FACULTY OF ENGINEERING & TECHNOLOGY

Brajesh Mishra
Assistant Professor
Department of Computer Science & Engineering

Topics Covered

Dynamic Source Routing (DSR)
Temporally Ordered Routing Algorithm (TORA)
Hybrid Protocol - Zone Routing Protocols
Zone routing protocol (ZRP)

Dynamic Source Routing (DSR)

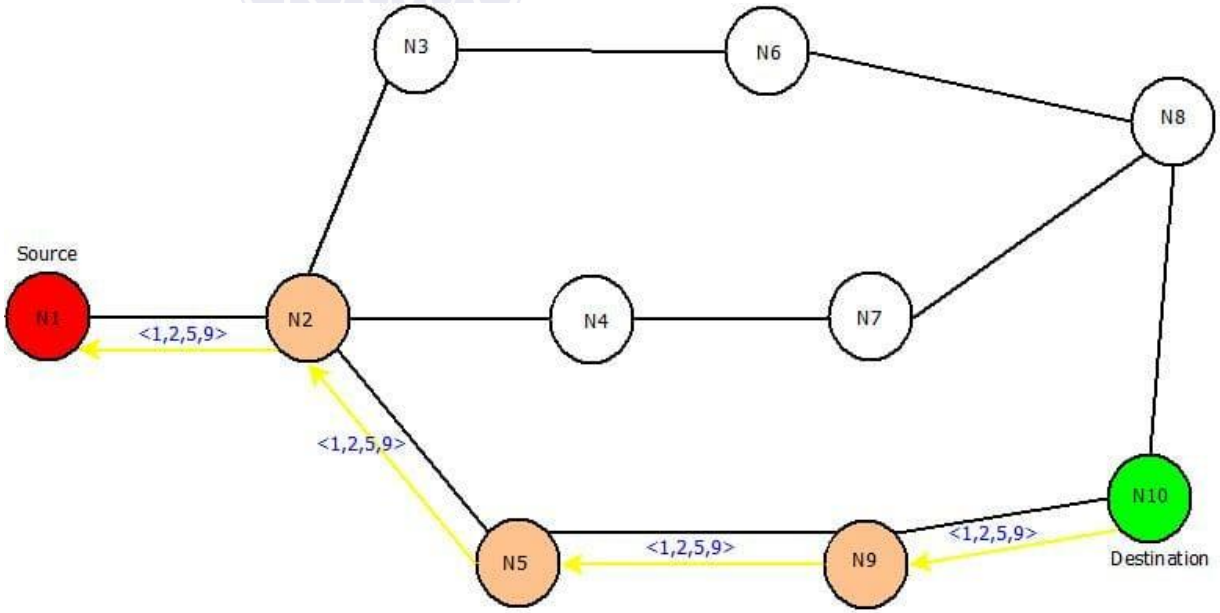
Dynamic source routing is an on-demand routing protocol which is based on source routing.
It is very similar to AODV in that it forms a route on demand when a transmitting computer requests one. But, it uses source routing instead of relying on the routing table at each intermediate device. Many successive refinements have been made to dynamic source routing.
This protocol works in two main phases:

- Route discovery
- Route maintenance

When a node has a message to send, it contacts to the route cache to determine whether is it has a route to the destination. If an active route to the destination exists, it is used to send a message.
Otherwise a node initiates a route discovery by broadcasting a route request packet. The route request stores the destination address, the source address, and a unique identification number.

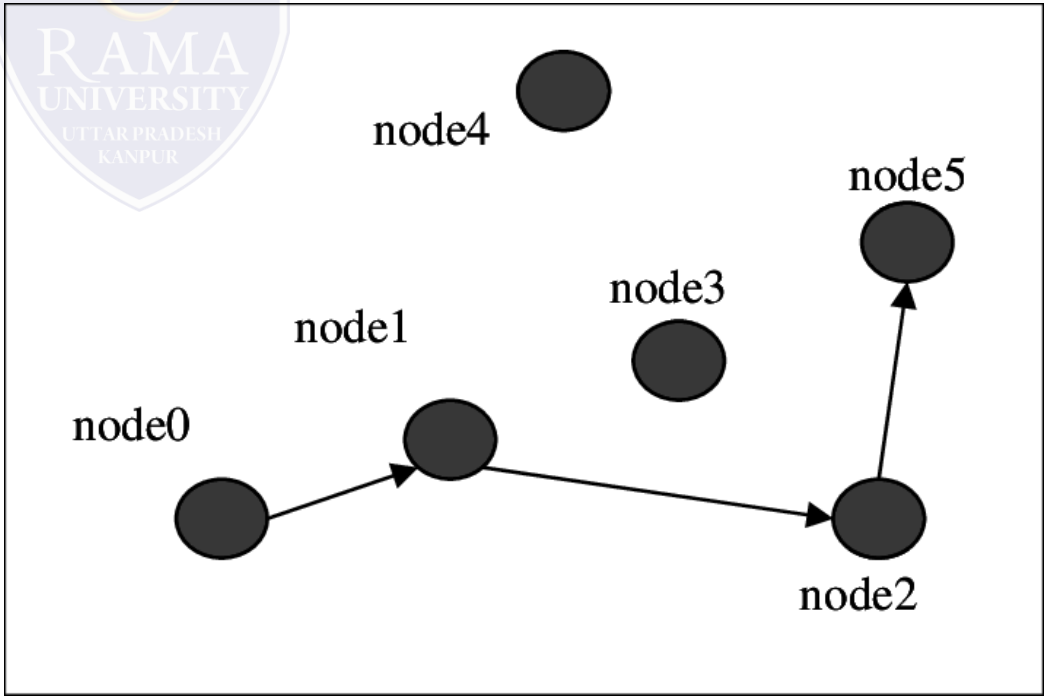
Dynamic Source Routing (DSR)

Each device that receives the route request checks whether it has a route to the destination. If it does not, it adds its own address to the route record of the packet and then rebroadcasts the packet on its outgoing links.
To minimize the no. of broadcasts, a mobile rebroadcasts a packet only if it has not seen the packet before and its own address was not already in the route record.



Temporally Ordered Routing Algorithm (TORA)

TORA (Temporally Ordered Routing Algorithm) is a source initiated on demand routing protocol.
It was invented by **Vincent Park and M. Scott Corson** from university of Maryland in 1997 for wireless ad hoc network.
TORA is a highly adaptive, efficient, loop-free and scalable routing protocol based on link reversal algorithm.



Temporally Ordered Routing Algorithm (TORA)

The main objective of TORA is to limit message propagation in the highly dynamic mobile computing environment. It means, it is designed to reduce communication overhead by adapting local topological changes in ad hoc network. Another main feature of TORA routing protocol is the localization of control packets to a small region (set of nodes) near the occurrence of a topological changes due to route break. Hence, each node of the network required to contain its local routing and topology information about adjacent nodes.

TORA supports multiple routes to transmit data packet between source and destination nodes of mobile ad hoc network. In short, TORA exhibits multipath routing capability.

Hybrid Protocol - Zone Routing Protocols

Hybrid protocols attempt to take advantage of best of reactive and proactive schemes. The basic idea behind such protocols is to initiate route discovery on demand but at a limited search cost. One of the popular hybrid protocols is zone routing protocol (ZRP).

Zone routing protocol (ZRP)

Zone routing protocol (ZRP)

Zone routing protocol is a hybrid of reactive and proactive protocols. It combines the advantage of both reactive and proactive schemes.
ZRP was invented by Zygmunt Haas of Cornell University. Zone routing protocol finds loop free routes to the destination.
ZRP divides the network into zones of variable size; size of the zone is determined radius of length ?, where the ? is the number of hops or nodes to the perimeter of the zone and not the physical distance.
In other words we can say that, the neighborhood of the local node is called a routing zone.
Specifically, a routing zone of the node is defined as the set of nodes whose minimum distance in hops from the node is no greater than the zone radius.
A node maintains routes to all the destinations proactively in the routing zone. It also maintains its zone radius, and the overlap from the neighboring routing zones.
To create a routing zone, the node must identify all its neighbors first which are one hop away and can be reached directly.
The Process of neighbor discovery is governed by the NDP (Neighbor Discovery Protocol), a MAC level scheme. ZRP maintains the routing zones through a proactive component called the intra-zone routing protocol (IARP) and is implemented as a modified distance vector scheme. Thus IARP is responsible for maintaining routes within the routing zone.