IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 7, July 2015.
www.ijiset.com
ISSN 2348 – 7968

Result On Performance of MANET Using Dissimilar Routing Algorithm

Miss. Bobby R. Sarode[1], Professor A. A. Nikose[2]

[1]RTMNU university, PBCE Nagpur, Maharashtra, India.

Department of computer science

[2]RTMNU university, PBCE Nagpur, Maharashtra, India.

Abstract:
Now a day's wireless ad-hoc network is receiving more popularity as compared to wired networks. A wireless ad hoc network is a decentralized type of wireless network. A Mobile Ad hoc Network can change locations and arrange itself. A Mobile Ad-Hoc Network (MANET) is self-configuring network of mobile nodes connected by wireless links to form an uninformed topology without the use of existing transportation. Previous make inquiries in ad hoc networking have generally studied the routing problem in a non-adversarial setting by considering the trusted atmosphere. In this paper, we investigation the design and performance evaluation of a new efficient on demand routing protocol for mobile ad-hoc networks. Up till now many routing algorithms have been proposed to find the routing trouble in mobile ad-hoc networks so it is difficult to evaluate the presentation of different routing protocols qualitatively as there are many point of view that affect the performance of network. The proposed TAODV (Tactical On Demand Distance Vector Routing Algorithm) algorithm performs superior for finding routing problems in Mobile Ad Hoc networks. Most of the proposed algorithms use a blind flooding technique through the route discovery process. This method is unsuccessful and creates excessive routing overhead. To defeat this problem, the forth put routing protocol uses a query localization technique that importantly reduces the network traffic and raises the performance of network. The simulation results clearly show that proposed on demand routing protocol is more efficient and resizable than existing ones.

Keywords: Mobile ad hoc network, AODV, Positional communication systems, Query localization technique, Tactical on demand distance vector (TAODV) and wireless networks.

Introduction:

1.1 MOBILE AD-HOC NETWORK

Now a day's wireless ad-hoc network is obtaining more good looks as compared to wired networks. A wireless ad hoc network is a decentralized type of wireless network. Mobile Ad-Hoc Network is a difficult distributed system that consists of a variety of wireless mobile nodes which can vigorously and freely systematize into temporary or "ad-hoc" network topologies, allowing devices to interrelate in areas absent having any predefined communication transportation. In Mobile Ad-Hoc Networks, each mobile hosts acts as the router as well as host at the identical time.

Figure 1.1 illustrates the overview of Mobile Ad-Hoc Network. In general, a wireless mobile node can act as any computing equipment that employs the air as the transmission medium. The wireless mobile node may be physically

attached to a vehicle, a person, or an airplane, to enable wireless communication among them.

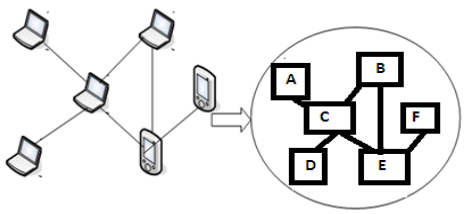


Figure 1.1 Overview of Mobile Ad-Hoc Network

All node wishing to contribute in an ad-hoc network must be enthusiastic to ahead packets for supplementary nodes. Thus each node acts together as a host and as a router. A node can be viewed as an theoretical entity consisting of a router and a set of united mobile hosts (Figure 1.2). A router is an entity, which, in the middle of other things runs a routing protocol. A mobile host is merely an IP-addressable host/entity. Ad-hoc networks are as well capable of treatment topology

ISSN 2348 – 7968

changes and malfunctions in nodes. It is permanent through network reconfiguration. For example, if a node foliage the network and causes link breakages, precious no des can with no trouble request new routes and the difficulty will be solved. This will somewhat add to the holdup, but the network will still be prepared. Wireless ad-hoc networks take benefit of the natural world of the wireless communiqué medium. In other words, in a wired network the substantial cabling is done a priori restricting the connection topology of the nodes. This constraint is not in attendance in the wireless domain and, supplyed that two nodes are within spreader range of every other, an immediate connection between them may form.

Literature survey:

Scalability of a routing protocol is its capability to carry the nonstop add to in the network factors (such as mobility speed, traffic speed and network dimension) without demeaning network presentation [CES2002]. It can pass on to the potential of a system to amplify total throughput beneath an greater than before load when resources (typically hardware) are added. Still although the amount of nodes in an ad hoc wireless network does not produce in the same scale as today's internet, the process of a great number of nodes in the ad hoc style is not far away. Routing with scalable presentation is one of the input challenges in organize big level mobile ad hoc networks as scalability has a straight family member with routing in the clouds, which in turn is connected with unreliable network parameters [BRI2008]. First, these family members must be implicit and examine properly. Second, the responsible routing plans for these relations must be work out watchfully to get better network presentation. Consequently, scalability is an significant subject for direction-finding protocols in MANETs.

ROLE OF CACHING IN ROUTE OPTIMIZATION

Caching is an significant element of any on-demand routing protocol for wireless ad hoc networks. In MANETs every one nodes work together in order to energetically set up and continue.Literature Survey 38 routing in the network, onward packets for all other to let announcement sandwiched between nodes not straight inside wireless transmission variety. For that more than a few optimization methods have been included into the basic DSR protocol to get better the presentation of the protocol. DSR uses the route cache at middle nodes. The route cache is occupied with routes that can be take outs from the in sequence contained in the data packets throughout their onwarding. This cache in order is used by the middle nodes to respond to the source when they take delivery of a route request packet throughout route detection phase. There are some confronts and issues such as mobility of nodes, power expenditure in battery and unfinished wireless bandwidth when caching methods are working in MANETs for data communiqué. Due to the pressure group of mobile nodes, MANETs may be alienated into many self-governing networks. Hence, a node cannot get back the preferred data from the remote server (data source) in another network. The entire data convenience will be reduced. Thus, the cached data in a mobile node may not be get back by other mobile nodes and then value of the cache is abridged.

Session Initiation Protocol SIP

Is an application layer control protocol second-hand for set up, adapt and rip down multimedia sitting, both unicast and multicast. It has been consistent inside the IETF for the request to multicast meeting and Internet receiver calls [JRO2002]. The most significant SIP process is that of attractive new contributor to a call. To attain this functionality we can differentiate dissimilar SIP entities: • Proxy Server: A proxy server take delivery of a request and then frontwards it towards the present location of the callee also in a in a straight line to the callee or to one additional server that might be better informed about the real location of the callee. • forward Server: A forward server receives a request and notify the visitor about the after that hop server. The caller then associates the next hop server in a straight line

2.3 Tactical Ad hoc on Demand Distance vector routing

It make use of the Query localization procedure that decrease network traffic .The load examination process is execute by each middle node that procedure a route request. The weight of a node is strong-minded by the distance end to end of the protocol queue at a node. The technique used to choose the best way is comparable to the process

ISSN 2348 – 7968

in Dynamic Load Aware Routing (DALR) Protocol. previous to spreading the route request packet, middle nodes settle on the distance end to end of its protocol line, if it is above the doorsill value “t”, it increase the load changeable in the packet. Three circumstances are specified in [19] to decide the whether the way is improved than another way. This technique make sure the load on each middle node and then chooses a path to reach its destination from the source node.

2.4 X-AODV

Comprehensive AODV (X-AODV)[6] is an adaptive move toward for protected and best path assortment that is mutual with Bays Estimator Fake Intelligent Method on basis of probabilistic assumption in arrange to become accustomed protected and non-congested path. Each node work out the most excellent appropriate path on the basis of two parameters i.e. congestion and SNR. This technique focuses on reasons for packet loss in addition to minimization of packet hammering ratio.

2.5 RO-AODV

Route Optimized Ad Hoc On demand Distance Vector Routing Protocol (RO-AODV) restrictions the route demand distribution action bottom on Route optimization. It optimizes AODV to carry out successfully and decreases routing in the clouds, holdup and force expenditure beneath far above the ground load circumstances. It uses an buildup Path List to evidence every one pathway nodes at what time a node take delivery of an RREQ to inform the route bench. Thus RO AODV get rid of some RREQs and decrease the in the clouds of manage messages and thus get better the presentation. This technique however augments the packet subtitle since it needs to preserve the foundation route.

PRESENT WORK

In this job we suggest an optimization in excess of a MANET Routing Protocol for way discovery.

3.1 **Efficient Routing Algorithm properties:-**

A lot of routing protocols for ad hoc networks have been future so far, every one contribution some benefit in excess of the preceding move toward. But in general, there are a number of common attractive possessions that some routing protocol intended for an ad hoc network be supposed to have as mentioned in [28]. These are:

- Loop free: attendance of loops in the trail as of the source to the destination consequence in incompetent routing. In the worst-case state of affairs, the packets might stay pass through the loop for an indefinite period and by no means arrive at their end.
- Distributed control: In a central routing scheme, single node provisions all the topological in order and creates all routing choices; so, it is neither healthy, nor scalable. The middle router can be a solitary point of breakdown; also, the network in the surrounding area of the middle router may get crowded with direction-finding question and reply.
- speedy routing: The earlier the routing choices are made, the earlier the small package can be routed towards the target, as the likelihood that the small packages take the selected route before it gets upset because of node mobility is fairly high.
- Localized response to topological alters: Topological modifies in one part of the network should lead to negligible modify in routing plans in other far-away parts of the network. This will remain the routing inform expenses in make sure and create the algorithm scalable.
- arge quantity of routes: Still if node mobility consequences in disturbance of some ways, other ways should be obtainable for packet releases.
- Power well-organized: A routing protocol should be control well-organized. That is the protocol should deal out the load; or else shut-off nodes might reason dividers topologies that might result in out-of-the-way routes.
- protected: A routing protocol should be safe. We require verification for exchange a few words nodes, non-repudiation and encryption for confidential networking to keep away from routing dishonesty.

ISSN 2348 – 7968

- QoS conscious: A routing protocol be supposed to also be conscious of Quality of Service. It should know concerning the holdup and throughput for a source purpose pair, and have to be clever to corroborate its long life so that a real-time request might rely on it.

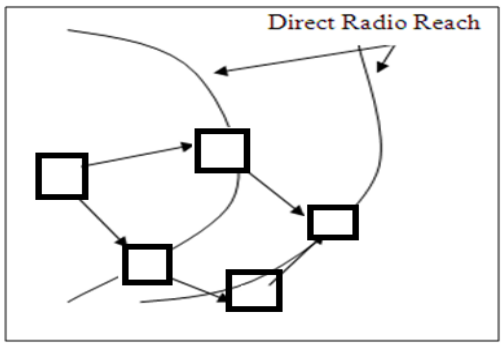


Figure 3.1 Routing in Ad-hoc networks

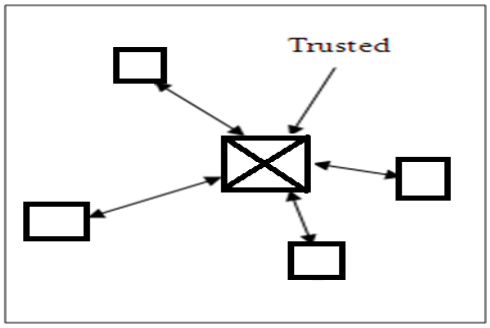


Figure 3.2 Routing in traditional networks

As the communiqué in MANET is from side to side wireless average, it is likely for any interloper to tap the communiqué easily. Wireless channels in attendance deprived defense and routing connected manage messages can be with no trouble interfere. The wireless average is vulnerable to listen in, bend indication meddling and overcrowding. An interloper can with no trouble pay attention in to know responsive routing in order or worse break off mail and deform them to influence routes, jam the signals to stop spread of routing in order. Thus routing protocols should be well get on to grip such type of problems.

Unlike wired networks, direction-finding in MANETs poses only one of its kind challenges. While conniving of routing protocols for MANETs we require to address more than a few issues connected with it.

3.4 AODV Routing Protocol

3.4.1 Overview

This routing protocol is designed for use by mobile nodes in ad hoc networks when two hosts wish to converse with every other and a route is fashioned to offer such connection [15]. Ad Hoc On-Demand Distance Vector Routing protocol [18, 19] is a pure on-demand route gaining system, since nodes that do not recline on active pathways neither uphold any routing in order nor contribute in any episodic direction-finding table connections. Moreover, a lump does not have to find out and uphold a route to one more node awaiting the require to converse, if not the previous node is offering its armed forces as an middle onward station to uphold connectivity between two other nodes. When the restricted connectivity of the portable node is of attention, each mobile node can become conscious of the other nodes in its district by the use of several method, counting local broadcast known as hello messages. The direction-finding bench of the nodes within the neighborhood are prearranged to optimize reply time to local actions and give quick reply time for needs for organization for new routes.

The primary objectives of AODV are:

a) To carry out path detection process when essential. AODV uses transmit route detection method.
b) To differentiate between restricted connectivity organization and all-purpose topology preservation
c) To transmit in order about alter in restricted connectivity to those adjacent mobile nodes those are probable to require the in order. The AODV algorithm allows lively, self-starting, multi-hop routing between contributes mobile nodes desire to set up and uphold an ad hoc network.

The process of AODV is loop-free, and by keep away from the Bellman-Ford “counting to time without end “difficulty it present a rapid meeting when the ad hoc network topology modify. When links fracture in the network, AODV reason the exaggerated set of nodes to be informs so that they are able to cancel those routes by means of the misplaced link. One unique characteristic of AODV is for every route admission there is a target series number associated with it. The destination series number is shaped by the purpose node to be built-in along with any route in order which it

sends to the ask for nodes. Using end sequence numbers with every route it make sure loop autonomy and is easy to agenda. Given the option between two route to a destination a demand node chooses the route with maximum sequence number. The route detection and preservation process has been discuss in the following section in detail.

3.4.2 Route Discovery

In this stage of route detection, the basis node transmits a route request (RREQ) packets for penetrating a way to every one its neighbors in the network. broadcast RREQ packets by the source node is alike as the broadcast in DSR routing protocol. The a variety of mechanisms of the RREQ small package comprise meadow such as the reason identifier (DId), the source identifier (SId), the purpose sequence number (DSeq), the source sequence number (SSeq), the Time To Live and the transmit identifier (Bid). When a RREQ small package is at home at an middle node, it could also onward the RREQ packet to one more middle node or it will get ready a Route Reply (RREP) small package if there live an obtainable valid path to the purpose in its cache. To stay absent from copy RREQ packets, the (SId, BId) pair meadow of RREQ is used. Every middle node go into the BID and the preceding node's speak to, when it broadcast RREQ packets in excess of the network. A timer is also linked with an each node in an effort to delete a RREQ small package in case the respond has not been conventional before it finish.

When an middle node take delivery of a RREP packet, it as well take delivery of the in order of the preceding node stored in it in arrange to onward the small package to its after that jump of the source's purpose. This is called as the "onward pointer" to the purpose node. By using this technique of onward packets to destination, in which every node holds merely the after that hop in order; as contrast to the source routing, anywhere all the middle nodes as of source to purpose are amass to reach its destination.

Figure 3.6 Portray an example of route discovery process in AODV. Assume that node A needs to propel a data packet to node G other than it has no straight route obtainable from source to destination an in its cache. Then source node starts a route discovery process. It transmit a RREQ packet to all its adjacent nodes D, B and C.

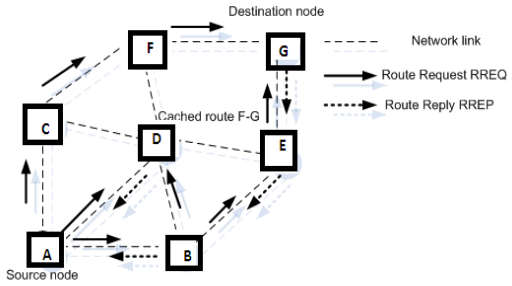


Figure 3.6 Route discovery process in AODV

every one the DSeq, BId , SId, DId, SSeq, in addition to TTL field are put in in the RREQ packet. at what time nodes B, C and D get release of RREQ packet after that every one these nodes right away look for their individual route caches to recognize an obtainable route. A contrast is done between the destination series number (DSeq) in the RREQ packet and the end series number in its matching admission in the route cache. If there is no way is obtainable in its way cache, then it basically forwards the RREQ to their neighbors. It respond to the basis node with a RREP packet which consists of the route in the direction of the purpose in the case condition the destination sequence number (DSeq) in the RREQ packet is superior. From Figure 3.6, where node C obtains a route to node G in its hoard and its destination series number (DSeq) is better when compare with that in the RREQ packet. as a result, it too sends a Route Reply (RREP) small package back to the basis node A. By responsibility these steps, node A has by now being stock up the path A-C-F-G. The destination node too sent back the Route Reply (RREP) small package to the source node. One likely route from source to purpose is A-B-E-G. From source to destination path all middle nodes on the trail create an inform on their routing tables with the newest its destination sequence number (DSeq) in the RREP packet.

3.5 object

This work in attendance that the proposed on demand routing algorithm performs better in mobile ad-hoc environment than other traditional algorithms. The future enhanced AODV based on Load and Delay for route detection in MANET algorithm carry out improved for solving routing troubles in Mobile Ad Hoc networks. In arrange to work out the far above the ground throughput pathway among the existing pathway from source

ISSN 2348 – 7968

to destination, we measured load and delays of entirety path. If the coldness increases holdup as well add to. In our suggestion, we describe cut-off circumstances to make a decision the high throughput pathway and classify the pathway pedestal on throughput.

It as well explain the plan of a novel on-demand routing algorithm. a number of goals of this thesis can be attained as follow:

- Get a all-purpose sympathetic of ad -hoc networks.
- produce a simulation surroundings that could be second-hand for further studies.
- Put into practice some of the planned routing protocol for wireless ad-hoc networks.
- Examine the technique hypothetically and from side to side simulation.
- Create a categorization of the technique with admiration to applicability in combination of tiny/huge networks, and mobile/semi-mobile nodes.
- Suggest technique for exact network scenarios.

3.5.1 TACTICAL ON DEMAND DISTANCE VECTOR ROUTING PROTOCOL (TAODV)

The Tactical AODV (TAODV), protocol is nothing but alteration of the Ad-hoc On-demand Distance Vector (AODV) routing protocol.

AODV was selected for the reason that it has the best presentation under PCS appropriate network conditions when it was compared to other protocols in simulation comparisons performed. In TAODV Routing information for each route to a destination node is maintained in a distributed fashion in the routing tables of the nodes in the network as similar in AODV. In this protocol by the generation of data packets for the destination is done only when it requested for the route from source to destination. Routes are only maintained as long as they are being actively used otherwise not. For this there is a timeout period for each route and if a route is not actively used in that particular period it is considered to be inactive then it is purged. It initiates a route discovery process, when a source node does not have a route to the destination. Once a route is found, then the data packets for the destination host are transmitted. If the route is broken between the source and destination node, during the communication session then route is repaired before further transmission can continue.

RESEARCH METHODOLOGY

4.1 Proposed work

In organize to work out the high throughput pathway in the middle of the accessible paths from source to destination, we measured load and delays of total path. If the remoteness increases delay also add to. In our suggestion, we describe cut-off circumstances to decide the high throughput path and classify the paths stands on throughput.

4.1.1 Delay

Delay on Transmission

Nodal dispensation involves four types of delays namely processing delay, queuing delay, transmission delay and propagation delay:

Processing Delay (dp)

What time a packet arrives (with all its bits), processing delay is the time inspired to determine the packet header and look at where it be supposed to be heading for. After processing, the router directs the packets to the line. This delay is more often than not in microseconds (μs).

Queuing Delay (dq)

Queuing holdup is the waiting time in the queue for a packet previous to it broadcasts against a link. The queuing delay of a exact packet will depend on the number of earlier-arriving packets that are queued and to come for broadcast crossways the connection. It is more often than not of the arrange milliseconds (ms). In the present work, we think average queuing delay in our calculations

Transmission Delay (dt)

The amount of time necessary to shove (i.e., transmit) each one of the packet's bits onto the link is called as broadcast delay. This comprise the adding up of present router information apart from sending acknowledgement signal from current router to the parent router/ downstream router on successful transmission.

ISSN 2348 – 7968

Propagation Delay (dg)

The time necessary to broadcast from the end of the downstream router to the upstream router is called as propagation delay. It is more often than not of the order milliseconds. So, the total nodal holdup is given by,

Dtn= dp+dq+dt+dg.

every of the on top of delay has a substantial impact on packet broadcast. A huge processing delay remain the buffer unfilled for most of the time; and a huge broadcast holdup fills the queue and next the packets (upcoming) may be misplaced due to unavailability of bandwidth. Queuing delay is most for a correct path selected and minimized for the most excellent path selected. In this work, our center is more on queuing delay as additional delays are more often than not hardware needy.

4.1.2 Load

To discover load of pathway there is require to discover number of packet is in queue for each node who are contributing in route assortment algorithm. When RREQ packet transmit for route discovery procedure this packet keep evidence of each node load and add to its path load. When this RREQ packet arrive at to destination, the destination read this value and choose path having low load for route organization as sending RREP packet to lightly loaded path.

This is standard value of packets beneath processing all middle nodes in path from source to destination.

4.1.3 Route Weight Calculation

future algorithm calculate total delay of path and total load on path by averaging worth of all nodes come into view between source and destination. Path assortment is based on weight of path weight of path is intended by bearing in mind both parameters load and delay evenly hence here constant pl and pd bring in any value between 0 and 1, these are assortment parameters such that pl+pd=1. If load is most effective value for path selection such type of networks where network traffic a lot loaded so improved to consider load primary selection criteria hence a is better than b to take more weighting to load than delay. MANET is spread up extended coldness for better coverage area so delay could be play vital role for path assortment because of more delay. If network is usually setup for delay and load so both choice limitation are equal to 0.5.

$$Wp=a*Lp + b*Dp \qquad (3)$$

Where Wp is weight of current path, Lp is load of path according every one nodes wrap this path and delay is standard delay of all nodes wrap within current path. pl and pd are constants between 0 and 1 such that pl+pd=1.

4.2 Proposed Methodology

For example from this Figure: node 4 take steps as a source node and node 2 take action as a destination node. Here to recognize the best route assortment in conditions of smallest amount delay and load is calculated as follows.

In mobile Ad-hoc network think the load and delay linked with each route is given as:

If Node 1: load=45 and delay =30

If Node 2: load=40 and delay =25

If Node 3: load=50 and delay =60

If Node 4: load=40 and delay =20

If Node 5: load=50 and delay =25

If Node 6: load=45 and delay =35

If Node 7: load=60 and delay =40

From source node to destination node present many numbers of routes obtainable. We think only four routes to reach destination node such as: 4-1-2, 4-3-2, 4-1-3-2 and 4-3-1-2.

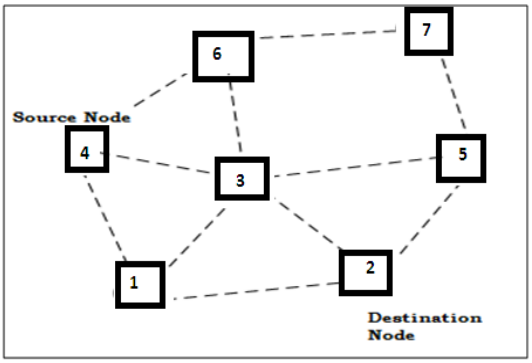


Figure 4.2 Mobile Ad-hoc Network

ISSN 2348 – 7968

Now the future algorithm work out the most excellent route from source to destination in terms of weight computation. For this the standard load and delay is intended in each route. Thus the average weight linked with each way is given as:

If Route I: 4-1-2:

W1= (0.5*40+0.5*20) + (0.5*45+0.5*30) + (0.5*40+0.5*25) = 100

If Route II: 4-3-2:

W1= (0.5*40+0.5*20) + (0.5*50+0.5*60) + (0.5*40+0.5*25) = 117.5

Route III: 4-1-3-2:

If W1= (0.5*40+0.5*20) + (0.5*45+0.5*30) + (0.5*50+0.5*60) + (0.5*40+0.5*25) = 163

If Route IV: 4-3-1-2:

W1= (0.5*40+0.5*20) + (0.5*50+0.5*60) + (0.5*45+0.5*30) + (0.5*40+0.5*25) = 155

Thus the smallest amount weight is find from route is 1-4-2, which is optimal path from source node 4 to destination node 2. So way number 1 will be most well-organized for transmitting information since having lowest weight. This assortment process bearing in mind load and delay both evenly. By placeing pl=1 and pd=0 this method believe only load for path assortment and not delay therefore this scheme turn out to be TAODV. From this algorithm the traffic there on each node in word of its load and delay in broadcast is also get. So the overcrowding on the network can be detached by be familiar with the path which is extremely loaded.

4.3 projected Algorithm

In general algorithm given in above part can be summaries as following steps for well-organized route discovery.

A. **NS-3 Simulation**
1. First design Wi-Fi topology in NS-3 simulator.
2. Then install MAC, IP and Application protocol on every node.
3. Then select MANET routing protocol AODV begin simulation
4. For all node
   a. RREQ begin
   b. Then Flooding of RREQ
   c. Gather behaviors information such as No. of packet broadcast, received, delay time, etc.
   d. Then serialize into .xml file format

B. **Selection Route**
1. If Input .xml data sleeve produce by NS-3 to JAVA Simulator
2. Then take out information
   a. For every node
   b. Input .xml onto Document Object Model)
   c. Compute average load and delay for each node.
   d. Display every one nodes in network at their x and y coordinate
3. Origin of route sum load and sum delay: compute Weight for each path as 0.5*load+0.5*delay choose best path according smallest amount weight.
4. Show chosen result path with all middle nodes in path.

This projected work setup ns3.13 simulation for compilation of routing in order as AODV protocol configures in simulation and JAVA tool is to imagine the path detection process by given technique and display pathway from source to destination.

RESULTS AND SIMULATION

Simulation is a very significant modern expertise. It can be applied to dissimilar science, engineering, or other request fields for dissimilar purposes. Computer help simulation can model theoretical and real-life objects or behavior on a computer so that it can be deliberate to see how the system purpose. dissimilar variables can be used to forecast the performance of the system. Computer simulation can be second-hand to assist the replica and psychoanalysis in many usual systems. characteristic application areas include physics, chemistry, environmental science, and human-involved systems in finances, finance or even societal science. Other important requests are in the manufacturing such as civil engineering, structural engineering, mechanical engineering, and computer engineering. submission of simulation expertise into networking area such as network traffic simulation.

ISSN 2348 – 7968

5.5 Snapshots

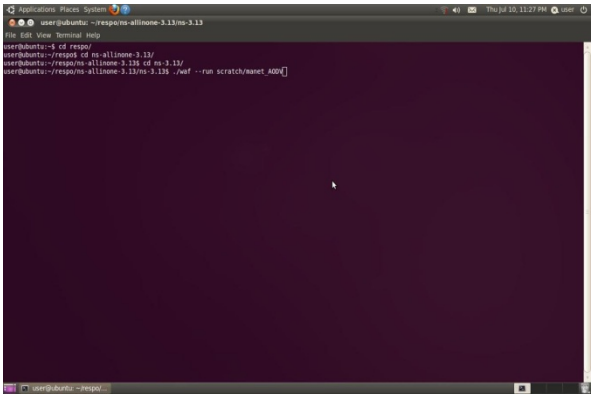


Figure 5.5 Control for running NS-3 simulation program file.

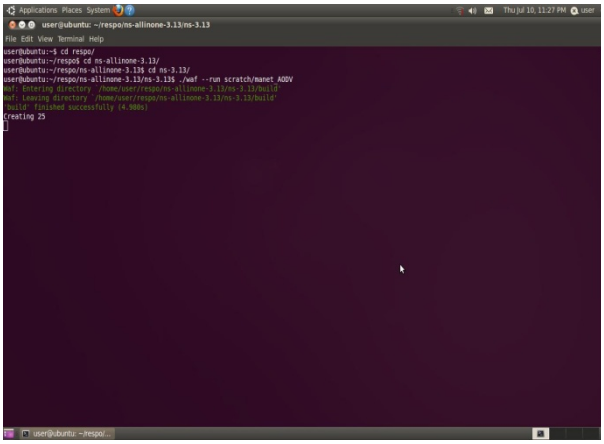


Figure 5.6 Execution and Compilation phase of Simulation.

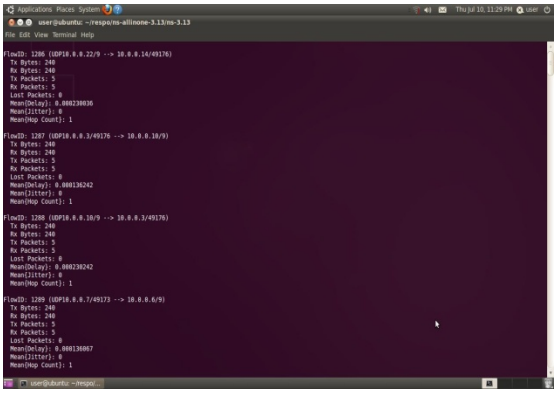


Figure 5.7 Results Node display on terminal screen.

5.6 Results

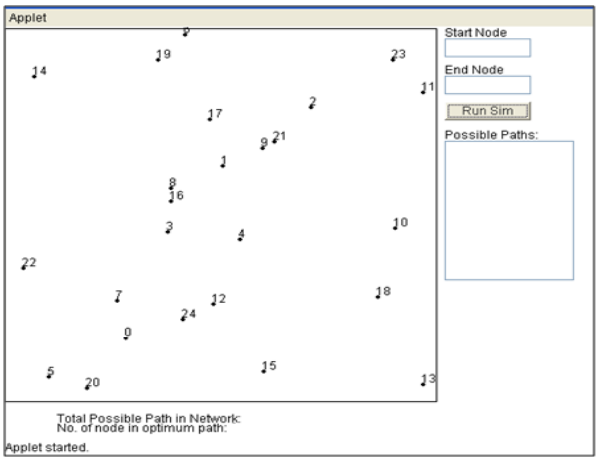


Figure 5.8 Visualization of network over JAVA simulation.

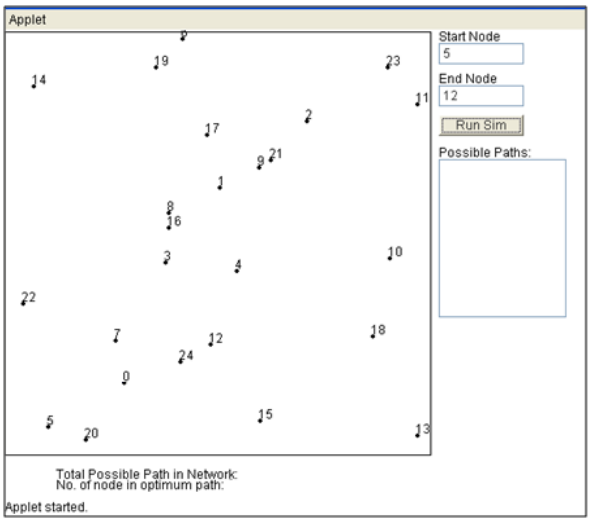


Figure 5.9 choose start and end node of route.

If we have bent one mobile Ad-hoc network which consists of 25 nodes having the broadcast variety as 100. By make this from side to side NS-3 simulator we create .xml file which is in use as input to the JAVA simulator. Following figure demonstrates the computation of route from source to destination. Out of 25 nodes some node might take act as the source node and destination node.

In this consequence we contain the best way in word of its smallest amount load and require smallest amount delay, which is shown by the weight connected with it. Here in the

ISSN 2348 – 7968

consequence shown in Fig.4, node 5 act as the source node and node 21 as the destination node, together nodes are stand for by the red circle.

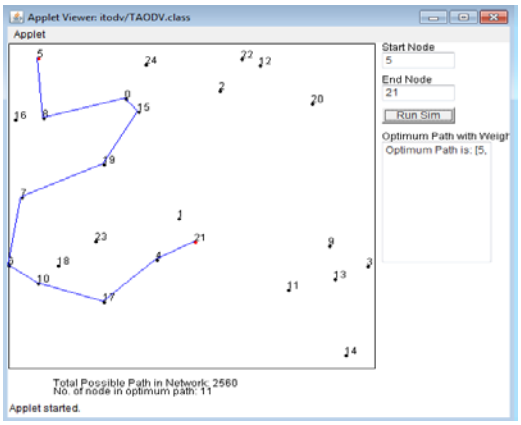


Figure 5.10 outcome viewing optimal path from source node to destination.

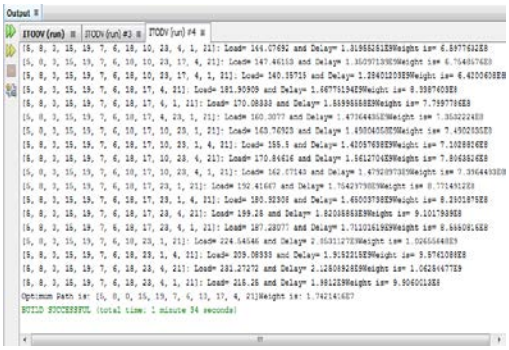


Figure 5.11 Result showing all possible routes from source to destination with weight

Figure 5.11 and Figure 5.12 shows there are 2560 routes available from source to the destination node and the best route among these route is [5,8,0,16,19,7,6,10,17,4,21]. The best route is calculated by the equation (1), having weight associated with this route is 17421416E7 which is the minimum weight among all routes.

Load Balancing Efficiency

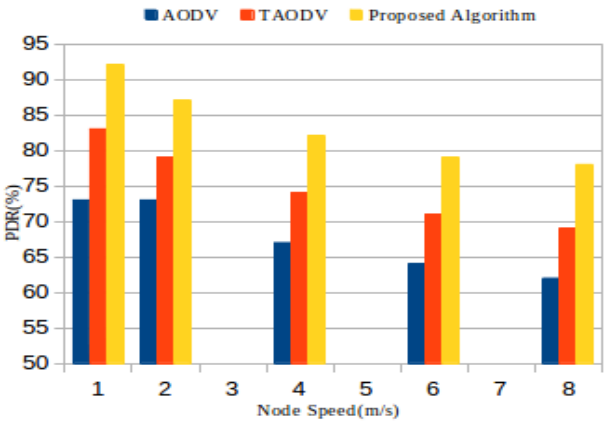
Fig.5.17 shows the load balancing efficiency of proposed scheme as a function of traffic load. The load is considered in terms of data packets sent per second. Efficiency varies from 61% to 90%. It increases gradually from lightly loaded network to heavy loaded network. It can be inferred that the load handling capability of proposed scheme is magnified for heavy loaded network. This is achieved by giving more weight age to load parameter (pd) while calculating weight of a path by using equation I. For heavy traffic scenarios we set pl=1 and pd=0 thus giving complete preference to load over delay. We calculate load balancing efficiency as the percentage difference in load of selected path and average load of alternative paths available.

Node Speed (m/s)	Delay (seconds)			Packet Delivery Ratio		
	AODV	TAODV	Proposed Algorithm	AODV	TAODV	Proposed Algorithm
1	0.62	0.28	0.11	73	83	92
2	0.57	0.25	0.13	73	79	86
3	0.56	0.28	0.17			
4	0.55	0.29	0.19	67	74	82
5	0.54	0.30	0.20			
6	0.53	0.31	0.21	64	71	79
7	0.52	0.318	0.21			
8	0.52	0.32	0.22	62	69	78

Table 5.2 Delay and PDR performances

Packet Delivery Ratio

Figure 5.16 shows a comparison of proposed algorithm with AODV and TAODV routing protocols in terms of packet delivery ratio as a function of mobility. It is observed that packet delivery ratio decreases for all three protocols with increase in mobility rate. But in all node speed scenarios, percentage of packets delivered by proposed algorithm is more than that of AODV and TAODV



CONCLUSION AND FUTURE WORK

Freshly Mobile Ad-hoc Networks (MANETs) have increased the notice of investigate community due to greater than before acceptance of its practice in real life request. MANETs are wireless networks which consist of a set of mobile

ISSN 2348 – 7968

nodes and allows multi-hop peer-to-peer routing without any obligation of predefined transportation for its deployment. Moreover, MANETs facilitate communication between the places where a cable cannot arrive at or the position where intrude a cable is infeasible. Also this type of network has the aptitude to deploy fast and do not depend on any pre-existent communications. more than a few computations such as judgment path, decide the best appropriate path and breakdown treatment have to be compute to assign a path from source to destination. Due to limited switching time, substantial quantity of time is inspired for these working out resulting into delays. Our proposal is based on the reality that as the detachment from sources to destination add to, the delay also add to irrespective of the data speed.

This work converse some significant issues connected to the load and delay impartial routing protocols for mobile ad hoc networks (MANET). Nodes in MANET have incomplete buffer space, bandwidth, and battery control etc. thus it is essential to deal out the travel in the middle of the mobile host for the improved association of load all from side to side in network. There are dissimilar metrics second-hand for the route assortment. Load complementary algorithms are holdup based, traffic based . In MANET, to progress the performance, it is very necessary to equilibrium the load. Load complementary is used to add to throughput of the network. Also it is probable to reduce traffic overcrowding and load throw into turmoil, make the most of nodes lifetime, packet release ratio as a result, end-to-end packet holdup can be reduce, and thus energy expenditure can be impartial in network. This work, planned an efficient answer for the assortment of high throughput pathways based on hasty routing protocol.

Results show significantly lesser delay and bigger Packet Delivery Ratio than the other algorithms.

In attendance work may be comprehensive to slot in query localization method to decrease flooding of RREQ packets therefore further ornamental the performance.

References

[1] Mahesh KM, and Das SR. On-demand multipath distance vector routing in Ad hoc networks. Ninth International Conference on Network Protocols, Washington D.C., USA, 2001, pp 14-23.

[2] Sharma Dhirendra Kumar, Chiranjeev Kumar and Jain Sandeep, Tyagi Neeraj, “An Enhancement of AODV Routing Protocol for Wireless Ad Hoc Networks”, 1st Int’l Conf. On Recent Advances in Information Technology | RAIT-2012 | IEEE, 2012

[3] Ahmad Syed Jalal, Reddy V.S. K., A. Damodaram and Radha Krishna P., “Efficient Path Estimation Routing Protocol for QoS in Long Distance MANETs”, IEEE, 2012.

[4] Khalaf Mustafa Bani, Ahmed Y. Al-Dubai and Abed Mourad, “New Velocity Aware Probabilistic Route Discovery Schemes for Mobile Ad hoc Networks”, IEEE, 2012.

[5] Taifei P. Y. Zhao, Xizheng Ke, “Position and velocity aided routing protocol in mobile ad-hoc networks,” International Journal of Digital Content Technology and its application, vol. 4, pp. 101-109, 2010.

[6] Tran Anh Tai, Myung Kyun Kim , “A real-time communication protocol considering load balancing in Adhoc Network”, IEEE, 2013.

[7] Mohd. Ayash, Mohd. Mikki, Kangbin Yim, “ Improved Aodv Routing Protocol to Cope with High Overhead in High Mobililty MANETs “, Sixth Int. Conference on Innovative Mobile and Internet Services in Ubiquitous Computing, 2012.

[8] Y.Hassan, M. Abd El-Aziz, and A. Abd El-Radi, ”Performance evaluation of mobility speed over MANET routing protocols,” International Journal of Network Security, November 2010,Vol. 11, No.3, pp.128-138.

[9] A.Mohammad, M.ould-khaoua, L.Mackenzie, abdulai “Dynamic probabilistic counter based routing in mobile adhoc network,”2nd international conference on Adaptive Science Technology, Jan 2009.

[10] P.Y.Taifei Zhao, Xizheng Ke, “Position and velocity aided routing protocol in mobile ad-hoc networks,” International Journal of Digital Content Technology and its application, vol. 4, pp. 101-109, 2010.

[11] M. uddin, Abdul Rahman, A. Alarifi, Mohd. Talha, A. Shah, Mohsin Iftikhar and A. Zomaya, "Improving performance of Mobile adhoc networks using efficient Tactical on demand distance vector (TAODV) routing algorithm, vol.8, international journal of innovation and control, June 2012.

[12] N. S. M. Usop, A. Abdullah and A. F. A. Abidin, Performance evaluation of AODV, DSDV & DSR routing protocol in grid environment, *International Journal of Computer Science and Network Security*, vol.9, no.7, pp.261-268, 2011.

[13] S. Nanda, and R. Gray, "Multipath location aided routing in 2D and 3D," Wireless Communications and Networking Conference, 2006, 3-6 Apr., IEEE Vol. 1, pp.311-317.

[14] Altalhi Abdulrahman H. Richard Golden G., III "Load-Balanced Routing through Virtual Paths:Highly Adaptive and Efficient Routing Scheme for Ad Hoc Wireless Networks",IEEE,2004

[15] Y. KO and N. H. Vaidya, "Location-Aided Routing (LAR) in mobile Ad-hoc networks," Wireless Networks, 2000, pp.307-321.

[16] J. Broch, D.A. Maltz, D.B. Johnson, Y. Hu and 1.Jetcheva, "A Performance Comparison of Multi-hop Wireless Ad Hoc Network Routing Protocols," in Proceedings of ACM MOBICOM'98, Dallas, Texas, USA, October 1998.

[17] Pham Peter P. and Perreau Sylvie, "Performance analysis of reactive shortest path and multipath routing mechanism with load balance", in Proc. Of the IEEE INFOCOM, march 3 April, 2003.

[18] C.E. Perkins and E.M. Royer, "Ad-Hoc on-Demand Distance Vector Routing", Proceedings of IEEE WMCSA'99, New Orleans, LA. (Feb.1999) pp: 90-100.

[19] C.E. Perkins, E. M. Belding-Royer, and S. R. Das, "Ad Hoc On-Demand Distance Vector Routing", IETF RFC 3561, July 2003.

[20] Widjaja Indra, Elwalid Anwar. MATE: MPLS Adaptive Traffic Engineering, draft-widjaja-mpls-mate-01. txt, Internet Draft [DB/ (DB/OL)] [S] . october ,1999.

[21] Amjad Ali, Wang Hiugiang "Node Centric Load Balancing Routing Protocol for Mobile Ad Hoc Networks ", Proceeding of International Multi Conference of Engineers abd computer Scientist 2012, Vol I, March 2012, Hong Kong.

[22] P. Pranitha, G. Swamy, and M. Aakunuri,"A review on enhanced GPSR protocol for wireless sensor networks," Computer Engineering and Intelligent Systems, 2011, Vol. 2, No. 4.

[23] O. Tonguz, N. Wisitpongphan, J. Parikh, F. Bai, P. Mudalige, and V. Sadekar, "On the broadcast storm problem in ad hoc wireless networks," in 3rd International Conference on Broadband Communications Networks and Systems, pp. 1 -11, 2006.

[24] Douglas S.J., Daniel Aguyao, John Bickrt and Robbert Morris, "A high Throughput path metric for multihop wireless routing" in Proc. Of 9th annual international conference on Mobile computing and networking, ACM, pp 134-146, 2003

[25] Rani Amita, Dave Mayank, , "Load Balancing Routing Mechanism for Mobile Ad Hoc Networks ", Int. J. Communications Network and System Sciences, 2009, 7, 627-635.