Routing Protocols- 10.02.2006

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Distance Vector and Routing

- Distance Vector Routing : requires that each node exchange information with its neighbouring nodes.Two nodes are said to be nebouring if they are both directly connected to the same network.
- 1)Each node keeps track of its least cost path from all nodes in the network.(the distance vector) 2)The entire information is periodically sent to all neighbors,whether or not the information has changed since the last send.
- 3)If no information received from a neighbor within a time,that link is assumed to be down. 4)Local information updated based on information received on the neighbor - If at node x, d(x,y) ¿ d(x,z)+d(z,y); where z is a neighbor of x,then update d(x,y) 5)Basically it is an implementation of Bellman-Ford shortest path algorithm

Issues to be handled:

- 1)Slow convergance - If a network becomes inaccessible,it may take a long time for all other routing tables to know this.
  2)Too much overheads - updates sent even if no change in routing table.
  3)Routing loops may take a long time to be detected.
  Counting to Infinity Problem : The condition continously loops packets around the network,despite the fundamental fact that the destination network is down.While routers are counting to infinity,the invalied information allows a routing loop to exist.
- Link State Protocols:
  - 1)Each node sends information about its neighbors(who and cost) to all nodes in the network.
    2)This information sent to all nodes by flooding.
    3)This information is sent only when a change occurs.
    4)Finally each node has complete information about the network - applies some least cost route to all other nodes.
- Optimizations to the Algorithm
  - The algorithm described above was made as simple as possible, to aid in ease of understanding. In practise, there are a number of optimizations which are used.

– Most importantly, whenever a change in the connectivity map happens, it is necessary to recompute the shortest-path tree, and then recreate the routing table. The BBN work discovered how to recompute only that part of the tree which could have been affected by a given change in the map.
– Also, the routing table would normally be filled in as the shortest-path tree is computed, instead of making it a separate operation.