iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** I **Month of publication:** January 2018

DOI: http://doi.org/10.22214/ijraset.2018.1056

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor :6.887
Volume 6 Issue I, January 2018- Available at www.ijraset.com

Performance Measure on the basis of Scalability and Mobility in AODV and OLSR

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Abstract: This Paper contributes Shorts information to AODV and OLSR for MANET's and defines the data delivery in mobile Ad-Hoc Network. There are many perimeters in MANET's such that network size, end to end delay throughput and packet delivery ratio on demand distance vector and optimizing link state routing. This simulation experiment showed that the OLSR protocol can efficient for data delivery as compared with OLSR protocol.

Keywords: AODV; OLSR; Throughput; MAC; Packet; Wireless Network

A. Terminology: The following acronym are used in this paper

1) Wireless network
2) Optimizing link state routing(OLSR)
3) Wireless routing protocol
4) Ad-Hoc on demand distance vector routing
5) DSDV
6) GRP(geographical routing protocol)
7) ZRP(Zone routing protocol)
8) TORA
9) MPR-multipoint relay
10) RREQ- Route request
11) RREP-Route reply
12) RERR –Route reply
13) TC-Topology control
14) MID-(Multiple interface declaration)

I. INTRODUCTION

An Ad-Hoc wireless network consists of a collection of geographically distributed that communicate over wireless links without the aid of any static infrastructure or centralized control. Mobile Ad-Hoc network MANET is a quickly deployable, self-configuring of mobile nodes. There is no need for existing infrastructure like base station or access point to function properly nodes is mobile in network. The network is highly dynamic. A satisfying performance can be achieved from wireless network configuration. The success relies upon the parameters such as size of the underlying network, network capacity coverage, topology control traffic control and monitoring, interaction between the node forming network topology, security protocol involved cross layer designing and many such as factors. Basically routing protocols are divided into three categories Proactive, Reactive & Hybrid**.** That is represented by diagram.

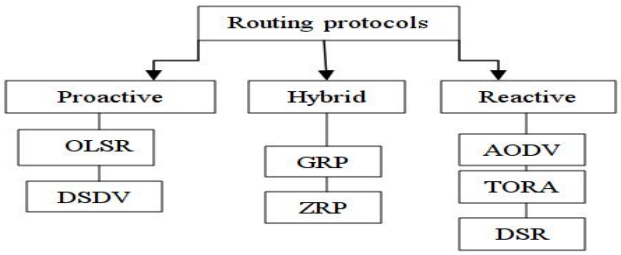


Figure 1 Routing Protocol

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Proactive routing protocols are table driven routing protocol & they always maintain current up to date routing information by sending control message periodically between the hosts which update their routing table. The proactive routing protocols use link state routing algorithm which frequently flood the link information about its neighbors. Reactive or on demand routing protocols create routes. When they are needed by source host & these routes are maintained while they are needed. Hybrid protocol is both the above protocols using the OLSR & DVR algorithm. There are existing hybrids protocols are ZRP, GRP. Our goal is to carry out performance study of two routing protocols for Ad-Hoc. Namely Ad-Hoc on demand distance vector (AODV) Routing protocol and OLSR.

II. OVERVIEW OF PROTOCOLS

The paper measure the performance between the two protocols one from the proactive routing protocols i.e. optimized link state routing algorithm & other reactive routing protocols (AODV).

A. Ad-Hoc on demand distance vector routing protocol

AODV is a type of reactive routing protocol which Implements the Bellman ford distance vector routing algorithm to determine the existing shortest path from source to destination node in a wireless Routing.

Ad-Hoc on demand distance vector routing protocol supports both unicast & multi-cast routing. Basically route request (RREQ) is used to request the route while route reply (RREP) is used for the reply & Route error (RERR) are control message used.

Whenever there is no predefine path from source to destination the source node floods a RREQ control message throughout the network which contains source IP address, Route Request ID (RREQ) which together uniquely identifies a (RREQ) & sequence number of source & destination nodes.

Every intermediate node compares its sequence number with the destination sequence number of (RREQ).Control message & the resulting shortest path reply is made through the destination node.

Sometimes may be multiple replies through RREP control message as there are multiple routes from source–to -destination the best path chosen through route discovery.

AODV receives the numerous benefits of less overhead, unicast and multi-cast transmission, Response to topological changes & on demand route discovery.

1) Disadvantage: expiry time for source to destination node is arduous the growing size of AODV affects the overall performance.

B. Optimizing Link State Routing Protocols (Olsr)

OLSR is a proactive routing protocol for mobile ad-hoc networks. The protocol inherits the stability of a link state algorithm and has the advantage of having routes immediately available when needed due to its proactive nature. OLSR is intended designed to work in a completely distributed manner and does not depend on any control entity. OLSR is developed for mobile ad- hoc network operates as a table driven, proactive protocol, i.e. Exchange topology information with other nodes of the network regularly. Each node selects a set of its neighbor nodes as 'Multi point-Point- Relay' (MPR). In OLSR, only nodes selected as such as MPRs are responsible for forwarding control traffic, intended for diffusion into the entire network. MPRs provide an efficient management for flooding control traffic by reducing the number of transmission required. The 3 kinds of control messages used are Topology Control (TC) and Hi messages and Multiple Interface Declaration (MID). The Hi messages are steadily flooded throughout the network to the neighboring nodes to maintain the routing table; TC includes MPR Selector List that broadcast the information about its publicized neighbors and MID permits multiple OLSR Interfaces in a network.

III. DATA DELIVERY METHODOLOGY

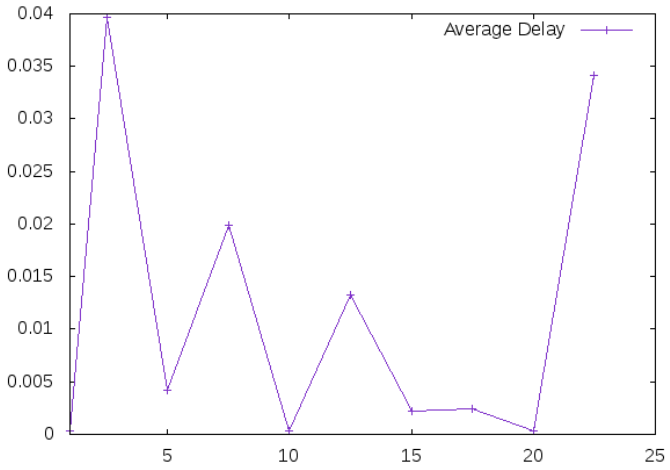
This planned knowledge delivery methodology indicates that the node information and location found from the broadcasting of the packet and ACK Packet received by the source Node; this packet includes destination node info, supply scientific discipline info and site of destination node. The forward lists are maintained by the supply node—those nodes WHO transfer the information to the destination node.

Scalability by using different number of nodes .every situation contains 30, 40 and 50 nodes respectively and OLSR shows lower delays but slightly higher than the AODV.

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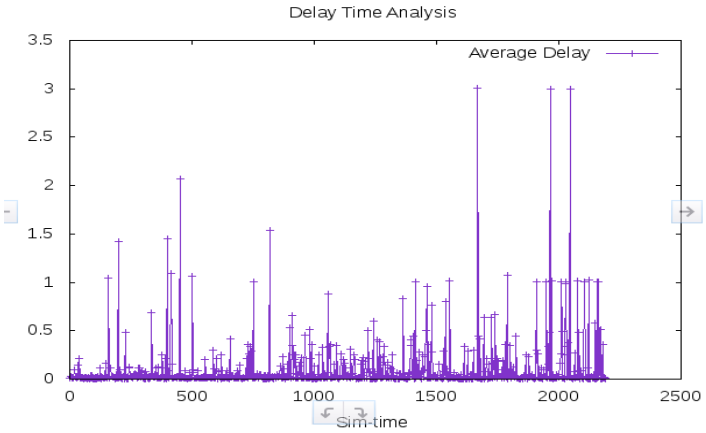
Table 1

Sr. No.	Node	Metrics	OLSR	AODV
1	40	Transmitted packet	1897	8517
		Total byte transmitted	174524 bytes	478598 bytes
		Received packet	1759	7589
		All received byte	161828	415842
		Lost packet	103	784
		Drop packet	138	998
		Total delay	20.2794	456.898
		Delay per packet	0.0106903	0.0532082
		Throughput (bit/sec)	1264.28 Kbps	3248.77 Kbps
		Packet delivery Ratio	92%	88%
2	Network Simulator		NS3	
3	Simulation Time		185 Sec	



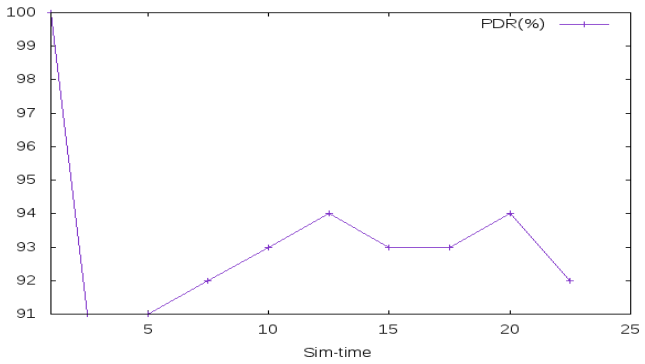
OLSR Average Delay Time

$$\text{Delay per Packet} = \frac{\text{Total Delay}}{\text{All Transmitted Packets}}$$



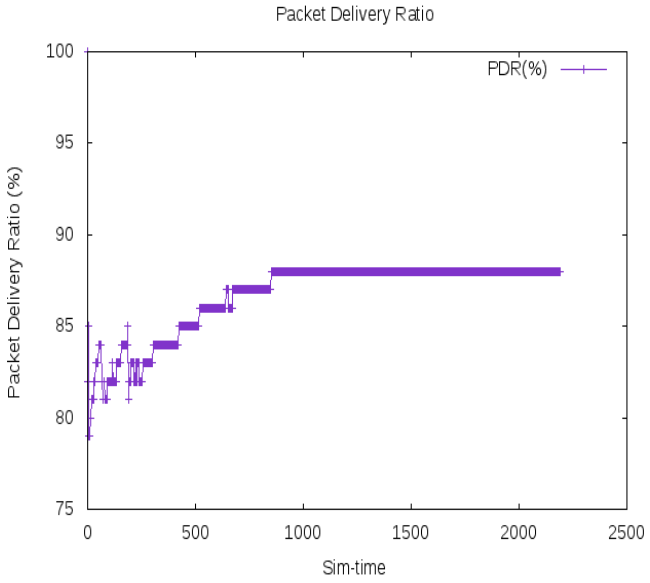
AODV Average delay Time

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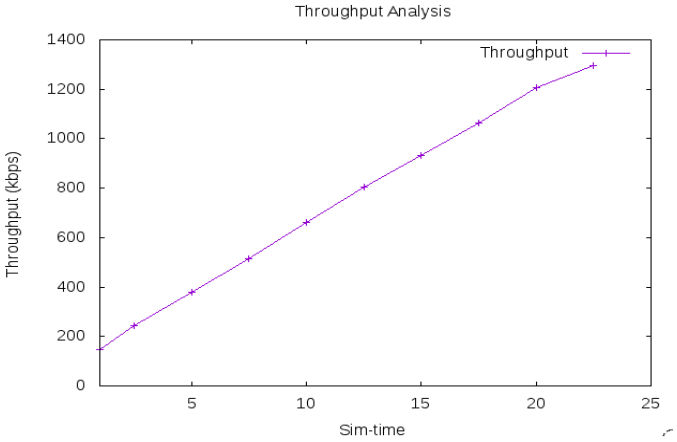


OLSR Packet Delivery Ratio

Packet Delivery Ratio = $\frac{\text{Received Packets}}{\text{All Transmitted Packets}}$

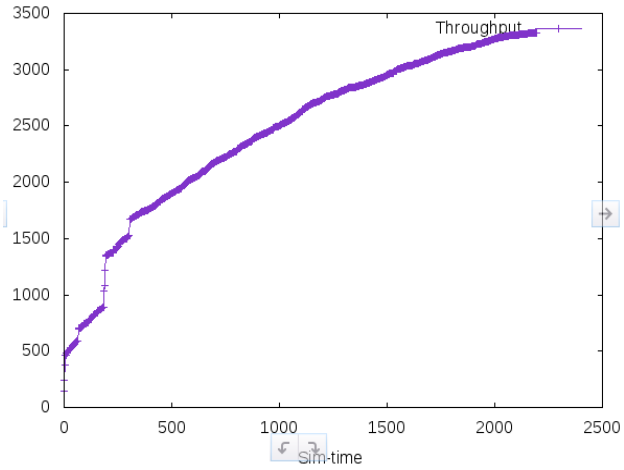


AODV Packet Delivery Ratio



OLSR Throughput

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AODV Throughput

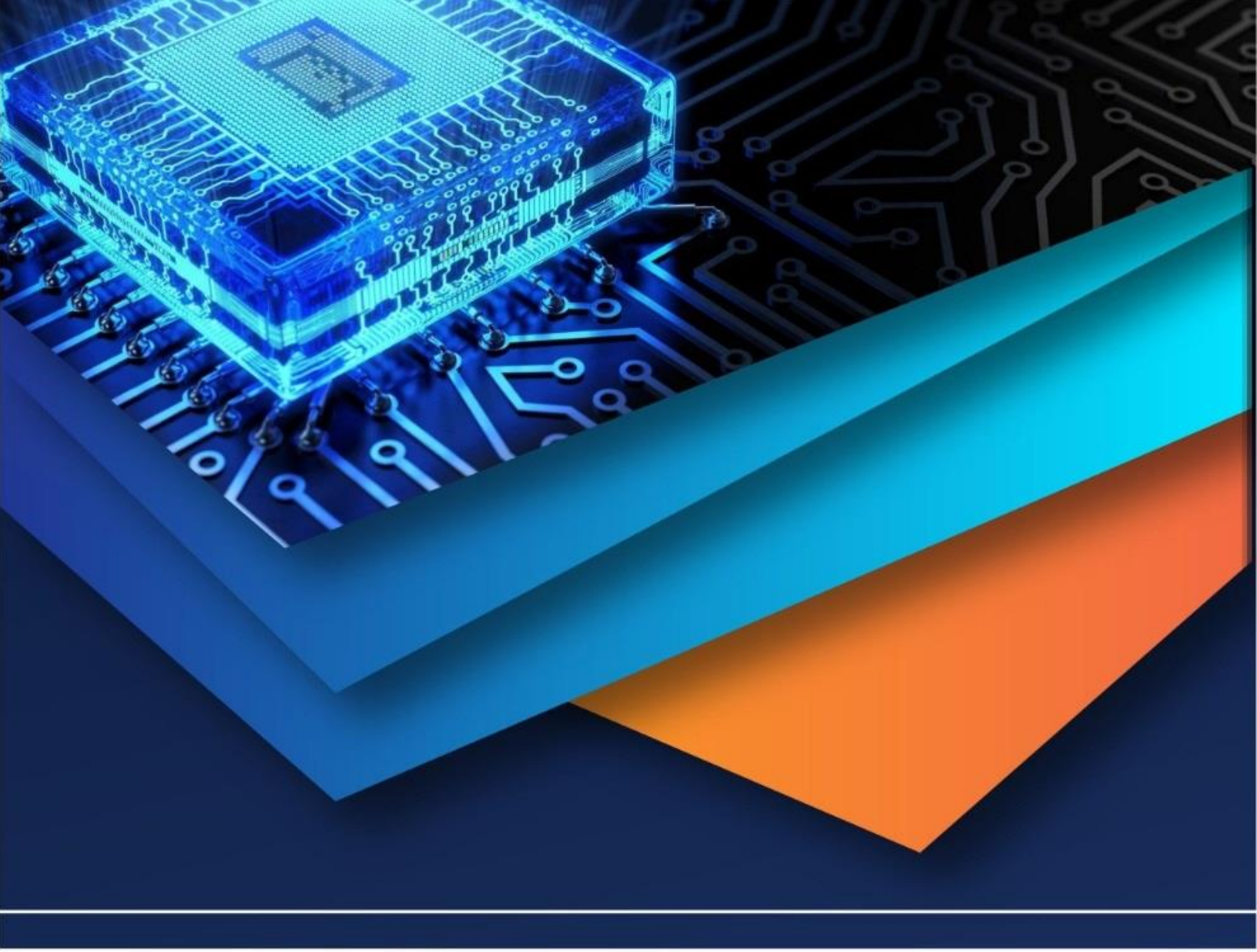
IV. CONCLUSION

In this paper, two MANET'S Protocols compared finally OLSR is better compare to AODV protocols.

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