



Katihar Engineering College, Katihar

(Department of Science Technology & Technical Education, Govt. of Bihar)
(Bihar Engineering Campus, Patna Bihar)

7th Sem Project -1

CAMPUS NETWORK SIMULATION USING CISCO PACKET TRACER

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Introduction

- ❖ This College Network mainly comprises of **Department** (CSE,EEE,CIVIL & Mech.) , **Hostel**, **Academic block** (TPO, Exam Cell & Others), **Principal Office**, **Server room**.
- ❖ All the hosts are assigned with static IPs and are assigned in the order in which it where set up. No support for dynamic IP allocations.
- ❖ Each department consists of some wired Pc and printers.



Project Statement

Developing a hierarchical network devices (routers, switches & Pcs) to create a multi-layered network structure creating different departments & users groups within campus.

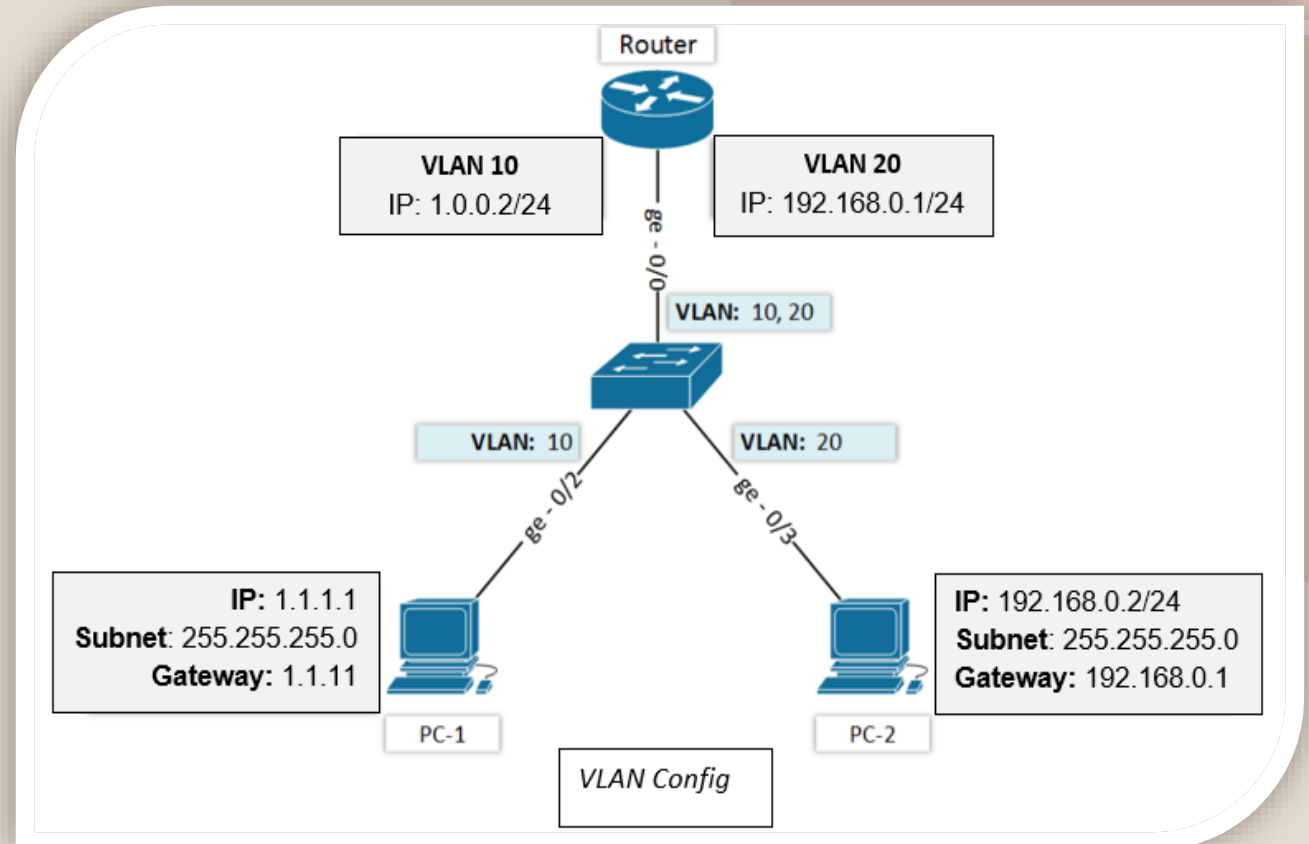
The project give an expected outcome with a functional & secure campus network model replicating real-world network scenario.

Packet Tracer Introduction

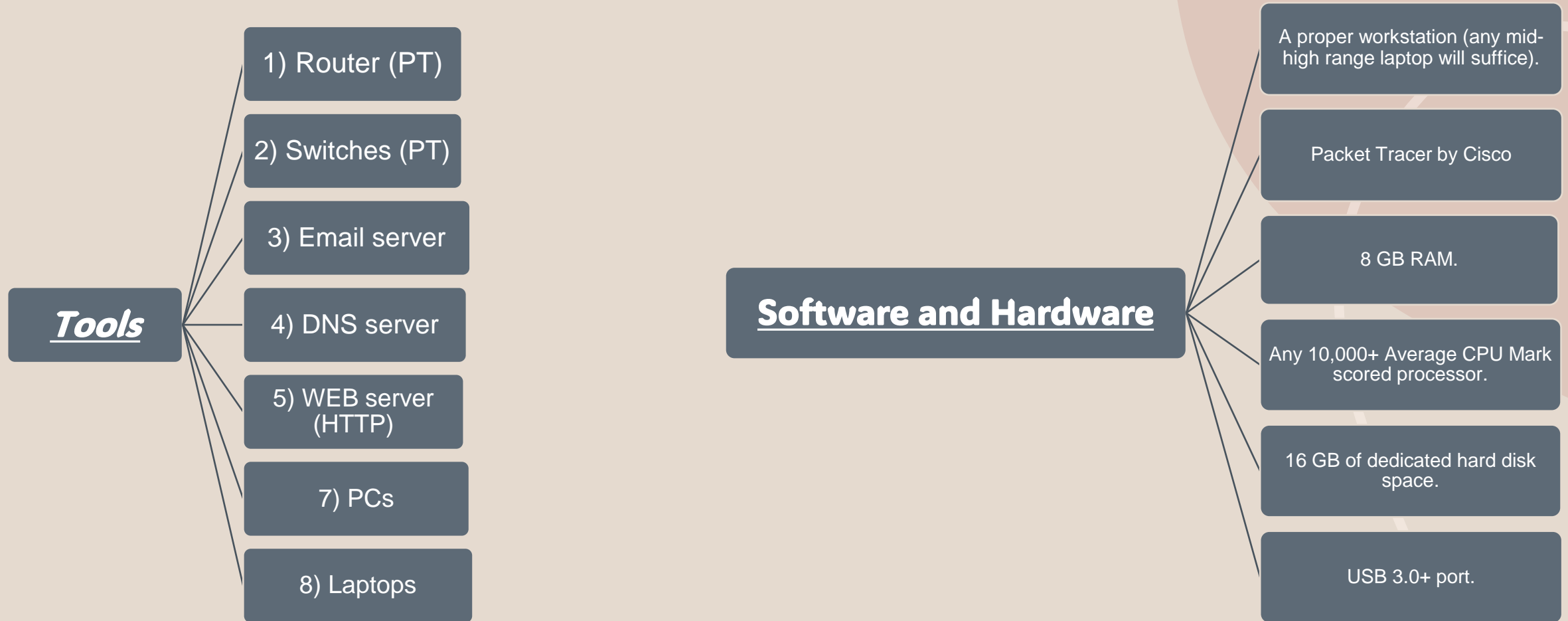
- ❖ Packet Tracer is a network simulation tool & virtual lab environment that allows to practice networking, and Internet of Things.
- ❖ Packet Tracer is an incredibly powerful learning tool with multiple modes that enable us to explore the vast world of networking.
- ❖ In simulation mode, we dive into how a network really works. We create a logical view of our network, configure our devices, and follow how data packets travel across our network.
- ❖ After that, physical mode puts us in the virtual lab to see how our logical view translates into physical devices and cables. We'll practice setting up our own device rack and selecting the right cables and ports.
- ❖ Packet Tracer has a built-in intelligent tutor as well to give us hints along the way, but only if we want them. Once we have the hang of it, it take our abilities even further by creating advanced networks with IoT devices, integrating Python code, or practicing your network automation skills.

Major Design Areas and Functional Areas

- ❖ Network Infrastructure and Design
- ❖ Networking Protocols and Standards
- ❖ Network Management and Optimization

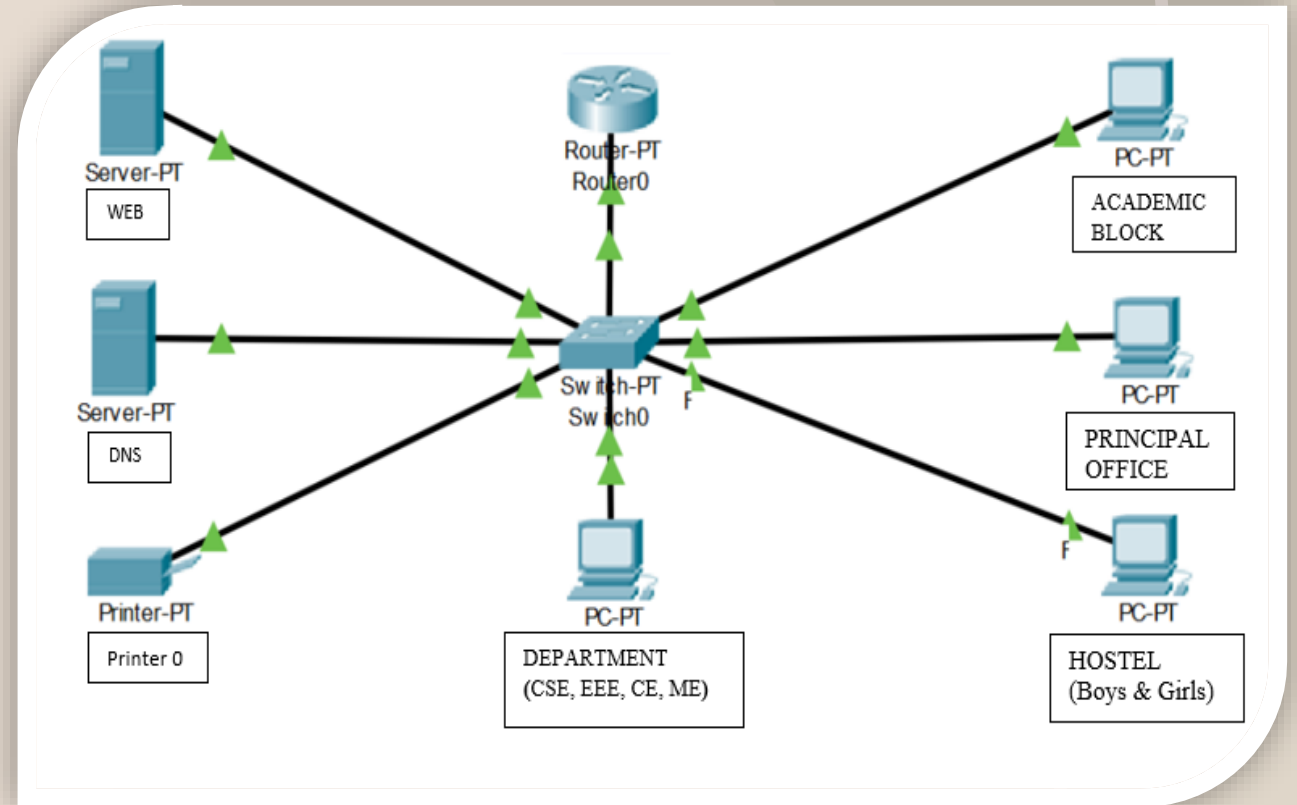


Tools ,Software and Hardware requirements



Our approach

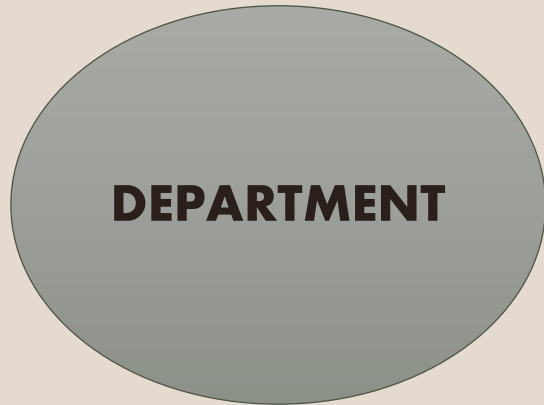
- ❖ The proposed wired network is implemented for our college campus.
- ❖ We have made a virtual visualization of the network using the Cisco Packet tracer which provides a huge platform for users to test their projects using simulation tools.
- ❖ A Wired network in an educational campus makes it easier for teachers and students to access educational resources, by enabling an important platform to exchange information.



Implementation

- To design the wired network of the Campus we initially started by placing the core devices into the frame as mentioned in the layout.
- Firstly, we placed the **main router** at the center of the college 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 **DNS / EMAIL, FTP and WEB** servers respectively.
- Campus router was connected to the campus switch which was further connected with wired access points of the **academic block** (TPO, Exam Cell & Others), **Department** (CSE,EEE,CIVIL & Mech.), **Hostel**(Boy's & Girl's),**Principal Office** and **Server Room**.
- The wired access points were then connected to computing devices (PCs, laptops, and smartphones).
- Similarly, the hostel router was connected to the hostel switch
- The wired access points were then connected to the computing devices (PCs and laptops), 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.

IP Allocation Plan



CSE
(192.168.2.1)

- CS HOD Cabin :- (192.168.2.2)
- CS LAB 1 :- (192.168.2.3)
- CS LAB 2 :- (192.168.2.4)
- CS LAB 3 :- (192.168.2.5)
- CS LAB 4 :- (192.168.2.6)
- Printer 7 :- (192.168.2.7)

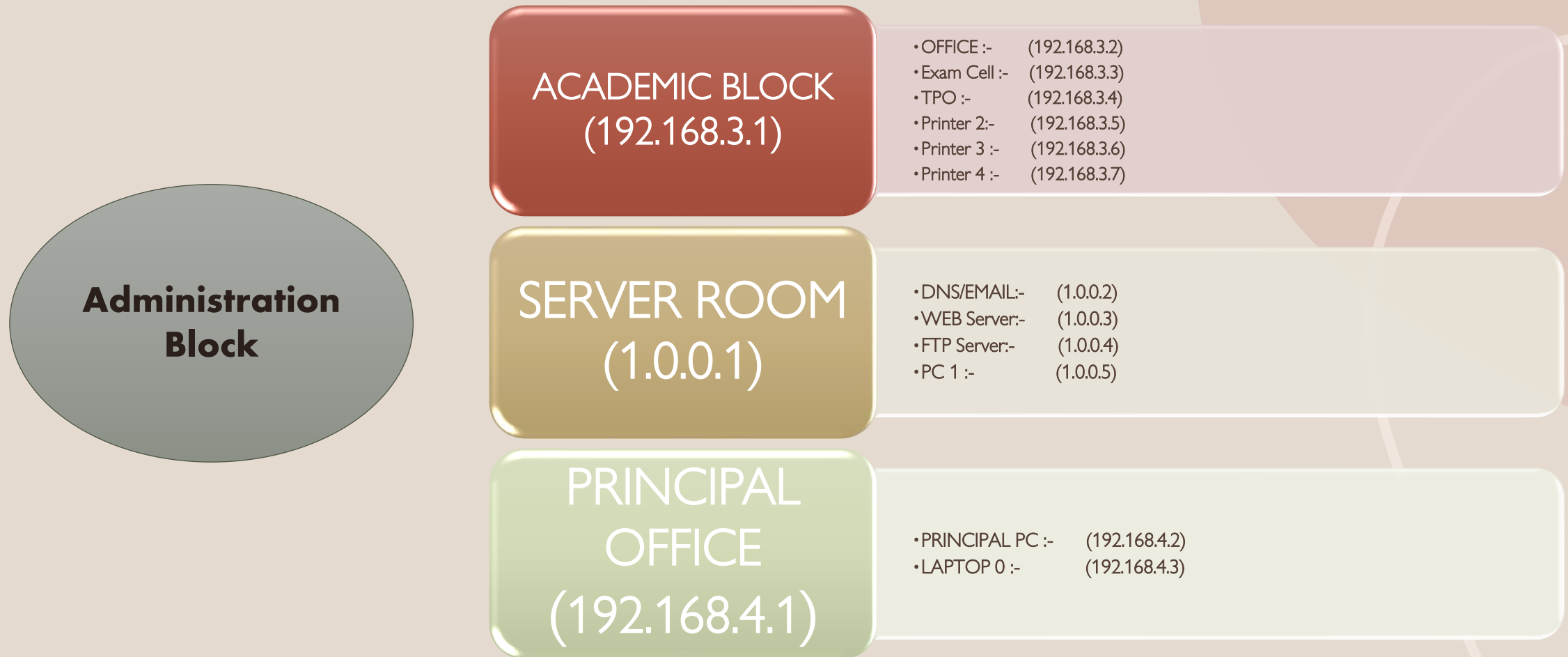
EEE
(128.168.0.1)

- EEE HOD Cabin :- (128.168.0.2)
- PC 3 :- (128.168.0.3)
- PC 4 :- (128.168.0.4)
- PC 5 :- (128.168.0.5)
- Printer 5 :- (128.168.0.6)

CIVIL & ME
(192.168.1.1)

- Civil HOD Cabin :- (192.168.1.2)
- ME HOD Cabin :- (192.168.1.3)
- CIVIL Lab 1 :- (192.168.1.4)
- ME Lab 1 :- (192.168.1.5)
- ME Lab 2 :- (192.168.1.6)
- Printer :- (192.168.1.7)
- Printer :- (192.168.1.8)

IP Allocation Plan



IP Allocation Plan



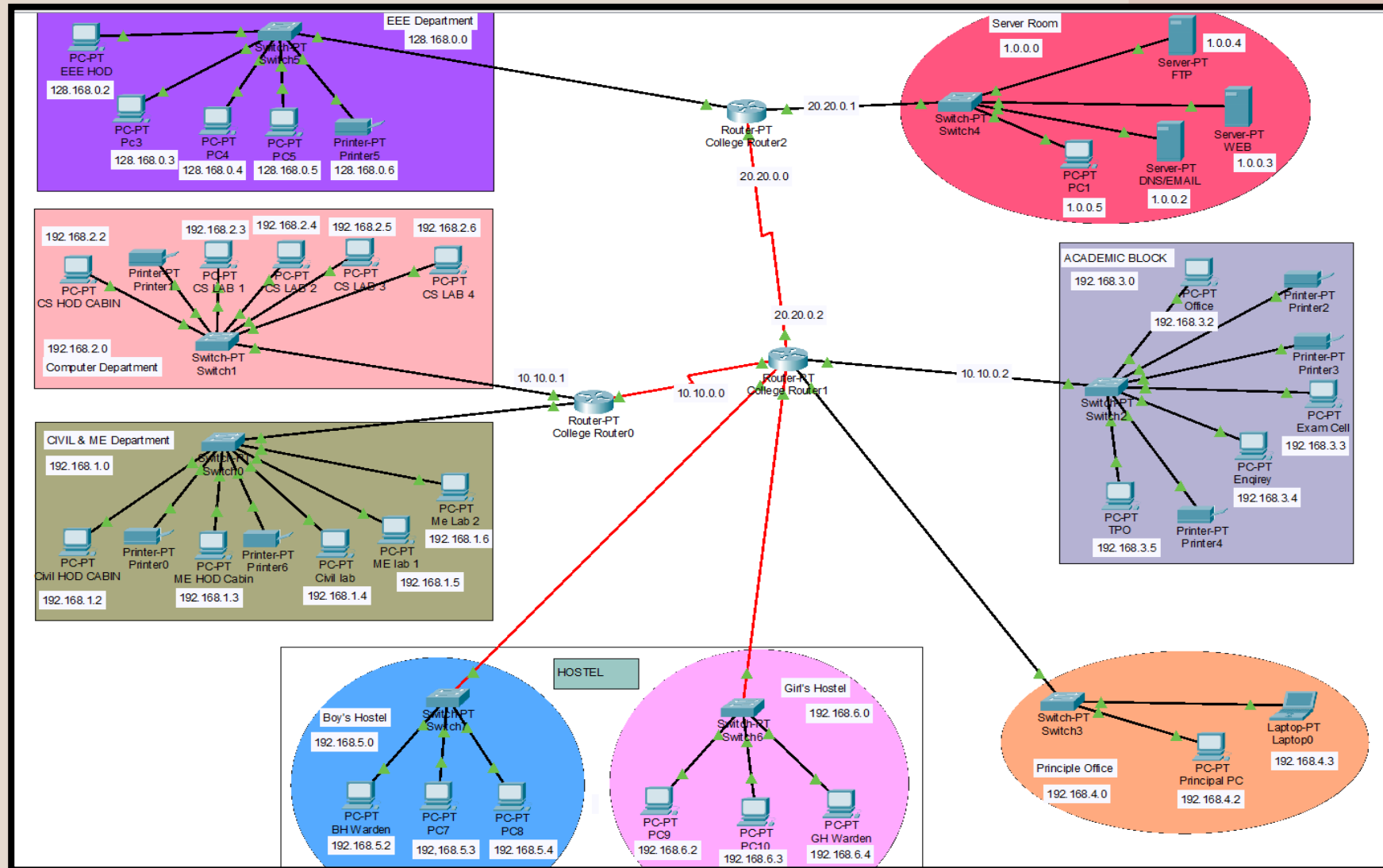
BOY'S HOSTEL
(192.168.5.1)

- Boy's Hostel Warden :- (192.168.5.2)
- PC 7 :- (192.168.5.3)
- PC 8:- (192.168.5.4)

GIRL'S HOSTEL
(192.168.6.1)

- Girl's Hostel Warden :- (192.168.6.2)
- PC 10 :- (192.168.6.3)
- PC 09 :- (192.168.6.4)

Final Discussion



Output

- a. Testing VLAN communications (IP Ping)
- b. Testing Web Hosting
- c. Email Server Hosting
- d. Testing FTP Server
- e. Traceroute

Future Scope

- ❖ The configuration and specifications are for the initial prototype and can further be developed and additional functionality can be added to increase support and coverage of our existing network



conclusion

- ❖ In this project, we designed a Campus Network using Cisco Packet Tracer that uses a networking topology implemented using servers, routers, switches, and end devices in a multiple area networks.
- ❖ We have covered all the necessary features that are required for a network to function properly. We have included 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 have included an email server to facilitate intra Campus communication through emails within the domain. We have used console passwords and ssh protocol to ensure a safe and secure transfer of data.

The background features a light gray base with large, soft-edged organic shapes in muted red and olive green. A thin white line outlines a shape on the right. In the top left, there is a faint, stylized illustration of a leafy branch.

Thank you