# NPS-LAB EXPERIMENT-9

**Configuring Network Address Translation (NAT) in Cisco Packet Tracer and Verifying the Setup**

**1. Network Setup**

This setup assumes a router with two network interfaces:

- **Inside Network**: For example, 192.168.1.0/24 on the GigabitEthernet0/0 interface.
- **Outside Network**: Connected to an ISP or another router with a public IP, for example, 203.0.113.1/30 on the GigabitEthernet0/1 interface.

**2. NAT Configuration on the Router**

**Step 1: Access the Router's CLI**

- Open Cisco Packet Tracer, select the router, and go to the **CLI** tab to access the command-line interface.

**Step 2: Enter Global Configuration Mode**

- Begin by accessing privileged EXEC mode using the appropriate command.
- Then, switch to global configuration mode.

**Step 3: Configure IP Addresses on Interfaces**

- **Inside Interface (LAN)**:
    - Enter the configuration mode for the internal network interface (GigabitEthernet0/0).
    - Assign an IP address (e.g., 192.168.1.1) with the correct subnet mask (255.255.255.0).
    - Set this interface as the "inside" for NAT.
    - Ensure the interface is activated and return to the global configuration mode.
- **Outside Interface (Connected to ISP)**:
    - Enter the configuration mode for the external network interface (GigabitEthernet0/1).
    - Assign the IP address 203.0.113.2 with the subnet mask 255.255.255.252.
    - Mark this interface as the "outside" for NAT.
    - Activate the interface and return to the global configuration mode.

**Step 4: Define an Access Control List (ACL)**

- Create an access list to define the internal (private) IP range that needs to be translated. This list will include the IP range for the internal network (e.g., 192.168.1.0/24).

**Step 5: Configure NAT Overload (PAT)**

- Set up NAT overload (also called Port Address Translation or PAT) using the external interface's IP address. This allows multiple internal devices to share the external public IP address for outbound connections.

**Step 6: Save and Exit**

- Save your configuration and exit global configuration mode.

---

**3. Verifying NAT Configuration**

**Step 1: View NAT Translations**

- Ping a device on the external network (such as the ISP router's IP) from a device on the internal network.
- Check the active NAT translations by viewing the translation table.

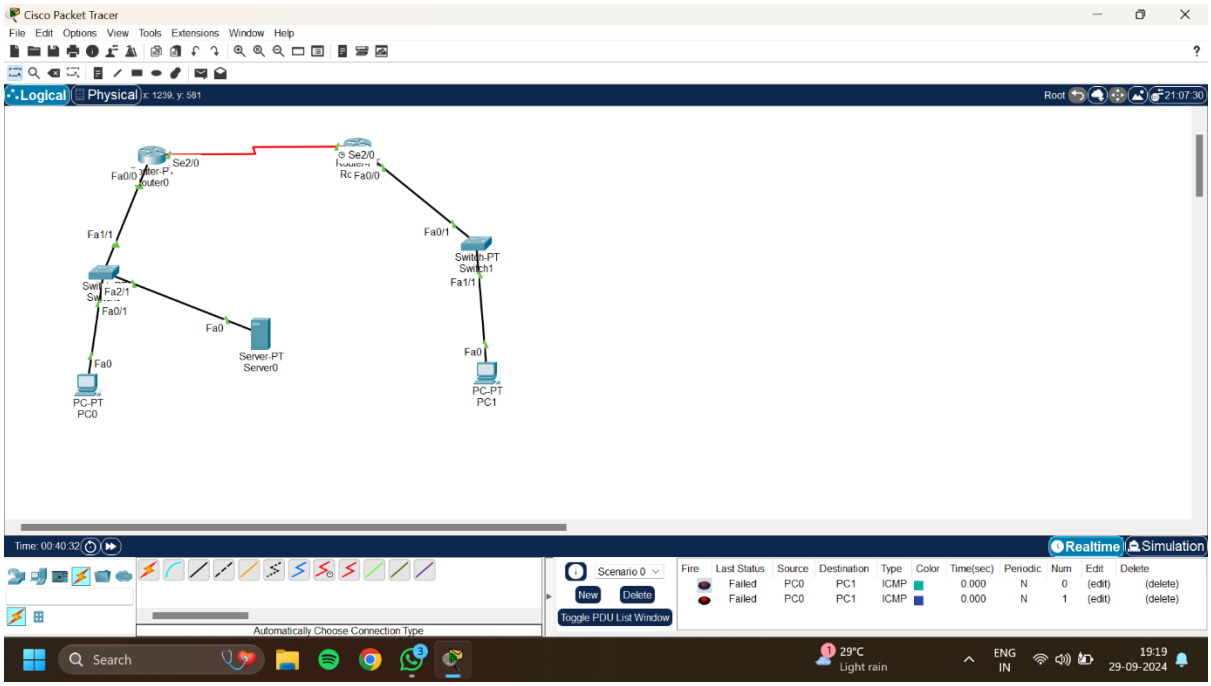
**Step 2: Verify NAT Statistics**

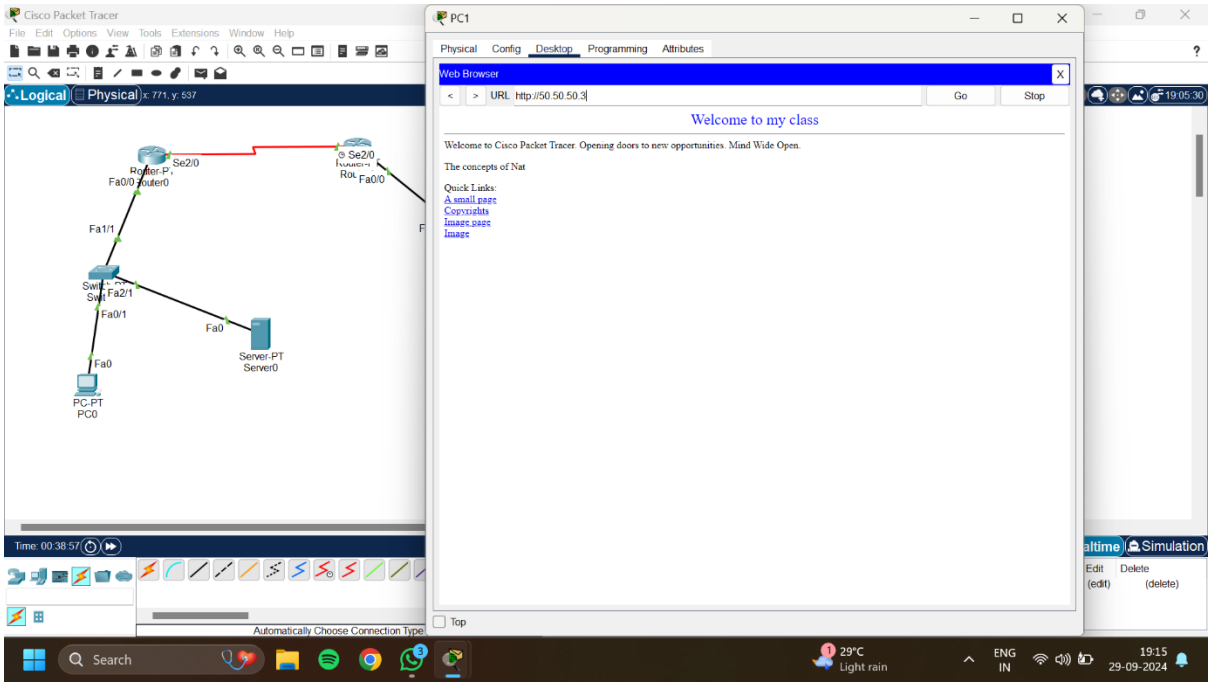
- Check the NAT statistics to ensure that translations are occurring. This will provide information about active translations and packet flows.

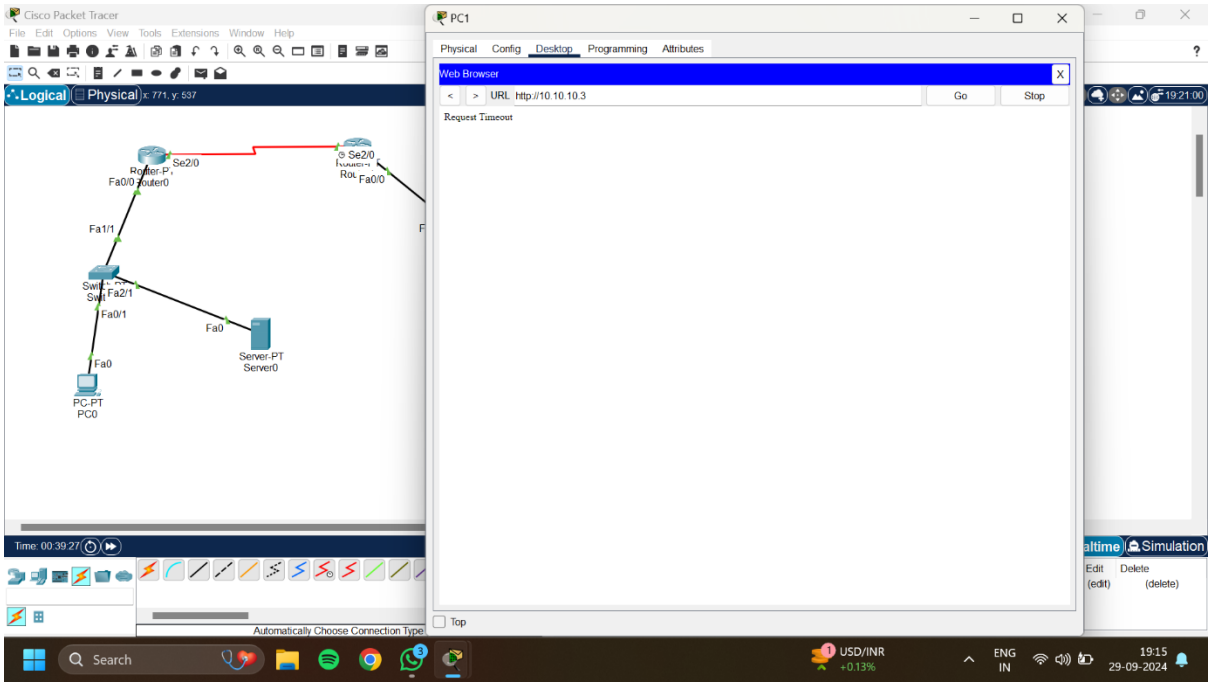
**Step 3: Test Connectivity**

- Use a PC within the internal network to ping an external address, such as a public DNS server (e.g., 8.8.8.8). Successful responses indicate that NAT is functioning properly.

For each ping from a device in the internal network, you should see entries in the NAT translation table, confirming that NAT is correctly configured and working.


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical
Root
Se2/0
Fa0/0
Fa1/1
Fa0/1
Switch-PT
Switch1
Fa2/1
Fa0
Server-PT
Server0
PC-PT
PC0
PC-PT
PC1
Time: 00:40:32
Realtime Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Failed PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
Failed PC0 PC1 ICMP 0.000 N 1 (edit) (delete)
Automatically Choose Connection Type
Search
29°C
Light rain
ENG
IN
19:19
29-09-2024


Cisco Packet Tracer
PC1
Physical Config Desktop Programming Attributes
Web Browser
URL http://50.50.50.3
Go
Stop
Welcome to my class
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
The concepts of Nat
Quick Links:
A small page
Copyrights
Image page
Image
Top
Logical Physical
Time: 00:38:57
Automatically Choose Connection Type
Search
29°C
Light rain
ENG
IN
19:15
29-09-2024


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical x: 771, y: 597
Router-P
Router0
Se2/0
Fa0/0
Fa1/1
Switch-PT
Switch0
Fa2/1
Fa0/1
Fa0
Server-PT
Server0
PC-PT
PC0
Time: 00:39:27
Automatically Choose Connection Type
PC1
Physical Config Desktop Programming Attributes
Web Browser
URL http://10.10.10.3
Go Stop
Request Timeout
Top
Simulation
Edit
Delete
(edit)
(delete)
Search
USD/INR
+0.13%
ENG
IN
19:15
29-09-2024