# ROUTING PROTOCOLS

### RIP (ROUTING INFORMATION PROTOCOL) :

It is a dynamic routing protocol that uses hop count as its metric to find the shortest path between networks

maximum limit of hop count is 15.

## Practical:

\*Create a network by placing pc’s ,routers and switches

\*Connect all devices using required cables

\*Assign ip addresses for pc’s and routers

#configuration :

PC1 : Go to command prompt ->> ipconfig 128.163.1.2 255.255.0.0 128.163.1.1

PC2 : Go to command prompt ->> ipconfig 192.168.1.2 255.255.255.0 192.168.1.1

# configuration :

R1 :

enable

config t

interface fa0/0

ip address 128.163.1.1 255.255.0.0

no shutdown

interface serial2/0

ip address 10.10.1.2 255.0.0.0

no shutdown

R2 :

enable

config t

interface fa0/0

ip address 192.168.1.1 255.255.255.0

no shutdown

interface serial2/0

ip address 10.10.1.3 255.0.0.0

no shutdown

\*After assigning ip addresses apply routing information protocol(RIP)

R1 :

enable

config t

router rip

network 10.0.0.0

network 128.163.0.0

network 192.168.1.0

\*Repeat the same process with R2

\*Send a packet from pc1 – pc2 to test the network connection

### OSPF (OPEN SHORTEST PATH FIRST) :

It is a dynamic routing protocol that uses the Shortest Path First (SPF) algorithm.

It calculates the most efficient path based on link cost rather than hop count.

## Practical:

\*Create a network by placing pc’s ,routers and switches

\*Connect all devices using required cables

\*Assign ip addresses for pc’s and routers

# configuration :

PC1 : Go to command prompt ->>ipconfig 128.163.1.2 255.255.0.0 128.163.1.1

PC2 : Go to command prompt ->> ipconfig 192.168.1.2 255.255.255.0 192.168.1.1

Routers configuration :

R1 :

enable

config t

interface fa0/0

ip address 128.163.1.1 255.255.0.0

no shutdown

interface serial2/0

ip address 10.0.0.1 255.0.0.0

no shutdown

interface serial3/0

ip address 30.0.0.2 255.0.0.0

no shutdown

R2 :

enable

config t

interface serial2/0

ip address 10.0.0.2 255.0.0.0

no shutdown

interface serial3/0

ip address 20.0.0.1 255.0.0.0

no shutdown

R3 :

enable

config t

interface fa0/0

ip address 192.168.1.1 255.255.255.0

no shutdown

interface serial2/0

ip address 20.0.0.2 255.0.0.0

no shutdown

interface serial3/0

ip address 30.0.0.1 255.0.0.0

no shutdown

\*Now apply open shortest path first in routers(OSPF)

R1 :

en

config t

router ospf 1

network 128.163.1.1 0.0.255.255 area 0

network 10.0.0.0 0.255.255.255 area 0

network 30.0.0.0 0.255.255.255 area 0

R2 :

en

config t

router ospf 1

network 10.0.0.0 0.255.255.255 area 0

network 20.0.0.0 0.255.255.255 area 0

R3 :

en

config t

router ospf 1

network 192.168.1.1 0.0.0.255 area 0

network 30.0.0.0 0.255.255.255 area 0

network 20.0.0.0 0.255.255.255 area 0

\*Here the network command uses wildcard masks

\*Send a packet from pc1 – pc2 to test the network connection

### BGP (BORDER GATEWAY PROTOCOL) :

It is a path-vector routing protocol used to exchange routing information between autonomous systems

It makes routing decisions based on multiple attributes such as path and network rules.

## Practical:

\*Create a network by placing pc’s ,routers and switches

\*Connect all devices using required cables

\*Assign ip addresses for pc’s and routers

# configuration :

PC1 : Go to command prompt ->> ipconfig 128.163.1.3 255.255.0.0 128.163.1.1

PC2 : Go to command prompt ->> ipconfig 192.168.1.3 255.255.255.0 192.168.1.1

#Routers configuration :

R1 :

enable

config t

interface fa0/0

ip address 128.163.1.1 255.255.0.0

no shutdown

interface serial2/0

ip address 10.0.0.1 255.0.0.0

no shutdown

R2 :

enable

config t

interface fa0/0

ip address 192.168.1.1 255.255.255.0

no shutdown

interface serial2/0

ip address 10.0.0.2 255.0.0.0

no shutdown

\*Now apply border gateway protocol in routers(BGP)

R1:

en

config t

router bgp 100

network 128.163.1.1

network 10.0.0.0

neighbor 10.0.0.2 remote-as 200

neighbor 192.168.1.2 remote-as 200

R2:

en

config t

router bgp 200

network 192.168.1.1

network 10.0.0.0

neighbor 10.0.0.1 remote-as 100

neighbor 128.163.1.2 remote-as 100

\*Send a packet from pc1 – pc2 to test the network connection

### EIGRP (ENHANCED INTERIOR GATEWAY ROUTING PROTOCOL) :

It is a that uses the diffusing update algorithm to determine the best path to a network based on a combination of metrics like bandwidth and delay.

It is also called as hybrid protocol because it has both features distance vector and link state protocols.

## Practical:

\*Create a network by placing pc’s ,routers and switches

\*Connect all devices using required cables

\*Assign ip addresses for pc’s and routers

# configuration :

PC1 : Go to command prompt -> >ipconfig 192.168.2.6 255.255.255.0 192.168.2.1

PC2 : Go to command prompt -> >ipconfig 192.168.3.6 255.255.255.0 192.168.3.1

PC3 : Go to command prompt -> > ipconfig 192.168.4.6 255.255.255.0 192.168.4.1

Routers configuration :

R1 :

en

config t

interface f0/0 192.168.2.1 255.255.255.0

no shutdown

interface serial2/0 10.0.0.1 255.0.0.0

no shutdown

R2 :

en

config t

interface f0/0 192.168.3.1 255.255.255.0

no shutdown

interface serial2/0 10.0.0.2 255.0.0.0

no shutdown

interface serial3/0 30.0.0.1 255.0.0.0

no shutdown

R3 :

en

config t

interface f0/0 192.168.4.1 255.255.255.0

no shutdown

interface serial2/0 30.0.0.2 255.0.0.0

no shutdown

\*Now apply enhanced interior gateway protocol for routers(EIGRP)

R1 :

en

config t

router eigrp 100

network 192.168.2.0 0.0.0.255

network 10.0.0.0 0.255.255.255

no auto-summary

R2 :

en

config t

router eigrp 100

network 192.168.3.0 0.0.0.255

network 10.0.0.0 0.255.255.255

network 30.0.0.0 0.255.255.255

no auto-summary

R3 :

en

config t

router eigrp 100

network 192.168.4.0 0.0.0.255

network 30.0.0.0 0.255.255.255

no auto-summary

\*Send a packet from pc1 – pc2 to test the network connection

## IS-IS (Intermediate System to Intermediate System):

It is a link state protocol used to move data efficiently within a large network.

IS-IS is a dynamic routing protocol that uses the Shortest Path First algorithm to determine the best path based on link cost, designed primarily for use in large ISPs

\* Packet Tracer does not support IS-IS at all.

\* if you type router isis the command may not exist or will not behave fully.

## **IGRP (Interior Gateway Routing Protocol):**

It is an old dynamic proprietary distance vector routing protocol that was used to exchange the routing information

\* Typing router igrp in Packet Tracer will show an error or do nothing.