# ANALYZING TRAFFIC BEHAVIOR AND TREATMENTS IN NGN IP CORE NETWORKS

This dissertation was submitted in partial fulfillment of the requirement for the Degree of Master of Science in Telecommunications

Department of Electronic and Telecommunication Engineering

University of Moratuwa.

A thesis presented by,

M.A.I.K KARUNARATNE

Supervised by

Eng. KITHSIRI SAMARASINGHE

In partial fulfillment of the requirement for the degree of

MASTER OF SCIENCE IN TELECOMMUNICATIONS

of the

FACULTY OF ELECTRONIC AND TELECOMMUNICATION ENGINEERING,

UNIVERSITY OF MORA TUW A,

SRI LANKA

2009

93923

# Abstract

Keywords: IP core network, mobile traffic, fast convergence, QoS, media gateways, MPLS.

Today Internet Protocol has taken over the entire communication. With the advancements in the new technologies cost of the IP related equipments has come down which has helped this exponential growth. with the increase of the usage the telecommunication service providers are expanding their infrastructure to cater the growth. Entire world is expanding their infrastructure mainly on IP equipments.

Integrating the legacy infrastructure to the IP Network has lot of challenges. The real challenges are the transporting delay sensitive traffic like voice over the IP Network, IP node failures, IP link failure detections, delay variations. There are proprietary systems being developed between the IP vendors and the others in order to over come these challenges which can sometime be not flexible to the telecom service provider. In this research an open standard based approach is used to integrate media gateways to an IP/MPLS Network. The challenges of the integration are discussed in this thesis.

A lab setup and a live network test were performed in order to measure the quality of the integration work. The interconnection methods were analyzed after going through the theories related to the media gateways and IP/MPLS technologies. Also since there. can be different type of traffic in an IP/MPLS network a traffic treatment method should also be developed

The major results of the research was that using open standards methods the Essential parameters for the Media gateway integration of the IP core networks can be achieved. Also the model that was developed for the traffic treatments was successful.

Media gateways interconnections with IP. networks are successful on open standards IP protocols. Fast convergence requirements, QoS requirements and jitter and delay requirements can be addressed using open standards IP protocols.

## Declaration

I certify that this dissertation does not incorporate without acknowledgement any material previously submitted for a degree in any University to the best of my knowledge and believe that it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for inter-library loans, and for the title and summary to be made available to outside organizations.

***UOM Verified Signature***

Signature of the Candidate

Date: 17.02.2011

To the best of my knowledge, the above particulars are correct.

***UOM Verified Signature***



Supervisor

(Eng. Kithsiri Samarasinghe)

A. T. L. K. Samarasinghe
Head
Department of Electronic &
Telecommunication Engineering
University of Moratuwa, Sri Lanka

# ACKNOWLEDGMENTS

I would like to make this an opportunity for showing my sincere gratitude towards the people and institute who helped me through out this project.

First of all, I wish to express my sincere thanks to my supervisor Eng. Kithsiri Samarasinghe of the Department of Electronic and Telecommunication Engineering, University of Moratuwa, Sri Lanka for his kind and valuable guidance despite his busy schedule. I also like to thank Dr. Ajith Pasqual who helped us as the co-ordinator of the M.Sc Project.

I also wish to extend my gratitude to all of my friends, for their support and encouragement extended towards the successful completion of this research project. Last but not least, I would like to thank my wife Sumedha for her continuous encouragement and support

I dedicate this thesis to my dear parents who dedicate their life for their children

# ACKNOWLEDGMENTS

I would like to make this an opportunity for showing my sincere gratitude towards the people and institute who helped me through out this project.

First of all, I wish to express my sincere thanks to my supervisor Eng. Kithsiri Samarasinghe of the Department of Electronic and Telecommunication Engineering, University of Moratuwa, Sri Lanka for his kind and valuable guidance despite his busy schedule. I also like to thank Dr. Ajith Pasqual who helped us as the co-ordinator of the M.Sc Project.

I also wish to extend my gratitude to all of my friends, for their support and encouragement extended towards the successful completion of this research project. Last but not least, I would like to thank my wife Sumedha for her continuous encouragement and support

I dedicate this thesis to my dear parents who dedicate their life for their children

# Table of Contents

# Table of Figures

# List of Tables