

CSE-307 NETWORKING LAB REPORT

On

7-Floors Office Building Network Setup and Configuration

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GitHub Repository Link: <https://github.com/Nissigrace/NETWORK-DESIGN>

Physical Scenario Creation:

The physical scenario for Shital Infotech Ltd. Includes a seven floor building with 7 computers per floor. Floor 1 and 2 use mesh topology for high tolerance, floor 3 and floor 4 use ring topology for efficient circular communication, and floor 5 to 7 use star topology for easy management. Each floor has a switch and a router.

To ensure optimal network performance, fault tolerance, and scalability, different network topologies have been implemented for different floors:

- There are 7 Default Gateways in this network
- There are 7 LAN's.

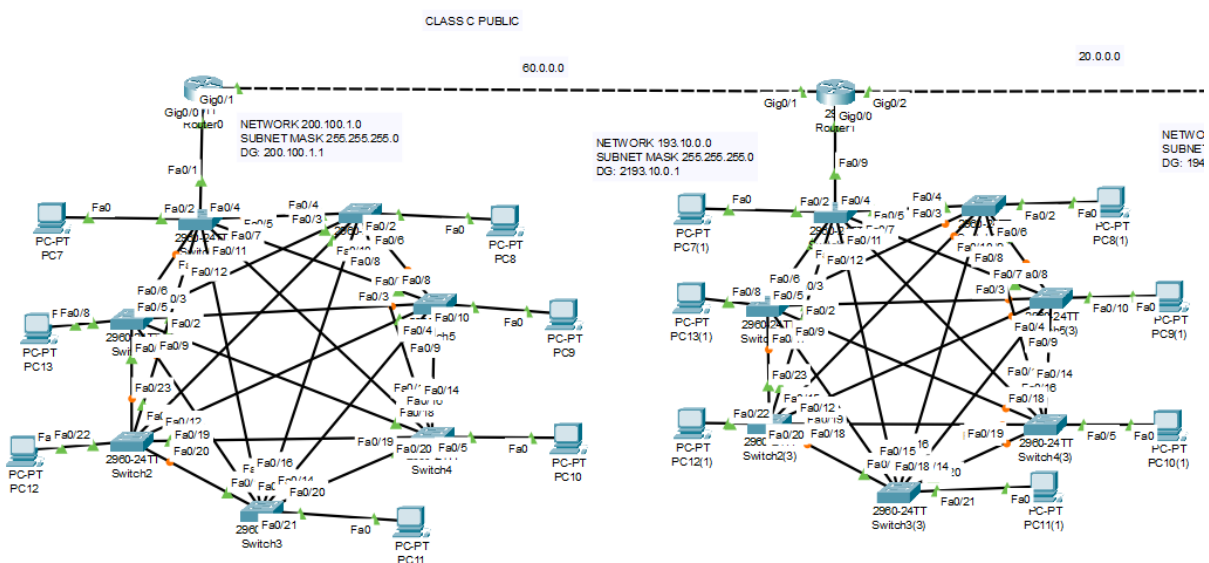


Fig 1. Floors 1-2

- **Switch used - 2960**
- **Router used -2911**
- **Floor 1 to Floor 2 – Mesh topology**
- **Floor 3 And Floor 4 – Ring Topology**
- **Floor 5,6, and – Star Topology**

IP Addressing Scheme

Following the **classful addressing scheme**:

Floor	Class	Network Address	Gateway Address
Floor 1	Class C Public	200.100.1.0/24	200.100.1.1
Floor 2	Class C Public	193.10.0.0/24	193.10.0.1
Floor 3	Class C Public	194.10.0.0/24	194.10.0.1
Floor 4	Class C Public	195.10.0.0/24	195.10.0.1
Floor 5	Class B Private	172.16.0.0/24	172.16.0.1
Floor 6	Class B Private	173.16.0.0/24	173.16.0.1
Floor 7	Class B Private	172.18.0.0/24	172.18.0.1

Table 1. Floor-wise Gateway and IP configuration

<p>Floor 1</p> <p><input type="radio"/> DHCP <input checked="" type="radio"/> Static</p> <p>IPv4 Address: 200.100.1.2</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 200.100.1.2</p> <p>DNS Server: 0.0.0.0</p>	<p>Floor 2</p> <p><input type="radio"/> DHCP <input checked="" type="radio"/> Static</p> <p>IPv4 Address: 193.10.0.2</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 193.10.0.1</p> <p>DNS Server: 0.0.0.0</p>
<p>Floor 3</p> <p><input type="radio"/> DHCP <input checked="" type="radio"/> Static</p> <p>IPv4 Address: 194.10.0.2</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 194.10.0.1</p> <p>DNS Server: 0.0.0.0</p>	<p>Floor 4</p> <p>IPv4 Address: 195.10.0.2</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 195.10.0.1</p> <p>DNS Server: 0.0.0.0</p>
<p>Floor 5</p> <p><input type="radio"/> DHCP <input checked="" type="radio"/> Static</p> <p>IPv4 Address: 172.16.0.2</p> <p>Subnet Mask: 255.255.0.0</p> <p>Default Gateway: 172.16.0.1</p> <p>DNS Server: 0.0.0.0</p>	<p>Floor 6</p> <p><input type="radio"/> DHCP <input checked="" type="radio"/> Static</p> <p>IPv4 Address: 173.16.0.2</p> <p>Subnet Mask: 255.255.0.0</p> <p>Default Gateway: 173.16.0.1</p> <p>DNS Server: 0.0.0.0</p>
<p>Floor 7</p> <p><input type="radio"/> DHCP <input checked="" type="radio"/> Static</p> <p>IPv4 Address: 172.18.0.2</p> <p>Subnet Mask: 255.255.0.0</p> <p>Default Gateway: 172.18.0.1</p> <p>DNS Server: 0.0.0.0</p>	

Table 2. Snaps of IP configuration window from pc of each floor

Router IP Configuration

```
Router>
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int gig0/0
Router(config-if)#ip address 172.16.2.1 255.255.0.0
Router(config-if)#no shutdown
```

```
Router>
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int gig0/1
Router(config-if)#ip address 172.19.1.2 255.255.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to
up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to up
```

```
Router(config-if)#
Router(config-if)#int gig0/2
Router(config-if)#ip address 172.20.1.1 255.255.0.0
Router(config-if)#no shutdown
```

Fig 4. Ex.IP addressing of Floor 2's router in CLI

Routing

In this project, we used RIP (Routing Information Protocol) for dynamic routing between the floor routers. RIP was configured on each floor's router, allowing the routers to automatically exchange routers and learn about networks on other floors.

This makes sure that devices from one floor can communicate with devices on any other floor without needing manual static routes for each connection.

Floor 1

```
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#no network 10.0.0.0
Router(config-router)#network 60.0.0.0
Router(config-router)#
&LT;INFO>PROTO-5-UPDOWN: Line protocol on Interface Giga
```

Floor 2

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#no network 10.0.0.0
Router(config-router)#network 60.0.0.0
Router(config-router)#
```

Floor 3

```
Router(config)#router rip
Router(config-router)#no network 200.100.3.0
Router(config-router)#network 194.10.0.0
Router(config-router)#exit
Router(config)#
```

Floor 4

```
Router(config)#router rip
Router(config-router)#no network 200.100.4.0
Router(config-router)#network 195.10.0.0
Router(config-router)#exit
Router(config)#exit
Router#
```

Floor 5

```
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#no network 128.16.0.0
Router(config-router)#network 128.16.0.0
Router(config-router)#no network 128.17.0.0
Router(config-router)#network 128.17.0.0
Router(config-router)#
```

Floor 6 and 7

```
Router(config)#router rip
Router(config-router)#network 128.17.0.0
Router(config-router)#network 173.16.0.0
Router(config-router)#network 172.18.0.0
Router(config-router)#
Router(config-router)#end
```