**CN Lab Experiment 6**

**Objective:**

In this experiment, you will configure Network Address Translation (NAT) on a router using Cisco Packet Tracer. NAT is used to translate private IP addresses within a local network to a public IP address for accessing the internet. This experiment will demonstrate the setup and configuration of NAT to allow internal network devices to communicate with external networks.

**Requirements:**

* Cisco Packet Tracer software.
* A GitHub account and a repository for lab assignments.
* Access to Google Classroom for submission.

**Procedure:**

**Network Design:**

● Router1 connected to Router2.

● PC0 connected to Router1.

● PC1 connected to Router2.

**Step 1:**

1. Determine IP address scheme:

○ Inside network (LAN): 192.168.10.0/24

○ Outside network (ISP): 200.0.0.0/30

**Step 2: Configuring Router1**

1. Select the router and open CLI.

2. Press ENTER to start configuring Router1.

3. Activate privileged mode:

○ Type enable

4. Access the configuration menu:

○ Type config t (configure terminal)

5. Configure interfaces of Router1:

○ FastEthernet0/0: (connected to PC0)

■ Type interface FastEthernet0/0

■ Configure with the IP address 192.168. 10.1 and Subnet mask 255.255.192.0

○ Serial 0/0/0: (connected to Router2)

■ Type interface Serial 0/0/0

■ Configure with the IP address 192.168.1.1 and Subnet mask 255.255.255.252

6. Finish configuration:

○ Type no shutdown to activate the interfaces

**Step 3: Configuring ISP Router**

1. Select the router and open CLI.

2. Press ENTER to start configuring Router1.

3. Activate privileged mode:

○ Type enable

4. Access the configuration menu:

○ Type config t (configure terminal)

5. Configure interfaces of Router1:

○ Serial 0/0/0: (connected to Router1)

■ Type interface Serial 0/0/0

■ Configure with the IP address 192.168.1.2 and Subnet mask 255.255.255.252

6. Finish configuration:

○ Type no shutdown to activate the interfaces

**Step 4: Configuring PCs**

1.Assign IP addresses to each PC:

○ PC0:

■ Go to the desktop, select IP Configuration, and assign the following:

■ IP address: 192.168.10.2

■ Subnet Mask: 255.255.255.0

■ Default Gateway: 192.168.10.1

○ PC1:

■ Go to the desktop, select IP Configuration, and assign the following:

■ IP address: 192.168.20.2

■ Subnet Mask: 255.255.255.0

■ Default Gateway: 192.168.20.1

**Step 5:** Configuring NAT on Router1

1. Define the inside and outside interfaces:

○ Access Router1 CLI and type the following commands:

■ interface FastEthernet0/0

■ ip nat inside

■ exit

■ interface Serial0/0/0

■ ip nat outside

■ exit

2. Configure a standard access list to permit the internal network:

○ access-list 1 permit 192.168.10.0 0.0.0.255

3. Configure NAT overload (PAT) for the internal network:

○ ip nat inside source list 1 interface Serial0/0/0 overloadStep

**Step 6: Verify NAT Configuration**

1. Test the connectivity by pinging from PC0 to the ISP Router:

○ Open the command prompt on PC0.

○ Type ping 200.0.0.2 and observe the response.

2. Check NAT translation table on Router1:

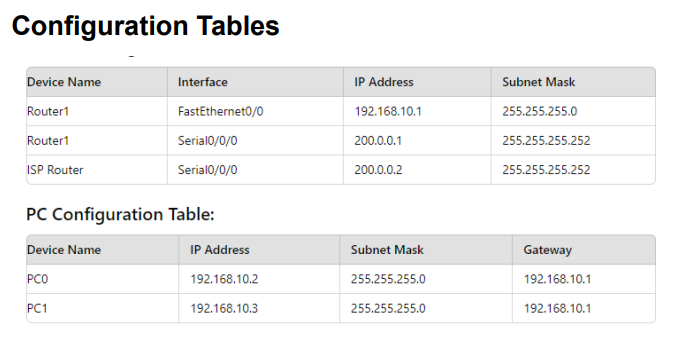
○ On Router1 CLI, type show ip nat translations to see the NAT entries.

**Step 7: Verify External Connectivity**

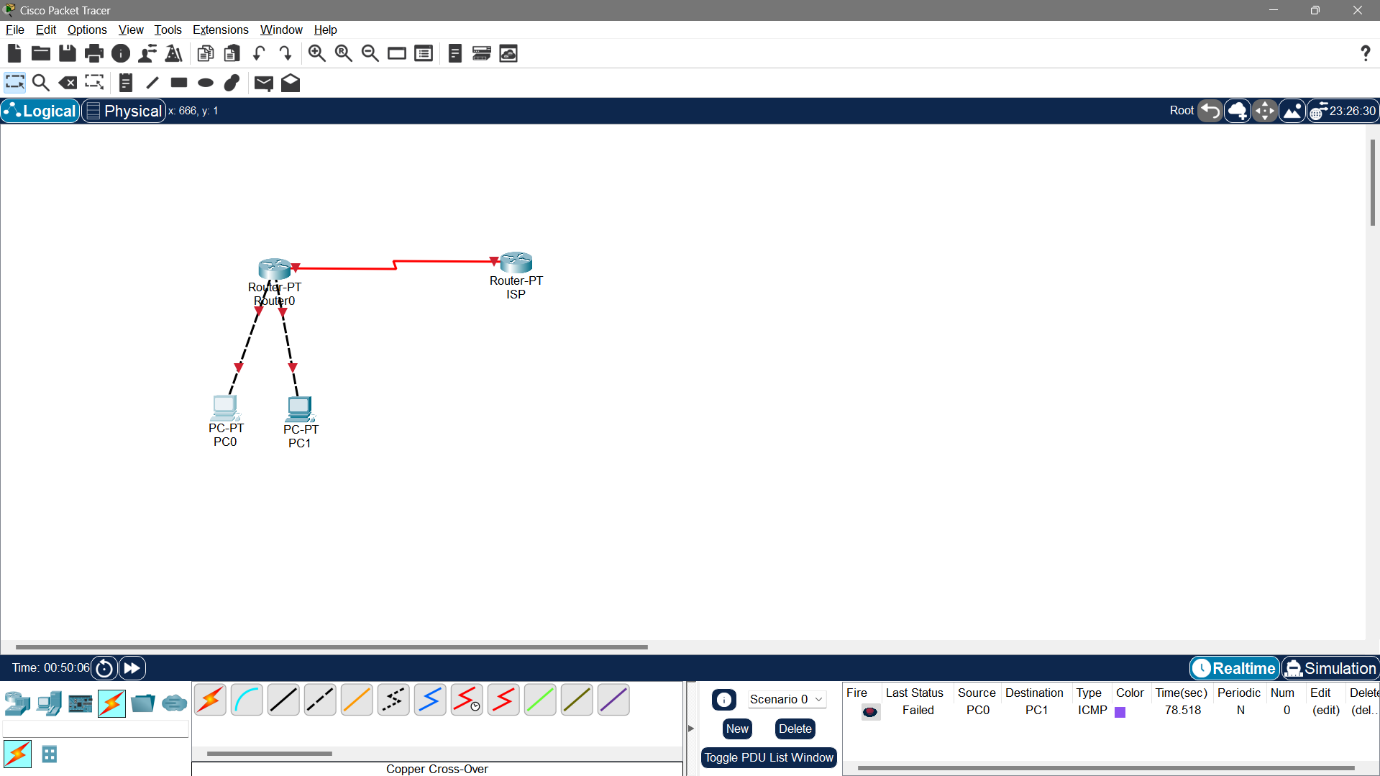
1. Test external connectivity by pinging a public IP (simulated):

○ On PC0, type ping 8.8.8.8 (replace with an actual reachable IP in Packet Tracer).

○ On PC1, type ping 8.8.8.8.



**Results:**

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* We Observe the packet traveling from PC0 to Router1, NAT translation occurring, then to the ISP Router and the external network.
* The acknowledgment packet travels back from the external network to PC0, confirming successful NAT configuration and communication.