Aim: To Design and Simulate NAT on router using Cisco Packet Tracer.

Software Used: Cisco Packet Tracer

Requirements: 2 Routers, 2 Switches, 1 server, 2 Pcs

Theory:

NAT stands for network address translation. It's a way to map multiple local private addresses to a public one before transferring the information. Organizations that want multiple devices to employ a single IP address use NAT, as do most home routers.

A NAT works by selecting gateways that sit between two local networks: the internal network, and the outside network. Systems on the inside network are typically assigned IP addresses that cannot be routed to external networks (e.g., networks in the 10.0.0.0/8 block). A few externally valid IP addresses are assigned to the gateway. The gateway makes outbound traffic from an inside system appear to be coming from one of the valid external addresses. It takes incoming traffic aimed at a valid external address and sends it to the correct internal system. This helps ensure security. Because each outgoing or incoming request must go through a translation process that offers the opportunity to qualify or authenticate incoming streams and match them to outgoing requests, for example. NAT conserves the number of globally valid IP addresses a company needs.

Procedure:
1. Take 2 Pt-Routers, 2 PCS, 1 Server and 1 switch. Arrange them in the following configuration. (As per output)
2. Connect the 2 Router using Serial DCE cable. Connect the PCS, Switches and Server using Copper Straight Through Cables.
3. Assign Ip Addresses to Pcs, Server and router.
4. Open Pt Router 0, go to CLI mode and type the following:

```
Router(config)#ip nat inside source static 10.10.10.2 50.50.50.2
Router>enable                                                     3
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip nat inside source static 20.20.20.2 60.60.60.2
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)# ip route 50.0.0.0 255.0.0.0 192.162.10.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```
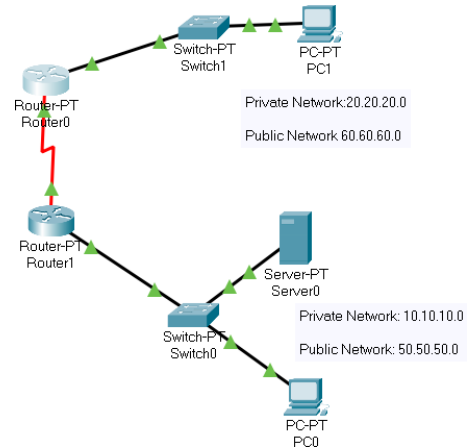
5. Do the same in another router.
```
Router(config)#ip route 60.0.0.0 255.0.0.0 192.162.10.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

6. Check Your Configuration using following command:(For Both Routers)

```
Router#show ip route
```

Output:

1. Network Design

2. Pinging To Pc 1 From Pc 0 using Public as well as Private IP address

3. Accessing server through Pc 1.
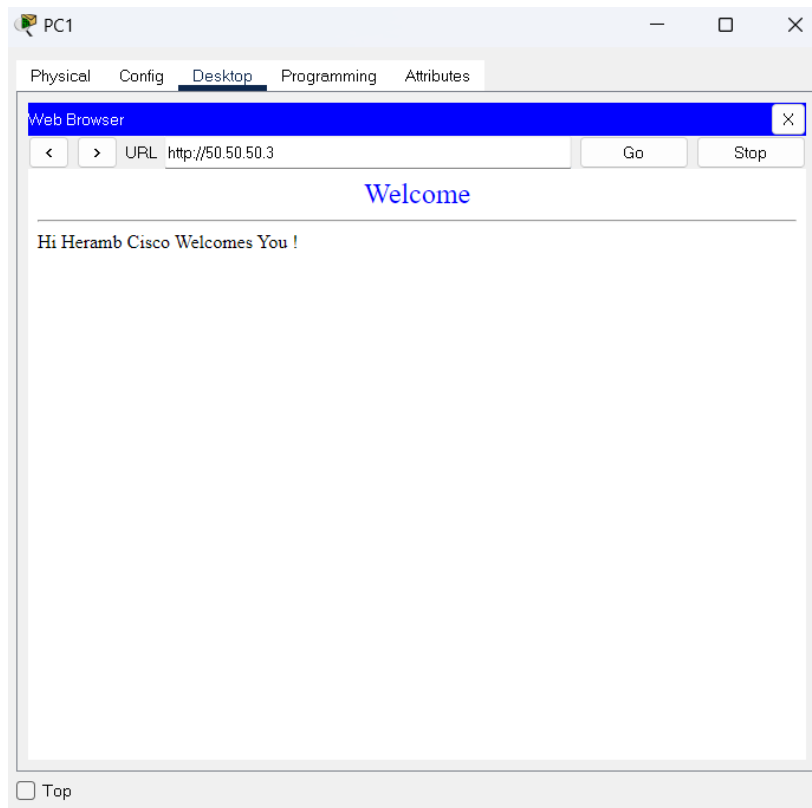
Conclusion:

Thus, we successfully designed and simulated NAT on router using ciscopack.