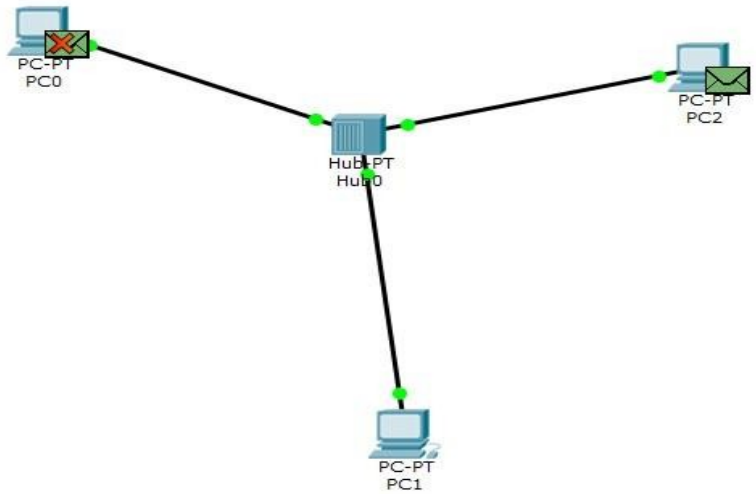
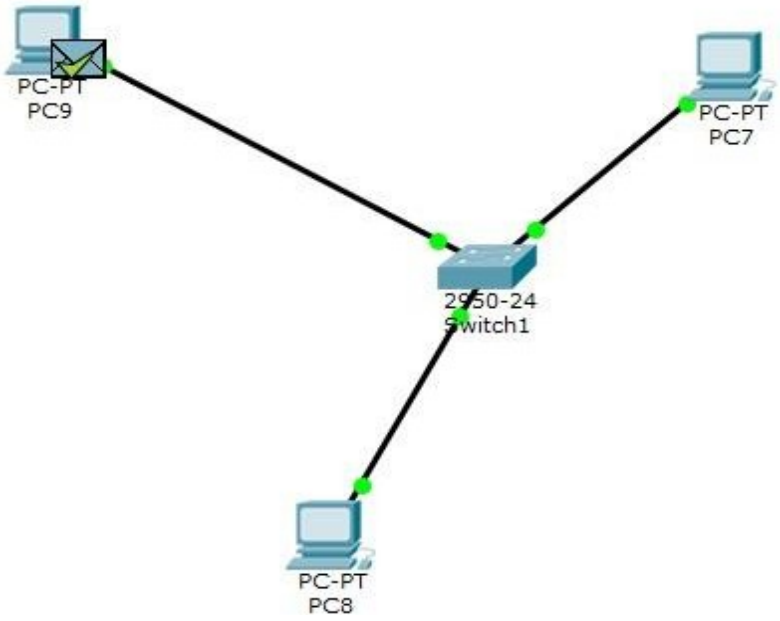
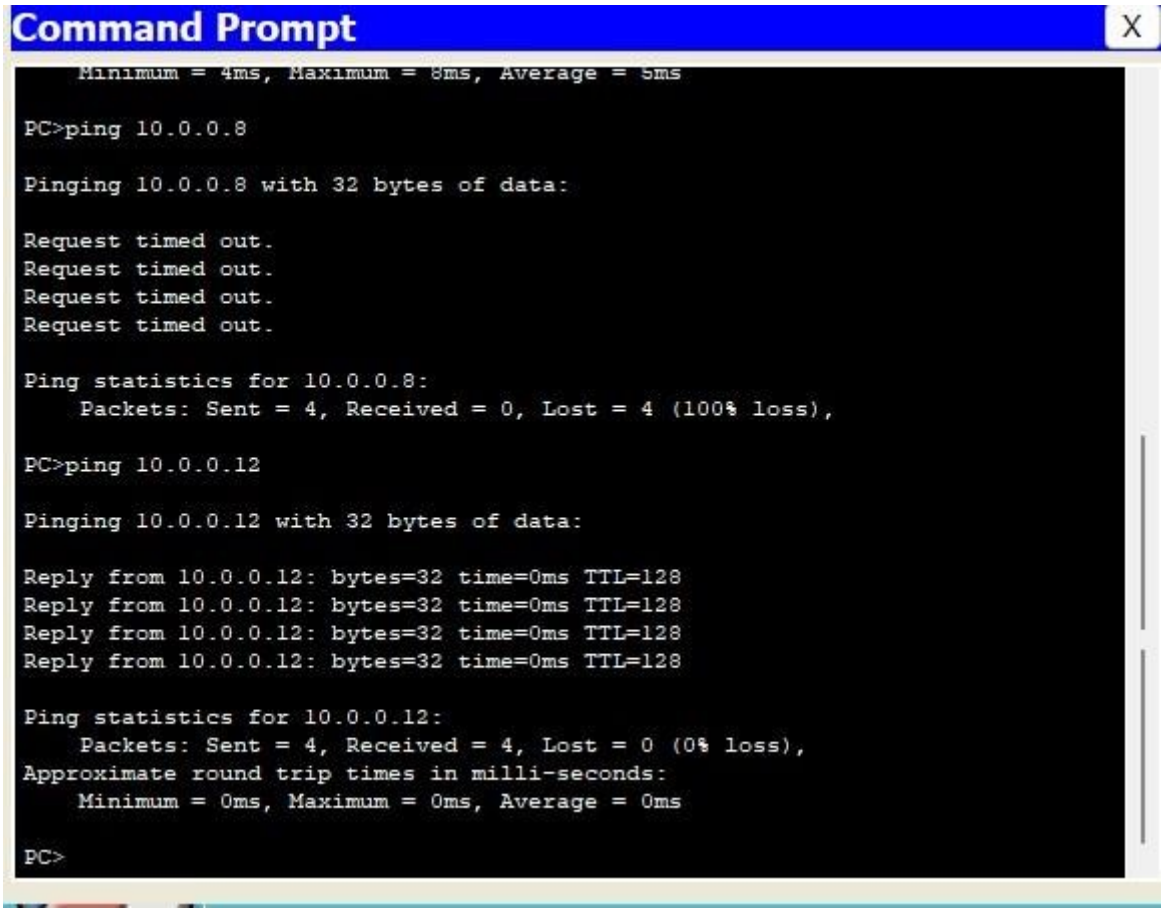
1) **Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping message.**

Topology:




```
Command Prompt
PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=1ms TTL=128
Reply from 10.0.0.2: bytes=32 time=3ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms

PC>
```





Observation:

Cisco Packet Tracer

This initial interface contains ten components. the ten components are

1. Menu Bar: This bar provides the file, edit, options view, tools, extensions and help menus. You will find basic commands and such as open, save, save as pkg, print and preferences in these menus. You will also be able to access the activity wizard from the extensions menus.

2. Main Tool Bar: This Bar provides shortcut icons to the file and edit menu commands. This bar also has copy, cut, paste options, zoom and redo. On the right, you will also find the network Information button, which you can use to enter a description for the current network.

3. Common Tools Bar: This bar provides access to these commonly used workspaces tools: select, move, layout, place note, delete, inspect, resize shape, add simple PDU & add complex PDU

4. Logical / Physical Workspace and navigation bar: You can toggle between the physical workspace & logical workspace with the tabs on this bar. In logical workspace, this bar allows you to go back to a previous level in a cluster, create new cluster and many more. In physical workspace, this bar allows you to navigate through physical location create a new at

and many more.

5. Workspace: This area is where you will create your network, watch simulations and view many kinds of info & statistics

6. Realtime/Simulation Bar: You can toggle between realtime mode with the tabs on this bar.

7. Network Component Box: This Box contains the type of devices and connections available in packet tracer

8. Device-Type Selection Box: This box contains the type of devices & connections to put into the workspace.

9. Device Specific selection Box: This box is where you choose specifically which devices you want to put in your network & which connections to make.

10. User Created Packet Window: This window manages the packets you put in the network during simulation scenarios.

Lab 1

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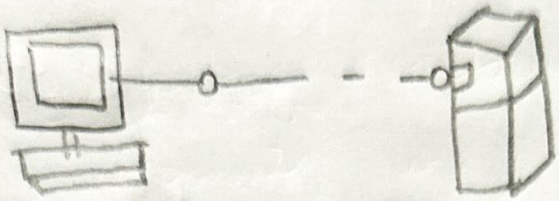


Q) A simple compute-service setup, Create a Topology and simulate sending a simple PDU from source to destination using hub and switch as connected devices and demonstrate ping messages

Aim

To set up a point to point network between a PC and a server, facilitating direct communication to observe data exchange

Topology:

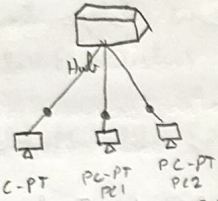
A PC (PC0) is connected to a sever using a corossover ethernet cable

IP address of PC0 10.0.0.1

IP address of server 0 : 10.0.0.201

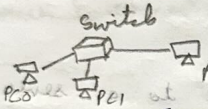
Observation : The direct connection allows PC0 to communicate with server 0, which is typical in small networks for tasks such as file sharing, service request or testing server responds to client queries

Hub & Switch



Aim: To create a simple network consisting of three PCs connected to a central hub and another network with three PCs connected to a switch. This configuration will help observe the behaviours of data transmission using hub & switch devices.

Topology:



Hub Network: Three PCs (PC0, PC1, PC2) are connected to hub (hub 0) using straight-through Ethernet cable

IP address: PC0 = 10.0.0.1, PC1 = 10.0.0.2, PC2 = 10.0.0.3

Switch Network: Three PCs (PC3, PC4, PC5) are connected to a switch network using straight through ethernet cable

IP address: PC3 = 10.0.0.4, PC4 = 10.0.0.5, PC5 = 10.0.0.6

Procedure:

1. Add 1 hub 1 switch and 6 PCs 1 PC0, PC2 for the hub; PC3, PC4, PC5 for the switch to the cisco packet tracer workspace

2. use copper straight through cable to connect PC0, PC1 and PC2 to Hub0 . parallely connect PC3, PC4 and PC5 to switch 0 using same type of cable.

3. Assign IP address to each PC and obtain subnet mask.

4. Switch to simulation mode to observe data traffic behaviour when data is sent between the devices.

5. In the hub network notice how the hub broadcasts packets to all devices causing potential traffic overload.

   In the switch network, observe how the switch forwards packets only to the intended recipients reducing unnecessary traffic.

6. The hub broadcasts data to all connected devices leading to more network congession. while the switch efficiently sends data only to the correct device, optimizing performance.

Observation

The hub broadcasts packets to all devices, which may cause unnecessary traffic.

The switch forwards packets only to the appropriate devices by learning MAC addresses, making it more efficient in reducing traffic.

Difference between Hubs & switches

Hubs	Switches
1. Hub broadcast data to all devices	1. switches send it only to the destination
2. Hubs create more traffic	2. switch reduces traffic by directing data
3. Hubs work at physical layer	3. switchs operate on data link layer
4. Hubs are slower due to shared bandwidth	4. switches are faster with delicated bandwidth
5. Hubs are cheap	5. switchs are more expensive but more efficient

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