

Project report

Data Communication And Networking Lab



**Members:**

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**Project Report: Campus Network Implementation**

**Introduction:** The campus network project aimed to establish a robust and efficient network infrastructure to facilitate seamless communication and data exchange within the educational institution. The network design incorporates various components such as routers, switches, servers, and VLANs to ensure scalability, security, and manageability.

**Network Topology:** The network topology consists of a main campus router connected to a cloud router, which serves as a gateway to the internet and cloud services. Additionally, there are branch routers established for connectivity between different campus locations. A multi-layer switch is deployed at both the main campus and branch campuses to manage local traffic efficiently. Multiple switches are interconnected within each campus to provide connectivity to various labs and buildings.

**Key Components:**

1. **Main Campus Router:** Acts as the central hub for network traffic management and connects to the cloud router for internet access.
2. **Branch Routers:** Establish connectivity between the main campus and branch campuses, enabling seamless communication across locations.
3. **Multi-layer Switches:** Installed at both main and branch campuses to manage local traffic efficiently, supporting VLANs for network segmentation.
4. **Lab and Building Switches:** Interconnected switches within each campus provide connectivity to labs, buildings, and other facilities, ensuring localized access to network resources.
5. **Servers:** Web servers and FTP servers are deployed within the network to host web applications and facilitate file transfer services for academic and administrative purposes.

**Protocols and Technologies Used:**

* **RIP v2**: Employed for dynamic routing, allowing routers to exchange routing information and adapt to network changes.
* **Sub interfaces:** Utilized for dividing physical interfaces into logical sub-interfaces, enabling efficient management of VLANs and traffic segregation.
* **VLANs (Virtual Local Area Networks):** Implemented for logical segmentation of the network, enabling better control and management of traffic.

Ip Configurations

**Routers:**

**Main campus router**

|  |  |  |
| --- | --- | --- |
| Interference | Ip Address | Subnet |
| Se0/1/0 | 10.10.10.5 | 255.255.255.252 |
| Se0/1/1 | 10.10.10.1 | 255.255.255.252 |

**Branch Router**

|  |  |  |
| --- | --- | --- |
| Interference | Ip Address | Subnet |
| Se0/1/0 | 10.10.10.2 | 255.255.255.252 |

**Cloud Router**

|  |  |  |
| --- | --- | --- |
| Interference | Ip Address | Subnet |
| Se0/1/0 | 10.10.10.6 | 255.255.255.252 |
| Gig0/0 | 20.0.0.1 | 255.255.255.252 |

**Main Campus Router Sub interference**

|  |  |  |
| --- | --- | --- |
| Interference | Vlan | Ip |
| Gig 0/0.10 | Vlan 10 | 192.168.1.1 |
| Gig 0/0.20 | Vlan 20 | 192.168.2.1 |
| Gig 0/0.30 | Vlan 30 | 192.168.3.1 |
| Gig 0/0.40 | Vlan 40 | 192.168.4.1 |
| Gig 0/0.50 | Vlan 50 | 192.168.5.1 |
| Gig 0/0.60 | Vlan 60 | 192.168.6.1 |

**Branch Campus Router Sub interference**

|  |  |  |
| --- | --- | --- |
| Interference | Vlan | Ip |
| Gig 0/0.70 | Vlan 70 | 192.168.7.1 |
| Gig 0/0.80 | Vlan 80 | 192.168.8.1 |

**Main Campus Building A:**

**Admin :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 0** | 192.168.1.0 | 10 | 192.168.1.1 |
| **Printer 0** | 192.168.1.0 | 10 | 192.168.1.1 |

**HR :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 1** | 192.168.2.0 | 20 | 192.168.2.1 |
| **Printer 1** | 192.168.2.0 | 20 | 192.168.2.1 |

**Finance :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 2** | 192.168.3.0 | 30 | 192.168.3.1 |
| **Printer 2** | 192.168.3.0 | 30 | 192.168.3.1 |

**Buisness :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 3** | 192.168.4.0 | 40 | 192.168.4.1 |
| **Printer 3** | 192.168.4.0 | 40 | 192.168.4.1 |

**Main Campus Building B:**

**Stud Lab :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 4** | 192.168.5.0 | 50 | 192.168.5.1 |
| **Printer 4** | 192.168.5.0 | 50 | 192.168.5.1 |

**IT Lan :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 5** | 192.168.6.0 | 60 | 192.168.6.1 |
| **Web Server** | 192.168.6.0 | 60 | 192.168.6.1 |
| **FTP Server** | 192.168.6.0 | 60 | 192.168.6.1 |
|  |  |  |  |

**Branch Campus Building A**

**Stud Lab :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 6** | 192.168.7.0 | 70 | 192.168.7.1 |
| **Printer 5** | 192.168.7.0 | 70 | 192.168.7.1 |

**Stud Lab :** Ip assigned through dhcp method

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Network** | **Vlan** | **Gateway** |
| **PC 7** | 192.168.8.0 | 80 | 192.168.8.1 |
| **Printer 6** | 192.168.8.0 | 80 | 192.168.8.1 |

**Network**

**Main Campus**

**A diagram of a network

Description automatically generated**

**Branch**

**A diagram of a computer network

Description automatically generated**