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A Review On Delay Optimization For Multimedia Traffic Over The MANET

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ABSTRACT

Multimedia data transmission over mobile ad-hoc network is critical, Because it require less delay and in-order packet delivery. Packet are transmitted through node buffers to reach the destination, The packets which are not coming in a defined order are stored within the buffer itself. After elapsing some time, these packets fill the buffer space and thereby dropping the incoming packet, It causes loss of packet and maximize delay. In this paper we study different approach for effective usage of the node buffer, that maximize in-order packet and minimize out of order packet in the node buffer simultaneously.

Keywords: MANETs, Multimedia Traffic,

network delay.

1. Introduction

MANET provide the customers with the network support "at anywhere and at any time "MANET are self-organizing and self-configuring. No infra-structure is needed to build and administer in MANETs. In MANET, We have collection of mobile nodes that can communicate with each other through wireless channels if communicating nodes are in the same range. In case nodes are out of the range then intermediate nodes play a major role in forwarding the message in multi-hop network increases delay and thereby affect the multimedia transmission over MANETs.

For multimedia traffic maintaining the sequence of packet and reducing the delay are crucial because packet can adopt multiple paths for transmission towards destination. Hence there is a probability that packets may come randomly into the buffer which in turn causes further delay & packet may not reach the destination within a given amount of time which cause loss of packet.

The existing approaches only optimize the bandwidth. They do not modify the order of packets which is an important criterion for multimedia traffic which reduce the delay and loss of packet.

2. Related Work

Wang, Yin, Agrawal [1] An analytical model to analysis energy efficiency of 802.11 DCF(Distributed Coordination Function) major factor such as the number of contention nodes, packet size, contention window, packet transmission collision probability and channel condition that affect the energy efficiency of 802.11 DCF. Previous work analysis the energy efficiency of DCF by considering both transmission errors and collisions. Based on this

analytical model, the impact of both contention window and packet size is determined and compared under different network configuration and channel condition. It is shown that under error-prone channel environment optimal packet size can have more significant improvement on the energy efficiency than optimal contention window, and combining both optimal contention window and packet size can achieve the maximum optimization. However, the fragmentation process increases the bandwidth usage and the delay, but not suitable for multimedia application.

Kohlar, Handley and Floyed [2] proposed a Datagram Congestion Control Protocol(DCCP) provide congestion control mechanism and useful for application with timing constraint on the delivery of data(streaming media, multiplayer, internet telephony). It provides flow-based semantics like in TCP, but does not provide reliable in-order delivery.

Sarwar,Lochin,Boreli [3]in this paper author present unreliable transport protocol like DCCP(Datagram Congestion Protocol) which provide congestion control but no unnecessary reliability have been proposed. DCCP regulate congestion and is well suited to VoIP and video application which need timely delivery of application packet rather than reliability unbounded by any time limit. Because of lack of reliability, unreliable transport protocol like DCCP miss the capability for in-order packet delivery, In this paper author proposed and approach for mitigating the impact of packet reordering to maximize performance of multimedia application. It uses buffer based mechanism for multimedia application, which ensures ordered packet delivery in given time threshold. Indeed, although multimedia application do not need reliability, their performance could significantly decrease when they do not have an in-order delivery service. Furthermore, Author showed that the use of reordering buffer also improves the performance of multimedia application although, this approach reduced response at the receiver side, as receiver buffer may increase delay when more number of packet received is in out-of-order and thereby resulting in loss of packets

Franti, Majanen [4]in this paper device operating in WLAN and running real-time application try to maximize network capacity by packet size optimization. In WLANs, delay and throughput depend on the packet size, packet transmission interval , and connection density. Therefore, they developed and applied control system to adjust transceivers packet size. For prevailing network conditions to achieve application dependent delay and throughput limits for real time traffic and to avoid unnecessary offloading. If the prevailing level of traffic in network exceeds capacity regardless of the control actions, devices prepare to perform asynchronous offloading of traffic to another accessed network and is motivated mainly by issues of congestion and flow control of WLAN system. The approach has poor response on MANETs particularly when the speed of the node change quickly.

Syed Jalal Ahmad, V.S.K. Reddy, A. Damodaram, P. Radha Krishna, [5] The existing approach do not modify the order of packets which is an important criterion for multimedia traffic. Their work investigate the effective usage of the node buffer, for transmitting the packet in-order. Knapsack algorithm is used to fill the packets in the buffer to optimize the delay for multimedia transmission over MANETs. Because, unlike other optimization algorithm, Knapsack possesses a unique property to maximize one parameter and minimize other

parameter simultaneously. It uses buffer as a leaky bucket where some packets can (a) remain in the buffer due to out-of-order sequence (b)directly reach to destination through intermediated nodes node or (c) become in-order within a specified time of transmission So, we apply dynamic approach of knapsack, Where we maximize the in-order capability of packets and at the same time minimize out-of-order packet in the buffer. This approach not only help to reduce and optimize the delay but also reduce loss of packets in the network. The main limitation of this approach is that the optimized value of buffer size and order of packet at any given time can be estimated only after computing all the values of the complete array using bottom-up approach. This increases computational complexity and more energy consumption.

Hristakeva, Shrestha[6]in this paper present comparative study of several design algorithm paradigm apply to the 0/1 knapsack problem. Knapsack problem is combinatorial optimization problem, where Given some items, pack the knapsack to get the maximum total value. Each item has some weight and some value. Total weight that we can carry is no more than some fixed number W. So we must consider weights of items as well as their benefit.

3.Conclusion and Future Work

In literature review several techniques have been proposed to optimize multimedia traffic flow. Sometimes they give good results but mobile ad-hoc network is still having problem for multimedia traffic because it requires more bandwidth and less delay to avoid loss and maintain the sequence of packets to synchronize with the receiver. Mostly packets are delivered out of order so it required extra delay for making packet in order, Dynamic approach of knapsack for making packet in order (in buffer) increases computational complexity and also require more energy consumption.

Another future research is to reduce time of solving 0/1 knapsack problem which optimizes the buffer usage by making as much as in-order packets in buffer, which are received out-of-order. This improves the correct sequence of in-orders packets to get better QoS for multimedia transmission in MANETs.

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