EMSR FOR MDC IN MANET

Akhil Dev Mishra Amity University Lucknow, India
Sudhanshu Mishra Amity University Lucknow, India
Mr. Vineet Singh (Sr. Lecturer) Amity University Lucknow, India

ABSTRACT
Multipath routing allows the establishment of multiple paths between source and destination node in mobile ad hoc networking. In order to increase the reliability of data transmission or to provide load balancing is more attention. In this synopsis we present the multipath source routing protocol (MSR) with some QoS guarantee. During the route discovery, the source node firstly checks whether it has routing information to destination node. If not than broadcast the RREQs to its neighbourhood node and finally to the destination. The destination node can construct a certain topology for network and path is maximally disjoint, loop free path, shortest delay from evenly distribute the data on multipath is our desirable routing. The proposed protocol distributes the same amount of data in the whole network on multiple paths.

Keywords
MANET; On-demand routing protocols; MSR; traffic load distribution; bandwidth of channel;

INTRODUCTION
Due to the rapid development in the mobile devices technology, wireless networks are becoming more and more popular. Wireless networks can be classified into two major types- infrastructure-based networks (for e.g. cellular networks) and Mobile Ad Hoc Networks (MANETs). The former ones use fixed base stations, which are responsible for coordinating the communications between the mobile hosts (nodes). The latter consist of several wireless hosts that are capable of communicating with each other without the use of a network infrastructure or any centralized administration. Since these networks are self-organizing and self-configuration, they can be used for emergency situations like disaster- relief, military applications, and emergency medical situations.

A mobile ad-hoc network (MANET) consists of mobile hosts equipped with wireless communication devices. The transmission of a mobile host is received by all hosts within its transmission range due to the broadcast nature of wireless communication and Omni-directional antenna. If two wireless hosts are out of their transmission ranges in the ad-hoc networks, other mobile hosts located between them can forward their messages, which effectively build connected networks among the mobile hosts in the deployed area. Due to the mobility of wireless hosts, each host needs to be equipped with the capability of an autonomous system, or a routing function without any statically established infrastructure or centralized administration. The mobile hosts can move arbitrarily and can be turned on or off without notifying other hosts. The mobility and autonomy introduces a dynamic topology of the networks not only because end-hosts are transient but also because intermediate hosts on a communication path are transient. In this work, we focus on the MSR (Multipath Source Routing) routing protocol, to make an efficient route selection on the basis of remaining energy level and average traffic load of the each node.

1.1 MSR OVERVIEW
Multipath Source Routing (MSR) is an extension of the on-demand DSR protocol. It consists of a scheme to distribute traffic among multiple routes in a network. MSR uses the same route discovery process as DSR with the exception that multiple paths can be returned, instead of only one (as with DSR).

When a source requires a route to a destination but no route is known (in the cache), it will initiate a route discovery by flooding a RREQ packet throughout the network. A route record will be contained in header of each RREQ in which the sequence of hops that the packet passes through is recorded. An intermediate node contributes to the route discovery by appending its own address to the route record. Once the RREQ reaches the destination, a RREP will reverse the route in the route record of the RREQ and traverse back through this route

Each route is given a unique index and stored in the cache, so it is easy to pick multiple paths from there. Independence between paths is very important in multipath routing; therefore disjoint paths are preferred in MSR. As MSR uses the same route discovery process as DSR, where the complete routes are in the packet headers, looping will not occur. When a loop is detected it will be immediately eliminated.

Since source routing is used in MSR, intermediate nodes do nothing but forward the packet according to the route in the packet-header. The routes are all calculated at the source. A multiple-path table is used for the information of each different route to a destination. This table contains for each route to the destination: the index of the path in the route cache, the destination ID, the delay (based on estimated RTT) and the calculated load distribution weight of a route. The traffic to a destination is distributed among multiple routes; the weight of a route simply represents the number of packets sent consecutively on that path.

This paper is organized as follows: Section II will introduce Literature Review, Section III introduces proposed work. Section IV will provide a deep discussion and analysis of EMSRs. Our paper finally concludes in section V with an outlook to future work.

1.2 LITERATURE REVIEW

Multipath Source Routing (MSR) is headway of the on-venture DSR [2, 8] meeting. It holds a plan to disperse activity among different courses in a schema. MSR utilizes the same course exposure handle as DSR with the prohibition that different ways may be returned, rather than unparalleled (as with DSR). Precisely when a source obliges a course to a goal however no course is known (in the store), it will dispatch a course revelation by flooding a RREQ bundle all through the skeleton. A course record will be held in header of every RREQ in which the movement of jumps that the pack passes through is recorded.

A transitional focus point helps the course revelation by connecting its pass on to the course record. Once the RREQ achieves the end, a RREP will turn around the course in the course record of the RREQ and cross again through this course each one course is given an exceptional record and set away in the store, so it is not tricky to pick different courses beginning there. Autonomy between courses is to an extraordinary degree segregating in multipath regulating, along these lines disjoint ways are upheld in MSR. As MSR utilization the same course exposure get prepared as DSR, where the complete courses are in the bundle headers, spinning around won't happen. Right when a round is recalled that it will be promptly killed.

Since source coordinating is utilized inside MSR, focus focuses do simply send the pack as indicated by the course in the group header. The courses are all figured at the source. An alternate way table is utilized for the data of every one of a kind course to a target. This table holds for each one course to the end of the line: the record of the way in the course hold, the destination ID, the deferral (revolved around assessed RTT) and the figured burden scattering weight of a course. The advancement to a target is scattered among different courses; the weight of a course generally relates to the measure of groups sent diligently on that way. We will discuss the proposed routing protocol in next section.

2. PROPOSED ROUTING PROTOCOL

As per above literature survey, motivates us to develop a new load aware Dynamic EMSR routing protocol, to make an efficient load distribution on selected multiple path on the basis of remaining bandwidth of each path . In this work, we define the remaining bandwidth as the differences between total available bandwidth of the channel and used bandwidth of the channel. Now find the minimum of the bandwidth of the link. In this way we find the minimum of each selected path .finally we go to divide the total available size of the packet which is transfer by the Node.

2.1 Description of EMSR

The revision of collected works gives an insight of altered attitudes of routing designed for MANET in order to attain peak concert in a given network scenario. After in depth analysis of the literature, it is clear that due to varying nature of MANET, no any protocol perform efficiently in each and every situation. Most of the optimization available in MSR should also be applicable to EMSR as well. So, the propose protocol performs better for distribution of data in evenly the routing path with low congestion path. The protocol tries to establish balance of traffic among the load in the each path.

As discussed in literature review, we see that none of the enhancements in MSR have considered traffic load. Most of the enhancements have been done in multipath source Routing protocols YonghuiChen‟‟in has proposed a bandwidth available distribution of packet in multipath protocol DSR. In Adhoc network routing protocols just like DSR did not take the bandwidth availability of node into account during distribution of packet. This approach is based on bandwidth availability and stability of the nodes. The choice of the node depends on residual energy and good mobility .This algorithm chooses the multiple paths for data distribution. In [4] efficient MSR routing is proposed. This convention selects multiple routes on the basis of transportation load on the node of multiple description coding. And it also enhances MSR mechanism which ensure congestion free routing path. Projected protocol is more efficient for broadcast that requires a link for extended period of time and instead of conveying entire data from side to side multiple routes. Earlier works mainly focused on the delay and hop count method to Transport the data, which might result into network failure due to congestion.

The proposed algorithm for even distribution of packet in a MANET for multiple descriptions coding on selected path are as follows:

While (path is selected to transport the data)
Do for each path
First calculate the bandwidth of each link in the selected paths for data transfer in a network.
We use the formula -
1. Total bandwidth of a link = used banwidth+remaining bandwidth.
2. Remaining Bandwidth = total bandwidth – remaining bandwidth

3. After calculating the remaining bandwidth of each link we perform –
Available bandwidth of selected path = min (bandwidth of link1, bandwidth of link2, bandwidth of link3…….. bandwidth of link n)

4. Total available bandwidth of selected path = Available bandwidth of selected path.
End do
5. Available bandwidth for the network = min (bandwidth of path1, bandwidth of path2 bandwidth of path3…….. bandwidth of path n)
6. Total available bandwidth of the network = No. of path * Available bandwidth of the network.

7. Amount of data transfer per selected path=

$$\frac{\text{Number of packet*size of each packet}}{\text{Total available bandwidth of the network}}$$

8. After this take the ceiling value of the Amount of data transfer per selected path.
End while

3. DISCUSSION AND ANALYSIS

In this way we evenly distribute the data in the synchronously for each selected path for MANET.

Suppose there is MANET in which there are eight nodes S, X, Y, Q, D, R, T, Z .Where

s- Source Node

D- Destination node

X Y, Z, T, Q, R-intermediate node
Suppose following:-
There are 13 packet is transfer from S to D.
Each packet size is 8 bit
Each link capacity =25Mbps.

In The MSR protocol there are multiple path is selected to transfer the data .since we evenly distribute the packet in the MANET we follow the Above Algorithm:

1. We find the selected path is
(I) Path1 S, X, Y, D
(ii) Path2 S, Q, R, D
2. Now For path1 S, X, Y, D
3. Remaining bandwidth of link SX=25-12=13Mbps (if12mbpschannel bandwidth is used)

Remaining bandwidth of link XY=25-5=20Mbps (if 5mbps channel bandwidth is used)

Remaining bandwidth of link YD=25-9=16Mbps (if 9mbps channel bandwidth is used)
Available bandwidth of selected path1 =min (13, 20, 16)

4. Similarly calculate for the path 2 S, Q, R, D
Remaining bandwidth of link SQ=25-15=10Mbps (if 15mbps channel bandwidth is used)
Remaining bandwidth of link QR=25-11=14Mbps (if 11mbps channel bandwidth is used)
Remaining bandwidth of link RD=25-13=12Mbps (if 13mbps channel bandwidth is used)

Available bandwidth of selected path2 =min (10, 14, 12)

= 10mbps

5. Available bandwidth for the network = min (10, 13) =10 mbps
6. Total available bandwidth of the network = No. of path * Available bandwidth of the network =2*10=20mbps.
7. Number of packet transfer per path=13*8/20=ceil (5.52) =6 pkt per path.

From the above algorithm we see that we transport the same amount data in each path which result in following term:

1. Reduce the problem of congestion.
2. Increase the packet delivery ratio(PDR)
3. Since equal distribution on same capacity channel so link failure is also reduce.
4. It improves the performance of MSR protocol.

.

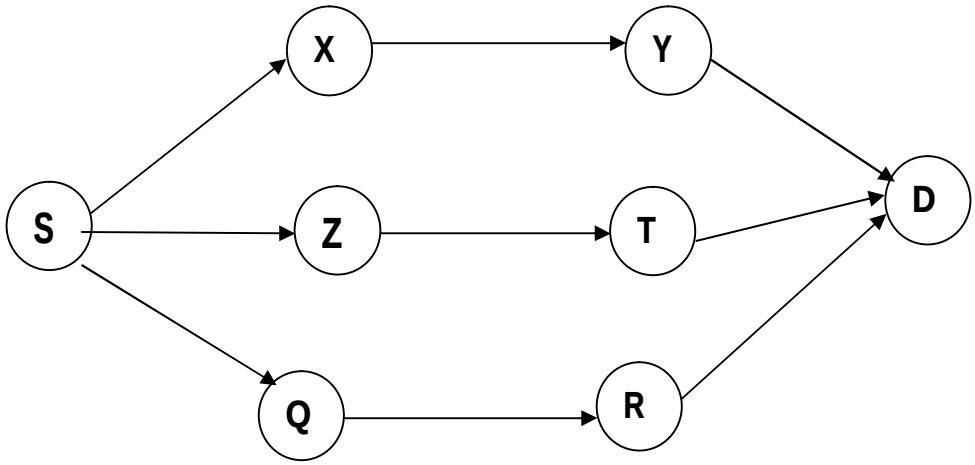

Fig1. A MANET network with eight nodes

CONCLUSION AND FUTURE WORK

In this model paper we proposed EMSR a protocol with enhanced load distribution mechanism which takes into account the remaining bandwidth to distribute the traffic load. Thus, rather than using the traditional metrics such as delay or hop count, we believe the channel's remaining bandwidth to be taken in to account as routing metric in a unified way which can give the better performance in MANET. Our future research work is to simulate EMSR and to obtain the performance result in terms of the packet delivery ratio, the average end to end delay and provide the congestion free network.

4. REFERENCES

1. S. Das, C. Perkins and E. Royer, "*Ad Hoc on Demand Distance Vector (AODV) Routing*", IETF RFC3561, July 2006.
2. D. Johnson, "*The Dynamic Source Routing Protocol for Mobile Ad Hoc Networks (DSR*)", IETF Internet Draft, draft-ietf-manet-dsr-09.txt, April 2007.

3. Lei Gong, YuebinBai and Ming Chen "Link Availability Prediction in Ad Hoc Networks," *14th IEEE 2008 International Conference on Parallel and Distributed System.* DepeiQian School of Computer Beihang University Beijing, pp 423-428.

4. N. Sadagopan, F. Bai, B. Krishnamachari, and A. Helmy. Paths: analysis of path duration statistics and their impact on reactive manet routing protocols. InMobiHoc '03: Pro-ceedings of the 4th ACM international symposium on Mobile ad hoc networking & computing, pages 245– 256, New York, NY, USA, 2003. ACM.

5.J.J. Garcia-Luna-Aceves and E.L.Madruga, "The Core-Assisted Mesh Protocol," IEEE Journal on Selected Areas in communications vol. 17, no. 8, August 1999, pp, 1380-1394.

6. Draft-chakeres-manet-manetid-03 (work in progress), February 2008.
7.[I-D.ietf-manet-nhdp] Clausen, T., Dearlove, C., and J. Dean, "Mobile Ad Hoc Network (MANET) Neighborhood Discovery Protocol (NHDP)", draft-ietf-manet-nhdp-11 (work in progress), October 2009.
8.[I-Diet-ospf-multi-instance] Lindem, A., Roy, A., and S. Mirtorabi, "OSPF Multi- Instance Extensions", draft-ietf-ospf-multi-instance-01 (work in progress), October 2009.
9.J. Schumann, "*Analysis of the Zone Routing Protocol*", December 2002.