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Lab Assignment 1 (CN)

Title: Design networks: (Use: Packet tracer / GNS)

Aim: Design Network: Design a simple network (LAN) with different topologies and test it using PINGs utility.

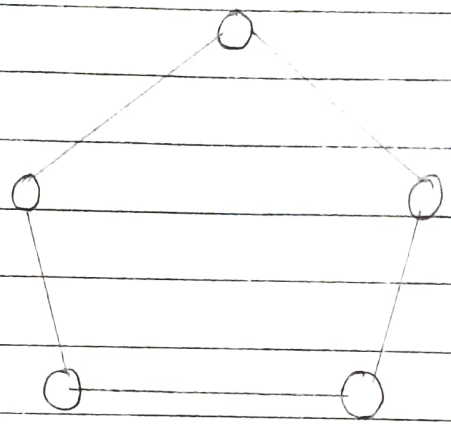
Objective:
1. To learn and understand concept of LAN and test it using PINGs command.
2. To design a network using various network topologies in cisco Packet Tracer.

Theory:
1. What is LAN?
Ans LAN or Local Area Network is a group computer or peripheral devices that are connected together. These devices may be connected with a physical media or a connectionless media within a certain geographical area. These devices can communicate and share resources with each other. LAN is decided upon geographical area covered by the network i.e. between range of a few kilometres.

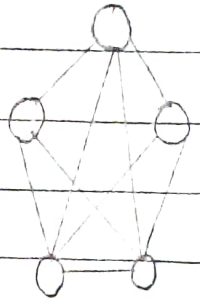
2. Define and explain various network topologies.

Ans Bus Topology: In bus network topology every node is connected in series along a single cable - eg. Cable Broadband distribution networks.

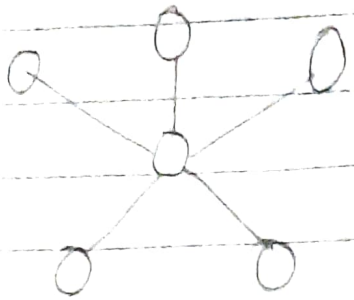
Ring Topology: In the ring network topology nodes are connected in a closed loop configuration. Data is passed in only one direction. eg- metro Network based on synchronous optical Networks.



Mesh Topology: The mesh topology links nodes with connections so that multiple paths between nodes / devices meshing multiple paths increased resiliency but also increases cost. More space is needed for dedicated links.



Star Topology: In star topology a central device connects to all other nodes through a central hub.



Hybrid Topology: The hybrid network topology is any combination of two or more topologies. Hybrid topologies typically provide exceptional flexibility.

Student Observation:

The ping command can give a connection relation amongst the devices that are connected together. The device which are not connected do not respond to ping command.

FAQ

Q1 Explain the use ping utility command with example.

Ans The ping command sends packets of data to a specific IP address on a network and then lets you know it long it took to transmit data and get a response.

Q2 use ping utility to determine connection between devices.

Eg. let there be a PC1 with IP address: 192.168.20.1, PC2 with IP address: 192.168.20.2, PC3 with IP address: 192.168.20.3. let only PC1 & PC2 be connected.

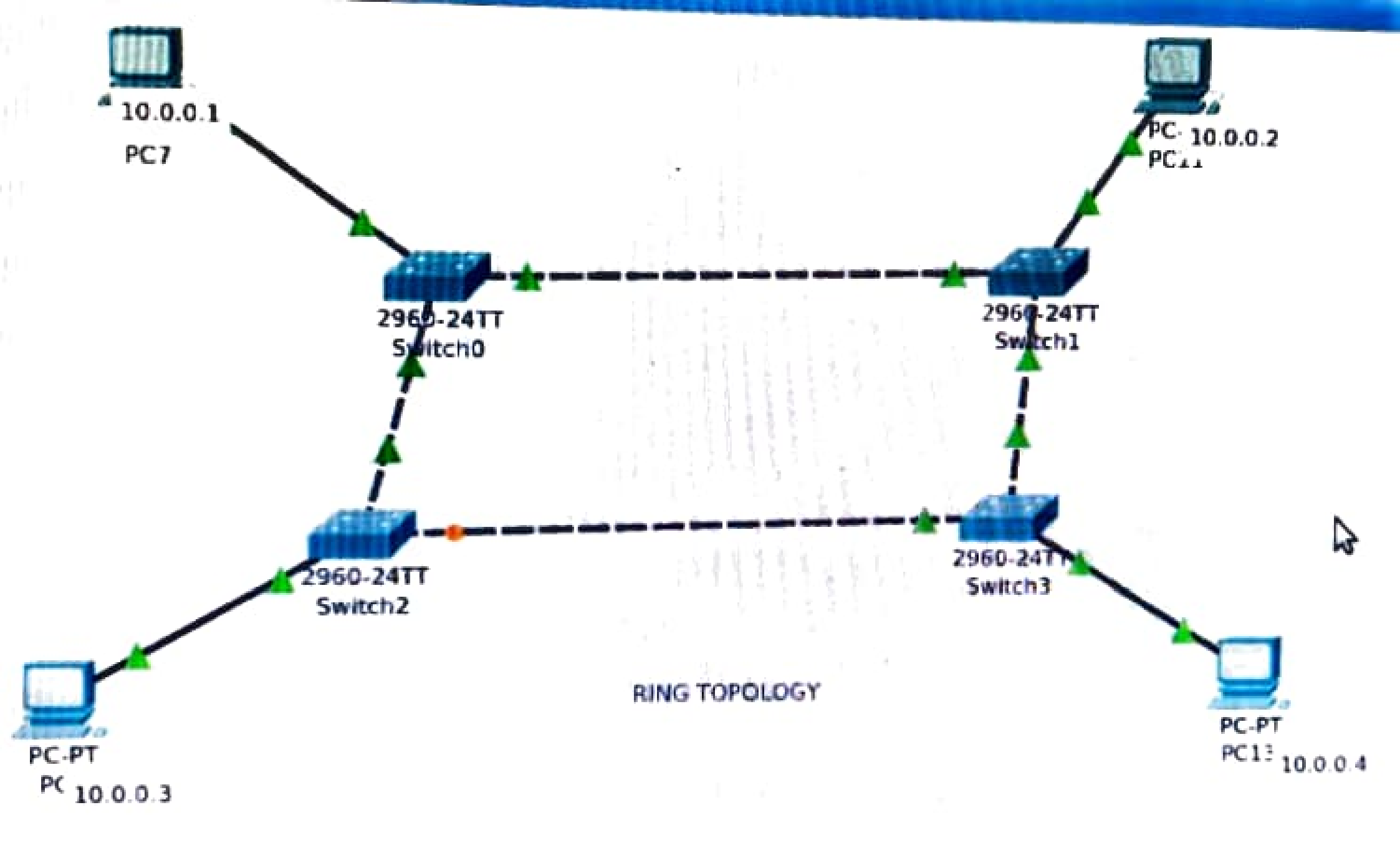
On using the command ping 192.168.20.2 on PC1 we receive time between packets and response which shows us that PC1 and PC2 are connected.
Using command ping 192.168.20.3 on PC2 will result in request time out as devices are not connected hence packet is never sent.

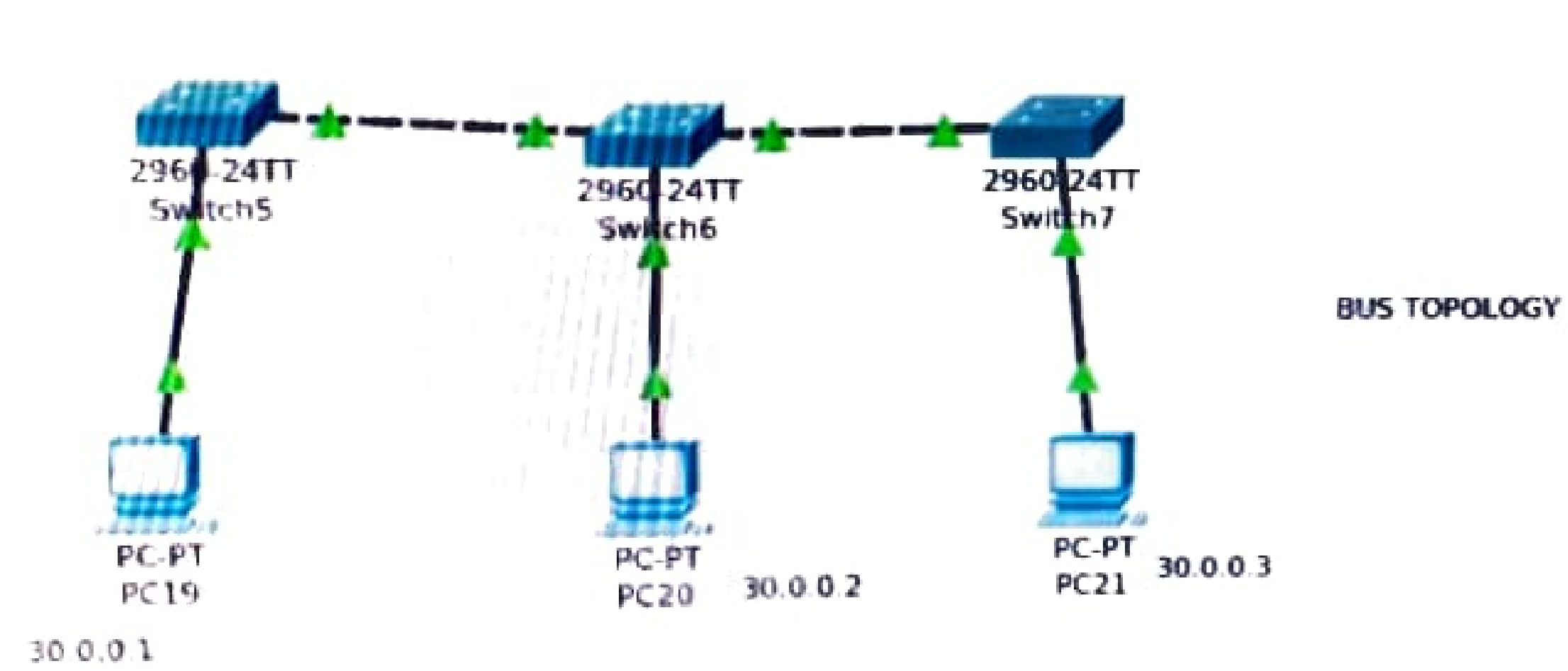
Q2 Compare various types of Networks.
Ans LAN
1. LAN is defined as a computer network that links local area
2. LAN is a wired network.
3. LAN network ownership is private.
4. The connection speed is very high. Eg- 2000 mbps.
5. Maintenance is very less.
6. Bandwidth is very high.
7. Eg- Hospital.

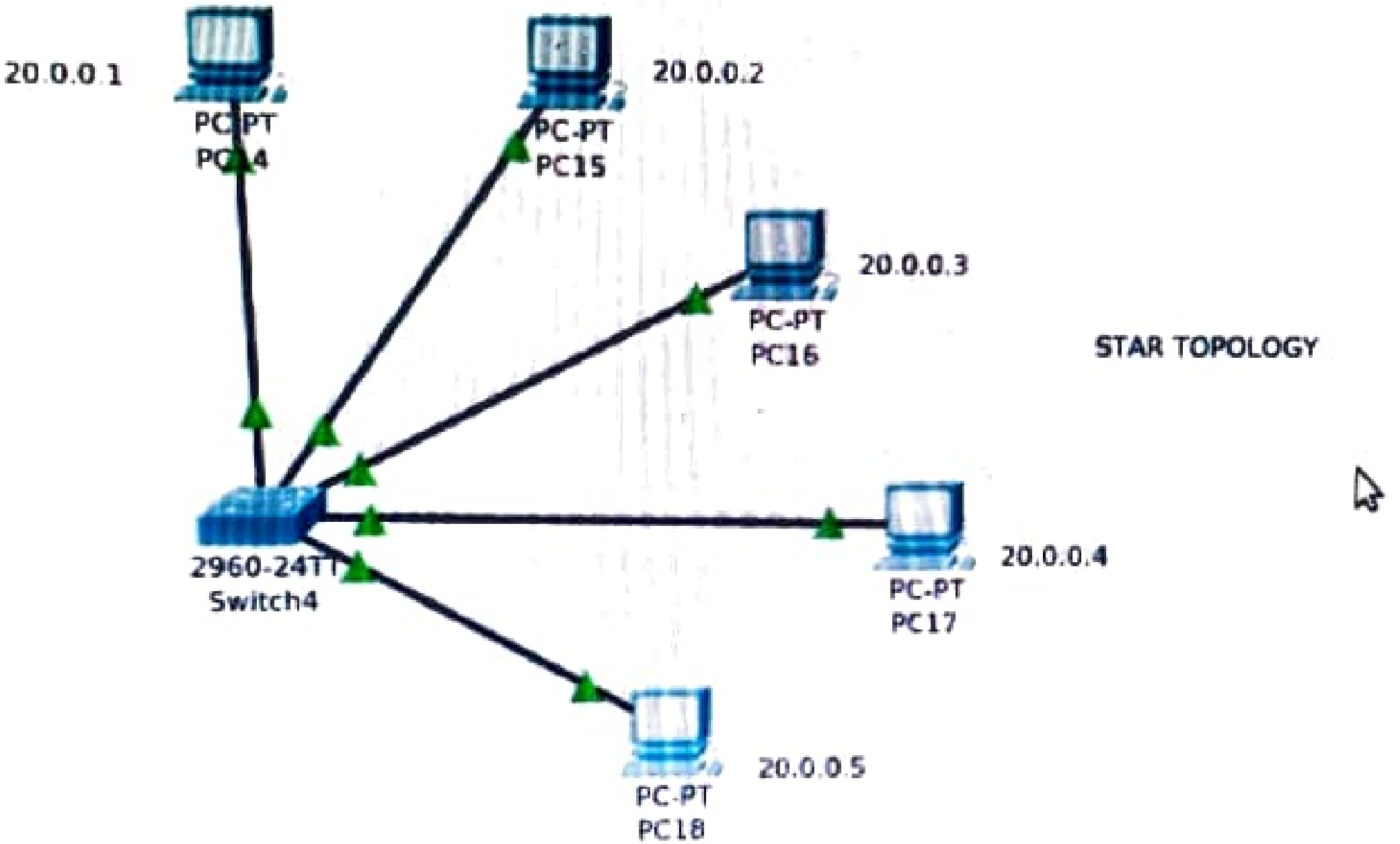
MAN
1. MAN is defined as a computer network that links the metropolian network.
2. MAN uses routers / modems for connections.
3. MAN ownership can be private / public.
4. MAN connection speed is moderate. eg- 44-155 mbps.
5. Maintenance cost is difficult.
6. Bandwidth is very less.
7. Eg- City.

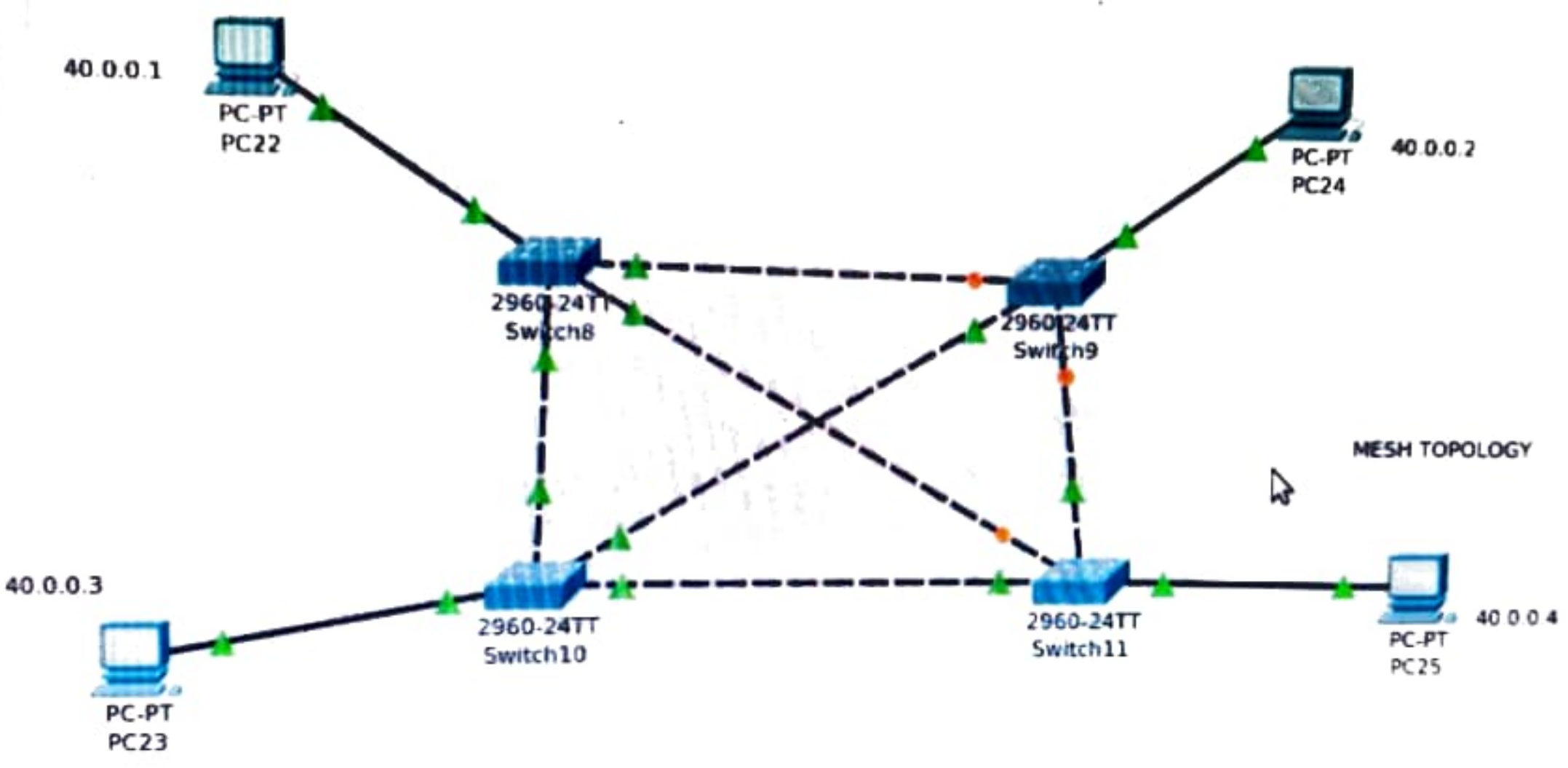
WAN

1. WAN is defined as tele communication network that covers large geographical area.
2. WAN is connected through 3Gs/4Gs broadbands
3. Ownership can be private/public.
4. The connection speed is very low i.e. 150 Mbps
5. The maintenance cost is difficult.
6. The bandwidth is relatively low.
7. Eg- Broadband and Internet through the country.


10.0.0.1
PC7
PC- 10.0.0.2
2960-24TT
Switch0
2960-24TT
Switch1
2960-24TT
Switch2
2960-24TT
Switch3
RING TOPOLOGY
PC-PT
10.0.0.3
PC-PT
10.0.0.4


2960-24TT
Switch5
2960-24TT
Switch6
2960-24TT
Switch7
BUS TOPOLOGY
PC-PT
PC19
PC-PT
PC20
30.0.0.2
PC-PT
PC21
30.0.0.3
30.0.0.1


20.0.0.1
PC-PT
PC14
20.0.0.2
PC-PT
PC15
20.0.0.3
PC-PT
PC16
STAR TOPOLOGY
2960-24TT
Switch4
20.0.0.4
PC-PT
PC17
20.0.0.5
PC-PT
PC18


40.0.0.1
PC-PT
PC22
PC-PT
PC24
40.0.0.2
2960-24TT
Switch8
2960-24TT
Switch9
MESH TOPOLOGY
40.0.0.3
2960-24TT
Switch10
2960-24TT
Switch11
40.0.0.4
PC-PT
PC25
PC-PT
PC23