ASSIGNMENT

ON

ITDC

Submitted By:

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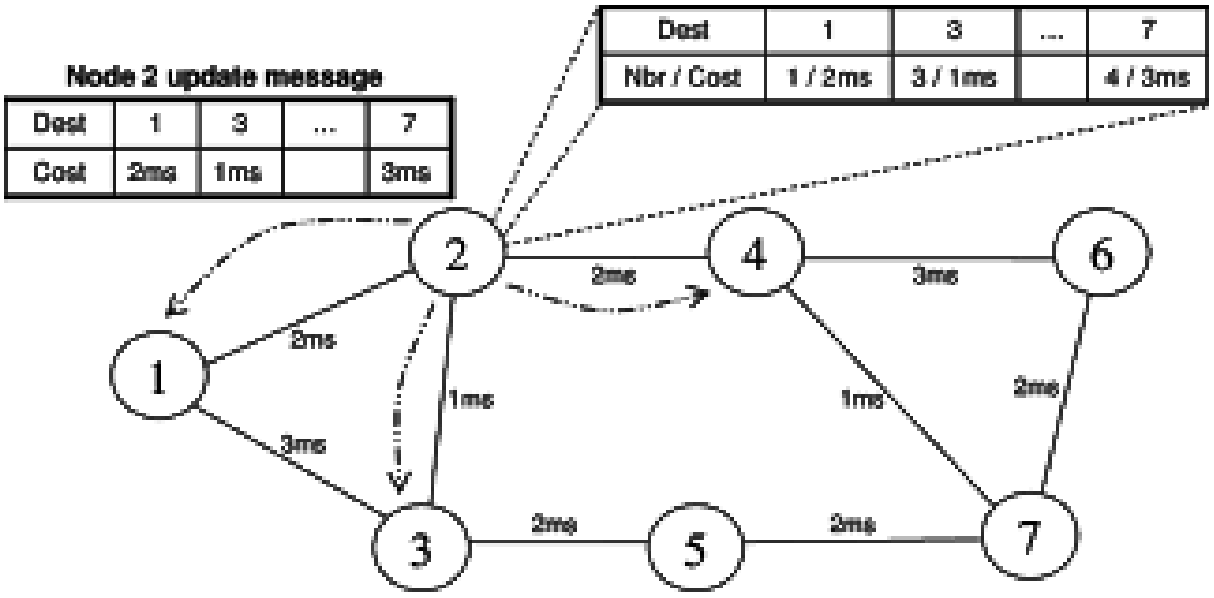
1. What is RIP ? Explain RIP with a neat diagram.
    1.1. What are the 4 times in RIP.
    1.2. RIP cant have more than 15 hops, Demonstrate.

Routing Information Protocol (RIP)

Routing Information Protocol (RIP) is a commonly used routing protocol in small to medium TCP/IP networks. It is a stable protocol that uses a distance-vector algorithm to calculate routes.

A router running RIP sends the contents of its routing table to each of its adjacent routers every 30 seconds. When a route is removed from the routing table, it is flagged as unusable by the receiving routers after 180 seconds, and removed from their tables after an additional 120 seconds.



An example of the working of RIP. The figure shows the routing table maintained in node 2, and one of the update messages that are periodically sent out by this node. The trajectories of the update messages are given in dashed lines. The cost of each link is given in milliseconds.

1.1. RIP has four timers update, invalid, hold down and flush timer,

update timer - after that broadcast sent 30 sec

invalid timer - after expire route declare as a invalid 180 sec

hold down - what does happen after hold down timer expire 180 sec

Flush timer - after expire route entry deleted from routing table 240 sec

1.2. Hop count is the number of routers occurring in between the source and destination network. The path with the lowest hop count is considered as the best route to reach a network and therefore placed in the routing table. RIP prevents routing loops by limiting the number of hopes allowed in a path from source and destination. The maximum hop count allowed for RIP is 15 and hop count of 16 is considered as network unreachable.

2. What is link state routing? Explain OSPF ? What are the advantages and disadvantages?

Link-state routing protocols are one of the two main classes of routing protocols used in packet switching networks for computer communications, the other being distance-vector routing protocols. Examples of link-state routing protocols include Open Shortest Path First (OSPF) and Intermediate System to Intermediate System.

The OSPF protocol is a link-state routing protocol, which means that the routers exchange topology information with their nearest neighbors. The topology information is flooded throughout the AS, so that every router within the AS has a complete picture of the topology of the AS. This picture is then used to calculate end-to-end paths through the AS, normally using a variant of the Dijkstra algorithm. Therefore, in a link-state routing protocol, the next hop address to which data is forwarded is determined by choosing the best end-to-end path to the eventual destination.

Advantages

- Fast Network Convergence
- Topological Map
- Hierarchical Design
- Event-driven Updates

Disadvantages

- Memory Requirements
- Processing Requirements
- Bandwidth Requirements

3. Explain OSPF, Types of OSPF links and Types of OSPF packets.

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OSPF - types of links

- Point-to-point link: The point-to-point link directly connects the two routers without any host or router in between.
- Transient link: When several routers are attached in a network, they are known as a transient link.
  The transient link has two different implementations:
  Unrealistic topology: When all the routers are connected to each other, it is known as an unrealistic topology.
  Realistic topology: When some designated router exists in a network then it is known as a realistic topology. Here designated router is a router to which all the routers are connected. All the packets sent by the routers will be passed through the designated router.
- Stub link: It is a network that is connected to the single router. Data enters to the network through the single router and leaves the network through the same router.
- Virtual link: If the link between the two routers is broken, the administration creates the virtual path between the routers, and that path could be a long one also.

Types of OSPF Packets

- Hello: neighbor discovery, build neighbor adjacencies and maintain them.
- DBD(Database Description): This packet is used to check if the LSDB between 2 routers is the same. The DBD is a summary of the LSDB.
- LSR(Link-state Request): Requests specific link-state records from an OSPF neighbor.
- LSU(Link State Update): Sends specific link-state records that were requested. This packet is like an envelope with multiple LSAs in it.
- LSAck(Link State acknowledgment): OSPF is a reliable protocol so we have a packet to acknowledge the others.