

CSE 405: Computer Networks
Section: 02, Spring-2021

A Project Report
on
**Design a full-fledged network for an organization
with multiple subnets.**

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Introduction:

A network topology is the physical layout of computers, cables and other components on a network. Now-a-days, network design is very crucial. There are a number of different topologies and a network can be built using multiple topologies. Such as mesh topology, bus topology and so on. Now-a-days wireless communication is very popular a. We use this technology in our Pc, Laptop, Mobile phone and many other devices. In this mini project a LAN network is design using Cisco Packet Tracer to create a complete model of the complex network by discovering the interconnectivity of the systems and sub networks.

Network Topology:

There are a number of different topologies and a network is made by using multiple topologies. There are many types of network topology. They are Bus topology, Mesh topology, Star topology, Hybrid topology, Ring topology and so on. Among of the topologies Mesh topology is one of the popular topology. We have used Mesh topology in this project.

IPv4 Structure:

An IPv4 address is a 32-bit address. For example: 192.168.10.1. IP address is composed of two types of addresses: network address, host address and the IP address component that determines which bits refer to the network and which bits refer to the host is called subnet mask.

HTTP Server:

Mainly HTTP server is used for hosting the webpages. It hosts the webpage. Here we have imported our university webpages to the HTTP server.

DNS Server:

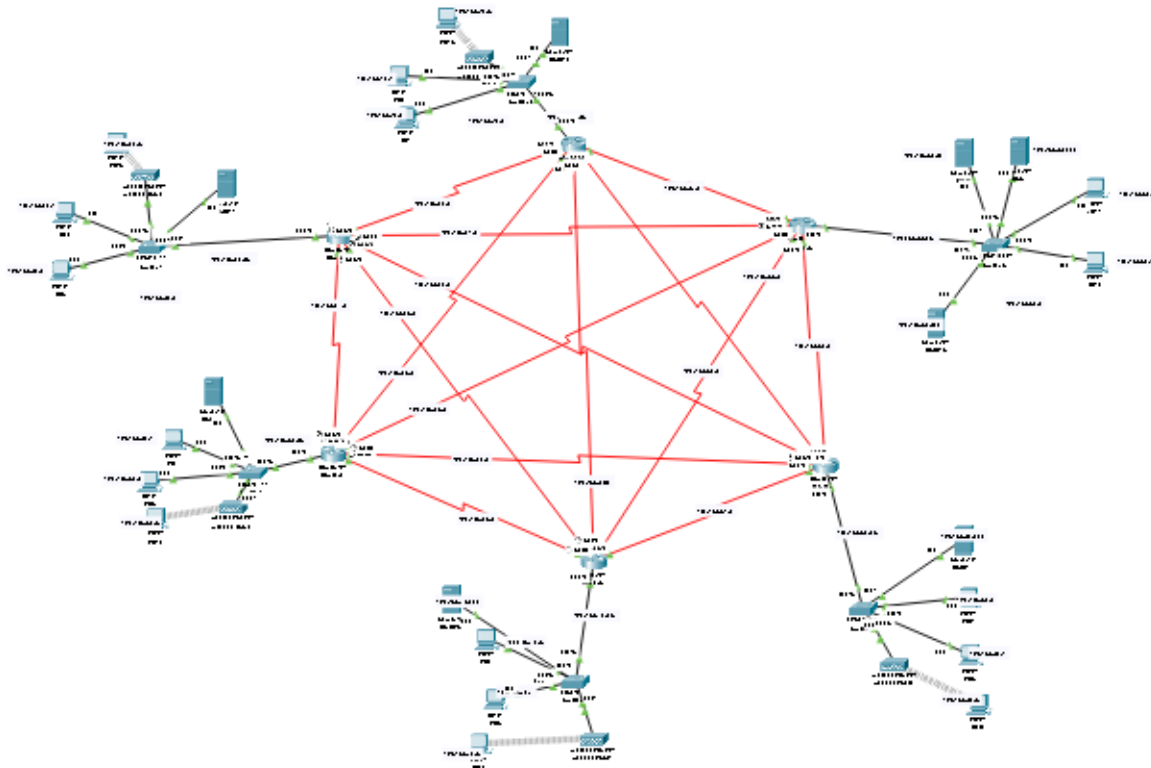
DNS server gives the IP address to the client. The main work this server is to give the IP address against URL. Like www.apollointernational.edu for this URL we use an IP address which is a HTTP server. Web page Ip: 192.168.60.50. It is mainly used to convert the domain name to equivalent IP address.

DHCP Server:

If there are enormous computers, then the server is very effective for pc connection. Many this DHCP sever is used by organizations, companies those who need a lot of pc connections. This server gives IP address automatically to the computers or devices. There is no need to give IP addresses manually. It is very time consuming for build a design.

Design and implementation:

Here, we can see a diagram University Area Network. The network builds of switches, routers and many end devices. The network that we designed to maintain the several criteria looks like this. Here, we have used six routers which are interconnected to each other. Routers are connected to each subnet. We have also used wireless connection here. We used it to connect the end device. Here all networks IP address, Gateway IP address, DHCP server address, Web Server address, DNS Server address and all end devices address are given.



Network Connection:

Here, router 4's network connection because all routers code are quite same. Here, code:

```
enable
config t
interface fa0/0
ip address 192.168.50.254 255.255.255.0
no shut
do wr
exit
```

```
interface se2/0
ipaddress 192.168.81.2 255.255.255.0
no shut
do wr
exit
```

```
interface se7/0
ipaddress 192.168.77.2 255.255.255.0
no shut
do wr
exit
```

```
interface se6/0
ipaddress 192.168.72.2 255.255.255.0
no shut
do wr
exit
```

```
interface se8/0
ipaddress 192.168.82.1 255.255.255.0
clock rate 64000
no shut
do wr
exit
```

```
interface se3/0
ipaddress 192.168.83.1 255.255.255.0
clock rate 64000
no shut
do wr
exit
```

Routing Table:

Here router 4's routing table because all routing table codes are quite same. Here, code:

```
enable
config t
router ospf 5
network 192.168.50.0 0.0.0.255 are 1
network 192.168.81.0 0.0.0.255 are 1
network 192.168.77.0 0.0.0.255 are 1
network 192.168.72.0 0.0.0.255 are 1
network 192.168.82.0 0.0.0.255 are 1
network 192.168.83.0 0.0.0.255 are 1
```

exit

Ping Test:

We check the Network connectivity and communication with the help of ping command. If anyone wishes to check connectivity then he can do it following the domain name or the IP address using ping command.

```
C:\>ping 192.168.60.1

Pinging 192.168.60.1 with 32 bytes of data:







Request timed out.
Reply from 192.168.60.1: bytes=32 time=56ms TTL=126
Reply from 192.168.60.1: bytes=32 time=83ms TTL=126
Reply from 192.168.60.1: bytes=32 time=47ms TTL=126

Ping statistics for 192.168.60.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 47ms, Maximum = 83ms, Average = 62ms

C:\>
```

PDU:

We can also add sample PDU to understand whether a networks pc is communicating with other networks pc:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Ec
	Successful	PC12	PC2	ICMP		0.000	N	0	(€
	Successful	PC12	PC3	ICMP		0.000	N	1	(€
	Successful	PC12	PC11	ICMP		0.000	N	2	(€

Limitation:

We can see, there are many limitations in this network. This network is very small so we can not use it. In real life network is much more complex from this network.

Future Scope:

By doing this project we get a feasible method to connect the multiple computers in a respective University area. Here, we can see a network which has developed with mesh connection. This is mainly a reflection of real-life problem. This topology transmits data very fast. We can design any kind of network through this project. The configuration and the specifications are for the initial prototype and can further be developed and additional functionality can be added to increase support and coverage. We are now the generation of wireless communication era. In future we can give all the network connections wireless.