

Assignment B3

Title : Configure Routing Protocol

Problem Statement: Configure RIP/OSPF/BGP using Packet Tracer

Objective : To configure protocols like RIP using Packet Tracer

Outcome: We will be able to configure protocols like RIP using Packet Tracer.

Obj. S/W & H/W Requirements:

- 1) Protocols: RIP, OSPF, BGP
- 2) Packet Tracer

Theory:

Routing Protocol: Routing protocols maintain routing tables where table contains a route to every destination network.

Dynamic Routing Protocols:

There are 3 types of it

- 1) Routing Information Protocol (RIP)
- 2) Open shortest path first (OSPF)
- 3) Border Gateway Protocol (BGP)

RIP & OSPF are interior gateway protocols (IGPs) they are designed to operate in a single autonomous system (AS). An AS is a group of networks administered by the same authority. BGP is an

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Exterior Gateway Protocol (EGP), which allows routes in different autonomous systems in exchange routes. Because BGP routers must regulate & traffic between networks controlled by organizations with different policies.

→ How Routing Protocols work?

A router constructs its routing table using the information it receives from other routers. The router changes its routing table in response to routing updates that provide additional information or notification that conditions in the network have changed. This responsiveness explains why using a protocol is often called dynamic routing.

→ How routers compute a route's metric & select the best route for their routing table?

Routing protocols can have a relatively complicated system for calculating a route's metric. So that you can select the best routing protocol for your network environment. If necessary, you can change which routes are chosen by alternating the default metrics that a protocol assigns certain routes.

→ What information routers include in routing updates:

With some routing protocols routers exchange their entire routing tables with other routing protocols. Routers exchange only portions of the routing tables.

When routers send & receive updates

To lower overhead & conserve bandwidth, you can alter how often routers send certain messages.

Routing Information Protocol:

RIP is one of the oldest dynamic routing protocols on the Internet that is still in use. RIP is an intra-domain routing protocol that uses a distance vector approach to determine the paths between routers. RIP minimizes the number of hops on each path, where each point-to-point link or LAN contributes a hop. Each RIP-enabled router periodically sends the content of its routing table to all its neighbouring routers in an update message. For each routing table entry, the router sends the destination and the distance to the destination measured in hops. When a router receives an update message ~~measured in hops~~ from a neighbouring router, it updates its own routing table.

→ Steps to configure RIP on router using Packet Tracer

1. Build the network topology
2. Configure IP addresses on PC & routers.

a) For PC

- Select the PC
- Config → FastEthernet
- Specify the IP address e.g. 192.168.5.1 or 192.168.5.1
- Subnet mask appears automatically
- Make sure port status is on.

b) For router

- Select the router
- Config → FastEthernet
- enter network IP address e.g. 192.168.5.254 or 192.168.5.254

- Config → serial and enter different network IP address.
- make sure port status is on.

3. Ping to check if packets are sent to other networks
router

4. To configure RIP on both routers

- select the router
- config → RIP
- Add respective networks into RIP routing.

5. Ping to check if packets are transferred.

Conclusion: Thus, we successfully understood the protocols and implemented RIP using Cisco Packet Tracer.