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Qos Metrics for end to end Stable Routing in MANET

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***Abstract*—** MANET dynamic routing protocols mainly used in reactive based routing in dynamic scenario and topology is unpredictable and uncertain in these cases, normal routing is not sufficient so we are changed QoS metrics to maintain end to end stable routing in the behavior of routing protocols. We are taken the QoS metrics used in AODV, TORA and DSR dynamic routing protocols and compare and analyzed in different node stupidities.

***Keywords*—** MANET, Routing Protocols, QoS metric parameters.

I. INTRODUCTION

MANET is highly dynamic wireless Networks, in MANET all nodes are moves dynamic way. MANET is not maintained centralized control but it can create self – organized network. In such way all nodes are moves randomly. Therefore, routing topology is unpredictable and uncertain. In the network all nodes act as router [1].

MANET routing protocol mainly categorized into 3 types. The first type is Proactive routing protocol, which is known as a table driven protocols provides the path pre-existing information. The second type is dynamic routing protocols, which is known as an on-demand protocol finds the path when they need. The third type is hybrid routing protocols, which supports both of proactive and dynamic routing mechanism depends on topology change [2]. We are considering the performance metrics are packet delivery ratio, throughput, load and delay in AODV, DSR and TORA.

II. ROUTING PROTOCOLS

Here, we are discussing the performance of the dynamic routing protocols, which are AODV, DSR and TORA

A. AODV (Ad-hoc On Demand Distance Vector routing):
This protocol maintains and constructs the route from the source to destination within it route lifetime. Same as the DSR, the AODV broadcast a routing request from the source node using RREQ packet. Find the path in between the source and destination. All are nodes maintains and originate in sequence no from the source node. The RREP packet establishing path from destination node depends on receiving the RREQ packet sequence number. The transmission of data packets used active routing nodes only [5].

B. DSR - Dynamic Source Routing protocol:
The source node – S, sends a message to target node –D, at that time, verify the path availability in routing table, if the path is not, S begins Route discovery method used RREQ message broad casting to its neighbour nodes, this process continues till the D finds in the network, if it is D, then it accumulated information from RREQ message and copies in RREP message sends to S. In Route Maintenance is when a node fails to reach to D, then RERR message to broadcast to every node [4].

C. TORA - Temporally Ordered Routing Algorithm routing:
It supports more dynamic network, multi-hop wireless network and also it adaptive protocol it depends on link reversal [4]. It can identify more than one path in between the source and destination, the entire process 3 steeps: the route identification, the route recreation and route maintenance. It provides control messages to identify to small clusters at every change of topologies.

III. RELATED WORK

QoS maintains provides a set of information requirements meet data in network routing in between source and destination. the QoS parameters establish the safety parameters to maintains the end to end communications, the QoS requirements not only the requirement of the quick response and error handing purpose , it can be used responds depends on applications responds quickly and constantly changing requirements. The MANETs all the nodes are

mobility nodes so existing Standard QoS routing protocols not suitable.

The QoS parameters respond as quickly as the changes in dynamic topology changes [3].The QoS based routing in MANET is complex to design in default for all routing parameters in the dynamic way to due to high node mobility and efficiently limited resources available bandwidth, memory, Queue size , every node in the network.

QoS routing Challenges: The challenges in QoS mechanisms for MANETs routing [6].

a) *Dynamic topology:*

The change in topology of MANETs is due to mobility node, the lifetime of the node in that network. Moreover, the changes in frequency is more and more than exchanges of control messages with congestion increase, in wireless links have the limited bandwidth. The error controls like link breakages, path loss, finding the path in the routing table, so delay increase, finally it leads transmission network overloads, the route mantes in routing protocols difficult [7].

b) *Wireless channels are Unreliable:*

This is due to Interference of the other channel's data, noise, the path finding effects the packet delivery ratio, reliability, throughput of the network.

c) *Lack of federal control mechanism:*

In MANET create a network on the ad-hoc basis in all the nodes are entering and living the network random. A Lack of federal manage mechanism is an inbuilt condition of the MANET it directly affected by routing protocol performance, so the genuineness of QoS provides depends on the application.

d) *Inaccurate state information:*

The link state information and flow state maintain MANET nodes, the link state delay, network bandwidth, jitter -delay in packets, packet-loss rate , more over it burdens the stability with the likes in the end to end.

The flow specific information identifies source and destination address, ID and QoS requirement parameters like bandwidth, jitter, and delays. It is necessarily due to node mobility and path parameters.

IV. SIMULATION

The work modeller simulation purposes we are using OPNET. It supports deferent communication devices, Protocols, networks [8]. Also provides to design to perform and analyze.

In this we are taken node density 25, 50, 75 and 100 mobile nodes AODV and DSR with TORA for proactive routing protocols. We are followed WLAN standards of IEEE 802.11g for simulation.

AIM of the model analyzes the behaviour of different MANET routing protocols. In the Table 1 show diverse parameters in the simulation. Using the Template

TABLE 1. Simulation PARAMETERS

Simulation Parameter	Value
Simulator	OPNET Modeler 14.5
Area	1000*1000 (m)
Network Size	25, 50, 75 and 100 nodes
Mobility Model	Random way point
Traffic Type	FTP
Simulation Time	600 sec
Address Mode	IPV4
Standard	IEEE 802.11g, 54Mb/s
Routing Protocols	AODV, TORA, DSR

V. EVALUATION RESULT

The simulation results have examined the MANET network performance, AODV and DSR, TORA protocols to take the different density of nodes [9].

We are taken the data type, Area size to be constant. The Data transmission rate is 54 Mb/s, stranded of IEEE 802.11g [8] these calculates performance parameters are [9]:

a) Throughput :

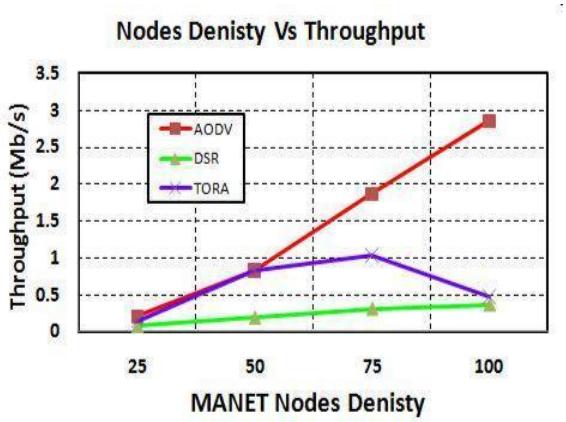

Figure.1. Throughput Vs the different number of nodes.

In Figure 1, AODV has the Throughput is highest. With the increase in node density, then throughput also increases in AODV, In DSR throughput is lowest, but it shows the best, if density increases throughput also increases consistently.

b) Network Load :

In Figure 2 that network Load increases depends on Node Density increases. The AODV protocol shows lowest in the load, in another observation, the Load DSR is improved than the TORA protocol. Here, the performance of AODV protocol is best.

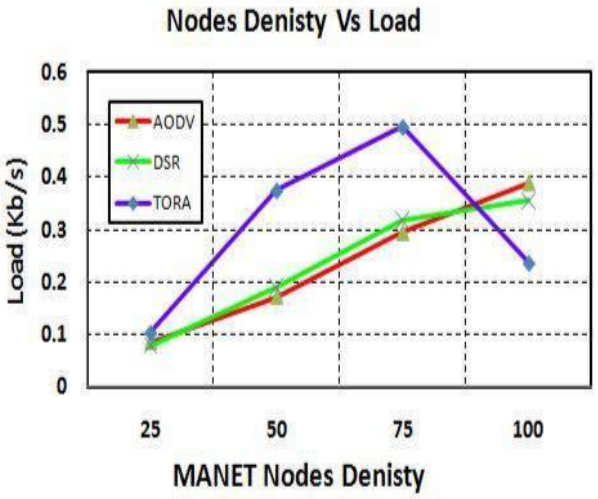

Figure 2. Differentiates between the load and node density.

c) Network Delay:

End-to-End delay has been taken, if delay in End-to-End increases depends on the Node Density increases. In this situation, DSR protocol is improved than the TORA protocol, finally, AODV has the lowest End-to-End delay which shows the best performance.

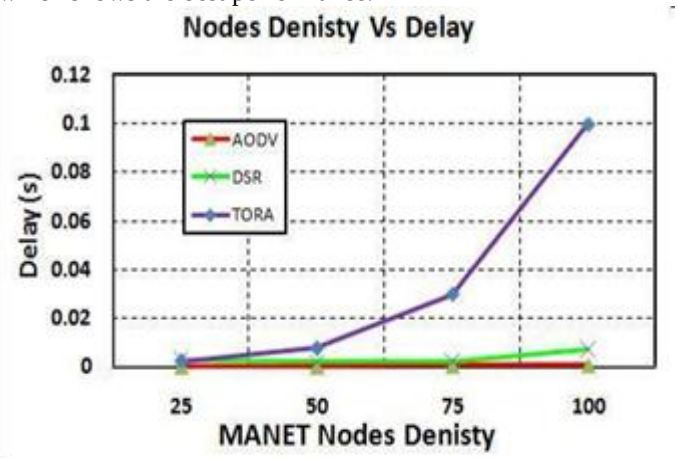

Figure 3. Delay

d) Data Dropped and Retry:

In Figure 4, Data Dropped and Retry increases depend on increasing node density. AODV routing protocols the data packet dropping is very less. Finally, the AODV protocol exhibits best performance.

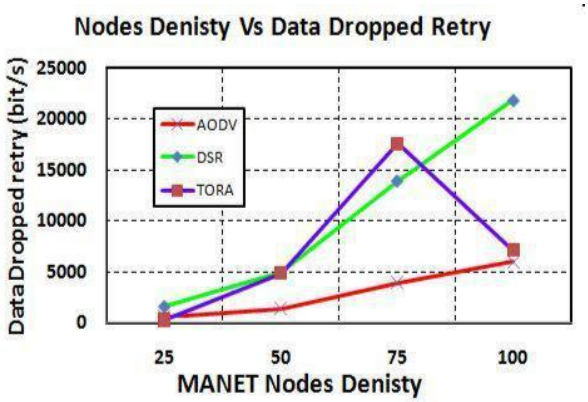

Figure 4. Data Dropped Retry

e) Data packets Dropped:

In Figure 5, in this experiment, no data dropped for AODV and DSR protocols in dissimilar node density. Finally, the nodes increase more than 75; more data packets dropped happened in TORA protocol.

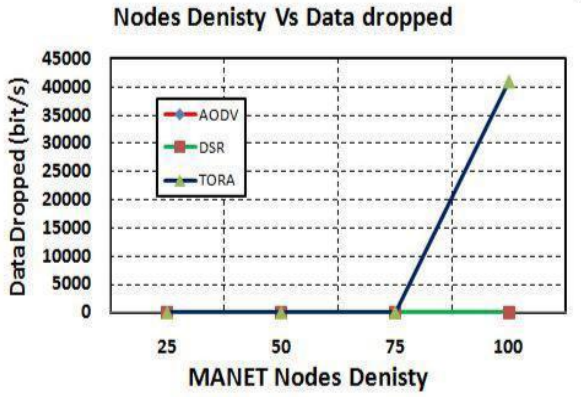

Figure . 5. Data packets Dropped

f) Packets Retransmission Attempts:

In Figure 6: The packet Retransmission Attempt increases if the increasing Node Density. The AODV routing protocols given the best performance in packet Retransmission Attempts. The DSR protocol shows better compared to TORA in packet Retransmission Attempt. Finally, the AODV has the lowest packet Retransmission Attempts is need.

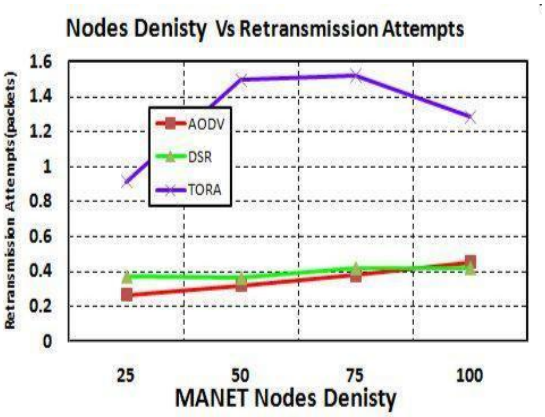

Figure 6. Packets Retransmission Attempts.

g) Media access Delay Vs node density:

In Figure V.7: The Media Access Delay increase depends on Node Density increases. The DSR protocol is better than the TORA protocol in view of media delay. The AODV protocol shows the best performance.

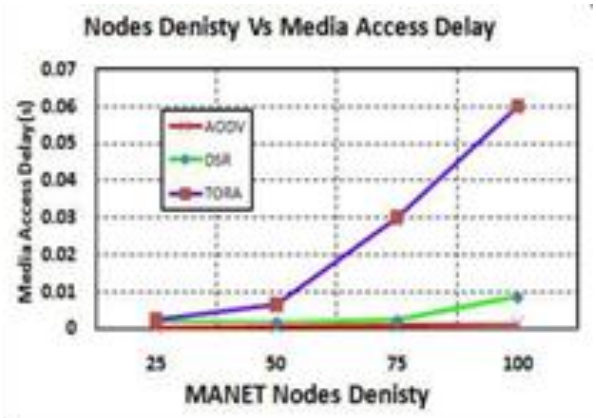

Figure .7. Media access Delay

h) send Routing Traffic:

In Figure 8: The Traffic Sent increases depend on node density increasing. The AODV Routing protocol performs better than other routing protocols.

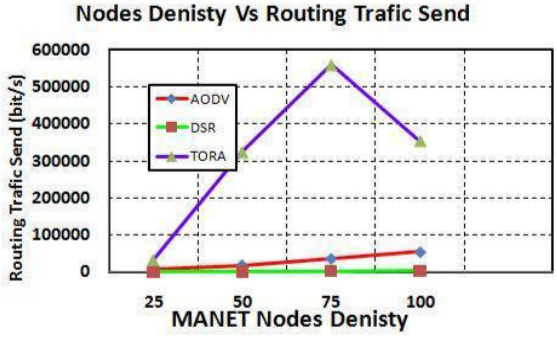

Figure 8. Routing Traffic Send

i) Packet Delivery Ratio:

In Figure 9: AODV and DSR protocols have good the packet delivery ratio (PDR), in TORA protocol shows in rapid down in the packet delivery ratio if node.

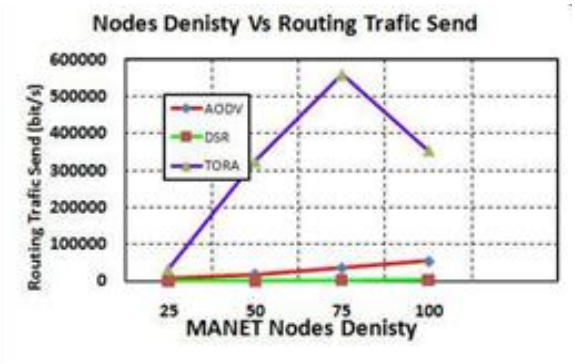

Figure .9. Packet Delivery Ratio

VI. CONCLUSION

Evaluate QoS metrics in diverse reactive protocols as AODV and DSR, TORA. The performance metrics are considering of node density in the WLAN standard IEEE 802.11g network, network Load, End-to-end packet delay, network throughput, packet Retransmission Attempts.

Our implementation analysis exhibits AODV is given the best performances when compared to the other protocols, which is used in QoS metrics data drop retry, load, media access delay, delay, retransmission attempts, in the case of DSR, the best QoS metrics are routing traffic send, throughput. Finally, every protocol behaves in different way in different applications; there are different parameters in a dissimilar environment. The overall AODV gives the best performance when compare to other reactive routing protocols.

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