Kelompok 3
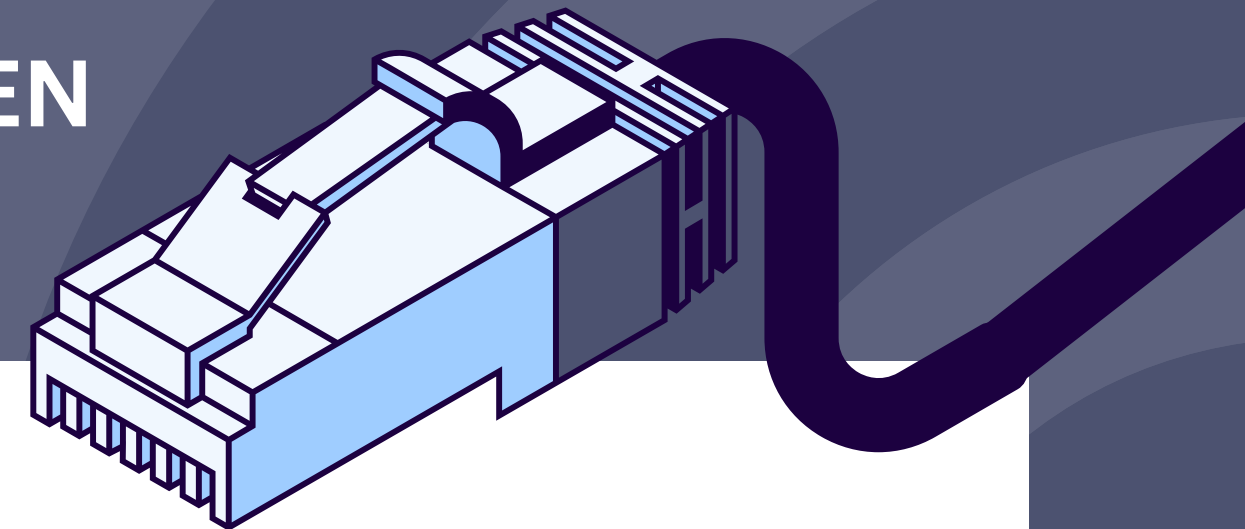**2702275024 - Raphael Brian Pratama**
2702249505 - Galio Geraldo
2702258440 - Bryan Wiguna
2702238634 - Stankovic Budiman Sasmita
2702279086 - Ricky Atha Ajie Alvianto
2702273302 - AGUNG NGURAH NAYAKA SURYA
2702331965 - RICHARD ANDERSEN

LEARNING OBJECTIVES

Devices used, Networking Media types and length of media used

IP Addressing & Subnetting

Routing

Application Layer

Device

Router adalah perangkat yang mengontrol lalu lintas jaringan dan menghubungkan jaringan lokal Anda ke internet. Lantai 1 dan 2 membutuhkan 6 router + 1 router utama lantai. Lantai 3 membutuhkan 3 router + 1 router utama lantai. Kemudian, semua router digabungkan di router utama. Total router yang dibutuhkan adalah 18 router.

Switch berfungsi untuk menyambungkan perangkat-perangkat akhir (PC) ke router. Switch diperlukan di setiap ruangan agar semua PC dapat terhubung ke routernya. Total switch yang diperlukan adalah 68 switch (mengikuti kelas).

Server berfungsi untuk memberikan akses internet kepada komputer agar komputer dapat menggunakan aplikasi berbasis internet (Application Layer). Membutuhkan 1 Server.

Komputer pribadi, atau PC, adalah perangkat titik akhir dalam jaringan komputer yang terhubung ke jaringan dan memungkinkan pengguna untuk terhubung ke internet dan berkomunikasi dengan perangkat lain. Membutuhkan 238 PC.

Device
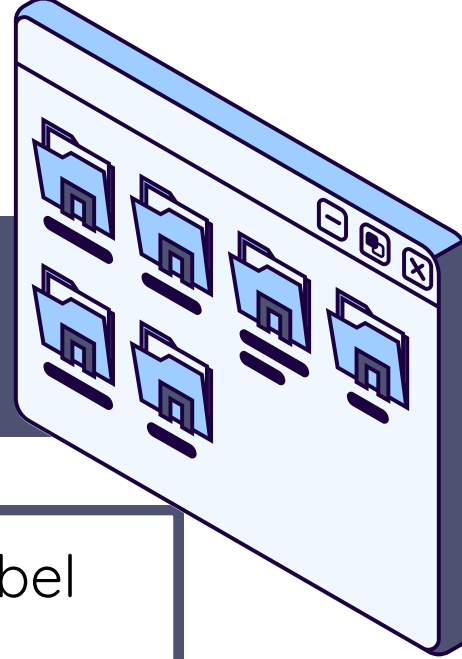
Kabel Ethernet untuk menggabungkan antara PC dengan Switch dan Switch dengan Router. Anggap panjang kabel per PC adalah 8 meter. Ruangan yang memiliki 25 PC membutuhkan kabel sepanjang 200 meter, ruangan yang memiliki 10 PC membutuhkan kabel sepanjang 80 meter, dan ruangan yang memiliki 1 PC membutuhkan kabel sepanjang 8 meter.

- Total lantai 1 : 1168 meter (2 ruangan 25 PC, 8 ruangan 10 PC, 16 ruangan 1 PC)
- Total lantai 2 : 592 meter (1 ruangan 25 PC, 3 ruangan 10 PC, 19 ruangan 1 PC)
- Total lantai 3 : 144 meter (18 ruangan 1 PC)
- Total semua lantai : 1904 meter

Kabel Serial digunakan untuk menghubungkan satu router dengan router lainnya. Anggap untuk menghubungkan dari router ke router utama lantai membutuhkan panjang 5 meter.

- Lantai 1 : 30 meter (6 router)
- Lantai 2 : 30 meter (6 router)
- Lantai 3 : 15 meter (3 router)
- Anggap untuk menggabungkan router utama lantai ke router utama membutuhkan 10 meter. Kabel yang diperlukan totalnya 30 meter (3 router utama lantai)
- Total kabel serial yang diperlukan adalah 105 meter

TREE TOPOLOGY
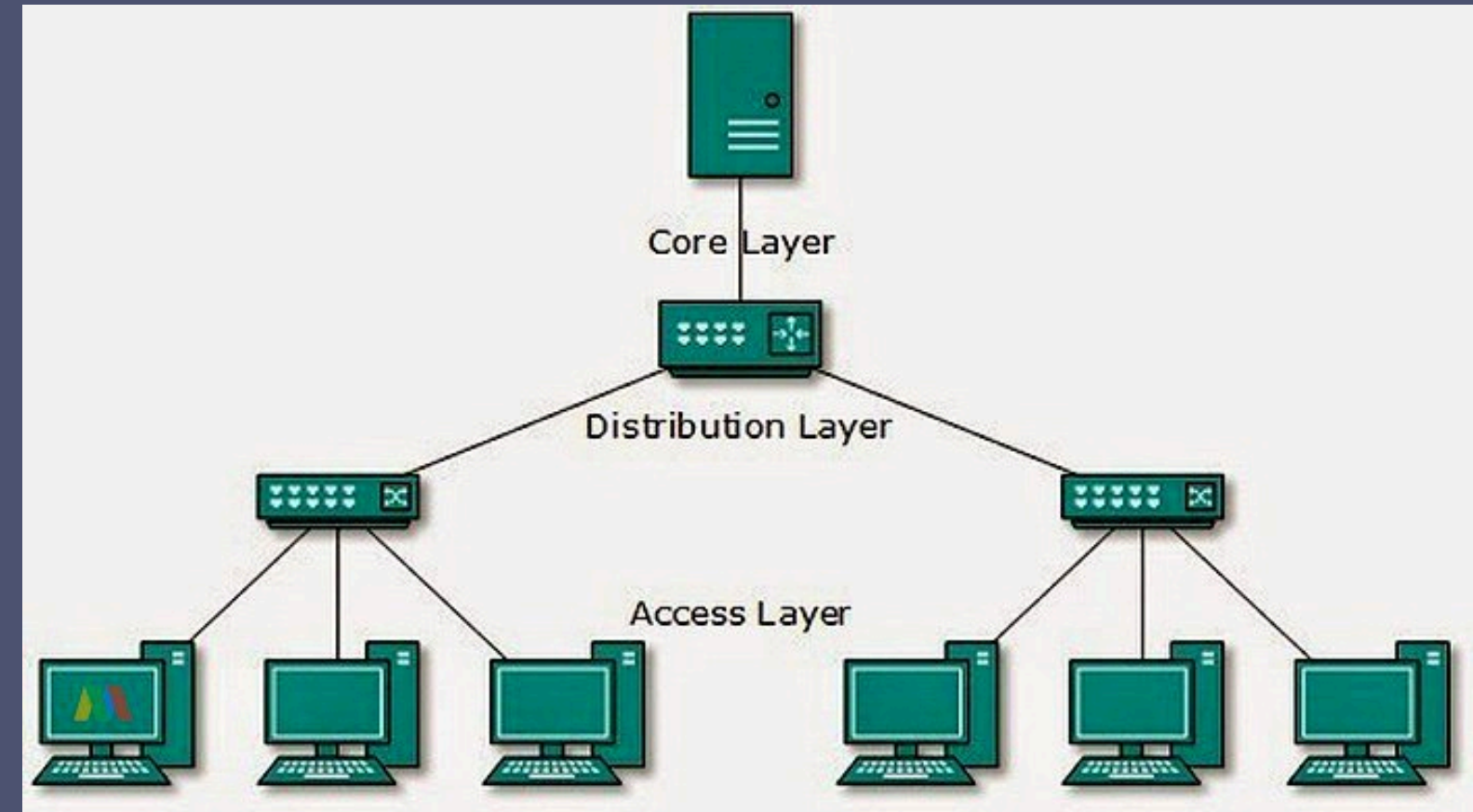
Topology tree (pohon) adalah salah satu jenis topologi jaringan yang menggabungkan fitur dari topologi star (bintang) dan bus. Dalam topologi ini, jaringan diorganisasikan dalam bentuk hierarki seperti struktur pohon, di mana ada node pusat yang berfungsi sebagai akar, dan node-node lain dihubungkan melalui beberapa tingkat yang menyerupai cabang-cabang pohon.

LANTAI 1

DENAH LANTAI 1
UNIV BINUS SYAHDAN
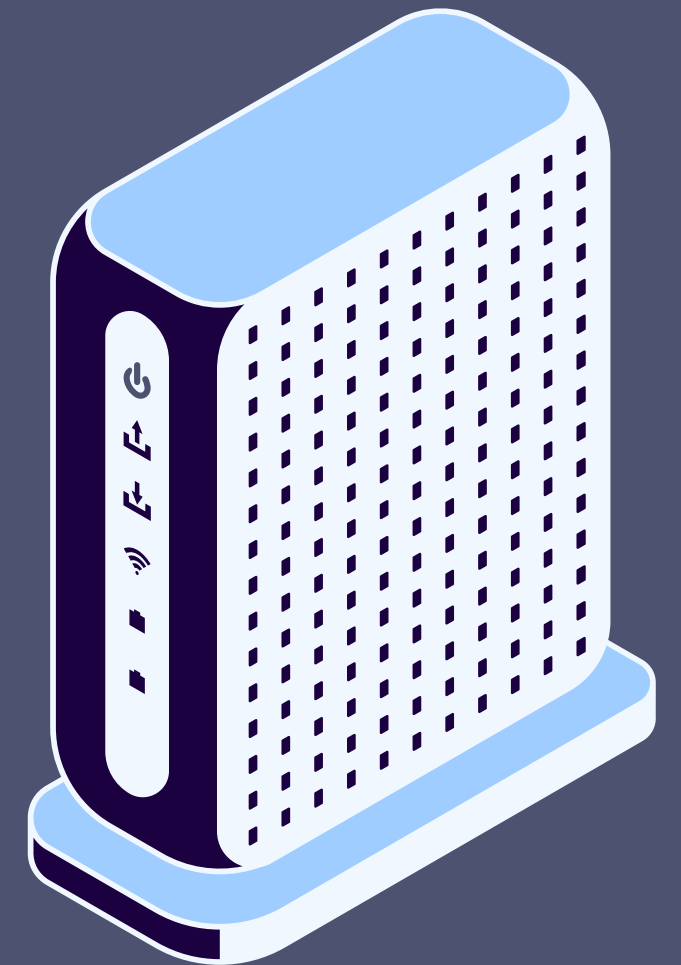
LANTAI 1

URUTAN KEBUTUHAN PC:
- Kelas Lab membutuhkan 25 PC
- Rektorat, dll membutuhkan 10 PC
- Kelas reguler membutuhkan 1 PC

KELAS LAB L1E (25 PC)
- Subnet Mask : 255.255.255.224
- Network Address : 192.168.1.0/27
- Usable IP Range : 192.168.1.1 - 192.168.1.30
- Broadcast Address : 192.168.1.31/27

KELAS LAB M1A (25 PC)
- Subnet Mask : 255.255.255.224
- Network Address : 192.168.1.32/27
- Usable IP Range : 192.168.1.33 - 192.168.1.62
- Broadcast Address : 192.168.1.63/27
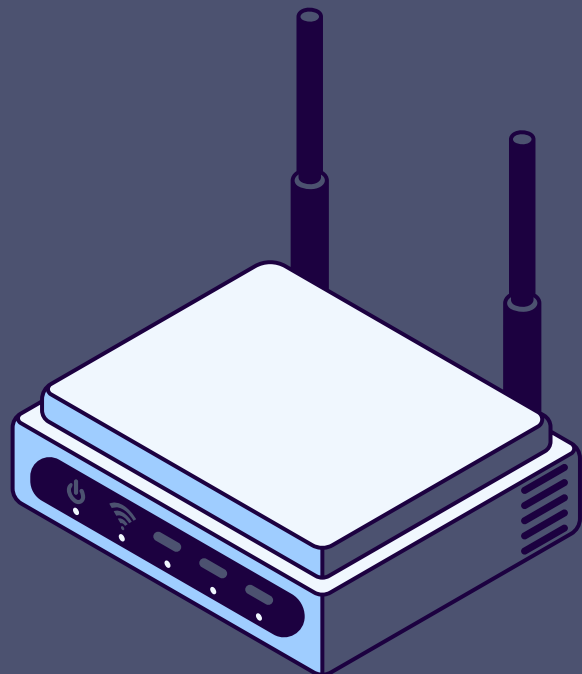
RUANGAN REKTORAT (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.64/28
- Usable IP Range : 192.168.1.65 - 192.168.1.78
- Broadcast Address : 192.168.1.79/28

RUANGAN PROFESOR (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.80/28
- Usable IP Range : 192.168.1.81 - 192.168.1.94
- Broadcast Address : 192.168.1.95/28

RUANGAN FASILKOM (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.96/28
- Usable IP Range : 192.168.1.97 - 192.168.1.110
- Broadcast Address : 192.168.111/28

LANTAI 1

RUANGAN AKADEMIS (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.112/28
- Usable IP Range : 192.168.1.113 - 192.168.1.126
- Broadcast Address : 192.168.1.127/28

RUANGAN INTER OFFICE (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.160/28
- Usable IP Range : 192.168.1.161 - 192.168.1.174
- Broadcast Address : 192.168.1.175/28

RUANGAN QMC (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.128/28
- Usable IP Range : 192.168.1.129 - 192.168.1.142
- Broadcast Address : 192.168.1.143/28

RUANGAN FAK. KOMPUTER DAN MEDIA (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.176/28
- Usable IP Range : 192.168.1.177 - 192.168.1.190
- Broadcast Address : 192.168.1.191/28
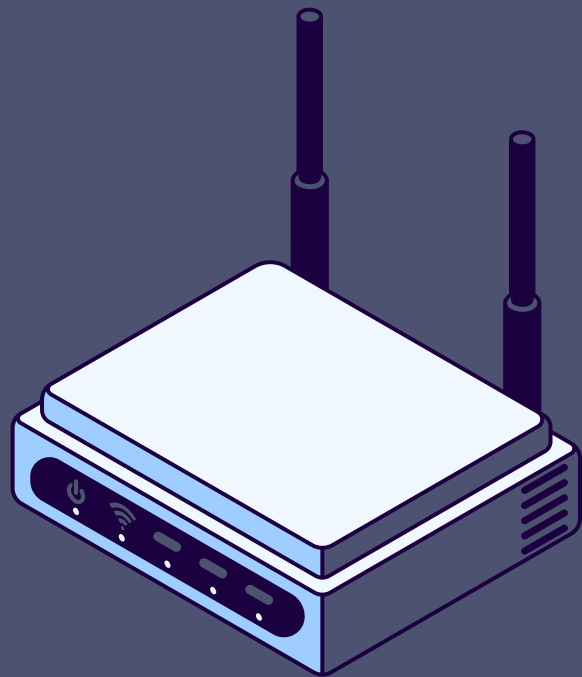
RUANGAN COPY CENTER (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.1.144/28
- Usable IP Range : 192.168.1.145 - 192.168.1.158
- Broadcast Address : 192.168.159/28

KELAS K1A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.192/30
- Usable IP Range : 192.168.1.193 - 192.168.1.194
- Broadcast Address : 192.168.195/30
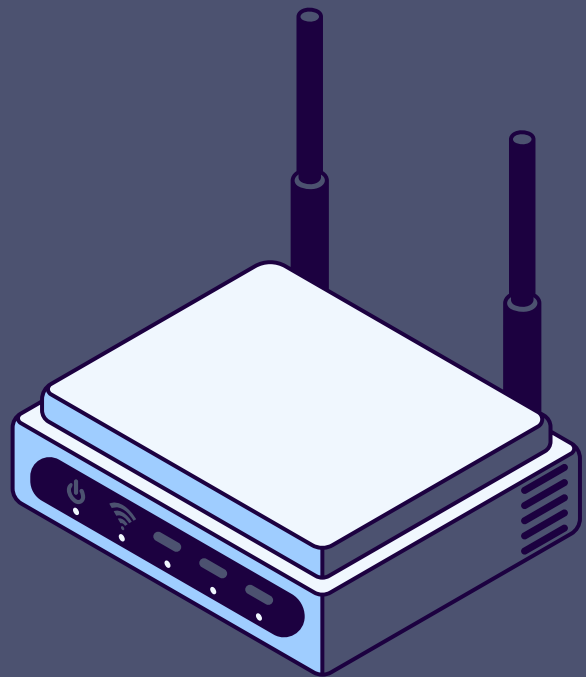
LANTAI 1

KELAS K1B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.196/30
- Usable IP Range : 192.168.1.197 - 192.168.1.198
- Broadcast Address : 192.168.1.199/30

KELAS K1C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.200/30
- Usable IP Range : 192.168.1.201 - 192.168.1.202
- Broadcast Address : 192.168.1.203/30

KELAS K1D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.204/30
- Usable IP Range : 192.168.1.205 - 192.168.1.206
- Broadcast Address : 192.168.207/30

KELAS K1E (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.208/30
- Usable IP Range : 192.168.209 - 192.168.1.210
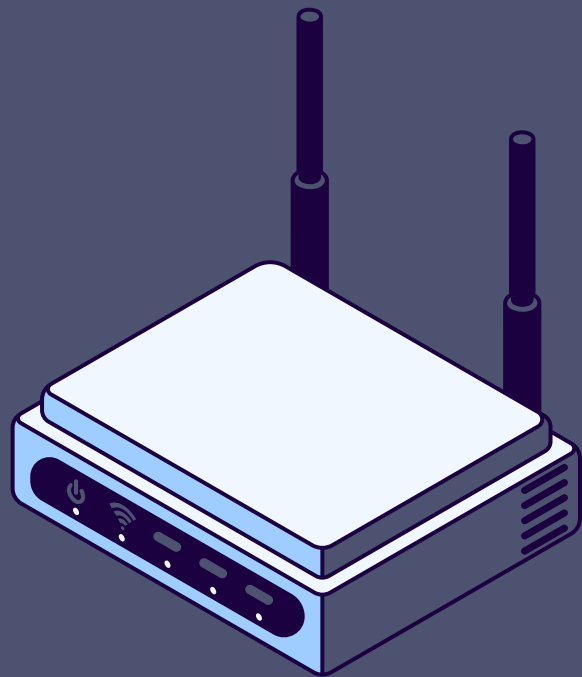- Broadcast Address : 192.168.1.211/30

KELAS K1F (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.212/30
- Usable IP Range : 192.168.1.213 - 192.168.1.214
- Broadcast Address : 192.168.1.215/30

KELAS L1A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.216/30
- Usable IP Range : 192.168.1.217 - 192.168.1.218
- Broadcast Address : 192.168.219/30

LANTAI 1

KELAS L1B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.220/30
- Usable IP Range : 192.168.221 - 192.168.1.222
- Broadcast Address : 192.168.1.223/30

KELAS L1C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.224/30
- Usable IP Range : 192.168.1.225 - 192.168.1.226
- Broadcast Address : 192.168.1.227/30

KELAS L1D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.228/30
- Usable IP Range : 192.168.1.229 - 192.168.1.230
- Broadcast Address : 192.168.1.231/30

KELAS L1F (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.232/30
- Usable IP Range : 192.168.233 - 192.168.1.234
- Broadcast Address : 192.168.1.235/30

KELAS J1A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.236/30
- Usable IP Range : 192.168.1.237 - 192.168.1.238
- Broadcast Address : 192.168.1.239/30

KELAS J1B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.240/30
- Usable IP Range : 192.168.1.241 - 192.168.1.242
- Broadcast Address : 192.168.1.243/30
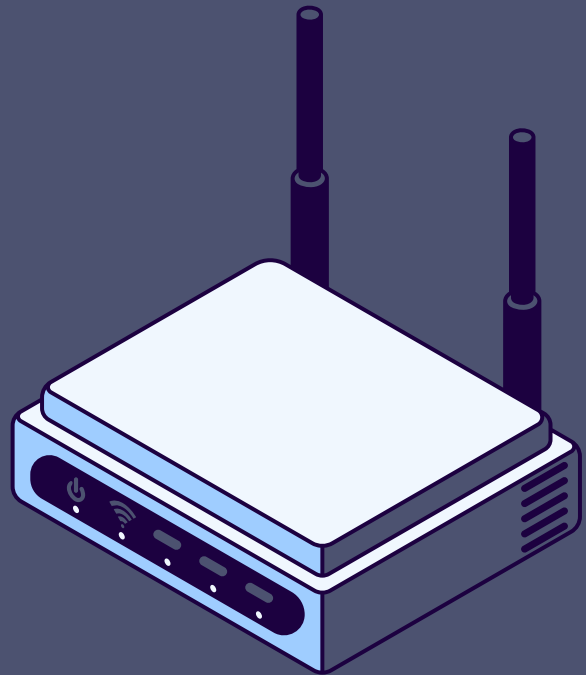
LANTAI 1

KELAS R1A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.244/30
- Usable IP Range : 192.168.245 - 192.168.1.246
- Broadcast Address : 192.168.1.247/30
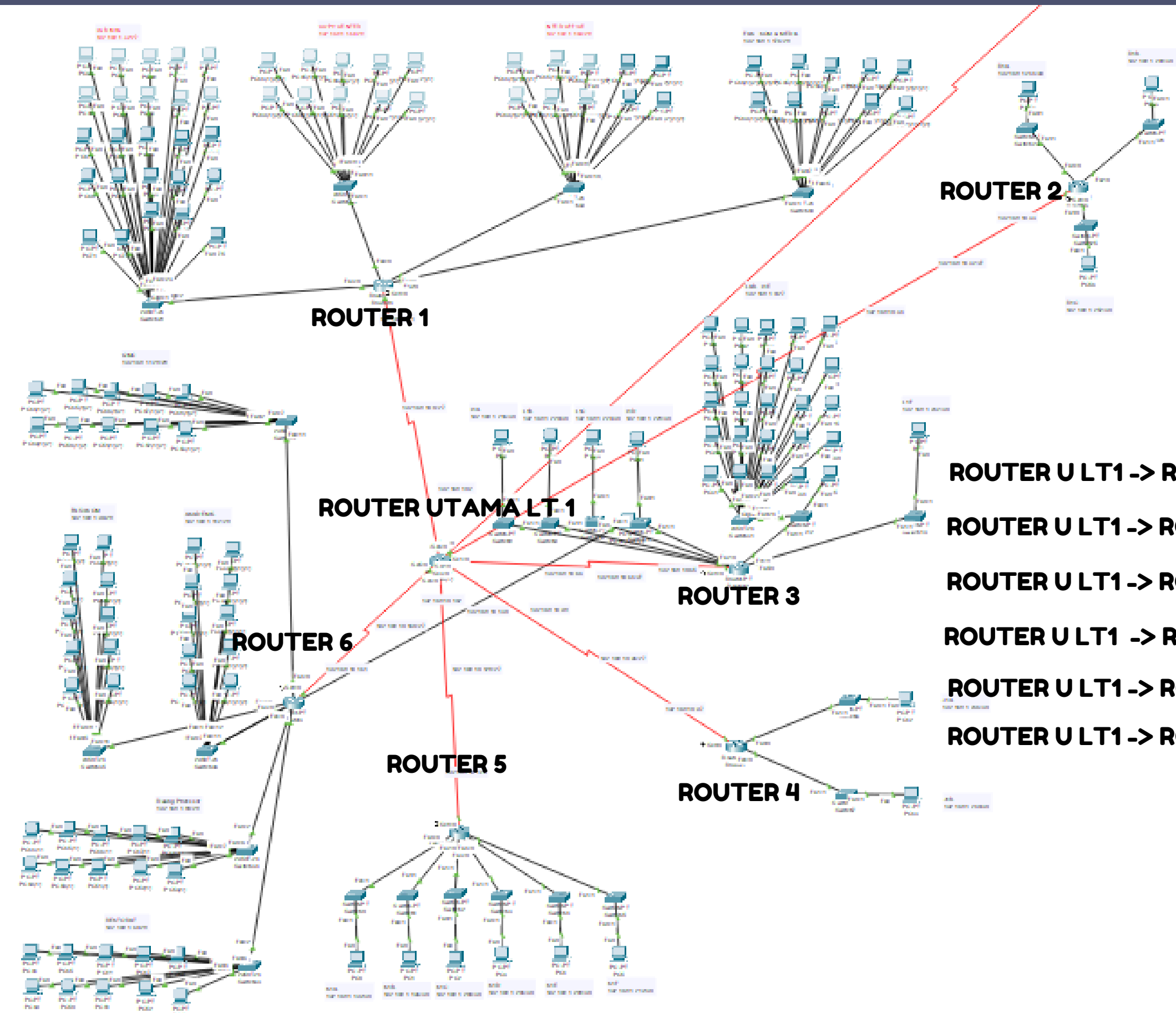
KELAS R1B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.248/30
- Usable IP Range : 192.168.1.249 - 192.168.1.250
- Broadcast Address : 192.168.1.251/30

KELAS R1C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.1.252/30
- Usable IP Range : 192.168.1.253 - 192.168.1.254
- Broadcast Address : 192.168.1.255/30

ROUTING LANTAI 1

ROUTER 1

ROUTER 2

ROUTER UTAMA LT 1

ROUTER 3

ROUTER 6

ROUTER 5

ROUTER 4

	SUBNET	IP ROUTER 1-6	IP ROUTER UTAMA
ROUTER U LT1 -> ROUTER 1 :	192.168.10.0/27	192.168.10.1/27	192.168.10.2/27
ROUTER U LT1 -> ROUTER 2 :	192.168.10.32/27	192.168.10.33/27	192.168.10.34/27
ROUTER U LT1 -> ROUTER 3 :	192.168.10.64/27	192.168.10.65/27	192.168.10.66/27
ROUTER U LT1 -> ROUTER 4 :	192.168.10.96/27	192.168.10.97/27	192.168.10.98/27
ROUTER U LT1 -> ROUTER 5 :	192.168.10.128/27	192.168.10.129/27	192.168.10.130/27
ROUTER U LT1 -> ROUTER 6 :	192.168.10.160/27	192.168.10.161/27	192.168.10.162/27

LANTAI 2

**DENAH LANTAI 2
UNIV BINUS SYAHDAN**
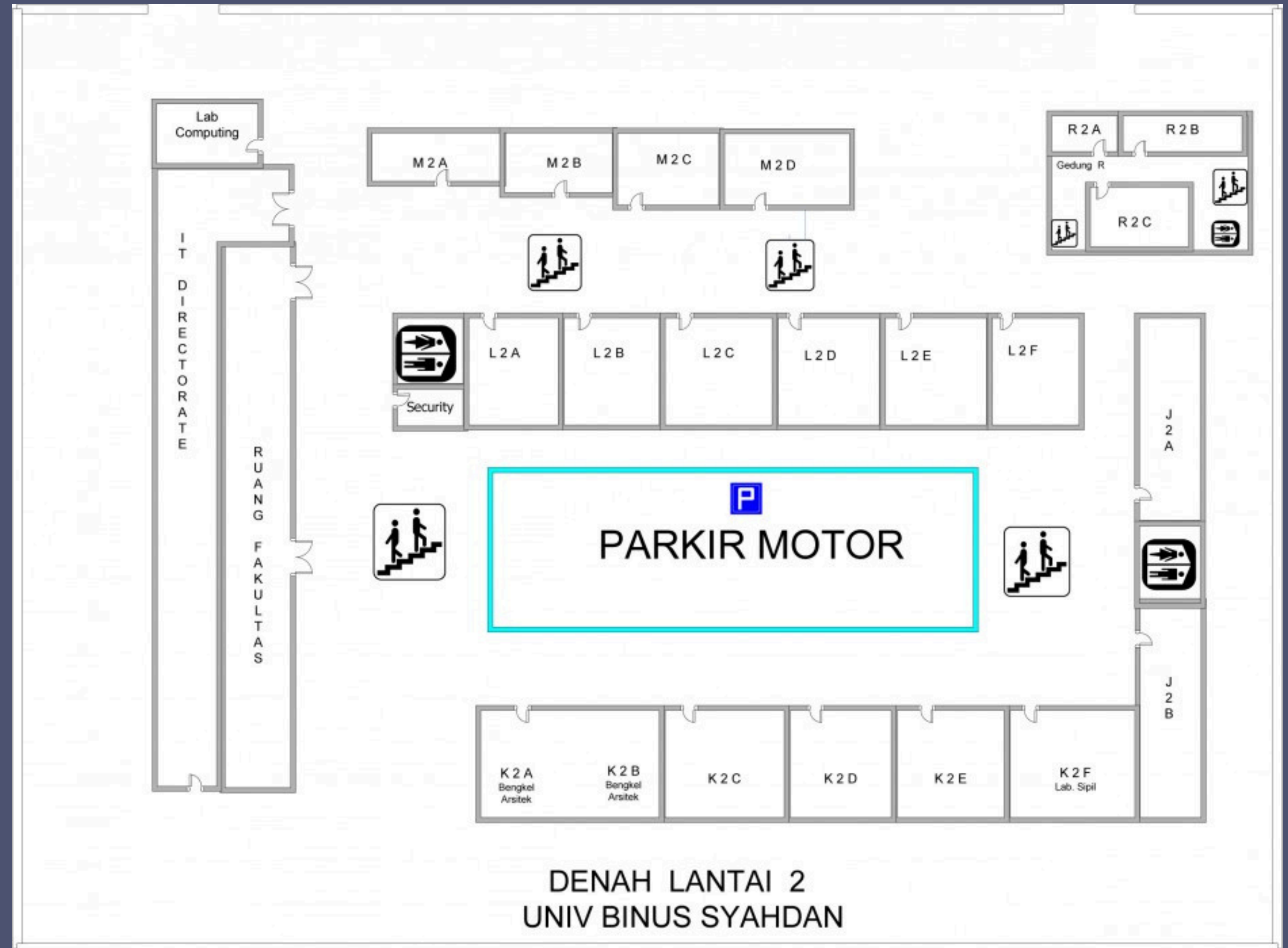
LANTAI 2

KELAS LAB SIPIL K2F (25 PC)
- Subnet Mask : 255.255.255.224
- Network Address : 192.168.2.0/27
- Usable IP Range : 192.168.2.1 - 192.168.2.30
- Broadcast Address : 192.168.2.31/27

LAB COMPUTING (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.2.64/27
- Usable IP Range : 192.168.2.65 - 192.168.2.78
- Broadcast Address : 192.168.2.79/27

R. IT DIRECTORATE (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.2.32/28
- Usable IP Range : 192.168.2.33 - 192.168.2.46
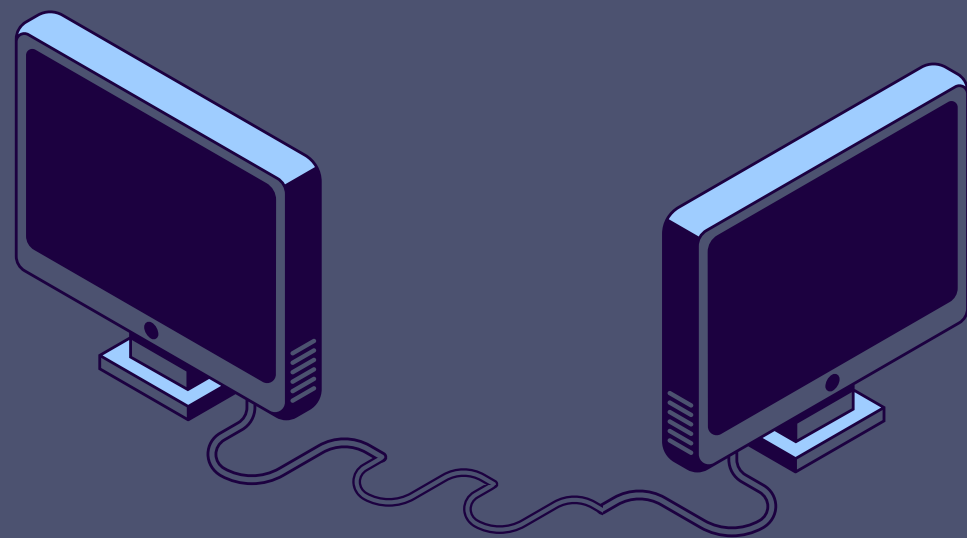- Broadcast Address : 192.168.2.47/28

KELAS J2A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.80/30
- Usable IP Range : 192.168.2.81 - 192.168.2.82
- Broadcast Address : 192.168.2.83/30

R. FAKULTAS (10 PC)
- Subnet Mask : 255.255.255.240
- Network Address : 192.168.2.48/28
- Usable IP Range : 192.168.2.49 - 192.168.2.62
- Broadcast Address : 192.168.2.63/28

KELAS J2B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.84/30
- Usable IP Range : 192.168.2.85 - 192.168.2.86
- Broadcast Address : 192.168.2.87/30

LANTAI 2

KELAS K2A & K2B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.88/30
- Usable IP Range : 192.168.2.89 - 192.168.2.90
- Broadcast Address : 192.168.2.91/30

KELAS K2C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.92/30
- Usable IP Range : 192.168.2.93 - 192.168.2.94
- Broadcast Address : 192.168.2.95/30

KELAS K2D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.96/30
- Usable IP Range : 192.168.2.97 - 192.168.2.98
- Broadcast Address : 192.168.2.99/30

KELAS K2E (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.100/30
- Usable IP Range : 192.168.2.101 - 192.168.2.102
- Broadcast Address : 192.168.2.103/30
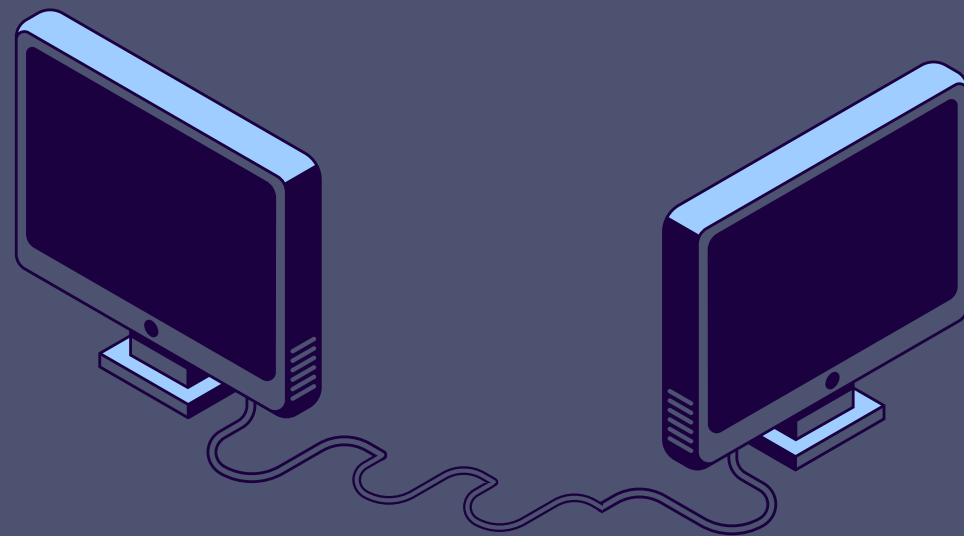
KELAS L2A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.104/30
- Usable IP Range : 192.168.2.105 - 192.168.2.106
- Broadcast Address : 192.168.2.107/30

KELAS L2B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.108/30
- Usable IP Range : 192.168.2.109 - 192.168.2.110
- Broadcast Address : 192.168.2.111/30

LANTAI 2

KELAS L2C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.112/30
- Usable IP Range : 192.168.2.113 - 192.168.2.114
- Broadcast Address : 192.168.2.115/30

KELAS L2D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.116/30
- Usable IP Range : 192.168.2.117 - 192.168.2.118
- Broadcast Address : 192.168.2.119/30

KELAS L2E (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.120/30
- Usable IP Range : 192.168.2.121 - 192.168.2.122
- Broadcast Address : 192.168.2.123/30

KELAS L2F (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.124/30
- Usable IP Range : 192.168.2.125 - 192.168.2.126
- Broadcast Address : 192.168.2.127/30
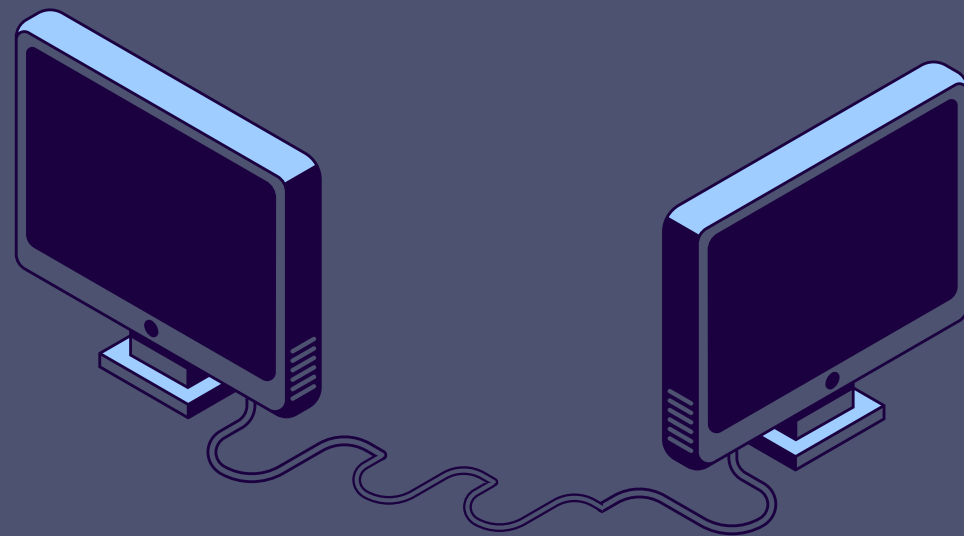
KELAS M2A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.128/30
- Usable IP Range : 192.168.2.129 - 192.168.2.130
- Broadcast Address : 192.168.2.131/30

KELAS M2B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.132/30
- Usable IP Range : 192.168.2.133 - 192.168.2.134
- Broadcast Address : 192.168.2.135/30

LANTAI 2

KELAS M2C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.136/30
- Usable IP Range : 192.168.2.137 - 192.168.2.138
- Broadcast Address : 192.168.2.139/30

KELAS M2D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.140/30
- Usable IP Range : 192.168.2.141 - 192.168.2.142
- Broadcast Address : 192.168.2.143/30

KELAS R2A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.144/30
- Usable IP Range : 192.168.2.145 - 192.168.2.146
- Broadcast Address : 192.168.2.147/30

KELAS R2B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.148/30
- Usable IP Range : 192.168.2.149 - 192.168.2.150
- Broadcast Address : 192.168.2.151/30
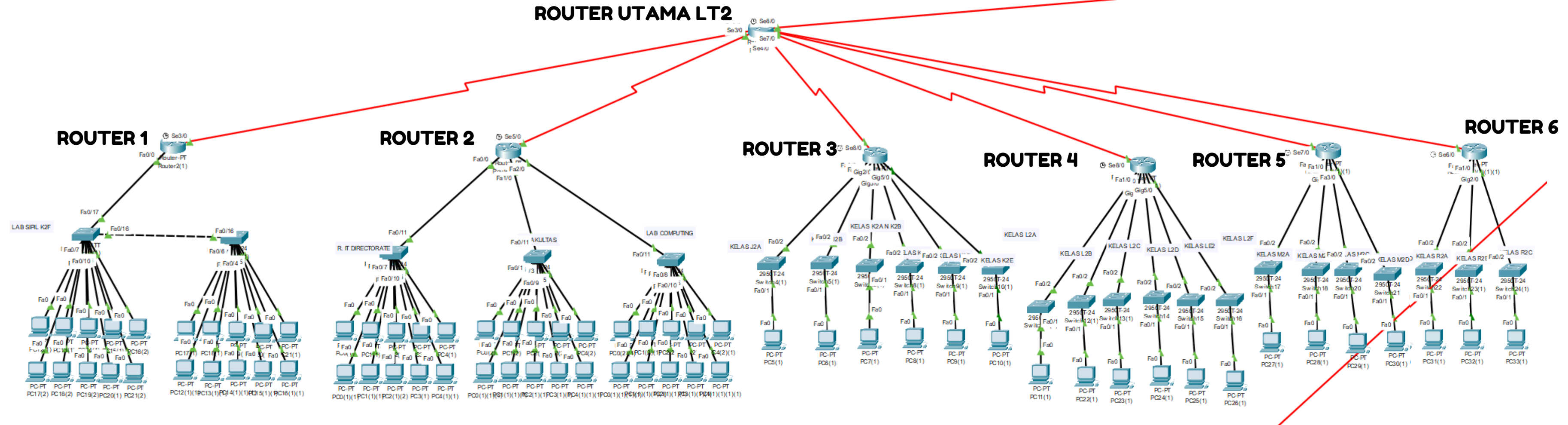
KELAS R2C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.2.152/30
- Usable IP Range : 192.168.2.153 - 192.168.2.154
- Broadcast Address : 192.168.2.155/3
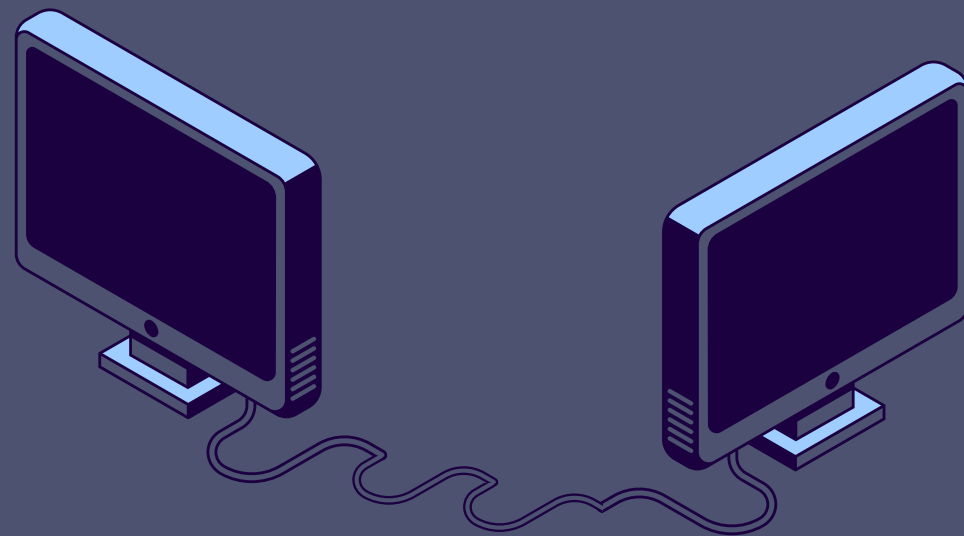
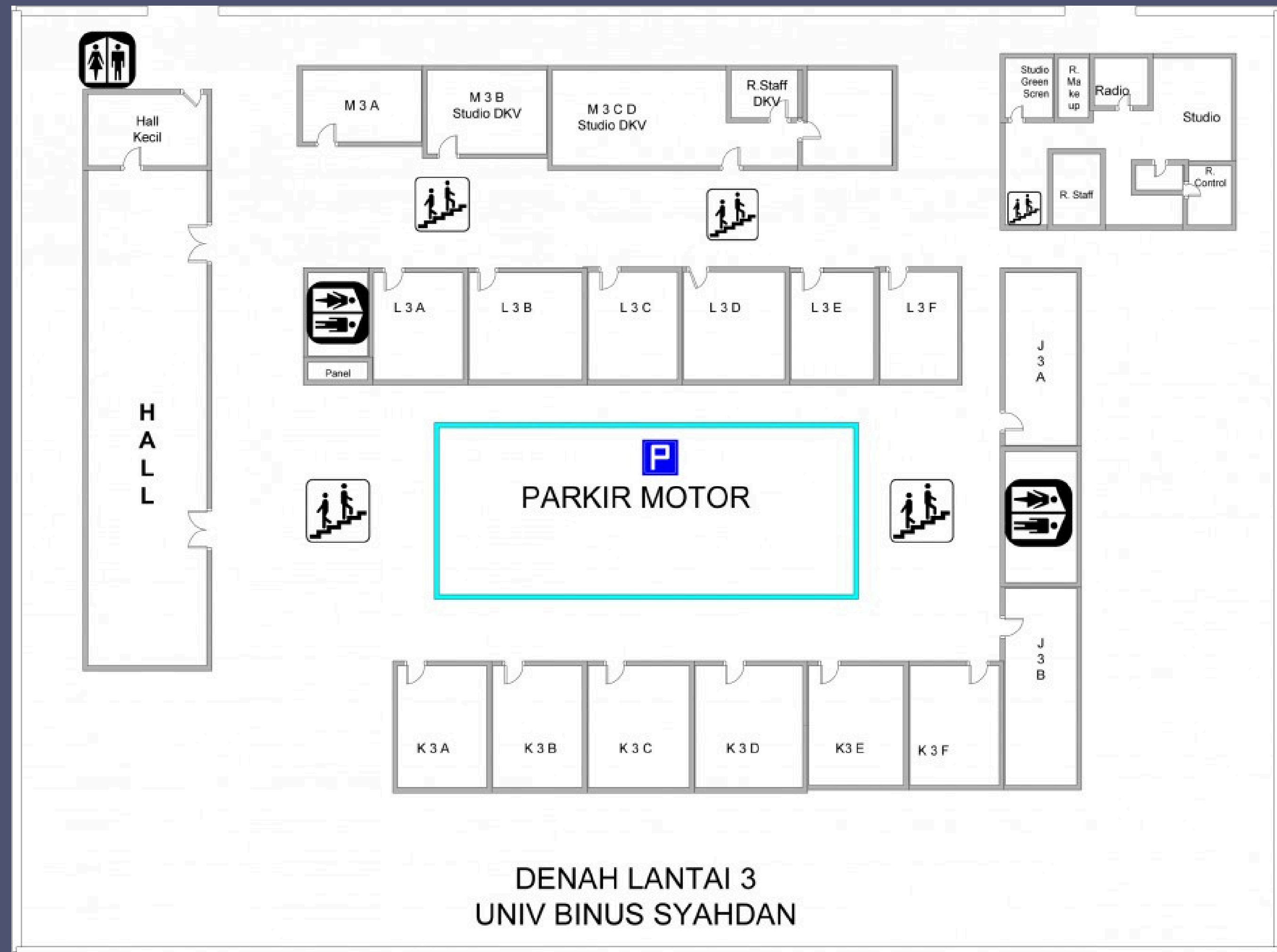# ROUTING LANTAI 2

	SUBNET	IP ROUTER UTAMA	IP ROUTER 1-6
ROUTER UTAMA LT2-> ROUTER 1 :	192.168.20.0/27	192.168.20.1/27	192.168.10.2/27
ROUTER UTAMA LT2 -> ROUTER 2 :	192.168.20.32/27	192.168.20.33/27	192.168.20.34/27
ROUTER UTAMA LT2 -> ROUTER 3 :	192.168.20.64/27	192.168.20.65/27	192.168.20.66/27
ROUTER UTAMA LT2 -> ROUTER 4 :	192.168.20.96/27	192.168.20.97/27	192.168.20.98/27
ROUTER UTAMA LT2 -> ROUTER 5 :	192.168.20.128/27	192.168.20.129/27	192.168.20.130/27
ROUTER UTAMA LT2 -> ROUTER 6 :	192.168.20.160/27	192.168.20.161/27	192.168.30.162/27

LANTAI 3

Hall Kecil

HALL

M 3 A

M 3 B
Studio DKV

M 3 C D
Studio DKV

R.Staff
DKV

Studio Green Scren

R. Make up

Radio

Studio

R. Staff

R. Control

Panel

L 3 A

L 3 B

L 3 C

L 3 D

L 3 E

L 3 F

J 3 A

P
PARKIR MOTOR

J 3 B

K 3 A

K 3 B

K 3 C

K 3 D

K 3 E

K 3 F

DENAH LANTAI 3
UNIV BINUS SYAHDAN

LANTAI 3

KELAS K3A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.0/30
- Usable IP Range : 192.168.3.1 - 192.168.1.2
- Broadcast Address : 192.168.3.3/30

KELAS K3B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.4/30
- Usable IP Range : 192.168.3.5 - 192.168.3.6
- Broadcast Address : 192.168.3.7/30

KELAS K3C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.8/30
- Usable IP Range : 192.168.3.9 - 192.168.3.10
- Broadcast Address : 192.168.3.11/30

KELAS K3D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.12/30
- Usable IP Range : 192.168.3.13-192.168.1.14
- Broadcast Address : 192.168.3.15/30

KELAS K3E (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.16/30
- Usable IP Range : 192.168.3.17 - 192.168.3.18
- Broadcast Address : 192.168.3.19/30

KELAS K3F (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.20/30
- Usable IP Range : 192.168.3.21 - 192.168.3.22
- Broadcast Address : 192.168.3.23/30

LANTAI 3

KELAS L3A (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.24/30
- Usable IP Range : 192.168.3.25-192.168.1.26
- Broadcast Address : 192.168.3.27/30

KELAS L3B (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.28/30
- Usable IP Range : 192.168.3.29- 192.168.3.30
- Broadcast Address : 192.168.3.31/30

KELAS L3C (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.32/30
- Usable IP Range : 192.168.3.33-192.168.3.34
- Broadcast Address : 192.168.3.35/30

KELAS L3D (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.36/30
- Usable IP Range : 192.168.3.37-192.168.1.38
- Broadcast Address : 192.168.3.39/30

KELAS L3E (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.40/30
- Usable IP Range : 192.168.3.41- 192.168.3.42
- Broadcast Address : 192.168.3.43/30

KELAS L3F (1 PC)
- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.44/30
- Usable IP Range : 192.168.3.45- 192.168.3.46
- Broadcast Address : 192.168.3.47/30

LANTAI 3

KELAS J3A (1 PC)

- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.48/30
- Usable IP Range : 192.168.3.49-192.168.1.50
- Broadcast Address : 192.168.3.51/30

KELAS J3B (1 PC)

- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.52/30
- Usable IP Range : 192.168.3.53- 192.168.3.54
- Broadcast Address : 192.168.3.55/30

KELAS M3A (1 PC)

- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.56/30
- Usable IP Range : 192.168.3.57-192.168.3.58
- Broadcast Address : 192.168.3.59/30

KELAS M3B(1 PC)

- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.60/30
- Usable IP Range : 192.168.3.61-192.168.1.62
- Broadcast Address : 192.168.3.63/30

KELAS M3CD (1 PC)

- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.64/30
- Usable IP Range : 192.168.3.65- 192.168.3.66
- Broadcast Address : 192.168.3.67/30

RUANG STUDIO, STAFF(1 PC)

- Subnet Mask : 255.255.255.252
- Network Address : 192.168.3.68/30
- Usable IP Range : 192.168.3.69- 192.168.3.70
- Broadcast Address : 192.168.3.71/30

ROUTING LANTAI 3
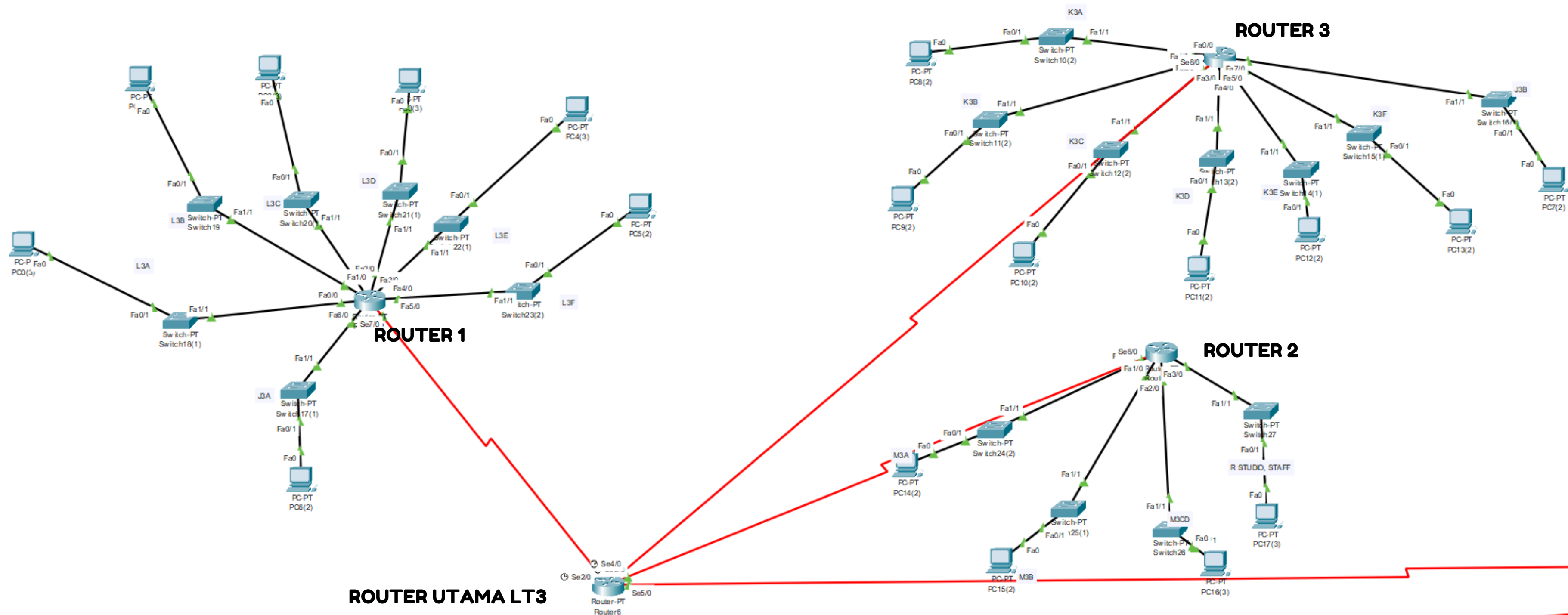
|	SUBNET	IP ROUTER UTAMA	IP ROUTER 1-3
ROUTER UTAMA LT3 -> ROUTER 1 :	192.168.30.0/27	192.168.30.1/27	192.168.30.2/27
ROUTER UTAMA LT3 -> ROUTER 2 :	192.168.30.32/27	192.168.30.33/27	192.168.30.34/27
ROUTER UTAMA LT3 -> ROUTER 3 :	192.168.30.64/27	192.168.30.65/27	192.168.30.66/27

ROUTING ROUTER UTAMA

	SUBNET	IP ROUTER UTAMA	IP ROUTER 1-3
ROUTER UTAMA -> ROUTER UTAMA LT 1 :	192.168.0.0/27	192.168.0.1/27	192.168.0.2/27
ROUTER UTAMA -> ROUTER UTAMA LT 2 :	192.168.0.32/27	192.168.0.33/27	192.168.0.34/27
ROUTER UTAMA -> ROUTER UTAMA LT 3 :	192.168.0.64/27	192.168.0.65/27	192.168.0.66/27

APPLICATION LAYER

192.168.100.0/27

Se3/0   Fa0/0
Se4/0   Se2/0
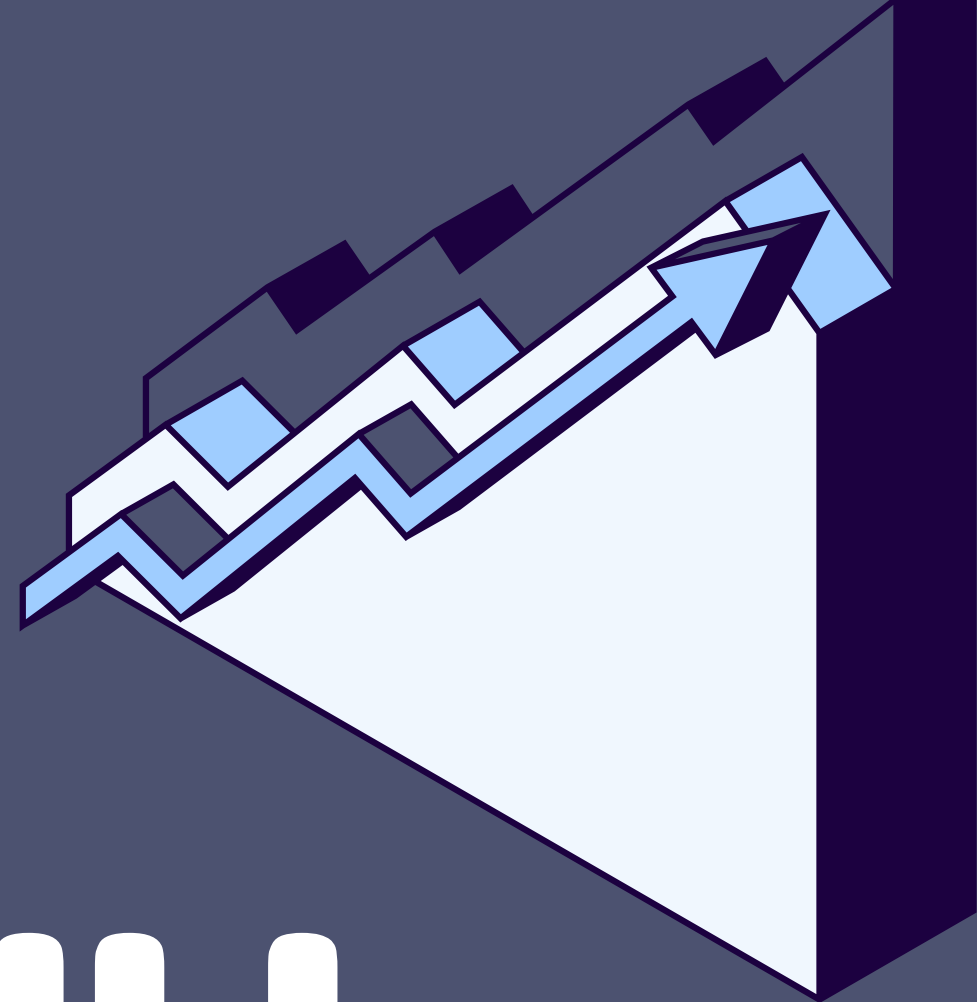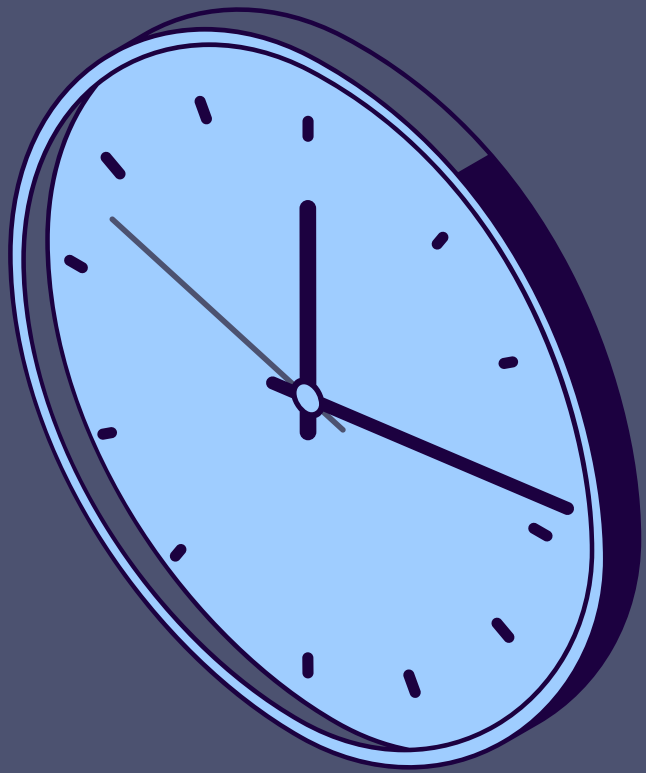Router-PT
Router9

Fa0
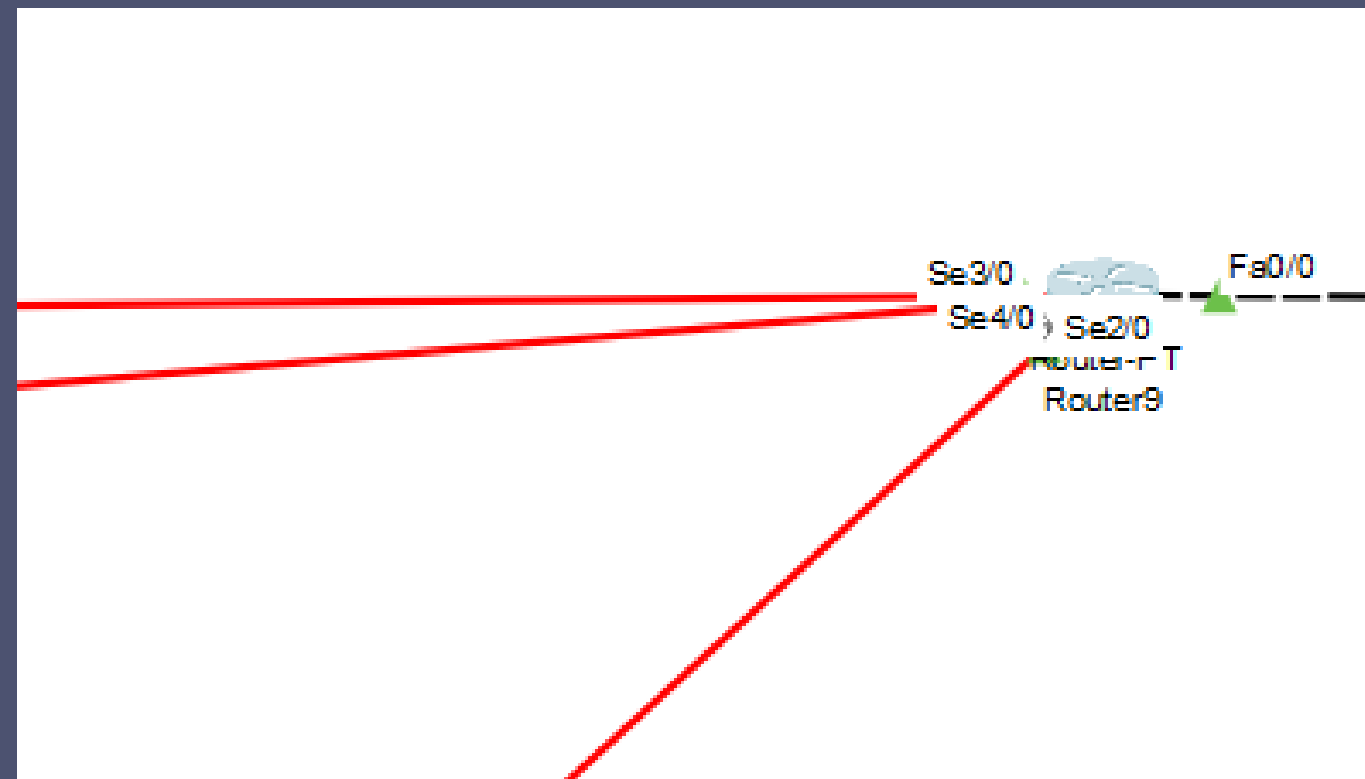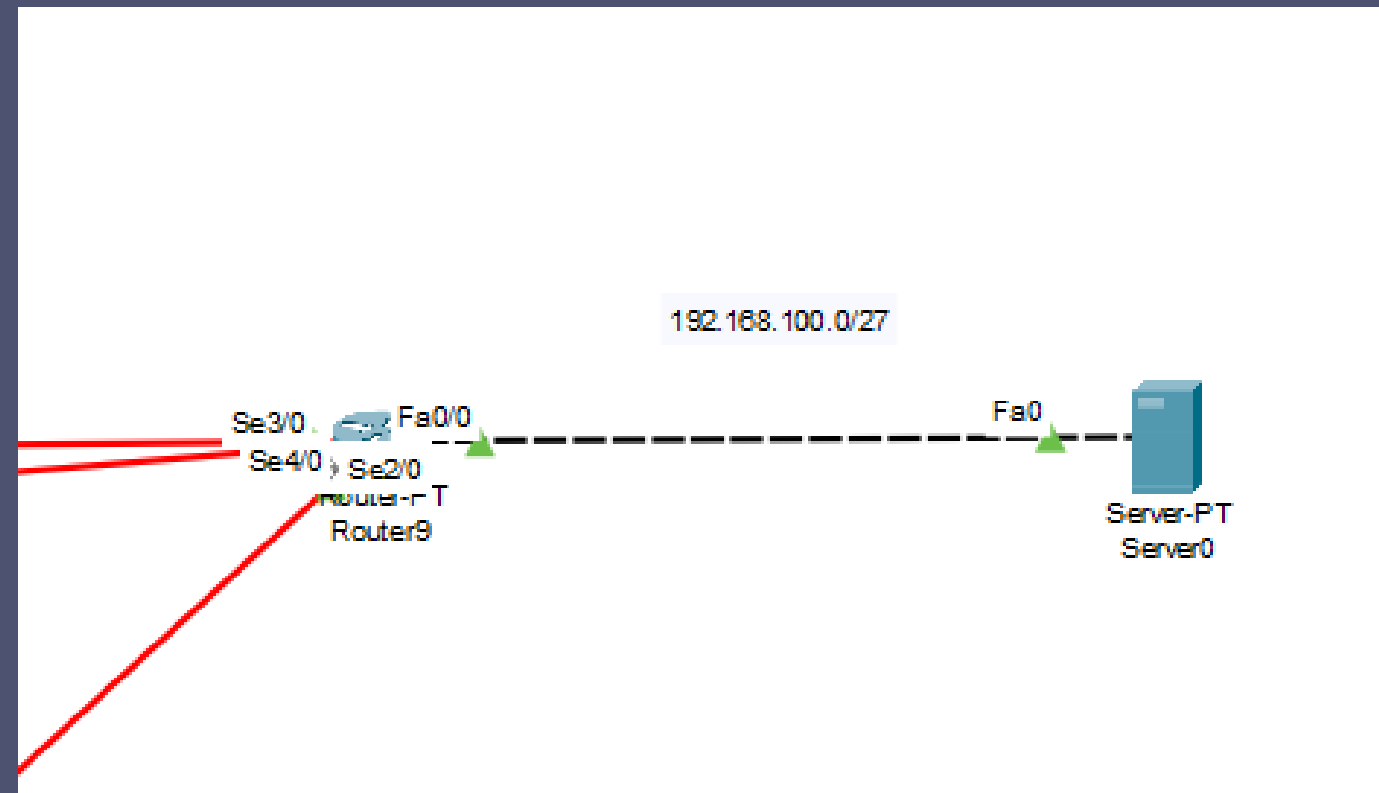
Server-PT
Server0

NETWORK ADDRESS : 192.168.100.0/27

SERVER IP SERVER : 192.168.100.1

DNS : 192.168.100.1

DOMAIN NAME : TES.COM

TERIMA KASIH