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# Survey on Reactive Protocols Based on Different Queuing Schemes

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***Abstract— When the number of packets augment beyond the limit that can be handled by the network resources, the network performance mortifies, which is known as congestion. In computer networks, plenty of resources are found such as bandwidths, buffers, servers, processor time and many more. Even in a short interval, the available buffer space at the target is not as much as needed for the arriving traffic, packet loss takes place. Similarly, if the total traffic entering the network is more than the bandwidth, the network will lead to congestion. The main research objective is to study the flow control mechanisms in MANET. Simulation is used to evaluate various network parameters such as number of sender and varying queue length.***

***Keywords— Mobile Ad-hoc network (MANET), Adhoc On-demand distance vector (AODV), Dynamic Source Routing (DSR) and Adhoc On-demand multipath distance vector (AOMDV), Effective Congestion Avoidance Scheme (ECAS).***

## I. INTRODUCTION

In this paper we revisit the recently voiced concern of the network congestion means the delay that may be fundamentally flawed as a signal for congestion control. In this paper, our main contribution is to demonstrate that the aggregate behaviour of the flow is the main concern for the congestion control and to design a novel flow count mechanism on various Reactive Protocols (AODV, AOMDV and DSR).

Recently, multitude independent measurement studies [1],[11], [2] have revealed that there might be least correlation between the delay measured by a flow and packet loss events. Basically, when loss of packet occurs and thus network queue is jam-packed, high delay is not accounted in all flows.

[1] Congestion simply means overcrowding or blockage due to overloading .It is similar to traffic jam caused by many cars on a narrow road.

In this paper, our main contribution is to examine the implications associated with congestion control. Low correlation between congestion and measured delay means that delay measurements are *prima facie*, an insufficient indicator of network congestion and thus their use for congestion control could be essentially flawed.

[2] Proposed to develop the Effective Congestion Avoidance Scheme (ECAS), which consists of congestion monitoring, effective routing establishment and congestion less based routing. The status of overall congestion is measured in congestion monitoring. In routing establishment, he propose the contention metric in the particular channel in terms of packet queue length, packet loss rate and drop ratio of packet to monitor the congestion status.

### *A. CONGESTION CONTROL IN MANETs*

[2] Congestion takes place in MANETs with inadequate resources. In these networks, shared wireless channel and dynamic topology leads to interference and fading during packet transmission. Packet victims and bandwidth deterioration are caused due to congestion, and thus wastage of time and energy occurs during its recovery. Congestion can be avoided using congestion-aware protocol by bypassing the affected links. Massive fairness problems and severe throughput dilapidation are some of the commonly recognized congestion related issues.

[3] An autonomous system of mobile nodes that are connected via wireless links in the absence of centralized administration or an existing network infrastructure, dynamically form mobile ad hoc networks. The nodes move haphazardly and organize themselves occasionally; thus, the network's topology may alter swiftly and impulsively.

[2] Congestion control is the foremost problem in ad-hoc networks. Congestion control is associated to controlling traffic incoming into a telecommunication network. To avoid congestive crumple or link capabilities of the transitional nodes and networks and to reduce the rate of sending packets congestion control is used extensively.

## II. RELATED STUDY

G.Vijaya Lakshmi et al, [5] suggested a queuing model to overcome the congestion problem in mobile adhoc network. The queuing mechanism is developed based on the probability distribution in different range of communication. The queuing mechanism hence improves the network metrics such as overall network throughput, reduces the route delay, overhead and traffic blockage probability. The approach is generated over a routing scheme in adhoc network.

Dr. Yogesh Chaba1 et al, [1] define congestion as the loss of utility to a network user due to high traffic loads and congestion control mechanisms as those that maximize a user's utility at high traffic loads .He consider the problem of protecting well-behaved users from congestion caused by ill-behaved users by allocating all users a fair share of the

 

network bandwidth. Fairness is said to be done when equal numbers of packets are received from each node and this will be achieved by limiting the queue size and limited bandwidth .This aggregate queue orders packets based on their timestamps rather than arrival order. Through simulation, we show the performance of reactive protocols like AODV, DSR and AOMDV.

Sanjeev Patel *et al.* [11] had shown a comparative analysis of throughput, queue length and delay for the various congestion control algorithms REM, SFQ and RED. He also included the comparative examination of loss rate for these algorithms having diverse bandwidth. Stochastic Fair Queuing (SFQ) guarantees fair access to network resources and prevents a busty flow from consuming more than its fair share. In case of (Random Exponential Marking) REM, the main implication is to decouple congestion measure from performance measure (queue length, delay or loss). Stabilized RED (SRED) is an additional technique of detecting nonresponsive flows.

Yuming Jiang *et al.* [6] proposed S-SFQ which is a single queue design and implementation of the well-known Start-time Fair Queuing (SFQ). This aggregate queue orders packets based on their timestamps rather than order of arrivals. With the help of simulation, we show the performance gains of S-SFQ over other default single-queue schemes such as RED and FIFO in terms of link utilization and flow fairness.

Dr.Ramachandra.V.Pujeri, et al, [2] proposed to develop the Effective Congestion Avoidance Scheme (ECAS), which consists of congestion monitoring, effective routing establishment and congestion less based routing. The status of overall congestion is measured in congestion monitoring. In routing establishment, he propose the contention metric in the particular channel in terms of packet queue length, packet loss rate and drop ratio of packet to monitor the congestion.

Ehssan Sakhaee *et al.* [7] present a scheme for reducing overall traffic and end-to-end delay in highly MANET networks. In this a new routing algorithm is introduced to reduce the frequency of flood requests by increasing the link duration of the selected paths. In order to elongate the path's duration, we can consider non unlink paths also. This concept is a new approach in route discovery as previous reactive routing protocols seek only disjoint paths. This scheme's basic concept is to broadcast only well-defined and explicit packets, referred to as "best packets" in the paper. The new protocol is simulated with respect to traffic overhead. Although his main aim in this paper is to reduce the net control traffic in a MANET network, there are other advantages arising from the proposed schemes, namely the increase in duration of link, reduction in the end-to-end delay, less disturbance in flow of data, and less path setups.

Matthew Andrews *et al.* [13] study the problem of jointly performing scheduling and congestion control in mobile adhoc networks so that network queues remain bounded and the resulting flow rates satisfy an associated network utility maximization problem. This work typically does not address a number of issues such as how signalling should be performed and how the new algorithms interact with other wireless protocols.

Wu-chang Feng, *et al.* [9] proposed, put into practice, and evaluated an active queue management algorithm, termed as BLUE. Using experiments done through simulation, it is analysed that BLUE performed notably better than RED, both in terms of buffer size requirements and packet loss rates in the network. He also proposed and examined another queue management algorithm, Stochastic Fair BLUE (SFB), which can recognize and rate-limit nonresponsive flows using a infinitesimal amount of state information.

Chunhung Richard Lin *et al.* [10] develop an admission control scheme which can guarantee bandwidth for real-time applications in multihop mobile networks. In his scheme, a host need not discover and maintain any information of the network resources status on the routes to another host until a connection request is generated for the communication between the two hosts, but can be done when former host is offering its services as an intermediate forwarding station to maintain connectivity between two other hosts. This bandwidth feature is important for a mobile network (e.g., wireless LAN, EGPRS, etc.) to interconnect wired networks with QoS support.

This control scheme contains bandwidth allocation and end-to-end bandwidth calculation. The basic concept behind this scheme is that the source (enhanced serving GPRS supporting node or the ATM gateway) is well-versed of the QOS and bandwidth available to any target in the mobile network. This knowledge helps in the establishment of QoS connections within the mobile network and the efficient support of real time applications.

ZHANG Li *et al.* [14] shows the traffic flow of a wireless Ad Hoc network, proposed the congestion control model after considering from the perspective game theory the communication of nodes and the neighbouring links. Based on this model, he also raises congestion and the optimization algorithm CCAD.

CCAD, with the end-to-end traffic flow as its study object and adopting end-to-end congestion control strategy, tried to reduce congestion in links and network. A congestion control technique is adopted at the nodes and the routing congestion control is also completed there. To handle the wireless Ad Hoc uncertain network parameters and time-varying topology structure, self-adapting optimization technique is used.

Dan Rubenstein *et al.* [8] proposed techniques based on delay or loss observations at end hosts to examine whether two flows experiencing congestion are congested because of the similar network resources. His new result is that this research holds good for unicast flows and the same procedures can also be applied in the case of multicast flows. He also put forward metrics which can be used for measuring the amount of congestion sharing between two flows.

TABLE 1: PERFORMANCE ANALYSIS BASED ON QUEUE LENGTH, THROUGHPUT AND DELAY

 

| PERFORMANCE METRICS | | RED | SFQ | REM |
|---|---|---|---|---|
| QUEUE LENGTH | MAX | 2 | 2 | 2 |
| | MIN | 0 | 0 | 0 |
| THROUGHPUT | MAX | 5.53 | 6.64 | 7.51 |
| | MIN | 0 | 0 | 0 |
| DELAY | MAX | 67.25 | 90.01 | 92.96 |
| | MIN | 60.03 | 60.03 | 60.03 |
| SEND PACKETS | | 37157 | 42554 | 49117 |
| LOST PACKETS | | 151 | 56 | 66 |

TABLE 2: COMPARATIVE ANALYSIS BASED ON DIFFERENT QUEUING SCHEMES

| PACKET LOSS(MBPS) | 2MBPS NON-RESPONSIVE FLOW | | | | 45MBPS NON-RESPONSIVE FLOW | | | |
|---|---|---|---|---|---|---|---|---|
| | SFB | RED | SFRED | SFQ+RED | SFB | RED | SFRED | SFQ+RED |
| TOTAL | 1.86 | 1.79 | 3.10 | 3.60 | 44.85 | 13.39 | 42.80 | 46.47 |
| NON-RESPONSIVE FLOW | 1.85 | 0.03 | 0.63 | 1.03 | 44.84 | 10.32 | 40.24 | 43.94 |
| ALL TCP FLOW | 0.01 | 1.76 | 2.57 | 2.47 | 0.01 | 3.07 | 2.56 | 2.53 |

## III. CONCLUSION

In this paper reactive protocols are studied. The performance evaluation parameters are Packet Delivery Ratio, Throughput. We have surveyed the impact of varying queue length and Flow Count on network performance. In this paper we address the problems with existing congestion control algorithms and we tried to show about various performance parameters of RED, SFQ, and REM.SFB provide protection against nonresponsive flows and large amount of buffer space is required in order to get RED to perform well.

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