International Journal of Advanced Information Science and Technology (IJAIST) ISSN: 2319:268
Vol.2, No.6, June 2013 DOI:10.15693/ijaist/2013.v2i6.17-19

Competent Data Delivery Through Dynamic Buffer Control In Manet

M.Shobana
Department of Computer Science and Engg.
SNS College of Technology
Sathy Main Road, Coimbatore – 641 035

Dr.S.Karthik
Department of Computer Science and Engg.
SNS College of Technology
Sathy Main Road, Coimbatore – 641 035

Abstract - Mobile Ad-hoc NETworks (MANET) is a self-configured and infrastructure less network where there is no base station and no fixed topology. The nodes in the network keep moving from one region to the other due to the dynamic nature of the network. This may lead to the link breakage between the nodes and thus causing a major issue of packet loss. The Packet Delivery Ratio (PDR) is degraded when the data access is affected during the handoff process, which affects the performance of the network. The fixed buffers can be used which helps in storing the data during the handoff process. But this increases the Round Trip Time delay for queuing data buffer for sending and receiving data. To overcome this issue, the dynamic buffer can be used which gets altered based on the bandwidth available. The Buffer Control Protocol (BCP) can be used for dynamic buffering. The BCP is a control protocol used by the MN to request buffering services at the BN. It is a simple and reliable messaging system composed of request and answer signal pairs. Based on the available bandwidth along with the current packet loss rate, we can dynamically increase or decrease the buffer size. The BCP protocol can be combined with any of the protocols. This avoids the unnecessary delay in RTT and enhances the PDR.

Keywords - BCP, Geographic Routing, RTT

I. INTRODUCTION

The Internet Engineering Task Force currently has working group named mobile ad hoc network (MANET) is a kind of wireless ad hoc network, where there is no infra-structure. The nodes move from one region to the other and hence it has a dynamic topology. Each node acts as router and host. Routing is an act by which the information moves from Source to Destination. There are several routing protocols in which the routing table can be used to determine the routes to the destination. But the traditional routing protocols are harmful due to the node mobility. So the geographic routing can be used in data transmission by determining the destination node location rather than the pre-determination of routes. The Global Positioning System (GPS) is one of the well-known techniques which can be used to determine the nodes location. In geographic routing the nodes knows its own location and the source node knows the destination location and this is appended with the packet header during the transmission process, which is used by the intermediate node for transmission of data. These geographic routing protocol can be paired with the buffer control schemes to give a better performance in data access which increases the PDR.

II. GEOGRAPHIC ROUTING

Geographic routing was introduced to eliminate some of the issues in existing routing protocols of MANET especially the topology-based protocols. These protocols use the node's position to transfer the data from one point to the other. By employing position information, geographic routing protocols do not need to establish and maintain routes, thereby eliminating routing table construction and maintenance. . It is probable that the forwarding scheme fails if there is no one-hop neighbor whose location is closer to the destination than that of the forwarding node. In such cases, recovery strategies are introduced to deal with such failures. Opportunistic Routing (OR) takes advantage of the spatial diversity and broadcast nature of wireless networks to combat the time-varying links by involving multiple neighboring nodes for the packet transmission. POR is a type of opportunistic routing.

A. Position-based Opportunistic Routing (POR)

POR is designed based on Geographic Routing and Opportunistic Forwarding. The information is transmitted just as in geographic routing through the node's location. For the destination location, we assume that a location registration and lookup service which maps node addresses to locations is available just as in [3]. When the source node initiates the transmission knowing the destination location, if the destination

moves to other region the information may get lost. So in this case the buffer node is used where the information can be stored. Than the destination location is predicted through an additional check mechanism where at each hop the neighbor list is checked for the destination node and then the information are passed on. By this the data loss is minimized.

B. Buffer Control Protocol (BCP)

In BCP MN will request the BN for the buffering service. The request signal(R) is send from the MN and the answer signal (S) is send from the BN. When the transmission is on process, if the destination node moves to the other region through Buffer Node (BN) we can store the data and later use it for the retransmission through the signals mentioned above. This avoids the packet loss in the network. Outgoing packets sent by the MN during the handoff period can be also lost during the handoff process. In such a case, a BN can also be implemented locally in the MN to provide a buffering solution for egress packets during the handoff period. Having a BN in both the MN and the network edge provides bi-directional buffering during handoff and packet loss in both directions will be compensated for. This BCP can be combined with POR (Position-based Opportunistic Routing) protocol which is a geographic routing protocol.

Thus the information is being passed through the nodes location through POR and zero packet loss through the BCP.

III. LITERATURE REVIEW

Shengbo Yang et al., in their paper [2] has proposed a Robust Geographic Routing protocol (RGR), in which the sub-optimal canditates will forward the packets if the best forwarder has failed in forwarding. The RGR design is based on geographic routing and opportunistic forwarding. The node is assumed to be aware of its own location and the positions of its direct neighbors. When a source node wants to transmit a packet, it gets the location of the destination first and then attaches it to the packet header together with its own location. The packet delivery ratio of RGR maintains at a high level regardless of the increase in node mobility while all the other routing protocols fail to deliver as many packets compared to RGR and the delivery ratio decreases significantly. The demerits of the RGR may be the overhead in buffer space and duplicate relay.

Hadi Noureddine et al., in [4] has proposed a new position-based Routing protocol for Mobile Ad hoc networks, referred to as FORTEL. Each node in the network maintains a location table that stores the location of all the other nodes. To discover a route to the destination, the source node relies on the location table to construct the destination's connectivity tree. G (V, E) is the graph representing the network, where V is the set of nodes in the network and E is the set of links connecting neighboring nodes, the connectivity tree of a specific destination, at a source node, is a tree representation of the sub-network in respect to that destination. Thus it computes the valid route to the destination node.

In [5], they have proposed a virtual-zone-based structure to implement scalable and efficient group membership management. A network-wide zone-based bi-directional tree is constructed to achieve more efficient membership management and multicast delivery. The position information is used to guide the zone structure building, multicast tree construction and multicast packet forwarding, which efficiently reduces the overhead for route searching and tree structure maintenance. Zone leader should be elected for each zone based on the center point of the zone, who manages the local group membership. Here when the Zone leader moves to the other region it creates a major issue.

Every protocol have their own merits and demerits. The BCP protocol is used as a control mechanism by which we can dynamically change the buffer size according to the bandwidth. Through buffering we can obtain zero packet loss during the transmission process.

IV. PROPOSED SYSTEM

When we want to transfer a packet from source to destination, due to dynamic changing network topology, the destination node may move to other region. This may sometimes lead to drop in the data packets. To overcome this issue we use buffer where we can store the data and later from the buffer we can transmit them.

Buffering service is a transient service, buffering begins once BN has received a BReq[initial] from an MN and negotiated values have been established. State information regarding the service is then maintained by the BN.

The size of the buffer allocated by BN can also be negotiated by the MN in BReq[initial]. The MN may have prior knowledge of the length of the handoff period and traffic rate and thereby be able to compute a reasonable value for buffer size (bsz). However, the BN can impose limit on this value to conserve memory

resources. Therefore, the BN dictates the final value for the bsz. This final value is communicated back to the MN by the BN as part of BAns[initial]. If the value imposed by the BN is unacceptable to the MN then the MN may withdraw its request for buffering service by signaling a BReq[stop] to the BN indicating its intent to terminate the buffering service. The MN may also indicate in the Breq[initial] if the bsz it proposes is the amount it absolutely requires and it cannot accept any less. The MN can indicate this by setting mandatory flag in Breq[initial] parameters. In the case that the BN cannot accommodate this requirement then the BN should immediately terminate the service and communicate the error back to the MN via BAns[initial]. In such a case the BN should not even keep state information regarding the service.

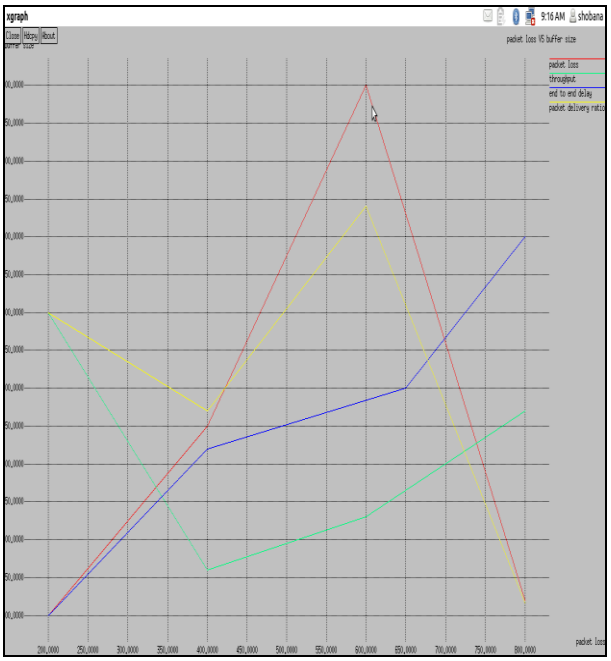

Figure 1. Buffer size vs Packet loss

The packet loss is being reduced from the above graph shown. Thus the BN gets the new CoA of the MN by the signal parameters and then the packets are forwarded to that location. By this we can prevent the data loss.

V. CONCLUSION

The data loss which is a major issue when a transmission is in progress is eliminated through Buffer Control Protocol (BCP). The buffering scheme helps in storing the data which is about to be lost in the network. We combine the BCP with the POR protocol by which the packets are transmitted based on the location of nodes. Thus we enhance the network performance by increasing the data delivery.

REFERENCES

[1] Shengbo Yang, Chai Kiat Yeo, and Bu Sung Lee, "Toward Reliable Data Delivery for Highly Dynamic Mobile Ad Hoc Networks", IEEE transaction on mobile computing, vol 11,no.1, January 2012.

[2] Shengbo Yang, Chai Kiat Yeo, Bu Sung Lee Centre for Multimedia and Network Technology School of Computer Engineering Nanyang Technological University, "Robust Geographic Routing with Virtual Destination based Void Handling for MANETs", 2010.

[3] Shengbo Yang, Feng Zhong, Chai Kiat Yeo, Bu Sung Lee Centre for Multimedia and Network Technology School of Computer Engineering, "Position based Opportunistic Routing for Robust Data Delivery in MANETs", 2009.

[4] Hadi Noureddine et.al "FORTEL: Forecasting Routing Technique using location information for Mobile Ad-hoc NETworks" IEEE,2010.

[5] Sreedevi et.al, "Efficient Data Delivery over MANET's through EGMP" Advances in Asian Social Science (AASS) vol.2, No.3, 2012.

[6] Manjeshwar,A. Agrawal, "TEEN: A Routing Protocol for Enhanced Efficiency in Wireless Sensor Networks,"in Parallel and Distributed Processing Symposium,IEEE Proceedings 15th International,Aug 2008.

[7] Notani, "Performance Simulation of Multihop Routing Algorithms for Ad-Hoc Wireless Sensor Networks Using TOSSIM, " In proceeding in 10th International Conference on Advanced Communication Technology, Vol. 1, pp. 508-513, Feb. 2008.

[8] Perkins,C.E., Royer.E.M, Das.S.R and Marine.M.K, "Performance Comparison of Two On-demand Routing Protocols for Ad hoc Networks," pages 16-28 , IEEE Personal Communications, 2001.

[9] Camp, Boleng.T, Davies.J, "A Survey of Mobility Models for Ad Hoc Network Research," Colorado School of Mines, Colorado, USA, 2002.