

Lab Task: 13

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Name: Muhammad Sherjeel Akhtar

Roll No: 20p-0101

Subject: Computer Networks Lab

**Submitted To Respected
Ma'am: Hurmat Hidayat**

Section: BCS-5B

**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).**

Answer:

Procedure:

In this case we are required to implement the S-NAT for web server and Dynamic-NAT for the Client Systems.

Also in this case we are required to use a single Topology.

Implementation:

So for the implementation of the above requirement, we are going to use the following Hardware.

- PC's
- Switch
- Router
- Server

Specifically:

Specifically we are going to use the following quantity of the above Hardware devices for our Topology.

PC's: 2

Switch: 2

Router: 2

Server: 2

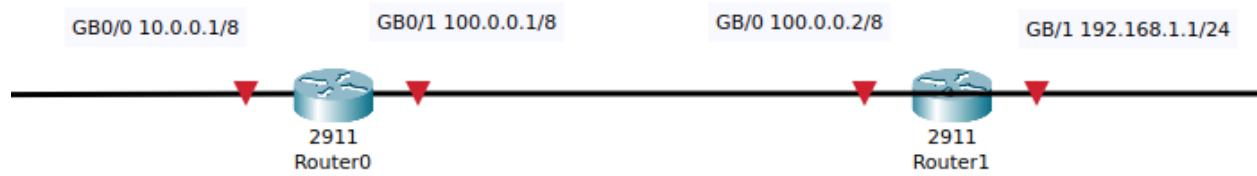
Key points:

For this specific Topology, we are going to use Copper-Straight-Through cable.

Visual Demonstration:

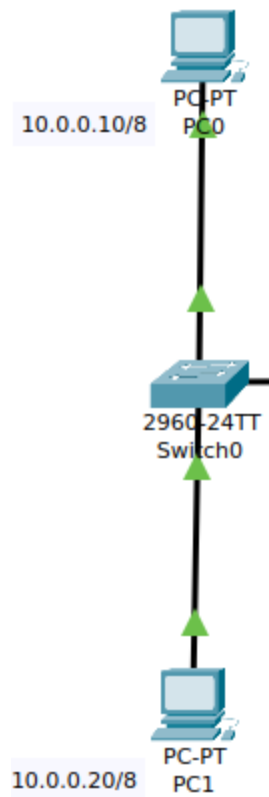
Routers:

We've place two routers in this case.



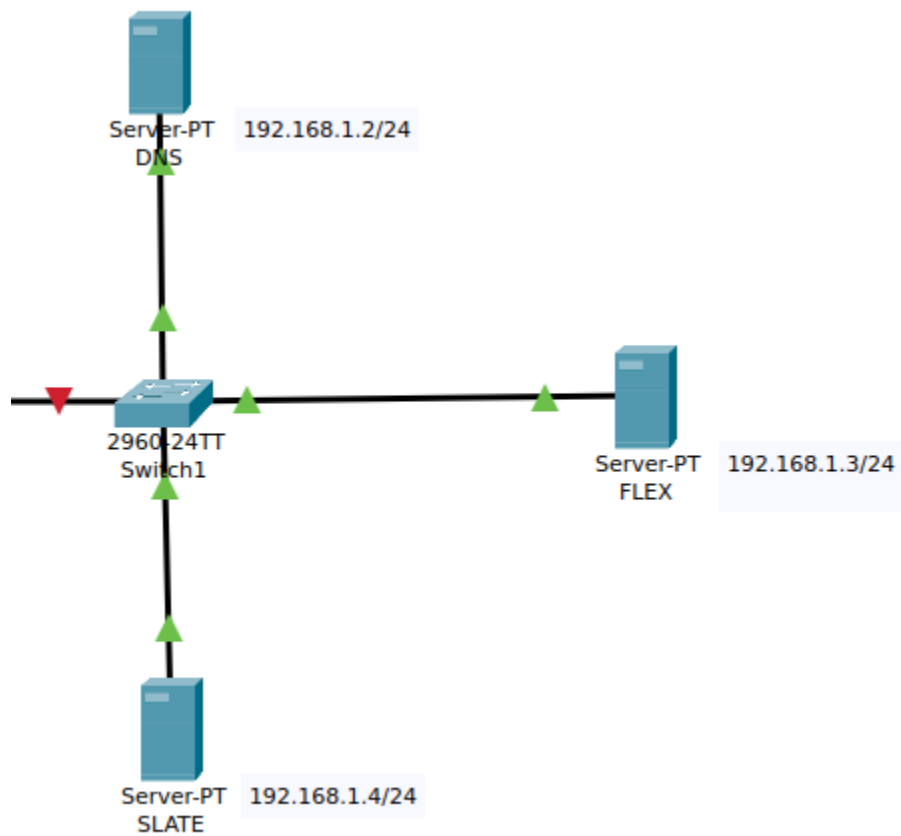
PC:

We've used two PC's in our Topology.



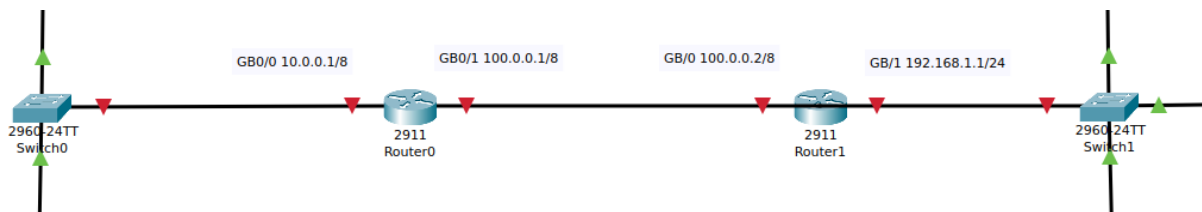
Server:

We've used three servers in our Topology.



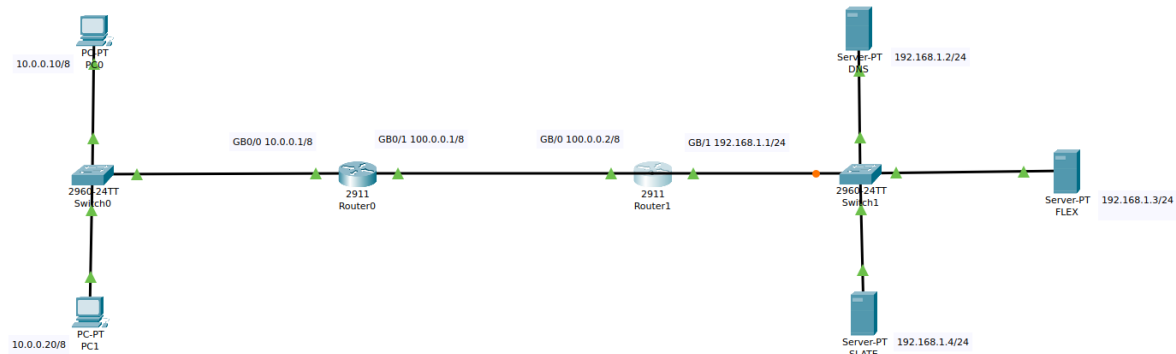
Switches:

We've used two switches in our Topology.



Visual Demonstration Of Topology As A Whole:

The whole topology is shown in the below picture.



Configurations & Setup:

First of all we are going to configure our routers.

“Router 0 & Router 1”

For this purpose, we will go into the configuration of both one by one.

Router 0 Configuration:

```

Router0
Physical  Config  CLI  Attributes
IOS Command Line Interface
To comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

Cisco CISC02911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
  
```

Router0

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
Router>en
Router#ifconfig
Translating "ifconfig"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown

Router(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

Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#no ip address
Router(config-if)#ip address 100.0.0.1 255.0.0.0
Router(config-if)#exit
Router(config)#interface GigabitEthernet 0/1
Router(config-if)#ip address 100.0.0.1 255.0.0.0
Router(config-if)#no shutdown

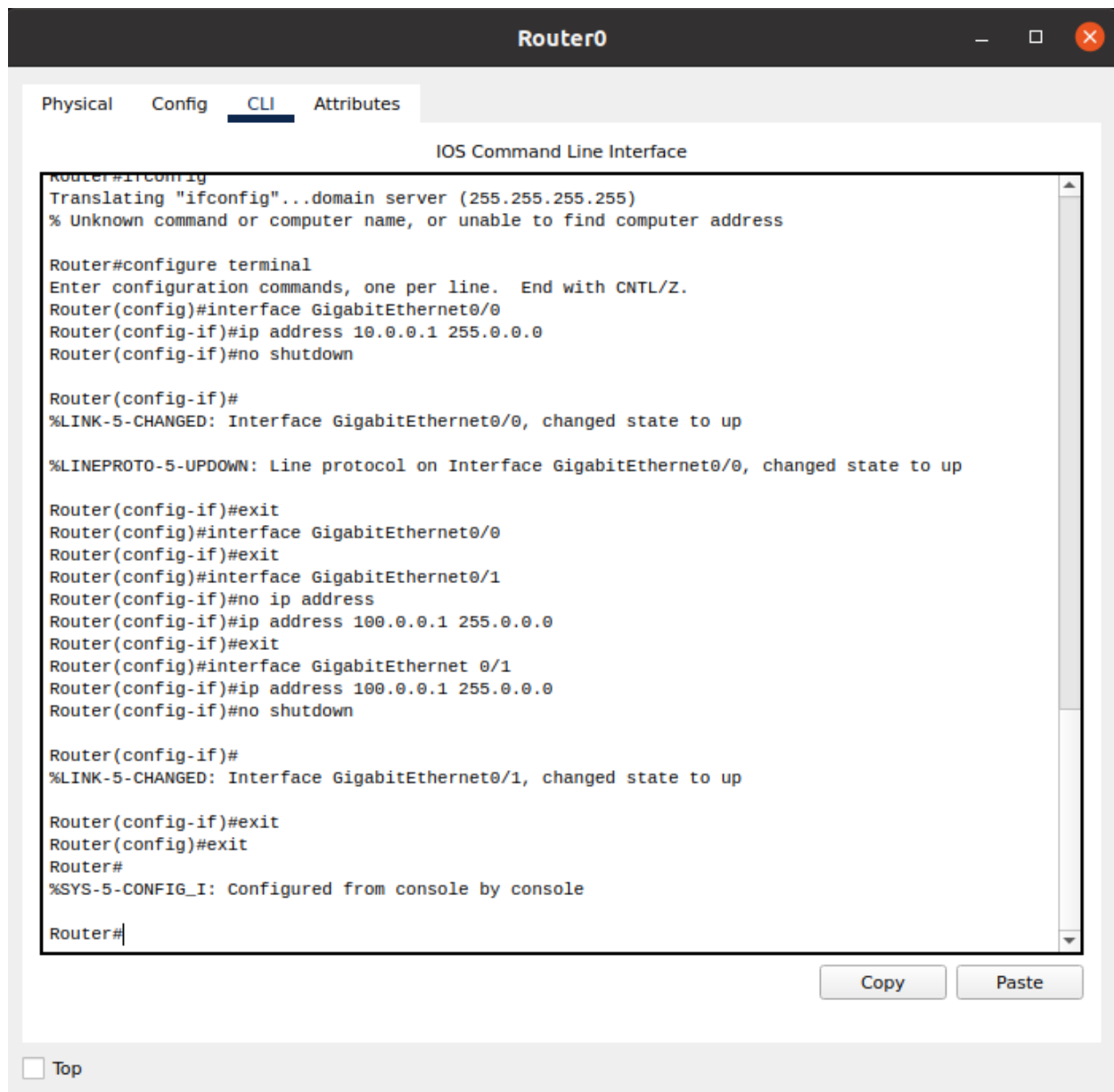
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#exit
```

Copy

Paste

☐ Top



Router 1 Configuration:

Router1

Physical

Config

CLI

Attributes

IOS Command Line Interface

Image text-base: 0x2100F918, data-base: 0x24729040

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

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Cisco CISC02911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
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DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>

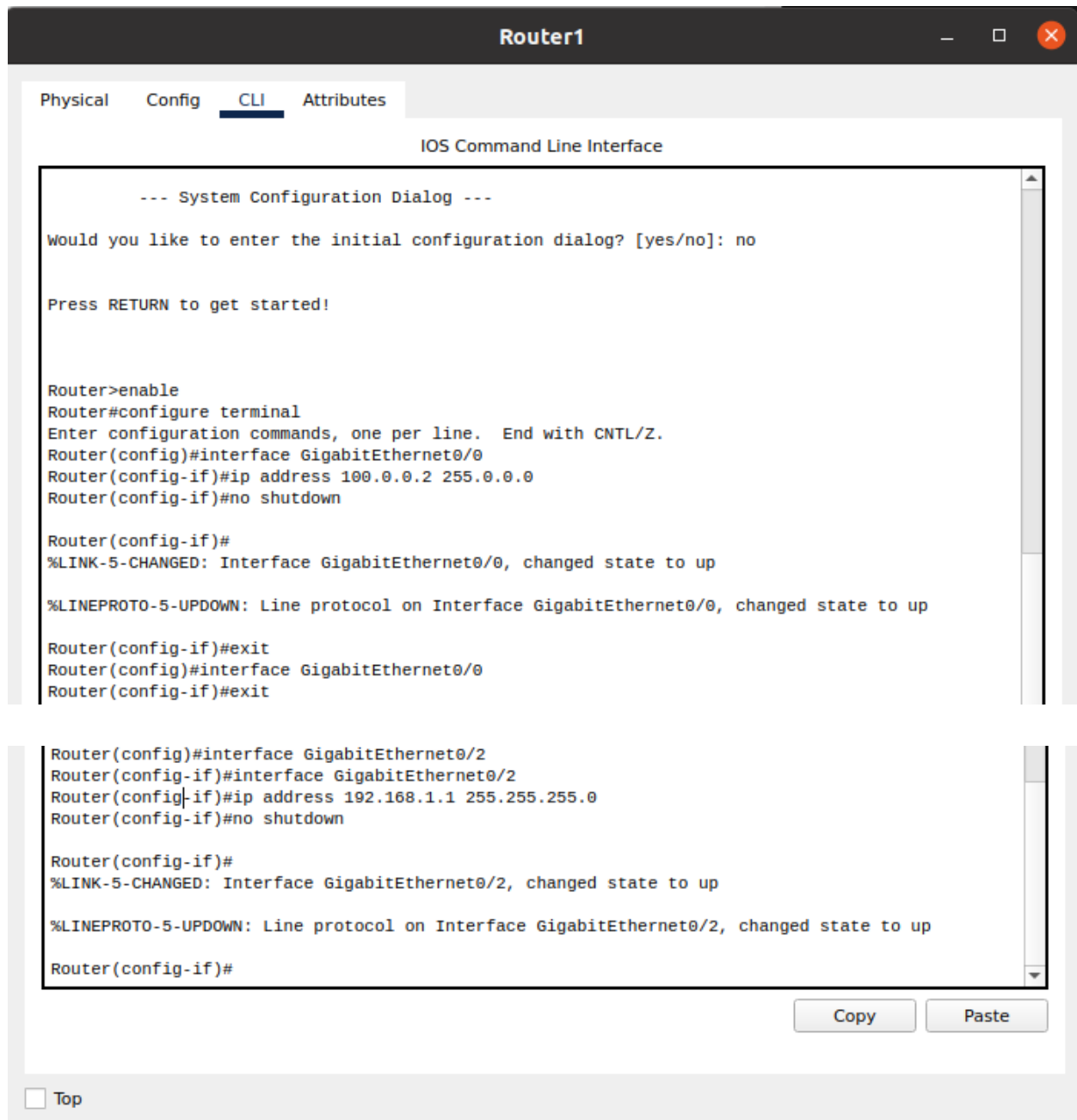
Copy

Paste

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Server Configuration:

First of all we will configure the DNS Server.

DNS Server(Domain Name System Server):

IP Configuration:

DNS

Physical

Config

Services

Desktop

Programming

Attributes

IP Configuration

X

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.1.2

Subnet Mask

255.255.255.0

Default Gateway

192.168.1.1

DNS Server

192.168.1.1

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::250:FFF:FED4:B58E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

DNS Configuration:

DNS

Physical
Config
Services
Desktop
Programming
Attributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DNS

DNS Service

☒ On
 ☐ Off

Resource Records

Name

Type

A Record

Address

Add

Save

Remove

No.	Name	Type	Detail
0	www.flex.com	A Record	192.168.1.3
1	www.slate.com	A Record	192.168.1.4

DNS Cache

☐ Top

Flex Server Configuration:

IP Configuration:

FLEX

Physical
Config
Services
Desktop
Programming
Attributes

IP Configuration
X

IP Configuration

☐ DHCP
☒ Static

IPv4 Address

Subnet Mask

Default Gateway

DNS Server

IPv6 Configuration

☐ Automatic
☒ Static

IPv6 Address
 /

Link Local Address

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

Flex HTTP Services Configuration:

We'll edit the index.html file in HTTP settings of the Flex Server.

FLEX

Physical

Config

Services

Desktop

Programming

Attributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

HTTP

HTTP

On

Off

HTTPS

On

Off

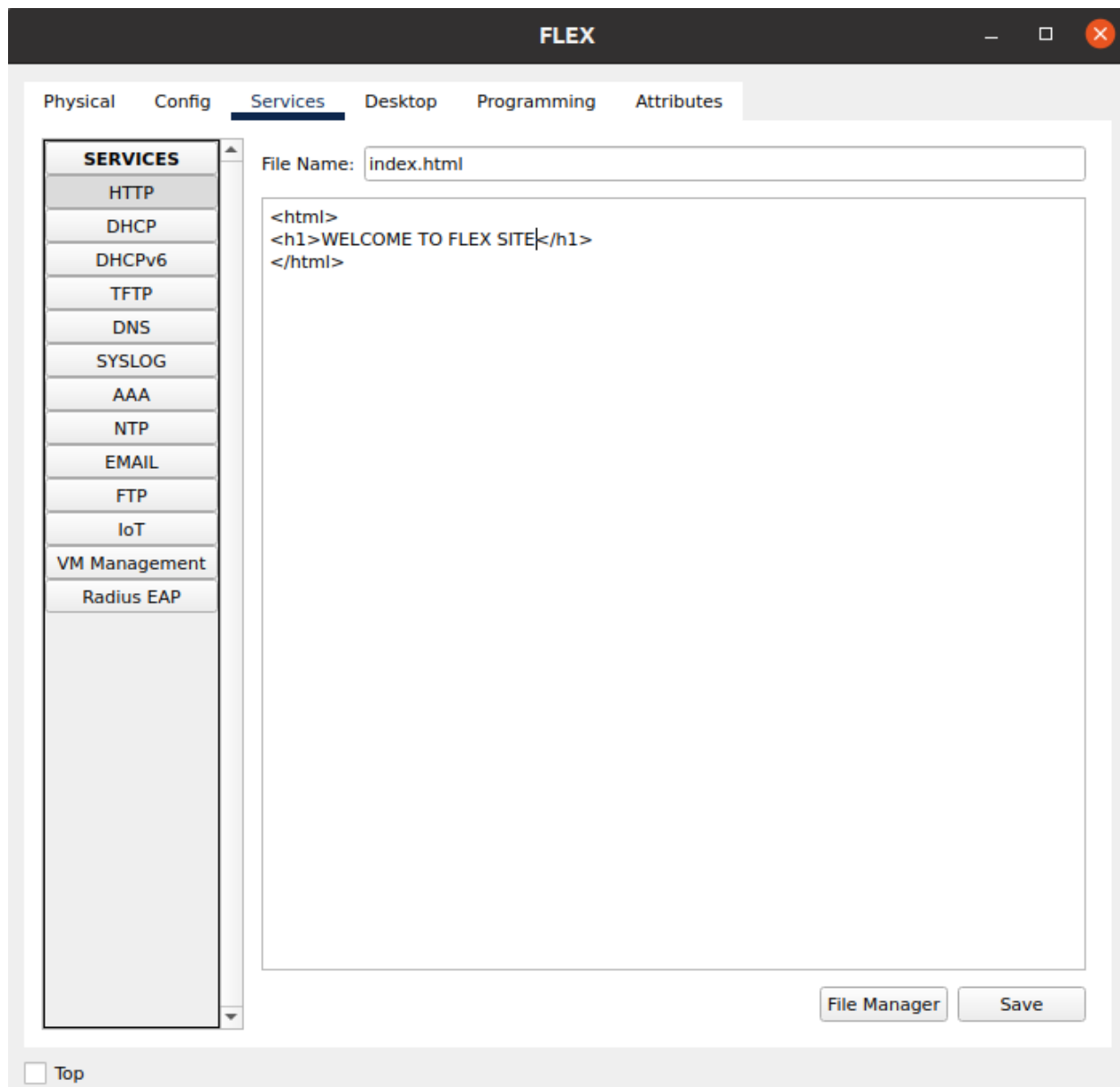
File Manager

	File Name	Edit	Delete
1	copyrights.html	(edit)	(delete)
2	cscoptlogo177x111.jpg		(delete)
3	helloworld.html	(edit)	(delete)
4	image.html	(edit)	(delete)
5	index.html	(edit)	(delete)

New File

Import

Top



Slate Server Configuration:

Slate Server IP Configuration:

SLATE

Physical

Config

Services

Desktop

Programming

Attributes

IP Configuration

X

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.1.4

Subnet Mask

255.255.255.0

Default Gateway

192.168.1.1

DNS Server

192.168.1.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::201:C7FF:FE87:93CB

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

Slate HTTP Services Configuration:

We'll edit the index.html file in HTTP settings of the Slate Server.

SLATE

Physical

Config

Services

Desktop

Programming

Attributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

HTTP

HTTPS

File Manager

	File Name	Edit	Delete
1	copyrights.html	(edit)	(delete)
2	cscoptlogo177x111.jpg		(delete)
3	helloworld.html	(edit)	(delete)
4	image.html	(edit)	(delete)
5	index.html	(edit)	(delete)

New File

Import

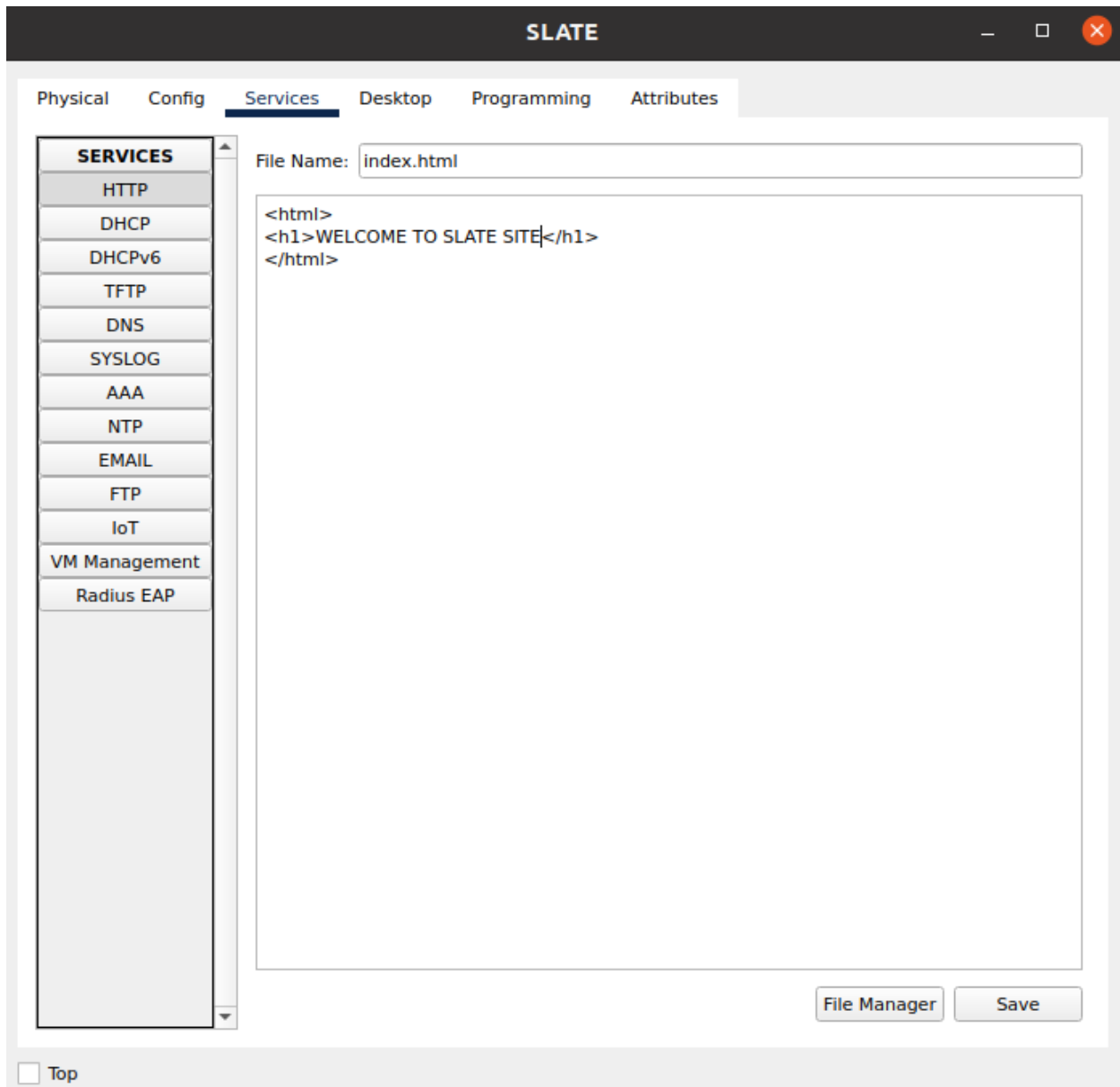
On

Off

On

Off

Top

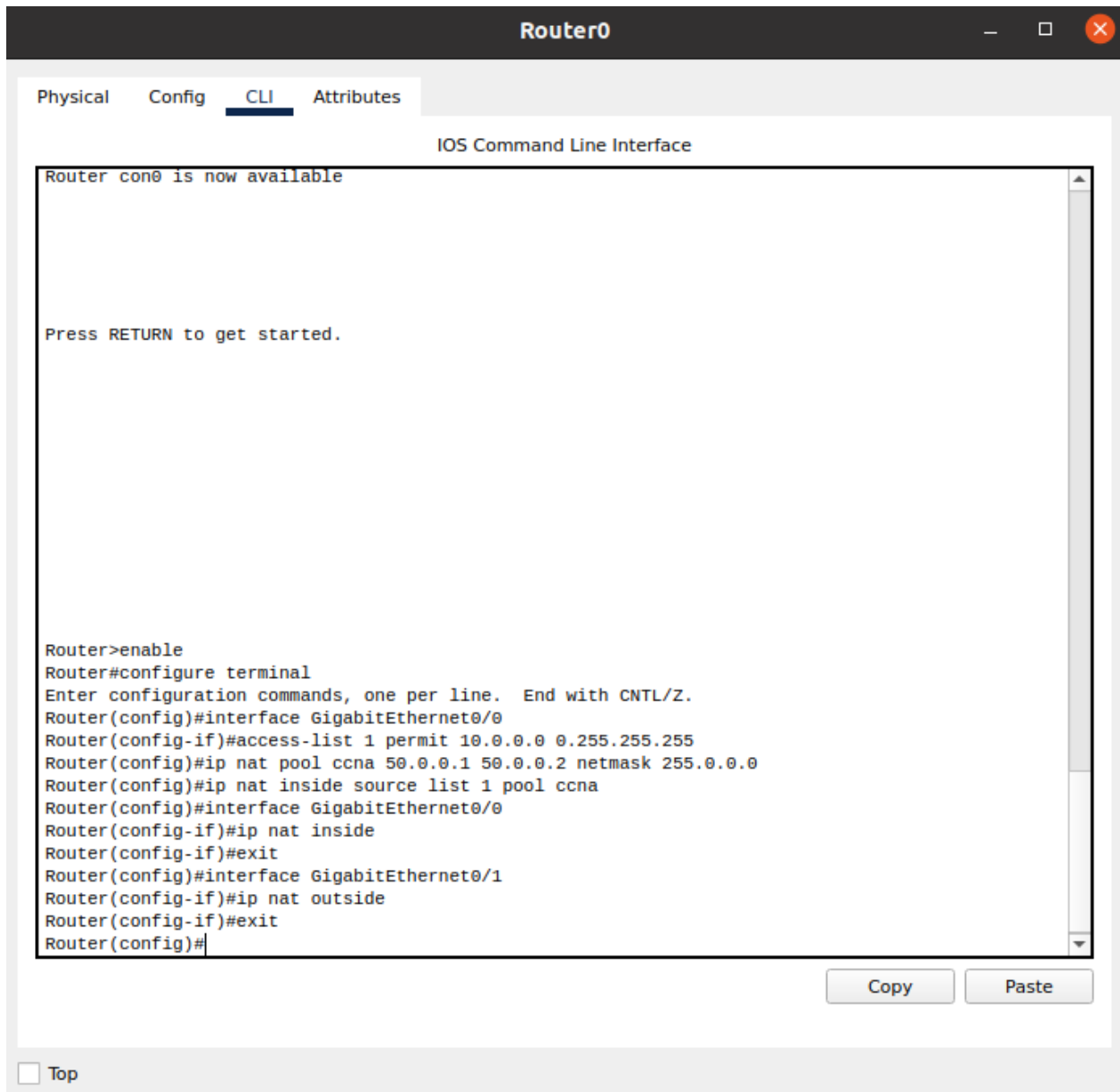


NAT Configuration:

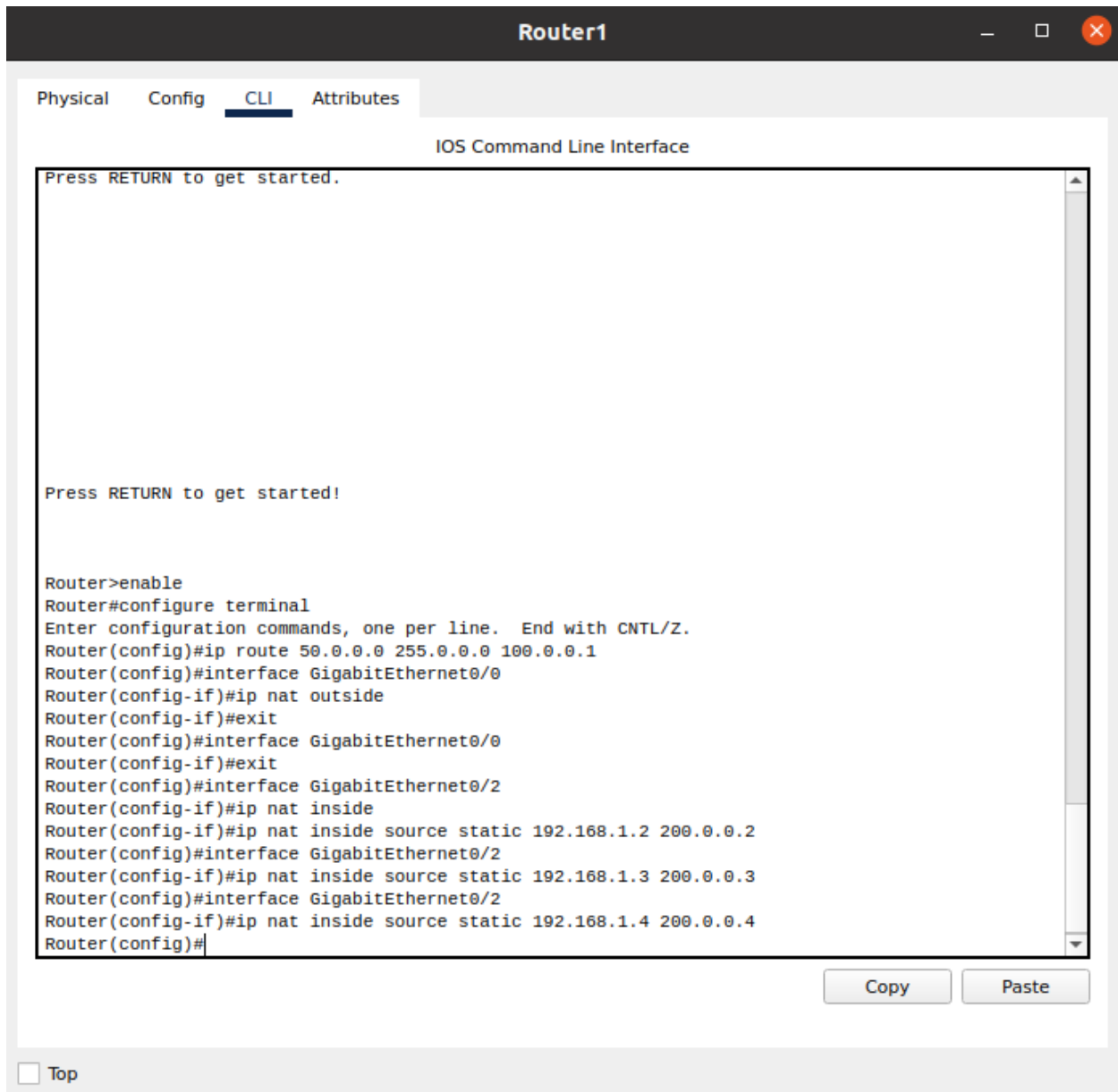
We'll do two NAT Configurations.

- NAT configuration for the Left Side Network
- NAT configuration for the Right Side Network

NAT configuration for the Left Side Network:



NAT configuration for the Right Side Network:



Routing Configuration:

We'll do routing for both the Routers.

Routing On Router 0:

Router0

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network

200.0.0.0

Mask

255.255.255.0

Next Hop

100.0.0.2

Add

Network Address

Remove

Equivalent IOS Commands

Press RETURN to get started!

Router>enable

Router#

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#

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Routing On Router 1:

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Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network

Mask

Next Hop

Add

Network Address

50.0.0.0/8 via 100.0.0.1

Remove

Equivalent IOS Commands

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#

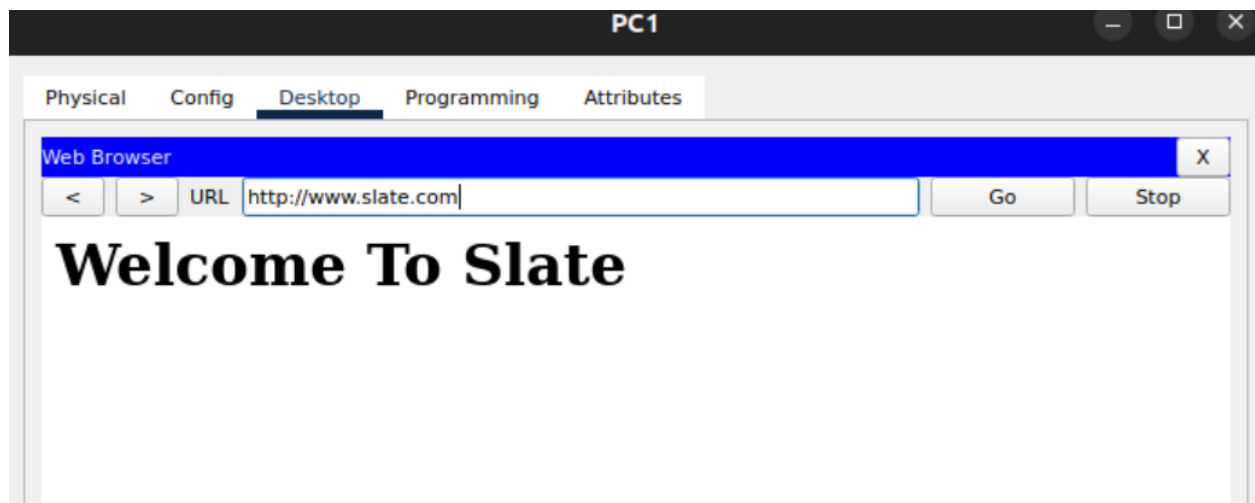
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Validating The Topology:

Flex Testing:



Slate Testing:



Fin.....!