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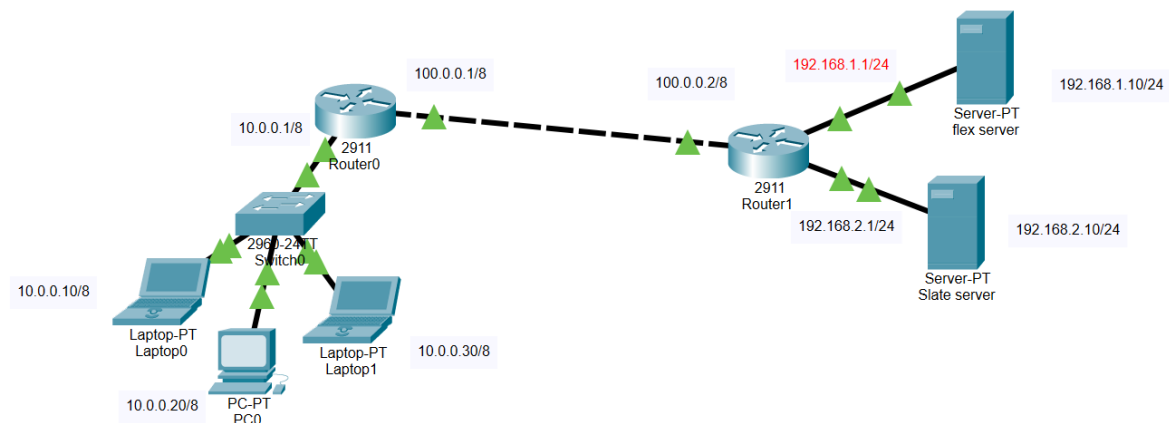
**Course Name: Computer Networks LAB**

**Submitted to : Mam Hurmat Hidayat**

**TASK:** Implement the S-NAT for web server of (flex and slate) and Dynamic-NAT for Client Systems in a single topology.(Use routers and switches).

Step 1:

Build a network topology.



Step 2: configure static IP in PCs & servers.

PCS:

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address: 10.0.0.10

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 10.0.0.20

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.1

DNS Server 0.0.0.0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 10.0.0.30

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.1

DNS Server 0.0.0.0

## Servers:

Physical Config Services **Desktop** Programming Attributes

IP Configuration X

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.1.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

Physical Config Services **Desktop** Programming Attributes

IP Configuration X

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.2.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.2.1

DNS Server 0.0.0.0

## Step 3: configuring router:

### Router 1:

```
R1(config-if)#int gig0/0
R1(config-if)#ip add 10.0.0.1 255.0.0.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#int gig0/1
R1(config-if)#ip add 100.0.0.1 255.0.0.0
R1(config-if)#no shut
```

The screenshot shows the 'Services' tab in the Cisco Packet Tracer configuration window for Router 1. On the left, a list of services is shown: HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The 'File Name' field is set to 'index.html'. The main text area contains the following HTML code:

```
<html>
<center><font size='+2' color='blue'>Flex Student</font></center>
<hr>Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
<p>Quick Links:
<br><a href='helloworld.html'>login Page</a>
<br><a href='copyrights.html'>Copyrights</a>
<br><a href='image.html'>Image page</a>
<br><a href='cscoptlogo177x111.jpg'>Image</a>
</html>
```

### Router 2:

```
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#int gig0/1
R2(config-if)#ip add 100.0.0.2 255.0.0.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

R2(config-if)#int gig0/0
R2(config-if)#exit
R2(config)#int gig0/0
R2(config-if)#ip add 192.168.1.1 255.255.255.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

R2(config-if)#int gig0/2
R2(config-if)#ip add 192.168.2.1 255.255.255.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
```

Physical Config **Services** Desktop Programming Attributes

SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP

File Name:

```
<html>
<center><font size='+2' color='blue'>State</font></center>
<hr>Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
<p>Quick Links:
<br><a href='helloworld.html'>Login here</a>
<br><a href='copyrights.html'>Copyrights</a>
<br><a href='image.html'>Image page</a>
<br><a href='cscoptlogo177x111.jpg'>Image</a>
</html>
```

#### Step 4: static NAT router configuration:

```
R2(config)#ip nat inside source static 192.168.1.10 200.0.0.10
R2(config)#ip nat inside source static 192.168.2.10 200.0.0.20
R2(config)#int gig0/1
R2(config-if)#ip nat outside
R2(config-if)#exit
R2(config)#int gig0/0
R2(config-if)#ip nat inside
R2(config-if)#exit
R2(config)#int gig0/2
R2(config-if)#ip nat inside
R2(config-if)#exit
R2(config)#
```

#### Step 5: Dynamic-NAT router configuration:

##### 1. Creating an access list of IP addresses which need translation.

```
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#
R1(config)#
R1(config)#access-list 1 permit 10.0.0.0 0.255.255.255
```

##### 2. Create a pool of all IP address which are available for translation

```
R1(config)#ip nat pool cnlab 50.0.0.1 50.0.0.2 netmask 255.0.0.0
R1(config)#
```

##### 3. Map access list with pool

```
R1(config)#ip nat inside source list 1 pool cnlab
R1(config)#
```

##### 4. Define inside and outside interfaces

```
R1(config)#int gig0/0
R1(config-if)#ip nat inside
R1(config-if)#
R1(config-if)#int gig0/1
R1(config-if)#ip nat outside
```

Step 5: we will configure static routing in routers

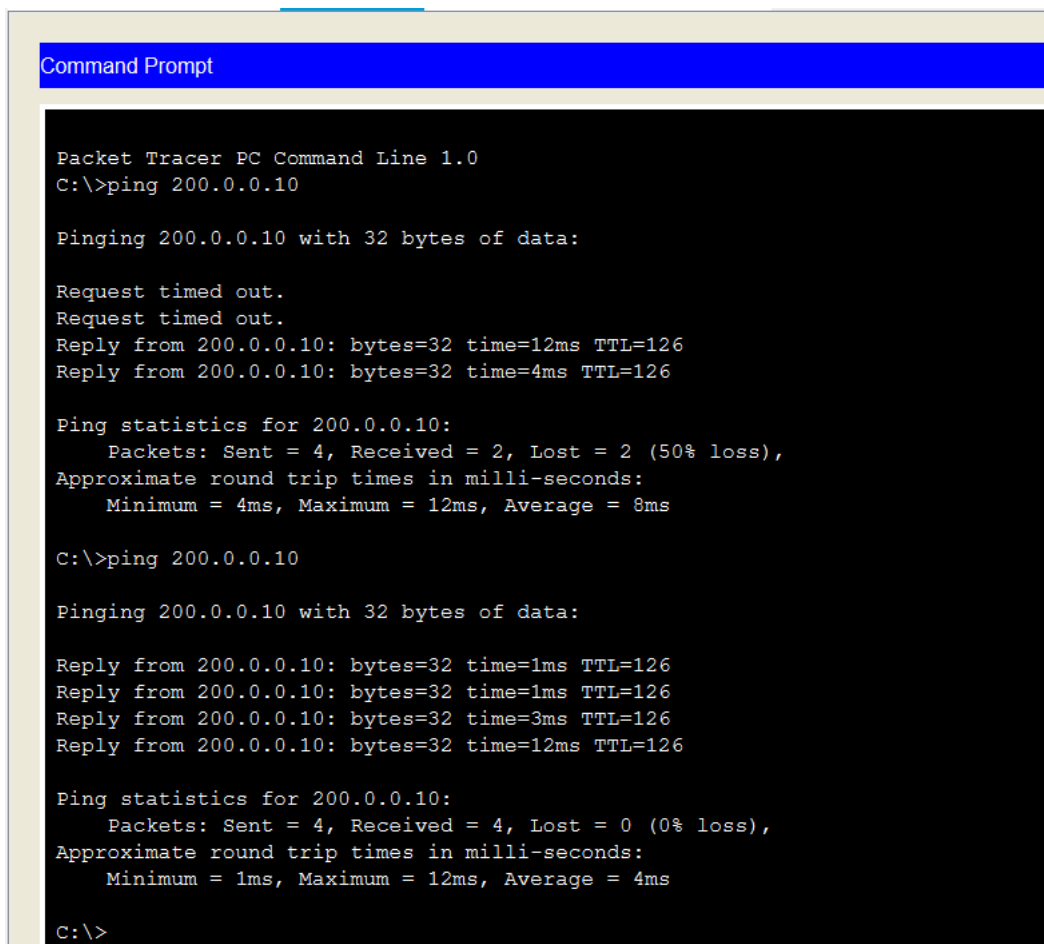
R1:

```
R1(config)#ip route 200.0.0.0 255.255.255.0 100.0.0.2
R1(config)#exit
```

R2:

```
R2(config)#ip route 50.0.0.0 255.0.0.0 100.0.0.1
R2(config)#
```

Step 6: We will check whether D-NAT is working or not by pinging and by other means like browsing flex site.



```
Command Prompt

Packet Tracer PC Command Line 1.0
C:\>ping 200.0.0.10

Pinging 200.0.0.10 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 200.0.0.10: bytes=32 time=12ms TTL=126
Reply from 200.0.0.10: bytes=32 time=4ms TTL=126

Ping statistics for 200.0.0.10:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 12ms, Average = 8ms

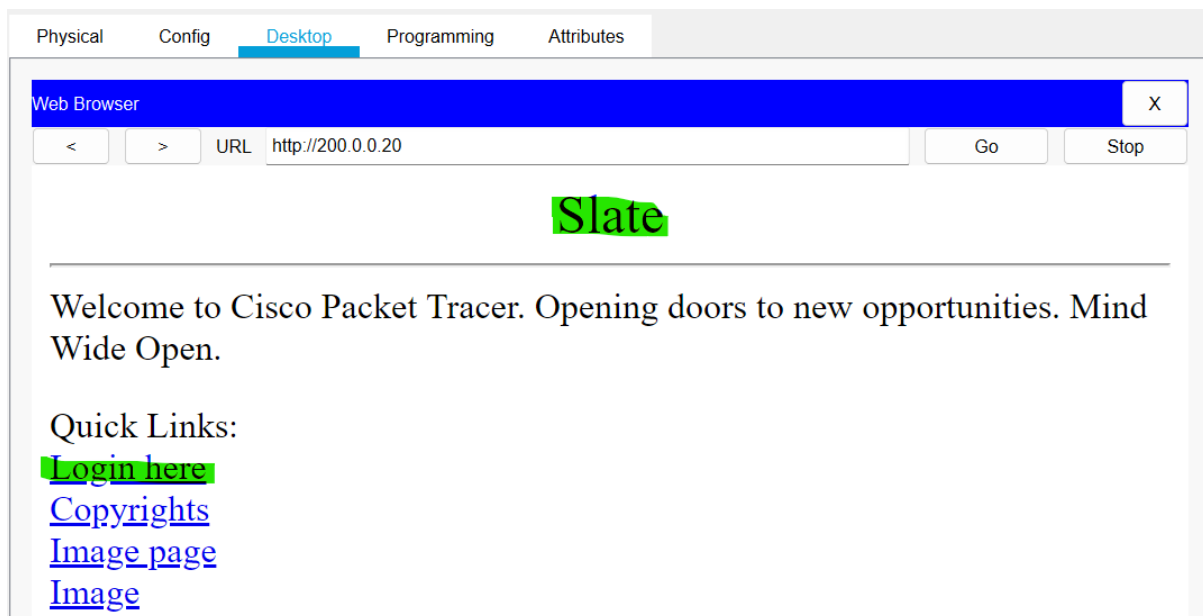
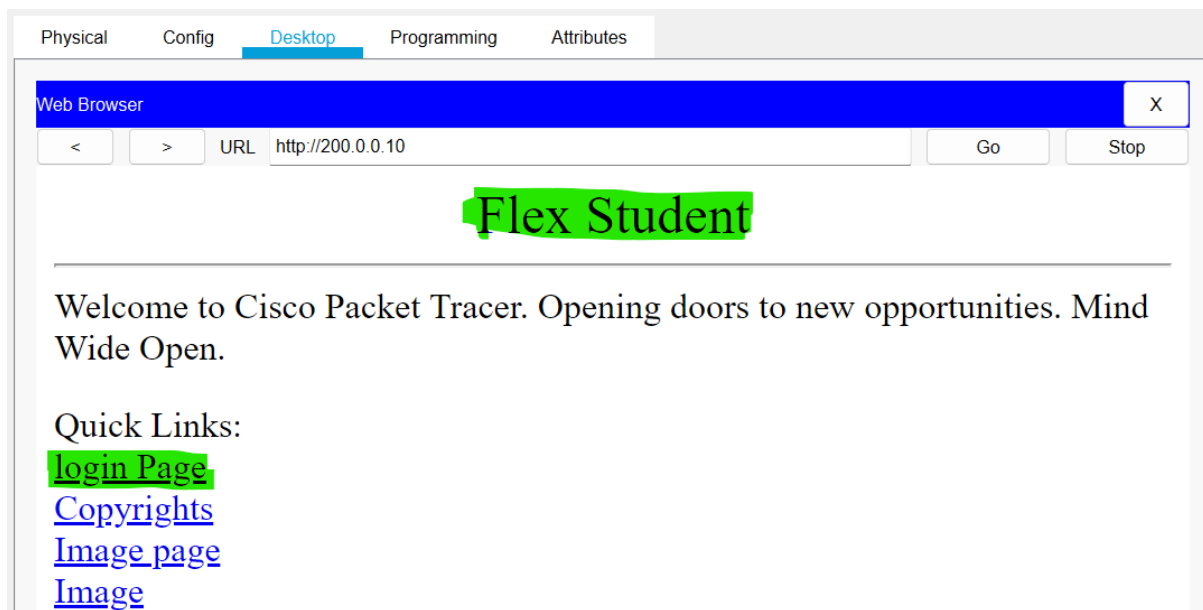
C:\>ping 200.0.0.10

Pinging 200.0.0.10 with 32 bytes of data:

Reply from 200.0.0.10: bytes=32 time=1ms TTL=126
Reply from 200.0.0.10: bytes=32 time=1ms TTL=126
Reply from 200.0.0.10: bytes=32 time=3ms TTL=126
Reply from 200.0.0.10: bytes=32 time=12ms TTL=126

Ping statistics for 200.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 12ms, Average = 4ms

C:\>
```



***THE END***