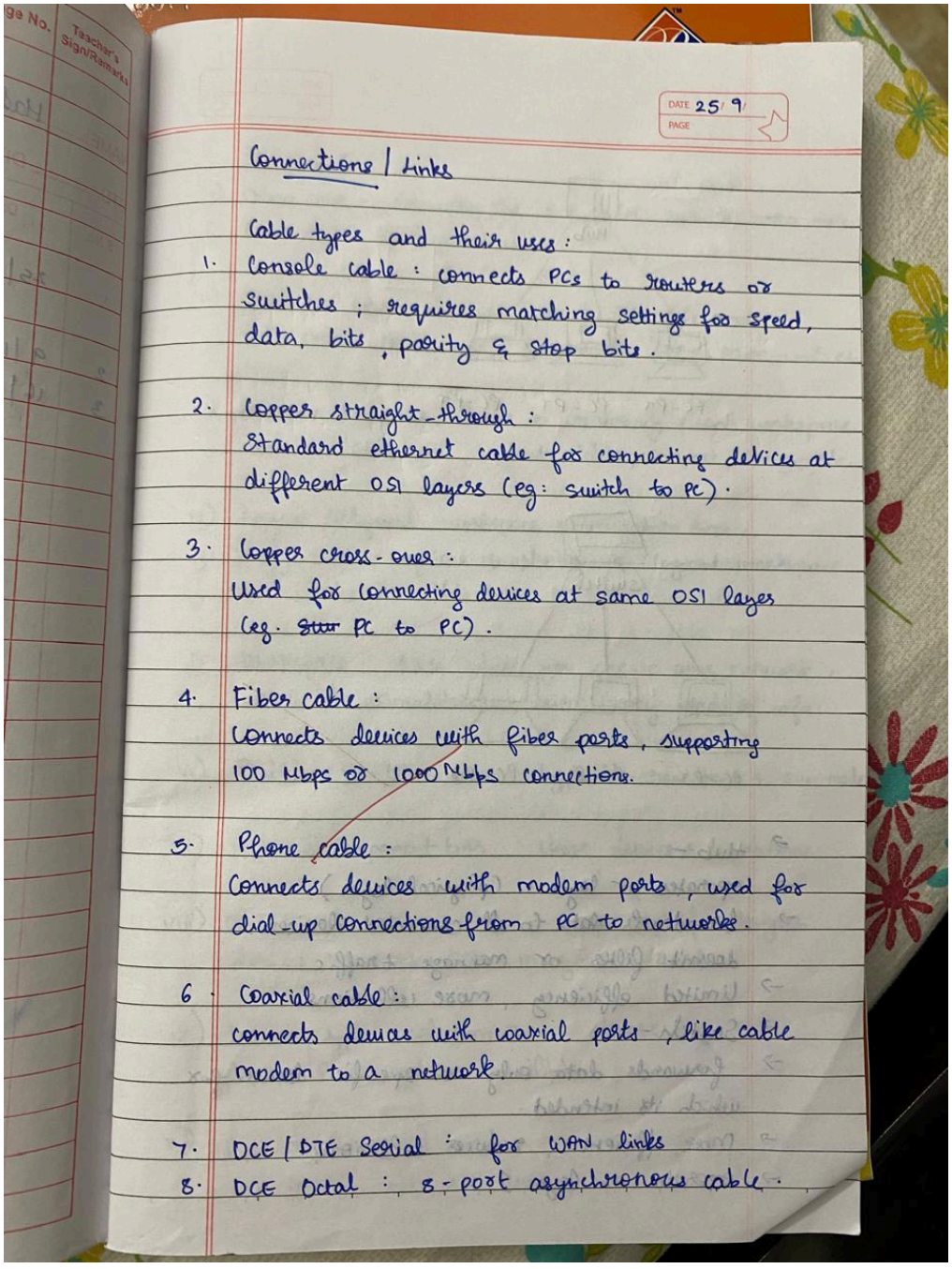
Lab 1 - 25/9/24



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Connections / Links

Cable types and their uses:

1. Console cable : connects PCs to routers or switches ; requires matching settings for speed, data, bits, parity & stop bits.

2. Copper straight-through :
Standard ethernet cable for connecting devices at different OSI layers (eg: switch to PC).

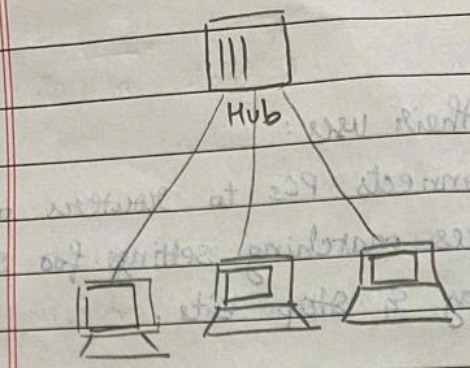
3. Copper cross-over :
Used for connecting devices at same OSI layers (eg. ~~Star~~ PC to PC).

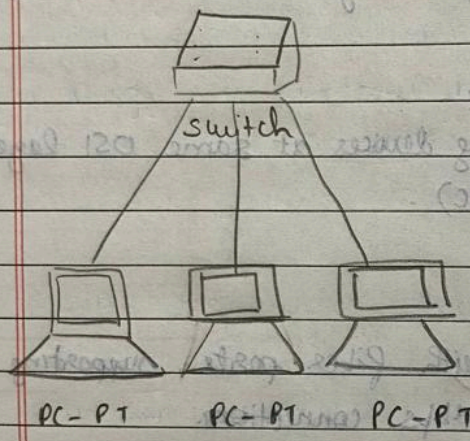
4. Fiber cable :
Connects devices with fiber ports, supporting 100 Mbps or 1000 Mbps connections.

5. Phone cable :
Connects devices with modem ports, used for dial-up connections from PC to networks.

6. Coaxial cable :
connects devices with coaxial ports, like cable modem to a network.

7. DCE / DTE Serial : for WAN links
8. DCE Octal : 8-port asynchronous cable.





→ Hub -
→ operates at layer 1 (physical layer)
→ broadcasts data to all connected devices. doesn't filter or manage traffic
→ limited efficiency, more collisions.
→ Switch -
→ forwards data only to specific device for which its intended.
→ more efficient, reduces collisions
→ operates on layer 2.

Components.

i) Menu bar - Provides the file, edit, options, view, tools, extensions & help menus.

ii) Main tool bar - shortcut icons to the file and edit menu commands. Buttons for copy, paste, undo etc.

iii) Common tool bar - Access to commonly used workspace tools : select, move, layout, delete, inspect, resize, etc.

iv) Logical / Physical workspace & navigation Bar : Toggle b/w physical workplace & logical workspace with tabs on this bar.

v) Workspace : Area where you create your network, watch simulations & view many kinds of info.

vi) Real time / Simulation Bar : toggle b/w real time & sim. mode

vii) Network Component bar : chose devices & connections.

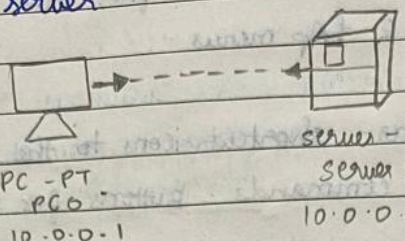
viii) Device specific selection Box : chosse specific designs devices & connections in your network.

ix) Device type selection Box : choose type of devices & connections availible

x) User created packet window : manages packets you put in the network during simulation scenarios.

Expt - 1

1. PC to server



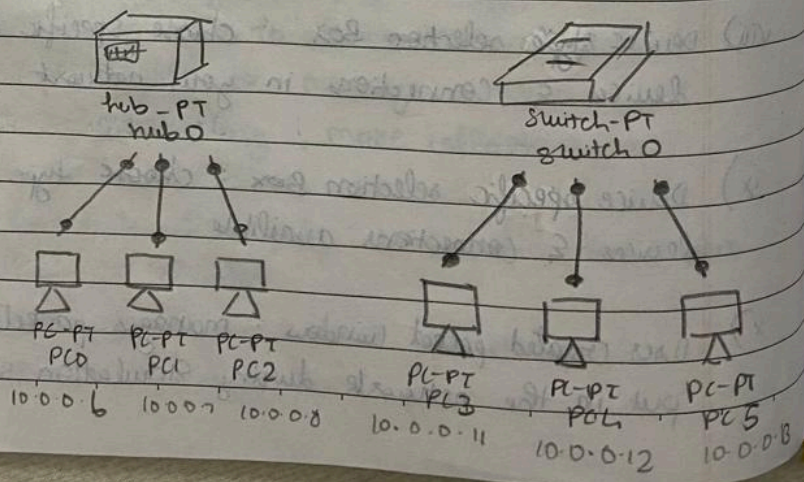
Aim: to set up a point to point network b/w a PC and a server, facilitating direct communication to observe data exchange.

Topology: A PC is connected to server using a crossover ethernet cable.

IP address of PC - 10.0.0.1, server - 10.0.0.2

Observation: Direct connection allows PC to communicate with server, which is typical in small networks for tasks such as file sharing, device requests or testing server response.

2. Hub & Switch



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Aim : to create network consisting of 3 PCs connected to a central hub & another network with 3 PCs connected to a switch. The connection will help observe the behaviour of data transmission using hub & switch devices.

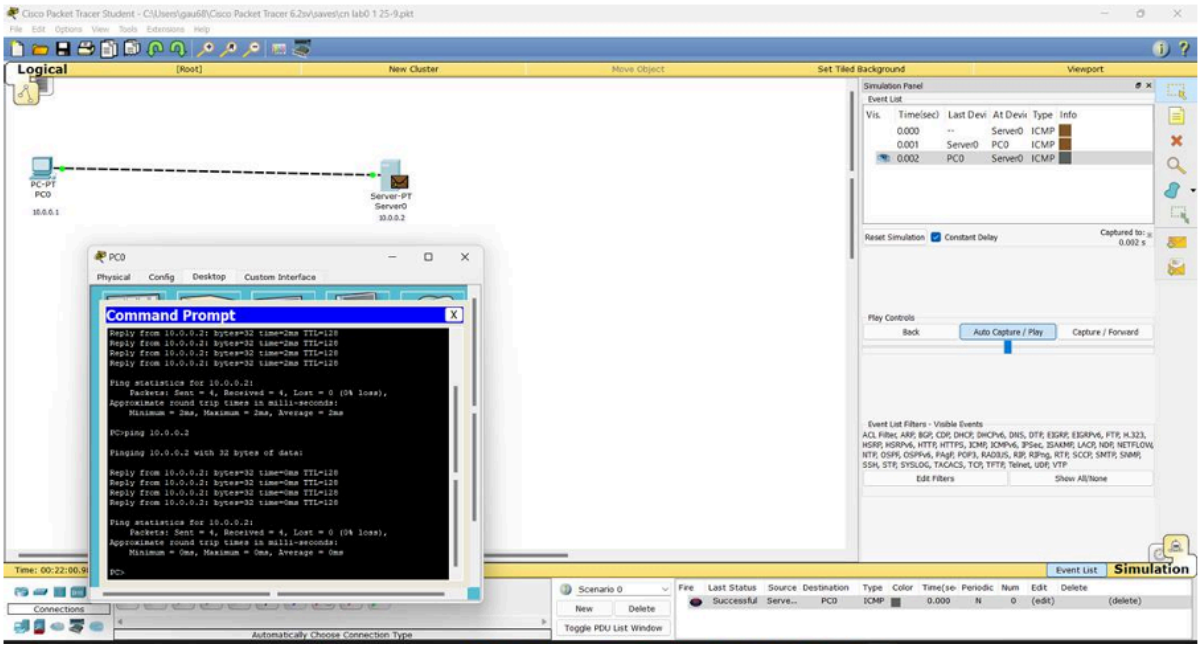
Topology : 3 pcs are connected to a hub & switch using straight through ethernet cables.

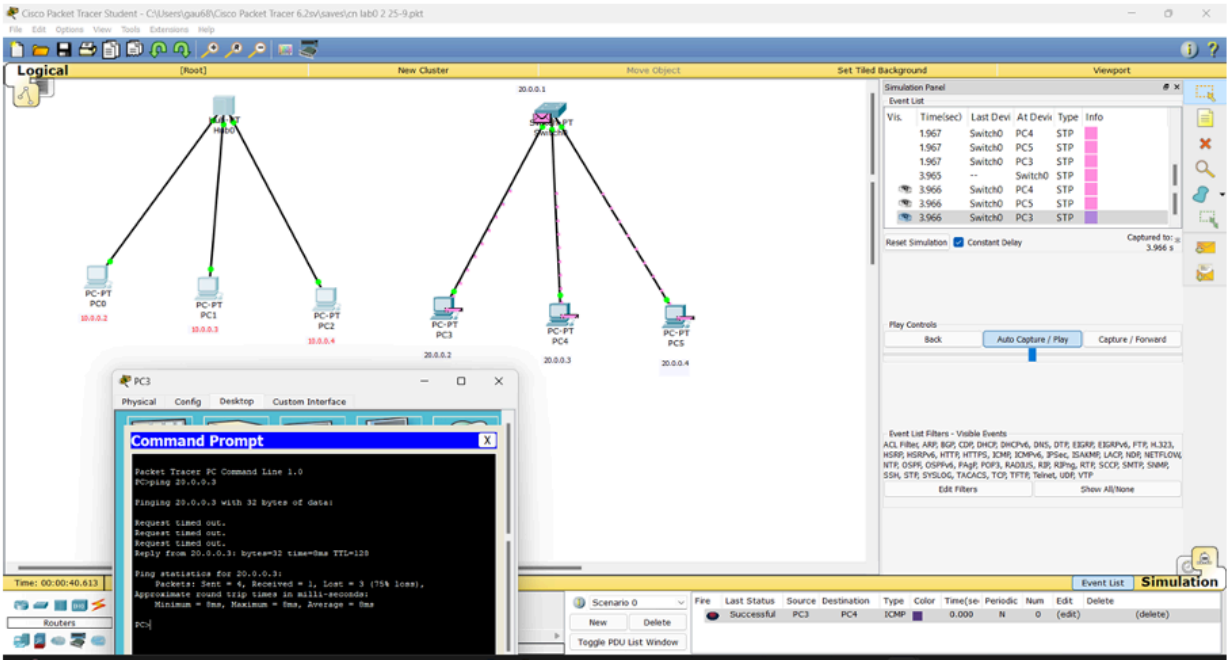
Observation: hub broadcasts packets to all devices which may cause unnecessary traffic. Switch forwards packets only to appropriate devices by learning MAC addresses, making it more efficient in reducing traffic.

→ Difference btn hub & switch.

Hub	Switch
• help broadcast data to all devices.	switches send it only to the destination.
• hubs create more traffic	They reduce traffic by directing data.
• cheaper & less effective.	more expensive & more effective.
• physical layer	data link layer.

Done 9/10/24


Logical
PC-PT
PC0
10.0.0.1
Server-PT
Server0
10.0.0.2
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Reply from 10.0.0.2: bytes=32 time=2ms TTL=128
Reply from 10.0.0.2: bytes=32 time=2ms TTL=128
Reply from 10.0.0.2: bytes=32 time=2ms TTL=128
Reply from 10.0.0.2: bytes=32 time=2ms 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 = 2ms, Maximum = 2ms, Average = 2ms
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=0ms 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
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 = 0ms, Average = 0ms
PC>
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window


Logical
PC-PT
PC0
10.0.0.2
PC-PT
PC1
10.0.0.3
PC-PT
PC2
10.0.0.4
PC-PT
PC3
20.0.0.2
PC-PT
PC4
20.0.0.3
PC-PT
PC5
20.0.0.4
20.0.0.1
PC3
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 20.0.0.3
Pinging 20.0.0.3 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Reply from 20.0.0.3: bytes=32 time=0ms TTL=128
Ping statistics for 20.0.0.3:
Packets: Sent = 4, Received = 1, Lost = 3 (75% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Event List
Simulation
Routers
Scenario 0
New
Delete
Toggle PDU List Window