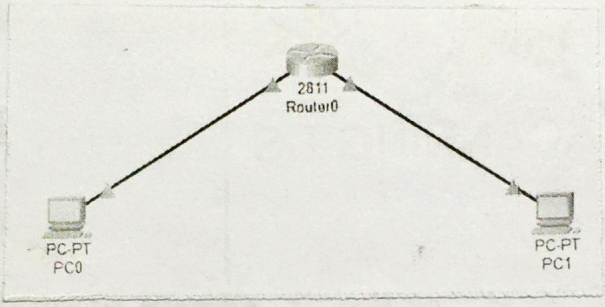
22/9/2025

Practical X

AIM: Internetworking with routers in CISCO PACKET TRACER simulator

a) Design and configure a simple internetwork using a router

In this network, a router and 2 PCs are used. Computers are connected with routers using a copper straight-through cable. After forming the network, to check network connectivity a simple PDU is transferred from PC0 to PC1.



Procedure:

Step 1: Configuring Router 1

1. Select the router and Open CLI.
2. Press ENTER to start configuring Router 1.
3. Type enable to activate the privileged mode.

Step 2: Configuring PCs

1. Assign IP addresses to every PC in the network
2. Select the PC, Go to the desktop and select IP configuration and assign an IP address, default gateway, Subnet Mask.
3. Assign the default gateway of PC0 as 192.168.10.1
4. Assign the default gateway of PC1 as 192.168.20.1

Step 3: Connecting PCs with Router

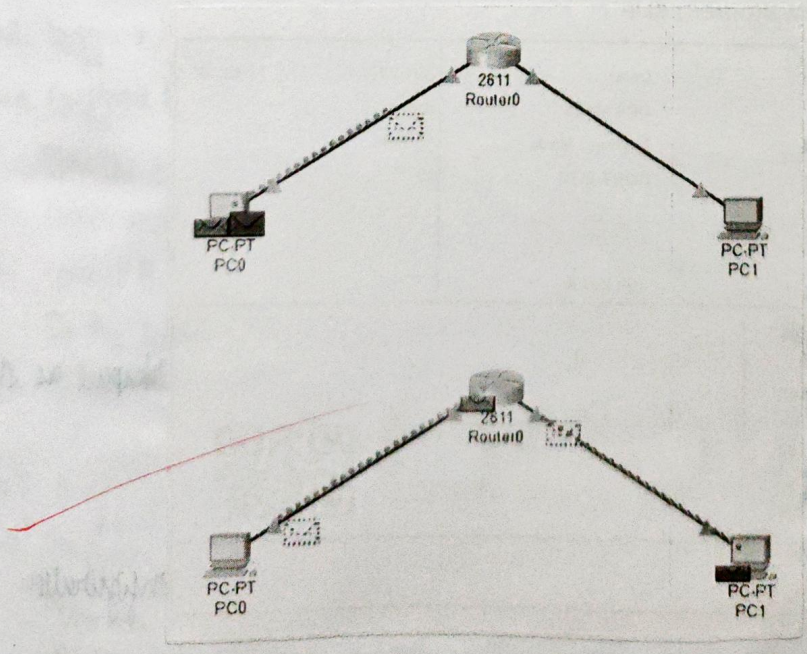
1. Connect FastEthernet0 port of PC0 with FastEthernet0/0 port of Router1 using a copper straight-through cable.
2. Connect FastEthernet0 port of PC1 with FastEthernet0/1 port of Router1 using a copper straight-through cable.

Router configuration Table:

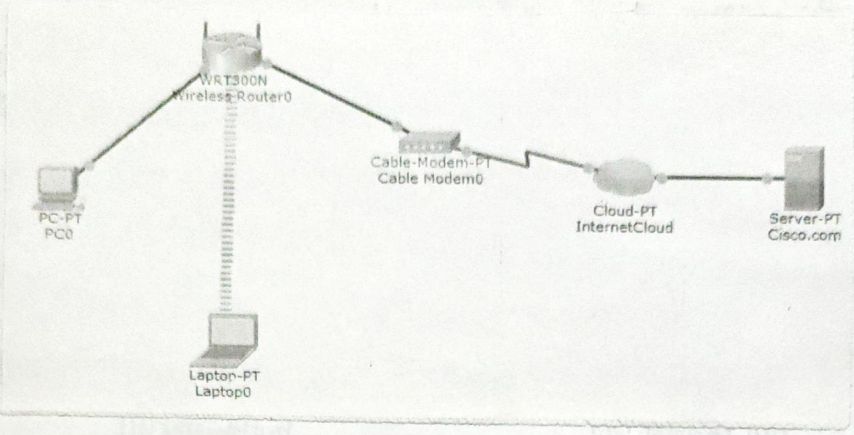
Device Name	IP address Fast Ethernet 0/0	Subnet Mask	IP address FastEthernet0/1	Subnet Mask
Router1	192.168.10.1	255.255.255.0	192.168.20.1	255.255.255.0

Pc configuration Table:

Device Name	IP address	Subnet Mask	Gateway
PC0	192.168.10.2	255.255.255.0	192.168.10.1
PC1	192.168.20.2	255.255.255.0	192.168.20.1



b) Design and configure an internetwork using wireless router, DHCP server and internet cloud.



Addressing Table

Device	Interface	IP address	Subnet Mask	Default Gateway
PC	Ethernet0	DHCP		192.168.0.1
Wireless Router	LAN	192.168.0.1	255.255.255.0	
Wireless Router	Internet	DHCP		
Cisco.com Server	Ethernet0	208.67.220.220	255.255.255.0	
Laptop	Wireless0	DHCP		

Part 1: Build a Simple Network in the Logical Topology Workspace

Step 1: Launch Packet Tracer

Step 2: Build the topology

a. Add network devices to the workspace.
Using the device selection box, add the network devices to the workspace as shown in the topology diagram.

b. Change display names of the network devices
Type the new name of the device into the Display box in the configuration window of the selected device.

c. Add the physical cabling between devices on the workspace

Using the device selection box, add the physical cabling between devices on the workspace as shown in the topology diagram.

The PC will need a copper straight-through cable to connect to the wireless router. The wireless router will need a copper straight-through cable to connect to the cable modem. The cabel modem will need a coaxial cable to connect to the Internet cloud. The Internet cloud will need copper straight-through cable to connect to the Cisco.com server.

Part 2: Configure the ~~wireless router~~ Network Devices

Step 1: Configure the wireless router

a. Create the wireless network on the wireless router

Open the device configuration window. In the Wireless router configuration window, change the Network Name (SSID). Type the name "HomeNetwork".

Configure the Internet connection on the wireless router.

Enable the DHCP Server settings and configure the static IP address of the DNS server as 208.67.220.220.

b. Click on Save Settings.

Step 2: Configure the laptop

a. Configure the laptop to access the wireless network

Open the device configuration window. In Physical tab, remove the Ethernet copper module and replace it with the Wireless WPC300N module.

Connect the laptop to the wireless network.

On the Laptop Configuration window, select PC Wireless icon. In connect tab, select the wireless network "HomeNetwork"

Step 3: Configure the PC

a. Configure the PC for the wired network

Open the IP configuration window and select the DCHP radio button. The PC will use this to receive an IPv4 address from the wireless router.

Open Command Prompt and verify that the PC has received an IPv4 address by issuing the ipconfig /all command.

Step 4: Configure the Internet cloud

a. Install network modules if necessary

The cloud device will need two modules if they are not already installed. The PT-CLOUD-NM-1CX which is for the cabel modem service connection and the PT-CLOUD-NM-1CFE which is for a copper Ethernet cable connection.

b. Identify the From and To Ports

In the Cloud device window, click Config tab and select Cable. In the first drop down box, choose Coaxial and in the second drop down box, choose Ethernet and click Add button to add these as the From Port and To Port.

c. Identify the type of provider

Step 5: Configure the Cisco.com server

a. Configure the Cisco.com server as a DHCP server

In the DHCP configuration window, configure a DHCP with the following changes:

Turn the DHCP service on

Pool name: DHCPpool

Default Gateway: 208.67.220.220

DNS server: 208.67.220.220

Starting IP address: 208.67.220.1

Subnet Mask: 255.255.255.0

Maximum number of Users: 50

b. Configure the Cisco.com server as DNS server to provide domain name to IPv4 address resolution.

Configure the DNS service using the following settings

Turn the DNS service on

Name: Cisco.com

Type: A Record

Address: 208.67.220.220

c. Configure the Cisco.com Server Global settings.

Configure the Global settings of the server as follows:

Select Static

Gateway: 208.67.220.1

DNS Server: 208.67.220.220

d. Configure the Cisco.com Server FastEthernet0 Interface settings

Configure the FastEthernet Interface settings of the server as follows:

Select Static under IP Configuration

IP Address: 208.67.220.220

Subnet Mask: 255.255.255.0

Part 3: Verify Connectivity

Step 1: Refresh the IPv4 settings on the PC

a) Verify that the PC is receiving IPv4 configuration information from DHCP.

In PC Configuration Window, select Desktop tab. Click the Command Prompt icon. In the command prompt, refresh the IP settings by issuing the commands ipconfig /release and then ipconfig /renew. The output should show that the PC has an IP address, a subnet mask, a default gateway, and DNS server address.

b) Test connectivity to the Cisco.com server from the PC

From the command prompt, issue the command ping Cisco.com. It may take a few seconds for the ping to return.

1. Write down the key features of configuring Wireless router and DHCP server.

Wireless Router

- Set SSID (network name).
- Set password & encryption for security
- Configure IP address of the router
- Enable/disable firewall and NAT
- Set channel to avoid interference

DHCP Server

- Automatically gives IP addresses to devices
- Set IP address range
- Configure subnet mask, gateway, DNS
- Option to reserve fixed

2. What is the significance of DHCP server in internetworking.

- Removes the need to manually assign IP addresses
- Ensures unique IPs for each device
- Reduces configuration errors
- Makes network management faster and easier, especially for large networks.

Result:

Hence, internetworking of routers was completed successfully.