**Computer** **Networks**

**Discussion** **About** **Project**

**Task** **1;**

**Rasikh** **Ali**

***Lab* *10***

***Lab* *10* *-* *Task***

Research about Topics for Project and submit a deliverables document having: • Organization Name

• Number of Floors of the Organization • Number of PC / Server in the system

**Answer**

Below is a **complete documentation** for your network infrastructure project with a selected **organization name** and other details:

### ****Project Document****

#### ****1. Organization Name:****

* **Organization Name**: **TechCorp Solutions**

**Rationale**: TechCorp Solutions is an IT services company that provides technological solutions to businesses. This company is selected for this project as it requires a robust networking infrastructure to ensure the smooth operation of its IT solutions and services.

#### ****2. Number of Floors of the Organization:****

* **Number of Floors**: **3 Floors**

**Rationale**: The organization has a 3-floor office building:

* **Ground Floor**: Reception area, conference rooms, and admin offices.
* **First Floor**: Workstations for employees and a server room.
* **Second Floor**: Management offices, meeting rooms, and additional workstations.

#### ****3. Number of PCs/Servers in the System:****

**PCs**:

* + **Employee PCs**: 30
  + **Management PCs**: 5
  + **Admin/Reception PCs**: 3
  + **Total PCs**: **38 PCs**

**Servers**:

* + **DNS Server**: 1
  + **DHCP Server**: 1
  + **Web Server**: 1
  + **Email Server**: 1
  + **Total Servers**: **4 Servers**

**Rationale**: The total number of PCs and servers reflects the needs of a medium-sized IT company. The servers are set up to manage key services like DNS, DHCP, web hosting, and email for internal and external communications.

### ****Network Infrastructure****

This section provides an overview of the networking setup for the organization.

#### ****Network Topology****:

* **Core Network Equipment**:
  + **Routers**: 3 Routers (Router 1, Router 2, Router 3) to manage inter-VLAN routing and connectivity.
  + **Switches**: 4 switches (Switch 1, Switch 2, Switch 3, Switch 4) to connect PCs and servers within the organization.
  + **Servers**: 4 servers (DNS, DHCP, Web, Email) for essential network services.

#### ****Server Configuration****:

* **DNS Server**: Configured with static IP addresses for managing domain name resolution within the network.
* **DHCP Server**: Configured to dynamically assign IP addresses to PCs in the organization.
* **Web Server**: Set up for internal or external web applications, hosted on a specific static IP.
* **Email Server**: Handles email communications internally and externally.

### ****Network Design:****

#### ****IP Addressing Scheme****:

**Router IP Addressing**:

* + **Router 1**: 192.168.1.1
  + **Router 2**: 192.168.2.1
  + **Router 3**: 192.168.3.1

**Switch IP Addressing**:

* + **Switch 1**: 192.168.1.2
  + **Switch 2**: 192.168.2.2
  + **Switch 3**: 192.168.3.2
  + **Switch 4**: 192.168.4.2

**Server IP Addressing**:

* + **DNS Server**: 192.168.1.3
  + **DHCP Server**: 192.168.2.3
  + **Web Server**: 192.168.3.3
  + **Email Server**: 192.168.4.3

#### ****Routing****:

* **Dynamic Routing**: OSPF or EIGRP is used between routers for inter-network communication.
* **VLAN**: VLANs are created to segment different departments (e.g., Admin, Employees, Management).
* **DHCP**: Dynamic Host Configuration Protocol (DHCP) is configured on **Router 1** to assign IPs dynamically to client PCs.
* **DNS**: DNS server configuration is set up for internal domain resolution and external name resolution through a public DNS provider.

### ****Services Configuration****:

#### ****1. DNS Configuration****:

* **Server**: DNS Server (IP: 192.168.1.3)
* **Service**: DNS is used to resolve domain names to IP addresses for both internal services (like the web server) and external communications.
* **Zones**: Forward and reverse lookup zones are configured for internal network services.

#### ****2. DHCP Configuration****:

* **Server**: DHCP Server (IP: 192.168.2.3)
* **Service**: The DHCP server assigns IP addresses dynamically to the client PCs, reducing the need for manual IP assignment and ensuring efficient network management.

#### ****3. VLAN Configuration****:

* **VLANs** are set up to separate traffic for different departments:
  + **VLAN 10**: Admin VLAN
  + **VLAN 20**: Employee VLAN
  + **VLAN 30**: Management VLAN
* **VLAN Routing**: Routed through **Router 1** using Inter-VLAN routing.

#### ****4. Web Server Configuration****:

* **Server**: Web Server (IP: 192.168.3.3)
* **Service**: Hosts internal websites and web applications for the organization.

#### ****5. Email Server Configuration****:

* **Server**: Email Server (IP: 192.168.4.3)
* **Service**: Handles internal email communication and external email exchange.