

Ex. No: 3 DHCP Configuration Using a Router

Date:25-08-2025

Objective

To configure a router to automatically assign IP addresses to client PCs using the Dynamic Host Configuration Protocol (DHCP).

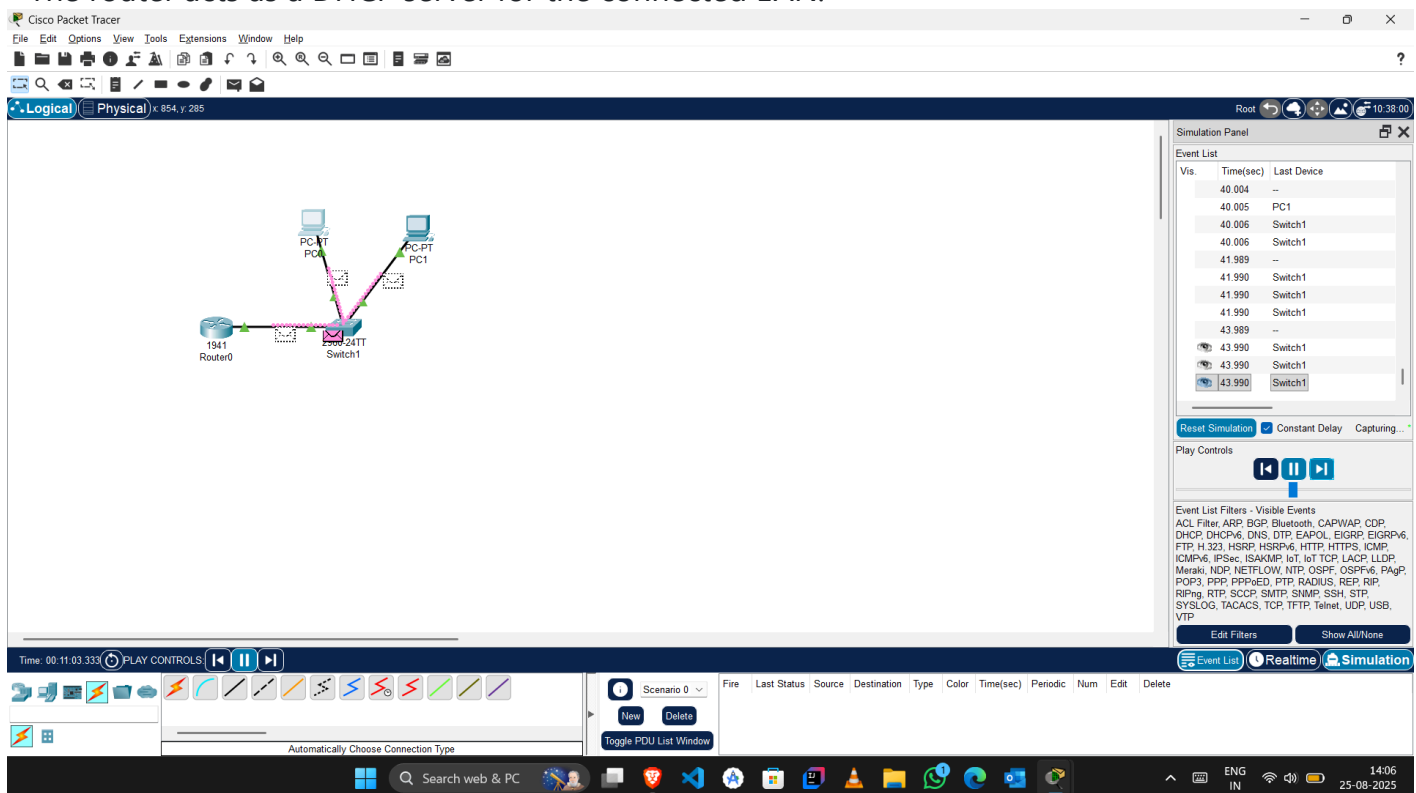
Apparatus/Tools Required

- Cisco Packet Tracer
- 1 Router
- 1 Switch
- 2 PCs
- Straight-through Ethernet cables

Network Topology Diagram

Description:

- PC0 and PC1 are connected to Switch0.
- Switch0 is connected to Router0 on FastEthernet0/0.
- The router acts as a DHCP server for the connected LAN.



IP Addressing Table

Device Interface IP Address Subnet Mask
Router0 FastEthernet0/0 192.168.50.1 255.255.255.0
PC0 NIC DHCP (Auto) Assigned by DHCP
PC1 NIC DHCP (Auto) Assigned by DHCP
DHCP Pool:

- Network Address: 192.168.50.0
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.50.1
- DNS Server: 8.8.8.8
- Excluded IP Range: 192.168.50.1 to 192.168.50.9

Procedure

1. Open Cisco Packet Tracer and add 2 PCs, 1 Switch, and 1 Router.
2. Connect both PCs to the Switch using straight-through cables.
3. Connect the Switch to Router0's FastEthernet0/0.
4. Assign the IP address 192.168.50.1 to the router's FastEthernet0/0 interface.
5. Enable the interface using the no shutdown command.

6. Configure the router as a DHCP server:
 - o Define the DHCP pool with network address, default gateway, and DNS.
 - o Exclude gateway and reserved addresses from the pool.
7. Set both PC0 and PC1 to obtain their IP address via DHCP (auto).
8. Verify that each PC receives an IP address dynamically.
9. Use the ping command to test connectivity between the two PCs.

Commands Used (Router CLI)

bash

CopyEdit

Router> enable

Router# configure terminal

Router(config)# interface fastethernet0/0

Router(config-if)# ip address 192.168.50.1 255.255.255.0

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# ip dhcp excluded-address 192.168.50.1 192.168.50.9

Router(config)# ip dhcp pool MYPOOL

Router(dhcp-config)# network 192.168.50.0 255.255.255.0

Router(dhcp-config)# default-router 192.168.50.1

Router(dhcp-config)# dns-server 8.8.8.8

Router(dhcp-config)# exit

Output (Screenshots)

• DHCP IP configuration shown in PC0 and PC1

The screenshot displays the Cisco Packet Tracer interface with a network topology consisting of a 1941 Router0, a 2960 Switch1, and two PCs (PC0 and PC1). The configuration windows for PC0 and PC1 are open, showing the following details:

PC0 Configuration:

- Interface: FastEthernet0
- MAC Address: 00E0.B069.8111
- IP Configuration: DHCP
- IPv4 Address: 192.168.50.10
- Subnet Mask: 255.255.255.0
- IPv6 Configuration: Automatic
- Link Local Address: FE80::2E0:B0FF:FE69:8111

PC1 Configuration:

- Interface: FastEthernet0
- MAC Address: 00E0.8FDB.ED58
- IP Configuration: DHCP
- IPv4 Address: 192.168.50.11
- Subnet Mask: 255.255.255.0
- IPv6 Configuration: Automatic
- Link Local Address: FE80::2E0:8FFF:FEDB:ED58

The Simulation Panel on the right shows the Event List with visible events for ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, and VTP.

• Router configuration screen

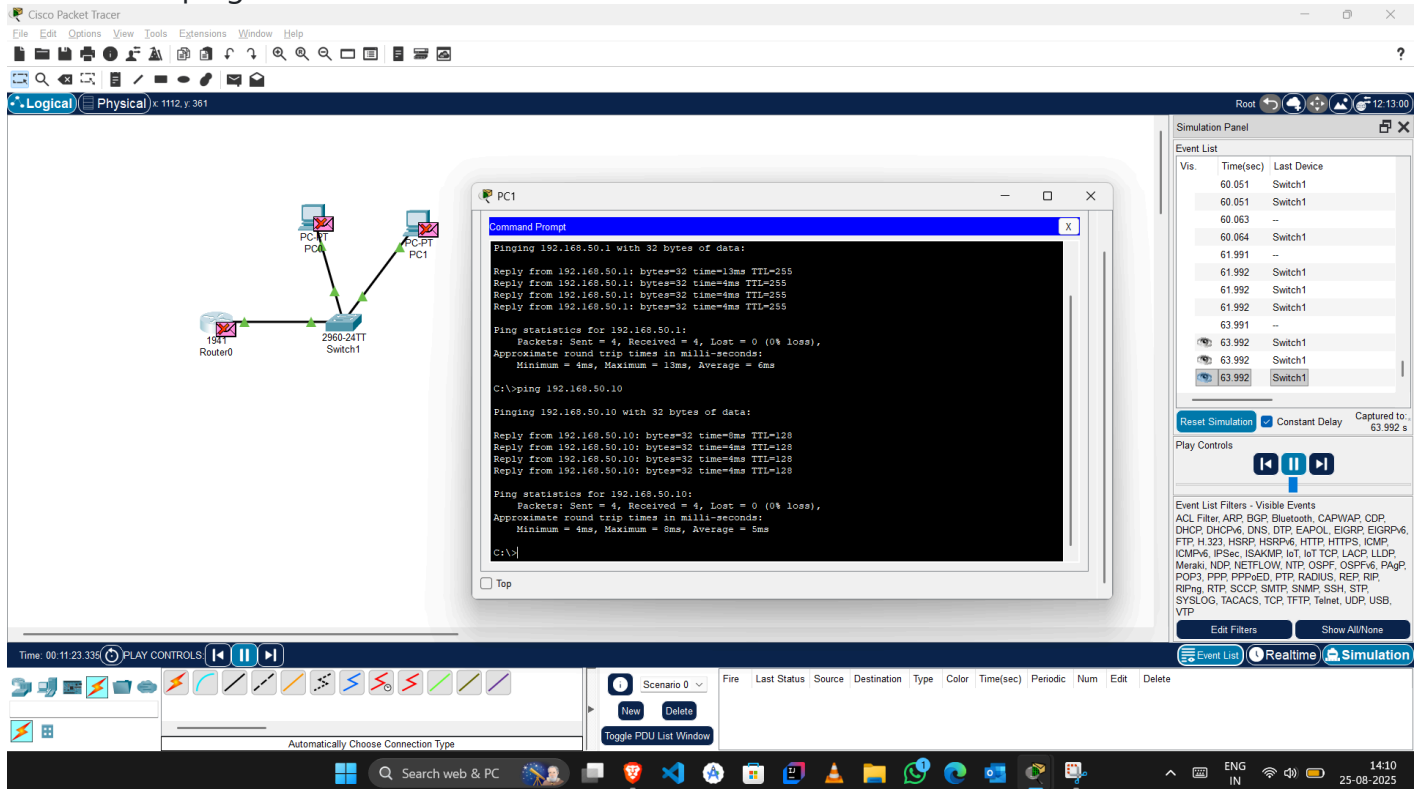
The screenshot displays the Cisco Packet Tracer interface with the same network topology. The configuration window for Router0 is open, showing the following configuration commands:

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Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.50.1 255.255.255.0
Router(config-if)#ip address 192.168.50.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINE-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#
%LINE-5-CHANGED: Interface GigabitEthernet0/0, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to down
Router(config-if)#no shutdown
Router(config-if)#
%LINE-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#no ip address
Router(config-if)#no ip address
Router(config-if)#
Router(config-if)#exit
Router(config)#ip dhcp pool mypool
Router(dhcp-config)#network 192.168.50.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.50.1
Router(dhcp-config)#nd-serve 8.8.8.8
^
% Invalid input detected at '^' marker.
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#exit
Router(config)#
Router(config)#
Router(config)#
  
```

The Simulation Panel on the right shows the Event List with visible events for ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, and VTP.

• Successful ping test between the two PCs



Result

Successfully configured a DHCP server on the router. PCs were dynamically assigned IP addresses and were able to communicate over the network.