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ROLL NO. 31258

: Date :	Page No :
/ /20	

Assignment No. 6

DOS :- 31-10-2021

Title :- Configuration of 3 routed network using protocol RIP / OSPF / BGP.

Problem statement :-

Use Packet Tracer tool for configuration of 3 routed network using one of the following protocol RIP / OSPF / BGP.

Objectives :-

To understand configuration using RIP / OSPF / BGP by using Packet Tracer tool.

Outcomes :-

After completion of assignment, students will be able to understand configuration using RIP / OSPF / BGP.

THEORY :-

Roll No. 31258

Date: / /20 | Page No.:

Static Routing :-

Typically used in hosts Enter subnet mask, router (gateway), IP address perfect for cases with few connections, doesn't change much E.g. host with a single router connecting to the rest of the Internet IP: 128.1.1.100

Dynamic Routing :-

Most routers use dynamic routing. Automatically build the routing tables. As we saw previously, there are two major approaches
- Link state Algorithms
- Distance Vector Algorithms

First some terminology
- AS = Autonomous system
  contiguous set of networks under one administrative authority
- Common routing protocol
  E.g. University of Alaska statewide, Washington state University
  E.g. Intel Corporation
- A connected network
  there is at least one route between any pair of nodes.

RIP (Routing Information Protocol) :-

- Distance Vector Algorithm

- Open standard protocol
- classful routing protocol
- Administrative Distance is 120
- Distance metric: # of hops (max = 15 hops)
- Distance vectors: exchanged every 30 sec via Response Message (also called advertisement)
- Each advertisement: route to up to 25 destination nets

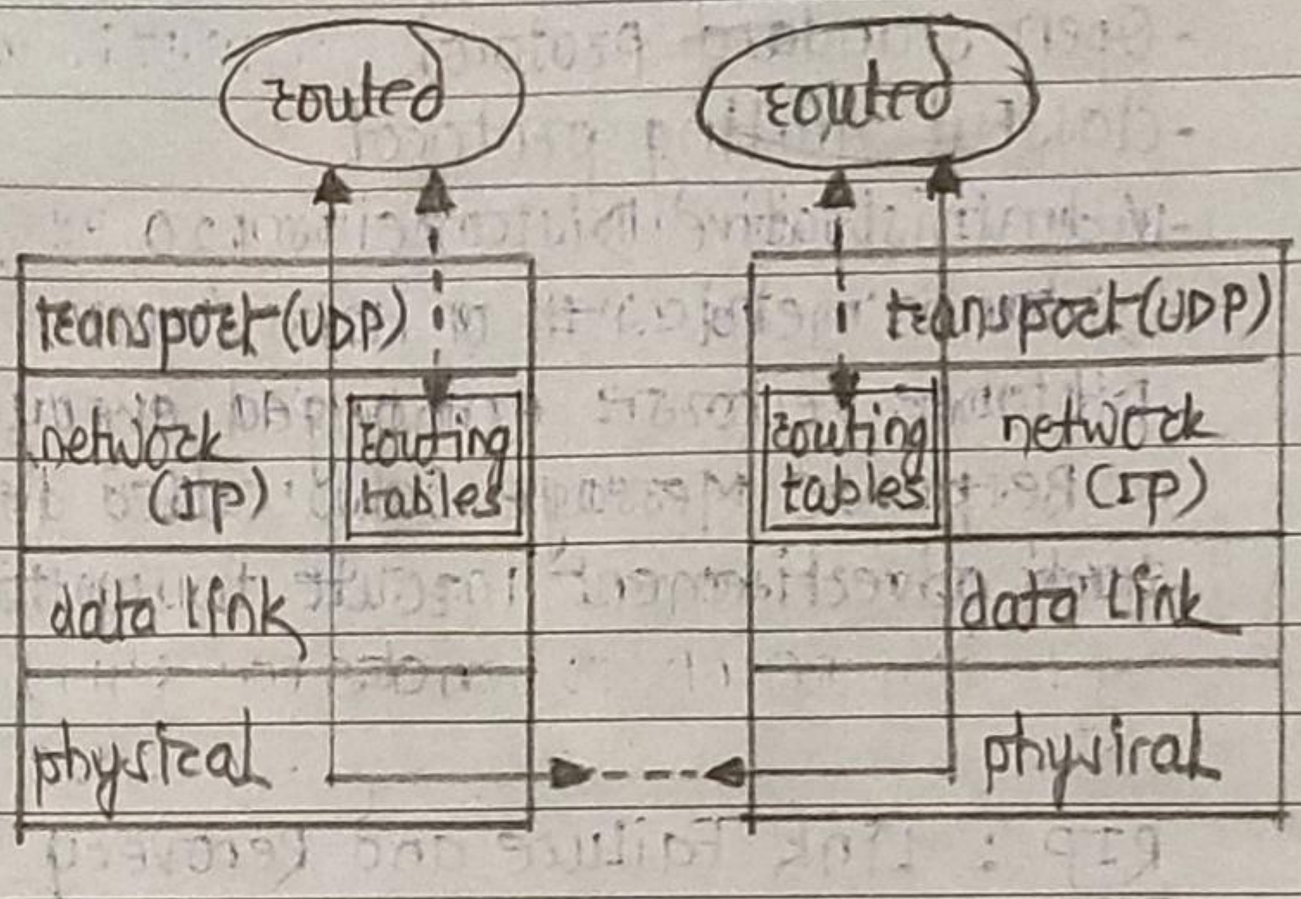
RIP: Link Failure and Recovery

- If no advertisement heard after 180 sec. neighbour/link declared dead routes via neighbour invalidated
- new advertisements sent to neighbours
- neighbour in turn send out new advertisements (if tables changed)
- link failure info quickly propogates to entire net.

RIP Table processing :-

RIP routing tables managed by application-level process called route-d (daemon) advertisements sent in UDP packets, periodically repeated Why UDP?

Figure :



RIP

Advantages :-

Simplicity ; little to no configuration, just start routed up Passive version for hosts If a host wants to just listen and update its routing table.

OSPF (Open shortest path First)

- "Open" : publically available.
- RFC 2328
- Uses Link State Algorithm
- LS packet dissemination
- Topology map at each node.
- Route computation using Dijkstra's algorithm
- OSPF advertisement carries one entry per neighbor router Metric is cost
- Administrative Distance 110
- conceived as a successor to RIP

OSPF "advanced" features (not in RIP) :-

Security : all OSPF messages authenticated (to prevent malicious intrusion); TCP connections used Multiple same-cost paths allowed (only one path in RIP) For each link, multiple cost metrics for different Type of service (e.g. satellite link cost set "low" for best effort; high for real time) Integrated uni- and multicast support : Multicast OSPF (MOSPF) uses same topology data base as OSPF Hierarchical OSPF in large domains.

BGP Terminology :-

Autonomous System : A collection of networks under a single administrative domain.

Inter-domain Routing : Routing between customer and the service provider.

Internal Routing : Uses IGP protocol (RIP OSPF) to exchange routing information inside the AS.

External Routing : Uses EGP protocol (BGP) to exchange routes between AS.

IBGP : When BGP is used inside an AS.

EBGP : When BGP is used between AS.

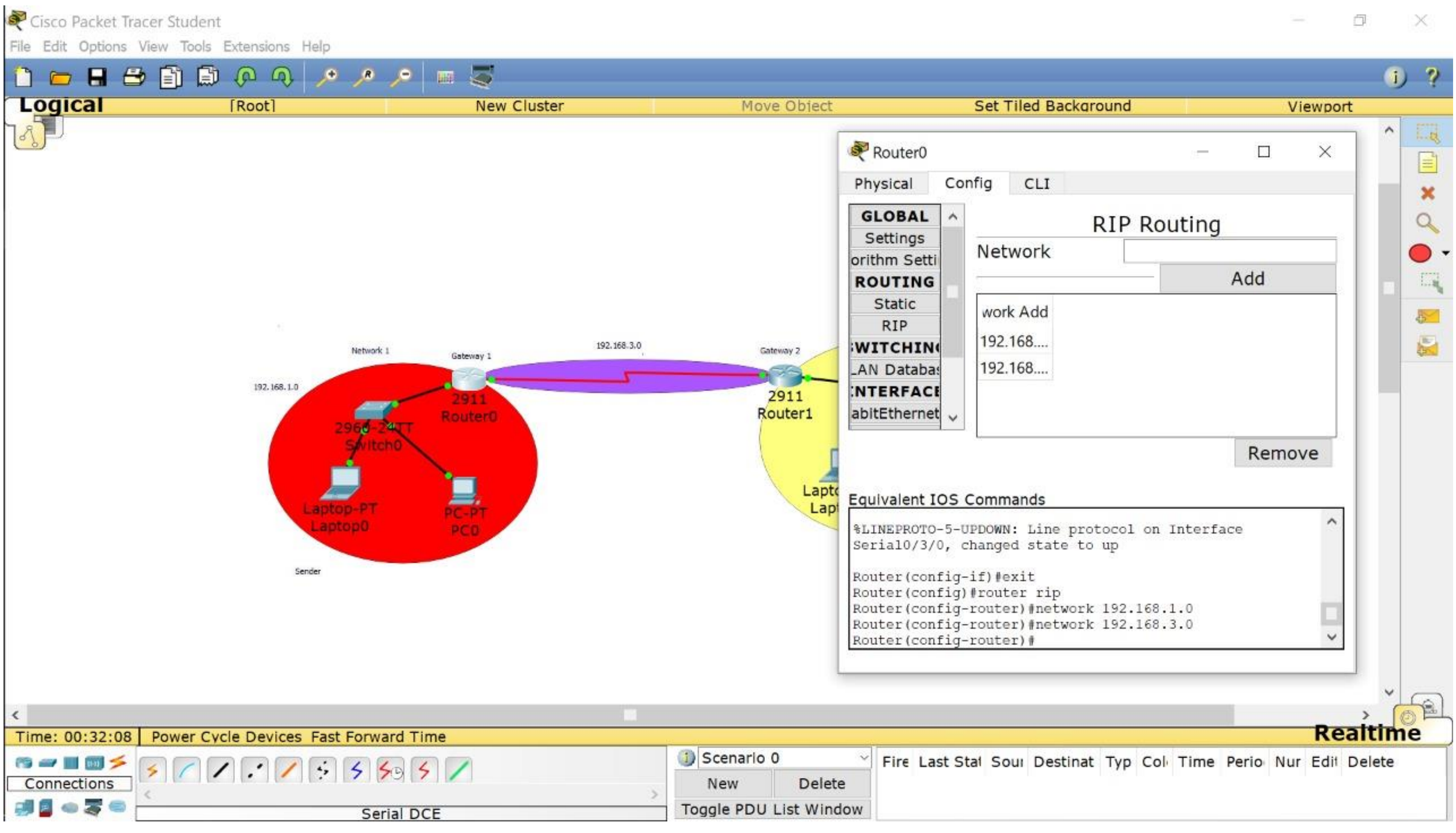
ROLL NO. 31258

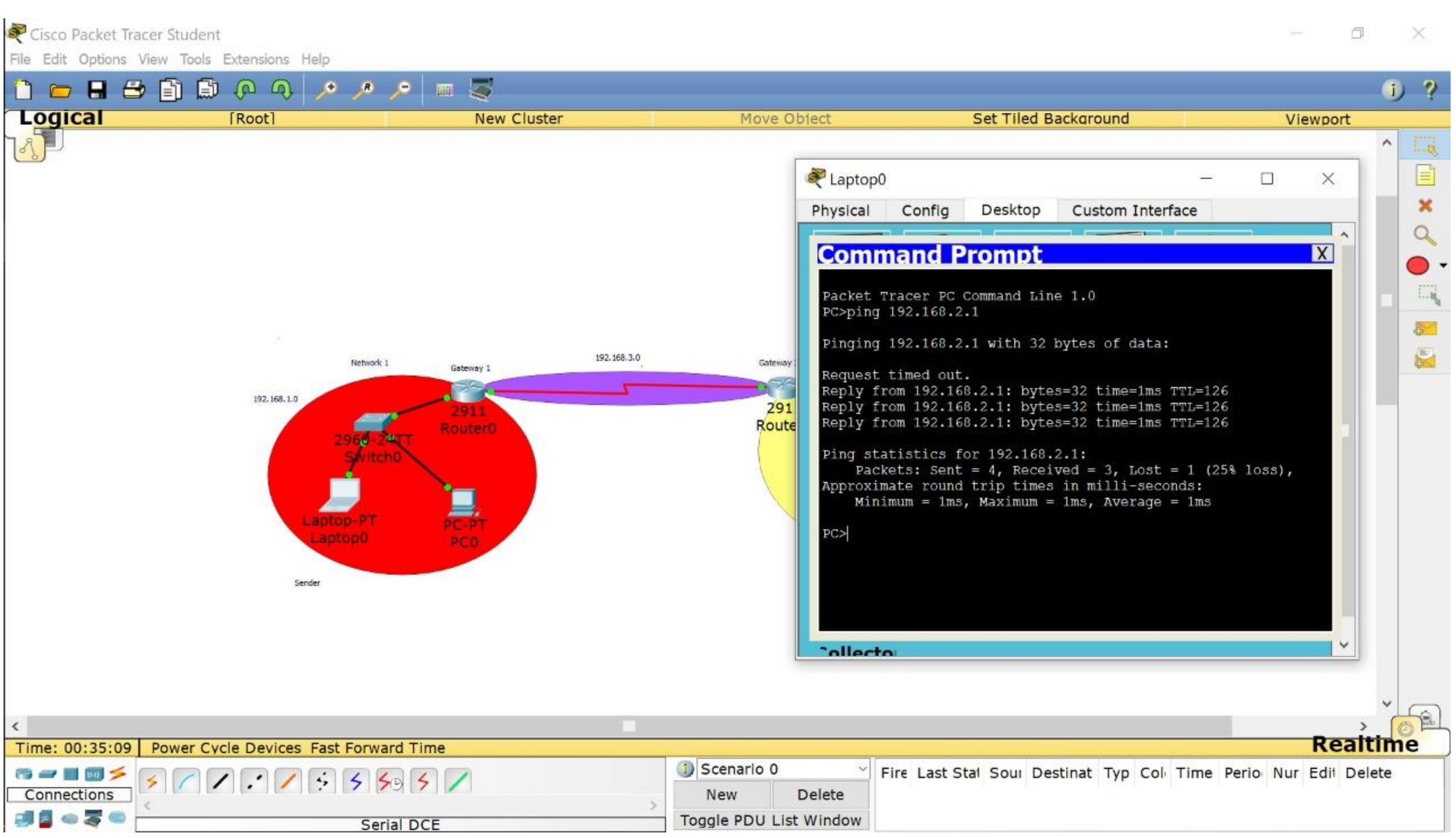
Date :	Page No.
/ /20	

Conclusion :-

Thus we have studied the Configuration of 3 router network using one of the following protocol RIP / OSPF / BGP.

OUTPUT :-

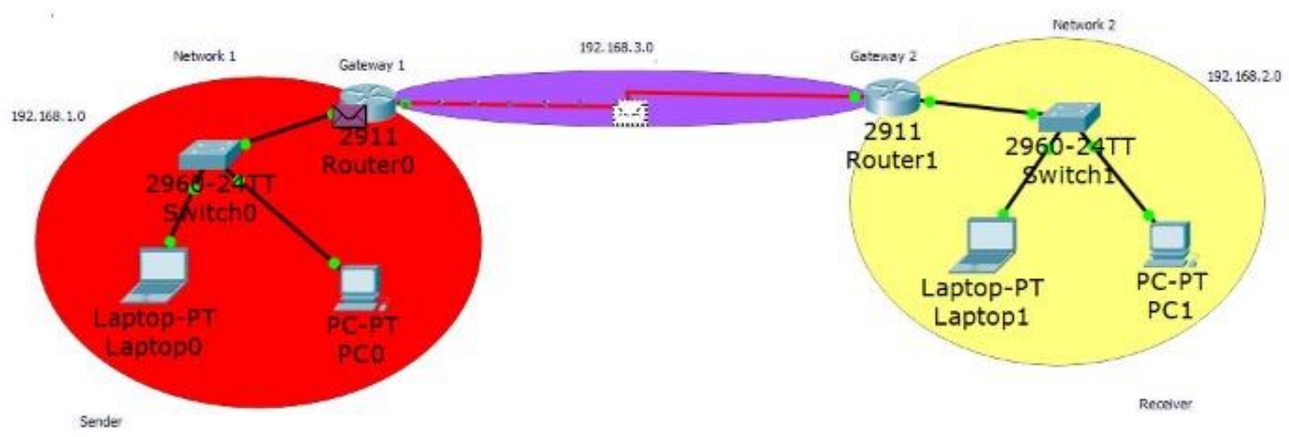




Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport



Simulation Panel

Event List

Vis.	Time(sec)	Last D	At De	Type	Info
	0.000	--	Lapt...	ICMP	
	0.001	Lapt...	Swit...	ICMP	
	0.002	Switc...	Rou...	ICMP	
	0.003	Rout...	Rou...	ICMP	

Reset Simulation | Constant Delay | Capturing...

Play Controls

Back | Auto Capture / Play | Capture / Forward

Event List Filters - Visible Events

ACL Filter, CDP, DHCPv6, DTP, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, RADIUS, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters | Show All/None

Time: 00:35:42.107 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward Event List Simulation

Connections

Serial DCE

Scenario 0

New | Delete

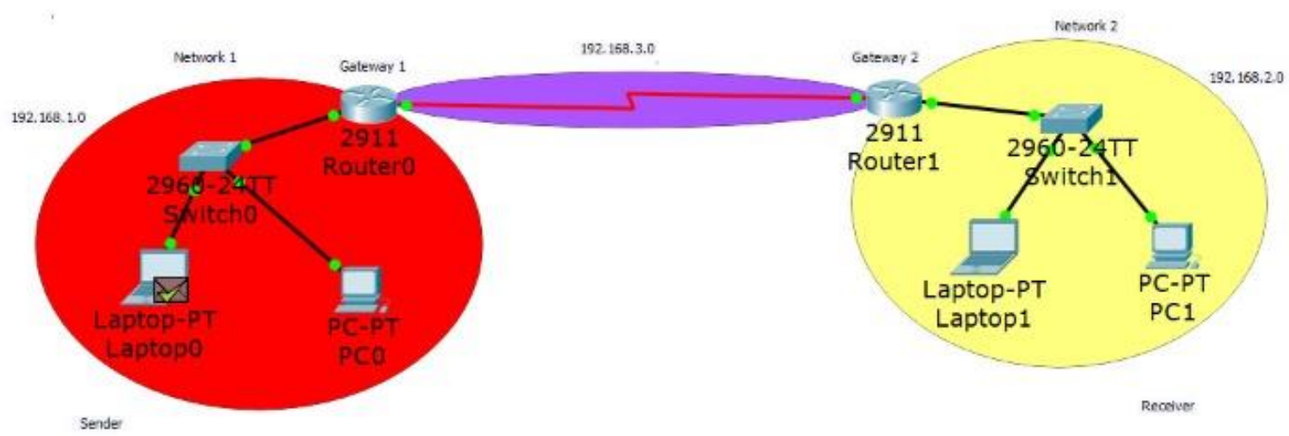
Toggle PDU List Window

Fire	Last Stat	Sour	Destinat	Typ	Col	Time	Perio	Nur	Edit	Delete
	In Prog...	La...	Laptop1	IC...		0.000	N	0	(e...	(delete)

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport



Simulation Panel

Event List

Vis.	Time(sec)	Last D	At De	Type	Info
	0.007	Switc...	Rou...	ICMP	
	0.008	Rout...	Rou...	ICMP	
	0.009	Rout...	Swit...	ICMP	
	0.010	Switc...	Lapt...	ICMP	

Reset Simulation | Constant Delay Captured to: 0.010 s

Play Controls

Back | Auto Capture / Play | Capture / Forward

Event List Filters - Visible Events

ACL Filter, CDP, DHCPv6, DTP, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, RADIUS, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters | Show All/None

Time: 00:35:52.693 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward Event List Simulation

Connections

Serial DCE

Scenario 0

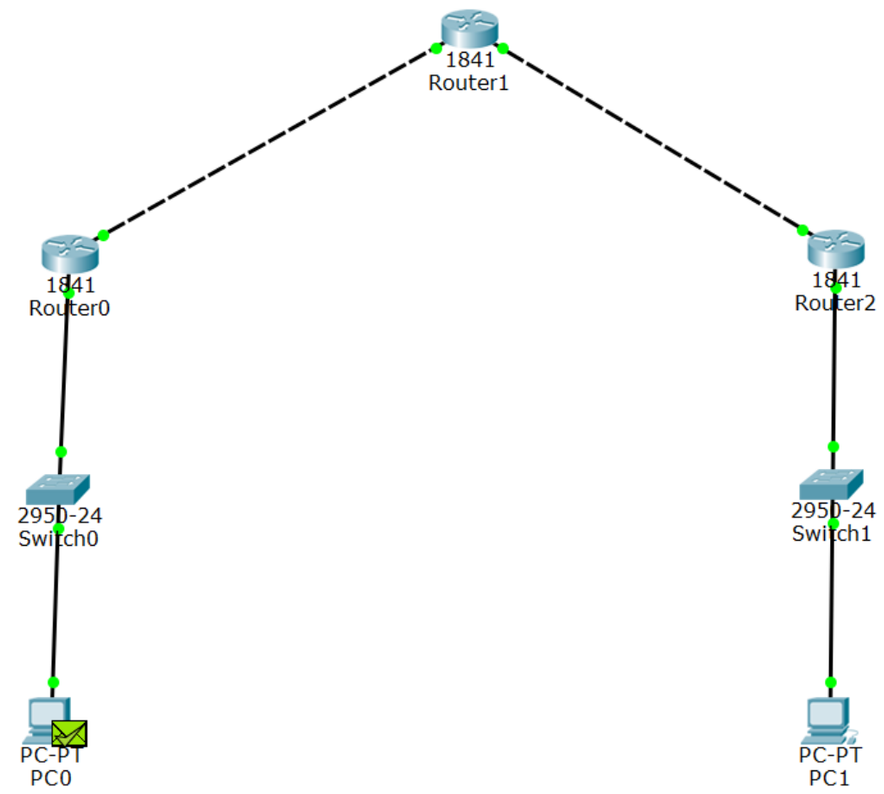
New | Delete

Toggle PDU List Window

Fire	Last Stat	Sour	Destinat	Typ	Col	Time	Perio	Nur	Edit	Delete
	Succes...	La...	Laptop1	IC...		0.000	N	0	(e...	(delete)

File Edit Options View Tools Extensions Help

Logical | [Root] | New Cluster | Move Object | Set Tiled Background | Viewport



Simulation Panel

Event List

Vis.	Time(sec)	Last De	At De	Type	Info
	0.008	Switc...	Rout...	ICMP	
	0.009	Rout...	Rout...	ICMP	
	0.010	Rout...	Rout...	ICMP	
	0.011	Rout...	Swit...	ICMP	
	0.012	Switc...	PC0	ICMP	

Reset Simulation | Constant Delay | Captured to: 0.012 s

Play Controls

Back | Auto Capture / Play | Capture / Forward

Event List Filters - Visible Events

ACL Filter, BGP, CDP, DHCPv6, DTP, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters | Show All/None

Time: 00:01:16.706 | Power Cycle Devices | PLAY CONTROLS: Back | Auto Capture / Play | Capture / Forward | Event List | Simulation

Routers

1841 1941 2620XM 2621XM 2811 2901 2911 819 Generic Generic

Scenario 0

New | Delete | Toggle PDU List Window

Fire	Last Statu	Sourc	Destinatic	Type	Colo	Time(s	Period	Num	Edit	Delete
	Successful	PC0	PC1	IC...		0.000	N	0	(ed...	(delete)