**Computer Networks Lab six Report**

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### **Objective**

### This lab focuses on configuring Network Address Translation (NAT) on a router to enable internal devices with private IP addresses to communicate with external networks using a public IP address. NAT facilitates secure communication by hiding internal addresses from external networks. This experiment demonstrates how to set up NAT using Cisco Packet Tracer.

### **Procedure**

### **Network Design:**

### **Router1** connected to the **ISP Router**.

### **PC0** connected to **Router1**.

### **PC1** connected to **Router1**.

### **IP Addressing Scheme:**

### **Inside Network (LAN)**: 192.168.10.0/24

### **Outside Network (ISP)**: 200.0.0.0/30

### **Step 1: Configure Network Addresses**

### **Inside Network (LAN)**:

### Network Address: 192.168.10.0/24

### **Outside Network (ISP)**:

### Network Address: 200.0.0.0/30

### **Step 2: Configuring Router1**

### **Access CLI of Router1**:

### Press ENTER to start configuration.

### **Activate Privileged Mode**:

### Type enable.

### **Access Configuration Mode**:

### Type config t.

### **Configure Interfaces**:

### **FastEthernet0/0** (connected to LAN):

### Command: interface FastEthernet0/0

### IP: 192.168.10.1

### Subnet Mask: 255.255.255.0

### **Serial0/0/0** (connected to ISP Router):

### Command: interface Serial0/0/0

### IP: 200.0.0.1

### Subnet Mask: 255.255.255.252

### **Activate Interfaces**:

### Command: no shutdown

### **Step 3: Configuring ISP Router**

### **Access CLI of ISP Router**:

### Press ENTER to start configuration.

### **Activate Privileged Mode**:

### Type enable.

### **Access Configuration Mode**:

### Type config t.

### **Configure Interfaces**:

### **Serial0/0/0** (connected to Router1):

### Command: interface Serial0/0/0

### IP: 200.0.0.2

### Subnet Mask: 255.255.255.252

### **Activate Interfaces**:

### Command: no shutdown

### **Step 4: Configuring PCs**

### **PC0 Configuration**:

### Go to the desktop of PC0, select **IP Configuration**, and assign:

### IP Address: 192.168.10.2

### Subnet Mask: 255.255.255.0

### Default Gateway: 192.168.10.1

### **PC1 Configuration**:

### Go to the desktop of PC1, select **IP Configuration**, and assign:

### IP Address: 192.168.10.3

### Subnet Mask: 255.255.255.0

### Default Gateway: 192.168.10.1

### **Step 5: Configuring NAT on Router1**

### **Define Inside and Outside Interfaces**:

### Command:

### interface FastEthernet0/0

### ip nat inside

### exit

### interface Serial0/0/0

### ip nat outside

### exit

### **Configure a Standard Access List to Permit the Internal Network**:

### Command:

### access-list 1 permit 192.168.10.0 0.0.0.255

### **Configure NAT Overload (PAT) for the Internal Network**:

### Command:

### ip nat inside source list 1 interface Serial0/0/0 overload

### **Step 6: Verify NAT Configuration**

### **Test Connectivity by Pinging from PC0 to ISP Router**:

### Open the command prompt on PC0.

### Type ping 200.0.0.2 and observe the response.

### **Check NAT Translation Table on Router1**:

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

### **Step 7: Verify External Connectivity**

### **Test External Connectivity by Pinging a Simulated Public IP**:

### 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.

### **Simulation of Designed Network Topology**

### **Sending a PDU from PC0 to an External Network**:

### Open **Simulation Mode** in Packet Tracer.

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

### Observe the packet traveling from PC0 to Router1, where NAT translation occurs, then to the ISP Router and external network.

### **Acknowledgment Packet**:

### Observe the acknowledgment packet traveling back from the external network to PC0, confirming successful NAT configuration and communication.

### **Screenshots**

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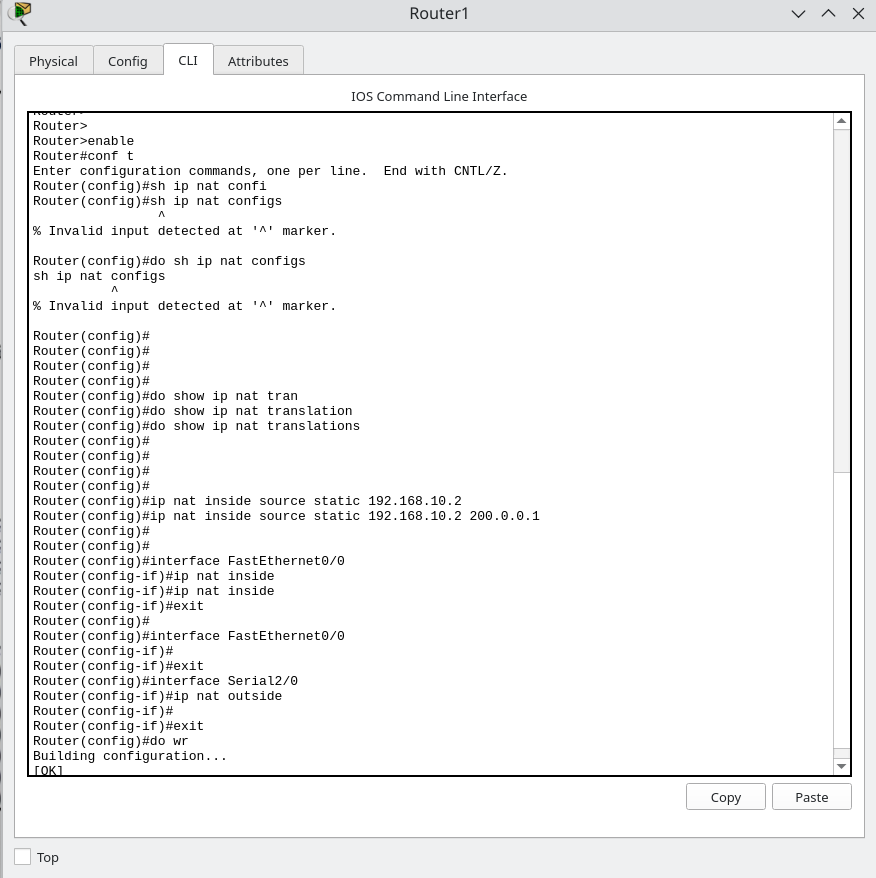
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