

UNIVERSITI TEKNOLOGI MARA

**THE REVOLUTION OF SOFTWARE DEFINED
NETWORKING IN TERMS OF CAPABILITY OF
NETWORK CENTRALIZATION COMPARED TO
CONVENTIONAL APPROACH**

NORDIANA BINTI GHANI

Dissertation submitted in partial fulfillment of the requirements
for the degree of
Master of Science

Faculty of Telecommunication & Information Engineering

January 2016

ABSTRACT

This paper presents a development of simulator based on Software Defined Networking. The characteristic of Controller and the way it works is studied to see capability of SDN which promises to enable network technology innovation and adaptability while reducing complexity and administrative overhead. Wireshark is used as monitoring tools to oversee the packets traverse between Controller and Routing devices. Network Topology is created and dump command is executed to display the information of the connected network nodes. The pingall command is then executed to view the interconnection between Controller and Routing Devices. Thus, the function of SDN controller is now derived. As a result, managing of networks can be simplified using SDN Controller.

Keywords—Software Defined Networking; SDN Controller; Control Plane; Data Plane

ACKNOWLEDGMENT

In the name of Allah the Most Merciful and the Most Gracious, Praise for His guidance and blessing for me. I would like to express my sincere gratitude to my supervisor, Assoc. Prof. Dr. Mat Ikram Bin Yusof for his guidance and assistance. His knowledge and support throughout this project has made this thesis completed and successful.

I wish to express my love and appreciation to my husband; Mohd Najib Abd Ghani, my daughter Nur Hasya Irdina for their understanding and endless love through the duration of my studies and to all my friends who have given me the motivation and moral support. Last but not least to my beloved parents: En Ghani Mat and Pn Wan Norizan Wan Hussein for the valuable support, guidance, encouragement, inspirations and for always being there for me and for their prayers to make this dream come true.

Above all, Alhamdulillah, thank to Allah.

TABLE OF CONTENTS

	Page
AUTHOR'S DECLARATION	I
ABSTRACT	II
ACKNOWLEDGEMENT	III
TABLE OF CONTENTS	IV
LIST OF FIGURES	V
LIST OF ABBREVIATION	VI
CHAPTER ONE: INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Objectives	2
1.4 Scope of Study	2
1.5 Significance of Study	3
1.6 Thesis Organization	3

CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

SDN adoption is increasing as its benefits become more important to organizations implementing approaches that make networking more complex, such as cloud computing, virtualization, and huge datacenters. Via abstraction of the network, SDNs increase the automation and implementation speed of many processes and procedures including physical- and virtual network management and reconfiguration, and the introduction of new services that often require a lot of manual work today [1]. Computer networks are typically built from a large number of network devices such as routers, switches that manipulate traffic for purposes other than packet forwarding [2]. In conjunction to that, many complex protocols implemented on them. Network operators are responsible for configuring policies to respond to a wide range of network events and applications. They have to manually transform these high level-policies into low-level configuration commands while adapting to changing network conditions. This complex task need to be accomplish with access to very limited tools. As a result, network management and performance tuning is quite challenging and thus error-prone. Software-Defined Networking (SDN) plays an important role in paving the way for effectively virtualizing and managing the network resources in an on demand manner [3].