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Research paper

An overview of various ad hoc routing protocols in MANET

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Abstract

Mobile ad hoc network is a wireless network which has peer to peer process .it is established to achieve a group of network to be connected in wireless network. It is a large network that transfers the data from source to destination .Here we are computing the routing protocols like (DSDV, AODV, OLSR, DSR, TORA, and ZRP) which is analyzed in the form of packet delivery ratio, throughput, end to end delay, Routing overhead. There are three types of ADHOC network routing protocol 1) table driven proactive protocol acts as background traffic generally, in ADHOC network the location of one node is send to other node through location this nodes transfer the data from one to other its done by DSDV and WRP. 2) on demand driven reactive it establish route between nodes when they are required to route packet data it is done by DSR and AODV. 3) hybrid protocol each node has its own zone radius.

Keywords: *MANET, DSDV, AODV, OLSR, DSR, TORA, and ZRP.*

1. Introduction

MANETS - mobile AD-HOC network means where a group of nodes are connected to each other and they transfer files in air mobility which generally means change of location they are dynamic. Generally when a data from one node to other node is transmitted where both nodes are connected to a general access point even they are closer to each other. Here in MANET(Fig 1:) system the network are not connected to a central network , a node which needs to transfer data itself create an AD-HOC network and the destination node get connected and transfer data(direct transfer of data.)

Fig. 1: Mobile ad hoc networks

2. Classification of routing protocol in MANET

Routing is a mechanism which connects origin and destination through telecommunication network. It is one if the major aspect in design, architecture and operations of networks. Routing is nothing but transferring the information from one node to another. Routing first shares the information with the neighbour before sharing it through the network. Ad hoc networks are communication through multi hop links since they it is wireless networks. They don't have any stationary infrastructure and base station for communication with the nodes. Degree of node mobility is the main reason for the frequent change in the network.

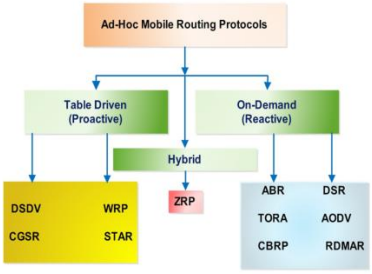

Fig. 2: Routing protocols

Proactive protocol

Protocols which maintains the routing information constantly is called as proactive protocols. Every network node shares the routing information with each another. The table in the routing maintains the routes information and it changes accordingly with the changes of topology. Link state routing produce these kind of routing protocols , there is difference among the protocols which comes under the category of routing information more over the tables are maintained by routing protocol. The proactive protocol will not work properly in large network because the routing table needs node entries for every node.
It leads to the increase in the bandwidth which has effect in overhead.

DSDV

DSDV is nothing but improved version of disturbed Bellman Ford algorithm in which in each node maintains the shortest path in a table. While receiving an update the node will forward it to its neighbour in order to communicate with broken link information to network. Therefore a one link break will load to broadcast the

table updated information to network, Which could be used in MANETS with some changes. Then these update will be spread to the network for maintaining an up to date view of the network topology.
The DSDV is subjected to increase the control overhead which is comparable to the total no of nodes in the network . It is not stable since it has limited bandwidth whose topologies can causes changes.

OLSR

Optimized link state routing is called as proactive link state routing protocol. OLSR uses topology control which will discover messages and then it spreads the link state information to the whole mobile ad hoc network. Individual nodes will use this kind of study information for every node in the network. Link state routing needs database information which is to be synchronized with the network.

Reactive or an demand protocols

AODV is a simple routing protocol for mobile ad hoc network where there is no fixed topology. It sends the node on request when a node preformed to send traffic to a host where is no route, a route request will be generated and the messages that will be drown in a limited form to every other nodes, Therefore this will cause traffic overhead and initial delay. A route is established when the destination receives the Reply Request message in an intermediate node with a valid route entry as long as a route is being found in the two end points, It will remain passive.

DSR

DSR which act as routing protocol in wireless mesh network and it similar in characteristics of AODV. The transmit node will request the AODV to form a route and moreover it will source routing. However, searching a route results in high bandwidth and energy. Finding a route will depend upon the maintenance and route discovery

AODV

Ad hoc on demand distance vector is abbreviated as AODV which is a reactive protocol, it requires a connection request and broadcast when a message reaches by the node even when it already has a route it will send a acknowledgement via temporary route. It has less number of nodes and also it has route request and reply messages.

Hybrid protocols

A hybrid protocol is proactive reactive routing protocol. It works upon the number of nodes which is activated and the request depends upon the gradient of traffic volumes.

TORA

TORA is nothing but temporally ordered routing algorithm .TORA is a process of creating route . This algorithm also acquires the route erasure and route connection. TORA will conserve the bandwidth when the route is no longer valid the node will be maintained in the network.

ZRP

Zone routing protocol is abbreviated as ZRP which is a hybrid wireless networking protocol while transferring the information to the network the reactive and proactive protocols will be used .It improves the speed and also decreases the processing overhead.

Performance analysis of MANET

It analysis different kinds of routing protocol based on performance metric

End to end delay

It is nothing but time taken for the packet to travel form source to destination in a network'

Packet delivery ratio

Packet delivery ratio is the time taken to analysis the total number of packet reaches the destination from the source

Throughput

Throughput is the process of transferring the packet from source to destination

routing overhead

It is determined by the number of routing packet.

3. Performance analysis of different routing protocols

Protocol	End to End delivery	Packet delivery ratio	Throughput	Routing Overhead
DSDV	high	Average	High	Very high
OLSR	Low	Average	Low	Increases with an increases in nodes
DSR	High	Low	Average	Increases with an increases in nodes
AODV	Average	Average	Average	low
TORA	High	Low	Average	Average
ZRP	High	Low	Average	Low

4. Conclusion

In this paper the analysis of various ad hoc routing protocol with their performance like (DSDV,OLSR,DSR,AODV,TORA, ZRP). In dsdv routing protocol it has excess overhead in the network and has limited bandwidth where as in aodv it leads to bandwidth consumption and inconsistent routes.zrp controls the overhead by establishing the features of proactive and reactive protocol but leads to increase the overhead in the form of query control. In olsr increases the message the overhead will also increases the processing power. Hence high mobility of the users in the network node increases the Improvement of routing overhead.

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