



**Faculty of Computing & Informatics**

**TCS2351 - Network Security**

**Assignment**

**Lecture Section: *TC01***

**Tutorial Section: *TT01***

**(Tri 1, 2021/2022)**

**Lecturer :Ng Keng Hoong**

**Group-3**

| <b>Name</b>            | <b>Student ID</b> | <b>Email</b>                  |
|------------------------|-------------------|-------------------------------|
| Rasul Yea Bari Sunbeam | 1191301031        | 1191301031@student.mmu.edu.my |
| Sumaya Sarker Snigdha  | 1191301017        | 1191301017@student.mmu.edu.my |

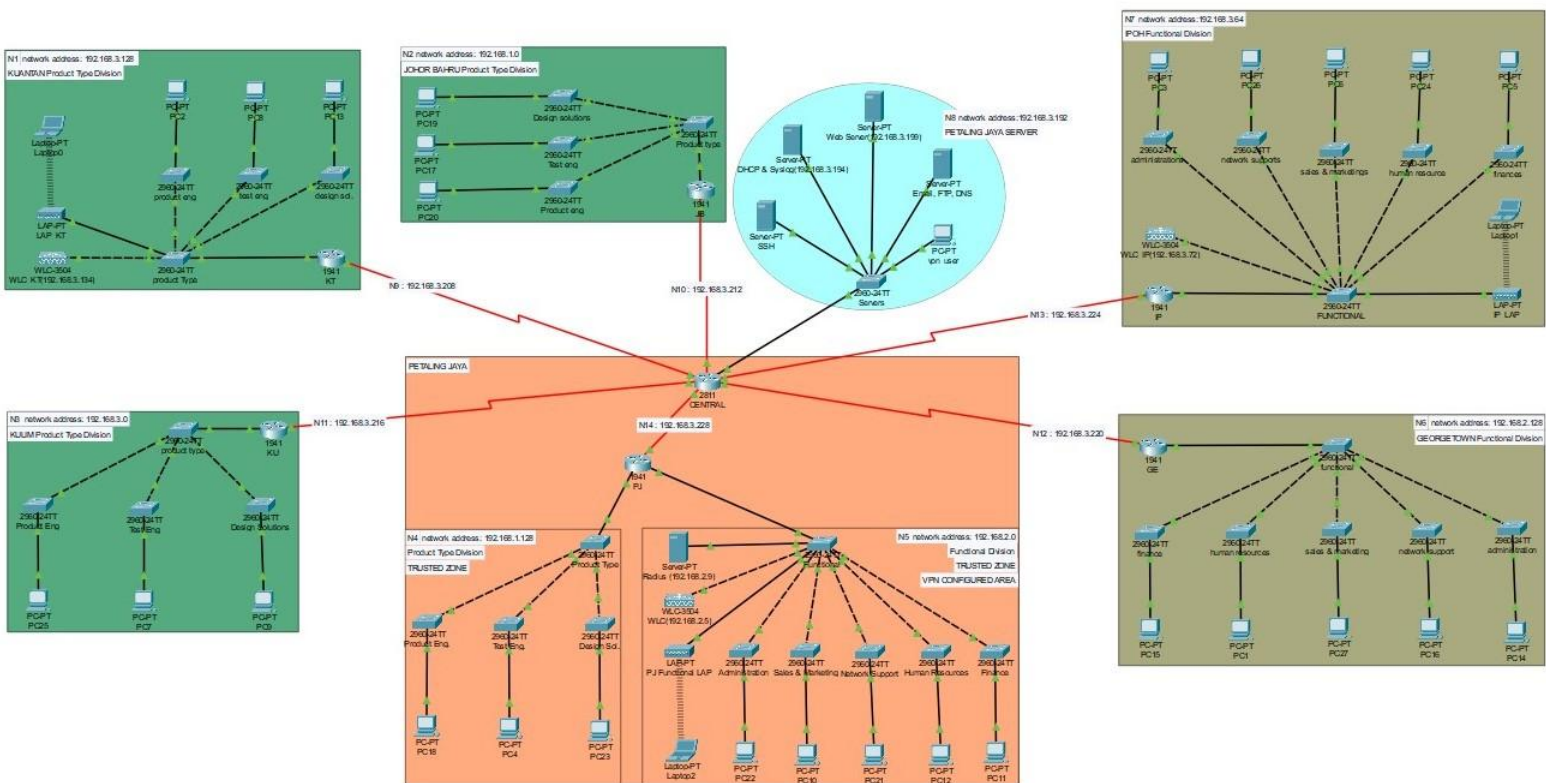
## Table Of Contents

|   |           |
|---|-----------|
| <b>Network Description</b>                              | <b>2</b>  |
| <b>Network Topology Design</b>                          | <b>2</b>  |
| <b>Network Protocol Used in this Network Design</b>     | <b>6</b>  |
| <i>Routing</i>  | 6         |
| <i>DHCP</i>   | 6         |
| <i>Network device security</i>                          | 6         |
| <i>Administrative access control for network device</i> | 7         |
| <i>Secure Remote Connections (encrypted)</i>            | 7         |
| <i>NTP &amp; event logging</i>                          | 7         |
| <i>AAA (local, radius,)</i>                             | 7         |
| <i>ACL</i>  | 7         |
| <i>ZPF</i>  | 7         |
| <i>Securing LAN configuration</i>                       | 8         |
| CAM table attack:                                       | 8         |
| DHCP attack:  | 8         |
| <i>VPN</i>  | 8         |
| <i>Wireless Security</i>                                | 8         |
| <b>Employees Description</b>                            | <b>9</b>  |
| <b>VLSM SUBNETTING</b>                                  | <b>10</b> |

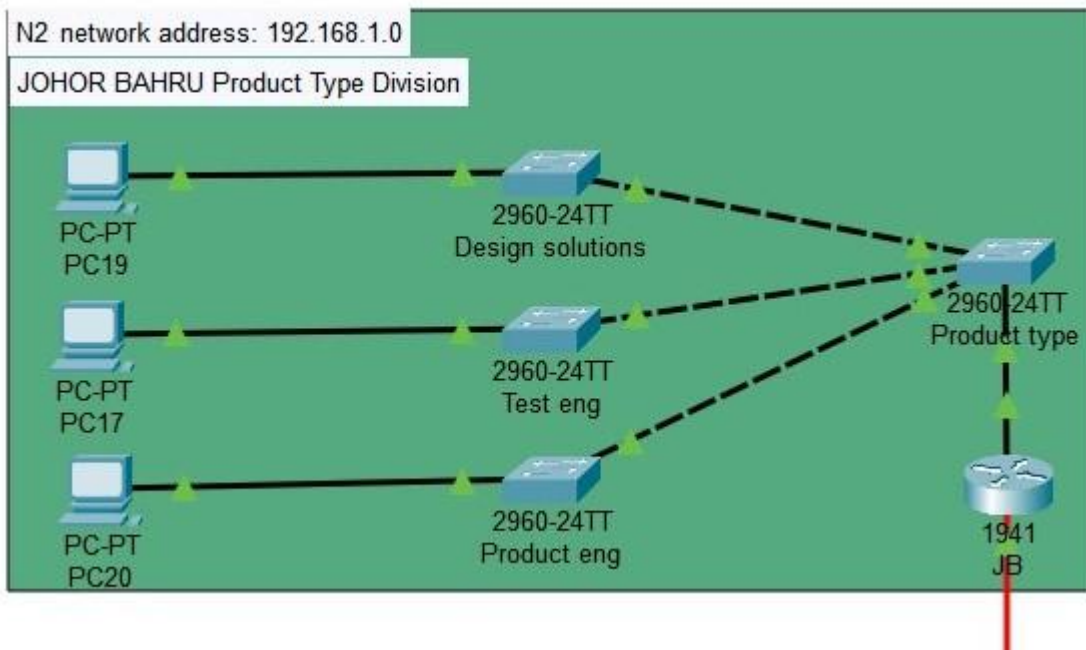
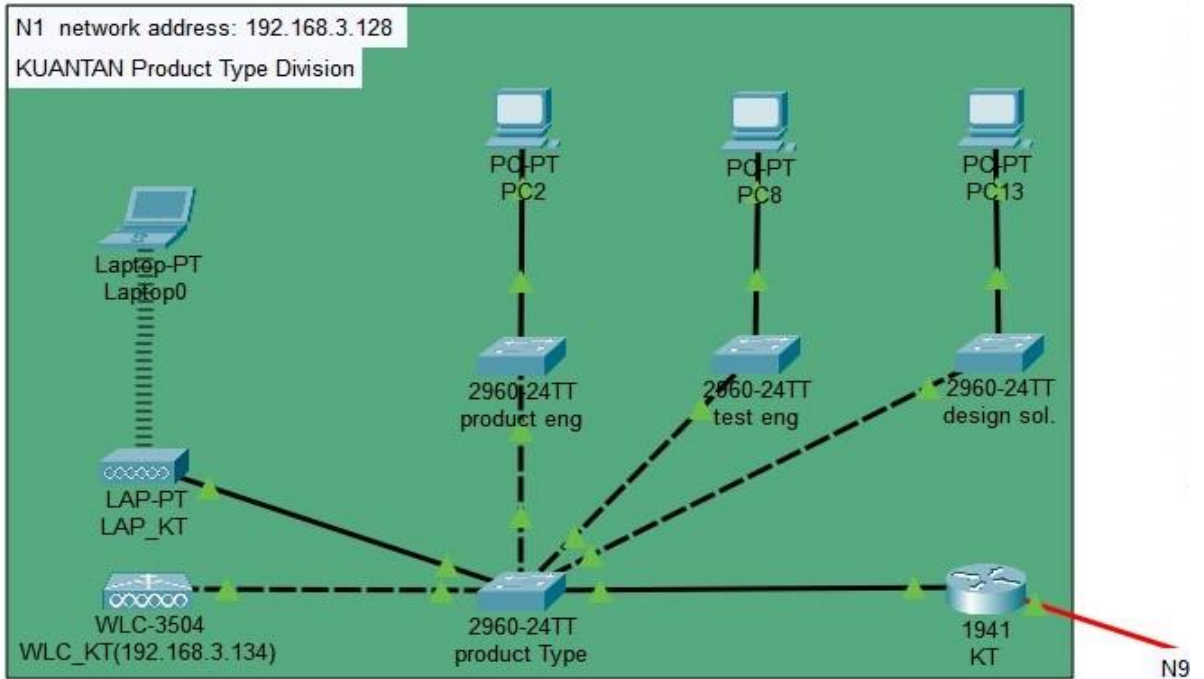
## Network Description

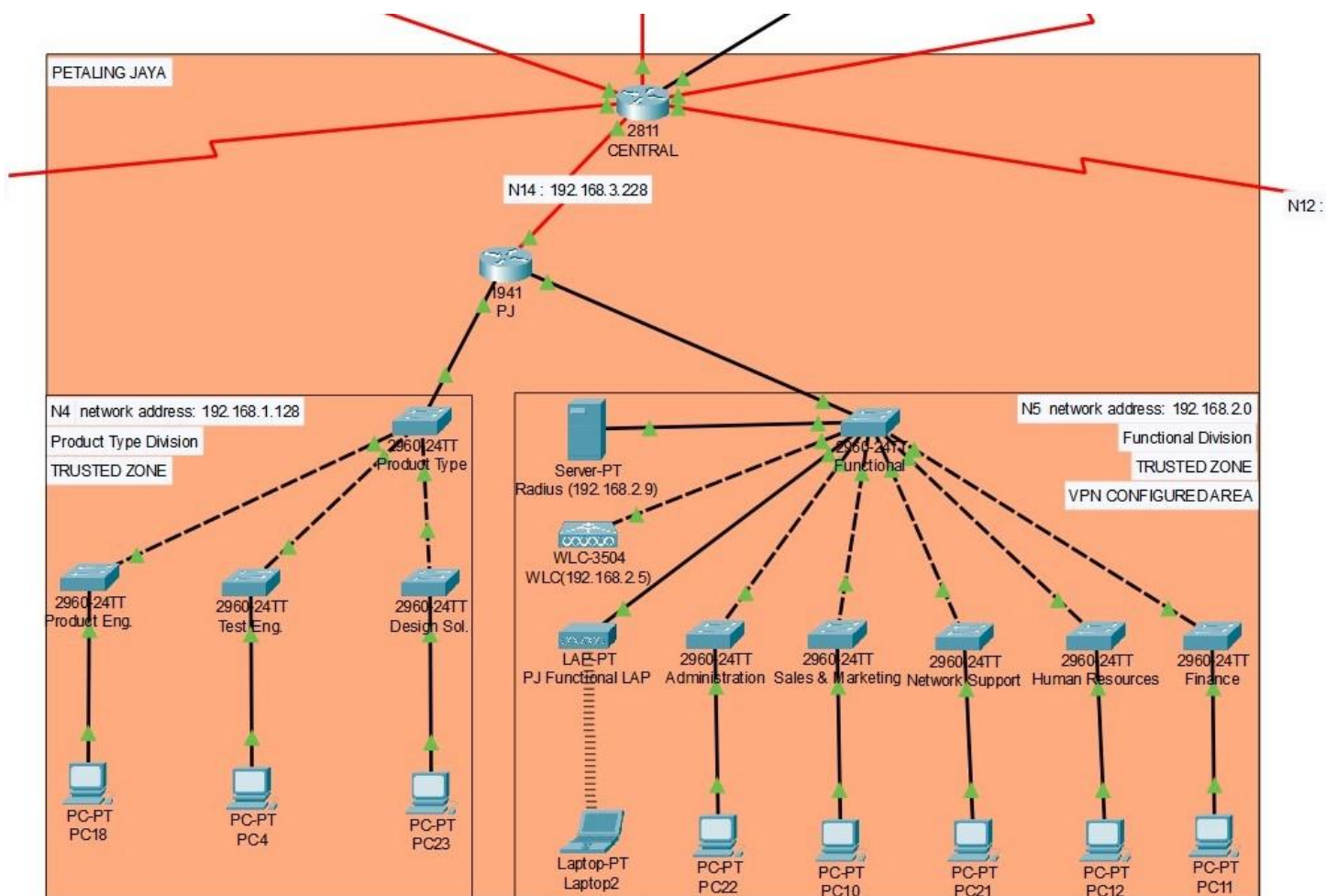
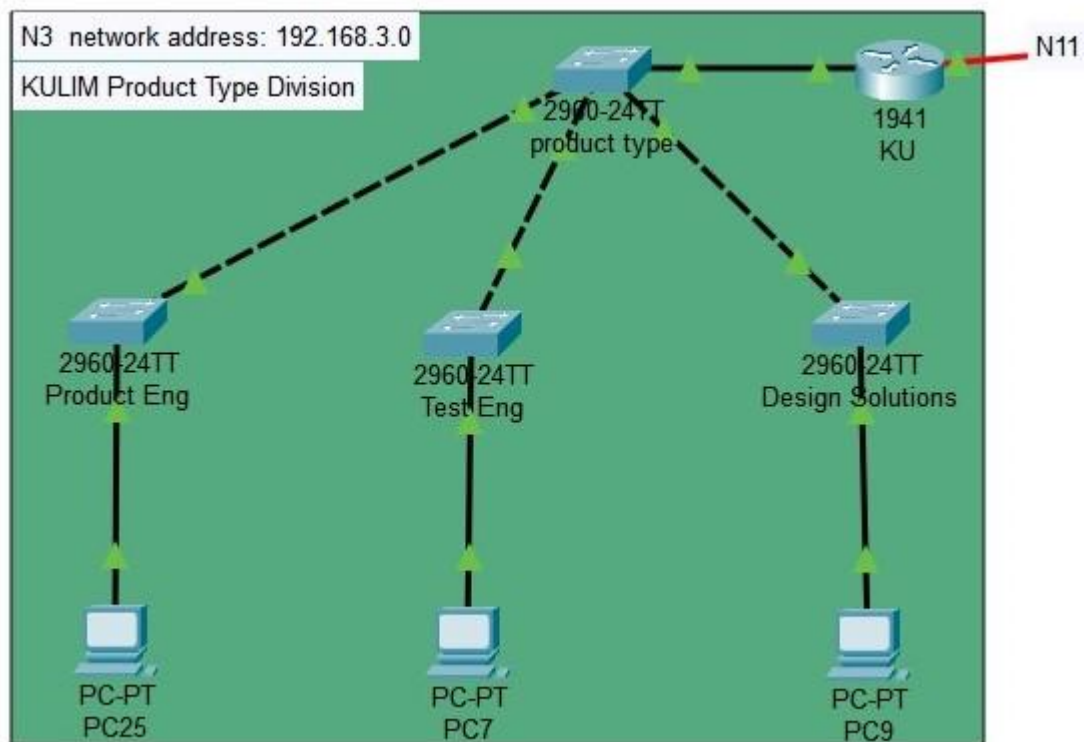
A network design for CHIP TECH with a total number of 433 employees with larger IP address block 192.168.1.0/ 25 will be assigned as its major IP address.

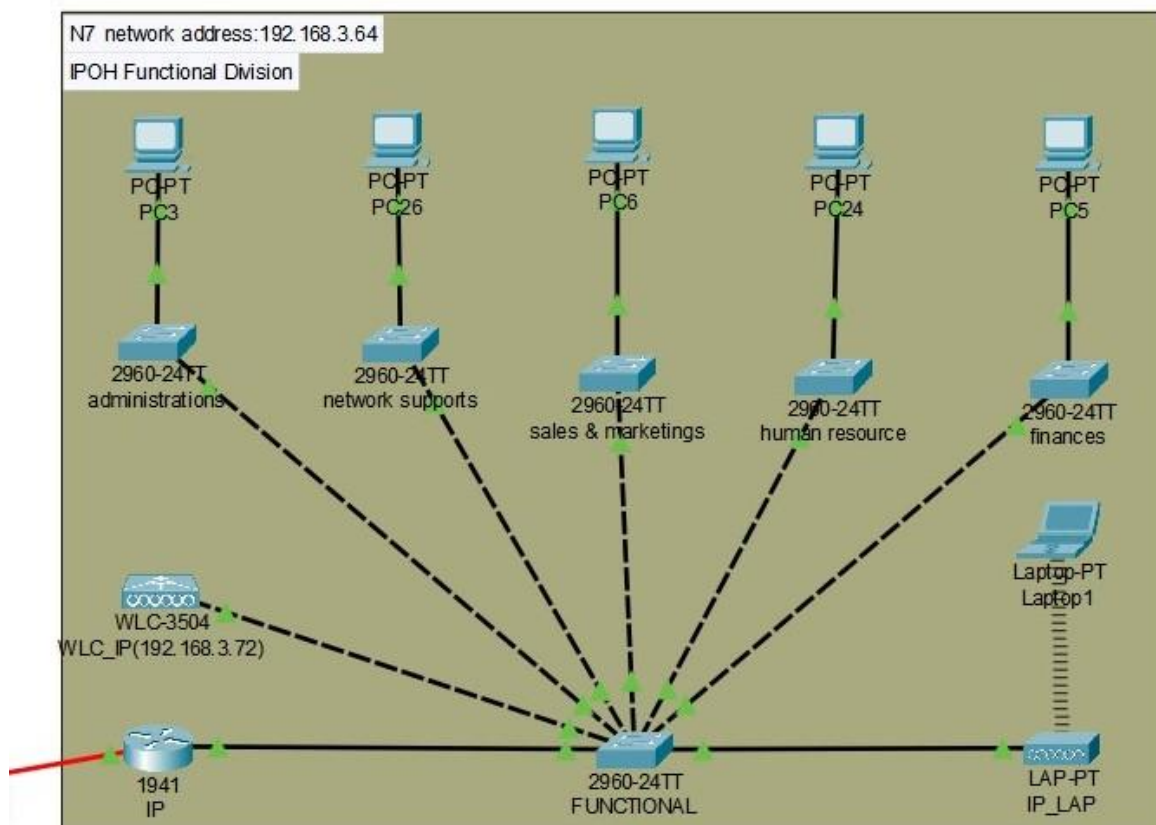
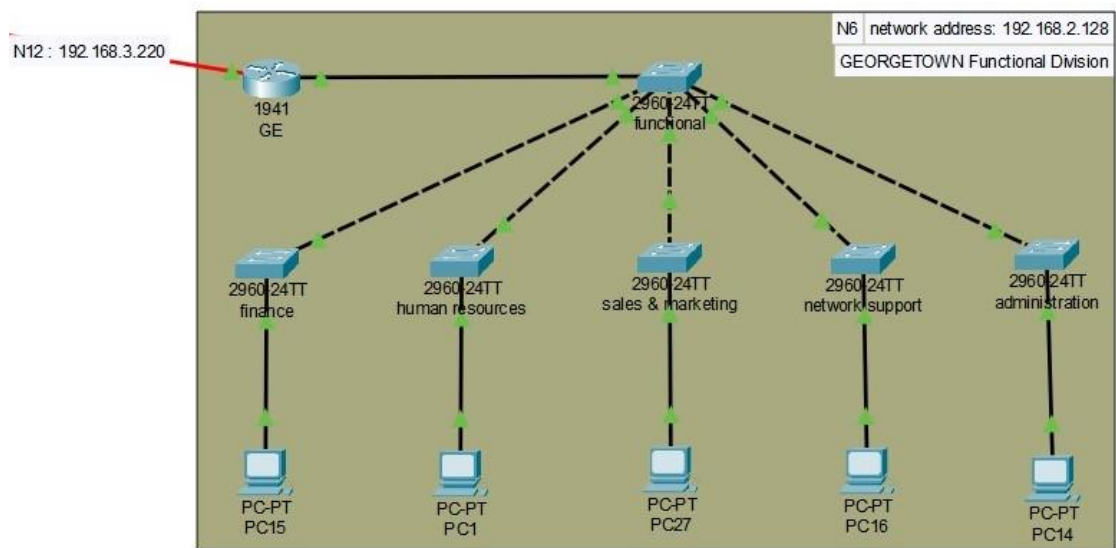
# Network Topology Design



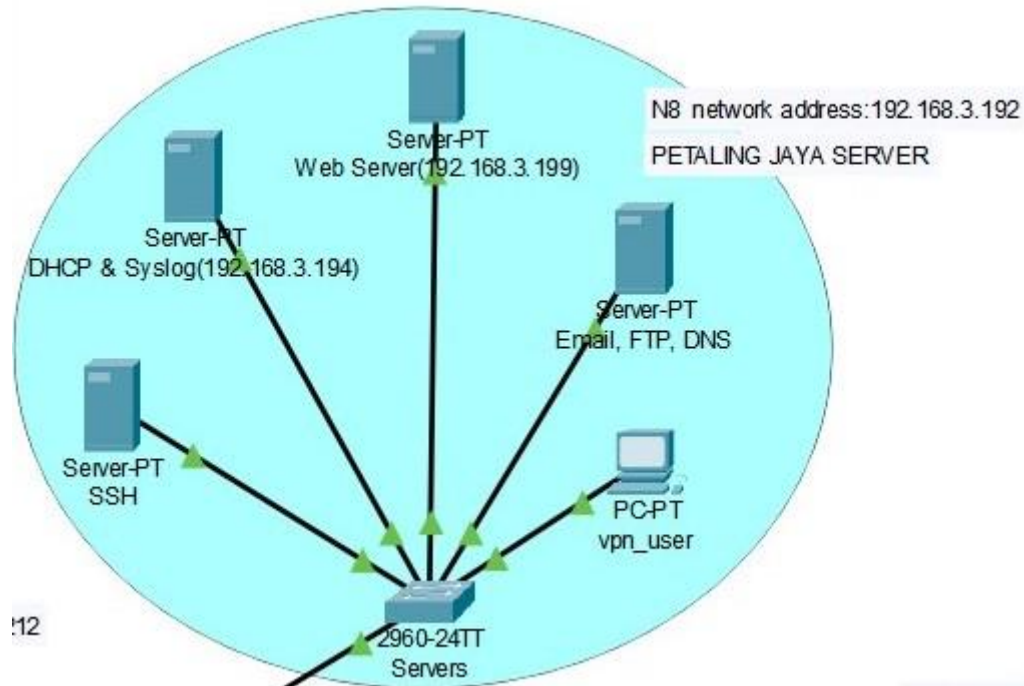
The Main office Petaling Jaya will be connected to other 5 branches Johor Bahru, Kuantan, Kulim, Georgetown and Ipoh through a point to point leased line made of fiber optics. The main office. The Main Office will have a server room with DHCP, Radius, Syslog, SSH, Mail and web Server connecting with an encrypted router.











## **Network Protocol Used in this Network Design**

### **Routing**

#### OSPF- Router ospf 1

Dynamic routes are configured on each branch's office and in the main office, to route the traffic from the inside network to another branch network.

### **DHCP**

DHCP is configured in the DHCP server, which is in the server room in the Petaling Jaya office 192.168.3.194 will be assigned to this server . Each of the hosts' IP addresses in this network system will be Allocated dynamically.

### **Network device security**

Every router has been configured with password in the console line as well as the vty line.

## **Administrative access control for network device**

User and admin has been created for access control for all network devices.

## **Secure Remote Connections (encrypted)**

Secure remote connections have been configured with SSH server and scp protocol is configured for securely transferring computer files between a local host and a remote host or between two remote hosts.

## **NTP & event logging**

For NTP , Petaling jaya' s router has been made the master router, and all other routers have been synchronized. And Syslog server is used for event logging , so that any event will be captured by syslog server.

## **AAA (local, radius,)**

Local aaa has been configured for VPN users and Remote aaa is configured in the radius server.

## **ACL**

ACL has been configured in the productive department of Petaling Jaya, Kulim, Kuantan and Johor Bahru office, to restrict the workers from misuse of the internet for entertainment purposes.

Extended access control list is also created for the zone firewall.

## **ZPF**

Firewall has been configured in PJ router Gig0/0 and Gig0/1 is Trusted Zone mentioned in the design and other areas are untrusted zones to block some users from accessing resources which are not allowed.

## **DNS, FTP, SMTP**

DNS, FTP and SMTP services have been configured to check whether ACL is working or not.



## **Securing LAN configuration**

### CAM table attack:

Every Second layer switch has been configured so that no more than 3 Mac addresses for a single port is allowed. And unused ports are down for 1st and 2nd layer switches to mitigate the attacks.

### DHCP attack:

All the trust ports are allowed for DHCP ip requests. And ip DHCP snooping limit rate is 6.

## **VPN**

VPN is configured for remote hosts who are working from home due to covid-19 for functional departments in PJ.

## **Wireless Security**

3 Wireless lan Controllers have been configured for LAP in Petaling jaya, Ipoh, Kuantan so that some users with wireless devices could use the company's intranet.

# Employees Description

| Location      | Department          | Number of Employees |
|---------------|---------------------|---------------------|
| Petaling Jaya | Product Engineering | 36                  |
|               | Test Engineering    | 31                  |
|               | Design Solutions    | 12                  |
|               | Administration      | 29                  |
|               | Human Resources     | 10                  |
|               | Sales and Marketing | 26                  |
|               | Network Support     | 6                   |
|               | Finance             | 8                   |
| Kulim         | Product Engineering | 30                  |
|               | Test Engineering    | 18                  |
|               | Design Solutions    | 5                   |
| Johor Bahru   | Product Engineering | 42                  |
|               | Test Engineering    | 22                  |
|               | Design Solutions    | 16                  |
| Kuantan       | Product Engineering | 19                  |
|               | Test Engineering    | 11                  |
|               | Design Solutions    | 4                   |
| Georgetown    | Administration      | 23                  |
|               | Human Resources     | 6                   |
|               | Sales and Marketing | 17                  |
|               | Network Support     | 4                   |
|               | Finance             | 16                  |
| Ipoh          | Administration      | 13                  |
|               | Human Resources     | 4                   |
|               | Sales and Marketing | 15                  |
|               | Network Support     | 5                   |
|               | Finance             | 5                   |
|               | <b>Total</b>        | <b>443</b>          |

## VLSM SUBNETTING

| Branch                     | Subnet   | Needed Size | CIDR | Subnet Mask     | Assignable range            | Network ID    | Broadcast     |
|----------------------------|----------|-------------|------|-----------------|-----------------------------|---------------|---------------|
| Kuantan                    | Net - 1  | 34          | /26  | 255.255.255.192 | 192.168.3.129-192.168.3.190 | 192.168.3.128 | 192.168.3.191 |
| Johor Bahru                | Net - 2  | 80          | /25  | 255.255.255.128 | 192.168.1.1 - 192.168.1.126 | 192.168.1.0   | 192.168.1.127 |
| Kulim                      | Net - 3  | 53          | /26  | 255.255.255.192 | 192.168.3.1-192.168.3.62    | 192.168.3.0   | 192.168.3.63  |
| Petaling jaya product type | Net - 4  | 79          | /25  | 255.255.255.128 | 192.168.1.129-192.168.1.255 | 192.168.1.128 | 192.168.1.256 |
| Petaling jaya Functional   | Net - 5  | 79          | /25  | 255.255.255.128 | 192.168.2.1-192.168.2.126   | 192.168.2.0   | 192.168.2.127 |
| Georgetown                 | Net - 6  | 66          | /25  | 255.255.255.128 | 192.168.2.129-192.168.2.255 | 192.168.2.128 | 192.168.2.256 |
| Ipoh                       | Net - 7  | 42          | /26  | 255.255.255.192 | 192.168.3.65-192.168.3.126  | 192.168.3.64  | 192.168.3.127 |
| Petaling jaya server house | Net - 8  | 2           | /28  | 255.255.255.240 | 192.168.3.193-192.168.3.206 | 192.168.3.192 | 192.168.3.207 |
| n/a                        | Net - 9  | 2           | /30  | 255.255.255.252 | 192.168.3.209-192.168.3.210 | 192.168.3.208 | 192.168.3.211 |
| n/a                        | Net - 10 | 2           | /30  | 255.255.255.252 | 192.168.3.213-192.168.3.214 | 192.168.3.212 | 192.168.3.215 |
| n/a                        | Net - 11 | 2           | /30  | 255.255.255.252 | 192.168.3.217-192.168.3.218 | 192.168.3.216 | 192.168.3.219 |
| n/a                        | Net - 12 | 2           | /30  | 255.255.255.252 | 192.168.3.221-192.168.3.222 | 192.168.3.220 | 192.168.3.223 |
| n/a                        | Net - 13 | 2           | /30  | 255.255.255.252 | 192.168.3.225-192.168.3.226 | 192.168.3.224 | 192.168.3.227 |
| n/a                        | Net - 14 | 2           | /30  | 255.255.255.252 | 192.168.3.229-192.168.3.230 | 192.168.3.228 | 192.168.3.231 |