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Routing Protocols for MANET

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Abtract-A mobile ad hoc network (**MANET**) is a continuously self-configuring, infrastructure-less network of mobile devices which is connected wirelessly. Each device in a **MANET** is free to move independently in any direction, and will therefore change its links to other devices frequently. Routing in MANET is demanding task. To overcome this problem routing classes has been introduced for MANET. Various routing classes such as proactive, reactive and hybrid classes are used. In this paper, i present a summary of the existing routing classes with a particular focus on their uniqueness and their functionality.

Key words: MANET, routing classe
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I. INTRODUCTION

A Mobile Ad-Hoc Network is a collection of independent mobile nodes that can communicate to each other via radio waves. MANET is self-arrange and infrastructure less network. MANET provides a routable process for exchange of packets from one node to another, because of there is wireless networking environment. Mobile Ad-Hoc Network finds the routes and maintains the routes with the help of routers. Mobile Ad-Hoc networks are extremely dynamic networks characterized by the nonappearance of physical infrastructure. The functionality of Mobile Ad-Hoc Network finds the routes and maintains the routes with the help of routers. in such networks, nodes are capable of moving and coordinating with their neighbors. Routing in MANETs is a one of the dynamically and demanding task and has received a great amount of awareness from researchers around the globe. To overcome this problem, a various number of routing classes have been introduced and the number is still rising day by day fastly. In this paper, i present a summary of a existing routing classes with a particular focus on their uniqueness and their functionality.
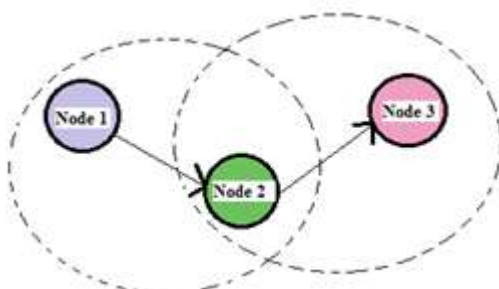
II. SUMMARY

Rest of the paper is organized as follows. Section III consists of information about routing mechanism of protocols used in MANET. Section IV presents classification of routing protocols in MANET. Section V compares the protocols whereas section VI concludes the paper.

III. ROUTING PROTOCOLS FOR MANET

Routing is an action to move the information from source point to destination point within the network. Routing basically divided into

two types: static routing and dynamic routing. Static routing refers to the routing policybeing manual. In static routing maintains a routing table by the administrator. Dynamic routing mainly depends upon the state. Mobile ad hoc network present the dynamic routing.These protocols can be divided into three classes: proactive class, reactive class and hybrid class.

IV. CLASSIFICATION OF ROUTING PROTOCOLS

Figure 1 Mobile ad hoc network

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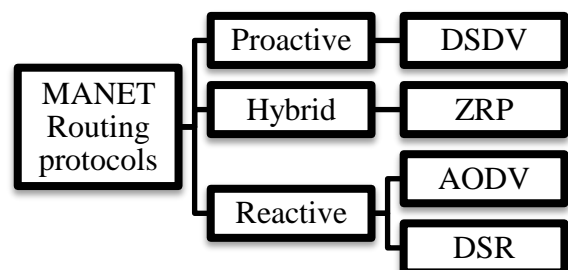
A.   PROACTIVE ROUTING PROTOCOL

With table-driven routing protocols, each node attempts to maintain consistent up to date routing information to every other node in the network. This is done in response to changes in the network by having each node update its routing table and propagate the updates to its neighboring nodes. Thus, it is proactive in the sense that when a packet needs to be forwarded the route is already known and can be immediately used. As is the case for wired networks, the routing table is constructed using either link-state or distance vector algorithms containing a list of all the destinations, the next hop, and the number of hops to each destination.

Ex. Destination sequenced distance vector (DSDV).

a.   DESTINATION SEQUENCED DISTANCE VECTOR (DSDV)

DSDV is Proactive routing class and this protocol is planned by Perkins and Bhagwat. The Destination-Sequenced Distance-Vector (DSDV) is routing class. The distance vector routing class is less robust as comparatively link state routing class. In this, each system maintains a routing related table containing entries for all the policy in the network. In organize to keep the routing table entirely reorganized at all the time each device occasionally broadcasts different routing communication to its neighbor devices. When a neighbor device receives the broadcasted different routing message from the sender and knows the existing relation cost to the device, it compares this value and the related value stored in its routing table.

Figure 2 route discovery of DSDV

B.   REACTIVE ROUTING PROTOCOL

With on-demand driven routing, routes are discovered only when a source node desires them.They do not maintain routing information or routing activity at the network nodes if there is no communication. In contrast to table-driven routing protocols, not all up-to-date routes are maintained at every node.

Ex. Ad-hoc On-demand Distance Vector routing (AODV) and Dynamic Source Routing (DSR).

a.   Ad-hoc On-demand Distance Vector routing (AODV)

AODV is important routing class in Reactive protocol and it builds routes via a route request/ route reply query sequence. When a source node wants a route to a target for which it does not already have a path, it transmits a route request (RREQ) packet to the network. Nodes getting this packet bring up to date their information for the source node and set up backward pointers to the initial node in the route tables A node getting the RREQ may launch a route reply (RREP) if it is either the target or if it has a route to the destination with the equivalent series number greater than or equal to that restricted in the RREQ. If this is the case, it unicasts an RREP back to the source node, otherwise, it retransmits the RREQ. Nodes keep the path of the RREQ's source node IP address and transmit ID of a better route. If they get an RREQ which they have already progressed, they reject the RREQ.
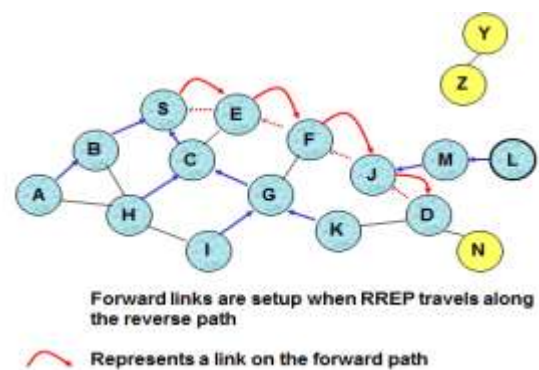

Forward links are setup when RREP travels along the reverse path

Represents a link on the forward path

Figure 3 route discovery of AODV

b.   Dynamic Source Routing (DSR)

DSR is one of the purest examples of an on-demand routing protocol that is based on the concept of source routing. It is designed especially for use in multihop ad hoc networks of mobile nodes. It allows the network to be completely self-organizing and self-configuring and does not need any existing network infrastructure or administration. DSR is composed of the two mechanisms of Route Discovery and Route Maintenance, which work together to allow nodes to discover and maintain source routes to arbitrary destinations in the network. DSR has a unique advantage by virtue of source routing. As the route is part of the packet itself, routing loops, either short – lived or long – lived, cannot be formed as they can be immediately detected and eliminated. If the destination alone can respond to route requests and the source node is always the initiator of the route request, the initial route may the shortest.
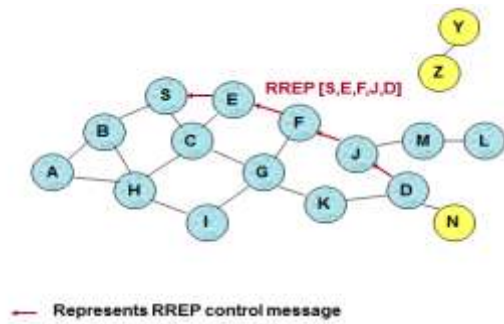
Represents RREP control message

Figure 4 route discovery of DSR

C. HYBRID ROUTING PROTOCOL

A hybrid model that combines reactive and proactive routing protocols.

Ex. Zone Routing Protocol (ZRP)

V. COMPARISON OF ROUTING PROTOCOL

Parameter	DSDV	AODV	DSR
Routing structure	Flat	Flat	Flat
Routing overhead	high	high	high
Caching overhead	Medium	Low	high
Throughput	Low	High	Low
Loop Free	Yes	Yes	Yes

VI. CONCLUSION

Some important characteristics of the three routing strategies such as Reactive, proactive and Hybrid protocols have been covered.Working of routing of protocols such as DSDV, DSR, ADOV has been done.A single routing protocol can't perform best in all situations. So, the choice of routing protocol should be done carefully according to the requirements of the specific application.

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