19L505 – COMPUTER NETWORKS ASSIGNMENT

UNICAST ROUTING PROTOCOL USING DIFFERENT TOPOLOGIES

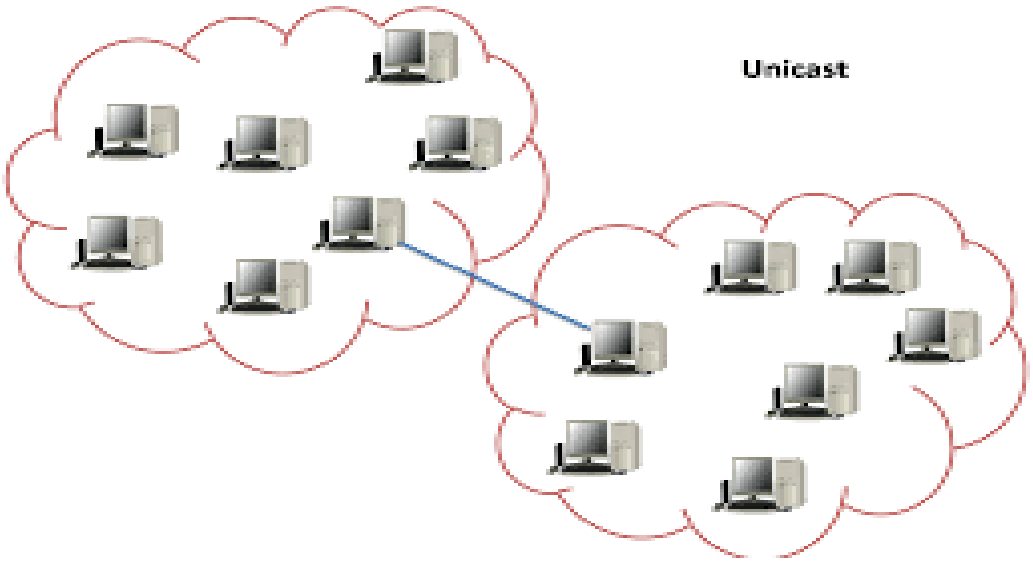
SUBMITTED BY

DHEVA DHARSHINIE-20L108
SHEENA-20L141

SANGEETHA-21L416

UNICASTING

- In computer networking, unicast is a one-to-one transmission from one point in the network to another point; that is, one sender and one receiver, each identified by a network address.



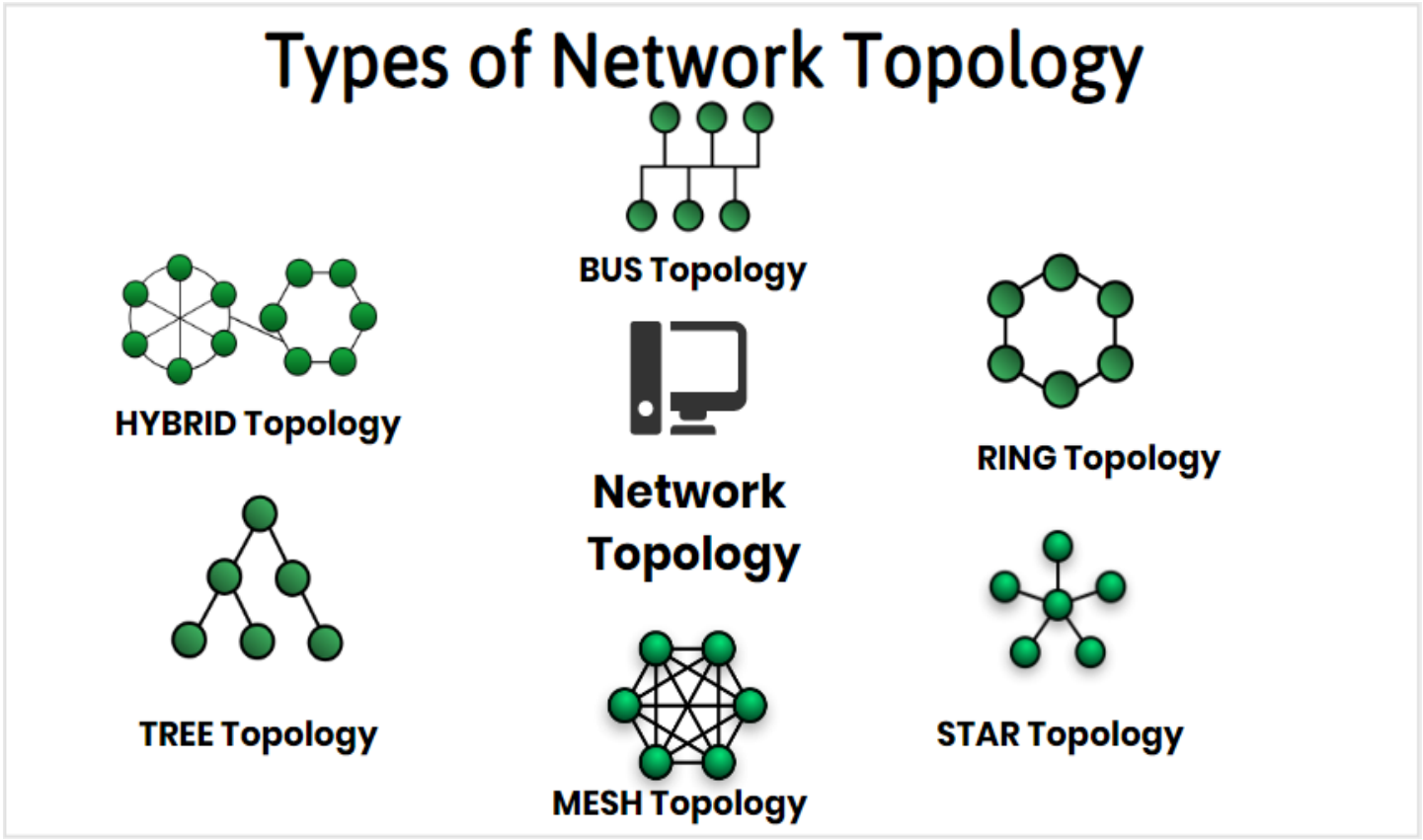
UNICAST ROUTING

- Routing unicast data over the internet is called unicast routing. It is the simplest form of routing because the destination is already known. Hence the router just has to look up the routing table and forward the packet to next hop.
- Class A , Class B , Class C supports unicast routing
- Class A - 0 to 127
- Class B - 128-191
- Class C - 192-223

TOPOLOGIES

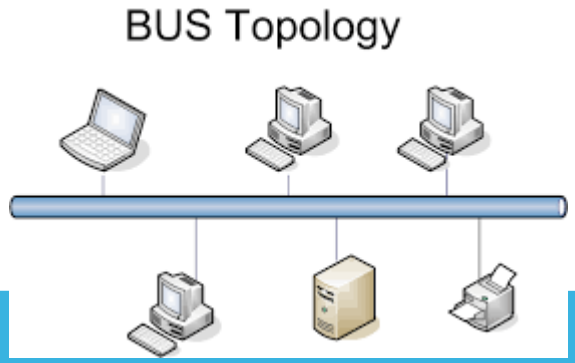
- Topologies define the structure of the network of how all components are interconnected to each other
- There are two types of topology : Physical and Logical topology
- A logical topology is how devices appear connected to the user.
- A physical topology is how they are actually interconnected with wires and cables.

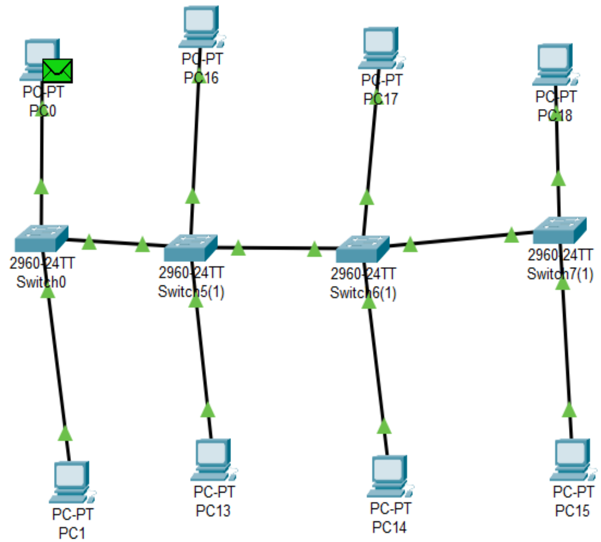
TYPES OF NETWORK TOPOLOGY

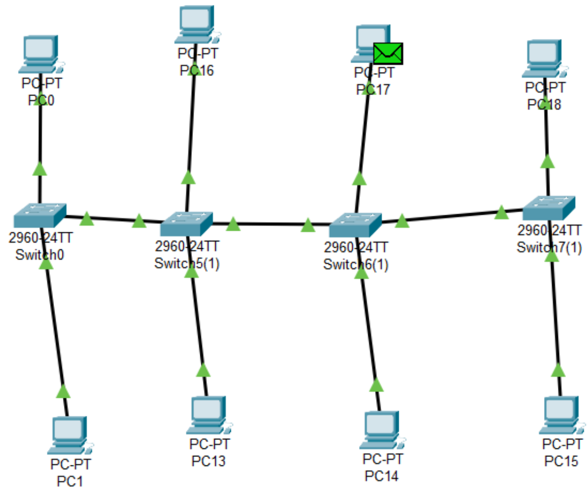


BUS TOPOLOGY

- The bus topology is designed in such a way that all the stations are connected through a single cable known as backbone cable
- Each node is either connected to the backbone cable by drop cable or directly connected to the backbone cable.
- When a node wants to send a message over the network, it puts a message over the network. All the stations available in the network will receive the message whether it has been addressed or not.




PC-PT
PC0
PC-PT
PC16
PC-PT
PC17
PC-PT
PC18
2960-24TT
Switch0
2960-24TT
Switch5(1)
2960-24TT
Switch6(1)
2960-24TT
Switch7(1)
PC-PT
PC1
PC-PT
PC13
PC-PT
PC14
PC-PT
PC15


PC-PT
PC0
PC-PT
PC16
PC-PT
PC17
PC-PT
PC18
2960-24TT
Switch0
2960-24TT
Switch5(1)
2960-24TT
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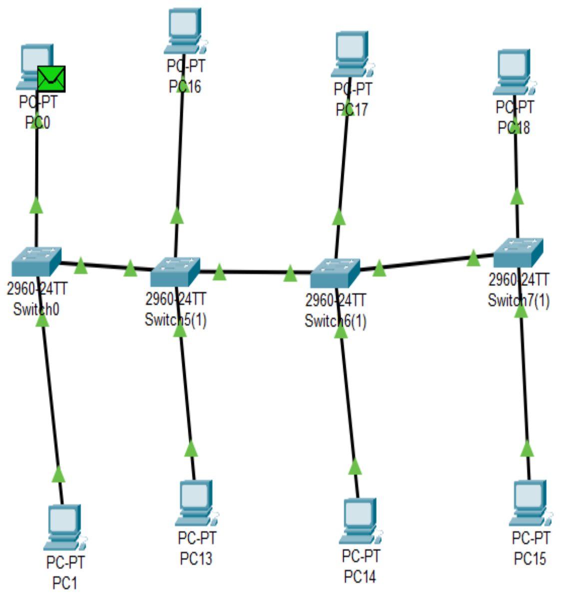
Switch7(1)
PC-PT
PC1
PC-PT
PC13
PC-PT
PC14
PC-PT
PC15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PC0
PC-PT
PC16
PC-PT
PC17
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PC18
2960-24TT
Switch0
2960-24TT
Switch5(1)
2960-24TT
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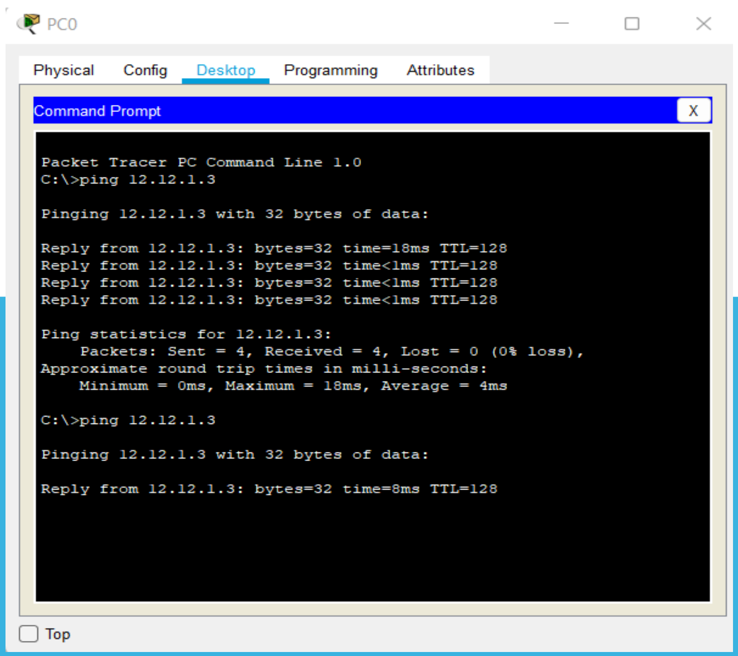
2960-24TT
Switch7(1)
PC-PT
PC1
PC-PT
PC13
PC-PT
PC14
PC-PT
PC15


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 12.12.1.3
Pinging 12.12.1.3 with 32 bytes of data:
Reply from 12.12.1.3: bytes=32 time=18ms TTL=128
Reply from 12.12.1.3: bytes=32 time<1ms TTL=128
Reply from 12.12.1.3: bytes=32 time<1ms TTL=128
Reply from 12.12.1.3: bytes=32 time<1ms TTL=128
Ping statistics for 12.12.1.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 18ms, Average = 4ms
C:\>ping 12.12.1.3
Pinging 12.12.1.3 with 32 bytes of data:
Reply from 12.12.1.3: bytes=32 time=8ms TTL=128
Top

ADVANTAGES OF BUS TOPOLOGY

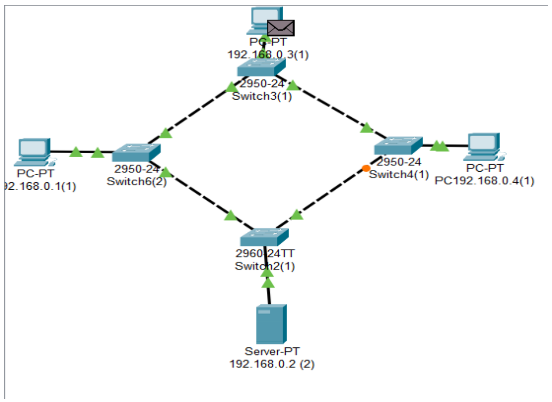
- Limited failure : A failure in one node will not have any effect on other nodes.
- Low-cost cable : In bus topology, nodes are directly connected to the cable without passing through a hub. Therefore, the initial cost of installation is low.
- It is easy to remove or connect devices in this network without affecting any other devices.
- Very cost effective as compared to other network topologies.

DISADVANTAGES OF BUS TOPOLOGY

- Extensive cabling : A bus topology is quite simpler, but still it requires a lot of cabling
- If two nodes send the message simultaneously, then the message from both the nodes collide with each other.
- It requires specialized test equipment to determine the cable faults. If any fault occurs in the cable, then it would disrupt the communication for all the nodes

RING TOPOLOGY

- Ring topology is like a bus topology, but with connected ends.
- The node that receives the message from the previous computer will retransmit to the next node.
- The data flows in one direction, i.e., it is unidirectional.
- It has no terminated ends, i.e., each node is connected to other node and having no termination point.
- The most common access method of the ring topology is Token passing.
- A token moves around the network, and it is passed from computer to computer until it reaches the destination.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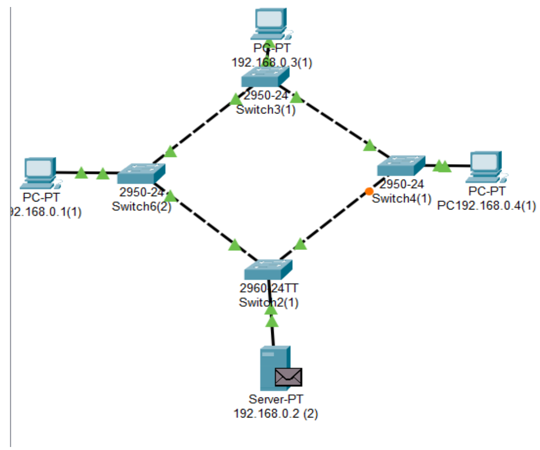
2950-24
Switch3(1)
PC-PT
2.168.0.1(1)
2950-24
Switch6(2)
2950-24
Switch4(1)
PC-PT
PC192.168.0.4(1)
2960 24TT
Switch2(1)
Server-PT
192.168.0.2 (2)


PC-PT
192.168.0.3(1)
2950-24
Switch3(1)
PC-PT
2.168.0.1(1)
2950-24
Switch6(2)
2950-24
Switch4(1)
PC-PT
PC192.168.0.4(1)
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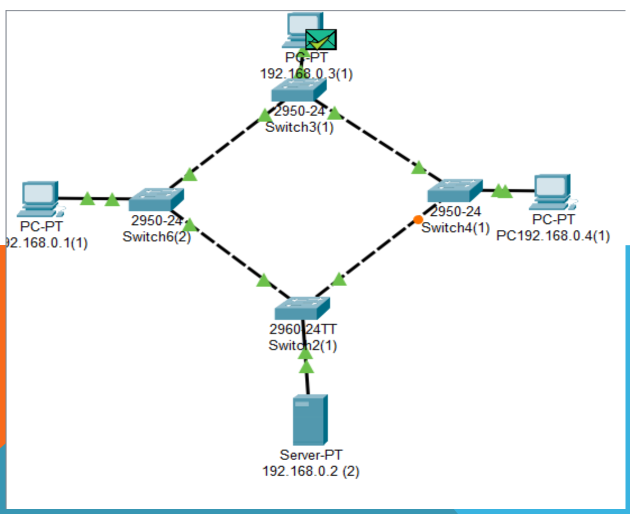
Switch2(1)
Server-PT
192.168.0.2 (2)


PC-PT
192.168.0.3(1)
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Switch6(2)
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PC-PT
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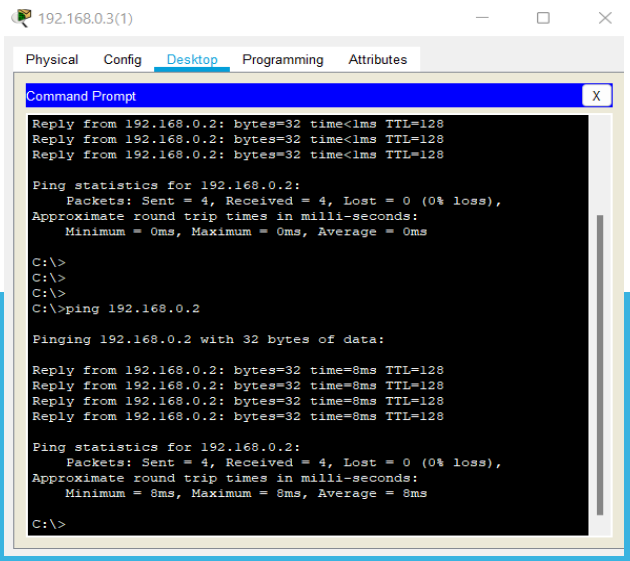
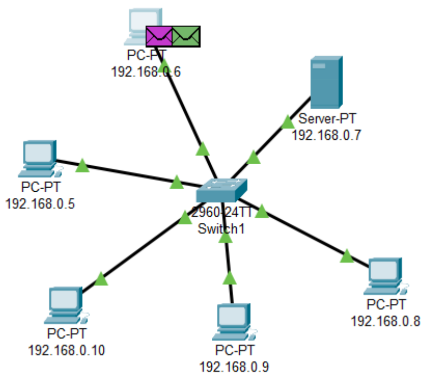
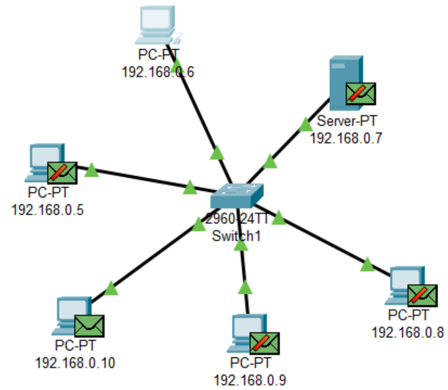
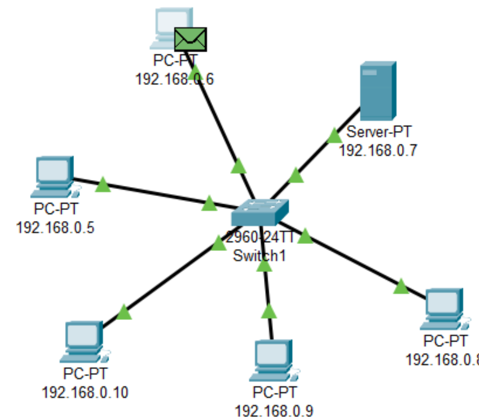
Switch2(1)
Server-PT
192.168.0.2 (2)


192.168.0.3(1)
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
C:\>
C:\>
C:\>ping 192.168.0.2
Pinging 192.168.0.2 with 32 bytes of data:
Reply from 192.168.0.2: bytes=32 time=8ms TTL=128
Reply from 192.168.0.2: bytes=32 time=8ms TTL=128
Reply from 192.168.0.2: bytes=32 time=8ms TTL=128
Reply from 192.168.0.2: bytes=32 time=8ms TTL=128
Ping statistics for 192.168.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 8ms, Maximum = 8ms, Average = 8ms
C:\>

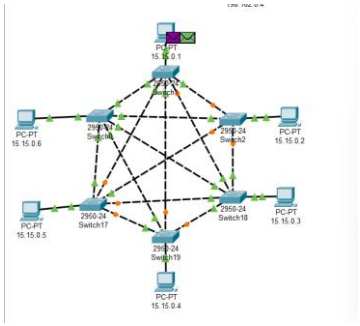
STAR TOPOLOGY

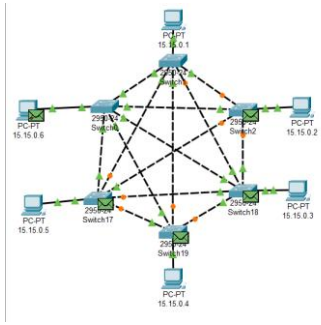


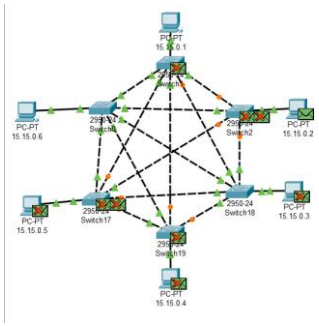


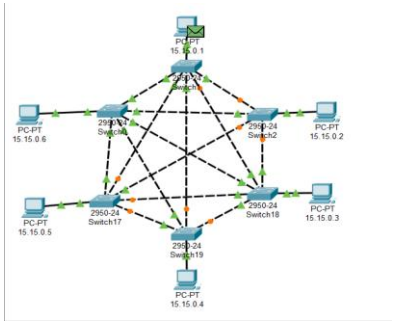


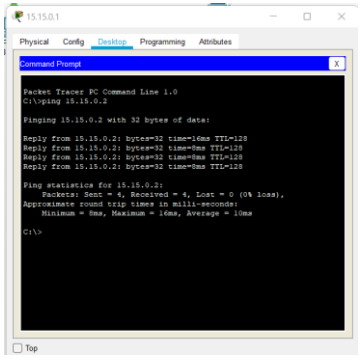
MESH TOPOLOGY

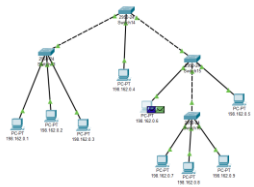


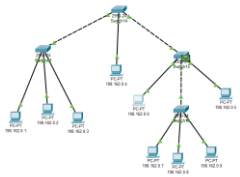


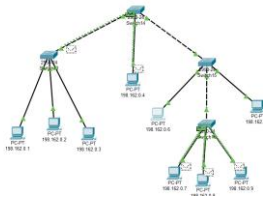


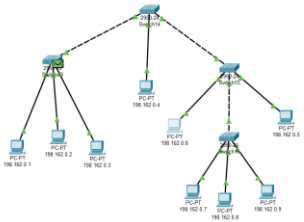


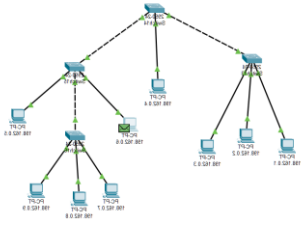


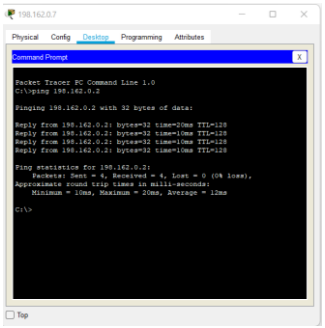











198.162.0.7
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 198.162.0.2
Pinging 198.162.0.2 with 32 bytes of data:
Reply from 198.162.0.2: bytes=32 time=20ms TTL=128
Reply from 198.162.0.2: bytes=32 time=10ms TTL=128
Reply from 198.162.0.2: bytes=32 time=10ms TTL=128
Reply from 198.162.0.2: bytes=32 time=10ms TTL=128
Ping statistics for 198.162.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 10ms, Maximum = 20ms, Average = 12ms
C:\>
Top

HYBRID TOPOLOGY