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# Performance in Heavy Load and in Lower Load Better Performance in MANET

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**Abstract: Mobile ad-hoc network (MANET) is a wireless network without infrastructure. Nodes can commutate each other without central infrastructure; because they are self organized and self configurable with easy deployment. To commutative each other it is required efficient routing protocols in MANET technology. In these I find out an efficient routing protocols for routing, and I had considered differ approaches like routing load, end to end packet delivery and performance of protocols. To analysis this I implemented two different routing protocols which are proactive and reactive. To analysis these aspects I used HTTP high and lower load traffic. And I conclude the efficiency of a network can be achieved by choosing the best suitable protocols based on the network requirement.**

## INTRODUCTION

The complete simulation scenario is implemented in OPNET 14.0, with modeler with DSR, OLSR and AODV routing protocols. These are the default protocol available with OPNET 14.0. The performance of the protocols is measured in terms of throughput and delay parameters. The average time taken by the packet in order to transmit in the network is named as delay where as the total amount of the data received by the receiver from the sender until the end of last packet transmission is known as throughput.

## ROUTING PROTOCOLS PERFORMANCE

To observe this scenario over MANET network in OPNET we have developed 2 simulation scenario which are 10, 20. And which are contains low and high number of nodes. This can be helpful for observing AODV, DSR, OLAR protocols in an office area which is 1000x1000m. The first thing that we have to do analysis the performance of 10 nodes for DSR, OLSR, AODV by using http. This scenario is observed for 1o mints and collected objects. We can observe that from simulation figure 1 showing that when 10 no nodes reactive Routing protocols DSR, AODV very high delay compared to proactive routing protocol OLSR compared of caching delay.

In figure 2 the simulation results for the 10 nodes on DSR, OLSR and AODV protocols over HTTP traffic shows that the throughput for the OLSR routing protocol is higher than that of DSR and AODV routing protocols, because it is independent of traffic and network density compared to reactive routing protocols.

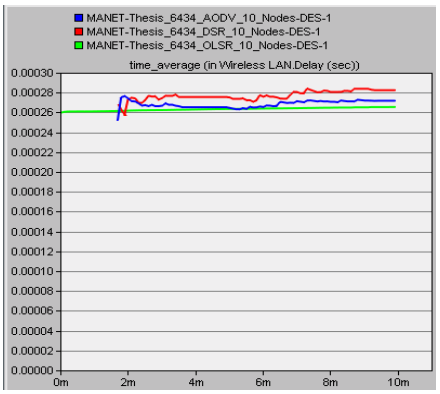


Figure 1 Delay of reactive routing protocols compare to proactive for 10 sec

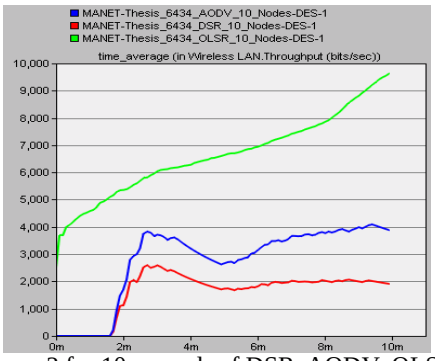


Figure 2 for 10 seconds of DSR, AODV, OLSR

It is observed that reactive routing protocols DSR, AODV delay compared to proactive routing protocols OLSR. Generally reactive routing protocols broadcasts there request to everyone in the network and waits till for response and it may delay and it is observed that high delay on reactive routing protocols DSR, AODV compared to proactive routing protocols. If scenario is extended to 20 nodes and simulation time is 10min. And reactive routing protocols DSR, AODV and proactive protocols OLSR over HTTP traffic server, simulation is analyzed. In the figure 3 observed that when number of nodes are increased to 20, proactive routing protocol OLSR showing delay compared to reactive routing protocols DSR, AODV. Actually it is observer that initially AODV and DSR show high delay, after that they did not show any big variance later. The better performance of reactive protocol AODV than the reactive protocol DSR is due to hop by hop initiation by AODV protocol on increasing number of sources this results in

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less delay in case of AODV than DSR protocol. It is observer that proactive MANET aimed routing table in each node, due to it nature it is delay. Figure 4 show that throughout DSR and AODV is the better performance compared to OLSR routing protocols. Due to their characteristics, means they Maintains routing in each node and updating table all these it degrades performance.

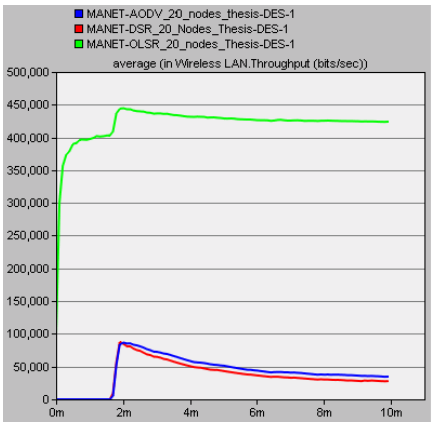


Figure 3 Delay of reactive routing protocols compare to proactive for 10 sec

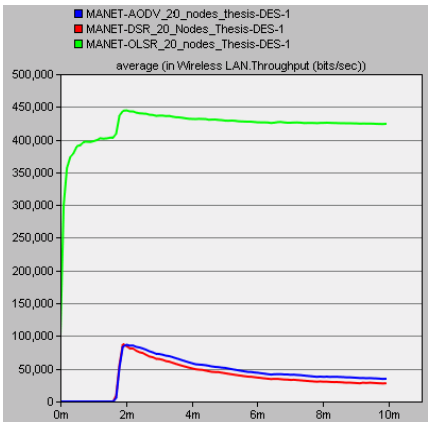


Figure 4 for 10 seconds of DSR, AODV, OLSR

## ROUTING PROTOCOLS LOAD ON MANET NETWORK

The scenario simulation environment is implemented in OPNET14.0 simulator using of DSR, AODV and OLSR routing protocols analyzed varying network load. The simulation consists of two different scenario. 1) HTTP heavy load 2) HTTP light load. These two different profiles HTTP heavy load traffic and HTTP light load traffic respectively this implies number of HTTP requests given by the users in the network designed will be higher in HTTP heavy load than HTTP light load traffic, 20 nodes were considered in each scenario with a constant speed of 10 M/S, and pause time is not considered in this network environment in analyzing the protocol performance and is set to constant0 and then each protocol performance is observed on two different loads using the performance parameters throughput and delay the behavior of protocols is analyzed.

*DSR Routing Load on Network*

In the figure 5 we can observe that delay for this routing protocol even high load in HTTP and lower load traffic. DSR show higher delay on heavy HTTP load traffic and lower delay in Lower HTTP load. The initial delay caused in the DSR protocol both in the high traffic and low traffic is quite high due to the reactive active nature that it needs to find the routes for transmitting the data and when it receive the data for transmission it will result in such incremental delay, and it is also observe that it is decreased and become constant. It found DSR is delay in case of heavy load compare to lower load. In the figure 6 DSR routing protocol shows heavy and lower load for HTTP. It is observed that when lower load, out shows higher output and when higher load less output. If case of lower load DSR shows better increment initially and then it is decreased and MANETained contestant. in the completely less performance in heavy load and in lower load better performance. This is due to change in topology DSR protocol experiences heavy traffic and it is possible to see new destinations to route the traffic and even breakage of existing links, generally DSR protocol Maintains the cache routes and in this case DSR protocol routes the traffic to the stale routes resulted due to breakage of links and this makes the heavy loss of packets resulting lower throughput on increasing network load, further it will implement the route discovery process to establish the new routes and then performs re transmissions this results in excessive delay.

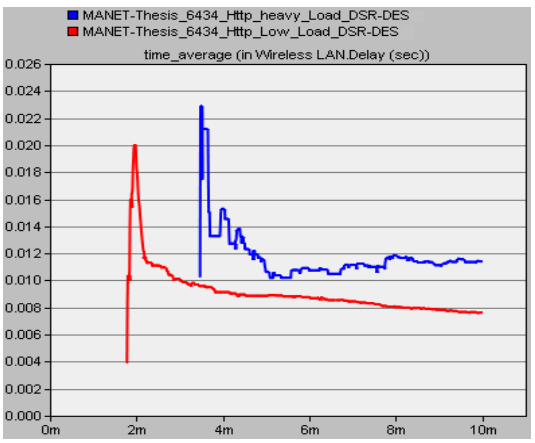


Figure 5 DSR routing load on http server heavy/lower load

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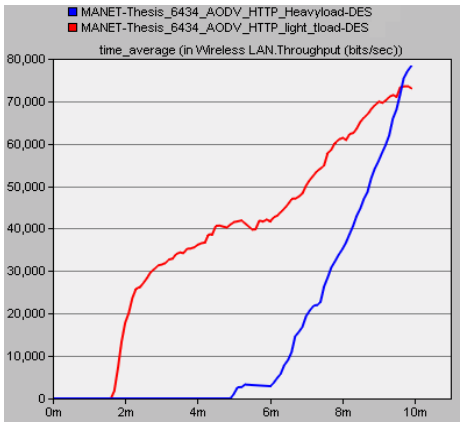


Figure 6 DSR routing load on through http server heavy/lower load

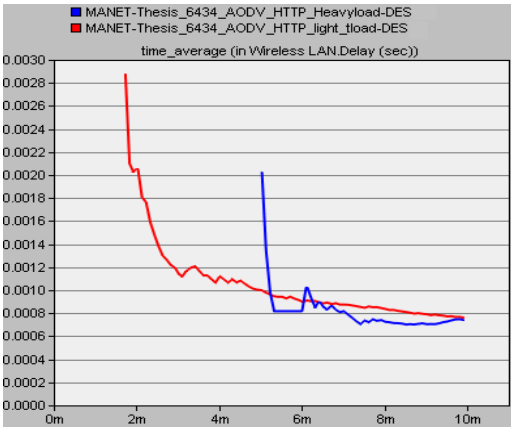


Figure 8 AODV routing load on through http server heavy/lower load

*AODV routing load on network*

This simulation is developed for 20 mobiles are moving 10m/s with a same speed and in this scenario no pause is considered and content is 0. AODV routing protocol is implemented on HTTP heavy and lower load, and performance metrics delay and completely. In the figure 7 we can observe that AODV implemented on HTTP heavy and lower load. It is observed that when AODV routing protocol lower delay when heavy load traffic compared to lower traffic load. Initial delay for the AODV protocol is little high in case of HTTP low load than HTTP high load, the delay for AODV in case both HTTP heavy and low load it decreases gradually and Maintains a constant delay. In the figure 8 we can observe output for AODV to HTTP heavy and lower load. It is observed that there increment throughout HTTP heavy and lower load traffic, even for lower load also. At last it is observer that high throughout on HTTP heavy load then lower load.

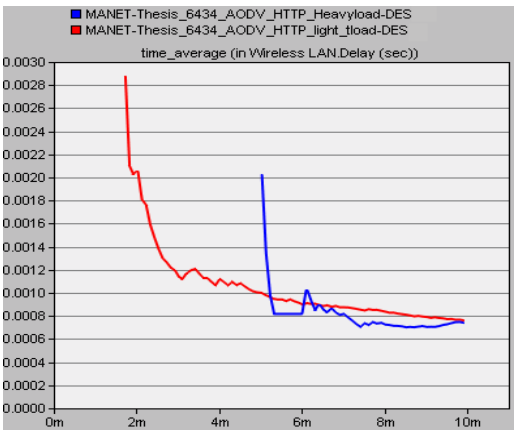


Figure 7 AODV routing load on http server heavy/lower load

*OLSR protocol routing load*

This simulation is developed for 20 mobiles are moving 10m/s with a same speed and in this scenario no pause is considered and content is 0. OLSR routing protocol is implemented on HTTP heavy and lower load, and performance metrics delay and completely. From the figure 9 we can observer that delay of OLSR protocol in HTTP heavy and lower load. It is observed that there is small difference of delay when heavy or lower load traffic. It is observe from graph OLSR protocol shows quite less delay in case of heavy traffic than in case of low load traffic initially and finally it shows in both the heavy and low load cases almost same delay approximately with a slight difference. From the figure 9 complete output of OLSR routing protocol in heavy and lower load traffic. It is observe that there is small difference in the heavy or lower load on HTTP traffic for completely. OLSR protocol due to its proactive nature it will always Maintains and updates its routing table information in each node this will help the OLSR protocol to follow its routing in order to direct the traffic to the destination efficiently though there is increase in network load.

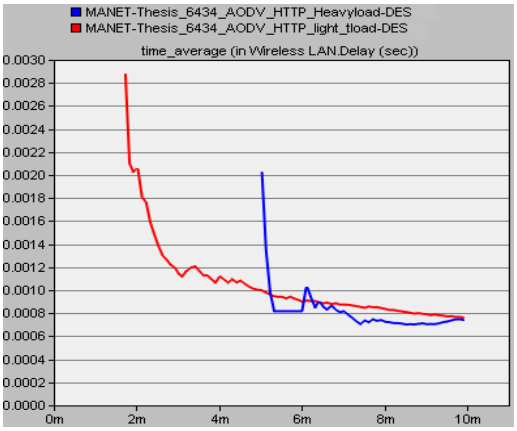


Figure 9 AODV routing load on http server heavy/lower load

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The complete scenario says that AODV is the better performance in heavy load http traffic. AODV protocol unlike the DSR protocol it will not MANETain any cache routes and on changing. Network topology it will setup new routes by the time, this will help AODV protocol to avoid loss of packets and excessive delay thus AODV protocol on HTTP heavy load outperforms HTTP low load, discussed in above.

*Critical evaluation parts of paper*

There are some Critical evaluations in the program and process, like collecting information from different peoples, websites and some other sources. One of the most critical parts of the project is implementation of scenario on OPNET 14. And another most critical part is configuring the designing of scenario and implementation of different modules in OPNET. I unable to implement DSDV routing protocols which is discussed in the previous chapters. But another proactive routing protocol named OLSR which is implemented in the scenario. OPNET GURU Edition is not supports MANET technology, instated of that I used OPNET 14 enterprise edition, which supports MANET technology. Even OPNET14 also supports OLSR routing protocol only. These are some problems which I faced while project implementation.

*Conclusion:* I implemented two different types routing protocols in this project proactive and reactive. This two routing protocols implemented OPNET simulator. The significant observation is, simulation results agree with expected results based on theoretical analysis. The performance of these two protocols measured with different scenario like 1) packet delivery fraction 2) packet delay at end to end point 3) routing load. All this scenario of performance is I comparison of protocols. The simulation results show that proactive routing protocols are better performance then reactive. It is also observed that the in heavy traffic load performance of the AODV is good. And when number of nodes are increased the performance will goes down for DSR. While working with OLSR, OLSR show small difference in entire simulation. Finally, based on our simulation results collected using our network conditions we conclude that the performance of the network rely on the network conditions and we confirm that the efficiency of a network can be achieved by choosing the best suitable protocols based on the network requirement as our results show performance variation on changing the network conditions.

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