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ARCHITECTURE OF NEW BUFFER MANAGEMENT SCHEME FOR CONTROLLING CONGESTION IN MANET

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ABSTRACT
Mobile ad hoc network (MANET) is a group of self-construct mobile nodes that are connected with similarly low bandwidth wireless links. It has the tendency to take decisions on its own that is autonomous state. The bridges in the network are generally known as a base station. Most of the mobile networks use Drop tail queue management where packets are dropped on queue overflow which is global simultaneity problem. In this paper we are providing architecture of buffer management to control congestion in MANET by a new scheme. We set a buffer between sender and receiver with an X(X is not defined yet) buffer limit. There are several neighboring nodes around that main buffer and every node have its own limit for placing no. of packets in it so that packets should not be dropped. An algorithm is also applied in this paper for controlling congestion under network.

KEYWORDS: Mobile Ad hoc Network, Congestion Control, Buffer Management.

INTRODUCTION
A wireless network consisting of mobile nodes equipped with wireless communication and networking capabilities, without network armature. A node in the network acts both as a mobile host and a router, offering to forward traffic on behalf of other nodes within the network.

Mobile Ad hoc Network (MANET) is self-constructing network of mobile devices which does not relay in any fixed armature. MANET nodes can be personal devices such as laptop, mobile phones and personal digital assistance (PDA's). Nodes in MANET can take part in the communication if they are in the range of network, and can move openly within communication range of network and nodes Which are outside the transmission range of network cannot take part in communication.

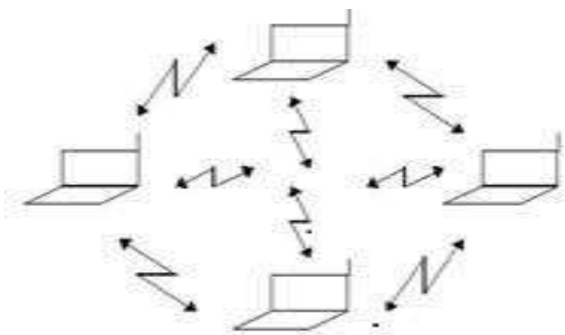

Fig I.1 Mobile Adhoc Network

Mobile Ad hoc Networks (MANET) consist of wireless nodes that form articulation network among themselves without a fixed infrastructure. Topology changes in MANET usually occur due to the mobility of a participating node or disintegration of a node due to loss of energy in that node. These dynamic conditions disturb the smooth communication between needs in the network. Conceptually, in MANET, a node may either function as an end node or as a router forwarding data packets between end nodes. Hence the health of the node in terms of accessible energy in the node becomes an important issue during the selection of an intermediate node.

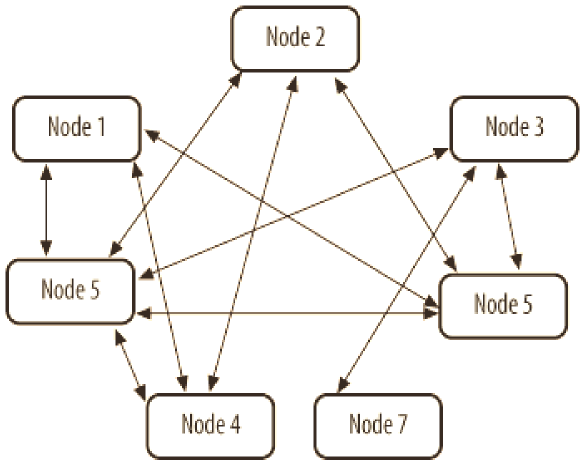

Fig I.2 Nodes in MANET

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

In this case, incoming packets are queued in buffer to wait for their turn of processing. There are many differences introduced in the research of QoS paradigm about how these queues are supervised at processing hops. Moreover, the buffer size also plays an important role in terms of number of packets that can be hold on in a queue before dropping the newly arrived packets (a case of buffer overflow). The queue management scheme of Drop Tail has been used for many years in which packets are dropped when the buffer is full. The limit of buffer is therefore the main parameter that controls the packet drop in this scheme. Later, Active Queue Management (AQM) was introduced which is now usual in the network world. In this scheme, the sending node is notified before the queue is near to be completely filled so that the sender can stop sending data or lower the rate of data transmission. Meanwhile, the existing length of queue is reduced with the processing and de-queuing of buffered packets. After a enough space is again present in the queue, the source can be allowed to send more packets for en-queuing in the buffer and further processing.

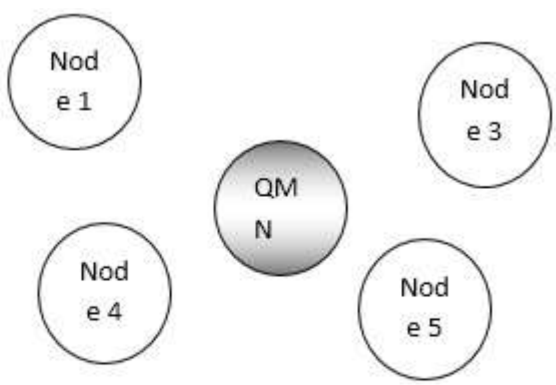

Fig I.3 The considered MANET scenario

PROBLEM DEFINITION

Congestion control involves the design of process and algorithms to statistically limit the demand-capacity mismatch, or dynamically control traffic sources when such a mismatch occurs. In the current Internet, the TCP transport protocol detects congestion only after a packet has been dropped at the gateway. However, it would clearly be undesirable to have large queues (possibly on the order of a late-bandwidth product) that were full much of the time; this would significantly increase the average postponement in the network. Therefore, with increasingly high-speed networks, it is increasingly important to have process 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 transmit packets with higher data rates due to contention of nodes and intervention areas on the route. Taking it as an advantage, some other nodes behave combatively as they can send packets with higher data rates to the destination node through intermediate nodes. Therefore, they can take larger space in the queues in unfair manner. Many algorithms were used earlier for controlling congestion but with these algorithms, packets were dropped.

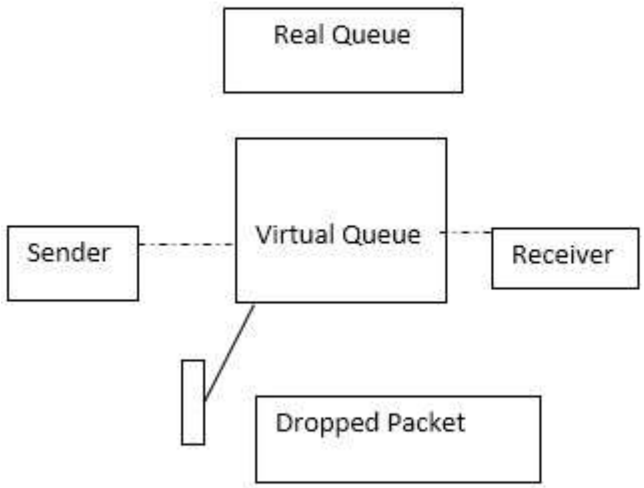

Fig II.1 Existing System

LITERATURE REVIEW

Muhammad Aamir et.al.[2013] introduce a new scheme of buffer management to handle packet queues in Mobile Ad hoc Networks (MANETs) for immovable and movable 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 adjacent 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 accustomed 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 flexible and inflexible traffic. The packets of inelastic flows are always stored ahead of those of the flexible 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 noneligible. Based on PID mechanism, priority dropping active queue management algorithm (PID_PD) provides the distinguished 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.

PROPOSED SYSTEM

We propose a scheme of buffer management for packet queues in MANETs for immovable and movable nodes. For a MANET node, the packet queue is maintained in such a way that an equal buffer space is allocated to each adjoining source and an allowable extension is also available to each neighbor to evade any underutilization of resources. The allocation is made in the buffer of a centrally interactive 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. We consider a MANET model working on Ad hoc On demand Distance Vector (AODV) routing protocol. It is a reactive protocol in which sources get routes to destinations when they demand for the same. Nodes only know their neighbors through routing table entries and keep track of neighbors by exchanging HELLO packets periodically. This Dissertation proposes a new scheme of buffer management to control congestion in MANET. We set a buffer between sender and receiver with an X(X is not defined yet) buffer limit. There are several neighboring nodes around that main buffer and every node have its own limit for placing no. of packets in it. When the packets are send from sender then firstly it goes to neighboring nodes and then one by one send to main buffer and from main buffer packets are send to destination. In this whole process, packets are not dropped or discarded. An algorithm is also applied in this paper for controlling congestion under network.

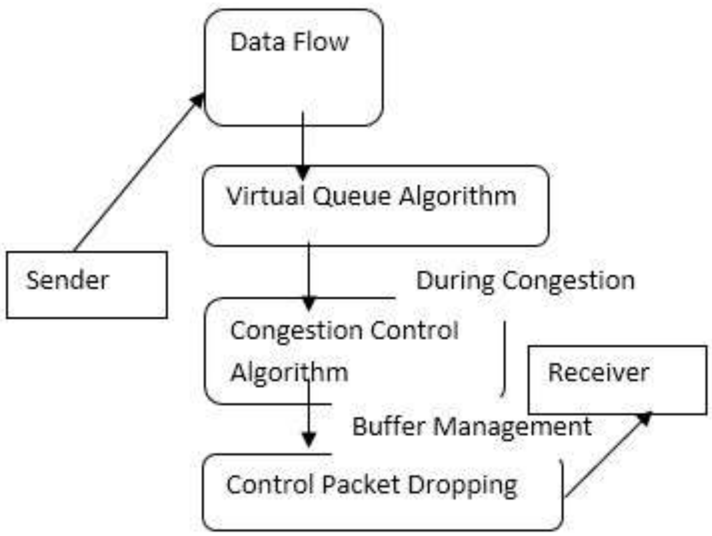

Fig IV.1 System Architecture

CONCLUSION

In this Paper we propose a scheme of buffer management for packet queues in MANETs for immovable and movable 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 takeover of some surrounding source. With the help of this scheme congestion in the network is controlled and improve the performance of the networks.

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