HEMVATI NANDAN BAHUGUNA GARHWAL UNIVERSITY

(A Central University)

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School of Engineering and Technology

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A PROJECT REPORT ON

E-WASTE MANAGEMENT

Submitted in partial fulfillment for the award of the degree of

Bachelor of Technology

in Computer Science and Engineering

Hemvati Nandan Bahuguna Garhwal University (A Central University)

Srinagar Garhwal (Uttarakhand)

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CANDIDATE DECLARATION

We, Suraj Mishra bearing the roll no. 19134501036, Kshitij Rajput, bearing roll no. 19134501020 and Abhinav Kashyap, bearing roll no. 19134501008 students of Bachelor of Technology in Computer Science and Engineering (CSE) at Hemvati Nandan Bahuguna Garhwal University (A Central University), Srinagar (Garhwal), submit this project entitled **"E-Waste Management"** to Dept. of Computer Science and Engineering, Hemvati Nandan Bahuguna Garhwal University, Srinagar (Garhwal) for the award of the Bachelors of Technology in Computer Science and Engineering and declaring that the work done is genuine and produced under the guidance of **Vijay Prakash Bijlwan (**Associate Professor), Department of Computer Science and Engineering. Hemvati Nandan Bahuguna Garhwal University, Srinagar (Garhwal), Uttarakhand. We further declare that the reported work in this project has not been submitted and will not be submitted, either in part or in full, for the award of any degree in this institute or any institute or university.

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CERTIFICATE

This is to certify that, this project report entitled **"E-Waste Management"** submitted by **Suraj Mishra** (roll no. 19134501036), **Kshitij Rajput** (roll no. 19134501020), **Abhinav Kashyap** (roll no. 19134501008) are a bonafide record of the work carried out by them in partial fulfillment of the requirement of the award of Bachelor of Technology in **Computer Science and Engineering** degree from **Hemvati Nandan Bahuguna Garhwal University**, Srinagar (Garhwal). This Project report has not been submitted to any other University or Institution for the award of any degree.

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INTRODUCTION

1.1 Overview

Electronic waste, commonly known as e-waste, refers to discarded electronic devices that have reached the end of their useful life or are no longer in use. These electronic devices range from computers, smartphones, tablets, and televisions to household appliances, electronics, and other consumer electronics. E-waste contains a variety of valuable and hazardous materials, making its management and disposal a significant environmental and public health concern.

With the rapid advancement of technology and the increasing demand for electronic products, the generation of e-waste has become a pressing global issue. Improper disposal of e-waste can lead to severe environmental and health problems due to the release of toxic substances such as lead, mercury, cadmium, and brominated flame retardants.

1.2 Purpose

E-waste management faces several challenges, including inadequate infrastructure, improper disposal practices, and a lack of awareness among consumers. However, there are also significant opportunities for innovation in recycling technologies, policy frameworks, and public awareness campaigns to address the issue effectively.

The purpose of e-waste management is to address the environmental, social, and economic challenges posed by electronic waste and to ensure the responsible handling of discarded electronic devices.

CHAPTER – 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM

Problem Statement: Increasing number of abandoned laptops and computers. The number of laptops and computers abandoned or thrown away each year globally can vary, and it's essential to note that specific figures may change over time due to factors such as technology advancements, consumer behavior, and e-waste management practices.

As of the last update in September 2021, it was estimated that around 50 million metric tons of electronic waste, including laptops and computers, were generated globally each year. However, this figure is for all electronic waste combined and is not specific to laptops and computers alone.

Despite the escalating volume of electronic waste (e-waste) globally, a major problem persists in the inadequate collection and recycling infrastructure, leading to improper disposal and environmental hazards.

2.2 PROPOSED SOLUTION

This project aims to address this challenge by proposing a sustainable solution to repurpose discarded laptops and computers as servers, contributing to e-waste reduction while fulfilling practical needs for efficient and eco-friendly server systems. Identify abandoned laptops and computers suitable for repurposing as servers. Evaluate their hardware capabilities, including processing power, storage capacity, and networking capabilities. Before repurposing, ensure that all data on the laptops and computers are securely wiped to protect personal information and sensitive data. Refurbish the devices by cleaning, repairing, and upgrading necessary components to ensure optimal performance as servers.

CHAPTER – 3
ANALYSIS OF GLOBAL E-WASTE

3.1 Globally Generated E-Waste
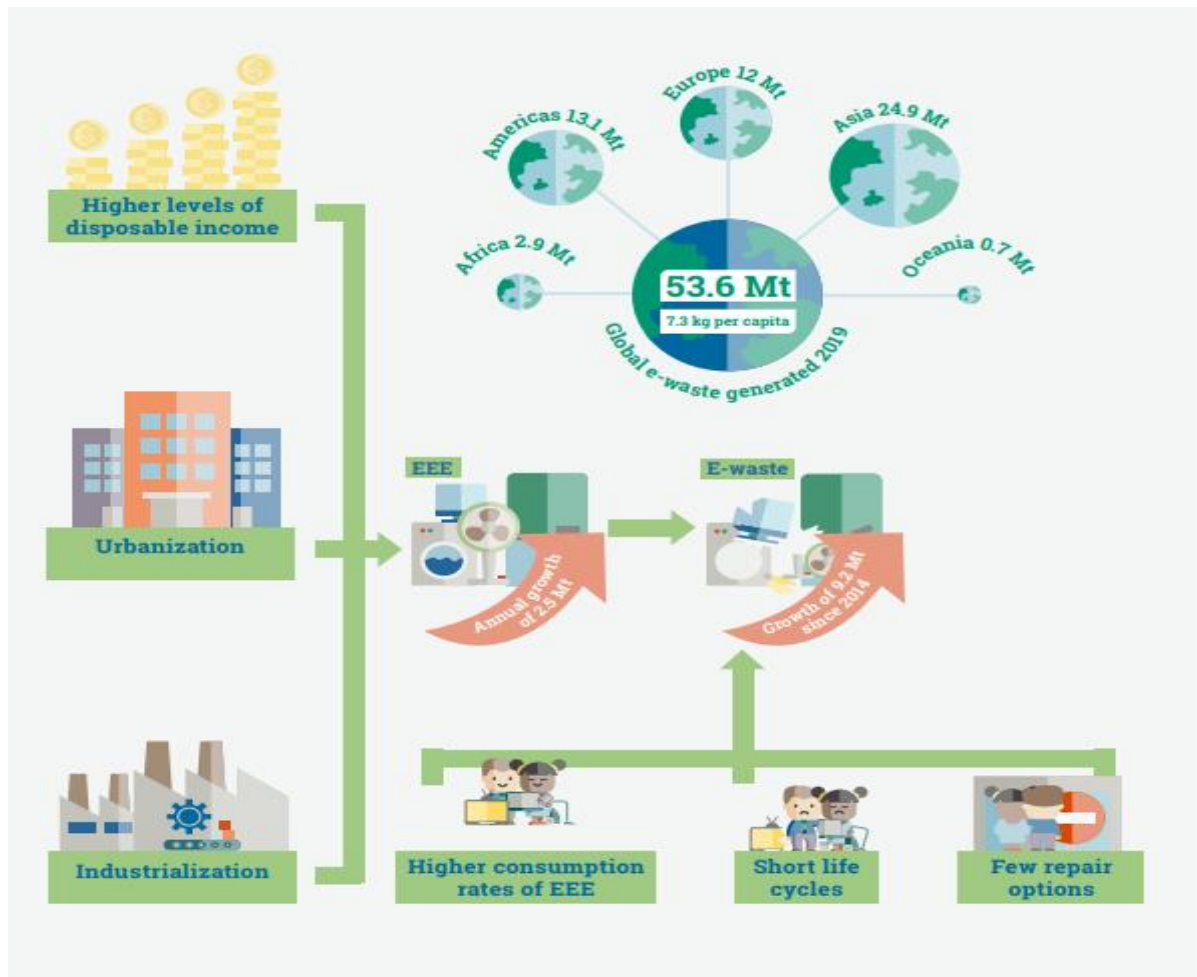
Fig. 3.1 Global E-Waste Generated

3.2 Analysis

In 2019, the world generated a striking 53.6 Mt of e-waste, an average of 7.3 kg per capita. The global generation of e-waste grew by 9.2 Mt since 2014 and is projected to grow to 74.7 Mt by 2030 – almost doubling in only 16 years. The growing amount of e-waste is mainly fuelled by higher consumption rates of EEE, short life cycles, and few repair options. Asia generated the highest quantity of e-waste in 2019 at 24.9 Mt, followed by the Americas (13.1 Mt) and Europe (12 Mt), while Africa and Oceania generated 2.9 Mt and 0.7 Mt, respectively. Europe ranked

first worldwide in terms of e-waste generation per capita, with 16.2 kg per capita. Oceania was second (16.1 kg per capita), followed by the Americas (13.3 kg per capita), while Asia and Africa generated just 5.6 and 2.5 kg per capita, respectively.
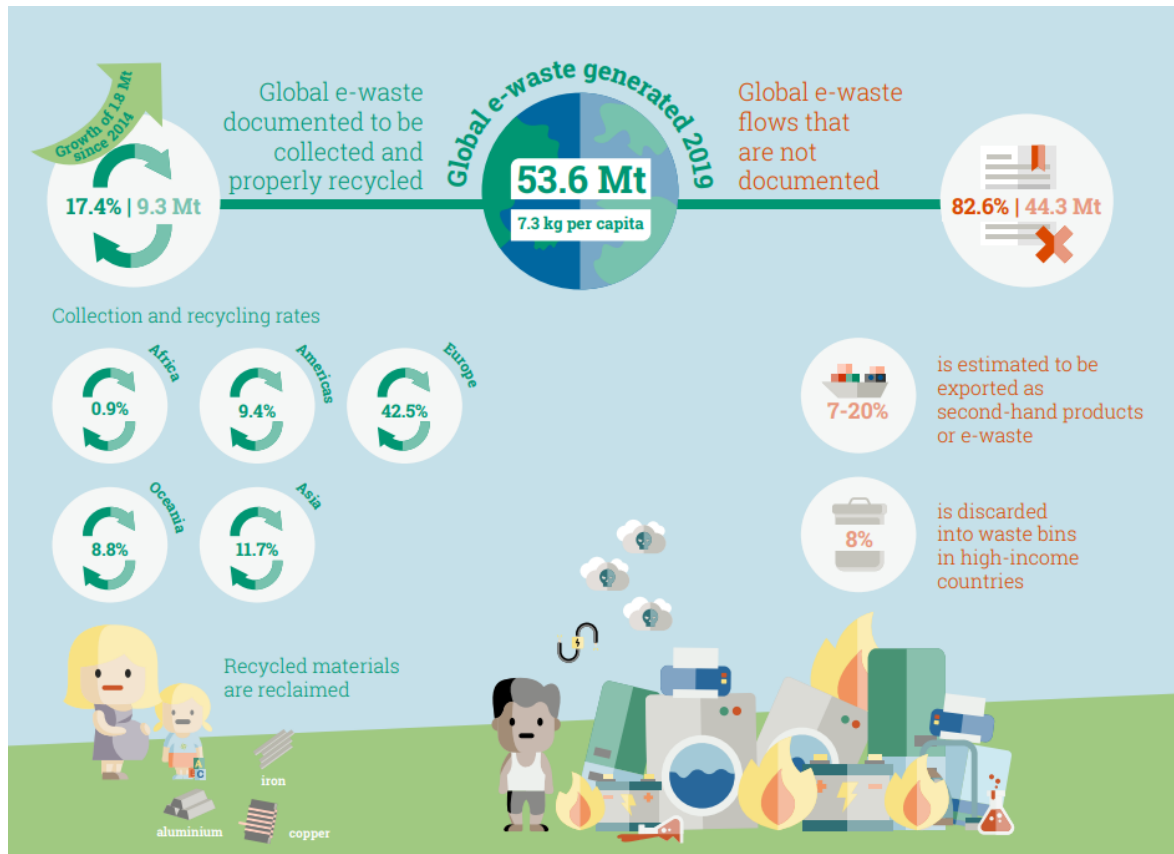
Fig. 3.2 Analysis of documented and not-documented E-Waste

In 2019, the formal documented collection and recycling was 9.3 Mt, thus 17.4% compared to e-waste generated. It grew with 1.8 Mt since 2014, an annual growth of almost 0.4 Mt. However, the total e-waste generation increased by 9.2 Mt, with an annual growth of almost 2 Mt. Thus, the recycling activities are not keeping pace with the global growth of e-waste. The statistics show that in 2019, the continent with the highest collection and recycling rate was Europe with 42.5%, Asia ranked second at 11.7%, the Americas and Oceania were similar at 9.4% and 8.8%, respectively, and Africa had the lowest rate at 0.9%.

The fate of 82.6% (44.3 Mt) of e-waste generated in 2019 is uncertain, and its whereabouts and environmental impact vary across the different regions. In high-income countries, a waste recycling infrastructure is usually developed, and:

• Around 8% of the e-waste is discarded in waste bins and subsequently landfilled or incinerated. This is mostly comprised of small equipment and small IT.

• Discarded products can sometimes still be refurbished and reused, and thus are usually shipped as second-hand products from high-income to low- or middle-income countries. However, a considerable amount of e-waste is still exported illegally or under the guise of being for reuse or pretending to be scrap metal. It can be assumed that the volume of transboundary movements of used EEE or e-waste ranges from 7-20% of the e-waste generated.

Global E-waste Generated by year

Year	kg per capita	Mt
2014	6.4	44.4
2015	6.6	46.4
2016	6.8	48.2
2017	6.9	50.0
2018	7.1	51.8
2019	7.3	53.6
2020	7.5	55.5
2021	7.6	57.4
2022	7.8	59.4
2023	8.0	61.3
2024	8.2	63.3
2025	8.3	65.3
2026	8.5	67.2
2027	8.6	69.2
2028	8.8	71.1
2029	8.9	72.9
2030	9.0	74.7

(Future projections do not take into account economic consequences related to the Covid-19 crisis)
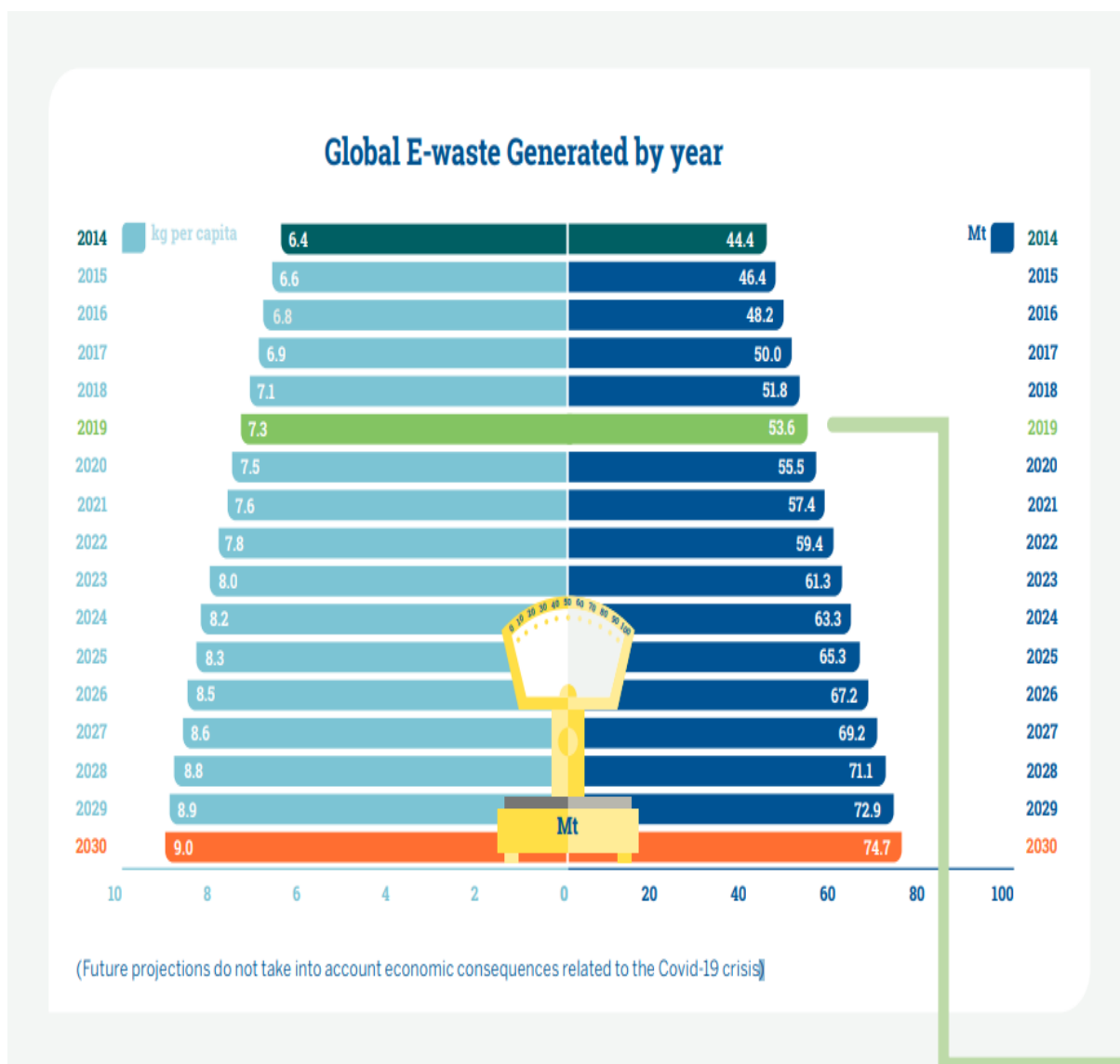
Fig. 3.3 Global E-Waste Generated by Year

CHAPTER - 4

E-WASTE MANAGEMENT SYSTEM

Creating a home server using abandoned laptops and computers can have several positive impacts on e-waste management:

- **Extended Lifespan:** By repurposing old laptops and computers as a home server, you give them a new lease on life. Instead of being discarded as electronic waste, these devices continue to be useful and productive, reducing the amount of e-waste generated.

- **Reduced Disposal:** E-waste is a growing environmental concern as electronic devices contain hazardous materials that can pollute the environment if not properly disposed of. By reusing old devices for your home server, you avoid contributing to the e-waste stream, which in turn helps in reducing the overall environmental impact.

- **Resource Conservation:** Manufacturing electronic devices requires significant amounts of raw materials, energy, and water. By repurposing old laptops and computers, you help conserve these valuable resources that would have been used to produce new equipment for your server needs.

- **Lower Carbon Footprint:** The production of new electronic devices contributes to greenhouse gas emissions. When you reuse existing hardware for your home server, you reduce the demand for new manufacturing, thereby indirectly lowering your carbon footprint.

- **Cost-Effective Solution:** Creating a home server with abandoned laptops and computers can be a cost-effective alternative to buying new hardware. This approach can save you money and at the same time contribute to reducing e-waste.

- **Educational and DIY Aspect:** Building a home server using old hardware can be a valuable learning experience, especially for those interested in technology and DIY projects. It encourages a culture of repair, reuse, and resourcefulness, which aligns with sustainable practices.

- **Encouraging Others:** When others see our example of repurposing old hardware for a home server, it may inspire them to consider similar approaches, further spreading the positive impact on e-waste management.

CHAPTER – 5

ORIGIN AND OBJECTIVE OF THE PROJECT

5.1 ORIGIN

The report will examine best practices for e-waste management in the context of VPS and other forms of technology, including the responsible disposal of electronics, the development of more sustainable technology, and the promotion of recycling programs. The report will also consider the role of governments and businesses in addressing the issue of e-waste, including regulations and initiatives aimed at reducing the environmental impact of technology.

E-waste or electronic waste is created when an electronic product is discarded after the end of its useful life. The rapid expansion of technology and the consumption-driven society results in the creation of a very large amount of e-waste.

E-waste is considered the "fastest-growing waste stream in the world" with 44.7 million tonnes generated in 2016- equivalent to 4500 Eiffel towers. In 2018, an estimated 50 million tonnes of e-waste were reported, thus the name 'tsunami of e-waste' given by the UN. Its value is at least $62.5 billion annually.

Rapid changes in technology, changes in media (tapes, software, MP3), falling prices, and planned obsolescence have resulted in a fast-growing surplus of electronic waste around the globe. Technical solutions are available, but in most cases, a legal framework, collection, logistics, and other services need to be implemented before a technical solution can be applied.

5.2 OBJECTIVES AND GOALS

- To provide customers with a flexible and customizable hosting solution: Your VPS should allow customers to configure their hosting environment to meet their specific needs, without the limitations of traditional shared hosting.
- To improve the performance and reliability of hosting: Your VPS should offer improved performance and reliability compared to traditional shared hosting, ensuring that customers' websites and applications are always available and running smoothly.
- To enhance security: Your VPS should provide customers with enhanced security features, such as isolated virtual environments, firewalls, and backups, to help protect their websites and applications from potential threats.

- To simplify the management of hosting environments: Your VPS should include tools and features that make it easy for customers to manage their hosting environment, reducing the technical expertise required and saving time and effort.

- To increase customer satisfaction: Your VPS should provide customers with a high-quality and dependable hosting solution that meets their needs and exceeds their expectations, leading to increased customer satisfaction and loyalty.

- To expand the market for hosting services: Your VPS offering should reach new markets and target new customers, increasing your market share and helping you to grow your business.
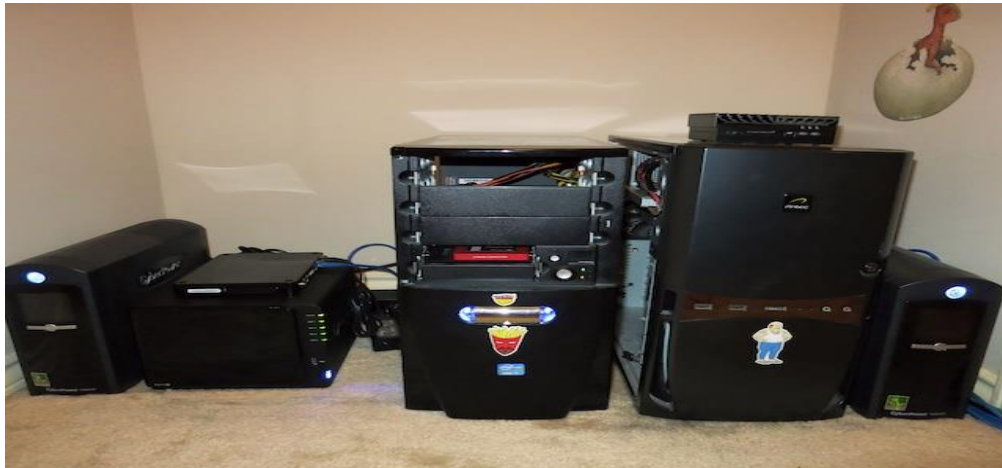
Fig. 5.1 Obsolete pcs and laptops

5.3 PURPOSE OF THE REPORT

- The purpose of the report, in this case, is to provide a comprehensive overview of the Virtual Private Server (VPS) project. The report should detail the background of the project, including its origin and the reasons for its creation. It should also outline the goals and objectives of the project, including what the VPS aims to achieve and the benefits it will bring to customers.
- The overall purpose of the report is to provide stakeholders with a clear understanding of the VPS project, including its goals and objectives, technical aspects, financial considerations, and the steps that will be taken to bring the project to fruition.

CHAPTER – 6

BENEFITS AND CHALLENGES

6.1 BENEFITS

- **Centralized File Storage:** A home server allows you to create a centralized repository for all your files and data. This can make managing and accessing your files from various devices within your home network easier.

- **Data Backup and Recovery:** With a home server, you can implement regular automated backups of your important data. In the event of a computer crash or accidental data loss, you can quickly restore your files from the server, ensuring you don't lose valuable information.

- **Media Streaming:** If you have a large collection of movies, music, or photos, a home server can act as a media server, allowing you to stream content to your smart TV, gaming consoles, or other devices around your home.

- **Remote Access:** A home server enables you to access your files and network from outside your home. This is particularly useful if you want to retrieve a document or share files while you're away from home.

- **Personal Cloud Services:** With the right software and configurations, you can turn your home server into a personal cloud, similar to services like Dropbox or Google Drive. This gives you more control over your data, and you won't have to rely on third-party providers.

- **Home Automation and IoT Management:** If you have smart home devices, a home server can serve as a central hub to manage and control them, potentially enhancing your home automation capabilities.

- **Privacy and Security:** Storing your sensitive data on a home server can provide better privacy and security compared to relying solely on cloud-based services. You have more control over access and security measures.

- **Learning and Skill Development:** Setting up and managing a home server can be a great learning experience. You can gain valuable skills related to networking, server administration, and software configuration.

- **Cost-Effectiveness:** In the long run, a home server can be more cost-effective than paying for cloud storage subscriptions, especially if you have a lot of data to store.

- **Customizability:** You have the freedom to choose the hardware and software components of your home server, tailoring it to your specific needs and preferences.

6.2 MAJOR CHALLENGES

- **Hardware Selection and Compatibility:** Choosing the right hardware components for your server can be challenging, especially if you're not familiar with server configurations. Ensuring compatibility between the motherboard, CPU, RAM, storage drives, and other components is crucial for a stable and efficient server.
- **Networking and Connectivity:** Setting up the networking and ensuring proper connectivity can be complex, particularly if you want to access your server from outside your home network. Configuring routers, firewalls, and port forwarding correctly is essential for secure and seamless remote access.
- **Operating System and Software Setup**: Installing and configuring the server's operating system and software can be daunting, especially if you're not experienced with server administration. Depending on your server's purpose, you might need to set up services like file sharing, media streaming, web hosting, or home automation software.
- **Security Concerns:** Home servers can be vulnerable to security threats if not properly secured. You need to take measures to protect your server from unauthorized access, data breaches, and malware attacks. This includes setting up strong passwords, enabling firewalls, keeping software up-to-date, and potentially using encryption for sensitive data.
- **Power Consumption and Noise:** Servers can consume a considerable amount of power, especially if they're running 24/7. This can lead to higher electricity bills. Some server components might also generate noise, which could be a concern if you want a quiet living environment.
- **Maintenance and Updates:** Like any computer system, home servers require regular maintenance, including software updates, data backups, and hardware checks. Ensuring the server's reliability and availability may demand ongoing attention.

CHAPTER – 7

DESIGN AND DEVELOPMENT

7.1 HARDWARE REQUIREMENT

- **CPU (Central Processing Unit):** Try to use laptops or computers with multi-core processors. The more cores, the better, as it will allow your server to handle multiple tasks simultaneously. Even older CPUs with multiple cores can be sufficient for basic server tasks.
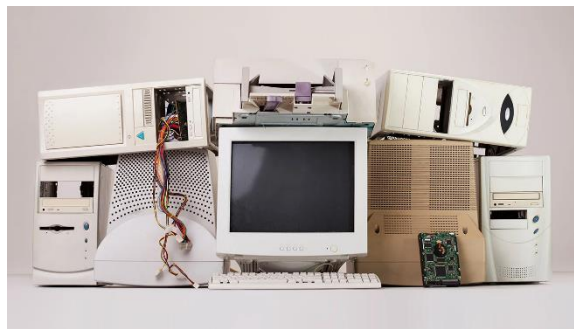
Fig. 7.1 CPU

- **RAM (Random Access Memory):** Having enough RAM is crucial for smooth server performance. Depending on your server's intended use, aim for at least 4GB of RAM, and if possible, 8GB or more for better performance. Upgrading RAM in older laptops/computers can often be done easily and relatively inexpensively.
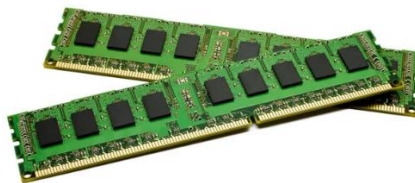
Fig. 7.2 RAM

- **Network Connectivity:** Ensure your laptop or computer has an Ethernet port or built-in Wi-Fi for network connectivity. A reliable network connection is essential for a server to communicate with other devices on your network or the internet.

Fig.7.3 Network Establishment

- **Power Supply and Cooling:** Verify that the laptop or computer's power supply is functional and stable. Proper cooling is also vital for any server, as it will likely be running for extended periods. Ensure the cooling system is clean and working correctly.

Fig. 7.4 Cooler

- **External Hard Drive(s):** To expand the storage capacity of your NAS, you can connect one or more external hard drives to your laptop via USB.

Fig. 7.5 External Hard Drive

7.2 ROUTER

Routers play a crucial role in creating a home-made server by enabling network connectivity and managing data traffic between devices on your local network and the internet.

- o Network Connectivity: Routers provide the necessary network connectivity for your home devices. By connecting your server to the router, it becomes accessible to other devices on the same network.
- o IP Address Assignment: Routers assign unique IP addresses to each device on your home network, including the server. This IP address allows other devices to identify and communicate with the server.
- o Port Forwarding: When you run a server, it often listens on specific ports for incoming data requests. Routers can be configured to forward incoming requests on certain ports to the internal IP address of your server, making it reachable from the internet. This process is called port forwarding.
- o Dynamic DNS (DDNS): If you have a dynamic IP address from your Internet Service Provider (ISP), your router's IP address may change periodically. DDNS services allow you to assign a hostname to your server, which dynamically updates to the changing IP address. This way, your server remains accessible even if the IP address changes.
- o Network Sharing: Routers facilitate sharing of resources and data between devices on the local network. This enables your server to interact with other devices, such as sharing files or media.
- o Wi-Fi Connectivity: Routers with Wi-Fi capability allow wireless devices to connect to the server and access its services without the need for physical cables.
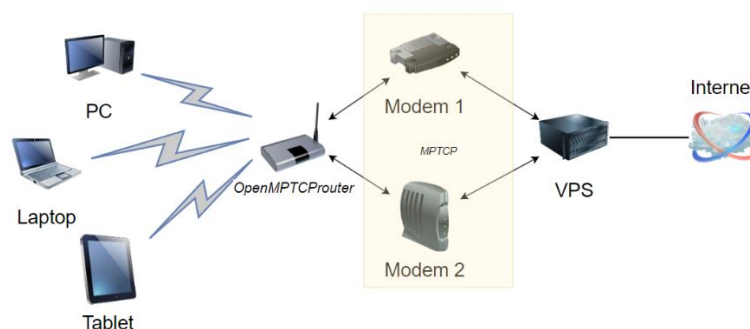
Fig. 7.6 Router

7.3 HARDWARE ASSEMBLING

1. **Gather Necessary Equipment:** You'll need the following items:
   - Abandoned old laptop (with working Ethernet or Wi-Fi)
   - External storage (USB drives or external hard drives)
   - Ethernet cable (if using a wired connection)

2. **Choose the Operating System:** Select a lightweight and server-friendly operating system. "UBUNTU" and "Open Media Vault" are popular choices for NAS setups. Both are based on FreeBSD/Linux and are designed to manage network storage.

3. **Install and Configure the OS:**
   - Download the ISO or image file of your chosen operating system.
   - Create a bootable USB drive using the image file and insert it into the laptop.
   - Boot the laptop from the USB drive and install the chosen operating system.
   - Follow the on-screen instructions to configure the basic settings, network, and user accounts.

4. **Connect External Storage:** Attach the external storage devices (USB drives or external hard drives) to the laptop. These will be used to store your data and act as your network-accessible storage.

5. **Set Up Network Sharing:** Configure the NAS software to share the external storage over the network using protocols like SMB/CIFS (Windows file sharing) or NFS (Network File System for Linux systems).

6. **Create Shared Folders:** Set up shared folders on the NAS where you can store and organize your files. You can create separate folders for different types of data (e.g., documents, media, backups).

7. **Configure User Access:** If you want to limit access to certain folders, create user accounts and set up permissions accordingly. This ensures that only authorized users can access specific data.

8. **Test and Access Your NAS:** Ensure that the NAS is working correctly by accessing the shared folders from other devices on your network. You should be able to read, write, and manage files through the network connection.

9. **Consider Data Backup (Optional):** Since you're using an old laptop, there's a higher risk of hardware failure. Implement a backup strategy to protect your data. You can back up your important files to cloud storage or another external device.

10. **Power Management:** Keep in mind that old laptops may not be as power-efficient as dedicated NAS devices. Configure power management settings to optimize energy usage and avoid overheating.

11. **Monitor and Maintain:** Regularly check your NAS for updates and security patches. Monitoring the system's health will help you identify any issues early on.

Fig. 7.7 Old Monitor

Fig. 7.8 Router and Old Monitor

7.4 SOFTWARE REQUIREMENT

- **Operating System:** Choose a suitable operating system to serve as the base for your NAS. Common choices include:
  - o **Free NAS:** An open-source operating system built for NAS purposes, based on FreeBSD.
  - o **Open Media Vault (OMV):** Another open-source NAS OS, based on Debian Linux.
  - o **Ubuntu Server:** You can also use a standard Linux distribution like Ubuntu Server and set up NAS services manually.

Fig. 7.9 Operating Systems

- **NAS Software:** If you choose Ubuntu Server or another generic Linux distribution, you'll need to install and configure NAS software manually. For instance, you can set up a NAS using:
  - o **Samba:** A widely used software suite that enables file and printer sharing between Linux, macOS, and Windows systems (through SMB/CIFS protocol).
  - o **NFS (Network File System):** For sharing files between Linux-based systems.

Fig. 7.10 NAS Software

- **Dynamic DNS (DDNS) Client (Optional):** If you want to access your private cloud from outside your home network, a DDNS client will help you maintain a consistent domain name for your server. Services like **Dyn DNS**, **No-IP**, or **Duck DNS** can provide DDNS functionality.
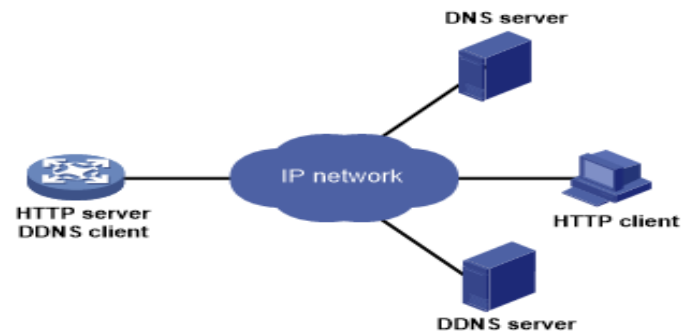
Fig. 7.11 DDNS

- **Security Software (Optional):** Depending on your needs, you may consider installing security software like firewalls and antivirus to protect your NAS from potential threats.
- **Backup Software (Optional):** Consider installing backup software to schedule regular backups of your data on the NAS.

CHAPTER – 8

NAS AND SERVER

8.1 NAS

A NAS system is a high-capacity storage device connected to a network that allows authorized network users and clients to store and retrieve data from a centralized location.

Fundamentally, a NAS device is simply a container for hard drives with some additional intelligence included for files to be shared and authorized. Because a NAS device uses a technology called Redundant Array of Independent Disks (RAID), it can distribute and duplicate the stored data across multiple hard disks. That redundancy ensures data resilience in the case of any failed drives.

Why do organizations use NAS?

NAS systems are versatile, flexible, and scalable, so you can add to existing solutions as your storage needs grow. They can be either pre-populated with disks or diskless and have one or two USB ports so you can connect printers or external storage drives to the network, allowing additional options for all connected users.

NAS devices are simple to operate and can be configured and managed through a browser-based utility, you may not need an IT professional on standby to manage storage. Additionally, a NAS device can be accessed remotely, allowing it to serve as a private Dropbox or Google Drive with far more storage and no monthly cost.

8.2 Working of NAS device

A NAS device runs on any platform or operating system. It is essentially a bundle of hardware and software with an embedded operating system to run independently. NAS devices contain anywhere from two to five hard drives to provide redundancy and fast file access. While NAS is often thought of as a mini-server, its controller only manages disks for storage and does not operate as a server.

In basic terms, a NAS device is an appliance that directly connects to the network either through a hardwired Ethernet (RJ45) cable or via Wi-Fi, thus creating a LAN instead of a WAN. It is assigned an IP address, and data transfer between users, servers, and a NAS via TCP/IP. NAS operates with a traditional file system—either a New Technology File System (NTFS) or NFS

for remote file services and data sharing. All storage on the device is accessed at the file level through a file share.

NAS devices deliver shared storage as network-mounted volumes and use protocols like NFS and SMB/CIFS. When it's used for shared storage, the NAS device attaches multiple servers to a common storage device. These "clusters" are often used for failover through a cluster-shared volume, which allows all cluster nodes to access the same data.

A NAS consists of the following elements:

Hardware: The hardware is simply a server that contains storage disks or drives, processors, and RAM. Known as a NAS box, unit, server, or head, it transfers only two types of requests: data storage and file sharing.

Software: Storage software is preconfigured and installed on the above hardware and deployed on a lightweight operating system embedded in the hardware.

Network switch: Users access data transfer protocols through this switch, which is essentially a central server that connects to everything and routes requests.

Protocols: Transmission control protocol (TCP) combines files into packets and sends them through internet protocols (IPs).

8.3 Server

A server is a computer or system that provides resources, data, services, or programs to other computers, known as clients, over a network. In theory, whenever computers share resources with client machines, they are considered servers. There are many types of servers, including web servers, mail servers, and virtual servers.

An individual system can provide resources and use them from another system at the same time. This means that a device could be both a server and a client at the same time.

Some of the first servers were mainframe computers or minicomputers. Minicomputers were much smaller than mainframe computers, hence the name. However, as technology progressed, they ended up becoming much larger than desktop computers, which made the term microcomputer somewhat farcical.

Initially, such servers were connected to clients known as terminals that did not do any actual computing. These terminals, referred to as dumb terminals, existed simply to accept input via

a keyboard or card reader and to return the results of any computations to a display screen or printer. The actual computing was done on the server.

Later, servers were often single, powerful computers connected over a network to a set of less-powerful client computers. This network architecture is often referred to as the client-server model, in which both the client computer and the server possess computing power, but certain tasks are delegated to servers. In previous computing models, such as the mainframe-terminal model, the mainframe did act as a server even though it wasn't referred to by that name.

As technology has evolved, the definition of a server has evolved with it. These days, a server may be nothing more than software running on one or more physical computing devices. Such servers are often referred to as virtual servers. Originally, virtual servers were used to increase the number of servers functions a single hardware server could do. Today, virtual servers are often run by a third party on hardware across the Internet in an arrangement called cloud computing.

A server may be designed to do a single task, such as a mail server, which accepts and stores email and then provides it to a requesting client. Servers may also perform several tasks, such as a file and print server, which both stores files and accepts print jobs from clients and then sends them on to a network-attached printer.

8.4 Types of Servers

- **Application Server:** Web apps are computer applications that operate inside a web browser. Application servers host these programs, allowing network users to run and utilize them without having to install a copy on their personal computers. These servers don't have to be connected to the Internet. Web-enabled PCs serve as their clients.

- **Database servers:** These servers keep a table of contents or index of the information that is spread out over a wide dispersed network. Computers, users, data exchanged via file servers, and web apps can all be part of a distributed network. Directory servers and name servers are a few examples of catalog servers. Any computer application that has to search the network is one of their clients. A domain member trying to log in is an example.

- **Communications server:** These servers keep up the environment required for one communication endpoint to identify and then connect with other endpoints. Depending on the network's openness and security settings, these servers may or may not have a

directory of communication endpoints and a presence detection service. Their customers are points of communication.

- **Computing server:** These servers distribute enormous quantities of processing power, including CPU and RAM, via a network. These kinds of servers can be used by any computer software that requires more CPU and RAM than a single computer is likely able to provide. To implement the client-server concept, which is essential, the client must be a networked computer.

- **Sharing files and folders:** Storage space for files and folders, or both, via a network is the function of a file server. Even though local applications might be clients, networked machines are the intended recipients.

- **Proxy server:** This server serves as a conduit between clients and servers, receiving incoming traffic from clients and forwarding it to the server. The use of a proxy server can be justified for several reasons, such as content screening and control, traffic performance enhancement, preventing unwanted network access, or simple traffic routing over a big and complicated network. Any networked computer can be one of the clients.

- **Web servers:** the servers that host websites. The World Wide Web is only feasible because of web servers. There are one or more web servers for each website. Computers equipped with web browsers serve as the clients.

CHAPTER – 9

WORKFLOW OF THE PROJECT

```
                        ┌──────────────┐
                        │    Start     │
                        └──────────────┘
                               │
                    ┌────────────────────┐
                    │ Old Laptop/Computer │
                    └────────────────────┘
                               │
            ┌──────────────────┴──────────────────┐
      ┌───────────┐                          ┌───────────┐
      │    NAS    │                          │    VPS    │
      └───────────┘                          └───────────┘


                          ┌──────────┐
                          │   NAS    │
                          └──────────┘
                               │
            ┌──────────────────┴──────────────────┐
  ┌────────────────────┐              ┌────────────────────────────────┐
  │ Install NAS OS on   │              │ Internet Connection via Ethernet│
  │        old PC       │              │                                │
  └────────────────────┘              └────────────────────────────────┘
            └──────────────────┬──────────────────┘
              ┌────────────────────────────────────┐
              │ Automatic IP address allocation, ID -│
              │ password and device control setup    │
              │ using NAS GUI.                       │
              └────────────────────────────────────┘
                               │
              ┌────────────────────────────────────┐
              │ A system within same network is      │
              │ required to access NAS (Network      │
              │ Attached Storage).                   │
              └────────────────────────────────────┘
```
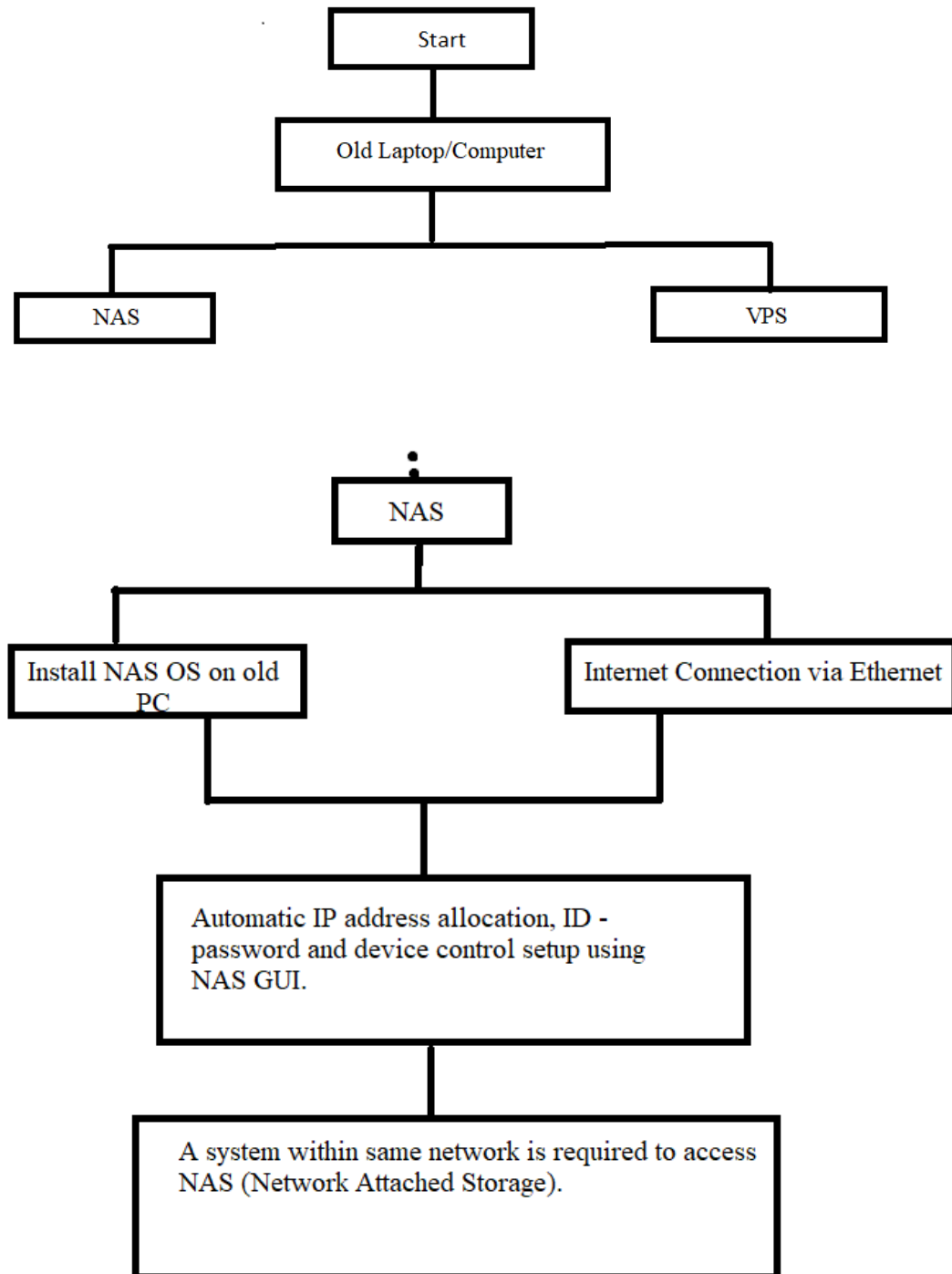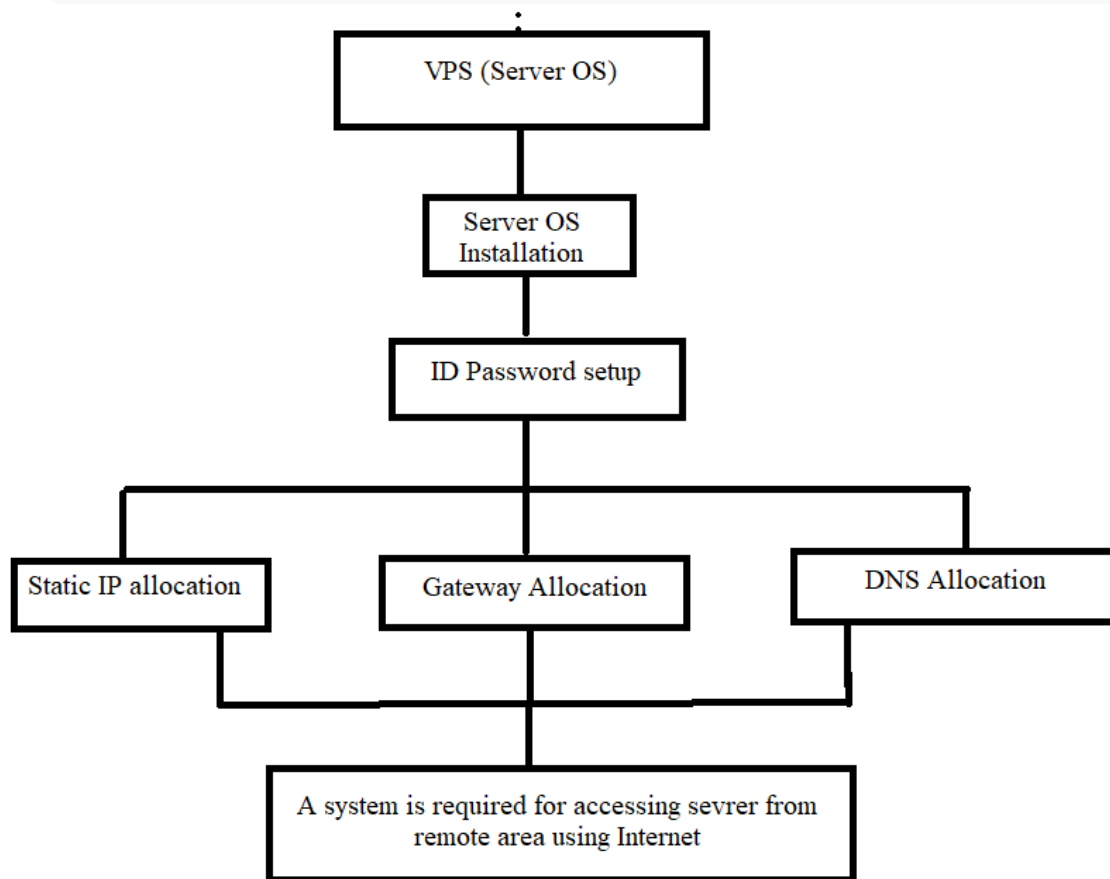
CHAPTER - 10

NAS SETUP AND TESTING

10.1 Setup

- **Select a laptop:** Selecting an old PC or Computer with a CPU is the initial step to making a homemade server, make sure you have a proper configuration such as enough RAM, as the server needs to be in working condition for 24/7, enough storage, because having enough storage will be beneficial for you so that you can use that storage freely, fast processor, to get fast access in your local device, Operating System, having a reliable OS for your computer make things easier. For this particular, we choose to work on Linux.
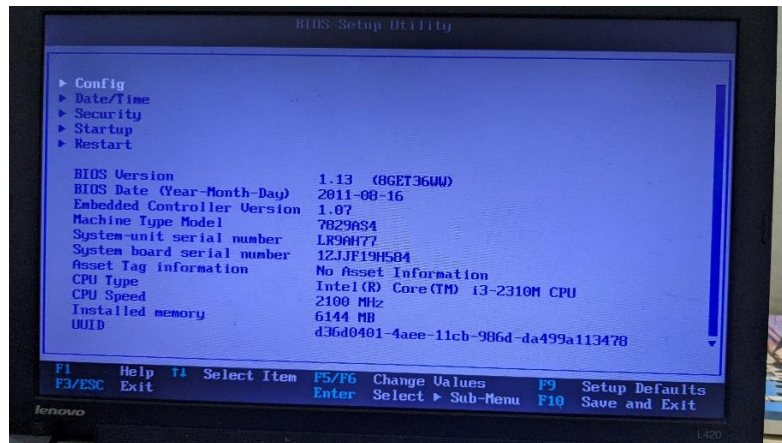

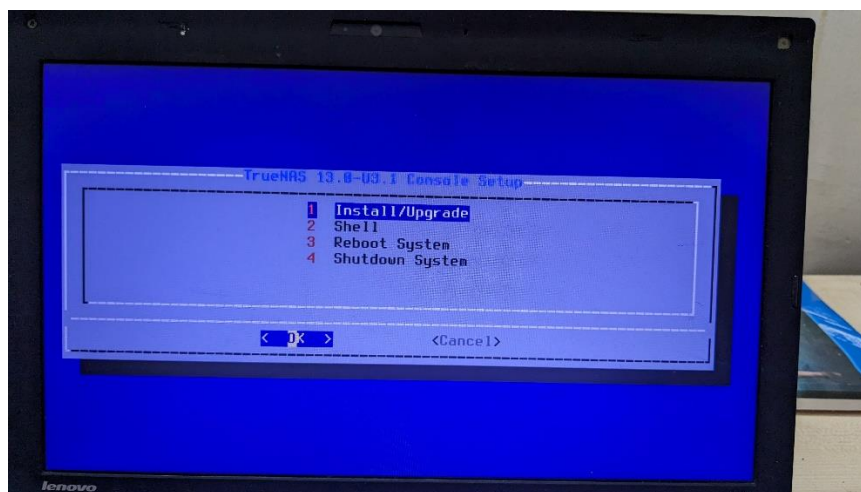**Fig. 10.1 BIOS Configuration**

- **NAS Software Setup:** Install and configure the NAS software (for example TrueNAS) according to the documentation and your preferences. Make sure you have a pen drive to store that software for a while. Insert the pen drive into the target PC and boot NAS software into the PC and make sure that the ethernet cable is connected to the laptop during the entire procedure as it will allot an IP address of the current network to the NAS server.

Fig. 10.2 NAS Software Setup

- **Installation of NAS and its Configuration:** Ensure your laptop and NAS is connected to the home network, either through Ethernet or Wi-Fi, and set up the appropriate IP addresses and network settings. This can be seen in **[Fig. 8.2]** that laptop and NAS are both connected to the home network. This step includes the installation of the NAS on the PC. Installation takes place in the boot loader section of the PC where we need to select under the console section Install/Upgrade after selecting installation will take place, it will take up to 5-10 minutes for installation.

Fig. 10.3 NAS Installation

- **Storage Configuration:** Set up your external hard drive(s) as part of the NAS storage pool, if applicable, and configure the file-sharing protocols (e.g., Samba or NFS). This step is optional if you want larger storage, you can add external storage or hard drive to your laptop but for this project, we have internal 1TB of storage which is available and free to use as NAS. While installing, a warning will appear which says to clean all

previous data inside the laptop, select yes to make the installation successful (but it will erase all previous data inside the laptop).
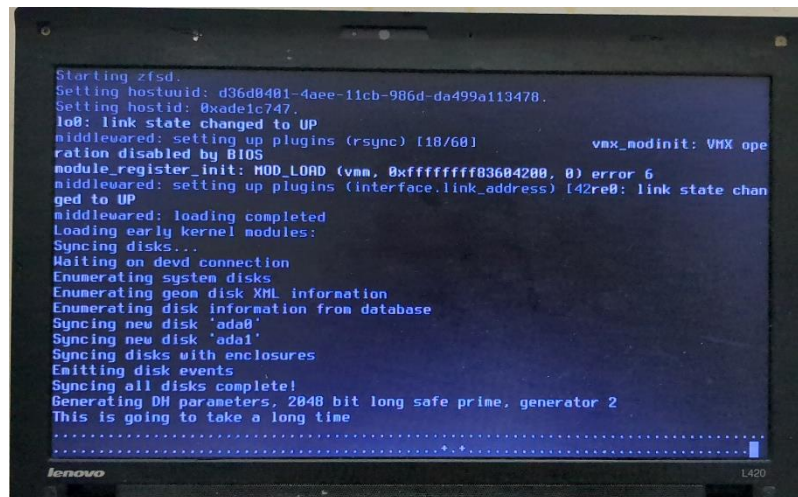

Fig. 10.4 Storage Configuration
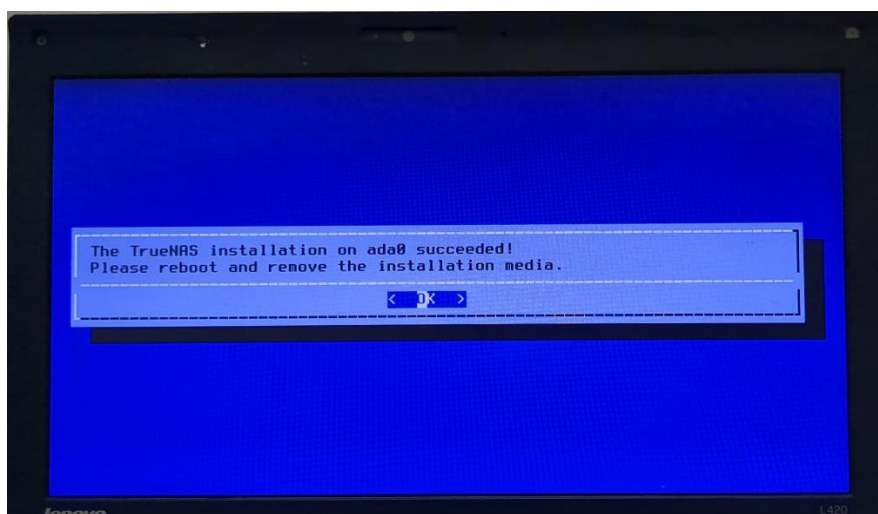
Fig. 10.5 Confirmation

- **NAS:** After installing NAS software, the home page will appear which shows several options on the screen. Select the Kernel option to sync all the disks inside the laptop including external storage too. After syncing all the disks NAS will generate the DH parameter which is going to take up to 5-10 minutes.

Fig.10.6 Booting

- **Console:** Once installation is done, you can see your console setup options such as
    - Configure Network Interfaces
    - Configure Link Aggregation
    - Configure VLAN Interface
    - Configure Default Route
    - Configure Static Routes
    - Configure DNS
    - Reset the Root Password
    - Reset Configuration to Defaults
    - Shell
    - Reboot
    - Shut Down
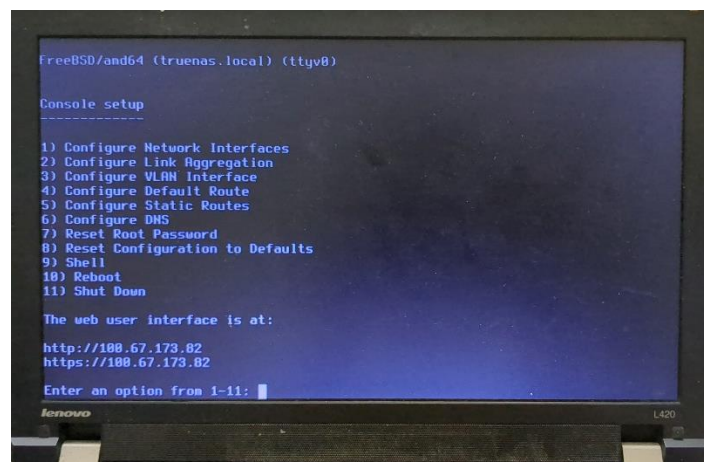
Fig. 10.7 Final Console

10.2 Remote Access

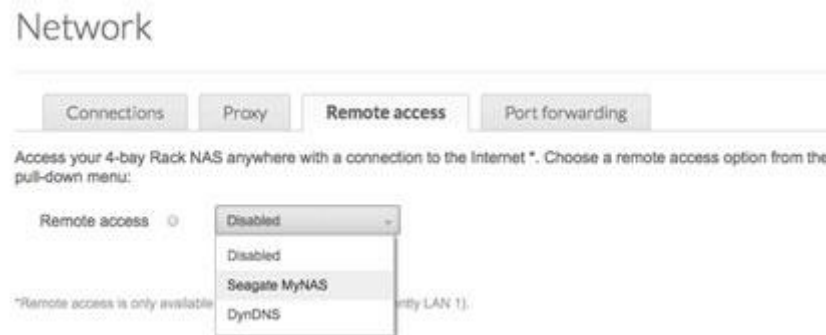If you want remote access to your NAS, configure port forwarding on your router or use a VPN for secure access.

Set up NAS remote access:

- Go to NAS OS > Network > Remote access.
- In the Remote access drop-down menu, choose Seagate MyNAS.

Fig. 10.8 Remote access

- Type a name for the NAS OS device in the Name field. The name should be different from the NAS OS device's network name.
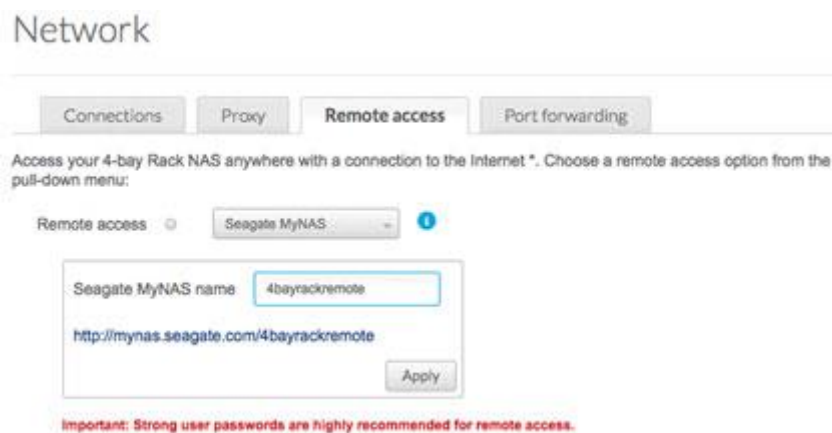
Fig. 10.9 Remote access configuration

- Choose Apply, NAS OS will query the MyNAS server to see if the name is available. If so, a message appears confirming the connection.

10.3 Failed connection

If you receive an error that the NAS is unable to connect to the Internet:

- Check if a proxy server is required to access the Internet. Contact your network administrator or Internet provider then review Network for further instructions on how to add your proxy server's address.
- Port forwarding may be required on your router. See the steps below.

10.4 Router issue

If the issue is related to your router, you will need to access its administration page to forward a port (by default, 8080). Once the port is opened for the NAS, MyNAS can gain access to it anywhere with a connection to the Internet. From the router's administration page, select its port forwarding tab to assign a port to the NAS. Refer to your router's documentation for details.

Once a port has been selected on your router, you must assign the port on the NAS:

- Go to NAS OS > Network > Remote access.
- Pass the cursor next to the Name field to enable the edit pull-down menu.
- Choose Advanced settings.
- In the dialogue window, choose Manual.
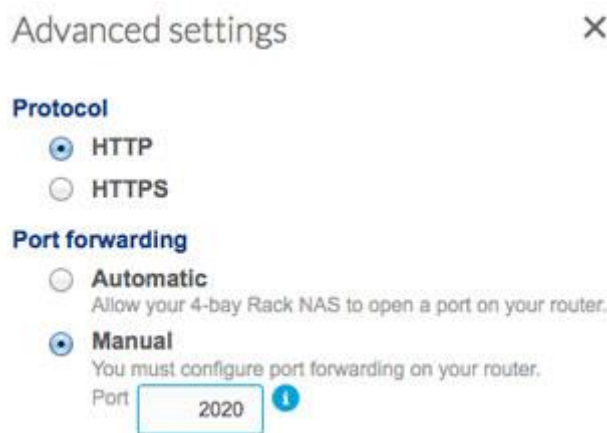
Fig. 10.10 Router Settings

- Type the port you forwarded on your router.
- Choose Apply.

10.5 Using MyNAS remote access

- Once MyNAS is configured, type your NAS's URL into any browser: http://mynas.seagate.com/name.
- The name is the name selected on the remote access page and not the NAS's network name.
- After you input the URL, you will be asked to log in to NAS OS. Note that this username and password are the credentials created by the administrator in NAS OS > Users.
- Once logged in, you will be able to access NAS OS to administer your NAS (if you have administrative privileges) and the File Browser. The File Browser lets you upload, download, and stream many types of multimedia files such as MP3.

10.6 Port Forwarding

Port forwarding is a way of making your router use a specific port to communicate with certain devices. By setting a specific port for your devices, you are telling your router to always accept requests for those ports and forward data to a device's private IP address.

To understand port forwarding, it helps to understand a little about how routers work first. Your router's job is to transmit an internet signal to all your devices over a local area network (LAN). To do this, your router assigns each device in your LAN its local IP address. For example, your computer will have a private IP address like 192.168.0.2 or 10.0.2.

Then, on top of that, the applications and services on each device are also assigned a port number. For example, an application on your computer will have an IP address with a port number attached like 192.168.0.2:80 or 10.0.0.2:80.

With this unique IP address and port number, your router knows which program or service to send information to. This lets you and others access devices and programs on your LAN over a wide area network (WAN).

10.7 How to Port Forward

To forward ports on your router, log into your router and go to the port forwarding section. Next, enter the port numbers and your device's IP address. Choose a forwarding protocol and save your changes.

Note: If you don't see a port forwarding option in your router's settings, you might have to upgrade. Check out our list of the best Wifi routers here to find one that works for you.

- Open a web browser, you can use Chrome, Firefox, Safari, or any browser you want.
- Then type your router's IP address into the address bar. If you don't know this information, check out this guide for how to find your router's IP address on a Mac or Windows 10 computer. It should be a series of numbers like 192. 168. X.X or 10.0.X.X. Also, make sure to take note of your computer's IP Address because you might need this information later.

- Next, enter your router's username and password.
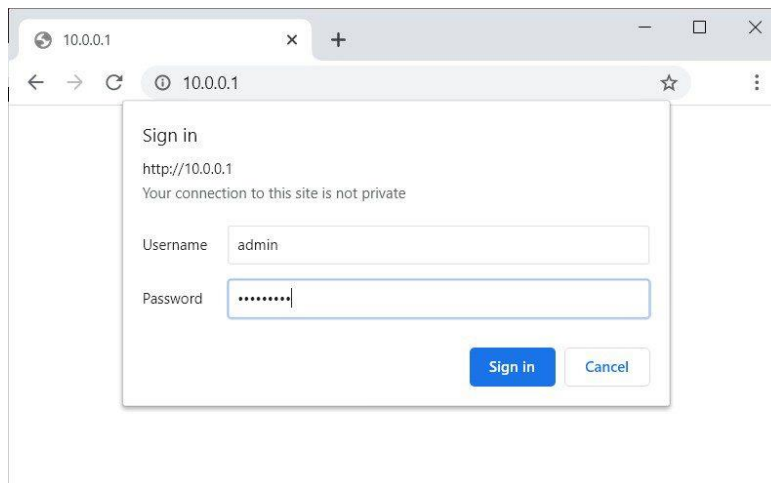
Fig. 10.11 Username and password

- Then go to the port forwarding settings on your router. The exact steps to get to the correct settings will vary depending on which router you have. In most cases, you will have to go to the Advanced tab and look for NAT, Security, Gaming, Advanced Setup, Firewall, or Virtual Servers.

- Next, create a new port forwarding rule. Some routers require you to click Add New, Add Custom Service, or something similar.
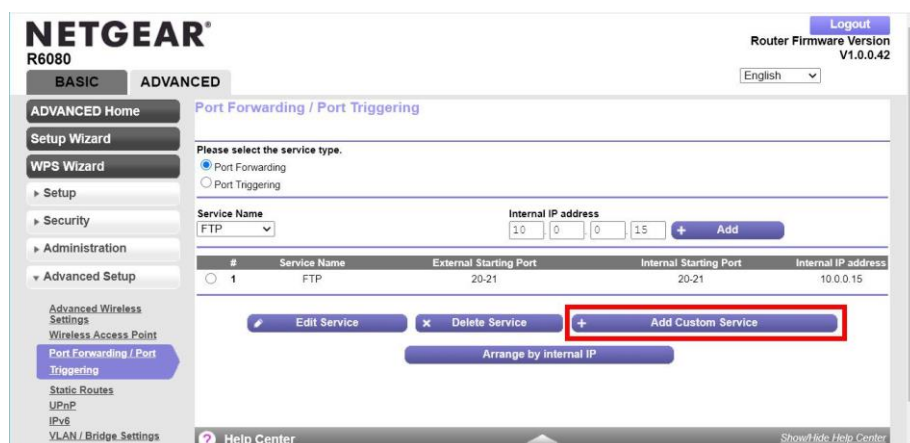
Fig. 10.12 Remote access UI

- Then enter a name for the service or application. You can give this any name you want. It is recommended that you use one that lets you identify the rule you've created.

- Next, type in the port number you want to use. Most routers let you select a port range separated by hyphens or multiple ports separated by commas. In most cases, it's easiest to set the same internal and external port numbers. You can choose a number between

0 to 65,535, but only ports 0 to 1023 are reserved for privileged services and are designated as well-known ports.

- Then select a port forwarding protocol. You will typically see the option to set your service type to TCP, UDP, TCP/UDP, Both, or All. Which one you choose will depend on the type of connection that is recommended to use for the specific application. However, you usually want to select the TCP/UDP option, Both, or All.

- Next, type in your computer's IP address. Most routers provide fields where you can enter the IP address of your device. Some routers let you choose a device instead of typing in the device's IP address.

- Finally, save your settings. Most of the time, you will be able to click on buttons that say Save or Apply. Other routers require you to click on Enable before you can hit on Save.

Fig. 10.13 Selecting features

10.7 Wake on LAN (WOL)

Wake-on-LAN (WOL) is a network technology that allows a computer or device to be remotely powered on or "woken up" from a sleeping or powered-off state using a special network packet. This feature is particularly useful for managing remote computers without physically accessing them.

Here's how Wake-on-LAN works:

- Hardware Support: To use Wake-on-LAN, the target computer's network interface card (NIC) or its motherboard must support this feature. Most modern computers and network cards do support WOL.

- Magic Packet: The "magic packet" is a special network packet that contains the MAC address (Media Access Control address) of the target computer. The MAC address is a unique identifier assigned to each network adapter. The magic packet is broadcasted on the local network and triggers the target computer to wake up.

- Sleeping State: The target computer must be in a sleep or low-power state for Wake-on-LAN to work. The sleeping state may be "Standby," "Sleep," or "Hibernate." In some cases, Wake-on-LAN can also work when the computer is completely powered off, but this requires a special feature called "Wake-on-LAN from Power Off" (WOLfPO) or "Wake-on-LAN from S5" support.

- Network Configuration: For Wake-on-LAN to function, the target computer must be connected to a local network, and the network adapter's power management settings must be appropriately configured to allow the adapter to wake up the computer.

- Sending the Magic Packet: To wake up the target computer, a device or software sends the magic packet to the network's broadcast address. The packet is then received by all devices on the local network. The target computer's NIC examines the packet, recognizes its MAC address, and triggers the wake-up process, powering on the computer from its sleep state.

- Security Considerations: Since the magic packet is sent as a broadcast on the local network, it is essential to ensure that Wake-on-LAN is used securely. Implementing Wake-on-LAN across the internet or untrusted networks could potentially pose security risks, so proper network configurations and firewall settings should be applied to limit access to this feature.

Overall, Wake-on-LAN is a convenient and efficient way to remotely manage and access computers without having to physically interact with them, making it a valuable tool for IT administrators and home users alike.

CHAPTER – 11

SERVER SETUP AND TESTING

1. First of all, we have to make a bootable pen drive/flash drive having a server OS, for example, Ubuntu Server OS, Cent OS, Windows Server OS, etc., and boot our old PC laptop using the pen drive and install server OS in it.
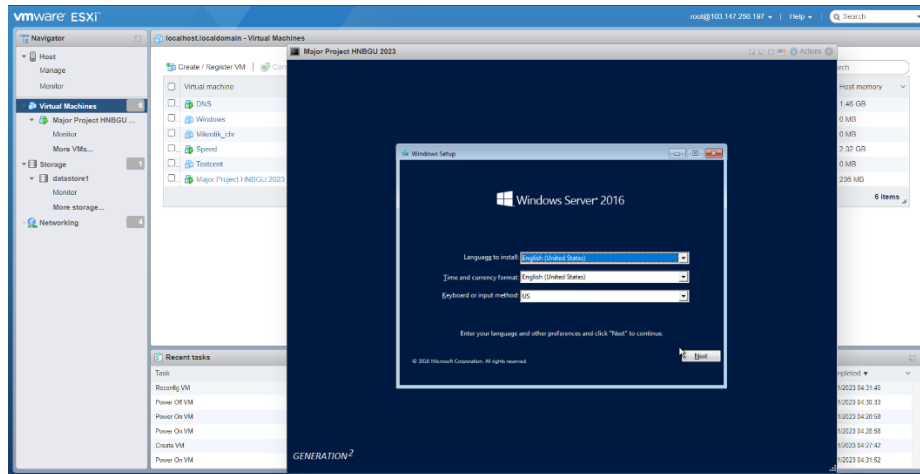
Fig. 11.1 Windows Installed on Server

2. Then after installing Server OS setup ID password as a login credential for server OS.
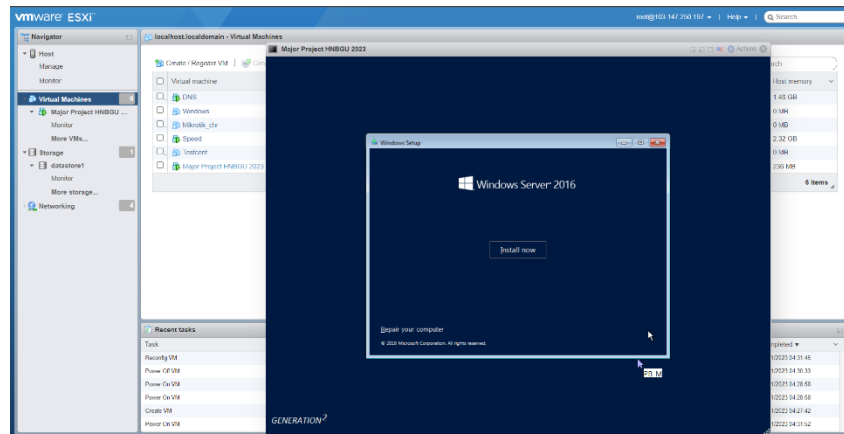
Fig. 11.2 Windows Setup

3. After this, go to network and internet setting → Change adapter setting → ethernet. Then insert static IP address, gateway and DNS address provided by your ISP of the same Network in which your server will reside.
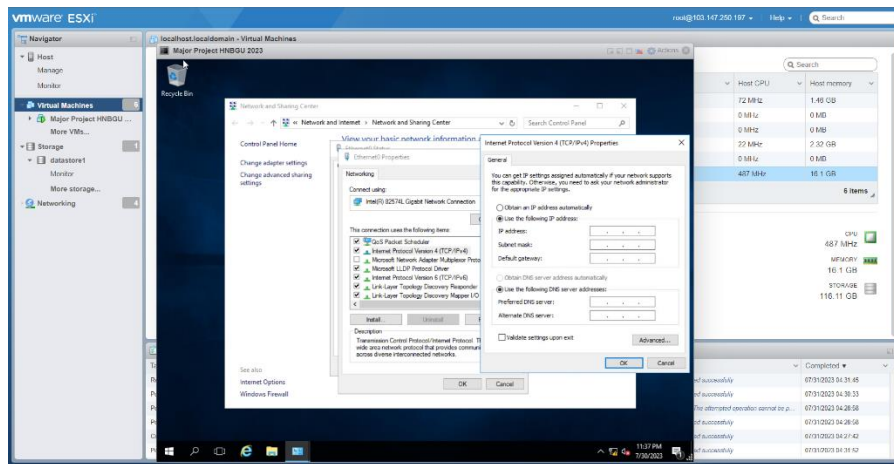
Fig. 11.3 General Information of Windows

4. After allocating IP addresses, reboot your system and then your server will be ready to use.
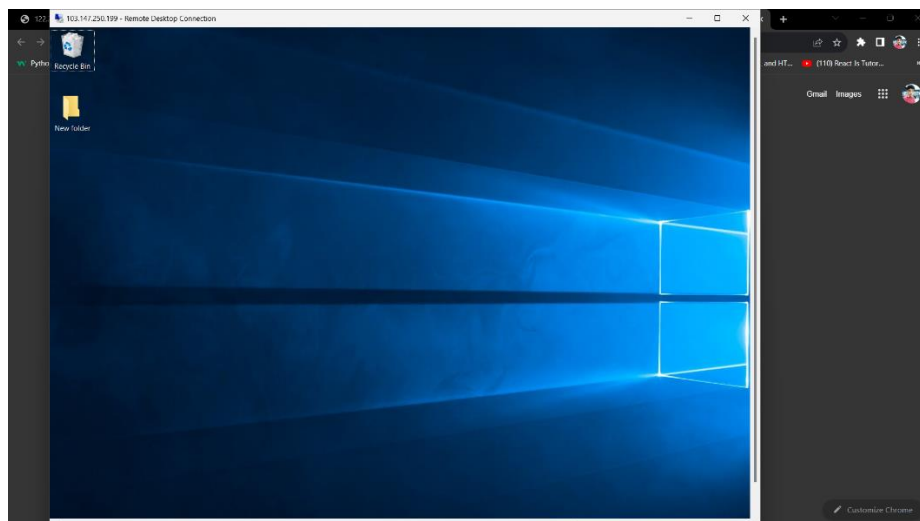
Fig. 11.4 Final window running on server

CHAPTER – 12

WEBSITE DEMO

12.1 Technology Used

Fig.12.1 HTML

- The Hyper Text Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.

- Web browsers receive HTML documents from a web server or local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

- HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes, and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as <img /> and <input /> directly introduce content to the page. Other tags such as <p> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags but use them to interpret the content of the page.

- HTML can embed programs written in a scripting language such as JavaScript, which affects the behavior and content of web pages. The inclusion of CSS defines the look and layout of content. The World Wide Web Consortium (W3C), former maintainer of

the HTML and current maintainer of the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.

Fig. 12.2 CSS

- Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML (including XML dialects such as SVG, MathML or XHTML).CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

- CSS is designed to enable the separation of content and presentation, including layout, colors, and fonts. This separation can improve content accessibility; provide more flexibility and control in the specification of presentation characteristics; enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, which reduces complexity and repetition in the structural content; and enable the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

- Separation of formatting and content also makes it feasible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (via speech-based browser or screen reader), and on Braille-based tactile devices. CSS also has rules for alternate formatting if the content is accessed on a mobile device.

- The name cascading comes from the specified priority scheme to determine which style rule applies if more than one rule matches a particular element. This cascading priority scheme is predictable.

- The CSS specifications are maintained by the World Wide Web Consortium (W3C). Internet media type (MIME type) text/css is registered for use with CSS by RFC 2318 (March 1998). The W3C operates a free CSS validation service for CSS documents.

Fig. 12.3 Java Script

- JavaScript often abbreviated as JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for webpage behavior, often incorporating third-party libraries. All major web browsers have a dedicated JavaScript engine to execute the code on users' devices.
- JavaScript is a high-level, often just-in-time compiled language that conforms to the ECMAScript standard. It has dynamic typing, prototype-based object orientation, and first-class functions. It is a multi-paradigm, supporting event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).
- The ECMAScript standard does not include any input/output (I/O), such as networking, storage, or graphics facilities. In practice, the web browser or other runtime system provides JavaScript APIs for I/O.
- JavaScript engines were originally used only in web browsers, but are now core components of some servers and a variety of applications. The most popular runtime system for this usage is Node.js.
- Although Java and JavaScript are similar in name, syntax, and respective standard libraries, the two languages are distinct and differ greatly in design.

Fig.12.4 Tailwind

Tailwind CSS is an open-source CSS framework. The main feature of this library is that, unlike other CSS frameworks like Bootstrap, it does not provide a series of predefined classes for elements such as buttons or tables. Instead, it creates a list of "utility" CSS classes that can be used to style each element by mixing and matching.

For example, in other traditional systems, there would be a class message warning that would apply a yellow background color and bold text. To achieve this result in Tailwind, one would have to apply a set of classes created by the library: bg-yellow-300 and font-bold. As of 17th May 2023, Tailwind CSS has over 68,400 stars on GitHub.

Features

Due to the difference in basic concepts about other traditional CSS frameworks such as Bootstrap, it is important to know the philosophy from which Tailwind was created, as well as its basic usage.

- Utility Classes: The utility-first concept refers to the main differentiating feature of Tailwind. Instead of creating classes around components (button, panel, menu, textbox, classes are built around a specific style element (yellow color, bold font, very large text, center element. Each of these classes is called utility classes.
- many utility classes in Tailwind CSS enable to control of a large number of CSS properties like colors, border, display type (display), font size and font, layout, shadow...

12.2 Improvement or Evaluation

This project is very useful for people who show interest in DIYs or want a cheap solution to store their data. Anyone can establish a home server by buying an old laptop in working condition and with enough capacity to store large files. Further, he/she can use the method as a business model to provide hosting services for websites or cloud storage.

For this specific project, we decided to create our demo website which looks like a well-known website called **"Hostinger".** Hostinger provides storage as a cloud service, serving websites, virtual private servers, etc.

For users like students, these services can be very costly and cannot be afforded so it is fun to create our homemade server which gives us the same services as Hostinger at a very low cost.

Further details of our demo website are provided on the next page.

12.3 HOSTING WEBSITE FRONT-END DEMO

1. **Navbar:** Under the navbar section, the website contains various navigations to different sections of the webpage with just one click. It also contains a login/register button which directs the user to the login/signup page for registration to our website.

2. **Login/Register:** The login/signup page will ask for some personal information about the current user which we are stored in the database, for this specific project we used MongoDB as a database which will store the user's information also it will help us to know about their needs or specifications of the user.

3. **Payment Gateway:** Users can be eligible to buy services after successful registration, they can easily avail services.
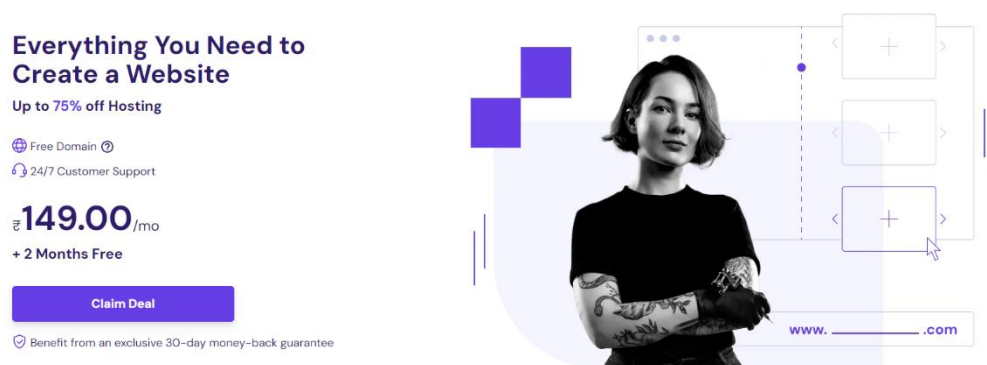
Fig. 12.4 Website Demo

Fig. 12.5 Plans

12.4 WEBSITE CODE

- **Navbar**

```
<style>
    #logo{
        font-weight: 600;
        text-transform: uppercase;
        color: #533a9f;
        font-size 1.2rem;
    }
</style>
<div id="navBar" class="bg-white w-full fixed z-50" style="top:0; margin:0;">
    <nav class="lg:mx-[40px] mx-[20px] lg:h-[88px] h-[62px] bg-white">
        <div class="w-full h-[48px] lg:py-[22px] py-[10px] flex flex-row justify-between">
            <div class="flex flex-row my-auto gap-[20px] items-center pt-2">
                HNBGU Server
                <div class="flex flex-row gap-[5px]">
                    <img src="assets/img/in-2x.webp" alt="IN" class="h-[18px] my-auto lg:block hidden">
                    <span class="font-semibold my-auto lg:block hidden" style="color:#2F1C6A">English</span>
                </div>
            </div>
            <div class="my-auto flex flex-row gap-[20px] items-center">
                <ul class="flex flex-row gap-[30px]">
                    <li class="my-auto lg: block hidden">
                        <a href="#" class="my-auto">
                            <span class="font-normal my-auto" style="color:#000000">WordPress</span>
                        </a>
                    </li>
                    <li class="my-auto">
```

```html
            <a href="#" class="my-auto lg:block hidden">
               <span  class="font-normal  my-auto"  style="color:#000000">Website
Builder</span>
            </a>
         </li>
         <li class="my-auto flex-row gap-[8px] lg:flex hidden">
            <a href="#" class="my-auto">
               <span                class="font-normal                my-auto"
style="color:#000000">Hosting</span>
            </a>
            <svg             data-v-7fc192fd=""             data-v-e6ac469e=""
xmlns="http://www.w3.org/2000/svg"  viewBox="0  0  24  24"  aria-label="arrow-down"
role="presentation" class="h-icon-dark" data-v-4aa81217="" style="width: 24px; height:
24px;"><g data-v-7fc192fd=""><path data-v-7fc192fd="" d="M7.41 8.59L12 13.17L16.59
8.59L18 10L12 16L6 10L7.41 8.59Z"></path></g></svg>
         </li>
         <li class="my-auto lg:flex hidden flex-row gap-[8px]">
            <a href="#" class="my-auto">
               <span                class="font-normal                my-auto"
style="color:#000000">Pro</span>
            </a>
            <svg             data-v-7fc192fd=""             data-v-e6ac469e=""
xmlns="http://www.w3.org/2000/svg"  viewBox="0  0  24  24"  aria-label="arrow-down"
role="presentation" class="h-icon-dark" data-v-4aa81217="" style="width: 24px; height:
24px;"><g data-v-7fc192fd=""><path data-v-7fc192fd="" d="M7.41 8.59L12 13.17L16.59
8.59L18 10L12 16L6 10L7.41 8.59Z"></path></g></svg>
         </li>
         <li class="my-auto lg: block hidden">
            <a href="#" class="my-auto">
               <span                class="font-normal                my-auto"
style="color:#000000">Domains</span>
            </a>
         </li>
      </ul>
```

```
<button class="px-[18px] py-[10px] font-semibold hover:scale-[1.02]
hover:duration-300 lg:block hidden" style="border:2px solid #2F1C6A; border-
radius:5px;"><a href="./user-registration/login.html">Login/Register</a></button>

<svg id="hamburger" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 24
24" aria-label="burger" role="presentation" class="pt-2 lg:hidden block h-nav__mobile-menu-
burger h-icon-dark" style="width: 34px; height: 34px;"><g data-v-165629f9=""><path data-
v-165629f9="" d="M2 5V7H22V5H2ZM2 11V13H22V11H2ZM2
17V19H22V17H2Z"></path></g></svg>

</div>

<div id="mobileMenu" class="mobile-menu fixed top-16 left-0 w-full h-full bg-
white z-40 pt-5">

<ul class="text-center">

<li class="py-2">

<div class="mx-[20px] flex flex-row justify-between">

<a href="#"><span style="color:#2F1C6A;" class="font-semibold text-
xl">WordPress</span></a>

<svg data-v-7fc192fd="" data-v-3bed47a8=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 20 20" style="width: 20px; height:
20px;"><path fill="#2F1C6A" fill-rule="evenodd" clip-rule="evenodd" d="m2.18 11.103-
.018-.11c-.157-.789-.165-5.1-.162-6.747.001-.392.228-.745.581-.908L9.582.092a.993.993 0
0 1 .836 0l7 3.246a1 1 0 0 1 .581.908c.004 1.647-.002 5.958-.153 6.747l-.018.11c-.995 5.355-
4.638 7.763-7.517 8.843l-.008.003a.897.897 0 0 1-.605-.003c-2.88-1.08-6.514-3.479-7.518-
8.843Zm14.19-.374-.02.113c-.844 4.513-3.81 6.601-6.346 7.604-2.534-1.002-5.493-3.082-
6.346-7.605l-.02-.118-.005-.026v-.001l-.008-.065a5.636 5.636 0 0 1-.02-.205 19.219 19.219 0
0 1-.036-.653 72.81 72.81 0 0 1-.048-1.855C3.503 6.715 3.5 5.428 3.5 4.576L10 1.563l6.5
3.013c0 .852-.002 2.14-.02 3.343-.01.686-.024 1.336-.045 1.858-.01.261-.022.482-
.035.655a5.763 5.763 0 0 1-.018.207l-.009.07-.004.02Zm-1.824-2.132a.758.758 0 0 0 0-
1.07.75.75 0 0 0-1.064 0l-3.984 4.001-1.976-1.985a.75.75 0 0 0-1.064 0 .758.758 0 0 0 0
1.07l2.508 2.519a.75.75 0 0 0 1.065 0l4.515-4.535Z"></path></g></svg>

</div>

</li>

<li class="py-2">

<div class="mx-[20px] flex flex-row justify-between">

<a href="#"><span style="color:#2F1C6A;" class="font-semibold text-
xl">Website Builder</span></a>

<svg data-v-7fc192fd="" data-v-3bed47a8=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 20 20" style="width: 20px; height:
20px;"><path fill="#2F1C6A" fill-rule="evenodd" clip-rule="evenodd" d="m2.18 11.103-
.018-.11c-.157-.789-.165-5.1-.162-6.747.001-.392.228-.745.581-.908L9.582.092a.993.993 0
```

0 1 .836 0l7 3.246a1 1 0 0 1 .581.908c.004 1.647-.002 5.958-.153 6.747l-.018.11c-.995 5.355-4.638 7.763-7.517 8.843l-.008.003a.897.897 0 0 1-.605-.003c-2.88-1.08-6.514-3.479-7.518-8.843Zm14.19-.374-.02.113c-.844 4.513-3.81 6.601-6.346 7.604-2.534-1.002-5.493-3.082-6.346-7.605l-.02-.118-.005-.026v-.001l-.008-.065a5.636 5.636 0 0 1-.02-.205 19.219 19.219 0 0 1-.036-.653 72.81 72.81 0 0 1-.048-1.855C3.503 6.715 3.5 5.428 3.5 4.576L10 1.563l6.5 3.013c0 .852-.002 2.14-.02 3.343-.01.686-.024 1.336-.045 1.858-.01.261-.022.482-.035.655a5.763 5.763 0 0 1-.018.207l-.009.07-.004.02Zm-1.824-2.132a.758.758 0 0 0 0-1.07.75.75 0 0 0-1.064 0l-3.984 4.001-1.976-1.985a.75.75 0 0 0-1.064 0 .758.758 0 0 0 0 1.07l2.508 2.519a.75.75 0 0 0 1.065 0l4.515-4.535Z"></path></g></svg>

        </div>

      <li class="py-2">

        <div class="mx-[20px] flex flex-row justify-between">

          Premium Hosting

          <svg data-v-7fc192fd="" data-v-3bed47a8="" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 20 20" style="width: 20px; height: 20px;"><path fill="#2F1C6A" fill-rule="evenodd" clip-rule="evenodd" d="m2.18 11.103-.018-.11c-.157-.789-.165-5.1-.162-6.747.001-.392.228-.745.581-.908L9.582.092a.993.993 0 0 1 .836 0l7 3.246a1 1 0 0 1 .581.908c.004 1.647-.002 5.958-.153 6.747l-.018.11c-.995 5.355-4.638 7.763-7.517 8.843l-.008.003a.897.897 0 0 1-.605-.003c-2.88-1.08-6.514-3.479-7.518-8.843Zm14.19-.374-.02.113c-.844 4.513-3.81 6.601-6.346 7.604-2.534-1.002-5.493-3.082-6.346-7.605l-.02-.118-.005-.026v-.001l-.008-.065a5.636 5.636 0 0 1-.02-.205 19.219 19.219 0 0 1-.036-.653 72.81 72.81 0 0 1-.048-1.855C3.503 6.715 3.5 5.428 3.5 4.576L10 1.563l6.5 3.013c0 .852-.002 2.14-.02 3.343-.01.686-.024 1.336-.045 1.858-.01.261-.022.482-.035.655a5.763 5.763 0 0 1-.018.207l-.009.07-.004.02Zm-1.824-2.132a.758.758 0 0 0 0-1.07.75.75 0 0 0-1.064 0l-3.984 4.001-1.976-1.985a.75.75 0 0 0-1.064 0 .758.758 0 0 0 0 1.07l2.508 2.519a.75.75 0 0 0 1.065 0l4.515-4.535Z"></path></g></svg>

        </div>

      <li class="py-2">

        <div class="mx-[20px] flex flex-row justify-between">

          Pro Features

          <svg data-v-7fc192fd="" data-v-3bed47a8="" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 20 20" style="width: 20px; height: 20px;"><path fill="#2F1C6A" fill-rule="evenodd" clip-rule="evenodd" d="m2.18 11.103-.018-.11c-.157-.789-.165-5.1-.162-6.747.001-.392.228-.745.581-.908L9.582.092a.993.993 0 0 1 .836 0l7 3.246a1 1 0 0 1 .581.908c.004 1.647-.002 5.958-.153 6.747l-.018.11c-.995 5.355-4.638 7.763-7.517 8.843l-.008.003a.897.897 0 0 1-.605-.003c-2.88-1.08-6.514-3.479-7.518-

8.843Zm14.19-.374-.02.113c-.844 4.513-3.81 6.601-6.346 7.604-2.534-1.002-5.493-3.082-6.346-7.605l-.02-.118-.005-.026v-.001l-.008-.065a5.636 5.636 0 0 1-.02-.205 19.219 19.219 0 0 1-.036-.653 72.81 72.81 0 0 1-.048-1.855C3.503 6.715 3.5 5.428 3.5 4.576L10 1.563l6.5 3.013c0 .852-.002 2.14-.02 3.343-.01.686-.024 1.336-.045 1.858-.01.261-.022.482-.035.655a5.763 5.763 0 0 1-.018.207l-.009.07-.004.02Zm-1.824-2.132a.758.758 0 0 0 0-1.07.75.75 0 0 0-1.064 0l-3.984 4.001-1.976-1.985a.75.75 0 0 0-1.064 0 .758.758 0 0 0 0 1.07l2.508 2.519a.75.75 0 0 0 1.065 0l4.515-4.535Z"></path></g></svg>

                                                            </div>

<li class="py-2">

<div class="mx-[20px] flex flex-row justify-between">

Free Domains

<svg data-v-7fc192fd="" data-v-3bed47a8="" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 20 20" style="width: 20px; height: 20px;"><path fill="#2F1C6A" fill-rule="evenodd" clip-rule="evenodd" d="m2.18 11.103-.018-.11c-.157-.789-.165-5.1-.162-6.747.001-.392.228-.745.581-.908L9.582.092a.993.993 0 0 1 .836 0l7 3.246a1 1 0 0 1 .581.908c.004 1.647-.002 5.958-.153 6.747l-.018.11c-.995 5.355-4.638 7.763-7.517 8.843l-.008.003a.897.897 0 0 1-.605-.003c-2.88-1.08-6.514-3.479-7.518-8.843Zm14.19-.374-.02.113c-.844 4.513-3.81 6.601-6.346 7.604-2.534-1.002-5.493-3.082-6.346-7.605l-.02-.118-.005-.026v-.001l-.008-.065a5.636 5.636 0 0 1-.02-.205 19.219 19.219 0 0 1-.036-.653 72.81 72.81 0 0 1-.048-1.855C3.503 6.715 3.5 5.428 3.5 4.576L10 1.563l6.5 3.013c0 .852-.002 2.14-.02 3.343-.01.686-.024 1.336-.045 1.858-.01.261-.022.482-.035.655a5.763 5.763 0 0 1-.018.207l-.009.07-.004.02Zm-1.824-2.132a.758.758 0 0 0 0-1.07.75.75 0 0 0-1.064 0l-3.984 4.001-1.976-1.985a.75.75 0 0 0-1.064 0 .758.758 0 0 0 0 1.07l2.508 2.519a.75.75 0 0 0 1.065 0l4.515-4.535Z"></path></g></svg>

</div>

<button class="fixed bottom-8 left-4 right-4 font-semibold py-3 mt-5 w-auto drop-shadow-lg" style="color:rgb(103,61,230); font-size:17px; border:2px solid rgb(103,61,230); border-radius:5px;">

Login to Client Area

</button>

</div>

<script>

document.getElementById('hamburger').addEventListener('click', function() {

```
                    const mobileMenu = document.getElementById('mobileMenu');

                    mobileMenu.classList.toggle('mobile-menu-open');

                });

        </script>

    </div>

</nav></div>
```

- **Script and style for drop down shadow**

```
<script>

                    window.addEventListener('scroll', function() {

            var navBar = document.getElementById('navBar');

            if (window.pageYOffset > 0) {

             navBar.classList.add('shadow');

            } else {

                    navBar.classList.remove('shadow');

            }

        });

    </script>
```

- **Plans and Configuration**

```
<div class="flex flex-col gap-[7px]">

                    <h1 class="font-semibold text-2xl" style="color:#2F1C6A">Premium
Web Hosting</h1>

                    <span style="color:#2F1C6A;" class="text-sm">Perfect package for
personal portfolio <br>websites</span>

                </div>

                <div class="flex flex-col gap-[14px] mx-auto">

                    <div>
```

```
                    <span          style="color:#727586;"          class="text-md"><s>₹
589.00</s></span>

                    <span    class="rounded-full    py-1    px-2    text-md    font-semibold"
style="color:#673DE6; background-color:#EBE4FF;">SAVE 75%</span>

                </div>

                <div class="flex flex-row mx-auto">

                <span class="font-normal text-xl" style="color:#2F1C6A;">₹</span>

                <span                     class="font-bold                    text-5xl"
style="color:#2F1C6A;">149.00</span>

                <span                    class="font-normal                    text-xl"
style="color:#2F1C6A;">/mo</span>

                </div>

                <h2  class="font-semibold"  style="color:#673DE6;  font-size:20px;">+  3
Months Free</h2>

                <button     class="font-semibold     py-3     w-full     drop-shadow-lg"
style="color:#ffffff; font-size:17px; background-color:#673DE6; border-radius:5px;">

                Add to cart

                </button>

                <span    class="text-center    text-md"    style="color:#727586;    font-
size:14px;">₹249.00/mo when you renew</span>

            </div>

            <div    style="background-color:#D5DFFF"    class="h-[3px]    w-full    mx-
auto"></div>

            <div class="flex flex-col gap-[14px]">

            <h1    class="font-semibold    text-left"    style="color:#2F1C6A;    font-
size:17px;">Top feature comparison</h1>

            <div class="flex flex-col gap-[8px]">

            <div class="flex flex-row justify-between">

            <div class="flex flex-row gap-[5px]">

                <svg             data-v-7fc192fd=""            data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-
.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0
.382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>
```
54

```
                              <span        style="color:#2F1C6A;"        class="text-sm"><span
class="text-sm font-semibold">100</span> Websites</span>

                       </div>

                       <svg           data-v-7fc192fd=""           data-v-3bed47a8=""
xmlns="http://www.w3.org/2000/svg"    viewBox="0    0    24    24"    aria-label="help"
role="presentation"    style="width: 20px; height: 24px;"><path fill="#2F1C6A" d="M12
2C6.489 2 2 6.489 2 12C2 17.511 6.489 22 12 22C17.511 22 22 17.511 22 12C22 6.489 17.511
2 12 2ZM12 4C16.4301 4 20 7.56988 20 12C20 16.4301 16.4301 20 12 20C7.56988 20 4
16.4301 4 12C4 7.56988 7.56988 4 12 4ZM12 6C9.79 6 8 7.79 8 10H10C10 8.9 10.9 8 12
8C13.1 8 14 8.9 14 10C14 12 11 12.367 11 15H13C13 13.349 16 12.5 16 10C16 7.79 14.21 6
12 6ZM11 16V18H13V16H11Z"></path></g></svg>

                       </div>

                       <div class="flex flex-row justify-between">

                       <div class="flex flex-row gap-[5px]">

                              <svg           data-v-7fc192fd=""           data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-
.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0
.382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>

                              <span         style="color:#2F1C6A;"         class="text-sm"><span
class="text-sm font-semibold">Unlimited</span> Bandwidth</span>

                       </div>

                       <svg           data-v-7fc192fd=""           data-v-3bed47a8=""
xmlns="http://www.w3.org/2000/svg"    viewBox="0    0    24    24"    aria-label="help"
role="presentation"    style="width: 20px; height: 24px;"><path fill="#2F1C6A" d="M12
2C6.489 2 2 6.489 2 12C2 17.511 6.489 22 12 22C17.511 22 22 17.511 22 12C22 6.489 17.511
2 12 2ZM12 4C16.4301 4 20 7.56988 20 12C20 16.4301 16.4301 20 12 20C7.56988 20 4
16.4301 4 12C4 7.56988 7.56988 4 12 4ZM12 6C9.79 6 8 7.79 8 10H10C10 8.9 10.9 8 12
8C13.1 8 14 8.9 14 10C14 12 11 12.367 11 15H13C13 13.349 16 12.5 16 10C16 7.79 14.21 6
12 6ZM11 16V18H13V16H11Z"></path></g></svg>

                       </div>

                       <div class="flex flex-row justify-between">

                       <div class="flex flex-row gap-[5px]">

                              <svg           data-v-7fc192fd=""           data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
```
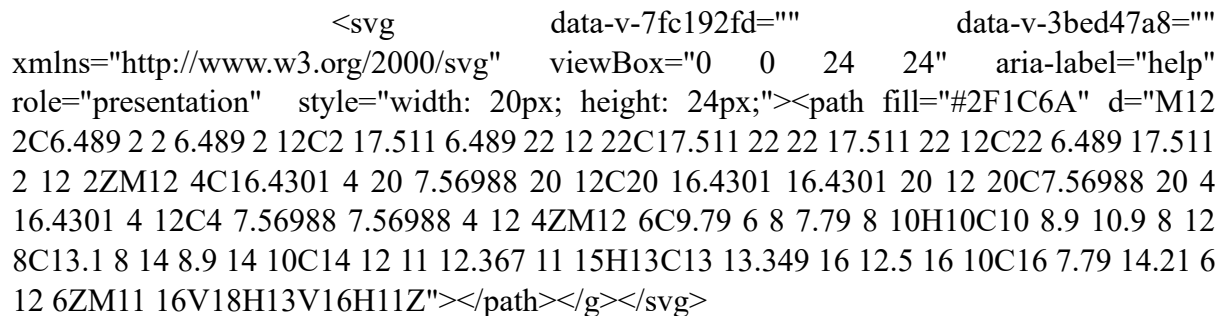
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0 .382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>
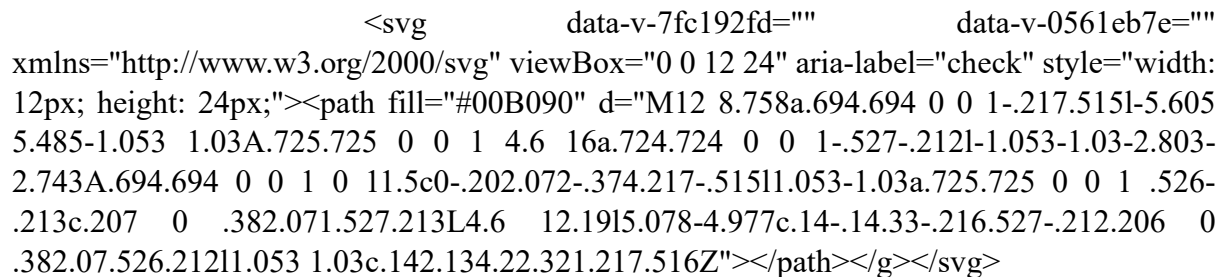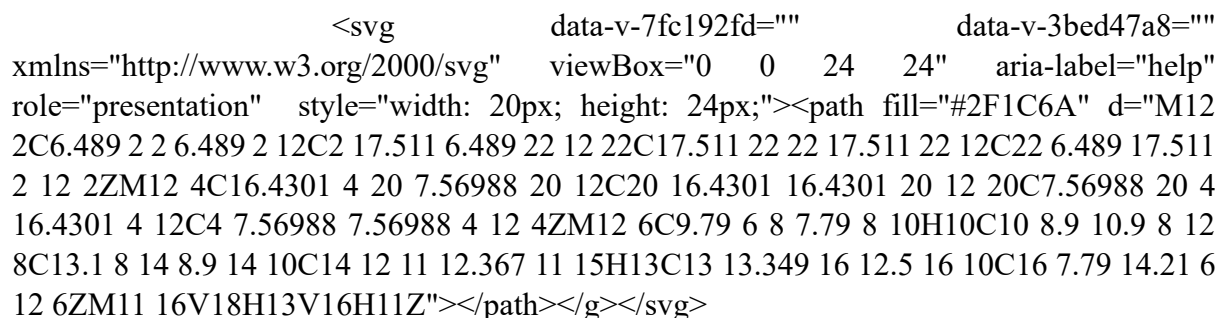
200 GB SSD Storage

</div>

</div>

<div class="flex flex-row justify-between">

<div class="flex flex-row gap-[5px]">

<svg data-v-7fc192fd="" data-v-0561eb7e="" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width: 12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605 5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0 .382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>

Free Domain (₹699.00 value)

</div>

<svg data-v-7fc192fd="" data-v-3bed47a8="" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 24 24" aria-label="help" role="presentation" style="width: 20px; height: 24px;"><path fill="#2F1C6A" d="M12 2C6.489 2 2 6.489 2 12C2 17.511 6.489 22 12 22C17.511 22 22 17.511 22 12C22 6.489 17.511 2 12 2ZM12 4C16.4301 4 20 7.56988 20 12C20 16.4301 16.4301 20 12 20C7.56988 20 4 16.4301 4 12C4 7.56988 7.56988 4 12 4ZM12 6C9.79 6 8 7.79 8 10H10C10 8.9 10.9 8 12 8C13.1 8 14 8.9 14 10C14 12 11 12.367 11 15H13C13 13.349 16 12.5 16 10C16 7.79 14.21 6 12 6ZM11 16V18H13V16H11Z"></path></g></svg>

</div>

<div class="flex flex-row justify-between">

<div class="flex flex-row gap-[5px]">

<svg data-v-7fc192fd="" data-v-0561eb7e="" xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width: 12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605 5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0 .382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>

Unlimited Free SSL

```
</div>
        <svg                data-v-7fc192fd=""                data-v-3bed47a8=""
xmlns="http://www.w3.org/2000/svg"    viewBox="0    0    24    24"   aria-label="help"
role="presentation"   style="width: 20px; height: 24px;"><path fill="#2F1C6A" d="M12
2C6.489 2 2 6.489 2 12C2 17.511 6.489 22 12 22C17.511 22 22 17.511 22 12C22 6.489 17.511
2 12 2ZM12 4C16.4301 4 20 7.56988 20 12C20 16.4301 16.4301 20 12 20C7.56988 20 4
16.4301 4 12C4 7.56988 7.56988 4 12 4ZM12 6C9.79 6 8 7.79 8 10H10C10 8.9 10.9 8 12
8C13.1 8 14 8.9 14 10C14 12 11 12.367 11 15H13C13 13.349 16 12.5 16 10C16 7.79 14.21 6
12 6ZM11 16V18H13V16H11Z"></path></g></svg>
      </div>
      <div class="flex flex-row justify-between">
        <div class="flex flex-row gap-[5px]">
          <svg                data-v-7fc192fd=""                data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-
.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0
.382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>
          <span       style="color:#2F1C6A;"       class="text-sm"><span
class="text-sm font-semibold">Daily</span> Backups (₹1,380.00 value)</span>
        </div>
        <svg                data-v-7fc192fd=""                data-v-3bed47a8=""
xmlns="http://www.w3.org/2000/svg"    viewBox="0    0    24    24"   aria-label="help"
role="presentation"   style="width: 20px; height: 24px;"><path fill="#2F1C6A" d="M12
2C6.489 2 2 6.489 2 12C2 17.511 6.489 22 12 22C17.511 22 22 17.511 22 12C22 6.489 17.511
2 12 2ZM12 4C16.4301 4 20 7.56988 20 12C20 16.4301 16.4301 20 12 20C7.56988 20 4
16.4301 4 12C4 7.56988 7.56988 4 12 4ZM12 6C9.79 6 8 7.79 8 10H10C10 8.9 10.9 8 12
8C13.1 8 14 8.9 14 10C14 12 11 12.367 11 15H13C13 13.349 16 12.5 16 10C16 7.79 14.21 6
12 6ZM11 16V18H13V16H11Z"></path></g></svg>
      </div>
    </div>
  </div>
  <div class="flex flex-col gap-[14px]">
    <h1   class="font-semibold   text-left"   style="color:#2F1C6A;   font-
size:17px;">Performance</h1>
    <div class="flex flex-col gap-[8px]">
      <div class="flex flex-row justify-between">
```

```html
<div class="flex flex-row gap-[5px]">

    <svg data-v-7fc192fd="" data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-
.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0
.382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>

        <span style="color:#2F1C6A;" class="text-sm"><span
class="text-sm font-semibold">1,50 GB</span> RAM</span>

    </div>

  </div>

  <div class="flex flex-row justify-between">

    <div class="flex flex-row gap-[5px]">

    <svg data-v-7fc192fd="" data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-
.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0
.382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>

        <span style="color:#2F1C6A;" class="text-sm"><span
class="text-sm font-semibold">2 CPU</span> Cores</span>

    </div>

  </div>

  <div class="flex flex-row justify-between">

    <div class="flex flex-row gap-[5px]">

    <svg data-v-7fc192fd="" data-v-0561eb7e=""
xmlns="http://www.w3.org/2000/svg" viewBox="0 0 12 24" aria-label="check" style="width:
12px; height: 24px;"><path fill="#00B090" d="M12 8.758a.694.694 0 0 1-.217.515l-5.605
5.485-1.053 1.03A.725.725 0 0 1 4.6 16a.724.724 0 0 1-.527-.212l-1.053-1.03-2.803-
2.743A.694.694 0 0 1 0 11.5c0-.202.072-.374.217-.515l1.053-1.03a.725.725 0 0 1 .526-
.213c.207 0 .382.071.527.213L4.6 12.19l5.078-4.977c.14-.14.33-.216.527-.212.206 0
.382.07.526.212l1.053 1.03c.142.134.22.321.217.516Z"></path></g></svg>

        <span style="color:#2F1C6A;" class="text-sm"><span
class="text-sm font-semibold">Dedicated</span> Resources</span>

    </div>

  </div>
```

```html
<div class="flex flex-row justify-between">
    <div class="flex flex-row gap-[5px]">
        <span style="color:#2F1C6A;" class="text-sm"><span class="text-sm font-semibold">Dedicated</span> IP Address</span>
    </div>
</div>
```

CONCLUSION

The report has shed light on a compelling and innovative approach to e-waste management, specifically focusing on reusing old laptops and computers by transforming them into homemade servers using NAS (Network-Attached Storage) software. This eco-friendly and cost-effective solution offers immense potential in addressing the growing problem of electronic waste while simultaneously creating practical and resourceful home server solutions.

Throughout this study, we have explored the environmental impact of e-waste, emphasizing the urgent need for sustainable practices to combat e-waste generation. By repurposing old laptops and computers, we can significantly extend their lifespan, reduce the burden on landfills, and minimize the extraction of valuable raw materials, contributing positively to environmental preservation.

The concept of converting obsolete devices into functional home servers using NAS software showcases the power of technological ingenuity. This approach enables individuals and small businesses to leverage their existing electronic assets, giving them a second life and promoting a culture of responsible consumption.

Moreover, the homemade server solution offers several advantages, such as cost-effectiveness, customization options, and data privacy control. By reusing old laptops and computers for personal data storage and networking needs, individuals can not only save money but also enjoy the satisfaction of contributing to the sustainable management of e-waste.

To realize the full potential of this approach, collaboration among various stakeholders is essential. Governments can play a significant role in promoting policies that incentivize e-waste recycling and encourage the adoption of sustainable practices like homemade servers. Tech companies and software developers can contribute by designing user-friendly NAS software and providing support for repurposing old devices.

Finally, embracing the concept of transforming old laptops and computers into homemade servers through NAS software aligns perfectly with the principles of circular economy and responsible electronic waste management. By taking advantage of existing technology and resources, we can move towards a more sustainable and environmentally conscious future. It is our collective responsibility to encourage, support, and implement such initiatives that not only benefit our personal needs but also safeguard the planet for generations to come. Together, let us embark on a journey to turn e-waste into an opportunity for innovation, conservation, and positive change.

FUTURE SCOPE

1. **Technological Advancements:** As technology continues to evolve, we can expect even more efficient and user-friendly NAS software, making it easier for individuals and small businesses to set up and manage their homemade servers. Advancements in hardware components and connectivity options may further enhance the performance and capabilities of these servers.

2. **Increased Adoption:** With growing awareness of the environmental impact of e-waste and the benefits of reusing electronic devices, more individuals and organizations are likely to embrace the idea of homemade servers. The cost-effectiveness, customizability, and control over data will make this solution appealing to a broader audience.

3. **Integration of IoT and Smart Home Devices:** The integration of homemade servers with Internet of Things (IoT) devices and smart home technologies is a promising direction. This could enable seamless data sharing and communication among various devices within a household, optimizing energy consumption and enhancing convenience.

4. **Business Applications:** Homemade servers can have applications in small businesses and startups, especially for those with limited budgets. As businesses seek eco-friendly and budget-friendly solutions, homemade servers can provide a compelling alternative to costly commercial data storage options.

5. **Educational Initiatives:** Educational institutions and organizations promoting sustainable practices may incorporate projects or workshops on reusing old laptops and computers for homemade servers. This would not only foster technical skills but also instill a sense of environmental responsibility among students and participants.

REFERENCES

1. https://www.truenas.com/ (TrueNAS Documentation)
2. https://rufus.ie/en/ (Rufus for Bootable Pen drives)
3. https://www.wikipedia.org/ (for technical terms)
4. https://ewastemonitor.info/ (official e-waste report globally)
5. www.google.com (for information and surveys)
6. https://www.seagate.com/in/en/manuals/network-storage/business-storage-nas-os/remote-access/mynas/ (remote access of NAS)
7. https://ubuntu.com/server (for ubuntu server OS)
8. https://www.microsoft.com/en-in/windows-server (windows server OS)