Green University of Bangladesh (GUB)
Dept. of Computer Science and Engineering

GREEN UNIVERSITY OF BANGLADESH (GUB)

INDUSTRIAL TRAINING REPORT
ON

Hardware and networking services are acquired

Submitted by
Md. Mahmudul Hasan (201015083)

A report from industry training that was submitted to the Department of Computer Science & Engineering was used to fulfill a portion of the requirements for the Bachelor of Science in Computer Science & Engineering degree.

Training Place	:	Express one Limited Road:-1,Housee:-09,Dhanmondi, . Dhaka -1209
Training Period .	:	1 May 2023 - 18 May 2023
Industrial Supervisor	:	Mst Naznin Akter
Academic Supervisor	:	Md Rafiqul Islam
Report Submission Date	:	07 July 2023

Green University of Bangladesh (GUB)
Dept. of Computer Science and Engineering

GREEN UNIVERSITY OF BANGLADESH (GUB)

INDUSTRIAL TRAINING REPORT

ON

Hardware and networking services are acquired

Submitted by
Md. Mahmudul Hasan (201015083)

A report from industry training that was submitted to the Department of Computer Science & Engineering was used to fulfill a portion of the requirements for the Bachelor of Science in Computer Science & Engineering degree.

Academic Supervisor
Md Rafiqul Islam
Lecturer
Department of Computer Science & Engineering
The Green University of Bangladesh

Industry Supervisor
Mst Naznin Akter
Senior IT officer
IT Department
Express one Limited

Declaration

I thus acknowledge that the success of this industrial training depends entirely My own effort and performance. I finished the art with my own talent and hard work Training This industry training report is undoubtedly worthy of my own requirements Competence and understanding. Which I completed after three weeks of eighty-four hour industrial training.Also, I have been told that this internship position is unique.

I further confirm that this internship work has not been submitted in whole or in part For any degree or diploma in any university.

Md. Mahmudul Hasan
ID: 201015083

Certificate

Green University of Bangladesh certifies that the Internship Report has been **"obtained Practical knowledge of hardware & networks, hardware and network operation routines, hardware and network sur-Vices"** submitted by **Md. Mahmudul Hasan (Student ID: 201015083)** are operated by He and 17 July 2023 have been submitted in partial fulfillment of the academic year Requirements for a Bachelor of Science degree in Computer Science and engineering.

_____
Md Rafiqul Islam
Supervisor

Accepted and approved in partial fulfilment of the requirement for the degree Bach- elor of Science in Computer Science and Engineering.

_____
Prof. Dr. Md. Saiful Azad
Chairman and Professor

_____
Name:
Lecturer

_____
Name:
Lecturer

_____
Name:
Lecturer

Acknowledgment

First of all, we give thanks to Almighty Allah, who created us and to Him we owe Coming back through death.

I would like to thank all the teachers of Green University from the bottom of my heart, Who teaches every student with utmost sincerity,honesty and ethics. i want I would like to thank the dedicated members of the CSE Department of Greene University.
I express my gratitude, and I would especially like to thank my dear honorable sir, **Md. Rafiqul Islam (Lecturer)** He was appointed as my super. Vissar sir encouraged me with valuable guidance. I always have Sir by my side; sir Helped me solve a problem; Sir's behavior impressed me; Sir is my inspiration, with whose help I have come this far.

I express my gratitude and thanks to **MST Nazneen Akhtar (Senior IT Officer),** IT Department, Express One Limited Company. he is mine Industrial Supervisor. He has been my assistant since my internship till now. he Guiding me from day one of my training. He was willing to share his own Experience, IT knowledge, and advanced information technology knowledge and Expertise related to the company's operations with us. He used to guide me to accomplish my daily tasks Job chanting for my internship. He taught me things I had never learned before. He taught me a practical way of living.

Finally, I would like to thank my parents, who have been a great source of inspiration For me. Without them, I wouldn't be here, and in their support I stand-I am here today. I pray to almighty Allah to give the grace to satisfy every parent with their children.

Abstract

The industrial training report for IT support engineers is a thorough account of the real-world training experience acquired while serving in that capacity. The training course concentrated on installing and configuring hardware and software, maintaining IT in-frastructure, and giving technical help for hardware and software problems. The paper discusses the training program's goals, including how various tools, software, and hard-ware would be used. The main information and skills picked up over the training time are also covered, along with the difficulties faced and how they were resolved. The The report also offers details on the firm where the training took place, including the kinds of IT support services offered, the business culture, and the working environment. The IT support engineer industrial training gave me a strong technical basis.

TABLE OF CONTENTS

List of Figures

Chapter 1

Introduction:

1.1 Organization Overview

There are many organizations that provide both BPO (Business Process Outsourcing).and IT services. An example of such an organization is Wipro Limited. Wipro Limited A global information technology, consulting and business process services company Headquartered in Bangalore. The company was established in 1945 and since then has become the world's largest and most respected IT service provider.Wipro offers a wide range of IT services, including application development and main-tenance, digital transformation, cloud services, analytics, cyber security and IT infra-Structure management. The company provides BPO services, including finance Accounting, human resources, customer service, and procurement outsourcing. of Wipro Clients span a wide range of industries including healthcare, retail, financial services.Manufacturing, and more. The company has a global presence, with over operations 50 countries and a diverse workforce of 200,000 employees. Wipro aims to Be a trusted partner to its clients, providing innovative solutions that help them achieve their goals Increase their business goals and drive. The company's core values include integrity, work-tomer focus, excellence, and teamwork, which guide his actions and decisions. Wipro An established and reputed organization offering a comprehensive suite of IT & IT Business BPO services around the world. [1] .

1.2 Company Profile

Express One Ltd. There is a team of over 80 skilled profesExpress One Ltd. A leading Information Technology Company based Bangladesh The company was established in 2000 with the aim of innovating- tive and state-of-the-art IT solutions for businesses and organizations.sionals who Specializing in a wide range of IT services including software development, digital trans-Architecture, IT Consulting, Cyber Security, Outsourcing, Data Analytics and IT Infrastructure-ture provides high-quality IT solutions Clients across industries including finance, healthcare, retail, and manufacturing Express One Ltd.And ISP provides services through its own server. Express one ltd. Commit-ted towards excellence, integrity, teamwork, innovation and customer satisfaction, which is reflected in its core values. The company aims to provide innovative and cutting-Edge solutions to its clients that enable their businesses to grow and achieve Their mission, while its vision is to become a leading provider of IT solutions Transforming businesses and communities. Overall, Express one ltd is a Innovative company dedicated to delivering exceptional value Creates a positive impact on society through the use of its clients and technology.

1.3 The organizational structure of Express one ltd .

Express one ltd . is a leading IT company based in Bangladesh, offering a wide range of IT services and solutions to clients .The organization struc-ture of Express one ltd . is hierarchical and divided into several departments, including:

1.3.1 Organizational structure overview

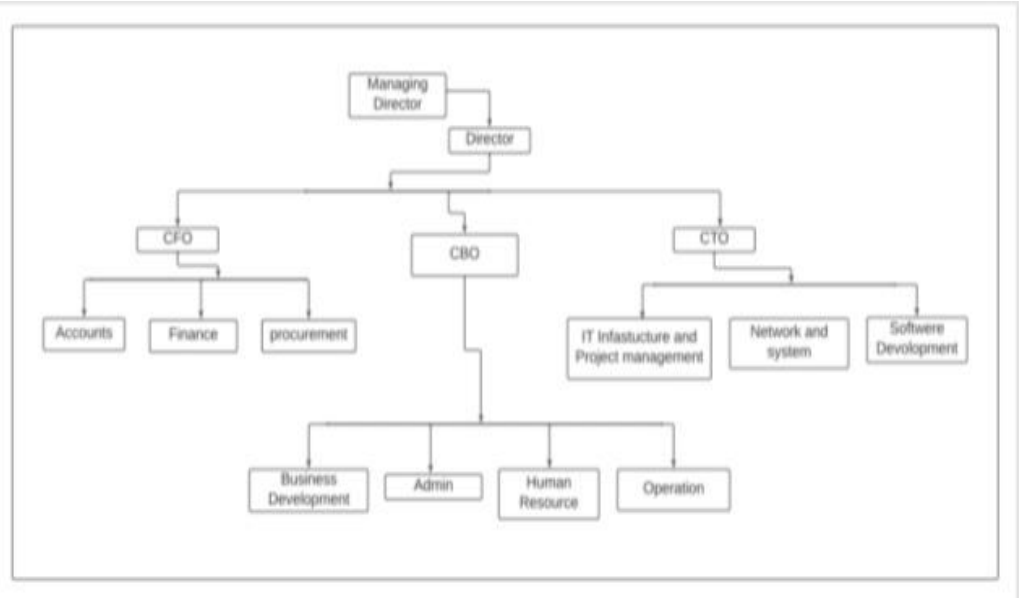


Figure 1.1: Organizational structure

- Executive Management: The executive management team includes the CEO and other senior executives who are responsible for overall people-Strategic planning, financial management, and company age decision making.

- Sales and Marketing: Sales and Marketing department is responsible for Promotion and sale of the company's products and services to clients. This de-Partly responsible for developing and implementing marketing strategies, Iden-Creating new business opportunities and relationships with clients.

- Operations: Operations department is responsible for day to day management Day-to-day activities of the company including project management, resource management-ment, and quality control.

- Human Resource: The human resource department is responsible for people-Ageing of the company's human resources including recruitment, training,performance Management Management, and Employee Relations.

- Finance and Accounting : The Finance and Accounting department is respon-sible for managing the company's financial operations, including financial plan-ning, budgeting, accounting, and reporting.
- Information Technology : The Information Technology department is responsi-ble for managing the company's IT infrastructure, including hardware, software,and networks. This department also provides IT support to the company's clients.

- Research and Development : The Research and Development department is re-sponsible for developing new products and services and improving existing ones.This department is also responsible for conducting research and keeping up-to-date with emerging technologies and industry trends.

  In summary, the organizational structure of Express one ltd. is hierarchical and consists of several departments, including executive management, sales and mar-keting, operations, human resources, finance and accounting, information technology,and research and development. This structure allows the company to efficiently manage its operations and deliver high-quality IT services and solutions to its clients [2].

1.4 The services of Express one Ltd :

- Express one Ltd. offers a wide range of IT services, including :

- Software Development :They offer custom software development services, in-cluding web applications, mobile apps, enterprise software, and software integra-tion.

- Digital Transformation :They help businesses to transform their operations and customer experience through digital technologies, including automation, artificial intelligence, and cloud computing.

- IT Consulting : They provide strategic IT consulting services, helping busi-nesses to align their IT strategy with their business goals and objectives.

- Cyber Security :They provide cyber security services including risk assessment,Vulnerability management, and incident response.

- Outsourcing: They provide outsourcing services for IT support, maintenance, and operations, allowing businesses to focus on their core competencies

- Data Analytics : They offer data analytics services including data warehousing, Data mining, and business intelligence, help businesses become data-driven decision.

- IT Infrastructure : They provide infrastructure services including network design Server administration, and cloud hosting, ensures that the business has a reliable and Secure IT infrastructure.

  Overall, Express one ltd Limited offers a comprehensive suite of IT services which Enables businesses to use the latest technology and stay ahead of the competition[3] .

1.5The Mission of Express one ltd :

- Express One Limited is an information technology company. Express One Limited aims to. provide innovative and state-of-the-art facilities.Solutions for their clients that enable them to grow their business and achieve their goals Specifically, their goals are to:

- Provide best quality IT products and services to their clients, ensuring them satisfaction and loyalty.

- Constantly innovate and improve their offerings to stay ahead of the curve A rapidly evolving technology landscape.
- With our strong team of skilled professionals who are dedicated to deliver excellence will be

- Express One Ltd. Create positive impact on society by using technology to deliver real solutions World problems and improving people's lives.

- Foster a culture of ethical business practices, transparency and accountability, and build strong relationships with their clients, partners and stakeholders.

Overall, Express One Limited aims to be a trusted and reliable partner For their clients, they provide the tools and skills they need to succeed The modern era.

1.6 The Vision of Express one Ltd :

- The vision of Express One Limited is a Innovative IT solutions that transform businesses and communities. Especially, theirs The view is:

- Be a thought leader in the technology industry, shaping the future through IT State-of-the-art innovation and research.

- Expand their footprint, reach new markets and serve different ranges Clients across various industries.

- Build strong partnerships with industry leaders, academic institutions, and re Search organizations for collaboration and knowledge sharing.

- Create a culture of excellence, attracting and retaining top talent from around People who are passionate about technology and its potential to make a positive difference in the world Impact on society.

- Deliver exceptional value to their clients by providing tailored, end-to-end IT Solutions that solve complex business challenges and drive sustainable growth.

Overall, the vision of Express one Limited is to be a transformative force IT drives positive change for industry, innovation, growth, and business Communities around the world.

1.7 The Value of Express one Ltd :

- Express One Limited's values reflect the company's commitment to excel-Lens, Integrity, Teamwork, Innovation and Customer Satisfaction. This is the standard guide The actions and decisions of the company and are embodied by its employees at all levels Express one Ltd. Its key values are:

- Excellence: Strive for superior quality and performance Everything they do with a focus on continuous improvement and learning.Integrity: Upholding the highest ethical standards and principles of integrity,Fairness, and transparency in all business practices.

- Teamwork: Fostering a collaborative and inclusive work environment, where Teamwork, mutual respect and open communication are valued.Innovation: Creativity, curiosity and experimentation and drive Innovation pushes the boundaries of what is possible.

- Customer Satisfaction: Putting the customer at the center of everything they do, and providing solutions that exceed their expectations and meet their needs.

  Overall, these values reflect Express One Limited's ex ante delivery commitments Unsurpassed value for its clients, creating a positive and supportive work environment for it Its employees, and create a positive impact on society through the use of technology [4] .

1.8 Methodology:

- I have prepared this report based on my experience during my internship. i am Completed Internship on Hardware & Network as IT Support from Express One Ltd. Express One Ltd. is a help care IT company, various types of IT here. Services are provided. The said help care IT company I have prepared the report in the light of all the services I have gained knowledge about.

Chapter 2

Specific details on training activities and report.

2.1 Introduction

- As an intern in Hardware and Networking Operations Department On May 01, 2023 at the behest of my Intership Supervisor MST Nazneen Akhter Let's start with hardware and networking.

- Hardware and networking training is very helpful to build our career in hardware and networking. The need of computer or the need of computer in our daily life is increasing day by day. Computers are also very essential in the field of information technology.

- The computer is made up of various parts each of which has a different type of function called hardware. And networking is simply a method of exchange Data on computer.

- How to connect to remote sites over wide area networks, the need for wireless networks, and how to mitigate security attacks should also be learned in hardware and networking training.

- Desktop Support, Network Connectivity Network Theory, Common Network Protocols.A variety of topics covered include Transmission Control Protocol/Internet Protocol (TCP/IP) services, network local area network (LAN) infrastructure, network WAN infrastructure, remote networking, disaster recovery, troubleshooting, network operating systems, and alternative network protocols. In the traming.

2.2 Objective:

- The main objective of Hardware and Networking training is to provide in-depth knowledge about various technologies of hardware and networking.

- Your job objective should highlight your knowledge as well as your knowledge in the field Desire to learn more.

- Various work disciplines including architecture, engineering, healthcare, etc Economics, advertising and more use internships.
- Some internships are used to give people an opportunity to study science,Others are specifically designed to give them real-world job opportunities experience.

- The core of our hardware and networking training is to provide granular knowledge. This training provides various and unique opportunities in the field of hardware and networking. It is a very demanding and job oriented field in the industry.

2.3 First Week:

2.3.1 Introduction Class with Hardware and networking Basic Idea:

Introduction to Hardware and Networking Class. In this class, hardware components are taught and a basic understanding of networking concepts is provided. Hardware refers to the physical components of a computer system, including devices that you can see and touch. These components are essential for the operation of a computer and its peripherals. Throughout this class, we will discuss various hardware components such as central processing unit (CPU), memory (RAM), storage devices (hard drive, solid-state drive), input devices (keyboard, mouse), will explore the output device (monitor). Printers), and more. You are given an idea of the functionality of each component and how they work together to enable the performance of a computer system.Networking, on the other hand, is the practice of connecting multiple devices together to share information and resources. It allows computers and other devices to communicate with each other, whether they are in the same room or on opposite sides of the world. In this class, we will cover basic networking concepts including local area networks (LAN), wide area networks (WAN), network topologies (such as star, bus, and ring), network protocols (such as TCP/IP). Network devices (routers, switches, modems). A basic understanding of how networks are set up and how data is transmitted across them is given.Practical examples and real-world scenarios are provided throughout the class to reinforce our understanding. A solid foundation in hardware and networking concepts is provided, allowing for further exploration of these topics and pursuit of more advanced studies or careers in the field.[5]

2.3.2 Classification of computers:

- Supercomputer: Supercomputer is the most powerful and fastest computer. They are used for complex calculations and simulations that require a lot of processing power.

- Mainframe Computers: Mainframes are large, powerful computers capable of handling extensive data processing and high-volume transactions.

- Minicomputers: Minicomputers are smaller than mainframes but larger than personal computers.

- Personal Computer (PC): The personal computer, or PC, is the most common type of computer used by individuals.

- Workstations: Workstations are high-powered computers used by professionals in fields such as graphic design, engineering, and scientific research.

- Servers: Servers are computers designed to provide services and resources to other computers on a network.

- Embedded Systems: Embedded systems are specialized computers integrated with other devices or systems to perform specific tasks.

- Mobile Devices: Mobile devices include wearable devices such as smartphones, tablets and smartwatches.

- These are some of the broad categories to classify computers.

2.3.3 Motherboard, CPU Box, Processor problem solving :

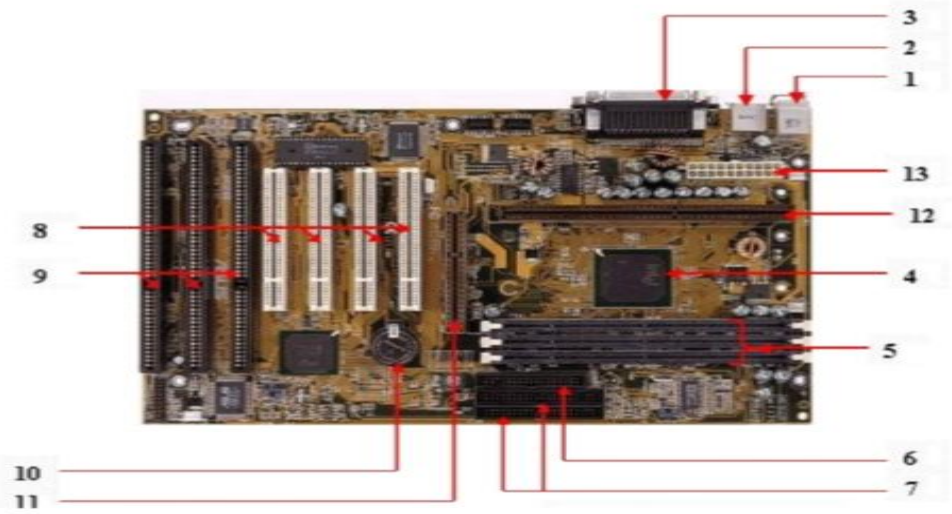


Figure2.1:Motherboard

Motherboard:

A motherboard is a circuit on which all the electronic components of a computer reside Connected includes both the internal parts of the system unit such as processor, display card Connectors for external components like monitor, sound card, memory etc. and mouse, Keyboard, hard disk, floppy disk etc. Ports and slots, which connect them Components, also present on the motherboard. Circuits on the motherboard support the data Transition between components. Bios, RAM slots and chipset are mounted too Motherboard.

Motherboard Components:

1) Microprocessor
2) Interrupt controller
3) Timer
4) PPI
5) Clock generator
6) Bus Controller
7) DMA controller
8) DRAM
9) ROM
10) I/O slots
11) Decoder, Multiplexer, Gates, F/F
12) Jumper and DIP
13) Transistor and diode
14) Ports and connectors
15) Built in speaker
16) AGP Slot
17) CMOS battery
18) External cache
19) PCI expansion slot

12

CPU Box:

Figure2.2:CPU Box

The CPU box is the heart and brain of the computer. All electronic circuits, power Supplies, floppy drives, and hard drives are housed in this box shape and size Box may vary from computer to computer. However, they all have the same electronics Circuits and internal parts. The storage unit of computer memory is also the same Box This box houses the primary memory of the PC on the electronic circuit board. These boards are not visible from outside. How about the CPU box.

Processor:

Figure2.3:Processor

- One of the most important parts of the computer is called the heart of the computer. the brain of a A computer is a processor. The processor in a modern computer is an integrated circuit chip.

- A chip can process millions of transistors and capacitors Transfers the data received through the input device and results to the output unit. processor Available today from several companies. Intel-PentiumIV, Xenon, Celeron, etc. are popular.[7]

2.3.4 Hardware and Software with Operating system installation:

- Hardware: Hardware refers to the physical components of a computer system that you can see and touch. Some common hardware components include CPU,RAM,HDD.

- Software: Software refers to the programs and instructions that run on a computer system. There are two main types of software operating systems, applications.

- Operating system installation:
- Check system requirements: Make sure your computer meets the minimum system requirements for Windows 11.

- Backup your data: Before proceeding with the installation, it is always a good idea to back up your important files and data.

- Obtain windows 11 installation media: You can either download an ISO file of Windows 11.

- Create installation media: If you download the ISO file, you need to create a bootable USB drive you can use tools like Rufus

- Boot from the installation media: Insert the bootable USB drive and reboot it. Enter BIOS or UEFI settings to change boot order and prioritize installation media. Save changes and exit BIOS/UEFI.

- Install windows 11: Your computer should now boot from the installation media. Click "Install Now" to proceed.

- Enter product key: If prompted, enter the product key for Windows 11.

- Accept the license terms: Read and accept the license terms to continue the installation.

- Select Installation Type: Select your preferred installation type. You can either perform an upgrade installation.

- Partition and format drives: If you choose a custom installation, you'll need to partition and format the drive where you want to install Windows 11.

- Wait for installation: Once you select the installation options, Windows 11 will start installing. This process may take some time, so be patient and avoid interrupting the installation.

- Set up windows 11: After the installation is complete, follow the on-screen prompts to personalize your Windows 11 experience.

- Install device drivers: Once you're on Windows 11, it's important to install the necessary drivers for your hardware.

- You have now successfully installed Windows 11 on your computer. Be sure to reinstall any necessary applications and restore your backed-up data[8]

2.3.5 Primary Memory, Secondary Memory, Power Supply Unit Problem solving:

Primary Memory:

- Primary Memory: Primary memory, also known as main memory or RAM (random access memory), is responsible for temporarily storing data that the computer is actively using. Here are some common problems and troubleshooting steps for primary memory:

- Insufficient Memory: When your computer runs out of memory, you may experience slow performance or errors. To fix this, close unnecessary programs or tabs and consider upgrading your RAM if your computer supports it.

- Memory errors: Sometimes, memory errors can occur due to faulty RAM modules. To diagnose this, you can run memory diagnostic tools such as Windows Memory Diagnostics or Memtest86. If errors are detected, try reseating or replacing the RAM modules.

Secondary Memory:

- Secondary Memory: Secondary memory refers to storage devices that retain data even when the computer is turned off. Examples include hard disk drives (HDD), solid-state drives (SSD), and external storage devices. Here are some common problems and solutions related to secondary memory:

- Data loss: If you experience data loss, it may be due to accidental deletion, formatting or faulty storage device. In such cases, you can use data recovery software or services to recover lost data. It is important to back up your important files regularly to prevent data loss

- Slow performance: Over time, secondary storage devices can become fragmented, causing slow performance. To combat this, you can defragment your hard drive using built-in tools like Disk Defragmenter (Windows) or optimize your SSD using Trim (for Windows) or similar tools provided by the operating system.

Power Supply Unit:

- Power Supply Unit (PSU): The power supply unit is responsible for providing power to your computer components. Here are some common problems and troubleshooting steps for PSUs:

- No power: If your computer won't turn on at all, check the power connections and make sure the PSU switch is on. Also, try plugging the computer into a different power outlet or using a different power cord If the problem persists, the PSU may be faulty and may require replacement.

  Overheating or fan problem: If you notice that the PSU fan is not spinning or the PSU is heating up abnormally, it could be due to a faulty fan or poor ventilation. Make sure the fan is clean and free of dust and debris. If necessary, consider replacing the fan or upgrading to a higher-quality PSU.

2.4 Second Week:

2.4.1 Power Supply how to maintain a computer hardware:

Main switch of power supply is heavy due to current rating and that too expensive Power supply has high power dissipation so efficiency is relatively low.Linear power supplies transmit many cores, reducing efficiency there and Increase in size and cost due to the need for extensive heat sink provision.In sMPS the O/P is not continuously regulated but switched on and off at relatively high rates.The frequency shifts the same size and results in the filter capacitor. The input is DC cut and Using high frequency (10 KHZ to 400 KHZ) and transfer active devices and converters The transferred high frequency waveform is rectified and filtered. A portion of the output voltage is used As the feedback signal of the drive circuit for the controller.

2.4.2 Basic troubleshooting and computer booting:

Basic troubleshooting:

- When it comes to basic troubleshooting, there are a few simple steps you can follow to help identify and resolve common problems. Here is a simplified guide:

- Identify the problem: Clearly define the problem you are experiencing. Is it related to hardware, software, connectivity or something else?

- Restart: Many problems can be solved by restarting the affected device or software.

- Check connections: If the problem involves hardware or network connections, make sure all cables, power cords, and connections are secure.

- Update Software: Older software can cause compatibility issues and bugs. Check for software updates for your operating system, applications, drivers or firmware and install them if available

- Uninstall conflicting software: Conflicting software or applications can cause problems.

- Run an antivirus scan: If you suspect a virus infection, run a thorough scan using reputable antivirus software.

- Clear cache and temporary files: Accumulated cache and temporary files can affect performance and cause problems.

- Check the error message: If you encounter the error message, note the specific details. Get help online to find solutions or troubleshooting steps that others have used.

Computer booting:

- Power-on: Pressing the power button on the computer starts the booting process.

- Power-on Self-Test : The computer's hardware components, such as the motherboard, CPU, RAM, and connected devices, go through a self-test to make sure they are working properly.

- Bootloader: Once the hardware passes POST, the computer looks for a bootloader.

- BIOS/UEFI: Basic Input/Output System (BIOS) or Unified Extensible Firmware Interface (UEFI) firmware communicates with the hardware and provides the necessary instructions for the boot process.

- Operating System Loading: The bootloader locates the operating system files on the storage device and loads them into the computer's memory (RAM).

- Kernel Initialization: The kernel of the operating system, the core component of the OS, initializes and configures various system components such as device drivers, memory management, and other essential services.

- User interface: Once the kernel is loaded, the OS presents the user with a login screen or a desktop environment, depending on the configuration.

2.4.3 Networking system of LAN MAN WAN:

- LAN (Local Area Network): A local area network (LAN) refers to a network that covers a small geographic area, such as a home, office building, or campus. LANs are commonly used to connect computers, printers, servers and other devices.

- MAN (Metropolitan Area Network): A Metropolitan Area Network (MAN) covers a larger geographic area, such as a city or a metropolitan area. It connects multiple LANs within a specific area to provide connectivity to a larger area. MAN is often used by organizations, educational institutions and government agencies to interconnect their offices and facilities spread across a city. MAN typically uses high-capacity network infrastructure such as fiber optic cables to ensure fast and reliable communication.

- WAN (Wide Area Network): A wide area network (WAN) is a network that covers a wide geographic area, such as multiple cities, countries, or even continents. WANs are designed to connect multiple LANs and MANs over long distances They are often used by large enterprises, Internet Service Providers (ISPs) and telecommunications companies to provide connectivity between their various locations. A WAN can use a variety of technologies,including leased lines, satellite links, and public networks such as the Internet, to establish connectivity between geographically dispersed locations.

2.4.4 OSI model, TCP/IP model Routing Basics and Routing protocol:

Both the OSI model and the TCP/IP model are conceptual frameworks used to understand and describe the various protocols and processes involved in computer networking.

OSI model:

- The OSI model consists of seven layers:

- Physical layer: deals with the physical transmission of data over the network, including the electrical, mechanical, and physical characteristics of the network interface.

- Data Link Layer: Provides error-free transmission of data frames between nodes on the same network segment, typically using MAC addresses.

- Network Layer: Manages the routing and addressing of data packets across multiple networks.

- Transport Layer: Ensures reliable data delivery between end systems.

- Session Layer: Manages communication sessions between applications on different devices.

- Presentation Layer: Translates data into a format that the application layer understands.

Application layer: Provides services directly to end users and applications such as file transfer, email, and web browsing.

TCP/IP model:

- The TCP/IP model is a simplified one. It consists of four levels:

- Network Interface Layer: Like the data link layer of the OSI model, deals with the protocols used to access the network.

- Internet Layer: It handles IP addressing, packet routing, and fragmentation and reassembly of packets.

- Transport Layer: It ensures reliable data delivery between end systems. TCP and UDP (User Datagram Protocol) operate at this layer.

- Application Layer: It provides direct services to applications and end users.

Routing Basics and Routing protocol:

- Routing is the process of determining the best path for data to travel from source to destination across a network.

- A routing protocol is a set of rules and algorithms that routers use to exchange information and make informed decisions about the best path for data to travel.

2.4.5 Classful and Classless Routing Protocols:

- Classful Routing Protocol: Classful routing protocol was used in the early days of the Internet when IP addresses were assigned based on class. IP address classes (Class A, Class B and Class C) were defined to assign different ranges of IP addresses to networks of different sizes. The classful routing protocol does not send subnet mask information with routing updates.

- Classless Routing Protocols: Classless routing protocols were introduced to overcome the limitations of classful routing protocols and support variable-length subnet masks (VLSM). Classless routing protocols provide more flexibility in network design and allow the use of subnets with different subnet masks within a network.

- Classless routing protocols are widely used in modern networks because they offer more flexibility, efficient address allocation, and better scalability than classful routing protocols.

2.5 Third Week:

2.5.1 Cisco software installation and router configure:

Cisco software installation:

- The installation process for Cisco software is discussed. Get the software: It can be purchased from Cisco or downloaded from Cisco's website.

- System requirements: Check the system requirements for the software to ensure that your environment meets the necessary hardware, operating system, and other prerequisites.

- Prepare the environment: Before installing the software, it is important to prepare your environment.

- Installation media: If you downloaded the software from the Cisco website, extract the installation files from the downloaded package. If you received physical installation media, insert it into the appropriate drive.

- Launch the installer: Start the installation process by launching the installer. It can run an executable file or use a command-line interface (CLI) to start the installation.

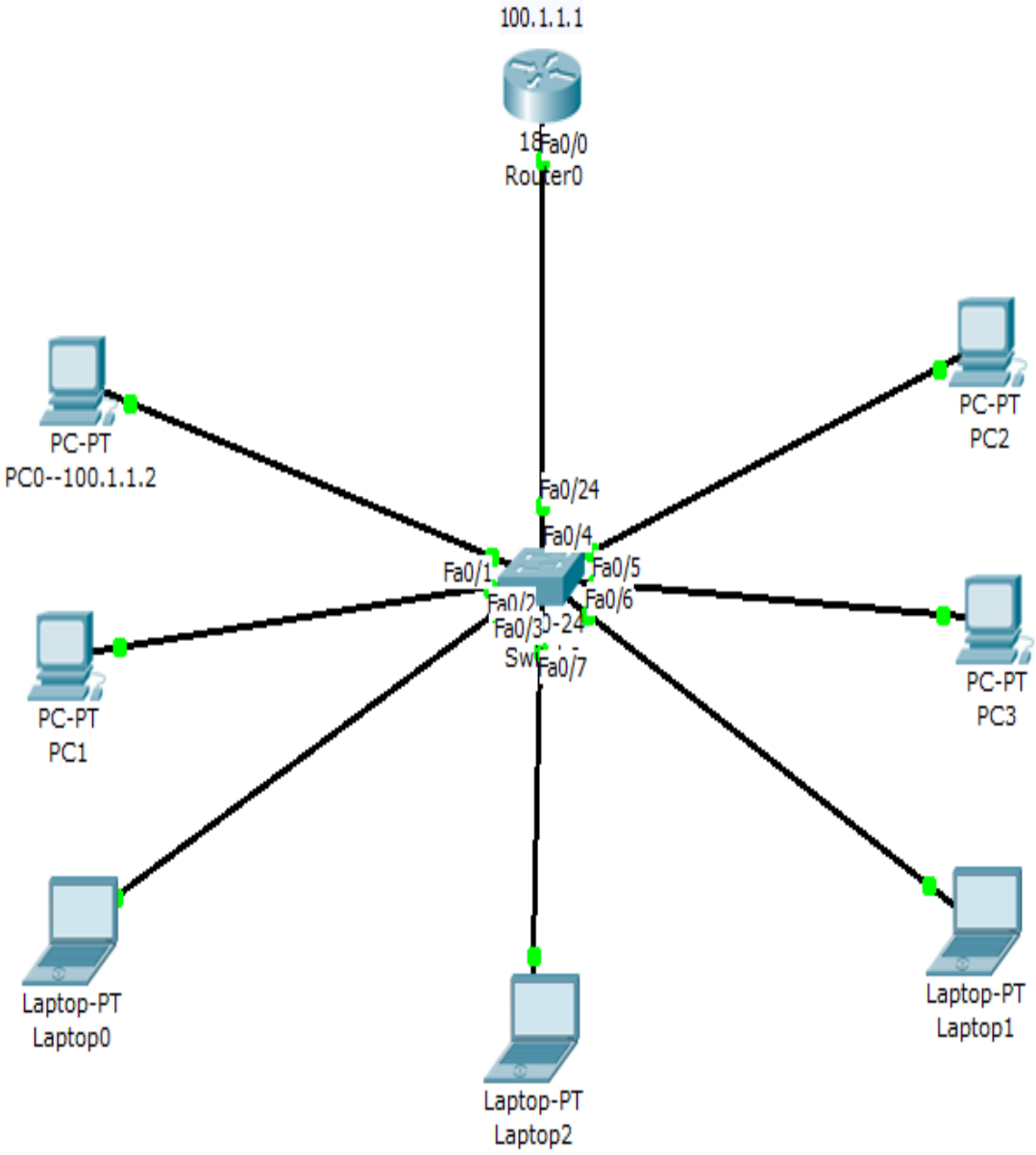
- Follow the installation wizard: The installation wizard will guide you through the installation process step by step. You may need to accept the software license agreement, choose an installation location, configure options, and provide any required credentials.

- Installation Progress: The installer will copy the necessary files to the designated location and configure the software components.

- Configuration: After installing the software, you may need to perform additional configuration steps. This includes establishing network connections, defining system parameters.

- Post-installation tasks: Once the software is installed and configured, it is important to perform post-installation tasks such as verifying the installation, applying necessary patches or updates, and testing the functionality of the software.

Router configure:



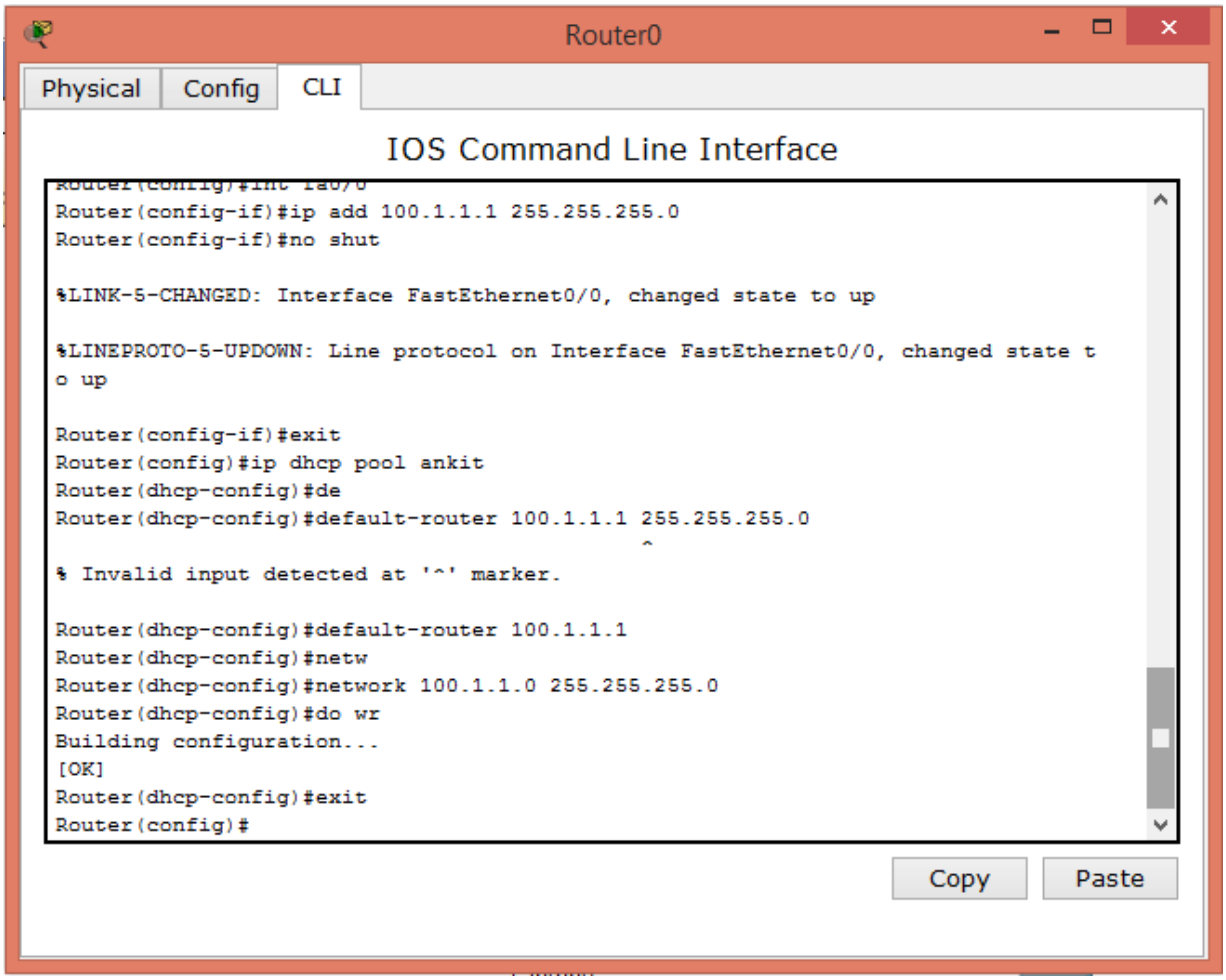


Figure2.4:Router configure

- A router is a type of device that acts as a central point between a computer and other devices that are part of a network.

- A router is equipped with holes called ports and computers and other devices are connected to the router using network cables.[9]

2.5.2 Design an Ethernet network:

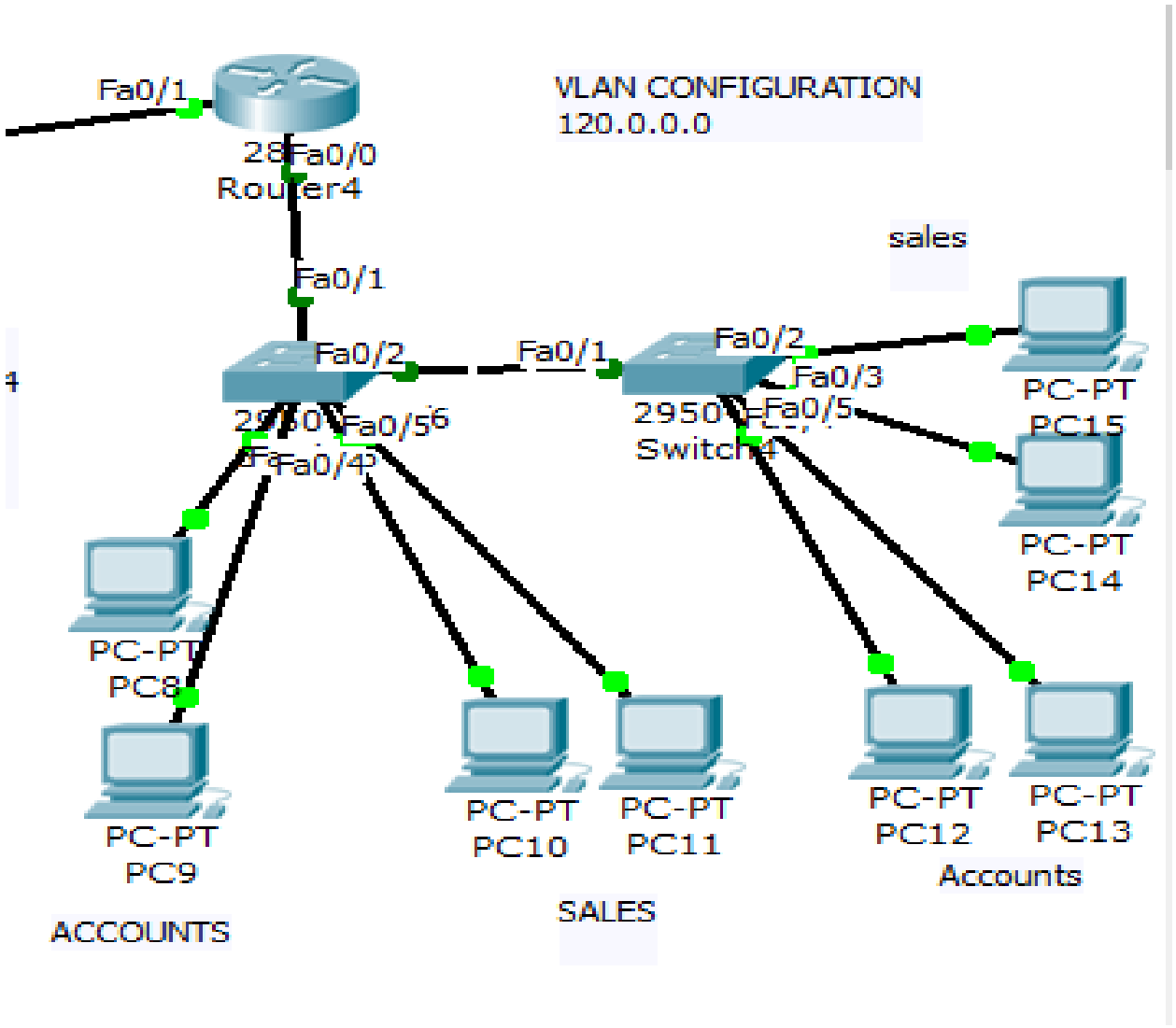


Figure2.5:VLAN

VLAN stands for Virtual Local Area Network

- Seen as a group of devices on different physical LANs can communicate with each other as if they were on the same physical LAN
- Configured through software rather than highly flexible hardware.
- In simple terms, a VLAN is a set of workstations within a LAN that can communicate with each other as if they were on a single, isolated LAN.
- What does it mean to say that they communicate with each other as if they were on a single, isolated LAN[10]

2.5.3 file sharing,Desktop Remote

File Sharing:

- Open File Explorer on your Windows Server.
- Locate the folder or file you want to share.
- Right-click on the folder or files and select "Properties.
- In the Properties window, go to the "Sharing" tab.
- Click on "Advanced Sharing"
- Check the box that says "Share this folder".
- Optionally, you can click the "Permission" button to specify who can access the shared files and what level of access they have.
- Click "OK" to apply the changes and close the Properties window.
- The folder or file is now shared on the network.

Remote Desktop Access:

- On your Windows server, open the "System" control panel.
- Click on "Remote Settings" or "Remote Desktop".
- In the Remote Desktop section, select the Allow remote connections option If necessary, click "Select Users" or "Add" to specify which users can access the server remotely.
- Click "OK" to apply the changes.
- Make a note of the server's IP address or hostname.
- To connect to the server remotely:
- On another computer, open the Remote Desktop client (Windows key + R, then type "mstsc" and press Enter).
- Enter the IP address or hostname of the Windows server. Click "Connect" and enter the username and password for the server when prompted.
- You should now have remote access to the Windows Server desktop.

2.5.4 hardware and networking overview and job sector of Hardware and networking

An overview of hardware and networking is given and the job sectors in this sector are discussed.

Some job titles in hardware are:

1.Systems Engineer

2.Field Service Engineers

3.Design Engineer

4.Project Engineer

Some job titles in networking are:

1.Technical assistance

2.System Administrator

3.IT Administrator

4.Network Administrator

5.Security database developer

2.6 Weekly Internship Plan

2.6.1 Gantt Chart

Figure2.6 : Gantt Chart One to Three Week

Chapter 3
Conclusion

3.1 Conclusion

- In conclusion, the company provided me with a wealth of practical knowledge and skills in light of my industrial training experience as an IT Support Engineer in a hardware and network. i achieve Experience in providing technical support for hardware and software issues, Installing and configuring software and hardware and managing the IT infrastructure and throughout the training, I had the opportunity to work alongside a trainee.

- Learned from experienced professionals in various teams and industries. The challenges I faced during training helped me develop critical problem-solving skills. skills, and I was able to apply the theories and concepts learned in the classroom Real world situation. The experience gave me confidence in my work ability Independently and as part of a team in a fast-paced, dynamic environment.Overall, the training provided me with a solid foundation in technical support service, and I believe the knowledge and skills gained during training will Be invaluable in my future career as an IT Support Engineer.

3.2 Theoretical Knowledge

Hardware:

- Central Processing Unit (CPU): The primary component of a computer that executes instructions and performs calculations.

- Random Access Memory (RAM): Temporary storage that holds data and instructions that the CPU needs for immediate access.

- Hard Disk Drive (HDD) and Solid-State Drive (SSD): Storage devices used to store data on a long-term basis.

- Motherboard: The main circuit board of a computer that connects the various hardware components.

- Graphics Processing Unit (GPU): A specialized processor that handles rendering and display functions.

- Input and output devices: Examples include keyboards, mice, monitors, printers, and scanners.

Networking:

- Local Area Network (LAN): A network that connects computers and devices within a limited area, such as a home or office.

- Wide Area Network (WAN): A network that spans a large geographic area, often connecting multiple LANs together.

- Router: A networking device that forwards data packets within a computer network.

- Switch: A device that connects multiple devices within a network and directs data traffic between them.

- IP Address: A unique numerical identifier assigned to each device connected to a network.

- Domain Name System (DNS): A system that translates domain names (eg, www.hasan.com) into IP addresses.

- Transmission Control Protocol/Internet Protocol (TCP/IP): The set of protocols used to transmit data over the Internet.

- Firewall: Network security device that monitors and controls incoming and outgoing network traffic.

Network Topologies:

- Bus topology: All devices are connected to a central wire, called a bus.

- Star Topology: All devices are connected to a central hub or switch.
- Ring Topology: Devices are connected in a circular manner, with each device connected to two neighboring devices.
- Mesh Topology: Every device is connected to every other device.

Network Protocol:

- Ethernet: A widely used standard for wired LAN connections.
- wi-Fi (Wireless Fidelity): A set of standards for wireless LAN connections
- Internet Protocol (IP): A protocol that enables data to be transmitted between devices over the Internet.
- Transmission Control Protocol (TCP): A protocol that ensures reliable delivery of data packets.
- User Datagram Protocol (UDP): A protocol that allows fast transmission of data packets but does not guarantee their delivery.

3.3 Practical Knowledge:

- Providing technical support to users, solving software and hardware problems here.
- Installing and configuring software applications, operating systems and others Surgery.
- Maintaining computer networks and troubleshooting network problems.
- Providing security support by implementing security measures and monitoring Security system

- Maintaining documentation for hardware and software inventory and tracking.

- Conduct periodic system audits and maintain backup systems.Creating and maintaining user accounts, permissions, and access controls.

3.4 Challenges

I could not have asked for a better experience at International. Working at Express One Limited helped me explore Real career and working in a multinational company. This is the highest it has ever been Cherish the choices and merits of my life. There were still some issues and problems During the internship platform hit and identified. IT support faces various challenges that can affect the effectiveness of IT Team and Express one ltd ability to maintain a reliable and secure IT infrastructure. As an IT Support Engineer, I may face some challenges, including:

a. Understanding Company Culture: Every company has a unique culture and Work environment. You may face challenges to understand and adapt Company culture, values and work processes.

b. Learning Company-Specific IT Systems: Express one Ltd. may be Has own IT systems and tools for IT support You may have to learn something new Company-specific software, processes and tools, which can be challenging.

c. Communication: Communication is essential for IT support. you may need To interact with different teams, clients or customers. You may encounter Chal-Understand their needs, explain technical issues, and deliver solution.

d. Time Management: IT support is a time-sensitive task. You may have multiple requests at the same time, and you need to prioritize and manage your time Efficiently meeting deadlines.

e. Multitasking: IT support requires multitasking skills. You may have to work
Multiple requests simultaneously and switch between them according to their priority.

f. Troubleshooting: Troubleshooting is an essential part of IT support. you May encounter challenging technical problems that require critical thinking and problem-Solving skills.

g. Stress Management: IT support can be a stressful job. May face anger Customers, high-pressure situations and tight deadlines. You have to manage Stress effectively to avoid burnout.

3.5 Scope of the study:

This report is based on hardware and networking systems. Along with the report
The complete hardware and network system is partially described.Technical Problem Solving: An IT Support Engineer intern should be able to:Diagnose and resolve technical issues that users may encounter, including issues including hardware, software, networking and security.

- Hardware Maintenance: Interns should learn how to assemble, disassemble and maintaining the various hardware components of the computer such as CPU, motherboard, RAM, hard disk, power supply etc.

- Software installation and configuration: The intern must learn how to install and configure various software applications, operating systems, and drivers.

- Network Administration: The intern should acquire knowledge of basic network-Able to generate ideas and solve networking problems such as connectivity, DNS, and DHCP.

- Cyber Security : Interns should learn how to protect against cyber threats,including virus, malware and phishing attacks, and maintain security Networks and Devices.

- Customer Service: The intern should know how to interact with users and pro-Through effective customer support including handling and resolution of user complaints-Resolve problems in a timely and efficient manner.

- Documentation and Reporting: The intern should learn how to document and Report technical issues, solutions, and preventative measures.Operating System: The intern should learn how to install, configure and man- Different operating systems age, such as Windows, Linux, and macOS.

- System Administration: The intern must learn how to operate and manage System resources such as storage, memory and CPU.

- Virtualization: The intern must learn how to install, configure and manage Virtual machines, virtualization software and virtual networks.
- Backup and Recovery : The intern should learn how to implement backup and Data backup, recovery techniques for various types of systems including disaster recovery Recovery, and business continuity planning.

- Server Administration: The intern will learn how to install, configure and Manage server software, such as web servers, email servers, and database servers.

- Cloud Computing: Interns learn about cloud computing technologies and how to deploy and operate cloud-based systems.

- Networking: The intern should learn about network protocols, devices and topology, and how to configure and troubleshoot network issues.

- Security: Interns should learn information security concepts and best practices Practices including access control, encryption and security auditing.

- Fundamentals of Networking: The intern has to learn about the fundamentals of networking, including the OSI model, IP addressing, subnetting and network devices. Such as routers, switches and firewalls.

- Network Topologies: Interns need to know about different types of networks Topologies including LAN, WAN, and VPN and how to design, implement and Manage them.

- Network Protocols : Interns should learn about network protocols viz TCP/IP, DHCP, DNS and HTTP, and how to configure and troubleshoot them. Network Security: The intern should learn about network security concepts, Such as firewalls, VPNs, IDS/IPS, and how to implement and maintain them.

- Network Administration : Interns should learn how to configure, manage and monitor network devices including routers, switches and firewalls.

- Network Troubleshooting: The intern should learn how to use network-Agnostic tools like ping, traceroute and network analyzer for troubleshooting network problem.

- Wireless Networking: The intern should learn about wireless network technology-WLAN standards and how to design,configure.

- Cloud Networking: The intern should learn cloud computing and how to do it Design, implement and manage cloud-based networks.

  Overall, the scope of study for an IT Support Engineer intern will be extensive Range of technical skills and knowledge related to computer hardware, software, net-Work, and security, operating systems, system administration, virtualization, backup and learning recovery, server administration, cloud computing, networking, security, and automation as well as customer service and documentation [11]

References:

[1] Andrew L Goertzen, Jonathan D Thiessen, Xuezhu Zhang, Chen-Yi Liu, Eric Berg, Daryl Bishop, Piotr Kozlowski, Fabrice Retiere, Vesna Sossi, Greg Stortz, et al. Application of hdmi® cables as an mri compatible single cable solution for readout and power supply of sipm based pet detectors. In 2012 IEEE Nuclear Science Symposium and Medical Imaging Conference Record (NSS/MIC), pages 3184–3188. IEEE, 2012.

[2] Matthew M Landis. The 3CX IP PBX Tutorial. Packt Publishing Ltd, 2010.

[3] James H Willig, Marc Krawitz, Anantachai Panjamapirom, Midge N Ray,Christa R Nevin, Thomas M English, Mark P Cohen, and Eta S Berner. Clos-ing the feedback loop: an interactive voice response system to provide follow-up and feedback in primary care settings. Journal of medical systems, 37:1–9, 2013.

[4] Mike Halsey and Mike Halsey. Installing windows 11 on your computer. Begin-ning Windows 10: Do More with Your PC, pages 551–573, 2015.45