International Refereed Journal of Engineering and Science (IRJES)
ISSN (Online) 2319-183X, (Print) 2319-1821
Volume 5, Issue 5 (May 2016), PP.86-88

Packet Loss Control Using Tokens at The Network Edge

Birru Devender[1], Korra Srinivas[2], Ch.Tulasi Ratna Mani[3], K. Aparna LakshmI[4]
[1]Working as Associate Professor, Holy Mary Institute of Technology and Science, Keesara , Affiliated to JNTU-Hyderabad, T.S, India.
[2,3,4]Working as Assistant Professor, Holy Mary Institute of Technology and Science, Keesara, Affiliated to JNTU-Hyderabad, T.S, India

Abstract: Research has studied numerous means of One of the key presently the Internet accommodates simultaneous audio, video, and data traffic. This requires the Internet to guarantee the packet loss which at its turn depends very much on congestion control. A series of protocols have been introduced to supplement the insufficient TCP mechanism controlling the network congestion. CSFQ was designed as an open-loop controller to provide the fair best effort service for supervising the per-flow bandwidth consumption and has become helpless when the P2P flows started to dominate the traffic of the Internet. Token-Based Congestion Control (TBCC) is based on a closed-loop congestion control principle, which restricts token resources consumed by an end-user and provides the fair best effort service with O(1) complexity. As Self-Verifying CSFQ and Re-feedback, it experiences a heavy load by policing inter-domain traffic for lack of trust. In this paper, Stable Token-Limited Congestion Control (STLCC) is introduced as new protocols which appends inter-domain congestion control to TBCC and make the congestion control system to be stable. STLCC is able to shape output and input traffic at the inter-domain link with O (1) complexity. STLCC produces a congestion index, pushes the packet loss to the network edge and improves the network performance. Finally, the simple version of STLCC is introduced. This version is deployable in the Internet without any IP protocols modifications and preserves also the packet datagram.
Keywords: congestion control protocols and algorithms which can solve the packet loss parameter can be kept under control.

I. INTRODUCTION

Modern IP network services provide for the simultaneous digital transmission of voice, video, and data. These services require congestion control protocols and algorithms which can solve the packet loss parameter can be kept under control. Congestion control is therefore, the cornerstone of packet switching networks. It should prevent congestion collapse, provide fairness to competing flows and optimize transport performance indexes such as throughput, delay and loss. The literature abounds in papers on this subject; there are papers on high-level models of the flow of packets through the network, and on specific network architecture. Despite this vast literature, congestion control in telecommunication networks struggles with two major problems that are not completely solved. The first one is the time-varying delay between the control point and the traffic sources. The second one is related to the possibility that the traffic sources do not follow the feedback signal.

This later may happen because some sources are silent as they have nothing to transmit. Originally designed for a cooperative environment. It is still mainly dependent on the TCP congestion control algorithm at terminals, supplemented with load shedding [1] at congestion links. This model is called the Terminal Dependent Congestion Control case.

Core-Stateless Fair Queuing (CSFQ) [3] set up an open- loop control system at the network layer, which inserts the label of the flow arrival rate onto the packet header at edge routers and drops the packet at core routers based on the rate label if congestion happens. CSFQ is the first to achieve approximate fair bandwidth allocation among flows with O(1) complexity at core routers. According to Cache Logic report, P2P traffic was 60% of all the Internet traffic in 2004, of which Bit-Torrent [4] was responsible for about 30% of the above, although the report generated quite a lot of discussions around the real numbers. In networks with P2P traffic, CSFQ can provide fairness to competing flows, but unfortunately it is not what end-users and operators really want. Token-Based Congestion Control (TBCC) [5] restricts the total token resource consumed by an end-user. So, no matter how many connections the end-user has set up, it cannot obtain extra bandwidth

In this project a new and better mechanism for congestion control with application to Packet Loss in networks with P2P traffic is proposed. In this new method the edge and the core routers will write a measure of the quality of service guaranteed by the router by writing a digital number in the Option Field of the datagram of the packet. This is called a token. The token is read by the path routers and interpreted as its value will give a measure of the congestion especially at the edge routers. Based on the token number the edge router at the source, thus reducing the congestion on the path. In Token-Limited Congestion Control (TLCC) [9], the inter-domain router restricts the total output token rate to peer domains. When the output token rate exceeds the threshold, TLCC will decreases the Token-Level of output packets, and then the output token rate will decrease.

II. METHODOLOGY

Sdlc Methdologies

This document play a vital role in the development of life cycle (SDLC) as it describes the complete requirement of the system. It means for use by developers and will be the basic during testing phase. Any changes made to the requirements in the future will have to go through formal change approval process.

Spiral Model

This was defined by Barry Boehm in his 1988 article, "A spiral Model of Software Development and Enhancement. This model was not the first model to discuss iterative development, but it was the first model to explain why the iteration models.

As originally envisioned, the iterations were typically 6 months to 2 years long. Each phase starts with a design goal and ends with a client reviewing the progress thus far. Analysis and engineering efforts are applied at each phase of the project, with an eye toward the end goal of the project.

The steps for Spiral Model can be generalized as follows:

- The new system requirements are defined in as much details as possible. This usually involves interviewing a number of users representing all the external or internal users and other aspects of the existing system.
- A preliminary design is created for the new system.
- A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product.
- A second prototype is evolved by a fourfold procedure:

1. Evaluating the first prototype in terms of its strengths, weakness, and risks.
2. Defining the requirements of the second prototype.
3. Planning and designing the second prototype.
4. Constructing and testing the second prototype.

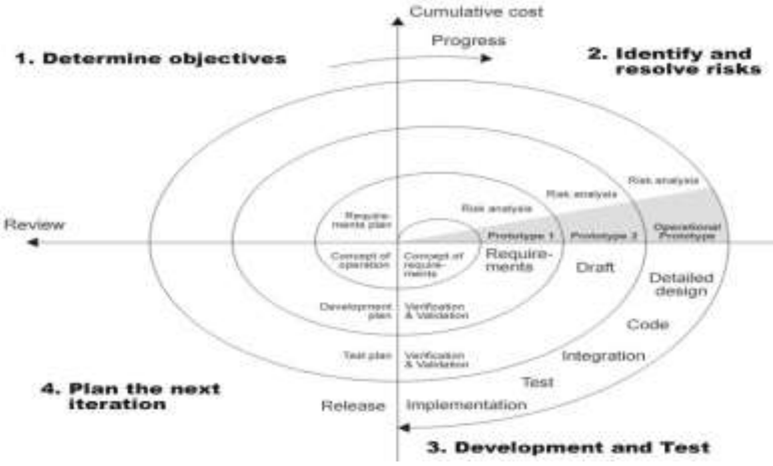
- At the customer option, the entire project can be aborted if the risk is deemed too great. Risk factors might involve development cost overruns, operating-cost miscalculation, or any other factor that could, in the customer's judgment, result in a less-than-satisfactory final product.
- The existing prototype is evaluated in the same manner as was the previous prototype, and if necessary, another prototype is developed from it according to the fourfold procedure outlined above.
- The preceding steps are iterated until the customer is satisfied that the refined prototype represents the final product desired.
- The final system is constructed, based on the refined prototype.
- The final system is thoroughly evaluated and tested. Routine maintenance is carried on a continuing basis to prevent large scale failures and to minimize down time.

Spiral model
Advantages:

- Estimates(i.e. budget, schedule etc .) become more relistic as work progresses, because important issues discoved earlier.
- It is more able to cope with the changes that are software development generally entails.

Software engineers can get their hands in and start woring on the core of a project earlier.

The following diagram shows how a spiral model acts like.



An Overview Of Proposed System

Modern IP network services provide for the simultaneous digital transmission of voice, video, and data. These services require congestion control protocols and algorithms which can solve the packet loss parameter can be kept under control. Congestion control is therefore, the cornerstone of packet switching networks. It should prevent congestion collapse, provide fairness to competing flows and optimize transport performance indexes such as throughput, delay and loss. The literature abounds in project on this subject; there are project on high-level models of the flow of packets through the network, and on specific network architecture.

III. CONCLUSION

This project is organized as follows. In section II, the architecture of Token-Based Congestion Control (TBCC), which provides fair bandwidth allocation to end-users in the same domain will be introduced. Section III evaluates two congestion control algorithms CSFQ and TBCC. In section IV, STLCC is presented and the simulation is designed to demonstrate its validity. Section V presents the Unified Congestion Control Model which is the abstract model of

CSFQ, Re-feedback and STLCC. In section VI, the simple version of STLCC is proposed, which can be deployed on the current Internet. Finally, conclusions will be given. To inter-connect two TBCC domains, the inter-domain router is added to the TBCC. To support the SKA arrangement, the inter-domain router should limit its output token rate to the rate of the other domains and police the incoming token rate from peer domains.

REFERENCES

[1]. Andrew S. Tanenbaum, Computer Networks, Prentice-Hall International, Inc.

[2]. S. Floyd and V. Jacobson. Random Early Detection Gateways for Congestion Avoidance, ACM/IEEE Transactions on Networking, August 1993.

[3]. Ion Stoica, Scott Shenker, Hui Zhang, "Core-Stateless Fair Queueing: A Scalable Architecture to Approximate Fair Bandwidth Allocations in High Speed Networks", In Proc. of SIGCOMM, 1998.

[4]. D. Qiu and R. Srikant. Modeling and performance analysis of BitTorrent-like peer-to-peer networks. In Proc. of SIGCOMM, 2004.

[5]. Zhiqiang Shi, Token-based congestion control: Achieving fair resource allocations in P2P networks, Innovations in NGN: Future Network and Services, 2008. K-INGN 2008. First ITU-T Kaleidoscope Academic Conference.

[6]. I. Stoica, H. Zhang, S. Shenker , Self-Verifying CSFQ, in Proceedings of INFOCOM, 2002.

[7]. Bob Briscoe, Policing Congestion Response in an Internetwork using Refeedback, In Proc. ACM SIGGCOMM05, 2005,

[8]. Bob Briscoe,Re-feedback:Freedom with Accountability for Causing Congestion in a Connectionless Internetwork, http://www.cs.ucl.ac.uk/staff/B.Briscoe/projects/e2ephd/e2ephd_y9_cutdown_appxs.pdf

[9]. Zhiqiang Shi, Yuansong Qiao, Zhimei Wu, Congestion Control with the Fixed Cost at the Domain Border, Future Computer and Communication (ICFCC), 2010.

[10]. Dina Katabi, Mark Handley, and Charles Rohrs, "Internet Congestion Control for Future High Bandwidth-Delay Product Environments." ACM Sigcomm 2002, August 2002.

[11]. Abhay K. Patekh, "A Generalized Processor Sharing Approach Flow Control in Integrated Services Networks: The Single-Node Case", IEEE/ACM Trans. on Network, Vol. 1, No.3, June 1993.

[12]. Sally Floyd, Van Jacobson, Link-sharing and Resource Management Models for Packet Networks, IEEE\ACM Transactions on Networking, Vol.3, No.4, 1995.