To Study Ad hoc Mobile Routing Protocol

Kavita Sethi

Guide Name: - Narinder Kumar Sharma
College: - Rpc Degree College
Email Id: - Sethikavita61@Gmail.Com

ABSTRACT

Ad hoc network is kind of network that is composed of different individual device that can communicate with each other directly. Many ad hoc network are the LANs networks where different devices enable to send data from one device to another devices without the help of any centralized access point. In MANET various routing protocol are used like table driven, on demand driven and hybrid routing protocol. AODV is a on demand routing protocol if the path is destroy of send the information than reestablish the path to send the information. The survey of the paper is to give the comparative analysis of all MANET routing protocol. the main purpose of this paper is to identify the which protocol is best on the basic of the comparative analysis of the MANET routing protocol.

INTRODUCTION

Computer network is an interconnection of various computers to share software, hardware and data through a communication medium between them. Two computers are said to be interconnected if they are able to exchange information with the help of transmission media like radio wave, microwave fibre optic etc.

Wireless networks are computer networks that are not connected by cables of any kind. The use of a wireless network enables enterprises to avoid the costly process of introducing cables into buildings or as a connection between different equipment locations.

Since the inception wireless networking there have been two types of wireless networks:

The infrastructure n/w: including some LANs.

The ad hoc n/w: ad hoc is Latin meaning "FOR THIS PURPOSE"

Ad hoc network is a wireless network. Ad hoc network is a collection of a two or more devices can wireless communication. Devices can communication with another nodes that is immediately within their radio range or a outside their radio range. The communication between a nodes anytime and in any place. The communication between has a devices either a homogenous or heterogeneous way. Homogenous way communication between a devices means all nodes have a identical responsibilities. Heterogeneous way communication between devices all nodes have different responsibilities.
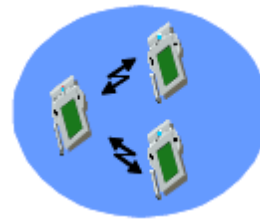

Fig: 1 Homogeneous ad hoc n/w Fig: 2 Heterogeneous ad hoc n/w [1]

MANET stands for a mobile ad hoc network. MANET is a wireless network. MANET is a collection of two or more devices these devices can communicate without the help of any infrastructure. In MANET nodes also works as

a router that is they also route packet for other nodes. MANET can be applied to different applications like educational, entertainment, enterprise, emergency [2] , personal area network and Bluetooth and collaborative work [3].MANET support a peer to peer communication means two nodes can communicate with each other directly. In MANET the range of transmission information is limited so the routing protocol is used for transfer the information source to destination.

Following are the type of routing protocol:

For transfer the information source to destination they are used a various routing protocols.
Requirements of routing protocol:
1. Route Discovery: First find the route from source to destination for transfer the information.
2. Packet Forwarding: After find the path then transfer the information.
3. Route Maintenance: Route maintenance is needed when the any route is move to the   position.
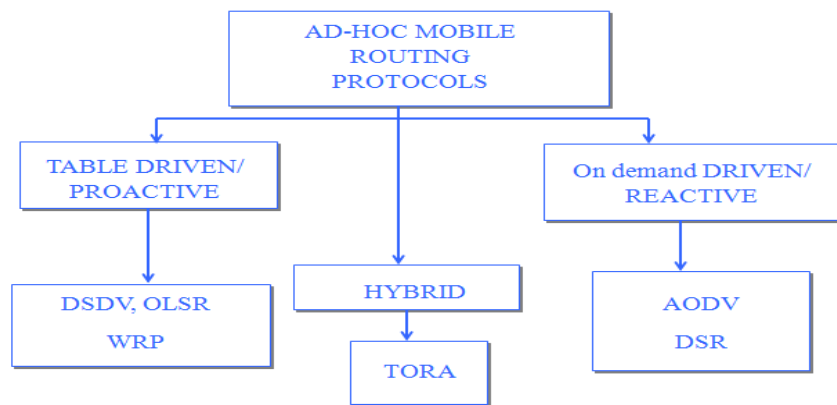

Fig: 3 routing protocol

There are a different ways to transfer information source to destination is reactive and proactive. Proactive (table driven) routing protocol is kind of protocol that if you want to transfer the information the information then the route is maintain in advance in the form of table. In a table maintain a route information of each node for transfer the data. example DSDV , OLSR , WRP.

Reactive (source on de and drive) routing protocol is kind of protocol that if you want to transfer the information then firstly can route discover and that can transfer the information[4] example AODV, DSR

Hybrid routing protocol is a communication of proactive and reactive routing protocol. Example TORA

2.   Survey
In this survey i am explain the different protocols are used in MANET.

2.1   DESTINATION SEQUENCE DISTANCE VECTOR(DSDV)
Destination sequence distance vector (DSDV)[5] is a table driven routine protocol. Each node in MANET can maintain the route table for the purpose of transfer the information and maintained a sequence number of a each node. The sequence number will help to fine the route from source to destination. A sequence number is used to allow mobile hosts to distinguish stale routes from new ones. Routing table is updates when the sequence number is changed. So therefore lot of network load in a route. The solution of this problem the DSDV can maintain the two route updates packets. The first is FULL DUMB is help to carries all available routing information and then transfer the

information. The second one is SMALLER INCREMENTAL packets this is help to maintained the those type of information that has been changed the last FULL DUMB.

2.2   OPTIMIZED LINK STATE ROUTING(OLSR)

OLSR routing protocol can be divided into three parts.[6]

1.   Neighbor/link sensing:neighbors and links are detected by HELLO messages. Messages can be transfer a symmetric and asymmetric ways.

A simple neighbor detected scenario.
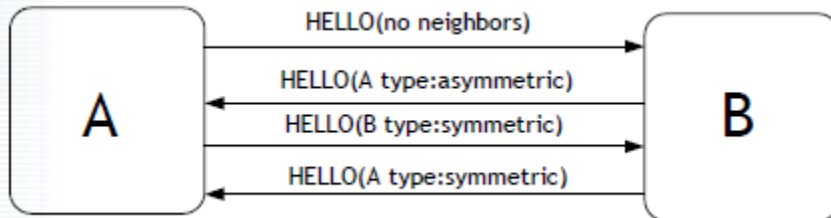

Fig: 4 neighbor/link sensing   [6]

2.   Multi point relay(MPR): The MPR is helpful to minimizes the sizes of control messages. The MPR select a nodes to transfer the information. So the MPR helps to reduces the number of duplicate transmission for information forwarding the packets. [1]
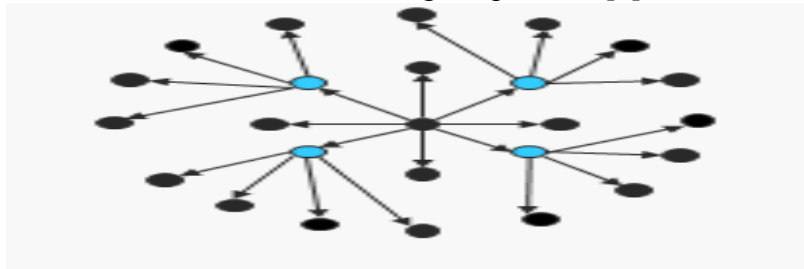

Fig: 5 uses a MPR   [6]

3.   Link state functionality:link state functionally has a two optimizations.[5]

a.   Only MPR declare a link state messaging.

b.   Only nodes a selected then the transfer the information.
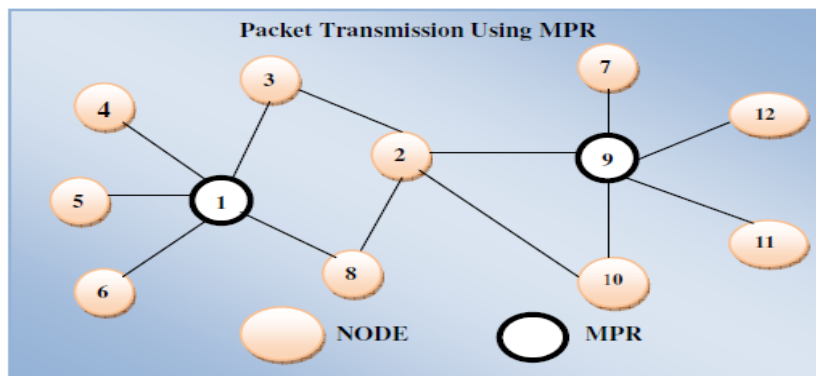

Fig: 6 Link state functionality   [7]

2.3   WIRELESS ROUTING PROTOCOL(WRP)

WRP[8] is a table driven protocol. The goal is to maintain the routing information in the form of table. WRP maintain a four table: distance table, routing table, link cost table and message retransmission list(MRP). The distance table indicates the number of nodes between the source and destination. The routing table indicates the address of the next hop node. The link cost table indicates the how much time is using to transfer the information source to destination. The MRP is contain the sequence number of update message, retransmission counter and the list of updates sends from the update message.

2.4   DYNAMIC SOURCE ROUTING(DSR)

Dynamic source routing(DSR)[1] is a on demand routing protocol. DSR used the two phases: route discovery and route maintenance. Suppose want to send a information source to destination then check whether the already path is exist or not. It the path is not exist then makes the paths for send a information. For create a path the route discovery phase is used. Each node a address and unique identification number Then the source broadcast the route request message to all nodes. Each nodes receiving the packet whether is known for destination. If it not known then add the address of the route record of the packet and forward the packet along its outgoing links. A route reply is generated when either the route request reaches the destination.
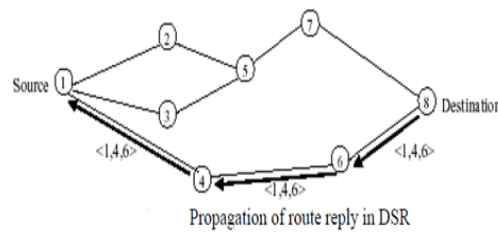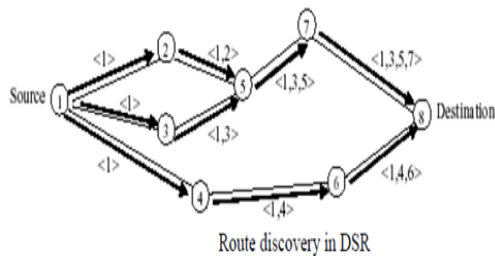

Fig: 7route discovery in DSR   Fig: 8 propagation of route reply in DSR [1]The route maintenance is accomplished is through the route error. When the node is move to the route then the route error message is send to the source with the help of intermediate nodes the route is destroy and then create the again route.

2.5   AD HOC DEMAND DISTANCE VECTOR PROTOCL (AODV)

Ad hoc on demand distance vector protocol [1] is a on demand driven protocol. It is a combination of dynamic source routing(DSR) and destination sequence dictation distance vector(DSDV). DSR is helpful for creating and maintain the route on demand and DSDV is helpful for maintain the sequence number of each nodes. AODV has two phases route discovery and route maintenance. AODV can minimizes the number of broadcast packets comparison the DSDV. Because the DSDV maintained the list of route for transfer the information. In route discovery phase it broadcast the route request (RREQ) to its neighbor. Each node has its sequence number and the broadcast id. During the process of forwarding the RREQ the intermediate nodes maintain in there route tables the address of neighbors from which the first copy of the broadcast packet was received , it helpful for establish the reverse path. Reverse path is help for the destination and intermediate nodes by Unicast a route reply (RREP) packet back to the neighbor from which it first received the RREQ. The route maintenance path is used when the path is destroy from the source to destination then route error (RERR) message is send to source the source may be re initiate the path.
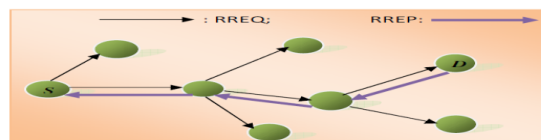

Fig:9AODV routing protocol with RREQ   [7]

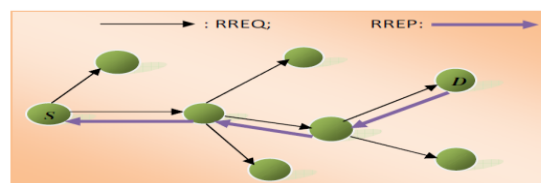

Fig: 10 AODV routing protocol with REER messageRREP message. [7]

2.6 TEMPORARY ORDERED ROUTING PROTOCOL(TORA)

Temporary ordered routing protocol (TORA) is a hybrid routing protocol. it is used to initiate the route on demand. There are the three phase of TORA protocol, route creation, route maintenance and route erase. For the route creation and route maintenance phase uses the height metric to establish a DAG(directed acyclic graph) root at the destination. For route creation the query and update packet are used. The source broadcast query packet to the nodes. Then the reply is send to source with the help of update packet.
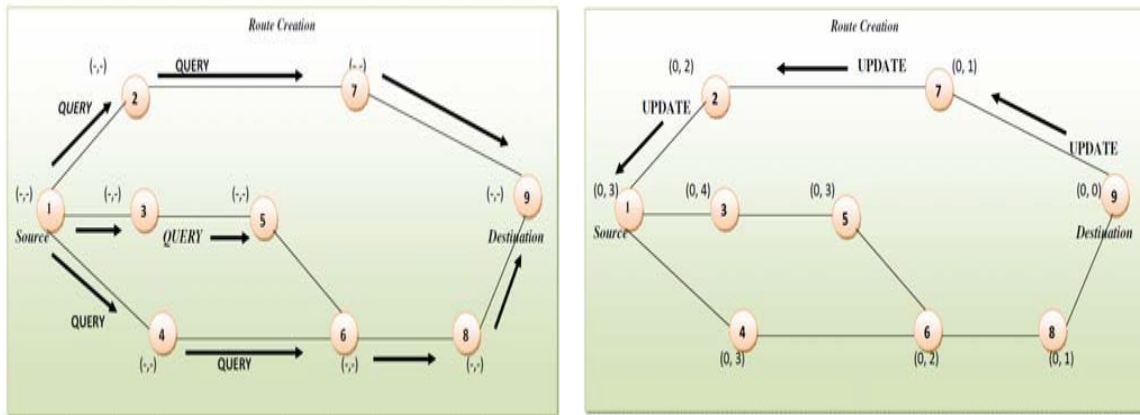

Fig: 11 and Fig:12 used for creation route in TORA [7]

In a route maintenance Changes in topology cause routes to be reestablished and the Route Erasure Upon partition detection routes are removed.

3 Comparison of MANET routing protocol

This table define the comparison of MANET routing protocol

Fig: 13 comparison of MANET routing protocol

s.no	Parameter	DSDV	WRP	OLSR	AODV	DSR	TORA
1.	Proactive	YES	YES	YES	NO	NO	NO
2.	Reactive	NO	NO	NO	YES	YES	NO
3.	Hybrid	NO	NO	NO	NO	NO	YES
4.	Broadcast request	NO	NO	NO	YES	YES	YES
5.	Message retransmission list(MRL)	NO	NO	YES	NO	NO	NO
6.	Require sequencing	YES	NO	NO	YES	YES	NO
7.	Update information	N/W load	Again maintain table	Effect on height metric	Route rediscover	Route rediscovery	Route rediscovery
8.	Route information maintain	According to sequence number	Maintain table	Maintain table	Maintain table	On demand	On demand
9.	Route regenerate	Sequence no change		Send control message	Link reversal route repair	Error message received source	Error message received source
10.	Distributed	NO	NO	NO	YES	YES	YES
11.	Medium	NO	NO	NO	YES	YES	YES

	access delay (MAC)						
12.	Execution time	FAST	FAST	FAST	SLOW	SLOW	SLOW
13.	Throughput	MORE	MORE	MORE	LESS	LESS	LESS
14.	Bandwidth wastage	NO	NO	NO	YES	YES	YES
15.	More load or control overhead	LESS	LESS	LESS	MORE	MORE	MORE
16.	End to End delay	LESS	LESS	LESS	YES	YES	YES
17.	Summary	Each node maintain a route table. The n/w load problem slove by full dumb and incremental table	Maintain route information four table. MRL, link cost routing, routing table and distance table.	Its used for sensing neighbor, multi point relay and link state functionality	Broadcast a packet neighbor nodes for route discovery and error message is used for the route maintenance.	Broadcast a packet neighbor nodes for route discovery and error message is used for the route maintenance.	DAG graph is used for route creation and route maintenance.

CONCLUSION

In this paper discussed the MANET routing protocol like a on demand proactive, reactive and hybrid and also discussed the comparative analysis of the MANET routing protocol like DSDV, AODV, OLSR, TORA, DSR etc. In the above comparative analysis of routing protocol the DSDV routing protocol is best because the throughput is more and execution speed is fast because all the information is get about of transfer the information in advance. In AODV routing protocol is best because it is on demand routing protocol but the execution speed is slow and throughput is less as comparison to the DSDV because if the routing path is destroy then make the new routing again and again until the information is transfer. To overwrite the disadvantage of the AODV routing protocol used the AODMV routing protocol. In AOMDV used multiple paths used for transfer the information source to destination. The new path is generated until the all paths are not destroy and also increased the throughput as comparison to the AODV.

REFERENCES

[1] Drs. Baruch Awerbuch & Amitabh Mishra "introduction to ad hoc network"

[2] Manjeet Gupta and Sonam Kaushik "Performance Comparison Study of AODV, OLSR and TORA Routing Protocols for MANETS" *International Journal Of Computational Engineering Research, Vol. 2, Issue No.3, May-June 2012, page no. 704-705*

[3] Carlas de Morais Cordeiro and dhrama p.agrawal "Mobile Ad Hoc Networking" page no. 3-4.

[4] Marco Fotino, Antonio Gozzi, Floriano De Rango, Salvatore Marano, Juan-Carlos Cano, Carlos Calafate Pietro Manzoni "Evaluating Energy-aware Behavior of Proactive and Reactive Routing Protocols for Mobile Ad Hoc Networks"

[5] Charles E. Perkins, Pravin Bhagwat "Highly Dynamic Destination Sequenced Distance Vector Routing (DSDV) for mobile computers" in processing of ACM SIGCOMM 94, page no 234-244, September 1994.

[6] Andreas Tønnesen http:// www.olsr.org

[7]Tamilarasan-Santhamurthy "A Quantitative Study and Comparison of AODV, OLSR and TORA Routing Protocols in MANET" IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 1, January 2012

[8] Shree Murthy and J.J. Garcia-Luna-Aceves "A Routing Protocol for Packet Radio Networks"