Simulation of Weighted Fair Queuing Techniques WFQT in Traffic Shaping Using OPNET

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Abstract:

With different traffic shaping we simulated on application that support Weighted Fair Queuing Techniques(WFQT) to control and smooth the traffic shaping in different applications. Internetnetworkavailable resources handlingrecongregation and essential cases in a high-speedpacketswitchdatanetwork, due to the expansion growthof modern streaming services. Networksimulation environmentare designed and modeledusing OPNET simulation software in order to overcome the limitation of the traditional queuings procedures. Various simulations scenarios are conducted. Analysis comparison with WDDRT, and CBWQRT is recorded. And also, various network traffics such as FTP, videoconferencing and voice applications among others are considered. This paper examines the implication of different WFQT on an IRouter. It also defines the performance of managing network resources during the period of traffic shaping.

Keywords: WFQT, OPNET, Traffic shaping.

I. INTRODUCTION

Traffic shaping is a way to help increase network performance by controlling the amount of data that flows into and out of the net paper. Traffic is categorized, queued, and directed according to network WFQT policies. In this paper we simulated and analyses new types of applications, traffic shaping techniques may be sufficient. OPNET Is developed by OPNET technologies; Inc. OPNET had been originally developed at the Massachusetts Institute of Technology (MIT) and since 1987 has become commercial software. It provides a comprehensive development environment supporting the modeling of communication instrument and distributed systems. Both behavior and performance of modeled systems can be analyzed by performing discrete event simulations [1]. Asynchronous Transfer Mode (ATM) over Ethernet or Fast Ethernet because it was faster, more scalable and offered a higher quality of service. Then along came Gigabit Ethernet, with a full array of standards for Category 5 copper wire, quality of service, virtual LAN support and significantly lower cost. There is sufficient evidence from the results to conclude that Gigabit Ethernet has been able to perform the same and in most cases better than ATM. The fact that we have not been able to make use of ATMs complete range of services, especially that of quality of service (QoS) provisions, leads a whole new area to be investigated. In our ATM backbone network, we have limited its functionality by hiding certain key features away from emulated legacy LANs. Although Gigabit Ethernet has proven itself to be a better backbone than ATM, it cannot be stressed enough that the full capability of ATM has not been utilized. Circuit-switched ATM is a strong and stable technology that manages IP voice and video messaging particularly well, and it will continue to be useful for specialized applications for years to come. For most organizations, Gigabit Ethernet seems to be the way to go as it provides the same and in most cases better performance than ATM as a backbone network, even in instrument that require the transmission of delay sensitive traffic such as video and voice [2].

Traffic shaping and traffic policing can only reduce the data rates but have no impact on aggregate traffic behavior. Further aggregation will maintain "burst within burst" phenomena in traffic trace time series. With this observation made the next generation network must deploy new aggregation models as data rates moves toward 100 Gigabytes per second per data port. New aggregation methods must rearrange data to minimize self-similarity and heavy tail without degradation in the quality of service.
For the moment we can’t escape from observed phenomena in network traffic but we can try further to understand it and to deploy instrument designed to support this kind of traffic. It is very difficult to predict network traffic but chaos theory helps us to understand and control this kind of phenomena. A realistic network traffic prediction, means lower costs and fewer problems [3].

II. CONTROL OF WFQT TO SHAPE TRAFFIC

Studies of shaping in internet traffic show the expansion of such exaggerated transfer through internet. For limiting properties network engineers can use WFQT traffic shaping traffic policing. It is demonstrated by [3] that rate limiting results in substantial peak bandwidth resulting lower costs. Rate limiting can be delivered by shaping or policing the traffic.

Figure(2) PDF for WFQT

Figure(3) Delay in WFQT

Figure(4) Video conferencing in WFQT

Figure(5) Gain conferencing in WFQT
III. MODIFICATION IN AGGREGATED TRAFFIC SHAPING

The modification in aggregated traffic behavior by shaping input traffic and further aggregation of this kind of trace will produce self-similarity and high value of parameter. We run simulation for different average shaping values to but the effect was the same related to the parameter. The only change was found in the peak data rates because shaped traffic offers a long term average data rate equal with the average shape value but with higher memory and utilization for routers on witch shape process is configured. Even if shaped trace seems to be smoother when we look at it, we can’t obtain smaller values for parameter.

In conclusion by implementation of shaping and policing techniques only quality of service and service level agreement can be achieved without any effect on self-similarity and detonation.

Improving traffic shaping employing WFQ which will use weight of each influx(queque) bandwidth asa weights(priorities) to several queues, such that the weight logically specifies the number of bits to transmit each time the router services that queue.

Weight of each influx(queque) rely upon type of utility ToS:

\[
\text{weight} = \frac{1}{\text{precedence} + 1}
\]

\[
\text{bandwidth} = \frac{1}{\text{weight} \text{ proportiosn}}
\]

We simulated the result in the research using OPNET software. Then concluding that WFQ T provide several substantial advantages, is fair allocation of band width and protection in each in fluxes. In this paper we focused on simulated features of WFQT which will possible perform. Showing that WFQT can promisedelay bounds and low losses stop passing influxes by using Packet-by-packetwe promise a fair distribution of the resources which results in a certain averagedelay per influx. The WFQT allocating three nearly irely upon quantities:

1. Bandwidth (which packet gets transmitted).
2. Promptness (when do the packets get transmitted).
3. Intermediate Space (which and when packets get dismiss by the WFQT).

Trying to investigate that according analysis of WFQT will producetlow intricatedly computation in the simulation using Networksimulation and OPNET software to achieve best QoS.

IV. CONCLUSION

Perhaps as they are the ones delivering the service it would be useful to get their perspective on outcome evaluation. (WFQT) provides automatically sorts among individual traffic streams without requiring that you first define access lists. It can manage one way or two way streams of data: traffic between pairs of applications or voice and video. It automatically smoothest out bursts to reduce average latency. In WFQ, packets are sorted in weighted order of arrival of the last bit, to determine transmission order. Using order of arrival of last bit emulates the behavior of Time Division Multiplexing (TDM), hence “fair”.

REFERENCES