

Mini Project- 2

(2020-21)

Campus Network Design Using Cisco Packet Tracer

SYNOPSIS



Institute of Engineering & Technology

Team Members

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About the Project:

The aim of this project is to design the topology of the university network using the software Cisco Packet Tracer with the implementation of wireless networking systems. This university network consists of the following devices:

- 1) Router (1941)
- 2) Switches (2960-24TT)
- 3) Email server
- 4) DNS server
- 5) WEB server (HTTP)
- 6) Wireless Device (Access Point)
- 7) PCs
- 8) Laptops
- 9) Smart phones

The design includes the following parts of the University:

- Hostel Blocks: Girls Block and Boys Block
- Academic Blocks: AB1 and AB2
- Dome Building and Library

Motivation:

Campus networking via wireless connection becomes an important part of campus life and provides the main way for teachers and students to access educational resources, which gives an important platform to exchange information.

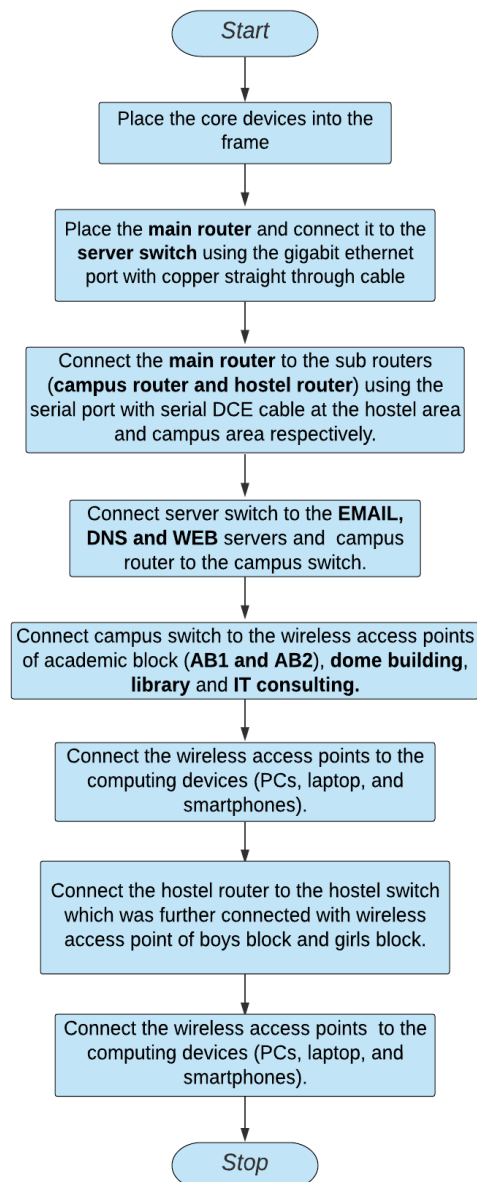
So, Campus must be “Digital Campus” i.e. well connected, fast, secure, reliable in terms of Networking.

Implementation & Flow Diagram :

- To design the wireless network of the university we initially started by placing the core devices into the frame.
- Firstly, we placed the **main router** at the center of the university outline, which was further connected to the **server switch** using the gigabit Ethernet port with copper straight-through cable and sub routers (**campus router and hostel router**) using the serial port with serial DCE cable at the hostel area and campus area respectively.
- The server switch was further connected to the **EMAIL, DNS, and WEB** servers respectively.
- Campus router was connected to the campus switch which was further connected with wireless access points of the academic block (**AB1 and AB2**), **dome building** and **library**.

- The wireless access points were then connected to computing devices (PCs, laptops, and smart phones).
- Similarly, the hostel router was connected to the hostel switch which was further connected with the wireless access point of boys block and girls block.
- The wireless access points were then connected to the computing devices (PCs, laptops, and Smart phones), every area has a dedicated access point which can only be connected with the help of a password.
- All these connections are made through Ethernet ports (gigabit Ethernet and fast Ethernet) using copper straight-through cables.

Flow Diagram:



Main Objective:

The proposed wireless network is implemented for a university campus. We will make a virtual visualization of the network using the Cisco Packet tracer which provides a huge platform for users to test their projects using simulation tools.

Simulation Environment:

The simulations of our network topology can be easily achieved using Cisco packet tracer. Using a Simulation mode, you can see packets flowing from one node to another and can also click on a packet to see detailed information about the OSI layers of the networking.

Packet Tracer offers a huge platform to combine realistic simulation and visualize them simultaneously. Cisco Packet Tracer makes learning and teaching significantly easier by supporting multi-user collaboration and by providing a realistic simulation environment for experimenting with projects.

Requirements:

a) Hardware:

- Processor: Minimum 2 GHz or more
- Hard Drive: Minimum 16 GB
- RAM: Minimum 8 GB

b) Software:

- OS – Window 7, 8 & 10
- Cisco Packet Tracer
- Adobe Flash Player

Team Contribution:

This Mini Project is divided into two sets:

- **Campus Area Network design** - by Jitendra Singh
- **Hostel Area Network design** - by Vivek Goyal

Conclusion:

In this project, we will design a University Network using Cisco Packet Tracer that uses a networking topology implemented using servers, routers, switches, and end devices in a multiple area networks. We will include a DNS server and a web server

for establishing a smooth communication system between different areas of our network and specifically for the communication between students and teachers.

We will also include an email server to facilitate intra university communication through emails within the domain. We will also use console passwords and SSH protocol to ensure a safe and secure transfer of data.

References:

- [1] https://en.wikipedia.org/wiki/Packet_Tracer
- [2] <https://www.paessler.com/it-explained/server>
- [3] <https://computernetworking747640215.wordpress.com/2018/07/05/secure-shell-ssh-configuration-on-a-switch-and-router-in-packet-tracer/>
- [4] <http://router.over-blog.com/article-how-to-configure-cisco-router-password-106850439.html>
- [5] <https://www.cognoscape.com/benefits-going-wireless/>

Git-Hub Link: https://github.com/vivek-goyal12/Campus_Network_Design