East West University

Project Report

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

Course Code: CSE405
Course Name: Computer Networks
Section: 03

Submitted to:

Dr. Anisur Rahman

Associate Professor

Department of Computer Science and Engineering

East West University

Submitted by:

Jubayer Alam Likhon

ID: 2021-2-60-071

Submission Date: 26-12-2023

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

Preface:
Apex University, 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 a complex networked systems to support several of its business process like admissions, advising, results, eTender, library management, accounts and so on. The task is to create a complete model of a complex network by discovering the interconnectivity of the systems and subnetworks, which will reflect the University of Scholars structure and facilities, features within the network.

Tools:

Components Used:

1. PT- Router
2. Wireless Routers
3. Straight Through Cable
4. Serial DCE cables
5. PT- Switches
6. PC as end devices
7. DNS Server
8. Web Server
9. DHCP server
10. Laptop, Smart Phone

Software Used:
- Cisco Packet Tracer

Network Summary:
- University's full network has covered with 6 campuses with 6 routers.
- All the IP address set by one DHCP server automatically & DNS server is use to locate Web server and HTML code is use to modify the web page.
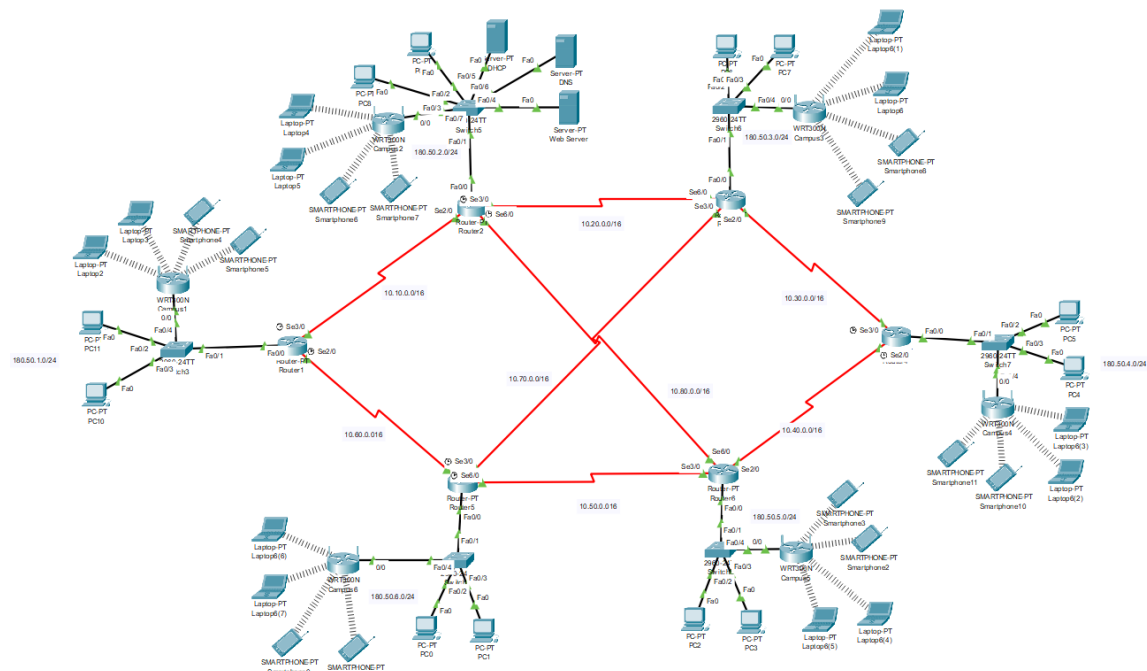
Physical Diagram

Figure 1: Network Model

Design Issues

Actually, there is no Design issues all the connection, servers, End devices are working perfectly.

Number of Hosts

Total number of hosts is: 36

Number of Networks

Total number of networks is: 20

Limitations

The network is very complex. Maintaining this network can create problems.

Lines of Code

Router Configuration Code:

Router 1 (Campus 1)
interface fa0/0
ip address 180.50.1.254 255.255.255.0
no shut
do wr
exit

interface se3/0
ip address 10.10.0.1 255.255.0.0
clock rate 64000
no shut
do wr
exit

interface se2/0
ip address 10.60.0.1 255.255.0.0
clock rate 64000
no shut
do wr
exit

Router 2 (Campus 2)
interface fa0/0
ip address 180.50.2.254 255.255.255.0
no shut
do wr
exit

interface se2/0
ip address 10.10.0.2 255.255.0.0
no shut
do wr
exit

interface se3/0
ip address 10.20.0.1 255.255.0.0
clock rate 64000
no shut
do wr
exit

interface se6/0
ip address 10.80.0.1 255.255.0.0
clock rate 64000
no shut
do wr
exit

Router 3 (Campus 3)
interface fa0/0

```
ip address 180.50.3.254 255.255.255.0
no shut
do wr
exit

interface se6/0
ip address 10.20.0.2 255.255.0.0
no shut
do wr
exit

interface se3/0
ip address 10.70.0.1 255.255.0.0
no shut
do wr
exit

interface se2/0
ip address 10.30.0.1 255.255.0.0
no shut
do wr
exit
```

Router 4 (Campus 4)
```
interface fa0/0
ip address 180.50.4.254 255.255.255.0
no shut
do wr
exit

interface se3/0
ip address 10.30.0.2 255.255.0.0
clock rate 64000
no shut
do wr
exit

interface se2/0
ip address 10.40.0.1 255.255.0.0
clock rate 64000
no shut
do wr
exit
```

Router 5 (Campus 5)
interface fa0/0
ip address 180.50.5.254 255.255.255.0
no shut
do wr
exit

interface se2/0
ip address 10.40.0.2 255.255.0.0
no shut
do wr
exit

interface se6/0
ip address 10.80.0.2 255.255.0.0
no shut
do wr
exit

interface se3/0
ip address 10.50.0.1 255.255.0.0
no shut
do wr
exit

Router 6 (Campus 6)
interface fa0/0
ip address 180.50.6.254 255.255.255.0
no shut
do wr
exit

interface se2/0
ip address 10.60.0.2 255.255.0.0
no shut
do wr
exit

interface se3/0
ip address 10.70.0.2 255.255.0.0
clock rate 64000
no shut
do wr
exit

```
interface se6/0
ip address 10.50.0.2 255.255.0.0
clock rate 64000
no shut
do wr
exit
```

Routing Table Code:

Router 1 (OSPF) (Campus 1)
```
router ospf 1
network 180.50.1.0 0.0.0.255 area 1
network 10.10.0.0 0.0.255.255 area 1
network 10.60.0.0 0.0.255.255 area 1
exit
```
Router 2 (OSPF) (Campus 2)
```
router ospf 2
network 180.50.2.0 0.0.0.255 area 1
network 10.10.0.0 0.0.255.255 area 1
network 10.20.0.0 0.0.255.255 area 1
network 10.80.0.0 0.0.255.255 area 1
exit
```
Router 3 (OSPF) (Campus 3)
```
router ospf 3
network 180.50.3.0 0.0.0.255 area 1
network 10.70.0.0 0.0.255.255 area 1
network 10.20.0.0 0.0.255.255 area 1
network 10.30.0.0 0.0.255.255 area 1
exit
```
Router 4 (OSPF) (Campus 4)
```
router ospf 4
network 180.50.4.0 0.0.0.255 area 1
network 10.30.0.0 0.0.255.255 area 1
network 10.40.0.0 0.0.255.255 area 1
exit
```
Router 5 (OSPF) (Campus 5)
```
router ospf 5
network 180.50.5.0 0.0.0.255 area 1
network 10.40.0.0 0.0.255.255 area 1
network 10.80.0.0 0.0.255.255 area 1
network 10.50.0.0 0.0.255.255 area 1
exit
```

Router 6 (OSPF) (Campus 6)
router ospf 6
network 180.50.6.0 0.0.0.255 area 1
network 10.60.0.0 0.0.255.255 area 1
network 10.70.0.0 0.0.255.255 area 1
network 10.50.0.0 0.0.255.255 area 1
exit

Conclusion:

Despite the difficulties, I carried out my plan in accordance with the project description and tried my hardest to complete this project flawlessly. A complete model of a complex network is designed in this project. This network was built with end devices, routers, switches, and wireless routers. Communication between all devices across the network was flawless. A web server was set up to display the web page for the Apex University. The website is also altered by using HTML code. A DHCP server was installed to provide IP addresses to all six campuses when needed, and a DNS server was also installed for the website.