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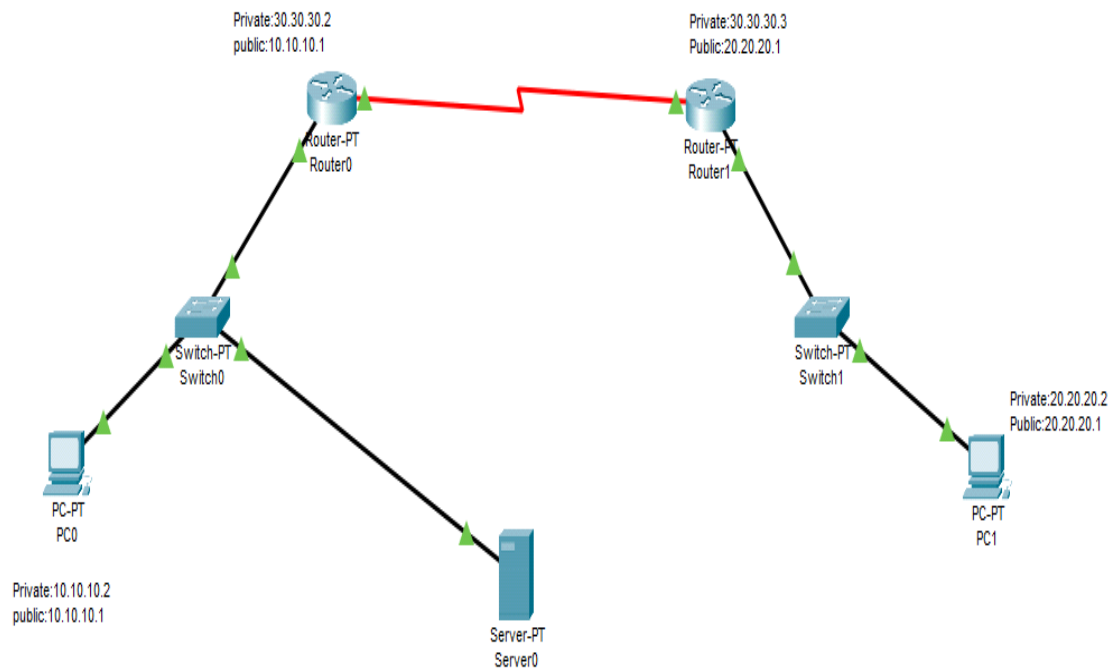
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Examining Network Address Translation (NAT) using Cisco Packet Tracer

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).



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

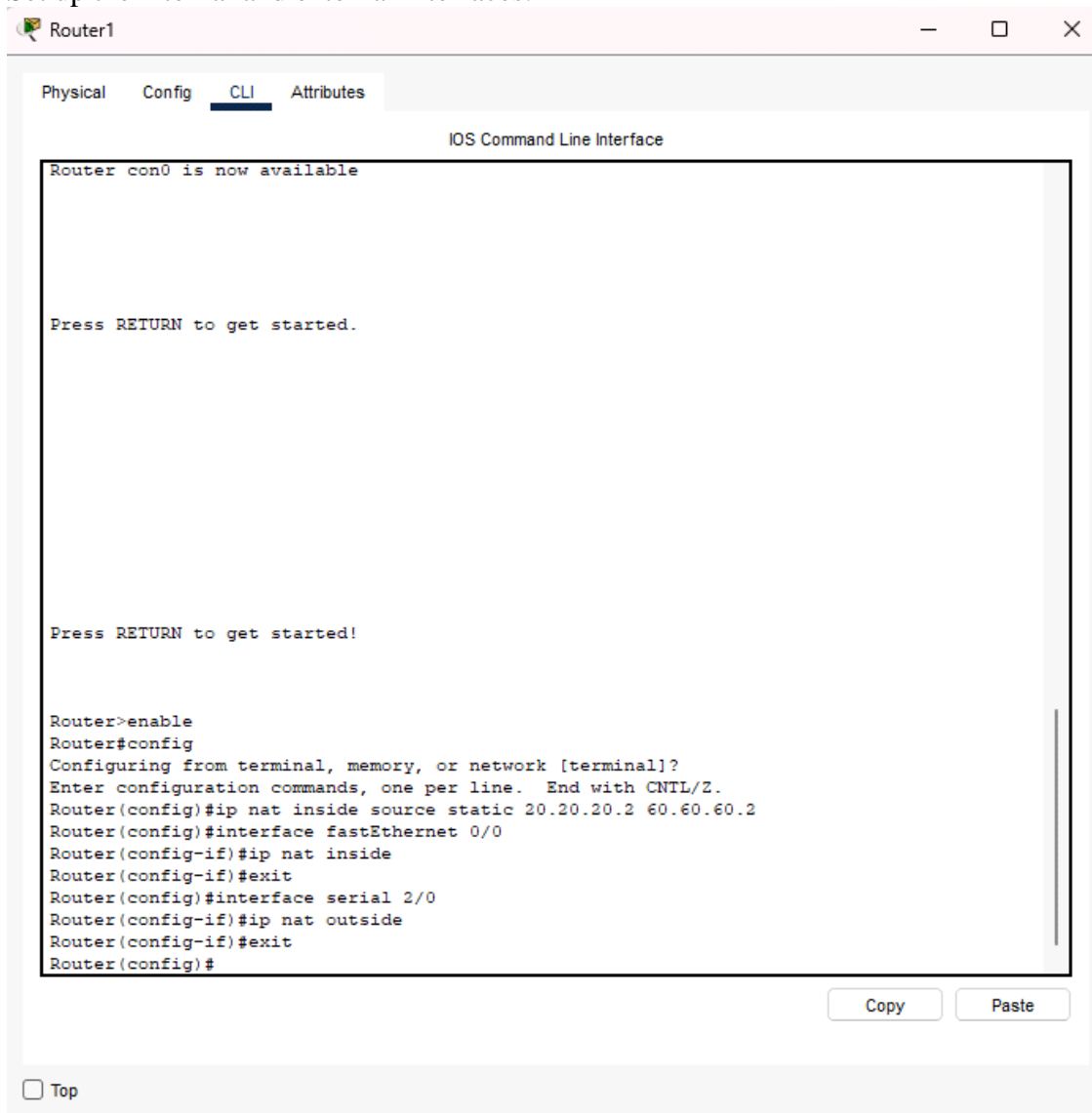
Gateway of last resort is not set

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#
```

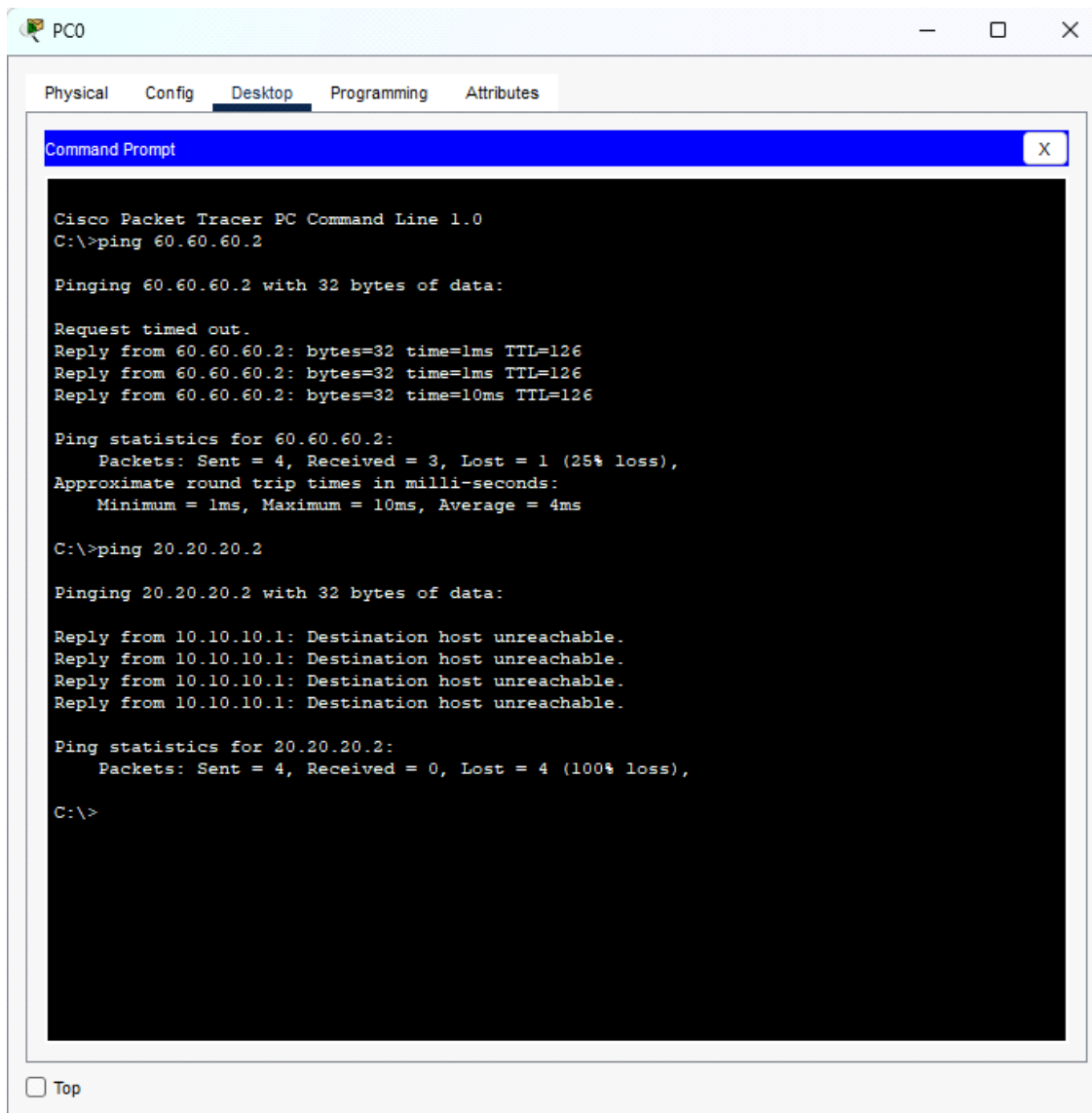
Configure Interfaces:

Set up the internal and external interfaces:



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](#)).



The screenshot shows a Cisco Packet Tracer PC Command Prompt window for PC0. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, showing a Command Prompt window. The Command Prompt displays the output of two ping commands. The first command is 'ping 60.60.60.2', which shows a successful ping with 32 bytes of data, a request timed out, and three successful replies from 60.60.60.2 with times of 1ms, 1ms, and 10ms, all with a TTL of 126. The ping statistics for 60.60.60.2 show 4 packets sent, 3 received, and 1 lost (25% loss), with approximate round trip times of 1ms, 10ms, and 4ms. The second command is 'ping 20.20.20.2', which shows four failed replies from 10.10.10.1 with the message 'Destination host unreachable'. The ping statistics for 20.20.20.2 show 4 packets sent, 0 received, and 4 lost (100% loss).

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 60.60.60.2

Pinging 60.60.60.2 with 32 bytes of data:

Request timed out.
Reply from 60.60.60.2: bytes=32 time=1ms TTL=126
Reply from 60.60.60.2: bytes=32 time=1ms TTL=126
Reply from 60.60.60.2: bytes=32 time=10ms TTL=126

Ping statistics for 60.60.60.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 10ms, Average = 4ms

C:\>ping 20.20.20.2

Pinging 20.20.20.2 with 32 bytes of data:

Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.

Ping statistics for 20.20.20.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

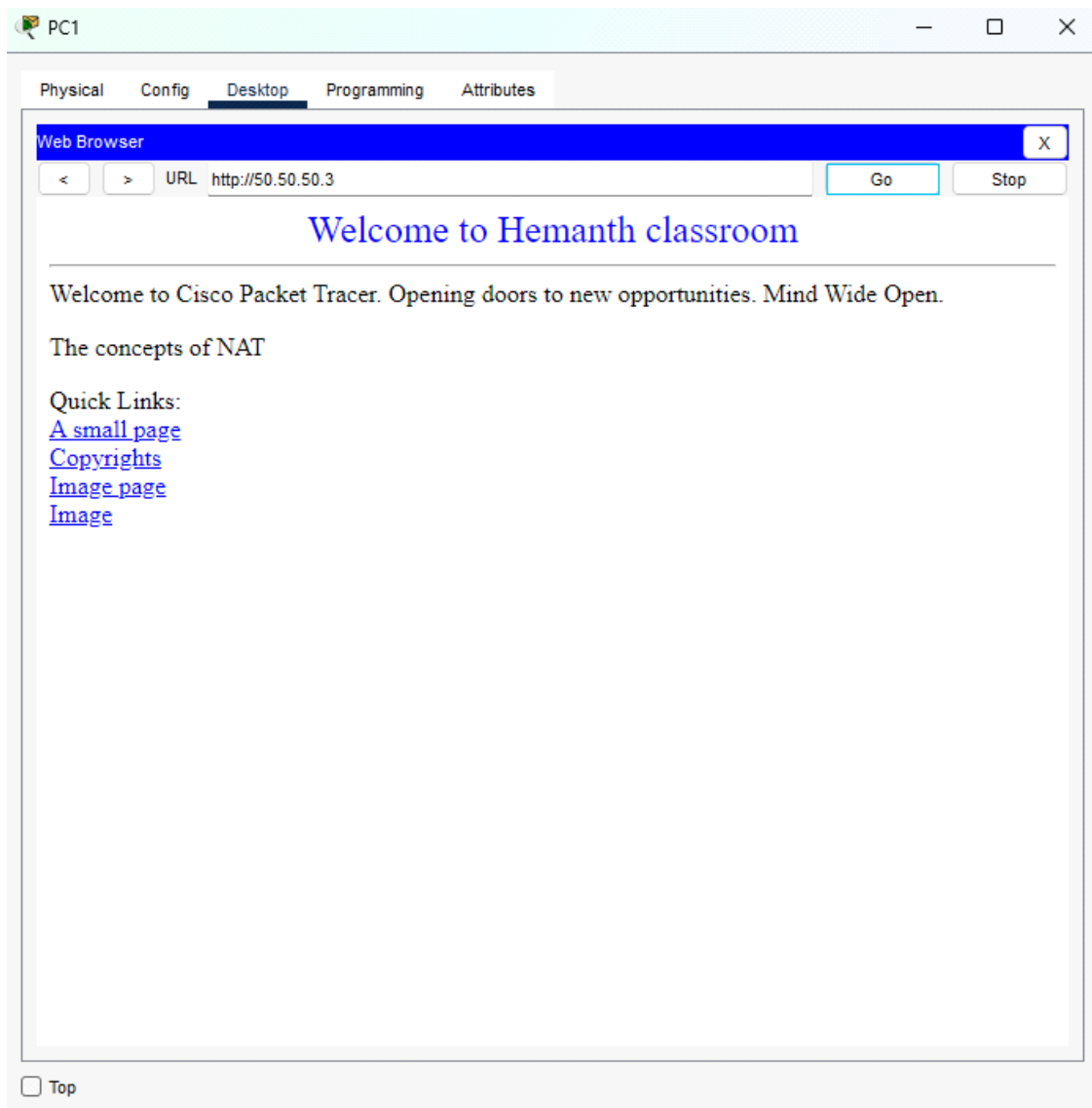
Observe the Output:

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.