EAST WEST UNIVERSITY

Project Report

CSE 405

Computer Networks

Submitted to-

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Submitted By-

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Section-3

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Title: Design a full-fledged network for an organization with multiple subnets.

Introduction:

University of Scholars, is an enterprise like East West University, owns many computers, with a complex network infrastructure. Apart from wired internet access to all the classrooms, labs, employee PCs, library and other administrative and academic wings, the university also provides wireless internet access for every campus. On top of that, the university runs complex networked systems to support several of its business process like admissions, advising, results, eTender, library management, accounts and so on.

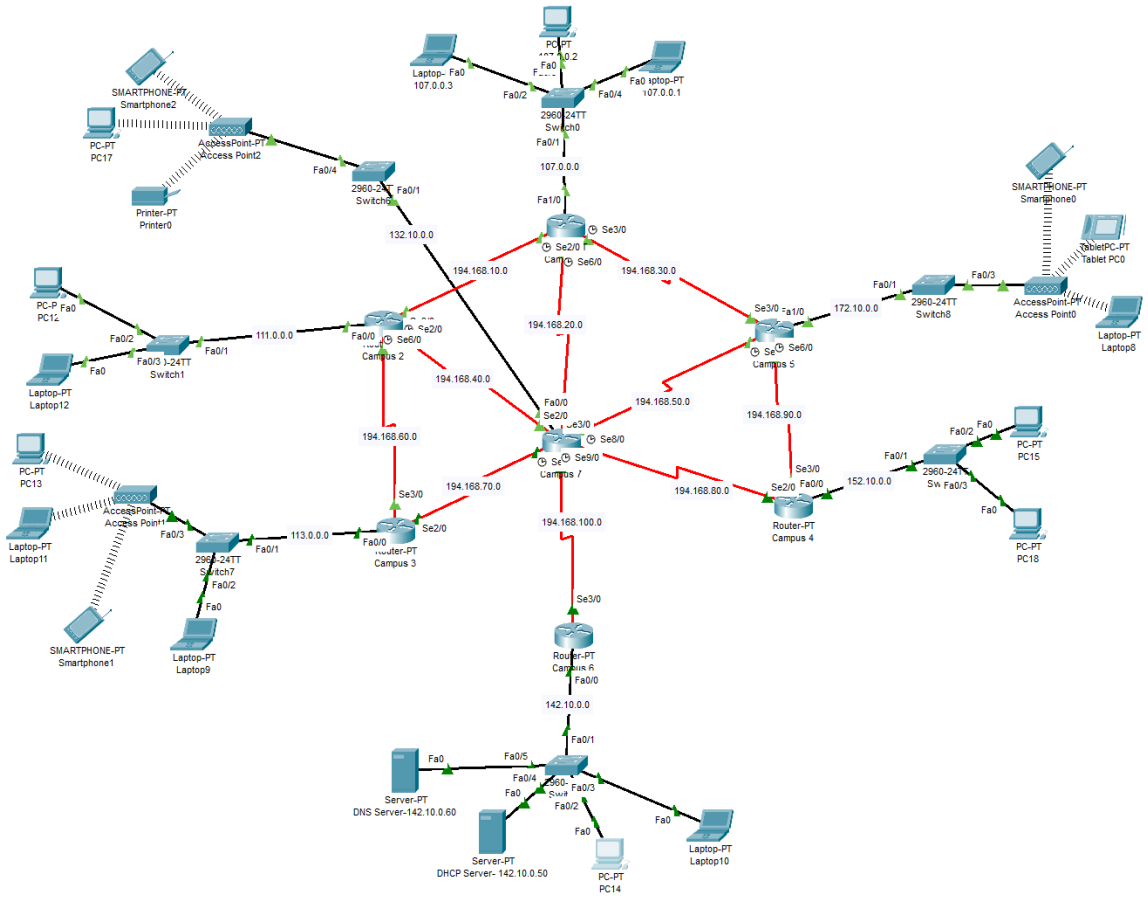
Tools:

- Cisco Packet Tracer Software (version 8.2.0)
- Laptop-Pt, Pc-Pt , Printer, Smartphone, Tablet.
- Switches (2960)
- Routers (PT)
- Access Point-PT (Wireless Device)
- Server-PT (Single Server For WEB, DHCP and DNS)
- Connectors (Copper straight through, Serial DCE)

Tasks Completed:

- Web page of the university reflects University of Scholars' web page because of all devices is connected to the server, which is acting as WEB, DHCP & DNS server.
- DNS sever was installed to locate webserver which redirects us to the website of University of Scholars.
- Single DHCP server provides all of the required IP to all of the networks.
- Wireless links to the networks are available.
- University's full network has covered its seven campuses with seven routers;
- Connectivity between all the hosts has been established.

Network Diagram:



Setup and configuration:

I have used Class A network for the hosts (107.0.0.0, 111.0.0.0, 113.0.0.0) and also used Class B (132.10.0.0, 142.10.0.0, 152.10.0.0, 172.10.0.0) , Class C networks for Router's Connector networks (194.168.10.0, 194.168.20.0, 194.168.30.0, 194.168.40.0, 194.168.50.0, 194.168.60.0, 194.168.70.0, 194.168.80.0, 194.168.90.0, 194.168.100.0), and for Server network I have used class B network 142.10.0.50 and 142.10.0.60.

For The Router IP Setup We have used a CLI code for each router,

```
Campus 1
---------
interface fa1/0
ip address 107.0.0.254 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.30.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se6/0
ip address 194.168.20.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se2/0
ip address 194.168.10.1 255.255.255.0
clock rate 64000
no shut
do wr

exit
```

```
Campus 2
---------
interface fa0/0
ip address 111.0.0.254 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.10.2 255.255.255.0
no shut
do wr

exit

interface se2/0
ip address 194.168.40.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se6/0
ip address 194.168.60.1 255.255.255.0
clock rate 64000
no shut
do wr

exit
```

```
Campus 3
---------
interface fa0/0
ip address 113.0.0.254 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.60.2 255.255.255.0
no shut
do wr

exit

interface se2/0
ip address 194.168.70.1 255.255.255.0
no shut
do wr

exit
```

```
Campus 4
---------
interface fa0/0
ip address 152.10.0.254 255.255.255.0
no shut
do wr

exit

interface se2/0
ip address 194.168.80.1 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.90.1 255.255.255.0
no shut
do wr

exit
```

Campus 5
---
interface fa1/0
ip address 172.10.0.254 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.30.2 255.255.255.0
no shut
do wr

exit

interface se6/0
ip address 194.168.90.2 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se2/0
ip address 194.168.50.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

Campus 6
---
interface fa0/0
ip address 142.10.0.254 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.100.1 255.255.255.0
no shut
do wr

exit

Campus 7
---
interface fa0/0
ip address 132.10.0.254 255.255.255.0
no shut
do wr

exit

interface se9/0
ip address 194.168.100.2 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se7/0
ip address 194.168.70.2 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se8/0
ip address 194.168.80.2 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se6/0
ip address 194.168.50.2 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 194.168.20.2 255.255.255.0
no shut
do wr

exit

interface se2/0
ip address 194.168.40.2 255.255.255.0
no shut
do wr

exit

To setup the Routing Table I have used the following CLI Code,

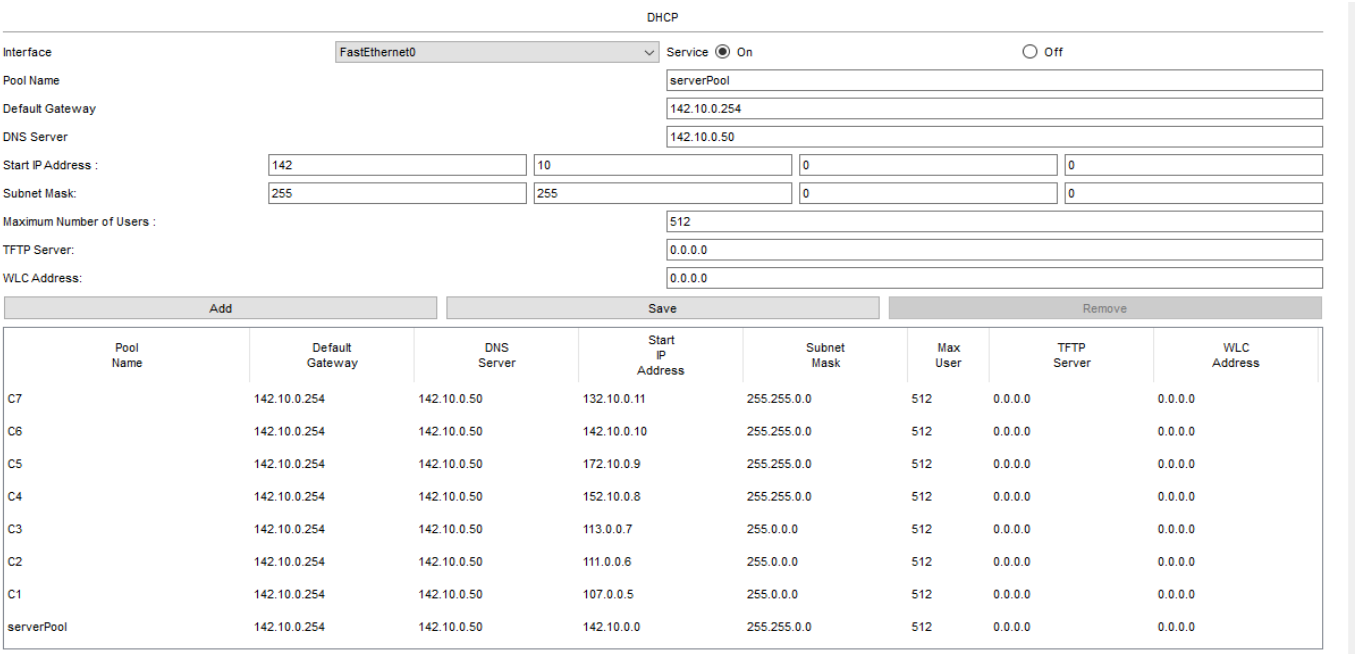
```
Campus 1
------------
router ospf  1
network 107.0.0.0 0.255.255.255 area 1
network 194.168.10.0 0.0.0.255 area 1
network 194.168.20.0 0.0.0.255 area 1
network 194.168.30.0 0.0.0.255 area 1
exit

Campus 2
------------
router ospf  2
network 111.0.0.0 0.255.255.255 area 1
network 194.168.10.0 0.0.0.255 area 1
network 194.168.40.0 0.0.0.255 area 1
network 194.168.60.0 0.0.0.255 area 1
exit

Campus 3
------------
router ospf  3
network 113.0.0.0 0.255.255.255 area 1
network 194.168.60.0 0.0.0.255 area 1
network 194.168.70.0 0.0.0.255 area 1
exit
```

```
Campus 4
------------
router ospf  4
network 152.10.0.0 0.0.255.255 area 1
network 194.168.80.0 0.0.0.255 area 1
network 194.168.90.0 0.0.0.255 area 1
exit

Campus 5
------------
router ospf  5
network 172.10.0.0 0.0.255.255 area 1
network 194.168.30.0 0.0.0.255 area 1
network 194.168.50.0 0.0.0.255 area 1
network 194.168.90.0 0.0.0.255 area 1
exit

Campus 6
------------
router ospf  6
network 142.10.0.0 0.0.255.255 area 1
network 194.168.100.0 0.0.0.255 area 1
exit

Campus 7
------------
router ospf  7
network 132.10.0.0 0.0.255.255 area 1
network 194.168.20.0 0.0.0.255 area 1
network 194.168.40.0 0.0.0.255 area 1
network 194.168.50.0 0.0.0.255 area 1
network 194.168.70.0 0.0.0.255 area 1
network 194.168.80.0 0.0.0.255 area 1
network 194.168.100.0 0.0.0.255 area 1
exit
```

To establish connection between the servers with all the other networks, I have used IP helper address, as it is a remote DHCP for other networks.

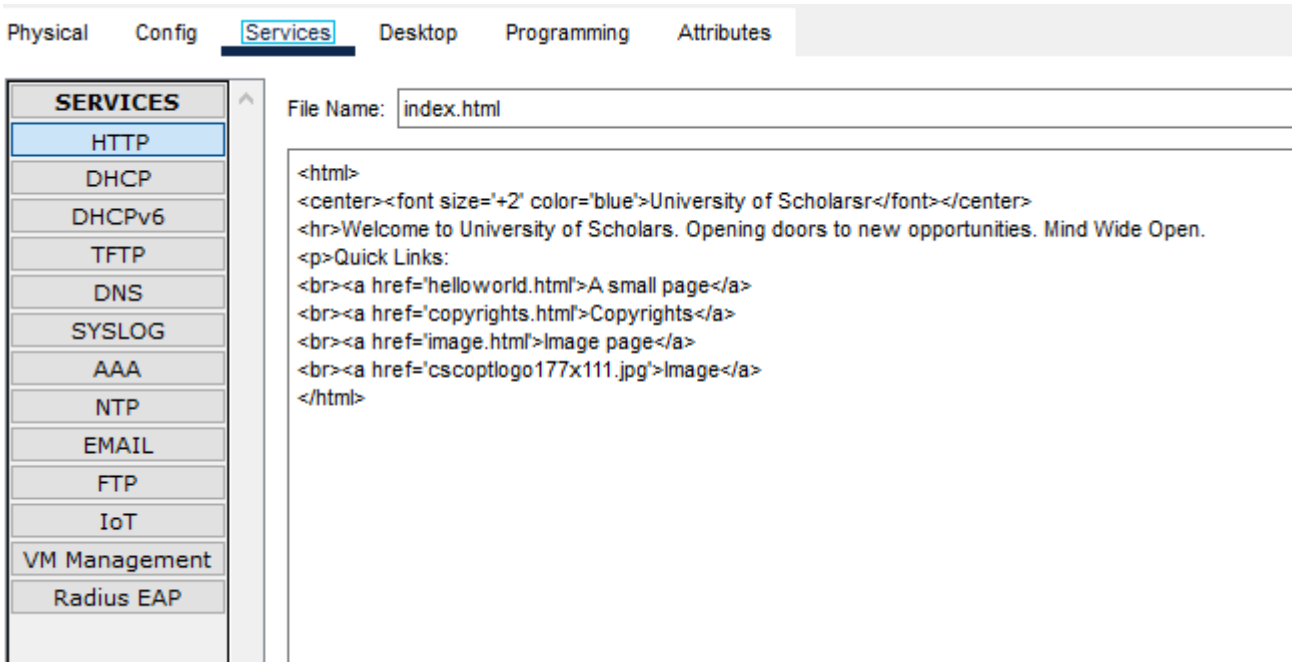
I have set the IP of the server to 142.10.0.50and set the helper address to all the interfaces as cli code, IP helper-address 142.10.0.50.

Server Setup:

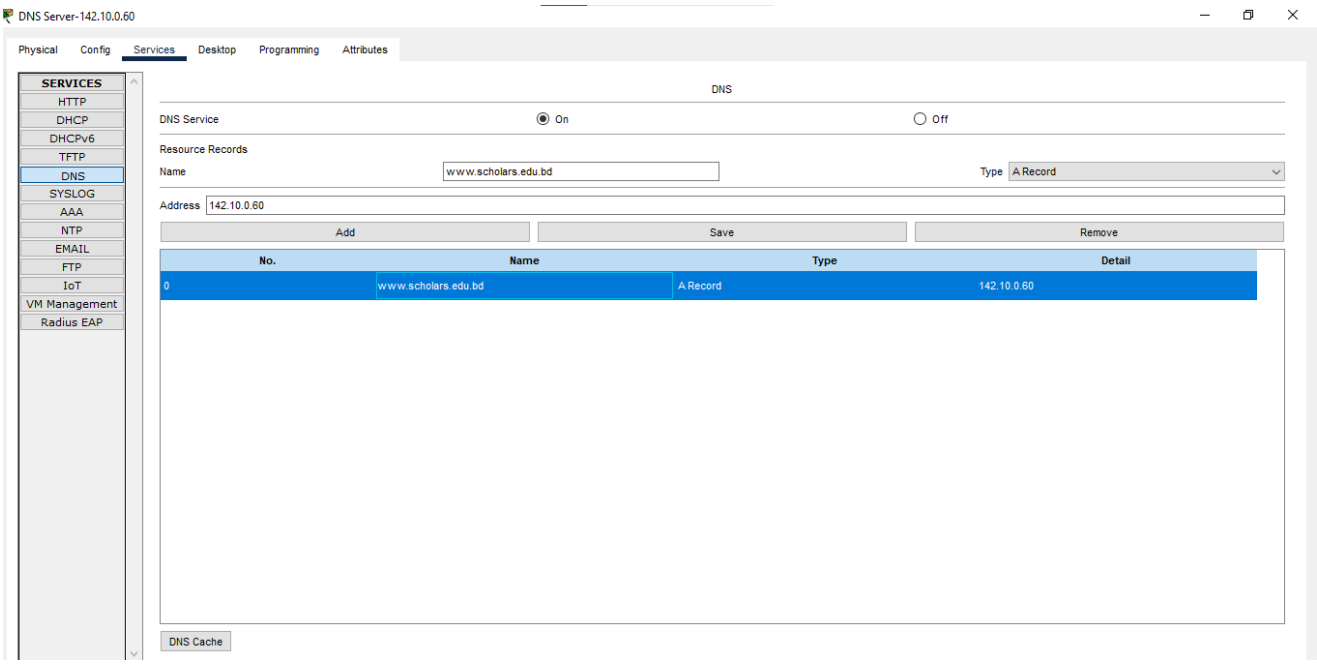


Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
C7	142.10.0.254	142.10.0.50	132.10.0.11	255.255.0.0	512	0.0.0.0	0.0.0.0
C6	142.10.0.254	142.10.0.50	142.10.0.10	255.255.0.0	512	0.0.0.0	0.0.0.0
C5	142.10.0.254	142.10.0.50	172.10.0.9	255.255.0.0	512	0.0.0.0	0.0.0.0
C4	142.10.0.254	142.10.0.50	152.10.0.8	255.255.0.0	512	0.0.0.0	0.0.0.0
C3	142.10.0.254	142.10.0.50	113.0.0.7	255.0.0.0	512	0.0.0.0	0.0.0.0
C2	142.10.0.254	142.10.0.50	111.0.0.6	255.0.0.0	512	0.0.0.0	0.0.0.0
C1	142.10.0.254	142.10.0.50	107.0.0.5	255.0.0.0	512	0.0.0.0	0.0.0.0
serverPool	142.10.0.254	142.10.0.50	142.10.0.0	255.255.0.0	512	0.0.0.0	0.0.0.0

Here, I have made some pools that would generate the IP range for different networks In the DHCP Server.

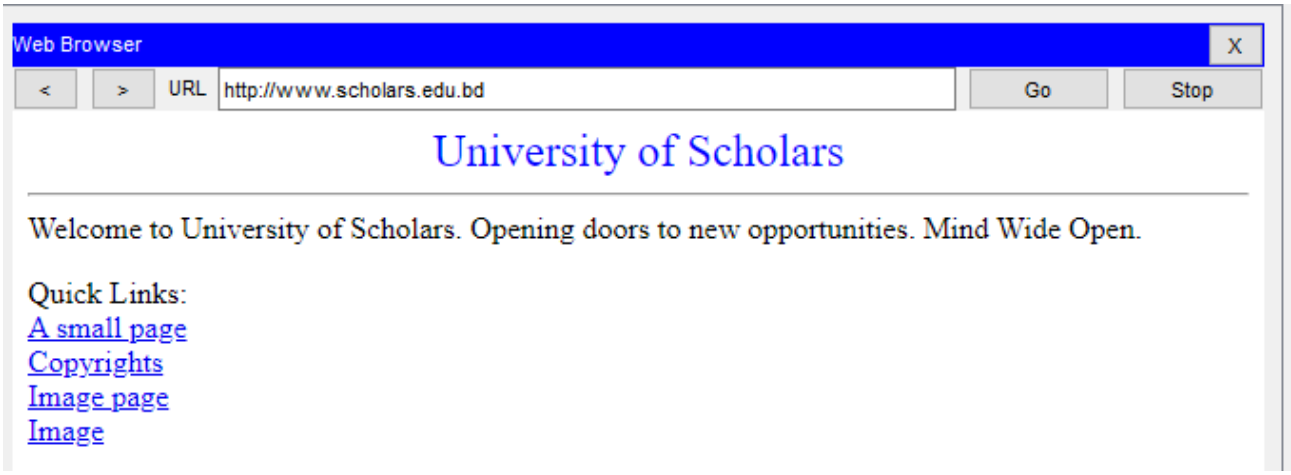


This will work as out http server and run the page index.html.



This is the DNS server.

Running the webpage from a PC:



Conclusion:

Here I used OSPF network architecture to configure the routers easily. I used wired and wireless connection also. I used DNS web server, DHCP server for setup IP address for every hosts. After all, every host could connect with each other.