

PROYEK AKHIR
JARINGAN KOMPUTER

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Link Penting	☰ ProyekAkhir_EF_15 https://github.com/calvinkatoroy/ProyekAkhir_EF_15

I. PENDAHULUAN

University of Network merupakan sebuah universitas di Indonesia yang sudah memiliki 3 cabang di berbagai lokasi, yaitu:

- Papua,
- Medan,
- Bandung.

Papua merupakan pusat dari University of Network.

University of Network memiliki 4 divisi di setiap cabangnya, yaitu **Administrator**, **Finance**, **Telco**, dan **Engineer**.

Persyaratan:

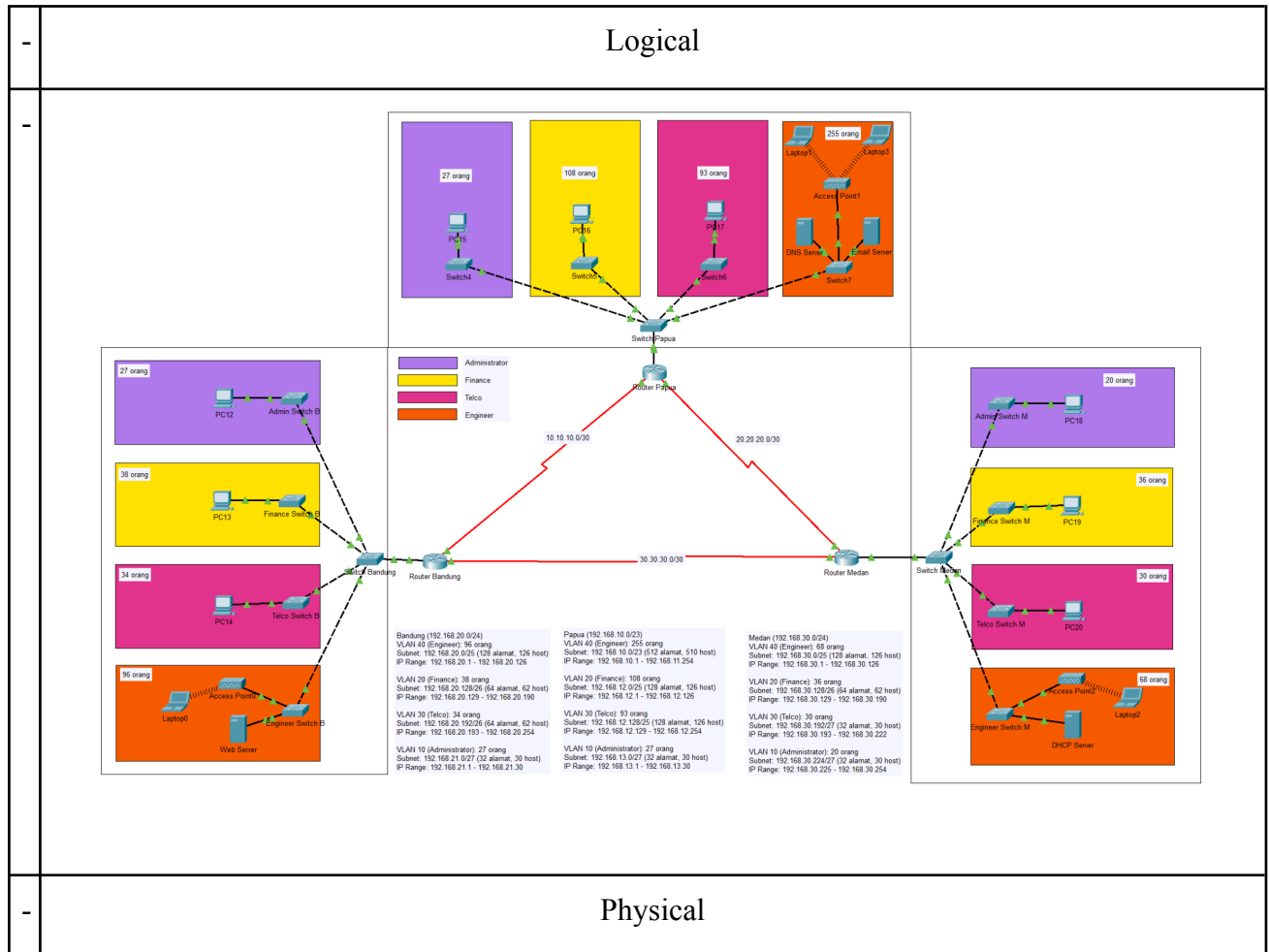
Universitas sangat mengutamakan kinerja terbaik, redundansi, skalabilitas, dan ketersediaan dalam infrastruktur jaringannya. Universitas telah membebaskan pengalamatan IP pada jaringannya, maka berikut adalah spesifikasi alamat IP yang saya petakan:

- WLAN : 10.10.0.0/16
- LAN : 192.168.0.0/16
- DMZ :

Persyaratan Teknis:

II.

1. Pembuatan Topologi Screenshot:





2. Tabel Pengalamatan IP

Cabang	Divisi	Jumlah Pegawai	Subnet	Net. Add.	FUA	LUA	Broad. Add.
Papua	Engineer	255	/23	10.0.0.0	10.0.0.1	10.0.0.254	10.0.0.255
	Finance	108	/25	10.0.2.0	10.0.2.1	10.0.2.126	10.0.2.127
	Telco	93	/25	10.0.2.128	10.0.2.129	10.0.2.254	10.0.2.255
	Admin.	27	/27	10.0.3.0	10.0.3.1	10.0.3.30	10.0.3.31
Bandung	Engineer	96	/25	172.16.0.0	172.16.0.1	172.16.0.126	172.16.0.127
	Finance	38	/26	172.16.0.128	172.16.0.129	172.16.0.190	172.16.0.191
	Telco	34	/26	172.16.0.192	172.16.0.193	172.16.0.254	172.16.0.255
	Admin.	27	/27	172.16.1.0	172.16.1.1	172.16.1.30	172.16.1.31

Medan	Engineer	68	/25	192.168.1.0	192.168.1.1	192.168.1.126	192.168.1.127
	Finance	36	/26	192.168.1.128	192.168.1.129	192.168.1.190	192.168.1.191
	Telco	30	/27	192.168.1.192	192.168.1.193	192.168.1.222	192.168.1.223
	Admin	20	/27	192.168.1.224	192.168.1.225	192.168.1.254	192.168.1.255

3. Konfigurasi IP Address pada Router

Screenshot:

[illegible]

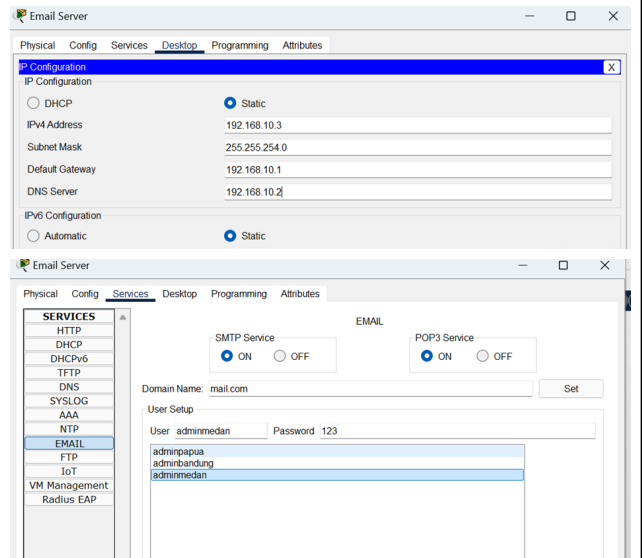
	<pre> Router(config)#int fa0/20.40 Router(config-if)#ip Router(config-if)#ip address 192.168.20.2 255.255.255.128 Router(config-if)#no shutdown Router(config-if)#exit Router(config)#end </pre>
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3. Konfigurasi pada Server

Screenshot:

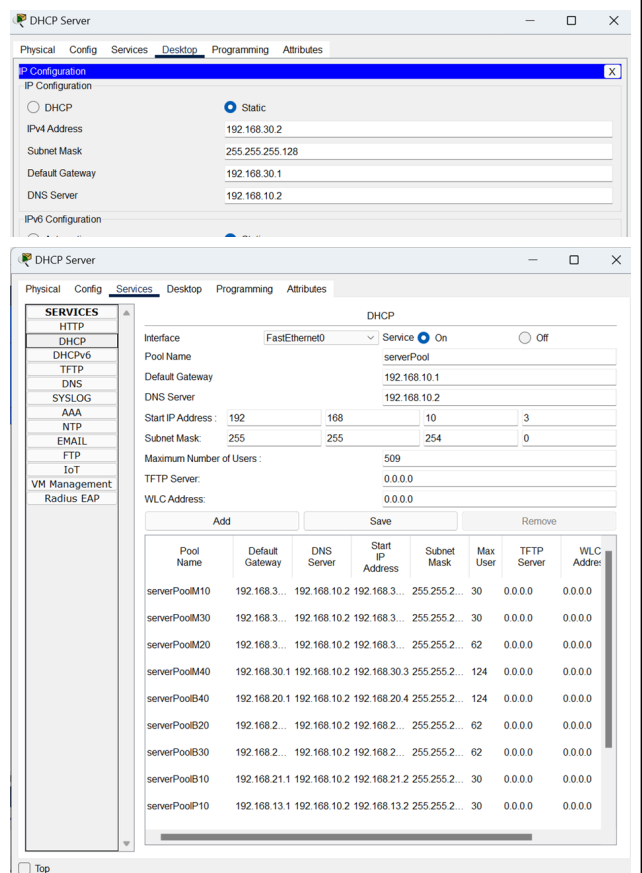
Device	Screenshot								
Web Server	<div><div><div>Web Server</div><div>Physical Config Services Desktop Programming Attributes</div><div>IP Configuration</div><div><div>IP Configuration</div><div><div><div>DHCP</div><div>Static</div></div><div>IPv4 Address192.168.20.2</div><div>Subnet Mask255.255.255.128</div><div>Default Gateway192.168.20.1</div><div>DNS Server192.168.10.2</div><div>IPv6 Configuration</div><div><div>Automatic</div><div>Static</div></div><div>IPv6 Address</div></div></div></div><div><div>Web Server</div><div>Physical Config Services Desktop Programming Attributes</div><div>SERVICES</div><div><div>File Name: index.html</div><div><html></div><div><center>University of Network</center></div><div>
Welcome to University of Network! Opening doors to new opportunities. Mind Wide Open.</div><div><p>Quick Links:</div><div>
A small page</div><div>
Copyrights</div><div>
image page</div><div>
image</div><div></html></div></div></div></div>								
DNS Server	<div><div><div>DNS Server</div><div>Physical Config Services Desktop Programming Attributes</div><div>IP Configuration</div><div><div>IP Configuration</div><div><div><div>DHCP</div><div>Static</div></div><div>IPv4 Address192.168.10.2</div><div>Subnet Mask255.255.254.0</div><div>Default Gateway192.168.10.1</div><div>DNS Server0.0.0.0</div><div>IPv6 Configuration</div><div><div>Automatic</div><div>Static</div></div><div>IPv6 Address</div><div>Link Local AddressFE80::204:AFFF:FE0D:7686</div><div>Default Gateway</div></div></div></div><div><div>DNS Server</div><div>Physical Config Services Desktop Programming Attributes</div><div>SERVICES</div><div><div>DNS</div><div>DNS Service<div>OnOff</div></div><div>Resource Records</div><div>Nameuniversityofnetwork.ac.idTypeA Record</div><div>Address192.168.20.2</div><div><div>Add</div><div>Save</div><div>Remove</div></div><table><thead><tr><th>No.</th><th>Name</th><th>Type</th><th>Detail</th></tr></thead><tbody><tr><td>0</td><td>universityofnetwork.ac.id</td><td>A Record</td><td>192.168.20.2</td></tr></tbody></table></div></div></div>	No.	Name	Type	Detail	0	universityofnetwork.ac.id	A Record	192.168.20.2
No.	Name	Type	Detail						
0	universityofnetwork.ac.id	A Record	192.168.20.2						

Email Server



The screenshot shows the Email Server configuration interface. The top window displays IP Configuration with Static IP settings: IPv4 Address 192.168.10.3, Subnet Mask 255.255.254.0, Default Gateway 192.168.10.1, and DNS Server 192.168.10.2. The bottom window shows the SERVICES list with EMAIL selected. The EMAIL configuration includes SMTP Service (ON), POP3 Service (ON), Domain Name (mail.com), and a list of users: adminpapa, adminbandung, and adminmedan.

DHCP Server



The screenshot shows the DHCP Server configuration interface. The top window displays IP Configuration with Static IP settings: IPv4 Address 192.168.30.2, Subnet Mask 255.255.255.128, Default Gateway 192.168.30.1, and DNS Server 192.168.10.2. The bottom window shows the DHCP configuration for the FastEthernet0 interface, with Service ON. It includes a table of IP pools:

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPoolM10	192.168.3...	192.168.10.2	192.168.3...	255.255.2...	30	0.0.0.0	0.0.0.0
serverPoolM30	192.168.3...	192.168.10.2	192.168.3...	255.255.2...	30	0.0.0.0	0.0.0.0
serverPoolM20	192.168.3...	192.168.10.2	192.168.3...	255.255.2...	62	0.0.0.0	0.0.0.0
serverPoolM40	192.168.30.1	192.168.10.2	192.168.30.3	255.255.2...	124	0.0.0.0	0.0.0.0
serverPoolB40	192.168.20.1	192.168.10.2	192.168.20.4	255.255.2...	124	0.0.0.0	0.0.0.0
serverPoolB20	192.168.2...	192.168.10.2	192.168.2...	255.255.2...	62	0.0.0.0	0.0.0.0
serverPoolB30	192.168.2...	192.168.10.2	192.168.2...	255.255.2...	62	0.0.0.0	0.0.0.0
serverPoolB10	192.168.21.1	192.168.10.2	192.168.21.2	255.255.2...	30	0.0.0.0	0.0.0.0
serverPoolP10	192.168.13.1	192.168.10.2	192.168.13.2	255.255.2...	30	0.0.0.0	0.0.0.0

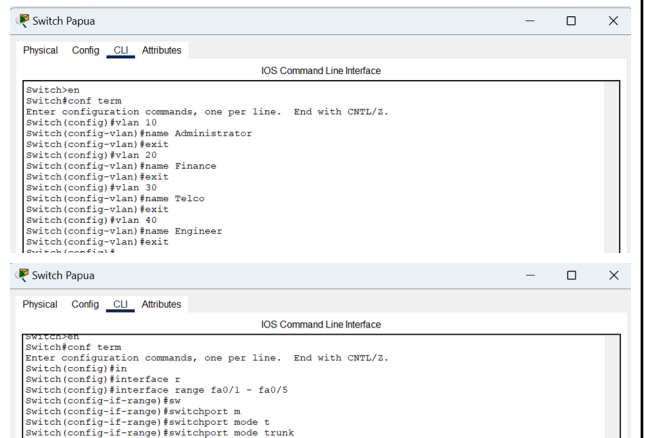
4. Konfigurasi pada Switch

Screenshot:

Device

Screenshot

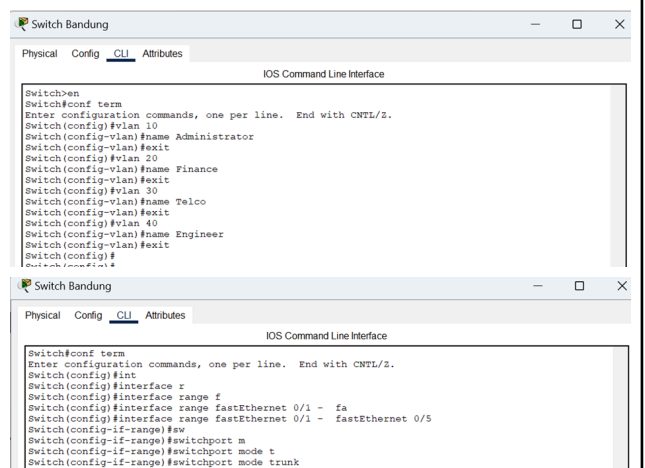
Switch Papua



```
Switch>en
Switch#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name Administrator
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name Finance
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name Telco
Switch(config-vlan)#exit
Switch(config)#vlan 40
Switch(config-vlan)#name Engineer
Switch(config-vlan)#exit
Switch(config-vlan)#exit
Switch(config)#
```

```
Switch>en
Switch#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#in
Switch(config)#interface r
Switch(config)#interface range fa0/1 - fa0/5
Switch(config-if-range)#sw
Switch(config-if-range)#switchport m
Switch(config-if-range)#switchport mode t
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#exit
```

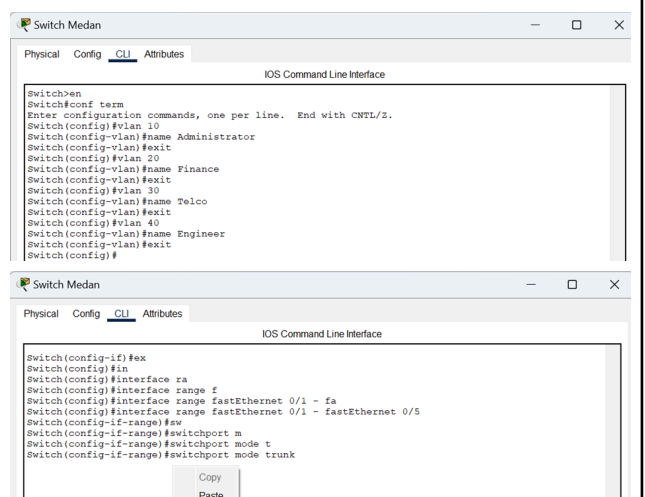
Switch Bandung



```
Switch>en
Switch#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name Administrator
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name Finance
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name Telco
Switch(config-vlan)#exit
Switch(config)#vlan 40
Switch(config-vlan)#name Engineer
Switch(config-vlan)#exit
Switch(config-vlan)#exit
Switch(config)#
```

```
Switch>en
Switch#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int
Switch(config)#interface r
Switch(config)#interface range f
Switch(config)#interface range fastEthernet 0/1 - fa
Switch(config-if-range)#sw
Switch(config-if-range)#switchport m
Switch(config-if-range)#switchport mode t
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#exit
```

Switch Medan



```
Switch>en
Switch#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name Administrator
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name Finance
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name Telco
Switch(config-vlan)#exit
Switch(config)#vlan 40
Switch(config-vlan)#name Engineer
Switch(config-vlan)#exit
Switch(config-vlan)#exit
Switch(config)#
```

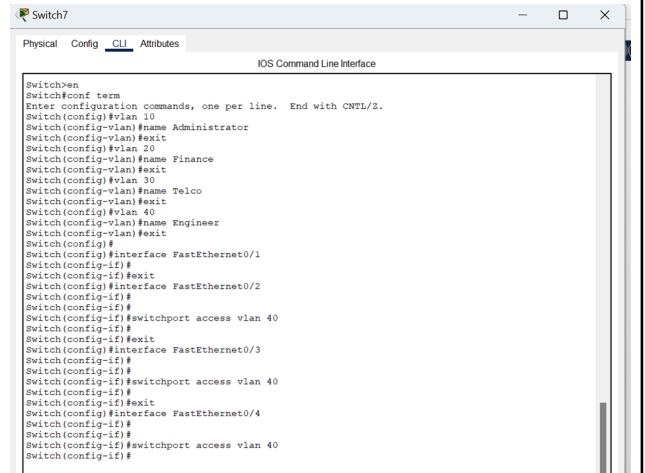
```
Switch>en
Switch#conf-if-range
Switch(config-if-range)#ex
Switch(config-if-range)#in
Switch(config-if-range)#interface ra
Switch(config-if-range)#interface range f
Switch(config-if-range)#interface range fastEthernet 0/1 - fa
Switch(config-if-range)#sw
Switch(config-if-range)#switchport m
Switch(config-if-range)#switchport mode t
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#exit
```

5. Konfigurasi Switchport Mode Access VLAN

Device

Screenshot

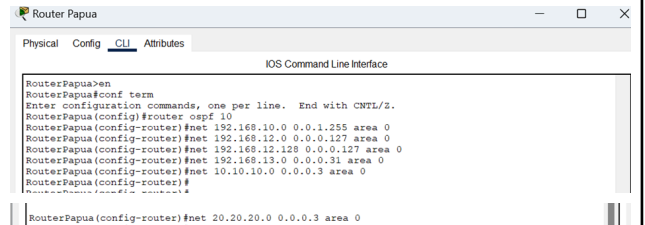
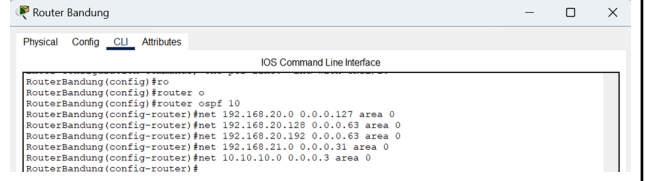
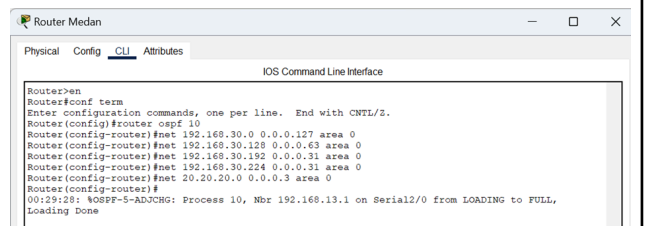
Switch



```
Switch7
Switch#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vian 10
Switch(config-vlan)#name Administrator
Switch(config-vlan)#exit
Switch(config-vlan)#vian 20
Switch(config-vlan)#name Finance
Switch(config-vlan)#exit
Switch(config-vlan)#vian 30
Switch(config-vlan)#name Telco
Switch(config-vlan)#exit
Switch(config-vlan)#vian 40
Switch(config-vlan)#name Engineer
Switch(config-vlan)#exit
Switch(config)#
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#switchport access vian 40
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
Switch(config-if)#switchport access vian 40
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#switchport access vian 40
Switch(config-if)#
Switch(config-if)#
```

6. Konfigurasi Routing OSPF pada Router

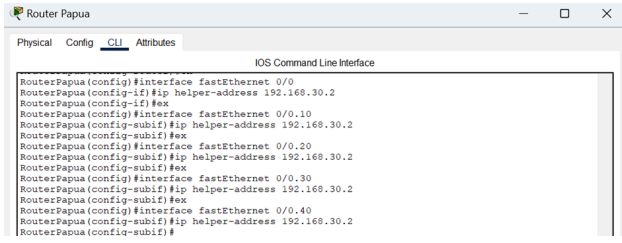
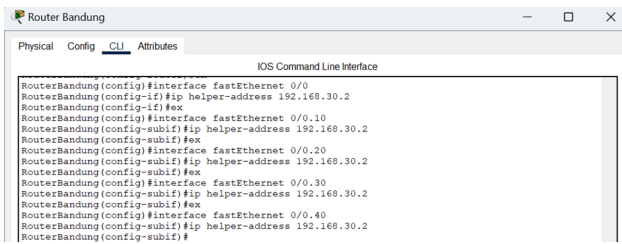
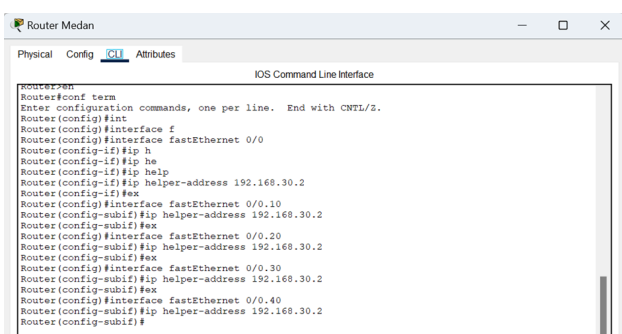
Screenshot:

Device	Screenshot
Router Papua	 <pre>Router Papua RouterPapua#conf term Enter configuration commands, one per line. End with CNTL/Z. RouterPapua(config)#router ospf 10 RouterPapua(config-router)#net 192.168.10.0 0.0.1.255 area 0 RouterPapua(config-router)#net 192.168.12.0 0.0.0.127 area 0 RouterPapua(config-router)#net 192.168.12.128 0.0.0.127 area 0 RouterPapua(config-router)#net 192.168.13.0 0.0.0.31 area 0 RouterPapua(config-router)#net 10.10.10.0 0.0.0.3 area 0 RouterPapua(config-router)# RouterPapua(config-router)#net 20.20.20.0 0.0.0.3 area 0 RouterPapua(config-router)#</pre>
Router Bandung	 <pre>Router Bandung RouterBandung(config)#ro RouterBandung(config)#router o RouterBandung(config)#router ospf 10 RouterBandung(config-router)#net 192.168.20.0 0.0.0.127 area 0 RouterBandung(config-router)#net 192.168.20.128 0.0.0.63 area 0 RouterBandung(config-router)#net 192.168.20.192 0.0.0.63 area 0 RouterBandung(config-router)#net 192.168.21.0 0.0.0.31 area 0 RouterBandung(config-router)#net 10.10.10.0 0.0.0.3 area 0 RouterBandung(config-router)#</pre>
Router Medan	 <pre>Router Medan Router#conf term Enter configuration commands, one per line. End with CNTL/Z. Router(config)#router ospf 10 Router(config-router)#net 192.168.30.0 0.0.0.127 area 0 Router(config-router)#net 192.168.30.128 0.0.0.63 area 0 Router(config-router)#net 192.168.30.192 0.0.0.31 area 0 Router(config-router)#net 192.168.30.224 0.0.0.31 area 0 Router(config-router)#net 20.20.20.0 0.0.0.3 area 0 Router(config-router)# 00:29:28: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.13.1 on Serial2/0 from LOADING to FULL, Loading Done Router(config-router)#</pre>

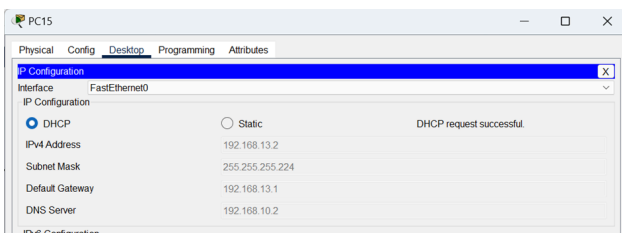
7. Konfigurasi IP Helper Address pada Router

Screenshot:

Device	Screenshot
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Router Papua	 <pre> RouterPapua(config)#interface fastEthernet 0/0 RouterPapua(config-if)#ip helper-address 192.168.30.2 RouterPapua(config-if)#exit RouterPapua(config)#interface fastEthernet 0/0.10 RouterPapua(config-subif)#ip helper-address 192.168.30.2 RouterPapua(config-subif)#exit RouterPapua(config)#interface fastEthernet 0/0.20 RouterPapua(config-subif)#ip helper-address 192.168.30.2 RouterPapua(config-subif)#exit RouterPapua(config)#interface fastEthernet 0/0.30 RouterPapua(config-subif)#ip helper-address 192.168.30.2 RouterPapua(config-subif)#exit RouterPapua(config)#interface fastEthernet 0/0.40 RouterPapua(config-subif)#ip helper-address 192.168.30.2 RouterPapua(config-subif)#exit </pre>
Router Bandung	 <pre> RouterBandung(config)#interface fastEthernet 0/0 RouterBandung(config-if)#ip helper-address 192.168.30.2 RouterBandung(config-if)#exit RouterBandung(config)#interface fastEthernet 0/0.10 RouterBandung(config-subif)#ip helper-address 192.168.30.2 RouterBandung(config-subif)#exit RouterBandung(config)#interface fastEthernet 0/0.20 RouterBandung(config-subif)#ip helper-address 192.168.30.2 RouterBandung(config-subif)#exit RouterBandung(config)#interface fastEthernet 0/0.30 RouterBandung(config-subif)#ip helper-address 192.168.30.2 RouterBandung(config-subif)#exit RouterBandung(config)#interface fastEthernet 0/0.40 RouterBandung(config-subif)#ip helper-address 192.168.30.2 RouterBandung(config-subif)#exit </pre>
Router Medan	 <pre> Router#conf term Enter configuration commands, one per line. End with CNTL/Z. Router(config)#int Router(config)#interface f Router(config)#interface fastEthernet 0/0 Router(config-if)#ip h Router(config-if)#ip he Router(config-if)#ip help Router(config-if)#ip helper-address 192.168.30.2 Router(config-if)#exit Router(config)#interface fastEthernet 0/0.10 Router(config-subif)#ip helper-address 192.168.30.2 Router(config-subif)#exit Router(config)#interface fastEthernet 0/0.20 Router(config-subif)#ip helper-address 192.168.30.2 Router(config-subif)#exit Router(config)#interface fastEthernet 0/0.30 Router(config-subif)#ip helper-address 192.168.30.2 Router(config-subif)#exit Router(config)#interface fastEthernet 0/0.40 Router(config-subif)#ip helper-address 192.168.30.2 Router(config-subif)#exit </pre>

8. Meminta IP Address DHCP pada End Device

Device	Screenshot
End Device	 <p>PC15 IP Configuration window showing DHCP configuration for FastEthernet0. The DHCP checkbox is selected, and the status indicates 'DHCP request successful'.</p>

9. Tes Ping antar PC dan End Device

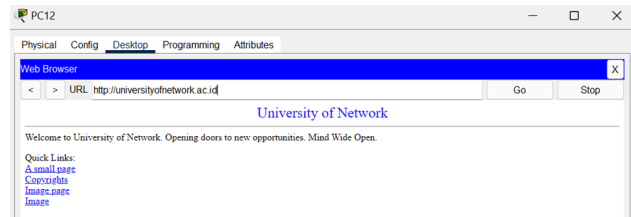
Device	Screenshot
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End Device

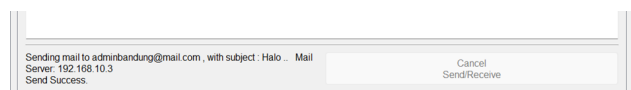
PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC12	PC15	ICMP		0.000	N	0	(edit)	
	Successful	PC12	PC18	ICMP		0.000	N	1	(edit)	
	Successful	PC13	PC16	ICMP		0.000	N	2	(edit)	
	Successful	PC13	PC19	ICMP		0.000	N	3	(edit)	
	Successful	PC14	PC17	ICMP		0.000	N	4	(edit)	
	Successful	PC14	PC20	ICMP		0.000	N	5	(edit)	
	Successful	Lapto...	Laptop1	ICMP		0.000	N	6	(edit)	
	Successful	Lapto...	DNS Server	ICMP		0.000	N	7	(edit)	
	Successful	Lapto...	Email Server	ICMP		0.000	N	8	(edit)	
	Successful	Lapto...	Laptop2	ICMP		0.000	N	9	(edit)	
	Successful	Lapto...	DHCP Server	ICMP		0.000	N	10	(edit)	

10. Uji Akses Web Perusahaan dengan Domain DNS

Device	Screenshot
PC	

11. Uji Kirim E-Mail antar PC Admin

Device	Screenshot
PC Pengirim	

PC Penerima

