PRAKTIKUM
JARINGAN KOMPUTER

Kelompok	**16**
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Subnetting Table

Jakarta

Divisi	Jumlah Host	Network Address	Subnet Mask	FUA	LUA	Broadcast Address
Engineer	240	192.168.0.0 /24	255.255.255.0	192.168.0.1	192.168.0.254	192.168.0.255
Finance	192	192.168.1.0 /24	255.255.255.0	192.168.1.1	192.168.1.254	192.168.1.255
Telco	64	192.168.2.0 /25	255.255.255.128	192.168.2.1	192.168.2.126	192.168.2.127
Research and Development	48	192.168.2.128 /26	255.255.255.192	192.168.2.129	192.168.2.190	192.168.2.191
Server_J	3	192.168.2.192 /29	255.255.255.248	192.168.2.193	192.168.2.198	192.168.2.199

Singapura

Divisi	Jumlah Host	Network Address	Subnet Mask	FUA	LUA	Broadcast Address
Engineer	64	192.168.4.0 /25	255.255.255.128	192.168.4.1	192.168.4.126	192.168.4.127
Finance	48	192.168.4.128 /26	255.255.255.192	192.168.4.129	192.168.4.190	192.168.4.191
Telco	48	192.168.4.192 /26	255.255.255.192	192.168.4.193	192.168.4.254	192.168.4.255
Research and Development	32	192.168.5.0/26	255.255.255.192	192.168.5.1	192.168.5.62	192.168.5.63
Server_S	3	192.168.5.64/29	255.255.255.248	192.168.5.65	192.168.5.70	192.168.5.71

Nusantara

Divisi	Jumlah Host	Network Address	Subnet Mask	FUA	LUA	Broadcast Address
Telco	47	192.168.6.0 /26	255.255.255.192	192.168.6.1	192.168.6.62	192.168.6.63
Engineer	43	192.168.6.64 /26	255.255.255.192	192.168.6.65	192.168.6.126	192.168.6.127
Finance	32	192.168.6.128 /26	255.255.255.192	192.168.6.129	192.168.6.190	192.168.6.191
Research and Development	16	192.168.6.192 /27	255.255.255.224	192.168.6.193	192.168.6.222	192.168.6.223

Antar Router

LAN	Jumlah Host	Network Address	Subnet Mask	FUA	LUA	Broadcast Address
Jakarta-Singapura	2	192.168.2.200 /30	255.255.255.252	192.168.2.201	192.168.2.202	192.168.2.203
Singapura-Nusantara	2	192.168.2.204 /30	255.255.255.252	192.168.2.205	192.168.2.206	192.168.2.207
Jakarta-Nusantara	2	192.168.2.208 /30	255.255.255.252	192.168.2.209	192.168.2.210	192.168.2.211

Etherchannel

Device (mode)	Port	Port Channel	Protocol
Eng (Passive) - RnD (Active)	F0/1-2	Port Channel 1	LACP
RnD (Auto) - Fin (Desirable)	F0/7-8	Port Channel 2	PAgP
Fin (Passive) - Telco (Active)	F0/5-6	Port Channel 3	LACP
Telco (Auto) - Eng (Desirable)	F0/3-4	Port Channel 4	PAgP

Router addressing

Device	Interface	IP Address / Subnet Mask	Default Gateway
Jakarta	G0/0	192.168.2.193/29	
	G0/1.10	192.168.2.129/26	
	G0/1.20	192.168.1.1/24	
	G0/1.30	192.168.2.1/25	
	G0/1.40	192.168.0.1/24	
	S0/0/0	192.168.2.201/30	
	S0/0/1	192.168.2.210/30	
Singapura	G0/0	192.168.5.65/29	
	G0/1.10	192.168.5.1/26	
	G0/1.20	192.168.4.12/26	
	G0/1.30	192.168.4.193/26	
	G0/1.40	192.168.4.1/25	
	S0/0/0	192.168.2.202/30	
	S0/0/1	192.168.2.205/30	
Nusantara	G0/1.10	192.168.6.193/27	
	G0/1.20	192.168.6.129/26	
	G0/1.30	192.168.6.1/26	
	G0/1.40	192.168.6.65/26	
	S0/0/0	192.168.2.206/30	
	S0/0/1	192.168.2.209/30	
DHCP IPv4 Server	F0/24	192.168.2.194/29	192.168.2.193
Web Server	F0/23	192.168.2.195/29	192.168.2.193
DNS Server	F0/23	192.168.5.67/29	192.168.5.65
Email Server	F0/24	192.168.5.66/29	192.168.5.65

Hostname dan banner message of the day

Digunakan untuk memberikan nama pada tiap router dan switch agar lebih mudah dibedakan saat konfigurasi.

1. Router.

```
Router(config)#host Jakarta
Jakarta(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Router(config)#hostname Singapura
Singapura(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Router(config)#hostname Nusantara
Nusantara(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

2. Switch.

```
Switch(config)#hostname RnD_J
RnD_J(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname Telco_J
Telco_J(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname RnD_S
RnD_S(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname Telco_S
Telco_S(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname RnD_N
RnD_N(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

```
Switch(config)#hostname Finance_J
Finance_J(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname Engineer_J
Engineer_J(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname Finance_S
Finance_S(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname Engineer_S
Engineer_S(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"

Switch(config)#hostname Finance_N
Finance_N(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

```
Switch(config)#hostname Telco_N
Telco_N(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

```
Switch(config)#hostname Engineer_N
Engineer_N(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

```
Switch(config)#hostname Server_S
Server_S(config)#banner motd "
Enter TEXT message.  End with the character '"'.
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

```
Switch(config)#hostname Server_J
Server_J(config)#banner motd "
Enter TEXT message.  End with the character '"'
*****************************
   AUTHORIZED ACCESS ONLY
*****************************"
```

Konfigurasi Console Password di Router

Memberikan password pada tiap router agar lebih aman.

1. Jakarta.

```
Jakarta(config)#line con 0
Jakarta(config-line)#password finpro16
Jakarta(config-line)#login
```

2. Singapura.

```
Singapura(config)#line con 0
Singapura(config-line)#password finpro16
Singapura(config-line)#login
```

3. Nusantara.

```
Nusantara(config)#line con 0
Nusantara(config-line)#password finpro16
Nusantara(config-line)#login
```

Pengalamatan Router

Membrikan IP address pada tiap interface dan sub-interface router. konfigurasi yang digunakan untuk Inter-VLAN routing ialah dengan Router-on-a-stick, ini dilakukan agar VLAN yang berbeda dapat berkomunikasi.

1. Jakarta

```
Jakarta(config)#int g0/1.10
Jakarta(config-subif)#ip add 192.168.2.129 255.255.255.192
Jakarta(config-subif)#int g0/1.20
Jakarta(config-subif)#ip add 192.168.1.1 255.255.255.0
Jakarta(config-subif)#int g0/1.30
Jakarta(config-subif)#ip add 192.168.2.1 255.255.255.128
Jakarta(config-subif)#int g0/1.40
Jakarta(config-subif)#ip add 192.168.0.1 255.255.255.0
Jakarta(config-subif)#int g0/0
Jakarta(config-if)#ip add 192.168.2.193 255.255.255.248
Jakarta(config-if)#no shut
```

```
Jakarta(config)#int s0/0/0
Jakarta(config-if)#no ip add
Jakarta(config-if)#ip add 192.168.2.201 255.255.255.252
Jakarta(config-if)#no shut
Jakarta(config-if)#int s0/0/1
Jakarta(config-if)#no ip add
Jakarta(config-if)#ip add 192.168.2.210 255.255.255.252
Jakarta(config-if)#no shut
```

2. Singapura

```
Singapura(config-if)#int g0/1.10
Singapura(config-subif)#ip add 192.168.5.1 255.255.255.192

Singapura(config-subif)#int g0/1.20
Singapura(config-subif)#no ip add
Singapura(config-subif)#ip add 192.168.4.129 255.255.255.192

Singapura(config-subif)#int g0/1.30
Singapura(config-subif)#ip add 192.168.4.193 255.255.255.192
Singapura(config-subif)#int g0/1.40
Singapura(config-subif)#ip add 192.168.4.1 255.255.255.128
Singapura(config-subif)#int g0/0
Singapura(config-if)#ip add 192.168.5.65 255.255.255.248

Singapura(config-if)#int s0/0/0
Singapura(config-if)#ip add 192.168.2.202 255.255.255.252

Singapura(config-if)#int s0/0/1
Singapura(config-if)#no ip add
Singapura(config-if)#ip add 192.168.2.205 255.255.255.252
```

3. Nusantara

```
Nusantara(config)#int g0/1.10
Nusantara(config-subif)#encap dot1q 10
Nusantara(config-subif)#ip add 192.168.6.193 255.255.255.224
Nusantara(config-subif)#no shut
Nusantara(config-subif)#int g0/1.20
Nusantara(config-subif)#encap dot1q 20
Nusantara(config-subif)#ip add 192.168.6.129 255.255.255.192

Nusantara(config-subif)#int g0/1.30
Nusantara(config-subif)#encap dot1q 30
Nusantara(config-subif)#ip add 192.168.6.1 255.255.255.192

Nusantara(config-subif)#int g0/1.40
Nusantara(config-subif)#encap dot1q 40
Nusantara(config-subif)#ip add 192.168.6.65 255.255.255.192
Nusantara(config-subif)#no sh
Nusantara(config-subif)#int g0/1
Nusantara(config-if)#no shut

Nusantara(config)#int s0/0/0
Nusantara(config-if)#no ip add
Nusantara(config-if)#ip add 192.168.2.206 255.255.255.252

Nusantara(config-if)#int s0/0/1
Nusantara(config-if)#no ip add
Nusantara(config-if)#ip add 192.168.2.209 255.255.255.252
Nusantara(config-if)#no sh
```

Pengalamatan server

1. DHCP Server.

○ DHCP	◉ Static
IPv4 Address	192.168.2.194
Subnet Mask	255.255.255.248
Default Gateway	192.168.2.193
DNS Server	192.168.5.194

2. Web Server.

○ DHCP	◉ Static
IPv4 Address	192.168.2.195
Subnet Mask	255.255.255.248
Default Gateway	192.168.2.193
DNS Server	192.168.5.194

3. DNS Server.

○ DHCP	◉ Static
IPv4 Address	192.168.5.67
Subnet Mask	255.255.255.248
Default Gateway	192.168.5.65
DNS Server	192.168.5.194

4. Email Server.

○ DHCP	◉ Static
IPv4 Address	192.168.5.66
Subnet Mask	255.255.255.248
Default Gateway	192.168.5.65
DNS Server	192.168.5.194

Konfigurasi VTP server dan client

Digunakan untuk mempermudah dalam mengkonfigurasi VLAN dengan menetapkan switch RnD pada setiap tempat menjadi server dan switch lainnya menjadi client

1. Jakarta

```
RnD_J(config)#vtp mode server
Device mode already VTP SERVER.
RnD_J(config)#vtp domain Jakarta
Changing VTP domain name from NULL to Jakarta
RnD_J(config)#vtp password Jakarta
Setting device VLAN database password to Jakarta
RnD_J(config)#vtp version 2
```

```
Engineer_J(config)#vtp mode client
Setting device to VTP CLIENT mode.
Engineer_J(config)#vtp domain Jakarta
Changing VTP domain name from NULL to Jakarta
Engineer_J(config)#vtp password Jakarta
Setting device VLAN database password to Jakarta
```

```
Telco_J(config)#vtp mode client
Setting device to VTP CLIENT mode.
Telco_J(config)#vtp domain Jakarta
Changing VTP domain name from NULL to Jakarta
Telco_J(config)#vtp password Jakarta
Setting device VLAN database password to Jakarta
```

```
Finance_J(config)#vtp mode client
Setting device to VTP CLIENT mode.
Finance_J(config)#vtp domain Jakarta
Changing VTP domain name from NULL to Jakarta
Finance_J(config)#vtp password Jakarta
Setting device VLAN database password to Jakarta
```

2. Singapura

```
RnD_S(config)#vtp mode server
Device mode already VTP SERVER.
RnD_S(config)#vtp domain Singapura
Domain name already set to Singapura.
RnD_S(config)#vtp pass Singapura
Password already set to Singapura
RnD_S(config)#vtp version 2
```

```
Engineer_S(config)#vtp mode client
Device mode already VTP CLIENT.
Engineer_S(config)#vtp domain Singapura
Domain name already set to Singapura.
Engineer_S(config)#vtp pass Singapura
Password already set to Singapura
```

```
Telco_S(config)#vtp mode client
Device mode already VTP CLIENT.
Telco_S(config)#vtp domain Singapura
Domain name already set to Singapura.
Telco_S(config)#vtp pass Singapura
Password already set to Singapura
```

```
Finance_S(config)#vtp mode client
Device mode already VTP CLIENT.
Finance_S(config)#vtp domain Singapura
Domain name already set to Singapura.
Finance_S(config)#vtp pass Singapura
Password already set to Singapura
```

3. Nusantara

```
RnD_N(config)#vtp mode server
Device mode already VTP SERVER.
RnD_N(config)#vtp domain Nusantara
Changing VTP domain name from NULL to Nusantara
RnD_N(config)#vtp pass Nusantara
Setting device VLAN database password to Nusantara
RnD_N(config)#vtp version 2
```

```
Engineer_N(config)#vtp mode client
Setting device to VTP CLIENT mode.
Engineer_N(config)#vtp domain Nusantara
Changing VTP domain name from NULL to Nusantara
Engineer_N(config)#vtp pass Nusantara
Setting device VLAN database password to Nusantara
```

```
Telco_N(config)#vtp mode client
Setting device to VTP CLIENT mode.
Telco_N(config)#vtp domain Nusantara
Changing VTP domain name from NULL to Nusantara
Telco_N(config)#vtp pass Nusantara
Setting device VLAN database password to Nusantara
```

```
Finance_N(config)#vtp mode client
Setting device to VTP CLIENT mode.
Finance_N(config)#vtp domain Nusantara
Changing VTP domain name from NULL to Nusantara
Finance_N(config)#vtp pass Nusantara
Setting device VLAN database password to Nusantara
```

Konfigurasi VLAN di switch VTP mode server

Membuat VLAN dan memberikan nama VLAN pada VTP server

1. RnD_J

```
RnD_J(config)#vlan 10
RnD_J(config-vlan)#name RnD
RnD_J(config-vlan)#vlan 20
RnD_J(config-vlan)#name Finance
RnD_J(config-vlan)#vlan 30
RnD_J(config-vlan)#name Telco
RnD_J(config-vlan)#vlan 40
RnD_J(config-vlan)#name Engineer
RnD_J(config-vlan)#vlan 99
RnD_J(config-vlan)#name Native
```

2. RnD_S

```
RnD_S(config)#vlan 10
RnD_S(config-vlan)#name RnD
RnD_S(config-vlan)#vlan 20
RnD_S(config-vlan)#name Finance
RnD_S(config-vlan)#vlan 30
RnD_S(config-vlan)#name Telco
RnD_S(config-vlan)#vlan 40
RnD_S(config-vlan)#name Engineer
RnD_S(config-vlan)#vlan 99
RnD_S(config-vlan)#name Native
```

3. RnD_N

```
RnD_N(config)#vlan 10
RnD_N(config-vlan)#name RnD
RnD_N(config-vlan)#vlan 20
RnD_N(config-vlan)#name Finance
RnD_N(config-vlan)#vlan 30
RnD_N(config-vlan)#name Telco
RnD_N(config-vlan)#vlan 40
RnD_N(config-vlan)#name Engineer
RnD_N(config-vlan)#vlan 99
RnD_N(config-vlan)#name Native
```

Konfigurasi mode access switchport

Membuat interface pada switch yang terhubung ke end device menjadi mode acceess yang sesuai dengan VLAN nya

1. Jakarta.

```
RnD_J(config)#int f0/24
RnD_J(config-if)#sw mode access
RnD_J(config-if)#sw access vlan 10

Telco_J(config)#int f0/24
Telco_J(config-if)#sw mode access
Telco_J(config-if)#sw access vlan 30

Finance_J(config)#int f0/24
Finance_J(config-if)#sw mode access
Finance_J(config-if)#sw access vlan 20

Finance_J(config)#int f0/23
Finance_J(config-if)#sw mode acc
Finance_J(config-if)#sw acc vlan 20

Engineer_J(config)#int f0/24
Engineer_J(config-if)#sw mode access
Engineer_J(config-if)#sw access vlan 40

Engineer_J(config)#int f0/23
Engineer_J(config-if)#sw mode acc
Engineer_J(config-if)#sw acc vlan 40
```

2. Singapura.

```
RnD_S(config-if-range)#int f0/24
RnD_S(config-if)#sw mode access
RnD_S(config-if)#sw acc vlan 10

Finance_S(config-if-range)#int f0/24
Finance_S(config-if)#sw mode access
Finance_S(config-if)#sw access vlan 20

Telco_S(config-if)#int f0/24
Telco_S(config-if)#sw mode access
Telco_S(config-if)#sw acc vlan 30

Engineer_S(config)#int f0/24
Engineer_S(config-if)#sw mode access
Engineer_S(config-if)#sw acc vlan 40
```

3. Nusantara.

```
RnD_N(config)#int f0/24
RnD_N(config-if)#sw mode access
RnD_N(config-if)#sw access vlan 10

Finance_N(config)#int f0/24
Finance_N(config-if)#sw mode access
Finance_N(config-if)#sw access vlan 20
```

```
Telco_N(config)#int f0/24          Engineer_N(config)#int f0/24
Telco_N(config-if)#sw mode access  Engineer_N(config-if)#sw mode access
Telco_N(config-if)#sw acc vlan 30  Engineer_N(config-if)#sw acc vlan 40
```

Konfigurasi switchport mode trunk

Membuat interface switch yang terhubung ke switch lain dan router menjadi mode trunk agar traffic data dapat menyebar dan ditransmisikan antar Switch.

1. Jakarta.

```
RnD_J#sh int tr
Port        Mode         Encapsulation  Status        Native vlan
Po1         on           802.1q         trunking      99
Po2         on           802.1q         trunking      99
Gig0/1      on           802.1q         trunking      99

Finance_J#sh int tr
Port        Mode         Encapsulation  Status        Native vlan
Po2         on           802.1q         trunking      99
Po3         on           802.1q         trunking      99

Telco_J#sh int tr
Port        Mode         Encapsulation  Status        Native vlan
Po3         on           802.1q         trunking      99
Po4         on           802.1q         trunking      99

Engineer_J#sh int tr
Port        Mode         Encapsulation  Status        Native vlan
Po1         on           802.1q         trunking      99
Po4         on           802.1q         trunking      99
```

2. Singapura.

```
RnD_S#sh int trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       on           802.1q         trunking      99
Fa0/2       on           802.1q         trunking      99
Fa0/7       on           802.1q         trunking      99
Fa0/8       on           802.1q         trunking      99
Gig0/1      on           802.1q         trunking      99

Engineer_S#sh int trun
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       on           802.1q         trunking      99
Fa0/2       on           802.1q         trunking      99
Fa0/3       on           802.1q         trunking      99
Fa0/4       on           802.1q         trunking      99

Telco_S#sh int trun
Port        Mode         Encapsulation  Status        Native vlan
Fa0/3       on           802.1q         trunking      99
Fa0/4       on           802.1q         trunking      99
Fa0/5       on           802.1q         trunking      99
Fa0/6       on           802.1q         trunking      99

Finance_S#sh int trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/5       on           802.1q         trunking      99
Fa0/6       on           802.1q         trunking      99
Fa0/7       on           802.1q         trunking      99
Fa0/8       on           802.1q         trunking      99
```

3. Nusantara.

```
RnD_N(config)#int r f0/1-2, f0/7-8
RnD_N(config-if-range)#sw mode trunk
RnD_N(config-if-range)#sw trunk native vlan 99

Engineer_N(config-if)#int r f0/1-4
Engineer_N(config-if-range)#sw mode trunk
Engineer_N(config-if-range)#sw trunk native vlan 99

Finance_N(config-if)#int r f0/5-8
Finance_N(config-if-range)#sw mode trunk
Finance_N(config-if-range)#sw trunk native vlan 99

Telco_N(config-if)#int r f0/3-6
Telco_N(config-if-range)#sw mode trunk
Telco_N(config-if-range)#sw trunk native vlan 99

RnD_N(config)#int g0/1
RnD_N(config-if)#sw mode trunk
sw trunk native vlan 99
```

Konfigurasi Etherchannel

Setiap switch yang terhubung dengan switch lainnya memiliki 2 kabel. Etherchannel digunakan untuk menggabungkan 2 kabel tersebut dengan membuat PAgP(desirable-auto) atau LACP(active-passive) pada interface yang sama.

1. Jakarta

```
Engineer_J(config)#int r fa0/1-2
Engineer_J(config-if-range)#channel-group 1 mode passive
Engineer_J(config-if-range)#int r fa0/3-4
Engineer_J(config-if-range)#channel-group 4 mode desirable

RnD_J(config)#int r fa0/1-2
RnD_J(config-if-range)#channel-group 1 mode active
RnD_J(config-if-range)#int r fa0/7-8
RnD_J(config-if-range)#channel-group 2 mode auto

Finance_J(config)#int r fa0/7-8
Finance_J(config-if-range)#channel-group 2 mode desirable
Finance_J(config-if-range)#int r fa0/5-6
Finance_J(config-if-range)#channel-group 3 mode passive

Telco_J(config)#int r fa0/5-6
Telco_J(config-if-range)#channel-group 3 mode active
Telco_J(config-if-range)#int r fa0/3-4
Telco_J(config-if-range)#channel-group 4 mode auto
```

2. Singapura

```
Engineer_S(config)#int r fa0/1-2
Engineer_S(config-if-range)#channel-group 1 mode passive
Engineer_S(config-if-range)#int r fa0/3-4
Engineer_S(config-if-range)#channel-group 4 mode desirable

RnD_S(config)#int r fa0/1-2
RnD_S(config-if-range)#channel-group 1 mode active
RnD_S(config-if-range)#int r fa0/7-8
RnD_S(config-if-range)#channel-group 2 mode auto

Finance_S(config)#int r fa0/7-8
Finance_S(config-if-range)#channel-group 2 mode desirable
Finance_S(config-if-range)#int r fa0/5-6
Finance_S(config-if-range)#channel-group 3 mode passive

Telco_S(config)#int r fa0/5-6
Telco_S(config-if-range)#channel-group 3 mode active
Telco_S(config-if-range)#int r fa0/3-4
Telco_S(config-if-range)#channel-group 4 mode auto
```

3. Nusantara

```
Engineer_N(config)#int r fa0/1-2
Engineer_N(config-if-range)#channel-group 1 mode passive
Engineer_N(config-if-range)#int r fa0/3-4
Engineer_N(config-if-range)#channel-group 4 mode desirable

RnD_N(config)#int r fa0/1-2
RnD_N(config-if-range)#channel-group 1 mode active
RnD_N(config-if-range)#int r fa0/7-8
RnD N(config-if-range)#channel-group 2 mode auto

Finance_N(config)#int r fa0/7-8
Finance_N(config-if-range)#channel-group 2 mode desirable
Finance_N(config-if-range)#int r fa0/5-6
Finance_N(config-if-range)#channel-group 3 mode passive

Telco_N(config)#int r fa0/5-6
Telco_N(config-if-range)#channel-group 3 mode active
Telco_N(config-if-range)#int r fa0/3-4
Telco_N(config-if-range)#channel-group 4 mode auto
```

Konfigurasi STP

Digunakan untuk menghindari terjadinya looping akibat redundant. STP yang digunakan ialah rapid-pvst, lalu masukkan setiap VLAN yang ada. Di setiap cabang, switch RnD dijadikan root primary

1. Jakarta.

```
RnD_J(config)#spanning-tree mode rapid-pvst
RnD_J(config)#spann
RnD_J(config)#spanning-tree  vlan 10,20,30,40,99
RnD_J(config)#spann
RnD_J(config)#spanning-tree  vlan 1,20,30,40,50,99 root primary

Telco_J(config)#spanning-tree mode rapid-pvst
Telco_J(config)#spann
Telco_J(config)#spanning-tree vlan 10,20,30,40,99
```

```
Finance_J(config)#spanning-tree mode rapid-pvst
Finance_J(config)#spann
Finance_J(config)#spanning-tree vlan 10,20,30,40,99

Engineer_J(config)#spanning-tree mode rapid-pvst
Engineer_J(config)#spann
Engineer_J(config)#spanning-tree vlan 10,20,30,40,99
```

2. Singapura.

```
RnD_S(config)#spanning-tree mode rapid-pvst
RnD_S(config)#spann
RnD_S(config)#spanning-tree vlan 10,20,30,40,99
RnD_S(config)#spann
RnD_S(config)#spanning-tree vlan 1,10,20,30,40,99 root primary

Telco_S(config)#spanning-tree mode rapid-pvst
Telco_S(config)#spann
Telco_S(config)#spanning-tree vlan 10,20,30,40,99
```

```
Finance_S(config)#spanning-tree mode rapid-pvst
Finance_S(config)#spann
Finance_S(config)#spanning-tree vlan 10,20,30,40,99

Engineer_S(config)#spanning-tree mode rapid-pvst
Engineer_S(config)#spann
Engineer_S(config)#spanning-tree vlan 10,20,30,40,99
```

3. Nusantara.

```
RnD_N(config)#spanning-tree mode rapid-pvst
RnD_N(config)#spann
RnD_N(config)#spanning-tree vlan 10,20,30,40,99
RnD_N(config)#spann
RnD_N(config)#spanning-tree vlan 1,10,20,30,40,99 root primary

Telco_N(config)#spanning-tree mode rapid-pvst
Telco_N(config)#spanning
Telco_N(config)#spanning-tree vlan 10,20,30,40,99
```

```
Finance_N(config)#spanning-tree mode rapid-pvst
Finance_N(config)#spann
Finance_N(config)#spanning-tree
% Incomplete command.
Finance_N(config)#spanning-tree vlan 10,20,30,40,99

Engineer_N(config)#spanning-tree mode rapid-pvst
Engineer_N(config)#spann
Engineer_N(config)#spanning-tree vlan 10,20,30,40,99
```

Konfigurasi switch server

Membuat vlan pada server dam membuat switchport mode access pada interface yang terhubung dengan end-device dan mode trunk pada interface yang terhubung dengan switch

1. Server_J.

```
Server_J(config)#vlan 50
Server_J(config-vlan)#name Server
```

```
Server_J(config-vlan)#int r f0/23-24
Server_J(config-if-range)#sw mode acc
Server_J(config-if-range)#sw acc vlan 50
Server_J(config-if-range)#int g0/1
Server_J(config-if)#sw mode trunk
```

2. Server_S.

```
Server_S(config)#vlan 50
Server_S(config-vlan)#name Server
```

```
Server_S(config)#int r f0/23-24
Server_S(config-if-range)#sw mode acc
Server_S(config-if-range)#sw acc vlan 50
Server_S(config-if-range)#int g0/1
Server_S(config-if)#sw mode trunk
```

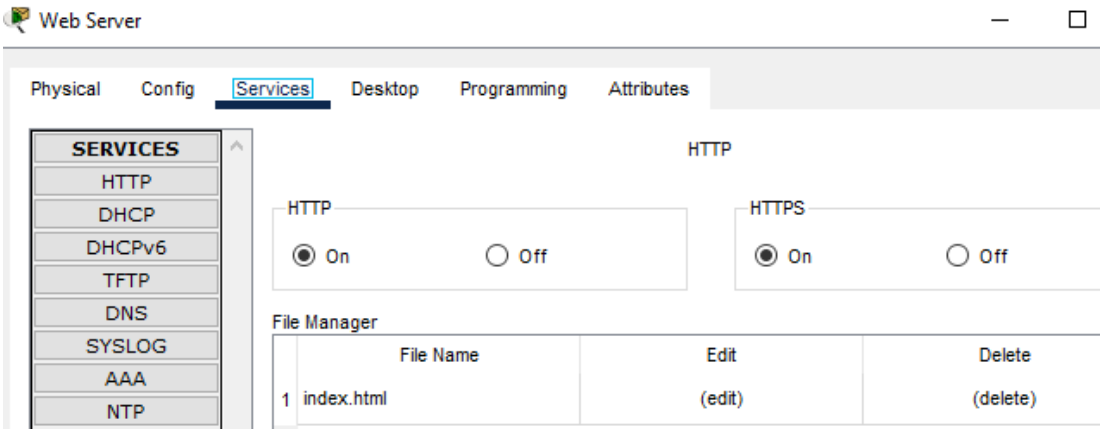
Konfigurasi server

1. DHCP Server.

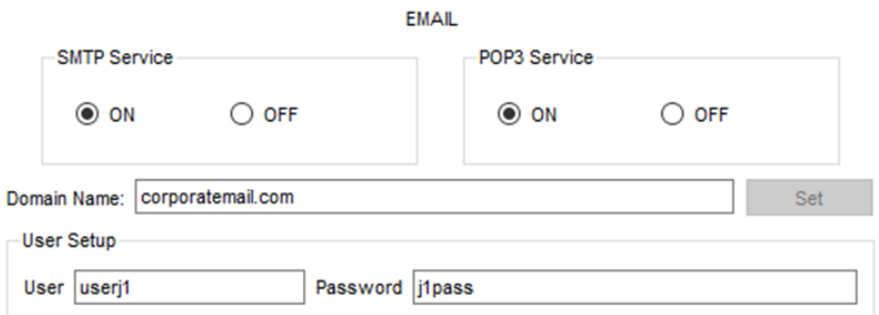
   Untuk mendapatkan IP secara dinamis maka dibuat sebuah DHCP server agar end device mendapatkan IP yang tersedia.

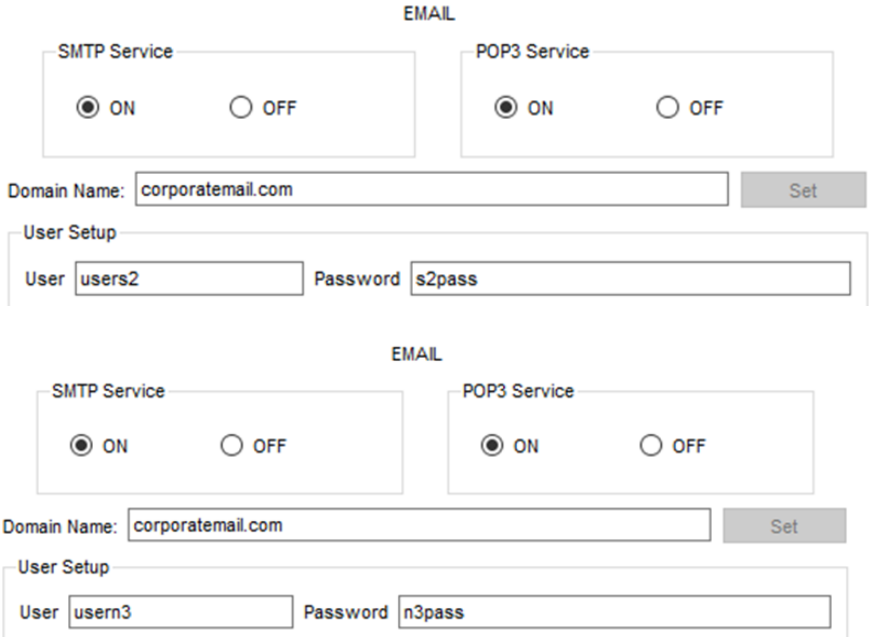
Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User
RnD_J	192.168.2.129	192.168.5.67	192.168.2.130	255.255.255.192	62
Finance_J	192.168.1.1	192.168.5.67	192.168.1.2	255.255.255.0	254
Telco_J	192.168.2.1	192.168.5.67	192.168.2.2	255.255.255.128	126
Engineer_J	192.168.0.1	192.168.5.67	192.168.0.2	255.255.255.0	254
RnD_S	192.168.5.1	192.168.5.67	192.168.5.2	255.255.255.192	62
Finance_S	192.168.4.129	192.168.5.67	192.168.4.130	255.255.255.192	62
Telco_S	192.168.4.193	192.168.5.67	192.168.4.194	255.255.255.192	62
Engineer_S	192.168.4.1	192.168.5.67	192.168.4.2	255.255.255.128	126
RnD_N	192.168.6.193	192.168.5.67	192.168.6.194	255.255.255.224	30
Finance_N	192.168.6.129	192.168.5.67	192.168.6.130	255.255.255.192	62
Telco_N	192.168.6.1	192.168.5.67	192.168.6.2	255.255.255.192	62
Engineer_N	192.168.6.65	192.168.5.67	192.168.6.66	255.255.255.192	62

2. Web Server.



3. Email Server.

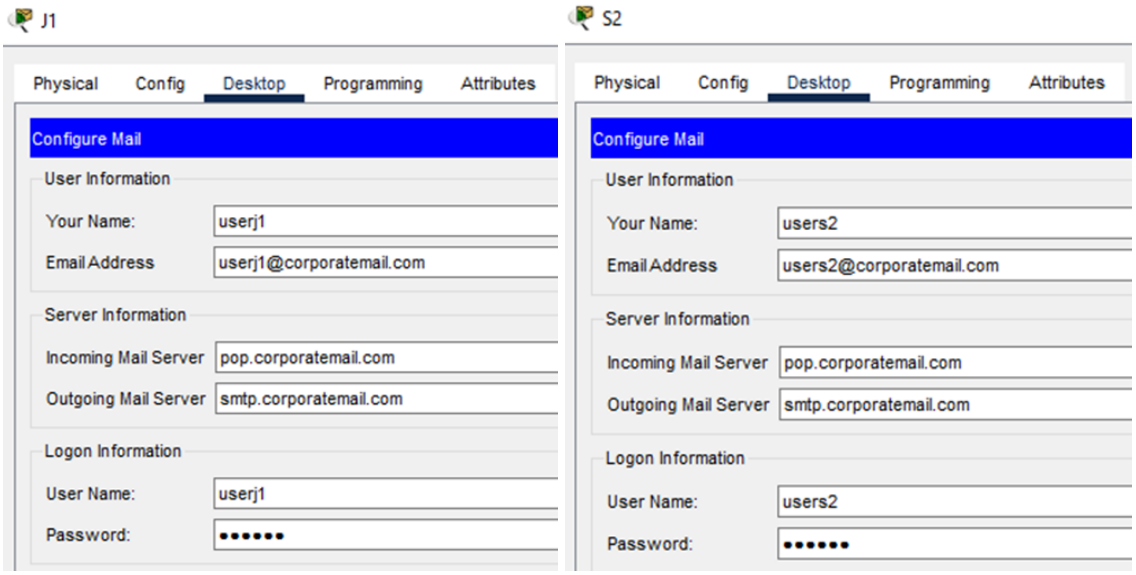


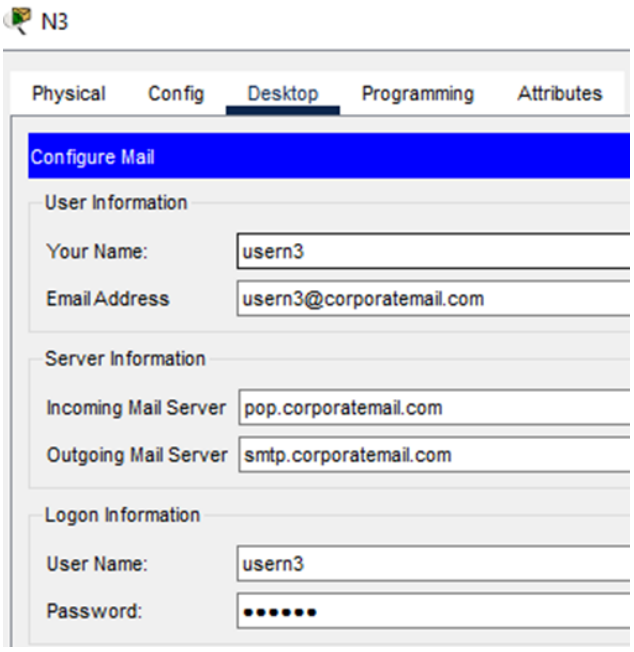


4. DNS Server.

No.	Name	Type	Detail
0	corporatemail.com	A Record	192.168.5.66
1	corporateweb.com	A Record	192.168.2.195
2	pop.corporatemail.com	CNAME	corporatemail.com
3	smtp.corporatemail.com	CNAME	corporatemail.com

5. End devices.





Konfigurasi ip helper address di router

Digunakan untuk membantu meneruskan dan menerima pesan antara DHCP server dengan client

1. Jakarta.

```
Jakarta(config-if)#int g0/1.10
Jakarta(config-subif)#ip helper
Jakarta(config-subif)#ip helper-address 192.168.2.194
Jakarta(config-subif)#int g0/1.20
Jakarta(config-subif)#ip helper-address 192.168.2.194
Jakarta(config-subif)#int g0/1.30
Jakarta(config-subif)#ip helper-address 192.168.2.194
Jakarta(config-subif)#int g0/1.40
Jakarta(config-subif)#ip helper-address 192.168.2.194
```

2. Singapura.

```
interface GigabitEthernet0/1.10
 encapsulation dot1Q 10
 ip address 192.168.5.1 255.255.255.192
 ip helper-address 192.168.2.194
!
interface GigabitEthernet0/1.20
 encapsulation dot1Q 20
 ip address 192.168.4.129 255.255.255.192
 ip helper-address 192.168.2.194

interface Serial0/0/0
 ip address 192.168.2.202 255.255.255.252
 ip helper-address 192.168.2.194
 clock rate 2000000
!
interface Serial0/0/1
 ip address 192.168.2.205 255.255.255.252
 ip helper-address 192.168.2.194
```

```
interface GigabitEthernet0/1.30
 encapsulation dot1Q 30
 ip address 192.168.4.193 255.255.255.192
 ip helper-address 192.168.2.194
!
interface GigabitEthernet0/1.40
 encapsulation dot1Q 40
 ip address 192.168.4.1 255.255.255.128
 ip helper-address 192.168.2.194
```

3. Nusantara.

```
Nusantara(config)#int g0/1.10
Nusantara(config-subif)#ip helper
Nusantara(config-subif)#ip helper-address 192.168.2.194
Nusantara(config-subif)#int g0/1.20
Nusantara(config-subif)#ip helper-address 192.168.2.194
Nusantara(config-subif)#int g0/1.30
Nusantara(config-subif)#ip helper-address 192.168.2.194
Nusantara(config-subif)#int g0/1.40
Nusantara(config-subif)#ip helper-address 192.168.2.194
Nusantara(config-subif)#int s0/0/0
Nusantara(config-if)#ip helper-address 192.168.2.194
```

Konfigurasi ip routing

Melakukan ip routing dengan EIGRP

1. Jakarta.

```
Jakarta(config)#router eigrp 1
Jakarta(config-router)#no auto-sum
Jakarta(config-router)#passive default
Jakarta(config-router)#no passive s0/0/0
Jakarta(config-router)#no passive s0/0/1
Jakarta(config-router)#network 192.168.2.192 0.0.0.7
Jakarta(config-router)#network 192.168.2.128 0.0.0.63
Jakarta(config-router)#network 192.168.2.192 0.0.0.7
Jakarta(config-router)#network 192.168.2.128 0.0.0.63
Jakarta(config-router)#network 192.168.1.0
Jakarta(config-router)#network 192.168.0.0
Jakarta(config-router)#network 192.168.2.0
```

2. Singapura.

```
Singapura(config)#router eigrp 1
Singapura(config-router)#net 192.168.4.0 0.0.0.127
Singapura(config-router)#net 192.168.4.128 0.0.0.63
Singapura(config-router)#net 192.168.4.192 0.0.0.63
Singapura(config-router)#net 192.168.5.0 0.0.0.63
Singapura(config-router)#net 192.168.5.64 0.0.0.7
Singapura(config-router)#net 192.168.2.200 0.0.0.3

Singapura(config-router)#net 192.168.2.204 0.0.0.3

Singapura(config-router)#no auto-sum

Singapura(config-router)#passive default
Singapura(config-router)#no passive s0/0/0
Singapura(config-router)#no passive s0/0/1
```

3. Nusantara.

```
Nusantara(config)#router eigrp 1
Nusantara(config-router)#no auto-sum
Nusantara(config-router)#passive default
Nusantara(config-router)#no passive s0/0/0
Nusantara(config-router)#no passive s0/0/1
Nusantara(config-router)#network 192.168.6.192 0.0.0.31
Nusantara(config-router)#network 192.168.6.128 0.0.0.63
Nusantara(config-router)#network 192.168.6.0 0.0.0.63
Nusantara(config-router)#network 192.168.6.64 0.0.0.63
Nusantara(config-router)#network 192.168.2.204 0.0.0.3
```

Konfigurasi port security

1. Jakarta.

```
RnD_J(config)#int f0/24
RnD_J(config-if)#sw port-security max 48

Finance_J(config)#int f0/24
Finance_J(config-if)#sw port-security max 132
Finance_J(config-if)#int f0/23
Finance_J(config-if)#sw port-security max 60
```

```
Telco_J(config)#int f0/24
Telco_J(config-if)#sw port-security max 64

Engineer_J(config)#int f0/24
Engineer_J(config-if)#sw port-security max 132
Engineer_J(config-if)#int f0/23
Engineer_J(config-if)#sw port-security max 108
```

2. Singapura.

```
RnD_S(config)#int f0/24
RnD_S(config-if)#sw port-security max 32

Telco_S(config)#int f0/24
Telco_S(config-if)#sw port-security max 48
```

```
Finance_S(config)#int f0/24
Finance_S(config-if)#sw port-security max 48

Engineer_S(config)#int f0/24
Engineer_S(config-if)#sw port-security max 64
```

3. Nusantara.

```
RnD_N(config)#int f0/24
RnD_N(config-if)#sw port-security max 16

Telco_N(config)#int f0/24
Telco_N(config-if)#sw port-security max 47
```

```
Finance_N(config)#int f0/24
Finance_N(config-if)#sw port-security max 32

Engineer_N(config)#int f0/24
Engineer_N(config-if)#sw port-security max 43
```

Konfigurasi maksimum host yang terhubung ke jaringan

1. Jakarta.

```
Jakarta(config)#ip dhcp excluded-address 192.168.0.242 192.168.0.254
Jakarta(config)#ip dhcp excluded-address 192.168.1.194 192.168.1.254
Jakarta(config)#ip dhcp excluded-address 192.168.2.66 192.168.2.126
Jakarta(config)#ip dhcp excluded-address 192.168.2.178 192.168.2.190
```

2. Singapura.

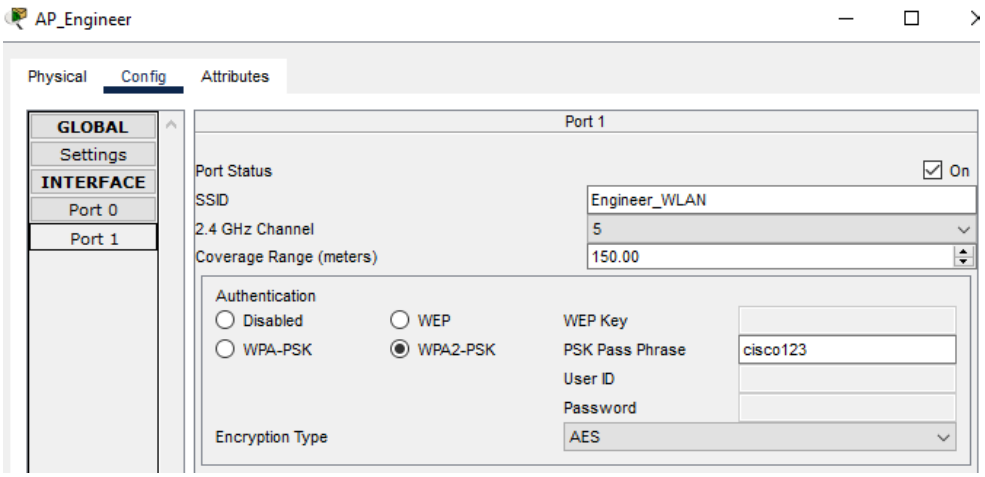
```
Singapura(config)#ip dhcp excluded-address 192.168.4.66 192.168.4.126
Singapura(config)#ip dhcp excluded-address 192.168.4.178 192.168.4.190
Singapura(config)#ip dhcp excluded-address 192.168.4.242 192.168.4.254
Singapura(config)#ip dhcp excluded-address 192.168.5.34 192.168.5.62
```

3. Nusantara.

```
Nusantara(config)#ip dhcp excluded-address 192.168.6.49 192.168.6.62
Nusantara(config)#ip dhcp excluded-address 192.168.6.109 192.168.6.126
Nusantara(config)#ip dhcp excluded-address 192.168.6.162 192.168.6.190
Nusantara(config)#ip dhcp excluded-address 192.168.6.210 192.168.6.222
```

Konfigurasi WLAN

1. Access Point.



2. PC.

- Menambahkan modul WMP300N agar PC mendapatkan interface nirkabel.

- Menghubungkan PC dengan AP_Engineer dengan memasukkan Pass Phrase.

Hasil akses web server

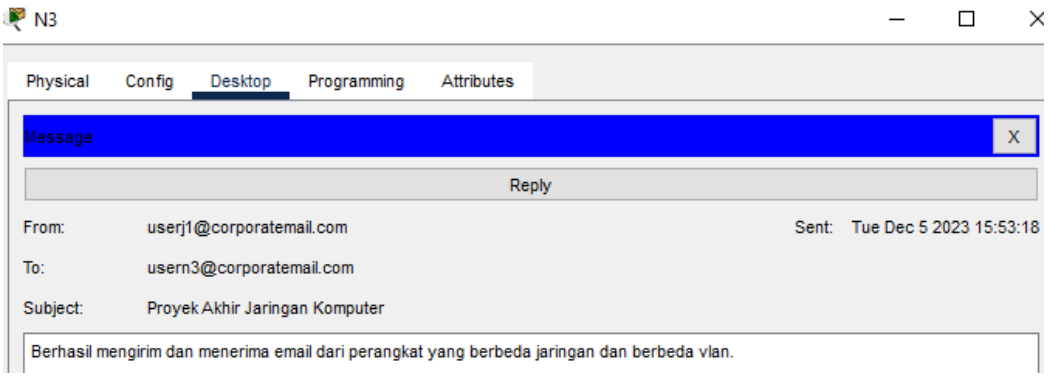
Hasil mengirim dan menerima email

1. Dari J1 ke N3.
   - Mengirim email.

```
Sending mail to usern3@corporatemail.com , with subject : Proyek Akhir Jaringan
Komputer ..  Mail Server: smtp.corporatemail.com
DNS resolving. Resolving name: smtp.corporatemail.com by querying to DNS
Server: 192.168.5.194  DNS resolved ip address: 192.168.5.195
Send Success.
```

   - Menerima email.

```
Receiving mail from POP3 Server pop.corporatemail.com
DNS resolving. Resolving name: pop.corporatemail.com by querying to DNS Server:
192.168.5.194  DNS resolved ip address: 192.168.5.195
Receive Mail Success.
```

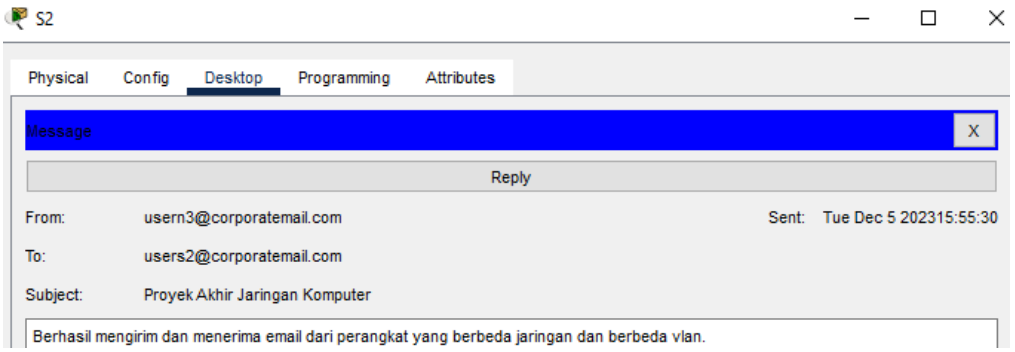


2. Dari N3 ke S2.
   - Mengirim email.

```
Sending mail to users2@corporatemail.com , with subject : Proyek Akhir Jaringan
Komputer ..  Mail Server: smtp.corporatemail.com
DNS resolving. Resolving name: smtp.corporatemail.com by querying to DNS
Server: 192.168.5.194  DNS resolved ip address: 192.168.5.195
Send Success.
```

- Menerima email.

```
Receiving mail from POP3 Server pop.corporatemail.com
DNS resolving. Resolving name: pop.corporatemail.com by querying to DNS Server:
192.168.5.194  DNS resolved ip address: 192.168.5.195
Receive Mail Success.
```



Hasil PDU dari beberapa perangkat

- VLAN sama.

Last Status	Source	Destination
Successful	J2	S2

- Berbeda VLAN.

Last Status	Source	Destination
Successful	J3	J2

- Berbeda jaringan.

Last Status	Source	Destination
Successful	N4	S3