

AN ANALYSIS OF SCTP IN BEST-EFFORT NETWORK WITH  
COMPETING FLOWS

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UNIVERSITI UTARA MALAYSIA

2011

11/11/2011  
11/11/2011  
11/11/2011  
11/11/2011

**AN ANALYSIS OF SCTP IN BEST-EFFORT NETWORK WITH  
COMPETING FLOWS**

A project submitted to the Dean of Research and Postgraduate Studies Office in partial  
Fulfillment of the requirement for the degree of  
Master of Science (Information Technology)  
Universiti Utara Malaysia

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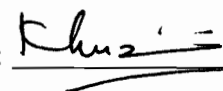
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## **ABSTRACT**

This study focuses on Stream Control Transmission Protocol (SCTP), which is defined by IETF in RFC 4960 as a new transport protocol. SCTP features such as multi-homing and multi-streaming, has attracted multimedia applications to use it as their transport protocol instead of UDP and TCP. However, the challenge faced by SCTP is in a best-effort network, where the network does not provide any Quality of Service for the upper layer. In this study, a comprehensive performance evaluation of SCTP in the best-effort network in the presence of other traffic flows will be carried out. The objectives of this research are to measure the performance of both TCP and SCTP over a Wired Network in terms of delay, jitter, and throughput in a network environment that has STCP with UDP traffic, and then compare SCTP and TCP performance results in terms of these performance metrics. All experiments conducted in this research were obtained through network simulation tools, i.e. NS 2. It is expected that the results obtained will become useful for future researchers in improving SCTP.

## **ACKNOWLEDGMENTS**

Firstly, praise to Allah SWT for guiding and blessing me with perseverance and strength to complete this project. Secondly, I would like to thank my parents, especially my father, may Allah bless his soul, forgive him and admit him into paradise. Also, my appreciation goes to my mother, siblings and friends for their support throughout my program, may Allah reward all of you abundantly. In addition, my gratitude goes to my Supervisor, En. Khuzairi Mohd Zaini, and my Co-Supervisor, En. Adib M.Monzer Habbal, for guidance, support and constructive criticism towards the completion of this project, may Allah help you all. Lastly, I am indebted if I do not appreciate everybody that took part in the completion of this project, especially the University Utara Malaysian administration, staff and students, May Allah continue to bless all of you, ameen.

Elbara Khalid Ali Waleed

February 2011

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## LIST OF ABBREVIATIONS

LAN	Local Area Network
WAN	Wide Area Network
HSTCP	High Speed Transmission Control Protocol
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol over Internet Protocol
FTP	File Transfer Protocol
HTTP	Hyper-Text Transfer Protocol
UDP	User Datagram Protocol
TFRC	TCP Friendly Rate Protocol
SCTP	Stream Control Transmission Protocol
MTU	Maximum Transmission Unit
OSI	Open Systems Interconnection
Ns-2	Network Simulator 2
WLAN	Wireless Local Area Network
VOIP	Voice Over IP
Ipdv	IP delay variation
RTEMS	Real-Time Executive for Multiprocessor System
RTO	Recovery Time Objective
MANET	Mobile Ad hoc Network
CWA	Congestion Window Action
CBR	Constant Bit Rate
PC	Personal Computer

# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

A network is a link between two or more devices such as computers, telephones or anything else for communication to achieve the work that has to do with exchange of files in the case of the sharing of one printer between many computers. Actually, there are two basic types of networks; firstly, Local Area Network (LAN), where many devices link with each other in a limited environment such as a school, building, or even lab. Secondly, a Wide Area Network (WAN), which is also a device link between each other, but in a larger area or environment such as Kedah, Kuala Lumpur or even the world. In addition, there are many ways for arranging networks, which is called network topology. There two types of topology; logical and physical topology. The logical topology describes how the network information flows through the network while the physical topology is concerned with where the access points are placed for the computer layout. The topology classification is regarded as point-to-point, star, link, bus, ring, tree, and mesh. This study will focus on one of the stated classifications.

Indeed, the network has rules and conventions for communicating between devices, which are called network protocols. Any layer from the network standard layers (physical, data link, network, transport, session, presentation and application) has special protocols that are mentioned as the link between two devices and keep the network in good shape. For example, High-Speed Transmission Control Protocol (HSTCP) has

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