NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

COMPUTER NETWORKS LAB

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Class	CS-A
Lab	08
Course	Computer Networks
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Submitted To	Lec. Naveed Yousaf
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IN LAB TASKS

Warm up Task [30 Minutes]

Answer each question in your own words (3 to 4 lines)

1. What is DHCP?

- **DHCP (Dynamic Host Configuration Protocol)** is a network management protocol used to automatically assign IP addresses and other configuration parameters (like subnet mask, default gateway, and DNS servers) to devices on a network.
- It eliminates the need for manual IP configuration.

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2. Why is DHCP important?

- **Automation:** Saves administrators from manually configuring IP addresses for every device.
- **Consistency:** Prevents IP conflicts by ensuring unique assignments.
- **Scalability:** Makes it easier to manage large networks with hundreds or thousands of devices.
- **Flexibility:** Supports mobile devices that frequently join/leave networks.

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3. How does DHCP work?

The DHCP process follows a **DORA sequence** (Discover, Offer, Request, Acknowledge):

- **Discover:** A client broadcasts a request asking for an IP address.
- **Offer:** The DHCP server responds with an available IP address and configuration details.
- **Request:** The client requests to use the offered IP address.
- **Acknowledge:** The server confirms and finalizes the lease, allowing the client to use the IP.

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4. What is a DHCP lease?

- A **DHCP lease** is the temporary assignment of an IP address to a client by the DHCP server.
- The lease includes a **duration** (time period) during which the client can use the IP.
- Once the lease expires, the client must renew it or request a new IP.

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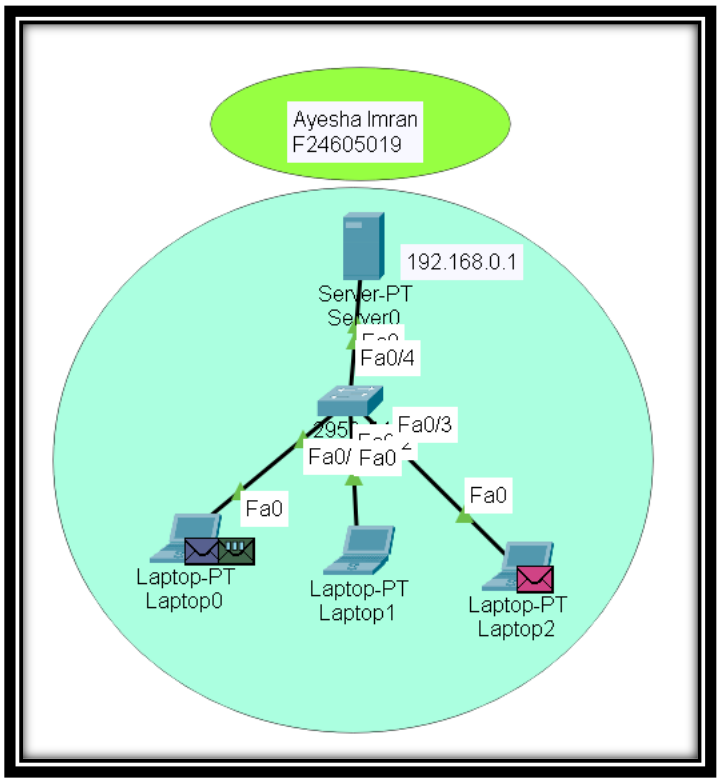
5. Explain the DHCP lease renewal process.

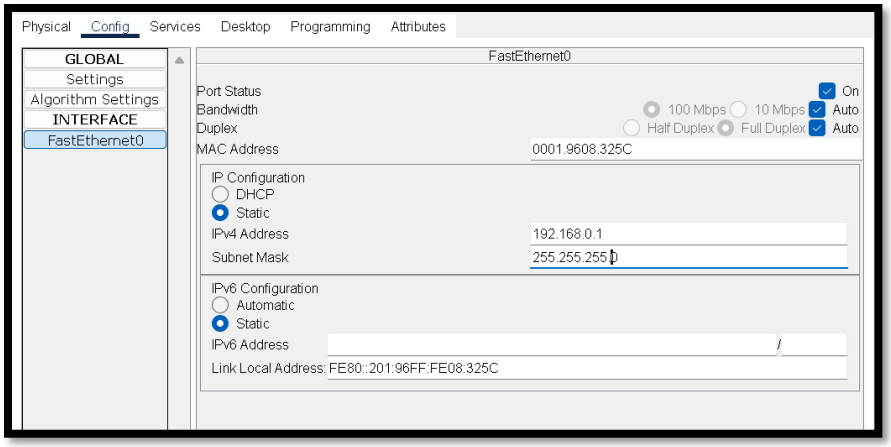
- **T1 (Renewal Time):** When 50% of the lease time has passed, the client sends a **unicast DHCPREQUEST** to the server that granted the lease, asking to renew.
- **T2 (Rebinding Time):** If the server doesn't respond by 87.5% of the lease time, the client broadcasts a DHCPREQUEST to any available DHCP server.
- **Expiration:** If no server responds before the lease expires, the client must stop using the IP and restart the DORA process to obtain a new one.

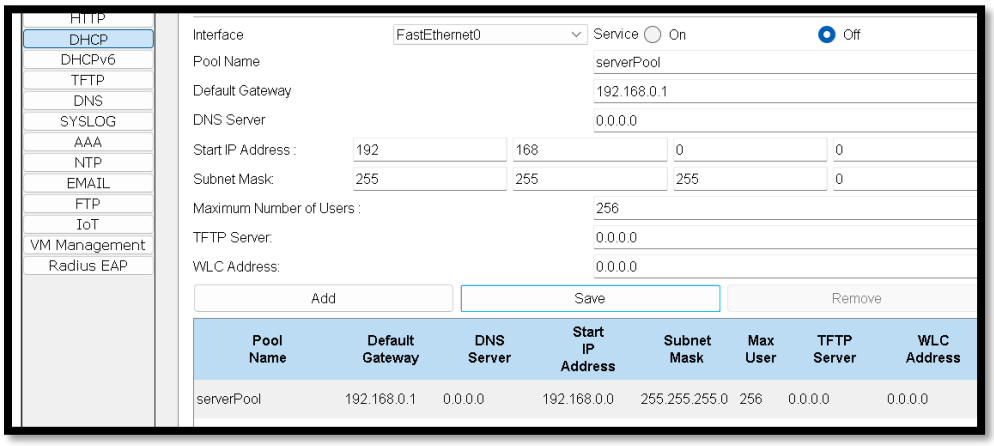
Task 1

By using Drag and drop draw topology diagram as Shown below and attach screenshot of each step.

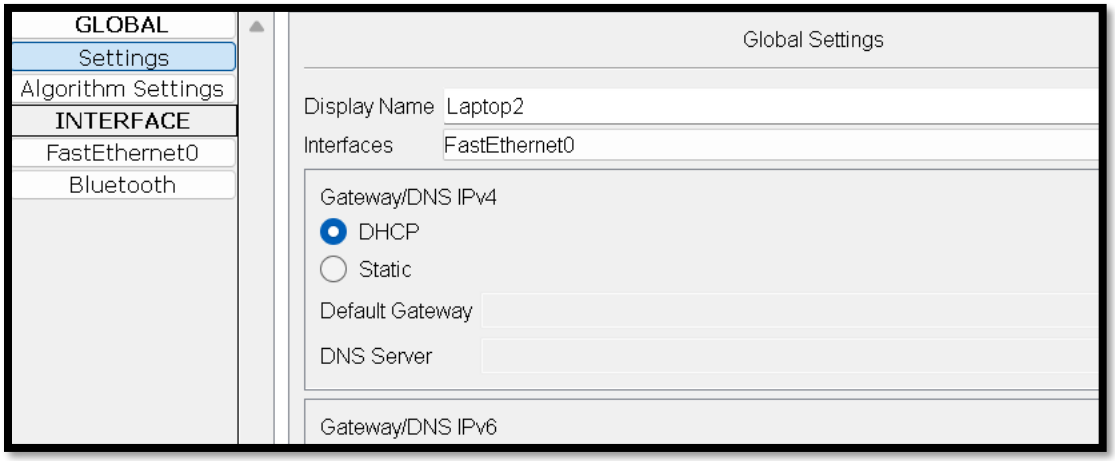


Server Configuration:

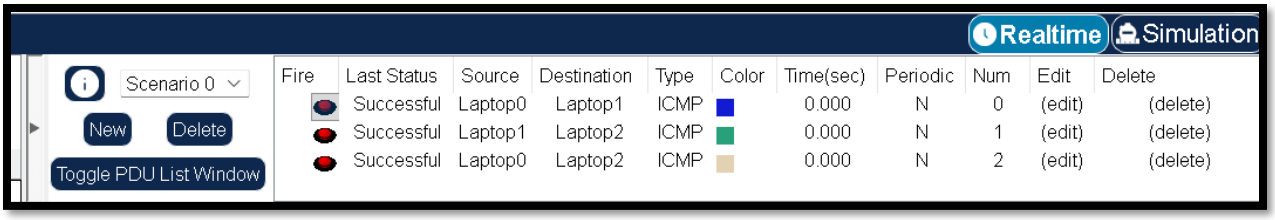




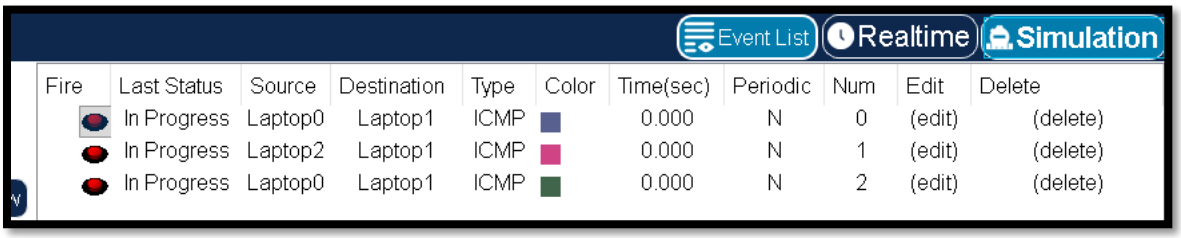
PC's Configuration:



Real Time:

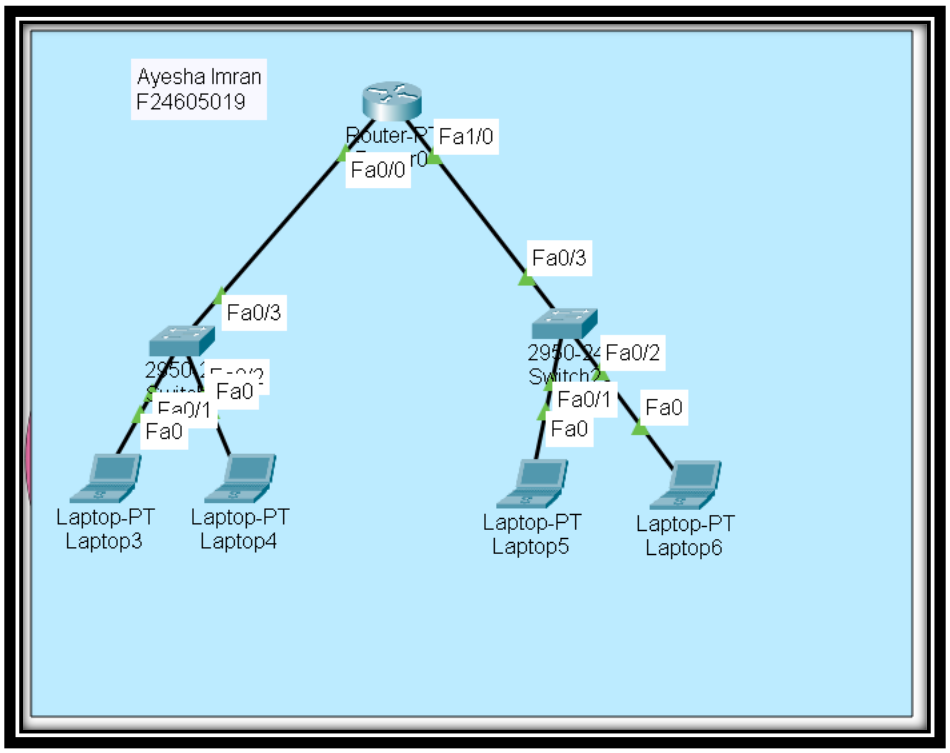


Simulation:

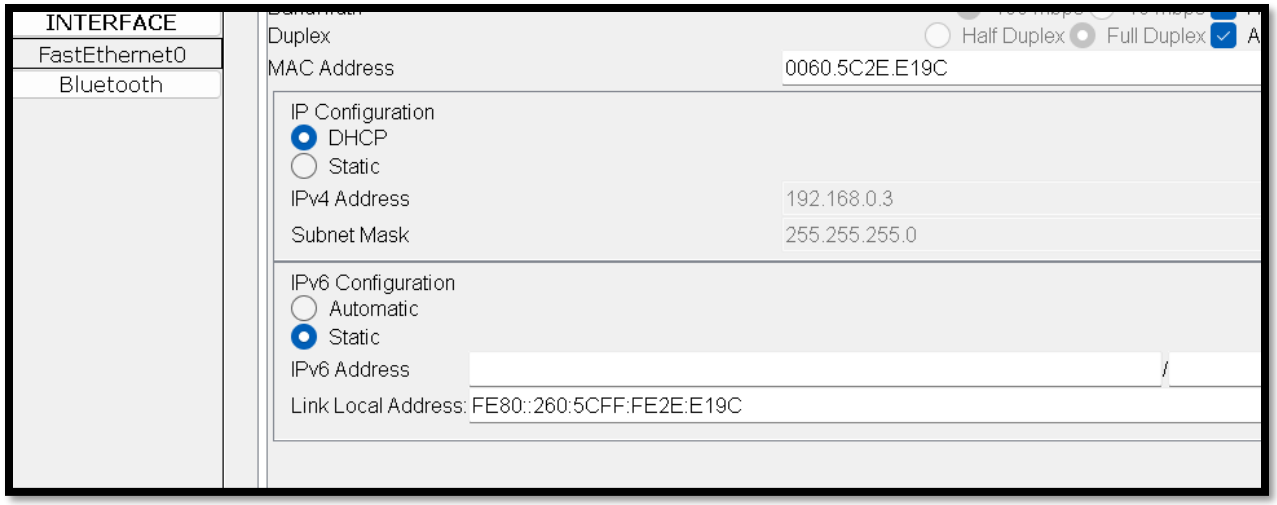


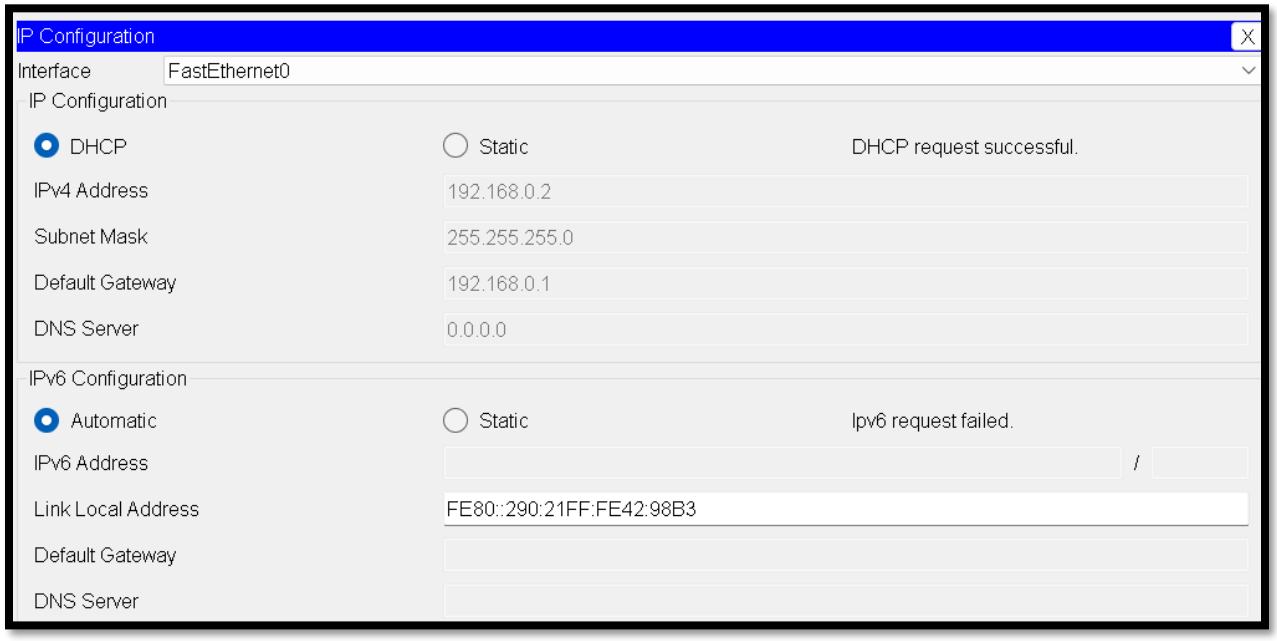
Task 2:

By using Drag and drop draw topology diagram as Shown below and attach screenshot of each step.



Pc's Configuration:



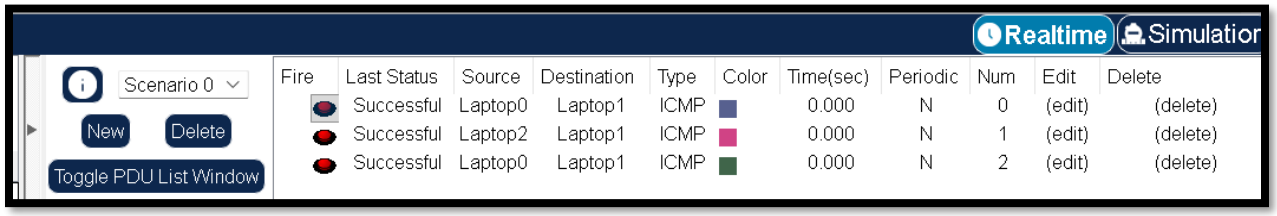


Router Configuration For Network1 And Network2:

```
Router#config ter
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#do write memory
Building configuration...
[OK]
Router(config-if)#ip dhcp pool net1
Router(dhcp-config)#default-router 192.168.0.1
Router(dhcp-config)#network 192.168.0.0 255.255.255.0
Router(dhcp-config)#exit
Router(config)#int fa1/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#do write memory
Building configuration...
[OK]
Router(config-if)#ip dhcp pool net2
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#exit]exit
                        ^
% Invalid input detected at '^' marker.

Router(dhcp-config)#
```

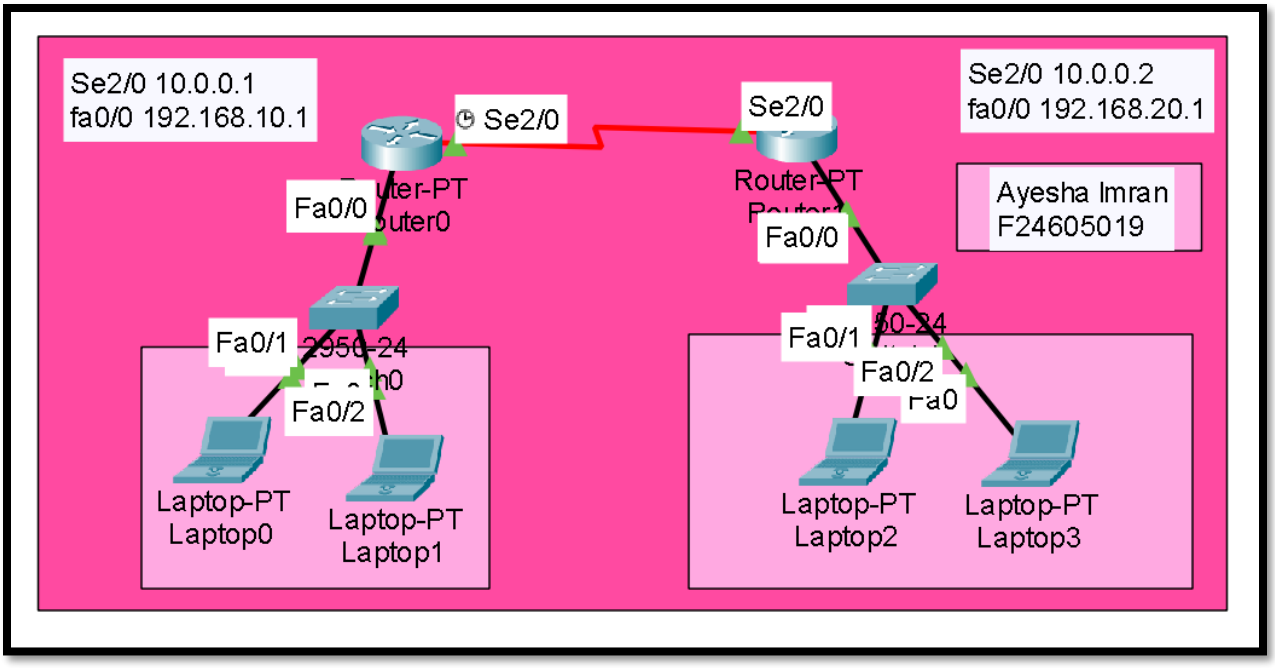
Real Time Packets:



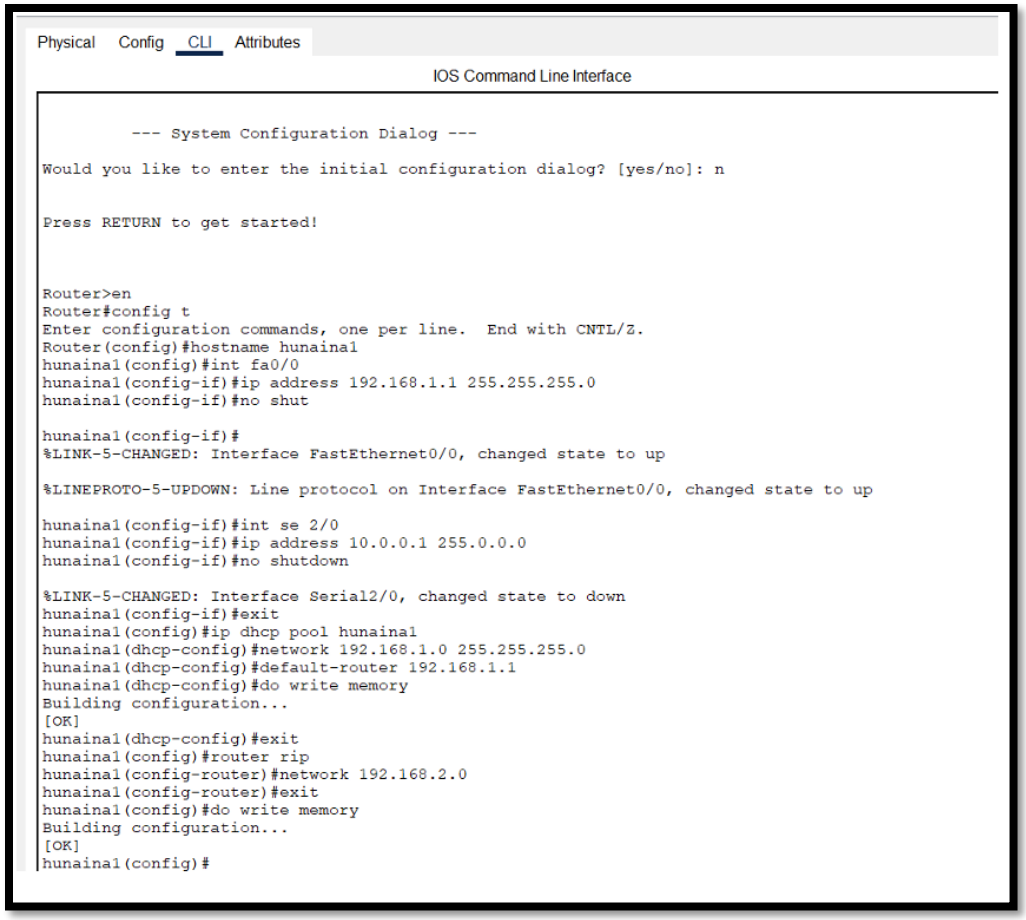
Task 3

You are tasked with setting up a network infrastructure using Cisco Packet Tracer. The goal is to implement DHCP services through Two routers and name each network with your own name example network 1 (dhcp pool abc1) and network 2(dhcp pool abc2)

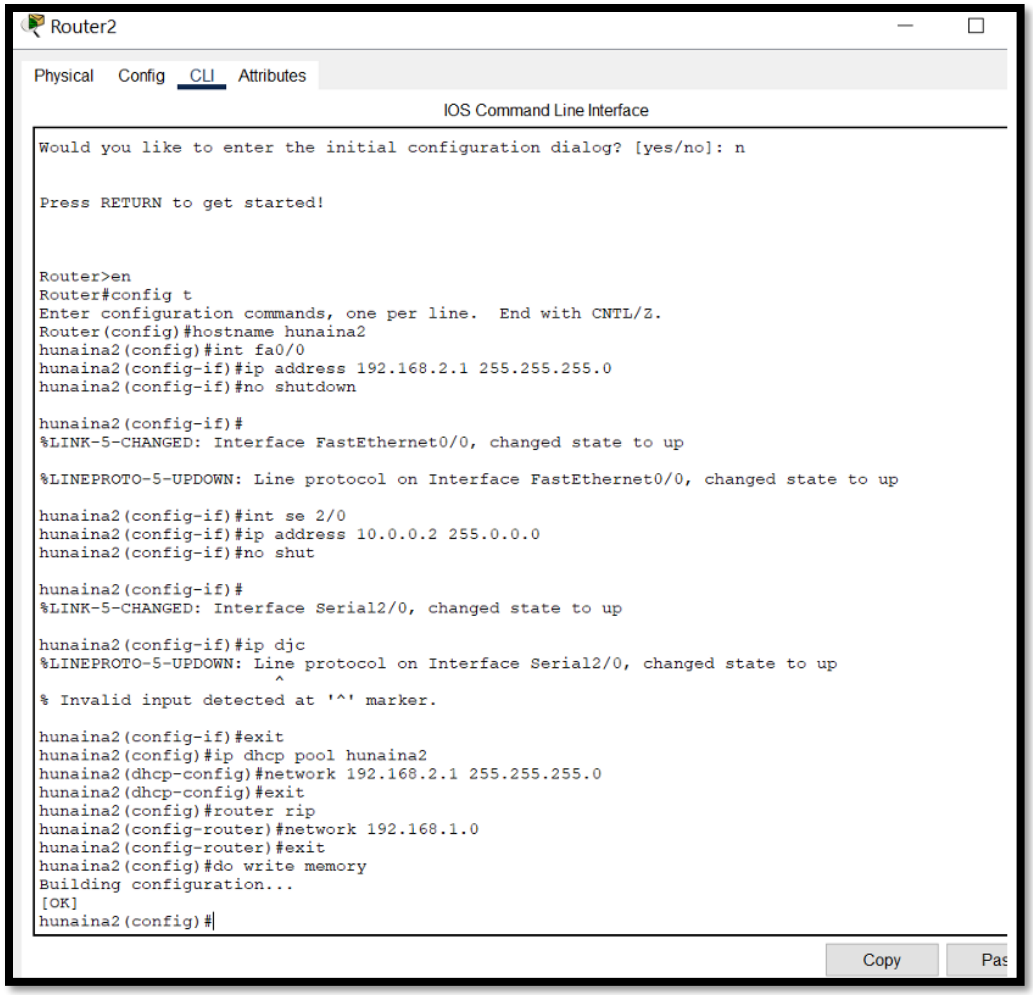
- Highlight different sections
- Send packets (Real time).
- Send packets(Simulation).
- Take screen shots of every step



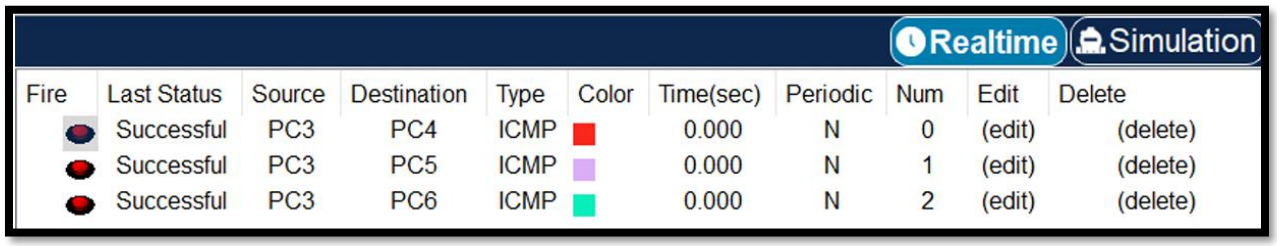
Router 1 Configuration:



Router 2 configuration:

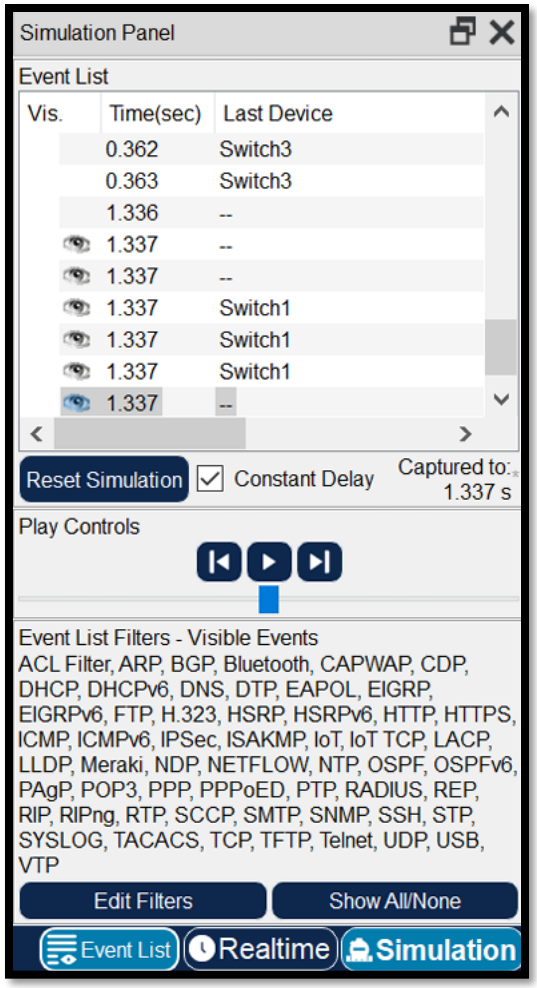


Real Time:



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC3	PC4	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC3	PC5	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC3	PC6	ICMP		0.000	N	2	(edit)	(delete)

Simulation:



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC3	PC4	ICMP		0.351	N	0	(edit)	(delete)
	Successful	PC3	PC5	ICMP		0.351	N	1	(edit)	(delete)
	Successful	PC3	PC6	ICMP		0.351	N	2	(edit)	(delete)