ABSTRACT

MANET is auto-configured and a system with independent mobile devices forms an infrastructure. Such kinds of networks are widely used in search and rescue, military missions, etc. due to the high versatility. There are many routing protocols for such networks or systems. Furthermore, node mobility produces an ever-changing topology of interaction in which routes split and new routes are continuously formed. This research article describes a relative and quantitative efficiency research using different nodes mobility in NS2 for AODV and DSR dynamic routing protocols. Performance metrics or measures such as PDR, Residual Energy and efficiency or throughput are examined in different networks, parameters of mobility such as nodes mobility speed. Network topology constraints are strongly or highly influenced by performance measures. Metrics of mobility, such as speed & stop period, have a slight effect on performance.

Keywords— Mobile ad hoc networks; Dynamic source routing (DSR); Metrics; Auto-configured; Throughput; Ad-Hoc On Demand Distance Vector Routing (AODV).

INTRODUCTION

A MANET i.e. Mbl Ad-hc Network is a bunches of mobile wireless computers (or nodes) in which nodes perform its work with each other by transmitting packets to results them to interact outside the reach of regular wireless transmission. Ad hoc networks do not require unified establishment or specified network infrastructure such as base stations or access points, and can be set up as needed quickly and cost-effectively. A MANET is an independent mobile user group that communicates through relatively slow wireless connections. The configuration of the network can vary quickly and erratically over time due to the mobile nodes. The process is hierarchical, where all network operation must be conducted by the nodes themselves, including finding the topology and delivering messages. It is therefore necessary to integrate routing functionality into the mobile nodes. The routers, the participant nodes serve as routers, have freedom to dynamically switch and randomly control themselves; hence, the wireless topology of the network can change rapidly and unpredictable ways.
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**Characteristics Of MANET**

Remote specially appointed system hubs are fitted with versatile transmissions and beneficiaries that have utilization receiving wires that can be emphatically directional (point-to-point), uni directional (communicate), possibly steerable, or some variety[1]. Are mote systems administration as an unconstrained, contingent upon the are of the hubs, their transmitter and collector inclusion designs, contact control levels and un settling influence levels of the co-channel, among the hubs, there is a directing convention or specially appointed & organize. With time, this topology can change as the hubs move oral their parameters of convey and gathering. These system high lights are characterized as pursues:

DSR, which for each target will hold a few way reserve passages. AODV centers around directing table postings without sources tearing to proclaim a RREP back to the source and afterward course information bundles back to the goal. AODV utilizes arrangement numbers to survey the nature of directing data at every end point and to a data inform steering circles. Such arrangement numbers are borne by all steering bundles. AODV’s significant component is the administration in every hub of clock based at concerning the utilization of individual steering tables sections.

A. Wireless methods for contact.
B. Nodes will play the two servers and connectors positions. C. Links of limited data transfer capacity, a dap table power.
D. Activity that is restricted by control.
E. Poor insurance of the body.
F. The layout of the dynamic system.
G. Prom in end up dates to the steering.

**ROUTINGPROTOCOLSOFAD-HCNETWORKS**

For Ad-Hc Mbl networks, many routing rules or the protocols have been deployed or developed [1]. Such rules and protocols also tack let he usual draw backs of these networks, including high power usage, limited throughput and higher or rates.

**A. Table – Drive Routing Protocols:**

Perfectly aligned and up-to-date mapping data for all nodes is established a teach node in table-driven dynamic routing.

**B. On – Demand Routing Protocols:**

The routes or path are created as and when requested or required in the On-Demand dynamic routing. If a source wants to send to a destination, the path exploration methods are invoked to locate the route to the location.

**AD-HOCON-DEMANDDISTANCE VECTORROUTING(AODV)**

AODV[2] utilizes a comparative course disclosure procedure to find courses when wanted. By and by, so as to keep up steering information, AODV receives anal
together different instrument. It utilizes exceptional tables of directing, one passage for each target. This is in contrast with

**DYNAMICSOURCEROUTING(DSR)**

Utilizing references teering is the key or basic element of DSR[4]. That is, the beneficiary realizes the goal's whole jumpy- bounce course. Such ways are put as idea away in as to re for the way. In the bundle header, the information parcels bear the source way. At the point when a hub in the specially appointed system at tempts to send an information parcel to an objective for which the course isn't now known, a course disclosure process is utilized to intuitively build up such a course revelation works by flooding bundles of the system with course demand (RREQ). Every hub that gets a RREQ retransmits it, except if it is the objective courses to has a course to the goal. Such a hub reacts to the RREQ with a bundle of course answer (RREP) steering back to the first source. In that manner source coordinated are RREQ and RREP bundles. The RREQ is build in gup the path through the frame work. By restoring this heading, the RREP courses itself back to the origin or the source. For sometime later, the course reclaimed by the RREP bundle is stored at the source. On the off chance that any connection is broken on a source highway, a course blunder (RERR) parcel will inform the source hub. Utilizing this connection, the source prohibits each course from its reserve. On the off chance that this course is as yet required, another course disclosure process must best rated by the source. DSR utilizes source directing and course reserving forcefully.

**V.PERFORMANCE METRICS**

**A. Packet delivery fraction**

The ratio or proportion of the data packets provided by the origin or sources to the destinations. Packages delivered and packages lost are taken into account.

**B. Throughput**

There are two output representations; one is the quantity of information transmitted in Kbps over the period of time. The other is the quantity of packet distribution derived from a combination of the no. of data pkts transmitted and the number of returned data packets.

**C.E-T-EDelay**

The time taken by the packet to reach the target is called end-to-end lag, because passing between two ends, i.e. Origin and destination.

**VI.SIMULATIONSETUPANDRESULT S**

The purpose of all the analyses or the simulations in this research article is to present a numerical or quantitative relationship between system performance parameters such as packet transmission ratio, throughput or efficiency and residual energy and other varying or different network or system parameters such as number of speed of nodes mobility. This simulation provides a comparative study or evaluation for routing two routing protocols i.e. first is AODV and second protocol is DSR by varying the speed of nodes or mobility of nodes i.e. 20m/ Sec, 40m/sec 60m/Sec. The overall simulation is carried out or done on NS 2(version2.35) which is installed onUBANTU16.04LTS. The parameters which are used for the simulation is given in the form of table below:-
Throughput for DSR and AODV with 20,40,60m/sec mobility

A. PKT TRANSMISSION RATIO

The ratio or proportion of the data packets provided by the origin or our urope Destination. Packages delivered and packages lost are put into considerations. It is calculated as:

\[ \text{Pkt transmission ratio} = \left( \frac{\text{Receive d packets}}{\text{Sent packets}} \right) \times 100 \]

From the above graph, authors analyze or conclude that the PDR value for DSR routing protocol gradually increases as the nodes mobility increases because pkt loss is less as maximum packets are received at the receiver side. But as the mobility or speed of the nodes is increased the PDR value for AODV routing protocol gradually decreases because the pkt loss is more because the links or connection are not properly established.

B. AVERAGE THROUGHPUT

The complete amount of packets in simulation time supplied or received by the target node is the throughput. The average throughput is calculated as:

\[ \text{Num Of Recd/(sp Time- s Time)} \times \left( \frac{8}{1000} \right) \]

From the above graph, authors conclude that the average throughput for DSR routing protocol will decrease with increase in mobility of nodes but after a threshold nodes mobility it starts increases. But for AODV routing protocol the throughput value will increase as the speed of devices increases, after a threshold value of speed throughput decreases gradually with an increase in node's mobility. The DSR protocol having higher throughput performs better in reference or comparison to AODV.

C. TOTAL RESIDUAL ENERGY

It is the amount or quantity of energy remaining from the total available energy after absorbing a certain quantity or amount of energy. The total residual energy is given or calculated as:

\[ \text{Residual Energy} = \text{Total available energy} - \text{consumed energy} \]

From the graph, authors investigate that the residual energy for both DSR and AODV routing protocols increases by increasing the nodes mobility. In DSR protocol, the energy gradually increases but in AODV protocol, the energy increases instantly.

CONCLUSION

In this paper authors investigates, the AODV and DSR routing rules that are utilized in MANET or Mbl Ad-hc Networks performance parameters such as PDR, Average throughput and Residual Energy. The DSR routing protocol out performs in responses of avg. throughput than AODV protocols as the throughput of the DSR protocol gradually increases as nodes mobility is increased. The PDR also better for DSR protocol in comparison for AODV protocol. Higher packet delivery shows that fewer packets are lost during the transmission between Origin or sender and destination or receiver.

FUTURESCOPE

For future work, the researchers can take some other routing protocols or rules used in MANET and a detailed simulation can be carried out to compare various routing
protocols based on various performance parameter. Some improvement in these routing rules could be given in response or order to overcome their limitations.

REFERENCES


Figure 1: Simple ad-hoc network with three participating nodes [1]

Figure 2: Categorization of Routing Protocols [2]

The parameters which are used for the simulation is given in the form of table below:-

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
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</tr>
<tr>
<td>Routing Protocol</td>
<td>AODV, DSR</td>
</tr>
<tr>
<td>Number of Nodes</td>
<td></td>
</tr>
<tr>
<td>Nodes Mobility</td>
<td>20m/ Sec, 40m/ Sec, 60m/ Sec</td>
</tr>
<tr>
<td>Traffic</td>
<td>CBR Simulation Time</td>
</tr>
<tr>
<td>Channel</td>
<td>Channel/ Wireless</td>
</tr>
<tr>
<td>Channel</td>
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</tr>
<tr>
<td>MAC Type</td>
<td>Mac/ 802_11</td>
</tr>
<tr>
<td>Antenna Model</td>
<td>Antenna/ Omni Antenna</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Interface Queue Type</td>
<td>Queue/ Drop Tail/ Pri</td>
</tr>
</tbody>
</table>

Figure 4: Scenario in DSR with 40m/sec 17 nodes

Figure 5: Scenario in DSR with 60m/sec 17 nodes

Figure 6: Scenario in AODV with 20m/sec 17 nodes
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