DESIGNING of MANET FOR THROUGHPUT AND DELAY CALCULATION WITH VARYING NODES

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Abstract : Mobile Ad hoc network (MANET) is a collection of mobile nodes that are arbitrarily located so that the interconnection between nodes is dynamically changing. In this paper an attempt has been made to explore the analysis work for 5 different routing algorithms (AODV, DSR, OLSR, GRP and TORA) with 2 parameters like delay and throughput. The above work has been simulated through software OPNET 14.5 and has been compared for each nodes group for particular algorithms. In this work, a comparative study is made between different node groups for particular specific algorithm using IEEE802.11g standard with constant speed of 36Mbps. All traffic node groups (20, 40, 60) are compared for 5 different routing algorithms in terms of delay and throughput.

IndexTerms **– MANET,AODV,DSR,OLSR,GRP,TORA**

I. INTRODUCTION

In the field of communication many changes in way of communication are occurring day by day. MANETs have many properties like it can be set up anywhere, nodes can perform the roles of both hosts and routers, multi-hop radio relaying, operating without a central coordinator, autonomous, no infrastructure needed and Instant deployment. Routing protocols are used to find out routes between mobile nodes. But due to some shortcomings like topology changes, bandwidth constraint and power constraint MANETs gives delay in particular network communication and sometimes it is difficult to find routes. There are different routing algorithms (protocols) available like AODV, DSR, OLSR, GRP and TORA for providing efficient routes between mobile nodes, but it is difficult to identify which algorithm performs best at different traffic conditions. To resolve this problem we have analyzed these algorithms in different situations of traffic. Hence the motivation of this paper is to analyze different algorithms for different mobile node groups in terms of delay and throughput.

II. DESIGNING OF NETWORK

Work Scenario

TABLE 1 : Simulation Parameters and their Value

Simulation Parameters	Value
Routing protocols	AODV, DSR, OLSR, GRP and TORA
Data rate	36Mpps
Transmit power	0.005W
Topology	Circular
Mobility profile	Random waypoint
IEEE standard	802.11g
Area	5000m^2
Applications	FTP and HTTP

To design 20 nodes MANET select node value 20 and the above parameter given in table 1 are applied then the steps being followed are as shown below figure.1-

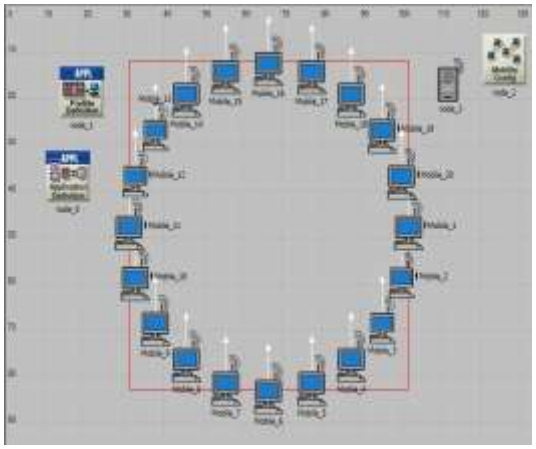

Fig.2: 20 node MANET

To design 40 nodes MANET select node value 40 and the above parameter given in table 1 are applied then the steps being followed are as shown below figure.2 -

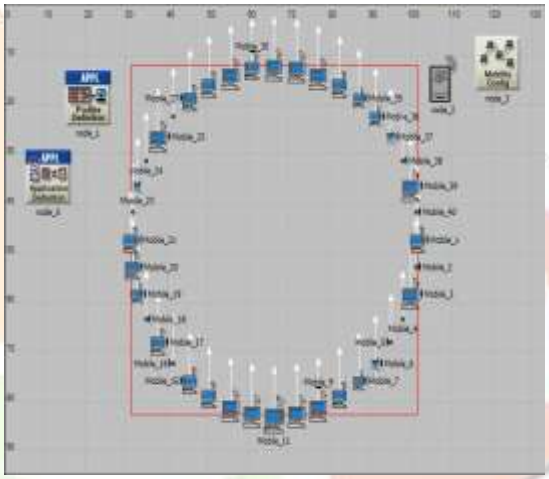

Fig.2: 40 node MANET

To design 60 nodes MANET select node value 60 and the above parameter given in table 1 are applied then the steps being followed are as shown below figure.3 –

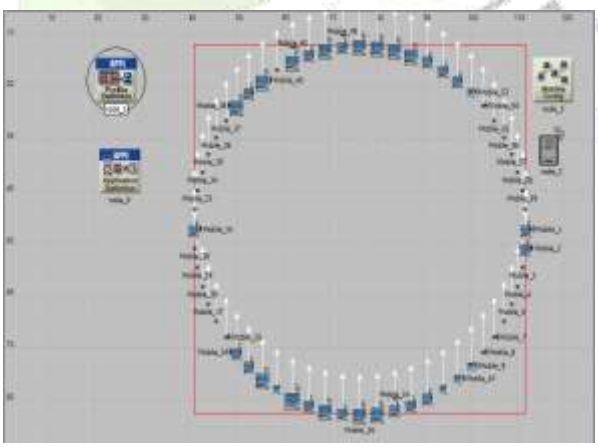

Fig.3: 60 node MANET

III. RESULTS AND DISCUSSION

3.1 AODV Delay Parameter Analysis

In this simulation, routing protocol AODV is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and delay parameters are analyzed. Simulation shows that as the no. of mobile nodes increase delay also increases as shown in graph. For individual 20, 40 and 60 nodes the delay is high initially and then decreases continuously.

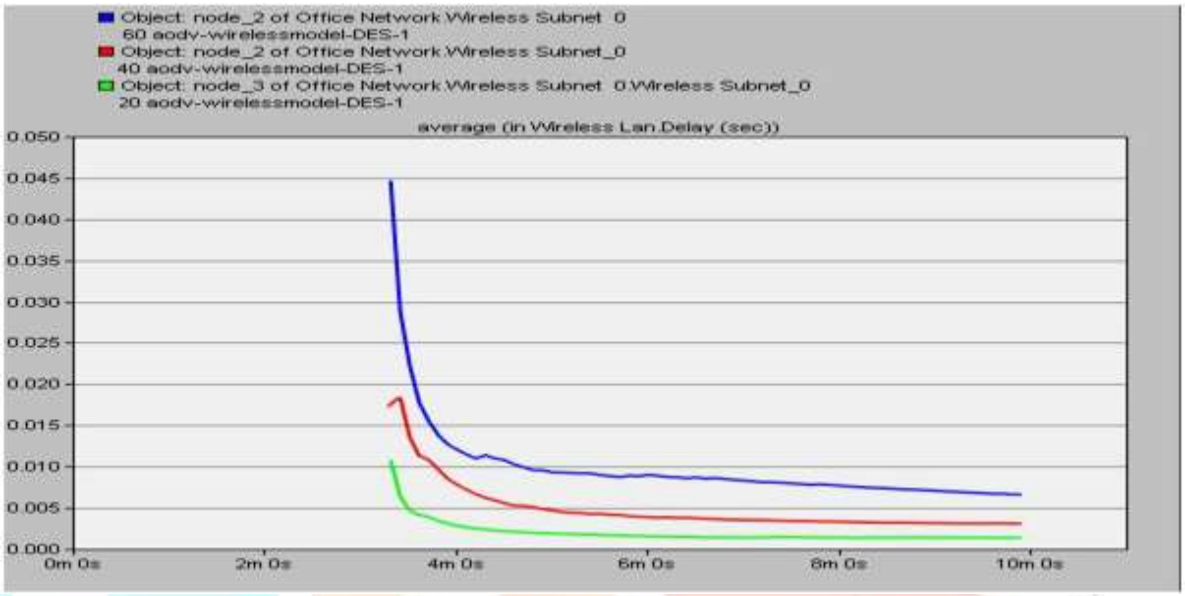

Fig.4: Comparison Graph of Delay for AODV (20, 40, 60)

3.2 AODV Throughput Parameter Analysis

In this simulation, routing protocol AODV is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and throughput parameters are analyzed. Simulation shows that as the no. of mobile nodes increase throughput also increases as shown in graph. For individual 20, 40 and 60 nodes the load parameter increases initially very fast and then become constant.

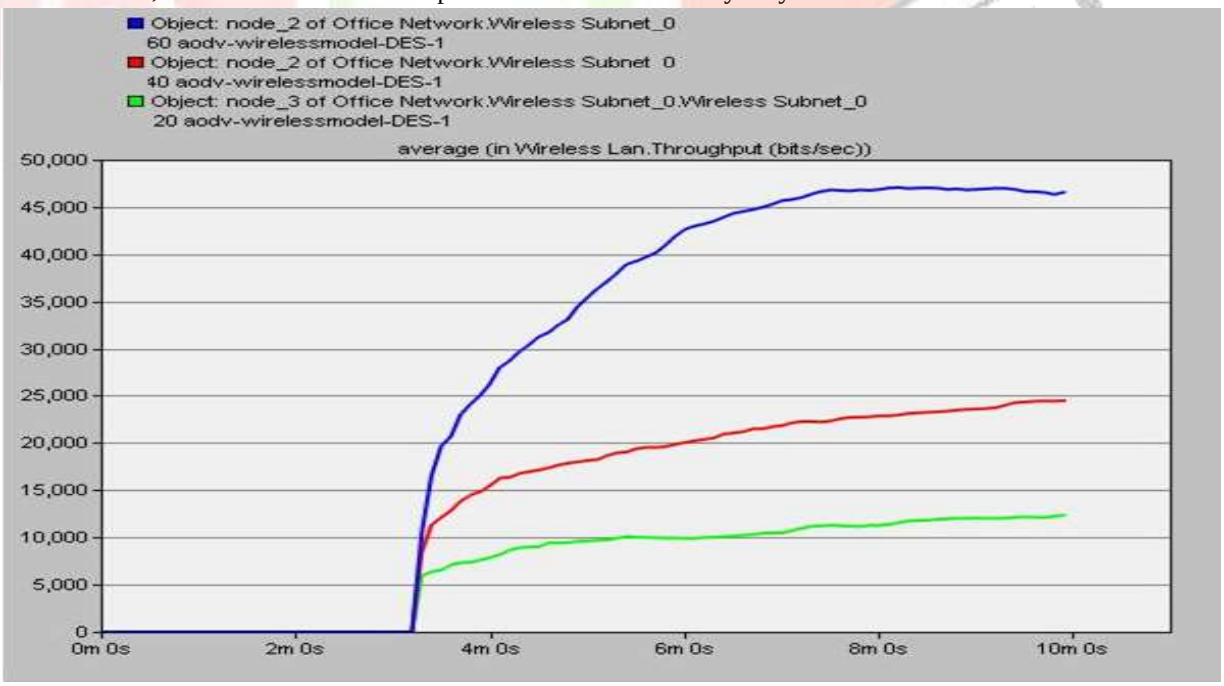

Fig.5: Comparison Graph of Throughput for AODV (20, 40, 60)

3.3 DSR Delay Parameter Analysis

In this simulation, routing protocol DSR is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and traffic delay parameters are analyzed. Simulation shows that as the no. of mobile nodes increase delay also increases but at very high traffic DSR response breaks down as shown in graph. Delay becomes very high at high traffic and for low traffic it is negligible.

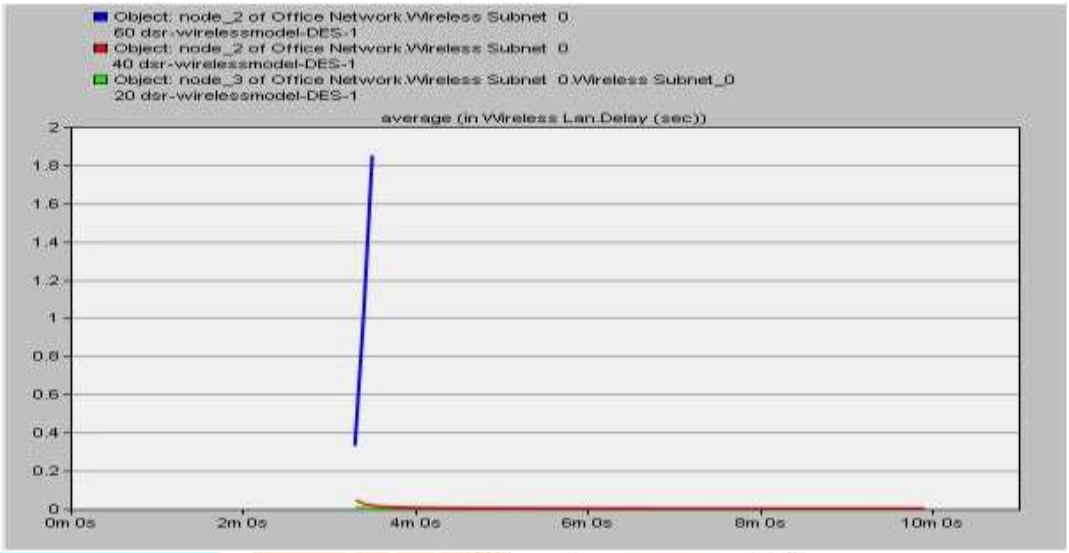

Fig.6: Comparison Graph of Delay for DSR (20, 40, 60)

3.4 DSR Throughput Parameter Analysis

In this simulation, routing protocol DSR is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and throughput parameters are analyzed. Simulation shows that as the no. of mobile nodes increase throughput also increases but at very high traffic DSR response starts disappearing as shown in graph.

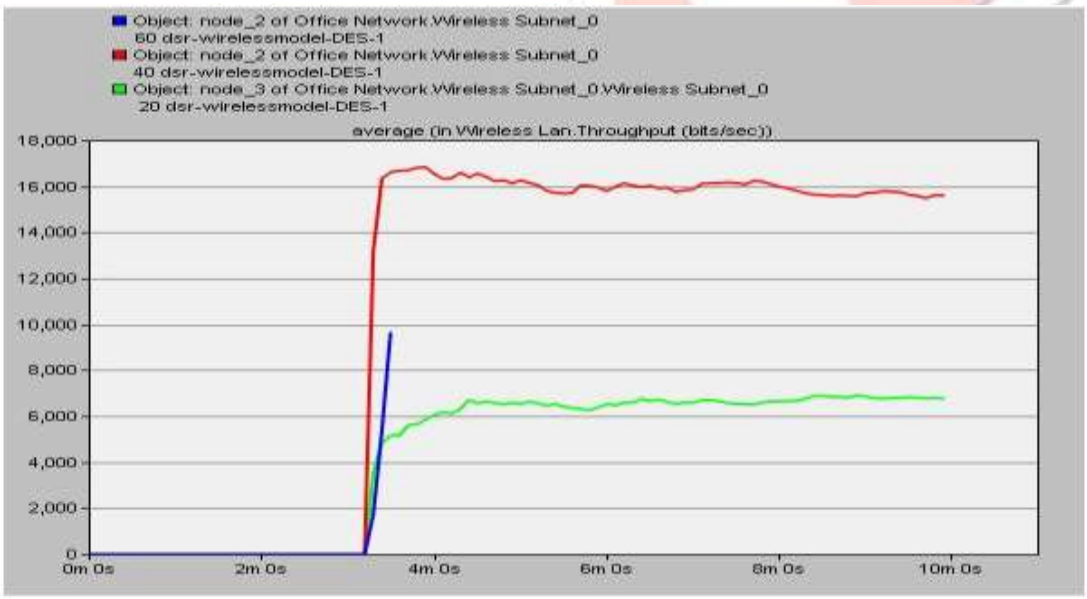

Fig.7: Comparison Graph of Throughput for DSR (20, 40, 60)

3.5 OLSR Delay Parameter Analysis

In this simulation, routing protocol OLSR is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and delay parameters are analyzed. Simulation shows that as the no. of mobile nodes increase delay also increases but in contrast to DSR and AODV delay initially low than start to increase in OLSR as shown in graph.

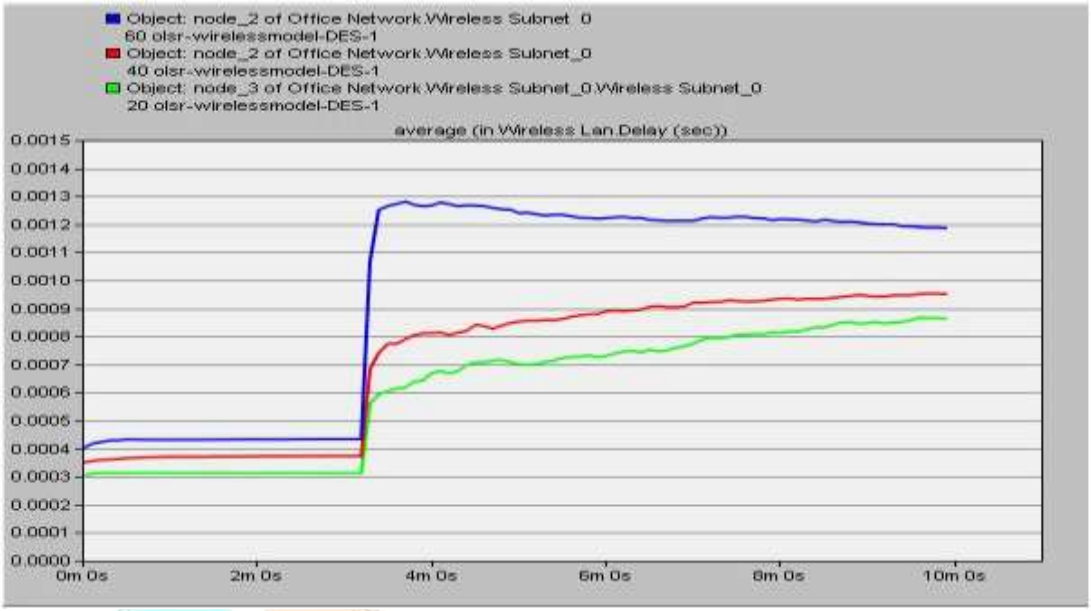

Fig.8: Comparison Graph of Delay for OLSR (20, 40, 60)

3.6 OLSR Throughput Parameter Analysis

In this simulation, routing protocol OLSR is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and throughput parameters are analyzed. Simulation shows that as the no. of mobile nodes increase throughput also increases as shown in graph.

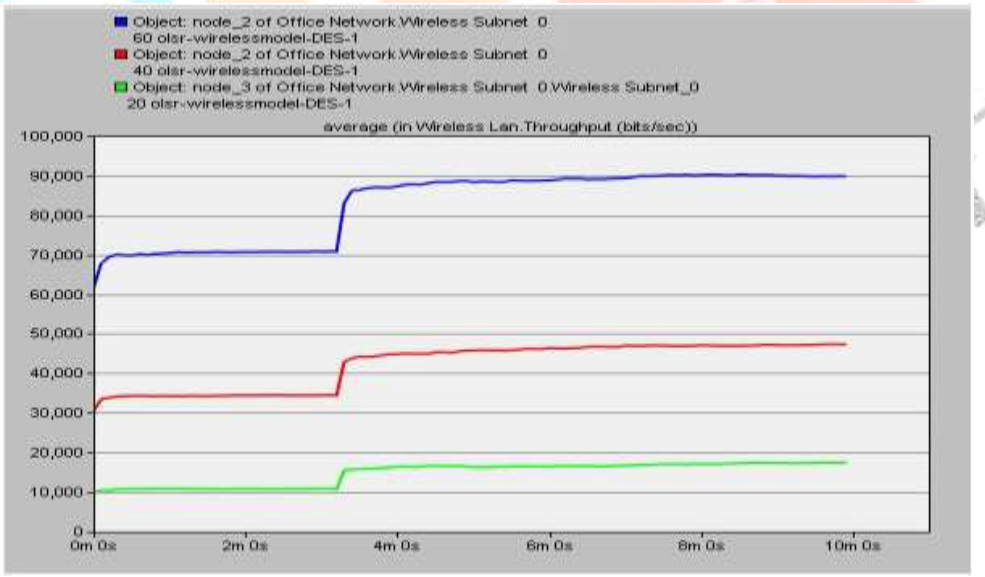

Fig.9: Comparison Graph of Throughput for OLSR (20, 40, 60)

3.7 GRP Delay Parameter Analysis

In this simulation, routing protocol GRP is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and delay parameters are analyzed. Simulation shows that as the no. of mobile nodes increases delay also increases but for each node delay starts negatively and then becomes constant and at last increases positively as shown in graph.

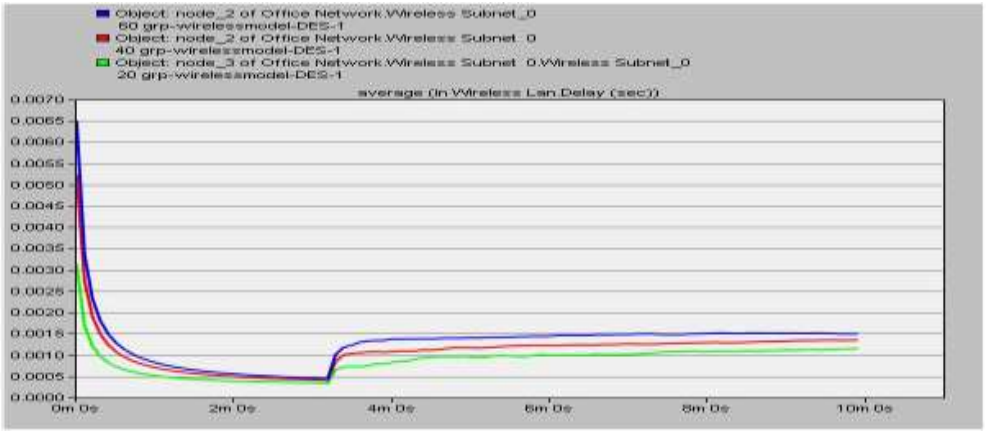

Fig.10: Comparison Graph of Delay for GRP (20, 40, 60)

3.8 GRP Throughput Parameter Analysis

In this simulation, routing protocol GRP is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and throughput parameters are analyzed. Simulation shows that as the no. of mobile nodes increase, throughput also increases but for each node bit transmission is starts negatively then became constant and at last increases positively as shown in graph.

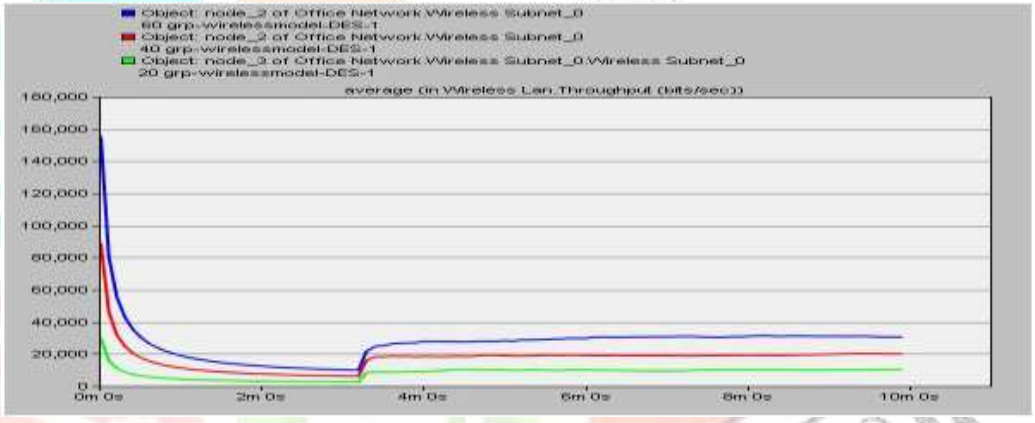

Fig.11.Comparison Graph of Throughput for GRP (20, 40, 60)

3.9 TORA Delay Parameter Analysis

In this simulation, routing protocol TORA is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and delay parameters are analyzed. Simulation shows that as the no. of mobile nodes increase, delay also increases as shown in graph.

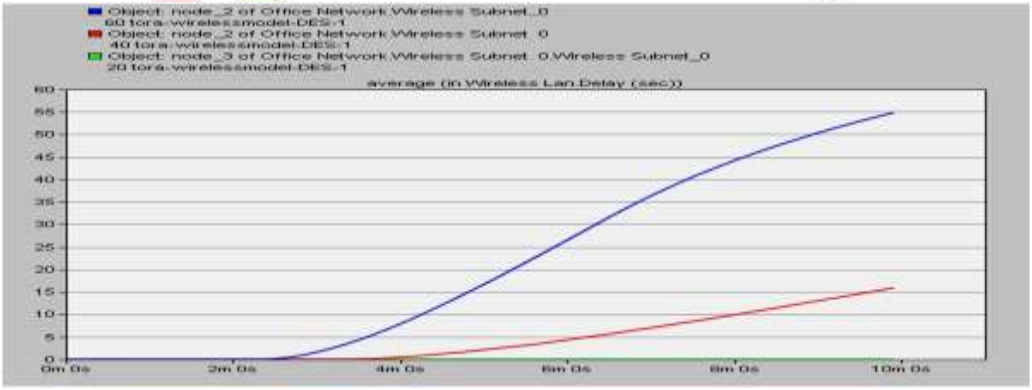

Fig.12: Comparison Graph of Delay for TORA (20, 40, 60)

3.10 TORA Throughput Parameter Analysis

In this simulation, routing protocol TORA is applied simultaneously to the 20, 40 and 60 MANET mobile station nodes and throughput parameters are analyzed. Simulation shows that as the no. of mobile nodes increase, throughput decreases in contrast to all other routing algorithms as shown in graph.

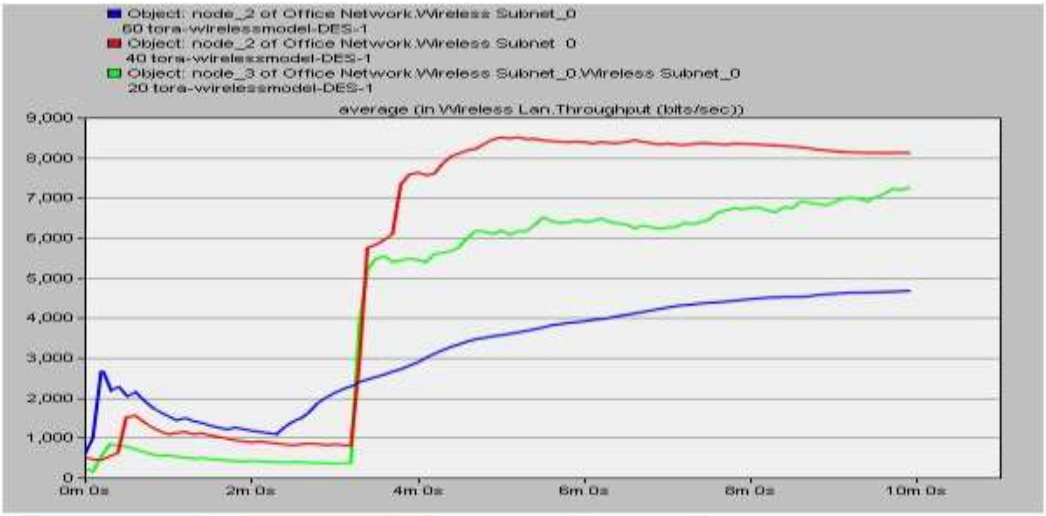

Fig.13: Comparison Graph of Throughput for TORA (20, 40, 60)

Table 2: Observation for different parameters

	Analysis for 20 Nodes in MANET		Analysis for 40 Nodes in MANET		Analysis for 60 Nodes in MANET	
Algorithm	Delay(Sec)	Throughput (bits/sec)	Delay(Sec)	Throughput (bits/sec)	Delay(Sec)	Throughput (bits/sec)
AODV	0.001	12000	0.004	24000	0.007	46000
DSR	0.001	7000	0.001	16000	increase	Increase
OLSR	0.00086	18000	0.00093	49000	0.0012	90000
GRP	0.0012	15000	0.0014	20000	0.0015	25000
TORA	0	7000	15	8000	55	5000

IV: CONCLUSION

From the above simulation result's conclusion can be summarize as -

- AODV performs best at every level node (20, 40, 60) mostly for throughput for both application ftp and http. Delay for every node is also good.
- DSR performs well only at low level (20, 40) and for 60 nodes its characteristic are undeterminable for application ftp and http.
- OLSR performs best for delay characteristics. For throughput parameter its characteristics are the best.

V: REFERENCES

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