LAB ASSIGNMENT-6

Lab 6: NAT Configuration

Experiment Overview:

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.

Procedure:

Network Design:

- Router1 connected to the ISP Router.
- PC0 connected to Router1.
- PC1 connected to Router1.

Step 1: Configure Network Addresses

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 Router1 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 LAN):

■ Type interface FastEthernet0/0

■ Configure with the IP address 192.168.10.1 and Subnet mask

255.255.255.0

○ Serial0/0/0 (connected to ISP Router):

■ Type interface Serial0/0/0

■ Configure with the IP address 200.0.0.1 and Subnet mask

255.255.255.252

6. Activate interfaces:

○ Type no shutdown

Step 3: Configuring ISP Router

1. Select the ISP Router and open CLI.

2. Press ENTER to start configuring the ISP Router.

3. Activate privileged mode:

○ Type enable

4. Access the configuration menu:

○ Type config t (configure terminal)

5. Configure interfaces of the ISP Router:

○ Serial0/0/0 (connected to Router1):

■ Type interface Serial0/0/0

■ Configure with the IP address 200.0.0.2 and Subnet mask

255.255.255.252

6. Activate interfaces:

○ Type no shutdown

ISP Router Command Line Interface:

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: 192.168.10.3

■ Subnet Mask: 255.255.255.0

■ Default Gateway: 192.168.10.1

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 overload

Router1 NAT Configuration Commands:

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.

Configuration Tables

Simulation of Designed Network Topology

Sending a PDU from PC0 to an External Network

1. Open the simulation mode in Packet Tracer.

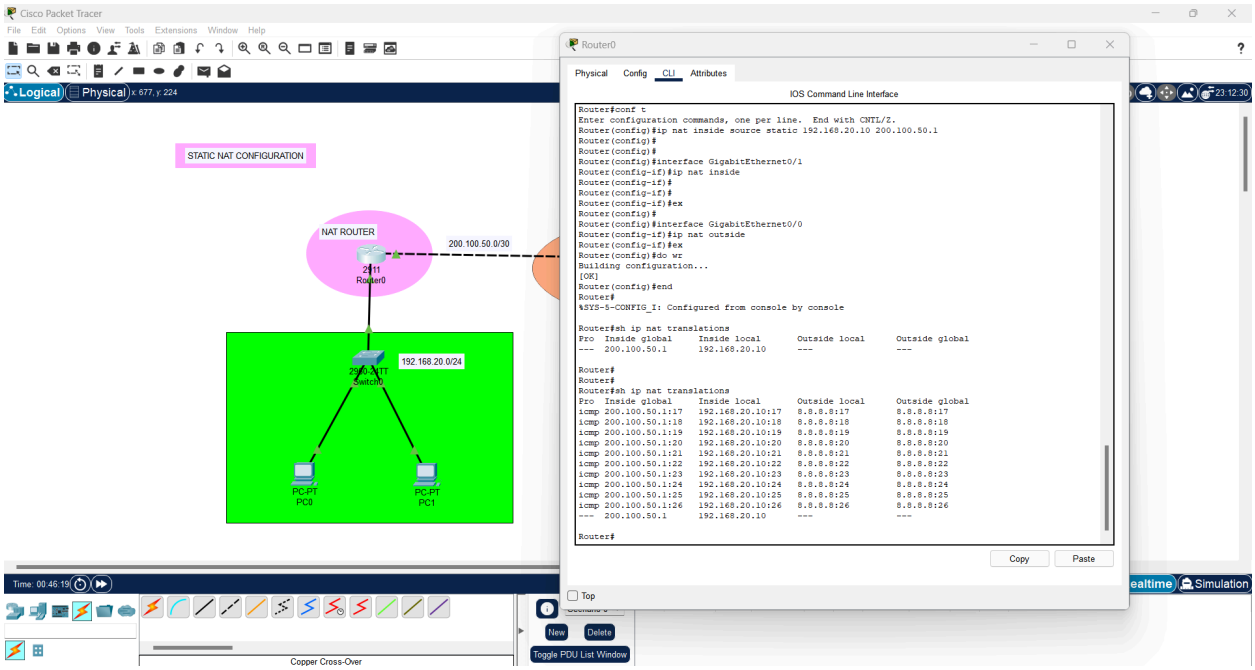
2. Send a PDU from PC0 to a simulated external IP (e.g., 8.8.8.8):

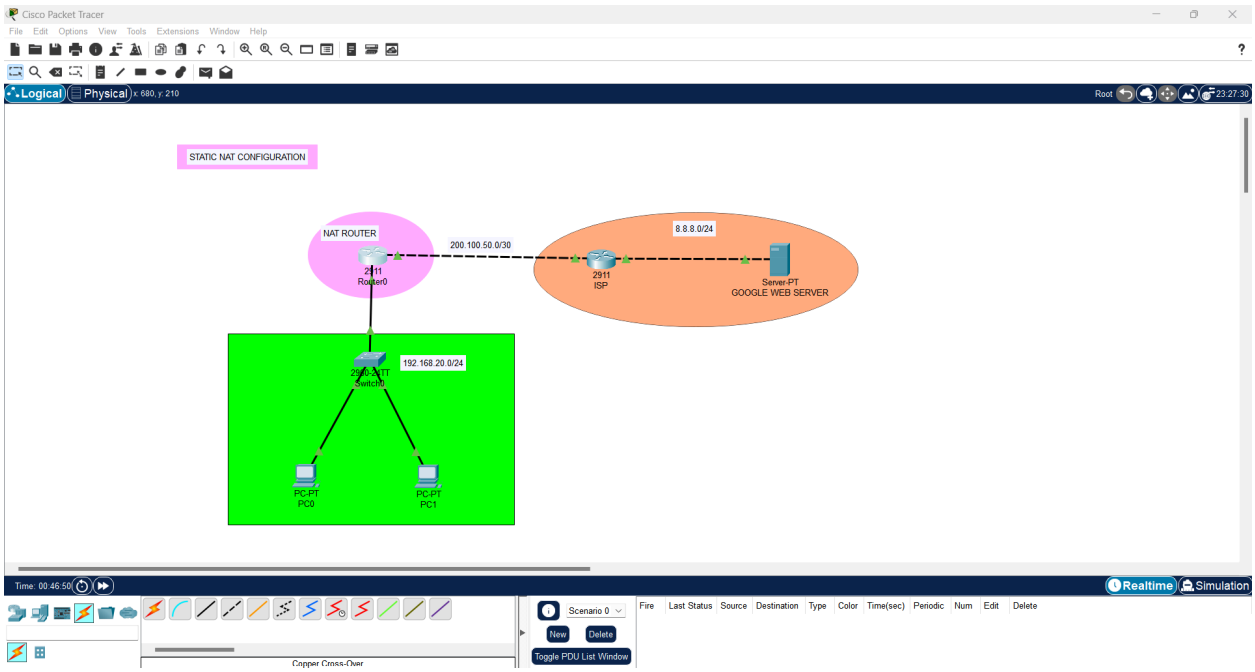
○ Observe the packet traveling from PC0 to Router1, NAT translation occurring, then to the ISP Router and the external network.

Acknowledgment from External Network to PC0

1. Observe the acknowledgment packet:

○ Ensure that the acknowledgment packet travels back from the external network to PC0, confirming successful NAT configuration and communication.


Cisco Packet Tracer
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip nat inside source static 192.168.20.10 200.100.50.1
Router(config)#
Router(config)#
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip nat inside
Router(config-if)#
Router(config-if)#
Router(config-if)#ex
Router(config)#
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip nat outside
Router(config-if)#ex
Router(config)#do wr
Building configuration...
[OK]
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#sh ip nat translations
Pro Inside global Inside local Outside local Outside global
--- 200.100.50.1 192.168.20.10 --- ---
Router#
Router#
Router#sh ip nat translations
Pro Inside global Inside local Outside local Outside global
icmp 200.100.50.1:17 192.168.20.10:17 8.8.8.8:17 8.8.8.8:17
icmp 200.100.50.1:18 192.168.20.10:18 8.8.8.8:18 8.8.8.8:18
icmp 200.100.50.1:19 192.168.20.10:19 8.8.8.8:19 8.8.8.8:19
icmp 200.100.50.1:20 192.168.20.10:20 8.8.8.8:20 8.8.8.8:20
icmp 200.100.50.1:21 192.168.20.10:21 8.8.8.8:21 8.8.8.8:21
icmp 200.100.50.1:22 192.168.20.10:22 8.8.8.8:22 8.8.8.8:22
icmp 200.100.50.1:23 192.168.20.10:23 8.8.8.8:23 8.8.8.8:23
icmp 200.100.50.1:24 192.168.20.10:24 8.8.8.8:24 8.8.8.8:24
icmp 200.100.50.1:25 192.168.20.10:25 8.8.8.8:25 8.8.8.8:25
icmp 200.100.50.1:26 192.168.20.10:26 8.8.8.8:26 8.8.8.8:26
--- 200.100.50.1 192.168.20.10 --- ---
Router#
Copy
Paste
Top
STATIC NAT CONFIGURATION
NAT ROUTER
2811
Router0
200.100.50.0/30
192.168.20.0/24
2960-24TT
Switch0
PC-PT
PC0
PC-PT
PC1
Logical
Physical
Time: 00:46:19
Realtime
Simulation
Copper Cross-Over
New
Delete
Toggle PDU List Window


Cisco Packet Tracer
Logical
Physical
Root
STATIC NAT CONFIGURATION
NAT ROUTER
2811
Router0
200.100.50.0/30
8.8.8.0/24
2911
ISP
Server-PT
GOOGLE WEB SERVER
192.168.20.0/24
2960-24TT
Switch0
PC-PT
PC0
PC-PT
PC1
Time: 00:46:50
Realtime
Simulation
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete