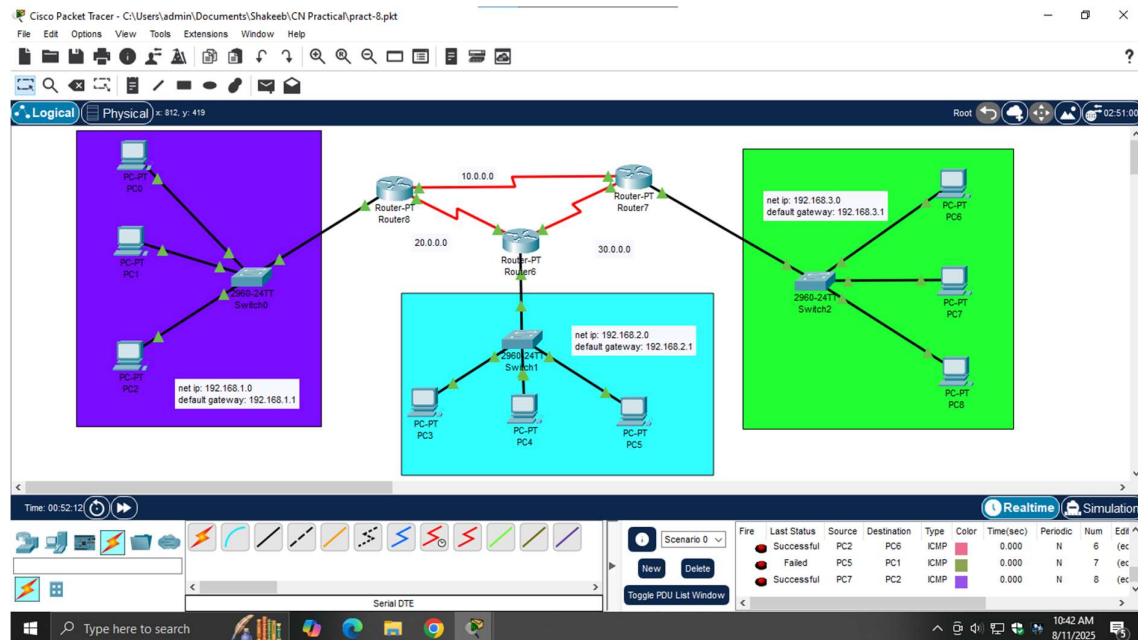


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Practical 8:

Aim: Create a network and implement RIP[Routing Information Protocol]



Physical **Config** CLI Attributes

FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0090.2B5A.DAA3
IP Configuration	
IPv4 Address	192.168.1.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

Equivalent IOS Commands

Press RETURN to get started!

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTRL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

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Physical **Config** CLI Attributes

Serial2/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	1200
IP Configuration	
IPv4 Address	10.0.0.1
Subnet Mask	255.0.0.0
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 FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
```

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Physical **Config** CLI Attributes

Serial3/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	1200
IP Configuration	
IPv4 Address	20.0.0.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

Equivalent IOS Commands

```
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
```

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Physical **Config** CLI Attributes

GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0

RIP Routing

Network	<input type="text"/>
	<input type="button" value="Add"/>

Network Address
10.0.0.0
20.0.0.0
30.0.0.0
192.168.1.0
192.168.2.0
192.168.3.0

Equivalent IOS Commands

```
Router(config)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#
Router(config-if)#
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
```

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.1763.AB95

IP Configuration

IPv4 Address 192.168.2.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

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)#interface FastEthernet0/0

Router(config-if)#

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Router6

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

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RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

Serial2/0

Serial2/0

Port Status

☒ On

Duplex

Full Duplex

Clock Rate

2000000

IP Configuration

IPv4 Address

20.0.0.2

Subnet Mask

255.0.0.0

Tx Ring Limit

10

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)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#

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Router6

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

Serial3/0

Port Status

Duplex

Clock Rate

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

Serial3/0

Port Status

Duplex

Clock Rate

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
```

Top

Router6

PhysicalConfigCLIAttributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

RIP Routing

Network

Network Address

10.0.0.0

20.0.0.0

30.0.0.0

192.168.1.0

192.168.2.0

192.168.3.0

Add

Remove

Equivalent IOS Commands

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#

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Physical **Config** CLI Attributes

FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	00E0.F7AE.7393
IP Configuration	
IPv4 Address	192.168.3.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

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

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Physical **Config** CLI Attributes

Serial2/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	10.0.0.2
Subnet Mask	255.0.0.0
Tx Ring Limit	10

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)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
```

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Router7

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

Serial3/0

Port Status ☒ On

Duplex ☐ Full Duplex

Clock Rate 1200

IP Configuration

IPv4 Address 30.0.0.1

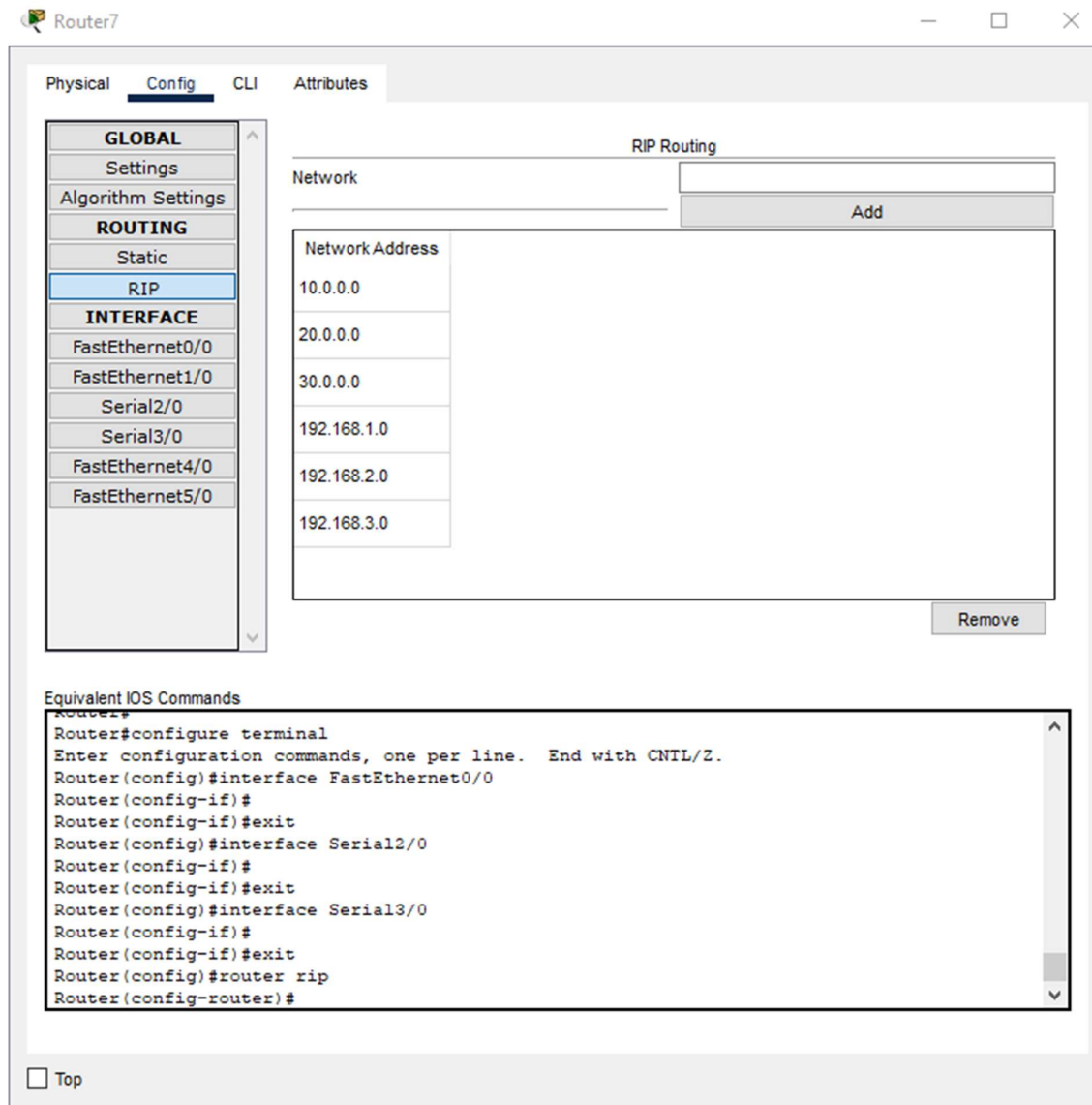
Subnet Mask 255.0.0.0

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 FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
```

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RIP (Routing Information Protocol) is one of the oldest **distance vector** routing protocols used in computer networks to help routers share information about network topology and find the best path to a destination.

1. Purpose

- RIP helps routers automatically update and exchange routing information so that data can find the shortest path through the network.
- It's mainly used in **small to medium-sized networks** (like LANs or small WANs).

2. How it Works

- **Routing Method:** Distance Vector (routes are chosen based on the number of hops).
- **Metric:** *Hop count* — each router the packet passes through is 1 hop.
- **Maximum hop count:** 15 (16 means unreachable). This limit prevents routing loops but also limits RIP's use in large networks.

- **Update Interval:** Every 30 seconds, routers send their entire routing table to their neighbors using **UDP port 520**.

3. Loop Prevention Mechanisms

Since RIP is a distance vector protocol, it's vulnerable to routing loops. It uses:

- **Split Horizon:** Don't advertise a route back in the direction it came from.
- **Route Poisoning:** Mark a failed route with hop count 16.
- **Hold-down Timers:** Delay acceptance of potentially bad route info.
- **Triggered Updates:** Send changes immediately when a route changes, instead of waiting for the 30-second timer.

Example:

Imagine three routers in a small network. Each router tells its neighbors the networks it knows about and how many hops away they are. If Router A hears from Router B that a network is 2 hops away, and B is 1 hop from A, A will record that network as 3 hops away.