SUPERIOR UNIVERSITY

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Roll No: SU92-BSSEM-F22-207

Subject: Computer Networks Lab

Project Documentation

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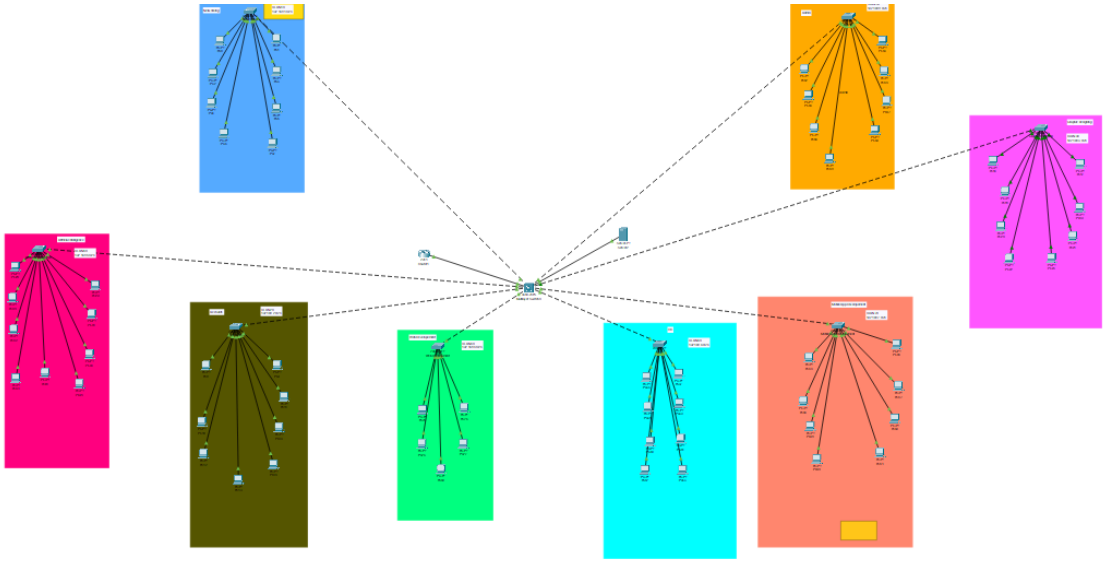
Submitted To: Sir Rasikh

Section: 5D

Organization name: Bitlogicx

Topology:



Documentation:

Server used: 1

Router used: 1

Multilayer Switch used: 1

Switch used: 8

Step 1: VLAN Configuration on the Switch

Create VLANs for each department

Switch>enable

Switch#configure terminal

Switch(config)#vlan 10

Switch(config-vlan)#name Networking

Switch(config-vlan)#exit

Switch(config)#vlan 20

Switch(config-vlan)#name Accounts

Switch(config-vlan)#exit

```
Switch(config)#vlan 30
Switch(config-vlan)#name Graphic_Designing
Switch(config-vlan)#exit
Switch(config)#vlan 40
Switch(config-vlan)#name Web_Developement
Switch(config-vlan)#exit
Switch(config)#vlan 50
Switch(config-vlan)#name Artificial_Intelligence
Switch(config-vlan)#exit
Switch(config)#vlan 60
Switch(config-vlan)#name HR
Switch(config-vlan)#exit
Switch(config)#vlan 70
Switch(config-vlan)#name Mobile_App_Development
Switch(config-vlan)#exit
Switch(config)#vlan 80
Switch(config-vlan)#name Admin
Switch(config-vlan)#exit

# Assign VLANs to switch ports (adjust ports as needed)
Switch(config)#interface range fa0/1-2
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit

Switch(config)#interface range fa0/3-4
```

```
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit

Switch(config)#interface range fa0/5-6
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 30
Switch(config-if-range)#exit

Switch(config)#interface range fa0/7-8
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 40
Switch(config-if-range)#exit

Switch(config)#interface range fa0/9-10
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 50
Switch(config-if-range)#exit

Switch(config)#interface range fa0/11-12
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 60
Switch(config-if-range)#exit

Switch(config)#interface range fa0/13-14
Switch(config-if-range)#switchport mode access
```

```
Switch(config-if-range)#switchport access vlan 70
Switch(config-if-range)#exit

Switch(config)#interface range fa0/15-16
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 80
Switch(config-if-range)#exit

# Configure a trunk port for router connection
Switch(config)#interface fa0/24
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
```

Step 2: Router Configuration for Inter-VLAN Routing

```
Router>enable
Router#configure terminal

# Create subinterfaces for each VLAN
Router(config)#interface gigabitEthernet 0/0.10
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 192.168.10.1 255.255.255.0
Router(config-subif)#exit
```

```
Router(config)#interface gigabitEthernet 0/0.20
Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0.30
Router(config-subif)#encapsulation dot1Q 30
Router(config-subif)#ip address 192.168.30.1 255.255.255.0
Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0.40
Router(config-subif)#encapsulation dot1Q 40
Router(config-subif)#ip address 192.168.40.1 255.255.255.0
Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0.50
Router(config-subif)#encapsulation dot1Q 50
Router(config-subif)#ip address 192.168.50.1 255.255.255.0
Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0.60
Router(config-subif)#encapsulation dot1Q 60
Router(config-subif)#ip address 192.168.60.1 255.255.255.0
Router(config-subif)#exit
```

```
Router(config)#interface gigabitEthernet 0/0.70
Router(config-subif)#encapsulation dot1Q 70
Router(config-subif)#ip address 192.168.70.1 255.255.255.0
Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0.80
Router(config-subif)#encapsulation dot1Q 80
Router(config-subif)#ip address 192.168.80.1 255.255.255.0
Router(config-subif)#exit
```

Step 3: Configure DHCP on the Router

```
# DHCP Pools for each VLAN
Router(config)#ip dhcp pool VLAN10
Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.10.1
Router(dhcp-config)#exit

Router(config)#ip dhcp pool VLAN20
Router(dhcp-config)#network 192.168.20.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.20.1
Router(dhcp-config)#exit
```

```
Router(config)#ip dhcp pool VLAN30
Router(dhcp-config)#network 192.168.30.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.30.1
Router(dhcp-config)#exit

Router(config)#ip dhcp pool VLAN40
Router(dhcp-config)#network 192.168.40.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.40.1
Router(dhcp-config)#exit

Router(config)#ip dhcp pool VLAN50
Router(dhcp-config)#network 192.168.50.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.50.1
Router(dhcp-config)#exit

Router(config)#ip dhcp pool VLAN60
Router(dhcp-config)#network 192.168.60.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.60.1
Router(dhcp-config)#exit

Router(config)#ip dhcp pool VLAN70
Router(dhcp-config)#network 192.168.70.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.70.1
Router(dhcp-config)#exit

Router(config)#ip dhcp pool VLAN80
```

Router(dhcp-config)#network 192.168.80.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.80.1

Router(dhcp-config)#exit

Step 4: Configure DNS on the Router

Set DNS Server

Router(config)#ip name-server 8.8.8.8

Router(config)#ip name-server 8.8.4.4

Step 5: Save Configurations

Save configurations

Switch#write memory

Router#write memory

IP Address Schema:

Networking: 192.168.10.0/24

Accounts: 192.168.20.0/24

Graphic Designing: 192.168.30.0/24

Web Developement: 192.168.40.0/24

Artificial Intelligence: 192.168.50.0/24

HR: 192.168.60.0/24

Mobile App Development: 192.168.70.0/24

Admin: 192.168.80.0/24

This configuration creates a VLAN-based network with DHCP and DNS support, allowing inter-VLAN communication through the router.