Various Packet Size on Different MANET Routing Protocols

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ABSTRACT

Mobile ad-hoc networks (MANET'S) are autonomously self-organized networks without infrastructure support. Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. MANET is single and multi-hop mobile wireless networks in which packets are transmitted in store and forward manner from one point to other point. When transmitting the packets from source to destination, packet size is very important parameter because once changing the packet size and also changing the performance of the MANET network. This paper to analyze the various packet size in MANET network. Analyze three different routing protocols AODV, DSR, ZRP and compare various parameters like Average End-to-End Delay (sec.), Average Jitter (sec.), and Throughput (bits/sec.). Here take 33 nodes MANET network and each node work as MANET station.

Keywords

MANET, AODV, ZRP, DSR, VARIOUS PACKET SIZE.

I. INTRODUCTION

Mobile Ad-hoc Network is called MANET. Ad-hoc network is a type of network in which packets are transmitted to their source to destination through wireless multi-hop connectivity. MANET is a collection of independent mobile nodes that can communicate to each other via radio waves. MANET have high throughput because it is a type of WLAN which have WLAN sharing capacity and relatively higher bandwidth. MANET is a dynamic network without fixed infrastructure due to their wireless nature and can be deployed as multi-hop packet networks. In this research, transmitting packets from source to destination from different routing path. Each and every MANET nodes having some amount of transmitting capacity. So here analysis the various packet sizes in the MANET environment for routing protocols. Analysing here takes 33 nodes in MANET network and vary their packet size finally compare performance for different routing protocols

II. ROUTING PROTOCOLS IN MOBILE ADHOC NETWORK

There are different existing routing protocols available in the network field that is proactive and reactive routing protocols.

Reactive routing protocol does not keep a record of all routes available in a network. This makes the system more light weight so there is no storage of route tables and no need to calculate best path scenarios. When a route is needed the system floods the network with route request packets. There are sent out to immediately connected routers that pass on the request for path to a given destination. If a router with conduct to the destination is reached it messages back its availability the first reply received determines the route to be used. Here discuss two routing protocols AODV, DSR. The Zone routing (ZRP) combines the advantages of the proactive and reactive approaches by maintaining an up-to-date topological map of a zone centered on each node.

A. *Ad hoc On-Demand Vector Routing(AODV)*

AODV is an 'on demand routing protocol' with small delay. That means that routes are only established when needed to reduce traffic overhead. AODV supports Unicast Broadcast and Multicast without any further protocols. The routes are very quickly in order to accommodate the movement of the mobile nodes and Link breakages can locally be repaired very efficiently. It maintains these routes as long as they are needed by the sources. Additionally, AODV forms trees which connect multicast group members. The trees are composed of the group members and the nodes needed to connect the members. AODV uses sequence numbers to ensure the freshness of routes. It is loop-free, self-starting, and scales to large numbers of mobile nodes

This protocol performs Route Discovery using control messages route request (RREQ) and route reply (RREP), whenever node wishes to send packet to destination. To control network wide broadcast of RREQs, the source node uses an expanding ring search technique. The forward path sets up in intermediate nodes in its route table with a lifetime association using RREP. AODV allows mobile nodes to respond to link breakages and changes in network topology in a timely manner. When either destination or intermediate node moves, a route error (RERR) is sent to the affected source nodes. When a source node receives the (RERR), it can reinitiate the route discovery if the route is still needed. Neighbourhood information is obtained from broadcast Hello packet.

B. *Dynamic Source Routing(DSR)*

The Dynamic Source Routing protocol (DSR) is a simple and efficient routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes. DSR allows the network to be completely self-organizing and self-configuring, without the need for any existing network infrastructure or administration. The protocol is composed of the two mechanisms of Route Discovery and Route Maintenance, which work together to allow nodes to discover and maintain source routes to arbitrary destinations in the ad hoc network.

Each node in the network maintains a route cache in which it caches the routes it has learned. To send data to another node, if a route is found in its route cache, the sender puts this route (a list of all intermediate nodes) in the packet header and transmits it to the next hop in the path. Each intermediate node examines the header and retransmits it to the node indicated after its id in the packet route.

C. *Zone Routing(ZRP)*

The Zone Routing Protocol (ZRP) combines the advantages of the proactive and reactive approaches by maintaining an up-to-date topological map of a zone centered on each node. Within the zone, routes are immediately available Part of the traffic is directed to nearby nodes. Therefore, ZRP reduces the proactive scope to a zone centered on each node. In a limited zone, the maintenance of routing information is easier. Further, the amount of routing information that is never used is minimized. Still, nodes farther away can be reached with reactive routing. Since all nodes proactively store local routing information, route requests can be more efficiently performed without querying all the network nodes.

III. PERFORMANCE METRICS

A. *Average Jitter*

The term jitter is often used as a measure of the variability over time of the packet latency across a network. A network with constant latency has no variation (or jitter).

B. *End-to-End Delay*

Network delay is the total latency experienced by a packet to traverse the network from the source to the destination. At the network layer, the end-to-end packet latency is the sum of processing delay, packet, transmission delay, and queuing delay. The end-to-end delay of a path is the sum of the node delay at each node plus the link delay at each link on the path.

C. *Throughput*

Throughput of the routing protocol means that in certain time the total size of useful packets that received at the destination nodes. The unit of throughput is Kilobits per second (kbps).

IV. SIMULATION RESULTS

The simulations were performed using qualnet 5.0. The following above section studied on AODV, DSR, ZRP routing protocol. These protocols have been simulated for Average jitter, Throughput, Average End-to-End delay. Here depict the routing performance of three different protocols under various packet sizes. Constant Bit Rate (CBR) traffic was used in simulation. Simulation was done by various packet sizes from 256, 512, 768, 1024, 1280, 1536, and 1792. Overall simulation time is 300s and simulation area 1000mX1000m.

Table: 1 various important parameters

Simulation Scenario

Parameter	Values
Routing Protocols	AODV, DSR,ZRP
Simulation area	1000m x1000m
Number of nodes	33
Mobility speed	1-10m/s
Mobility Model	Random Way Point
Simulation time	300s
Traffic model	Constant Bit Rate(CBR)
Pathloss model	Two Ray
Channel frequency	2.4GHZ
Network layer	IPV4
Packet Sizes	256,512,768,1024,1280,1536,1792

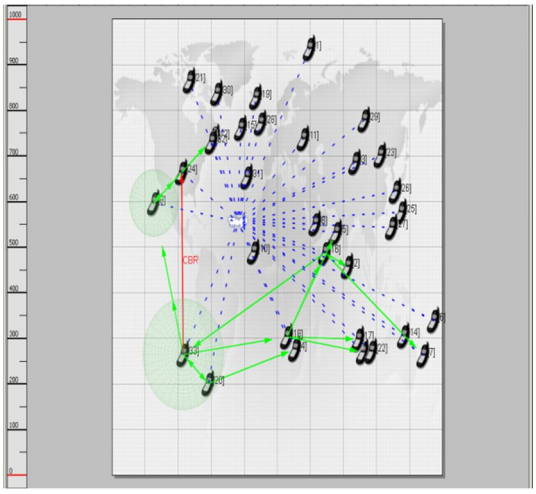

Fig. 1: Simulation scenario depicting network topology

This simulation Shows, there are 33 nodes for three different routing protocol used such as AODV, DSR, ZRP for various packet size model. Here using traffic model is Constant bit rate (CBR).

A. *Average jitter*

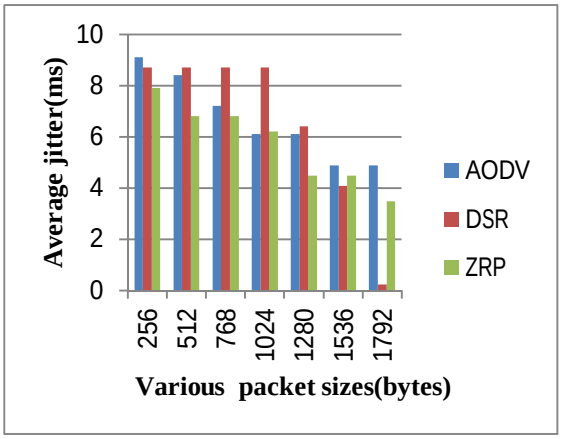

Fig. 2:Average jitter Vs Various packet sizes for AODV, DSR and ZRP

Fig. 2 Show that the Average jitter for three different routing protocols with various packet size model.jitter is low for compare to other two routing protocols.So Here increasing packet size with three different routing protocol, decrease the performance of jitter level.

B. End-to-End delay

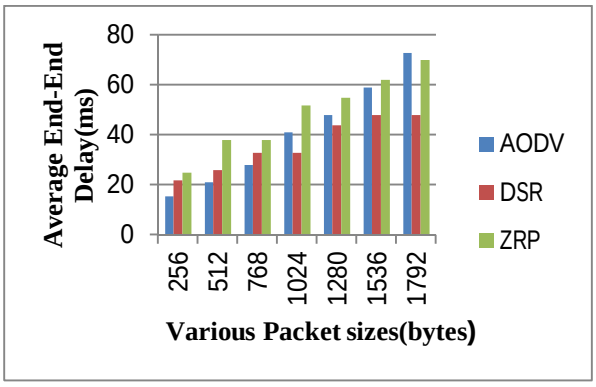

Fig. 3:Average End-to-End delay Vs Various packet sizes for AODV, DSR and ZRP

Fig. 3 Shows that Ent-to-End delay for three different routing protocols with various packetm size model.So here understood once increasing the packet size for three different routing protocols, Performance of End-to-End delay is also increasing.

C. *Throughput*

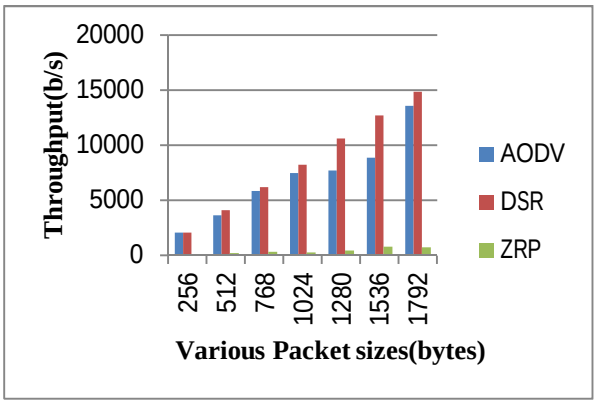

Fig. 4:Throughput Vs Various packet sizes for AODV, DSR and ZRP

Fig. 4 Shows that Throughput for three different routing protocol with various packet size model. Increasing throughput for three different routing protocol, when increasing the packet size for three different routing protocols.

V. CONCLUSION

In this paper performed the simulaton to compare the performance of three different routing protocols.Such as AODV,DSR,ZRP with various packet sizes and performance parameter is Jitter, End-to-End delay, throughput.The results showed the performance of the two reactive protocols (DSR and AODV) was better than ZRP. The performance of DSR routing protocol was better than other two routing protocols. So DSR routing protocol wsa better throughput compare the other two routing protocols..The overall performance of DSR was better than the other two protocols except in the case of end to end delay.

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