

ABSTRACT

A Design for the Practical Implementation of a Computer Facility and Computer Network for the Department of Mathematics & Computer Science

Ikram Mohammed

This work is dedicated to all persons who have influenced and assisted me in a positive manner throughout my life. Special mention must be made of my parents and my wife who have sacrificed tremendously in their attempts to help me. In order to facilitate the improved development of computer science students and assistance of my professors and colleagues at the University. My foremost to alleviate some of the difficulties experienced by staff and student members of the Department, there is a need to provide a more adequate computing facility comprising suitable computer resources on the network. There should also exist a means of providing an easy upgrade path for the resources and network involved. In this research project, a design for such a local area network (LAN) and the distribution of appropriate resources on the network is proposed. The network design is based on the TCP/IP protocol running over switched 10baseT Ethernet. Services and resource allocation is considered in terms of the requirements for a predominant Windows NT client-server environment, within which exists UNIX based servers. Such an infrastructure will provide an open upgrade path because the design and implementation is based on open standards for both hardware and software.

Table of Contents

List of Tables and Figures	v
The Existing Situation	1
Local Area Network (LAN) Design	5
Overview	5
Possible Technologies	6
A Possible Design	12
This work is dedicated to all persons who have influenced and assisted me in a positive manner throughout my life. Special mention must be made of my parents and my wife who have sacrificed tremendously in their attempts to help me, especially throughout my effort to complete this report. I also acknowledge the assistance of my professors and colleagues at the University. My foremost gratitude is to my Creator, the Most Beneficent, Most Merciful.	
Immediate Software Requirements	29
Authentication	31
<i>"... and my success (in my task) can only come from Allah: in Him I trust and unto Him I look." (Qur'an 11:88).</i>	
File and Application Services	33
Print Services	41
Intranet and Messaging Services	43
Internet Services	50
Security	53
Physical Security	58
Network and System Security Policy	64
General guidelines for enabling better network and system security	66
UNIX specific security issues	69
Windows NT Security Model	68
Windows NT security specific issues	62
Administrative Requirements	67
The Issue of Network Addresses	67
Name Resolution	71
Node Naming Conventions	73
Data Backups	74
Network Management and Monitoring	77