
اونيۏرسيتي مليسيا ڤهڠ السلطان عبد الله

UMPSA

UNIVERSITI MALAYSIA PAHANG
AL-SULTAN ABDULLAH

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| COURSE | DISTRIBUTED AND PARALLEL COMPUTING |
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# 1.0 INTRODUCTION

Mengaji Enterprise, a forward-thinking organization, understands the critical importance of strong and efficient network infrastructure to support its day-to-day activities. In this case study, we explore the design of two key departments within the business office network, focused on the merging of different computer models to meet the varied needs of each department. The goal is to compare and contrast the performance of linear, parallel, and distributed computer approaches, while also considering the practical difficulties that appear when working with geographically spread systems.

The first part of the case study shows a sequential computing plan for a single department, where processes are performed one after another, giving a standard for performance comparison. In comparison, the second department uses a parallel computer design, where jobs are split and handled simultaneously to improve productivity. Finally, we explore a distributed computing setup involving three machines placed in different countries—Malaysia and Singapore—demonstrating the difficulties and performance issues of running distributed systems across international lines.

Key measures such as delay, CPU time, and traffic are used to examine the success of each network design. The case study also critically discusses the output from a network model, analysing the real-world effects of the different methods and how they fit with the enterprise's practical goals. We will measure and compare the CPU time gaps between the linear and distributed network designs, giving useful insights into their efficiency in a multi-department business setting.

# 2.0 NETWORK TOPOLOGY DESIGN

## 2.1 DISTRIBUTED COMPUTING DESIGN

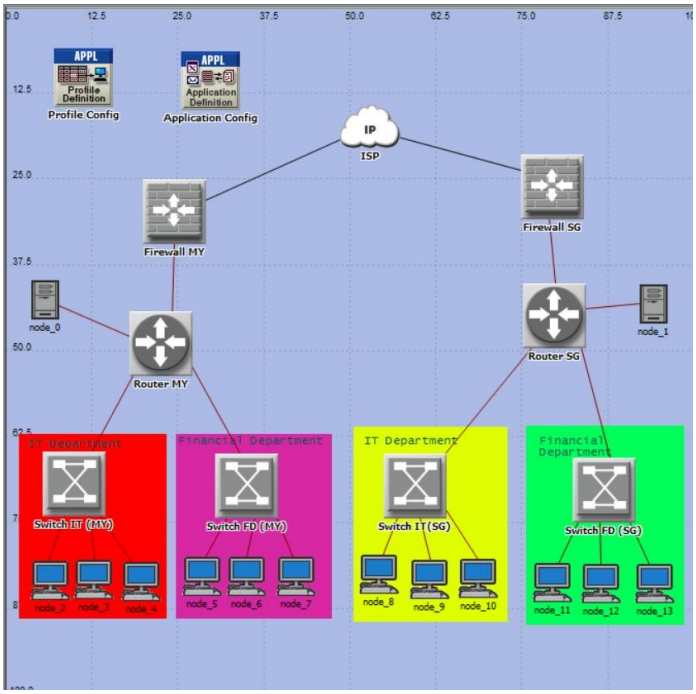



Figure 1.1 Distributed Computing Design

## 2.2 PARALLEL COMPUTING DESIGN

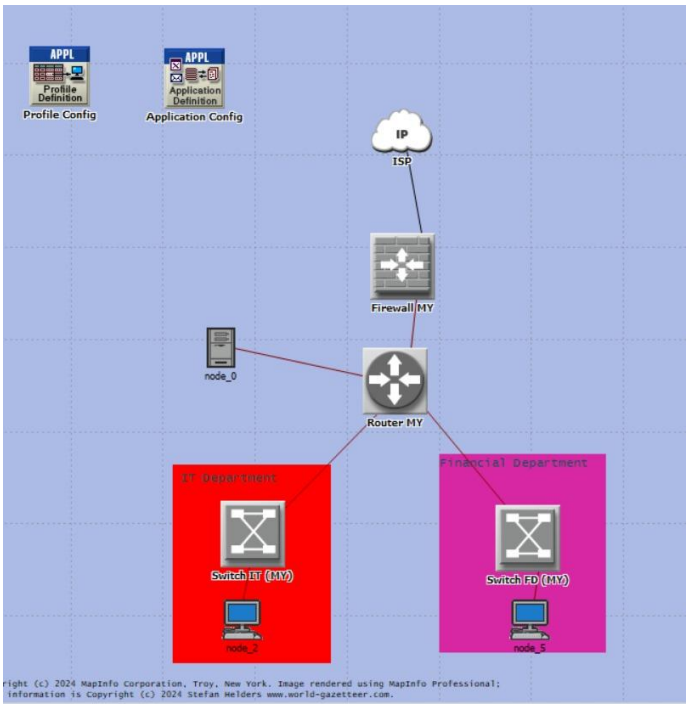
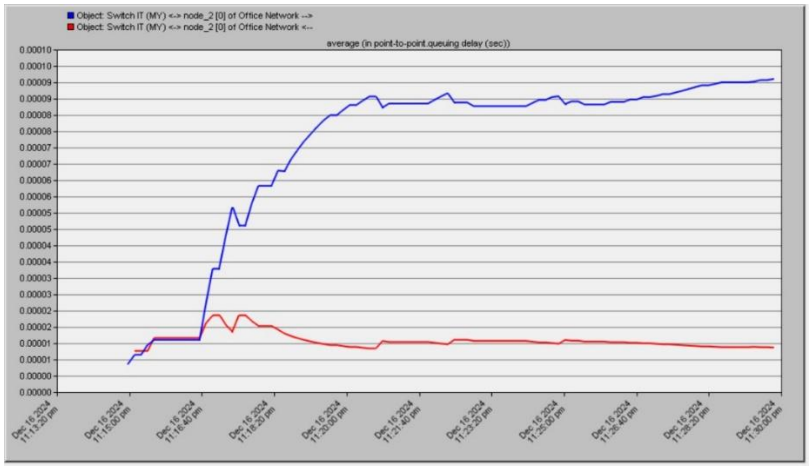



Figure 1.2 Parallel Computing Design

# 3.0 COMPARISON ANALYSIS

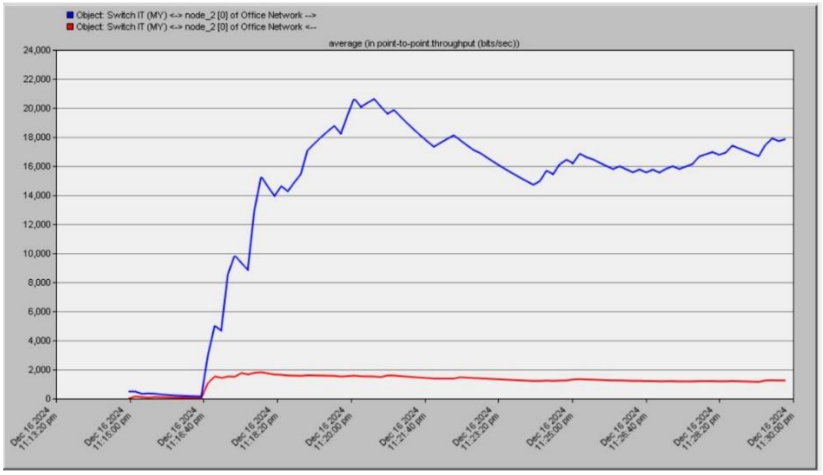
## 3.1 DISTRIBUTED COMPUTING DESIGN

### 3.1.1 DELAY TIME



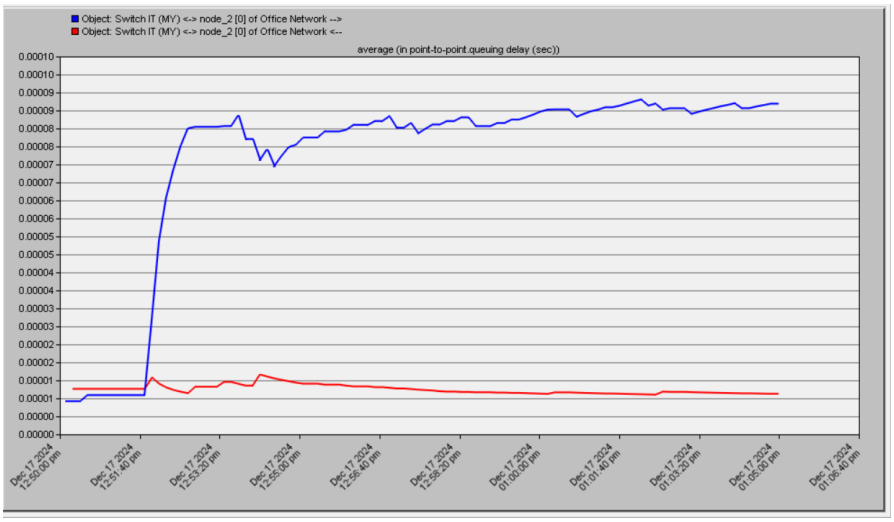

### 3.1.2 CPU TIME


### 3.1.3 THROUGHPUT

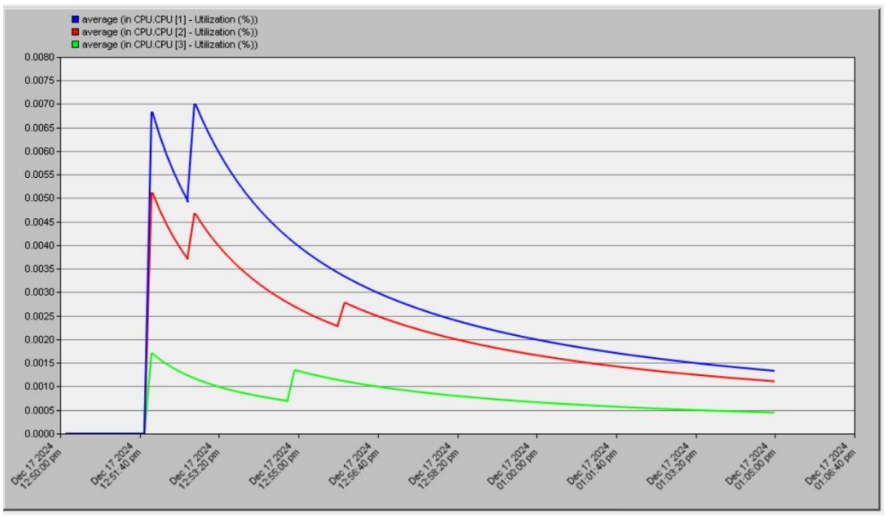


## 3.2 PARALLEL COMPUTING DESIGN

### 3.2.1 DELAY TIME




### 3.2.2 CPU TIME




### 3.2.3 THROUGHPUT