Practical 11:

AIM:

a)Simulate Static Routing Configuration using CISCO Packet Tracer

1. Adding Static Routes

 Each router knows only the networks directly connected to it. If you need

to reach a network not directly connected, you add a static route.

 For example, on Router0, networks 10.0.0.0/8, 20.0.0.0/8, and 40.0.0.0/8

are directly connected, but 30.0.0.0/8 and 50.0.0.0/8 are not. So, you add

routes for 30.0.0.0/8 and 50.0.0.0/8.

2. Creating Main and Backup Routes

 Administrative Distance (AD) decides the preference of routes: the

lower the AD, the higher the preference.

 Example: To configure two routes to the same destination, Router0 could

use:

ip route 30.0.0.0 255.0.0.0 20.0.0.2 10 (main route with AD 10)

ip route 30.0.0.0 255.0.0.0 40.0.0.2 20 (backup route with AD 20)

 This setup makes the route via 20.0.0.2 the main route, and the router will

switch to 40.0.0.2 if 20.0.0.2 becomes unavailable.

3. Router Configurations

 Configure static routes on each router for networks not directly

connected.

 Example configurations:

o Router0: Adds routes for 30.0.0.0/8 and 50.0.0.0/8.

o Router1: Sets up routes for 10.0.0.0/8 and 40.0.0.0/8, using

Router0 as the main path and Router2 as backup.

o Router2: Adds static routes to reach 10.0.0.0/8 and 30.0.0.0/8.

4. Verifying Routes

 Verify routes by using commands:

show ip route static

 This command shows the static routes currently in use by the router. Only

the main routes with the lowest AD values should appear unless they’re

unavailable, in which case the backup route will show.

5. Testing Route Failover

 To see if the router switches to a backup route if the main route fails:

1. Test connectivity using tracert or ping from a device on a

connected network.

2. Disconnect or “break” the link on the main route.

3. Re-run the tests to confirm that the router now uses the backup

route.

6. Deleting a Static Route

 To remove a static route:

1. View the existing routes with:

show ip route static

2. Use the no ip route command with the specific route details to

delete it. If a backup route exists, it will automatically replace the

main route.

Example of deleting a route:

no ip route 30.0.0.100 255.255.255.255 40.0.0.2

Following these steps, you can add, prioritize, verify, test, and delete static

routes in a straightforward manner on each router.

AIM:

b)Simulate RIP using CISCO Packet Tracer

Step-by-Step RIP Configuration Guide

1. Initial IP Configuration for Devices

Device Interface IP Address Connected to

PC0 Fast Ethernet 10.0.0.2/8 Router0’s Fa0/1

Router0 Fa0/1 10.0.0.1/8 PC0’s Fast Ethernet

Router0 S0/0/0 192.168.1.249/30 Router1’s S0/0/0

Router0 S0/0/1 192.168.1.254/30 Router2’s S0/0/1

Router1 S0/0/0 192.168.1.250/30 Router0’s S0/0/0

Router1 S0/0/1 192.168.1.246/30 Router2’s S0/0/0

Router2 S0/0/0 192.168.1.245/30 Router1’s S0/0/1

Router2 S0/0/1 192.168.1.253/30 Router0’s S0/0/1

Router2 Fa0/1 20.0.0.1/8 PC1’s Fast Ethernet

PC1 Fast Ethernet 20.0.0.2/8 Router2’s Fa0/1

2. Assign IP Addresses to Devices

o Configure each device’s IP through Packet Tracer:

 For PCs: Access the PC’s IP Configuration and assign the

IPs as listed above.

 For Routers: Access CLI, enter global configuration mode,

and assign IPs to each interface.

3. Enable and Configure Interfaces on Routers

o Use the following commands to set up each router interface.

Example for Router0:

Router&gt; enable

Router# configure terminal

Router(config)# interface fastEthernet 0/1

Router(config-if)# ip address 10.0.0.1 255.0.0.0

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 0/0/0

Router(config-if)# ip address 192.168.1.249 255.255.255.252

Router(config-if)# clock rate 64000

Router(config-if)# bandwidth 64

Router(config-if)# no shutdown

Repeat similar steps for Router1 and Router2, adjusting IP addresses as per their

configuration.

4. Configuring RIP on Routers

o RIP setup involves:

 Enabling RIP

 Adding directly connected networks to the RIP

advertisement.

Configuration for Router0:

Router(config)# router rip

Router(config-router)# network 10.0.0.0

Router(config-router)# network 192.168.1.248

Router(config-router)# network 192.168.1.252

Configuration for Router1:

Router(config)# router rip

Router(config-router)# network 192.168.1.244

Router(config-router)# network 192.168.1.248

Configuration for Router2:

Router(config)# router rip

Router(config-router)# network 20.0.0.0

Router(config-router)# network 192.168.1.244

Router(config-router)# network 192.168.1.252

5. Verification

o Use the ping command on PC1 to test connectivity to PC0.

o Use the tracert command to trace the path and verify which route is

used by RIP.

6. Testing Redundancy

o Simulate a route failure by disconnecting the cable between

Router0 and Router2 on their serial interfaces.

o Use tracert again to see RIP redirecting traffic through an alternate

route (via Router1).