Classifications of Routing Protocols: ...Cntd

❖ ***Proactive routing protocols:***

✓ These are table-driven protocols. These are extensions of the wired network routing protocols. They maintain the global topology information in the form of tables at every node.

✓ These tables are updated frequently in order to maintain consistent and accurate network state information.

We consider:

❖ Destination Sequenced Distance Vector Routing Protocol (DSDV);

❖ Wireless Routing Protocol (WRP);

❖ Cluster Head Gateway Switch Routing Protocol (CGSR).

❖ Source-Tree Adaptive Routing Protocol (STAR);

Common Positives:

✓ Low delay of route setup process: all routes are immediately available;

Common Negatives:

✓ High bandwidth requirements: updates due to link loss leads to high control overhead;

✓ Low scalability: control overhead is proportional to the number of nodes;

✓ High storage requirements: whole table must be in memory.

Classifications of Routing Protocols: ...Cntd

❖ ***Proactive routing protocols:***

➢ **Destination Sequenced Distance Vector Routing Protocol (DSDV):**

✓ Modification of the Bellman-Ford algorithm where each node maintains:
- the shortest path to destination;
- the first node on this shortest path.

✓ This protocol is characterized by the following:
- Routes to destination are readily available at each node in the Routing Table (RT).
- RTs are exchanged between neighbors at regular intervals.
- RTs are also exchanged when significant changes in local topology are observed by a node.

➢ **Wireless Routing Protocol (WRP):**

✓ Similar to DSDV, but it uses multiple tables for routing processes.

✓ Differs from table maintenance and in the update procedure.

– Uses a set of tables to maintain more accurate information instead of single topology information

– Not only updates distance for transmitted neighbor but also checks the other neighbors' distance.

• ***Distance Table:*** Contains distance and predecessor(penultimate node) node for a destination

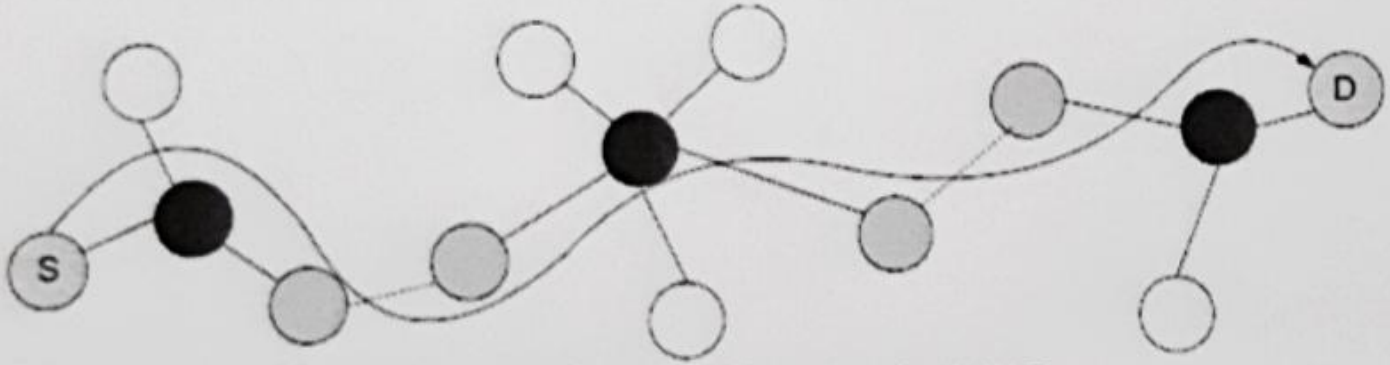
• ***Routing Table:*** Contains shortest distance, predecessor node, successor node(next node to reach destination), and status of the path

• ***Link Cost Table:*** Cost of relaying messages through each link and number of update periods passed since the last successful update was received (for detecting link breaks)

• ***Message Retransmission Table:*** Update message that is to be retransmitted with a counter. The counter is decremented after every update message retransmission.

- **Cluster head Gateway Switch Routing protocol:**

- It is characterized by the following:
  - ✓ Nodes are organized into clusters, each having an elected cluster-head;
  - ✓ Cluster head provides a coordination within its transmission range (single hop);
  - ✓ Token-based scheduling is used within a cluster for sharing bandwidth between nodes;
  - ✓ All communications pass through the cluster head;
  - ✓ Communication between cluster is done using the common nodes (gateways with two interfaces).



Abstract representation of routing in GGSR

- **Source-Tree Adaptive Routing protocol (STAR):**

✓ There are two protocols with different aims:

- Least Overhead Routing Approach (LORA): Minimize control overhead irrespective of optimality.
- Optimum Routing Approach (ORA): Provide optimal routes irrespective of the control overhead.

✓ The STAR protocol operates as follows:

- Each node is required to:
  - Send an update message to its neighbors during initialization;
  - Send update messages about new destinations, chances of routing loops, costs of paths.
- Every node broadcasts its source-tree information:
  - Wireless links used by the node in its preferred path to destinations.
- Every node builds its partial graph of topology based on:
  - Its adjacent links with neighbors, source-tree broadcasts by neighbors.