



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

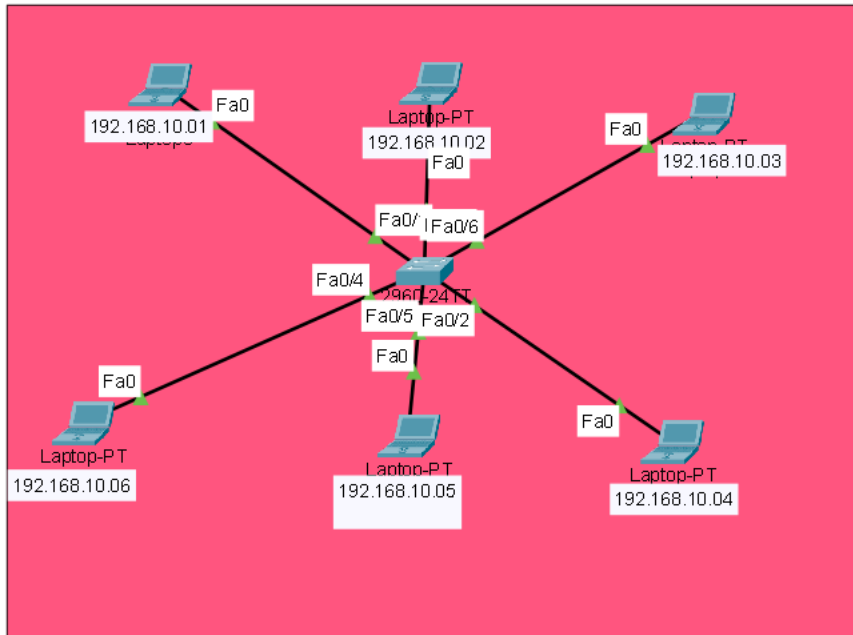
DEPARTMENT OF COMPUTER SCIENCE

COMPUTER NETWORKS LAB

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Class	CS-A
Lab	04
Course	Computer Networks
Date	02-October-25
Submitted To	Lec. Naveed Yousaf

IN LAB TASKS

1. Label each Laptop with unique ip address.
2. Highlight different sections (3).



3. ping Laptop1 to Laptop6.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.02

Pinging 192.168.10.02 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time=1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

4. ping Laptop2 to Laptop5.

```
Pinging 192.168.10.04 with 32 bytes of data:

Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=3ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>
```

5. ping Laptop6 to Laptop3.

```
C:\>ping 192.168.10.03



Pinging 192.168.10.03 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=1ms TTL=128





Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

6. Send packet Laptop2 to Laptop4 (Real time).



Realtime Simulation										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop1	Laptop0	ICMP		0.000	N	0	(edit)	(delete)

7. Send packet Laptop5 to Laptop1(Simulation).

Event List Realtime Simulation										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	In Progress	Laptop1	Laptop0	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Laptop5	Laptop1	ICMP		0.000	N	1	(edit)	(delete)

8. Identify topology name

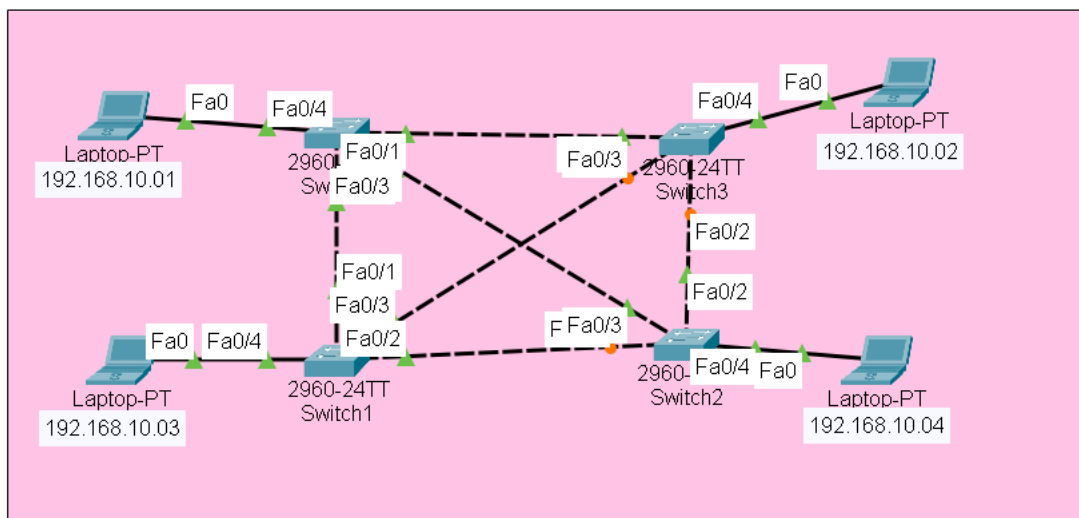
Star Topology.

Realtime Simulator										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop1	Laptop0	ICMP		0.000	N	0	(edit)	(delete)

Lab Task 02

Mesh Topology (LAN)

1. Create a network with 4 PCs (PC1, PC2, PC3, PC4).
2. Connect them in a Mesh topology using switches (each PC must have multiple paths to others).
7. Label each Laptop with unique ip address.
8. Highlight different sections.



4. Assign IP addresses to PCs using the block 192.168.10.0/24.

GLOBAL	FastEthernet0	
Settings	Port Status	<input checked="" type="checkbox"/> On
Algorithm Settings	Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
INTERFACE	Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
FastEthernet0	MAC Address	000C.8547.011D
Bluetooth	<div>IP Configuration</div> <div> <input type="radio"/> DHCP <input checked="" type="radio"/> Static </div> <div> IPv4 Address: 192.168.10.1 Subnet Mask: 255.255.255.0 </div> <div> <div>IPv6 Configuration</div> <div> <input type="radio"/> Automatic <input checked="" type="radio"/> Static </div> <div> IPv6 Address: <input type="text"/> / <input type="text"/> </div> </div>	
	Link Local Address: FE80::20C:85EE:FE47:11D	

5. Subnet Mask → 255.255.255.0

6. Test connectivity by pinging between all PCs.

Pinging Laptop 1 with laptop 2, 3, and 4:

```
Pinging 192.168.10.02 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time=1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

```
C:\>ping 192.168.10.03

Pinging 192.168.10.03 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

```
Pinging 192.168.10.04 with 32 bytes of data:

Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=3ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>
```

Pinging Laptop 02 with 1, 3 and 4:

```
Pinging 192.168.10.01 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

```
C:\>ping 192.168.10.03

Pinging 192.168.10.03 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time=1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

```
C:\>ping 192.168.10.04

Pinging 192.168.10.04 with 32 bytes of data:









Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

3. Example: Use 4 switches and send packets, interconnect them so redundancy exists.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	--	Laptop1	Laptop0	ICMP		0.000	N	0	(edit)	(delete)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop3	Laptop1	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Laptop2	Laptop0	ICMP		0.000	N	2	(edit)	(delete)
	Successful	Laptop0	Laptop3	ICMP		0.000	N	3	(edit)	(delete)
	Successful	Laptop3	Laptop2	ICMP		0.000	N	4	(edit)	(delete)

Lab Task 03

Tree Topology (LAN)

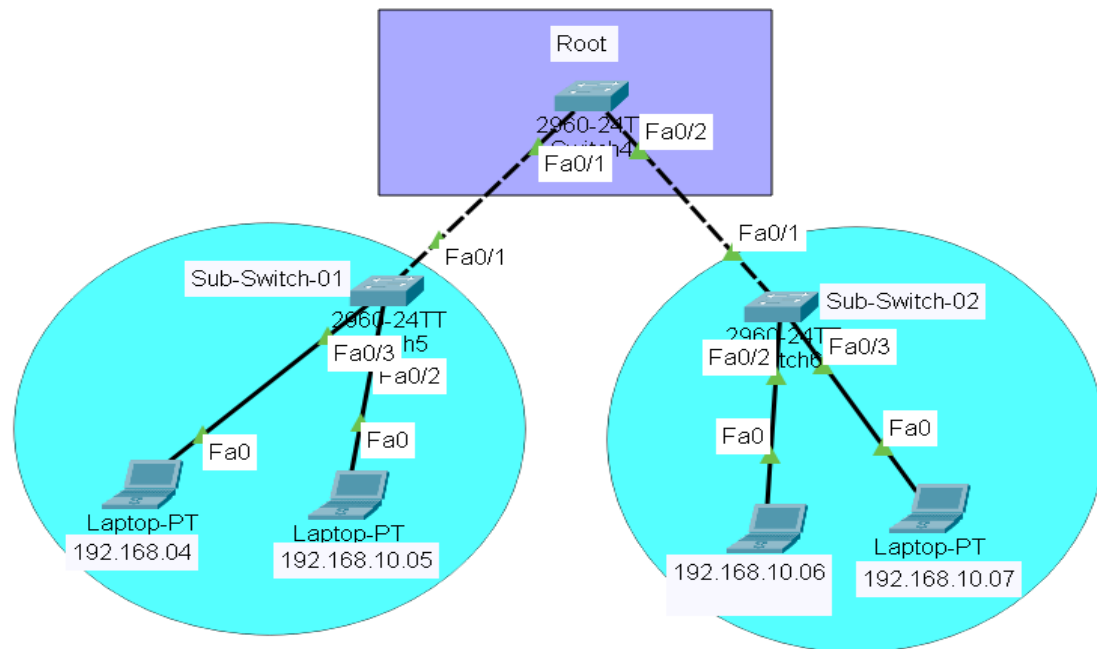
1. Build a Tree topology with:

- **One main switch (Root).**
- **Two child switches connected to the main switch.**
- **Each child switch connects to 2 PCs (total 4 PCs).**

2. Assign IP addresses from 192.168.20.0/24

- **Subnet Mask → 255.255.255.0**

3. Label each Laptop with unique ip address.



4. Test connectivity by pinging from one PC to all others.

```
C:\>ping 192.168.10.04

Pinging 192.168.10.04 with 32 bytes of data:

Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

```
Pinging 192.168.10.02 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time=1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```


5. Check Results in Both Cases Real-time and Simulation mode ad Screen Shots.

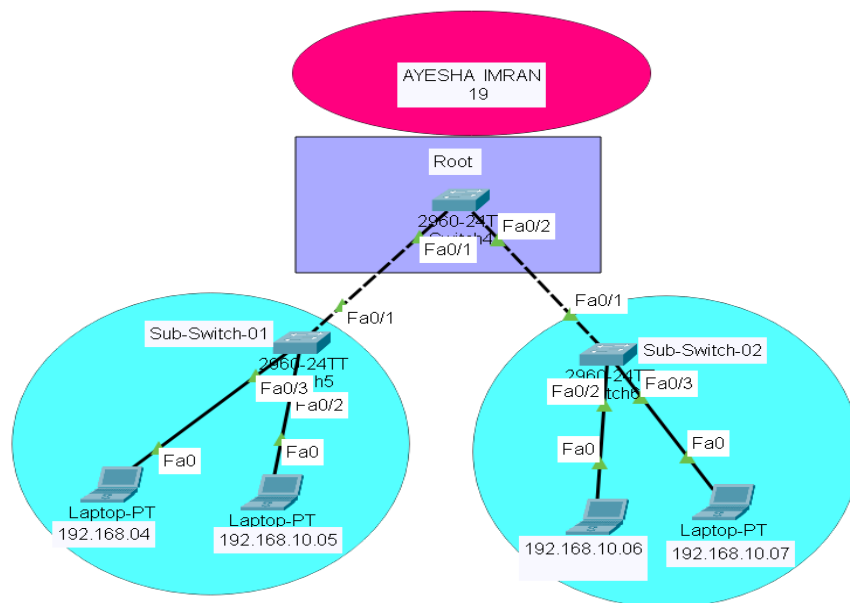
Cases Real-time:

Realtime Simulation										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop2	Laptop0	ICMP		0.000	N	2	(edit)	(delete)
	Successful	Laptop0	Laptop3	ICMP		0.000	N	3	(edit)	(delete)
	Successful	Laptop3	Laptop2	ICMP		0.000	N	4	(edit)	(delete)

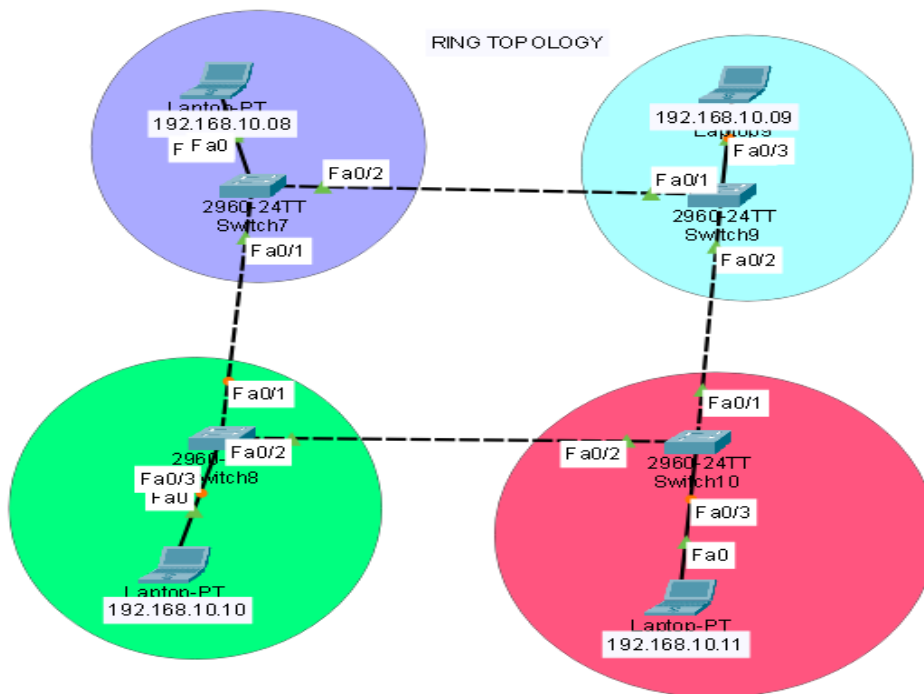
Simulation:

Event List Realtime Simulation										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop1	Laptop0	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Laptop3	Laptop1	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Laptop2	Laptop0	ICMP		0.000	N	2	(edit)	(delete)
	Successful	Laptop0	Laptop3	ICMP		0.000	N	3	(edit)	(delete)

6. Label and Highlight Topology with Your name and ID



RING TOPOLOGY:



BUS TOPOLGY:

