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Performance of Reactive and Proactive MANET Routing Protocols with Trajectories

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Abstract-- Ad hoc network, for the communication process wireless methods are applied nowadays. Wireless mechanism is a most popular communication in this century. There are many protocol is working in the wireless networks. Reactive and proactive protocol are the important methods are applied in the wireless networks, in reactive protocol method has two important protocol called AODV and DSR, Such as proactive protocol has OLSR. Reactive protocol, rather than, there is no relationship between all other nodes, the reactive protocol makes connection between the nodes for exchange information. Proactive protocol which makes connection between networks nodes regularly for exchange information. It is examining about reactive (AODV and DSR) and proactive protocols (OLSR) analysis in the wireless networks. For the comparison result will be implementing in the OPNET Modeller 16.0.the performance of the routing protocols will be examined by to metrics delay and throughput. Three routing protocols described through a different methods and different trajectories. The protocol evaluation study will be observed and conclusion will be presented, explaining which protocol method is the best for mobile ad hoc networks. Dynamic and the reliable protocols are very important for the ad hoc networks and it does not have base station, and the network topologies vary regularly.

Keyword-- *Ad hoc network, AODV, DSR, OLSR, OPNET*

I. INTRODUCTION Background

Wireless network is essential significant nowadays because of wireless devices improvement is increasing and it performs the best in higher data rate.ad hoc and infrastructure are the two types of mode in wireless. ad hoc network every single system plays router role. So that it can easily maintain the path within the nodes. All infrastructure modes there will be access point between wirelesses network through the access point. MANET is nothing but Mobile Adhoc Network that means every single node can make establish the connection and communicate with other nodes. Here the radio waves only the carries the signal between the mobile nodes. This wireless structure easily can make in anywhere. In the wireless structure many different protocol are performing operation this thesis shows some of protocol operation and best protocol operation in wireless network. This thesis describes about three important protocols AODV, DSR and OLSR. This AODV is comes under and the reactive or proactive method. And it has a bi-directional contacts and the maintenance the active route. And also this provides unicast and multicast relation between the nodes. In the AODV method there is sequence number is mainly used for find the target node and most recent path. There is low delay when connection establishes.DSR (Dynamic Routing Protocol) protocol is like AODV. This process is comes under reactive method. It uses a routing table in between the nodes. By using this routing table easily the source node will find the destination node. This routing table has the details about the destination node. Shortest path is also finding by using this routing table. OLSR this protocol works under the link state algorithm and this protocol comes under the proactive. This protocol mainly for exchange the information between the neighbour nodes. It will be updating the topological information in every single node. And it has a many point relays (MPRs) which is used for minimize the duplicate retransmission when flooding occurs. This OSLR protocol which uses shortest route algorithm. This algorithm is mainly used for find the shortest route for destination. In the wireless network on-demand protocols are performs well when compared to table driven protocols. AODV protocol has important characteristic like sending hello messages to work the route perfect. It has very low delay.

Aim

1. Research different protocols in wireless network such as on-demand and table-driven
2. Best protocol for wireless network.

Objective

1. Discuss path finding protocols in wireless network.
2. Review the characteristic different between the on-demand and table driven protocols
3. Propose AODV process in wireless network.
4. Analyze AODV in wireless network.
5. Propose DSR process in wireless network
6. Analyze DSR process in wireless network.
7. Propose of OLSR protocol in wireless network
8. Analyze of OLSR protocol in wireless network.
9. Implement the protocol result in opnet tool and shows which protocol gives the best performance in wireless network Research problem

In the wireless networks routing protocols are performing in a different ways. AODV performs three important mechanisms in wireless network which increase the speed of the entire network and this find the lower cost route. AODV has hello message method which is used to find the broken link and also which is used to find new nodes. This type of protocol is also called as reactive protocol, which perform well in wireless network.Dynamic source routing, path innovation and maintenance, this method is used for find the path in entire network and it will continue the route properly to transmit. This is also called as on-demand or proactive protocol. In OLSR, it has topological information about each node. And it will use the shortest path method. This is also

called as proactive or table driven protocol.Its focus on researching about best protocol in wireless network. Wireless network has different protocol like AODV, DSR and OLSR. This is based on the analysing the protocol performance and the mechanism. AODV has different characteristics that are going to be analysing here.

Research method

The solution of this dissertation is reactive and proactive protocol performance will be implementing in the OPNET 16.5. Protocols are implementing in OPNET tool for analysing all the three protocol and finally give the best protocol results. This performance is based on the analysing all the three protocol results.

II. DRIVEN PROTOCOL IN MANET Proactive in MANET

This proactive protocol has different types DSDV, WRP, Global state routing, fisheye state routing and Hierarchical state routing, zone -basedhierarchical linkstate routing protocol, cluster-head Gateway switch routing protocol. Dynamic target Sequenced Distance Vector Routing Protocol: this important protocol has all information about the destination node. How many hopes to make initiator and the target node sequence numbers. The sequence node can solve the looping problem.. Here station sends total entire routing table to the other node. Whenever the changes occur in the path finding table the source node update all message and this will send routing table the other node also. This protocol updates the routing table in two methods "full dump" and "incremental update". FULL DUMP it will send entire cache table to the other nodes. "INCREMENTAL UPDATE" it will send last update in the routing table. Sequence number is assigned for all routes. When route has the same sequence number that route is called better route. That is called shortest path.

Wireless Routing Protocols

Wireless path finding protocol is also called distance vector routing protocol here every node has four types of table.

1. Routing table
2. Message retransmission list table(MRL)
3. Link cost table
4. Distance table

Here distance table, this table has all the information about the distance destination node. A via other neighbour B, C. And also it has same downstream path from the node C. Routing table, node A contains all the information about the distance node. From B and C it has the linkage to target node. This special tag, and this is used for identify entry path on invalid path. Predecessor is also there to detect the loops and to avoid the counter fit problem. Link table, it has rate of link from nearest neighbour node. Message retransmission list table, when it will not get acknowledge from neighbour node. It will perform the retransmission process. That retransmission update will send to the neighbour node also. To maintain the link, this update message will be shared to the neighbour node also. The nodes update the update message through message retransmission list if there is no update not in present list. Initiator node will send hello information to target node to know the particular system is available. When it receives some update information that particular node will discover the better route to the target. After find the new path. The entire new route will be updated in routing table. There is algorithm is used for finding the consistency check. This algorithm is used for avoid the looping problem.

Global State Routing

1. Distance table
2. Next hop table
3. Topology table
4. Neighbour record

Neighbour record is nothing but it has all the information about the neighbour node. Topology table has time stamp and link status from initiator to target in entire network. In next hop has packets for destination and also it has information about source to destination shortest path. In this table it updates the routing information. When i receive the routing message from the node and al the new information updated in the table.

Fisheye State routing

This protocol is development of GSR. When the node receive the large amount of update messages it will reduced the bandwidth. In the fisheye state routing will not have a detail amount of node. It will exchange information about the nearest nodes. All nodes reduce the message size. Every node will get accurate message about the other node and details data's reduce the distance from node increases.

Hierarchical state routing

Cluster and portioning is the important in the mobile nodes. All the nodes portioned into cluster. Cluster is managed by the cluster based algorithm. Nodes of physical cluster are sending to all other nodes. These are all information exchange through the gateway.

III. REACTIVE PROTOCOLS IN MANET

MANET is nothing but mobile ad hoc network, nowadays cellular, satellite and wireless fidelity are most important for exchange information. The entire routing node is not act as end system this will play router to forwarded data. This systems are movable in

the network here the nodes are changing their position often. Reactive protocol is the popular method in the ad-hoc routing technology. This is the large and the scalable routing technology whenever it gets the request. It will be reducing the routing overhead by continuously sending the data's this is the methods is used in wireless technology for best communication. There is a special meaning in Latin "for this". Early Ad-hoc network only designed for the military application. Early 1990's this method will combined with the wireless LAN and Bluetooth. 1997 internet engineering group launched MANET with the routing protocols. They implement routing protocols because to improve the data rate and the efficiency. At present there are more than fifty protocols are implemented in the wireless environment.

Application of MANET

1. Military
2. Universities
3. Open broadband connection sharing
4. Sensor
5. Frequently it will update the routing tables.

Advantages of MANET

1. Easily can implement this structure in any places
2. This MANET gives scalable result with more nodes

Disadvantages of MANET

1. Some security protocol in the network is not working properly in the ad-hoc
2. If any malicious nodes with in entire network it is hard to find the malicious
3. There is some good protocol in the wired network but it is tough to implement in the wireless node

Important mechanisms required for cellular ad-hoc network

1. For the path finding mechanisms multichip operation is essential for mobile nodes
2. Internet access method
3. Self-configuring method is need allocation mechanism
4. Security mechanisms.

AODV (Ad-hoc on demand Distance protocol)

This protocol is similar to DSR protocol. These two protocols maintain some table entry by using this table it can find the destination. All the routing tables contain the following details Active neighbour node. Next hop address, sequence number, hopes to reach destination.

There is two important mechanism are involved in AODV Protocol.

Route discovery and maintenance: before send data to target node, source search destination address in path finding table whenever it finds that table then this will send the information to the target. Sometimes, destination route address is not will be there in path finding table .it will choose the path finding method, in this process the source will send path request to all nearest neighbour nodes. Neighbour node sends this to nearest node. This will send the request until it will find the route. When it find new route this will update that details in the route table. And it will send hello message to the destination node for the availability.

AODV has advantage is control the traffic messages and the processing is also slow. Easily it can adapt with network topology more than ten thousand nodes it will give the reliable and scalable result in the wireless network. It has only one disadvantage is bi-directional. Because of the bi-directional it will get delay. When the link gets break it will get delay s.

The maintenance of time based state is a major quality of AODV which means that a routing ingress is not newly used is expire. Nearest neighbours are notify in entire of route crack.

Control messages used only for the discovery and broken link are as follows:

1. RREQ (Route Request Message)
2. RREP (Route Reply Message)
3. RERR (Route ErrorMessage)
4. HELLO messages

Route Request Message: Route request packet is filled through the entire network when path is not accessible for target system or end system. The opinion are covered in the route request packet are as follows.

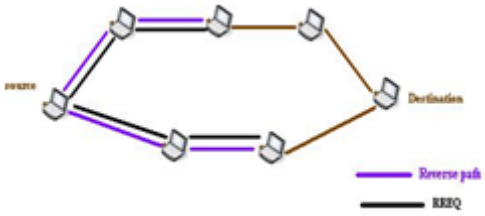
1. Initiator address
2. Request id
3. Initiator sequence number
4. Destination Address

5. Target Sequence Number
6. Hop count

A **Route request** is standard by the initiator information and the request ID, each and every time source system send a new request and request ID is increased. After some times receive of request information, every node verify the appeal ID and initiator address match up. The new route request is lasting, if there is existing path request information with equal join up of point of view.

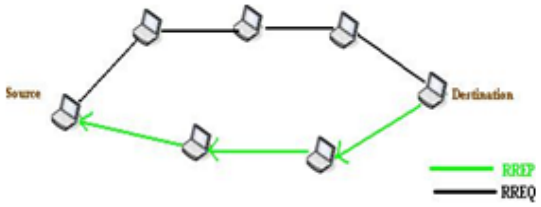
If there is no path towards the target system, it rebroadcasts the route request with incremented hop count.

A route reply is generate and it will sent back to the initiator node if a initiator system has path with series number larger than.



Route Reply Message: on having a suitable path to target, if that node is target, a path reply (RREP) message is sent to the source by the node.

Route Error message: The neighbourhood nodes are monitored. When a route that is active is vanished, the neighbourhood nodes are notified by RERR (Route Error Message) on both sides of link.



HELLO messages: these are broadcasted in order to know neighbourhood nodes. The neighbourhood nodes are in a straight away communicated. In AODV, HELLO messages are broadcasted in order to tell the nearest neighbours about the creation of the linkage. These messages are not broadcasted for the reason that of short time to live with a value equal to one.

Advantages of AODV

1. Main improvement of AODV is sequence number destination sequence number is used to find the latest route r new route.
2. When compare to the other protocol this AODV connection setup delay is very low.

Disadvantage of AODV

1. Sometimes it will waste the bandwidth because of periodic beaconing leads.
2. For a single request it will forward the many multiple path reply so that it will get traffic.

Overview of AODV

AODV and DSR is "source routing" DSR does source routing but the AODV will not do the source routing. When the source sends data to the destination, AODV will not send the whole route to the destination. First it will check the routing table for the next hop. This checks routing table because this one wants know the hop to destination. When the data reach the next hop it will send the information to other target. Router request and responses is the main important in this concern. AODV has only one routing table for the whole route and it uses different mechanism for the routing information. AODV has sequence number for every destination node. By using sequence numbers it maintains some timer for every time. Because of routing table will get expired in a particular time, if it is not use for long time. Sometimes the initiator node will send information to the target node with don't have any route then the target node will send path request to entire networks. If the problem occurs in the link then it will transmit the request error data to the destination. Then the target nodes remove this route then it will find the new path for the destination and it will be updating in the path finding table. When there is a problem in the network, the routing node will find the different path for the destination from the routing table. For all routing node maintain some predecessor node. Predecessor node indicates as a RERR when the hop link gets break. AODV performs unicast and multicast

AODV Unicast Operation

Reactive protocols, it has special unicast operation

Route discovery

Route Maintenance

Route discovery: this route discovery occurs when the source node not find any path to target node. When the situations occur in the initiator node will send the (RREQ) to the all neighbour node to find the destination. RREQ has four field such as address of the destination node, broadcast id,source number, destination s number and hop count.

Broadcast id --------- unique number for all RREQ

Destination sequence number----- intermediate nodes are using this DSN. By using this it can easily find the destination path.

Source sequence node.....> this is also same as the above but this one is the reverse route from the destination node.

Route Management

This method has database entry for the destination node. It has six fields such as destination address, hop, amount of hops, and dynamic neighbour list intended in support of the route and expiry time. Target node find new path for the destination system. After that it will replace previous route. Initiator node moves one area to other location it will not accomplish the path innovation procedure. If that initiator node moves it will forward unsolicited route request to the initiator node.

Local Connectivity

AODV has special features for finding destination node called "Hello" messages. This message comes with RREP and TTL (time to live). This gives the meaning that, the hello messages will not reach the beyond the nearest neighbour.

AODV Multicast Operation

The AODV multicast and unicast has the RREQ and RREP operation. Multicast has tree structure. Tree portioned in to members and nodes. Nodes connected with members. In the unicast protocol gets benefits from the information while finding the path for multicast traffic. This may reduce the strength route

Route Discovery

When source need to find a path for multicast. This will send path request to all nodes in networks. In the RREQ node has a destination address. This destination address is set to the entire multicast group. J_flag, this is the message is used to become a multicast route.

Multicast of the RREP message is different from the unicast RREP.

Group_Leader_Addr.....> multicast group leader is stored in a name.

Mgroup_hop.....> this hop is initializing with zero and it will increment the value in every hop.

Group Hello Message

To ensure the fresh route the protocol relies on group wide DSN. The group hello messages are an unsolicited RREP message. This TTL message has greater than diameter of entire network. Here RREP message has group address and the sequence number. Sequence number for every group will be increment when the hello message is broadcast to the other node.

Hop_cnt field.....> this field which is used initialize the value as a zero and incremented by other neighbour node. When the nodes get the Hello message, then it will update in request table.

Multicast Tree Maintenance

When the mobile node join in. it will get automatic activation. Pruning tree when the node leaves from the other node or group. Find the error and repair the repair the broken link. Repair is consists of repairing and re-establishing the broken node when the links process goes down and reconnecting tree to the network.

Comparisons of AODV Protocol with other Protocols

There is a protocol is also doing the process like AODV such as DVMRP and MOSPF. This protocol is also performing the "HELLO" operation. Each protocol has the different algorithm to create the path between the routers. AODV has the different ways if a node not in the group member. That particular node plays as a router for the other host to join to the node.If the protocol get repair with the path the AODV will find the broken link and repair the broken path. But the other protocol will not find the broken link. MOSPF routers recalculating the links according to acknowledge.

DSR, is also has the same operation like AODV. Both protocols are doing the same operation such as unicast and multicast. ODMRP is not a unicast but this is performing the multicast operation. It will not create any tree structure. It will create only the mesh- based method. DSR is performing the source routing process so this protocol is also perform the AODV operation. IP frame work only designed for the next hop –based routing.

Characteristics of AODV protocol

1. It does not have any central administrative for controlling forwarding packets.
2. This protocol is mainly reducing traffic in the network.
3. AODV reduces the traffic and increase the latency and find the new route for packets.
4. Hello messages are support for route
5. It is mainly used for unicast and the multicast in the wireless network
6. There is no long delay in the AODV. There is only small delay in AODV.
7. Broken links are repaired very soon
8. To track the neighbour node periodically it will send the hello messages to the neighbour node.
9. To get the accuracy information it will use the sequence number

IV. DSR PROTOCOL (Dynamic Source Routing)

DSR, this protocol before it sends the data to the destination. Source can recognize each and every intermediate system details towards to the target node. All the nodes has cache which has all the information about the routing information. This protocol has

same features like AODV path discovery and maintenance. When the initiator node knows about the destination node it will send the data directly. When it needs to find the destination and this will send path request information to nearest neighbour node. In the request node it has details about the initiator address, target address and the unique no. When the other node receive this route request message it will check in the cache when the neighbour find the destination node information then it will sent route reply message to the source node. Once it receives the appeal reply message it will forward the information to the destination system through the neighbour node.

DSR use three different methods of control packets for path discovery and maintenance. They are

1. Route reply
2. Route error
3. Route request

Overview of DSR

1. Route discovery
2. Route maintenance

Route discovery

This protocol only designed for several-hop wireless ad-hoc network of cellular phone nodes. Self-configuring and self- requiring are the important method in the DSR. No more existing protocol in this method. All the network nodes cooperate with other node to forward the packets. This protocol gives highly reactive output. Delivery of packets ensures successful output. When source system “A” will send information to the target system “D” . First source node finds the path to the route cache. as soon as path is not expire in path cache initiator sent the data to the destination node. The path is unexpired then this will send route request to all other neighbour node. When nearest neighbour node receives path request, neighbour system send that RREQ to all other node. So that it will find the destination.

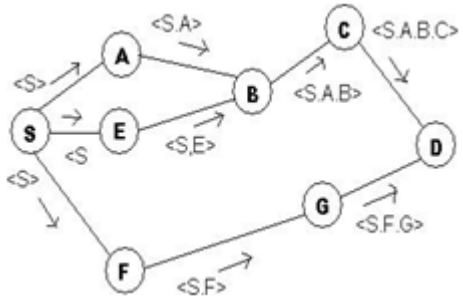
Source address

Destination address

Route address

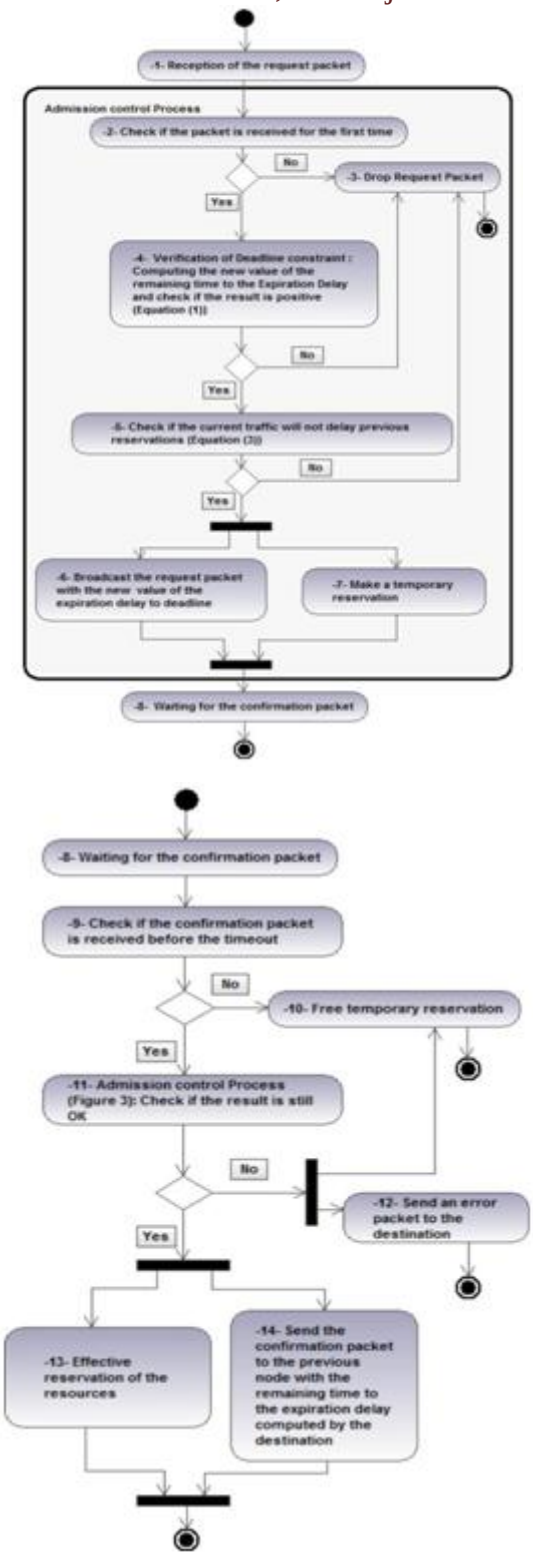
Request of ID

When destination receives RREQ the destination send RREP to the source. When the neighbour node detects the link to the next node towards the destination is problem. Then the route caches send the error information to initiator cache. After receives the route cache problem then it will find the new path for initiator. DSR works with small medium in MANET.



When initiator node ”S” send data to the information to the target node ”D”. It will create the route discovery by sending RREQ. Intermediate node (A, E, F) receives the RREQ and it will send to the neighbour node. Likely, the neighbour node is also sending the appeal to the neighbour node when the target node receives the request it will send the responses to the initiator.

Initiator node by using the Route (S, F, G)



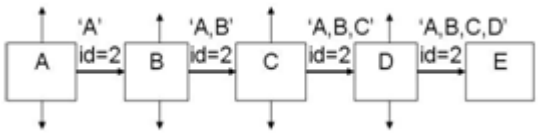
Route Discovery

For example Source node “A” wants to discover path towards target node “E”. When the initiator starts transmission first this will send “path request” to all nodes. This request has

Source identification number

Destination identification number

Unique request number



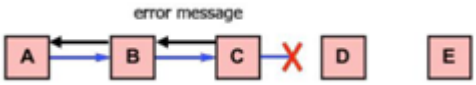
And this request has the intermediate node address also. When all nodes receive the request from initiator node. If target nodes receive the appeal it will send the path reply to the initiator node. Initiator node will get the reply after that that node will catch correct path in the cache. After update the details in path cache .initiator node send the information to target node. or else this does the process in the different way. The TARGET system will check the very recent route request in the route cache for the identification. If the request is there it will discard the new request. In this example node "B" send route request to "C" and "D" ,only gets the better request from initiator after that the node "C" send request to the node "E".

The same way node "E" sends the reply to the destination node. Otherwise "E" should find the route discovery to the source. Whenever it discovers the route it will send the path to the similar way. Node "E" performs the reverse the sequence of hop from the route cache. When this initiate the route discovery. The sending source node keeps all the original packets in the "send buffer".

DSR, "source routing" are the important method in the DSR protocol when the source send the information to the target, for all packet the whole route is going to be dedicated. DSR head is included in all the packets. All other neighbour node needs to know the entire network topology. All the routes will be in the cache. Each packet carries the header so it can easily find the destination. Path Discovery, without knowing any destination details sometime the source send the information to the target node. This is the condition source sent all the RREQ to the neighbour node if target node receive route request then this one will reply the for the request whether it has route or no route. the target node knows about destination it will send the route reply to the initiator node. Then the initiator nodes get that information then update in the routing table. By updating in the routing table it can easily find the route when it wants to send the data again.

Route Maintenance

Dynamic source routing, all the nodes confirming the other node in source route receives the data's. Each node is forwarded node to node routing. Information will not receive by any other device. That is going to be in a particular time. Path error information is sent to the target node. Finally it removes from route cache. So that the source node create the other path to the target node. If no path in their path it will sent path request to nearest neighbour system



In this diagram, target system "A "dependable with the node linkage from A to B. Such as system B is also dependable for next B to C. system C is also dependable for C to D. D is also dependable for E.In this diagram C is not getting any responses from node D. C will send some of the request to the D. Finally it sends the path error information to the source A.Once initiator receives the path fault messages from C. this will destroy the whole damaged path from the path cache. If it is has a route to the destination. It will be updating new path to the route cache and it will send the packets. Otherwise it will start the new route discovery

Advantages of DSR

Reactive routing protocol periodically updates the routing table like the proactive protocols

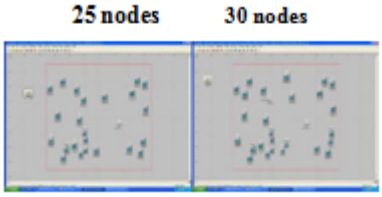
Middle nodes will use path cache information perfectly, if there is path to target node. It will send the information to the target. There is no path to target node then it will find the new path to the target node.

"HELLO MESSAGES" is not available from the initiator, then the initiator will create new path to the destination.

Disadvantages of DSR

1. Route protocol will not perform the repair the operation locally
2. Broken link only communicate to the Initiator it will not communicate to other neighbour node.
3. It cannot perform the operation more than 200 nodes in MANET.
4. When the flood occurs collision occurs in the packets.
5. There is a delay occurs when the node establishes the new connection.

DSR Scenarios

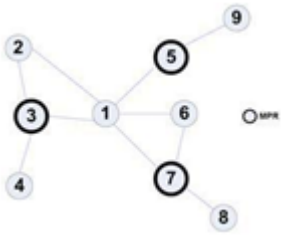


V. OVERVIEW OF OLSR (Optimized Link State Routing Protocol)

OLSR is a proactive routing protocol and is also referred as table driven protocol. It will perfectly and permanently store the data in the cache table. This is necessary to recognize there is no traffic in the OLSR protocol. This is not like other protocol, accuse for the real method of routing traffic. OLSR could to a definite amount be describe as a route maintain protocol indict for maintain the path finding table used only routing packages, despite such protocols are continually referred to as path finding protocols.

OLSR keeps tracks in path finding table in direct to propose a path if needed. OLSR will be implementing in any ad hoc. Network nodes particular as a multipoint relay (MPR) by a few neighbour system declare this data regularly in their control messages. Thereby, nodes announce to the entire network that has achieve ability to nodes which selected it as MPR. In path calculation, the MPRs are used to form the route from a given node to any destination in the network. The protocol needs the MPRs to make

possible capable flood of control information in the network. OLSR inherit the model of forward and relay from HIPERLAN (a MAC layer protocol) which is uniform by ETSI. This is proactive or table driven protocol. This protocol uses for periodic control information to form a topology. In the MANET, it has a special stand-alone routing table.

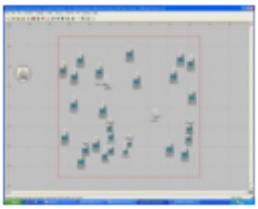


TC – Topology Control information are linkage state signalling done only by OLSR. This type of messaging is optimized in different behaviour using MRPs.

MID – Multiple Interface Declaration messages are transmitted by nodes running OLSR on more than on interface. This information records every IP address use by single node.

OLSR Scenarios

25 Nodes



VI. COMPARISON STUDY

This study describe will evaluate the property and show direction-finding technologies ad hoc network: proactive and reactive. After comparison, AODV and its most relevant protocol DSR is compared to study the main objective points of AODV performance.

Contrast Reactive and Proactive Protocols

OLSR has three following different control messages "HELLO "HELLO data sent to all neighbours node. This information is used only for neighbour and MPR.

The simulations method is available with ADOV and DSR protocols. The outputs only depend with different regulations. The following table shows the aspects between ADODV and DSR.

Arguments	Table driven protocols	On-demand Protocols
Route update	attempt to keep consistent, up-to-date routing packets from all nodes to other different nodes in the entire network	A route is built only when needed.
Delay	Stable broadcast of routing information at regular intervals still when topology will change this propagate will not occur.	There are no periodic updates. Control information is not propagated.
Mobility	Traffic which is very sparse in all nodes and computers.	It will not incur substantial traffic and power problem compared with table driven routing protocols.
favourite network	Information latency is a reduce amount when compared to proactive protocols. Low mobility and small ad hoc network.	Data latency is extra when compared with table driven protocols for the reason that a route need to be built. Large network, high mobility but moderate demands.

Route available	A route to each other node in ad-hoc network is at all times available	Not available all the times

Proactive Protocols	**Reactive Protocols**
Every time it will update routing table in the nodes. All the nodes are changing their position often	Reactive protocols not update the routing information as like reactive it will update the information only if it is needed
There is no topology occurs periodically, then the constant propagation in the routing information	There is no periodic updating
Traffic and the power utilization fright in general in mobile and systems	There is no traffic and power consumption. When compared to the on-demand protocols
packet delivery latency is very less when compared to the on-demand protocols	First packet delivery latency is more when compare to the table driven protocols
There is a route to all other neighbour node	That is not available in the reactive protocols

Comparison of AODV with DSR

1. The two most important popular protocols in On-demand distance vector algorithms are AODV and DSR. These two have same Discovery of Route and Mechanism of Maintenance Route in which all routing packets are in all middle nodes along the route.
2. The important contrasts are
3. DSR use source routing: While in AODV, the source node has the entire route from source to destination. Source has the next node and number of intermediate nodes from initiator to target system.

While DSR does not, AODV will sent the Hello information to the all the nodes periodically.

While AODV has only one route for each, DSR will store several paths toward from one target system.

AODV is a proactive and reactive routing protocol, which means that path is created by AODV from a target no more than reactive. AODV is performs good in both unicast and multicast routing. AODV maintains path is like more enviable by initiator. In addition, it will make the trees which connect multicast group members. All the trees are collection of many group member and nodes mandatory to connect with the member. AODV starts path rediscovery when the link will get disconnect, when the DSR finds the new path to the target node in the routing table, AODV has more transparency for path maintenance.

Anyway, DSR will insert each and every node route in the packet header format. This creates bulky data size, more transmit transparency and small efficiency. While AODV may fail, there is no problem with unidirectional links in DSR

Comparison of AODV with OLSR

OLSR as proactive protocol provides huge control traffic transparency over entire network. It saves the bandwidth. OLSR in conditions of cache and memory transparency for the reason that maintains the routing table for all entire networks require a large amount ofcommunication between all nodes more cargo space rather than use AODV. Paths too for no reason used are maintained.Latency is the major drawback of AODV reactive protocol. AODV route finding method will take much more time. This type of hold-up is a critical issue in the network. In addition, a proactive division of AODV enlarges the control messages capability and communication cost. It will spoil the reactive assets of the AODV. Scalability other demerits of AODV protocol: by means of expansion of whole network the standard route length increase, and the future chance path is worthless. So the AODV is effectively works with the minimum appropriate only for small and medium size networks, the scalable maximum value is more 1000 nodes.

DSR

The Dynamic Source Routing protocol is based on source path finding method to transfer packets. DSR must be on familiar terms with the total path to the destination before a sender node sends data packets. Or else, DSR will make the first move a route discovery part by flooding a ROUTE REQUEST (RREQ) message. The ROUTE REQUEST message holds the series of hops it transferred all the way through in the message header. Any nodes in the entire network that have received and repeated ROUTE REQUEST message will not broadcast it once more. The destination node wills response with a path reply packet to the initiator when an ROUTE REQUEST messages reaches the target node. The path reply packet hold path information obtained from the ROUTE REQUEST packet. The sender and all of the traversed nodes will know the path to target when route request packet traverses toward the back to sender. Every node in the entire network uses a path cache to store the entire path to preferred destinations. Route breakdown is detected by the failure of message transmissions. Such a breakdown will start a route error message to the sender. They will remove all the paths that use the broken link from their route cache when the source and the intermediate nodes take delivery of the error message. In DSR, the path calculated is loop-free because loops can be detected with no trouble and removed by the source routing. A small amount of optimizations are planned for DSR. For example, a flooded route query can be quenched.

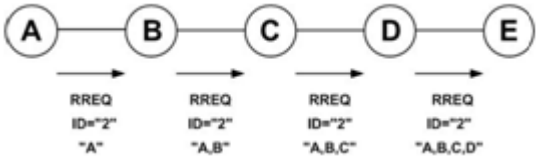
DSR is easy and loop-free. Still, it may waste bandwidth if each end every data packet holds the complete path information. The reply time may be large for the reason that the source node has to stay for a doing well ROUTE REQUEST if there is no path finding data to the future target node is available. Additional together, if the destination is unapproachable from the target node suitable for a network divider, the target system will carry on to send ROUTE REQUEST messages, probably congesting the network. DSR can allow to the network to be entirely self-organizing and self-configuring and does not require any old one network communications or organization.

AODV

As DSR includes the complete route information in the data packet header, it may possibly waste bandwidth and corrupt performance, particularly while the data contents in a packet are little. AODV routing tries to get better performance by maintenance of the routing information in each and every node. The major dissimilarity between these two protocols are that DSR uses source path finding at the same time as AODV uses forwarding tables at each and every node.

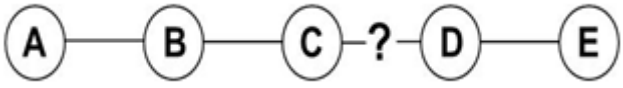
The route is calculated hop by hop in AODV. Hence, the data packet must not contain the total path. AODV route discovery mechanism is extremely like to that in DSR. Any individual of nodes in entire network will place positive a invalidate path pointing in direction of the source when receives an ROUTE REQUEST packet in AODV. When the favourite target or in the middle of node have a new path to target node, the target or in-between node respond by transfer a route reply information reverse to the initiator system via the turnaround route recognized when the path request was forwarded. This process establishes an onward path pointing to the destination, when neighbour node gets the path reply. AODV saves bandwidth and performs fit in a bulky MANET in view of the fact that a data packet does not hold the complete path information.

Since in DSR, the reply time may possibly be huge if the source node's routing table has no entry to the destination and thus be required to determine a path earlier than message transmission. Routing tables which simply contain information regarding next hop and initiator are used for path finding data maintenance. While route linkage disconnects, for example, mobile node is out or choice, neighbour nodes will become aware of the nonappearance of this link. But hence Neighbour nodes will make sure whether there is any route in their routing tables which uses broken down link. But there is unmoving require for packet transmission, sender node will make fresh ROUTE REQUEST packet. In addition, each and every one route contain the not working down linkage must detached from path caches and DSR protocol violently use the initiator path finding and path caches. Original plan of AODV is undertaken after understanding with DSDV routing mechanism. Similar to DSDV, AODV provides loop free routes at the same time as repairing link breakages but nothing like DSDV; it doesn't have need of international episodic routing advertisements. One more important characteristic element of AODV is the capability to give unicast, multicast and broadcast communication. AODV uses the mechanism of a broadcast route discovery algorithm and then the unicast route reply message.



Route Discovery Process in DSR

In the above example figure, node A needs path to node E. It transmits route request packet to their neighbours with a random ID. Neighbours onward that kind of broadcast, and at each and every node, the reverse node entry is additional into the ROUTE REQUEST packet. This can send ROUTE REPLY to node a using reverse route included in the packet, when node E receives this corresponding ROUTE REQUEST. ROUTE REPLY packets have the request ID and reverse route.



Route Maintenance process of DSR

Route maintenance process in the above DSR, Node A is answerable for the flood among the nodes A and B, node B is in charge for the flood between nodes B and C, and so on. If node A is transferring data to node E, by means of earlier cached route, and node C didn't collect whichever acknowledgement from D, then node C deduces the link is out of order and sends ROUTE REQUEST packet to node A and whichever further node who had before used this link. Troubled nodes will take away this route from their table, and use an additional one, or start route discovery process.

CONCLUSION

This analysis shows that reactive protocols are best for ad hoc networks. In above we discussed about AODV protocols and its operation. Unicast and multicast operation gives full details about packet transmission in wireless ad-hoc networks. In DSR protocol we discussed about route discovery and route maintenance. These two protocols describe performance of reactive protocol. In proactive protocols we discussed about the OLSR protocol. Comparative study describes the reactive protocol (AODV and DSR) has efficient output when compare to that other proactive protocols (OLSR) in high mobility network for heavy load. All the routing protocols are doing good performance in wireless network but reactive protocol doing better performance. Because this reactive protocol path finding protocol perform new path discovery and path maintenance. Throughput, delay and load these important parameters are discussed in above chapters. All the reactive proactive protocols are implementing in the OPNET 16.0. By using this OPNET Modeller all the three parameters are implementing.Nowadays wireless networks are performs better operation for exchanging information. For the wireless networks there are so many mechanism perform the better

operation in wireless networks. Path finding is very important in the wireless networks. Routing protocols are performs packets forwarding in the wireless network. Reactive protocols are needed for wireless networks because when the mobile node increases in the wireless network also it will give the good performance. When compare to the proactive protocols. Proactive protocols also gives good performance despite not like a proactive protocol. Throughput, delay and load these are the parameters are implementing in the OPNET Modeller find the better operation protocol in wireless network. The final results of the OPNET Modeller shows that reactive protocols are gives the better performance when compare to the other protocol in the wireless protocol**.** So, we implement reactive and protocol in OPNET Modeller, we have implement in different variety of combination such as 20,25 and 30 nodes despite proactive protocols not efficient in throughput, delay and load when compare to the reactive protocol. So consider about all the results reactive protocols are best in mobile ad- hoc network.

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