A Survey on MANET Congestion Control Mechanism using Buffer Management

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Abstract—Mobile Adhoc Network (MANET) are used most commonly all around the world, because it has the ability to communicate each other without any fixed network. It has the tendency to take decisions on its own that is autonomous state. MANET is generally known for infrastructure less. The bridges in the network are generally known as a base station. Mobile ad hoc network (MANET) is a group of self-organized mobile nodes that are associated with comparatively low bandwidth wireless links. Network based congestion avoidance which involves managing the queues in the network devices is an integral part of any network. Most of the mobile networks use Drop tail queue management where packets are dropped on queue overflow which is global synchronization problem. In this paper, we are providing a survey on MANET Congestion Control Mechanism Using Buffer Management.

Key words: Mobile Adhoc Network, Congestion Control, Buffer Management

I. INTRODUCTION

A Mobile Adhoc Network (MANET) is a type of ad hoc network. Ad hoc means arranged or happening whenever necessary and not planned in advance. Ad hoc is a LAN which allows new network devices to be added quickly. Mobile ad hoc network is a collection of independent nodes which forms a temporary network without any fixed infrastructure or central controller; For establishing network wireless connections (wi-fi) are used or any other medium such as satellite or cellular transmission. Each device in a MANET is free to move independently in any direction. The movement of nodes is random in MANET. Therefore MANETs have a dynamic topology. When different services are the part of some network, it is necessary to give priority to the packets of delay sensitive services such as Voice over IP (VoIP) and video streaming applications. This is usually referred as Quality of Service (QoS) implementation in a network. When packets are processed according to their assigned priority, more packets of the same or other services also arrive usually at QoS processing hops.

Congestion is a situation in communication networks in which too many packets are present in a part of the subnet. Congestion may occurs when the load on the network (number of packets send to the network) is greater than the capacity of the network (number of packets a network can handle).

Fig 1: Mobile Adhoc Network

Much of the time; this would significantly increase the average delay in the network. Therefore, with increasingly high-speed networks, it is increasingly important to have mechanisms that keep throughput high but average queue sizes low. MANET nodes are resource constrained devices which have limited battery life and memory/storage spaces. In such conditions, data sent from sources which transmit packets with less data rates does not get a fair share in queues. However, such sources are not capable to

II. LITERATURE REVIEW

Muhammad Aamir et.al.[2013] introduce a new scheme of buffer management to handle packet queues in Mobile Adhoc Networks (MANETs) for fixed and mobile nodes. In this scheme, try to achieve efficient queuing in the buffer of a centrally communicating MANET node through an active queue management strategy by assigning dynamic buffer space to all neighboring nodes in proportion to the number of packets received from neighbors and hence controlling packet drop probabilities. The proposed algorithm is triggered on the occurrence of a selected incident, the allocation is dynamically adjusted according to the instantaneous share of neighbors in the node’s buffer and the gap between the occupied and allocated buffer space.

Iyyapillai Ambika et. al.[2014] his paper proposes an effective queuing architecture, which supports both elastic and inelastic traffic. The packets of inelastic flows are always stored ahead of those of the elastic flows. If a link is critically loaded by the inelastic traffic, it results in large delays and elastic traffic may have some delay constraints that are non eligible. Based on PID mechanism, priority dropping active queue management algorithm (PID_PD) provides the differentiated service for the different layers or frames according to their priority. Simulation results proved that the proposed architecture offers better fairness and delivery ratio with reduced delay and drop.

Mr. A. Chandra et. al. [2014] this paper made an effort to present a queue management approach. However the approach has outperformed existing queue management techniques RED and REM. Here choke packet mechanism is used to send the feedback to sender. It involves additional overhead to the traffic. Maintenance of virtual queue consumes additional buffer space. Decreasing of the size of virtual queue can be carried in future.

Pham and Perreau et. al. [2003] have proposed a load-balancing mechanism that pushes the traffic farther from the center of the network, using a routing metric that takes into account a node’s degree of centrality, for both proactive and reactive routing protocols. Their approach improves the load distribution and significantly enhances the network performances in terms of average delay and reliability. However this approach use only single path
routing, which may cause extra overhead under high node mobility due to frequent route breaks.

III. CONCLUSION

This survey paper gives an overview of several congestion control algorithm using buffer management scheme. We can conclude that there is no single algorithm for congestion control in MANET. Nodes in MANET have limited bandwidth, buffer space, queue etc. So it is essential to distribute the traffic among the mobile nodes. In MANET, to improve the performance, it is very essential to balance the traffic congestion. Also it is possible to maximize nodes transfer, packet delivery ratio, and minimizes traffic congestion, end-to-end packet delay and network performance can be improved. In our future work, we will propose a scheme of buffer management for packet queues in MANETs for fixed and mobile nodes. The allocation is made in the buffer of a centrally communicating MANET node and it is based on number of packets received in the queue at node’s buffer to utilize the buffer space efficiently without any monopolization of some surrounding source.

REFERENCES