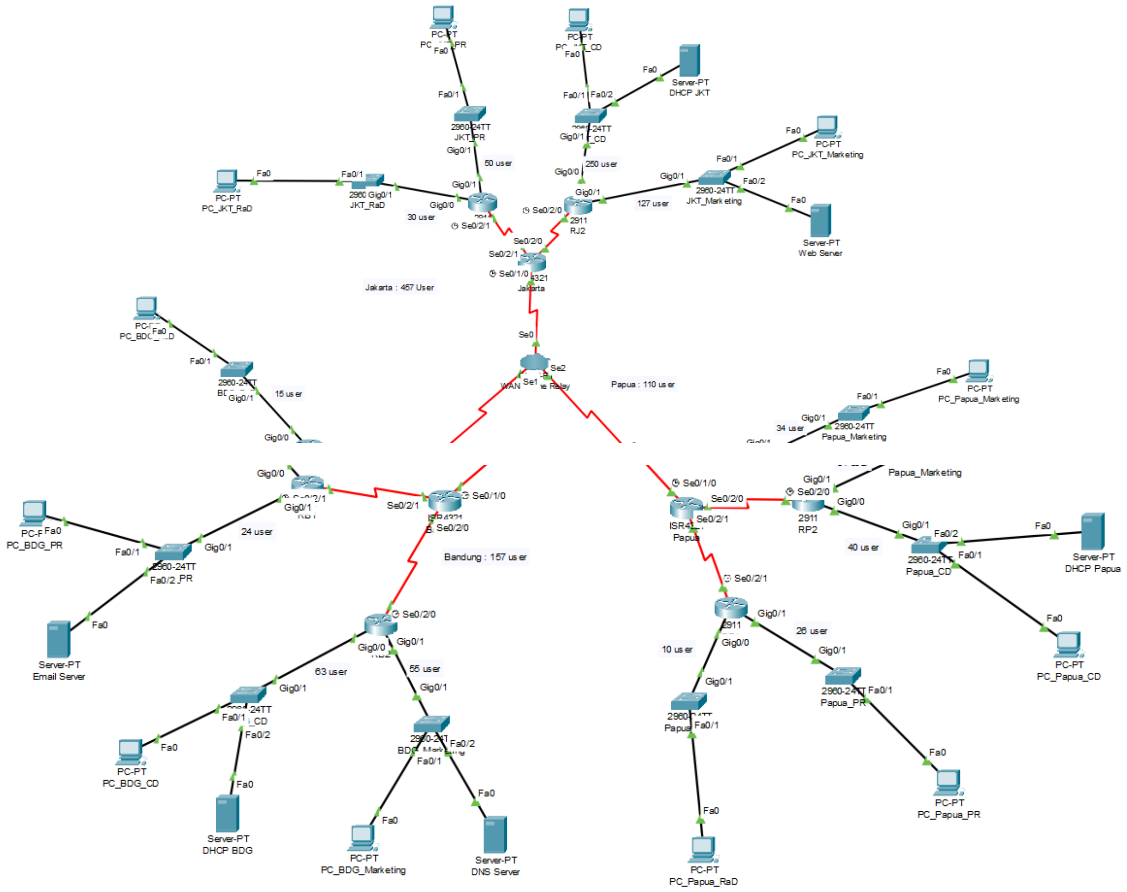
Rafi' Noval Hady

TOPOLOGI



ADDRESSING

Tabel Addressing Cabang Jakarta

Device	Interface	IP Address	Subnet	Default Gateway
Jakarta	Se0/2/0	192.20.0.1	/30	
	Se0/2/1	192.20.1.1	/30	
	S0/1/0	10.21.0.1	/24	
RJ1	Se0/2/1	192.20.1.2	/30	
	G0/0	192.21.2.65	/27	
	G0/1	192.21.2.1	/26	
RJ2	Se0/2/0	192.20.0.2	/30	
	G0/0	192.21.0.1	/24	

	G0/1	192.21.1.1	/24	
PC_JKT_RaD	Fa0	DHCP		
PC_JKT_PR	Fa0			
PC_JKT_CD	Fa0			
DHCP JKT	Fa0	192.21.0.254	/24	192.21.0.1
PC_JKT_Marketing	Fa0	DHCP		
Web Server	Fa0	192.21.1.2	/24	192.21.1.1

- Jakarta

```
Jakarta(config)#int s0/2/0
Jakarta(config-if)#ip add 192.20.0.1 255.255.255.252
Jakarta(config-if)#int s0/2/1
Jakarta(config-if)#ip add 192.20.1.1 255.255.255.252
Jakarta(config-if)#int s0/1/0
Jakarta(config-if)#ip add 10.21.0.1 255.255.255.0
```

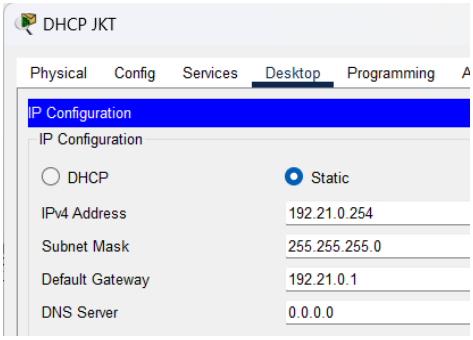
- RJ1

```
R1(config)#int s0/2/1
R1(config-if)#ip add 192.20.1.2 255.255.255.252
R1(config-if)#int g0/0
R1(config-if)#ip add 192.21.2.65 255.255.255.224
R1(config-if)#int g0/1
R1(config-if)#ip add 192.21.2.1 255.255.255.192
```

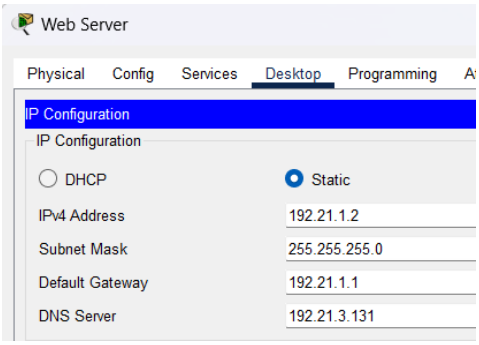
- RJ2

```
RJ2(config)#int s0/2/0
RJ2(config-if)#ip add 192.20.0.2 255.255.255.252
RJ2(config-if)#int g0/0
RJ2(config-if)#ip add 192.21.0.1 255.255.255.0
RJ2(config-if)#int g0/1
RJ2(config-if)#ip add 192.21.1.1 255.255.255.0
```

- DHCP JKT



Web Server



Tabel Addressing Cabang Bandung

Device	Interface	IP Address	Subnet	Default Gateway
Bandung	Se0/2/0	192.20.2.1	/30	
	Se0/2/1	192.20.3.1	/30	
	S0/1/0	10.21.0.2	/24	
RB1	Se0/2/1	192.20.3.2	/30	
	G0/0	192.21.3.225	/27	
	G0/1	192.21.3.193	/27	
RB2	Se0/2/0	192.20.2.2	/30	
	G0/0	192.21.3.1	/25	
	G0/1	192.21.3.129	/26	
PC_BDG_RaD	Fa0	DHCP		
PC_BDG_PR	Fa0			
Email Server	Fa0	192.21.3.195	/27	192.21.3.193
PC_BDG_CD	Fa0	DHCP		
DHCP DBG	Fa0	192.21.3.3	/25	192.21.3.1
PC_BDG_Marketing	Fa0	DHCP		
DNS Server	Fa0	192.21.3.131	/26	192.21.3.129

- Bandung

```
Bandung(config)#int s0/2/0
Bandung(config-if)#ip add 192.20.2.1 255.255.255.252
Bandung(config-if)#int s0/2/1
Bandung(config-if)#ip add 192.20.3.1 255.255.255.252
Bandung(config-if)#int s0/1/0
Bandung(config-if)#ip add 10.21.0.2 255.255.255.0
```

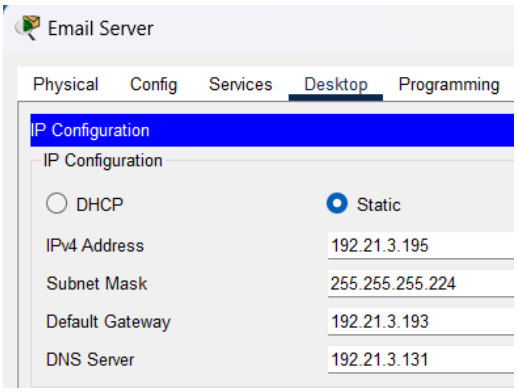
- RB1

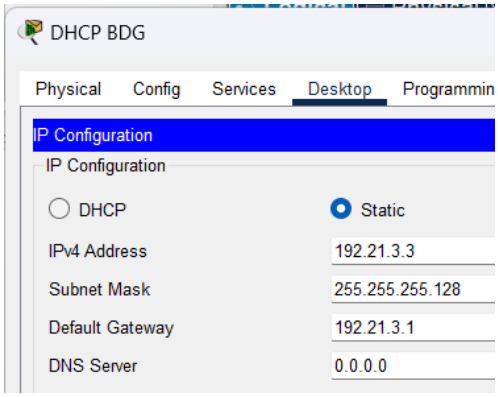
```
RB1(config)#int s0/2/1
RB1(config-if)#ip add 192.20.3.2 255.255.255.252
RB1(config-if)#int g0/0
RB1(config-if)#ip add 192.21.3.225 255.255.255.224
RB1(config-if)#int g0/1
RB1(config-if)#ip add 192.21.3.193 255.255.255.224
```

- RB2

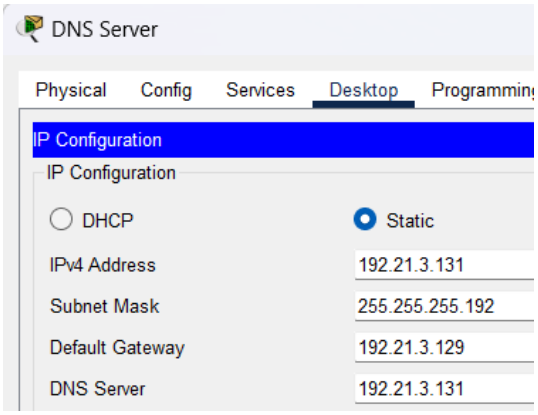
```
RB2(config)#int s0/2/0
RB2(config-if)#ip add 192.20.2.2 255.255.255.252
RB2(config-if)#int g0/0
RB2(config-if)#ip add 192.21.3.1 255.255.255.128
RB2(config-if)#int g0/1
RB2(config-if)#ip add 192.21.3.129 255.255.255.192
```

- Email Server DHCP BDG





- DNS Server



Tabel Addressing Cabang Papua

Device	Interface	IP Address	Subnet	Default Gateway
Papua	Se0/2/0	192.20.4.1	/30	
	Se0/2/1	192.20.5.1	/30	
	S0/1/0	10.21.0.3	/24	
RP1	Se0/2/1	192.20.5.2	/30	
	G0/0	192.21.4.161	/28	
	G0/1	192.21.4.129	/27	
RP2	Se0/2/0	192.20.4.2	/30	
	G0/0	192.21.4.1	/26	
	G0/1	192.21.4.65	/26	
PC_Papua_RaD	Fa0	DHCP		

PC_Papua_PR	Fa0			
PC_Papua_CD	Fa0			
DHCP Papua	Fa0	192.21.4.3	/26	192.21.4.1
PC_Papua_Marketing	Fa0	DHCP		

- Papua

```
Papua(config)#int s0/2/0
Papua(config-if)#ip add 192.20.4.1 255.255.255.252
Papua(config-if)#int s0/2/1
Papua(config-if)#ip add 192.20.5.1 255.255.255.252
Papua(config-if)#int s0/1/0
Papua(config-if)#ip add 10.21.0.3 255.255.255.0
```

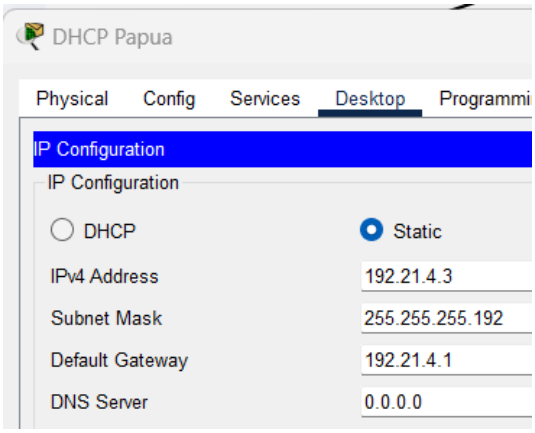
- RP1

```
RP1(config)#int s0/2/1
RP1(config-if)#ip add 192.20.5.2 255.255.255.252
RP1(config-if)#int g0/0
RP1(config-if)#ip add 192.21.4.161 255.255.255.240
RP1(config-if)#int g0/1
RP1(config-if)#ip add 192.21.4.129 255.255.255.224
```

- RP2

```
RP2(config)#int s0/2/0
RP2(config-if)#ip add 192.20.4.2 255.255.255.252
RP2(config-if)#int g0/0
RP2(config-if)#ip add 192.21.4.1 255.255.255.192
RP2(config-if)#int g0/1
RP2(config-if)#ip add 192.21.4.65 255.255.255.192
```

- DHCP Papua



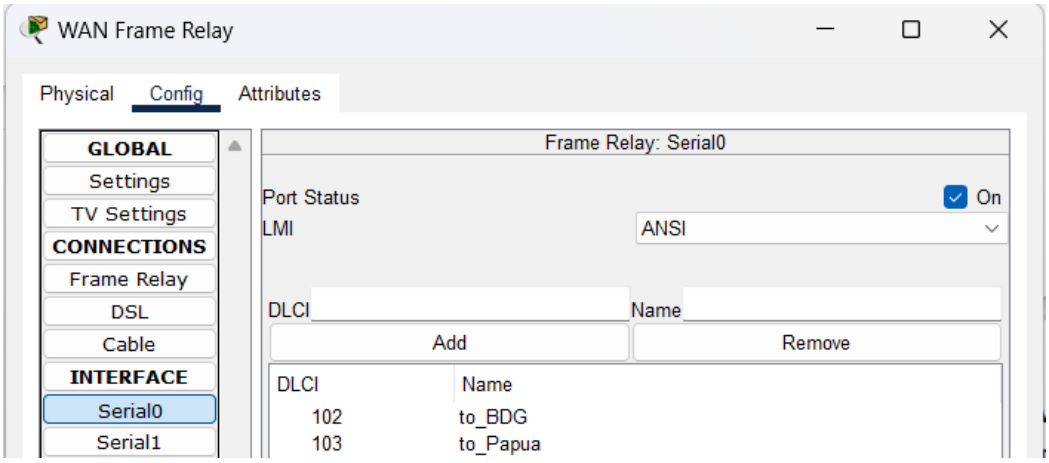
WAN FRAME RELAY

Tabel DLCI

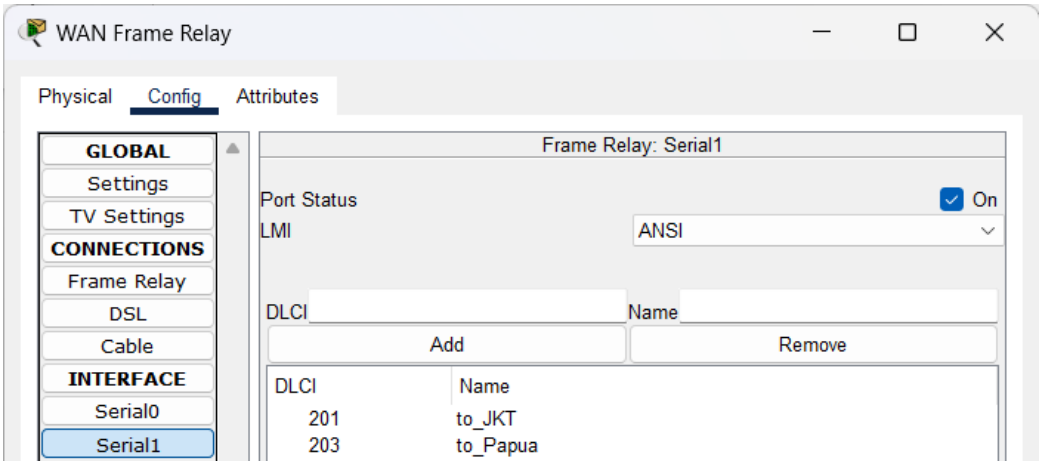
Interface	Name		
	to_JKT	to_BDG	to_Papua
S0 (Jakarta)	-	102	103
S1 (Bandung)	201	-	203
S2 (Papua)	301	302	-

Konfigurasi Interface DLCI

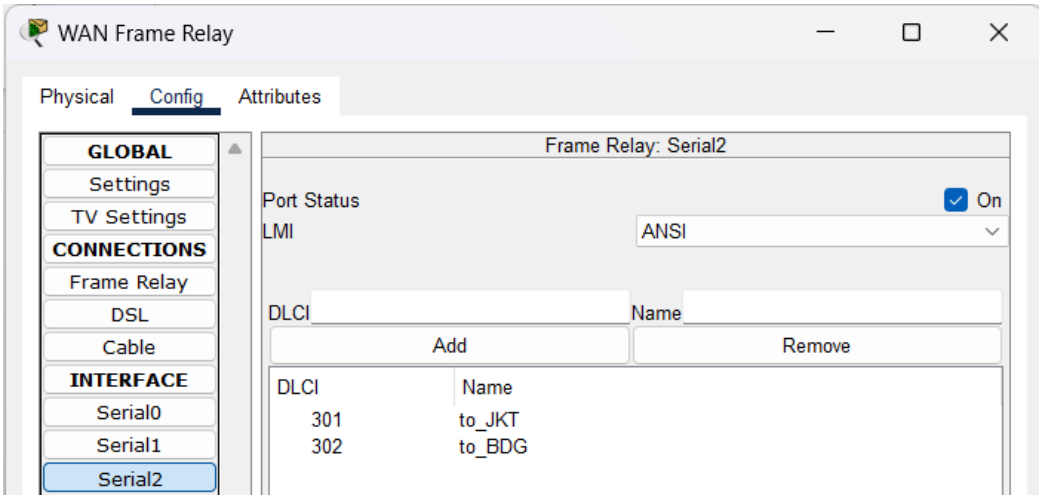
- S0



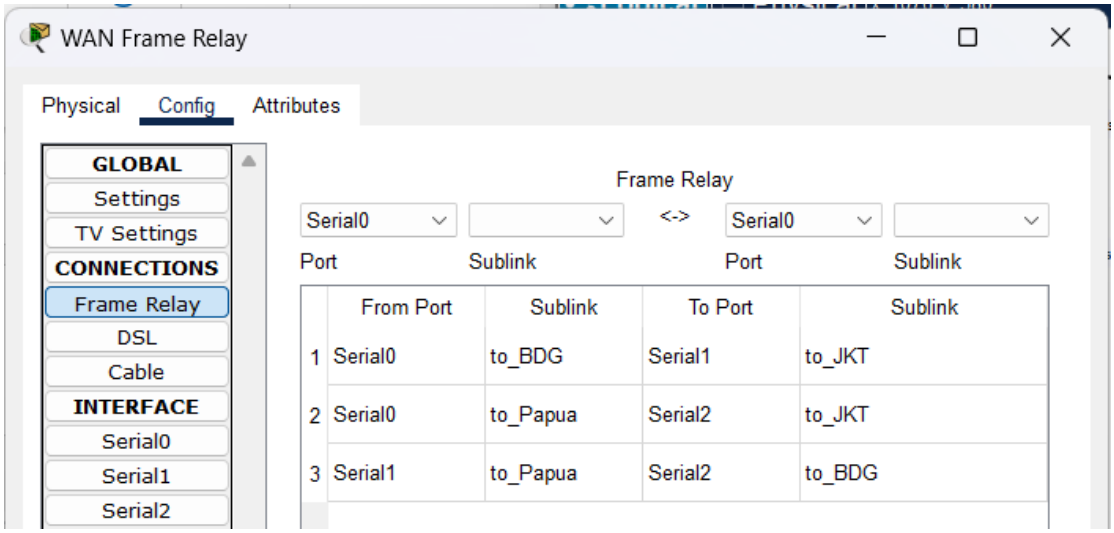
- S1



- S2



Konfigurasi Frame Relay pada Cloud



Konfigurasi Frame Relay Router

- Jakarta

```
Jakarta(config)#int s0/1/0
Jakarta(config-if)#encap frame-relay
Jakarta(config-if)#frame-relay map ip 10.21.0.2 102 broadcast
Jakarta(config-if)#frame-relay map ip 10.21.0.3 103 broadcast
Jakarta(config-if)#frame-relay lmi-type ansi
```

- Bandung

```
Bandung(config)#int s0/1/0
Bandung(config-if)#encap frame-relay
Bandung(config-if)#frame-relay map ip 10.21.0.1 201 broadcast
Bandung(config-if)#frame-relay map ip 10.21.0.3 203 broadcast
Bandung(config-if)#frame-relay lmi-type ansi
```

- Papua

```
Papua(config)#int s0/1/0
Papua(config-if)#encap frame-relay
Papua(config-if)#frame-relay map ip 10.21.0.1 301 broadcast
Papua(config-if)#frame-relay map ip 10.21.0.2 302 broadcast
Papua(config-if)#frame-relay lmi-type ansi
```

Penjelasan

- Penggunaan encap frame-relay untuk agar ip yang menggunakan wan dapat saling terhubung dan dapat menjaga keamanan ip yang menggunakan wan
- Frame-relay map ip <ip address> <DLCI> broadcast untuk menghubungkan frame relay yang telah dibuat dengap ip yang ingin dihubungkan sehingga dapat saling terhubung satu sama lain dengan DLCI yang sesuai dengan konfigurasi frame relay juga
- Frame-relat lmi-type <type> untuk menentukkan type dari lmi yang digunakan frame relay agar sesuai dengan konfigurasi yang telah dilakukan pada frame relay

Hasil

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Jakarta	Bandung	ICMP		0.000	N	0	(edit)	
	Successful	Jakarta	Papua	ICMP		0.000	N	1	(edit)	
	Successful	Bandung	Papua	ICMP		0.000	N	2	(edit)	

ROUTING EIGRP

- Jakarta

```
Jakarta(config)#ro ei 21
Jakarta(config-router)#network 192.20.0.0 0.0.0.3
Jakarta(config-router)#network 192.20.1.0 0.0.0.3
Jakarta(config-router)#network 10.21.0.0 0.0.0.255
```

- RJ1

```
R1(config)#ro ei 21
```

```
R1(config-router)#network 192.20.1.0 0.0.0.3
R1(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 192.20.1.1 (Serial0/2/1) is up: new
adjacency

R1(config-router)#network 192.21.2.65 0.0.0.31
R1(config-router)#network 192.21.2.1 0.0.0.63
R1(config-router)#passive-int g0/0
R1(config-router)#passive-int g0/1
```

- RJ2

```
RJ2(config)#ro ei 21
RJ2(config-router)#network 192.20.0.0 0.0.0.3
RJ2(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 192.20.0.1 (Serial0/2/0) is up: new
adjacency

RJ2(config-router)#network 192.21.0.1 0.0.0.255
RJ2(config-router)#network 192.21.1.1 0.0.0.255
RJ2(config-router)#passive-int g0/0
RJ2(config-router)#passive-int g0/1
```

- Bandung

```
Bandung(config)#ro ei 21
Bandung(config-router)#network 192.20.2.0 0.0.0.3
Bandung(config-router)#network 192.20.3.0 0.0.0.3
Bandung(config-router)#network 10.21.0.0 0.0.0.255
Bandung(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 10.21.0.1 (Serial0/1/0) is up: new
adjacency

Bandung(config-router)#
```

- RB1

```
RB1(config)#ro ei 21
RB1(config-router)#network 192.20.3.0 0.0.0.3
RB1(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 192.20.3.1 (Serial0/2/1) is up: new
adjacency

RB1(config-router)#network 192.21.3.225 0.0.0.31
RB1(config-router)#network 192.21.3.193 0.0.0.31
RB1(config-router)#passive-int g0/0
RB1(config-router)#passive-int g0/1
```

- RB2

```
RB2(config)#ro ei 21
RB2(config-router)#network 192.20.2.0 0.0.0.3
RB2(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 192.20.2.1 (Serial0/2/0) is up: new
adjacency

RB2(config-router)#network 192.21.3.1 0.0.0.127
RB2(config-router)#network 192.21.3.129 0.0.0.63
RB2(config-router)#passive-int g0/0
RB2(config-router)#passive-int g0/1
```

- Papua

```
Papua(config)#ro ei 21
Papua(config-router)#network 192.20.4.0 0.0.0.3
Papua(config-router)#network 192.20.5.0 0.0.0.3
Papua(config-router)#network 10.21.0.0 0.0.0.255
Papua(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 10.21.0.2 (Serial0/1/0) is up: new
adjacency

%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 10.21.0.1 (Serial0/1/0) is up: new
adjacency

Papua(config-router)#
```

- RP1

```
RP1(config)#ro ei 21
RP1(config-router)#network 192.20.5.0 0.0.0.3
RP1(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 192.20.5.1 (Serial0/2/1) is up: new
adjacency

RP1(config-router)#network 192.21.4.161 0.0.0.15
RP1(config-router)#network 192.21.4.129 0.0.0.31
RP1(config-router)#passive-int g0/0
RP1(config-router)#passive-int g0/1
```

- RP2

```
RP2(config)#ro ei 21
RP2(config-router)#network 192.20.4.0 0.0.0.3
RP2(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 21: Neighbor 192.20.4.1 (Serial0/2/0) is up: new
adjacency

RP2(config-router)#network 192.21.4.1 0.0.0.63
RP2(config-router)#network 192.21.4.65 0.0.0.63
RP2(config-router)#passive-int g0/0
RP2(config-router)#passive-int g0/1
```

Penjelasan

- Melakukan routing dengan EIGRP karena lebih mudah dan cepat dilakukan dalam konfigurasinya pada topologi yang sedang ke besar dan bandwidth untuk pengiriman paket EIGRP dapat dimimalisir sehingga lebih effisien
- Router eigrp <AS> digunakan untuk mengaktifkan proses EIGRP agar dapat digunakan
- Network <ip address> <wildmask> untuk menjalin adjacency dengan jaringan tersebut agar jaringan dapat saling terhubung satu sama lain
- Passive-interface <interface> untuk membuat interface tersebut tidak ikut partisipasi dalam routing eigrp sehingga penggunaan bandwidth lebih hemat serta setiap end device dapat saling mengirim paket karena interface yang ke end device tidak dilibatkan dalam pengiriman infomasi router jaringan.

Hasil

- Jakarta

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC_JK...	PC_JKT_PR	ICMP		0.000	N	0	(edit)	
	Successful	PC_JK...	PC_JKT_CD	ICMP		0.000	N	1	(edit)	
	Successful	PC_JK...	DHCP JKT	ICMP		0.000	N	2	(edit)	
	Successful	PC_JK...	PC_JKT_Mark...	ICMP		0.000	N	3	(edit)	
	Successful	PC_JK...	Web Server	ICMP		0.000	N	4	(edit)	
	Successful	PC_JK...	PC_JKT_CD	ICMP		0.000	N	5	(edit)	
	Successful	PC_JK...	PC_JKT_Mark...	ICMP		0.000	N	6	(edit)	
	Successful	PC_JK...	PC_JKT_Mark...	ICMP		0.000	N	7	(edit)	

- Bandung

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC_BD...	PC_BDG_PR	ICMP		0.000	N	0	(edit)	
	Successful	PC_BD...	PC_BDG_CD	ICMP		0.000	N	1	(edit)	
	Successful	PC_BD...	PC_BDG_Mar...	ICMP		0.000	N	2	(edit)	
	Successful	Email ...	PC_BDG_CD	ICMP		0.000	N	3	(edit)	
	Successful	Email ...	PC_BDG_Mar...	ICMP		0.000	N	4	(edit)	
	Successful	PC_BD...	DNS Server	ICMP		0.000	N	5	(edit)	

- Papua

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC_Pa...	PC_Papua_PR	ICMP		0.000	N	0	(edit)	
	Successful	PC_Pa...	PC_Papua_CD	ICMP		0.000	N	1	(edit)	
	Successful	PC_Pa...	PC_Papua_Ma...	ICMP		0.000	N	2	(edit)	
	Successful	PC_Pa...	DHCP Papua	ICMP		0.000	N	3	(edit)	
	Successful	PC_Pa...	PC_Papua_Ma...	ICMP		0.000	N	4	(edit)	
	Successful	PC_Pa...	PC_Papua_Ma...	ICMP		0.000	N	5	(edit)	

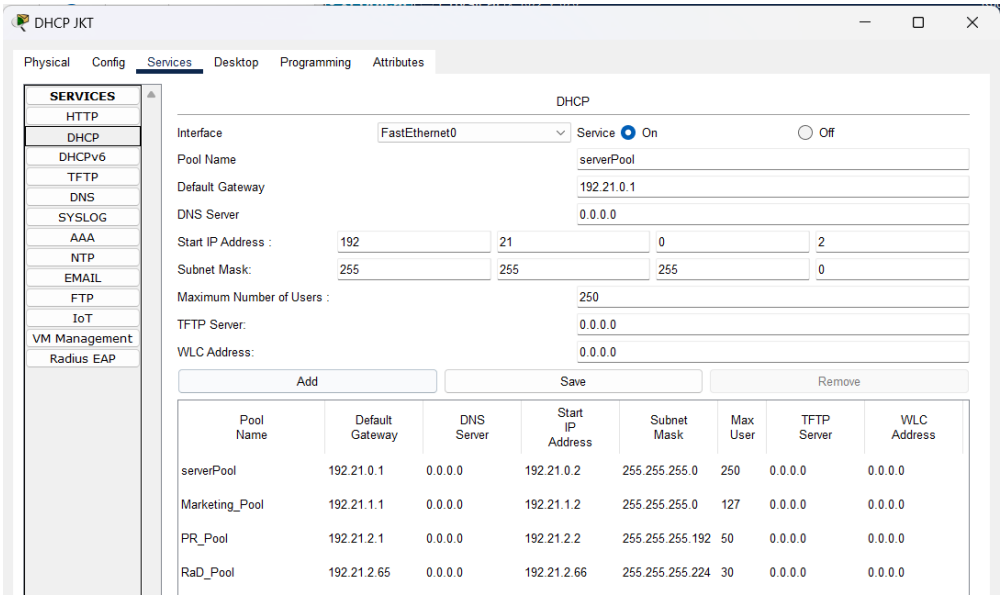
- Antar kota

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC_JKT_RaD	PC_BDG_RaD	ICMP		0.000	N	0	(edit)	
	Successful	PC_JKT_RaD	PC_BDG_PR	ICMP		0.000	N	1	(edit)	
	Successful	PC_JKT_RaD	DHCP BDG	ICMP		0.000	N	2	(edit)	
	Successful	DNS Server	PC_JKT_PR	ICMP		0.000	N	3	(edit)	
	Successful	PC_JKT_CD	PC_Papua_Marketing	ICMP		0.000	N	4	(edit)	
	Successful	PC_JKT_CD	PC_Papua_CD	ICMP		0.000	N	5	(edit)	
	Successful	Web Server	PC_Papua_PR	ICMP		0.000	N	6	(edit)	
	Successful	Web Server	PC_Papua_RaD	ICMP		0.000	N	7	(edit)	
	Successful	PC_BDG_RaD	PC_Papua_Marketing	ICMP		0.000	N	8	(edit)	
	Successful	PC_BDG_RaD	PC_Papua_CD	ICMP		0.000	N	9	(edit)	
	Successful	PC_BDG_CD	PC_Papua_PR	ICMP		0.000	N	10	(edit)	
	Successful	PC_BDG_CD	PC_Papua_RaD	ICMP		0.000	N	11	(edit)	

DHCP

- Jakarta



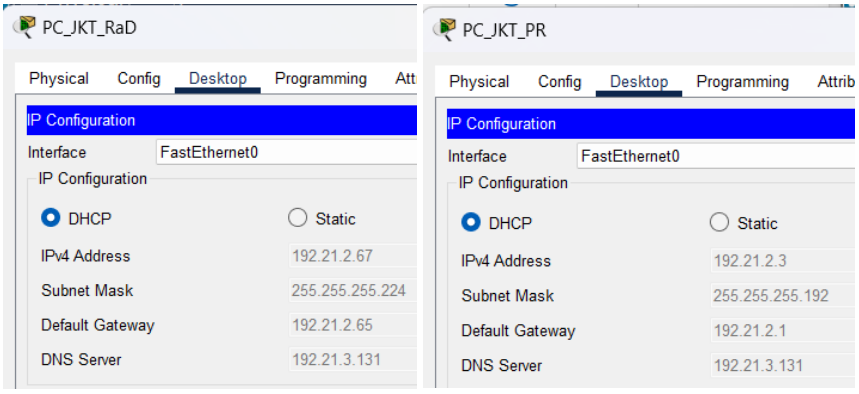
- RJ1

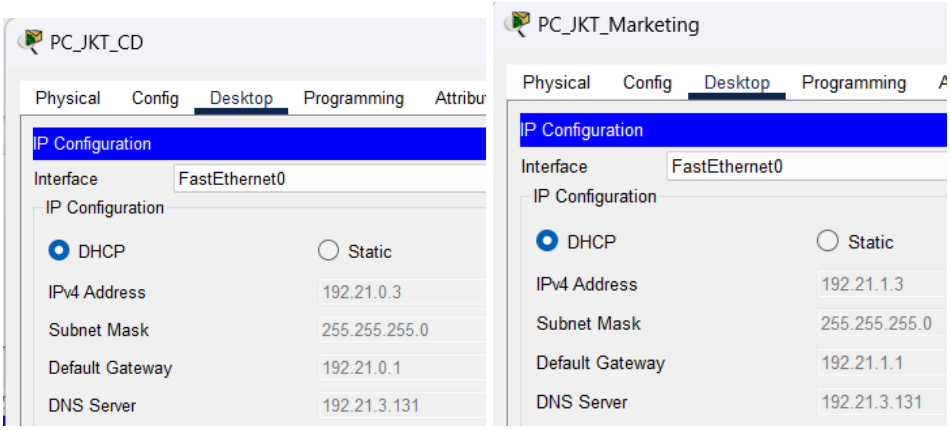
```
R1(config)#int g0/0
R1(config-if)#ip helper-address 192.21.0.254
R1(config-if)#int g0/1
R1(config-if)#ip helper-address 192.21.0.254
R1(config-if)#
```

- RJ2

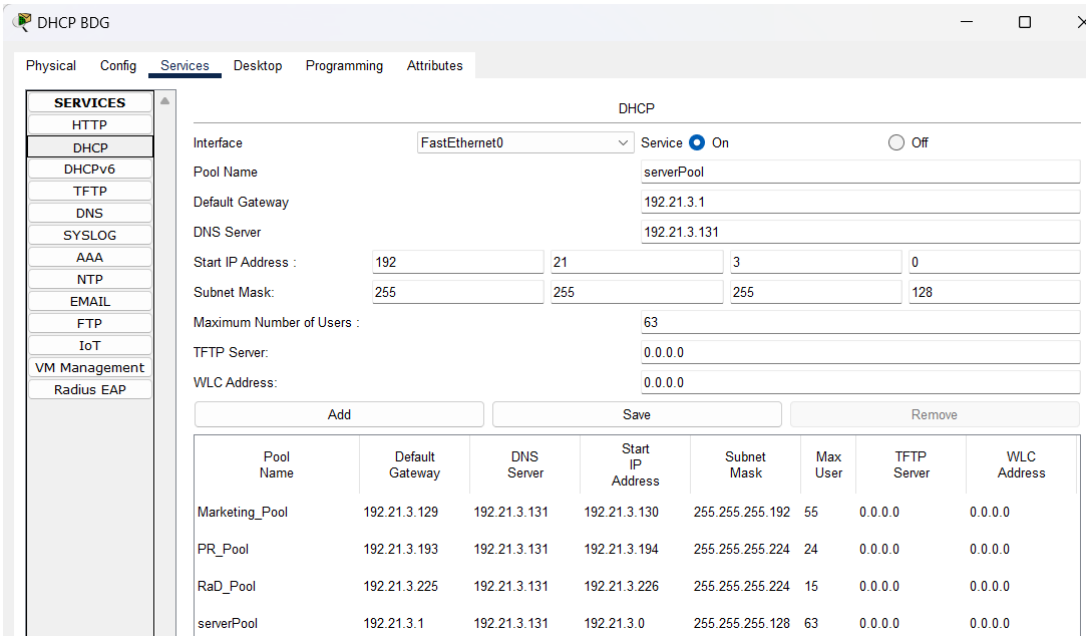
```
RJ2(config)#int g0/1
RJ2(config-if)#ip helper-address 192.21.0.254
```

Hasil





- Bandung



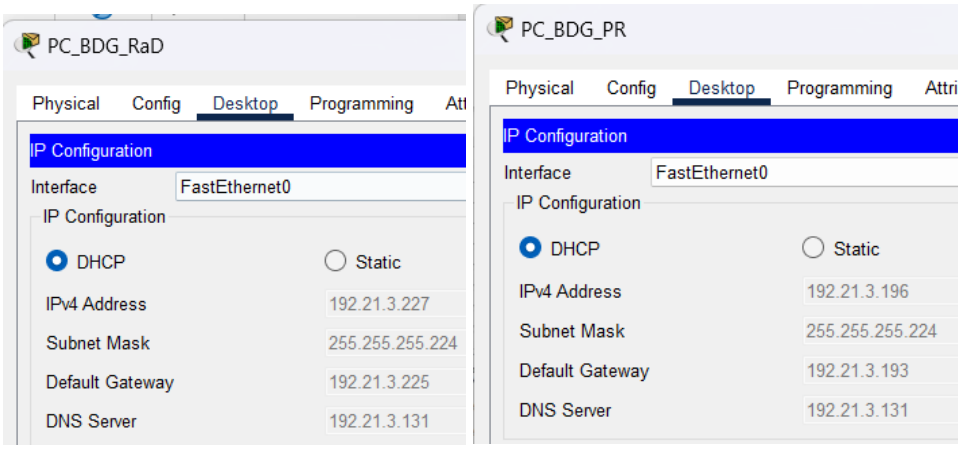
  - RB1

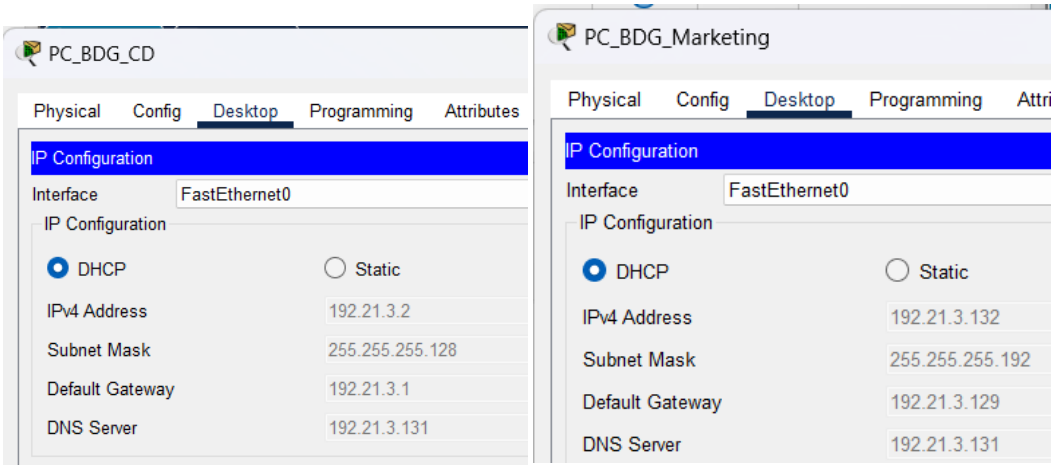
```
RB1(config)#int g0/0
RB1(config-if)#ip helper-address 192.21.3.3
RB1(config-if)#int g0/1
RB1(config-if)#ip helper-address 192.21.3.3
```

  - RB2

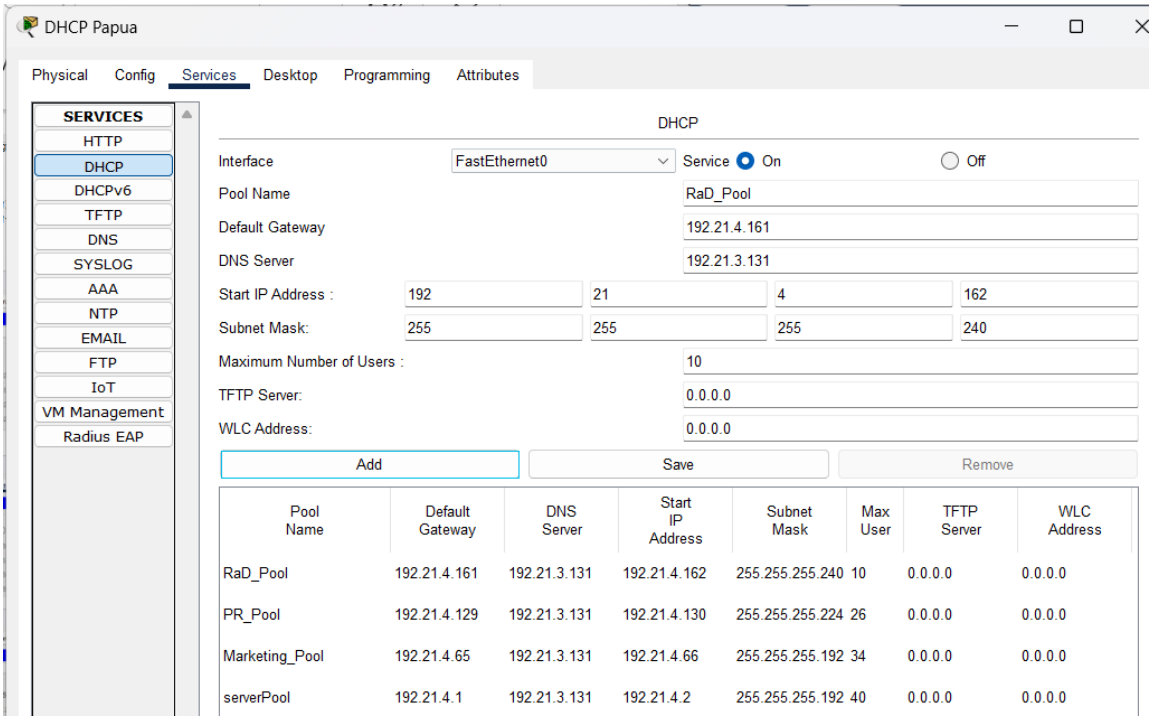
```
RB2(config)#int g0/1
RB2(config-if)#ip helper-address 192.21.3.3
```

Hasil





- Papua



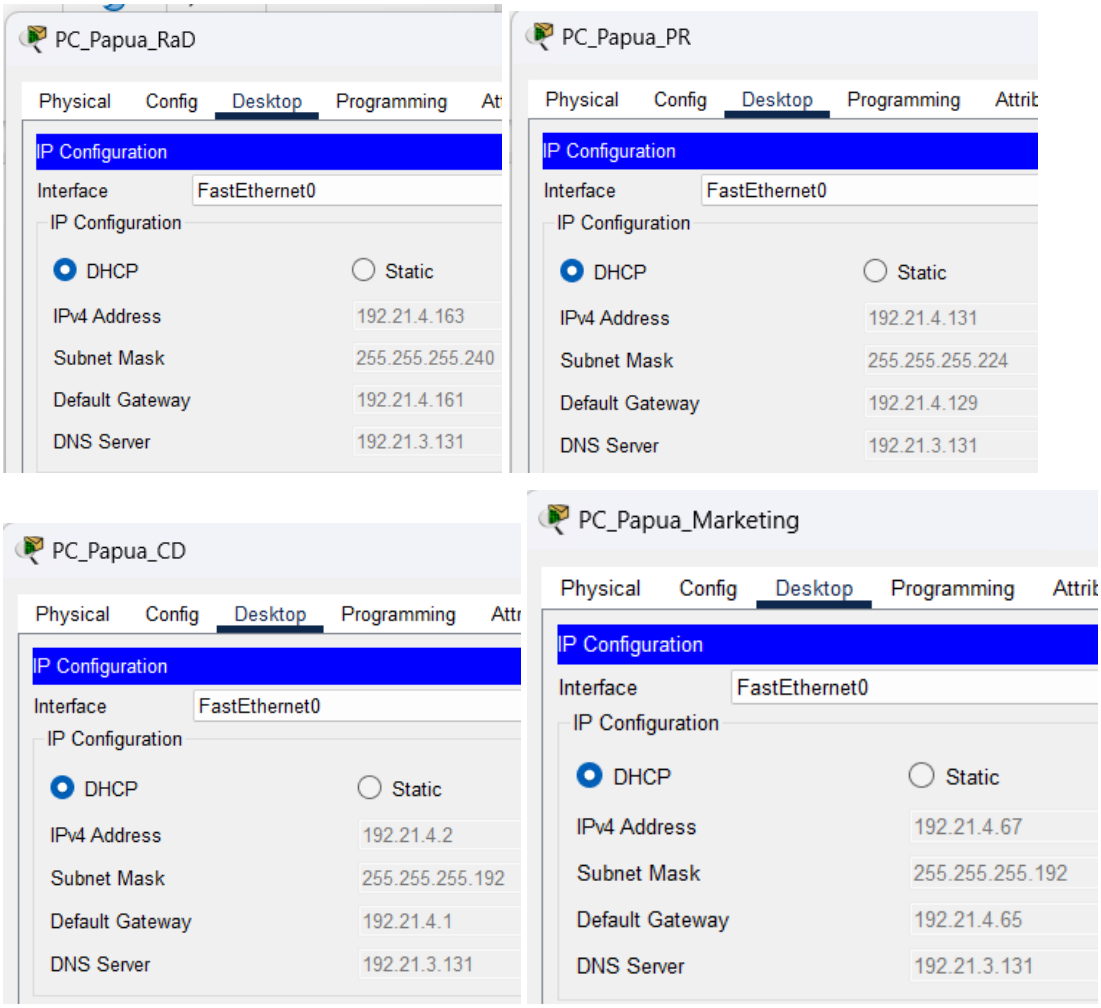
  - RP1

```
RP1(config)#int g0/0
RP1(config-if)#ip helper-address 192.21.4.3
RP1(config-if)#int g0/1
RP1(config-if)#ip helper-address 192.21.4.3
```

  - RP2

```
RP2(config)#int g0/1
RP2(config-if)#ip helper-address 192.21.4.3
```

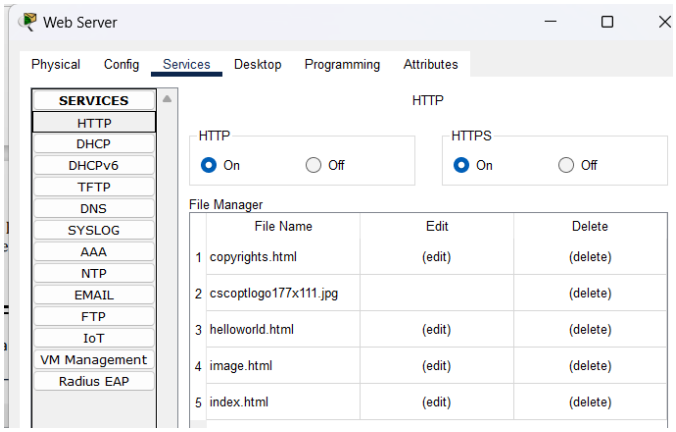
Hasil



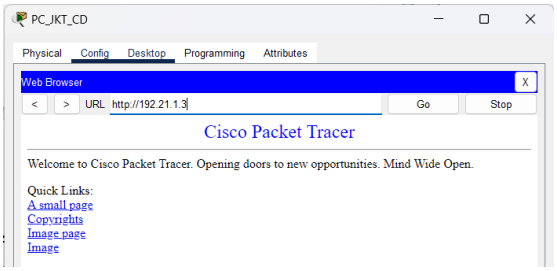
Penjelasan

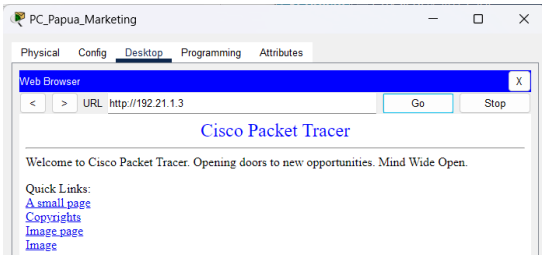
- Konfigurasi DHCP di DHCP server dengan ip, default gateway, ip dns server, dan jumlah host yang sesuain dengan ketentuan
- Ip helper-address untuk membantu routing pada DHCP agar DHCP jaringan dapat berhasil dengan interface yang menuju ke end device

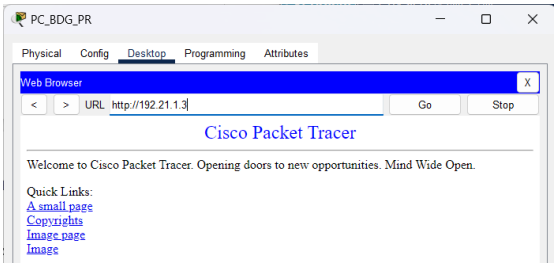
WEB SERVER



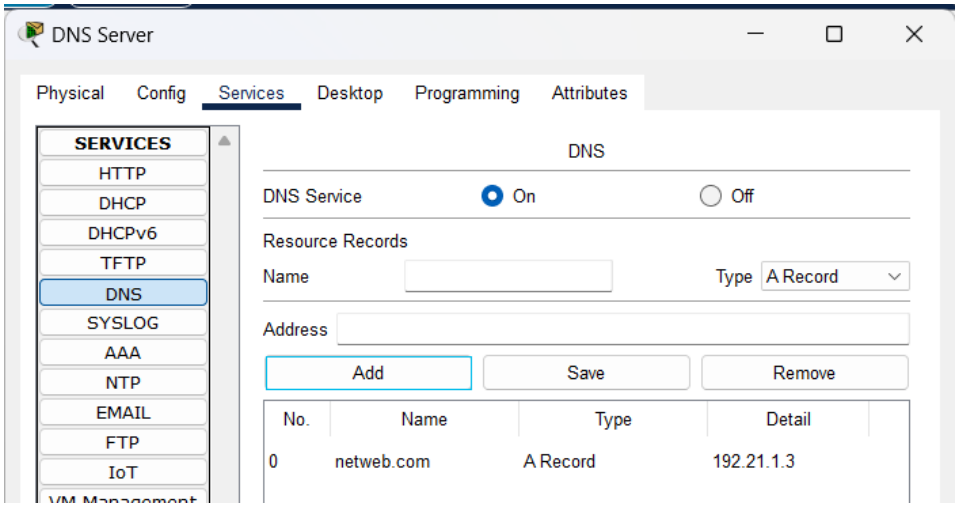
- Hasil



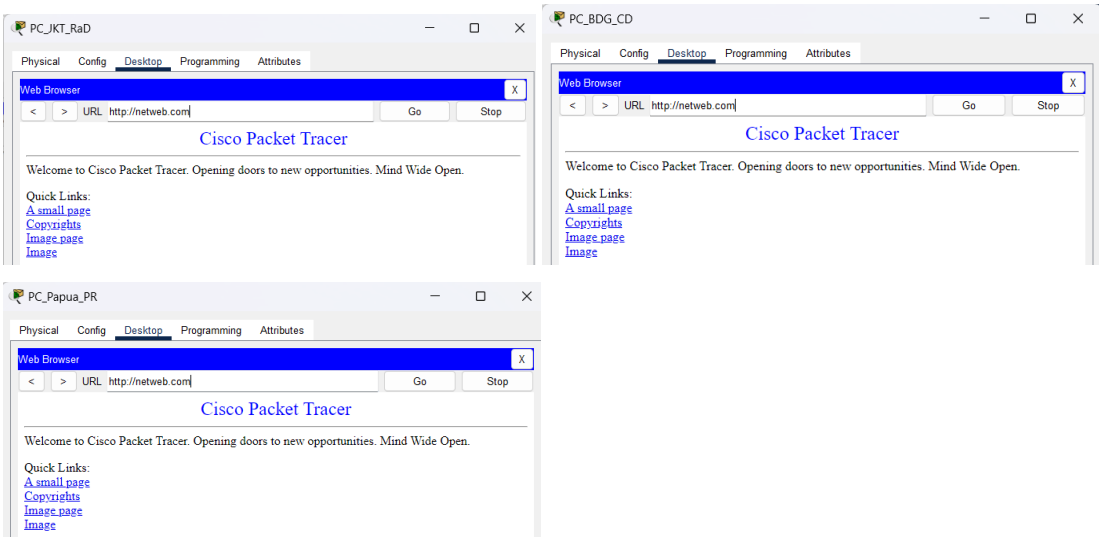




DNS SERVER

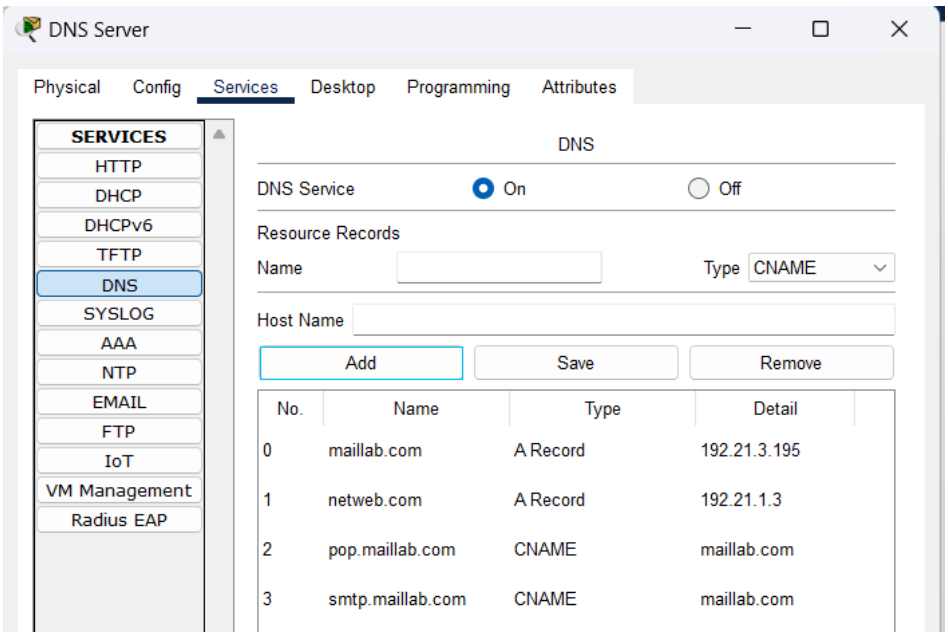


- Hasil

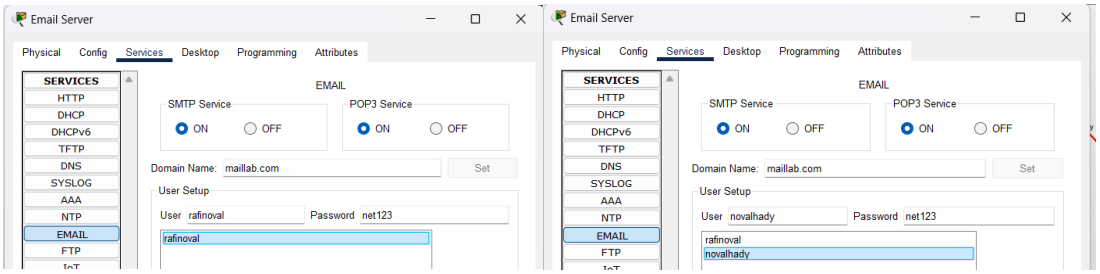


EMAIL SERVER

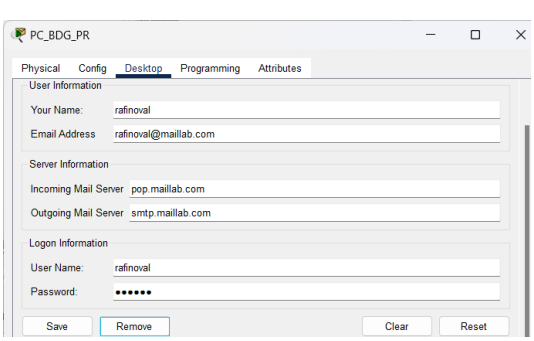
- Konfigurasi DNS Server

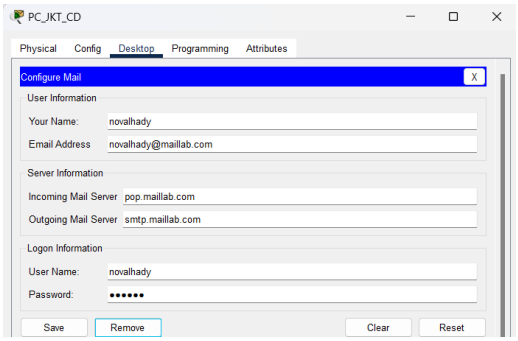


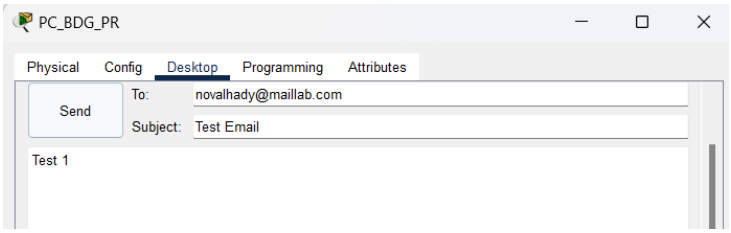
- Konfigurasi Email Server

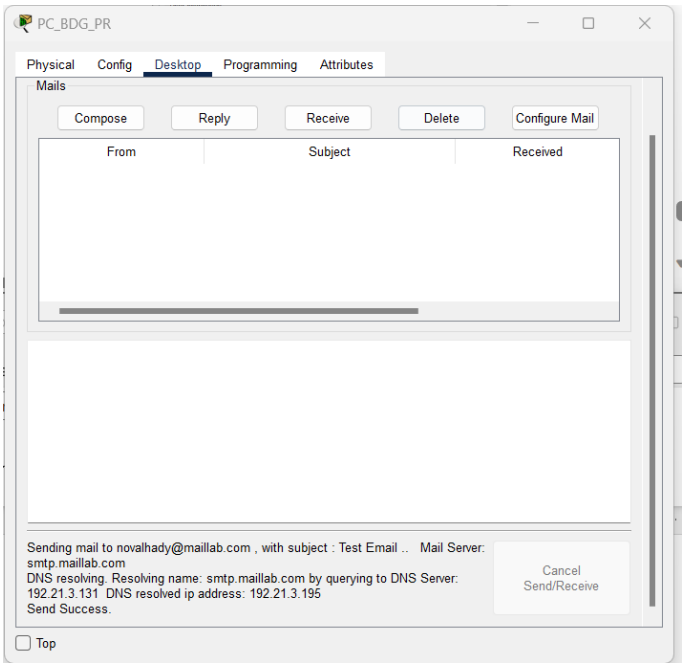


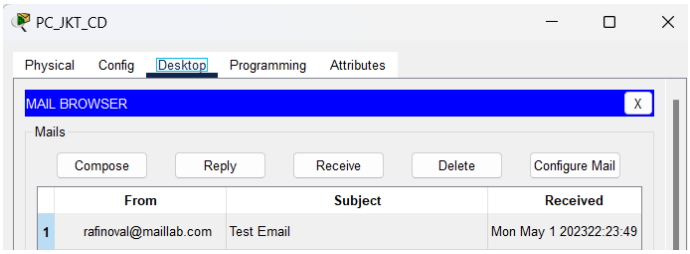
- Konfigurasi Email End Device

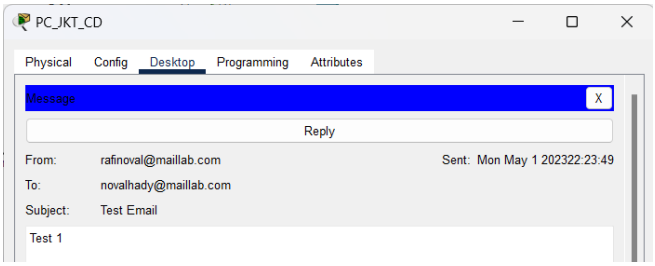

PC_BDG_PR
Physical
Config
Desktop
Programming
Attributes
User Information
Your Name:
rafinoval
Email Address
rafinoval@maillab.com
Server Information
Incoming Mail Server
pop.maillab.com
Outgoing Mail Server
smtp.maillab.com
Logon Information
User Name:
rafinoval
Password:
Save
Remove
Clear
Reset


PC_JKT_CD
Physical
Config
Desktop
Programming
Attributes
Configure Mail
X
User Information
Your Name:
novalhady
Email Address
novalhady@maillab.com
Server Information
Incoming Mail Server
pop.maillab.com
Outgoing Mail Server
smtp.maillab.com
Logon Information
User Name:
novalhady
Password:
Save
Remove
Clear
Reset


PC_BDG_PR
Physical
Config
Desktop
Programming
Attributes
Send
To:
novalhady@maillab.com
Subject:
Test Email
Test 1


PC_BDG_PR
Physical
Config
Desktop
Programming
Attributes
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
Sending mail to novalhady@maillab.com , with subject : Test Email .. Mail Server: smtp.maillab.com
DNS resolving. Resolving name: smtp.maillab.com by querying to DNS Server: 192.21.3.131 DNS resolved ip address: 192.21.3.195
Send Success.
Cancel Send/Receive
Top


PC_JKT_CD
Physical
Config
Desktop
Programming
Attributes
MAIL BROWSER
X
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
1
rafinoval@maillab.com
Test Email
Mon May 1 202322:23:49


PC_JKT_CD
Physical
Config
Desktop
Programming
Attributes
Message
X
Reply
From:
rafinoval@maillab.com
Sent:
Mon May 1 202322:23:49
To:
novalhady@maillab.com
Subject:
Test Email
Test 1

ACL

- RB1

```
RB1(config)#ip ac e RaD_ACL
RB1(config-ext-nacl)#p ip 192.21.3.226 0.0.0.31 192.21.2.66 0.0.0.31
RB1(config-ext-nacl)#p ip 192.21.3.226 0.0.0.31 192.21.4.162 0.0.0.15
RB1(config-ext-nacl)#p ip 192.21.3.226 0.0.0.31 h 192.21.1.2
RB1(config-ext-nacl)#p ip 192.21.3.226 0.0.0.31 h 192.21.3.195
RB1(config-ext-nacl)#p ip 192.21.3.226 0.0.0.31 h 192.21.3.131
RB1(config-ext-nacl)#p ip 192.21.3.226 0.0.0.31 h 192.21.3.3
RB1(config-ext-nacl)#p udp a a eq 67
RB1(config-ext-nacl)#p udp a a eq 68
RB1(config-ext-nacl)#int g0/0
RB1(config-if)#ip access-group RaD_ACL in
RB1(config-if)#ex
RB1(config)#ip ac e PR_ACL
RB1(config-ext-nacl)#p ip 192.21.3.194 0.0.0.31 192.21.2.2 0.0.0.63
RB1(config-ext-nacl)#p ip 192.21.3.194 0.0.0.31 192.21.4.130 0.0.0.31
RB1(config-ext-nacl)#p ip 192.21.3.194 0.0.0.31 h 192.21.1.2
RB1(config-ext-nacl)#p ip 192.21.3.194 0.0.0.31 h 192.21.3.195
RB1(config-ext-nacl)#p ip 192.21.3.194 0.0.0.31 h 192.21.3.131
RB1(config-ext-nacl)#p ip 192.21.3.194 0.0.0.31 h 192.21.3.3
RB1(config-ext-nacl)#p udp a a eq 67
RB1(config-ext-nacl)#p udp a a eq 68
RB1(config-ext-nacl)#int g0/1
RB1(config-if)#ip access-group PR_ACL in
RB1(config-if)#
```

- RB2

```
RB2(config)#ip ac e CD_ACL
RB2(config-ext-nacl)#p ip 192.21.3.2 0.0.0.127 192.21.0.2 0.0.0.255
RB2(config-ext-nacl)#p ip 192.21.3.2 0.0.0.127 192.21.4.2 0.0.0.63
RB2(config-ext-nacl)#p ip 192.21.3.2 0.0.0.127 h 192.21.1.2
RB2(config-ext-nacl)#p ip 192.21.3.2 0.0.0.127 h 192.21.3.195
RB2(config-ext-nacl)#p ip 192.21.3.2 0.0.0.127 h 192.21.3.131
RB2(config-ext-nacl)#p ip 192.21.3.2 0.0.0.127 h 192.21.3.3
RB2(config-ext-nacl)#p udp a a eq 67
RB2(config-ext-nacl)#p udp a a eq 68
RB2(config-ext-nacl)#int g0/0
RB2(config-if)#ip access-group CD_ACL in
RB2(config-if)#ex
RB2(config)#ip ac e Mar_ACL
RB2(config-ext-nacl)#p ip 192.21.3.130 0.0.0.63 192.21.1.2 0.0.0.255
RB2(config-ext-nacl)#p ip 192.21.3.130 0.0.0.63 192.21.4.66 0.0.0.63
RB2(config-ext-nacl)#p ip 192.21.3.130 0.0.0.63 h 192.21.1.2
RB2(config-ext-nacl)#p ip 192.21.3.130 0.0.0.63 h 192.21.3.195
RB2(config-ext-nacl)#p ip 192.21.3.130 0.0.0.63 h 192.21.3.131
RB2(config-ext-nacl)#p ip 192.21.3.130 0.0.0.63 h 192.21.3.3
RB2(config-ext-nacl)#p udp a a eq 67
RB2(config-ext-nacl)#p udp a a eq 68
RB2(config-ext-nacl)#int g0/1
RB2(config-if)#ip access-group Mar_ACL in
RB2(config-if)#
```

- RP1

```
Enter configuration commands, one per line.  End with CNTL/Z.
RP1(config)#ip ac e RaD_ACL
RP1(config-ext-nacl)#p ip 192.21.4.162 0.0.0.15 192.21.3.226 0.0.0.31
RP1(config-ext-nacl)#p ip 192.21.4.162 0.0.0.15 192.21.2.66 0.0.0.31
RP1(config-ext-nacl)#p ip 192.21.4.162 0.0.0.15 h 192.21.1.2
RP1(config-ext-nacl)#p ip 192.21.4.162 0.0.0.15 h 192.21.3.195
RP1(config-ext-nacl)#p ip 192.21.4.162 0.0.0.15 h 192.21.3.131
RP1(config-ext-nacl)#p ip 192.21.4.162 0.0.0.15 h 192.21.4.3
RP1(config-ext-nacl)#p udp a a eq 67
RP1(config-ext-nacl)#p udp a a eq 68
RP1(config-ext-nacl)#int g0/0
RP1(config-if)#ip access-group RaD_ACL in
RP1(config-if)#ex
RP1(config)#ip ac e PR_ACL
RP1(config-ext-nacl)#p ip 192.21.4.130 0.0.0.31 192.21.2.2 0.0.0.63
RP1(config-ext-nacl)#p ip 192.21.4.130 0.0.0.31 192.21.3.194 0.0.0.31
RP1(config-ext-nacl)#p ip 192.21.4.130 0.0.0.31 h 192.21.1.2
RP1(config-ext-nacl)#p ip 192.21.4.130 0.0.0.31 h 192.21.3.195
RP1(config-ext-nacl)#p ip 192.21.4.130 0.0.0.31 h 192.21.3.131
RP1(config-ext-nacl)#p ip 192.21.4.130 0.0.0.31 h 192.21.4.3
RP1(config-ext-nacl)#p udp a a eq 67
RP1(config-ext-nacl)#p udp a a eq 68
RP1(config-ext-nacl)#int g0/1
RP1(config-if)#ip access-group PR_ACL in
RP1(config-if)#
```

- RP2

```
RP2(config)#ip ac e CD_ACL
RP2(config-ext-nacl)#p ip 192.21.4.2 0.0.0.63 192.21.0.2 0.0.0.255
RP2(config-ext-nacl)#p ip 192.21.4.2 0.0.0.63 192.21.3.2 0.0.0.127
RP2(config-ext-nacl)#p ip 192.21.4.2 0.0.0.63 h 192.21.1.2
RP2(config-ext-nacl)#p ip 192.21.4.2 0.0.0.63 h 192.21.3.195
RP2(config-ext-nacl)#p ip 192.21.4.2 0.0.0.63 h 192.21.3.131
RP2(config-ext-nacl)#p ip 192.21.4.2 0.0.0.63 h 192.21.4.3
RP2(config-ext-nacl)#p udp a a eq 67
RP2(config-ext-nacl)#p udp a a eq 68
RP2(config-ext-nacl)#int g0/0
RP2(config-if)#ip access-group CD_ACL in
RP2(config-if)#ex
RP2(config)#ip ac e Mar_ACL
RP2(config-ext-nacl)#p ip 192.21.4.66 0.0.0.63 192.21.1.2 0.0.0.255
RP2(config-ext-nacl)#p ip 192.21.4.66 0.0.0.63 192.21.3.130 0.0.0.63
RP2(config-ext-nacl)#p ip 192.21.4.66 0.0.0.63 h 192.21.1.2
RP2(config-ext-nacl)#p ip 192.21.4.66 0.0.0.63 h 192.21.3.195
RP2(config-ext-nacl)#p ip 192.21.4.66 0.0.0.63 h 192.21.3.131
RP2(config-ext-nacl)#p ip 192.21.4.66 0.0.0.63 h 192.21.4.3
RP2(config-ext-nacl)#p udp a a eq 67
RP2(config-ext-nacl)#p udp a a eq 68
RP2(config-ext-nacl)#int g0/1
RP2(config-if)#ip access-group Mar_ACL in
RP2(config-if)#
```

- RJ1

```
Rl(config)#ip ac e RaD_ACL
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 192.21.3.226 0.0.0.31
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 192.21.4.162 0.0.0.15
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 192.21.2.2 0.0.0.63
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 192.21.0.2 0.0.0.255
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 192.21.1.2 0.0.0.255
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 h 192.21.1.2
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 h 192.21.3.195
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 h 192.21.3.131
Rl(config-ext-nacl)#p ip 192.21.2.66 0.0.0.15 h 192.21.0.254
Rl(config-ext-nacl)#p udp a a eq 67
Rl(config-ext-nacl)#p udp a a eq 68
Rl(config-ext-nacl)#int g0/0
Rl(config-if)#ip access-group RaD_ACL in
Rl(config-if)#ex
Rl(config)#ip ac e PR_ACL
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 192.21.4.130 0.0.0.31
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 192.21.3.194 0.0.0.31
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 192.21.2.66 0.0.0.31
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 192.21.0.2 0.0.0.255
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 192.21.1.2 0.0.0.255
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 h 192.21.1.2
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 h 192.21.3.195
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 h 192.21.3.131
Rl(config-ext-nacl)#p ip 192.21.2.2 0.0.0.63 h 192.21.0.254
Rl(config-ext-nacl)#p udp a a eq 67
Rl(config-ext-nacl)#p udp a a eq 68
Rl(config-ext-nacl)#int g0/1
Rl(config-if)#ip access-group PR_ACL in
Rl(config-if)#
```

- RJ2

```
RJ2(config)#ip ac e CD_ACL
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 192.21.4.2 0.0.0.63
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 192.21.3.2 0.0.0.127
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 192.21.2.2 0.0.0.63
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 192.21.2.66 0.0.0.31
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 192.21.1.2 0.0.0.255
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 h 192.21.1.2
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 h 192.21.3.195
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 h 192.21.3.131
RJ2(config-ext-nacl)#p ip 192.21.0.2 0.0.0.255 h 192.21.0.254
RJ2(config-ext-nacl)#p udp a a eq 67
RJ2(config-ext-nacl)#p udp a a eq 68
RJ2(config-ext-nacl)#int g0/0
RJ2(config-if)#ip access-group CD_ACL in
RJ2(config-if)#ex
RJ2(config)#ip ac e Mar_ACL
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 192.21.4.66 0.0.0.63
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 192.21.3.130 0.0.0.63
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 192.21.2.2 0.0.0.63
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 192.21.0.2 0.0.0.255
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 192.21.2.66 0.0.0.31
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 h 192.21.1.2
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 h 192.21.3.195
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 h 192.21.3.131
RJ2(config-ext-nacl)#p ip 192.21.1.3 0.0.0.255 h 192.21.0.254
RJ2(config-ext-nacl)#p udp a a eq 67
RJ2(config-ext-nacl)#p udp a a eq 68
RJ2(config-ext-nacl)#int g0/1
RJ2(config-if)#ip access-group Mar_ACL in
RJ2(config-if)#
```

Hasil

Jakarta

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC_JK...	PC_JKT_PR	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC_JK...	PC_JKT_CD	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC_JK...	PC_JKT_Mark...	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC_JK...	PC_BDG_RaD	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC_JK...	PC_Papua_RaD	ICMP		0.000	N	4	(edit)	(delete)
	Failed	PC_JK...	PC_BDG_PR	ICMP		0.000	N	5	(edit)	(delete)
	Successful	PC_JK...	PC_BDG_PR	ICMP		0.000	N	6	(edit)	(delete)
	Successful	PC_JK...	PC_Papua_PR	ICMP		0.000	N	7	(edit)	(delete)
	Failed	PC_JK...	PC_Papua_Ma...	ICMP		0.000	N	8	(edit)	(delete)
	Successful	PC_JK...	PC_BDG_CD	ICMP		0.000	N	9	(edit)	(delete)
	Successful	PC_JK...	PC_Papua_CD	ICMP		0.000	N	10	(edit)	(delete)
	Failed	PC_JK...	PC_BDG_PR	ICMP		0.000	N	11	(edit)	(delete)
	Successful	PC_JK...	PC_Papua_Ma...	ICMP		0.000	N	12	(edit)	(delete)
	Successful	PC_JK...	PC_BDG_Mar...	ICMP		0.000	N	13	(edit)	(delete)
	Failed	PC_JK...	PC_Papua_PR	ICMP		0.000	N	14	(edit)	(delete)

Bandung

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	PC_BD...	PC_BDG_PR	ICMP		0.000	N	0	(edit)	(delete)
	Failed	PC_BD...	PC_BDG_CD	ICMP		0.000	N	1	(edit)	(delete)
	Failed	PC_BD...	PC_BDG_Mar...	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC_BD...	PC_JKT_RaD	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC_BD...	PC_Papua_RaD	ICMP		0.000	N	4	(edit)	(delete)
	Successful	PC_BD...	PC_Papua_PR	ICMP		0.000	N	5	(edit)	(delete)
	Successful	PC_BD...	PC_JKT_PR	ICMP		0.000	N	6	(edit)	(delete)
	Successful	PC_BD...	PC_Papua_CD	ICMP		0.000	N	7	(edit)	(delete)
	Successful	PC_BD...	PC_JKT_CD	ICMP		0.000	N	8	(edit)	(delete)
	Successful	PC_BD...	PC_Papua_Ma...	ICMP		0.000	N	9	(edit)	(delete)
	Successful	PC_BD...	PC_JKT_Mark...	ICMP		0.000	N	10	(edit)	(delete)
	Failed	PC_BD...	PC_Papua_CD	ICMP		0.000	N	11	(edit)	(delete)
	Failed	PC_BD...	PC_JKT_RaD	ICMP		0.000	N	12	(edit)	(delete)
	Failed	PC_BD...	PC_Papua_RaD	ICMP		0.000	N	13	(edit)	(delete)

Papua

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	PC_Pa...	PC_Papua_PR	ICMP		0.000	N	0	(edit)	(delete)
	Failed	PC_Pa...	PC_Papua_CD	ICMP		0.000	N	1	(edit)	(delete)
	Failed	PC_Pa...	PC_Papua_Ma...	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC_Pa...	PC_BDG_RaD	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC_Pa...	PC_JKT_RaD	ICMP		0.000	N	4	(edit)	(delete)
	Failed	PC_Pa...	PC_BDG_Mar...	ICMP		0.000	N	5	(edit)	(delete)
	Successful	PC_Pa...	PC_BDG_PR	ICMP		0.000	N	6	(edit)	(delete)
	Successful	PC_Pa...	PC_JKT_PR	ICMP		0.000	N	7	(edit)	(delete)
	Failed	PC_Pa...	PC_JKT_Mark...	ICMP		0.000	N	8	(edit)	(delete)
	Successful	PC_Pa...	PC_BDG_CD	ICMP		0.000	N	9	(edit)	(delete)
	Successful	PC_Pa...	PC_JKT_CD	ICMP		0.000	N	10	(edit)	(delete)
	Failed	PC_Pa...	PC_BDG_RaD	ICMP		0.000	N	11	(edit)	(delete)
	Successful	PC_Pa...	PC_JKT_Mark...	ICMP		0.000	N	12	(edit)	(delete)
	Successful	PC_Pa...	PC_BDG_Mar...	ICMP		0.000	N	13	(edit)	(delete)
	Failed	PC_Pa...	PC_JKT_PR	ICMP		0.000	N	14	(edit)	(delete)

Penjelasan

- Ip ac e <poolname> untuk mengaktifkan acl extended dimana acl extended lebih spesifik dalam mengontrol access list yang diinginkan seperti khusus untuk utp, udp, atau ip suatu jaringan
- Permit ip digunakan untuk mengizinkan ip jaringan untuk dapat mengakses ke ip jaringan yang diinginkan dengan penggunaan wildmask agar sesuai dengan banyak host yang telah ditentukan agar sesuai dengan host pada jaringan tersebut.

- Permit udp any any eq 67 dan 68 digunakan untuk jaringan apa saja dapat mengizinkan DHCP dapat terjadi
- Ip access-group <poolname> in digunakan karena acl extended lebih efisien digunakan pada router yang berada di source sehingga digunakan in untuk menfilter paket yang dikirim melalui router.

NAT

```
Papua(config)#ip nat pool NATPapua 201.165.221.1 201.165.221.110 netmask
255.255.255.128
Papua(config)#ip ac e NATPOOL
Papua(config-ext-nacl)#p ip 192.21.4.0 0.0.0.255 a
Papua(config-ext-nacl)#ex
Papua(config)#ip nat inside source list NATPOOL pool NATPapua
Papua(config)#int s0/2/0
Papua(config-if)#ip nat in
Papua(config-if)#int s0/2/1
Papua(config-if)#ip nat in
Papua(config-if)#int s0/1/0
Papua(config-if)#ip nat out
```

```
RJ2(config)#ip route 0.0.0.0 0.0.0.0 s0/2/0
%Default route without gateway, if not a point-to-point interface, may impact
performance
```

```
Jakarta(config)#ip route 201.165.221.0 255.255.255.128 10.21.0.3
Jakarta(config)#
```

```
Papua(config-if)#do sh ip nat t
Pro  Inside global     Inside local       Outside local      Outside global
icmp 201.165.221.1:1   192.21.4.66:1      192.21.1.3:1       192.21.1.3:1
```

Penjelasan

- Mendefinisikan natpol untuk dinamic nat agar ip inside dapat di translasi ke ip outside
- Mendefinisikan route default agar dapat terhubung