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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:

- **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).
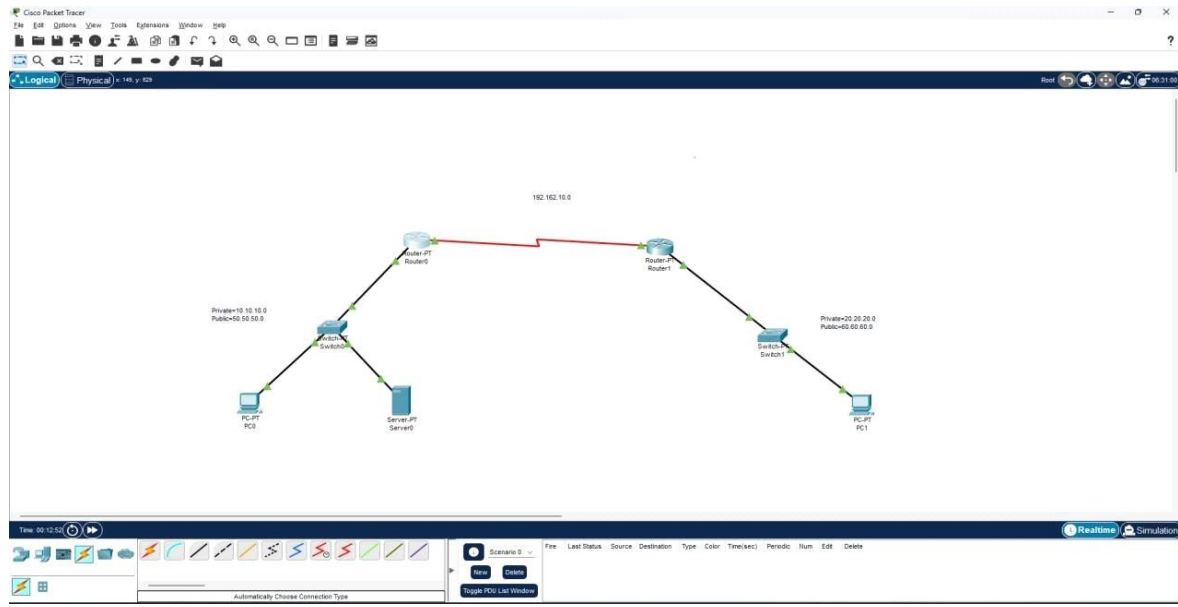
- **Configuring NAT on the Router**

  - **Steps:**
    - **Access the Router CLI:** Click on the router and go to the CLI tab.
    - **Enter Global Configuration Mode:**

```
Router> enable
Router# configure terminal
```

       3,**Configure Interfaces:**

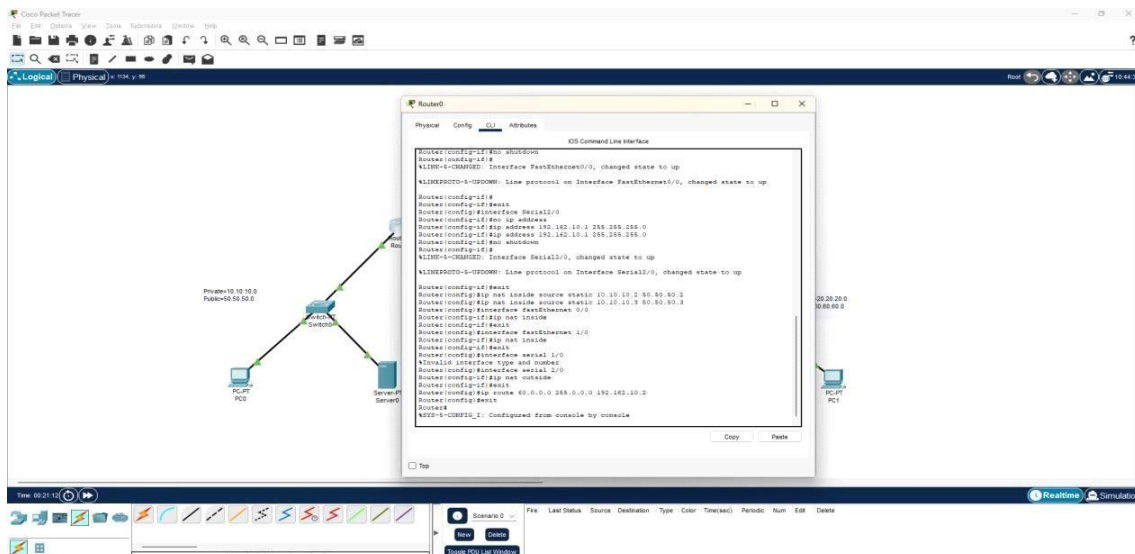Name: VAISHAAL RAJHA T C G
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Set up the internal and external interfaces:

- **Configure NAT Overload (PAT):**


```
Router(config)# access-list 1 permit 192.168.1.0 0.0.0.255
```

Define an access list to match the internal IP range:

Configure NAT to translate the internal addresses to the external address:

This configures PAT (Port Address Translation), which allows multiple internal IPs to share a single external IP.

- **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`).
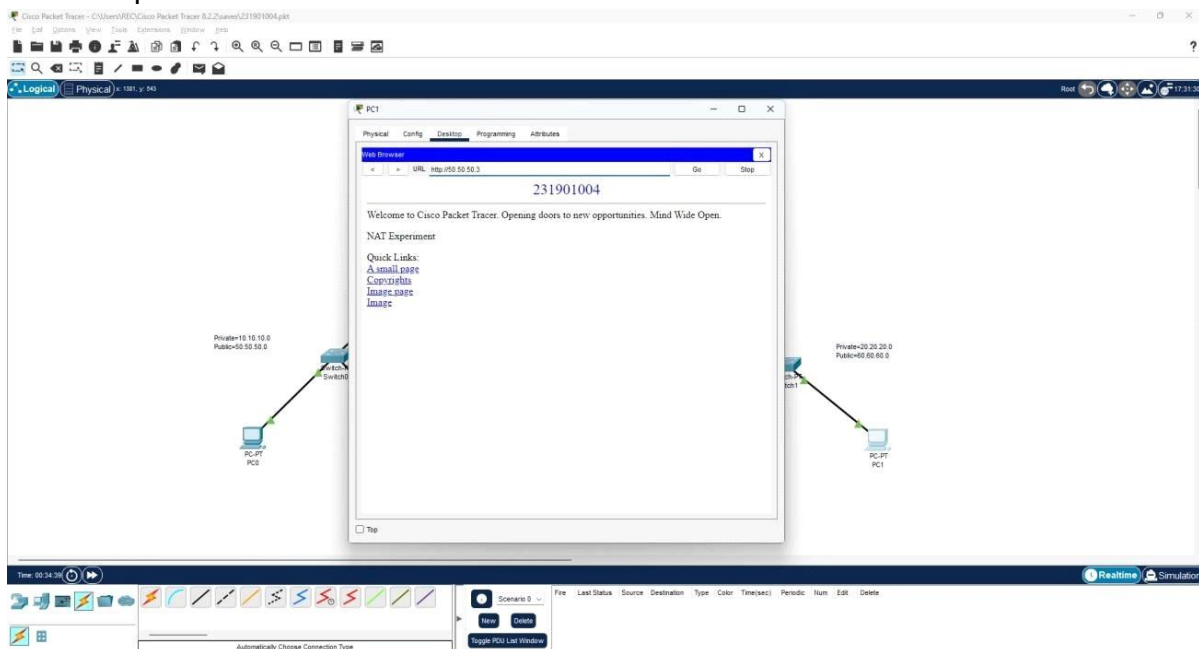   - **Verify NAT Translations:**

```
Router# show ip nat translations
```

On the router CLI, check the NAT translation table to see the active translations:

Observe the Output:

The NAT translation table should show the mapping of the internal private IP addresses to the external public IP.

- **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.

- **Saving the Configuration**

```
Router# copy running-config startup-config
```

Don't forget to save the configuration on the router to avoid losing the settings:

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By following these steps, you can effectively examine and understand how NAT works in a network environment using Cisco Packet Tracer.

Result:

Thus, the experiment of Network Address Translation(NAT) was Examined.