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Sec: 5-A

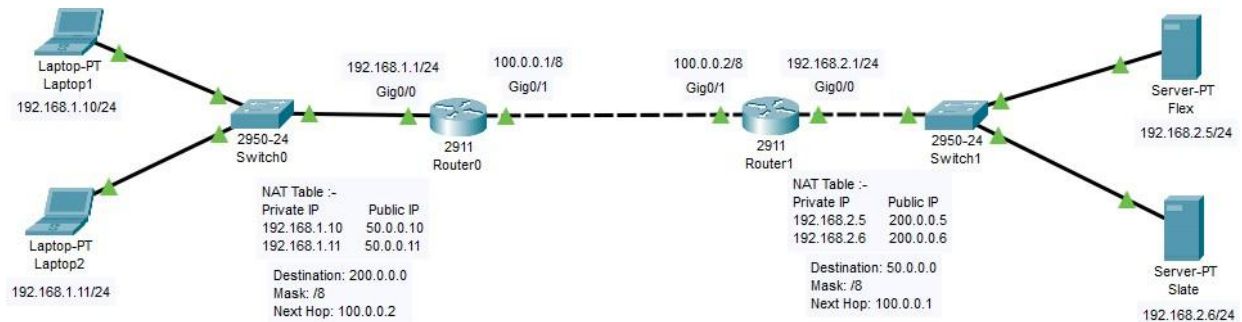
Computer Networks

Lab Task 12

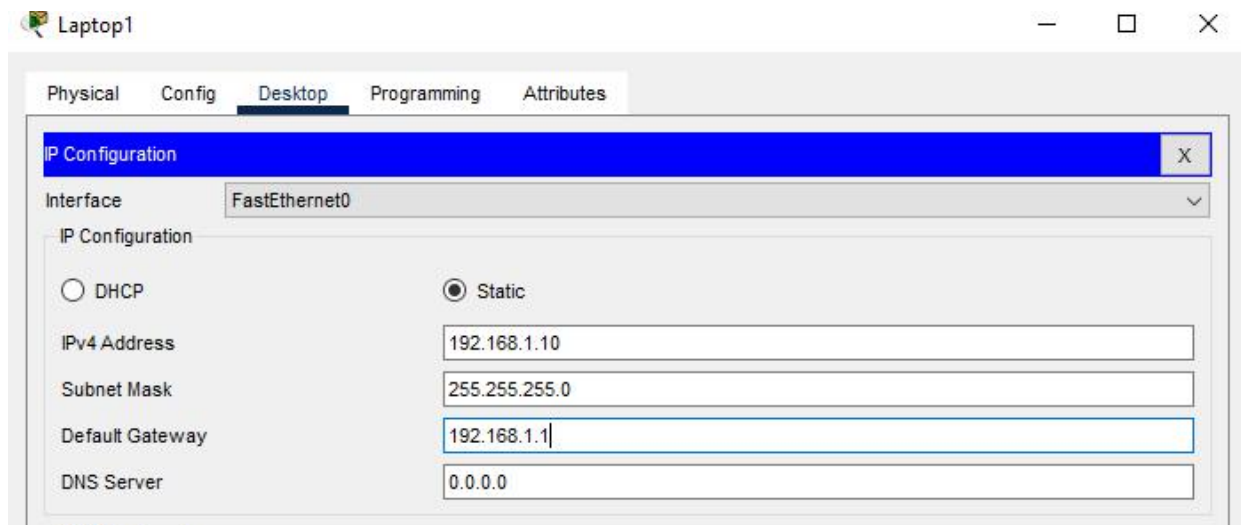


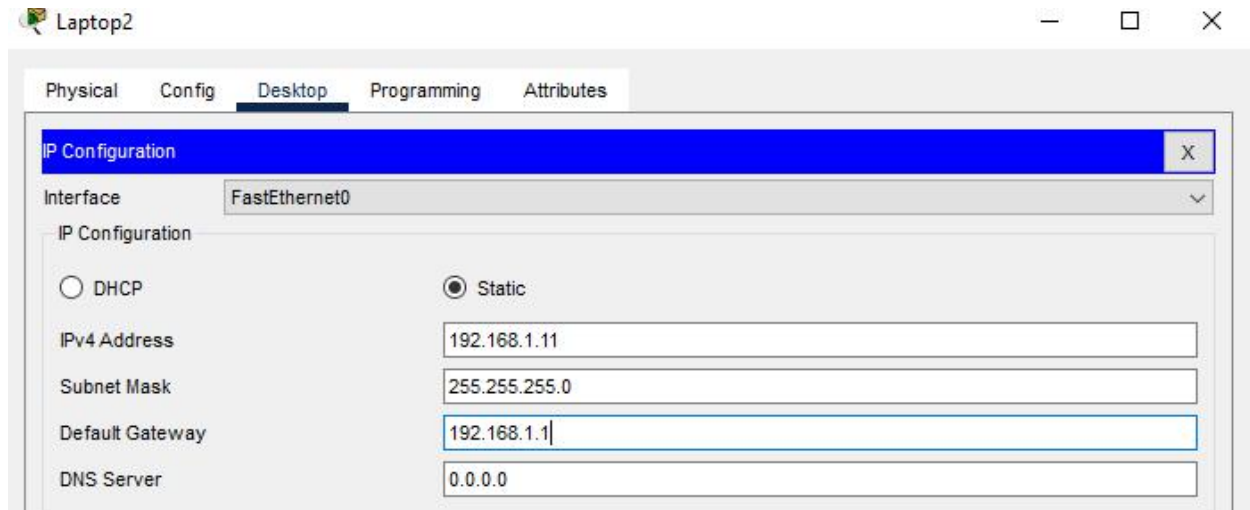
Implement the S-NAT for web servers of (flex and slate) in a single topology.

Topology:



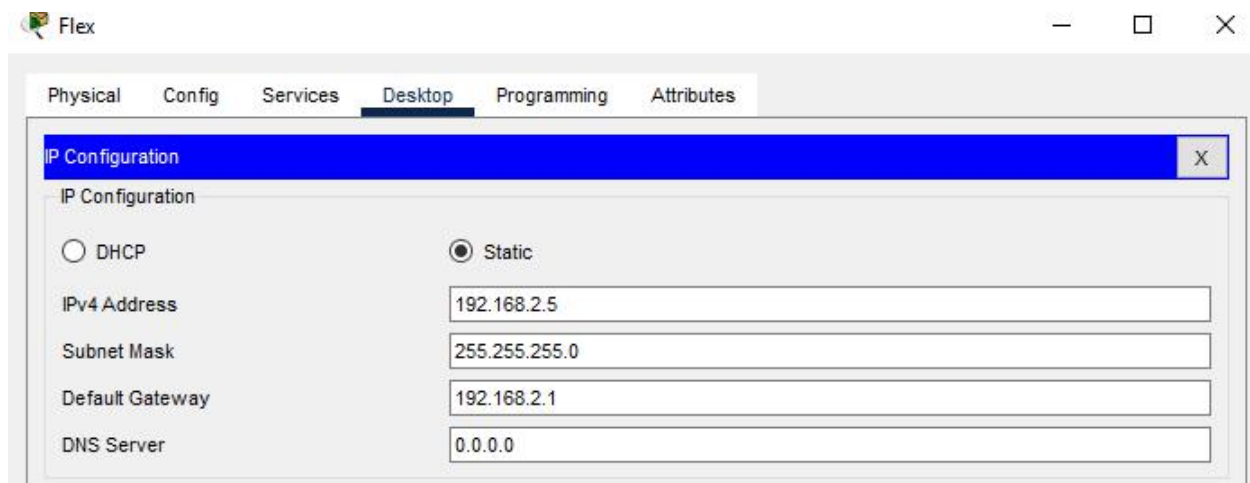
PC configuration :





Server Configuration :

Flex:



Slate:

Slate

Physical Config Services **Desktop** Programming Attributes

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.2.6

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.2.1

DNS Server: 0.0.0.0

Router Configuration :

Router 0 :

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/0

Port Status: ☒ On

Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address: 0007.ECC3.9501

IP Configuration

IPv4 Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/1

Port Status: ☒ On

Bandwidth: ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address: 0007.ECC3.9502

IP Configuration

IPv4 Address: 100.0.0.1

Subnet Mask: 255.0.0.0

Tx Ring Limit: 10

Router1 :

Router1

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/0

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0030.A3C3.0701

IP Configuration

IPv4 Address 192.168.2.1

Subnet Mask 255.255.255.0

Router1

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/1

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0030.A3C3.0702

IP Configuration

IPv4 Address 100.0.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

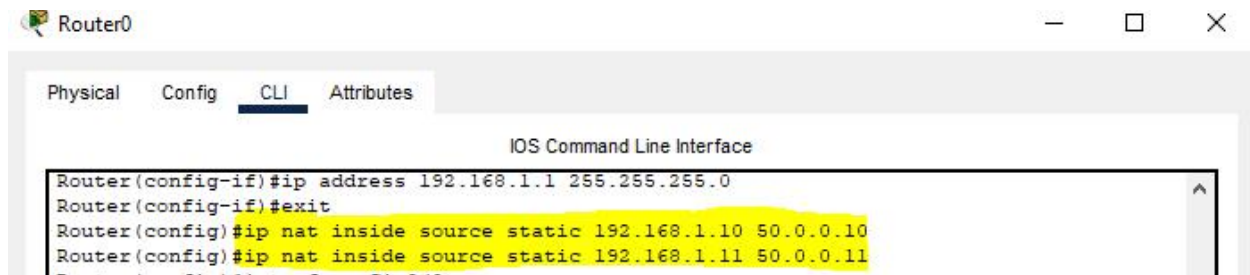
Configure Static NAT:

For Router 0 :

Static NAT configuration requires three steps

1. Define IP address mapping :

In static NAT, we have to map each inside local IP address with inside global IP address. Following command in Screenshot is used for mapping.

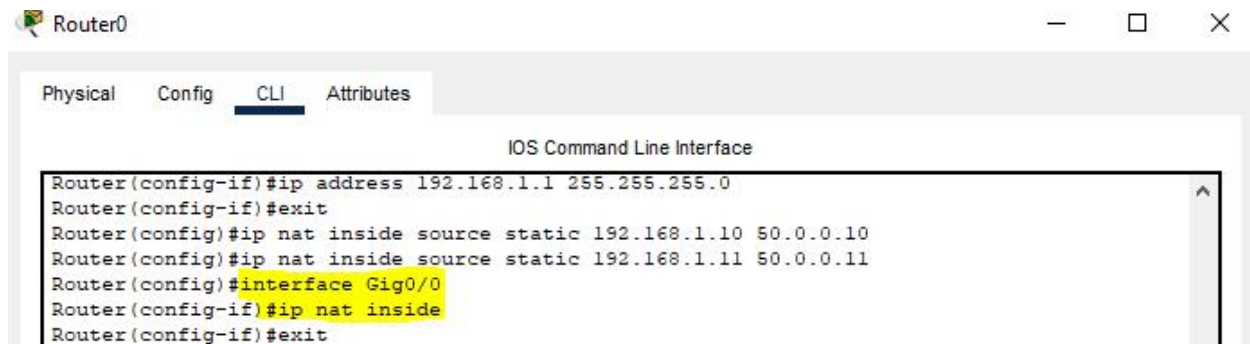


The screenshot shows the CLI of Router0 with the following commands entered:

```
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#ip nat inside source static 192.168.1.10 50.0.0.10
Router(config)#ip nat inside source static 192.168.1.11 50.0.0.11
```

2. Define inside local interface:

In the second step we have to define which interface is connected with the local network. Following command will define interface Gig0/0 as inside local.

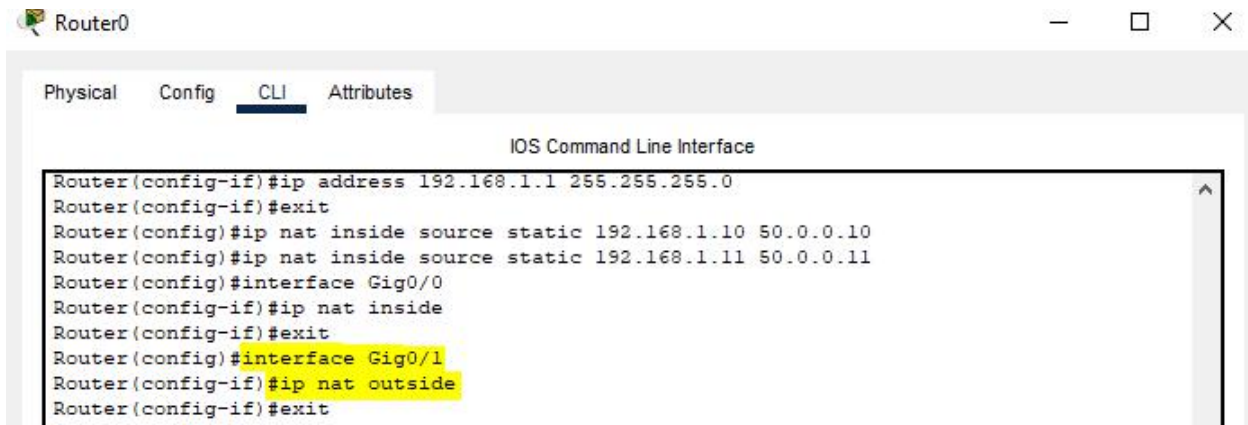


The screenshot shows the CLI of Router0 with the following commands entered:

```
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#ip nat inside source static 192.168.1.10 50.0.0.10
Router(config)#ip nat inside source static 192.168.1.11 50.0.0.11
Router(config)#interface Gig0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
```

3. Define inside global interface:

In the third step we have to define which interface is connected with the global network. Following command will define interface Gig0/1 as inside global.

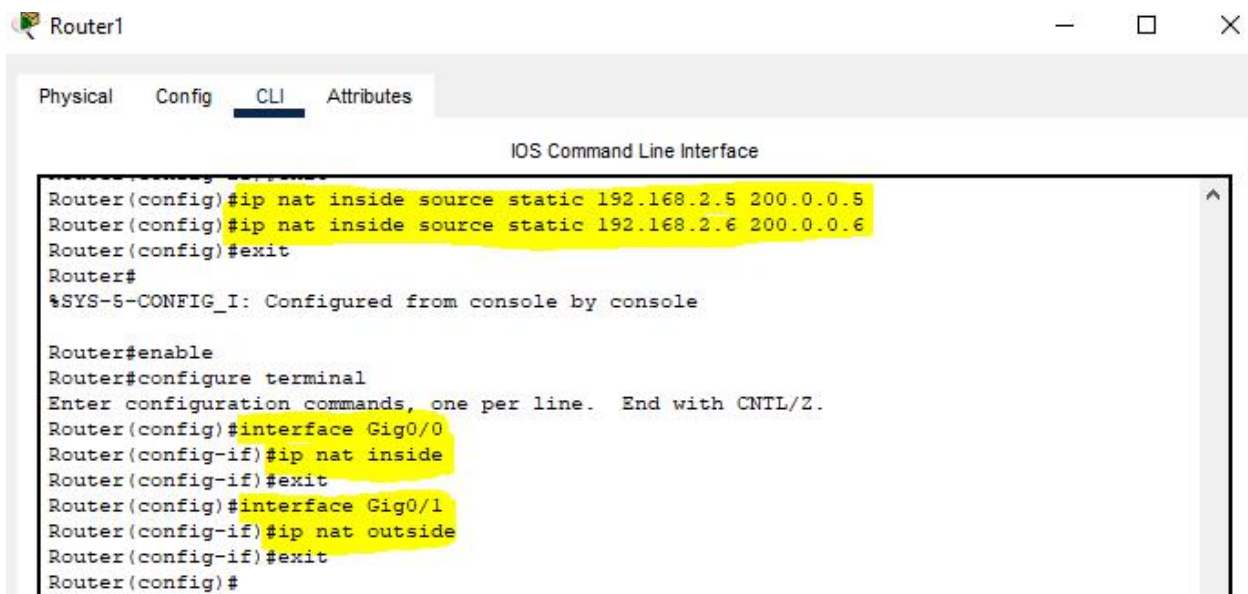


The screenshot shows the CLI window for Router0. The 'CLI' tab is selected. The command history shows the following commands being entered:

```
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#ip nat inside source static 192.168.1.10 50.0.0.10
Router(config)#ip nat inside source static 192.168.1.11 50.0.0.11
Router(config)#interface Gig0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#interface Gig0/1
Router(config-if)#ip nat outside
Router(config-if)#exit
```

For Router1 :

We will repeat the same three steps for this router:



The screenshot shows the CLI window for Router1. The 'CLI' tab is selected. The command history shows the following commands being entered:

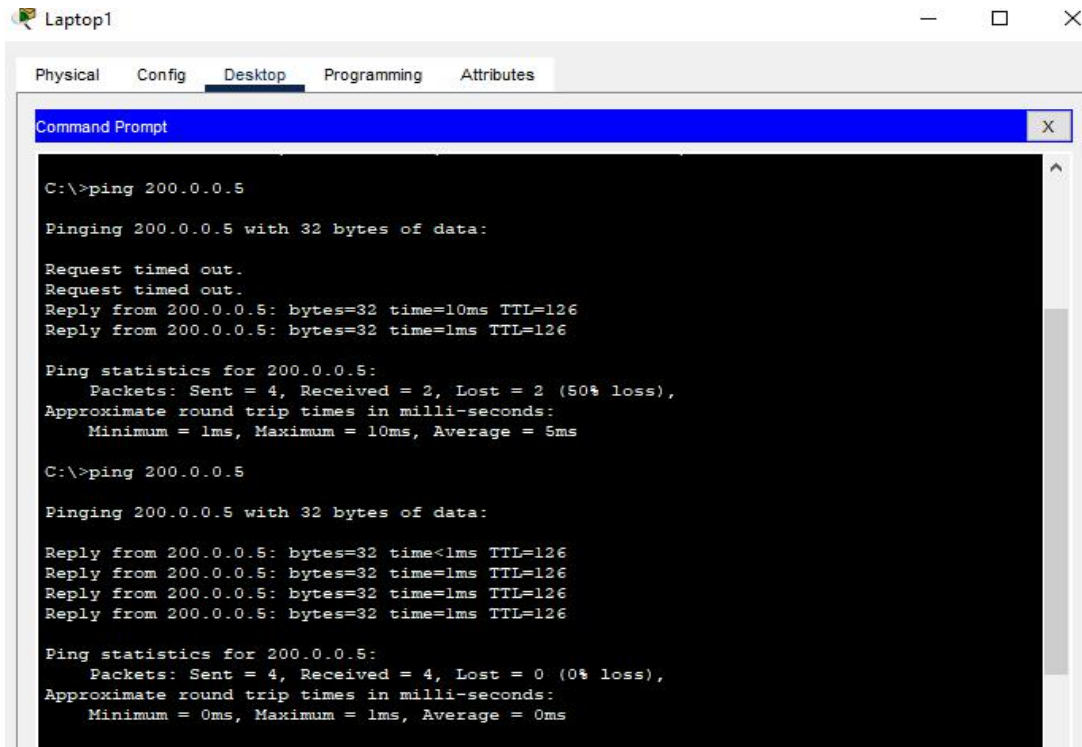
```
Router(config)#ip nat inside source static 192.168.2.5 200.0.0.5
Router(config)#ip nat inside source static 192.168.2.6 200.0.0.6
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Gig0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#interface Gig0/1
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#
```


Testing Static NAT Configuration :

To test this setup click Laptop 1 and Desktop and click Command Prompt.

- Run ping 200.0.0.5 command.



```
C:\>ping 200.0.0.5

Pinging 200.0.0.5 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 200.0.0.5: bytes=32 time=10ms TTL=126
Reply from 200.0.0.5: bytes=32 time=1ms TTL=126

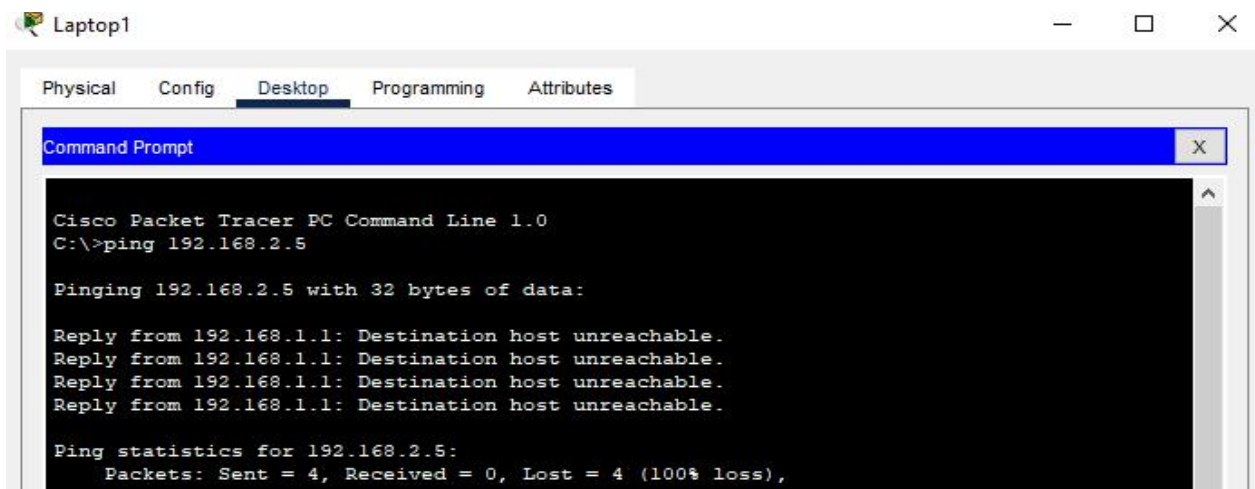
Ping statistics for 200.0.0.5:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 10ms, Average = 5ms

C:\>ping 200.0.0.5

Pinging 200.0.0.5 with 32 bytes of data:

Reply from 200.0.0.5: bytes=32 time<1ms TTL=126
Reply from 200.0.0.5: bytes=32 time=1ms TTL=126
Reply from 200.0.0.5: bytes=32 time=1ms TTL=126
Reply from 200.0.0.5: bytes=32 time=1ms TTL=126

Ping statistics for 200.0.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.5

Pinging 192.168.2.5 with 32 bytes of data:

Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.

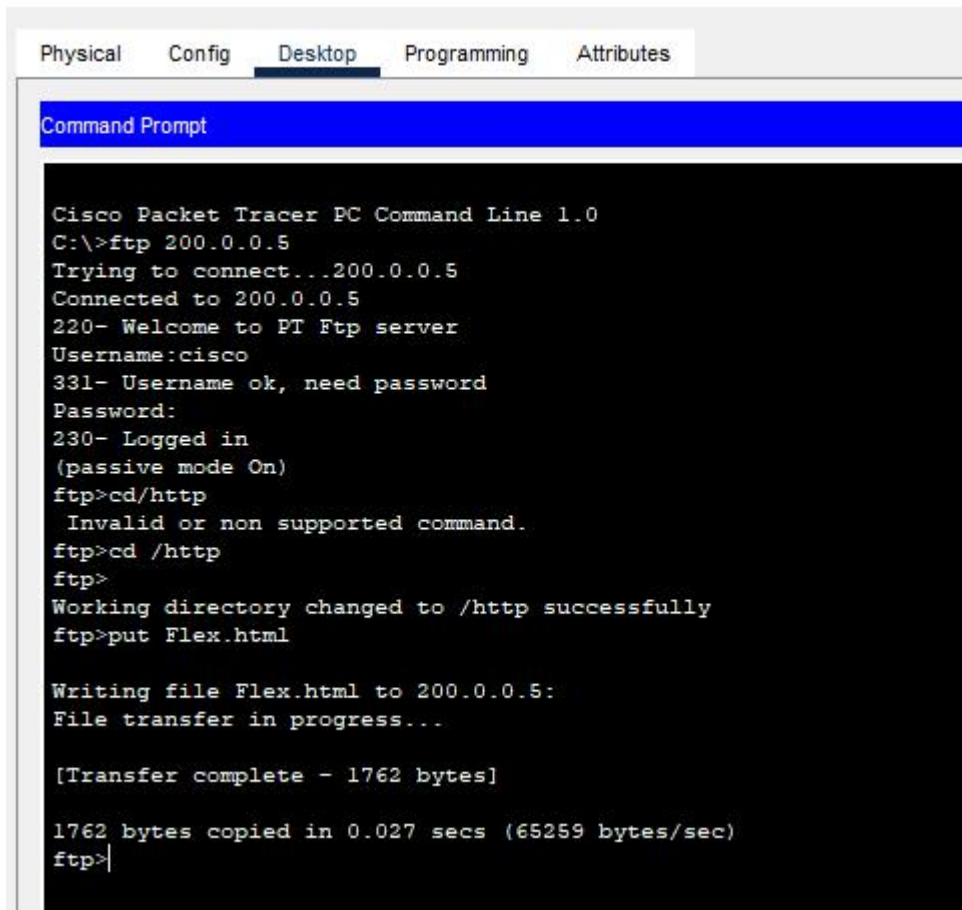
Ping statistics for 192.168.2.5:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

- Run ping 192.168.2.5 command.

This Command gives the error “Destination Host Unieachable” because we aie tiying to access a iemote device on its local IP addiess which is not possible because we can access iemote devices only on their Public ip addresses.

Creating File & putting it on Flex Server

Laptop2



The image shows a Cisco Packet Tracer PC Command Line interface for a device named 'Laptop2'. The 'Desktop' tab is selected. A Command Prompt window is open, displaying the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ftp 200.0.0.5
Trying to connect...200.0.0.5
Connected to 200.0.0.5
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>cd/http
Invalid or non supported command.
ftp>cd /http
ftp>
Working directory changed to /http successfully
ftp>put Flex.html

Writing file Flex.html to 200.0.0.5:
File transfer in progress...

[Transfer complete - 1762 bytes]

1762 bytes copied in 0.027 secs (65259 bytes/sec)
ftp>
```

Flex



The image shows the 'Services' configuration window for a device named 'Flex'. The 'Services' tab is selected. The window displays a list of services on the left and their status on the right.

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

HTTP

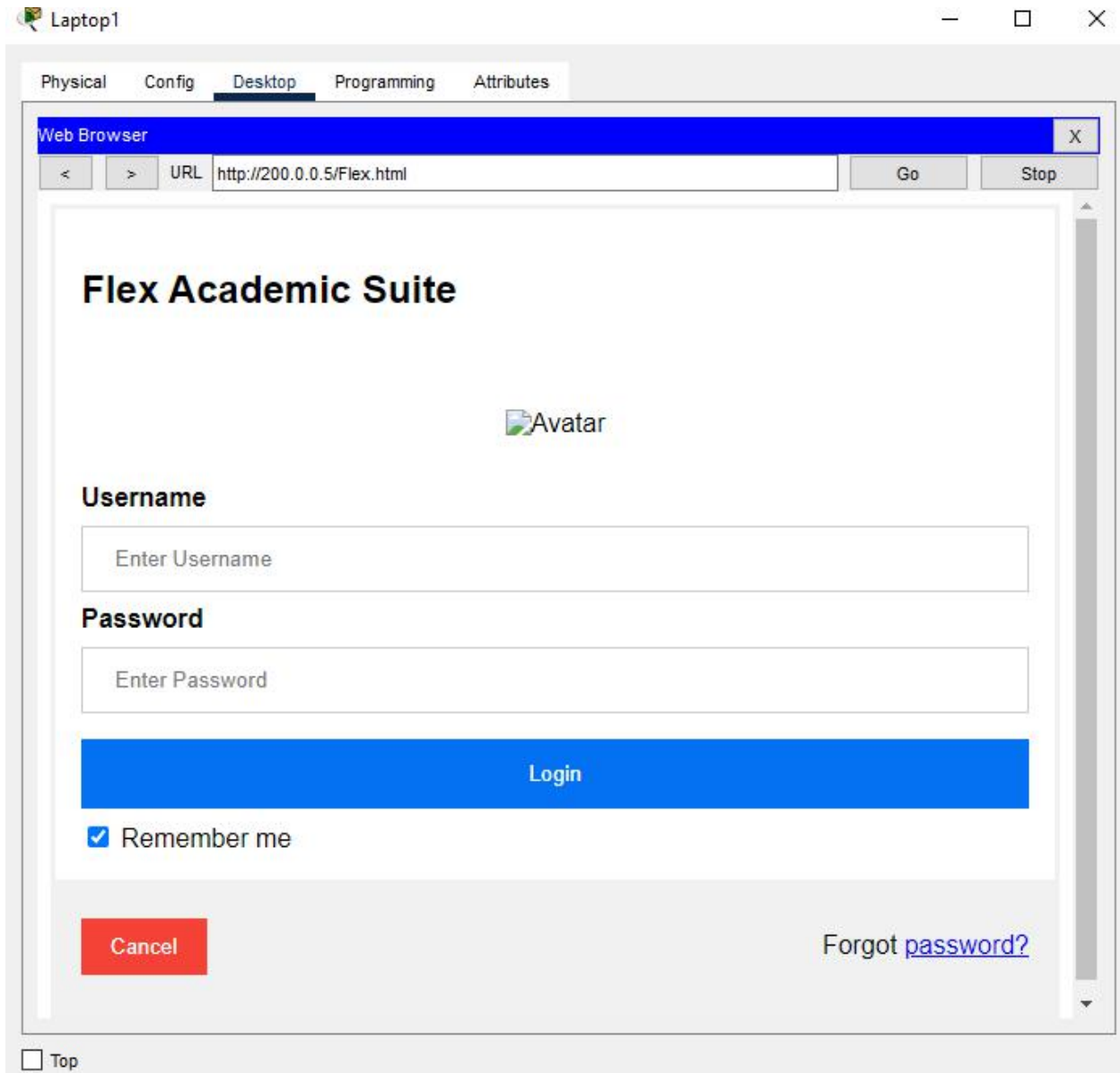
HTTP: ☒ On ☐ Off

HTTPS: ☒ On ☐ Off

File Manager

	File Name	Edit	Delete
1	Flex.html	(edit)	(delete)
2	copyrights.html	(edit)	(delete)

Doing the last testing. Click Laptop1 and click Desktop and click Web Biowsei and access 200.0.0.5.



Above figure confirms that host 192.168.1.10 is able to access the 200.0.0.5.