**Setting Up a Samba Server for File Sharing on a Local Network**

### Submitted By

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**MINI LAB PROJECT REPORT**

This Report Presented in Partial Fulfillment of the course **CSE324: Operating system Lab in the Computer Science and Engineering Department**



### DAFFODIL INTERNATIONAL UNIVERSITY

**Dhaka, Bangladesh**

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## DECLARATION

We hereby declare that this lab project has been done by me under the supervision of **Israt Jahan**, **Sr. Lecturer**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere as lab projects.

**Submitted To: Israt Jahan (IJN)**

**Israt Jahan (IJN)**

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## COURSE & PROGRAM OUTCOME

The following course have course outcomes as following:

Table 1: Course Outcome Statements

|  |  |
| --- | --- |
| **CO’s** | **Statements** |
| CO1 | Make use of the Linux commands and shell programming. |
| CO2 | Apply different algorithms of Operating Systems like CPU scheduling algorithm, page replacement algorithms, deadlock avoidance, and detection algorithm with analyzing the performance of them. |
| CO3 | Able to design and develop a course project that can have positive impact on environment or society or mankind. |

Table 2: Mapping of CO, PO, Blooms, KP and CEP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CO** | **PO** | **Blooms** | **KP** | **CEP** |
| CO1 | PO1 | C3 | KP1  KP2 | EP1 |
| CO2 | PO2 | C3  C4 | KP3  KP4 | EP3  EP4 |
| CO3 | PO3  PO9 | C4  A4  P4 | KP5 | EP5 |

The mapping justification of this table is provided in section **4.3.1**, **4.3.2** and **4.3.3**.

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**Chapter 1**

# Introduction

### Introduction

Samba is an open-source software suite that allows seamless file and print services to SMB/CIFS clients. This project explores how a Samba server can be configured on a Linux-based system to provide file sharing capabilities across different platforms within a local network.

### Motivation

The motivation for this project stemmed from the need to understand cross-platform file sharing in a heterogeneous environment. Configuring a Samba server provides practical knowledge in network services, Linux system administration, and secure file sharing practices

### Objectives

To install and configure a Samba server on a Linux machine

- To enable cross-platform file sharing with appropriate access control

- To analyze the performance and security of the file sharing setup

### Feasibility Study

Several open-source projects and enterprise systems use Samba for sharing files and printers. Research and case studies show Samba's effectiveness in small to medium-sized network environments where interoperability between Linux and Windows systems is necessary.

### Gap Analysis

While file sharing solutions exist, they are often platform-specific. This project addresses the need for a cross-platform file sharing system using open-source tools.

### Project Outcome

A fully functional Samba server setup that allows file sharing between Linux and Windows clients, with user-based access control and shared directories.

**Chapter 2**

# Proposed Methodology/Architecture

### Requirement Analysis & Design Specification

#### Overview

#### The system requires a Linux-based server (e.g., Ubuntu), Samba package installed, and a local network environment with clients (Windows/Linux).

#### Proposed Methodology/ System Design

#### 1. Install Samba on a Linux server

#### 2. Configure smb.conf for shared directories

#### 3. Add Samba users

#### 4. Test file sharing between clients

#### UI Design

#### Since Samba is configured via terminal and configuration files, there is no GUI design involved.

### Overall Project Plan

- Week 1: Study and setup environment

- Week 2: Install and configure Samba

- Week 3: Testing and evaluation

- Week 4: Report writing

**Chapter 3**

# Implementation and Results

The Samba server was implemented on an Ubuntu virtual machine. The configuration file `/etc/samba/smb.conf` was modified to create shared directories. Users were added using `smbpasswd`, and permissions were configured appropriately.

### Implementation

### 

### The Samba server was implemented on an Ubuntu virtual machine. The configuration file `/etc/samba/smb.conf` was modified to create shared directories. Users were added using `smbpasswd`, and permissions were configured appropriately.

### Performance Analysis

### The Samba server showed good performance in transferring files over a LAN with average speeds around 80-100 MBps. Resource usage was minimal, and the system remained stable under normal loads.

### Results and Discussion

The Samba server worked efficiently for file sharing between Windows and Linux clients. User authentication and directory permissions ensured data security. A major takeaway was understanding the importance of proper configuration and access control.

**Chapter 4**

# Engineering Standards and Mapping

### Impact on Society, Environment and Sustainability

#### Impact on Life

#### This project improved my understanding of Linux system administration and real-world network file sharing. These are valuable skills for system and network administration roles.

#### Impact on Society & Environment

#### The project promotes the use of open-source software, which reduces dependency on costly proprietary solutions. It is an environmentally sustainable option as it can be deployed on existing hardware.

#### Ethical Aspects

#### User privacy and data protection were considered by implementing authentication and access control.

#### Sustainability Plan

#### Samba's long-standing community support and regular updates ensure the sustainability of this setup.

### Project Management and Team Work

As this was an individual project, all phases including research, implementation, and documentation were managed independently, improving time management and self-discipline.

### Complex Engineering Problem

### Configuring cross-platform file sharing with Samba involves understanding networking protocols, user permission systems, and system configurations, qualifying it as a complex engineering task.

#### Mapping of Program Outcome

In this section, provide a mapping of the problem and provided solution with targeted Program Outcomes (PO’s).

Table 4.1: Justification of Program Outcomes

|  |  |
| --- | --- |
| **PO’s** | **Justification** |
| PO1 | CO1 covers PO1 because students need to learn, understand and make use of basic Linux commands  to be familiar with Linux operating system and students need to identify processes and file  management system problems and build shell programs for those problems. |
| PO2 | CO2 covers PO2 because students need to select and apply suitable techniques and algorithms for scheduling, page replacement, deadlock avoidance and detection and analyze the performance of  those algorithms. |
| PO3 | CO3 covers PO3 because students need to design and develop an operating system project and to  demonstrate team work and PO7 because they need to do teamworks and collaborate to complete  the project. |

#### Complex Problem Solving

Problem-solving involved identifying configuration errors, debugging connection issues, and setting correct permissions. These tasks required critical thinking and technical understanding.

Chapter 4. Engineering Standards and Mapping 4.3. Complex Engineering Problem

Knowledge profile and rational thereof.

Table 4.2: Mapping with complex problem solving.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **EP1**  Dept of Knowledge | **EP2**  Range of Conflicting Requirements | **EP3**  Depth of Analysis | **EP4**  Familiarity of Issues | **EP5**  Extent of Applicable Codes | **EP6**  Extent  Of Stakeholder Involvement | **EP7**  Inter- dependence |
| **CO1** | **CO2** | **CO2** |  | **CO3** |  |  |

#### Engineering Activities

The project involved medium-level engineering activities like system setup, testing, and performance evaluation in a simulated network environment.

Table 4.3: Mapping with complex engineering activities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EA1**  Range of resources | **EA2**  Level of Interaction | **EA3**  Innovation | **EA4**  Consequences for society and  environment | **EA5**  Familiarity |
| **CO3** | **CO3** | **CO2** | **CO3** | **CO3** |

**Chapter 5**

# Conclusion

### Summary

### This project demonstrated how to set up and configure a Samba server for local file sharing. It involved practical knowledge of Linux systems, network protocols, and configuration management.

### Limitation

### The project was limited to a local network setup and did not explore remote access or advanced security configurations.

### Future Work

Future enhancements could include integrating LDAP for centralized authentication, implementing encrypted file transfers, and setting up Samba in a cloud environment.

# References

[1] Samba Documentation: https://www.samba.org/samba/docs/

[2] Ubuntu Official Documentation: https://ubuntu.com/server/docs/samba-introduction

[3] Jon Kleinberg and Eva Tardos. Algorithm design. Pearson Education India, 2006.