BEHAVIOUR OF AODV PROTOCOL IN MANET MINING

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ABSTRACT: Mobile Ad-hoc network (MANET) is an infrastructure less network with mobile nodes. The nodes dynamically form a temporary network for the transmission of data from source to destination. MANET Mining discovers the hidden relationship among the nodes, even though they are independent of each other. Security is one of the challenging issues in MANET. There are many routing protocols in MANET mining. AODV is one of them. AODV (Ad-hoc On-Demand Distance Vector) is a reactive routing protocol and establishes a route to a destination only on demand. In this paper we have focused on the performance of AODV protocol

KEYWORDS: MANET; Mining; AODV.

I. INTRODUCTION

MANET Mobile Ad-hoc Network) is a wireless type of network. MANETs are collection of mobile nodes and are self- managed without any pre-existing infrastructure and centralized management. The set of rules followed by the massage packets from source to destination is known as Routing Protocols. Protocols in MANET are classified in three categories: Proactive Routing Protocol, Reactive Routing Protocol and Hybrid Routing Protocol. AODV is a Reactive Routing Protocol. It establishes a path to the destination when it is require [6].

Ad-hoc On-Demand Vector (AODV) routing protocol is used in MANET and other wireless Ad-hoc networks. AODV uses three massage types: Route Request (RREQs), Route Replies (RREPs) and Route Errors (RERRs).The AODV reacts fast to the topological changes and does not need any central management system to control the routing process in the network. AODV reduces the control traffic massages overhead while finding new route. AODV saves storage as well as energy. Routing Table keeps one entry per destination and an invalid path is deleted which contains error packets.

The nodes are mobile in nature so it is possible that the valid route is expired. It is difficult to determine the expiry time. A large network is more vulnerable to link breakages and requires high control overhead for its maintenance. The performance of AODV protocol may be poor. Route learning is limited only to the source of any routing packets; it causes AODV to flood more for route discovery which may increases network overhead and many redundant transmissions that may generate broadcast storm problem. We have discussed brief about the introduction of AODV. Next MANET mining,, working of AODV, methodology , result and analysis and finally conclusion

II. MANET MINING

Data mining is a process of analyzing data from different perspective and extracting useful information by applying various data mining techniques. When Data Mining approaches are applied to MANET, it is called MANET Mining. MANET Mining is a powerful method to get hidden relationships among routing nodes and these relationships provide useful information to different MANET protocols in different layers.

III. WORKING OF AODV

Ad hoc On-Demand Distance Vector (AODV) is a routing protocol for mobile ad hoc network. It is a reactive protocol that generates a route to a destination only when required. AODV uses three massage types: Route Request (RREQs), Route Replies (RREPs) and Route Errors (RERRs). Fields for ,

Table-1: Route Request (RREQs):

Sorce address	Request Id	Source Seque.no	Destination Address	Destination Seque. no	Hop count

Table-2: Route Replies (RREPs):

Sorce address	Destination Address	Destination Seque. no	Hop Count	Life time

AODV maintains two operating modes: Route Discovery and Route Maintenance as shown in the figure 1.

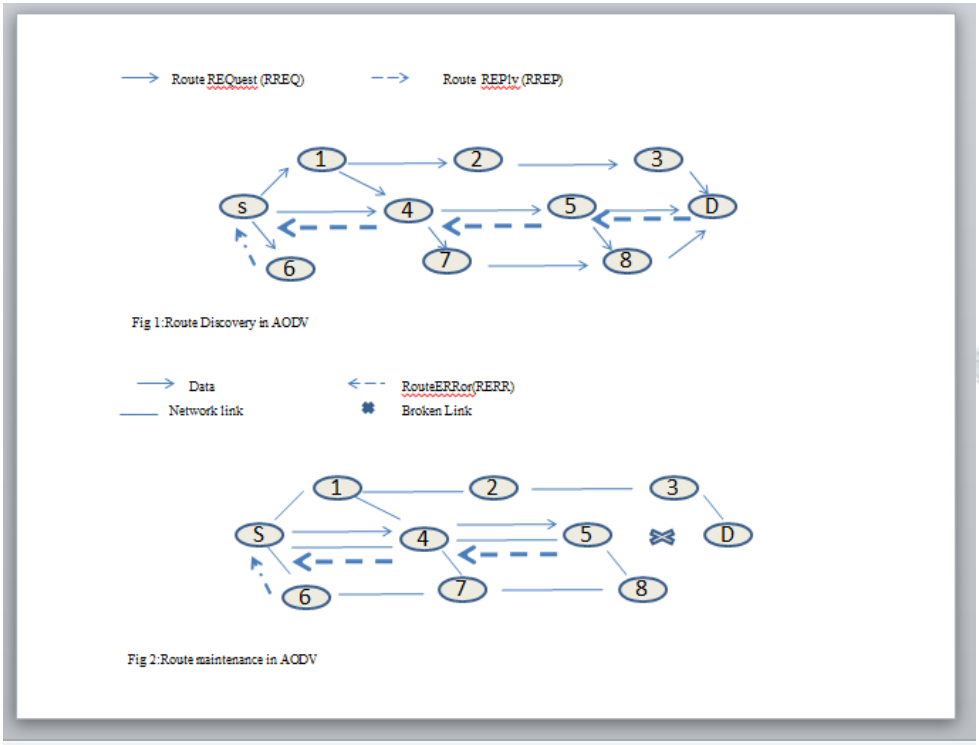

Figure1: Routing in AODV

Route Discovery mode:

Route Discovery starts at initial stage when the source node does not have a valid route to the destination node. The source node broadcast Route REQuest (RREQ) packet which contains data to all the neighbors and when the neighboring nodes receive a RREQ, they rebroadcast the packet if they do not have a fresh enough route to the destination node in their caches. This process will be repeated until Route REPly(RREP) massage is received by source node. Once the source node receives the RREP, it can start sending the data packets to the destination. Multiple RREP massages may be received by source for different routes. A source node updates its routing table when a RREP has a higher sequence number and selects the best path to the destination.

Route maintenance mode:
When a node detects a link failure, the node sends a Route ERRor (RERR) packet to the source, which again initiates a new route discovery process.

IV. METHODOLOGY:

In this section we have discussed the experimental setup, followed by results and Analysis.

Experimental Setup:

The experimental set up is shown in table 3. We have used the scenario parameters for each of the cases varying the number of nodes and area of simulation. Parameters used in our experiment is as follows

Table 3- Parameters used

Simulator	NS3
No. of Nodes	10-50
Routing Protocol	AODV

Simulation Time	300sec
Pause time	1.0 s
Node mobility Speed	20 m/s
Data Flow	UDP
Data Packet Size	128 bytes
Simulation area	$100m^2$ - $500m^2$
Channel Capacity	2Mbps
Mobility Model	Random Way 2D

V. RESULTS AND ANALYSIS:

The number of nodes is varied from 10 to 50. 10 nodes are distributed in the simulation area of $100*100m^2$ with node mobility speed 20m/s and simulation time 300sec. The channel capacity is 2Mbps and the packet size is 128 bytes. The same scenario is for 20, 30, 40 and 50 nodes in the simulation area $100*100m^2$. Throughput & dropped packet is analyzed for the area $100*100m^2$ for nodes 10 to 50. Then we calculated throughput for the simulation area 200*200, 300*300, 400*400 and finally for 500*500 with nodes varied from 10 to 50 as shown in Figure-2.1. We observed that the throughput depends on the area of simulation. Throughput varies when the number of nodes changes. From the graph it is clear that throughput gives good results in the terrain area $500*500m^2$ for 20 nodes.

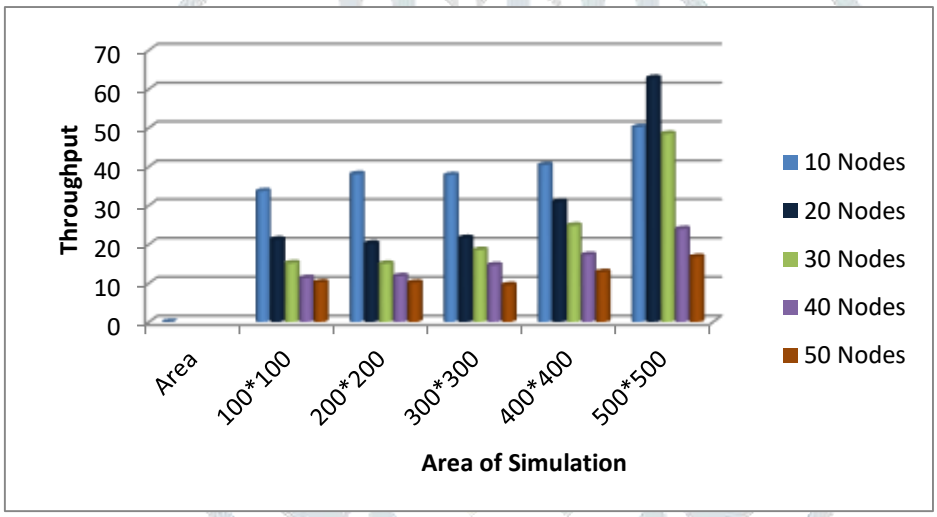

Figure -2.1: Throughput Analysis

From Figure-2.2 it is observed that for 10 nodes the dropped packet is high in the area of simulation $500*500m^2$ whereas for 20 nodes the dropped packet is more in the area $400*400m^2$. In case of 30, 40 nodes it is higher in $500*500m^2$ and finally for 50 nodes in the simulation area $200*200m^2$. From the analysis it is clear that the dropped packet is not dependent on area of simulation and varies randomly.

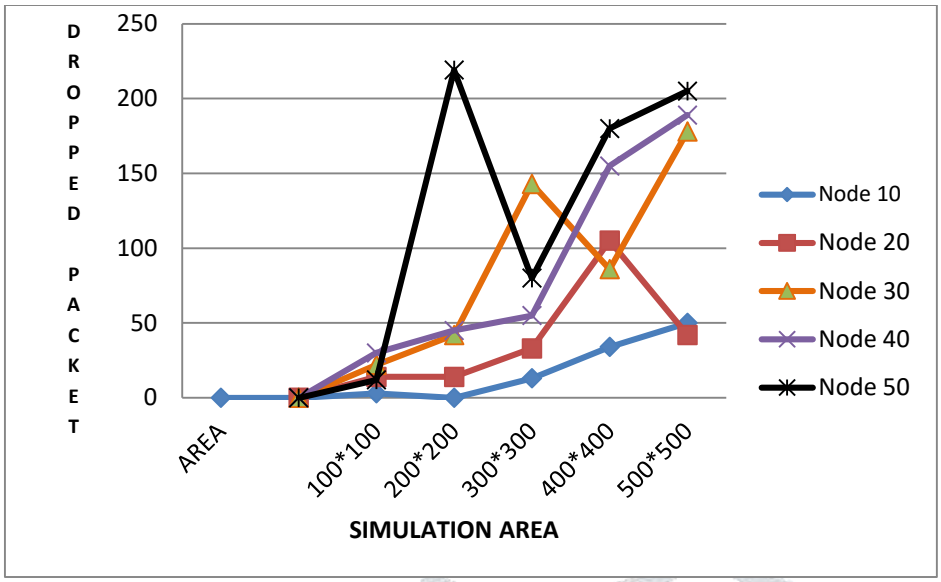

Figure -2.2: Dropped Packet Analysis

VI. CONCLUSION AND FUTURE WORK

In this paper , we have analyzed the impact of throughput for different area of simulation in MANET based on AODV routing protocol. We compared the throughput varying the nodes and simulation area. From the experiment , we concluded that the throughput of AODV depends on the simulation area. In our simulation,when area is 500*500m^2 we got good performance Of AODV. Dropped packets are not dependent on area of simulation and can vary randomly.

In future we are planning to implement MANET Mining to get more hidden relationships between the nodes to control the traffic for larger network areas.

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