

Computer Networks

Lab Task #14

Saad Ahmad

20P-0051

Topology:

3x labs

1x academics building

1x Server room

Requirements:

4x Routers

5x switches

PCs

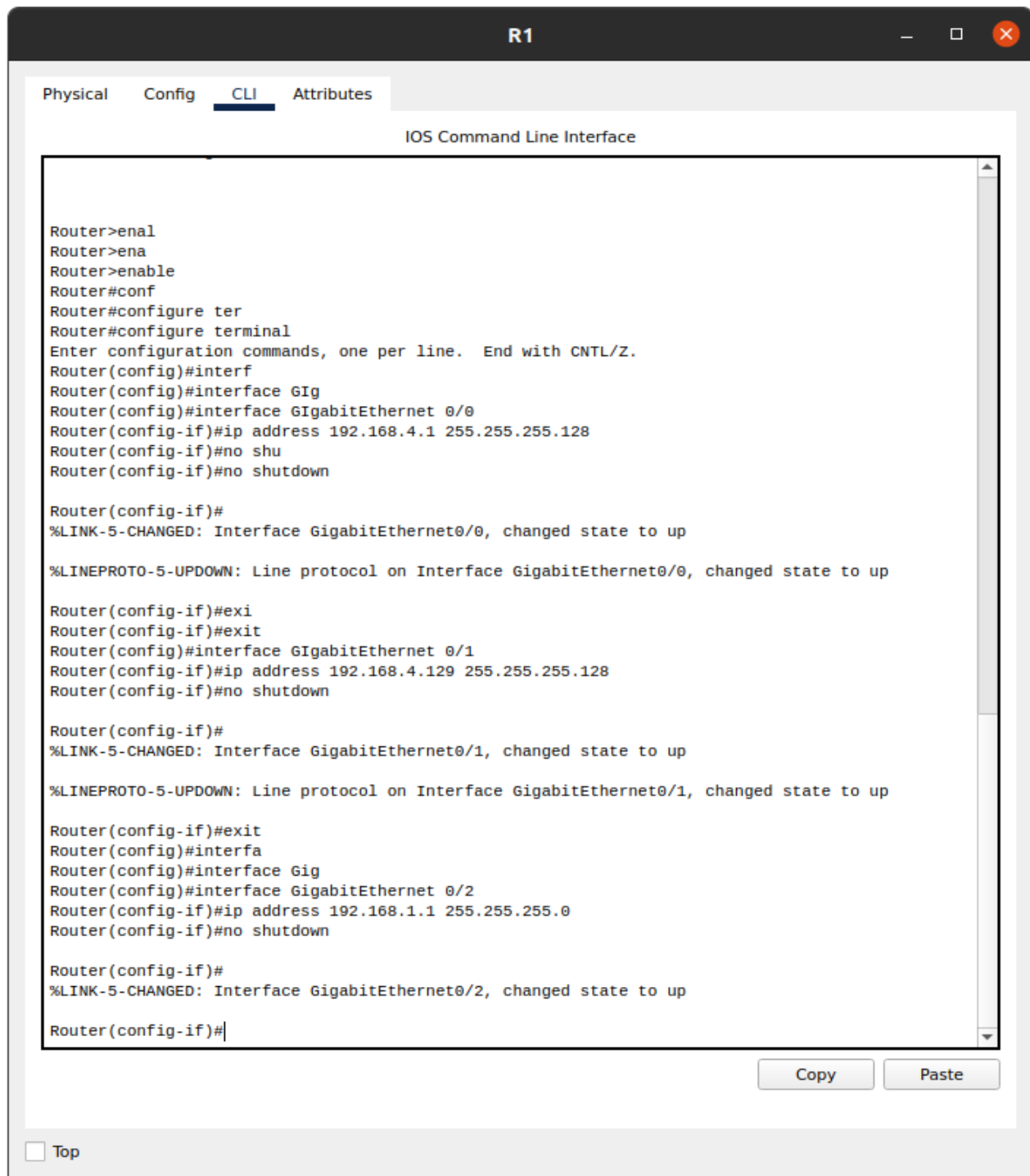
Server

Networks:

there will be 7 networks in this topology.

Configuring Routers:

Router #1



R1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#inter
Router(config)#interface Gig
Router(config)#interface GigabitEthernet 0/0
Router(config-if)#ip dhc
Router(config-if)#ip dhcp pool p1
Router(dhcp-config)#netwo
Router(dhcp-config)#network 192.168.4.0 255.255.255.128
Router(dhcp-config)#default
Router(dhcp-config)#default-router 192.168.4.1
Router(dhcp-config)#dns
Router(dhcp-config)#dns-server 192.168.7.2
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
```

Copy

Paste

☐ Top

R1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged 192.168.4.2.

Router(dhcp-config)#exit
Router(dhcp-config)#exit
Router(config)#interf
Router(config)#interface Gig
Router(config)#interface GigabitEthernet 0/1
Router(config-if)#ip dhcp pool p2
Router(dhcp-config)#netwo
Router(dhcp-config)#network 129.168.4.128 255.255.255.128
Router(dhcp-config)#network 192.168.4.128 255.255.255.128
Router(dhcp-config)#default
Router(dhcp-config)#default-router 192.168.4.129
Router(dhcp-config)#dns
Router(dhcp-config)#dns-server 192.168.7.2
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
Router(dhcp-config)#
```

Copy

Paste

☐ Top

Router #2

R2

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
Router>enab
Router>enable
Router#confi
Router#config
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#inter
Router(config)#interface Gig
Router(config)#interface GigabitEthernet 0/0
Router(config-if)#ip address 192.168.1.2 255.255.255.0
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 GigabitEthernet 0/1
Router(config-if)#ip address 192.168.5.1 255.255.255.0
Router(config-if)#no shutdown

Router(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

Router(config-if)#exit
Router(config)#interface GigabitEthernet 0/2
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown

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

Router(config-if)#exit
Router(config)#interface GigabitEthernet 0/1
Router(config-if)#ip dhcp pool p1
Router(dhcp-config)#network 192.168.5.0 255.255.255.0
Router(dhcp-config)#defau
Router(dhcp-config)#default-router 192.168.5.1
Router(dhcp-config)#dns
Router(dhcp-config)#dns-server 192.168.7.2
Router(dhcp-config)#
```

Copy

Paste

☐ Top

Router#3

R3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router>enable
Router#confi
Router#configure term
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interf
Router(config)#interface Gig
Router(config)#interface GigabitEthernet 0/0
Router(config-if)#192.168.2.2 255.255.255.0
      ^
% Invalid input detected at '^' marker.

Router(config-if)#ip address 192.168.2.2 255.255.255.0
Router(config-if)#no shu
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)#exi
Router(config-if)#exit
Router(config)#interfa
Router(config)#interface Gig
Router(config)#interface GigabitEthernet 0/1
Router(config-if)#ip address 192.168.6.1 255.255.255.0
Router(config-if)#no shutdown

Router(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

Router(config-if)#exit
Router(config)#interface GigabitEthernet 0/2
Router(config-if)#ip address 192.168.3.1 255.255.255.0
Router(config-if)#no shutdown

Router(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

Router(config-if)#exit
Router(config)#ip dhcp pool p1
Router(dhcp-config)#netw
Router(dhcp-config)#network 192.168.6.0 255.255.255.0
Router(dhcp-config)#defau
Router(dhcp-config)#default-router 192.168.6.1
Router(dhcp-config)#dns
Router(dhcp-config)#dns-server 192.168.7.2
Router(dhcp-config)#exit
Router(config)#
```

Copy

Paste

☐ Top

Router#4

R4

Physical

Config

CLI

Attributes

IOS Command Line Interface

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

Press RETURN to get started!

Router>enable

Router#conf

Router#configure termi

Router#configure terminal

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

Router(config)#interfa

Router(config)#interface Gig

Router(config)#interface GigabitEthernet 0/0

Router(config-if)#ip address 192.168.3.2 255.255.255.0

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 GigabitEthernet 0/1

Router(config-if)#ip address 192.168.7.1 255.255.255.0

Router(config-if)#no shutdown

Router(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

Router(config-if)#exit

Router(config)#

Copy

Paste

☐ Top

Configuring static routing

Router#1

R1

PhysicalConfigCLIAttributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network192.168.7.0

Mask255.255.255.0

Next Hop192.168.1.2

Add

Network Address

192.168.5.0/24 via 192.168.1.2

192.168.6.0/24 via 192.168.1.2

192.168.7.0/24 via 192.168.1.2

Remove

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#ip route 192.168.5.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.6.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.7.0 255.255.255.0 192.168.1.2
Router(config)#
```

☐ Top

Router #2

R2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network192.168.7.0

Mask255.255.255.0

Next Hop192.168.2.2

Add

Network Address

192.168.4.0/25 via 192.168.1.1

192.168.4.128/25 via 192.168.1.1

192.168.6.0/24 via 192.168.2.2

192.168.7.0/24 via 192.168.2.2

Remove

Equivalent IOS Commands

Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 192.168.6.0 255.255.255.0 192.168.2.2
Router(config)#no ip route 192.168.6.0 255.255.255.0 192.168.1.1
Router(config)#ip route 192.168.7.0 255.255.255.0 192.168.2.2
Router(config)#no ip route 192.168.7.0 255.255.255.0 192.168.1.1
Router(config)#

Top

Router #3

R3

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network

192.168.7.0

Mask

255.255.255.0

Next Hop

192.168.3.2

Add

Network Address

192.168.4.0/25 via 192.168.2.1

192.168.4.128/25 via 192.168.2.1

192.168.5.0/24 via 192.168.2.1

192.168.7.0/24 via 192.168.3.2

Remove

Equivalent IOS Commands

Router(config)#

Router(config)#

Router(config)#

Router(config)#ip route 192.168.4.0 255.255.255.128 192.168.2.1

Router(config)#ip route 192.168.4.128 255.255.255.128 192.168.2.1

Router(config)#ip route 192.168.5.0 255.255.255.128 192.168.2.1

Router(config)#no ip route 192.168.5.0 255.255.255.128 192.168.2.1

Router(config)#ip route 192.168.5.0 255.255.255.0 192.168.2.1

Router(config)#ip route 192.168.7.0 255.255.255.0 192.168.3.2

Router(config)#

Top

Router#4

R4

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network192.168.6.0

Mask255.255.255.0

Next Hop192.168.3.1

Add

Network Address

192.168.4.0/25 via 192.168.3.1

192.168.4.128/25 via 192.168.3.1

192.168.5.0/24 via 192.168.3.1

192.168.6.0/24 via 192.168.3.1

Remove

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#

Router(config)#ip route 192.168.4.0 255.255.255.128 192.168.3.1

Router(config)#ip route 192.168.4.128 255.255.255.128 192.168.3.1

Router(config)#ip route 192.168.5.0 255.255.255.0 192.168.3.1

Router(config)#ip route 192.168.6.0 255.255.255.0 192.168.3.1

Router(config)#

☐ Top

Configuring PCs using DHCP in routers and assigning dynamic IPs.

L1

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address

192.168.4.3

Subnet Mask

255.255.255.128

Default Gateway

192.168.4.1

DNS Server

192.168.7.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::201:97FF:FE95:4D54

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

PC1

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address

192.168.4.131

Subnet Mask

255.255.255.128

Default Gateway

192.168.4.129

DNS Server

192.168.7.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::20D:BDFF:FE34:CE6E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

PC3

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address

192.168.5.3

Subnet Mask

255.255.255.0

Default Gateway

192.168.5.1

DNS Server

192.168.7.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::20B:BEFF:FE46:C606

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

L4

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☒ DHCP

☐ Static

IPv4 Address

192.168.6.2

Subnet Mask

255.255.255.0

Default Gateway

192.168.6.1

DNS Server

192.168.7.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::20B:BEFF:FEDC:AC3E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

Configuring DNS

DNS

Physical

Config

Services

Desktop

Programming

Attributes

IP Configuration

X

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.7.2

Subnet Mask

255.255.255.0

Default Gateway

192.168.7.1

DNS Server

192.168.7.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::201:96FF:FE9E:1145

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

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

www.flex.com

Type

A Record

Address

192.168.7.3

Add

Save

Remove

No.	Name	Type	Detail
0	www.flex.com	A Record	192.168.7.3

DNS Cache

Top

Configuring Flex server

Flex

Physical

Config

Services

Desktop

Programming

Attributes

IP Configuration

X

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.7.3

Subnet Mask

255.255.255.0

Default Gateway

192.168.7.1

DNS Server

192.168.7.2

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::20C:CFFF:FEB3:6AC

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

Testing the connections:

