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Section: BCS-5A

LAB TASK 13

Network Address Translation (NAT)

Task: Implement the Dynamic-NAT Configuration for web server of (flex and slate) in a single topology.

There will be four steps to implement Dynamic-NAT configuration:

1. Create an access list of IP addresses which need translation

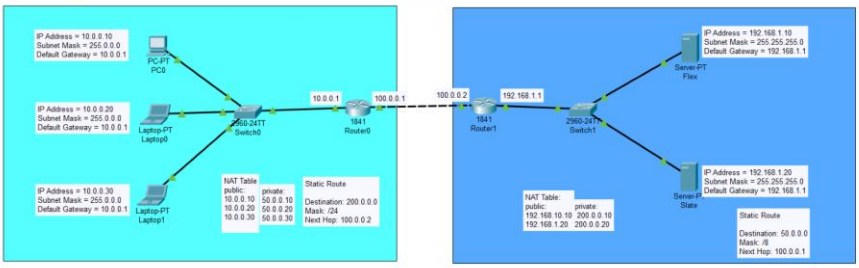
2. Create a pool of all IP address which are available for translation

3. Map access list with pool

4. Define inside and outside interfaces

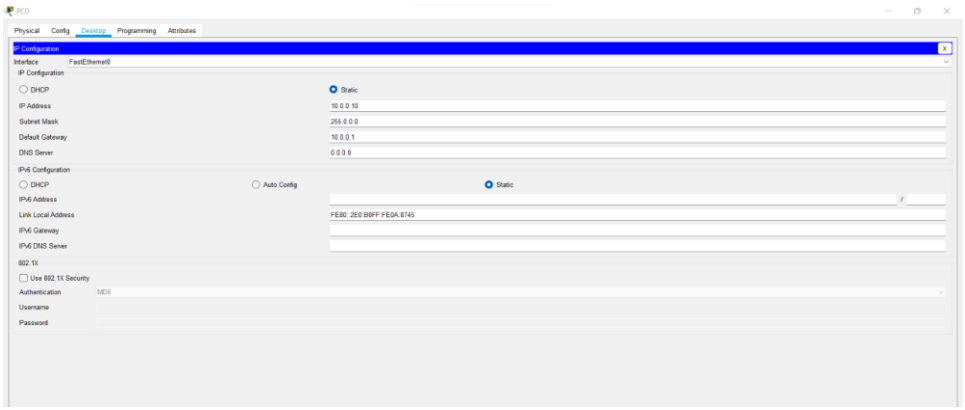
I will be using the same topology that I have used in lab 12.

Step1: Create this topology in the packet tracer.



Step2: Assign Ip addresses, default mask and default gateway to all PC's and Server.

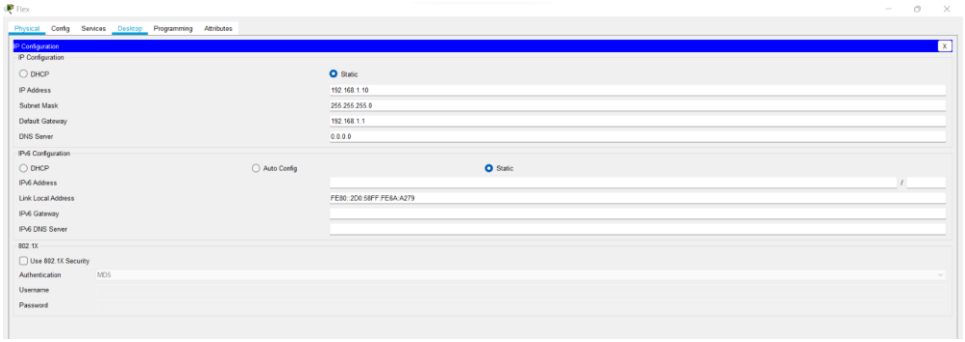
PC0:



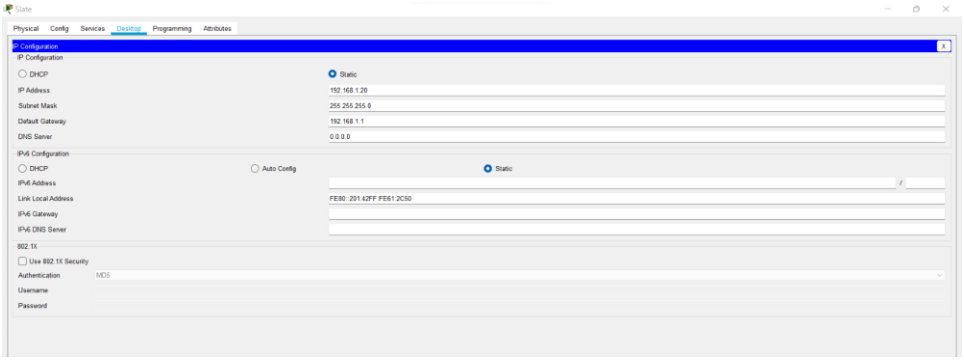
Laptop0:

Laptop1:

Flex Server:



Slate Server:

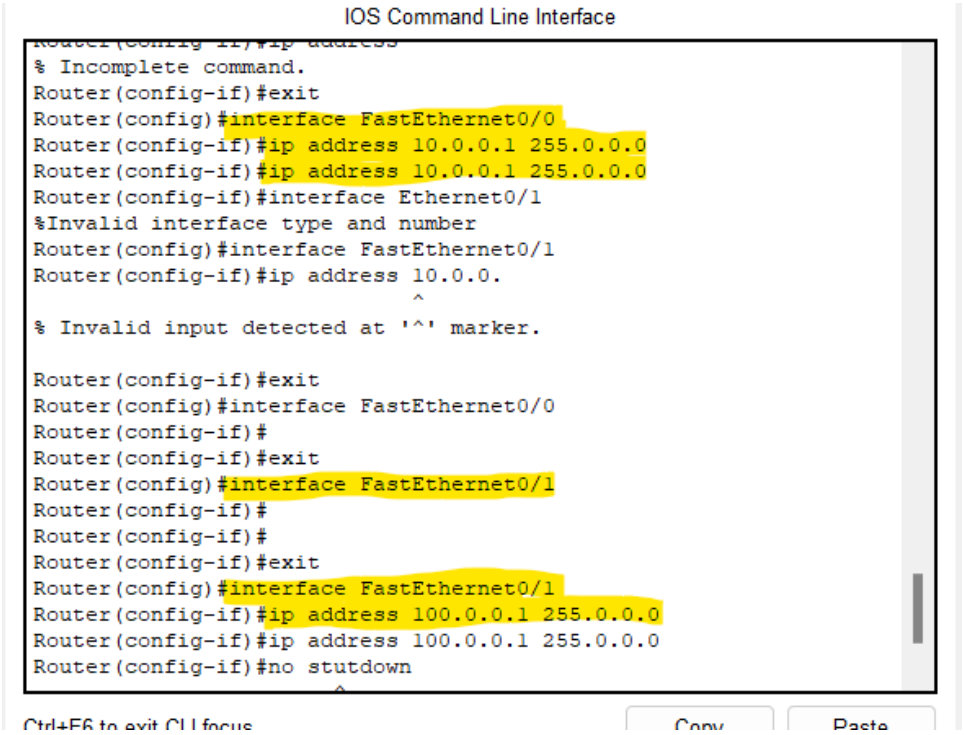


Step3: Router 0 and Router 1 Configuration.

Router 0 Configuration:

- Assign IP addresses to both router ends.
- Add public and private ip addresses
- Tell the router which interface is inside local and which interface is inside global.

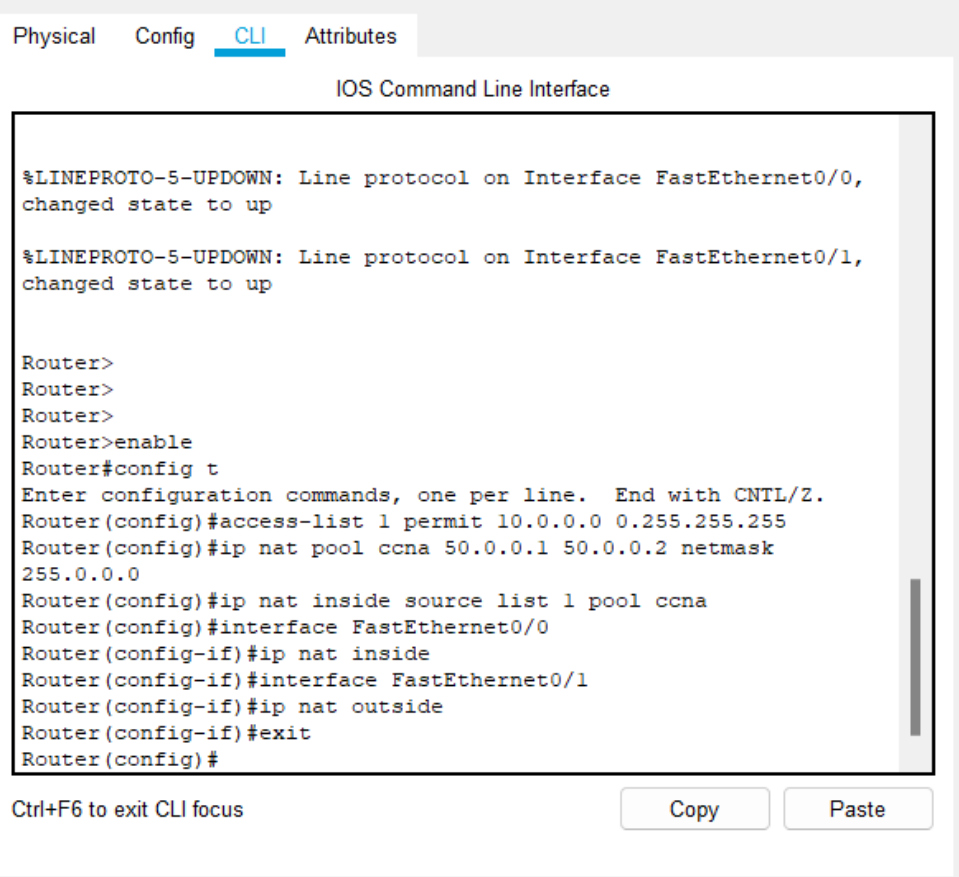
Assigning IP addresses to both router Interfaces:



Configure Static NAT

Dynamic NAT configuration requires three steps: -

1. Define IP address mapping



Router 1 Configuration:

- Assign IP addresses to both router ends.
- Add public and private ip addresses
- Tell the router which interface is inside local and which interface is inside global.

Assigning IP addresses to both router Interfaces:

```
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 100.0.0.2 255.0.0.0
Router(config-if)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
```

Ctrl+F6 to exit CLI focus Copy Paste

Configure Static NAT

Static NAT configuration requires three steps: -

1. Define IP address mapping

```
Router(config-if)#
Router(config-if)#ip nat inside source static 192.168.1.10
200.0.0.10
Router(config)#ip nat inside source static 192.168.1.20
200.0.0.20
```

2. Define inside local interface

```
Router(config-if)#
Router(config-if)#
Router(config-if)#interface FastEthernet0/1
Router(config-if)#ip nat inside
Router(config-if)#
```

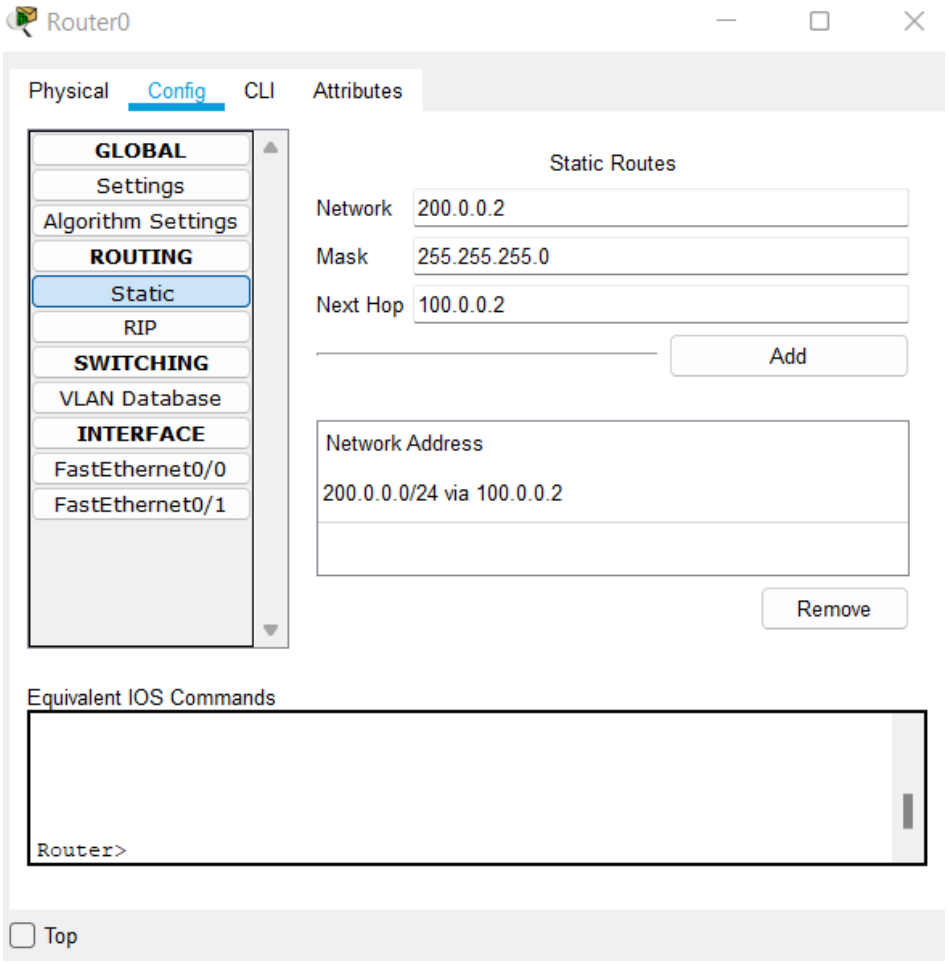
3. Define inside global interface

```
Router(config)#interface FastEthernet0/0
Router(config-if)#ip nat outside
Router(config-if)#
```

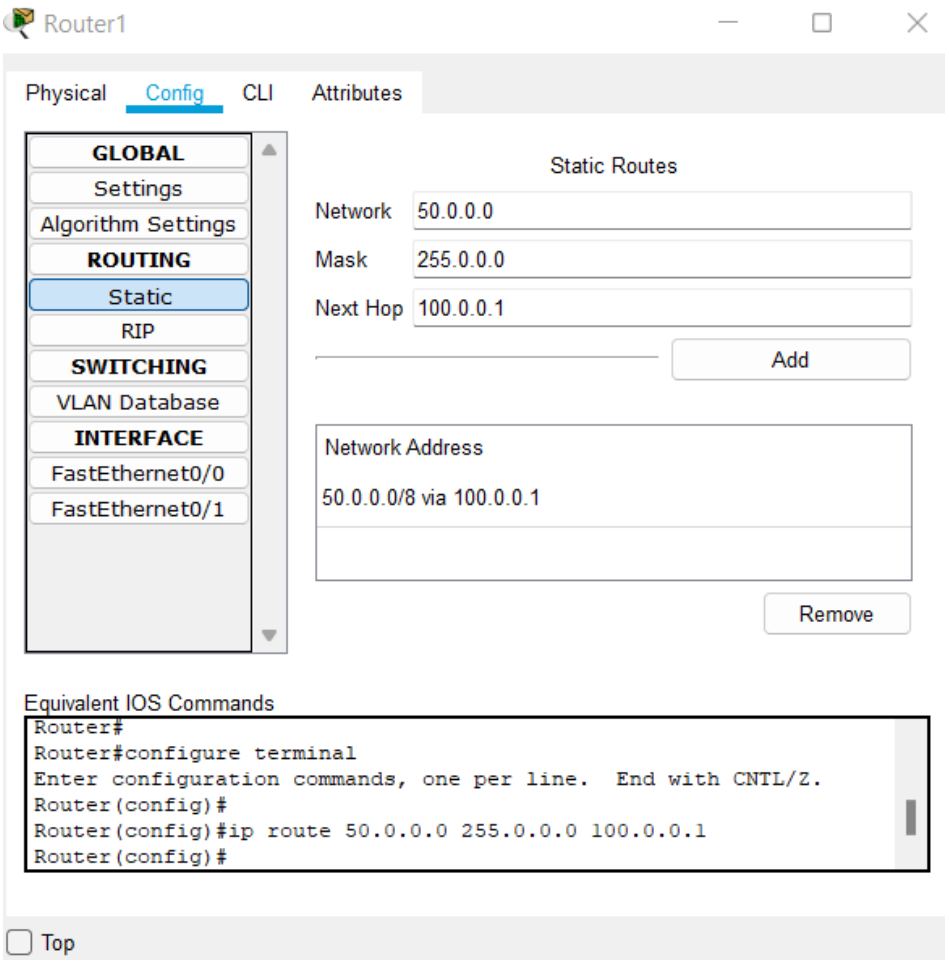
Ctrl+F6 to exit CLI focus

Step4: Static Routing for Router R0 and R1

Static Routing for R0:

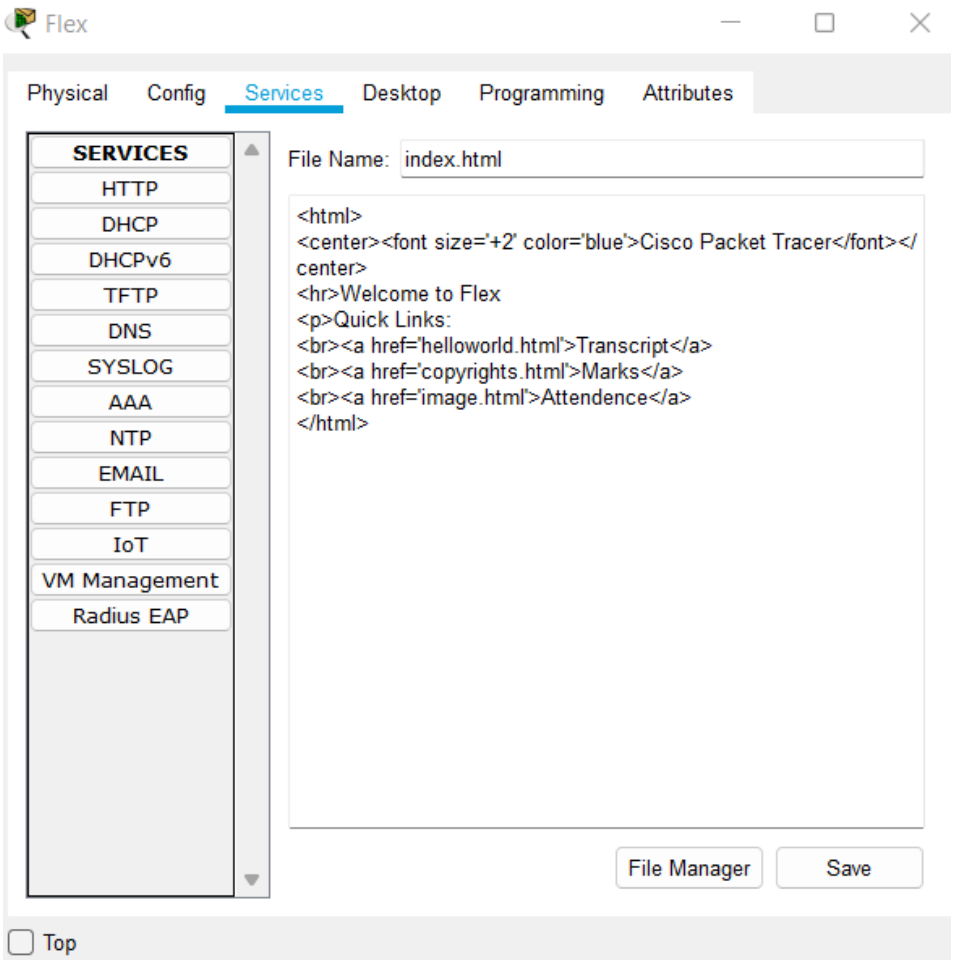


Static Routing for R1:

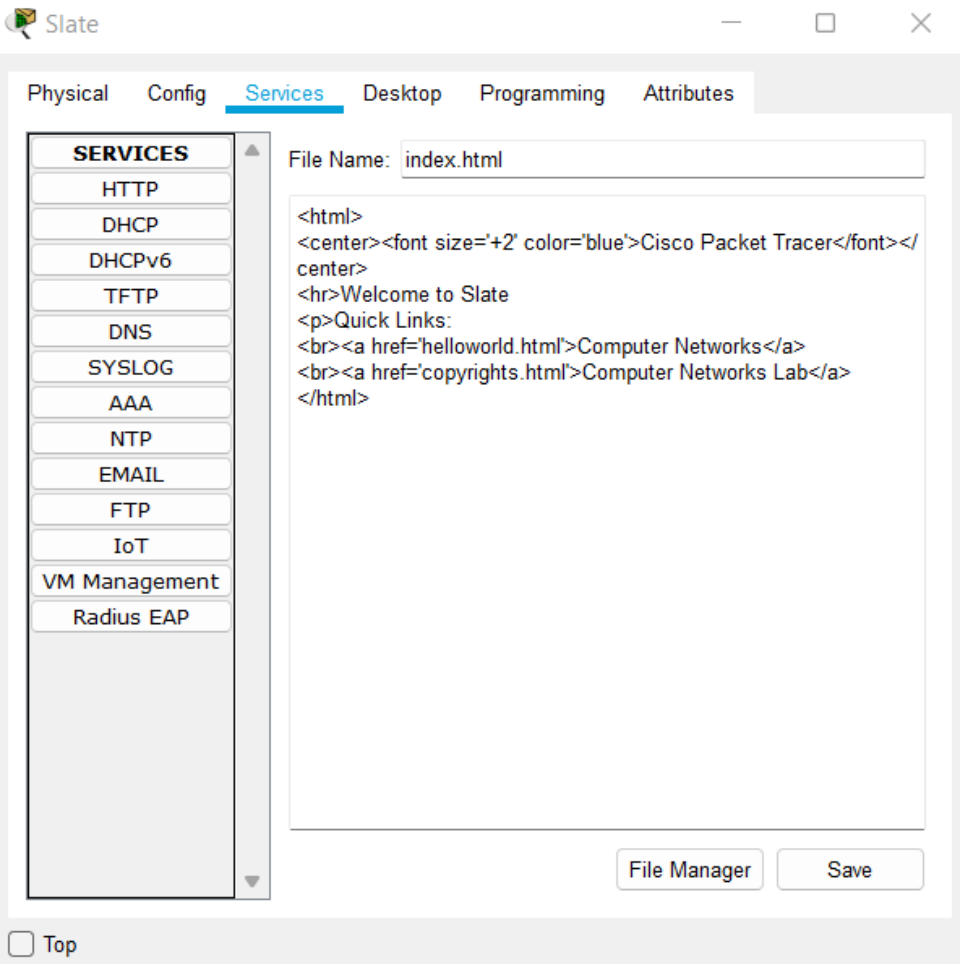


Step5: Edit the index.html file of Flex and Slate server.

Flex Server:



Slate Server:



Step 6: Verification

Now all the configuration are done. We can access the flex and slate with the help of public IP addresses. If we try to access it with private IP address then we would not able to do that.

Pinging the Flex server with Public IP Address:

```
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=1ms TTL=126
Reply from 200.0.0.10: bytes=32 time<1ms 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 = 0ms, Maximum = 1ms, Average = 0ms
```

Pinging Flex Server with private IP address:

```
C:\>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:

Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Request timed out.

Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

Why ping not successful with private IP address of Flex server?

Ans: We have pinged with IP address 192.168.1.10. This IP goes to the router and router then check that this IP address is available or not. There it does not find entry for the 192.168.1.10 because it's a private IP address. That's why router does not host with this IP. So, It will send the error back "Destination host unreachable".

Pinging the Slate server with Public IP Address:

```
C:\>ping 200.0.0.20

Pinging 200.0.0.20 with 32 bytes of data:

Reply from 200.0.0.20: bytes=32 time<1ms TTL=126
Reply from 200.0.0.20: bytes=32 time<1ms TTL=126
Reply from 200.0.0.20: bytes=32 time<1ms TTL=126
Reply from 200.0.0.20: bytes=32 time<1ms TTL=126

Ping statistics for 200.0.0.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Pinging the Slate Server with Private IP Address:

```
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

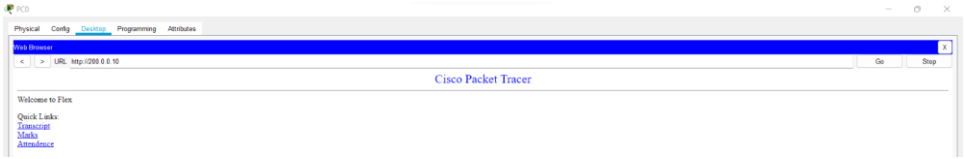
Why ping not successful with private IP address of Flex server?

Ans: We have pinged with IP address 192.168.1.10. This IP goes to the router and router then check that this IP address is available or not. There it does not find entry for the 192.168.1.10 because it's a private IP address. That's why router does not host with this IP. So, It will send the error back "Destination host unreachable".

Accessing Slate and Flex using web Browser with public IP addresses:

Slate:

Flex:



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