Exp No: 07   **Date:31/08/2024**

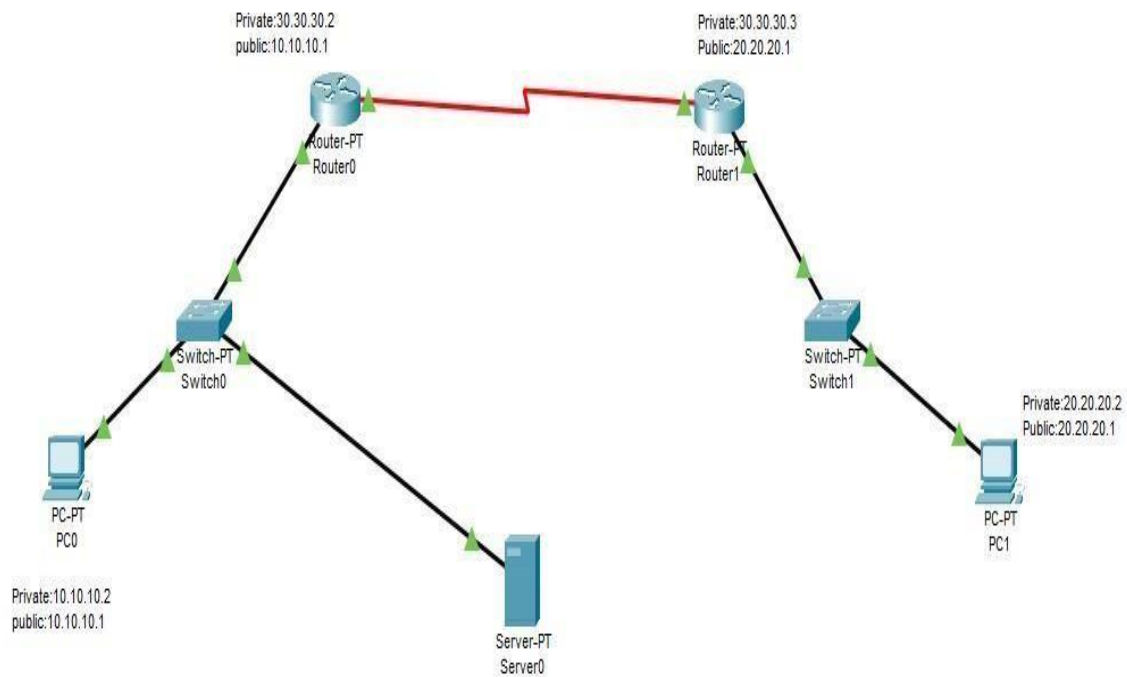**ROLLNO:231901503**   **NAME:M.KALAIYARASI**

Examining Network Address Translation (NAT) using Cisco Packet Tracer

Aim : Examining Network Address Translation (NAT) using Cisco Packet Tracer involves several steps. NAT is commonly used to allow multiple devices on a local network to share a single public IP address for accessing the internet. Here's how you can set up and examine NAT using Cisco Packet Tracer:

1. Setting Up the Network Topology

- **Devices Required:**
- One or more PCs (for testing connectivity)
- One router (to configure NAT)
- One switch (to connect the PCs and the router)
- One server (to simulate an external network, like the internet) • **Steps:**
- **Place the Devices:** Drag and drop the required devices onto the workspace.
- **Connect the Devices:** Use the appropriate cables (copper straight-through for PCs to the switch, copper cross-over for switch to router) to connect the devices.
- **Assign IP Addresses:**
- Assign private IP addresses (e.g., 192.168.1.0/24) to the PCs and the router's internal interface. • Assign a public IP address (e.g., 200.0.0.1/30) to the router's external interface. • Assign an IP address to the server that simulates an external network (e.g., 200.0.0.2/30).

Private:30.30.30.2
public:10.10.10.1

Private:30.30.30.3
Public:20.20.20.1

Router-PT
Router0

Router-PT
Router1

Switch-PT
Switch0

Switch-PT
Switch1

Private:20.20.20.2
Public:20.20.20.1

PC-PT
PC0

PC-PT
PC1

Private:10.10.10.2
public:10.10.10.1

Server-PT
Server0

2. Configuring NAT on the Router

- **Steps:**
- **Access the Router CLI:** Click on the router and go to the CLI tab.
- **Enter Global Configuration Mode:**

```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    20.0.0.0/8 is directly connected, FastEthernet0/0
C    30.0.0.0/8 is directly connected, Serial2/0
S    50.0.0.0/8 [1/0] via 30.30.30.1

Router#
```
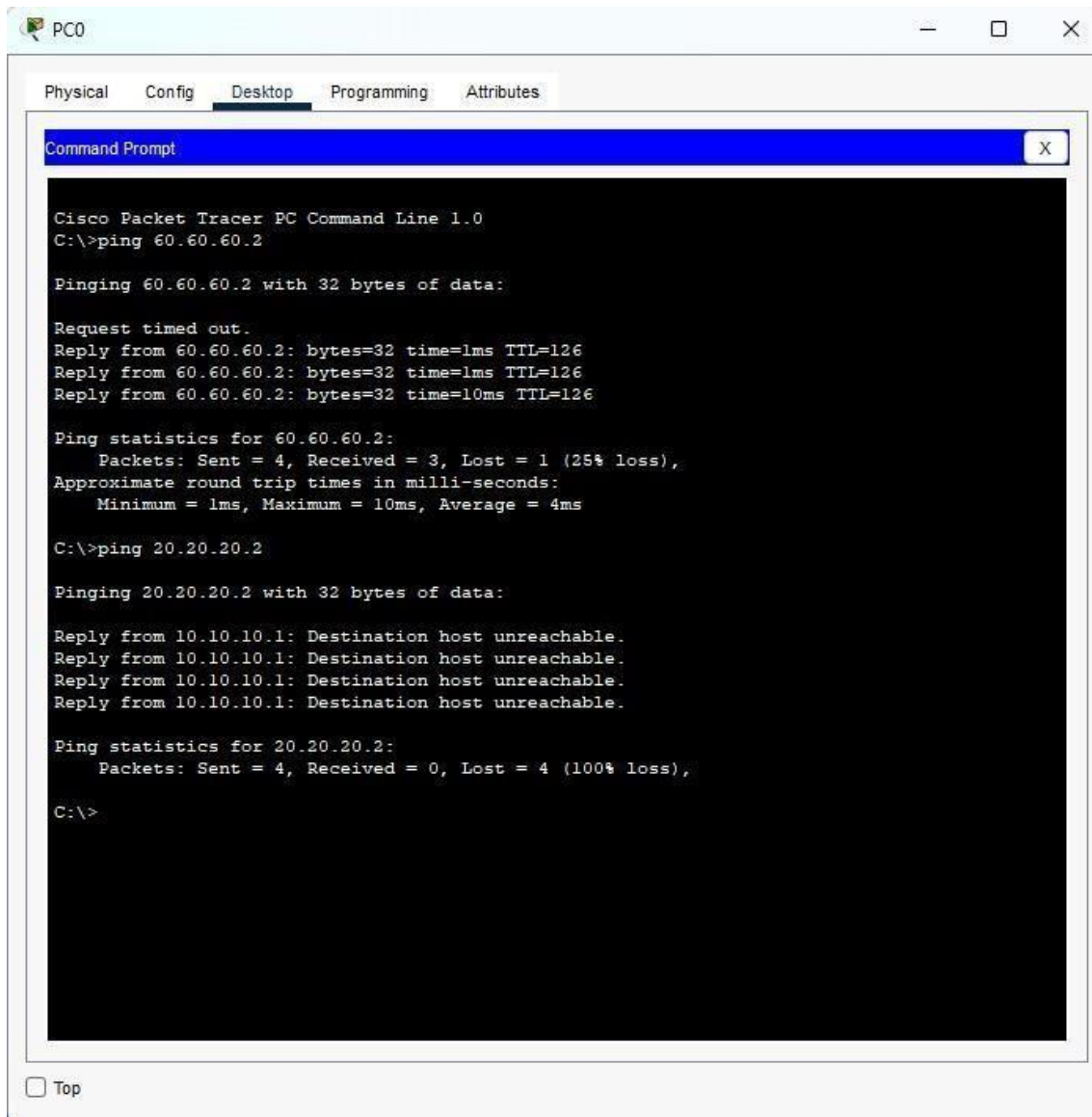
Configure Interfaces:

Set up the internal and external interfaces:


```
Router1                                                    —    □    ×

  Physical    Config    CLI    Attributes

                              IOS Command Line Interface

  Router con0 is now available




  Press RETURN to get started.







  Press RETURN to get started!



  Router>enable
  Router#config
  Configuring from terminal, memory, or network [terminal]?
  Enter configuration commands, one per line.  End with CNTL/Z.
  Router(config)#ip nat inside source static 20.20.20.2 60.60.60.2
  Router(config)#interface fastEthernet 0/0
  Router(config-if)#ip nat inside
  Router(config-if)#exit
  Router(config)#interface serial 2/0
  Router(config-if)#ip nat outside
  Router(config-if)#exit
  Router(config)#
                                              Copy        Paste

  ☐ Top
```

3. Testing NAT

- **Steps:**
- **Ping from a PC to the External Network:**

- From one of the PCs, open the command prompt and try to ping the external server (e.g., ping 200.0.0.2).
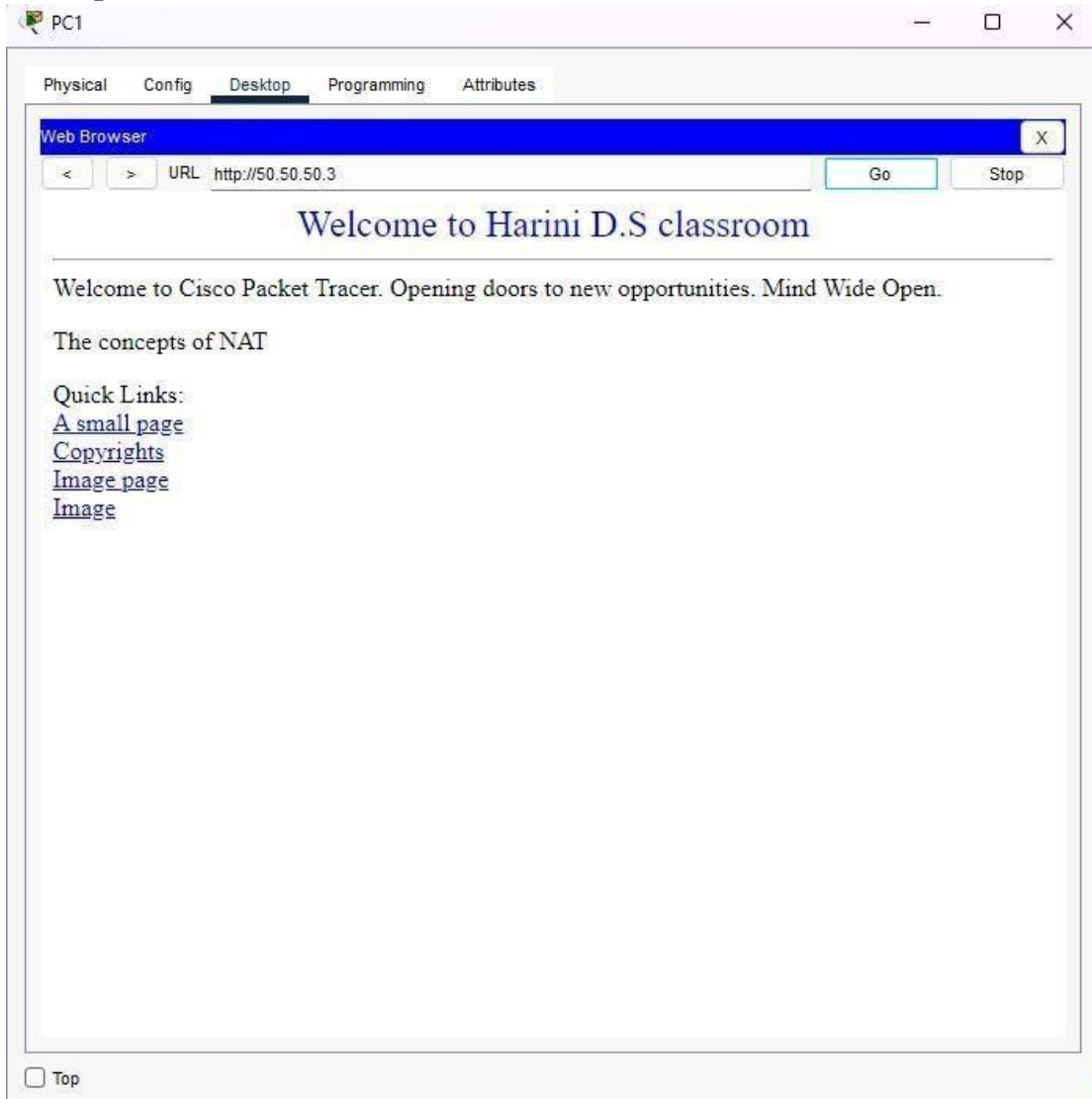

Observe the Output:
The NAT translation table should show the mapping of the internal private IP addresses to the external public IP.

4. Observing the Traffic

- Use the simulation mode in Packet Tracer to visually observe the NAT process as packets move from the internal network to the external network.

Final output:

Result: Network Address Translation (NAT) using Cisco Packet Tracer has been examined.