Practical-1

Aim: Perform a practical to install Cisco packet tracer and study all its controls and components.

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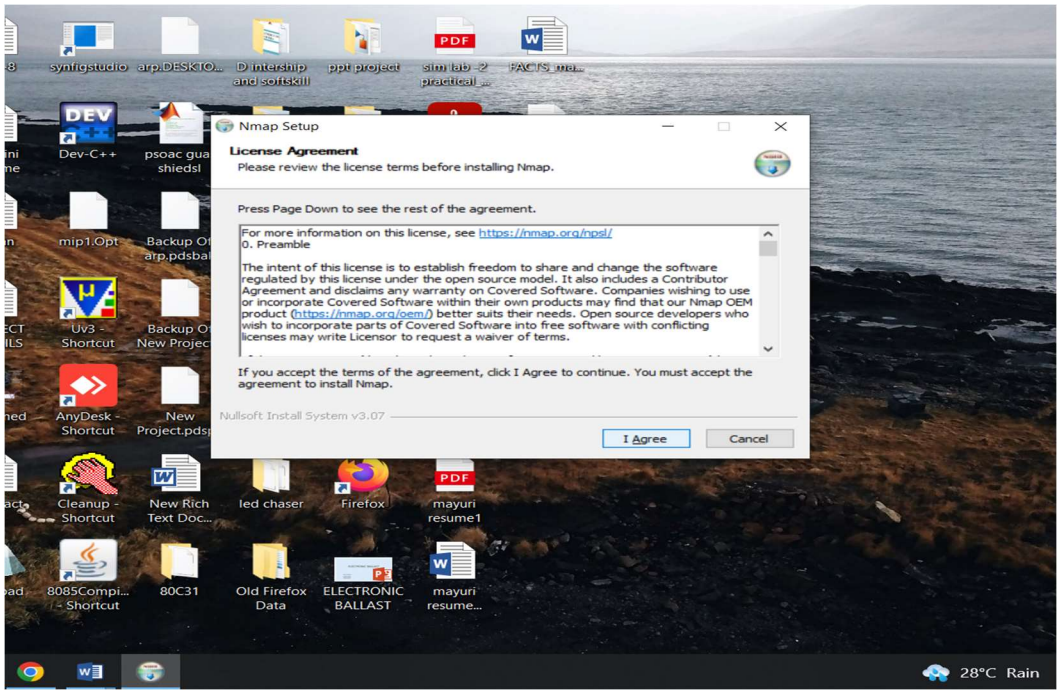
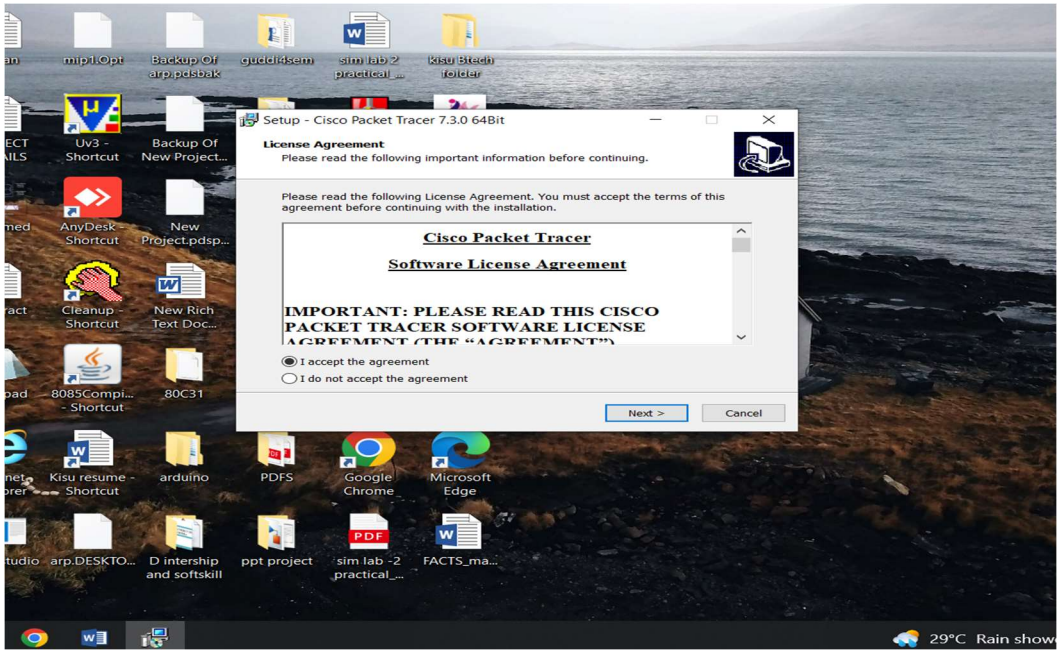
➢ Installation Steps:

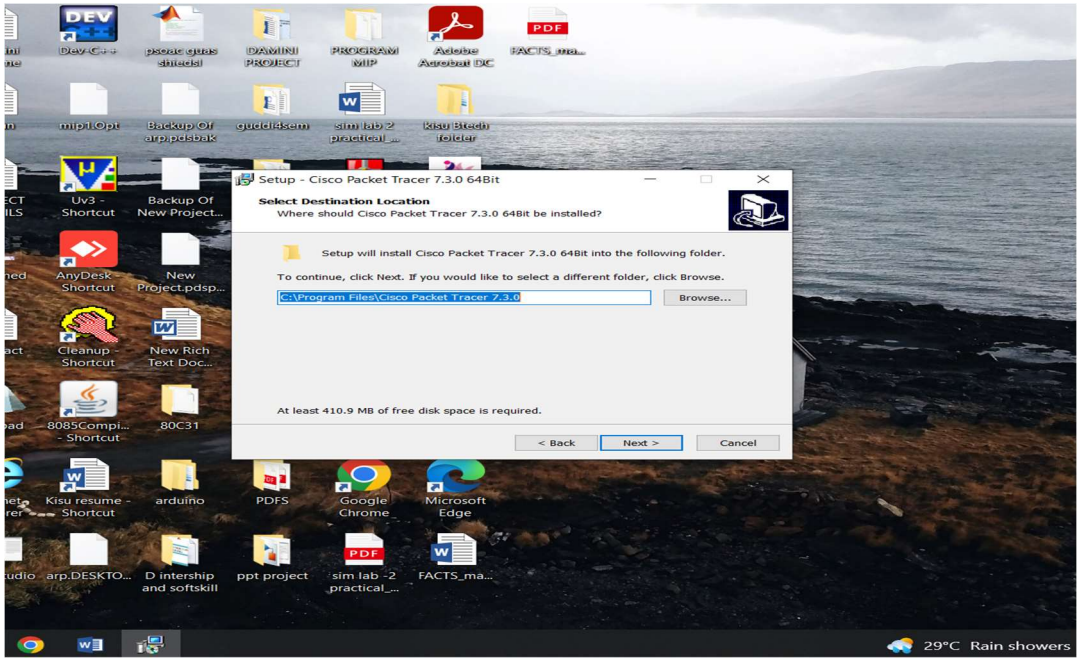
Step 1:



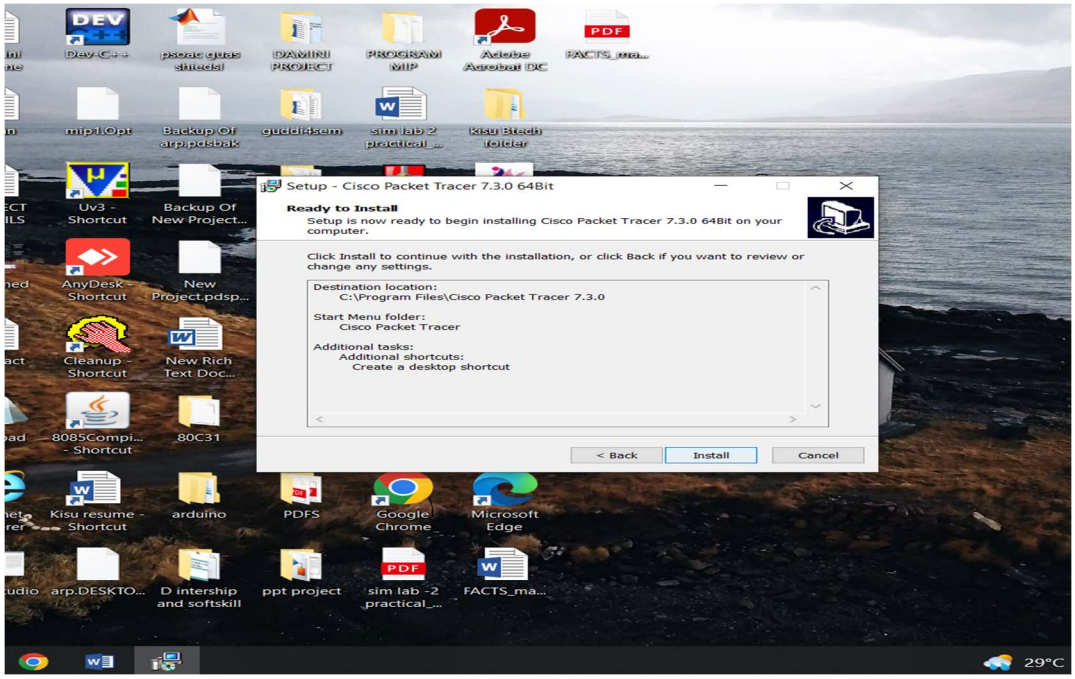
Step 2:



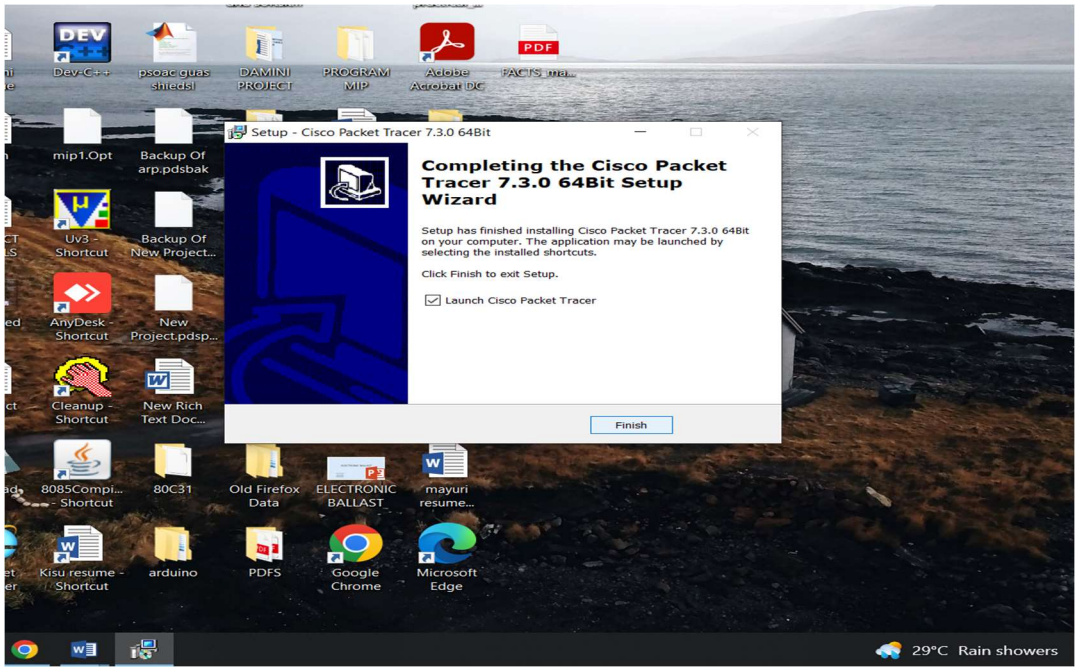
Step 3:


Setup - Cisco Packet Tracer 7.3.0 64Bit
Select Destination Location
Where should Cisco Packet Tracer 7.3.0 64Bit be installed?
Setup will install Cisco Packet Tracer 7.3.0 64Bit into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\Cisco Packet Tracer 7.3.0
Browse...
At least 410.9 MB of free disk space is required.
< Back
Next >
Cancel
29°C Rain showers

Step 4:


Setup - Cisco Packet Tracer 7.3.0 64Bit
Ready to Install
Setup is now ready to begin installing Cisco Packet Tracer 7.3.0 64Bit on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Program Files\Cisco Packet Tracer 7.3.0
Start Menu folder:
Cisco Packet Tracer
Additional tasks:
Additional shortcuts:
Create a desktop shortcut
< Back
Install
Cancel
29°C

Step 5:



➢ Components Description:

1) Network Devices:

Networking hardware, also known as network equipment or computer networking devices, are electronic devices which are required for communication and interaction between devices on a computer network.

1. Hub:

- Hub is one of the basic icons of networking devices which works at physical layer and hence connect networking devices physically together.
- Hubs are fundamentally used in networks that use **twisted pair cabling** to connect devices. They are designed to transmit the packets to the other appended devices without altering any of the transmitted packets received.

- **Hub falls in two categories:**

  - **Active Hub:**
    They are smarter than the passive hubs. They not only provide the path for the data signals in fact they regenerate, concentrate and strengthen the signals before sending them to their destinations. Active hubs are also termed as **'repeaters'**.

  - **Passive Hub:**
    They are more like point contact for the wires to built in the physical network. They have nothing to do with modifying the signals.

2. Switch:

- Switches are the linkage points of an Ethernet network. Just as in hub, devices in switches are connected to them through twisted pair cabling. But the difference shows up in the manner both the devices; hub and a switch treat the data they receive.
- **Hub** works by sending the data to all the ports on the device whereas a **switch** transfers it only to that port which is connected to the destination device.

➢ **Types of Switch:**

1)2960-24TT:
Cisco Catalyst 2960 Series switches support voice, video, data, and highly secure access.

2)Switch-PT:
The Switch-PT generic switch **provides ten slots, one console port, and one auxiliary port**.

3. Router:

- Routers are network layer devices and are particularly identified as Layer- 3 devices of the OSI Model. They process *logical* addressing information in the Network header of a packet such as IP Addresses.

➢ **Types of Router:**

1)ISR4331:

Cisco 4331 Integrated Services Router delivers 100 Mbps to 300 Mbps aggregate throughput and offers one Enhanced service-module (SM-X) slot, which supports for both single- and double-wide service modules provides flexibility in deployment options.

2)ISR1941:

The Cisco 1941 Integrated Services Router (ISR) **delivers highly secure data, mobility, and application services**. Key features include: 2 integrated 10/100/1000 Ethernet ports. 2 enhanced High-Speed WAN Interface Card slots that can host 2 single wide or 1 double wide and 1 single wide (e)HWIC.

2) End Devices:

These devices form the interface between users and the underlying communication network. A host device is either the source or destination of a message transmitted over the network.

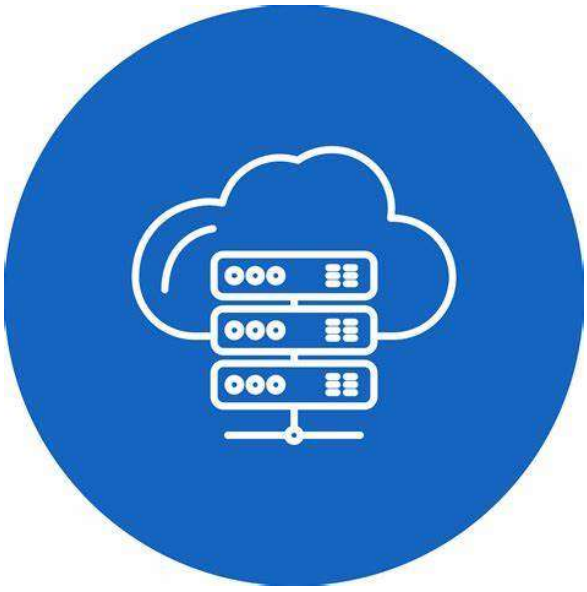
1. PC:

- In its more general usage, a personal computer (PC) is **a microcomputer designed for use by one person at a time**..
- Prior to the PC, computers were designed for (and only affordable by) companies who attached terminals for multiple users to a single large computer whose resources were shared among all users.

2. Laptop:

- A laptop computer, sometimes called a notebook computer by manufacturers, is a battery- or AC-powered personal computer generally smaller than a briefcase that can easily be transported and conveniently used in temporary spaces such as on airplanes, in libraries, temporary offices, and at meetings.

3. Server:



- A server is **a computer program or device that provides a service to another computer program and its user, also known as the client**. In a data center, the physical computer that a server program runs on is also frequently referred to as a server.

4. printer:

- A printer is **a device that accepts text and graphic output from a computer and transfers the information to paper**, usually to standard-size, 8.5" by 11" sheets of paper. Printers vary in size, speed, sophistication and cost.

5. Analog-Phone-PT:

- An analog phone is **one which makes use of analog technology**. Analog technology is simply the process by which the technology takes an audio or video signal and translates it into electronic pulses (the human voice being transmitted over the phone, for instance).

3) Connections:

This is used To Connect Network devices to End Devices.

1. Console Cable:

- Rollover cable (also known as a Yost cable, Cisco cable, or a Console cable) is **a type of null-modem cable that is used to connect a computer terminal to a router's console port**.
- This cable is typically flat (and has a light blue color) to help distinguish it from other types of network cabling.

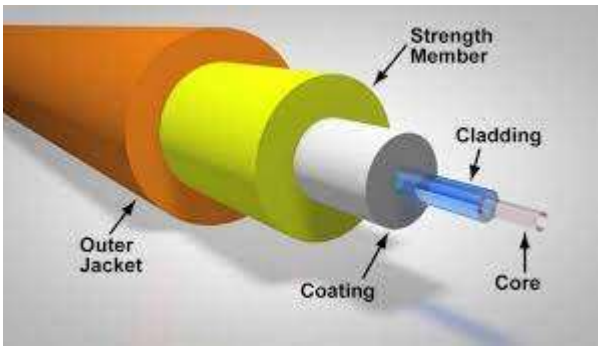
2. Copper Straight-Through Cable:

- Straight-through cable is **a type of twisted pair copper wire cable for local area network (LAN) use for which the RJ-45 connectors at each end have the same pinout** (i.e., arrangement of conductors).

3. Copper Cross-Over Cable:

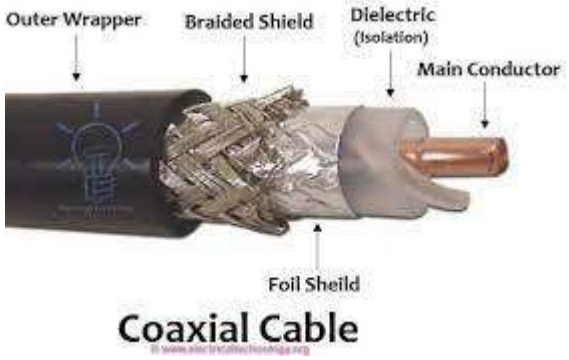
- A crossover cable is **a type of cable installation that is used for the interconnection of two similar devices**. It is enabled by reversing the transmission and receiving pins at both ends, so that output from one computer becomes input to the other, and vice versa.

4. Fiber-Optic Cable:



- A **fiber-optic cable**, also known as an **optical-fiber cable**, is an assembly similar to an electrical cable, but containing one or more optical fibers that are used to carry light.
- The optical fiber elements are typically individually coated with plastic layers and contained in a protective tube suitable for the environment where the cable is used.

5. Coaxial Cable:



- A coaxial cable is an electrical cable with a copper conductor and an insulator shielding around it and a braided metal mesh that prevents signal interference and cross talk. Coaxial cable is also known as **coax.**

Practical-2

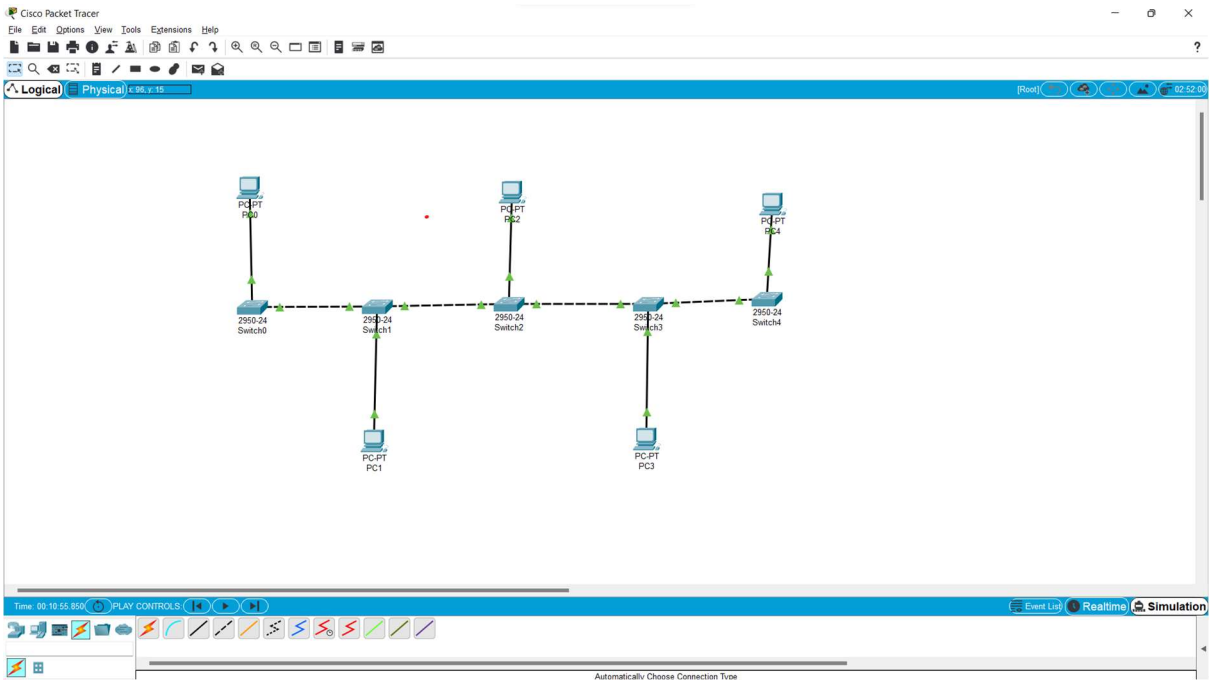
Aim: Create a topology in cisco packet tracer to understand the working of all the networking devices and networking media. (Bus, ring, star and mesh topology).

1)Bus Topology:

Bus topology, also known as line topology, is **a type of network topology in which all devices in the network are connected by one central RJ-45 network cable or coaxial cable**.

- The single cable, where all data is transmitted between devices, is referred to as the bus, backbone, or trunk.

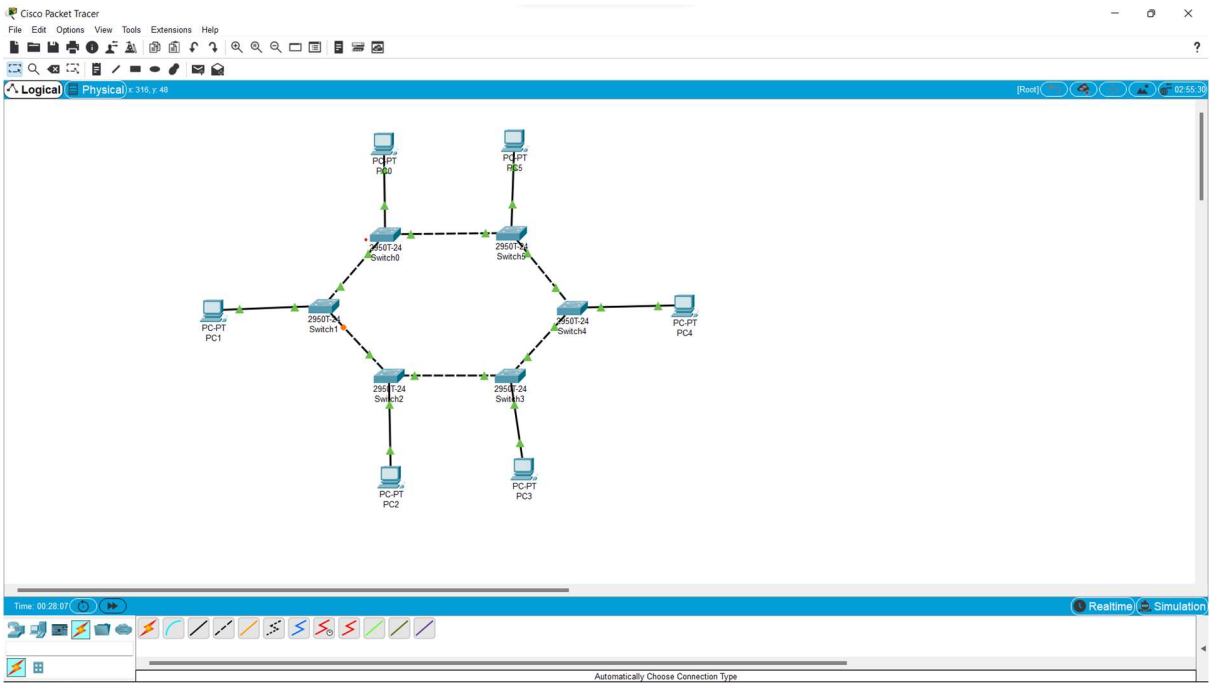
Example:



2)Ring Topology:

A **ring topology** is a network configuration where device connections create a circular data path. Each networked device is connected to two others, like points on a circle. Together, devices in a ring topology are referred to as a **ring network**.

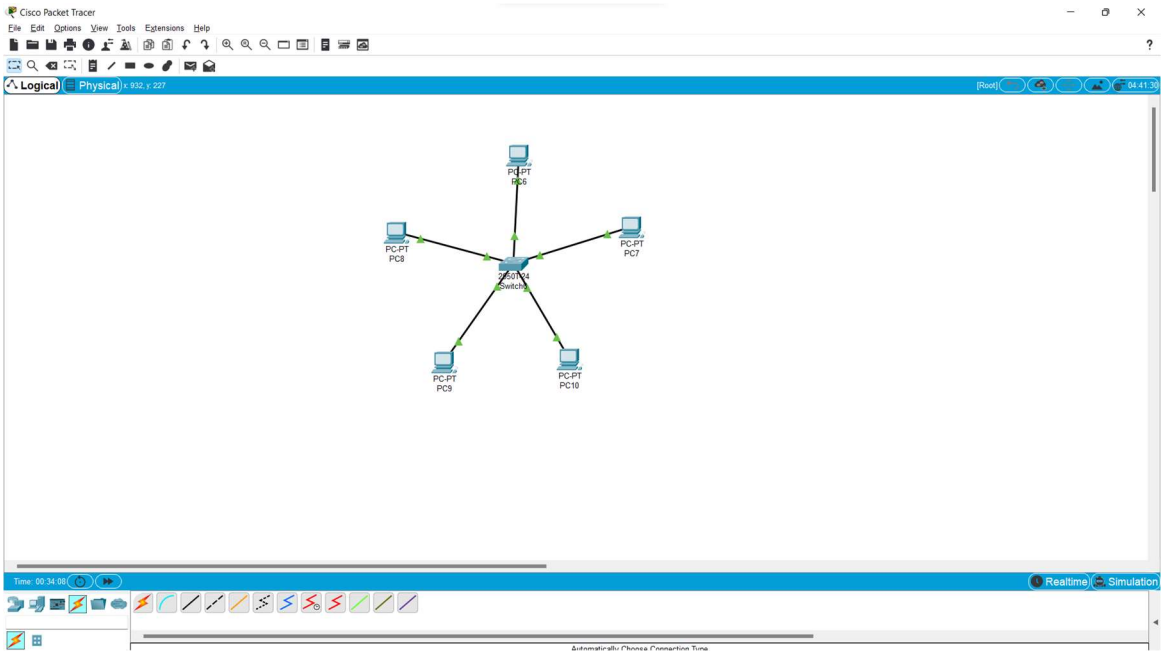
Example:



3)Star Topology:

Star topology is **a network topology in which each network component is physically connected to a central node such as a router, hub or switch**. In a star topology, the central hub acts like a server and the connecting nodes act like clients.

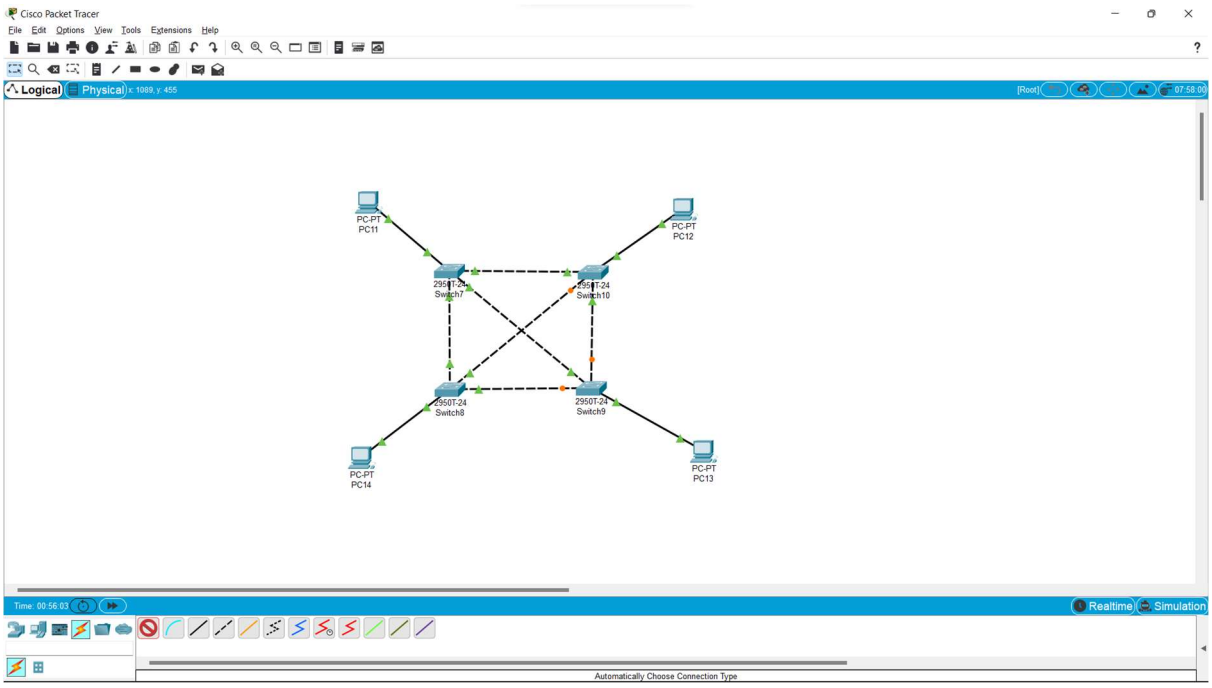
Example:



4)Mesh Topology:

In a mesh topology **there is no central connection point**. Instead, each node is connected to at least one other node and usually to more than one. Each node is capable of sending messages to and receiving messages from other nodes. The nodes act as relays, passing on a message towards its final destination.

Example:

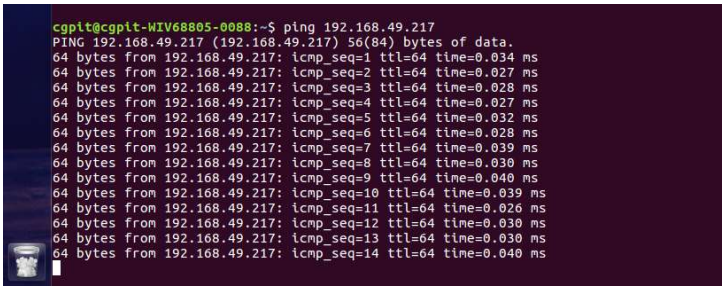


Practical-3

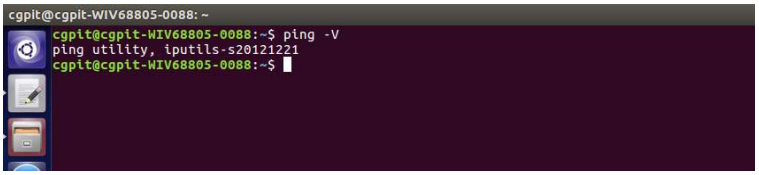
Aim: Perform a Practical to Demonstrate ping, arp and route command in Linux Operating System.

Ping Commands:

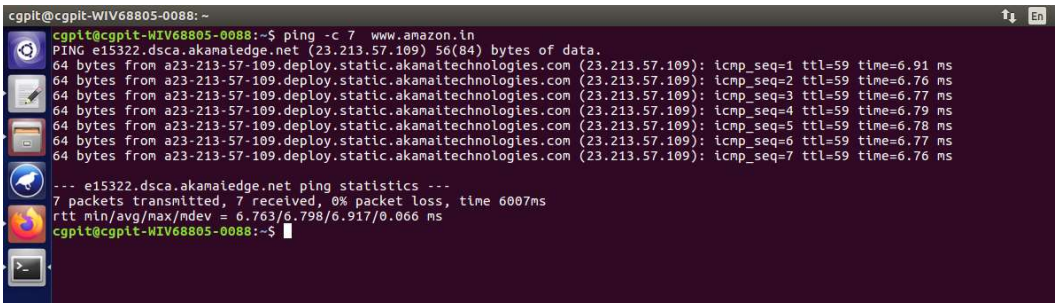
1. **ping 192.168.49.217**
   - ping a Single Target



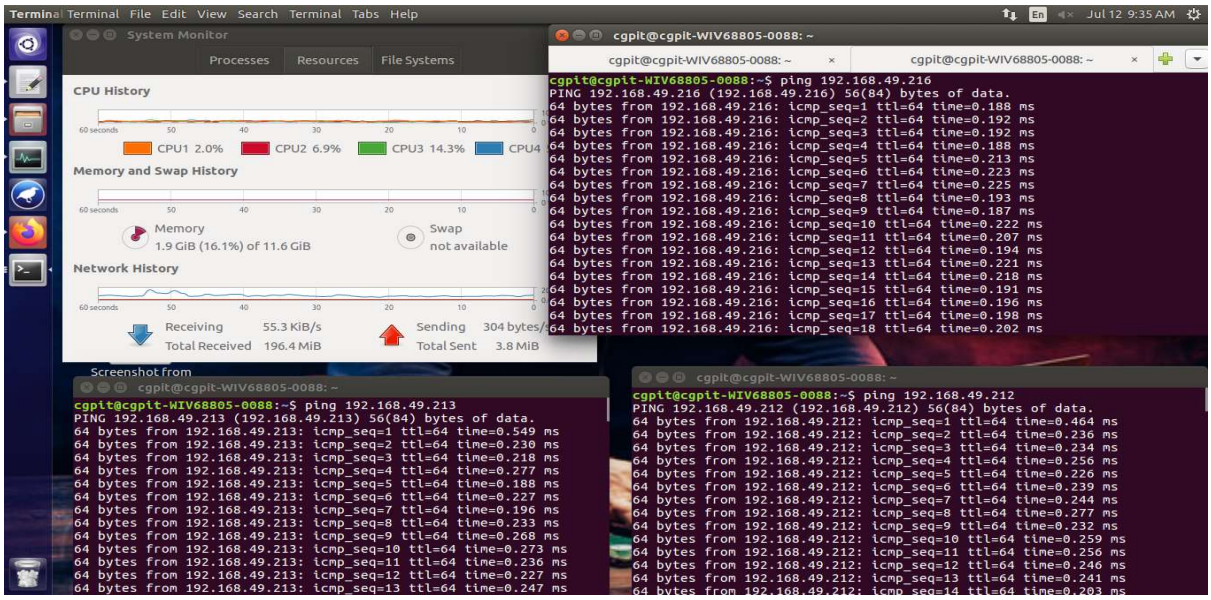
2. **ping -V**
   - It is Used To Check Version of ping



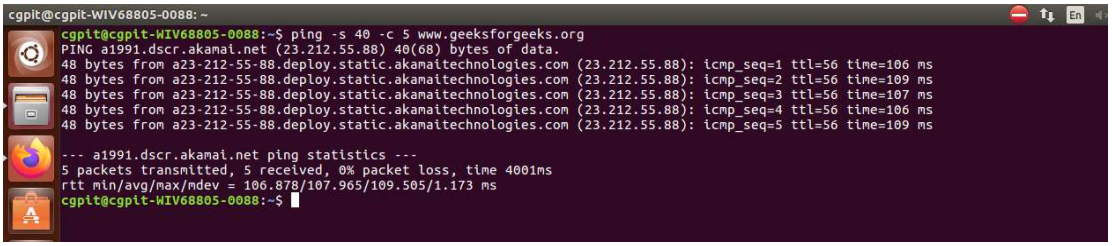
3. **Ping -c www.amazon.in**
   - Stop after sending count ECHO_REQUEST packets. With deadline option, ping waits for count ECHO_REPLY packets, until the time- out expires.



4. **ping 192.168.49.212,ping 192.168.49.213,ping 192.168.49.216**
   - Ping Multiple IP address.

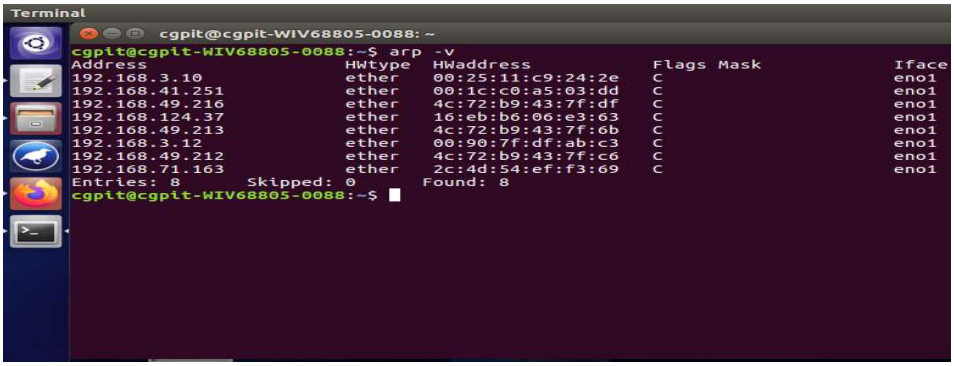


5. **ping -s 40 -c 5 www.geeksforgeeks.org**
   - Controlling the size of packets send.



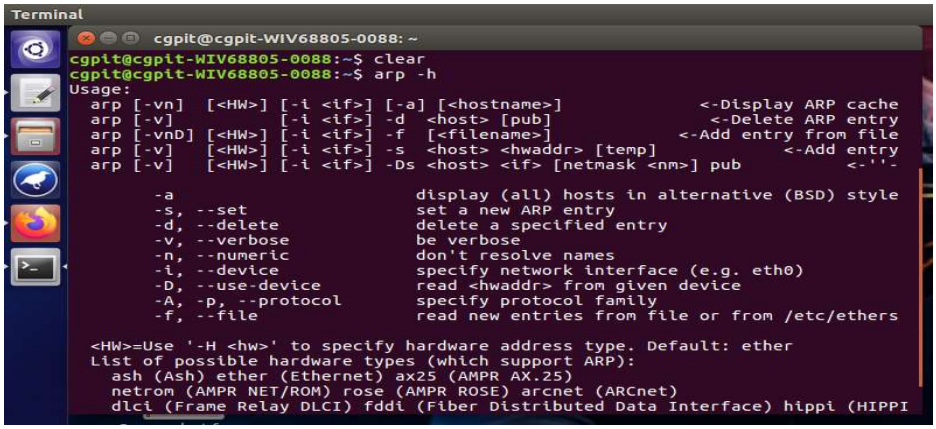
arp Commands:

1. **arp -v**
   - This option shows the verbose information



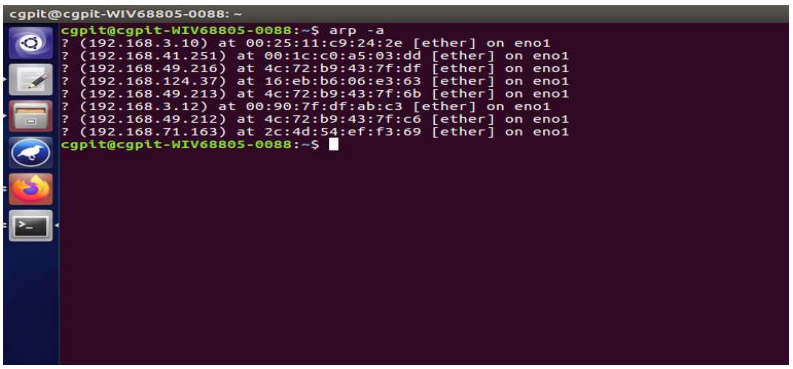
2. arp -h

- This tells *arp* which class of entries it should check for. Default value is ether.



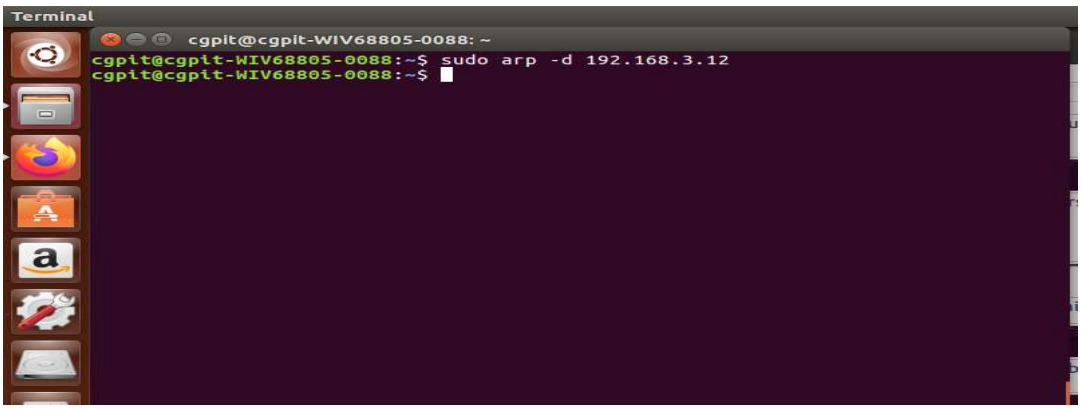
3. arp -a

- This option is used for showing entries of the specified host. If nothing is passed all entries will be displayed.



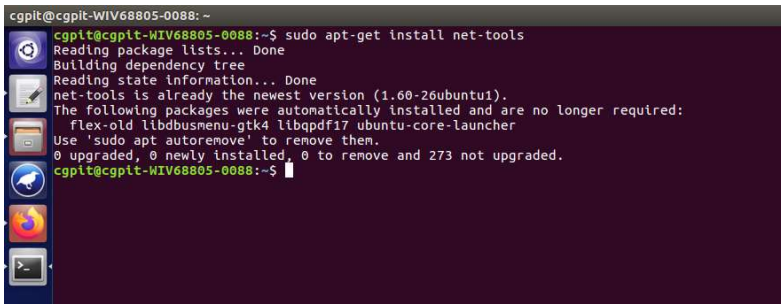
4. arp -d

- Removes any entry for the specified host.



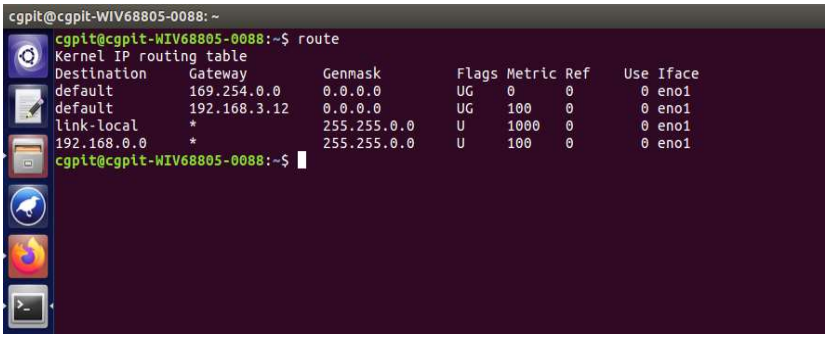
route Commands:

- Installation of Route.



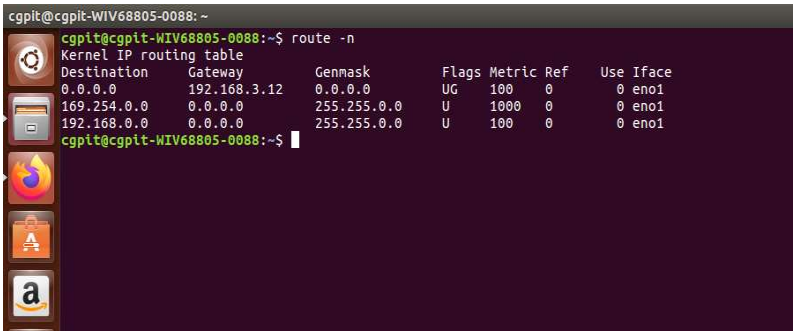
1. route

- To display the IP/kernel routing table.



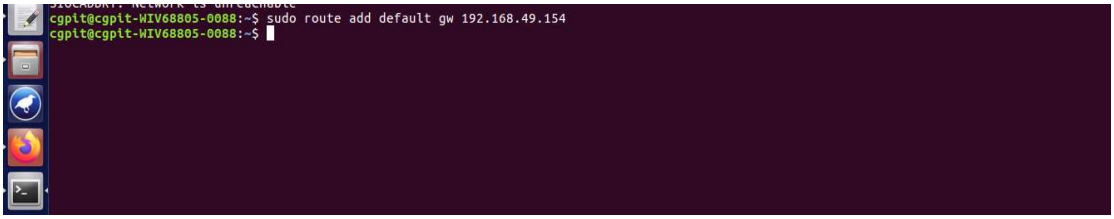
2. route -n

- To display routing table in full numeric form.



3. sudo route add default gw

- To add a default gateway.



4. route del default

- To delete the default gateway.