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Comparative Study of AOMDV and AODV Routing based on Load Analysis in MANET

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***Abstract*—** Routing is not easy in Mobile Ad hoc Network (MANET) because of shifting the position of mobile nodes. The topology of the network is often change and entirely dynamic. In this paper we proposed a routing performance of AODV and AOMDV protocols in MANET. The AODV (Ad hoc On demand Distance Vector) protocol is the unipath routing protocol and established the route in on demand manner. The multipath protocol has an ability to steadiness the load of the network proficiently. The AOMDV (Ad hoc On demand Multipath Distance Vector) is the multipath routing protocol and established the more than two route as the back-up route or another routes for data transmission and receiving in MANET. The substitute route exist is definitely improves the routing performance which is main aspect in this research. The performance of both the protocols are measured through highest load handling, average load handling capability of nodes and routing performance is base on the packet delivery fraction, throughput and end-to-end delay. The performance of AOMDV protocol is enhanced than the unipth AODV and also handle the load through distributed to another paths. The AOMDV give the better routing performance as contrast to AODV routing protocol.

***Keywords*—** MANET, Routing, AODV, AOMDV, load balancing.

I. INTRODUCTION

A mobile ad hoc network [1] is a group of digital data terminal prepared with wireless transceivers that can exchange a data with one another without using any predetermined networking infrastructure. Communication is maintain by the transmission of data packets over a general wireless Channel.

In current scenario the mobile ad-hoc network (MANETs) is self-configuring network of mobile nodes connected by wireless links. Self-configurability and rapid deployment characteristic of the MANET makes it most attractive choice for users. Routing in this network is a main issue which decides network performance. Using Ad Hoc On-Demand Distance Vector routing by variation the TTl parameter and comparing the same approach on other protocols also like DSDV,DSR and TORA .Also find the energy utilization and delay. Due to unbalanced node usage, some of the battery powered nodes drain out faster than others. This leads to route re-discovery causing larger average end to end delay and more control overhead. In this research work we are presenting an improved AODV protocol against flooding attacks by variation in the TTL parameters. The proposed protocol introduces a stability factor which conserves and stabilizes energy amongst the nodes, and the delay reduction mechanism which decrease the average end-to-end delay of the network. The NS-2 and OPNET simulator is used to find out the difference for each protocol parameter using AODV and DSR, DSDV, simulation results are observed for wireless network scenarios with variation of node mobility, pause time, network area and packet sent rate. The results show that the end to end delay in mobile scenarios reduce significantly, without much affecting the other quality of services using time to limit parameters so in that case this research work is to find out the highly perform to system against attacks.

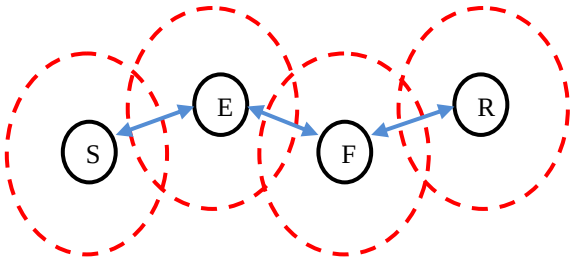

Figure1 Example of MANET

MANET is a group of independent mobile user that communicates more than moderately bandwidth and power constrained wireless links. MANET has capacity to set up networks at anytime, anywhere. These networks are built, work and maintained by its own because each node performs dual role of host and router. By and large, these

nodes have a partial transmission range and so each node search for the support of its adjacent nodes in forwarding packets. In order to establish routes between two nodes, which are away from each other than a single hop, special routing protocols are already designed. This unique feature is responsible to route the message in spite of dynamic topology of network. Important characteristics of a MANET Characteristics:

Dynamic Topologies: Nodes are free to move arbitrarily with different speeds; thus the network topology may change randomly and at unpredictable times. For these nodes, the most important system design optimization criteria may be energy conservation.

Limited Bandwidth: Wireless links continue to have significantly inferior capacity than infra structured networks. In addition, the realized throughput of wireless communications – after accounting for the effects of multiple access, fading, noise, and interference conditions, etc., is often much less than a radio's maximum transmission rate Security Threats : Mobile wireless networks are usually more prone to physical security threats than fixed-cable nets. The increased possibility of eavesdropping, spoofing, and minimization of denial-of service type attacks has been carefully considered.

1.1.1 Advantages of MANET

The following are the advantages of MANETs:

- They provide access to information and services regardless of geographic location.
- These networks can be set up at any position and time.

1.1.2 Disadvantages of MANET

Some of the disadvantages of MANETs are as follows:

- Inadequate resources and physical security.
- Intrinsic mutual trust in danger to attacks.
- Lack of approval facilities.
- Volatile network topology makes it hard to detect malicious nodes.
- Security protocols for wired networks cannot work for ad hoc networks,

II. APPLICATIONS OF AD HOC NETWORKS

Some of the classic applications include of MANET are:

A. Military Applications

Variety of services can be provided by sensor networks to military and air force like information collection, battlefield surveillance, intrusion detection and attack detection. In this area of application sensor networks have fairly an advantage over other networks because enemy attacks can harm or destroy some of the nodes but nodes failure in MANET doesn't affect the entire network. Possible uses of MANET in military are:

1) Enemy Tracking and target classification: Moving objects with significant metallic content can be detected using specially designed sensors. So enemies can be tracked and civilians are ignored. This system specially helps in detecting armed soldiers and vehicles.

B. Battlefield surveillance:

Important areas and borders can be directly monitored using sensor networks to obtain information regarding any enemy activity in that area. These provide fast meeting of information provides time for fast reply. Battlefield harm assessment: Sensor networks can be deploying after the clash or attacks to gather information of damage estimation.

C. Infrastructure:

MANET can be deploy as a part of communications security. Critical buildings, monuments, stadiums can be protected from terrorist attacks with sensor networks. Sensors can alarm the user about possible risk using the same mechanism as enemy detection. Anyone with major metal content can be detected as a possible risk and additional action can be taken by the users who are treatment the safety of the event. Even sensor nodes can be employed in vehicle which gives go forward tracking mechanism for vehicles as well as tracking

D. Traffic Control:

Sensor networks have been used for vehicle traffic monitoring and control for quite a while. Most traffic intersection has either in the clouds or buried sensors to detect vehicles and control traffic lights. Furthermore, video cameras are often used to monitor road segments with heavy traffic, with the video sent to human operator at central locations. This kind of network is the separation of MANET called (Vehicular Ad hoc Network) VANET.

III. CLASSIFICATION OF ROUTING PROTOCOLS

categorization of routing protocols in mobile ad hoc network can be done in many ways; the routing protocols can be categorized as Proactive (Table Driven), Reactive (on-demand) and Hybrid depending on the network arrangement.

A. Proactive routing Protocols

The proactive routing protocols are table driven. They usually use Link State Routing algorithms. Link State algorithms preserve a full or partial copy of the network topology and costs for all known links. The reactive routing protocols create and preserve routes only if these are needed on demand. They usually use Distance Vector Routing algorithms that keep only information about next hop to neighbors and costs for paths to all known destination. Their main disadvantage is due to the consumption of bandwidth

in sending revise packets periodically even when they are not essential, such as when there are no link breakages or when only a few routes are needed Examples of Proactive MANET Protocols include: Optimized Link State Routing (OLSR), Fish-eye State Routing (FSR), Destination-Sequenced Distance Vector (DSDV) etc.

B. Reactive Routing Protocols

Reactive protocols are intended to minimize routing overhead. In On Demand Routing protocols, the fundamental condition for connectivity is to find out routes to a node via flooding of request messages. The AODV routing protocol is one of the reactive routing protocols for mobile ad-hoc networks. As long as a route is live, hasty routing protocols only perform route protection operations and resort to a new route detection only when the existing one breaks. The advantage of this on-demand operation is that it usually has a much lower standard routing overhead in comparison to proactive protocols. However, it has the disadvantage that a route discovery may involve flood the entire network with query packets. Flooding is extravagant, which can be required quite often in case of high mobility or when there are a large number of active source-destination pairs. Moreover, route discovery adds to the latency in packet delivery as the source has to wait till the route is determined before it can transmit. Despite this drawback, on-demand protocols get comparatively more attention than proactive routing protocols, as the bandwidth gain makes them more scalable.

On-demand (reactive) routing presents an attractive and important departure from the conventional proactive approach. Main idea in on-demand routing is to find and maintain only needed routes. Recall that proactive routing protocols maintain all routes without regard to their ultimate use. The clear advantage with discovering routes on-demand is to keep away from incurring the cost of maintaining routes that are not used. This approach is attractive when the network traffic is irregular, burst and directed mostly toward a small subset of nodes. However, since routes are formed when the needs arise, data packets experience queuing delays at the source while the route is being found at session beginning and when route is being repaired later on after a failure. Another, not so obvious consequence of on-demand routing is that routes may become suboptimal, as time progresses since with a pure on-demand protocol a route is used until it fails. The different types of On Demand driven protocols are Ad hoc On Demand Distance Vector (AODV), Ad-hoc On-demand Multipath Distance Vector Routing (AOMDV). Hybrid protocols look for to combine the Proactive and Reactive approaches.

Ad Hoc on Demand Distance Vector (AODV)

The ad hoc on-demand distance-vector (AODV) routing protocol is an on-demand routing protocol; all routes are discovered only when required, and are maintained only as long as they are being use. Routes are discovered through a route discovery cycle, whereby the network nodes are queried in search of a route to the destination node. When a node with a route to the destination is discovered, that route is reported back to the source node that request the route the following section explain the features of AODV that permit it to discover and preserve loop free route.

IV. AD-HOC ON-DEMAND MULTIPATH DISTANCE VECTOR ROUTING (AOMDV)

Ad-hoc On-demand Multipath Distance Vector Routing (AOMDV) [2] protocol is an addition to the AODV protocol to compute multiple loop-free and link disjoint paths [3]. The routing entry for each destination contains a list of the next-hops along with the corresponding hop counts. All the next hops have the identical sequence number. This helps in keeping track of a route. For each destination, a node maintains the advertised hop count, which is defined as the maximum hop count for all the paths, which is used for sending route advertisements of the destination. Each duplicate route advertisement received by a node defines an interchange path to the destination. Loop freedom is certain for a node by accepting interchange paths to destination if it has a less hop count than the advertised hop count for that destination. Because the maximum hop count is used, the advertised hop count therefore does not alter for the same sequence number [3]. When a route announcement is received for a destination with a greater sequence number, the next-hop list and the advertise hop count are reinitialized. AOMDV can be used to find node-disjoint or link-disjoint routes. To find node-disjoint routes, each node does not immediately reject duplicate RREQs. Each RREQs arriving via a different neighbor of the source defines a node-disjoint path. This is because nodes cannot be broadcast replica RREQs, so any two RREQs arriving at middle node via a different neighbor of the source could not have traversed the same node. In an attempt to get multiple link-disjoint routes, the destination replies to duplicate RREQs, the destination only replies to RREQs arriving via unique neighbors [3]. The advantage of using AOMDV is that it allows intermediate nodes to reply to RREQs, while still selecting disjoint paths.

V. RELATED WORK

In this section the previous work that has done in this field is discussed.

Manveen Singh Chadha, Rambir Joon, Sandeep[1] "Simulation and Comparison of AODV, DSR and AOMDV Routing Protocols in MANETs" In this work an effort has been made to evaluate the performance of three prominent on demand reactive routing protocols for MANETs:- Ad hoc On Demand Distance Vector (AODV), Dynamic Source Routing (DSR) protocols and Ad-hoc On-demand Multipath Distance Vector Routing (AOMDV) . DSR and AODV are reactive entry detection algorithms where a mobile device of MANET connects by gateway only when it is needed. AOMDV was designed primarily for highly

dynamic ad hoc networks where link failures and route breaks occur frequently. It maintains route for destination in active communication and uses sequence statistics to determine the newness of routing information to stop routing loops. It is a timer-based protocol and provides a way for mobile nodes to react to link breaks and topology change.

Pooja Dahiya, Gunjan Madan, Reema Gupta [6] "Performance Evaluation Of Aodv And Aomdv On The Basis Of Throughput" in this title we discuss, there are currently two variation of mobile wireless networks- infrastructure and infrastructure less networks. The infra-structured networks, also identified as Cellular network, have fixed and wired gateways. They have fixed base station which are connected to other base stations through wires. The other type of network, infrastructure less network, is known as Mobile Ad Network (MANET). These networks have no fixed routers.

Neha Gupta, Dr. Harish Chaudhary, Umang Garg [7]"Simulation Of Aodv & Aomdv Using Scmac & Proposed Solution To Improve Throughput In Manet" In this title we also proposed a multichannel MAC protocol for MANET to improve throughput of n/w. The IEEE 802.11 standard allows for the use of several channel obtainable at the physical layer, but its MAC protocol is designed only for a single channel. A single channel MAC protocol does not effort well in a multi channel atmosphere because of multichannel unseen terminal problem .Our proposed protocol enable host to utilize multiple channels, thus increasing network throughput. We have compare this multichannel protocol with single channel and proved it more well-organized in terms of throughput than single channel.

Mina Vajed Khiavi, Shahram Jamali [8] "Performance Comparison of AODV and AOMDV Routing Protocols in Mobile Ad Hoc Networks"

In this title we compare AODV and AOMDV routing protocols for MANETs. The AODV is a unipath routing protocol and AOMDV is a multipath version of AODV. We analyses these routing protocols by wide simulations in NS-2 simulator and show that how number of nodes, pause time and traffic rate affect their performance. Performance of AODV and AOMDV is evaluated based on Packet Delivery Ratio, Network Life Time, System Life Time and End-to-End Delay.

Ramprasad Kumawat, Vinay Somani, [9] "Comparative Study of On-demand Routing Protocols for Mobile Ad-hoc Network" This title investigate all these routing protocols corresponding to packet delivery fraction (pdf), throughput, normalize routing load and end to end wait. The ns-2 simulation results showed that AODV has always low routing load compared to AOMDV in both static and dynamic network for each set of connections. AOMDV provided improved results at high gap but worst in case of end to end delay. We have also seen that, DSR perform well in terms of end to end delay in both static and dynamic networks.

P. Jammulaiah, Dr.P. Chenna Reddy[10] "Simulation and Comparison of AOMDV, AODV and DSR in Manets" In this title three routing protocols AODV (Ad-hoc on-Demand Distance Vector), AOMDV (Ad-hoc on Demand Multipath Distance Vector) and DSR (Dynamic source Routing Protocol) are compared. The performance of three routing protocols is analyzed in terms of their Packet Delivery Fraction, Average End-to-End Delay, Routing overhead, Route Discovery Frequency, and Throughput. NS2 simulator is used for comparison and critical analysis of AOMDV is done to find its merits and demerits.

Rajeswari. K, Vimala. S[11] " Performance evaluation of AODV, AOMDV, GPSR, and APU in MANETS" The main goal of MANETs is to design of dynamic routing protocols with good performance and less overhead. With the growing popularity of GPS and, geographic routing protocols are becoming an good-looking choice for use in mobile ad hoc networks. The attention of Mobile ad hoc networks is amplified due to multi hop infrastructure-less transmission. In most existing routing protocols like AODV, AOMDV, GPSR and APU are susceptible to node mobility especially for large scale networks. In this title, we contrast above mentioned routing protocols and examine the appropriate algorithm for best energy use, less packet delay and high packet delivery part. The performance differentials are analyzed using NS-2 network simulator.

Rahul Deshmukh, Jitendra Rai [12] "Performance Based Comparative analysis of AODV & AOMDV Protocols Under Energy Constrain" This title is an attempt has been made to compare the performance of AODV with its variation of Multipath version AOMDV. The comparison has been done under two protocols namely UDP and TCP. The tools used for the simulation are NS2 which is the main simulator, NAM (Network Animator) and Trace graph which is used for prepare the graphs from the draw files. The outcome presented in this dissertation work evidently indicates that the performance of AOMDV is enhanced than AODV with respect to throughput and energy consumption. **R.Balakrishna, U.Rajeswar Rao , N.Geethanjali N[13]** "Performance issues on AODV and AOMDV for MANETS" In this title, we compare and evaluate the performance of two types of On demand routing protocols-Ad-hoc On-demand Distance Vector (AODV) routing protocol, which is uni-path and Ad hoc On-demand Multi path Distance Vector (AOMDV) routing protocol. We note that on compare the presentation of AODV and AOMDV, AOMDV incur more routing overhead and packet delay than AODV but it had a improved efficiency when it comes to number of packets drop and packet delivery.

Bharti Kukreja, Sanjeev Kambhra[14] "Performance Comparison of Routing Protocols in MANET" In this title an attempt has been made to compare the presentation of two main on demand hasty routing protocols for MANETs that is Ad hoc On Demand Distance Vector (AODV) and

Ad-hoc On-demand Multipath Distance Vector Routing (AOMDV). AODV is hasty gateway discovery algorithm where a mobile machine of MANET gets connected to gateway only when it is needed. AOMDV was designed generally for highly dynamic ad hoc networks where link fails and route break occur frequently. It maintains routes for destinations and makes use of sequence numbers to determine the newness of routing information to prevent from the routing loops. The performance metrics are analyzed by varying simulation time.

Brahm Prakash Dahiya[15] "Performance Analysis and Evaluation of AODV & AOMDV in MANET" in this title the author discus the performance study and assessment of AODV and AOMDV based on throughput, packets lost, packets delay and quality of services. The author will implement both protocols using the ns-2 simulator.

VI. PROPOSED WORK

The Mobile ad-hoc network is a self arrange network, where every nodes self decision maker and give the service to previous nodes. MANET is infrastructure less network because nodes freely move anywhere in the network, that is critical confront for route organization between the nodes. The Many researchers design the routing protocol i.e. proactive, reactive and hybrid but automatic routing protocol is more suitable for mobile ad-hoc communication, because automatic work where on demand based routing needs. The routing means of protocol is depend on the network conditions and the routing procedure of association establishment to data release in dynamic network. The network conditions are measures in the heavy load and light load. The routing protocol AODV is the best uni-path protocol for MANET environment. The load distribution and assessment is the extra work in the AODV protocol but likely only in a single path. But in AOMDV protocol has a inbuilt load balancing move towards by providing the alternatives for data delivery. In this work our objective to analyze the behaviour and hidden performance parameter of AODV and AOMDV routing i.e. contention, queue analysis, congestion etc. multipath routing is better routing approach where multiple nodes simultaneously share the common channel, because its give multipath between communicator nodes and improved individual channel utilization technique. With the help of AOMDV routing approach standard end-to-end delay and routing overhead minimize and improved the performance of the network. The AOMDV is better and provides well-organized data delivery. The few of the advantages of the AOMDV multipath routing protocols over AODV unipath are:-

- Providing the optional route for data delivery.
- Includes the ability of load balancing or distribution to all network nodes well.
- The possibility of retransmission of data is summary by that the flooding of routing packets is also minimized.
- The average end to end delay is minimized and provides better data delivery.

VII. SIMULATION ENVIRONMENT

Mobile ad-hoc network routing protocol are simulated through network simulator-2 and apply following given simulation parameter. Due to node mobility, every node is active that arise the problem how to control network topology and for that use ad-hoc on insist based routing protocol AODV, AOMDV and recognized the path between sources to target. Both routing are uses drop tail queue because that store incoming packet on first come first serve bases and while queue is full than packet drop from the tail bit (top of the queue), its give equal service to each users. Next is antenna type as all directional that spread data all direction in equal power that is benefit while uses MANET communication because no assure where the node actual position in real time and which direction in chiefly time located. In this table also define various basic required parameters for the communication and established the network.

VIII. SIMULATION PARAMETERS

The simulation of network is done on the basis of following simulation parameters mentioned in table1. These simulation parameters are common for both the routing protocols.

Table I Simulation Parameters

Parameters	Values
Network Size	1200*1200m
Number of Mobile Nodes	100
Channel	Wireless Channel
Radio-Propagation Model	Two Ray Ground
MAC	802.11
Interface Queue	Drop Tail Pri-Queue
Antenna Model	Omni Antenna
Routing Protocol	AODV, AOMDV
Transport Layer	TCP, UDP
Application Layer	FTP, CBR
Packet Size	500 byte
Mobility Model	Random
Simulation End	100 second

A. Performance Metrics

- **Average Load:**
  It is a total sum of all node loads divide by total number of participated node and calculated by
- **Average load = $\sum k_i / n$**
  Where i = 1 to n, k = load of node and n = participated node The average load analysis provide the load distribution factor of network where that is smallest amount it means load is fairly distributed and minimizes the network congestion and increase the performance of the network.

- **End to End Delay:** The Daley is calculate by the time taken of data sends from sender to receiver, its include all the probable delays caused by buffering during route detection latency, queuing at the interface queue, retransmission delays at the MAC, and propagation and transfer times.
- **End-to-End delay = (Buf_d + Q_d + rt_d + $prop_d$ + Tx_d)** Where Buf_d = buffering during route discovery latency

Q_d= queuing delay

rt_d= retransmission delays

$Prop_d$= propagation delay

Tx_d= transfer delay

IX. RESULTS DISCUSSION

The simulation results are evaluated on the basis of the considered simulation parameters and the performance of AODV and AOMDV is measured through performance metrics.

A. Average Load Analysis of AODV and AOMDV

The load handling capacity of routing protocol is improves the routing performance. The routing protocol is playing the important role in data delivery. These protocols are provides the link in between sender to receiver through multi-hop selection. The AODV is established single link but AOMDV is able to establish multiple links in between sender and receiver. In AODV the average load is about 1.3 % but the AOMDV multipath protocol load handling is about 1%. This analysis is shows that, AOMDV is distributing the load efficiently and provides better routing performance than AODV.

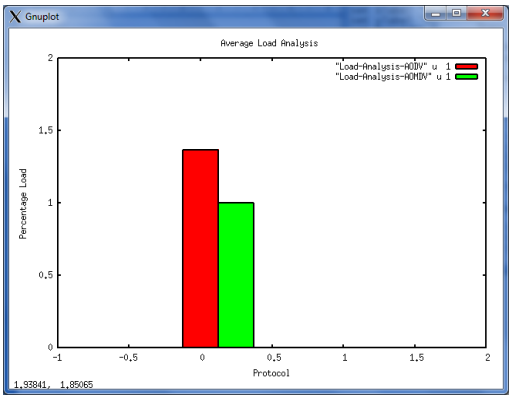

Figure 2 Average Load Analysis

B. Maximum Load Handling of AODV and AOMDV

The single path is not able to handle the load in network efficiently but in multipath routing the load is handled efficiently because of alternative route is always exists, if the present one is fail. No doubt AODV is the efficient routing protocol in MANET but this protocol is established the single link in between sender and receiver by that their load handling capacity is low i.e. mentioned in this analysis. The maximum load handling analysis of AODV and AOMDV is mentioned in figure 1. The max load on AODV protocol is about 14% but AOMDV is balanced the load by that max load on AODV is only 3%, that shows better routing performance.

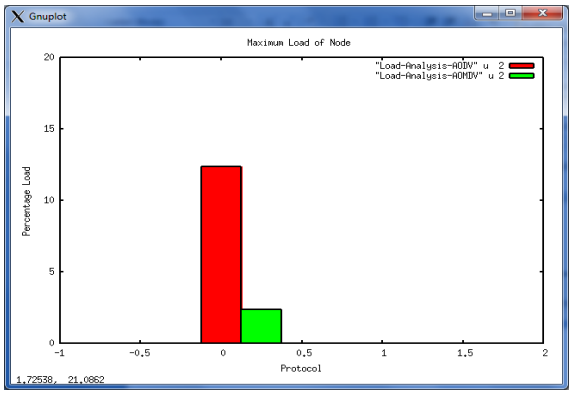

Figure 3 Load Handling Analysis

C. End -to-End Delay Analysis of AODV and AOMDV

The better data receiving in network is shows the possibility of retransmission of data is minimum but their opposite is produces the possibility of data loss of maximum delay in network. In this graph the end-to-end delay (measures in milli-seconds) analysis of AODV and AOMDV routing protocols is evaluated and observe that the performance of AOMDV is better because of reduces the possibility of retransmission. The maximum delay is count in AODV is about 20ms but at time 20 seconds but AOMDV maximum delay is only count 4 ms at the end of simulation.

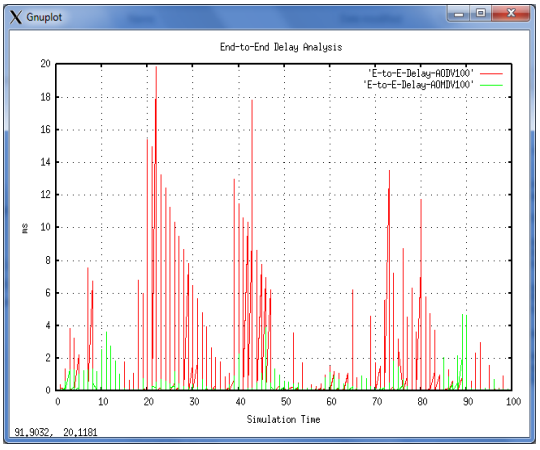

Figure 4 End -to-End Delay Analysis

D. Routing Load Analysis of AODV and AOMDV

The routing packets are flooding by every routing protocol to finding sender and receiver for established

connection in between sender and receiver. The guided media is provides the stable and reliable path but in wireless network the signals are move in air and in MANET nodes are also moves randomly and try to maintain their connectivity. The less routing packets flooding is confirm the better routing performance i.e. the performance of AOMD protocol and just opposite of the performance of AODV is showing the degradable routing performance. The minimum routing packers flooding is correspond to better data receiving in dynamic network.

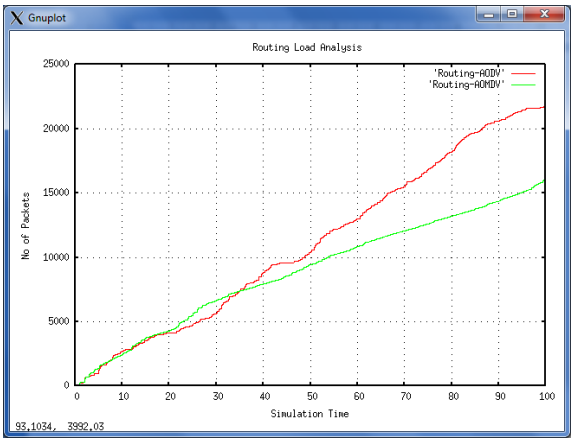

Figure 5 Routing Load Analysis

E. Packet Delivery Ratio (PDR) Analysis of AODV and AOMDV

The packet delivery Ratio (PDR) analysis is measure the percentage of data packets received at destination. The better data receiving w.r.t sending is shows the better PDR performance. The PDR performance of AODV protocol is about 91% up to end of simulation. The AODV routing performance is forming the curve from 60 to 70 to 80 and then reaches to 80 to 90 but in AOMDV routing protocol the performance is about 94% at the starting and maintained at 93% up to end of simulation. The packets receiving of AOMDV is better than AODV because of better load handling and minimum drop of packets.

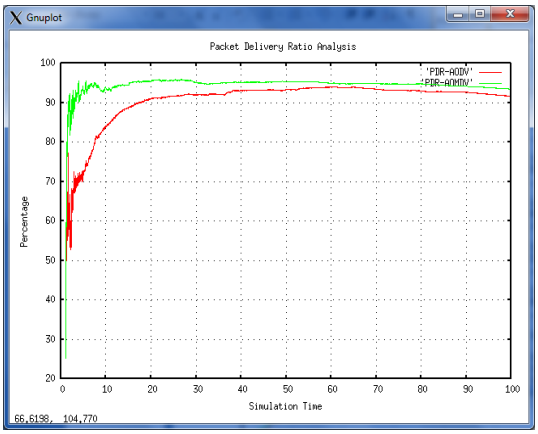

Figure 6 PDR Analysis

F. Summarized Routing Performance of AODV and AOMDV

The AOMDV is provides the better routing performance then AODV because of better load handling capability. The routing performance of AOMDV and AODV is mentioned in table 1. The delay and NRL performance is almost more than one third reduced. In this table the routing performance like PDR, NRL, delay and packets drop are illustrated that the AOMDV is the better routing protocol for data receiving.

Table II Overall Summery

Parameter	***AODV***	***AOMDV***
SEND	9004	10828
RECV	8254	10117
ROUTINGPKTS	713	289
PDF	91.67	93.43
Average e-e delay(ms)	162.41	50.3
NRL	0.09	0.03

G. Packets Drop Reasons in AODV and AOMDV

There are many different reasons of packets dropping in network. These reasons are degrades the routing performance. The different drop reason mentioned in table 1 shows that due to congestion in AODV large number of packets are dropped but AOMDV is reduced it one third and shows the 12 % performance improvement than AODV. The AOMDV protocol is provides the reliable data delivery and better data delivery than AODV protocol.

Table III All Type Packet Drop Analysis

Parameter	**AODV**		**AOMDV**	
Drop from Contention	67		31	
Drop from Queue	1		0	
Drop from Timeout and Call back	603		616	
Total Drop Via Congestion	3690		1095	
Total Drop	4361	19.53%	1742	7.58%
Actual Performance	17971	80.47%	21234	92.42%

X. CONCLUSION AND FUTURE WORK

In this paper proposed new parameter i.e. percentage of load, average load and maximum percentage of load after that hidden data drop dependent parameter is also analyze i.e. contention, queue, call-back and congestion etc. all the define parameter as well as known parameter based analyze the behavior of AODV and AOMDV routing and conclude that AOMDV (ad-hoc on demand multipath distance vector) routing is outperform with respect to all aspect, because that uses the multipath based packet switching

mechanism for data communication. Here observe the behavior through following aspects.

- Multipath routing send 20% more data as compare to AODV routing
- AOMDV based approach receives 22% more data from AODV
- Routing overhead of multipath mechanism is 60% lower than uni-path routing ad-hoc on demand multipath distance vector gives 1.76% more packet delivery ratio as compare to AODV
- From the above point conclude that ad-hoc on demand multipath distance vector routing is better as compare to AODV. Multipath routing is use full where network rush is greater so further we use the AOMDV routing and its enhancement to fine graining the output and increases the network performance with respect to quality of service and security issue of AOMDV.
- AOMDV is uniformly distribute the load of network to all participated node but AODV does not distribute uniformly
- AOMDV is excellent with respect to all aspect because data drop is only 7.58%, but AODV perform less as compare to AOMDV because its data drop is 19.53% that is nearly three times greater than the AOMDV protocol.

XI. REFERENCES

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