

# A Review about Routing Protocols used in MANET

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**ABSTRACT:-** Mobile ad-hoc network is very popular in now days. It has various fields in which it is very useful and mainly used. MANET work on wireless technology in which mobile is work as a node and they node are dynamically connected to each other and act like the network. MANET is dynamic in nature every node can move anywhere in network. MANET is the main research topic for authors in recent years. In MANET mobile are battery operated so routing protocol must be less energy consuming and the minimum number of node is used for packet transfer. GA is used for optimal solution which is helpful to generate the best result. Routing is the major problem of MANET because the node are battery operated so path should contain the less number of node so node can transfer packet from source to destination easily. Here in this paper we are discussing about the three routing protocols which is the major part of MANET system.

**KEYWORDS:** MANET, Routing protocols, Proactive (table-driven), Reactive (on-demand), Hybrid.

## 1. INTRODUCTION:

MANET [1] is mobile ad-hoc network which is wireless system network. MANET is infrastructure-less in which mobile node are free to move anywhere. There is no centralized node to host a system so it is dynamic in nature. In MANET node has the low transmission range because they are battery operated and some node cannot connected to each other without route so routing is essential step in MANET. In MANET all nodes are the host and router because in MANET there is no centralized hub so all task is performed by nodes. Routing is the process through which message can forwarded from source to destination. Protocol is the set of rule through which routing is done. MANET is multi-hop routing wireless network where structure of network change dynamically. So the correct and efficient routing protocol must be chosen for data transfer. Some properties which must be followed by the routing protocols are:

- 1) The route which is chosen should be less power consuming.
- 2) The route should be secured.
- 3) The number of nodes which is used for data transfer should be minimum.



Figure 1: Ad-hoc network structure [2]

## Routing protocols in MANET

Routing [2] is the method through which packet is move from source to destination. Protocol is the set of rules which described the best path for packet transfer and monitor the all operations so with the help of routing algorithm packet can be transferred node to node using less battery consuming. Routing protocol is mainly classified in three categories.

There are three types of routing protocols [3]

- 1) Table-driven(Proactive) routing protocols
- 2) Source initiated (On-demand) routing protocols
- 3) Hybrid routing protocols

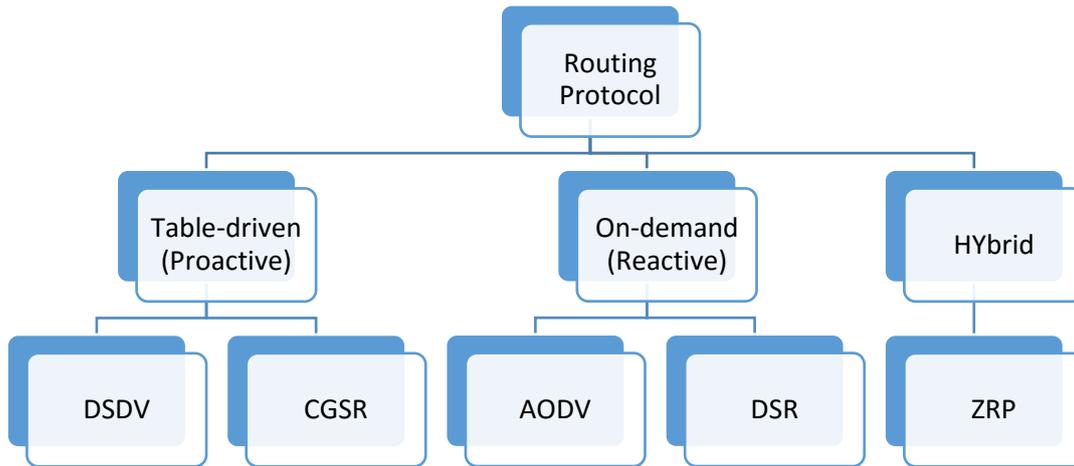


Figure 2: Routing Protocols in MANET

1. Table- driven (proactive) protocol [4]

It implies from the that table driven protocol means it work on the methods of table that means in a network all nodes information is stored in the form of table. This type of protocol maintain the route of all destinations, which is required or not. If any change is occur in the network than node send this information to its all neighbours to update their tables. Proactive protocol reduce the traffic overhead because it passes the packet immediately using known path which is already mention in table. Proactive protocol has some advantage and disadvantage. Main advantage is that it can transfer packet easily because predefine route information. Disadvantage is that regular update tables so it takes more battery power. It has slow process on link fail.

DSDV (Destination Sequenced Distance Vector) routing protocol [5]

DSDV is Proactive routing protocol which is work on the bellman-ford algorithm. In DSDV protocol each node maintain the table which has the information about neighbours. The information of table is updated periodically. In the table of DSDV each node has its sequence number when any change occur then new sequence number is assign which is greater than the previous one so that new table is broadcasted to neighbours and route update with greater number is received, the old route is replaced. Each node contain the information in its table which is

- 1) Its own sequence number
- 2) Destination IP address
- 3) Number of hops which is required to reach destination
- 4) Sequence number of node which has information regarding destination

CGSR (Cluster head Gateway Switch Routing)

It is based on cluster. In this cluster head routing [6] there is set of nodes and one node is the head of them is called the cluster head and all clusters are connected to each set of nodes through the gateway node. Gateway node has the two and more cluster head as the neighbours.

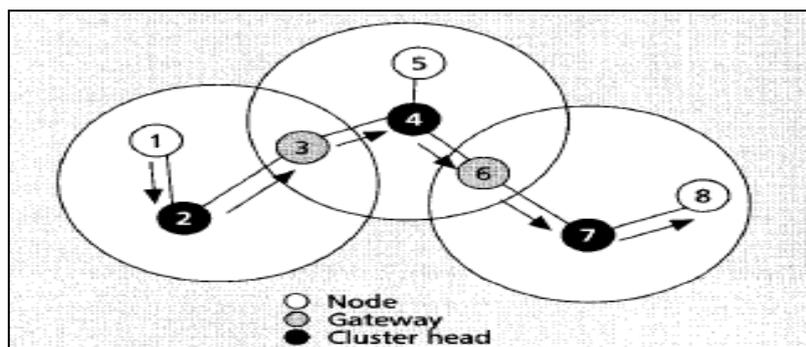


Figure 3: CGSR

## 1. Reactive(On-demand) protocols

Reactive routing [7] is known as source initiated or on-demand routing protocol. It is set up a link between the pair of nodes only when it is necessary. According to requirement if any node want to find the any other node than route discovery process started in network and get reply. There is two types of reactive routing protocols are discussed which is:

- a) AODV
- b) DSR

### Ad-hoc demand vector routing protocol (AODV)

AODV [8] is based on the on-demand routing protocol in this routing protocol source node sent the RREQ (request message) its nearby nodes with the help of flooding method. When neighbour node receive the route request message if it not the desire destination then it again rebroadcast the request message to his nearby nodes. It also note down the address of the sending node from where the message is coming so that it can send the reply message to source node. When the RREQ message reached the destination node than RREP (route reply) message is send by destination node. The RREP message is forwarded with the help of intermediate node they forwarded the message to their neighbours. In AODV it uses the DestSeqNum to find update of destination. It update table only when DestSeqNum of current packet is greater than the previous one. When there any link break is happened then RERR (route error) message generated and forwarded by node to their neighbours. After getting RERR message source node still want route than route discovery process reinitiated.

### DSR (Dynamic Source Routing)

DSR [9] is also on-demand routing protocol which is self-configuring routing protocol. It is mainly work on two methods which is route discovery and route maintenance. DSR is uses in multi-hop wireless ad-hoc network. In DSR when a node need a routing than route discovery phase is flooded in network and if route is not find than routing process is used to find the route address of destination and stored temporarily in route cache. When sender node want the route of destination then it first check its own cache if it has the alive route cache then use it otherwise it start a route discovery process. Node send the route discovery process to its neighbours and it again and again forwarded to their neighbours until it reach the destination node. If in mid of process any mid node has the route of destination then it forward to the sender using reverse path if mid node doesn't has the route of destination than it forward the request to their neighbour. Request process is forwarded until destination not come.

## 2. HYBRID ROUTING PROTOCOL [9]

It is the combination of both proactive and reactive protocols. That means hybrid protocol work on fundamental of proactive and reactive protocols. Firstly it work like proactive because in starting it has the routing table but whenever node find that they don't have the route of target then they start the route discovery process and work like reactive protocol. Hybrid protocol is ZRP (Zone Routing Protocol) which has the features of both proactive and reactive protocols.

### ZRP (Zone Routing Protocol)

It is work on the concept of Zone. It was proposed to reduce the control overhead of routing process. ZRP [10] routing protocol work on two concepts which is intrazone routing protocols second interzone routing protocol. In intrazone routing it is work on the basis of proactive routing protocols in which it maintain the local topology. It work within his own specified zone. In interzone routing protocol it is work on the basis of reactive routing protocol when destination node is not in range of intrazone routing than interzone routing works to find the destination node which is in range of interzone routing protocol.

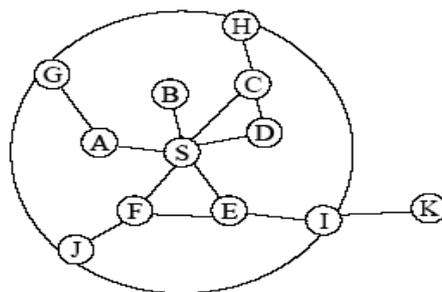


Figure 4: ZRP with radius =2

## CONCLUSION

In this survey we are focusing on the three routing protocols which is very important part of MANET. Routing is essential part of this because with the help of routing the message is forwarded from source to destination. Here we discussed the three routing protocols that is proactive, reactive and hybrid protocols with their advantage and drawbacks. According to survey the result is that all protocols have some advantages and some limitations that means single one can't perform the best for all conditions. Some are good for some situations and some are for others so the survey says that protocol which is used for communication must be selected according to required applications. It is typical task to decide which routing protocol is best because all have different features which depends on network conditions. So according to research we concluded that no one routing protocol is perfect so selection of protocol should be according to requirement which is best suitable for the required conditions. In future our work to find out the best suitable routing protocol for the network which will provide the optimized result based on the term of throughput, RBP (remaining battery power), security and fitness value of nodes.

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