MIT World Peace University

Computer Networks
Second Year B. Tech, Semester 3

Configuration of Static and Dynamic NAT

Practical Report
Assignment 6

Prepared By

Krishnaraj Thadesar
Cyber Security and Forensics
Batch A1, PA 20

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1 Aim and Objectives

Implement Static and Dynamic NAT Configuration with Packet Tracer

2 Devices

2.1 Devices Used

1. 1 Switch 2960 with 24 LAN Ports
2. 2 Generic PCs
3. 2 Routers.
4. 1 Server.

3 Cables

1. Straight LAN Cable to connect unlike Devices
2. Crossover LAN Cable to connect like Devices

4 Procedure to Configure the Network

1. Create the Network as shown in the figure below.
2. Connect the various components with respective cables.
3. Assign IP Addresses to the devices.
4. Execute Appropriate commands on the routers.
5. Open Web browser on PCs and Laptops and check if they are able to access the server public IP.

5 Commands

```
FOR ROUTER 0


Router>
Router>enable
Router#
Router(config-if)#clock rate 56000
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
```

```
Router(config)#interface Serial0/2/0
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#ip nat inside source static 10.0.0.1 213.20.1.1
Router(config)#ip route 0.0.0.0 0.0.0.0 Serial0/2/0
%Default route without gateway, if not a point-to-point interface, may impact performance
Router(config)#
```

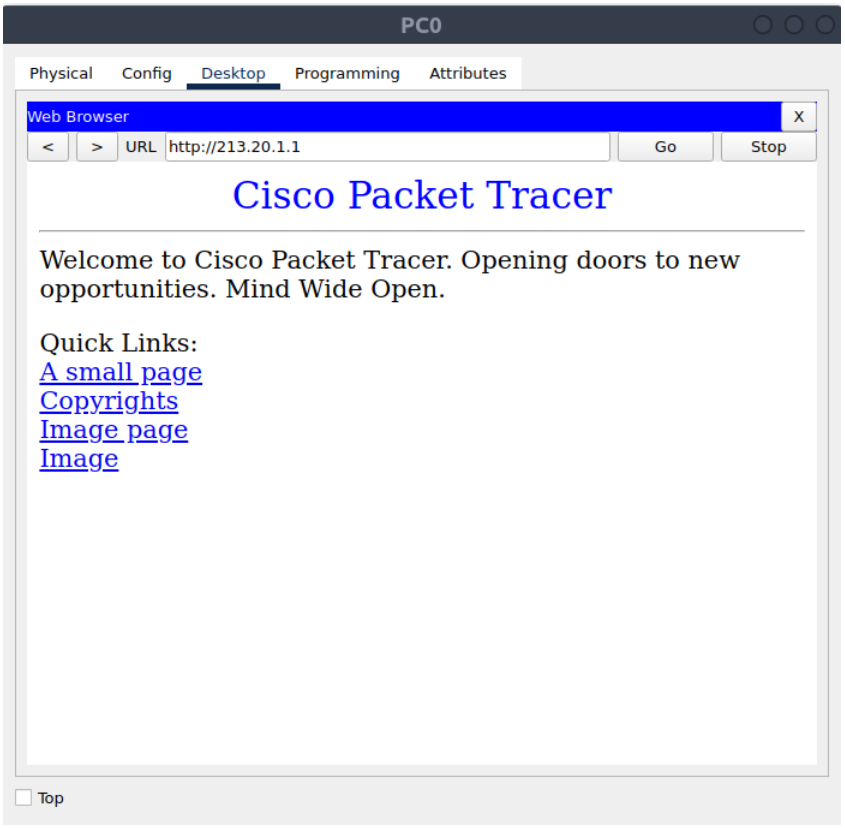
FOR ROUTER 2

```
Router>enable
Router#
Router(config-if)#clock rate 56000
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#ip nat inside source static 20.0.0.1 213.20.1.2
Router(config)#ip nat inside source static 20.0.0.2 213.20.1.2
Router(config)#
Router(config)#
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#ip route 0.0.0.0 0.0.0.0 Serial0/1/0
%Default route without gateway, if not a point-to-point interface, may impact performance
Router(config)#
```

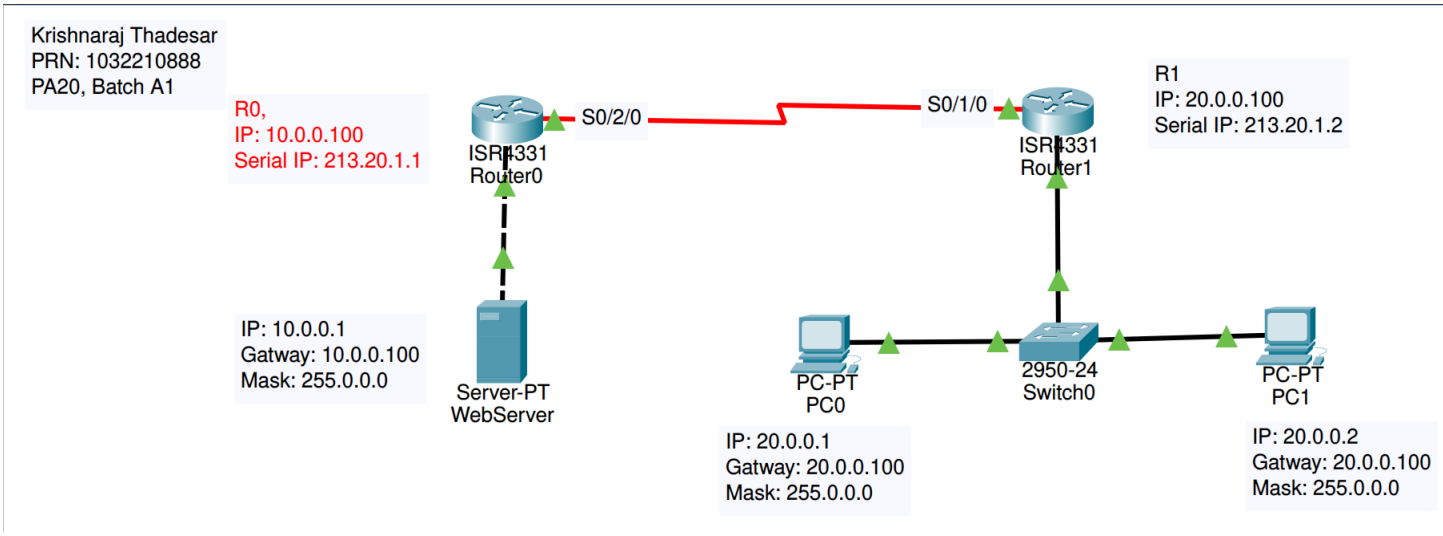
6 Platform

Operating System: Arch Linux x86-64
IDEs or Text Editors Used: Visual Studio Code
Programs Used: Cisco Packet Tracer v6.0.1

7 Output



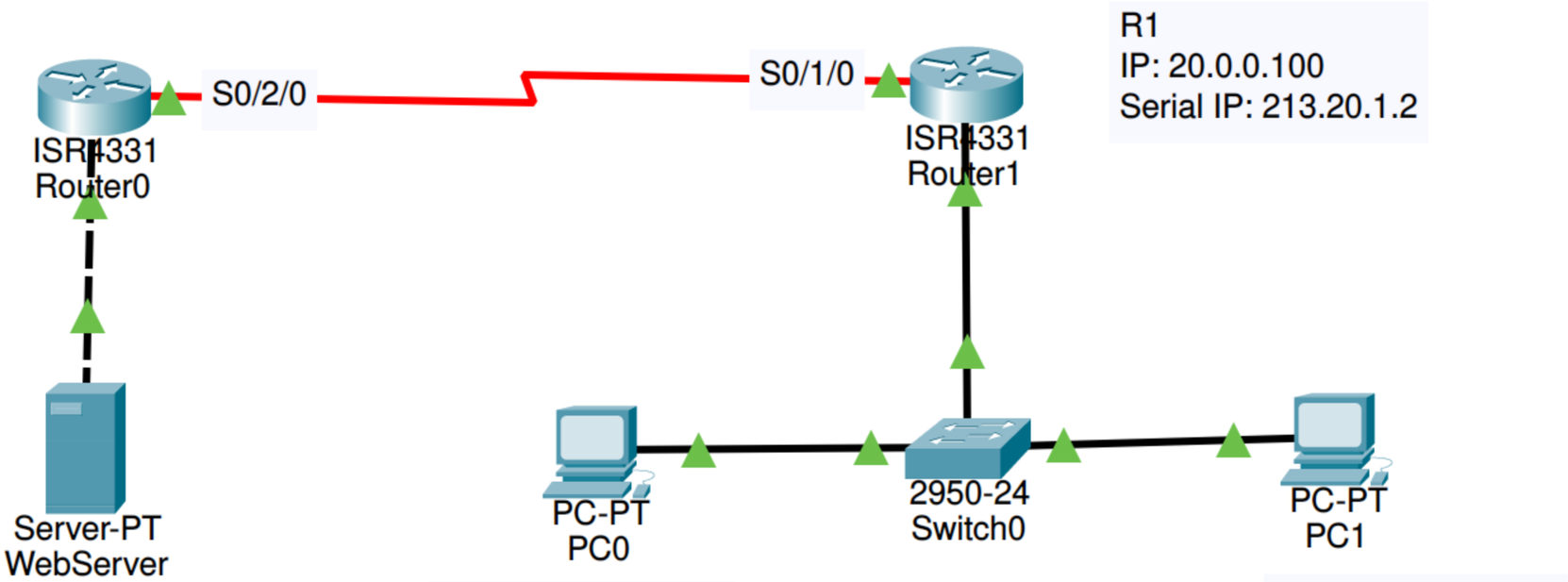
8 Connection Screenshot



9 Conclusion

Thus we have successfully configured Static and Dynamic NAT in Cisco Packet Tracer.

Krishnaraj Thadesar
PRN: 1032210888
PA20, Batch A1



28/11/22

CN- Assignment

Static and Dynamic Nat configuration

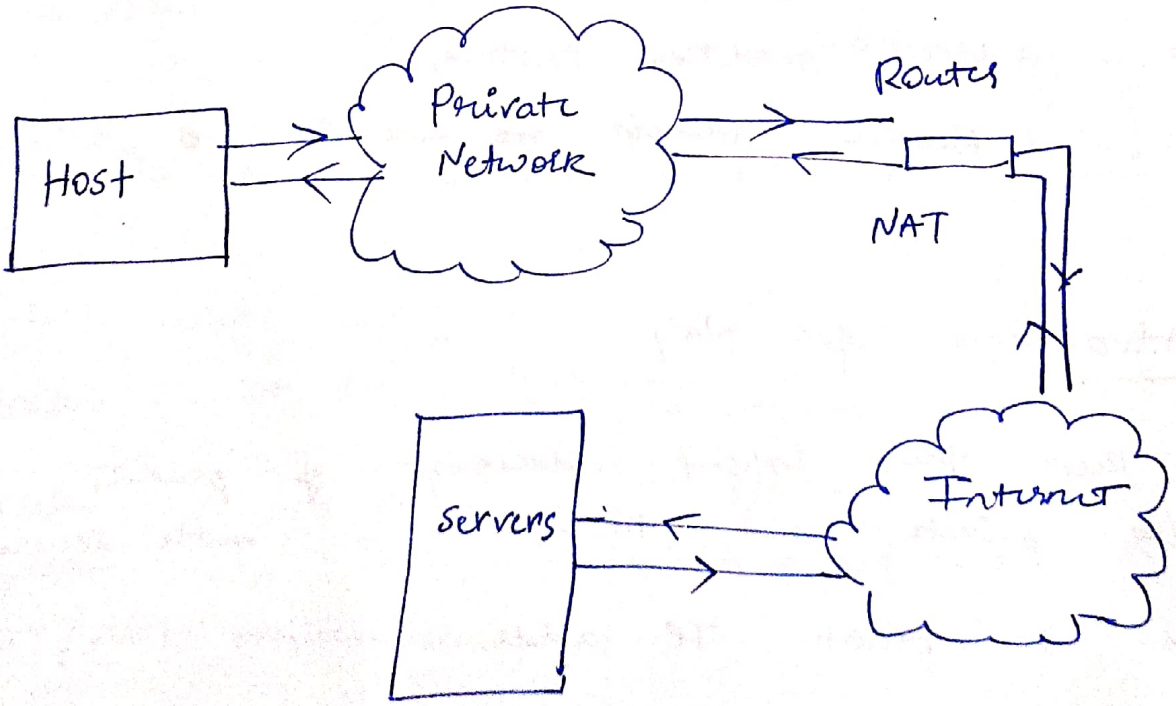
Krishnaraj P7
PA20 , A2

Theory:

⊛ Definition of NAT with diagram:

NAT - Network address translation : It is a way to map multiple private IP addresses to a public one for transferring the information.

Organizations that want multiple devices to use a single IP address use Nat; so do most routers at home.



(*) Static and Dynamic Methods:

Mapping a logical address to its corresponding physical address.

— Static Mapping:

- It means creating a table that associates a logical address with a physical address.
- It needs to be updated periodically.

Dynamic Mapping

- Each time a machine knows one of the 2 IP addresses (logical or physical), it can use a protocol to find the other one.

ARP – (Address resolution protocol)
RARP – (Reverse Address ~~to~~ resolution protocol)

(*) Advantages for NAT

- It keeps the internal addressing of private networks private and therefore is more secure.
- Reuse of private IP addresses.
- Connecting a large no. of hosts to the global internet; using a smaller no Public IP.

(A) FAQ's

Q(1) What command will show us the translations active on our router?

— The command "show ip nat translations" will show you the translation table containing all the active Nat entries.

Q(2) What is the difference between Nat and PAT ?

NAT	PAT
— stands for network address translation.	— stands for port address translation.
— Private IP addresses are translated to Public	— Private IP addresses are translated to public via port number.
— NAT is superset of PAT	— PAT is Dynamic NAT
— NAT uses IPV4 addresses - It has 3 types - Static - Dynamic - PAT / NAT overloadings	— Also uses IPV4 . has 2 types. — static — Overloaded PAT.