

# **LAPORAN TUGAS BESAR JARKOM**



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**PROGRAM STUDI S1 SISTEM INFORMASI**

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# **BAB 1**

## **PENDAHULUAN**

### **1.1 Studi Case**

Sebuah universitas ingin membangun jaringan untuk kompleks asramanya. Jaringan ini harus mendukung subnet untuk Asrama Putra (52 host), Asrama Putri (39 host), Staf Kantin & Asrama (11 host), dan Kantin (44 host). Terdapat area Gym yang setiap mahasiswa dapat terkoneksi jaringan secara otomatis. VLAN akan memisahkan lalu lintas berdasarkan asrama dan fasilitas umum. Area kantin dan Staf asrama memerlukan koneksi antar-VLAN untuk bisa merespon komunikasi pada area kantin. Empat router akan menghubungkan Asrama Putra, Asrama Putri, Kantin & Staf Asrama, dan Gym untuk akses ke intranet maupun internet dengan lancar.

Laporan ini menjelaskan pembuatan jaringan untuk area asrama di sebuah universitas yang terdiri dari beberapa lingkup. Setiap lingkup dipisahkan menggunakan VLAN untuk menjaga keamanan dan efisiensi jaringan, dengan koneksi antar router menggunakan static routing. GYM diberikan akses internet menggunakan DHCP agar mahasiswa dapat langsung terhubung ke jaringan secara otomatis tanpa konfigurasi manual. Selain itu, koneksi antar VLAN digunakan khusus untuk kantin dan staff asrama untuk mendukung komunikasi operasional antar divisi.

## BAB 2

### PERANCANGAN JARINGAN

#### 2.1 TABEL VLSM

Vlan	NAMA VLAN	Host	Ip switch	Ip network	Subnetmask	Default gateway	IP range
10	KANTIN	44	192.168.10.10	192.168.10.0	255.255.255.192	192.168.10.1	192.168.10.2 - 192.168.10.62
20	STAFF	11	192.168.10.10	192.168.20.0	255.255.255.240	192.168.20.1	192.168.20.2 - 192.168.20.14
30	ASRAMA PUTRI	39	192.168.10.2	192.168.30.0	255.255.255.192	192.168.30.1	192.168.30.2 - 192.168.30.62
40	ASRAMA PUTRA	52	192.168.10.1	192.168.40.0	255.255.255.192	192.168.40.1	192.168.30.2 - 192.168.30.62
50	GYM	-	192.168.10.6	192.168.50.0	255.255.255.0	192.168.50.1	192.168.30.2 - 192.168.30.254

#### 2.2 Network Analys

Department	Host	CIDR	Subnet Mask
Kantin	44 hosts	/26	255.255.255.192
Staff	11 hosts	/25	255.255.255.240
Asrama Putri	39 hosts	/26	255.255.255.192
Asrama Putra	52 hosts	/26	255.255.255.192
Gym	250 hosts	/24	255.255.255.0

#### 2.3 Vlans

Vlans ID	Name
10	Kantin
20	Staff
30	Asrama Putri
40	Asrama Putra
50	GYM

#### 2.4 Router

Device	Interface	Ip address	Subnet Mask	Encapsulation
RTR-Asrama Putra	Gig0/0.40	192.168.40.1	255.255.255.192	40
RTR-Asrama Putri	Gig2/0.30	192.168.30.1	255.255.255.192	30
RTR-Gym	Gig1/0.50	192.168.50.1	255.255.255.0	50
RTR-Kantin & Staff	Gig1/0.10 & Gig2/0.20	192.168.10.1 & 192.168.20.1	255.255.255.192 & 255.255.255.240	10 & 20

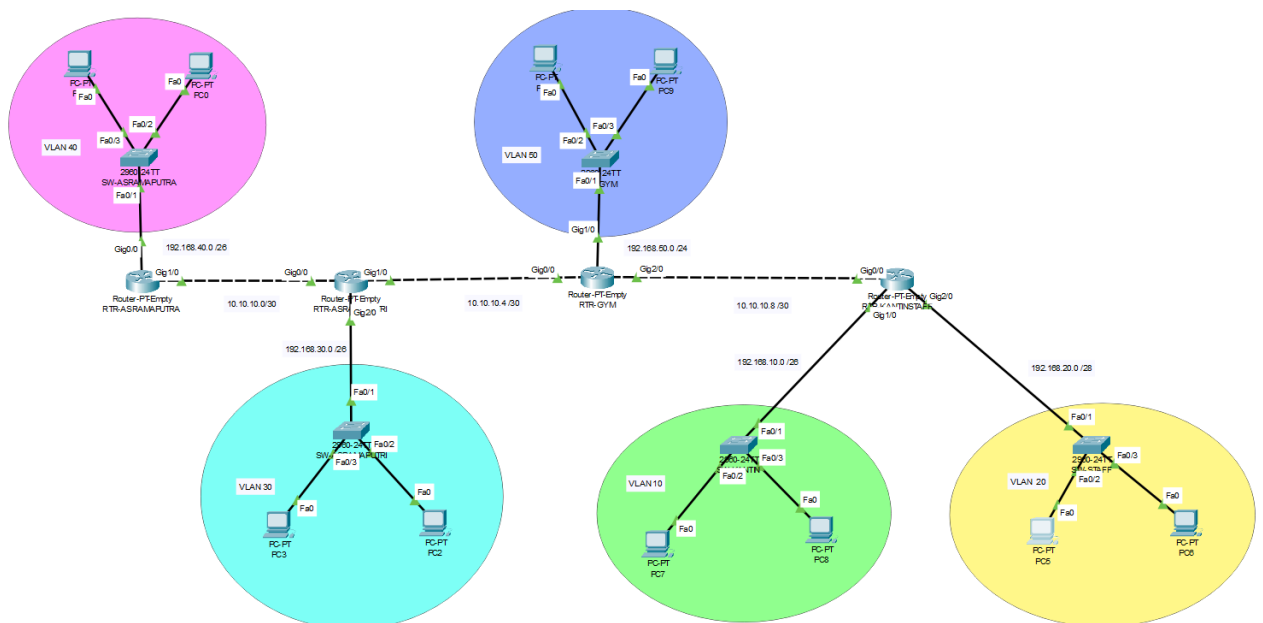
## 2.5 Device

Device	IP Address	Subnet Mask	Gateway	VLAN
PC0	192.168.40.2	255.255.255.192	192.168.40.1	40
PC1	192.168.40.3	255.255.255.192	192.168.40.1	40
PC2	192.168.30.2	255.255.255.192	192.168.30.1	30
PC3	192.168.30.2	255.255.255.192	192.168.30.1	30
PC5	192.168.20.2	255.255.255.240	192.168.20.1	20
PC6	192.168.20.3	255.255.255.240	192.168.20.1	20
PC7	192.168.10.2	255.255.255.192	192.168.10.1	10
PC8	192.168.10.3	255.255.255.192	192.168.10.1	10
PC9	192.168.50.2	255.255.255.0	192.168.50.1	50
PC10	192.168.50.3	255.255.255.0	192.168.50.1	50

## 2.6 Switch

Switch	Port	Mode	VLAN
SW-ASRAMAPUTRA	Fa0/1	trunk	-
SW-ASRAMAPUTRA	Fa0/2	access	40
SW-ASRAMAPUTRA	Fa0/3	access	40
SW-ASRAMAPUTRI	Fa0/1	trunk	-
SW-ASRAMAPUTRI	Fa0/2	access	30
SW-ASRAMAPUTRI	Fa0/3	access	30
SW-GYM	Fa0/1	trunk	-
SW-GYM	Fa0/2	access	50
SW-GYM	Fa0/3	access	50
SW-KANTIN	Fa0/1	trunk	-
SW-KANTIN	Fa0/2	access	10
SW-KANTIN	Fa0/3	access	10
SW-STAFF	Fa0/1	trunk	-
SW-STAFF	Fa0/2	access	20
SW-STAFF	Fa0/3	access	20

## 2.7 TOPOLOGI



## 2.3 Konfigurasi jaringan & Static Routes

### 2.3.1. RTR-ASRAMAPUTRA

- VLAN: 40
- IP Subnet: 192.168.40.0/26
- Perangkat: 2 PC
- Router terhubung dengan IP: 10.10.10.1/30
- Static routes:

The screenshot shows the RTR-ASRAMAPUTRA configuration window. On the left is a sidebar with a tree view containing 'GLOBAL' (with sub-items 'Settings' and 'Algorithm Settings'), 'ROUTING' (with sub-items 'Static' and 'RIP'), and 'INTERFACE' (with sub-items 'GigabitEthernet0/0' and 'GigabitEthernet1/0'). The 'Static' option under 'ROUTING' is selected. The main area is titled 'Static Routes' and contains input fields for 'Network', 'Mask', and 'Next Hop', followed by an 'Add' button. Below these is a table of configured static routes:

Network Address
192.168.30.0/26 via 10.10.10.2
192.168.50.0/24 via 10.10.10.2
192.168.10.0/26 via 10.10.10.2
192.168.20.0/28 via 10.10.10.2
0.0.0.0/0 via 10.10.10.2
10.10.10.8/30 via 10.10.10.2

A 'Remove' button is located at the bottom right of the table. At the bottom of the window, there is a section titled 'Equivalent IOS Commands' containing a terminal-like text area with the following text:

```
RTR-ASRAMAPUTRA>enable
RTR-ASRAMAPUTRA#
RTR-ASRAMAPUTRA#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

At the very bottom left, there is a checkbox labeled 'Tnn'.

### 2.3.2 RTR-ASRAMAPUTRI

- VLAN: 30
- IP Subnet: 192.168.30.0/26
- Perangkat: 2 PC
- Static routes:

The screenshot displays the configuration interface for RTR-ASRAMAPUTRI. The top navigation bar includes tabs for Physical, Config, CLI, and Attributes. The left sidebar shows a tree structure with categories: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), and INTERFACE (GigabitEthernet0/0, GigabitEthernet1/0, GigabitEthernet2/0). The main panel is titled 'Static Routes' and contains input fields for Network, Mask, and Next Hop, along with an 'Add' button. Below these fields is a table listing configured static routes. At the bottom, the 'Equivalent IOS Commands' section shows the CLI commands to enable the configuration and enter terminal mode.

Network Address
192.168.40.0/26 via 10.10.10.1
192.168.50.0/24 via 10.10.10.6
192.168.10.0/26 via 10.10.10.6
192.168.20.0/28 via 10.10.10.6
10.10.10.8/30 via 10.10.10.6

```
RTR-ASRAMAPUTRI>enable
RTR-ASRAMAPUTRI#
RTR-ASRAMAPUTRI#configure terminal
```

### 2.3.3 RTR-GYM

- VLAN: 50
- IP Subnet: 192.168.50.0/24
- Router: RTR-GYM
- Perangkat: 2 PC
- Router terhubung dengan IP: 10.10.10.6/30
- Static routes:

The screenshot displays the RTR-GYM configuration window. The 'Config' tab is active, and the 'Static Routes' section is selected in the left-hand menu. The main area shows a table of static routes with columns for Network Address, Network, Mask, and Next Hop. The table contains five entries: 192.168.40.0/26 via 10.10.10.5, 192.168.30.0/26 via 10.10.10.5, 192.168.10.0/26 via 10.10.10.10, 192.168.20.0/28 via 10.10.10.10, and 10.10.10.0/30 via 10.10.10.5. Below the table is a 'Remove' button. At the bottom, the 'Equivalent IOS Commands' section shows a terminal window with the following commands: RTR-GYM>enable, RTR-GYM#, and RTR-GYM#configure terminal.

Network Address	Network	Mask	Next Hop
192.168.40.0/26	via	10.10.10.5	
192.168.30.0/26	via	10.10.10.5	
192.168.10.0/26	via	10.10.10.10	
192.168.20.0/28	via	10.10.10.10	
10.10.10.0/30	via	10.10.10.5	

```
RTR-GYM>enable
RTR-GYM#
RTR-GYM#configure terminal
```



### 2.3.4. RTR-KANTINSTAFF

- Kantin:
  - VLAN: 10
  - IP Subnet: 192.168.10.0/26
  - Perangkat: 2 PC
  - VLAN ini berkomunikasi dengan VLAN 20 (inter-VLAN)
- Staff:
  - VLAN: 20
  - IP Subnet: 192.168.20.0/28
  - Perangkat: 2 PC
  - VLAN ini berkomunikasi dengan VLAN 10 (inter-VLAN)
- Static routes:

The screenshot shows the RTR-KANTINSTAFF configuration window. The 'Config' tab is active, and the 'Static Routes' section is selected. The left sidebar shows a tree view with 'GLOBAL' (Settings, Algorithm Settings), 'ROUTING' (Static, RIP), and 'INTERFACE' (GigabitEthernet0/0, GigabitEthernet1/0, GigabitEthernet2/0). The main area displays the 'Static Routes' configuration with fields for Network, Mask, and Next Hop. Below these fields is a table of configured static routes. At the bottom, there is a section for 'Equivalent IOS Commands' showing the commands used to configure the static routes.

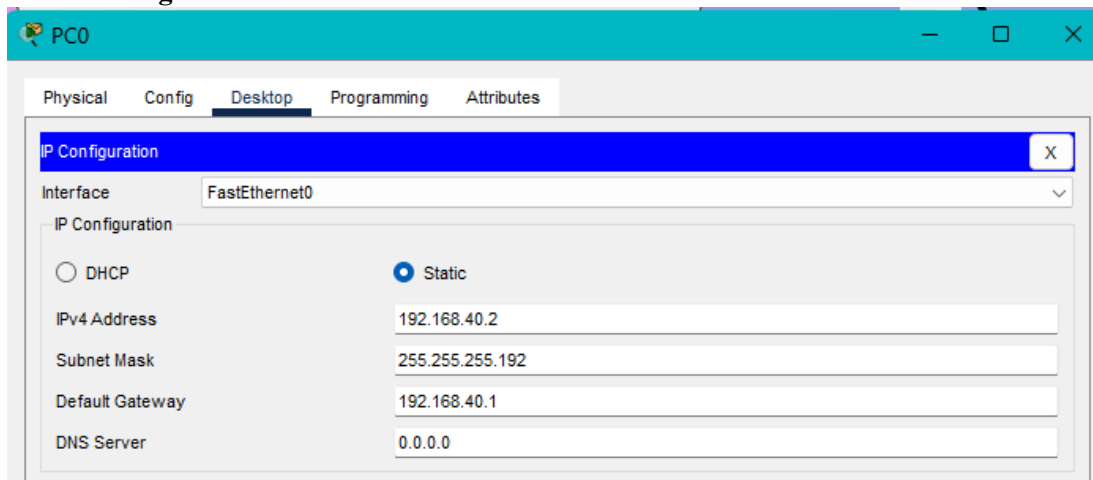
Network Address
192.168.40.0/26 via 10.10.10.9
192.168.30.0/26 via 10.10.10.9
192.168.50.0/24 via 10.10.10.9
10.10.10.0/30 via 10.10.10.9
10.10.10.4/30 via 10.10.10.9

```
RTR-KANTINSTAFF>enable
RTR-KANTINSTAFF#
RTR-KANTINSTAFF#configure terminal
```

## BAB 3

### DETAIL CONFIGURATION

#### 3.1 IP Configuration



PC0

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

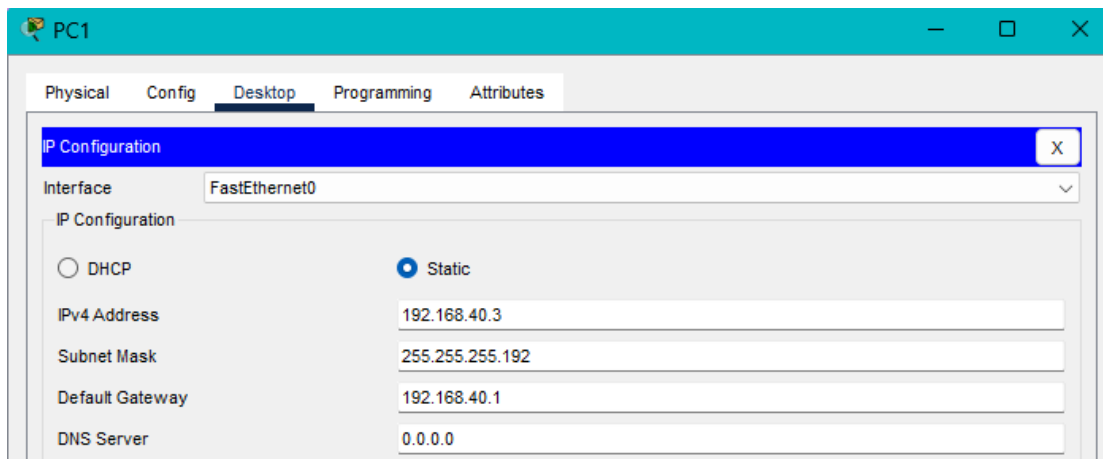
☐ DHCP ☒ Static

IPv4 Address: 192.168.40.2

Subnet Mask: 255.255.255.192

Default Gateway: 192.168.40.1

DNS Server: 0.0.0.0



PC1

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

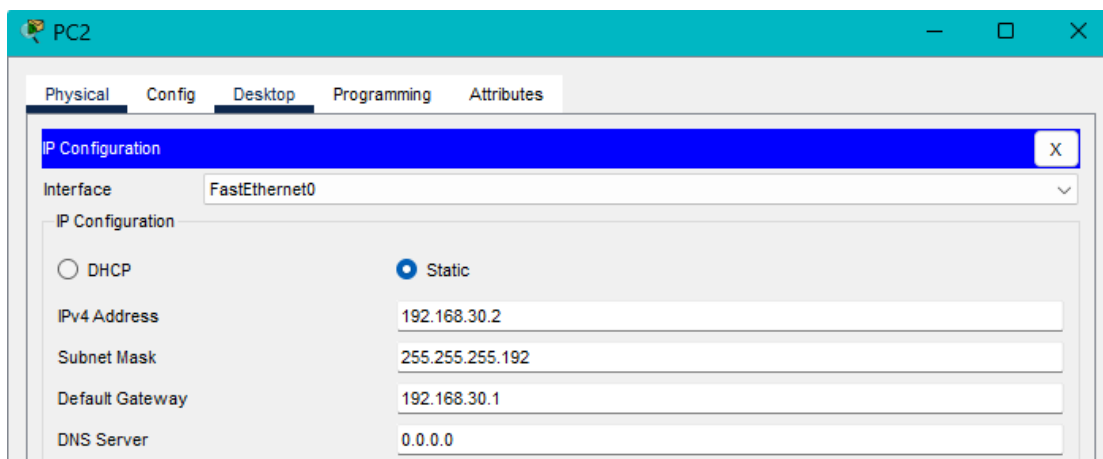
☐ DHCP ☒ Static

IPv4 Address: 192.168.40.3

Subnet Mask: 255.255.255.192

Default Gateway: 192.168.40.1

DNS Server: 0.0.0.0



PC2

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.30.2

Subnet Mask: 255.255.255.192

Default Gateway: 192.168.30.1

DNS Server: 0.0.0.0

PC3

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.30.3

Subnet Mask 255.255.255.192

Default Gateway 192.168.30.1

DNS Server 0.0.0.0

PC5

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.20.2

Subnet Mask 255.255.255.240

Default Gateway 192.168.20.1

DNS Server 0.0.0.0

PC6

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.20.3

Subnet Mask 255.255.255.240

Default Gateway 192.168.20.1

DNS Server 0.0.0.0

PC7

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.10.2

Subnet Mask 255.255.255.192

Default Gateway 192.168.10.1

DNS Server 0.0.0.0

PC8

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.10.3

Subnet Mask 255.255.255.192

Default Gateway 192.168.10.1

DNS Server 0.0.0.0

PC9

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.50.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.50.1

DNS Server 0.0.0.0

PC10

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address

192.168.50.3

Subnet Mask

255.255.255.0

Default Gateway

192.168.50.1









DNS Server

0.0.0.0

## BAB 4

### HASIL TESTING & FILE PKA

#### 4.1 PERCOBAAN INTER-VLAN & STATIC ROUTING

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC3	PC7	ICMP		0.000	N	1	(edit)	
	Successful	PC8	PC5	ICMP		0.000	N	2	(edit)	
	Successful	PC2	PC0	ICMP		0.000	N	3	(edit)	
	Successful	PC10	PC7	ICMP		0.000	N	4	(edit)	

Pengujian konektivitas jaringan telah berhasil dan sesuai ketentuan studi case

1. Pc8 di switch kantin dan pc5 di switch staff sudah berhasil inter-vlan
2. Pc3 di router asrama putri dan pc7 di switch kantin berhasil static routing
3. Pc10 di router gym yang menggunakan dhcp bisa static routing ke pc7 di switch kantin

#### 4.2 File PKA here

[https://drive.google.com/file/d/1WP0tKfNrDy8euK24QLikT\\_wamolr3a9t/view?usp=drive\\_link](https://drive.google.com/file/d/1WP0tKfNrDy8euK24QLikT_wamolr3a9t/view?usp=drive_link)