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NAT CONFIGURATION LAB

IN CISCO PACKET TRACER

HANDS-ON LAB

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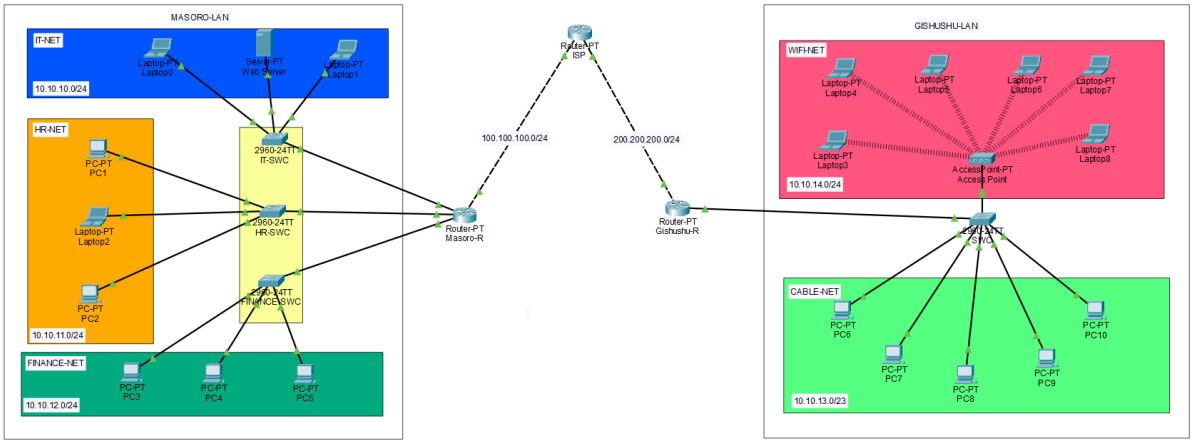
1. Introduction

In this network topology, **Network Address Translation (NAT)** was configured to allow internal devices from both **Masoro** and **Gishushu LANs** to communicate with external networks through their respective routers. NAT enables multiple private IP addresses to share a single public IP, conserving address space and enhancing network security by hiding internal addresses from the outside world.

On the **Masoro router**, NAT was implemented using **Access List 12** to define the internal private networks (**10.10.10.0/24**, **10.10.11.0/24**, and **10.10.12.0/24**). On the **Gishushu router**, **Access List 15** was used to identify the internal networks (**10.10.13.0/24** and **10.10.14.0/24**). Each router used **Port Address Translation (PAT)**, commonly known as **NAT overload**, to allow multiple LAN devices to share the same public IP address — **100.100.100.1** for Masoro and **200.200.200.1** for Gishushu.

2. Network Topology Design



Routers: Used to make connect network and Acts as DHCP server

Switch: Connects multiple end devices

End Devices (Server, PCs/Laptops): Clients used in topology

3. NAT (PAT & Static NAT) Configuration

Step 1: Define inside and Outside Interface

```
29061(config)# interface g9/0
29061(config-if)# ip nat outside
29061(config-if)# exit
29061(config)# interface range g8/0 - g6/0
29061(config-if-range)# ip nat inside
29061(config-if-range)# exit
```

i**p nat outside:** Marks the WAN interface as outside

ip nat inside: Marks the LAN interfaces as inside for NAT

Step 2: Create an Access List to define inside Address

```
29061(config)# access-list 11 permit 10.10.10.0 0.0.0.255
29061(config)# access-list 11 permit 10.10.11.0 0.0.0.255
29061(config)# access-list 11 permit 10.10.12.0 0.0.0.255
29061(config)# access-list 11 deny host 10.10.10.10
```

access-lists 11 permit 10.10.10.0 0.0.0.255: Defines which private IPs are allowed to be translated (Masoro's LANs).

access-lists 11 deny 10.10.10.10 0.0.0255: Excludes the server IP from translation

Step 3: Apply NAT Overload (PAT)

```
29061(config)# ip nat inside source list 11 interface g9/0 overload
```

ip nat inside source list 11 interface g9/0 overload: Tells the router to use the public IP of the outside interface (g9/0) for all internal users

overload: Enable PAT (Port Address Translation) many private IPs share one public IP, using different port numbers

4.Verification of NAT

Use the following command

```
29061# show ip nat translations
29061# show ip nat statistics
```

show ip nat translation: displayes private ip address translated to public ip adderress

```
29061-R#show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
icmp 100.100.100.1:4   10.10.10.10:4      10.10.14.2:4       10.10.14.2:4
icmp 100.100.100.1:5   10.10.10.10:5      10.10.14.2:5       10.10.14.2:5
icmp 100.100.100.1:6   10.10.10.10:6      10.10.14.2:6       10.10.14.2:6
icmp 100.100.100.1:7   10.10.10.10:7      10.10.14.2:7       10.10.14.2:7
icmp 100.100.100.1:8   10.10.10.10:8      10.10.14.2:8       10.10.14.2:8
```

show ip nat statistics: table that shows nat details.

```
29061-R#show ip nat statistics
Total translations: 4 (0 static, 4 dynamic, 4 extended)
Outside Interfaces: GigabitEthernet9/0
Inside Interfaces: GigabitEthernet6/0 , GigabitEthernet7/0 , GigabitEthernet8/0
Hits: 0  Misses: 19
Expired translations: 5
Dynamic mappings:
```

5. Challenge Faced:

After configuring **NAT overload**, I noticed that my network connections suddenly stopped working. Devices in the LAN could not access external networks, and pings to other routers failed.

Cause:

The issue occurred because **multiple overload configurations** were applied on the same router interface. This caused conflicting NAT translations, preventing the router from handling address mappings correctly.

Solution:

To resolve the problem, I disabled one of the overload configurations and kept only the correct one for the active outside interface.

```
29061(config)# no ip nat inside source list 15 interface g9/0 overload
```

Summary:

After completing the NAT configuration on both routers:

Private networks in Masoro and Gishushu could access external networks using a single shared public IP (via overload).

The configuration used `ip nat inside` for LAN interfaces and `ip nat outside` for WAN interfaces.

Access Control Lists (ACLs) defined which networks were eligible for translation.

Verification with commands such as `show ip nat translations` and `show ip nat statistics` confirmed successful address translation.

END.