Abstract

Congestion management is one of the most important issues for high speed applications, relying on the transfer of multimedia traffic over the networks. It is essential to the quality of service (QoS) which is an essential element of a well-managed networks. However, to bring less traffic drop from the networks as a service needed by high speed applications is more important. In the real world, with limited resources and various bottlenecks, it is extremely important to perform proper allocation source rate within a network to gain more throughput.

To address this deficiency, the existing flow control algorithms were explored which is implement base on ***Quality of Service*** (Clark 1997, p.633). In high speed networks the traffic is much more increasing due to multimedia application required. However, a telecommunications service or networks provider to gauge user's perceptions of the service by ***network performance*** (Clark 1997, p 636) parameters such as bit error ratio (BER) provide a bit worst.

A series of integrated studies was undertaken, exploring many research methodology consist of analyze and math proofed, to gather empirical result to compare with Adaptive Rate control (ARC), my algorithm. The existing flow control algorithm has showed the improvements in throughput parameter. It was the unit of analysis as these algorithms are ideally placed to gain more ***throughput*** (Koshnevis 1994, p 54) with low of ***mean queue time*** (Koshnevis 1994, p 62), ***mean queue length*** (Koshnevis 1994, p77), packets drop and therefore make valuable use of ACR. In addition, existing flow control algorithms were less likely to have dedicated schedule queue,

which allowed the research to continue on increasing the number of throughput parameter.

The initial and replication studies use the research papers in IEEE proceeding which is specialized in network performance evaluation. A comparative study was undertaken to determine the similar and difference between each algorithms. Simulation was used to examine the number of throughput also mean queue time, mean queue length and packet drop. Qualitative analysis of this parameters provide a complete answer of what is the best algorithm to apply in such networks.

The result of the empirical studies indicated that most flow control algorithms in networks work well in particular time, not all time. Major barriers to becoming involved in flow control algorithm were identified as concern about ***source rate*** (Koshnevis 1994, p 32), ***service time*** (Koshnevis 1994, p 39) and number of packet dropped.

Results from the flow control algorithms, that obtained from the empirical studies to the math proof and simulation demonstrated that performance was not good enough in peak rate, throughput is low due to bottle neck service, high mean queue length value, also packet dropped. So the research encompassed in this dissertation show ARC flow control algorithm that can solve previous problems.

ARC algorithm was tested in such ATM network, MPLS network and wireless Ad-Hoc network. The results from the simulation indicated that throughput increased even through high peak rate was

generated. And also ARC algorithm obtained low of mean queue time, mean queue length and packets drop.

Moreover, series of policing control algorithm were studied, using existing policing control algorithms compared to ARC algorithm to address the result. The existing policing algorithms were tested by simulation. The result of the empirical studies indicated that most policing control algorithms in networks will function well in particular time, but not all the time. Major barriers to becoming involved in policing control algorithm were identified add on flow control algorithm as about ***queuing policy*** (Koshnevis 1994, p 122), ***queue capacity*** (Koshnevis 1994, p 125).

Results from the policing control algorithms, that obtained from the empirical studies to the simulation demonstrated that performance was not good enough in peak rate, throughput is low due to bottle neck service, high mean queue length value, also packet dropped. So the research encompassed in this dissertation show ARC flow control algorithm that can solve policing control problems.

The research encompassed in this dissertation strongly recommends that ARC can perform the congestion avoidance and more flexible approach in implementation rather than existing flow control algorithm and policing algorithm. The limitation of this research is the results cannot be generalized beyond complex networks. However in the future research, using ARC algorithm approach, can testify such complicated networks.