UNIVERSITI PUTRA MALAYSIA

INCREASING TCP FRIENDLINESS BY IMPLEMENTING SIMPLE ADAPTIVE CONGESTION CONTROL FRAMEWORK IN WIRELESS NETWORK

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By

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Thesis Submitted to the School of Graduate Studies, University Putra Malaysia, in Fulfillment of the Requirements for the Degree of Master of Science

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Table of Contents

ABSTRACT

Abstract of project presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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Supervisor : Dr. Fahrul Hakim Ayob, PhD

Faculty : Computer Science and Information Technology

As new connection innovations and sub-systems multiply and develop an extensive number of TCP variations have been produced for various kinds of the system situations. They can prompt significant execution picks up by exploiting neighborhood qualities of the particular arrange. Be that as it may, these TCP variations couldn't be consequently picked by the bring down system conditions. In this experiment, we create an congestion control mechanism ACCF, a versatile congestion based control structure, which dismiss consequently progress amid current congestion control algorithm components as indicated by the difference in the system status. At that point we play out

a straightforward usage of ACCF over the systems with high data transmission defer item. It can shift the congestion control mechanism methods amid the deferral centered ones then the misfortune centered ones as indicated by the system position.. For the reenactment measures, the trial comes about demonstrate that the execution of ACCF is essentially enhanced when contrasted with other best in class calculations in term of throughput, reasonableness and TCP-Friendliness.

ABSTRAK

Abstrak tesis ini dikemukakan kepada Senat Universiti Putra Malaysia untuk memenuhi keperluan Ijazah Sarjana

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JULY 2018

Penyelia : Dr. Fahrul Hakim Ayob, PhD

Fakulti : Komputer Sains Dan Teknologi Maklumat

Sebagai inovasi sambungan dan sub-sistem yang banyak dan banyak berkembang dan mengembangkan banyak variasi TCP telah dihasilkan untuk pelbagai jenis situasi sistem. Mereka boleh memaksa pelaksanaan yang penting dengan mengeksploitasi kualiti kejiranan susunan tertentu. Jadi, kerana itu, variasi TCP ini tidak boleh dijadikan pilihan dengan menurunkan keadaan sistem. Dalam makalah ini, kami mencadangkan ACCF, struktur kawalan kesesakan yang serba boleh, yang boleh menyebabkan kemajuan di antara komponen kawalan kesesakan sedia ada seperti yang ditunjukkan oleh perbezaan dalam status sistem. Pada ketika itu, kami menggunakan penggunaan ACCF secara lurus terhadap sistem dengan item penghantaran data

penunggang yang tinggi (BDP). Ia boleh menukar pendekatan kawalan kesesakan antara yang berasaskan deferral dan yang berasaskan kemalangan yang ditunjukkan oleh status sistem. Bagi langkah-langkah reenactment, perbicaraan itu membuktikan bahawa pelaksanaan ACCF pada dasarnya dipertingkatkan apabila dibandingkan dengan pengiraan kelas terbaik yang lain dari segi keluaran, kewajaran dan TCP-Keramahan.

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APPROVAL SHEET

This project has been submitted to the Faculty of Computer Science and Information Technology of University Putra Malaysia and has been accepted in partial fulfilment of the requirement for the degree of Master of Computer Science.

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LIST OF TABLES

LIST OF FIGURE

LIST OF ABBREVIATIONS

ACCF	Adaptive Congestion Control Framework
RTT	Round Trip Time
NS	Network Simulator
TCP	Transmission Control Protocol
ACK	Acknowledge
CC	Congestion Control

CHAPTER 1

INTRODUCTION

1.1 Introduction

Applications using the internet depend on the Transmission Control Protocol (TCP) to convey information dependably over the system. Despite the fact that it remained not some portion of TCP's essential outline, the furthermost indispensable component in congestion control of TCP, that decides TCP's execution attributes. These region has remained proceeding to pull studies and designing exertion on the grounds that new connection advancements and sub-systems have multiplied and developed. For instance, the previous couple of decade an expansion at remote systems through inconstant bottleneck rates; datacentre networks which has great rates, short delays, and connections in obtainable stack ways using over the top buffering, with highly variable cellular wireless networks, self-inflicted packet delays; relations through no congestive stochastic loss; besides networks by great bandwidth-delay product (BDP).

The results of the algorithm presented in this paper, will be compared with the existing algorithms according to the anchor paper that I have selected for my final year project

1.2 Overview

This section highlights the background of TCP and also the congestion control mechanism, as well as inherent problems. The problem statement is equally stated, as well as the research objective, scope, and respectively in sections 1.2, 1.3 & 1.4.

1.4 Project Abstract

In high BDP networks there consist of various protocols which are presented, comprising the loss-based, together with delay based and the interaction of loss-based and delay-based methods. Restricting TCP to a particular system and exploiting neighbourhood qualities of that system can prompt real execution picks up. In TCP congestion control mechanism can be brought to be adjusted to new circumstances, that constraint architecture progress. It is the purpose of this project to accomplish the adaptive congestion mechanism control for diverse status of network automatically.

1.5 Problem Statement

Typical TCP might not adjust the congestion control mechanism to new-fangled circumstances. Basically as a standard TCP it not created to adapt the congestion control algorithm with a new cases. These TCP variants cannot automatically or selected according to a different network state. Some of the basic or prominent congestion variants, for example are, BIC and Cubic, TCP Reno implemented at type of diverse versions of Linux kernel.

- Basically further congestion control methods cannot simply implemented easily except it is deployed manually by them. It will very much unreasonable

to select a suitable congestion control unit for each point and this effect TCP Friendliness.

- Furthermore, the state of network which are lower, such as the accessible bandwidth together with router's buffer size, is time unpredictable. Together everything would eventually cause the programmed selection a trial and cause the fairness to decrease.

1.6 Research Objective

Standardized TCP are unable to adjust the congestion control mechanism to a different circumstances.

- This experiment is aim to achieve the simple adaptive congestion control using Fast TCP & Cubic TCP congestion algorithm for different network status through two parameters which are packet loss event, and delay based event to upturn the TCP Friendliness in wireless network.

1.7 Research Scope

- Covers congestion algorithm as targeted to delay-based together with the loss-based ones based on the status of network.
- Studies on TCP Fast And TCP Cubic congestion control Protocols to integrate their protocol to produce ACCF.
- Scope Limits to Congestion Algorithm of TCP Fast and TCP Cubic only.

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