

University Networking Project

18CSS202J- Computer Communication Project Report

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University/ CAMPUS Networking Project using Packet Tracer

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BONAFIDE CERTIFICATE

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INTRODUCTION

CISCO PACKET TRACER:

The main purpose of Cisco Packet Tracer is to help students learn the principles of networking with hands-on experience as well as develop Cisco technology specific skills. Since the protocols are implemented in software only method, this tool cannot replace the hardware Routers or Switches. Interestingly, this tool does not only include Cisco products but also many more networking devices.

ROUTER:

The definition of a router is a service or person to transfer messages, or a device for smoothing the bottoms of grooves in wood or metal, or a computer networking device that allows multiple devices to access the Internet simultaneously through a single IP address... An example of a router is a mail carrier.

SWITCH:

A network switch is networking hardware that connects devices on a computer network by using packet switching to receive and forward data to the destination device. A network switch is a multiport network bridge that uses MAC addresses to forward data at the data link layer of the OSI model.

ABSTRACT

Computer networks have a significant impact on the working of an organization. Universities depend on the proper functioning and analysis of their networks for education, administration, communication, e-library, automation, etc. An efficient network is essential to facilitate the systematic and cost-efficient transfer of information in an organization in the form of messages, files, and resources. The project provides insights into various concepts such as topology design, IP address configuration, and how to send information in the form of packets to the wireless networks of different areas of a University.

In this project, we connect multiple LAN's of various departments such as labs, libraries, classrooms, hostels and administration to a common server which makes passing of messages and packets throughout the whole network of the university easier.

The project resembles the various LAN's, of various building or departments which help the college run in an organized manner by connecting them into a single network where transfer of files happen in an easier manner.

The main importance of this project is that the various devices across departments or which are at a longer distance from each other are connected to a single network so that the transfer of files or connecting with each other becomes much easier and safer than connecting through wireless network or relying on third party connections can make the communication less safer and slower than the anticipated time.

Our project, University/campus Networking Project using Packet Tracer helps a university campus by connecting various devices through a single network and increasing the speed of communication and securing the details of the files shared.

In this project we are connecting different buildings such as library, labs, classrooms, administration, auditorium and hostel. We are considering connection of all these buildings through switches and routers.

OBJECTIVE OF PROJECT

In this mini-project, we defined a simulation of campus networks based on wired networking. The network is divided into two sets: one for the University Building and the other for the Hostel Campus.

The major aim of this project is to show the wired connectivity that is used in universities to make the network efficient. Reliable and fast connectivity is the major concentration of this project.

In order to provide equal functionality to all the users (college staff and students), we have added DNS, Email, and HTTP servers for the maximum utilization of resources. Hence the campus network provides different services such as connecting the user to the internet, data sharing among users (students, teachers, and different university members), accessing different web services for different functionalities, so it needs wired networking for smooth processing.

SOFTWARE AND HARDWARE REQUIRMENTS:

- A proper workstation (any mid-high range laptop will suffice).
- Packet Tracer by Cisco
- 8 GB RAM.
- Any 10,000+ Average CPU Mark scored processor.
- 16GB of dedicated hard disk space.
- USB3.0+ port.

INTRODUCTION

BREIF KNOWLEDGE ABOUT OUR APPROACH:

The proposed wired network is implemented for a university 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.



NETWORK REQUIREMENTS:

SRMIST KTR outline is considered for this wired university network. The network is divided into 3 areas:

- a. University Building – It is further divided into various subareas labs, library and classrooms.
- b. Leisure Building - It is further divided into various subareas like hostel, administration and auditorium.
- c. Admin Building- It is further divided into admin and research department.

IMPLEMENTATION AND FLOW DIAGRAM:

- 1.To design the wired network of the university building we initially started by placing the core devices into the frame as mentioned in the layout.
2. Firstly, we placed the **main router** at the centre of the university outline, which was further connected to the **server switch** using 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.

3. The server switch was further connected to the **EMAIL, DNS, and WEB** servers respectively.

4. Campus router was connected to the campus switch which was further connected with wireless access points of the academic block and other blocks.

5. The wired access points were then connected to computing devices (PCs). Similarly, the hostel router was connected to the hostel and gym switches which were further connected with the wired access point of hostel block.

6. All these connections are made through Ethernet ports (gigabit Ethernet and fast Ethernet) using copper straight-through cables.

COMPONENTS:

Devices	Required Nos
PC's	23
Switches	11
Routers	3
Copper cross over	34
Serial DCE	3

Procedure:

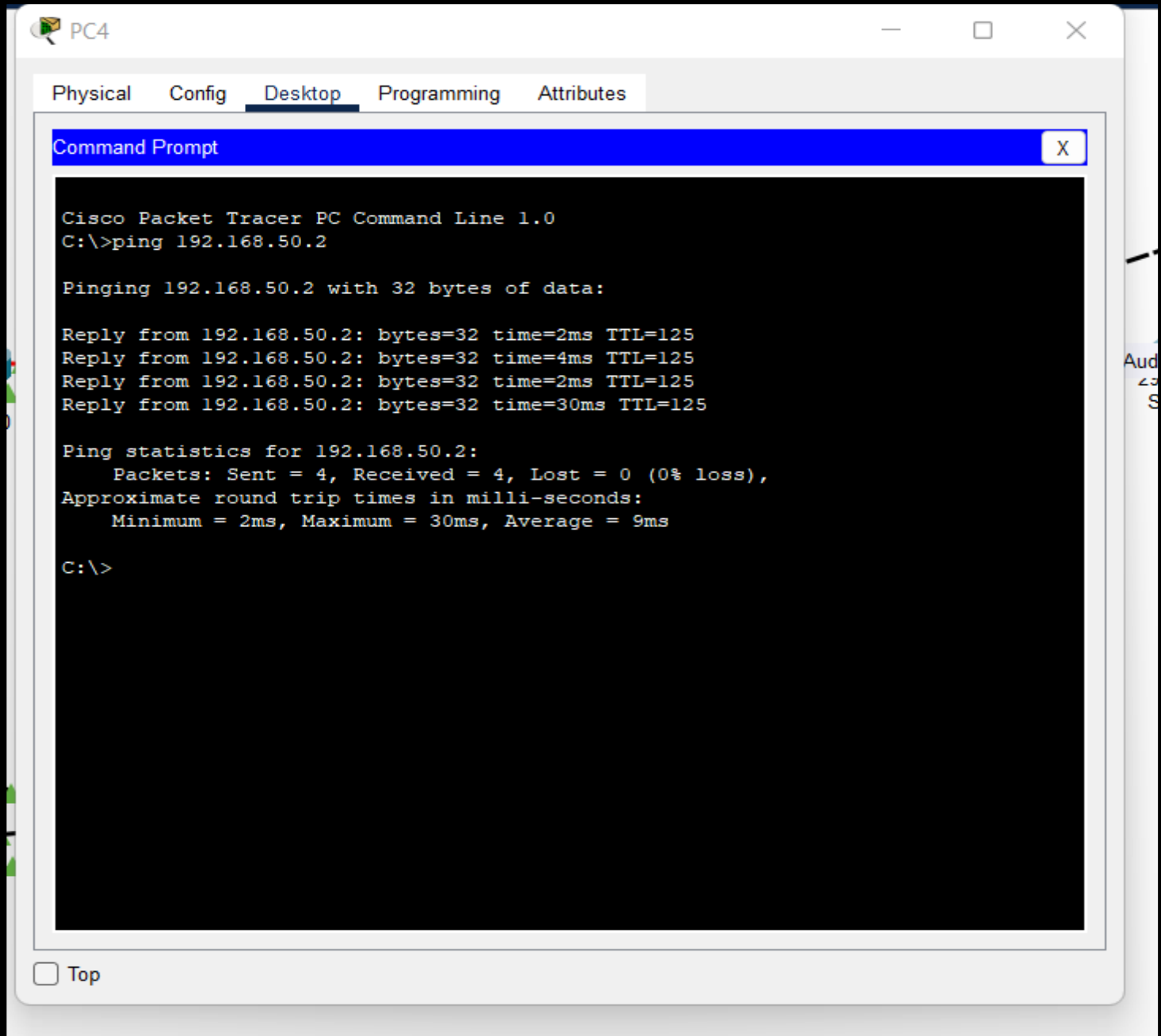
- ❖ Drag all the PC's on the workspace area and connect to switches as per the project diagram below.
- ❖ Connect all the PC's to switches.
- ❖ Then we have networks such as lab, library, classrooms, administration, hostel, admin and research.
- ❖ Connect all the switches of each building to the designated routers and connect each of the routers to each other.
- ❖ Designate IP addresses to each of the computers as well as the routers.
- ❖ Designate RIP (Routing Information Protocol) to each of the router and configure them in RIP section.

List of networks

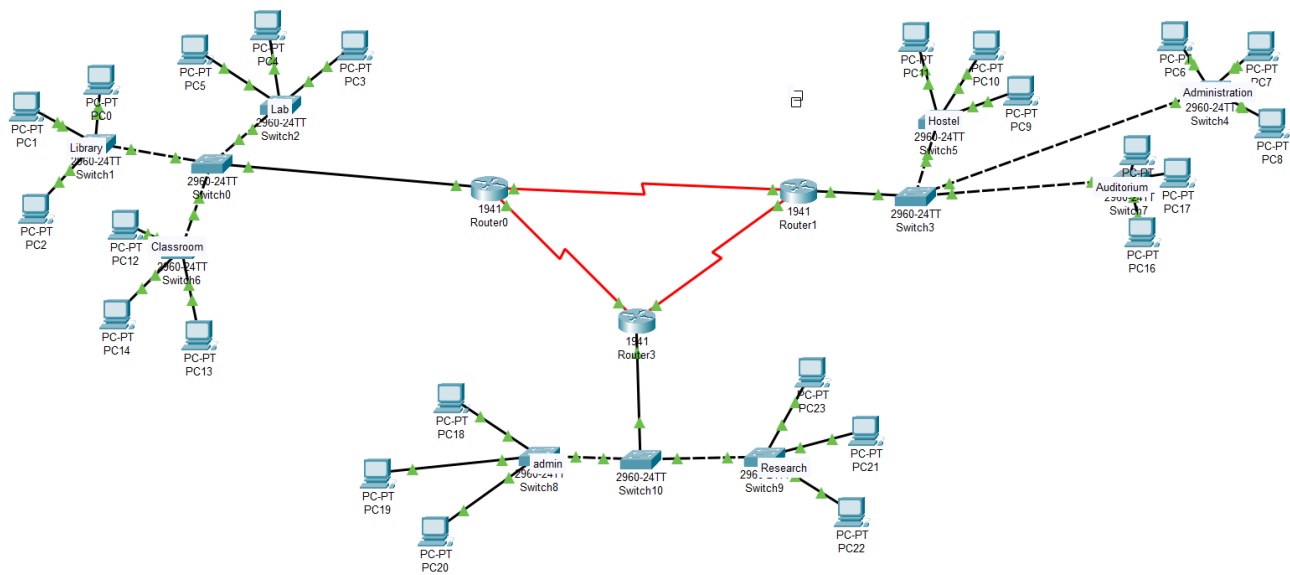
- ❖ Lab
- ❖ Library
- ❖ Classroom
- ❖ Administration
- ❖ Auditorium
- ❖ Hostel
- ❖ Admin
- ❖ Research

Packet Tracer Image

PING COMMAND



CIRCUIT DIAGRAM



CONCLUSION

We have successfully implemented our project in Cisco packet tracer and achieved our desired outputs.

By our project we created a connection where various buildings/departments of a university are connected through a single network.

The major advantages of this project are:

- ❖ Faster communication among the PC's of the network
- ❖ More secure communication among the PC's
- ❖ Accessibility of data from other system data is easier

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