

**PERFORMANCE ANALYSIS OF TFRC AND UDP OVER MOBILE-IP  
NETWORK WITH COMPETING FLOWS**

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**UNIVERSITI UTARA MALAYSIA**

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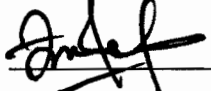
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## **Abstract**

This study aimed to conduct a performance analysis of TFRC and UDP over mobile-IP network with competing flows that enables to investigate three major performance metrics such as jitter, throughput, packet loss and packet delay. Two different transport layer protocols have been used in this analysis. As mobility has been the core issue of computing of 21st century, this research aims to contribute to this phenomenon by implementing performance analysis in mobile IP network, where mobile devices (nodes) are moved from access points to access points (AP) in order to exemplify the suitability of TFRC and UDP in wireless networking. Moreover to collect data about crucial performance metrics features. The experiment has been conducted by Network Simulation (NS-2).

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## **List of Abbreviation**

APs	Access Points
BS	Base Station
CBR	Constant Bit Rate
CoA	Care of Address
DSL	Digital Subscriber Line
FA	Foreign Agent
HA	Home Agent
ISDN	Integrated Services Digital Network
IP	Internet Protocol
ITU	International Telecommunication Union
LAN	Local Area Network
MH	Mobile Host
Ns-2	Network Simulator 2
PC	Personal Computer
QoS	Quality of service
RTT	Round-trip delay time
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol over Internet Protocol
TFRC	TCP Friendly Rate Protocol
PDA	Personal Digital Assistant
UDP	User Datagram Protocol
VOIP	Voice Over IP
WAN	Wide Area Network

WLAN            Wireless Local Area Network

3G              Third Generation

## CHAPTER ONE

### INTRODUCTION

#### 1.1. Introduction

As every significant research we are obliged to meet certain requirement in order to provide reliable studies. Different studies have focused on measuring and evaluation the performance of TCP in provide a particular importance which give inherent shared nature of Grid services and to the limited capabilities based on hardware and software tools that are typically available to satisfy a client's request. Moreover, measuring the performance on the online environments need always to apply an effective techniques for these measurements such as QoS for measuring the client's satisfaction on the online environments of e-Business and e-Science environments. Measuring the network performance has been reported different issues during measuring and elaborating the logical structure of the Network circuit. This kind of measurements addresses the abilities to provide much better services to a large extent (Orge, et al., 2004).

More specifically, the Transmission Control Protocol (TCP) is used by the users to adjust the sending rate in response to changing network conditions. In a network the computers communicates with the help of IP-address. In an organization the transmission of data has to be very much secured (Hayder, N., et al., 2008). The organizations may use Dynamic IP addressing (Mohd, D.,

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