

nstitute of Computer And Technology

B.Tech – CSE(BDA)

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Sem:- 2

Sub:- BCS

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Prac:- 3

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Aim: Interconnection of various Local area networks using routers.

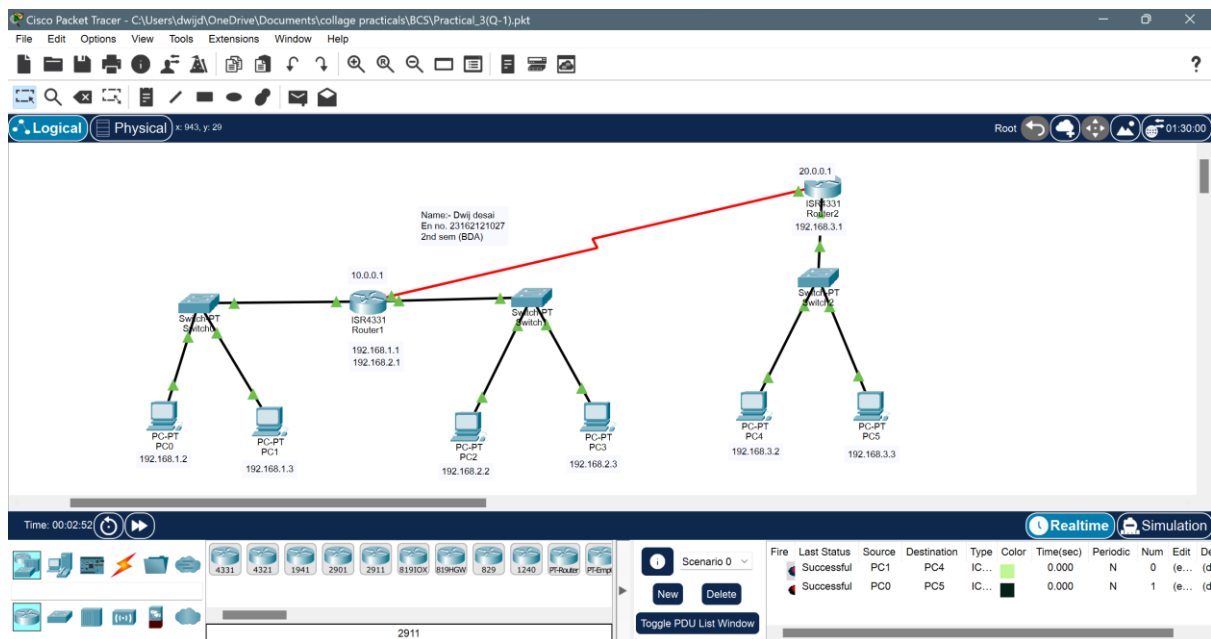
Procedure:

Case 1: Zenith Enterprise has three departments: Production, Sales and Admin. Each department contains two hosts. You are appointed as Network Engineer in Zenith Enterprise. Design the network to provide connectivity between these three departments.

Description :

Zenith Enterprise has three departments: Production, Sales, and Admin, with two desktop computers (hosts) in each department. The network design includes a single switch connecting all hosts and a router for internet access. Each department is assigned a unique IP subnet for efficient routing. Basic security measures, like firewall rules and access control lists, are in place. DHCP and DNS servers handle IP assignment and name resolution. This setup offers a straightforward network infrastructure for Zenith Enterprise's needs.

Design :



Device Configuration:

- For PC0

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

Bandwidth

Duplex

MAC Address

☒ On

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

☐ Half Duplex

☒ Full Duplex

☒ Auto

0004.9ABA.E472

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.1.2

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address:

FE80::204:9AFF:FEBA:E472

☐ Top

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC0

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.1.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

- For PC1

PC1

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC1

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.1.1

DNS Server

Gateway/DNS IPv6

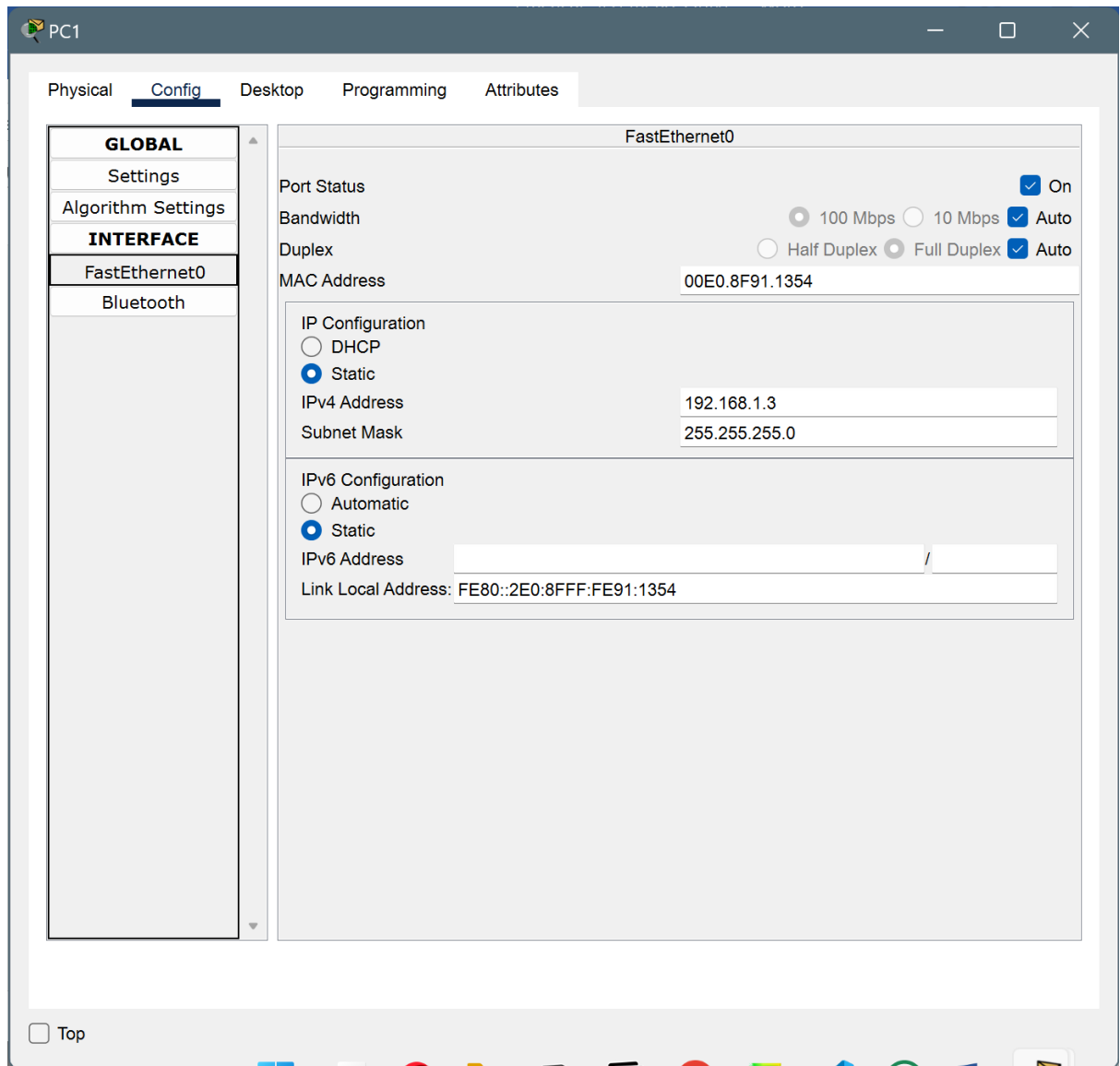
Automatic

Static

Default Gateway

DNS Server

Top



- For PC2

PC2

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address0060.7015.A7C0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.2.2

Subnet Mask255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address/

Link Local Address: FE80::260:70FF:FE15:A7C0

☐ Top

PC2

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display NamePC2

InterfacesFastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway192.168.2.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

☐ Top

- For PC3

PC3

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC3

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.2.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC3

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

00D0.BCE9.A3AE

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.2.3

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::2D0:BCFF:FEE9:A3AE

☐ Top

- Router1

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

Port Status

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ On

Bandwidth

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.C952.98ED

IP Configuration

IPv4 Address

192.168.1.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

☐ Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.C796.A8EA

IP Configuration

IPv4 Address

192.168.2.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

☐ Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

RIP Routing

Network

Network Address

10.0.0.0

192.168.1.0

192.168.2.0

Add

Remove

Equivalent IOS Commands

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/2

Router(config-if)#

Router(config-if)#exit

Router(config)#router rip

Router(config-router)#

☐ Top

- For PC4

PC4

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC4

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.3.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC4

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address0050.0FD2.74D0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.3.2

Subnet Mask255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address/

Link Local Address: FE80::250:FFF:FED2:74D0

☐ Top

- For PC5

PC5

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC5

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.3.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC5

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

100 Mbps

10 Mbps

On

Bandwidth

Auto

Duplex

Half Duplex

Full Duplex

Auto

MAC Address

0050.0F36.7CD9

IP Configuration

DHCP

Static

IPv4 Address

192.168.3.3

Subnet Mask

255.255.255.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address

FE80::250:FFF:FE36:7CD9

Top

- Router2

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

Port Status

1000 Mbps

☒ 100 Mbps

10 Mbps

☒ On

Bandwidth

1000 Mbps

☒ 100 Mbps

10 Mbps

☒ Auto

Duplex

Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

000A.41C4.3196

IP Configuration

IPv4 Address

192.168.3.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

%LINK-5-CHANGED: Interface Serial0/2/0, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/0, changed state to up

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

☐ Top

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

RIP Routing

Network

Network Address

10.0.0.0

20.0.0.0

192.168.3.0

Add

Remove

Equivalent IOS Commands





```

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#

```

☐ Top

Packet Transfer :

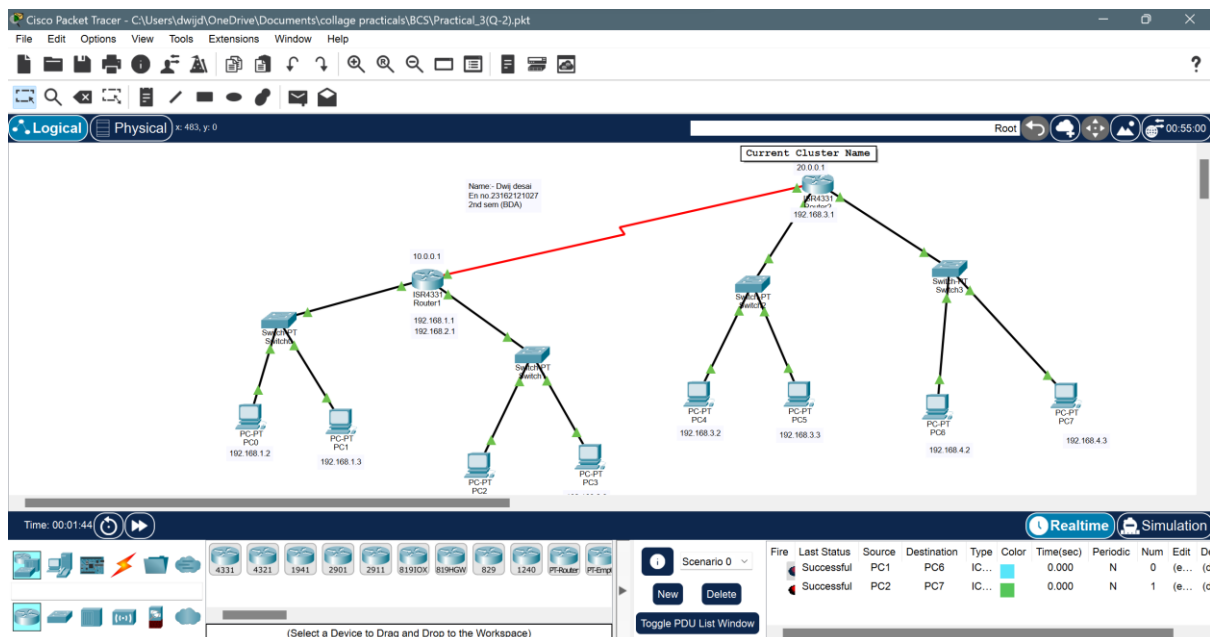
| Fire | Last Status | Source | Destination | Type | Color | Time(s) | Perioc | Num | Edit | De |
|---|-------------|--------|-------------|------|---|---------|--------|-----|--------|----|
|  | Successful | PC1 | PC4 | ICMP |  | 0.000 | N | 0 | (edit) | (d |
|  | Successful | PC0 | PC5 | ICMP |  | 0.000 | N | 1 | (edit) | (d |

Case 2: Green Tech Pvt. Ltd. contains four departments: Production, Sales, Admin and R&D. Each department has two hosts. You are appointed as Network Engineer in Green Tech Pvt. Ltd. Design the network to provide connectivity between these four departments.

Description :

Green Tech Pvt. Ltd. comprises four departments: Production, Sales, Admin, and R&D, each with two desktop computers (hosts). The network design features a central router connecting the departments, with each department having its own switch for host connections. Each department is assigned a unique IP subnet for efficient routing. Basic security measures, such as firewall rules and access control lists, are implemented. DHCP and DNS servers manage IP assignment and name resolution. This setup offers a straightforward network infrastructure for Green Tech Pvt. Ltd.'s operations.

Design :



Device Configuration:

- For PC0

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0004.9ABA.E472

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.1.2

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::204:9AFF:FEBA:E472

☐ Top

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC0

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.1.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

- For PC1

PC1

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC1

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.1.1

DNS Server

Gateway/DNS IPv6

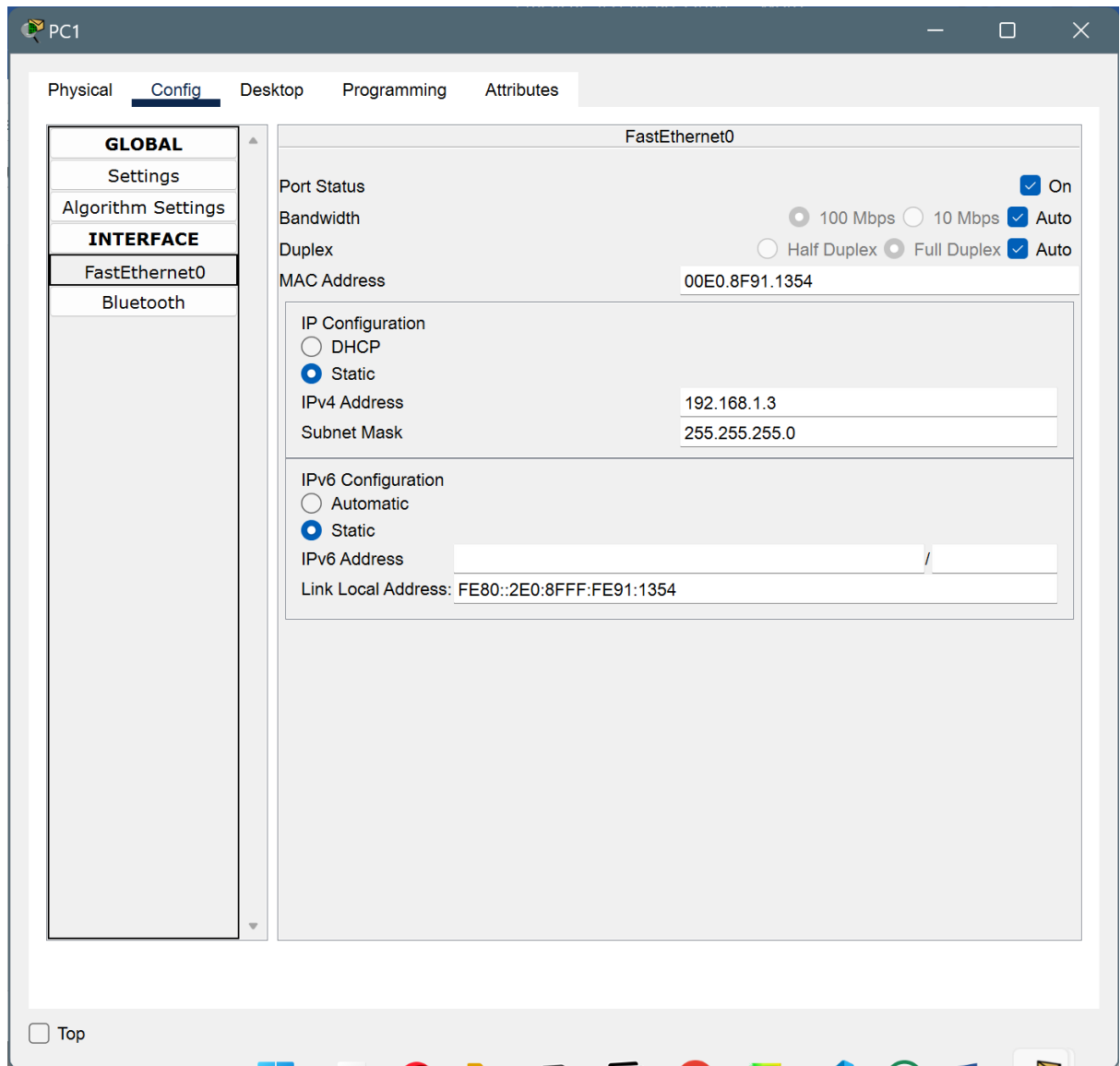
Automatic

Static

Default Gateway

DNS Server

Top



- For PC2

PC2

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address0060.7015.A7C0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.2.2

Subnet Mask255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address/

Link Local Address: FE80::260:70FF:FE15:A7C0

☐ Top

PC2

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display NamePC2

InterfacesFastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway192.168.2.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

☐ Top

- For PC3

PC3

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC3

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.2.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC3

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

00D0.BCE9.A3AE

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.2.3

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::2D0:BCFF:FEE9:A3AE

☐ Top

- Router1

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

On

1000 Mbps

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

0001.C952.98ED

192.168.1.1

255.255.255.0

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.C796.A8EA

IP Configuration

IPv4 Address

192.168.2.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

☐ Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

RIP Routing

Network

Network Address

10.0.0.0

192.168.1.0

192.168.2.0

Add

Remove

Equivalent IOS Commands

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/2

Router(config-if)#

Router(config-if)#exit

Router(config)#router rip

Router(config-router)#

☐ Top

- For PC4

PC4

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC4

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.3.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC4

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

100 Mbps

10 Mbps

On

Bandwidth

Auto

Duplex

Half Duplex

Full Duplex

Auto

MAC Address

0050.0FD2.74D0

IP Configuration

DHCP

Static

IPv4 Address

192.168.3.2

Subnet Mask

255.255.255.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address:

FE80::250:FFF:FED2:74D0

Top

- For PC5

PC5

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC5

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.3.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC5

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0050.0F36.7CD9

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.3.3

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address: FE80::250:FFF:FE36:7CD9

☐ Top

- For PC6

PC6

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC6

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.4.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC6

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒

On

Bandwidth

☒100 Mbps

☐10 Mbps

☒Auto

Duplex

☐Half Duplex

☒Full Duplex

☒Auto

MAC Address

00E0.F7EC.4B40

IP Configuration

☐DHCP

☒Static

IPv4 Address

192.168.4.2

Subnet Mask

255.255.255.0

IPv6 Configuration

☐Automatic

☒Static

IPv6 Address

Link Local Address

FE80::2E0:F7FF:FEEC:4B40

☐ Top

- For PC7

PC7

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC7

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.4.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC7

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0090.2B7E.E135

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.4.3

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address: FE80::290:2BFF:FE7E:E135

☐ Top

- Router2

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

On

1000 Mbps

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

000A.41C4.3196

192.168.3.1

255.255.255.0

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#ip address 192.168.4.1 255.255.255.0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Top

Router2

Physical

Config

CLI

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Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex

☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address00E0.F7A4.4C72

IP Configuration

IPv4 Address192.168.4.1

Subnet Mask255.255.255.0

Tx Ring Limit10

Equivalent IOS Commands

```
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#ip address 192.168.4.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
```

☐ Top

Router2

Physical
Config
CLI
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Algorithm Settings

ROUTING

Static

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SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

RIP Routing

Network

Network Address

10.0.0.0

192.168.3.0

192.168.4.0

Add





Remove

Equivalent IOS Commands

Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#ip address 192.168.4.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#

☐ Top

Packet Transfer :

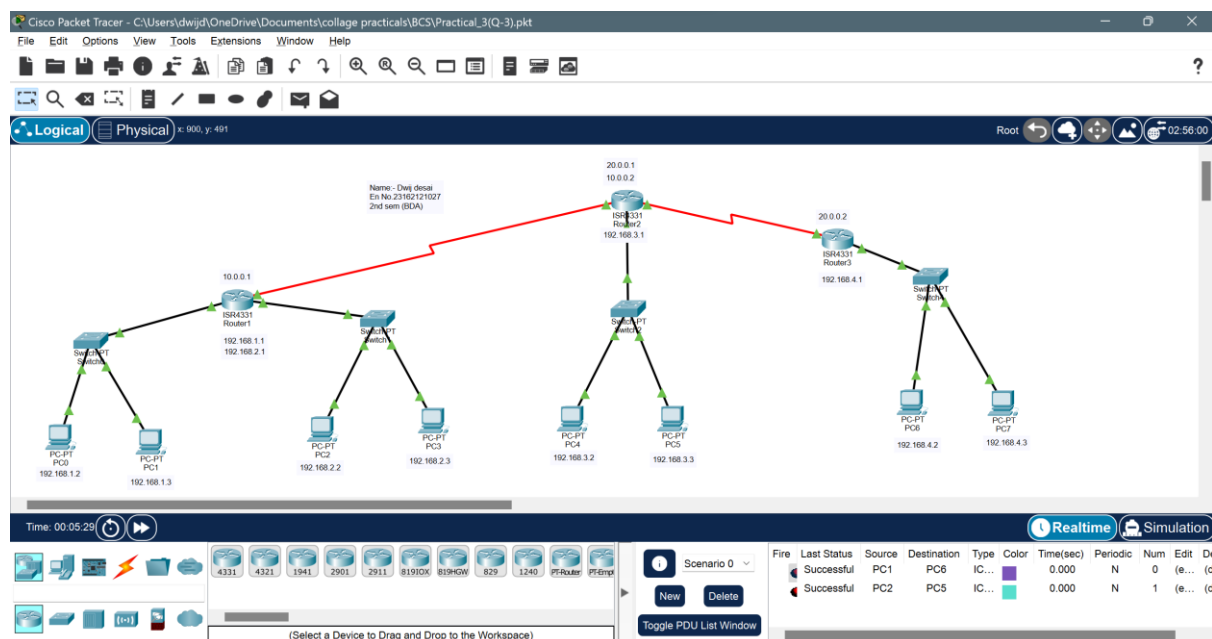
| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | De |
|---|-------------|--------|-------------|-------|---|-----------|----------|-----|----------|----|
|  | Successful | PC2 | PC5 | IC... |  | 0.000 | N | 0 | (e... (d | |
|  | Successful | PC1 | PC7 | IC... |  | 0.000 | N | 1 | (e... (d | |

Case 3: Sigma Solution Pvt. Ltd. contains five departments: Production, Sales, Admin, R&D and Marketing. Each department has two hosts. You are appointed as Network Engineer in Sigma Solution Pvt. Ltd. Design the network to provide connectivity between these five departments.

Description :

Sigma Solution Pvt. Ltd. consists of five departments: Production, Sales, Admin, R&D, and Marketing, each with two desktop computers (hosts). The network design includes a central router connecting the departments and a dedicated switch for each department. Each department is assigned a unique IP subnet for efficient routing. Basic security measures, like firewall rules and access control lists, are implemented. DHCP and DNS servers manage IP assignment and name resolution. This setup offers a simple and effective network infrastructure for Sigma Solution Pvt. Ltd.'s operations.

Design :



Device Configuration:

- For PC0

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

100 Mbps

10 Mbps

On

Bandwidth

Auto

Duplex

Half Duplex

Full Duplex

Auto

MAC Address

0004.9ABA.E472

IP Configuration

DHCP

Static

IPv4 Address

192.168.1.2

Subnet Mask

255.255.255.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address:

FE80::204:9AFF:FEBA:E472

Top

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC0

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.1.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

- For PC1

PC1

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC1

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.1.1

DNS Server

Gateway/DNS IPv6

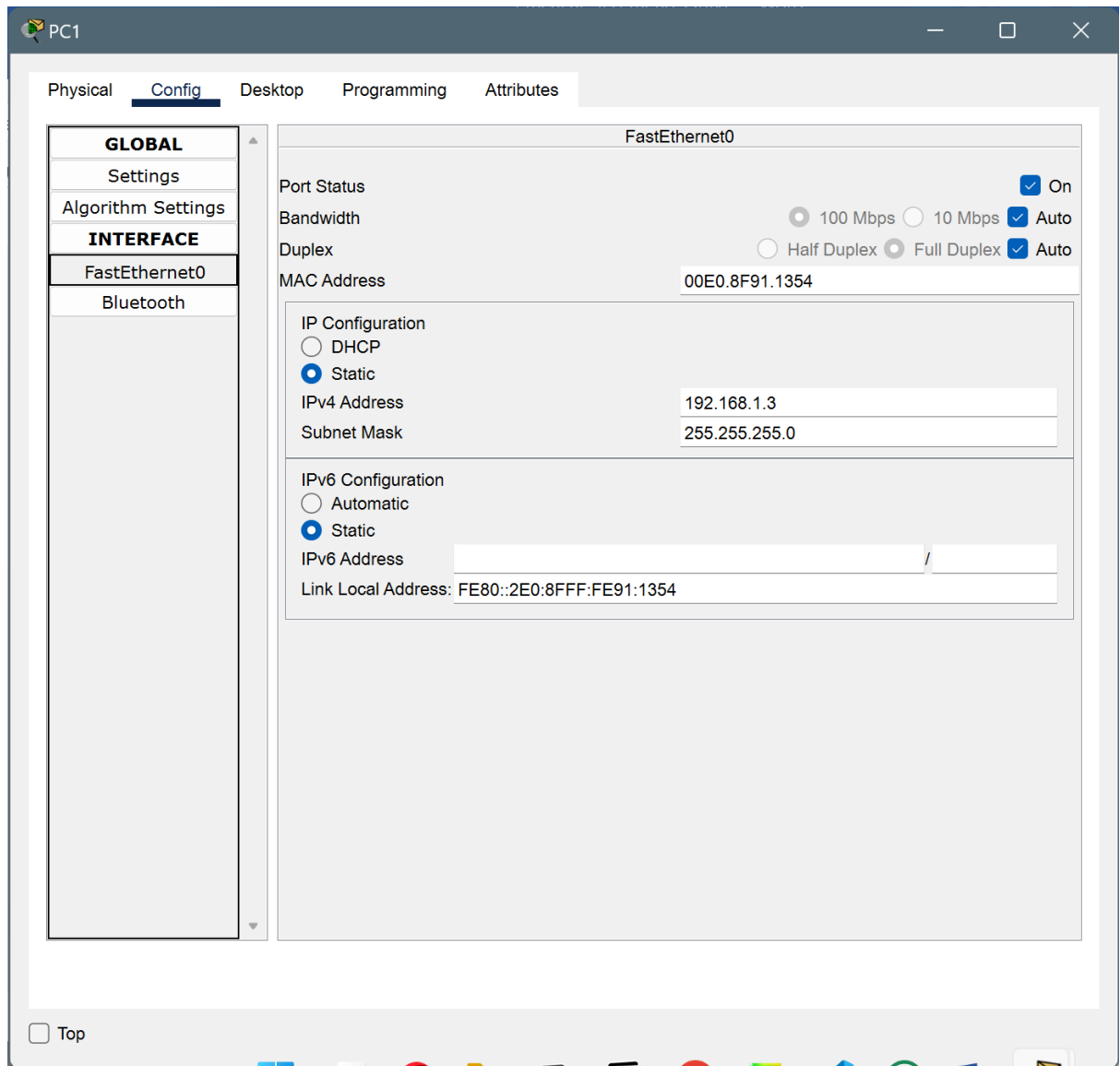
Automatic

Static

Default Gateway

DNS Server

Top



- For PC2

PC2

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

100 Mbps

10 Mbps

On

Bandwidth

Auto

Duplex

Half Duplex

Full Duplex

Auto

MAC Address

0060.7015.A7C0

IP Configuration

DHCP

Static

IPv4 Address

192.168.2.2

Subnet Mask

255.255.255.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address

FE80::260:70FF:FE15:A7C0

Top

PC2

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC2

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.2.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

- For PC3

PC3

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC3

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.2.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC3

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

00D0.BCE9.A3AE

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.2.3

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address: FE80::2D0:BCFF:FEE9:A3AE

☐ Top

- Router1

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

Port Status

☒ On

Bandwidth

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.C952.98ED

IP Configuration

IPv4 Address

192.168.1.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

☐ Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.C796.A8EA

IP Configuration

IPv4 Address

192.168.2.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

☐ Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

RIP Routing

Network

Network Address

10.0.0.0

192.168.1.0

192.168.2.0

Add

Remove

Equivalent IOS Commands

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/2

Router(config-if)#

Router(config-if)#exit

Router(config)#router rip

Router(config-router)#

☐ Top

- For PC4

PC4

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC4

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.3.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC4

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

100 Mbps

10 Mbps

On

Bandwidth

Auto

Duplex

Half Duplex

Full Duplex

Auto

MAC Address

0050.0FD2.74D0

IP Configuration

DHCP

Static

IPv4 Address

192.168.3.2

Subnet Mask

255.255.255.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address:

FE80::250:FFF:FED2:74D0

Top

- For PC5

PC5

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC5

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.3.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC5

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0050.0F36.7CD9

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.3.3

Subnet Mask

255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::250:FFF:FE36:7CD9

☐ Top

- For PC6

PC6

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC6

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.4.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC6

PhysicalConfigDesktopProgrammingAttributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex☒ Full Duplex

☒ Auto

MAC Address00E0.F7EC.4B40

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.4.2

Subnet Mask255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address/

Link Local Address: FE80::2E0:F7FF:FEEC:4B40

☐ Top

- For PC7

PC7

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display Name

PC7

Interfaces

FastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway

192.168.4.1

DNS Server

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

PC7

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

100 Mbps

10 Mbps

On

Bandwidth

Auto

Duplex

Half Duplex

Full Duplex

Auto

MAC Address

0090.2B7E.E135

IP Configuration

DHCP

Static

IPv4 Address

192.168.4.3

Subnet Mask

255.255.255.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address

FE80::290:2BFF:FE7E:E135

Top

- Router2

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/0

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

On

1000 Mbps

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

000A.41C4.3196

192.168.3.1

255.255.255.0

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#ip address 192.168.4.1 255.255.255.0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Top

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex

☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address00E0.F7A4.4C72

IP Configuration

IPv4 Address192.168.4.1

Subnet Mask255.255.255.0

Tx Ring Limit10

Equivalent IOS Commands

```
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#ip address 192.168.4.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
```

☐ Top

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/2/0

Serial0/2/1

RIP Routing

Network

Network Address

10.0.0.0

192.168.3.0

192.168.4.0

Add

Remove

Equivalent IOS Commands

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#ip address 192.168.4.1 255.255.255.0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface GigabitEthernet0/0/1

Router(config-if)#

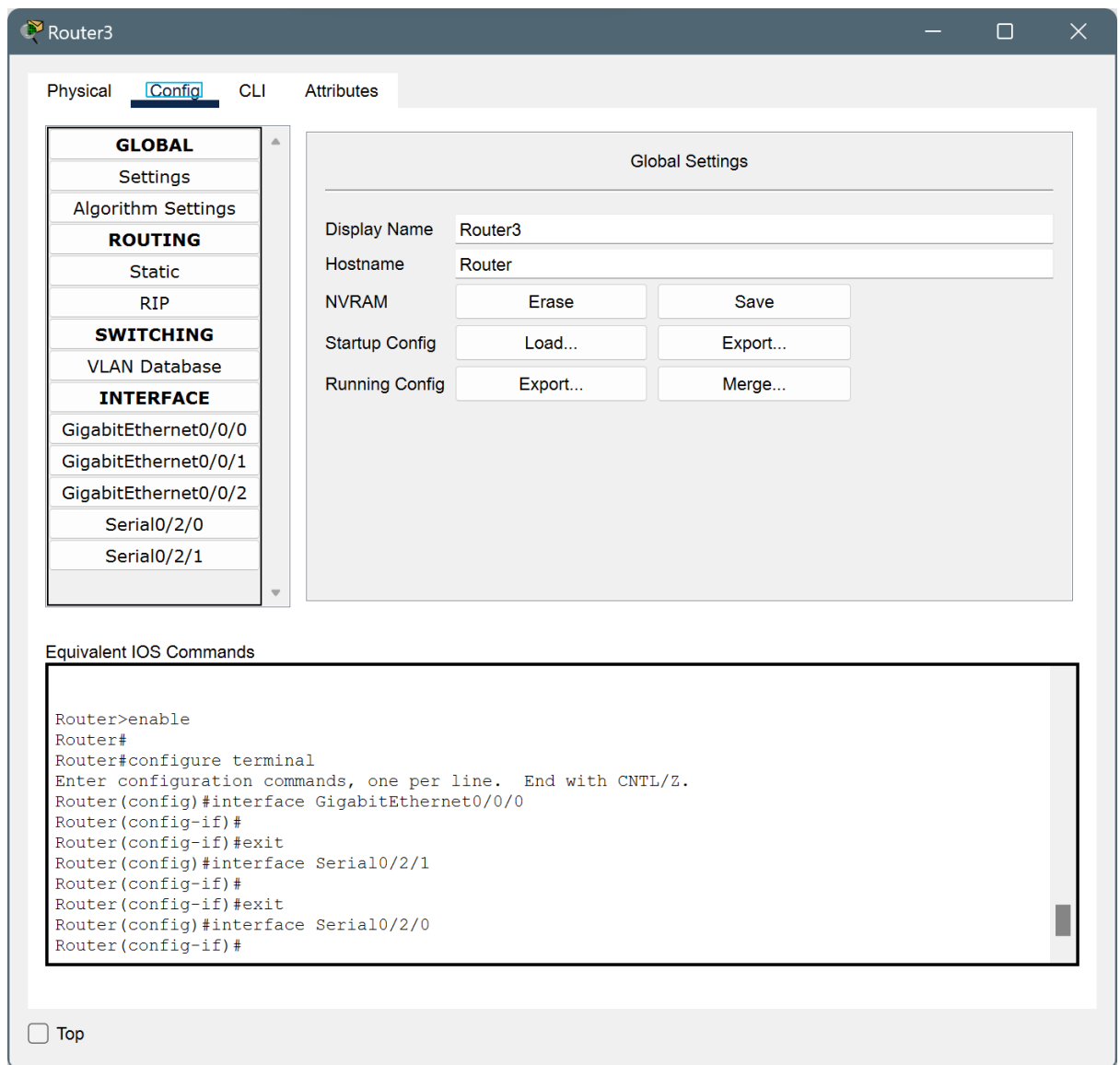
Router(config-if)#exit

Router(config)#router rip

Router(config-router)#

☐ Top

- Router3



Packet Transfer :

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | De |
|------|-------------|--------|-------------|-------|-------|-----------|----------|-----|-------|----|
| | Successful | PC1 | PC6 | IC... | | 0.000 | N | 0 | (e... | (d |
| | Successful | PC2 | PC5 | IC... | | 0.000 | N | 1 | (e... | (d |

Conclusion: