ECONOMIC DESIGN OF EFFECTIVE DATA TRANSFER AND STORAGE SYSTEM

Major project report submitted
in partial fulfillment of the requirement for award of the degree of

Bachelor of Technology
in
Computer Science & Engineering

By

BHEESETTY AKHIL (20UECS1067) **(21608)**

Under the guidance of
Ms. P. SASI GRESA, M.E.,
ASSISTANT PROFESSOR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SCHOOL OF COMPUTING

VEL TECH RANGARAJAN DR. SAGUNTHALA R&D INSTITUTE OF SCIENCE & TECHNOLOGY

(Deemed to be University Estd u/s 3 of UGC Act, 1956)
Accredited by NAAC with A++ Grade
CHENNAI 600 062, TAMILNADU, INDIA

July, 2024

ECONOMIC DESIGN OF EFFECTIVE DATA TRANSFER AND STORAGE SYSTEM

Major project report submitted
in partial fulfillment of the requirement for award of the degree of

Bachelor of Technology
in
Computer Science & Engineering

By

BHEESETTY AKHIL (20UECS1067) **(21608)**

Under the guidance of
Ms. P. SASI GRESA, M.E.,
ASSISTANT PROFESSOR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SCHOOL OF COMPUTING

VEL TECH RANGARAJAN DR. SAGUNTHALA R&D INSTITUTE OF SCIENCE & TECHNOLOGY

(Deemed to be University Estd u/s 3 of UGC Act, 1956)
Accredited by NAAC with A++ Grade
CHENNAI 600 062, TAMILNADU, INDIA

July, 2024

CERTIFICATE

It is certified that the work contained in the project report titled ECONOMIC DESIGN OF EFFECTIVE DATA TRANSFER AND STORAGE SYSTEM by BHEESETTY AKHIL (20UECS1067) has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

Signature of Supervisor
Ms. P. SASI GRESA
ASSISTANT PROFESSOR
Computer Science & Engineering
School of Computing
Vel Tech Rangarajan Dr.Sagunthala R&D
Institute of Science & Technology
July, 2024

Signature of Head of the Department
Computer Science & Engineering
School of Computing
Vel Tech Rangarajan Dr. Sagunthala R&D
Institute of Science & Technology
July, 2024

Signature of the Dean
Dr.S.P Chokkalingam
Professor & Dean
Computer Science & Engineering
School of Computing
Vel Tech Rangarajan Dr. Sagunthala R&D
Institute of Science & Technology
July, 2024

DECLARATION

We declare that this written submission represents my ideas in our own words and where others ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

(Signature)

BHEESETTY AKHIL

Date: / /

APPROVAL SHEET

This project report entitled as ECONOMIC DESIGN OF EFFECTIVE DATA TRANSFER AND STORAGE SYSTEM by BHEESETTY AKHIL (20UECS1067) is approved for the degree of B.Tech in Computer Science & Engineering.

Examiners **Supervisor**

Ms. P. SASI GRESA,M.E.,
ASSISTANT PROFESSOR,.

Date: / /

Place:

ACKNOWLEDGEMENT

We express our deepest gratitude to our respected **Founder Chancellor and President Col. Prof. Dr. R. RANGARAJAN B.E. (EEE), B.E. (MECH), M.S (AUTO),D.Sc., Foundress President Dr. R. SAGUNTHALA RANGARAJAN M.B.B.S.** Chairperson Managing Trustee and Vice President.

We are very much grateful to our beloved **Vice Chancellor Prof. S. SALIVAHANAN,** for providing us with an environment to complete our project successfully.

We record indebtedness to our **Professor & Dean, Department of Computer Science & Engineering, School of Computing, Dr.S.P CHOKKALINGAM, M.E., Ph.D.,** for immense care and encouragement towards us throughout the course of this project.

We are thankful to our **Head, Department of Computer Science & Engineering,Dr.M.S. MURALI DHAR, M.E., Ph.D.,** for providing immense support in all our endeavors.

We also take this opportunity to express a deep sense of gratitude to our Internal Supervisor **Ms. P. SASI GRESA, M.E.,(in capital letters)** for his/her cordial support, valuable information and guidance, he/she helped us in completing this project through various stages.

A special thanks to our **Project Coordinators Mr. V. ASHOK KUMAR, M.Tech., Ms. C. SHYAMALA KUMARI, M.E.,** for their valuable guidance and support throughout the course of the project.

We thank our department faculty, supporting staff and friends for their help and guidance to complete this project.

BHEESETTY AKHIL (20UECS1067)

ABSTRACT

The growing demand in the market for increased storage capacity is mainly because of our dependency on the Internet. Network provides a dedicated file server to manage all kinds of files. It is an independent Storage device which is connected directly to the network. Due to its availability on the network it can be easily accessed by any number of heterogeneous clients. The Network Attached Storage devices readily available in the market these days are highly overpriced and do not provide much scope for enhancements, another aspect which is to be taken into consideration is that in most instances these devices consume a fair amount of power. This proposed approach aims at providing a low cost NAS system which is easy to use and configure. It also comprises of added security features and Web Server capabilities. It enables you to have round the clock available storage device which is handy as well as power saving and allows accessibility to data on and off the network.

Keywords: New technology file system, Web Server,Static IP address, Mac address, Subnet mask, Port forwarding and Secure socket shell.

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

HDD	Hard Disk Drive
IP	Internet Protocol
LAN	Local Area Network
MAC	Media Access Control
NAS	Network Attached Storage
NTFS	New Technology File System
OMV	Open Media Vault
OS	Operating System
RI	Raspberry Pi
RFI	Request For Information
SSD	Solid State Drive
SSH	Secure Socket Shell
SSP	Storage Service Provider
SWAP	Shared Wireless Access Protocol
WAN	Wide Area Network
WI-FI	Wireless Fidelity

TABLE OF CONTENTS

Chapter 1

INTRODUCTION

1.1 Introduction

Network-attached Storage or NAS for short is a really good device to have if you are dealing with a large number of files and data. I have so much of my work-related content on my PC Internal HDD that it leaves not much room for my personal data, so I usually store them on an external HDD, but each time someone in my family needs any file or photos I have to plug in and copy files from my HDD.

The OS used in this setup is a debian os named Open Media Vault OS which is a free OS for setting up in homes and small offices. One or more disk (and possibly tape) drives can be attached to many NAS systems to increase total capacity. Clients always connect to the NAS head IP address, rather than to the individual storage devices.Clients generally access the NAS over an Ethernet connection. The NAS appears on the network as a single node, which is the main head of this setup.

1.2 Aim of the project

The main aim of this project is to build a cost-effective cloud storage and data transfer system which can be built by our selves.

1.3 Project Domain

This project Economic Design of Effective Data Transfer and Storage System lies under the domain of Cloud Networking which a is service in which company's networking procedure is hosted on public or private cloud. Cloud Computing is source manage in which more than one computing resources share identical platform and customers are additionally enabled to get entry to these resources to specific extent it is similar fashion shares networking however it gives greater superior features and network features in cloud with interconnected servers set up under cyberspace.

1.4 Scope of the Project

Cloud computing is the most common buzz and ubiquitous in IT companies by making their lives easier and simpler than ever. You might be considering how cloud computing is making life easier in IT companies. Although, you don't need to be a tech person to understand or to have a career in Cloud computing. During the pandemic, the organisation moved toward remote work which has created immense demand for cloud service. In 2022, it is expected the market will have 35 precent of growth in cloud computing. Hence, making it one of the most demanded skill sets in the IT sector. Cloud computing has many exciting career opportunities such as cloud migration, AWS/Azure, SAP, and machine learning. These are some of the top skills required in the IT Sector.

Chapter 2

LITERATURE REVIEW

[1] Peng, Y., Zhu, Y., 2021 "A Network Storage Framework Based on SAN," The 7th International Conference on Computer Science Education (ICCSE), The world is growing fast along with the data storage so, our data strage framework is an efficient framework and transfers the data from sender side to receiver end within a short period of time.The dynamic file allocation algorithm in is based on the current allocation state and disk access frequencies. This paper describes a study of machine characteristics and usage in a model organization as a first step towards exploring the feasibility of Storage@desk. Based on the test results in the research that has been done, it can be concluded that the access test based on the device was successfully carried out by accessing via smartphone and desktop devices

[2]R. Revanth, 2019 "Creating a personal cloud storage using NAS (network attachedstorage)," Testing the NAS functionality was successfully carried out by installing an application stored on the NAS drive. The quality of a virtual cloud server built using Virtual box is still far from being seen from the tests' results. With this, it is necessary to follow up to provide good service to users who will use this cloud storage service.It can provide dedicated storage for one device or shared storage across many devices. The cloud approach may also be best for applications with long-term storage needs, such as for legal or compliance issues.

[3] P. M. Corcoran, 2019 "Practical aspects of video data transfer to network storage using 802.11 WLAN technology for low-end consumer digital cameras," The practical implementation of video data transfer to network storage NAS using WLAN has implemented successfully and tests run by the setup are accurate with a perfect data transfer rate.Based on the results of our investigations a server-side application prototype is implemented which can reliably handle up to 3 concurrent connections from client devices.

[4] Yan Han ,2018 “On the clouds: A new way of computing”.The author reviews cloud computing services and providers, then presents his experience of running multiple systems. Information technology has developed a lot in these recent years, the cloud storage networking is the perfect example for large amount of storage required to keep their data and only that but also to access them over the WLAN through mobile phone, laptop or any other networking devices.It can be concluded that the access test based on the device was successfully carried out by accessing via smartphone and desktop devices, then simultaneously testing access, the user can access the own cloud service.

[5]Tajuddin, A., 2019 ”Comparative Analysis of the Performance of FreeNAS and NAS4FREE as Network Attached Storage (NAS) Network Operating Systems on Local Area Networks (LAN)”. JISIKA publications. Based on the simultaneously testing access, the user can access the own cloud service, but the virtual server restarts by itself, this shows that the server virtual has not been able to handle so much traffic. To access data, many computer users in the network continue to increase, impacting the selection of servers, and large data storage media is necessary.

Chapter 3

PROJECT DESCRIPTION

3.1 Existing System

The cloud storage services in these days are very expensive which comes with a limited storage, the service cost is very high that a common man cannot afford the price not only the cost but also the storage capacity provided by the company is less, with that we can buy a new storage drive. High cost, extra charges on using trial period, requires maintenance, annual charges on using their services.

3.2 Proposed System

Network-attached storage (NAS) is dedicated file storage that enables multiple users and heterogeneous client devices to retrieve data from centralized disk capacity. Users on a local area network (LAN) access the shared storage via a standard Ethernet connection.

3.3 Feasibility Study

3.3.1 Technical Feasibility

The average PC contains increasingly large amounts of storage with an ever greater amount left unused. There is an opportunity for organizations to harness the vast unused storage capacity on their PCs to create a very large, low cost, shared storage system. What is needed is a virtual storage system to exploit and manage the unused portions of existing PC storage devices and make it reliably accessible to users and applications. We call our vision of such a virtual storage system Storage@desk (SD). This paper describes a study of machine characteristics and usage in a model organization as a first step towards exploring the feasibility of Storagedesk. This paper presents the results of our data collection efforts, our analysis of the data, our

simulation results, and our conclusion that a Storage@desk system is indeed feasible and holds promise as a cost effective way to create massive storage systems.

3.3.2 Social Feasibility

Large and mid-sized enterprises are very likely to already own one or more NAS systems in their data centers. However, unlike a SAN, parts of a NAS product could be managed by standard network administrators rather than storage specialists. Also, you may find products residing in departments or remote offices; this sometimes leads to office managers having to become modestly familiar with the technology.

3.4 System Specification

3.4.1 Hardware Specification

Storage	Seagate external hard drive
Boot	Sandisk Cruzer Blade 64Gb
Router	Tp link Router 300mbps
System	Raspberry Pi 4b+ 2gb ram
Cable	Ethernet Cable

3.4.2 Software Specification

Linux	Open media vault
OS	Open Media Vault
LAN	Local area network
WAN	Wide area network
System	Raspberry Pi 4b+
WI-FI	Wireless fidelity
Server	Github.com

3.4.3 Standards and Policies

Some NAS devices run a standard operating system, such as Microsoft Windows, while others run a vendor's proprietary OS. IP is the most common data transport protocol, but some midmarket NAS products might support additional protocols.The security policy of our network attached system in this document describes the security features that are deployed on your router. It is protected by the debain os that is the open media vault itself it also provides an inbuilt security and defender and in with that said the windows firewall defender is more than enough to secure our data.

Chapter 4

METHODOLOGY

4.1 General Architecture

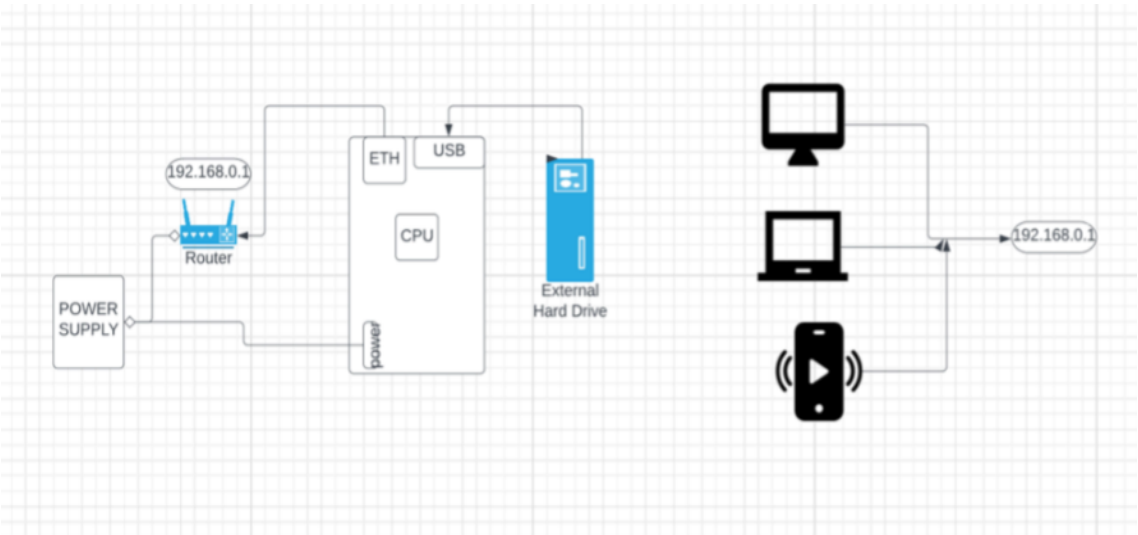


Figure 4.1: **Architecture**

In the fig 4.1,the first and foremost is to gather all the components required for the setup.Connect the tp link router to the power supply and connect the ethernet cable port of the router to the port of the raspberry pi. Make sure the router is connected to modem for internet access. Next log on to the router setting page the default ip address of the the router is 192.168.0.1 in then hop to dhcp client list and find the ip address of the raspberry pi.Make sure to note down or remember the ip address of the pi.

4.2 Design Phase

4.2.1 Data Flow Diagram

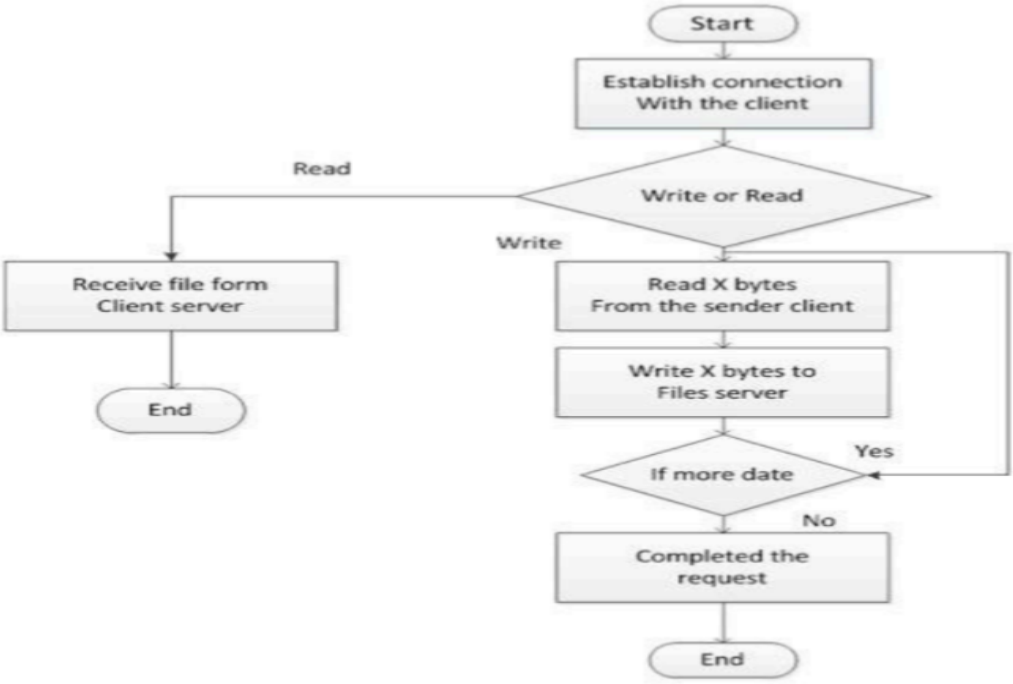


Figure 4.2: **Data Flow Diagram**

In the fig 4.2 the diagram indicates the flow of data from the external storage device to the user with the intervention of the server. The server is a bridge like connection between storage or the client and the user. The storage is mapped into computer for easy access after the successful connection with the server.

4.2.2 Use Case Diagram

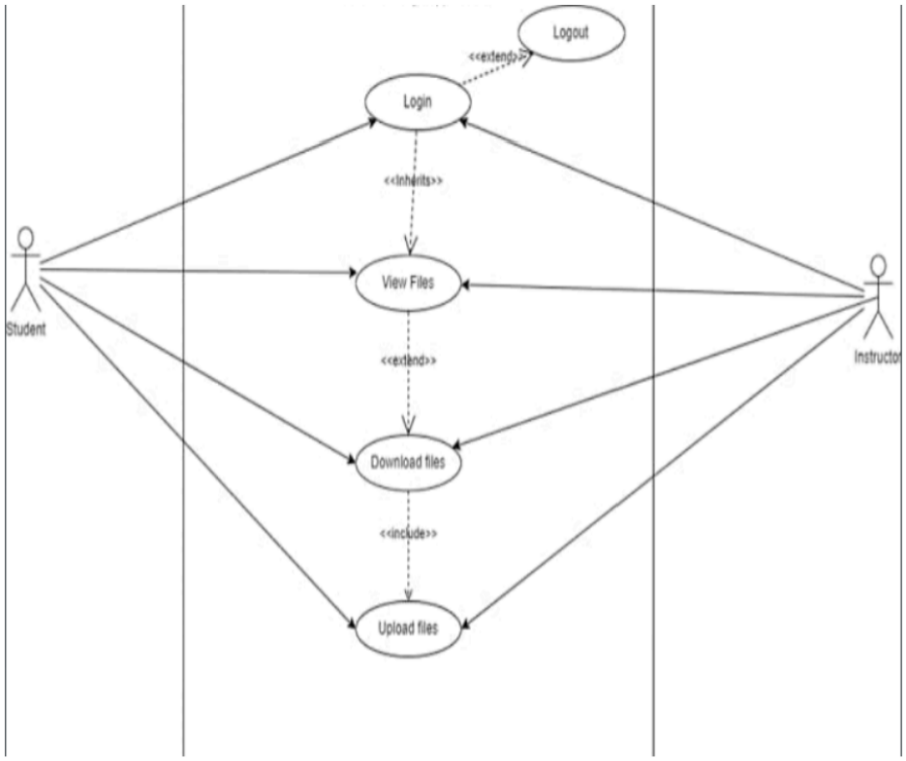


Figure 4.3: **Use Case Diagram**

In the fig 4.3,the use case describes the relation between the user and client with acknowledgement of the process happening to complete their task. In this diagram the authorised user requests the data from the storage, the connection between them is established by the server it checks whether the user is authorised or not if yes it allows else rejects. Then the data is transferred from storage to the receiver, by using the 7 layers of computer network from sender till receiver. This is a clean and secure process which is secured by the in built defender provided by the operating system and along with the windows defender.

4.2.3 Class Diagram

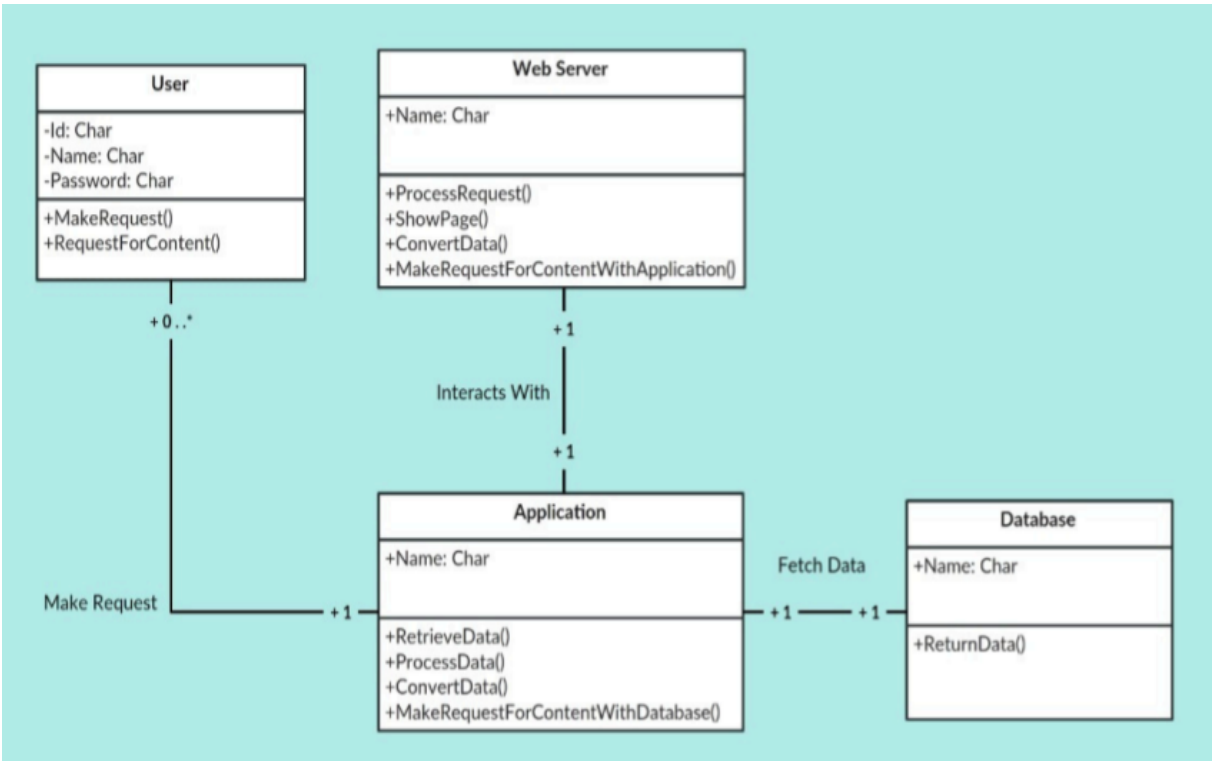


Figure 4.4: **Class Diagram**

In the fig 4.4,the class diagram defines the attributes, functions and relation between the other processes in the same system. In this the user is given by his userid, password, and name then the connection with the application is established, the application having the user id. name and password of the user it is connected to the web server of his allocated prevaillages and then the web server to the database containing the information.

4.2.4 Sequence Diagram

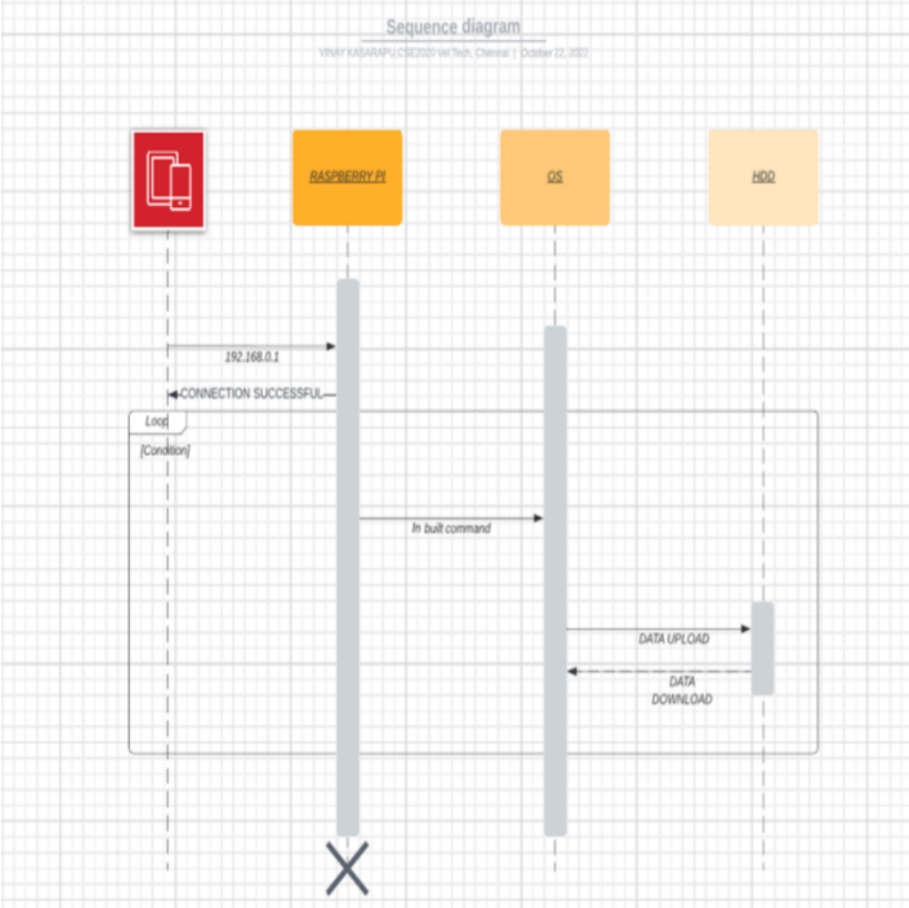


Figure 4.5: **Sequence diagram**

In the fig 4.5,the sequence diagram defines the transaction from start till end in a simple horizontal lines explaining the whole process of the system is called use case diagram. In this figure the mobile device is connected to the same network and the other components raspberry pi is also connected to the same network. After the installation the data is ready to share, download and upload.

4.2.5 Collaboration diagram

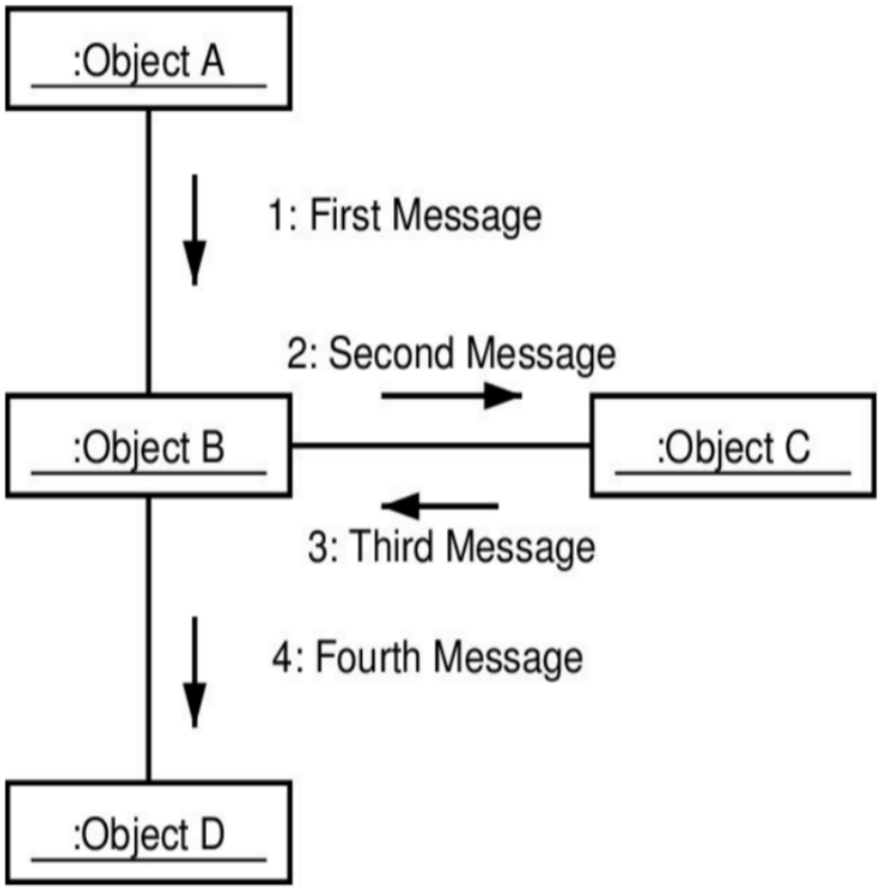


Figure 4.6: **Collaboration Diagram**

The above fig 4.6 describes the collaborative process of the network attached storage, which describes how the message is sent from one part to the other and the execution is clearly described in the diagram. The message 1 is the request for accessing the server and the message 2 for requesting and retreiving data from the database for other part of transaction.Here the object A is the router and object B is the pi system where object C is the storage system or the database, object D is the target or the final stage of the processes that is the target device.

4.2.6 Activity Diagram

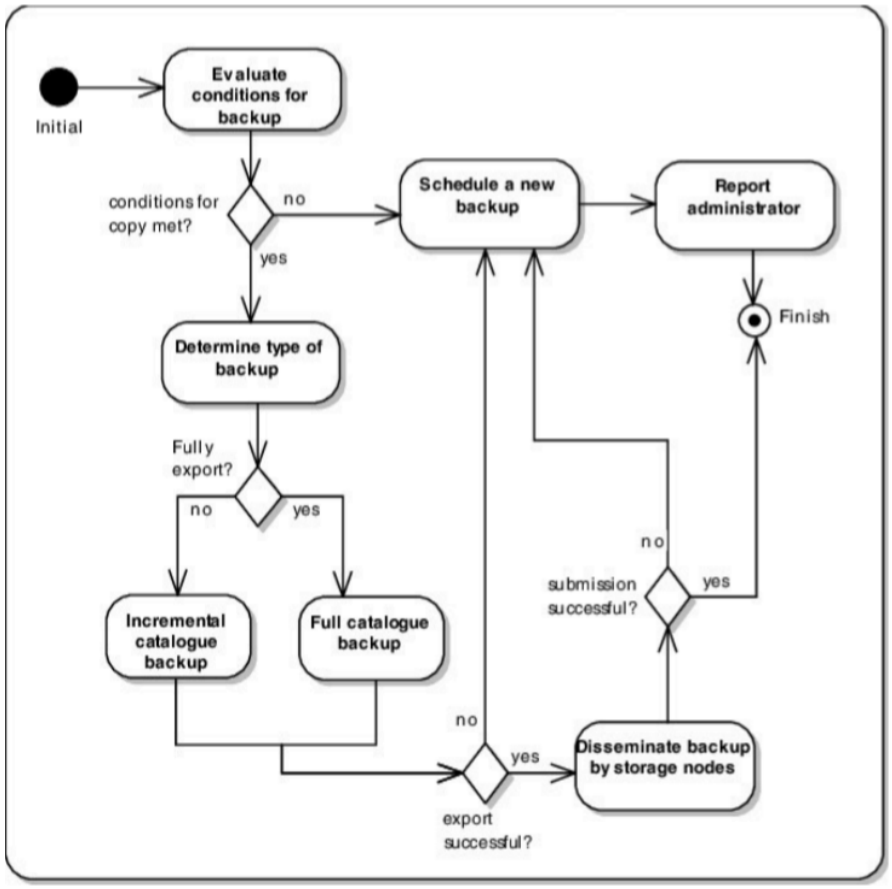


Figure 4.7: **Activity Diagram**

In the fig 4.7,the graphical representations of workflows of step wise activities and actions with support for choice, iteration and concurrency.The above diagram defines how the data is stored and transferred to the target device. The process starts with evaluating the backup then scheduling the backup when and where to reach the backup.If in case the data is not exported to the target device successfully or encountered an error within the process then the server will again reschedule and start the process from initial position.

4.3 Module Description

4.3.1 Setup And Configuration

We have gathered all the resources for our project and configured the raspberry pi to our home WIFI network via ethernet cable .By logging on to the router web page we found the IP address of the raspberry pi as we are connecting to the pi wirelessly we have to enable Secure Socket Shell (SSH), after enabling now we have to config the pi using apt-config command and update , upgrade the pi using apt-update and apt-upgrade command on the command terminal. With this steps our Pi ready to install a derbian OS into it i.e Open Media Vault (OMV).

4.3.2 Installing The OS

A Derbian OS has to be installed into our Pi. An OS which runs on Linux based commands that means we can perform a single task at a single where, multi tasking is not allowed is called Derbian OS. The OMV is a special designed OS for the storage devices. The full version of the OS can be acquired by configuring some settings in the web page.

4.3.3 Mapping the Hard Drive

The full version of the OS is acquired, then we mount our storage to the pi, make sure that the drive is formatted in ext4 type and mounted again into it now, we add the HDD and the process is complete now using run command type the IP address provided by the OMV and share the files into the HDD.

Chapter 5

IMPLEMENTATION AND TESTING

5.1 Input and Output

5.1.1 Input Design

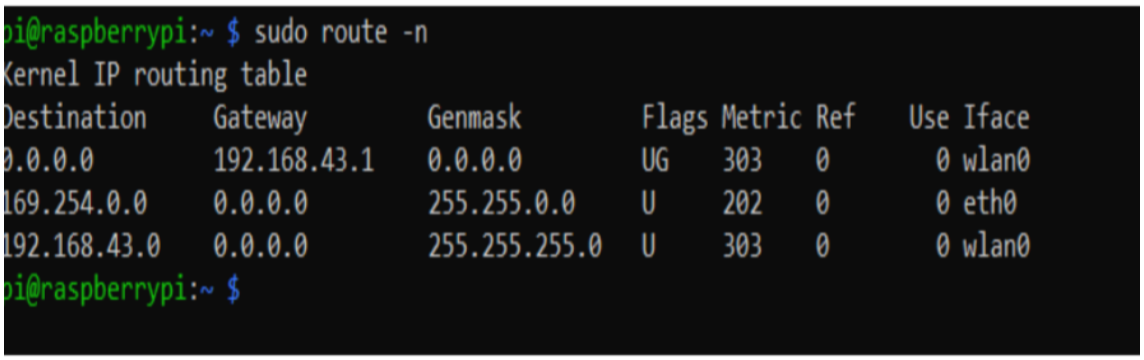


Figure 5.1: **Obtaining the Mac and Ip address of the Pi**

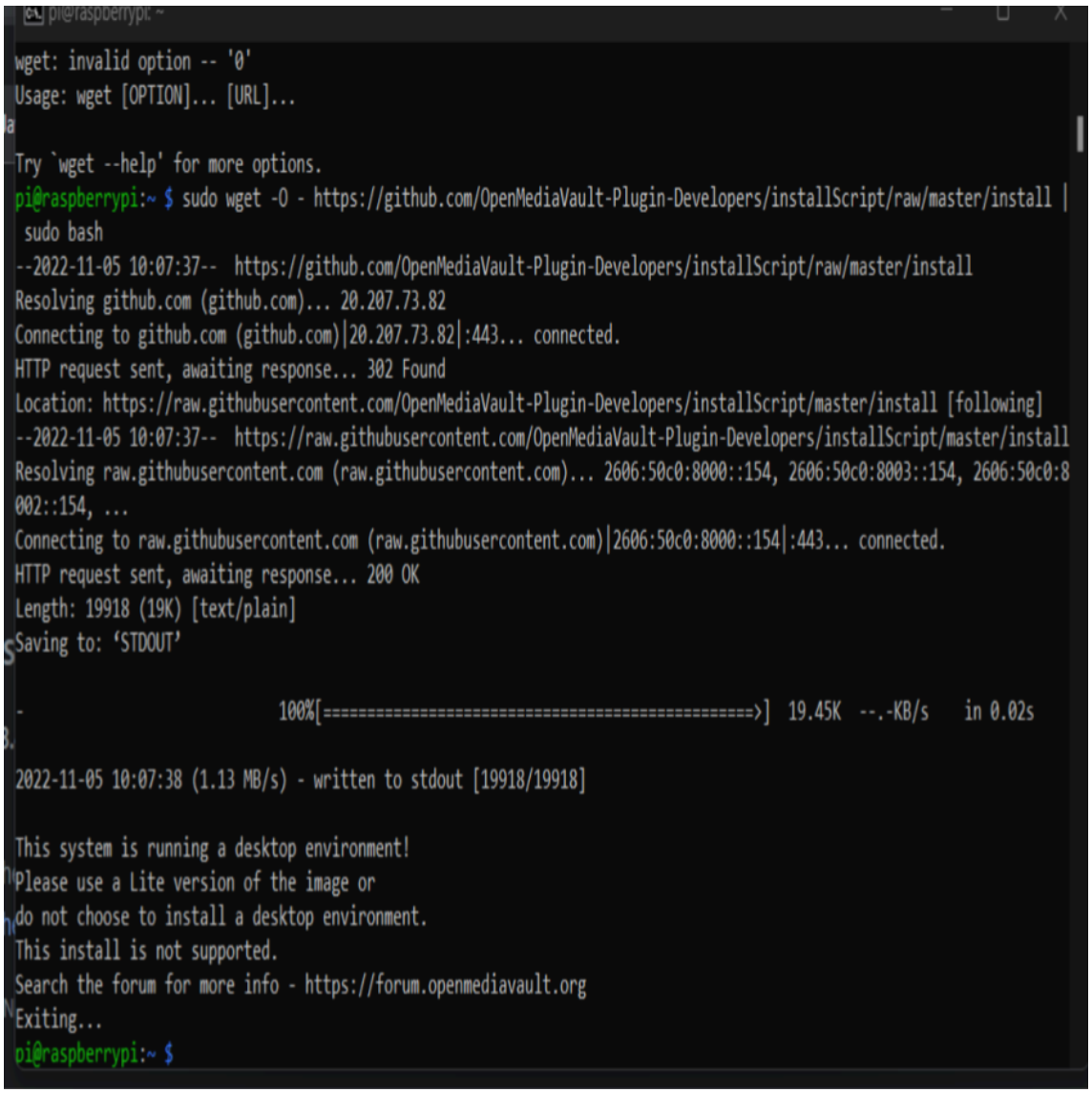


Figure 5.2: **Installing the OMV onto the Pi**

5.1.2 Output Design

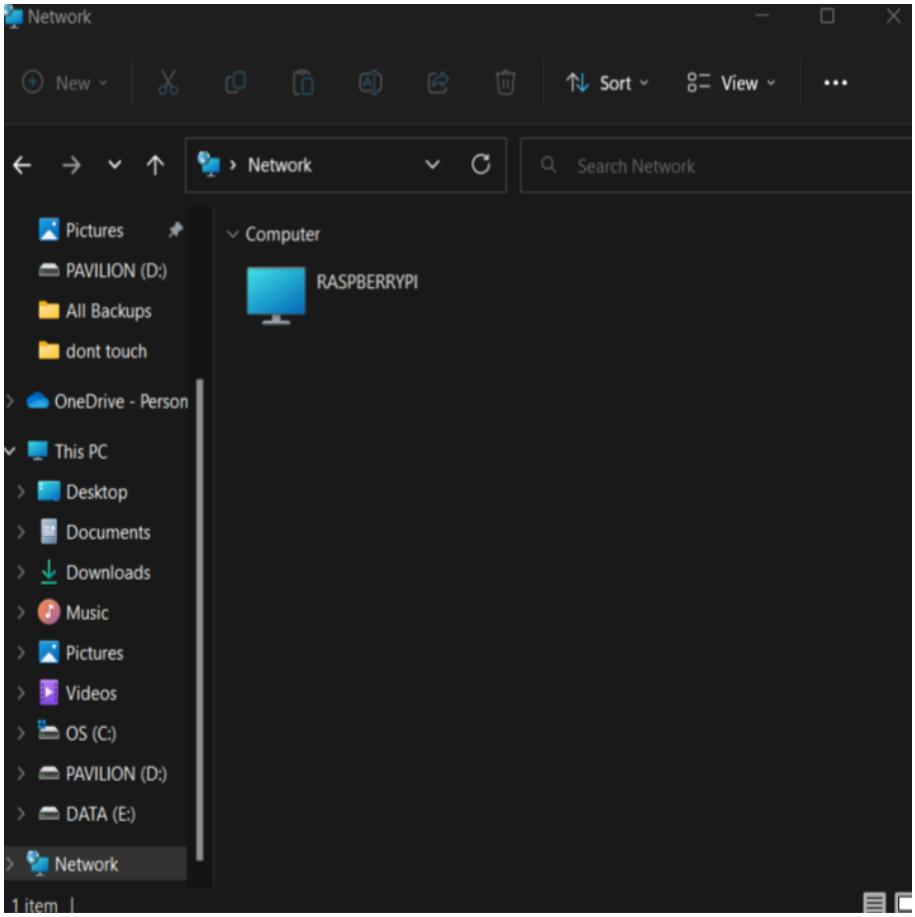


Figure 5.3: **Mapping the HDD**

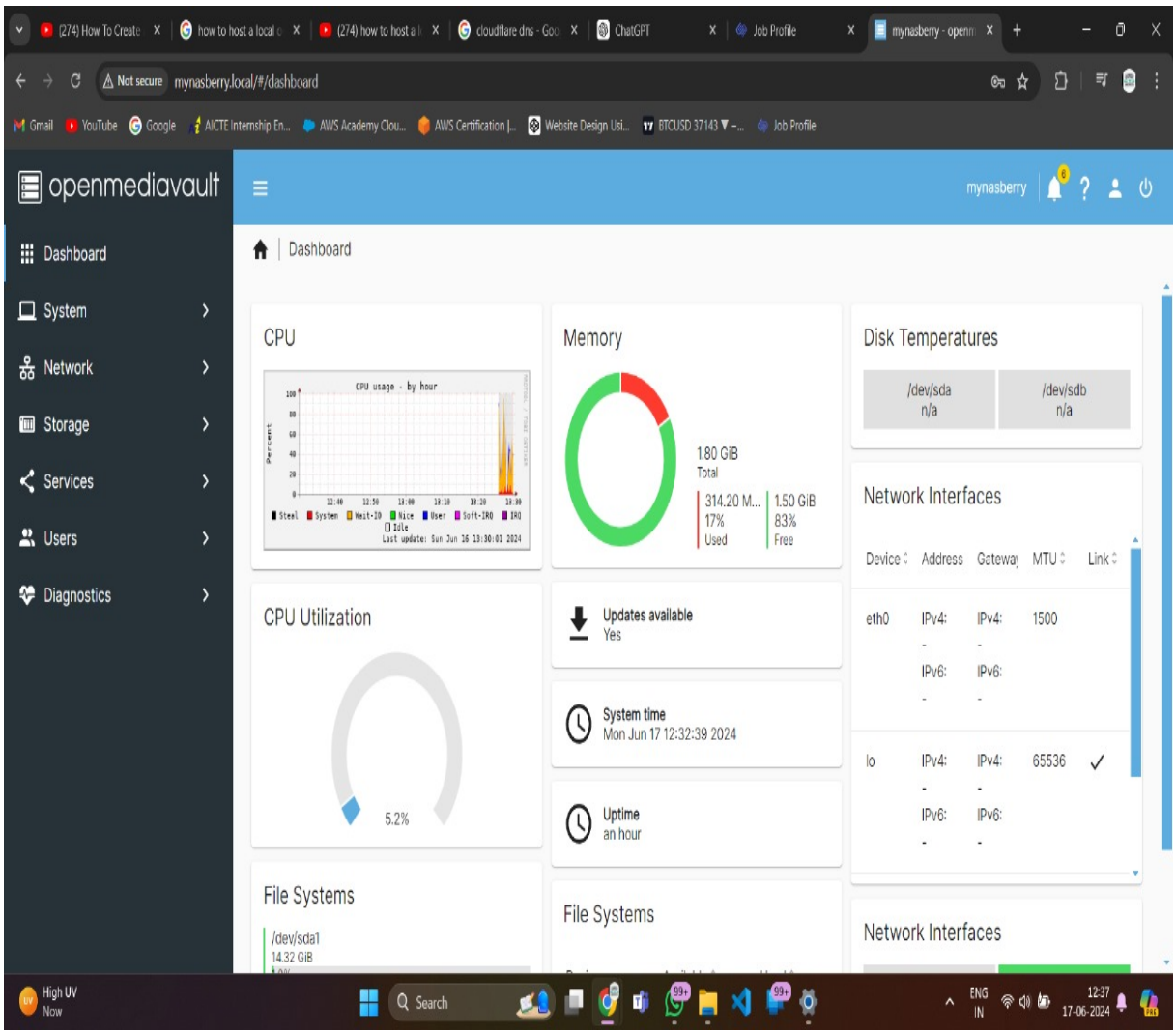


Figure 5.4: **Dashboard of OMV**

5.2 TESTING

5.2.1 UNIT TESTING

The components required for our projects are brought and were tested to see whether the componenets are working individually.The components we tested here are the Raspberrry Pi ,Router, micro SD card, Hard disk. All the components connections were checked and working properly .

5.2.2 INTEGRATION TESTING

The model parts are put together after Unit testing and were tested together on their working.We gave a connection to the Raspberry Pi via Ethernet cable with the Router, to configure the IP address of the Raspberry Pi. The Raspberry Pi and the HDD are put together for testing the data transfer and data storage.

5.2.3 SYSTEM TESTING

The system testing is done on the entirety of the model and all of them are working exactly as they are supposed to be we have setup a new static Ip address for the Pi and mapped to the server and then connect to the OMV server.

5.2.4 FUNCTIONAL TESTING

In this project we have used the pre-built commands for the Pi to configure and set a data storage system some of the commands are listed below. Sudo rpi-eeprom-update: If it flags that an update is available, as we mentioned earlier, one option is to run sudo apt update followed by sudo apt full-upgrade to fully update your Pi's software, firmware included. Sudo rpi-eeprom-upgrade: This commands upgrades the update available on the pi. Echo ¡ssh : This commands enables the secure socket shell on the pi for the user to access without using display .

Chapter 6

RESULTS AND DISCUSSIONS

6.1 Efficiency of the Proposed System

Network-attached Storage or NAS for short is a really good device to have if you are dealing with a large number of files and data. I have so much of my work-related content on my PC Internal HDD that it leaves not much room for my personal data, so I usually store them on an external HDD, but each time someone in my family needs any file or photos I have to plug in and copy files from my HDD.The OS used in this setup is a debian os named Open Media Vault OS which is a free OS for setting up in homes and small offices. One or more disk (and possibly tape) drives can be attached to many NAS systems to increase total capacity. Clients always connect to the NAS head IP address, rather than to the individual storage devices.Clients generally access the NAS over an Ethernet connection. The NAS appears on the network as a single node which is the main head of this setup.

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Conclusion

Cloud storage is an emerging technology and has a great changing impact on the way businesses and organizations manage their information and data. Cloud storage provides massive scalability, high performance, data resiliency, and 99.999 percent readability. There are four different types of deployment models of cloud storage provided by cloud services provider according to the requirements of the clients. The general architecture of the cloud storage is also discussed in the article along with the pros and cons. Based on the test results in the research that has been done, it can be concluded that the access test based on the device was successfully carried out by accessing via smartphone and desktop devices, then simultaneously testing access, the user can access the own cloud service, Testing the NAS functionality was successfully carried out by installing an application stored on the NAS drive. This setup is also cost effective and economically affordable.

7.2 Future Enhancements

Network storage pool accessibility using techniques such as Cloud Storage. Individuals can use network storage as an extension or replacement of their directly attached drive. Network Storage centralization can be achieved through Virtualization.Taking a technological leap to centralized virtual storage using converging technologies, moving towards more efficient and unified Green technology where 10 data becomes available all the time.

Chapter 8

PLAGIARISM REPORT

Dupli Checker

PLAGIARISM SCAN REPORT

28%
Plagiarised

72%
Unique

Date	2024-08-03
Words	292
Characters	2285

Content Checked For Plagiarism

1.1 Introduction
Network-attached Storage or NAS for short is a really good device to have if you are dealing with a large number of files and data. I have so much of my work-related **content on my PC Internal HDD that it leaves not much room for my personal data,** so I usually store them on an external HDD, but each time someone in my family **needs any file or photos I have to plug in and copy files from my HDD.**
The OS used in this setup is a debian os named Open Media Vault OS which is a **free OS for setting up in homes and small offices.** One or more disk (and possibly **tape) drives can be attached to many NAS systems to increase total capacity. Clients** always connect to the NAS head IP address, rather than to the individual storage devices.Clients generally access the NAS over an Ethernet connection. The NAS appears on the network as a single node, which is the main head of this setup.
1.2 Aim of the project
The main aim of this project is to build a cost-effective cloud storage and data transfer system which can be built by our selves.
1.3 Project Domain
This project Economic Design of Effective Data Transfer and Storage System lies under the domain of Cloud Networking which a is service in which company's net-working procedure is hosted on public or private cloud. Cloud Computing is source **manage in which more than one computing resources share identical platform and customers are additionally enabled to get entry to these resources to specific extent** it is similar fashion shares networking however it gives greater superior features and **network features in cloud with interconnected servers set up under cyberspace.**
1

Matched Source

Similarity 63%
Title:NAS (Network Attached Storage) Using Raspberry Pi
Network-attached Storage or NAS for short is a really 🔎good ✔ device to have if you are dealing with a large number of files and data.

Similarity 9%
Title:Introduction to Network Attached Storage (NAS) - Lifewire

Chapter 9

SOURCE CODE & POSTER PRESENTATION

9.1 Source Code

```
#!/usr/bin/python

import cgi
import subprocess

print("Content-Type: text/plain;charset=utf-8")
print()

storage = cgi.FieldStorage()
command = storage.getvalue("x")

if command is None:
    output = "No output"

elif "date" in command or "Date" in command or "DATE" in command:
    output = subprocess.getoutput("date")

elif "memory" in command or "mem" in command or "Memory" in command:
    output = subprocess.getoutput("free -m")

elif "disk" in command or "space" in command or "Disc" in command or "Disk" in command:
    output = subprocess.getoutput("df -h")

elif "ip" in command or "IP" in command:
    output = subprocess.getoutput("ifconfig")

elif "cal" in command or "calender" in command or "Cal" in command or "Calender" in command:
    output = subprocess.getoutput("cal")

elif "files" in command or "file" in command:
    output = subprocess.getoutput("ls -a")

elif "images" in command or "image" in command or "img" in command:
    output = subprocess.getoutput("docker images")

```

```
elif "pull" in command and ("image" in command or "img" in command) and "ubuntu" in command:
    output = subprocess.getoutput("docker pull ubuntu")

elif "pull" in command and ("image" in command or "img" in command) and "nginx" in command:
    output = subprocess.getoutput("docker pull nginx")

elif "version" in command:
    output = subprocess.getoutput("docker -v")

elif "run" in command or "launch" in command and "ubuntu" in command:
    output = subprocess.getoutput("docker run -d ubuntu")

elif "run" in command or "launch" in command and "nginx" in command:
    output = subprocess.getoutput("docker run -d nginx")

elif "container" in command and "list" in command:
    output = subprocess.getoutput("docker ps -a")

else:
    output = "Invalid command. Try another."

print(output)
```

9.2 Poster Presentation

ECONOMIC DESIGN OF EFFECTIVE DATA TRANSFER AND STORAGE SYSTEM

Department of Computer Science & Engineering
School of Computing

1156CS601 – MAJOR PROJECT
SUMMER SEMESTER 23-24

ABSTRACT

The growing demand in the market for increased storage capacity is mainly because of our dependency on the Internet. Network Attached Storage (NAS) provides a dedicated file server to manage all kinds of files. It is an independent Storage device which is connected directly to the network. Due to its availability on the network it can be easily accessed by any number of heterogeneous clients. The Network Attached Storage devices readily available in the market these days are highly overpriced and do not provide much scope for enhancements, another aspect which is to be taken into consideration is that in most instances these devices consume a fair amount of power. This proposed approach aims at providing a low cost NAS system which is easy to use and configure. It also comprises of added security features and Web Server capabilities. It enables you to have round the clock available storage device which is handy as well as power saving and allows accessibility to data on and off the network.

TEAM MEMBER DETAILS

vtu 21608/Bheesetty Akhil
vtu21608@veltech.edu.in
8897805037

INTRODUCTION

Network-attached Storage or NAS for short is a really good device to have if you are dealing with a large number of files and data. I have so much of my work-related content on my PC Internal HDD that it leaves not much room for my personal data, so I usually store them on an external HDD, but each time someone in my family needs any file or photos I have to plug in and copy files from my HDD.

The OS used in this setup is a debian os named Open Media Vault OS which is a free OS for setting up in homes and small offices. One or more disk (and possibly tape) drives can be attached to many NAS systems to increase total capacity. Clients always connect to the NAS head IP address, rather than to the individual storage devices. Clients generally access the NAS over an Ethernet connection. The NAS appears on the network as a single "node," which is the main head of this setup.

The purpose of NAS is to enable users to collaborate and share data more effectively. It is useful to distributed teams that need remote access or work in different time zones. This setup is used to implement an application, and combine the functionality of a series of tools in order to enable a Raspberry Pi to create a Network Attached Storage.

METHODOLOGIES

Setup and Configuration : We have gathered all the resources for our project and configured the raspberry pi to our home WIFI network via ethernet cable .By logging on to the router web page we found the Ip address of the raspberry pi as we are connecting to the pi wirelessly we have to enable Secure Socket Shell (SSH), after enabling now we have to config the pi using apt-config command and update , upgrade the pi using apt-update and apt-upgrade command on the command terminal. With this steps our Pi ready to install a debian OS that isOpen Media Vault (OMV).

Installing the OS : A Debian OS has to be installed into our Pi. An OS which runs on Linux based commands that means we can perform a single task at a single where, multi tasking is not allowed is called Debian OS.

Mapping the Hard Drive: The full version of the OS is aquired, then we mount our storage to the pi, make sure that the drive is formatted in ext4 type and mounted again into the server.

RESULTS

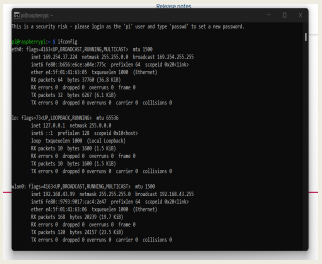
The components required for our projects are brought and were tested to see whether the components are working individually. The components we tested here are the Raspberry Pi ,Router, micro SD card, Hard disk. All the components connections were checked and working properly .

We successfully installed the Debian OS into the raspberry pi and mapped the drive into our system , after logging into the mapped drive now, we can able to share data within each other.

We have thoroughly checked all the commands, components and setup a storage drive for the network.

Table 1. Speed and Time representation table.

File type	Size (in mb)	Time Taken	Speed(m/s)
Audio	2.5 mb	90 sec	1.5
Video	756 mb	5 min 30sec	4.8
Text	1.5 mb	2 sec	1
Document	3.2 mb	7-8 sec	1.2
Large File	4.5 gb	12 min	3.5
Games	20 gb	1hr	5



STANDARDS AND POLICIES

Some NAS devices run a standard operating system, such as Microsoft Windows, while others run a vendor's proprietary OS. IP is the most common data transport protocol, but some midmarket NAS products might support additional protocols.

The security policy of our network attached system in this document describes the security features that are deployed on your router. It is protected by the debain os that is the open media vault itself it also provides an inbuilt security and defender and in with that said the windows firewall defender is more than enough to secure our data.

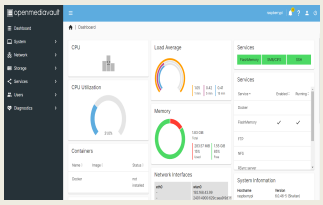


Figure 1. Dashboard of the OMV.

CONCLUSIONS

Based on the test results in the research that has been done, it can be concluded that the access test based on the device was successfully carried out by accessing via smartphone and desktop devices, then simultaneously testing access, the user can access the own cloud service, Testing the NAS functionality successfully carried out by installing an application stored on the NAS drive. This setup is also cost effective and economically affordable.

ACKNOWLEDGEMENT

Supervisor name: Ms. P. SASI GRESA, M.E.,
Mobile no: +91 6369070792

Reference

[1] Peng, Y., Zhu, Y., and Luo, J. ”Comparative Analysis of the Performance of FreeNAS and NAS4FREE as Network Attached Storage (NAS) Network Operating Systems on Local Area Networks (LAN)”. JISIKA, VoL.3, No.1(ISSN: 2338 -137X), 2021.

[2] R. Revanth, “Creating a personal cloud storage using NAS (network attached storage),” Software Engineering, vol. 11 , no. 2 , pp. 17-22 , 2021.

[3] P. M. Corcoran and I. Raducan, “Practical aspects of video data transfer to network storage using 802.11 WLAN technology for lowend consumer digital cameras”, IEEE Trans. Consumer Electron., vol. 49, no. 4, pp. 902–910, Nov 2020.

[4] Yan Han . “On the clouds: A new way of computing”, DAS solution, vol 7:p 86-22,Dec 2019

[5] Tajuddin, A., 2019 “A Network Storage Framework Based on SAN,” Policy of Storage, 2019.