

**Session 2023-2027**

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**Course:**

Computer Networks Lab

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**Project Report**

**Description:**

This is the large university network. It has two campuses. One main campus and other is branch campus. We use 3 layer switches with each campus network and then further 2 layer switches. We use about 10 VLANS. It has three buildings e-g Building A, Building B and Building C which is further divided into many networks. We have here cloud which has email address Server. We use here Dynamic routing and assign IP Addresses by using DHCP. We use three different networks. We used three number of routers.

**Used Ip Address:**

* 192.168.1.2
* 192.168.2.2
* 192.168.3.2
* 192.168.4.2
* 192.168.5.2
* 192.168.6.2
* 192.168.7.2
* 192.168.8.2
* 192.168.9.2
* 192.168.10.2
* 20.0.0.1

**Departments:**

* **Main Campus:**

Admin

HR

Finance

Business

Engineering and computing

Art and design

Student Lab

IT department

* **Branch Campus**

Staff

Student Lab

**VLANs**

* **Creation of VLANs**: VLANs (Virtual Local Area Networks) are used to segment network traffic logically rather than physically.
  + **Why**: VLANs are created for security, to segment network traffic, and to reduce broadcast domains.
  + **How Many**: We used 10 VLANS in this university network. Each VLAN has its own network.

**Routing**

We used here DHCP routing in this university network. By using dhcp we automatically assign IP addresses to PCs by using pools. Here are the following code lines we use for configuration.

**Configuration of Routers and switches**

--For config two layer switches and vlans:

int range fa0/1-24

switchport mode access

switchport access vlan 100

exit

--This is for 3 layer switch to access its related vlans

int gig 1/0/3

switchport mode access

switchport access vlan 100

-For trunk wire on switch:

int gig1/0/1

switchport trunk encapsulation dot1q

switchport mode trunk

exit

--For switch configuration.

Switch> enable

Switch# configure terminal

Switch(config)# interface G0/1

Switch(config-if)# switchport mode trunk

Switch(config-if)# switchport trunk encapsulation dot1q

Switch(config-if)# exit

Switch(config)# exit

Switch# show interfaces G0/1 switchport

--intervlan routing and dhcp configuration

int gig0/0.10

encapsulation dot1Q 10

ip address 192.168.1.1 255.255.255.0

service dhcp

ip dhcp pool admin-pool

network 192.168.1.0 255.255.255.0

default router 192.168.1.1

dns-server 192.168.1.1

exit

--RIP version2 (routing information protocol)

router rip

version 2

network 192.168.9.0

network 192.168.10.0

network 10.10.10.0

exit

do wr

**Wireframe:**