EAST WEST UNIVERSITY

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

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Course Title: Computer Networks

Section: 3

Submitted to:

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Title: Designing a Full-fledged Network for an Organization with Multiple Subnets.

Preface: Our goal from this project is to design a network that will work for a university. It has subnetting for access control and it is also design keeping future expansion in mind. 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 a complex networked systems to support several of its business process like admissions, advising, results, eTender, library management, accounts and so on.

Software: Cisco Packet Tracer 8.2.1

Tools:

1. Router
2. Wireless Router
3. Switch
4. DNS Server
5. Web Server
6. DHCP Server
7. Straight Through Cable
8. Serial DCE Cable
9. Laptop
10. Desktop
11. Smart Phone

Physical Diagram:

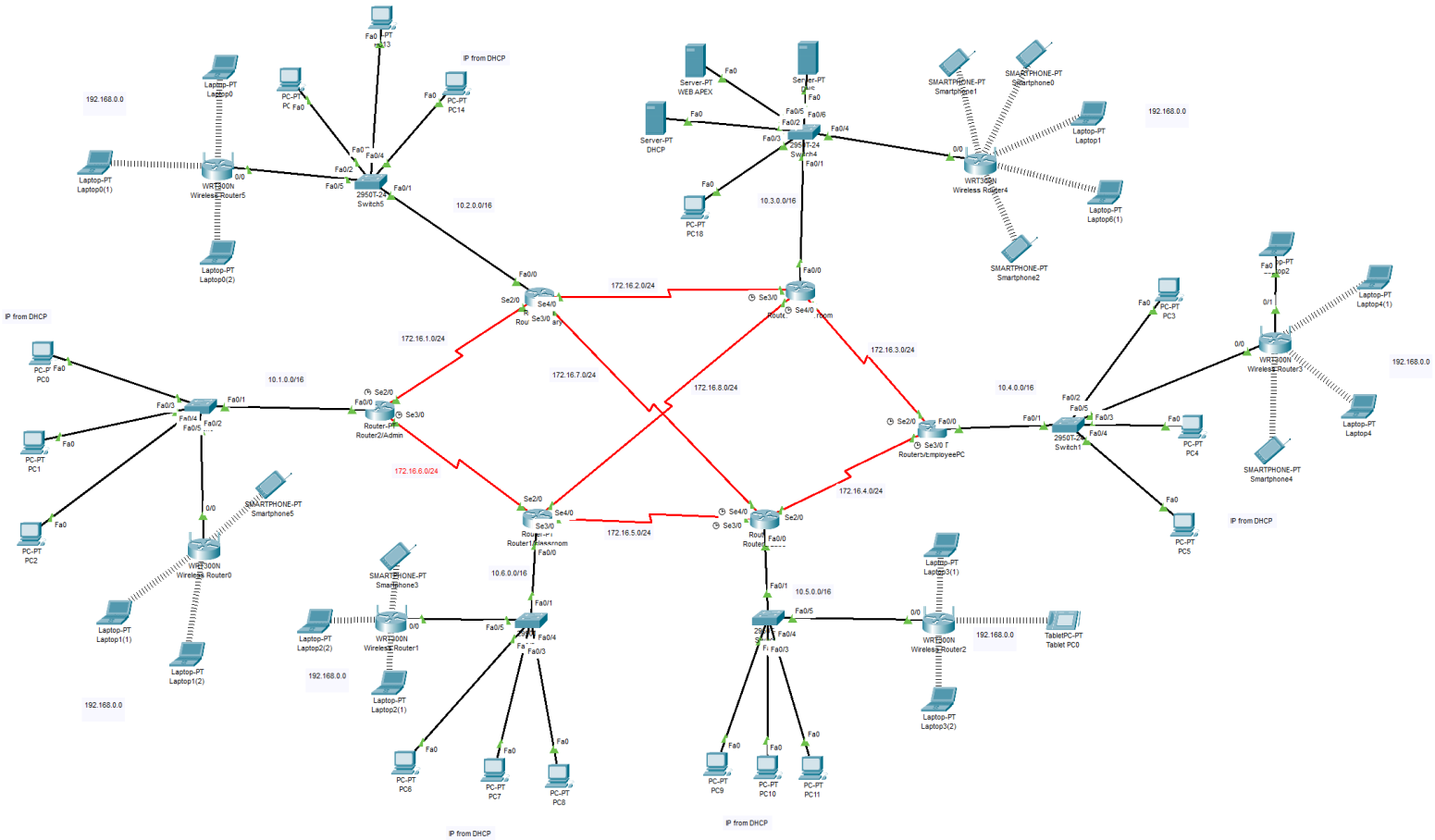

Figure 1: Network Model

Design Issue: There is no apparent design issues. This model can be connected to the internet as well. Because it uses of Private IPs.

Number of Hosts:

Total number of hosts is 37

Networks:

Total network is 20

Limitation:

When power cycling the whole model, it runs into DHCP failure due to forgetting previous dynamic routing table (OSPF).

Lines of Code:

Router 2

```
interface fa0/0
ip address 10.1.0.255 255.255.0.0
no shut
do wr

exit

interface se2/0
ip address 172.16.1.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se3/0
ip address 172.16.6.1 255.255.255.0
clock rate 64000
no shut
do wr

exit
```

Router 1

```
interface fa0/0
ip address 10.6.0.255 255.255.0.0
no shut
do wr

exit

interface se2/0
ip address 172.16.6.2 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 172.16.5.2 255.255.255.0
no shut
do wr
```

```
interface se4/0
ip address 172.16.8.2 255.255.255.0
no shut
do wr

exit
```

Router 6

```
interface fa0/0
ip address 10.5.0.255 255.255.0.0
no shut
do wr

exit

interface se2/0
ip address 172.16.4.2 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 172.16.5.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se4/0
ip address 172.16.7.1 255.255.255.0
clock rate 64000
no shut
do wr

exit
```

Router 5

```
interface fa0/0
ip address 10.4.0.255 255.255.0.0
no shut
```

do wr

exit

interface se2/0
ip address 172.16.3.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se3/0
ip address 172.16.4.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

Router 4

interface fa0/0
ip address 10.3.0.255 255.255.0.0
no shut
do wr

exit

interface se2/0
ip address 172.16.3.2 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 172.16.2.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

interface se4/0

ip address 172.16.8.1 255.255.255.0
clock rate 64000
no shut
do wr

exit

Router 3

interface fa0/0
ip address 10.2.0.255 255.255.0.0
no shut
do wr

exit

interface se2/0
ip address 172.16.1.2 255.255.255.0
no shut
do wr

exit

interface se3/0
ip address 172.16.7.2 255.255.255.0
no shut
do wr

exit

interface se4/0
ip address 172.16.2.2 255.255.255.0
no shut
do wr

exit

OSPFRouter2

router ospf 2
network 172.16.1.0 0.0.0.255 area 1
network 172.16.6.0 0.0.0.255 area 1
network 10.1.0.0 0.0.255.255 area 1

OSPFRouter3

router ospf 3
network 172.16.1.0 0.0.0.255 area 1
network 172.16.2.0 0.0.0.255 area 1
network 172.16.7.0 0.0.0.255 area 1
network 10.2.0.0 0.0.255.255 area 1

OSPFRouter4

router ospf 4
network 172.16.3.0 0.0.0.255 area 1
network 172.16.2.0 0.0.0.255 area 1
network 172.16.8.0 0.0.0.255 area 1
network 10.3.0.0 0.0.255.255 area 1

OSPFRouter5

router ospf 5
network 172.16.3.0 0.0.0.255 area 1
network 172.16.4.0 0.0.0.255 area 1
network 10.4.0.0 0.0.255.255 area 1

OSPFRouter6

router ospf 6
network 172.16.5.0 0.0.0.255 area 1
network 172.16.4.0 0.0.0.255 area 1
network 172.16.7.0 0.0.0.255 area 1
network 10.5.0.0 0.0.255.255 area 1

OSPFRouter1

router ospf 1
network 172.16.5.0 0.0.0.255 area 1
network 172.16.6.0 0.0.0.255 area 1
network 172.16.8.0 0.0.0.255 area 1
network 10.6.0.0 0.0.255.255 area 1

Helper Address

interface fa0/0
ip helper-address 10.3.0.254
ip helper-address 10.3.0.2

Server Configuration:

DHCP (10.3.0.254):

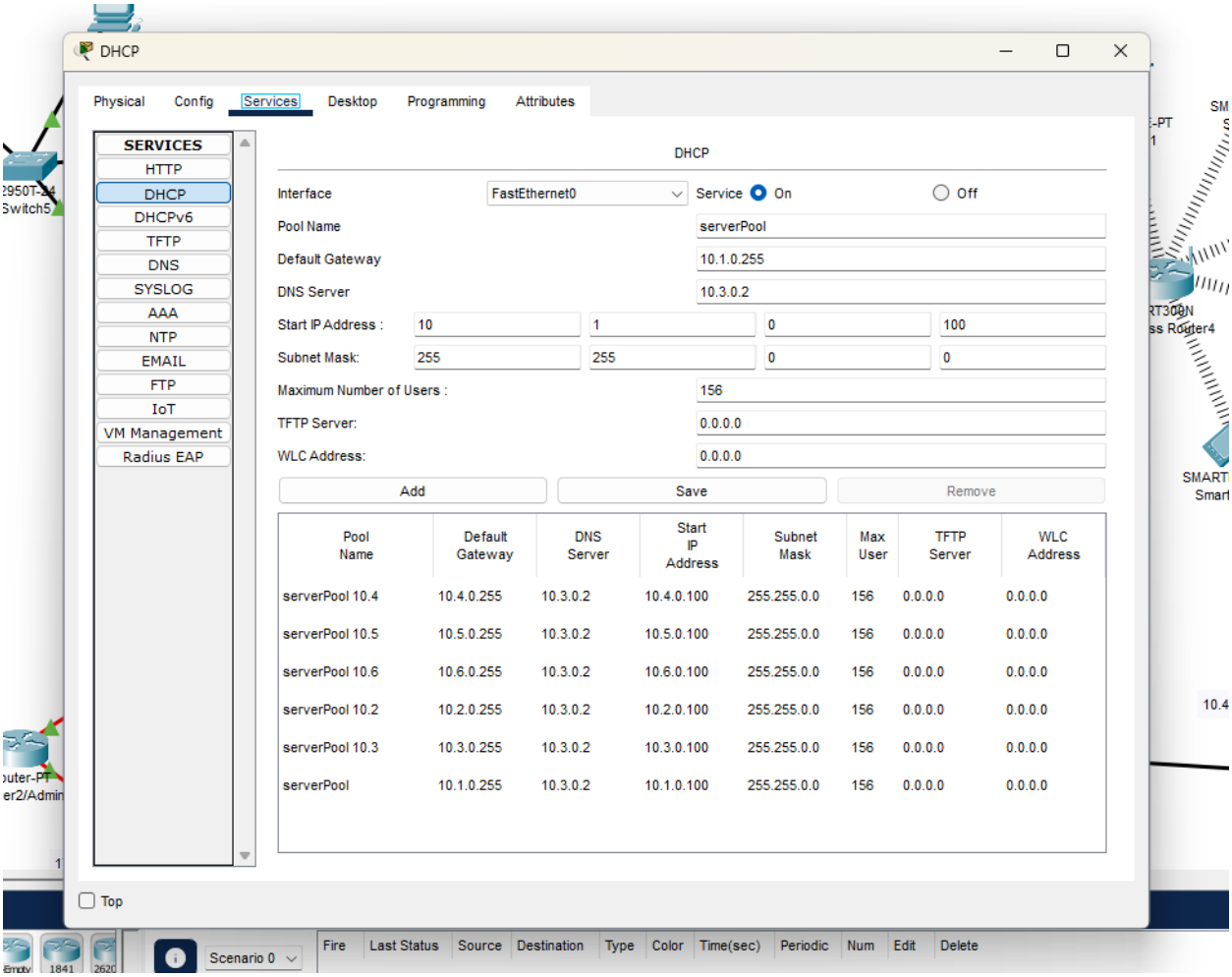

Figure 2: DHCP serverpool

DNS (10.3.0.2):

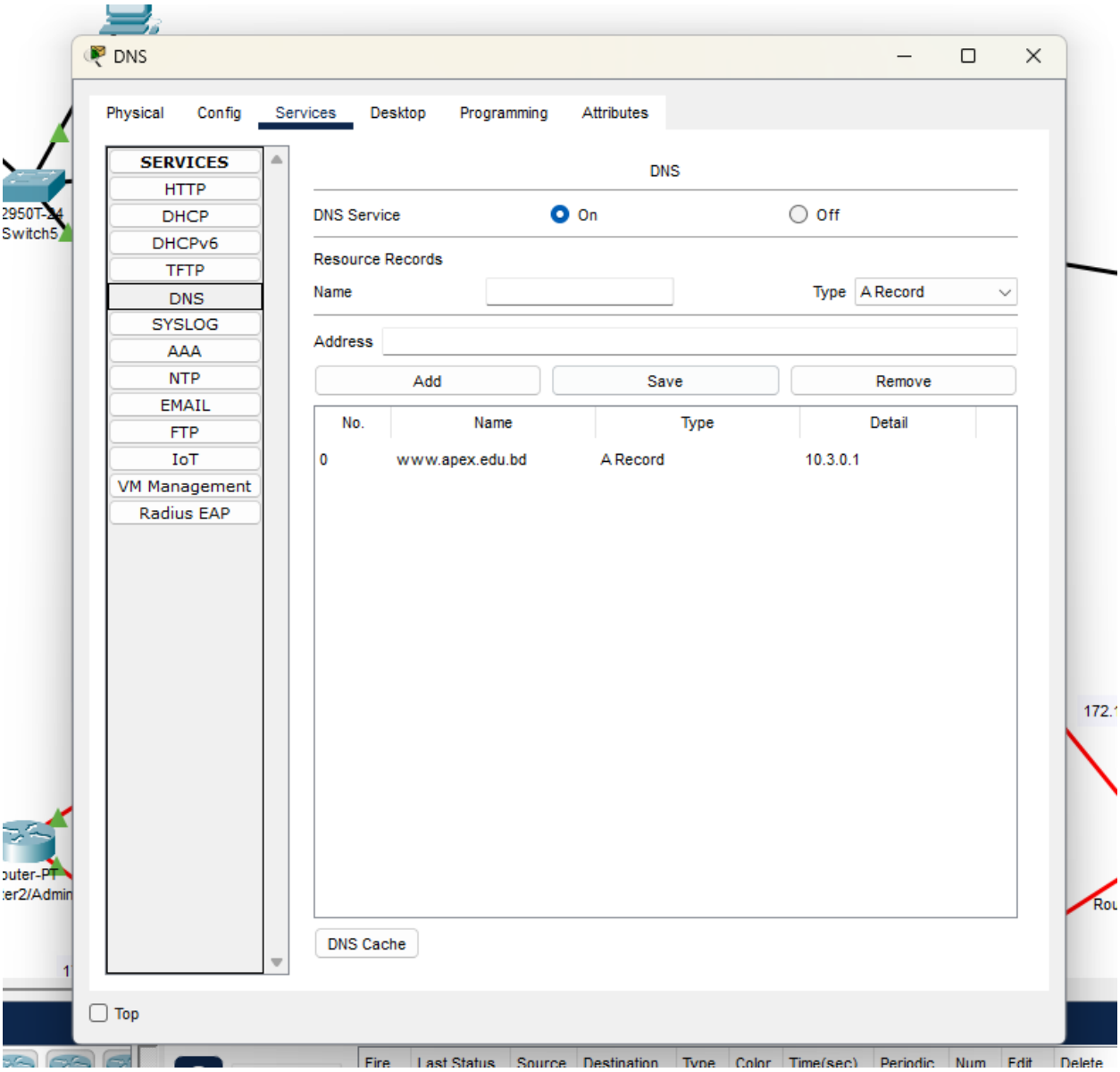

Figure 3: DNS

Web Server (10.3.0.2):

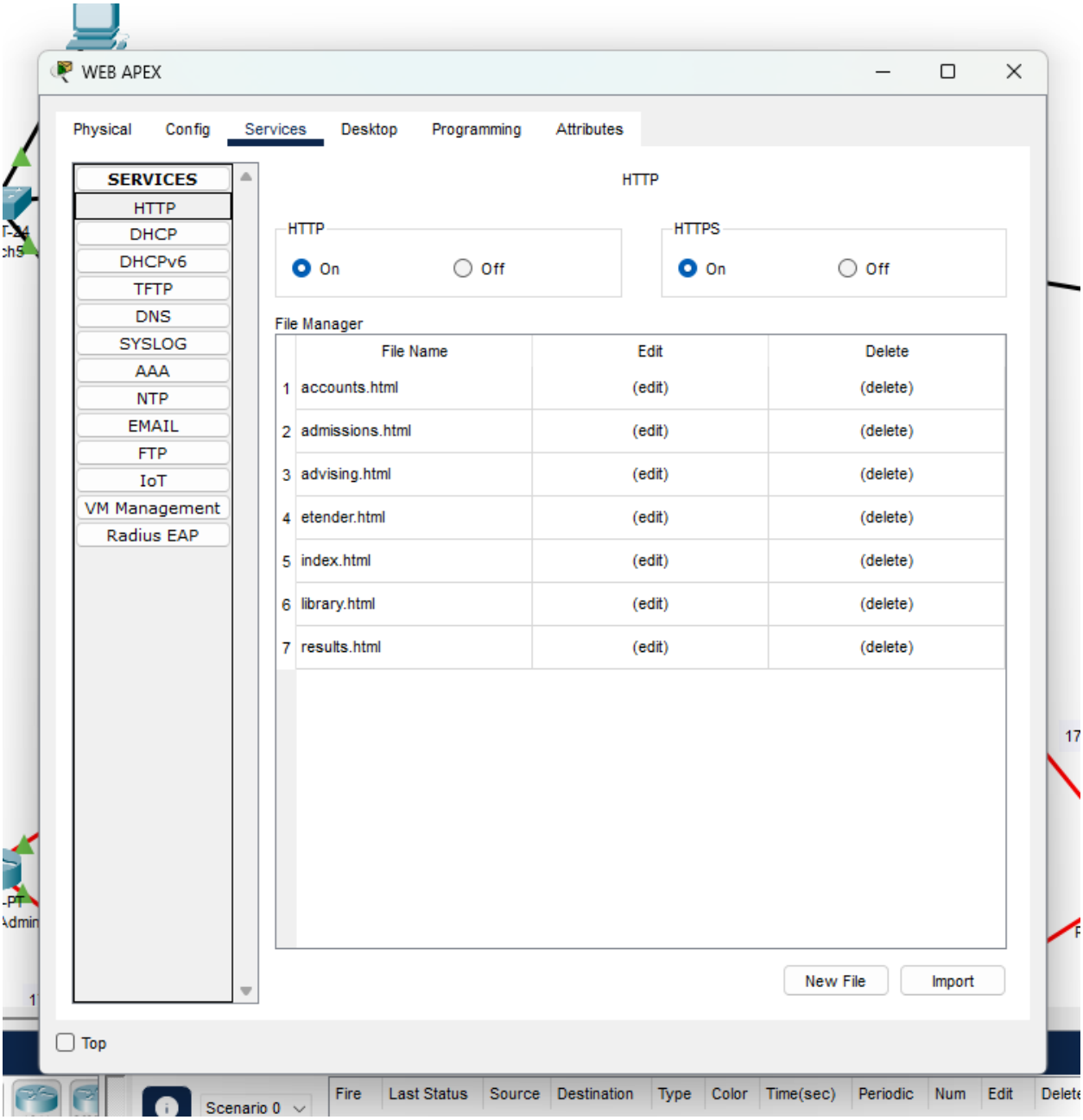

Figure 4: WEB Server

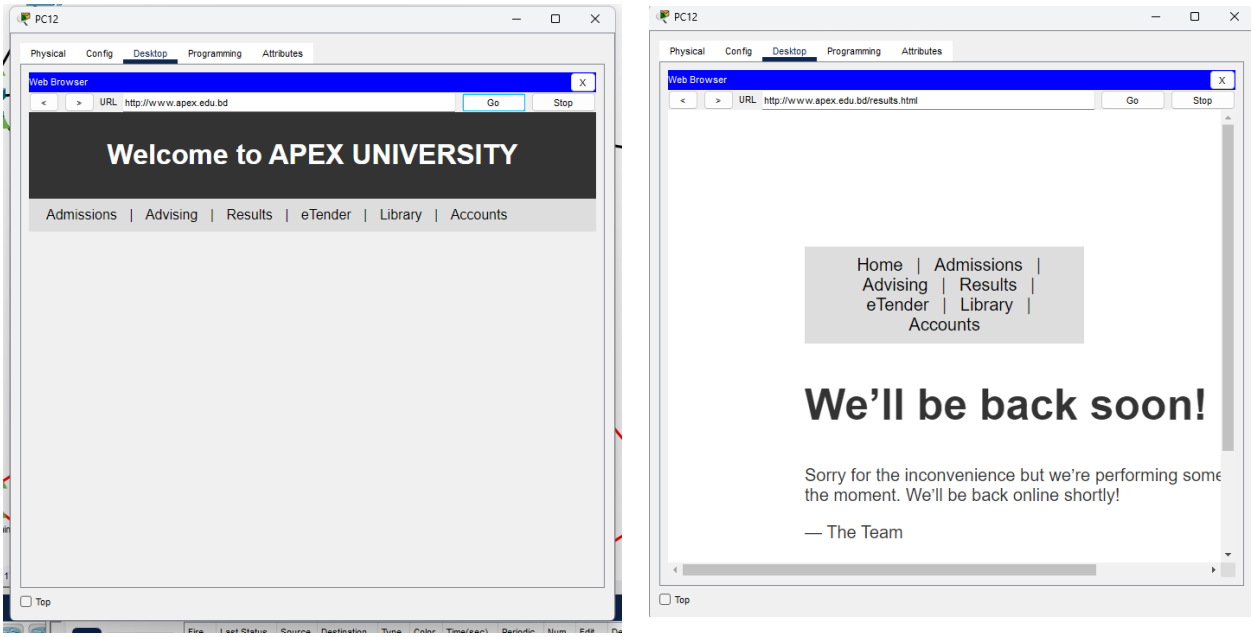

Figure 5: Website

Conclusion:

I have tried to make the network in accordance to the project guidelines. In this project, a complete model of a complex network is designed using end devices, routers, switches, and wireless routers. We have also created a DHCP server to automatically serve IP addresses to the end devices. There is a web server that serves APEX UNIVERSITY's webpage. And lastly a DNS server is installed to translate http://www.apex.edu.bd to IP address.