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Analysis of Dynamic Buffer Management Approaches in Mobile Ad hoc network

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Abstract—Mobile ad hoc network also known as wireless ad hoc network is one of the most popular network technologies in research and development. The ad hoc nature of network keep attracted researchers and engineers for finding the new and enhance techniques. This paper presents a analysis on mobile ad hoc network and the buffer management technique. Therefore the paper includes the MANET details, buffer management techniques, recent research work centered on buffer management and a proposal for improving the network performance by incorporating the buffer management in MANET**.**

Keywords-MANET, efficent routing, buffer management, load balancing, survey on buffer management

1.Introduction

Mobile ad hoc network is a new technology. That is basically invented for those conditions where the management of huge infrastructure and maintenance is costly, such as battle ground. MANET (Mobile ad hoc network) is defined by its own characteristics; it is self-organizing, mobile communication manner where topologies are dynamically created. Due to the ad hoc nature of the network infrastructure and mobility it is still an area of new research and development. Due to mobility of wireless communication two major issues are found in such kind of network i.e. performance and security [1]. Mobile ad hoc network simulates some characteristics by which the network is differentiated from the other kind of networks [2].

Fig. - MANET

Each node acts as both host and router i.e. autonomous in behavior.
Multi-hop radio relaying- When a source node and destination node for a message is out of the radio range, then the network is capable of multi-hop routing.

Allotted nature of operation of protection, routing and host charter.The nodes can be part of or go away the community anytime, growing the community topology dynamic in nature.
The nodes can join or leave the network anytime, creating the network topology dynamic in nature
Mobile nodes are characterized by fewer memories, power and light weight features.
The reliability, performance, stability and capacity of wi-fi links are regularly inferior when compared with stressed out links. This suggests the patchy hyperlink bandwidth of wireless links.
Mobile and self generated behavior which demands minimum human intervention to configure the network All nodes have same functions with similar High user density and large level of user mobility Nodal connectivity is intermittent. High user density and large level of user mobility Nodal connectivity is intermittent.obligations and abilities and as a result it paperwork a complete symmetric environment The above characteristics of MANET attract researchers in domain of MANET, but some key issues and challenges are also available which limit the performance and security of MANET. A MANET environment has to overcome certain issues of limitation and inefficiency. It contains [3]:

A Limited Range of Wireless Transmission –
The restricted radio band ends up in reduced information the rates compared to wireless networks. thus the best of measure usage information is critical by keeping low overhead as potential

The wireless link characteristic square measure time varying in nature - there square degree some transmission impediments like vanishing, route loss, blockage and interference that growth the willing behaviour of wi-fi channels. the person of the community relies upon the infrastructure that the community holds at that factor. have demonstrated that the pro-posed Q-learning fairness mechanism improves the Jain fairness index up to 30%, a drastic increase of average throughput for a starving flow via extensive measurements. Moreover, we have ap-plied our Q-learning mechanism on single-homed SCTP to investi-gate whether the fairness mechanism has any effect on fairness of single-homed SCTP against other flows coming from farther away hops. The result has confirmed that the Q-learning mechanism ef-fectively increases the fairness of single-homed SCTP towards far-ther away nodes.[3]. The Future Internet of Things (IoT) will connect billions of battery-powered radio-enabled
devices. Some of them may need to communicate with each other and with Internet gateways (border routers) over multi-hop links. While most
IoT scenarios assume that for this purpose devices use energy-efficient IEEE 802.15.4 radios, there are use cases where IEEE 802.11 is preferred

Packet Losses due to Errors in Transmission – MANETs appreciate better bundle misfortune because of elements which incorporate concealed terminals that outcomes in impacts, remote channel issues (extreme BER), impedance, and incessant breakage in ways because of portability of hubs, propelled crashes because of the nearness of shrouded terminals and unidirectional hyperlinks despite its potentially higher energy consumption Author extend the IEEE 802.11 power saving mode (PSM), which allows WLAN devices to enter a low-power doze state to save energy, with a traffic announcement scheme that facilitates multi-hop communication. The Internet of Things will connect not only Zigbeeen abled devices, such as industrial sensors, but also consumer electronics that typically uses Wi-Fi for network connectivity. we proposed MH-PSM, an extension of the standard IEEE
802.11 PSM that enables low-latency ad hoc communication over multiple hops[4]. Dingde Jiang studied the energy-efficient multicast

Route Changes due to Mobility- The dynamic nature of topology ends up in frequent path breaks.
Frequent Network Partitions- The random motion of nodes regularly ends in the partition of the set of connections. This in particular affects the intermediate nodes.

II. Litreture Review

This section provides the literature survey on recently made contributions for improving the MANET using buffer management technique.
Hassan Al-Mahdi, Mohamed A. Kalil propose a Dynamic Hop-Aware Buffering (DHAB) scheme to reduce the packets loss and delay in MANETs.they evaluate the performance of the proposed scheme through multi-dimensional continuous-time Markov chain and simulation, where important performance

metrics(parameters), i.e., end to end delay, packet loss and blocking probability are derived**.** buffer management scheme at the intermediate nodes plays a vital role in increasing or decreasing those parameters The analytical and simulation results show that, the DHAB outperforms the Drop-tail scheme and the QoS of the different traffic types can be simply controlled by carefully choose the values of the thresholds *T*, *T*1and *T*2.[1] .author propose a CA-based Resource Prediction mechanism considering Mobility (CA-RPM) that predicts the resources using agents through the resource prediction agency consisting of one static agent, one cognitive agent and two mobile agents. CA creates static/mobile agent during the process of resource prediction. Initially, the designed time-series Wavelet Neural Networks (WNNs) predict traffic and mobility. They plan to use these predicted resources for its efficient utilization in QoS routing is future work[2]. Nasim Arianpoo ∗, VictorC.M. Leung compare the proposal with standard CMT-SCTP and Resource pool CMT-SCTP (CMT/RP-SCTP). measurements have shown that CMT-SCTP is more aggressive towards flows coming from farther away hops compared with single-homed SCTP the fairness behavior of CMT-SCTP on a multi-hop wireless testbed introduce a dispensed Q-gaining knowledge of mechanism to decorate the fairness of CMT-SCTP affiliation towards different flows. The proposed technique uses Reinforcement study-ing (RL) to gather information about network dynamics. The acquired knowledge is used to choose the best action to improve the fairness index of the network communication aiming at multi-hop wireless networks.And Analyse energy metric and energy efficiency metric of multi-hop networks, network coding is used to improve network throughput**.** three basic structures to perform network coding as possible as it can be. Then the proposed energy- efficient multicast routing algorithm can flexibly exploits the network structures to maximize network throughput and decrease network energy consumption[5]. new cross-layer scheme *Cooperation between channel Access control and TCP Rate Adaptation* (CATRA) aiming to manage TCP flow contention in multihop ad hoc network. The simulations on various topologies have proved the effectiveness of CATRA scheme. In addition to fairness, CATRA scheme also achieves quite good performance in terms of throughput[6].

III.Buffer Management Survey

Buffer Management Scheme:

1)Drop Tail: Drop Tail is a Passive Queue Management (PQM) calculation which just sets a most extreme length for each line at switch. Switches choose when to drop parcels. It utilizes first in first out calculation. In Drop Tail, the activity is not separated. Every parcel is has a similar need. At the point when the line cradle is completely filled, the parcels arrived a short time later are dropped till the line is full. That is, Drop Tail will continue disposing of/dropping the parcel until the point that the line has enough space for new bundles.

2) RED: during this technique, dropping is predicated on the edge values; minimum threshold T(min) and most threshold T(max). RED monitors the common queue size avg, and checks whether or not it lies between some minimum threshold and most threshold. If it does, then inbound packet is born or markedwith likelihood p=p(avg) that is associateincreasing perf orm of the common queue size . If avg exceed T(max) , all the packet arrived are going to bedropped/discarded.

3) DHAB (Dynamic hop aware buffering):- End-to-end delay and loss probability are two important parameters for evaluating the performance of multihop ad hoc networks. One of the main reasons for increasing the value of those parameters; is the buffer management scheme in the intermediate nodes. The number of hops that the packet traversed is not taken into account in most existing buffer management schemes. Dropping a packet which traversed a large number of hops; results in more retransmission overhead and therefore more congestion in networks than dropping a packet with a small number of hops. In this paper, we propose a buffer management scheme named Hop-Aware Buffering (HAB). HAB is based on virtual partitioning of the buffer at each node according to the number of hops that the packets traversed from source to relaying node. The partitions are correlated and dynamically changed according to the traffic load. An analytical model based on a 4-dimensional Markov chain and simulation is carried out. The results show that HAB outperforms droptail in terms of end-to-end

delay and loss probability. The drop tail scheme and the qos of the different traffic types can be simply controlled by choose the values of the threshold t, t1 and t2.

IV. Buffer Management Evaluation

Issues in buffer management scheme There square measure several introduced within the variations analysis of QoS paradigm concerning queues however these square measure managed at process Moreover, Moreover, The buffer size conjointly plays a crucial term of variety role in s of packets which will be command very before dropping the fresh packet (a arrived case of buffer overflow)[1] The queue management theme of Drop Tail has been used for several years during which packets square measure born once the full. The length of buffer is buffer is thus the most parameter controls the packet that come bythis theme. Later, Active Queue Management (AQM) was introduced that is currently prevailing the within world. during this' the causing node is notified theme before about be utterly crammed so the queue is just the sender will stop causing lower knowledge or the speed of information transmission. Meanwhile, this length of queue is shortened with the process and de-queuing of buffered packets. once a decent area is once more on the market within the supply be the queue may allowed to send additional packets for en-queuing

Conclusion

This paper is intended to find the improvement of MANET(free to move independently in any direction, and will therefore change its links to other devices frequently) to optimize the QoS of network. Therefore first the different techniques available for improving MANET using buffer evaluation are studied. In next the review of existing technique is proposed. Finally by concluding the available techniques a new optimal route discovery process is formulated.

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