

UNIVERSITI TEKNOLOGI MARA

Adaptive Policing and Shaping Algorithms on Inbound Traffic Using
Generalized Pareto distribution

NOR AZURA AYOP

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ABSTRACT

This paper present an analysis of inbound internet traffic and development of Adaptive Policing and Shaping Algorithms on inbound internet traffic and fitted to traffic model. Network “bursting” is a normal event in internet traffic engineering, but the bustiness of throughput data will violent the committed rate that provided by ISP. The objective of this research is to characterize inbound internet traffic collected on real live IP-based campus network, to develop Adaptive Policing and Shaping Algorithms with percentage level on Inbound Traffic based on traffic characterization and to compare the policing and shaping performance on bandwidth used, processing time and packet loss. Then, traffic is fitted to best traffic model and percentage level Policing and Shaping algorithm is developed to control the bandwidth used. The research scope is based on collected of internet traffic on IP-based network real live traffic at 16 Mbps speed line. By using MATLAB software, the Open Distribution Fitting application is fitted to the collected data to identifying the best distribution and the results presents GPD shows the highest value for best fitted traffic model. Log likelihood estimation technique is used to fit the best 2-parameter CDF compared to Weibull, Normal and Rician distribution model. The percentage level 5% under original bandwidth used is developed on policing and shaping algorithms to control bandwidth used. Result present performances upgraded around 3% of time processing and approximately 73% of bandwidth saved. This result help to expand the view of new idea in modelling the tele-traffic algorithm based on bandwidth management and time processing improvement. The most important matter is the understanding about the internet traffic’s flow and characteristic.

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TABLE OF CONTENTS

SUPERVISOR'S DECLARATION	i
AUTHOR'S DECLARATION	ii
ABSTRACT	iii
DEDICATION	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF FIGURE	viii
LIST OF TABLE	ix
LIST OF ABBREVIATIONS	x
CHAPTER 1 - INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Significance of Study	3
1.4 Research Objectives	3
1.5 Research Scope	3
1.6 Summary of Chapter	4
CHAPTER 2 - LITERATURE REVIEW	5
2.1 Internet Traffic Model	5
2.2 Traffic Theory	6
2.3 Bandwidth management	7
2.4 Quality of Services in Network	7
2.5 Summary	8
CHAPTER 3 - METHODOLOGY	9
3.2 Traffic Distribution Model	11
3.3 Summary	12

CHAPTER 1

INTRODUCTION

1.1 Research Background

The requirement to have improvement in internet traffic management nowadays became crucial. The users demand is increasing sky rocketed day by day. Through research and observation on daily life of internet traffic, researcher has created so many algorithm that has one sole mission, it is to handle internet traffic effectively [1]. The successful in emerging the next generation of telecommunication such as LTE cannot promise the best internet performance if they can't manage their shared wireless resources in the most efficient way [2]. Although there is a lot of development of algorithm, method or scheme are developed to control network traffic in an IP-based network but still, organizations faces high volume of traffic used every day [3]. Traffics that run in the IP-based network may comprise from different network protocols and heterogeneous applications which cause burst traffic with the used of new technology on the internet [4].

Therefore, to ensure the Quality of Service (QoS) is efficiently supported, networks need to understand and recognize the characteristics for each type of services and their requirement, so that the sufficient resources can be reserved to meet the QoS requirement. It is important to differentiate different type of traffic and their requirement so that they can be treat accordingly [5]. Thus, to describe the internet traffic activities and their character, traffic modelling is first procedure to engage. Traffic modelling provide conceptual framework in mathematics before implement in traffic simulation by using associated software. Studying the complicated traffic and evaluate the impact of interventions, can contribute in planning and designing the operating of internet traffic system [6].