Batch: A1	**Roll No.: 16010123012**
Experiment / assignment / tutorial No.: 08	
Grade: AA / AB / BB / BC / CC / CD /DD	
Signature of the Staff In-charge with date	

Experiment No.:8

TITLE: Study and configure RIP protocol using Cisco Packet tracer

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AIM: To study and configure RIP protocol using Cisco Packet tracer

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Expected Outcome of Experiment:
CO:

Books/ Journals/ Websites referred:

1. A. S. Tanenbaum, "Computer Networks", Pearson Education, Fourth Edition
2. B. A. Forouzan, "Data Communications and Networking", TMH, Fourth Edition

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Pre Lab/ Prior Concepts:
IPv4 Addressing, Subnetting, Distance Vector Protocol, Router configuration Commands.

New Concepts to be learned: RIP Protocol and its configuration.

RIP (Routing Information Protocol)
RIP is a standardized Distance Vector protocol, designed for use on smaller networks. RIP was one of the first true Distance Vector routing protocols and is supported on a wide variety of systems.
RIP adheres to the following Distance Vector characteristics:

- RIP sends out periodic routing updates (every 30 seconds)
- RIP sends out the full routing table every periodic update.
- RIP uses a form of distance as its metric (in this case, hop count).
- RIP uses the Bellman-Ford Distance Vector algorithm to determine the best "path" to a particular destination

Other characteristics of RIP include:

- RIP supports IP and IPX routing.
- RIP utilizes UDP port 520
- RIP routes have an administrative distance of 120.
- RIP has a maximum hop count of 15 hops.

RIP Versions
RIP has two versions, Version 1 (RIPv1) and Version 2 (RIPv2).
RIPv1 (RFC 1058) is ***classful***, and thus does not include the subnet mask with its routing table updates. Because of this, RIPv1 does not support **Variable Length Subnet Masks (VLSMs)**. When using RIPv1, networks must be contiguous, and subnets of a major network must be configured with identical subnet masks. Otherwise, route table inconsistencies (or worse) will occur. RIPv1 sends updates as broadcasts to address 255.255.255.255.

RIPv2 (RFC 2543) is ***classless***, and thus does include the subnet mask with its routing table updates. RIPv2 fully supports VLSMs, allowing discontiguous networks and varying subnet masks to exist.

Other enhancements offered by RIPv2 include:

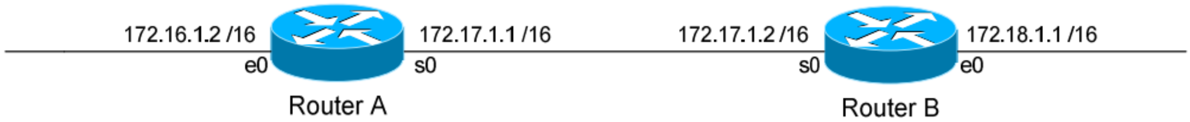
- Routing updates are sent via multicast, using address 224.0.0.9
- Encrypted authentication can be configured between RIPv2 routers
- Route tagging is supported.

RIPv2 can interoperate with RIPv1. By default:

- RIPv1 routers will send only Version 1packets
- RIPv1 routers will receive both Version 1 and 2 updates
- RIPv2 routers will both send and receive only Version 2 updates

We can control the version of RIP a particular interface will “send” or “receive.”
Unless RIPv2 is manually specified, a Cisco will default to RIPv1 when configuring RIP.

RIPv1 Basic Configuration



Routing protocol configuration occurs in Global Configuration mode. On Router A, to configure RIP, we would type:

Router(config)# router rip
Router(config-router)# network 172.16.0.0
Router(config-router)# network 172.17.0.0

The first command, router rip, enables the RIP process.
The network statements tell RIP which networks you wish to advertise to other RIP routers. We simply list the networks that are directly connected to our router. Notice that we specify the networks at their classful boundaries, and we do not specify a subnet mask.
To configure Router B:

Router(config)# router rip
Router(config-router)# network 172.17.0.0
Router(config-router)# network 172.18.0.0

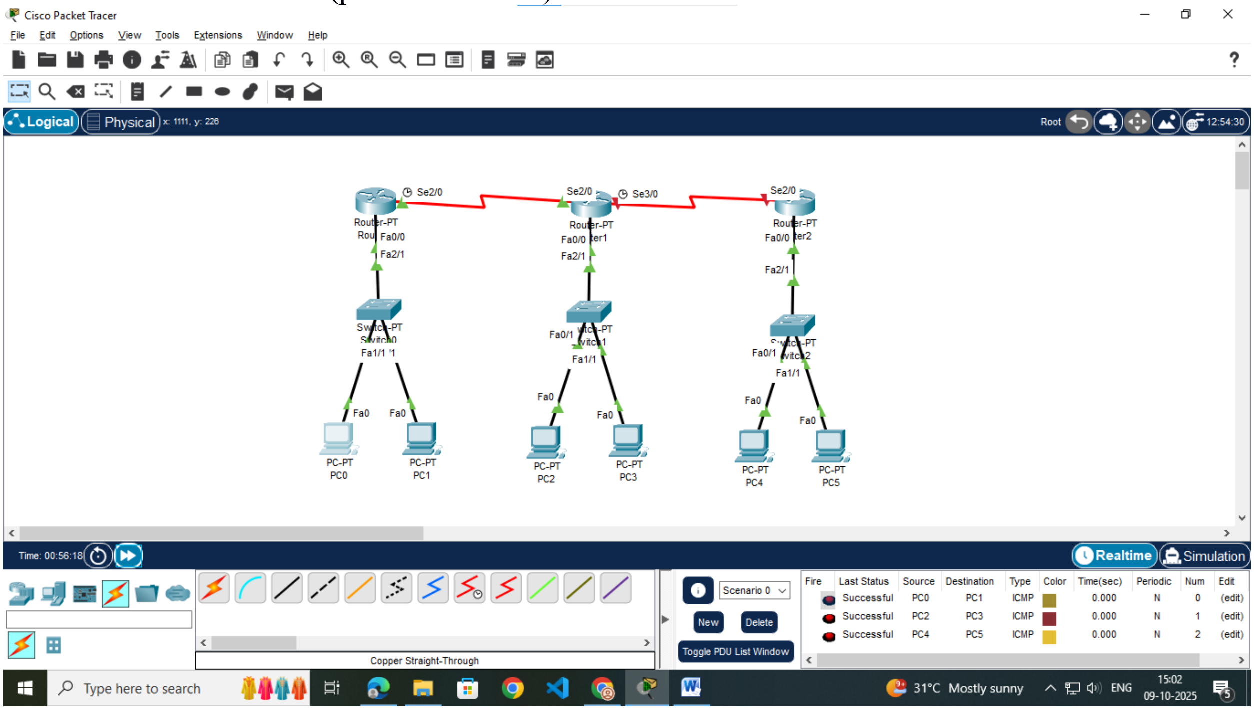
The routing table on Router A will look like:

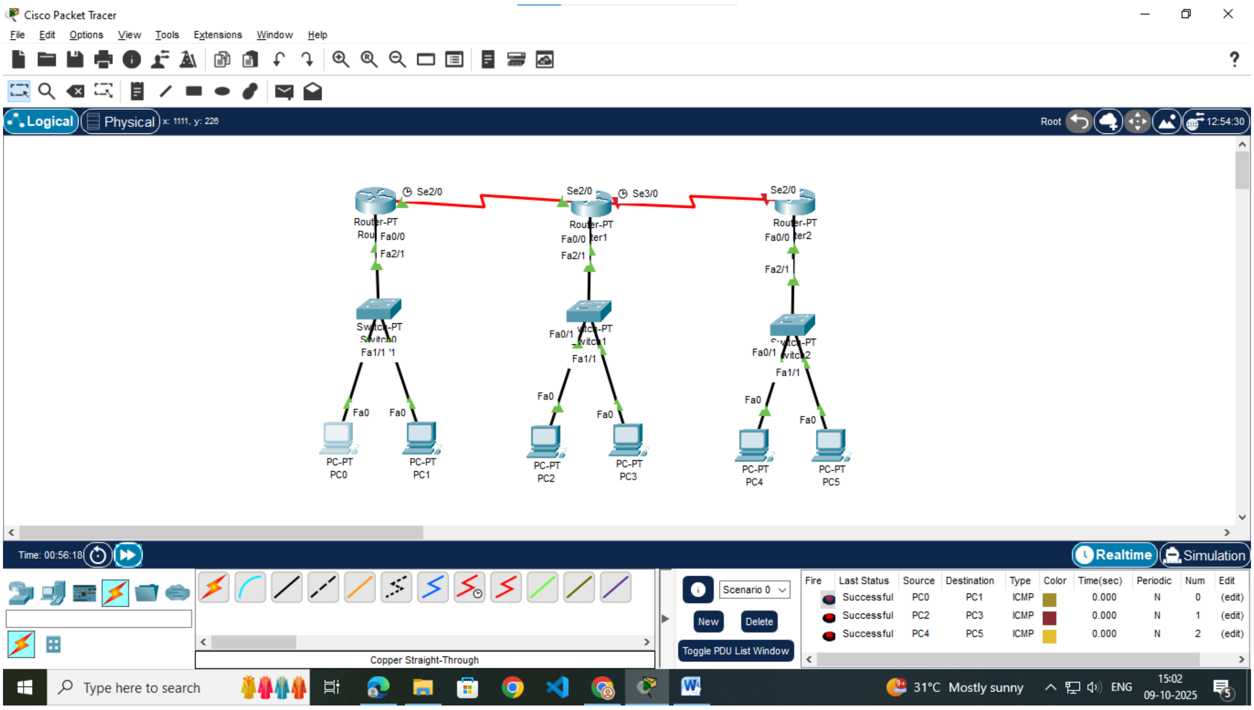
RouterA# show ip route
Gateway of last resort is not set
C 172.16.0.0 is directly connected, Ethernet0
C 172.17.0.0 is directly connected, Serial0
R 172.18.0.0 [120/1] via 172.17.1.2, 00:00:00, Serial0

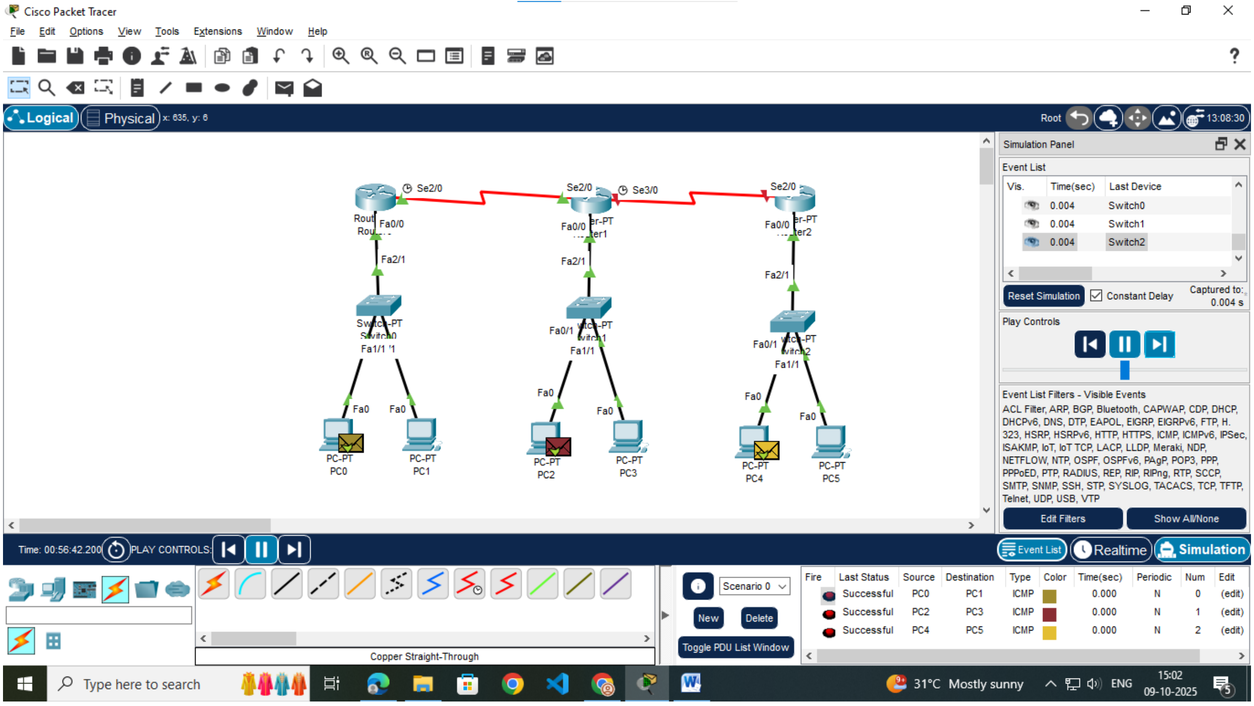
The routing table on Router B will look like:

RouterB# show ip route
Gateway of last resort is not set
C 172.17.0.0 is directly connected, Serial0
C 172.18.0.0 is directly connected, Ethernet0
R 172.16.0.0 [120/1] via 172.17.1.1, 00:00:00, Serial0

IMPLEMENTATION: (printout of code)







Physical Config Desktop Programming Attributes

Command Prompt X

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Cisco Packet Tracer PC Command Line 1.0
C:\>ping 20.20.20.1

Pinging 20.20.20.1 with 32 bytes of data:

Request timed out.
Reply from 20.20.20.1: bytes=32 time=10ms TTL=126
Reply from 20.20.20.1: bytes=32 time=10ms TTL=126
Reply from 20.20.20.1: bytes=32 time=10ms TTL=126

Ping statistics for 20.20.20.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 10ms, Average = 10ms

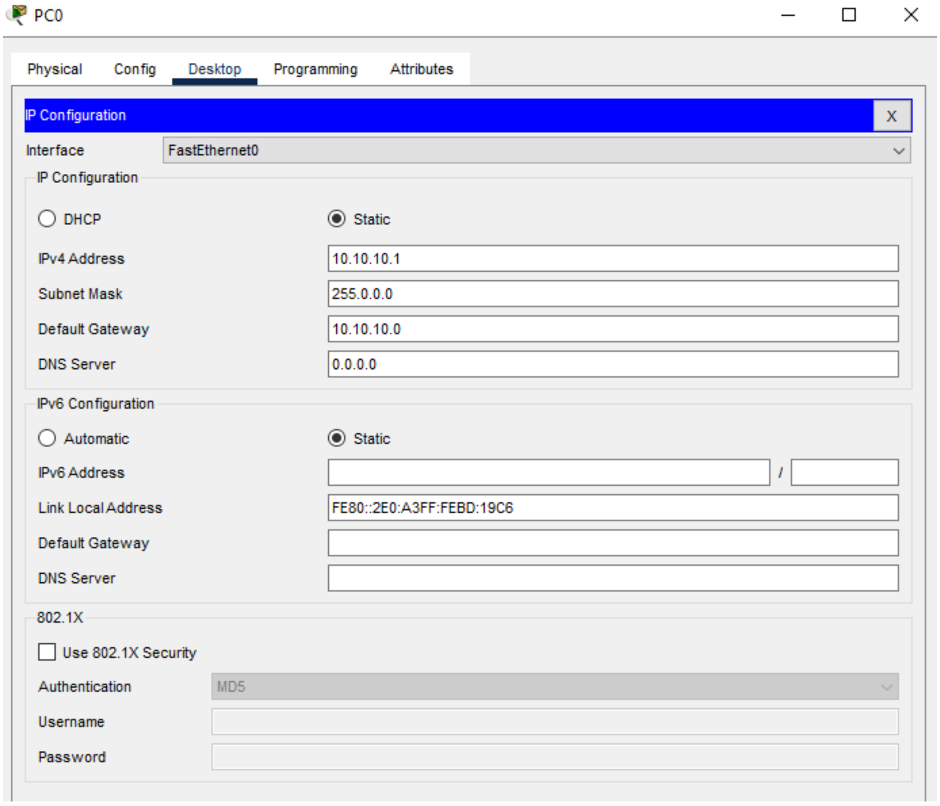
C:\>ping 10.10.10.2

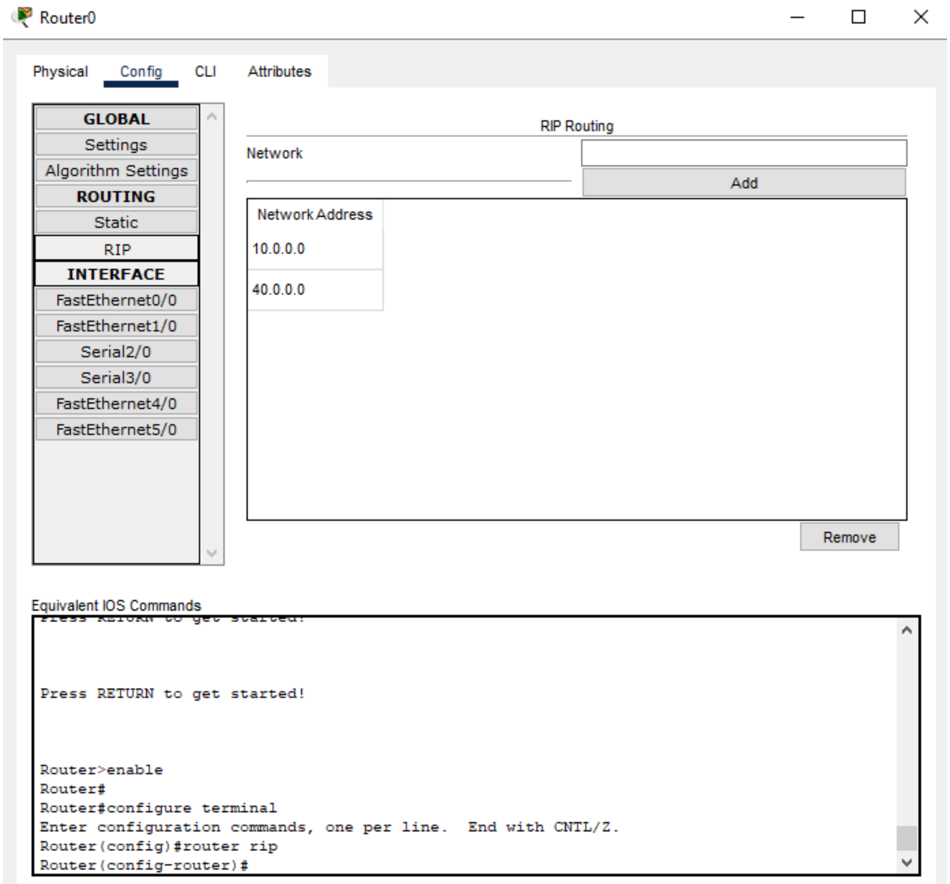
Pinging 10.10.10.2 with 32 bytes of data:

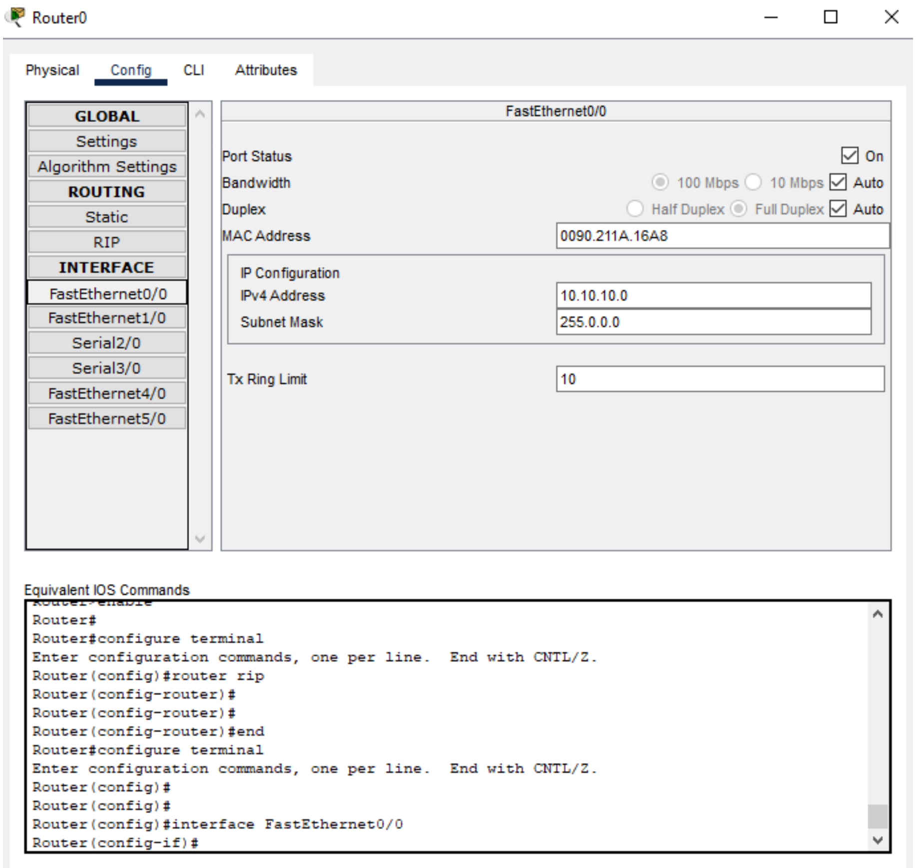
Reply from 10.10.10.2: bytes=32 time<1ms TTL=128
Reply from 10.10.10.2: bytes=32 time<1ms TTL=128
Reply from 10.10.10.2: bytes=32 time=1ms TTL=128
Reply from 10.10.10.2: bytes=32 time=21ms TTL=128

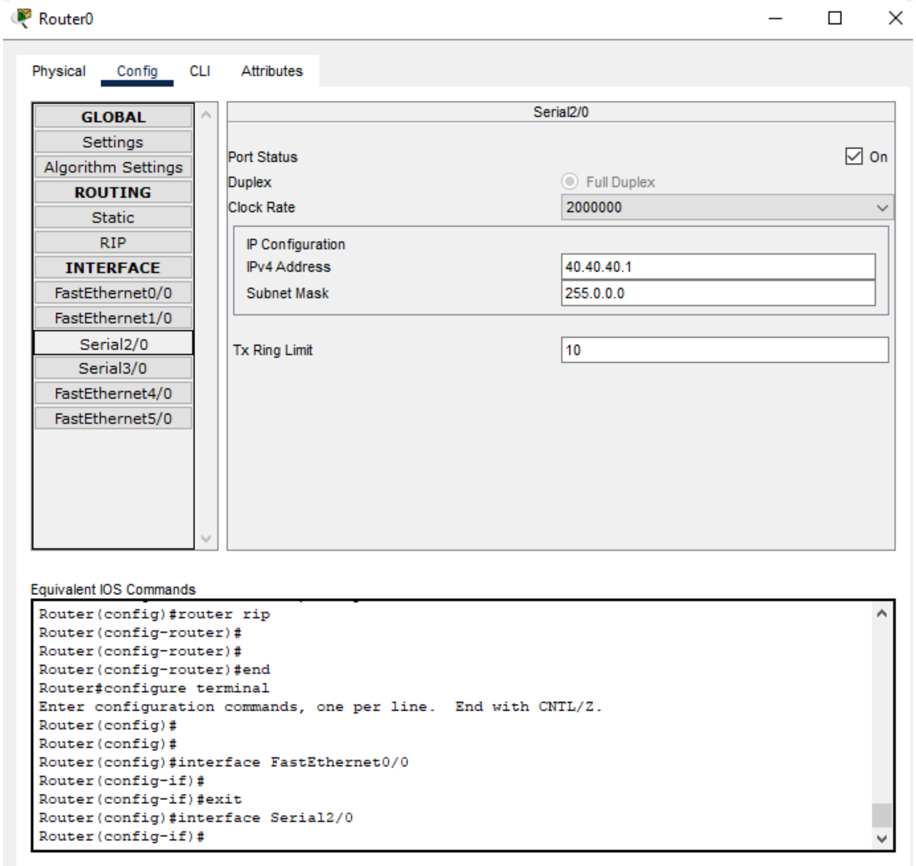
Ping statistics for 10.10.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 21ms, Average = 5ms

C:\>
```


PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.10.10.1
Subnet Mask
255.0.0.0
Default Gateway
10.10.10.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2E0:A3FF:FEBD:19C6
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password


Router0
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
Add
Network Address
10.0.0.0
40.0.0.0
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 rip
Router(config-router)#


Router0
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
0090.211A.16A8
IP Configuration
IPv4 Address
10.10.10.0
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#interface FastEthernet0/0
Router(config-if)#


Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
2000000
IP Configuration
IPv4 Address
40.40.40.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#router rip
Router(config-router)#
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#

CONCLUSION:

Post Lab Questions

1. .... are two popular examples of distance vector routing protocols.

A. OSPF and RIP
B. RIP and BGP
C. BGP and OSPF
D. BGP and SPF

2. A .... routing table contains information entered manually.

A. static
B. dynamic
C. hierarchical
D. non static

3. A .... routing table is updated periodically using one of the dynamic routing protocols.

A. static
B. dynamic
C. hierarchical
D. non static

4. Which of the following is not the category of dynamic routing algorithm.

A. Distance vector protocols
B. Link state protocols
C. Hybrid protocols
D. Automatic state protocols

5. In ….... forwarding, the mask and destination addresses are both 0.0.0.0 in routing table.

A. next-hop
B. network-specific
C. host-specific
D. default

6. Differentiate between Distance Vector Routing and Link State Routing.

Distance Vector Routing	Link State Routing
Bandwidth required is less due to local sharing, small packets and no flooding.	Bandwidth required is more due to flooding and sending of large link state packets.
Based on local knowledge, since it updates table based on information from neighbours.	Based on global knowledge, it have knowledge about entire network.
Make use of Bellman Ford Algorithm.	Make use of Dijakstra's algorithm.
Traffic is less.	Traffic is more.

Converges slowly i.e, good news spread fast and bad news spread slowly.	Converges faster.

Date: 09/10/2025 **Signature of faculty in-charge**