Multicast Routing Protocols in Adhoc Mobile networks

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Abstract:

The majority of applications are in areas where rapid deployment and dynamic reconfiguration are necessary and a wire line network is not available. These include military battlefields, emergency search and rescue sites, classrooms, and conventions where participants share information dynamically using their mobile devices. Well established routing protocols do exist to offer efficient multicasting service in conventional wired networks. These protocols, having been designed for fixed networks, may fails to keep up with node movements and frequent topology changes in a MANET. Therefore, adapting existing wired multicast protocols as such to a MANET, which completely lacks infrastructure, appear less promising. Providing efficient multicasting over MANET faces many challenges, includes scalability, quality of service, reliable service, security, Address configuration, Applications for multicast over MANET. The existing multicast routing protocol do not addresses these issues effectively over Mobile Adhoc Networks (MANET).

1. Introduction:

Add few words for introduction and change according to u r wish Ad hoc routing protocols are classified in to two different categories 1) **Proactive**. Proactive routing protocol updates their information periodically. Some Proactive routing protocols are DSDV [5]

DBF [6] etc. 2) **Reactive**. Reactive routing protocol creates a route destination on demand basic. Some of reactive routing protocols are DSR [7], AODV [8] etc.

The main objective of this paper is studying of mobile ad hoc network (MANET) routing protocols in grid environment. And it makes the comparison of DSDV and DSR routing protocols, by using performance matrices and average end to end delay, packet delivery fraction, average routing load and data packets lost. And also the study of analysis discussed that which is the better one and which is should be implemented in MANET technology.

2. Literature review:

In past five years lot of researches and improvement done in MAINT technology and number of routing protocols proposed so far. The performance of the DSDV routing protocol, which is one the most famous routing protocols for multi-hop ad hoc networks, is analyzed in. [4]. Comparison of routing protocols in MANET is difficult, because it considered performance matrices. Without measuring performance i.e. end to end delay of DSDV and DSR, it is not suggested to implement.

2.1 Destination-Sequenced Distance-Vector Routing (DSDV)

DSDV is one the early algorithm. DSDV is one of the appropriate algorithms for small networks. DSDV is a table driven routing sachem for ad hoc mobile network based on Bellman-ford algorithm. It is developed by C. Perkins and P.Bhagwat in 1994. Main aim of the algorithm was to solve routing loop. Each entry in the routing table contains a sequence number, the sequence numbers are generally even if a link is present; else, an odd number is used. The number is generated by the destination, and the emitter needs to send out the next update with this number [9]. Routing information is distributed between nodes by sending full dumps infrequently and smaller incremental updates more frequently. DSDV requires regular updates of its routing

tale, and which requires a battery power with small amount of bandwidth even network is ideal. And when every the topology of the network changes, a new sequence number is important to re- coverage.

Mr. Rafi U Zamam proposed an efficient DSDV protocol for Ad hoc network. Eff-DSDV overcomes the problem of stale routes, and thereby improves the performance of regular DSDV. This proposal protocol is implemented in the NCTUcs simulator for the comparisons of DSDV and DSR protocol. He considered the performance issues of Packet-delivery ratio, and the end to end delay of packets, dropped packets, and routing overhead. [3]

2.2 Dynamic Source Routing (DSR)

DSR is simple algorithm based on source routing. In dynamic source routing determining source route requires along with address of each devise between the sources to destination during route discovery. The provided path information is cached in each node processing the route discovery packets. To provide source routing, each packet contains address of the each devise and path of the packet. This may over head on large networks. And it forms a route on-demand when transmitting computers requests once. How ever it uses source routing instated on routing table at each intermediate devise. [1] To avoid this source routing, it defines a flow id option to transmit packets hop-by-hop. And updated routing information maintained in each node. [11] DSR routing protocol based on two phases 1) Route Maintenance 2) route discovery.

The proposed protocol by (Mr. D. Johnson y. Hu & Maltz 2004), DSR is a simple and an efficient active routing protocol that designed especial for use of wireless mobile ad hoc networks. It is designed for high quality wireless network like more than 300 nodes. It incurs very low overhead but reacts very quickly to change the network. DSR protocol allows an ad hoc network to be self-organizing and self-configuring without relaying on existing networks. [1]. Mr. Samyak Shah1, Amit Khandre2, Mahesh Shirole3 and Girish Bhole proposed of comparison on demand reactive routing protocol DSR along with the AODV with trades anal proactive DSDV routing protocol. A simulation model with MAC and physical layer models is used to study interlayer interactions and their performance implications. On-demand routing protocols, AODV and DSR performance is better then table driven DSDV routing protocol [2].

3. Simulation

Many network simulators are available like open net modular, GLOMOSIM, NS2 etc. But **NS- 2** Network simulators is chosen for the proposed project. Ns2 chosen because of supports networking research and education purpose. Ns2 is suitable for designing of new protocol and comparison of traffic evolutions. Ns 2 open sources freely available in internet. Most of the people develop and they utilize for research. This ns2 is mostly runs on Linux and MAC operating systems. Ns2 is object-oriented, discrete event driven network simulator which is developed at UC Berkley. And this program is completely written in C++ and TCL. NS2 is primarily useful at local area network. For the first time those who using this it is difficult, but it is easy to use. To work with this simulation there is lot of documentation is available which is written by the developers.

3.1 Simulation Model

Network Simulator (NS-2.34) accepts input as a scenario file. The proposed project runs under 2mbps bit rate. And the fixed number of packet sizes of 512 bytes with a pause time. The simulation uses 5 different nodes with one source and destination and by 2 getaways. The scenario contains exact way of each node and the exact packets source by each node, and with that exact time at which each change in motion or packet sources is to occur. The trace file created by each run, it the file stored in disk, and it is analyzed using a variety of scripts, and the file is calls trace file, with extension of (.tr). The trace tile that counts the number of packets successfully delivered and the length of the paths taken by the packets, as well as additional information about the internal functioning of each script executed. This data is further analyzed with AWK file. The bellow figure show the exact flow of data.

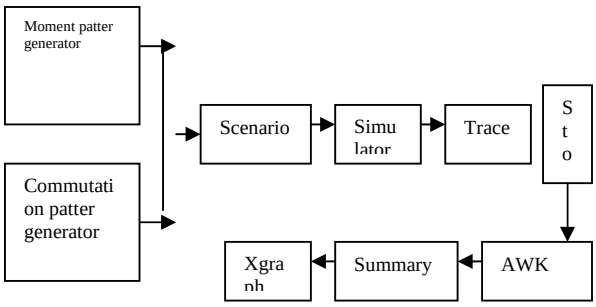


Figure 1: Simulation model

3.2 Simulation

The aim of proposed project is implementation of DSDV and DSR routing protocols for 5 different nodes sending CRB packets with randomly. After that CRB and scenario file generated. After that DSDV simulation will be done and NAM, trace file created. And the same way another NAM and trace file will be generated.

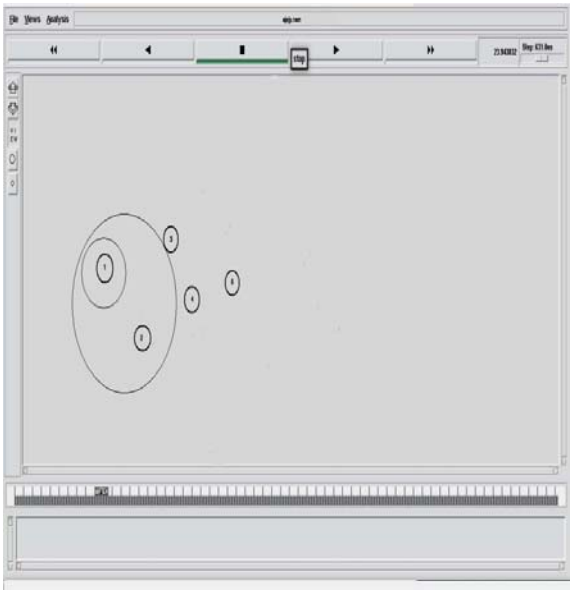


Figure 2: Packet discovery

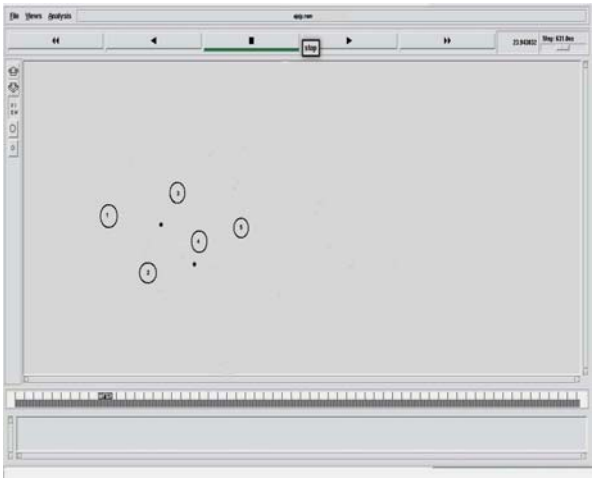


Figure 3: Packet dropping

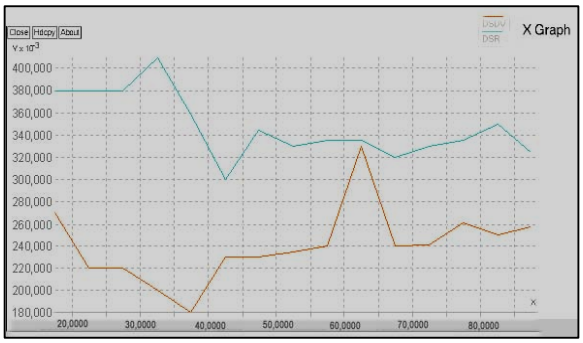
The mobility model uses the random waypoint in a rectangular area. The area is configured with 500 X 800 m with a 5 nodes. And these five mobile nodes communicate with some fixed nodes located on the internet through a getaway. And it is then selects a random destination in defined topology area and moves to the destination with a random speed. Once the destination is reached, another random destination is target at a pause time. The pause time which effective relative time of the mobiles, is varied. And the simulation time is 100 simulated second. The simulation goal is comparing different approaches for getaway, the traffic sources chosen is to be constant bit rat (CBR). In this study we found that each node generates packets for every 0.2 seconds. Means for every one minute each source generates 5 packets. And each packet contains 512 of bytes of data. It means the total amount of data generated is 5*512*8=20 bits per second each sources. The complete traffic Patten is generated by CMU traffic generator.

4. Analysis and results:

There are three different approaches for performance matrices. **1) Packet delivery fraction, 2) average end to end delay of packets, 3) Average routing load.**

4.1 Packet delivery ratio:

It is observed that for mobiles more link breaks due to the shorter routes getaway problem. Due to link break it is possible that lost of data packets, because source continuously sends data packets until it gets reroute reply message from any mobile node that the link has been broken. Getting route reply message from source can be delay or long time, during this time data can be lost. When a pause time interval increase mobile node receives



less getaway information and it is not able to update the route getaway for short advertisement intervals. The positive effect of periodic information decreases and advertisement inter increases.

Figure 4: Packet delivery ratios

4.2 End to end delay:

It is observed that the average end to end delay is less for DSDV protocol comparing to DSR protocol. Because of the periodic getaway information sent by the getaways allows the all mobile nodes to update their route tale according to the getaway, for finding latest and shorter getaway. But while coming to DSR end to end delay is more because of it is reactive approach, a mobile node continuous to use a route to a getaway until the links is broken. But in some times it may be long and even if a mobile nod is near to another getaway in that even it doesn't uses this getaway. And it continuously sends data packets along the long route to getaway until the link is broken. For this the delay of data packets increase for end to end, once it is delay for all packets will be delayed. And it is also observed that end to end delay decreases for very sort time when the advertisement interval is increase.

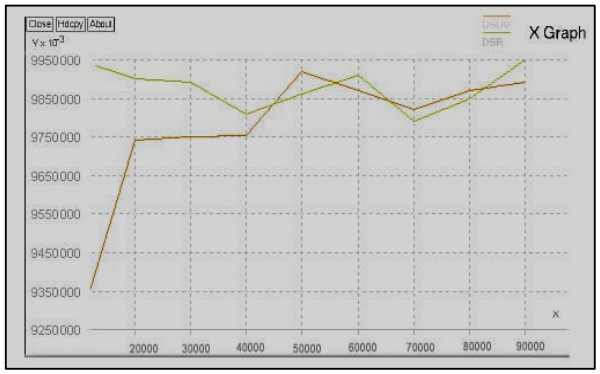


Figure 5: End to end delay.

4.3 Routing load:

It observed that lower routing load for DSR comparing to DSDV, when number of nodes are increased. In DSDV routing table maintained in each node and this table transmits data packets to other nodes in the network. The occasion routing table may be old or it may not be updated. In DSDV the routing table will be maintained in each host, due to that the average routing load on network.

5. Conclusion:

The proposed papers implemented two different routing protocols Destination sequenced Distance vector (DSDV) and Dynamic Source Routing (DSR) protocol. The performance of these two protocols measured with different scenario like 1) packet delivery fraction 2) packet delay at end to end point 3) routing load. The simulation results show that Dynamic Source Routing (DSR) protocol is better then DSDV. It is also observed that some time DSDV is also better then DSR. It is also observed that the speed and performance of the DSR is very good. And when number of nodes are increased the performance will goes down for DSDV. While working with DSDV, in DSDV routing each host maintains routing a table. This may cause routing load on network. And it is also observed that when the pause time low performance is better. But when the pause time is higher, it is better performance of DSR comparing to DSDV. And all these performances are depends on different seniors.

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