

CHAPTER I

INTRODUCTION



1.1 Background

The number of people using the Internet is topped 100 million, in 1998 provided by the Texas-based monitoring organization Matrix Information and Directory Services (MIDS). Figure 1.1 indicates that the Internet is almost double size in every years, up from 57 million users in January 1997

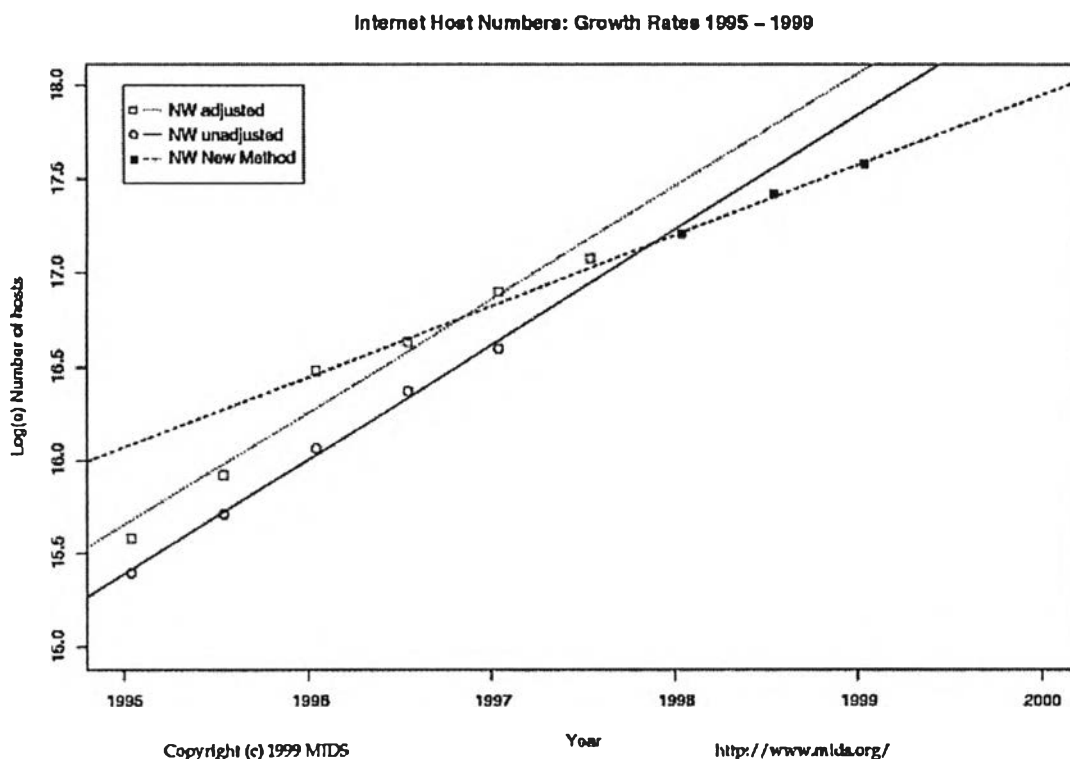


Figure 1.1 State of Internet Host numbers with Growth rate.

Since the World Wide Web (WWW) is popular extremely. Many reports indicate that its growth is increasing continuously, as a result the network load and response time is dramatically increased. Presently there are many formats of WWW document transferred through Internet e.g., texts, images, video, audio, and etc. and the diversity of user request require WWW that was cached in order to reduce response time.

The increasing access response times and long wait times are attributed to an Internet bandwidth that has not increased at the same rate as the growth in demand. Bandwidth and response time problems trend to more users use the Internet. Thus, saving bandwidth and improving response time is a major of Internet research. A usage of cache is one solution to increase the performance in response time of Internet applications. A copy of each document requested from the server on Internet, is duplicated and stored at the Proxy server. This approach way can reduce the transmission distance. The WWW cache contains documents of the various sizes and formats of the document that is stored

The objective of this study is to experiment for the alternative network models as Direct Access, Single Level, and Hierarchy Level model and to propose a relevant. A cache size, based on some theory and the information sciences. The study also gathers a current cache size performance and actual empirical data to determine the efficient cache size to fit the Web growth.

1.2 Current Situation

The Chulalongkorn University campus network is selected as a case study. Currently, the request of World Wide Web application in Chulalongkorn University that is monitored and recorded at the gateway server, is about 25 times per second, and also 1 Mbyte per second. The traffic of World Wide Web application is increasing continuously as the traffic performance shown in the Table 1.1

Table 1.1 Packets status of Chulalongkorn university;
http://161.200.255.161:8001

Packets	Average	Min.	Max.
Requests /Second	-	-	25
Bytes/Second	-	-	1,007,850
Second/Min	12.510	0.016	6,928.133
Object Size (Byte)	10,215.5	21	30,121,379

The Office of Information Technology is an organization of Chulalongkorn University which provides services and advisory of electronic information technologies and systems for Chulalongkorn University people and organizations. Because of the limitation of network resource, it is difficult to provide efficiently the service performance of HTTP protocol, used by World Wide Web application. As a result, it effects to the service performance of HTTP protocol and trends to cause the problems that is stated in the statement of problems

1.3 Statement of the Problems

According to the most popular usage of Internet as Hypertext Transfer Protocol used by World Wide Web in Chulalongkorn university. An office of Information Technology—an organization of Chulalongkorn university—which is responsible to service and advise of electronic information technology and systems for Chulalongkorn university, has some information of HTTP packets monitoring, shown in a Figure 1.2;

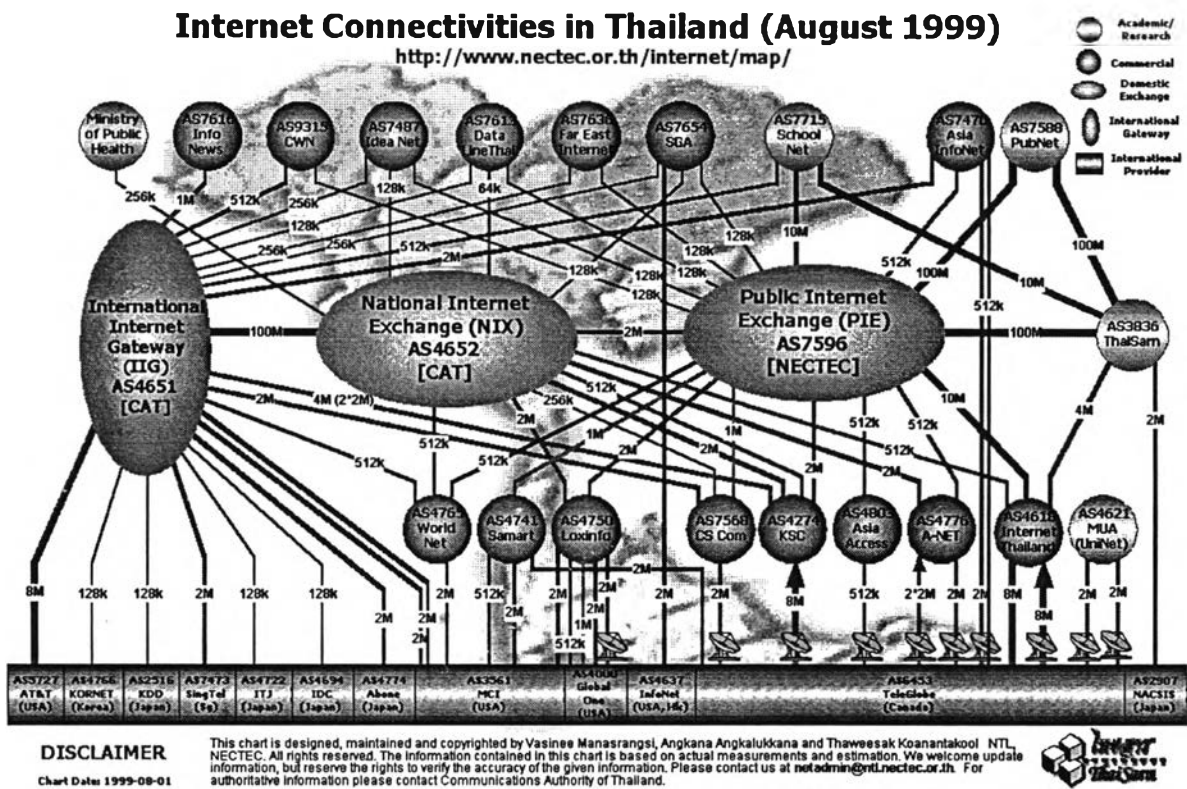


Figure 1.2 Internet Connectivities in Thailand (August 1999)

The computer server which consists of HewlettPackard and Digital servers, carries 16 Gigabytes and 2 Gigabytes for hypertext information and distributing about 11,000 documents to the Internet community in each day.

Because the speed of Internet Linkage in Chulalongkorn University going through Inter-University Network of Ministry of University Affairs, is limited up to 1 Mbyte in maximum and also shared with other universities, shown in the Figure 1.2, it would be affected the service performance of HTTP usage.

The World Wide Web in Chulalongkorn may experience some problems such as transferring data interrupted, transferring data error and disconnected during response-reply from servers and long waiting response time, when end users in Chulalongkorn University are using Web.

1.4 Objective of Thesis

1. To study the service performance factors affecting HTTP protocol used by World Wide Web
2. To design and experiment alternative network models for increasing service performance for HTTP

1.5 Scopes of Thesis

1. To consider only relevant factors of service performance of HTTP protocol used by World Wide Web
2. To investigate and measure the HTTP packets hourly
3. To design experimental models and conduct simulation for departmental Web usage

1.6 Procedure of Thesis

1. Conduct related literature survey
2. Collect data and investigate packets of HTTP
3. Define alternative network models to service performance of HTTP
4. Design experimental alternative models for increasing service performance of HTTP
5. Determine the experimental models
6. Evaluate the results of before-and-after comparison
7. Write the report
8. Suggestion

1.7 Expected Benefit

1. Increase service performance for HTTP protocol used by World Wide Web
2. Reduce the turnaround time of World Wide Web usage
3. Advise a guideline for a campus network design to other universities
4. To be a prototype model for service implementation for HTTP protocol
5. To perceive the HTTP protocol demands in the future with appropriate models

1.8 The Organization of Thesis

CHAPTER I: INTRODUCTION

This chapter describes the Internet utilization current situation and the statement of the problems. The objective is to study the factors and experiment the alternative network models, to increase performance in response time of HTTP. The scope is to study a case of campus network in Chulalongkorn University.

CHAPTER II: LITERATURE REVIEW & PROXY SERVER

This chapter describes about the literature survey in HTTP and TCP packet, including the concept of communication between client and server, the response time structure. It is stated about the deployment of Proxy server with several models that is able to increase the service performance of Internet application within the campus network in various environments.

CHAPTER III: STATISTICAL AND ECONOMICAL THEORY

This chapter describes the theory of statistic and uses non-parameter test and analyze the data experiments, including to set the hypothesis.

CHAPTER IV: THE EXPERIMENTS FOR THREE NETWORK MODELS

This chapter experiments the alternative models with three models in order to increase the performance of HTTP that are Direct Access, Single Level, and Hierarchy Level model. Three experimental models are explained.

CHAPTER V: THE EXPERIMENT OF CACHE SIZE

This chapter explains about the experiment of suitable cache size for Web usage in the level of department that are simulated and calculated by the actual using Internet. The experiment applies regression analysis to find the suitable cache size with the highest hit rate of performance of HTTP, and takes less response time.

CHAPTER VI: CONCLUSION AND RECOMMENDATION

This chapter concludes and recommends about the best model to increase the performance of HTTP effectively and perform good response time of a usage of World Wide Web. Recommendation is stated for any to increase their networking.

REFERENCES**APPENDIX A: Cache Information**