

**Universiti Teknologi MARA**

**EARLY DETECTION FOR SERVER  
AVAILABILITY IN UNIVERSITY MALAYA  
DATA CENTER**

**Mohd Azizi Bin Osman**

**Thesis submitted in fulfilment of the requirements for  
Bachelor of Science (Hons)  
(Data Communication and Networking)  
Faculty of Computer and Mathematical Sciences**

**January 2016**

## **ACKNOWLEDGEMENTS**

Firstly, I give thanks to Almighty ALLAH, the merciful for guiding me to this stage of my life.

I am indebted to a large number of people in completing this project, all of whom have contributed in one way to the other successful of completion of my Bachelor Degree program in Universiti Teknologi Mara, Malaysia (UiTM). First I would like to thank my supervisor Puan Siti Arpah binti Ahmad for her guidance, valuable suggestion and promptness in reviewing my project.

I would like to express my highly appreciation to my family, parents and especially my beloved wife for her incredible support and patience.

Last but not least, I would like to give my gratitude to all my friends.

May ALLAH give continuous rewards to all of you. Amin

## **ABSTRACT**

Early detection for server availability in UM Data Center is developed specifically for the Data Center department in University of Malaya. This system is generally to facilitate the process of the administrators to manage servers and make it more efficient and effective. The current system has been used manually to monitor the servers and many changes need to fulfill current requirement. The objective of the system is to design the detection algorithm for server availability, to develop the detection algorithm for server availability and to test the detection algorithm form server availability. This scripts will monitor some of the servers performance and able to send notification to the administrators via email and SMS prior to the occurrence of errors in servers of the servers.

|   |            |
|---|------------|
| <b>SUPERVISOR’S APPROVAL</b>                                  | <b>ii</b>  |
| <b>DECLARATION</b>  | <b>iii</b> |
| <b>ACKNOWLEDGEMENTS</b>                                       | <b>iv</b>  |
| <b>ABSTRACT</b>   | <b>v</b>   |
| <b>LIST OF FIGURES</b>  | <b>iii</b> |
| <b>LIST OF TABLES</b>   | <b>iv</b>  |
| <b>1 INTRODUCTION</b>   | <b>1</b>   |
| 1.1 <i>Background of Study</i>                                | 1          |
| 1.2 <i>Problem Statement</i>                                  | 2          |
| 1.3 <i>Project Aims and Objective</i>                         | 3          |
| 1.4 <i>Project Scope</i>                                      | 4          |
| 1.5 <i>Significance of the Project</i>                        | 5          |
| Summary   | 5          |
| <b>LITERATURE REVIEW</b>                                      | <b>6</b>   |
| 2.1 <i>Introduction</i>                                       | 6          |
| 2.2 <i>Open Source Server Monitoring System</i>               | 7          |
| 2.2.1 <i>Munin Server Monitoring System</i>                   | 8          |
| 2.2.2 <i>Cacti Server Monitoring System</i>                   | 10         |
| 2.2.3 <i>Monit Server Monitoring System</i>                   | 12         |
| 2.2.4 <i>Nagios Core 3.2.0</i>                                | 13         |
| 2.3 <i>Comparison of Open Source Server Monitoring System</i> | 14         |
| <b>METHODOLOGY</b>  | <b>15</b>  |
| 3.1 <i>Methodology Framework</i>                              | 15         |
| 3.2 <i>Design Phase</i>                                       | 17         |
| 3.3 <i>System Architecture</i>                                | 18         |
| 3.4 <i>Setup</i>  | 19         |
| 3.5 <i>Implementation</i>                                     | 22         |
| 3.5.1 <i>Installing CentOS 6.4 on a Server</i>                | 23         |
| 3.5.2 <i>Unexpected Issues</i>                                | 24         |
| 3.6 <i>Testing and Submission</i>                             | 24         |
| 3.6.1 <i>Testing script for detect Unreachable Host</i>       | 25         |
| 3.6.2 <i>Testing Script For Detect Storage Space</i>          | 25         |

# CHAPTER 1

## 1 INTRODUCTION

This chapter provides the background and rationale for the study. It also gives details of the significant early detection for servers availability in UM data center, the issues and problems that led to this research.

### 1.1 Background of Study

University of Malaya (*UM*) is the prime university; it is the intention of the university to surpass the services provided to the community in general and consumers in particular university. Among them is the management of Information Technology Centre. In this case, Data Center department can be seen to play an important role in the realization of the university's efforts to consistently meet the needs of customers and employees through the high availability of the server access.

Data Center Management Division is responsible for ensuring that data and information in digital form, owned by the University of Malaya stored in a sound infrastructure and is always within easy reach safely by entities that have been identified through controlled access. Along with this, the Data Center Division must have a task of providing high availability of server access to ensure that there is no downtime for server availability. This is to improve the high availability access to all the systems in the university Malaya