CHARACTERIZATION OF INTERNET TRAFFIC IN UUM WIRELESS NETWORKS

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UNIVERSITI UTARA MALAYSIA

2012

CHARACTERIZATION OF INTERNET TRAFFIC IN UUM WIRELESS NETWORKS

A project submitted to Dean of Research and Postgraduate Studies Office in partial

Fulfillment of the requirement for the degree

Master of Science (Information Technology)

Universiti Utara Malaysia

By

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ABSTRACT

The development in communication technology and the propagation of mobile devices, lightweight, with built-in, high-speed radio access in wireless are making wireless access to the Internet the popular situation rather than a wire line. Whereas, the growth of the wireless network with additional mobile devices in the UUM and increasing number of users led to slow wireless connection. Therefore, understanding the behavior of traffic analysis helps us to develop, manage WLAN technology, and deploy. It help us to apply our workload analysis results to issues in wireless network deployment, such as capacity planning, and potential network optimizations, such as algorithms for load balancing across multiple Access Points (APs) in a wireless network. The trace composes of two parts: firstly, one that connects to the core switch in computer center which is connected with the distribution switches that link the Access Point (APs) with the wireless network at campus, and secondly, another one for the measurement of bulk data transfers and interactive data exchange between two nodes in UUM library, which had been initiated at that time. This thesis investigates the performance network and users' behavior in UUM wireless network.

ACKNOWLEDGEMENTS

"In the name of Allah the Most Beneficent and Most Merciful"

All praises and thanks to the Almighty, Allah (SWT), who helps me to finish this project, Allah gives me the opportunity, strength and the ability to complete my study for Master degree after a long time of continuous work.

No volume of words is enough to express my gratitude towards my guides, Dr. Adib M. Monzer Habbal and Dr. Masuddi Bin Mahmuddin, who have been very concerned and have aided for all the material essential for the preparation of this thesis report. They have helped me explore this vast topic in an organized manner and provided me with all the ideas on how to work towards a research-oriented venture.

I am thankful to Mr. Adi Affandi Ahmed, Mr. Mohd Samsu and Dr. Omer Abdullah, for the motivation and inspiration that triggered me for this thesis work.

I am also thankful to Prof. Dr. Zulkhairi Md Dahalim, Mr. Khairil Adli Bin Abdul Rahman, Madam Farah, and all staff in Computer Center of UUM, for to support me and help me in data capture. Finally, it would not been possible for me to complete the study and this project without the help by Allah and then supporting and encourage from my family and friends. First and foremost, my gratitude goes to my father and mother for motivation me and for their prayers for me, may Allah bless them. To my brothers (Salam, Hussam, and Bassam), nephew humam and sisters for supporting me and had a great influence to finish my master study. To My friends PhD (Student) Munadil K. Faaeq , Ahmed fareed, Ibrahim and Saifuddin Hatim thanks for standing beside me and giving support in all period of study. Thanks for all persons who helped or contributed to finish my Master program.

Wisam

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LIST OF ABBREVIATION

AAA	Authentication, Authorization and Accounting Administrations.
AM	Amplitude Modulation.
ASK	Amplitude Shift Keying.
ASN	Access Service Network.
ASP	Application Service Provider.
AWGN	Additive White Gaussian Noise.
BER	Bit Error Rate.
BPSK	Binary Phase Shift Keying.
BS	Base Station.
DA	Destination Address
CC	Convolution Code.
CEPT	European Conference of Postal and Telecommunications.
CMIP	Common Management Information Protocol
CSN	Connectivity Service Network.
DAA	Detect and Avoid.
DKG	Dewan Kuliah Gugusan.
DL	Downlink.
DNS	Domain Name System.
DoS	Denial of Service.
DPSK	Differential Phase Shift Keying.
DPP	Dewan Penginapan Pelajar.
DPP YAB	Dewan Penginapan Pelajar Yagasan Al-Buqhari.
DSL	Digital Subscriber Line.
DSSS	Direct sequence Spread Spectrum.
DUR	Downlink to Uplink Ratio.
ECC	Electronic Communications Committee.
FCC	Federal Communications Commission.
FDM	Frequency Division Multiplexing.
FDMA	Frequency Division Multiple Access.
EDC	Executive Development Center.
FEC	Forward Error Correction.

FFT Fast Fourier Transform.

FHSS Frequency-hopping spread spectrum.

FTAM File Transfer and Access Management Protocol

FTM File Transfer Protocol

FTM Fakulti Teknologi Maklumat

FM Frequency Modulation.

FPAU Fakulti Pengajian Antarabangsa dan Undang-Undang.

FSK Frequency Shift Keying.

GW Gateway.

HAP High Altitude Platform.

HTTP Hypertext Transfer Protocol

IEEE Institute of Electrical and Electronic Engineers.

IFFT Inverse Fast Fourier Transform.

IMS IP Multimedia Subsystem.

IP Internet Protocol.

ISI Inter Symbol Interference.

ISP Internet service provider.

ITU International Telecommunication Union.

LAN Local Area Network.

LOS Line of Sight.

LTE Long Term Evaluation.

MAC Media Access Control.

MB-OFDM Multiband OFDM.

Mbps Mega bit per second.

MBWA Mobile Broadband Wireless Access.

MFSK Multiple Frequency Shift Keying.

MGF Moment Generating Function.

MPSK Multilevel Phase Shift Keying.

MS Mobile Station.

MTRNG Mersenne Twister Random Number Generator.

NLOS None-Line of Sight.

NS Network Simulator.

NSP Network Service Provider.

NWG Network Group.

OECD Organization for Economic Co-operation and Development.

OFDM Orthogonal Frequency Division Multiplexing.

OFDMA Orthogonal Frequency Division Multiple Access.

PAPR Peak-to-Average Power Ratio.

PE Probability of Error.

PHY Physical layer.

PK Pusat Komputer.

PSD Power Spectral Density.

PSK Phase Shift Keying.

PSTN Public Switched Telephone Network.

PUSC Partially Used Sub-Carrier.

QAM Quadrature Amplitude Modulation.

QoS Quality of Service.

QPSK Quadrature Phase Shift Keying

RA Receiver Address

RNG Random Number Generator.

RS Reed-Solomon.

RSNA Robust Security Network Association

SMTP Simple Mail Transfer Protocol

SNR Signal to Noise Ratio.

SS Subscriber station.

STA Station

TDMA Time Division Multiple Access.

TA Transmitter Address.

TCP Transmission Control Protocol

UDP User Datagram Protocol

UP Uplink.

Wi-Fi Wireless Fidelity.

WiMAX Worldwide Interoperability for Microwave Access.

WLAN Wireless Local Area Network.

WMAN Wireless Metropolitan Area Network.

CHAPTER ONE

INTRODUCTION

In this chapter, wireless characterization is discussed in order to improve communication performance. This chapter highlights the concepts of Wi-Fi in term of standards and protocols. The attempt is to improve wireless services by study the characterization of UUM wireless network. The research problem, objectives and research questions together with significance of the study are included in this chapter.

1.1 BACKGROUND

The development in communication technology and the widespread use of Mobile devices that are lightweight, compact, high speed radio access in wireless technology are increasingly popularizing wireless access to the Internet. WLAN runs on IEEE 802.11 technology and are catering to connectivity in various places such as, universities, companies, corporation, and even in public places such as shopping malls, airports, lounges, and libraries, etc.; in other words, where personnel spend a considerable amount of time outside of work and home. In Malaysia, most of connections to the networks depend on wireless network and most of these rely on free frequency 2.4 and 5GHZ. The environment in this is study on the University Utara Malaysia (UUM). A few areas of information technology are developing so rapidly as that of the current Wireless - LAN (WLAN). Always, new Wireless – Standards are adopted by the demands for ever increasing data throughout and greater range [1, 2]**.** In 2005, there are ten completely new wireless technologie**s** [3]. The needs for security requirements, so far doesn't indicate the signs of existence, and it is well known that wireless networking's update occurs most of the time and this includes the telecommunications field which in turn has many classifications or

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