

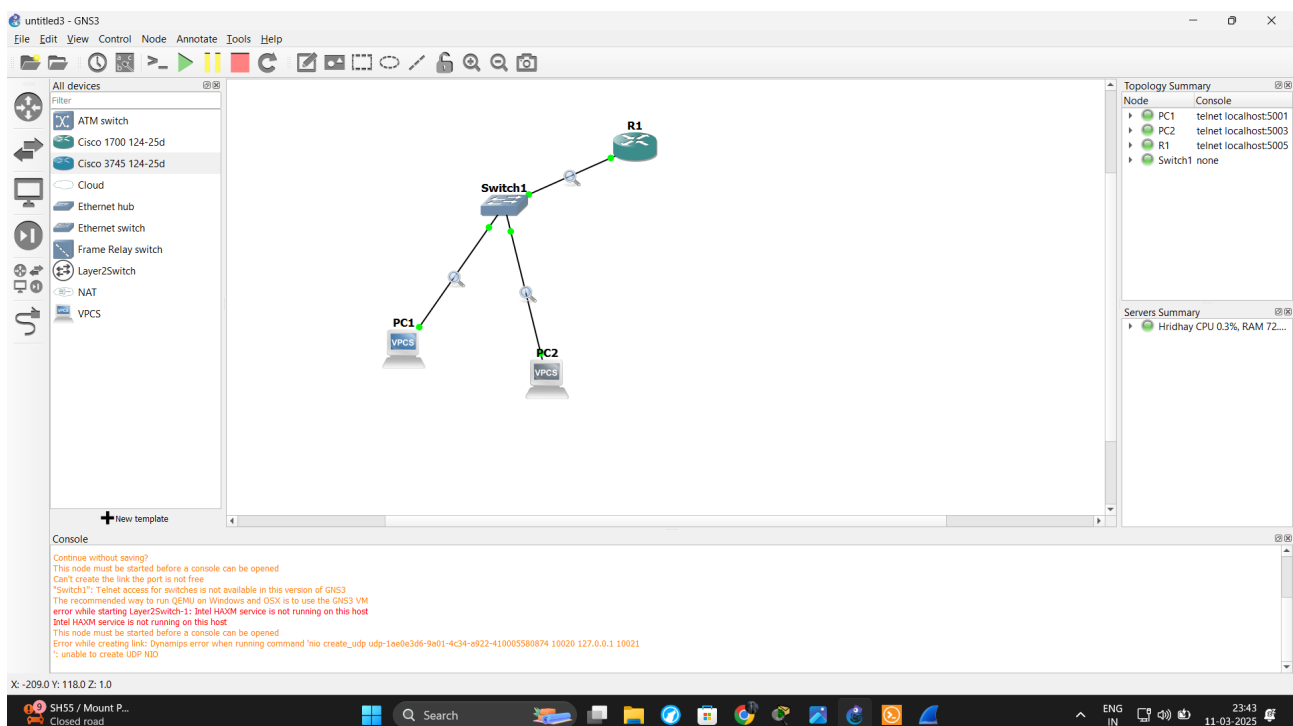
Dynamic Host Configuration Protocol is a network protocol that is used to automate the process of assigning ip addresses and other network configurations to devices in a network instead of manually assigning them.

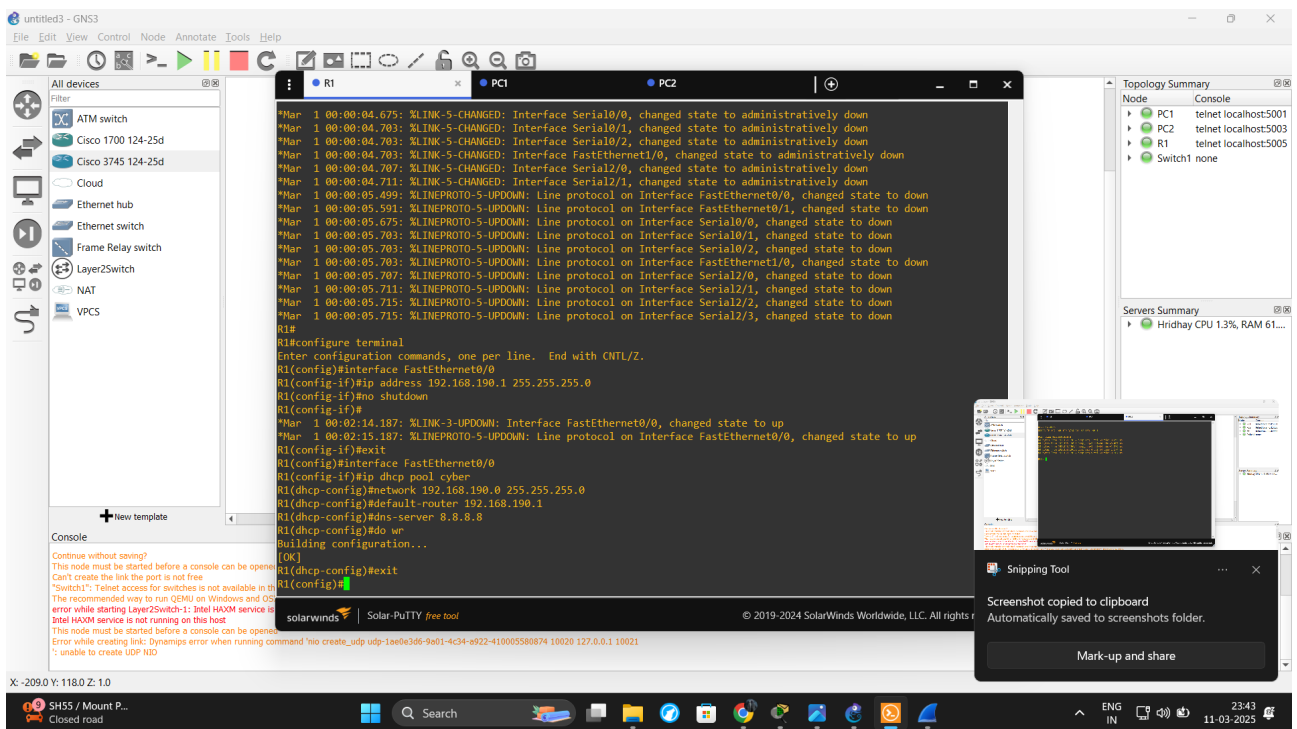
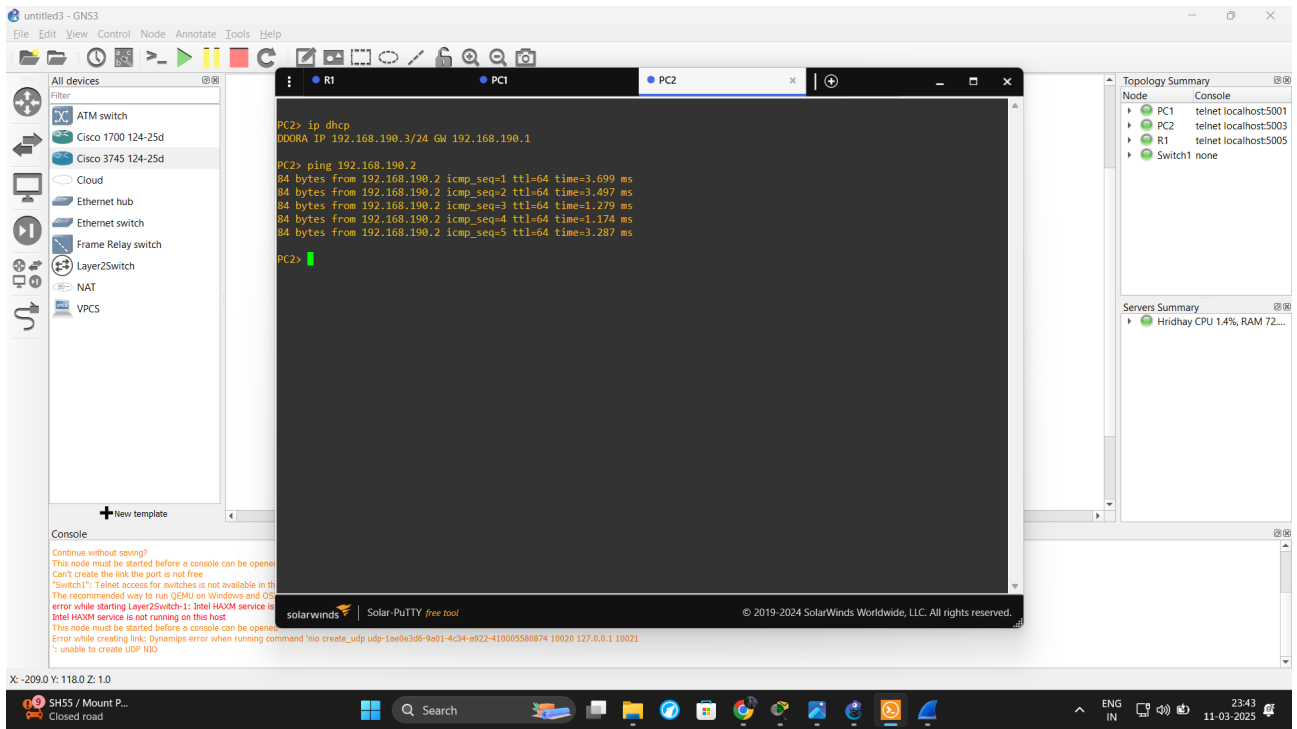
Working of DHCP:

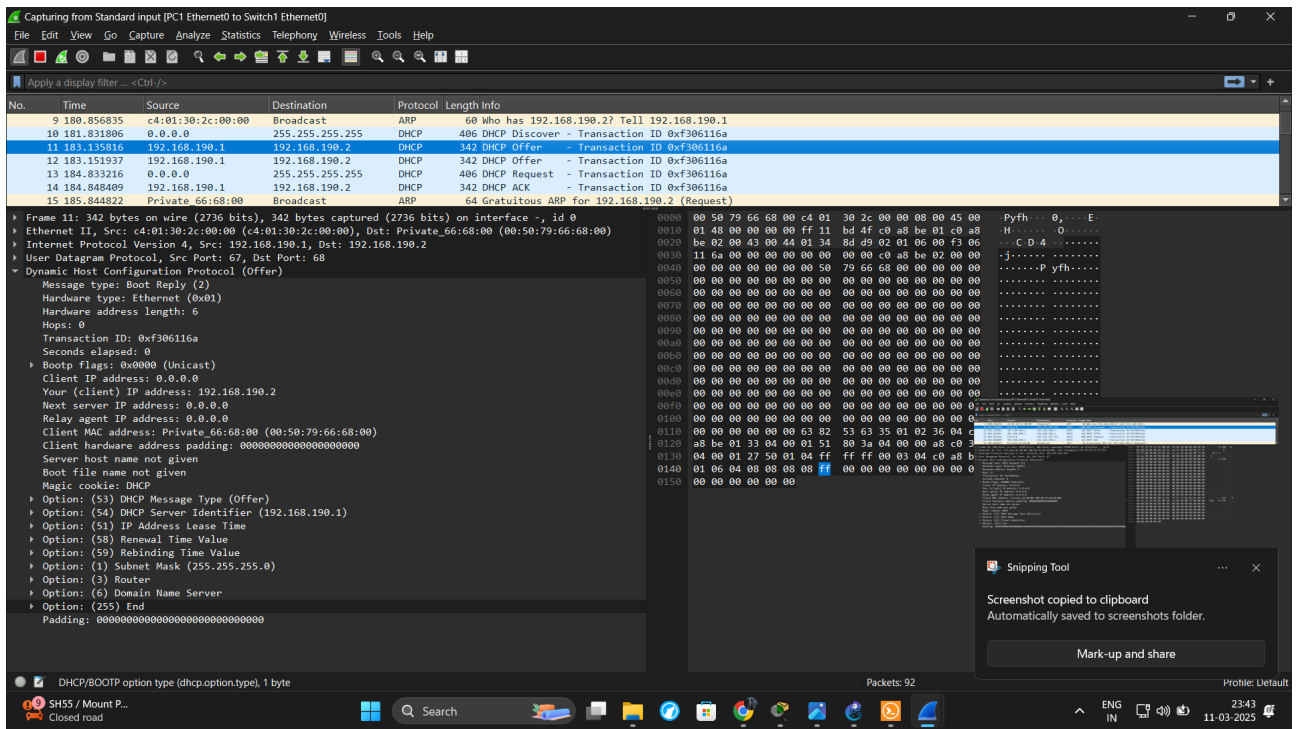
- 1) When a new node is added to the network, it broadcasts a DHCP discover message to all the nodes in the network in order to find the DHCP Server.
- 2) The server will then broadcast a DHCP offer message to the new node specifying the allotted ip address and other configurations.
- 3) The new node accepts this message and then broadcasts a ARP request message to check if other hosts on the network have the same ip address.
- 4) If the allotted address is unique then the new node broadcasts a DHCP request message to the DHCP server saying that it has accepted the allotted ip address and configuration.
- 5) The DHCP server then sends a DHCP acknowledgment message to confirm the new node's IP address lease, completing the IP address allocation process.

Experiment Configurations:

- 1) Open GNS3, design and make the connections according to the network in the image.
- 2) Right click all the connections of each end node and select capture option to open Wireshark and capture the traffic flowing through the connection.
- 3) Apply DHCP filter to see and analyze DHCP messages.
- 4) Set a pool of ip addresses for that can be used by the dhcp protocol to allocate ip addresses.
- 5) Configure all devices to use dhcp protocol to collect the ip addresses.







Capturing from Standard input [PC1 Ethernet0 to Switch1 Ethernet0]

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter -- <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
9	180.856835	c4:01:30:2c:00:00	Broadcast	ARP	60	Who has 192.168.190.2? Tell 192.168.190.1
10	181.831806	0.0.0.0	255.255.255.255	DHCP	406	DHCP Discover - Transaction ID 0xf306116a
11	183.135816	192.168.190.1	192.168.190.2	DHCP	342	DHCP Offer - Transaction ID 0xf306116a
12	183.151937	192.168.190.1	192.168.190.2	DHCP	342	DHCP Offer - Transaction ID 0xf306116a
13	184.833216	0.0.0.0	255.255.255.255	DHCP	406	DHCP Request - Transaction ID 0xf306116a
14	184.848409	192.168.190.1	192.168.190.2	DHCP	342	DHCP ACK - Transaction ID 0xf306116a
15	185.844822	Private 66:68:00	Broadcast	ARP	64	Gratuitous ARP for 192.168.190.2 (Request)

Frame 14: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface -, id 0

Ethernet II, Src: c4:01:30:2c:00:00 (c4:01:30:2c:00:00), Dst: Private_66:68:00 (00:50:79:66:68:00)

Internet Protocol Version 4, Src: 192.168.190.1, Dst: 192.168.190.2

User Datagram Protocol, Src Port: 67, Dst Port: 68

Dynamic Host Configuration Protocol (ACK)

Message type: Boot Reply (2)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 0

Transaction ID: 0xf306116a

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

Client IP address: 192.168.190.2

Your (client) IP address: 192.168.190.2

Next server IP address: 0.0.0.0

Relay agent IP address: 0.0.0.0

Client MAC address: Private_66:68:00 (00:50:79:66:68:00)

Client hardware address padding: 000000000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (ACK)

Option: (54) DHCP Server Identifier (192.168.190.1)

Option: (51) IP Address Lease Time

Option: (58) Renewal Time Value

Option: (59) Rebinding Time Value

Option: (1) Subnet Mask (255.255.255.0)

Option: (3) Router

Option: (6) Domain Name Server

Option: (255) End

Padding: 00000000000000000000000000000000

Bytes 86-149: Server host name (dhcp.server)

Packets: 122

Profile: Default

78°F Mostly cloudy

Search

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