

Ex. NO : 11

DATE : 21.10.25

## ROUTING AT NETWORK LAYER.

### A) AIM :

Simulate Static Routing configuration using Cisco packet tracer.

### Concept :

- \* Static routing means manually adding routes to a router's routing table.
- \* Used when network paths are simple or fixed.
- \* If two routes exist for the same destination the router uses the route with the lower Administrative Distance (AD) as the main route and the other as a backup route.
- \* If the main route fails the backup route automatically takes over.

### Network Setups :

Router Directly connected Network Other Network  
(Need static Router)

Router 0 10.0.0.0-18, 20.0.0.0-18, 40.0.0.18 30.0.0.0-18, 30.0.0.18

Router 1 20.0.0.0-18, 30.0.0.0-18, 50.0.0.0-18 20.0.0.0-18, 40.0.0.0-18

Router 2 40.0.0.0-18, 50.0.0.0-18 10.0.0.0-18, 20.0.0.0-18

### Router configuration :

Router 0:

Router > enable

Router # configure terminal

Router (config) # ip route 30.0.0.0 255.0.0.0 20.0.0.2.10

Router (config) # ip route 30.0.0.100 255.255.255.255 . . .

Router (config) # ip route 50.0.0.0 255.0.0.0 20.0.0.1

Router # show route static

Router 1 :

Router > enable

Router # configure terminal

Router (config) # ip route 10.0.0.0 255.0.0.0 20.0.0.110

Router (config) # ip route 40.0.0.0 255.0.0.0 20.0.0.40

Router # show ip route static

Router 2 :

Router > enable

Router # configure terminal

Router (config) # ip route 10.0.0.0 255.0.0.0 20.0.0.110

Router (config) # ip route 30.0.0.0 255.0.0.0 20.0.0.2

Router # show ip route static

Verifications :

1. Use show ip route to view static routes.
2. Use ping or tracer to test connectivity between network.
3. To test back up routes, disconnect the main link (e.g. between Router 0 and Router 1) - backup route will automatically activate.

Deleting a static Router :

Router # show ip route static

Router (config) # no ip route 30.0.0.0 255.0.0.0 20.0.0.2

If a backup route exists of below the main router automatically .

RESULT :

static routing was successfully configured and verified using CISCO PACKET TRACER. The routers automatically switched to backup router when the main router failed.

(B) AIM :

Simulate RIP (Routing Information Protocol)  
using CISCO Packet Tracer.

concept :

- \* RIP is a dynamic routing protocol that automatically exchanges routing between routers.
- \* It uses hop count as a metric (maximum 15 hops).
- \* If one router fails, automatically switches to an alternate route.

Network Setup.

Device	Interface	IP Address/Subnet	Connected to
PC0	Fast Ethernet	192.0.0.2/8	Router Fa0/1
Router 0	Fa0/1	10.0.0.1/8	PC0
Router 0	SD1/0/0	192.168.1.249/30	Router 2 SD1/0/1
Router 0	SD1/0/1	192.168.1.254/30	Router 0 Fa0/0/0
Router 1	SD1/0/0	192.168.1.250/30	Router 2 SD1/0/0
Router 1	SD1/0/1	192.168.1.246/30	Router 1 SD1/0/0
Router 1	SD1/0/1	192.168.1.246/30	Router 1 SD1/0/1
Router 2	SD1/0/0	192.168.1.245/30	Router 0 SD1/0/0
Router 2	SD1/0/1	192.168.1.253/30	
Router 2	Fa0/1	20.0.0.1/30	PC1
PC1	Fast Ethernet	20.0.0.2/30	Router Fa0/1

## Router Configuration Steps:

- 1) Assign IP Address

Example for Router 0:

Router > Enable

Router # configure terminal

Router (config) # interface fast ethernet 0/1

Router (config) # ip address 10.0.0.1 255.0.0.0

Router (config-ip) # no shutdown

Repeat similar steps Router 1 and Router 2 using PCs.

- 2) Configure RIP protocol:

Router 0:

Router (config) # router rip

Router (config-router) # network 10.0.0.0

Router (config-router) # network 192.168.1.252

Router (config-router) # network 192.168.1.248

Router 1:

Router (config) # router rip

Router (config-router) # network 192.168.1.244

Router (config-router) # network 192.168.1.248

Router 2:

Router (config) # router rip

Router (config-router) # network 192.168.1.244

Router (config-router) # network 192.168.1.252

Router (config-router) # network 20.0.0.0

## Verification:

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- \* use ping to test connectivity between R0 (10.0.0.2) and R1 (20.0.0.2)
- \* Use traceroute to trace the route taken by packets.
- \* Disconnect the Router0 - Router2 Serial link to simulate failure.  
→ RIP automatically switches to the alternate path via Router 1.

## RESULT:

RIP routing protocol was successfully configured and verified. Routers dynamically exchanged route information and automatically rerouted traffic when the main link failed.

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