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Research Article

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

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Abstract:

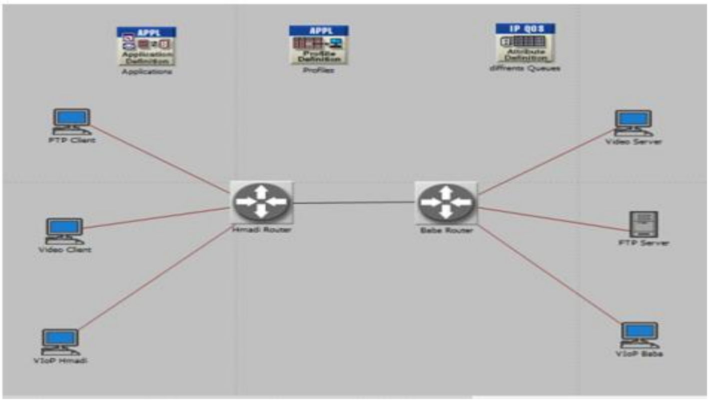
Withdifferent traffic shaping we simulated on application that support Weighted Fair Queuing Techniques(WFQT) to control and smooth the traffic shaping in different applications. Internetnetworkavailable resources handlingarecongregation and essential cases in a high-speedpacketswitchdatanetwork, dueto the expansion growthof modern streaming services. Networksimulation environmentare designed and modeledusing OPNETsimulation software in-order toovercomethelimitationof the traditional queuingprocedures. Various simulations scenarios are conducted.Analysis comparisonwith WDDRT, and CBWQRTisrecorded. Andalso, variousnetworktrafficssuchas:FTP, videoconferencing andvoiceapplicationsamong othersareconsidered.This paperexaminesthe implication ofdifferent WFQT on an IProuter.Italso definestheperformanceofmanaging networkresourcesduring theperiodof 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 networkWFQT 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 aggregationmethods must rearrange data to minimize self-similarity andheavy tail without degradation in the quality of service.

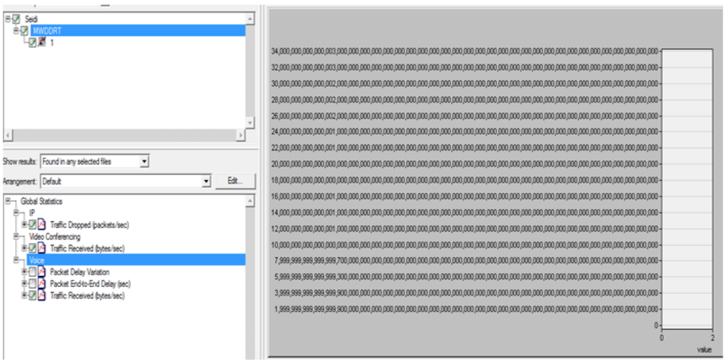


Figure(1)Create and Configure the Network

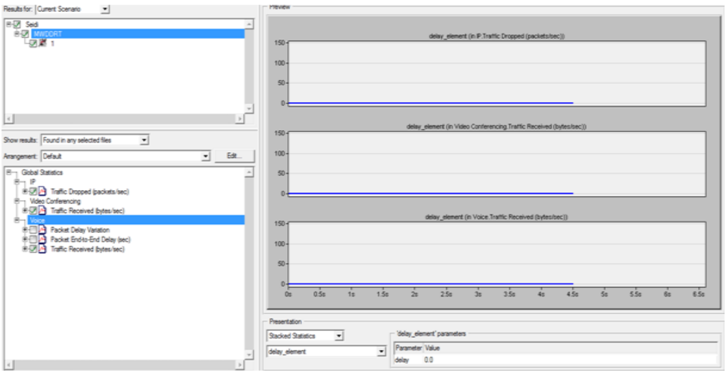
For the moment we can't escape from observedphenomena in network traffic but we can try further tounderstand it and to deploy instrument designed to supportthis kind of traffic. It is very difficult to predict networktraffic but chaos theory help us to understand and controlthis kind of phenomena. A realistic network traffic prediction, means lower costs and fewer problems [3].

II. CONTROL OF WFQT TO SHAPE TRAFFIC

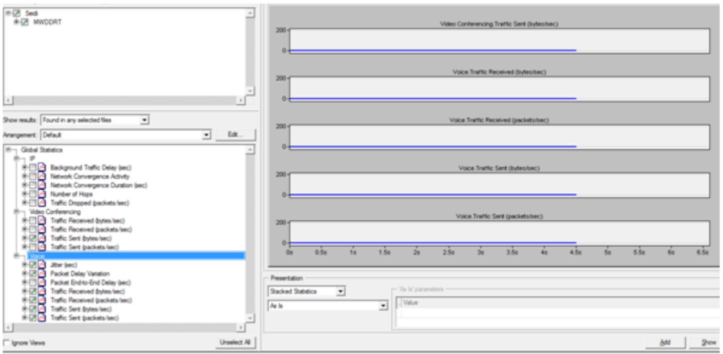
Studies of shaping in internet traffic show the expansion of such exaggerate transfer through internet. For limiting properties network engineers can use WFQT traffic shaping traffic policing. It is demonstrated by [3] that rate ting transfers results in substantial peak bandwidth resulting lower costs.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



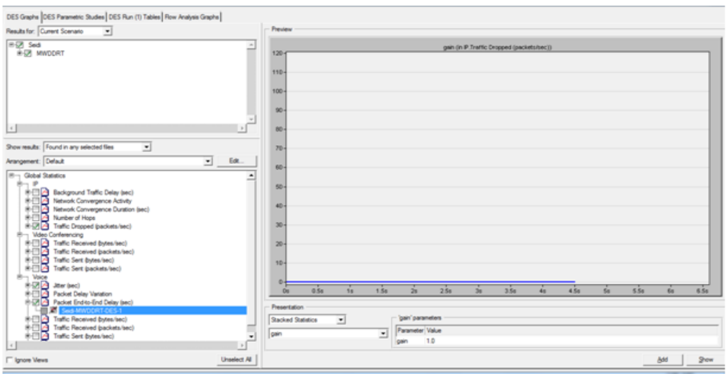
Figure(2)PDF for WFQT



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.

Improvingtraffic shaping employing WFQTwhichwe'llusea weighttoeach influx(queue)bandwidthasa weights(priorities)toseveralqueues,suchthattheweight logicallyspecifies thenumberof bits to transmit each time the router services that queue.

Weight of each influx(queue) relyupon on typeofutilityToS:

$$weight = \frac{1}{precedence + 1} \quad (1)$$

$$bandwidth = \frac{1}{weight\_proportions}$$

We simulated the result in the research using OPNET software. Then concluding that WFQ Tprovidesseveralsubstantialadvantages, is fair allocation of band width and protection in each in fluxes. In this paper wefocusedonsimulated features of WFQT which will possible perform

Showing thatWFQTcanpromisedelay boundsandlowlossestopassing influxesby using Packet-by-packetwe promiseafairdistributionofthereoriginswhichresultsina certainaveragedelay perinflux.TheWFQTallocatingthreenearly inrely upon quantities:

1) Bandwidth (which packet gets transmitted).
2) Promptness (When do thosepacketsget transmitted).
3) IntermediateSpace(which and when packets get dismiss bythe WFQT).

Tryingto investigatethat accordinganalysis of WFQTwill producelow intricately computationinthesimulationusing NetworksimulationandOPNETsoftware toachieve best QoS.

IV. CONLUSION

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".

REFRENCES

[1] Mrs. Saba Siraj, Mr. Ajay Kumar Gupta and Mrs Rinku-Badgujar, Network Simulation Tools Survey. International Journal of Advanced Research in Computer and Communication Engineering 2012; 1(4): www.ijarcce.com.

[2] Daian Daniel-Simion. Traffic Shaping and Traffic Policing Impacts on Aggregate Traffic Behavior in High Speed Networks.International Journal of Advanced Computer Science, Vol. 2, No. 10, Pp. 389-393, Oct., 2012.

[3] Massimiliano Marcon, Marcel Dischinger, Krishna P. Gummadi, and Amin Vahdat, San Diego. The Local and Global Effects of Traffic Shaping in the Internet. In Proc. Of ACM SIGCOMM, August 2008.

[4] Potorac, A. D. Consideration on VoIP Throughput in 802.11 Network's, in Vol. 9, Nr. 3, 2009, on page(s): 45 – 50, Advanced in Electrical and Computer Engineering.

[5] Shalangwa D.A, "Evaluation of bandwidth performance in a corporate network by using asimulation model," Journal of Engineering andTechnology Research, Vol. 6, No. 1(Jan. 2014), pp.1-5.6. Jose, "Cisco Virtual Networking Index Forecast", White Paper, May, 2013.

