

**Performance Evaluation Of AODV And DSR Routing Protocols using
VOIP In MANET-Based Over IPv6 networks**

By

Mohamed Salah Ahmed Ibrahim



**- LIBRARY -
INFRASTRUCTURE UNIVERSITY
KUALA LUMPUR**

**Project Paper Submitted in Partial Fulfillment of the Requirement for the Master in
Information Technology in the Faculty of Creative Media and Innovative Technology**

IUKL

2016

DECLARATION

I declare that, this thesis, entitled "Performance evaluation of AODV and DSR routing protocols using VOIP in MANET-Based over IPv6 networks" is the result of my own work except as cited in the references. This report has not been previously submitted for any degree and is not concurrently submitted in candidature of any other degree

Signature: 

Full name: MOHAMED SALAH AHMED IBRAHIM

Matric Number : 143914185

Date: 17th March 2016

ACKNOWLEDGMENT

I thank God almighty for helping me and giving me the strength to finish this project. Also

I thank him for make it easy for me to finish my study courses.

I would like to express my deepest gratitude to my supervisor **DR. MOHAMMED AWADH AHMED BEN MUBARAK** for his constant support in making this project easy.

I would like to express my sincere indebtedness and gratitude to my parents and to my dearest siblings for their love, dream and sacrifice throughout my life. I cannot find the appropriate words that could properly describe my appreciation for their devotion, support and faith in my ability to attain my goals. I would like to acknowledge their comments and suggestions, which was crucial for the successful completion of this project.

Finally I would like to dedicate this project to my father, my loving mother; for their prayers, patience, devotion and encouragement throughout the entire time spent in completing this project.

I say thank you all.

TABLE OF CONTENT

DECLARATION PAGE.....	ii
APPROVAL PAGE.....	iii
ACKNOWLEDGMENT.....	iv
ABSTRACT.....	v
TABLE OF CONTENT.....	vi
LIST OF FIGURE.....	x
LIST OF TABLES.....	xi
CHAPTER 1: INTRODUCTION	
1.1 INTRODUCTION.....	1
1.2 PROBLEM STATEMENTS.....	2
1.3 OBJECTIVES.....	2
1.4 RESEARCH SCOPE.....	3
1.5 RESEARCH MOTIVATION.....	3
1.6 RESEARCH CONTRIBUTION.....	3
1.7 RESEARCH TOOLS.....	3
1.8 CONCLUSION.....	4
CHAPTER 2: LITERATURE REVIEW	
2.1 INTRODUCTION.....	5
2.2 IPV4 AND IPV6 NETWORKS.....	5
2.3 MANET APPLICATIONS.....	6
2.3.1 ENVIRONMENT APPLICATIONS.....	7
2.3.2 APPLICATIONS IN COMMERCIAL AREA.....	7
2.3.3 TRACKING APPLICATIONS.....	7
2.4 WSNS COMPARISON WITH MANETS.....	8
2.5 ROUTING PROTOCOLS CLASSIFICATION IN MANET.....	10
2.5.1 PROACTIVE ROUTING PROTOCOLS.....	10
2.5.2 REACTIVE ROUTING PROTOCOLS.....	11
2.5.2.1 AD HOC ON-DEMAND DISTANCE VECTOR.....	11
2.5.2.2 DSR ROUTING PROTOCOL.....	12

2.6	PREVIOUS CASE STUDIES	13
2.7	CONCLUSION.....	16

CHAPTER 3 : RESEARCH METHODOLOGY

3.1	INTRODUCTION.....	17
3.2	BUILD THE SIMULATION ENVIRONMENT.....	18
3.3	IPV4 & IPV6 BASE.....	20
3.4	ROUTING PROTOCOL TEST.....	20
3.5	NUMBER OF NODE.....	20
3.6	CAPTURE THE OUTPUT.....	20
3.7	ANALYZE AND INTERPRET THE OUTPUT.....	21
	3.7.1 NUMBER OF HOP PER ROUTE.....	21
	3.7.2 THROUGHPUT.....	21
	3.7.3 END TO END DELAY.....	22
3.8	REPORTING THE RESULTS.....	22
3.9	CONCLUSION.....	23

CHAPTER 4: IMPLEMENTATION OF SIMULATION

4.1	INTRODUCTION.....	24
4.2	SIMULATION ENVIRONMENT.....	25
4.3	CONCLUSION.....	36

CHAPTER 5: RESULTS OF SIMULATION

5.1	INTRODUCTION.....	37
5.2	RESULTS AND DISCUSSION.....	37
	5.2.1 NUMBER OF HOP PER ROUTE.....	38
	5.2.2 THROUGHPUT.....	40
	5.2.3 END TO END DELAY.....	42
5.3	ANALYSIS OF THE RESULT.....	44
	5.3.1 NUMBER OF HOP PER ROUTE.....	44
	5.3.2 THROUGHPUT.....	46
	5.3.3 END TO END DELAY.....	47
5.4	CONCLUSION.....	48

CHAPTER 6: CONCLUSION AND FUTURE WORK

6.1 CONCLUSION..... 49
6.2 FUTURE WORK..... 50
REFERENCE..... 51

LIST OF FIGURE

Figure 2.1	MANET routing protocols.....	10
Figure 2.2	Route discovery IN AODV.....	12
Figure 3.1	Steps of a systematic simulation study.....	18
Figure 3.2	Simulation scenario.....	19
Figure 4.1	OPNET modular 14.5 interface.....	26
Figure 4.2	Wireless network deployment.....	26
Figure 4.3	Wireless network deployment interface.....	27
Figure 4.4	Wireless network deployment location.....	27
Figure 4.5	Wireless network deployment technology.....	28
Figure 4.6	Wireless network deployment geographical and node placement	28
Figure 4.7	Wireless network deployment model node.....	29
Figure 4.8	Wireless network deployment summary.....	29
Figure 4.9	Network scenario.....	30
Figure 4.10	Node attributes.....	31
Figure 4.11	Clear IP addresses.....	32
Figure 4.12	IPV6 addresses.....	32
Figure 4.13	Object palette tree.....	33
Figure 4.14	Final network	33
Figure 4.15	RX group configuration.....	34
Figure 4.16	Application configuration.....	34
Figure 4.17	Profile configuration.....	35
Figure 4.18	Choose result.....	35

LIST OF TABLES

2.1 Comparison of WSN and MANET networks.....	9
3.1 Simulation parameters.....	19

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

A mobile ad hoc network (MANET) is a self-arranging network of mobile nodes linked by wireless links. In other words, a MANET is a group of communication nodes that wish to talk with each other, but has no fixed infrastructure and no predetermined topology of wireless links. Any node in a MANET is free to move in any direction, and that will change its links to other nodes regularly. Single nodes are responsible for automatically looking for other nodes that they can communicate with it directly. Due to the limitation of each node transmission coverage, not all of the nodes can interconnect directly with each other. Each node must forward packets that is unrelated to it and act like a router. The main challenge in initiating a MANET is preparing each device to constantly prepare the information required to correctly route the traffic. Therefore, nodes are required to transmit packets that belong to other nodes in order to carry the data through the network. The important feature of ad hoc networks is the changes in connections and link characteristics are presented in node mobility and power control practices. The main goal in this project is evaluating the performance of AODV and DSR routing protocol in MANET based in IPv6 networks. From here we can analyze the results and notice the effect by these routing protocols on applications.



REFERENCE

- A. K. Dwivedi (2009) "Performance of Routing Protocols for Mobile Ad hoc and Wireless Sensor Networks: A Comparative Study".
- Amritbir Singh (2013) "Comparative Analysis of OLSR and AODV under IPv6 Environment"
- Anu Arya, Jagtar Singh (2014) "Comparative Study of AODV, DSDV and DSR Routing Protocols in Wireless Sensor Network Using NS-2 Simulator" International Journal of Computer Science and Information Technologies, Vol. 5 (4),
- Baran Kiziltan, Majid Khan and Francesco M. Velotti (2011) "Performance Evaluation of Efficient and Reliable Routing Protocols for Fixed-Power Sensor Networks." IEEE.
- Dipti Chauhan (2014) "Performance Evaluation of Different routing protocols in IPv4 and IPv6 networks based on Packet Sizes".
- Jagdeep Kaur, Rupinder (2014) "A Simulation Based Performance Analysis of AODV and DSDV Routing Protocols in MANETs" August
- Jenq-Shiou Leu, Yun-Sun Yee (21 Sept. 2009). "Scrutinizing Performance of Ad Hoc Routing Protocols on Wireless Sensor Networks".
- J. N. Al-Karaki and A. E. Kamal, (2004) "Routing Techniques in Wireless Sensor Networks: A Survey", IEEE Wireless Communications,
- Krishna Kumar Chandel (2012) "Performance Analysis of Routing Protocols Based on IPV4 and IPV6 for MANET"
- Marcin Matuszewski, Esko Kokkonen, (2009). "Performance Evaluation of Wireless Sensor Network Routing Protocols for Real Time Application Support"

Mohd Nazir Ismail(2011) " *A Performance Comparison of Multi-Hop Wireless Ad Hoc Network Routing Protocols.*" IEEE,.

Nandini Mukherjee, Niladri Chakraborty(2011). " *Simulation Based Evaluation of MANET Routing Protocols for Static WSN.*" IEEE.

Pradeep Kumar Gaur(2013) " *Effect of AODV Routing Protocol and IPV6 Addressing on Heterogeneous Wireless Ad-Hoc Networks*"

Rajashree.V.Biradar,V.C.Patil, Sawant, Dr. R.R. Mudholkar, " *Classification and Comparison of Routing Protocols in Wireless Sensor Networks, Special Issue on Ubiquitous Computing Security Systems*".

Rohani Bakar, Muhammad Ibrahim. (2012) " *Performance Evaluation of AODV, DSDV & DSR Routing Protocol in Grid Environment*" , IEEE.

Sabin Bhandari and Sangman Moh (2014)" *Feasibility Study of DSDV and AODV Routing Protocols in Mobile Sensor Networks* " Contemporary Engineering Sciences, Vol. 7.

V. Ramesh, Dr. P. Subbaiah, N. Koteswar Rao and M. Janardhana Raju, (2010) " *Performance comparison and analysis of DSDV and AODV for MANET,*" International Journal on Computer Science and Engineering, vol. 02, pp. 183-188.

Vaishnavi, V. & Kuechler, B. (2012) " *Simulation, Analysis and Performance Comparison among different Routing Protocols for Wireless Sensor Network*".