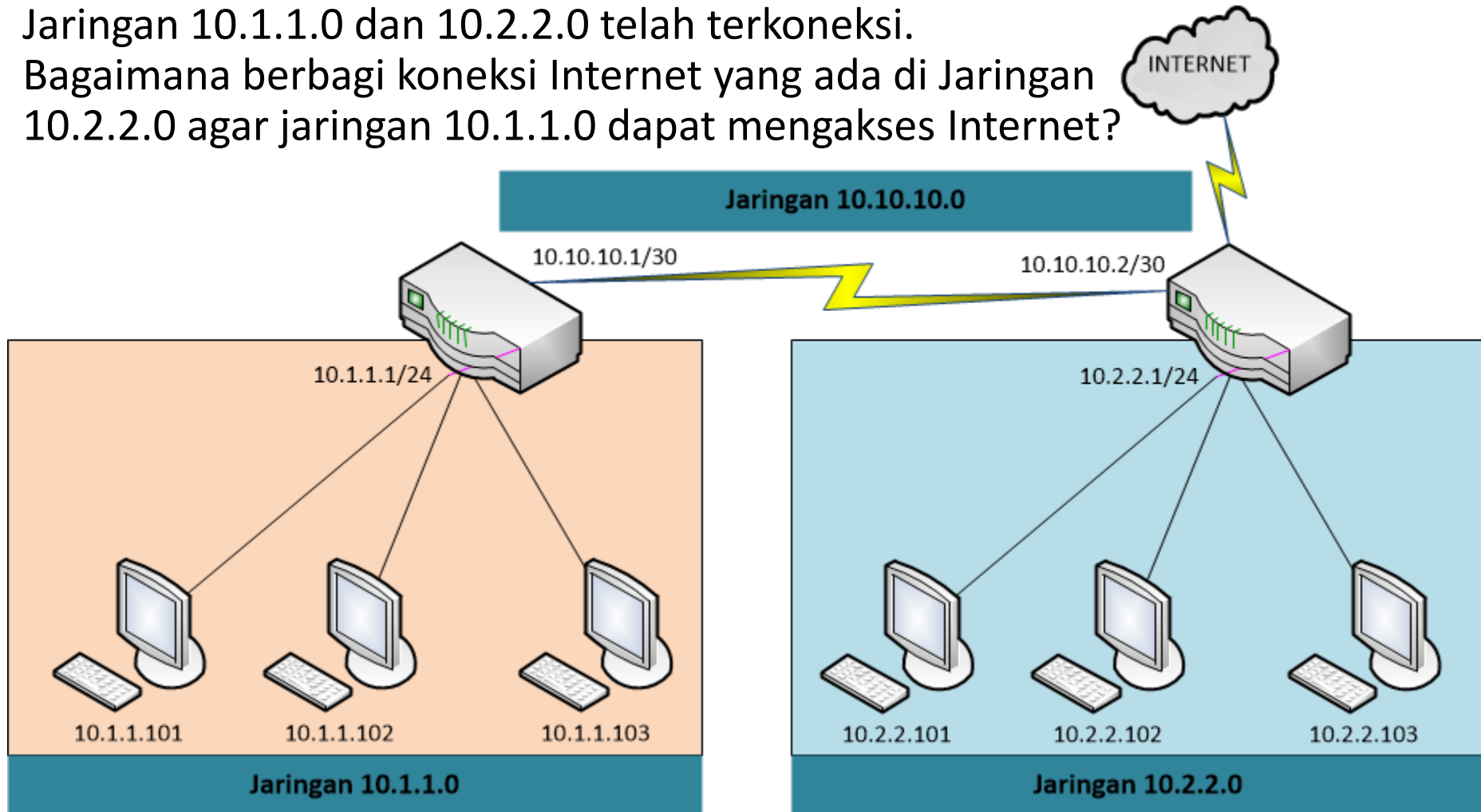
enabled active

Test Koneksi

- Apakah ping dari PC 1 (10.1.1.101) ke PC 2 (10.2.2.101) berhasil?
- Harusnya, sesuai dengan konfigurasi Routing, dua jaringan (10.1.1.0 dan 10.2.2.0) sudah dapat terkoneksi dan dapat saling berbagi data.
- Jika tidak berhasil, ada kemungkinan fitur Firewall di PC tujuan ping menolak protokol ICMP. Matikan fitur Firewall tersebut.

Scenario 2: Koneksi Antar Lokasi (Jaringan, *Wire*)

Jaringan 10.1.1.0 dan 10.2.2.0 telah terkoneksi.
Bagaimana berbagi koneksi Internet yang ada di Jaringan 10.2.2.0 agar jaringan 10.1.1.0 dapat mengakses Internet?



Router 2: IP Address untuk Ether1

- Ether1 akan dihubungkan ke Internet, misal ke Speedy dan IP addressnya diperoleh secara dinamis (DHCP Client)
- Klik IP >> DHCP Client. Klik + dan sesuaikan dengan gambar di sebelah!

New DHCP Client

DHCP | Status

Interface: ether1

Hostname:

Client ID:

☒ Use Peer DNS

☒ Use Peer NTP

☒ Add Default Route

Default Route Distance: 0

OK

Cancel

Apply

Disable

Comment

Copy

Remove

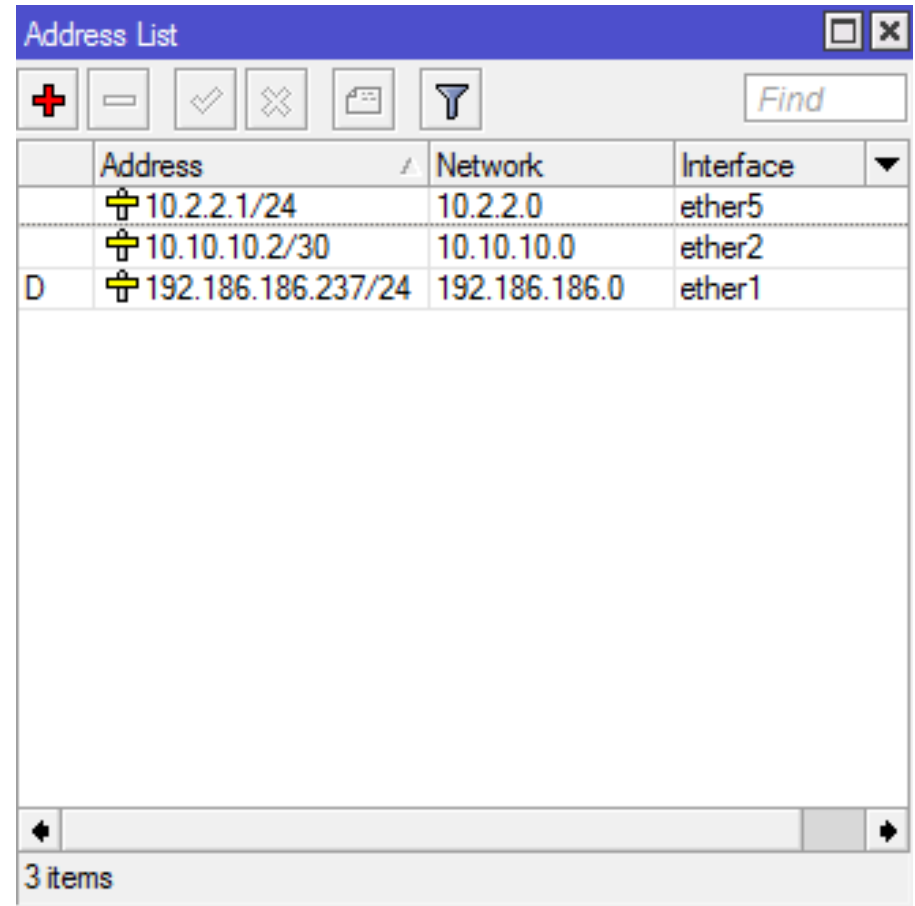
Release

Renew

enabled | Status: stopped

Router 2: Ether1, Ether2, Ether5

- Ether2 terhubung ke Ether1 di Router 1
- Ether5 terhubung ke PC
- Ether1 terkoneksi ke Internet, IP Address dinamis:
192.186.186.237/24



	Address	Network	Interface
	10.2.2.1/24	10.2.2.0	ether5
	10.10.10.2/30	10.10.10.0	ether2
D	192.186.186.237/24	192.186.186.0	ether1

3 items

Router 2: Routing & NAT

- Tambahkan rute ke 0.0.0.0/0 via 192.186.186.254
- Klik IP >> Firewall. Pilih Tab NAT, klik +. Chain: srcnat, Out Interface: Ether1, Action: Masquerade.

New NAT Rule

General Advanced Extra Action Statistics

Chain:

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

In. Interface:

Out. Interface:

Packet Mark:

Connection Mark:

Routing Mark:

Routing Table:

Connection Type:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

Router 1: Routing ke Internet

- Seperti pada Router 2, tambahkan rute ke 0.0.0.0/0 pada Router 1, seperti pada gambar

Route <0.0.0.0/0>

General | Attributes

Dst. Address: 0.0.0.0/0

Gateway: 10.10.10.2 | reachable ether1

Check Gateway:

Type: unicast

Distance: 1

Scope: 30

Target Scope: 10

Routing Mark:

Pref. Source:

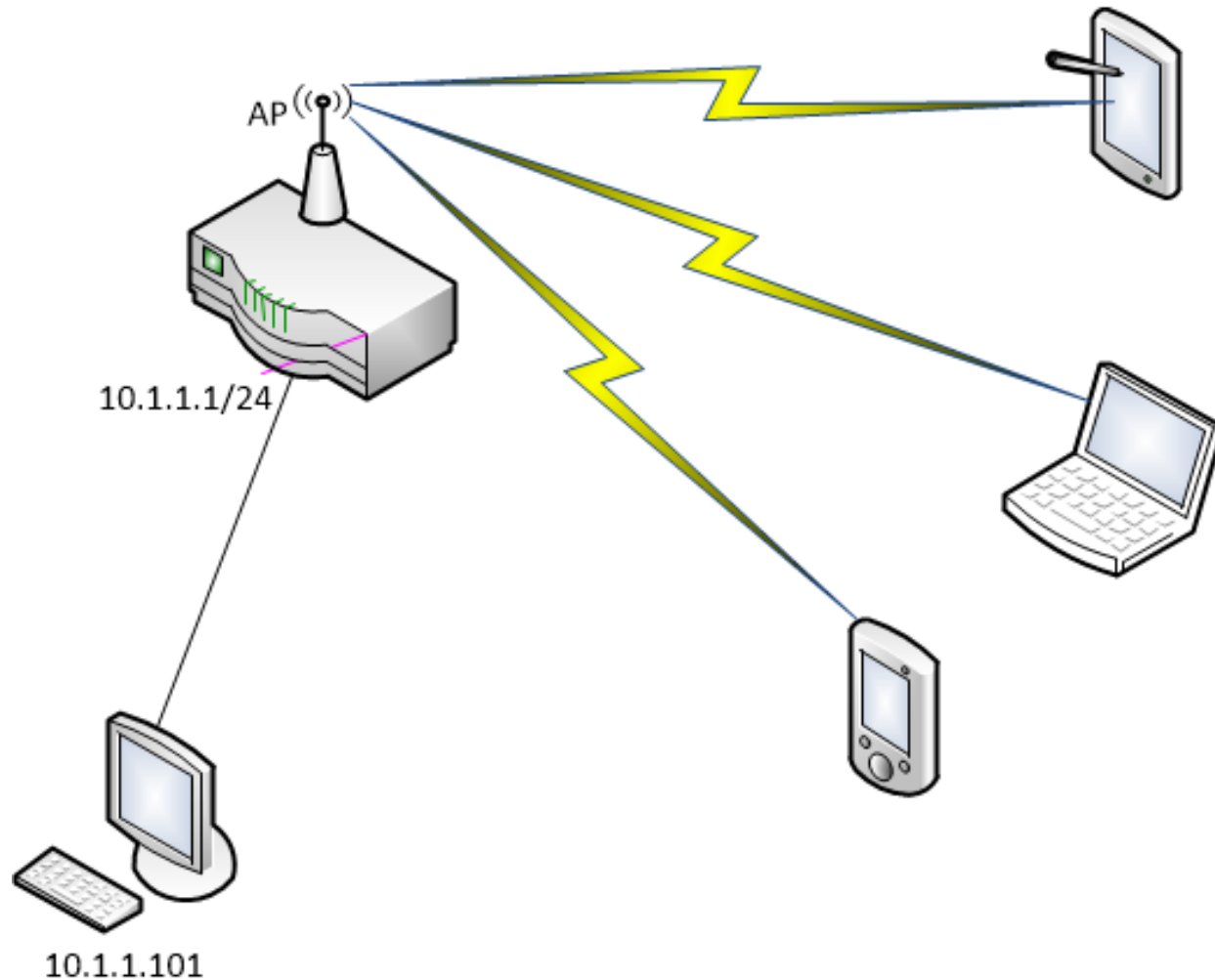
OK
Cancel
Apply
Disable
Comment
Copy
Remove

enabled | active

Test Koneksi Internet dari PC

- Bukan console pada PC 1 (10.1.1.101)
- Gunakan ping (misal ke 192.186.186.237 dan google.com)
- Buka Web Browser, coba akses trunojoyo.ac.id dan bangkalankab.go.id.
- Berhasil???

Scenario 3: Hotspot (AP)

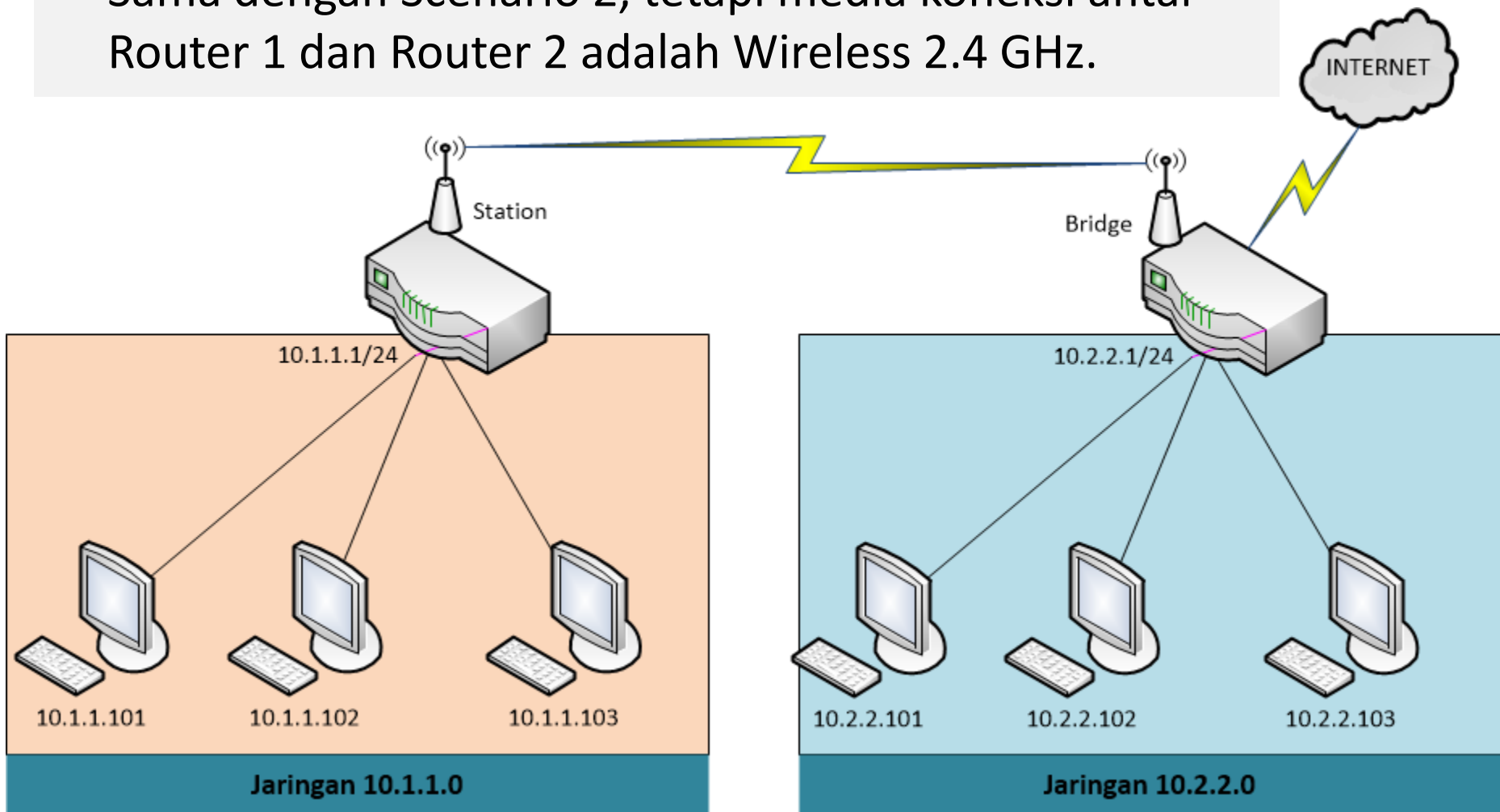


Langkah Mudah Membangun Hotspot

- Perangkat yang digunakan RouterBoard 951-2n yang sudah built-in Access Point (AP) 2.4 GHz kategori N.
- Membangun hotspot dimulai dengan klik IP >> Hotspot.
- Klik Setup Hotspot. Ikuti langkah-langkahnya...
- Klik Wireless. Double click wlan1. Pada halaman Wireless, tentukan SSID dan frekuensi dimana AP akan berjalan. Lihat scenario 4 untuk jelasnya.

Scenario 4: Koneksi Antar Lokasi *Wireless*

- Sama dengan Scenario 2, tetapi media koneksi antar Router 1 dan Router 2 adalah Wireless 2.4 GHz.



Router 2: Mengaktifkan *Access Point*

- Klik **Wireless**. Klik interface **wlan1**. Konfigurasi ada pada halaman **Wireless**.
- **Mode**: AP Bridge atau Bridge
- **Frequency**: tidak boleh sama dengan yang sudah digunakan di lokasi sekitar
- **SSID**: pengenal Access Point, tidak boleh sama dengan yang telah berjalan di lokasi sekitar.

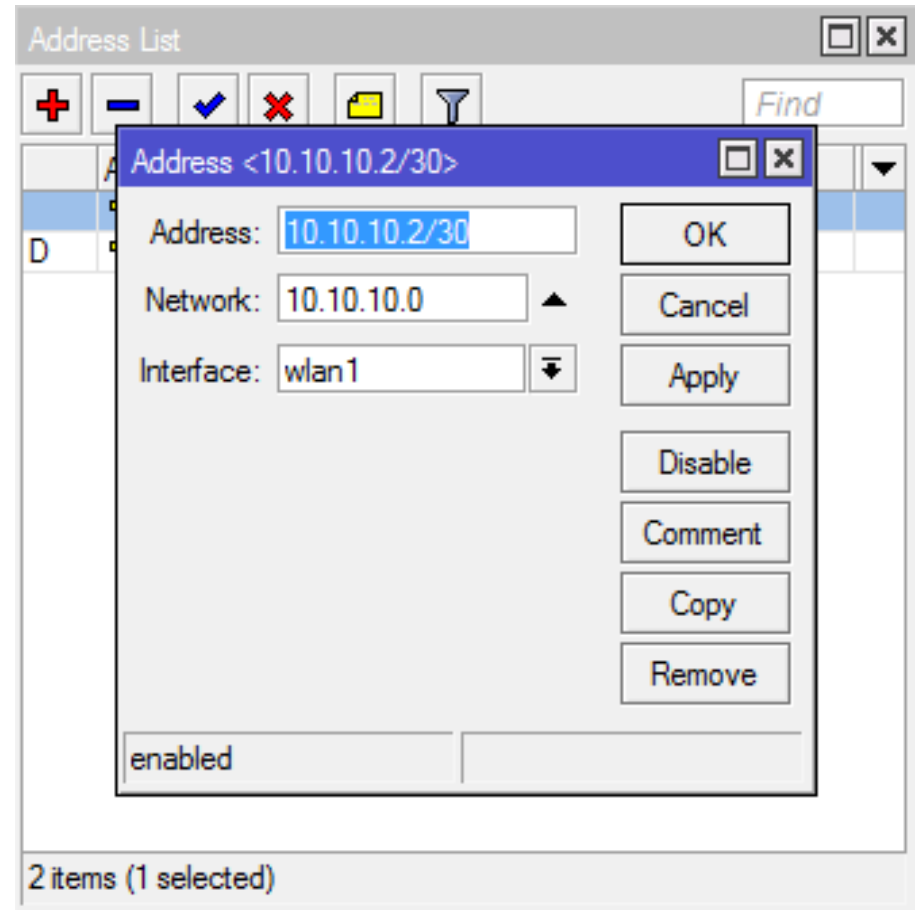
The screenshot shows the 'Interface <wlan1>' configuration window with the 'Wireless' tab selected. The configuration fields are as follows:

Field	Value
Mode	ap bridge
Band	2GHz-B/G/N
Channel Width	20MHz
Frequency	2442 MHz
SSID	Net02Wifi
Scan List	default
Wireless Protocol	unspecified
Security Profile	default
Bridge Mode	enabled
Default AP Tx Rate	
Default Client Tx Rate	
Default Authenticate	<input checked="" type="checkbox"/>
Default Forward	<input checked="" type="checkbox"/>
Hide SSID	<input type="checkbox"/>

Buttons on the right side of the window include: OK, Cancel, Apply, Disable, Comment, Torch, Scan..., Freq. Usage..., Align..., Sniff..., Snooper..., Reset Configuration, and Advanced Mode.

Router 2: IP Address wlan1

- IP Address yang sebelumnya diberikan untuk Ether2: 10.10.10.2 dialihkan untuk wlan1
- Lepas kabel UTP yang tersambung ke Ether2.



Router 1: Station Bridge

- Double click interface wlan1
- Buka halaman Wireless.
- Klik Scan...
- Pilih SSID yang mewakili AP Bridge wlan1 dari Router 2.
- Klik Connect.

Scanner (Running)

Interface: wlan1

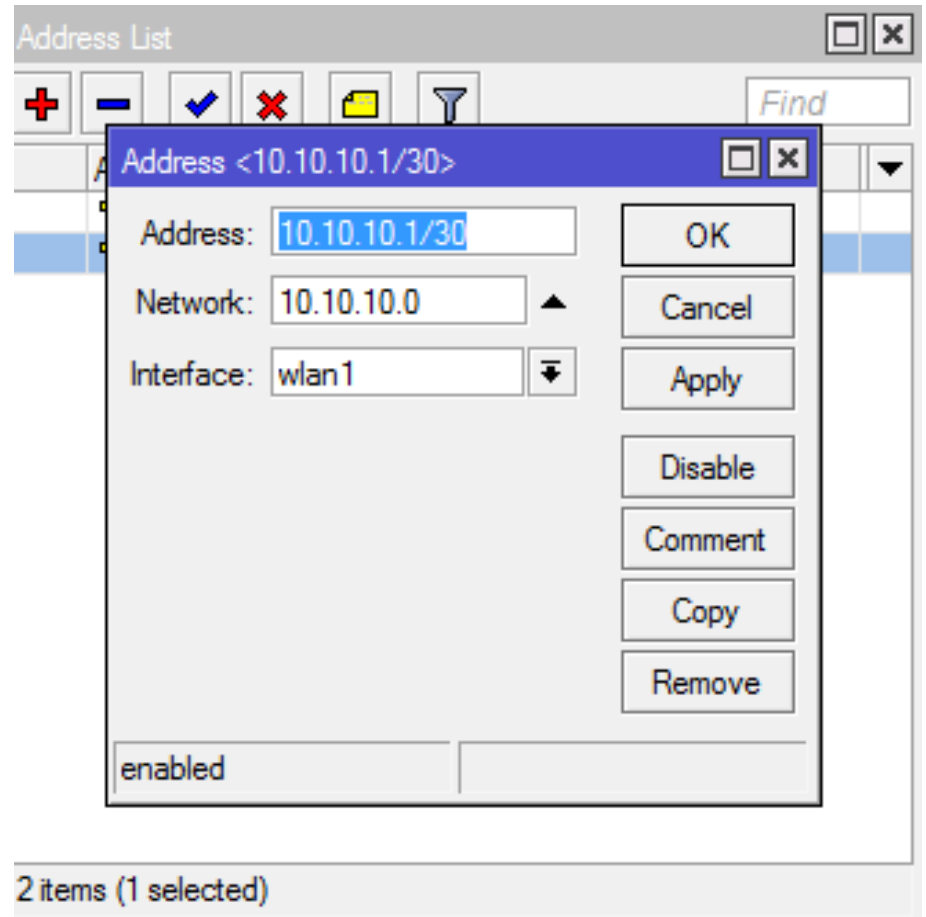
Start
Stop
Close
New Window
Connect

	Address	SSID	Band	Chan...	Frequ...	Signa...	Noise...	Signa...	Radio Name	RouterO...	
APR	D4:CA:6D:96:59:27	Coba	2GHz...	20MHz	2412	-55	-111	56	D4CA6D965927	6.23	
ARB	D4:CA:6D:96:6F:7D	Mikrotek	2GHz...	20MHz	2412	-51	-111	60	D4CA6D966F7D	5.25	
AP	00:24:A8:BE:B2:50	PUSKOM	2GHz...	20MHz	2412	-80	-111	31			
RB	D4:CA:6D:B6:1A:2F	indrabirowo	2GHz...	20MHz	2422	-55	-109	54	D4CA6DB61A2F	5.25	
RB	D4:CA:6D:96:6F:FB	MikroTik...	2GHz...	20MHz	2422	-59	-109	50	D4CA6D966FFB	5.25	
A	3C:D9:2B:83:B3:30	Library_Lt.3	2GHz...	20MHz	2422	-91	-109	18			
A	C0:25:5C:8E:C2:B0	Library-Lt4b	2GHz...	20MHz	2437	-81	-107	26			
ARB	D4:CA:6D:A5:D2:...	Net02Wifi	2GHz...	20MHz	2442	-17	-105	88	D4CA6DA5D281	5.25	
ARB	D4:CA:6D:89:AB:44	Fandi	2GHz...	20MHz	2442	-66	-105	39	D4CA6D89AB44	5.25	
AP	00:1E:E5:9D:63:25	SAC	2GHz...	20MHz	2462	-77	-108	31			
RB	D4:CA:6D:14:9A:7F	CAKRA ...	2GHz...	20MHz	2437	-95	-107	12	Cakra	5.26	
PRB	D4:CA:6D:9F:DF:...	Mikroba	2GHz...	20MHz	2457	-57	-106	49	D4CA6D9FD7C7	5.25	
APR	D4:CA:6D:9F:C4:...	H-Cok	2GHz...	20MHz	2457	-64	-106	42	D4CA6D9FC4D9	5.25	

13 items (1 selected)

Router 1: IP Address untuk wlan1

- Alih IP Address
10.10.10.1 dari Ether1
ke wlan1.



Router 1: Test koneksi ke wlan1 di Router 2

- Ping ke 10.10.10.2
- BERHAS!!!L

The screenshot shows the Windows 'Ping' utility window. The 'General' tab is selected. The 'Ping To:' field contains '10.10.10.2'. The 'Interface:' field is empty. The 'ARP Ping' checkbox is unchecked. The 'Packet Count:' field is empty. The 'Timeout:' field is set to '1000' ms. On the right side, there are buttons for 'Start', 'Stop', 'Close', and 'New Window'. Below the input fields is a table showing the results of the ping test.

Seq #	Host	Time	Reply Size	TTL	Status
0	10.10.10.2	8ms	50	64	
1	10.10.10.2	6ms	50	64	
2	10.10.10.2	6ms	50	64	
3	10.10.10.2	6ms	50	64	
4	10.10.10.2	4ms	50	64	
5	10.10.10.2	8ms	50	64	
6	10.10.10.2	6ms	50	64	
7	10.10.10.2	5ms	50	64	
8	10.10.10.2	7ms	50	64	
9	10.10.10.2	6ms	50	64	
10	10.10.10.2	6ms	50	64	
11	10.10.10.2	6ms	50	64	
12	10.10.10.2	6ms	50	64	
13	10.10.10.2	6ms	50	64	
14	10.10.10.2	6ms	50	64	

Summary statistics at the bottom: 57 items, 57 of 57 packets received, 0% packet loss, Min: 0 ms, Avg: 7 ms, Max: 19 ms.

Router 1: NAT (Masquerade)

The screenshot shows the 'NAT Rule' configuration window in Mikrotik WinBox. The window has a title bar 'NAT Rule <>' and several tabs: 'General', 'Advanced', 'Extra', 'Action', and 'Statistics'. The 'General' tab is active. The configuration fields are as follows:

- Chain: (with a dropdown arrow)
- Src. Address:
- Dst. Address:
- Protocol:
- Src. Port:
- Dst. Port:
- Any. Port:
- In. Interface:
- Out. Interface: ☐ (with a dropdown arrow)
- Packet Mark:
- Connection Mark:
- Routing Mark:
- Routing Table:
- Connection Type:

On the right side of the window, there is a vertical stack of buttons: OK, Cancel, Apply, Disable, Comment, Copy, Remove, Reset Counters, and Reset All Counters.

- Klik IP >> Firewall
- Klik halaman NAT
- Klik +

PC 1 (10.1.1.101): Test koneksi

- Ping yahoo.com
- Buka bangkalankab.go.id pada Web Browser