FACULTY OF INFORMATION TECHNOLOGY

DEPARTMENT OF BUSINESS INFORMATION TECHNOLOGY

ACADEMIC INTERNSHIP REPORT

DONE AT

Rwanda Development Board(RDB)

Submitted by Christian BARAKA

Registration Number: 20356

Supervised by Laurence

January 29,2020

DECLARATION

I, **Christian BARAKA** , hereby declare that the work presented in this internship report carried out at Rwanda Development Board from 02nd October 2019 to 09th November 2019 is my original work and it has never been presented or submitted to any other universities or institutions of higher learning for award of any degree, and it is leading to my partial fulfillment for the requirements of the award of the Bachelor degree in Information Technology.

Names: Christian BARAKA

Signature: ……...

Date …… / …… / …….

CERTIFICATION

This is to certify that Mr. Christian BARAKA**,** a student at Adventist University of Central Africa (AUCA) with registration number of 20356 has completed 6 weeks of internship at Rwanda Development Board(RDB) in IT OPERATION DIVISION.

This report was completed successfully under supervision of Miss. Laurence

Supervised by:

Miss Laurence

Signature: .....

Through: IT Operation Division Manager

Mr. Desire Manzi

Signature: .....

ACKNOWLEDGEMENT

Firstly, I thank The Almighty God who blessed me with good health and strength to accomplish this internship at Rwanda Development Board, I wouldn't have done it if it wasn't for His daily blessings upon me.

Secondly, I would like to thank the Adventist University of Central Africa (AUCA) administration, staff and lecturers, for their help in giving me the needed knowledge and preparing me to be able to accomplish this internship.

Additionally, I want to express my deepest gratitude and special thanks to Rwanda Development Board, for giving me the opportunity to do the internship in their organization, it was a privilege to be a part of your organization especially in IT Operation Division, I really appreciated your help and the knowledge you gave me during this internship.

With a great pleasure I also extend my gratitude to Human Resource Unit of RDB for giving students the opportunity to increase their knowledge and get experience by working with experienced staffs of RDB. Special thanks to **Desire Manzi** the IT Operation Division Manager, **Didier Mpore** the Webmaster Specialist Team Leader.

I am extremely grateful and remain indebted to Miss **Laurence** the Network Administrator who supervise me through this work in spite of their occupations. Thanks to all RDB staffs for their flexibilities and sociability.

ABSTRACT

This internship report is a result of a practical training which was done within a period of 45 weeks from 02nd October 2019 to 29th November 2019 at Rwanda Development Board (RDB). It provides information on RDB's background, Mission, Vision and services it offers.

The objective of this internship was to provide me an experience to put in practice theories learnt in class as well as having an idea about what happens in work environment, to practice communication and teamwork skills.

This internship has contributed a lot to the improvement of my knowledge made through different practices that I had from this organization; this organization has enough network equipment and I learned a lot about personal computer repairing and network cabling and troubleshooting.

This report consists of different parts. Chapter one is composed with the general introduction, organization's profile, mission, vision and objectives of the organization. Chapter two is composed with various activities carried out during this internship. Chapter three includes discussion of experience and challenges faced during this internship. Lastly, the fourth chapter comprises general conclusion and recommendation.

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LIST OF ACRONYMS AND ABBREVIATIONS

BSC: Broadband Systems Corporation
CAPMER: Centre d'appui aux petites et Moyennes enterprises au Rwanda
CD-ROM: Compact Disk-Read Only Memory
CPU: Central Processing Unit
Dep't: Development
EIA: Environmental Management Authority
HIDA: Human resource and Institutional Capacity Development Agency
ICT: Information Communication Technology
ISP: Internet Service Provider
IT: Information Technology
LAN: Local Area Network
MAN: Metropolitan Area Network
NAT: Network Address Translation
NIC: Network Interface Card
O S: Operating System
ORTPN: Office Rwandais du Tourisme et des Parcs Nationaux
P C: Personal Computer
PC: Personal Computer
RAM: Random Access Memory
RCRSA: Rwanda Commercial Registration Services Agency
RDB: Rwanda Development Board
RIEPA: Rwanda Investment and Export Promotion Agency
RITA: Rwanda Information and Technology Authority

ROM: Read Only Memory
SEZ: Special Economic Zone
SME's: Small Medium Enterprises
SPIU: Single Project Implementation Unit
UPS: Uninterruptible Power Supply
UTP: Unshielded Twisted Pair
VLANs: Virtual Local Area Networks
WAN: Wide Area Network

CHAPTER ONE: INTRODUCTION

1.0 Introduction

The internship is a common practice that any student should undertake in a due course of his/her learning period. He/she has to pass through this program training before completing his/her studies.

It involves the application of learned skills in class to an organization related to student's major and helps students to have a global picture of how practical work is done and gain interpersonal skills and promote personal growth and development

1.1 Profile of the organization

Figure 1: RDB Headquarters

Rwanda Development Board (RDB), is a government department that integrates all government agencies responsible for the attraction, retention and facilitation of investments in the national economy. It was established in 2009 by the government of Rwanda by Organic Law No 53/2008 of 02/09/2008. RDB Headquarters is located on KG 220 Street, Gishushu, Rukiri Sector, Gasabo District, Kigali City.

RDB was created through merge of the following institutions:

- Rwanda Information and communication Technology Authority (RITA)
- Organization and functioning of Rwanda office of tourism and national parks (ORTPN)
- Rwanda Commercial Registration Services Agency(RCRSA)
- Rwanda Investment and Export Promotion Agency (RIEPA)
- Rwanda Environmental Management Authority (EIA function)
- Human resource and institutional capacity development Agency(HIDA)
- Centre d'appui aux petites et Moyennes enterprises au Rwanda (CAPMER)

1.2 Mission

The mission of RDB is to fast-track development activities by improving the lives of Rwandan, promote local and foreign direct investment, carry out privatization programs, promote entrepreneurship and private enterprise, and implement policies and strategies in support of tourism, conservation and ICT infrastructure and to increase the capacity of staffs in the public, private.

1.3 Vision

Rwanda to be transformed into a global hub for business, investment and innovation is the vision of RDB. To be a quick hit squad that attacks Rwanda's most urgent development challenges captures opportunities to drive economic growth, and infect the Government of Rwanda with a practical, aggressive mindset.

1.4 Responsibilities

The core responsibility of RDB is to accelerate efforts by executing economic strategies to make Rwanda compelling global hub for business, Investment and innovation in order to achieve the Rwandan target which is vision 2020.

1.5 Functions of the organization

Rwanda Development Board provides the following functions:

- Taking the lead of **development** activities
- Attracting and facilitating investment
- Supporting exports
- Building human capacity
- Tourism and conservation of natural resources
- Building a hub of Information and Communication Technology
- Provide guidelines for government's project proposals and they implementations
- Cooperate and collaborate with other regional and international institutions

1.6 The organizational structure

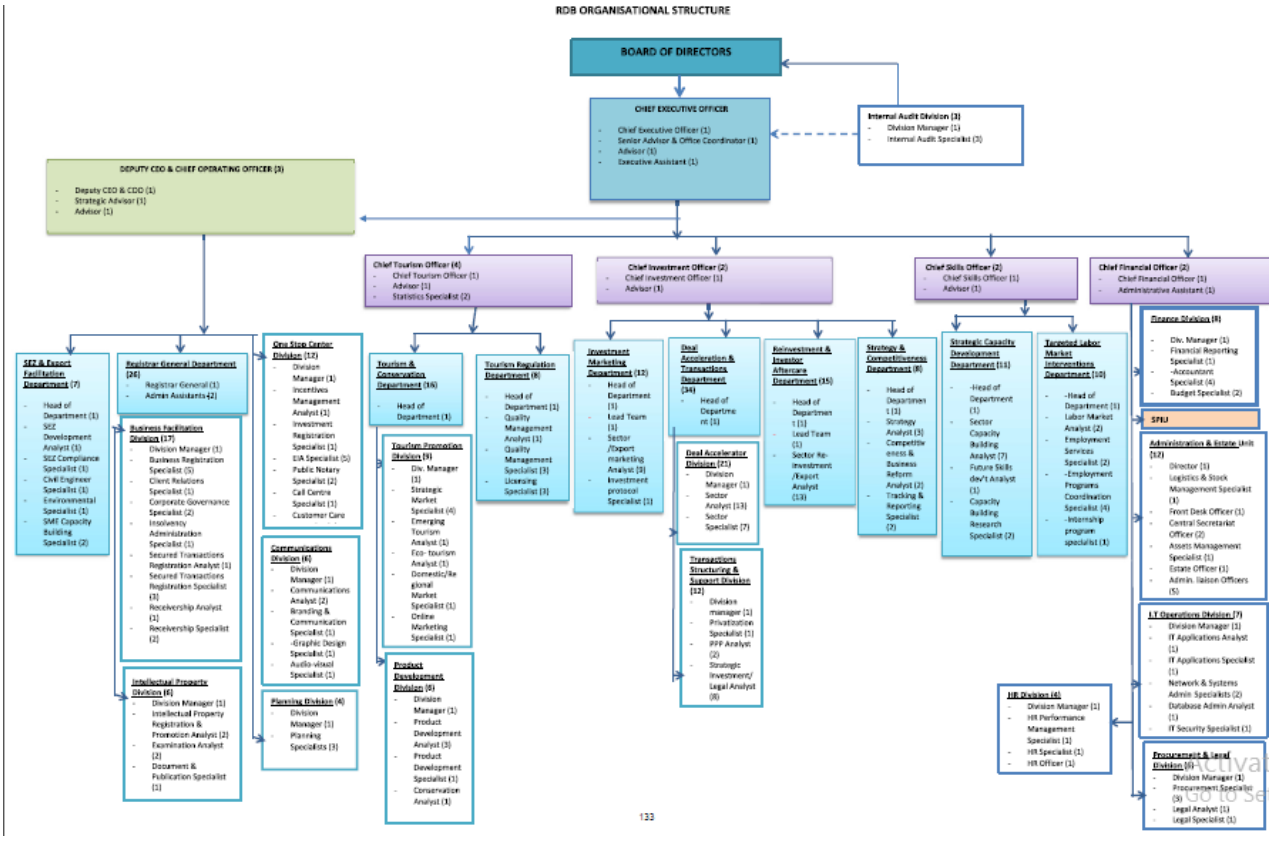


Figure 2: RDB Organizational structure

As a national institution, RDB has a general directorate comprised of the Chief executive officer (CEO), Deputy CEOs & Chief Operating Officer who also substitutes the CEO in case of absence or inconvenience to perform his duties, through it is not prescribed in the organic law establishing RDB. Below there are four deputy chief executive officers and director general of general services with different responsibilities, they are governed by the law governing public servants.

The Chief Executive Officer of RDB is appointed and removed from office by a Presidential order. While Other Deputy CEOs & Chief executive Officers of General Directorate are appointed and removed from office by an order of the Prime Minister. Their terms of office are different in

accordance with the post. Below these Deputy CEOs there are other heads of departments who conduct all activities carried out in their departments.

For the smooth running of the all operations it's divided into five departments to mentions: Business Operations and Services (RDB BOS) which is made up of former RIEPA, CAPMER, RCRSA, EIA and Privatization Secretariat. Information Technology (RDB IT) which is made up former RITA.

Tourism and Conservation (RDB T&C) which is made up of former ORTPN. Human Capital and Institutional Development (RDB HCID) made up of a unit of former HIDA. Chief Financial Officer (CFO) who is in charge of Finance and Administration of RDB. Human capital and Institutional Development division; this division within RDB has three broad mandates: Developing national and local expertise and capacity, instituting mechanisms of increasing experts in the country and Developing institutional capacity.

Regarding on the organizational structure, RDB staffs work in team so that they can achieve RDB vision. The following are the responsibilities of each department.

INVESTMENT PROMOTION AND IMPLEMENTATION

The investment promotion division is the gateway to investing in Rwanda. RDB showcase investment opportunities available in its priority sectors for investors seeking to make a profitable expansion into the region or the continent as a whole. The investment promotion division of the RDB

- Reaches out investors with specific investment opportunities through international road shows as well as individual business presentations by our foreign office representatives
- Facilitate prospecting investors coming to Rwanda by putting them in contact with people and entities they wish to meet;
- Organizes sector specific conferences and networking session held in Kigali
- Assists with inquiries and information gathering on behalf of the investor
- Seeking potential local and foreign partners in Rwanda for potential investors

RDB EXPORT DEVELOPMENT AND BUSINESS DEPARTMENT

Rwanda is promoting export so that it can correct the problem of trade deficit. It is in that way that RDB focuses on the following aspects to develop export.

- Develop and implement some part of National Export Strategy (NES) that seeks to raise Rwanda's international competitiveness and lead to significant improvement in the country's export performance, and thus reduce the trade deficit.
- Identify goods that have a large domestic market, develop and implement a strategy on how to efficiently produce them within Rwanda without using protectionism or protecting local industries and companies.
- Improving quality of products and services to meet standards.
- Implement an appropriate trade information system that improves access to information on national and international trade flows.
- Facilitate trade by removing barriers and fostering greater integration into regional and international trading networks.
- Provide sector-specific support for viable new industries: silk, textiles, processed fruits and vegetables, dairy products, as well as value addition in existing sectors such as horticulture and leather production.

RDB'S OFFICE OF THE REGISTRAR GENERAL

This department shows clearly the number of companies run their activities in Rwanda where it goes further to:

- Register intellectual property
- Register security interests in moveable property
- Register security interests in immoveable property

You can also register your business online on the dedicated website org.rdb.rw with continuous improvement in the service delivery, RDB make doing business in Rwanda simpler.

RDB SERVICES DEVELOPMENT DEPARTMENT

The services development department performs the following activities:

- Identification and development of opportunities for private sector investment in the priority sub sectors
- Policy advocacy to improve the investment climate for the sector
- Targeted strategic support to companies operating in the sector
- Jobs created in the Services sector

RDB INFORMATION AND COMMUNICATIONS TECHNOLOGY DEPARTMENT

The ICT department has the mandate to facilitate and support development of Rwanda's ICT sector towards transforming Rwanda into an ICT hub for the region. The main responsibilities of the ICT department are:

- Taking the Lead: As the government institution that fast tracks Rwanda's development, RDB will spearhead Rwanda's progress toward building a mature, knowledge-based economy. RDB/ICT proactively pursues the most urgent challenges hindering Rwanda's ICT competitiveness and ensures that the highest-value opportunities are captured.
- Laying the Foundation for Economic Growth: RDB/ICT focuses on developing and deploying the critical ICT infrastructure in order to lay the foundation for sustained economic growth.
- Building a Hub of Information and Communication Technology: RDB/ICT will lead the efforts to establish Rwanda as a regional hub for information and communication technology (ICT) with a robust ICT industry, encompassing and facilitating e-commerce, e-services, applications development, and automation. ICT will be harnessed to generate wealth and be a key economic driver.
- Contribute to ICT Policy Formulation: RDB/ICT will spearhead Policy formulation, coordination and implementation for private sector development and

economic growth. Its priority is policy advocacy and ensuring that the best policies and practices are put in place and adopted to facilitate private sector development.

CONSERVATION DEPARTMENT AND TOURISM DEPARTMENT

This department is among the important department helping Rwanda to keep its nature so RDB

- Promote tourism cluster
- Tourism marketing
- Provide special support to tourism
- Make follow-up on tourism industry

1.7 Objectives of industrial training

1.7.1 General objectives

The major aim of the industrial training is to help the students to be familiar with the working environment by putting into practice the theories learned in classrooms and apply them in their respective field thus gaining new knowledge.

1.7.2 Specific objectives

The specific objectives of industrial training are:

- To provide students the opportunity to test their interest in a particular career before permanent commitments are made.
- To develop skills in the application of theory to practical work situations.
- To develop skills and techniques directly applicable to their careers.
- Internships will increase a student's sense of responsibility and good work habits.
- To expose students to real work environment experience, gain knowledge in writing report in technical works/projects.
- Internship students will have higher levels of Professions performance.

- Internship programs will increase student earning potential upon graduation.
- To build the strength, teamwork spirit and self-confidence in students' life.
- To enhance the ability to improve students' creativity skills and sharing ideas.
- To build a good communication skill with group of workers and learn to learn proper behavior of corporate life in industrial sector.
- The student will be able instilled with good moral values such as responsibility, commitment and trustworthy during their training.
- To gain practical oriented work experience
- To link theoretical knowledge acquired in class with practical work
- To learn from professionals and experts
- To experience how institution executes its responsibilities

CHAPTER TWO: ACTIVITIES CARRIED OUT AND GAINED EXPERIENCES

2.0 Introduction

This chapter will provide a review on the tasks carried out during internship and the output of those activities and show the skills I developed. This chapter has a hardware part which talks about computer maintenance, troubleshooting, repairing and networking part. This chapter will show how the internship helped me to put in action the lesson learnt from school.

2.1 Hardware Part

In order to troubleshoot a computer, one must have good knowledge of hardware part of a computer which is the physical part the computer that is tangible, and we can see it.

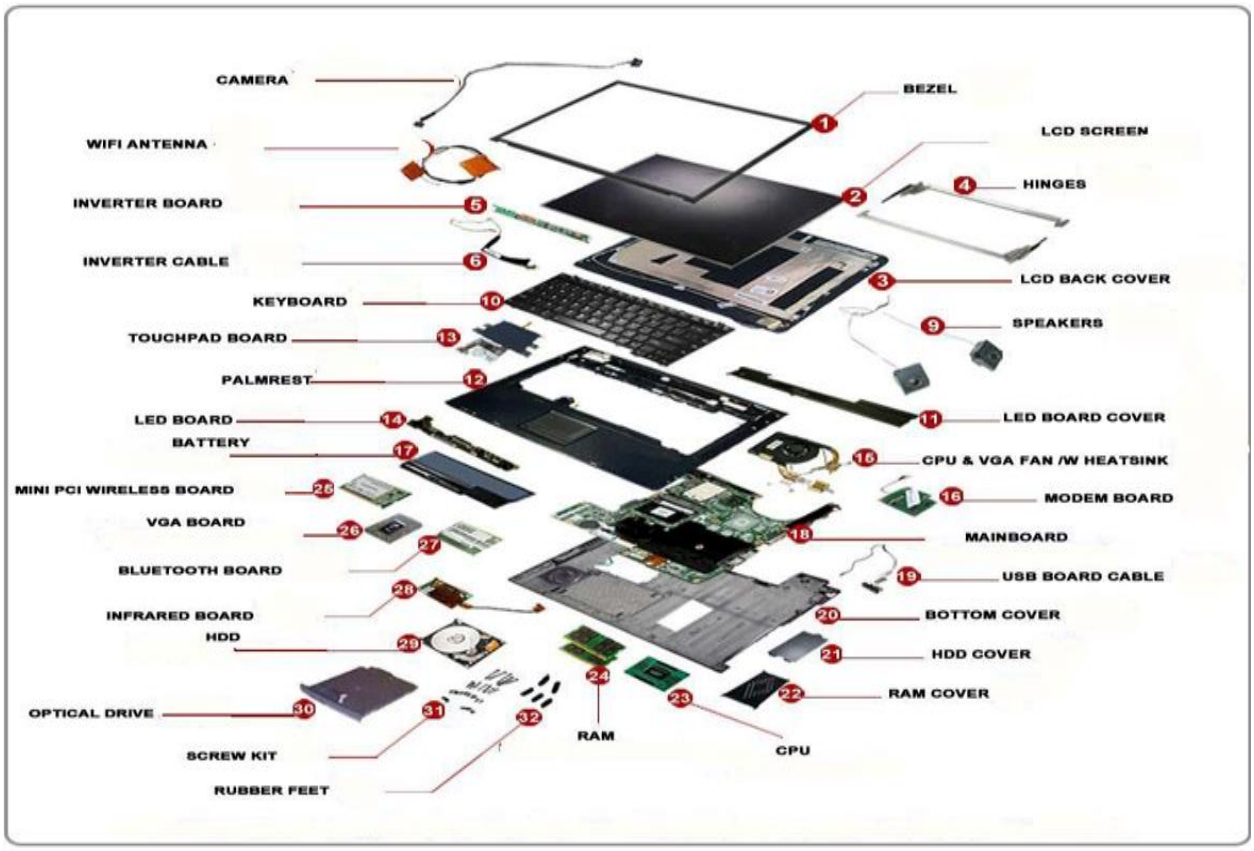


Figure 3: Physical parts of a computer

2.1.1 Computer disassembling

There are various components of hardware's and most of them are assembled in one hardware component called computer case.

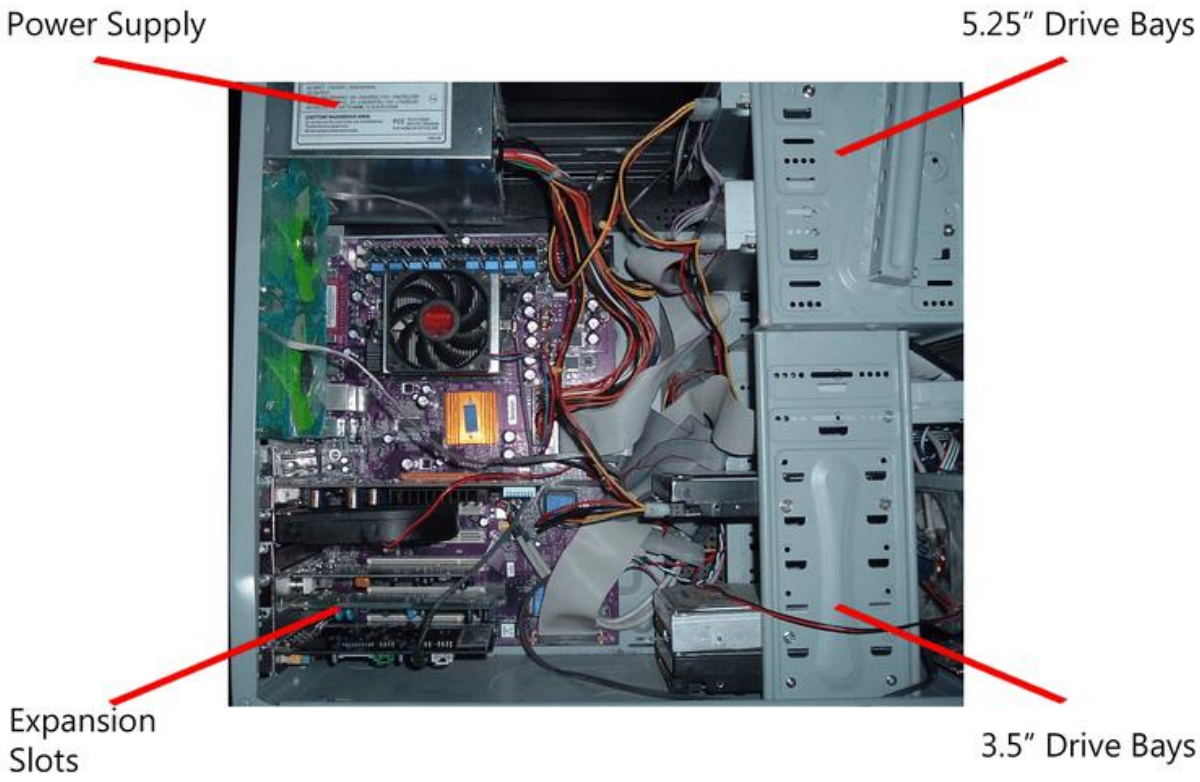


Figure 4: Inside computer case

- **Power Supply:** The power supply connects to nearly every device in the PC to provide power. It is located at the rear of the case.
- **Drive Bays:** The 5.25" and 3.5" drive bays house the many kinds of storage devices a computer might contain.
- **Expansion Slots:** The expansion slots at the rear of the case are specially cut out so the peripherals connected to the motherboard can extend from the case for easy connection to external devices such as printers, monitors and other external devices.

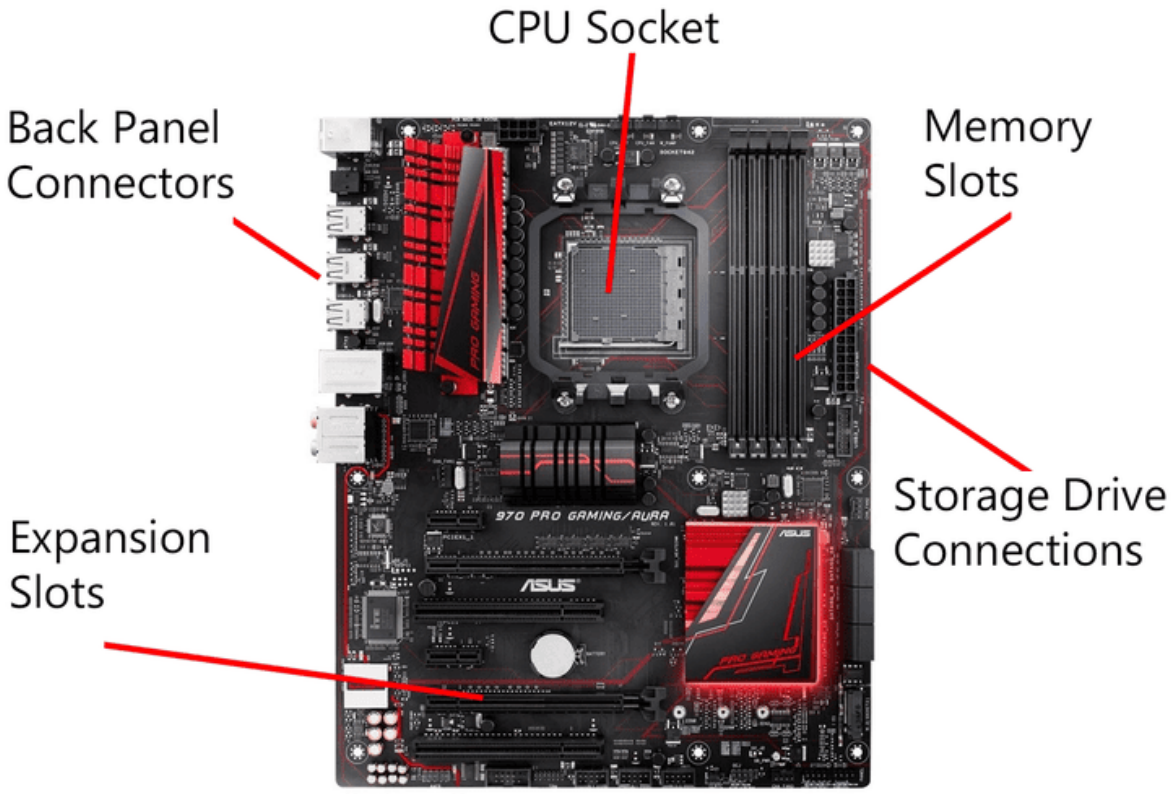


Figure 5: The Motherboard

The motherboard is mounted inside the computer case and is securely attached via small screws through pre-drilled holes. All of the components in a computer connect to the motherboard in one way or another.

- **Expansion Cards:** Motherboards usually contain a number of slots for internal peripheral cards like video cards and sound cards to connect to.
- **Back Panel Connectors:** The back-panel connectors extend out the back of the case for connection to external peripherals.
- **CPU & Memory Sockets:** The CPU and memory connect directly to the motherboard via the CPU socket connector and memory slots.
- **Storage Drive Connectors:** Storage devices are connected via cables to the motherboard. There are special connectors for floppy drives, optical drives and hard drives.

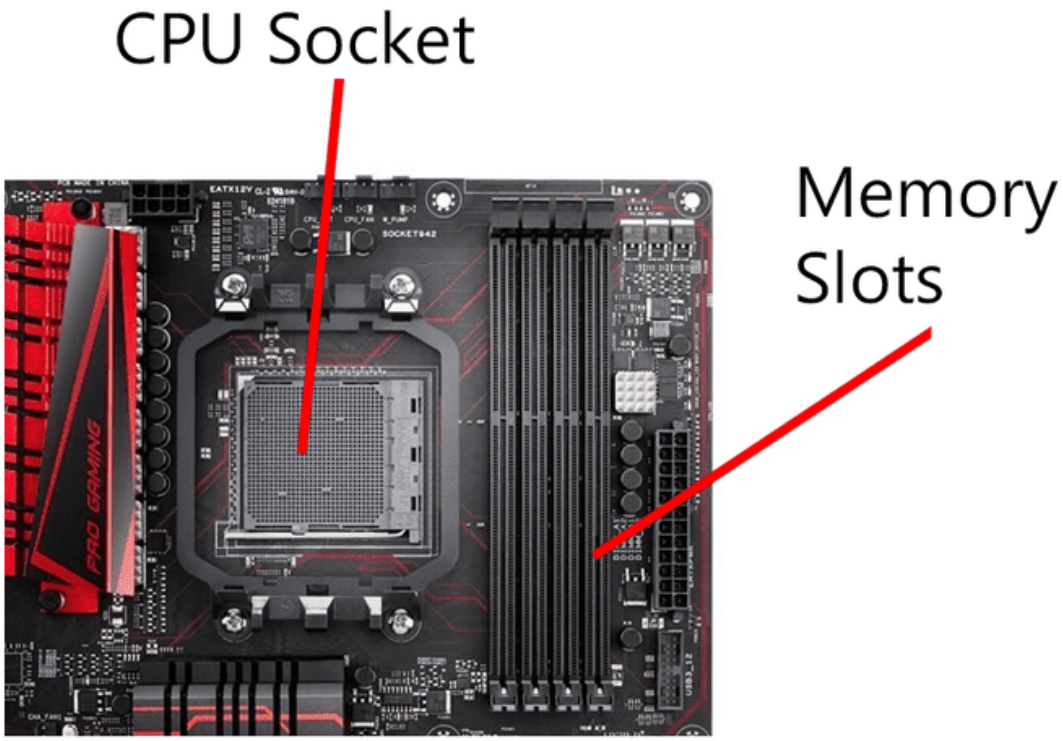


Figure 6: CPU and Memory

- **CPU:** The Central Processing Unit(CPU) attaches directly to a CPU socket on the motherboard located inside the computer. The CPU is inserted into the socket pin-side-down and a small lever helps to secure it. In some pictures of a motherboard, you may see a large fan seated atop the CPU to help disperse heat.
- **Memory:** Memory is installed in memory sockets located on the motherboard. These are easily locatable by looking for the small hinges on either side that lock the memory in place.

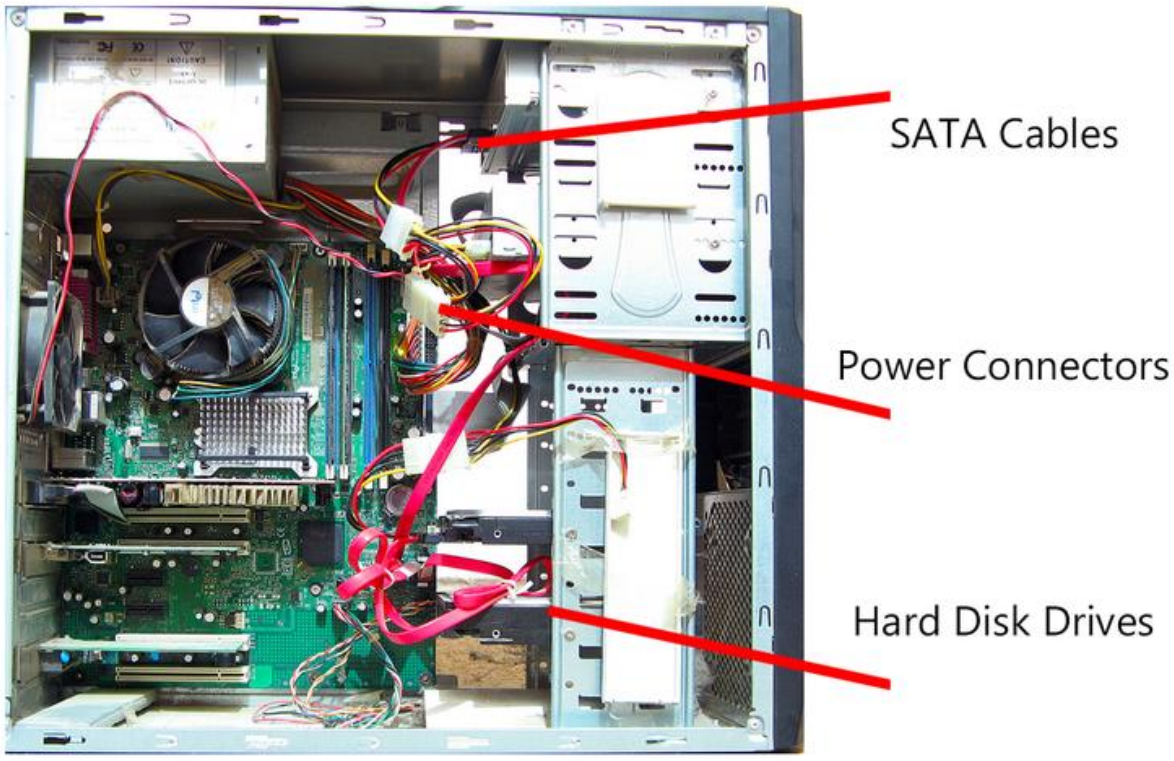


Figure 7: Storage Devices

Storage drives such as hard drives, optical drives and floppy drives all connect to the motherboard via cables and are mounted inside the computer.

- **SATA Cables:** This example shows two hard disk drives that connect to the motherboard via SATA cables for fast hard drive access. Another kind of connection is the older PATA cable connection, but an example isn't shown in this image.
- **Power Connectors:** Power from the power supply is delivered to both drives via cables that plug into the power port on the drives.

Figure 8: Peripheral Cards

Peripheral cards, such as the video card pictured, connect to compatible slots on the mother, inside the computer.

- **PCI Connector:** This peripheral card was designed with a PCI connector and must be used in this type of slot on the motherboard.

Other types of peripheral cards include sound cards, wireless network cards, modems, and more. More and more functions typically found on peripheral cards, such as video and sound, are being integrated directly onto the motherboard to decrease costs.

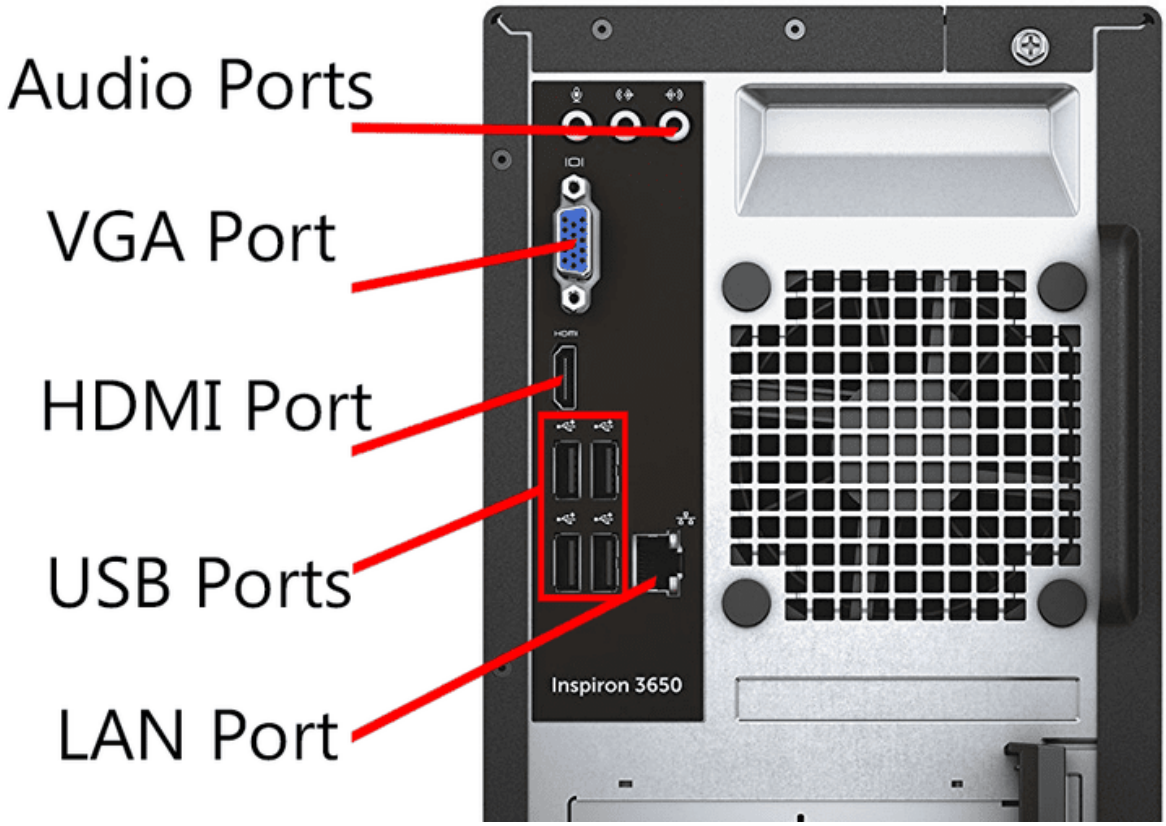


Figure 9: External Peripherals

Most external peripherals connect to the motherboard connectors that extend from the rear of the case.

- **USB Ports:** Devices like mice, keyboard, digital cameras, scanners and printers often connect to the motherboard via the USB ports.
- **LAN Port:** The LAN port is used to connect the PC to a local network or to high speed internet services.
- **VGA & HDMI Ports:** On this motherboard, there's an HDMI port and a VGA port to provide video out to those types of display devices.
- **Audio Ports:** Integrated line-out, microphone and line-in ports provide access to integrated audio, meaning there is no need for sounds cards on this particular computer.
- **PS/2 Ports:** Older keyboards and mice that aren't USB devices will connect to the computer via the PS/2 ports, which are not shown in this image above. Newer computers don't typically come with PS/2 connections.
- **Serial & Parallel Ports:** Are a serial port and parallel port to allow connections to printers and other external devices. Like mice and keyboards, these devices have basically been replaced by USB.

2.1.2 Troubleshooting common problems

Below is a list of some problems experienced while assembling a pc.

Problem: The pc does not boot; the power and HDD LED does not come on; and there is no display on monitor.

Solution: Check that your main power cable is plugged into the ATX power supply; Make sure you have connected the ATX power connector to the motherboard; Check if the cable for the power switch at front of the pc is connected to the correct pins on the motherboard.

Problem: The power LED comes on but the PC does not boot; there is no display on monitor.

Solution: Check if the processor is firmly into the socket; Check CPU jumpers to verify if CPU frequency is correctly set.

Problem: The PC does not boot; but is beeping

Solution: Different BIOS manufacturer use various numbers of beeps to indicate faulty with various hardware. In an award BIOS motherboard, you will get following beeps:

1 long 2 short: Graphics card is not securely into the place, or faulty

1 long 3 short: Graphics card is not securely into the place, or faulty video memory.

Continuous beeps: No memory, or memory not securely into place, or could be faulty
Continuous high/low beeps: No CPU, or CPU not securely into place, or could be faulty. Please refer to your motherboard manual to confirm what the beeps are trying to tell you.
Problem: The PC boots but the PC speed is incorrect.
Solution: The CPU frequency jumper setting is incorrect. Refer to your motherboard manual to set it correctly
Problem: The HDD is not being detected by the BIOS.
Solution: Check if you connected the IDE cable to the motherboard correctly, is pin 1 on the IDE cable connected to pin 1 on the IDE sockets on both motherboard connector and HDD connector. Check if the HDD jumper is set to master and any other device sharing the same cable is set to slave.
Problem: I cannot access my CD/DVD-ROM in DOS mode, hence cannot install windows.
Solution: CD/DVD-ROM device driver is not installed. Install the manufacturer supplied device driver. If you don't have a device drive disk, you can use the windows boot sector disk which will provide access to your CD/DVD-ROM, so that you can install windows.

2.1.3 Formatting PCs and O.S Installation

1. **Back up all your data first** Doing a clean install erases everything on your hard drive apps, documents, *everything.*
2. Choose what kind of media you want to create. You can use CD, DVD or USB flash drive
3. Boot from your flash drive. You can usually do this by pressing F2 (or a similar key) at startup, then choosing your flash drive from the list that appears.
4. *When prompted for a key, enter your Windows 7, 8, or 8.1 key to activate Windows 10. you can skip this step and follow the below instructions to do a clean install.*
5. Choose your language, time, keyboard and edition of Windows.
6. You should be greeted with the Windows 10 installer. Follow the initial prompts and, when given the option, choose "Custom: Install Windows Only".
7. Select the hard drive you want to install Windows 10 on. If you aren't sure which drive or partition it is, look for the largest one, or the one that says "Primary" in the right column—

that's probably it (but make extra sure before continuing, because you will erase that hard drive!)

8. Click the "Format" button. (If the Format button is grayed out, click "Delete", then click "New".) Press Next to install Windows on that drive.
9. Allow the installation wizard to guide you through the rest of the process.
10. Windows may restart many times during the installation and when its done give you the screen to enter your username and password.
11. You will see Windows 10 desktop. That is, you have successfully installed Windows 10 on your PC.

Figure 10: Formatting a computer1

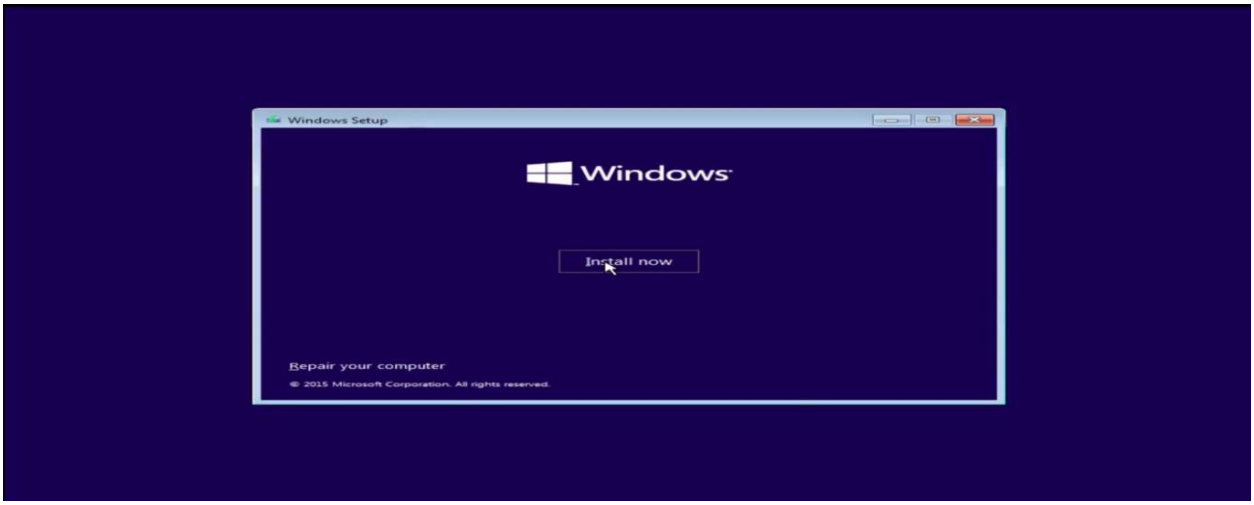


Figure 11: Formatting a computer2

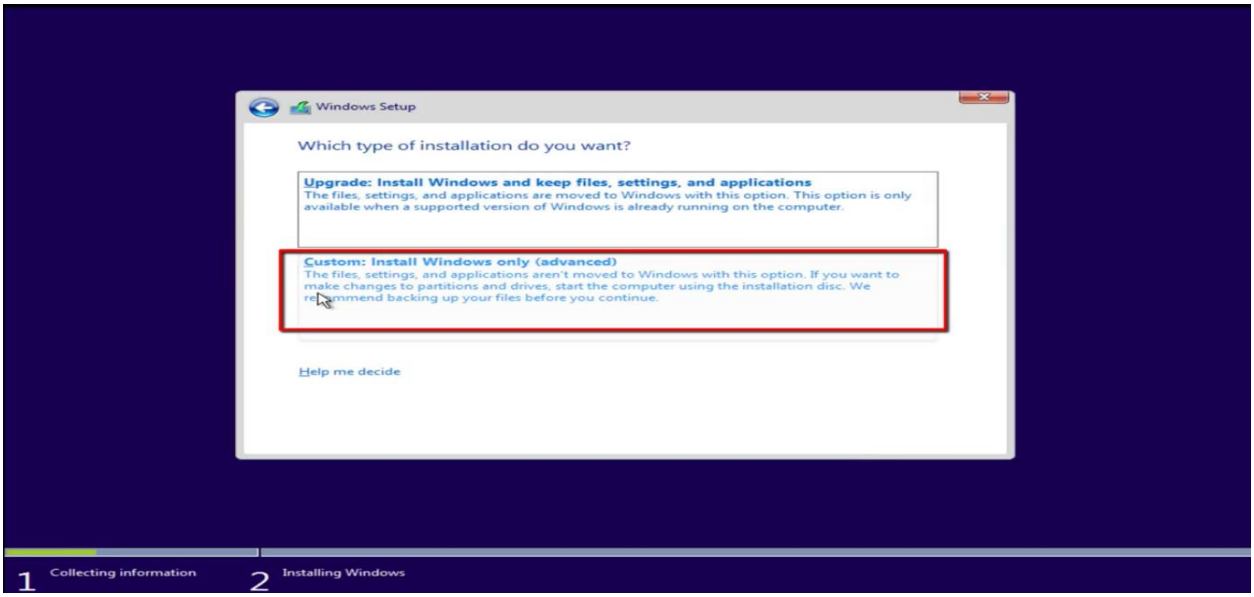


Figure 12: Formatting a computer3

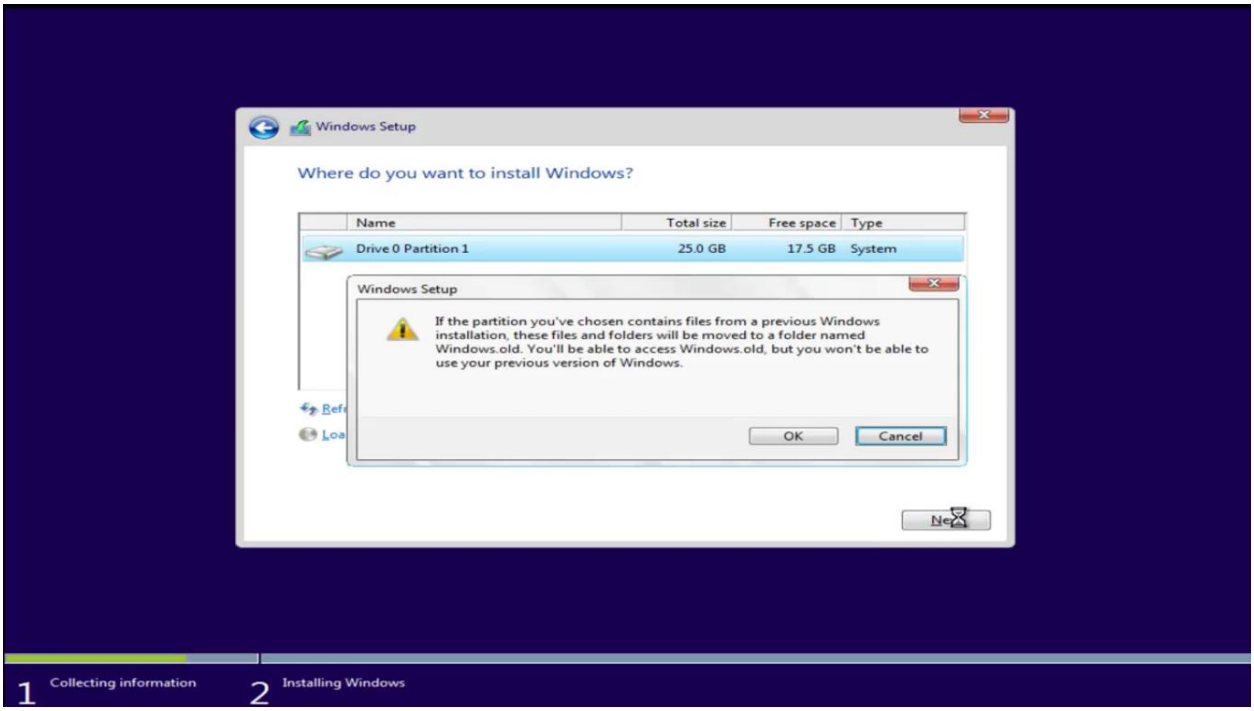


Figure 13: Formatting a computer4

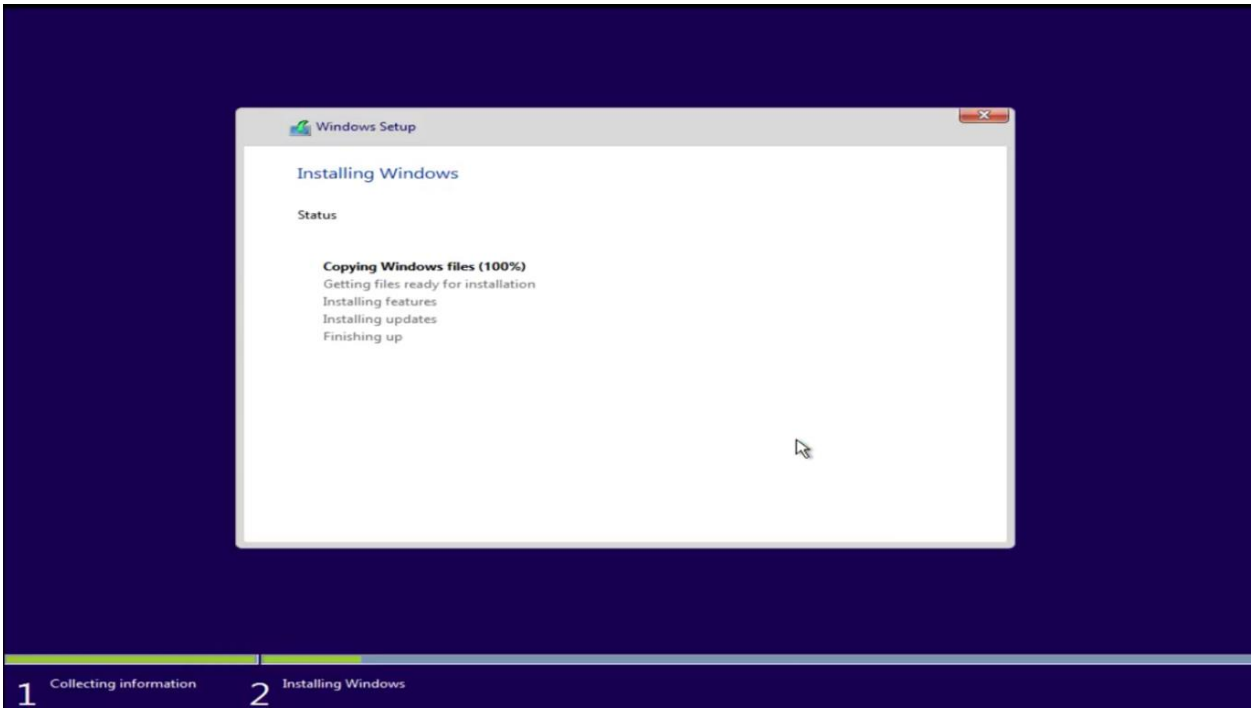


Figure 14: Formatting a computer5

2.2 Networking Part

In network part of the training, I learned about network cabling technologies and network troubleshooting and joining PC's the domain name, configuration of IP Phone.

2.2.1 Network Cabling

Cable is the medium through which information usually moves from one network device to another. In network cabling we focused on making network cables and testing connectivity within them.

Purchasing Ethernet cables can be quite expensive and pre-made lengths are not always the length you need. Making Ethernet cables is easy with a box of bulk Category 5e Ethernet cable and RJ-45 connectors that are attached to the cut ends of your preferred cable length.

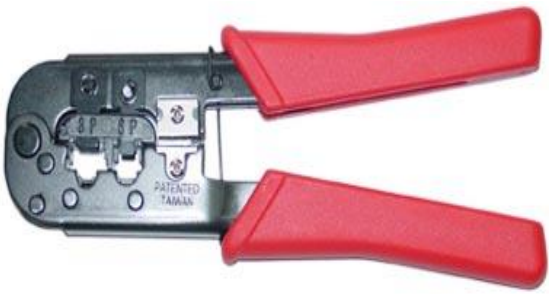


Figure 15: bulk cable **Figure 16: bulk connectors** **Figure 17: crimping tool**

There are two kinds of Ethernet cables you can make, **Straight Through** and **Crossover.**
The Ethernet network cable is made of 4 pair high performance cable that consists twisted pair conductors that used for data transmission. Both end of cable is called RJ45 connector.

The cable can be categorized as Cat 5, Cat 5e, Cat 6 UTP cable. Cat 5 UTP cable can support 10/100 Mbps Ethernet network, whereas Cat 5e and Cat 6 UTP cable can support Ethernet network running at 10/100/1000 Mbps. Straight and crossover cable can be Cat3, Cat 5, Cat 5e or Cat 6 UTP cable, the only difference is each type will have different wire arrangement in the cable for serving different purposes.

Straight Cable

Pin ID	Side A	Side B
1	Orange-white	Orange-white
2	Orange	Orange
3	Green-white	Green-white
4	Blue	Blue
5	Blue-white	Blue-white
6	Green	Green
7	Brown-white	Brown-white
8	Brown	Brown

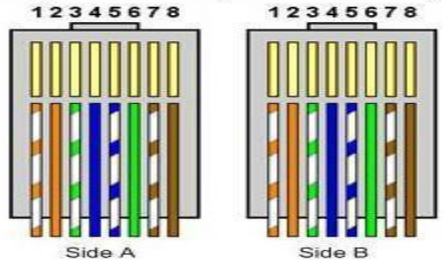


Figure 18: Straight cable

You usually use straight cable to connect different type of devices. This type of cable will be used most of the time and can be used to:

1) Connect a computer to a switch/hub's normal port.

2) Connect a computer to a cable/DSL modem's LAN port.

3) Connect a router's WAN port to a cable/DSL modem's LAN port.

4) Connect a router's LAN port to a switch/hub's uplink port. (normally used for expanding network)

5) Connect 2 switches/hubs with one of the switch/hub using an uplink port and the other one using normal port.

If you need to check how straight cable looks like, it's easy. Both side (side A and side B) of cable have wire arrangement with same color.

Crossover Cable

Pin ID	side A	side B
1	Orange-white	green-white
2	Orange	green
3	green-white	orange-white
4	blue	brown-white
5	blue-white	Brown
6	green	orange
7	brown-white	Blue
8	brown	blue-white

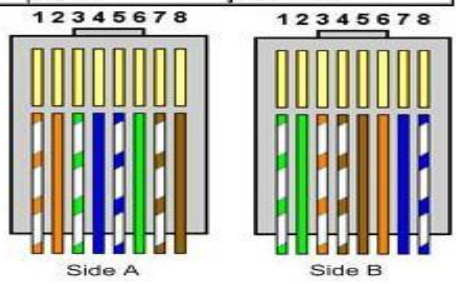


Figure 19: Crossover cable

Sometimes you will use crossover cable, it's usually used to connect same type of devices.

A crossover cable can be used to:

1) Connect 2 computers directly.

2) Connect a router's LAN port to a switch/hub's normal port. (normally used for expanding network)

3) Connect 2 switches/hubs by using normal port in both switches/hubs.

In you need to check how crossover cable looks like, both side (side A and side B) of cable have wire arrangement with following different color.

2.3 Network services and architecture

- **Network services**

SahanNet will be designing the network to facilitate the users in RDB for services of internet Access and wireless connectivity to entire building of RDB along with support of Voice over IP name the services will be as follows

- IP Routing
- Wireless
- Security
- VOIP
- Network Management

- **Network Architecture**

The Diagram below gives the logical setup of Rwanda Development Board (RDB)

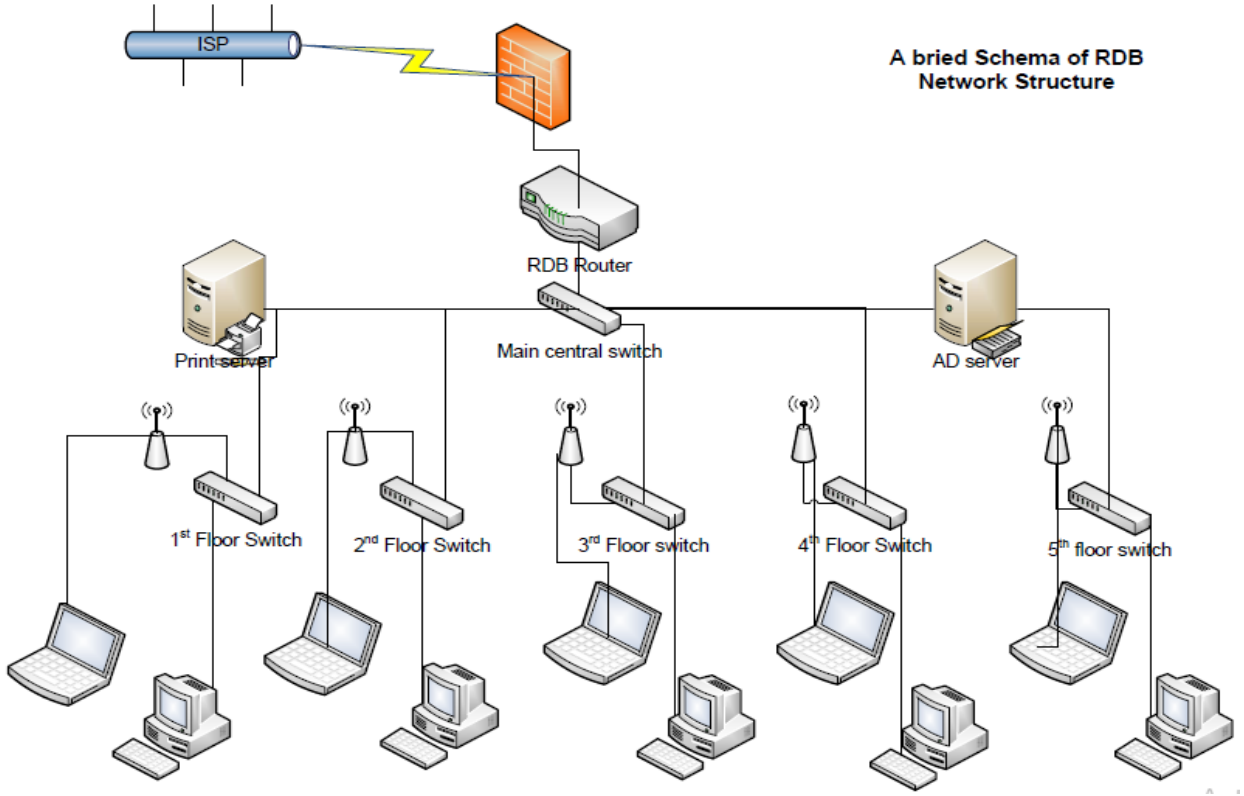


Figure 20: Network Architecture

The network of RDB is served from a server room which receives internet from BSC. The server room serves all departments of this large organization as described in the figure above.

2.4 **Joining the domain name**

A domain is a collection of computers on a network with common rules and procedures that are administered as a unit. Each domain has a unique name. Typically, domains are used for workplace networks. To connect your computer to a domain, you'll need to know the name of the domain and have a valid user account on the domain.

Open System by clicking the **Start** button, right-clicking **Computer**, and then clicking **Properties**.

Under **Computer name, domain, and workgroup settings**, click **Change settings**. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

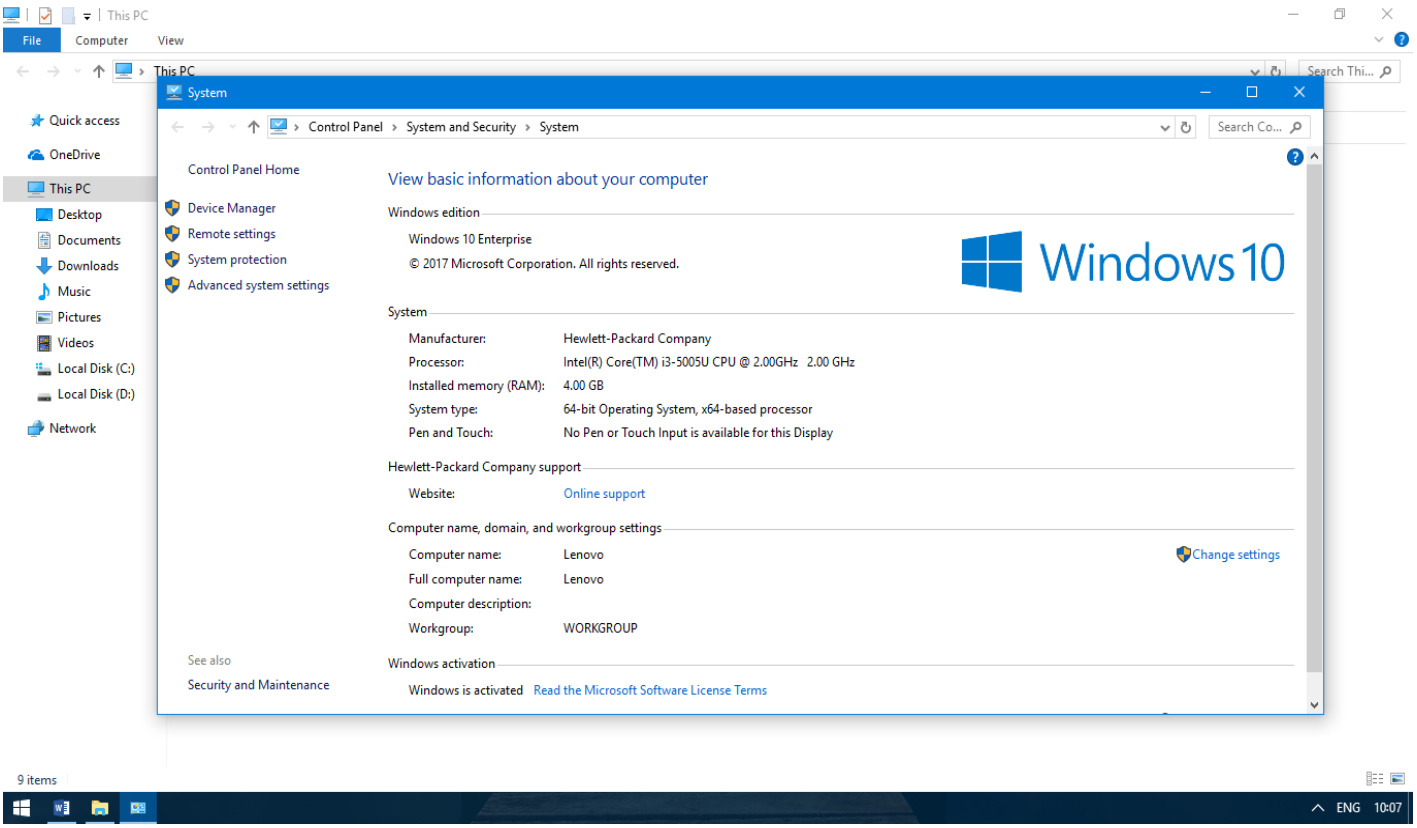


Figure 21: Computer properties

Click the **Computer Name** tab, and then click **Change**. Alternatively, click **Network ID** to use the Join a Domain or Workgroup wizard to automate the process of connecting to a domain and creating a domain user account on your computer.

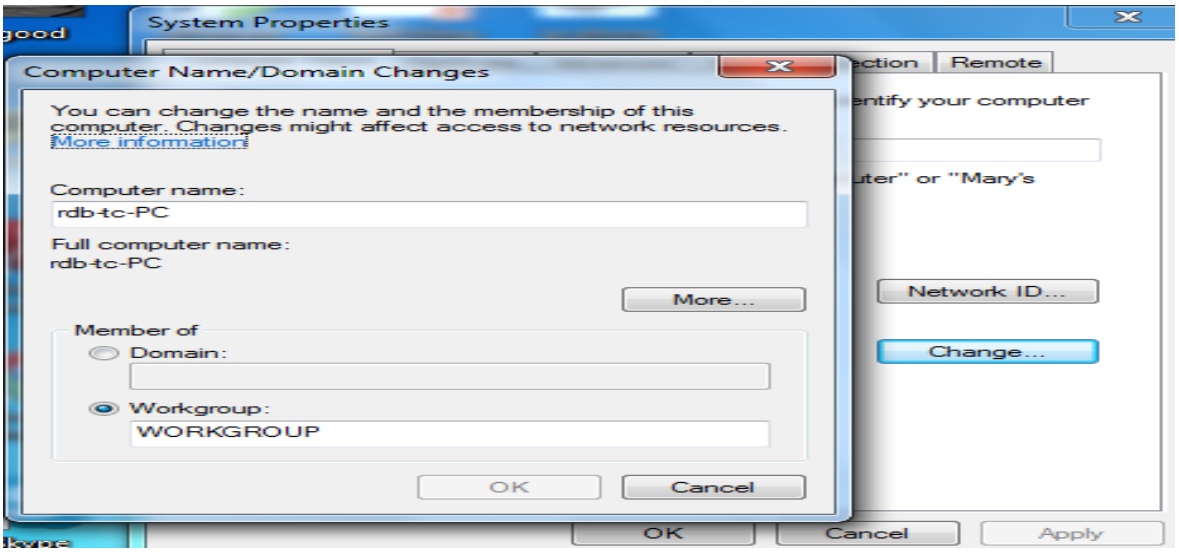


Figure 22: Changing computer name

Under **Member of**, click **Domain**. Type the name of the domain that you want to join, and then click **OK**.

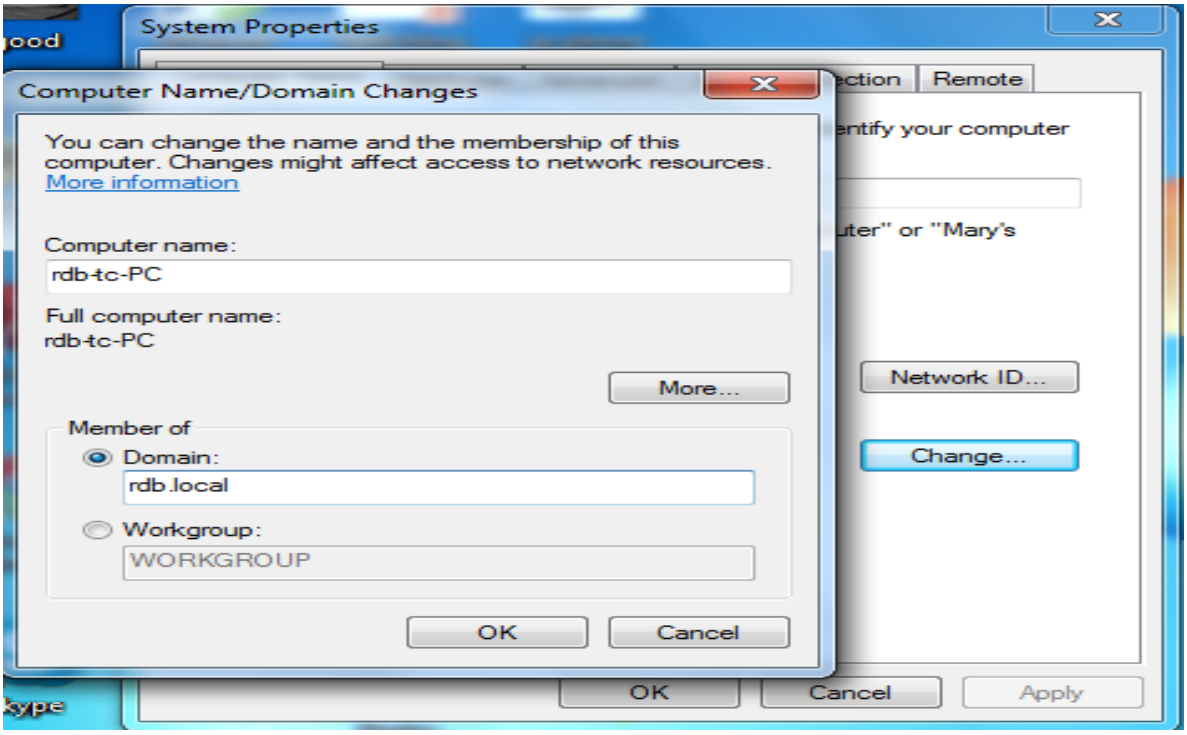


Figure 23: Adding a computer to a domain

You will be asked to type your user name and password for the domain.

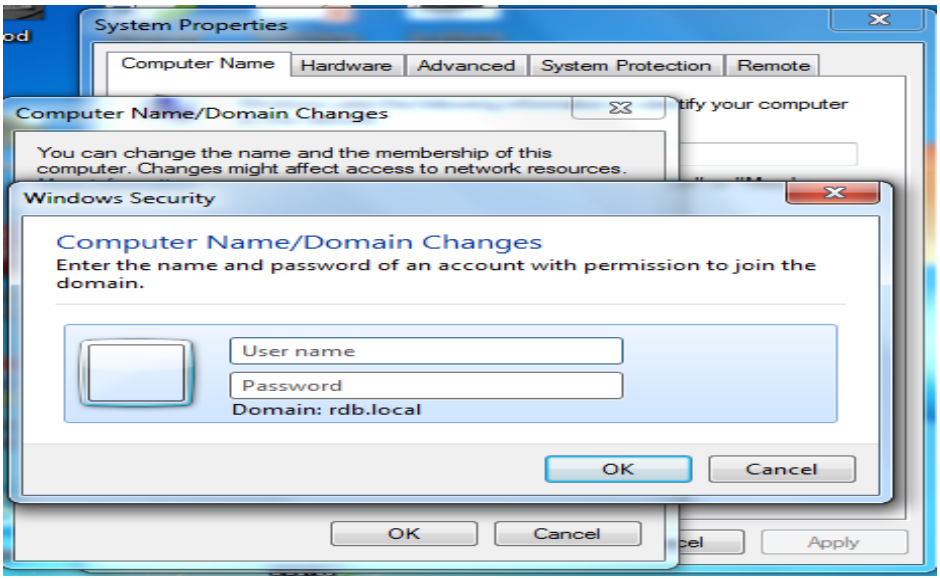


Figure 24: providing credentials of a domain

A confirmation pop up box will welcome you to the domain; you will be prompted to restart your computer. You must restart your computer before the changes take effect.

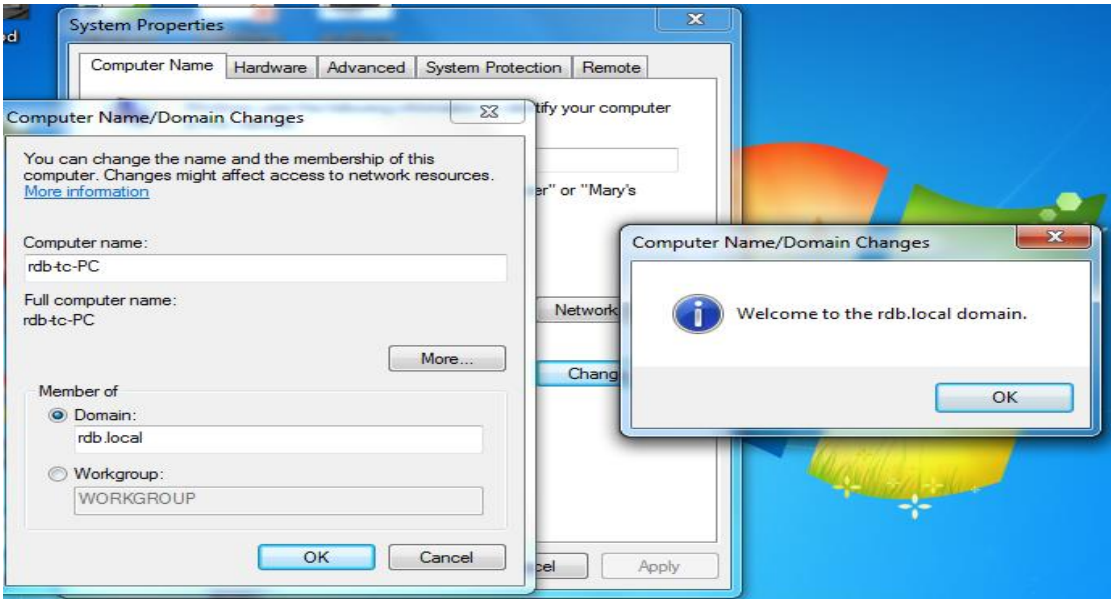


Figure 25: Joining a domain

2.5 **Connecting users to the printer**

When users are on the domain, to connect them to printers you browser printers from the shared folder by writing it's IP address in run as shown below.

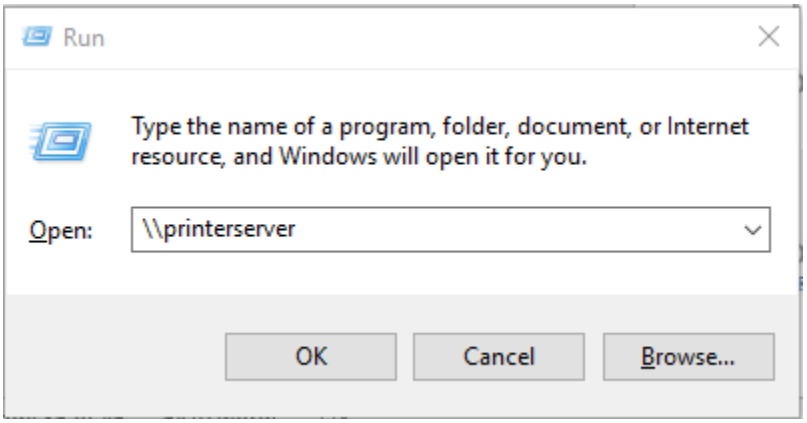


Figure 26: Accessing shared folder

You will get a new window automatically and choose the printer by using right click and choose connect and you will be able to connect to the printer of your choice.

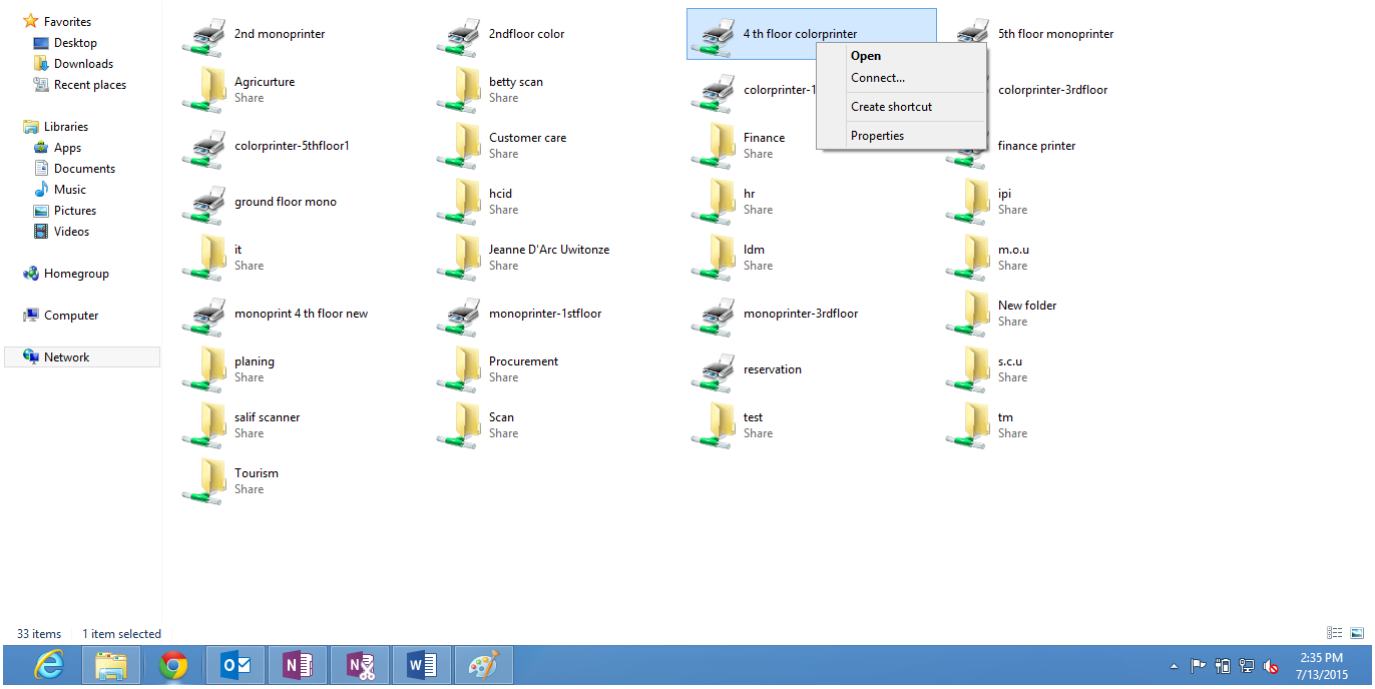


Figure 27: Connecting to a printer

2.6 **Network devices**

- **Switch**

A network switch is a computer networking device that connects network segments. The term commonly refers to a Network bridge that processes and routes data at the Data link layer (layer 2) of the OSI model. Switches that additionally process data at the Network layer (layer 3 and above) are often referred to as Layer 3 switches or Multilayer switches. The term network switch does not generally encompass unintelligent or passive network devices such as hubs and repeaters.

Figure 28: Switch

- **Router**

A **router** is a device that forwards data packets along networks. A **router** is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP's network. **Routers** are located at gateways, the places where two or more networks connect but in RDB they use firewalls

Figure 29: Router

- **Wireless Access Points**

(WAP) is a device that allows wired communication devices to connect to a wireless network using Wi-Fi, Bluetooth or related standards. The WAP usually connects to a router, and can relay data between the wireless devices (such as computers or printers) and wired devices on the network.

Figure 30: Wireless Access Points

- **IP Phones**

IP Phone is a full-feature telephone that provides voice communication over the same data network that your computer uses, allowing you to place and receive phone calls, put calls on hold, transfer calls, make conference calls, and so on.

Figure 31: IP phone

2.7 Configuration of IP phones

STEP 0: Make sure that all the required materials are available.

The IP phone comes with the following items:

-The phone

-A small network cable

-The adapter

-The apos.cfg file

STEP 1: Getting the configuration file in the already configured IP Phone.

Go to command Prompt then enter the location of wish to save the configuration file and execute the following commands:

Ex : C:\Users\christianr\cd Desktop ↲

C:\Users\christianr\Desktop> ftp [IP address of the phone] ↲

User: [root] ↲

Password: [router] ↲

ftp>get apos.cfg↲

ftp> bye↲

Open the copied file with Notepad2 application downloadable for free on internet; check the properties of your operating system. (32bits or 64bits).

STEP 2: Modifying the apos.cfg file.

Go on the following lines and modify the following:

Change the IP address of the interface fa0/0 to the wished IP

Change the “Phone Display-name” (Phone number)

Change the “Destination Pattern” as same phone number

Add the “display-name” (to indicate the Department/Division)

Save the apos.cfg file

STEP 3: Configuring of the phone.

Plug the cable into the PC Port of the IP phone and enter the configuration of the phone

On your computer change the IP address to a static IP of the same range as the configured phone; (Ex: IP: 192.168.10.2, SM: 255.255.255.0, GW:192.168.10.1)

One the phone proceeds:

Press on the <Menu> key followed by the <OK> key

Network Setup+OK Key

Internet Setup+OK Key

Disable the DHCP

Repeat from 1 and 2 steps to enable ftp service

Scroll down to the SERVICES location

Press F1 key.

STEP 4: Configuring the newly phone.

Go on your computer and do the following:

Ex : C:\Users\username\cd Desktop ↲

C:\Users\username\Desktop> ftp [192.168.10.1] ↲

User: [root] ↲

Password: [router] ↲

ftp>put apos.cfg↲

ftp>bye.

Restarting the IP Phone to save the configuration.

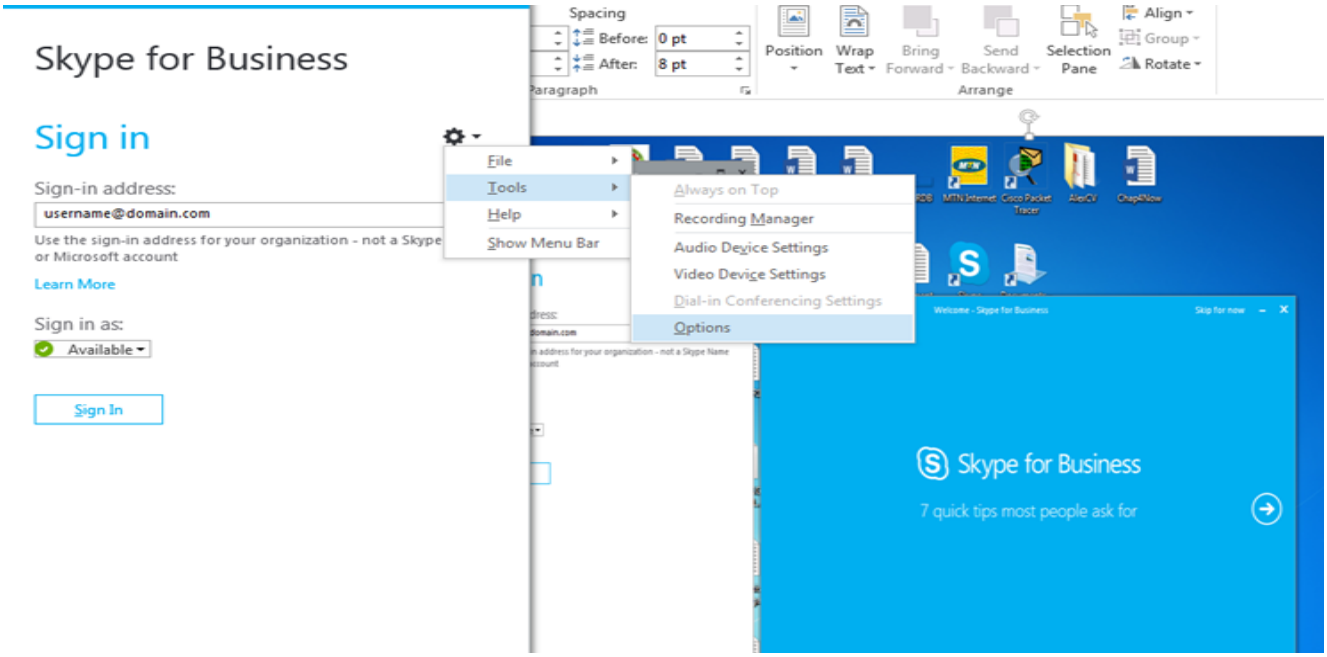
2.8 **Skype for Business**

Skype for business formerly known as Microsoft Lync is an instant-messaging client used with Skype for Business Server or with Skype for Business Online.

Installation of Skype for business

When installing Microsoft office 2013, Skype for business is also included by the name Lync so to install it you just follow the steps and for Microsoft office 2010 you need to install it separately on your computer depending on the version of your OS that is to say 32-bits and 64-bits version.

To configure skype for business you go on the top menu then choose tools then options and Then you choose manual configuration and enter both internal and external server names as shown in the figure below.



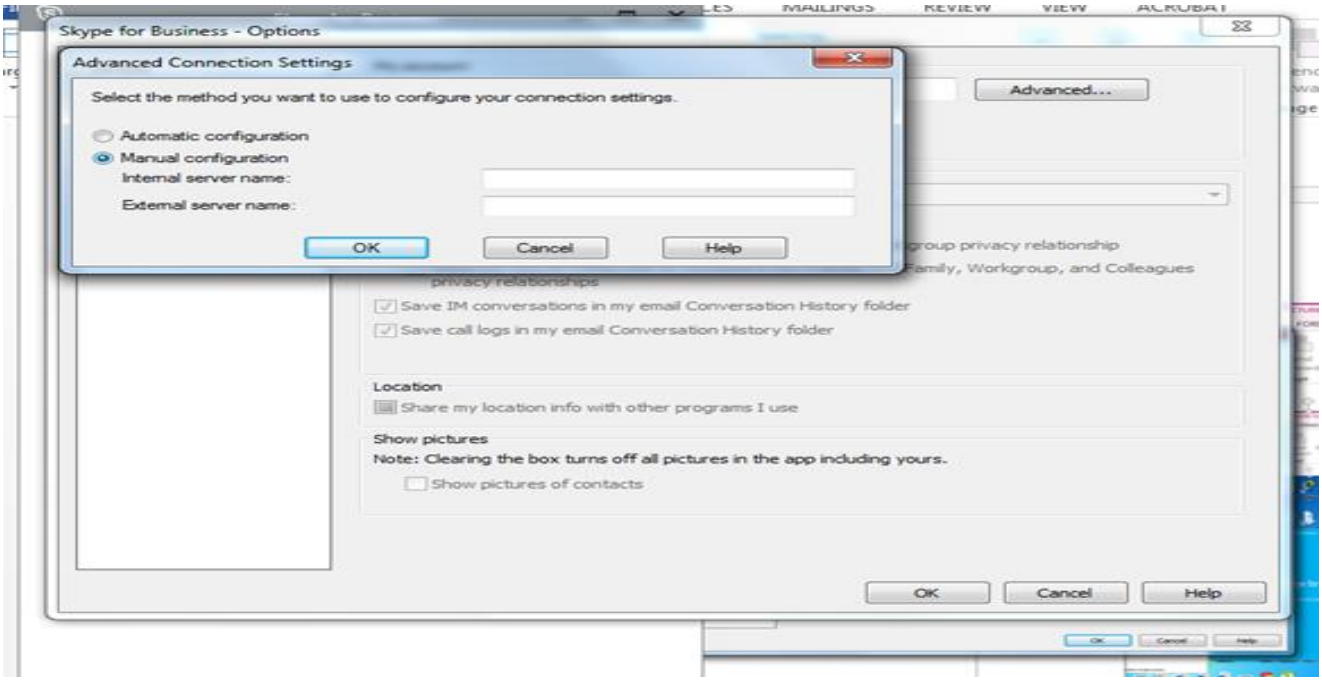


Figure 32: Skype for business configuration

2.9 Server Room Architecture

I looked on how server room is configured with many different devices such as: routers, firewall, server computer, fiber optics cables and UPS. I get the explanation of how all those devices work together to provide the network to RDB. There are different servers such as AD server, Printer server etc.…

CHAPTER THREE: REFLECTION ON INDUSTRIAL TRAINING

3 Introduction

This chapter talks about the experience gained and the challenges I faced during internship.

3.0 Description of the work performance

This table describe the period of work performance in each section.

WEEK	ACTIVITIES
02/10/2019 - 6/10/2019 07/10/2019 - 10/10/2019 11/10/2019 - 14/10/2019	Hardware Maintenance and Troubleshooting -Assembling of computers -Cleaning the computer -Troubleshooting of the computer -Supporting the Users
15/10/2019 - 18/10/2019 19/10/2019 - 22/10/2019 23/10/2019 - 26/10/2019	Software (Installation) -Installation of software from freeNAS server -Installation of different OS -Supporting the Users
27/10/2019 - 30/10/2019 02/11/2019 - 05/11/2019 06/11/2019 - 09/11/2019	Networking and Configuration -Network cabling -Network troubleshooting -Network configuration -Routing Protocol -Vlan configuration -Using of network simulation like GNS3 -Server room configuration -Supporting the Users
12/11/2019 - 15/11/2019 16/11/2019 - 19/11/2019	Printing and Scanning -Printer and Scanner functions

20/11/2019 - 23/11/2019	-Printer and Scanner configuration -Supporting the Users
24/11/2019 - 29/11/2019	

3.1 Discussion of experience gained

Industrial training is a skill development program designed to prepare students of universities, and colleges for transition from the school environment to work environment where they participate in different work activities in an organization.

This work experience program gives students the opportunity to be part of an actual work situation outside the classroom and thus help them to prepared for the job after finishing they studies.

After the internship I am able to connect classroom theory with current industry challenges, and I have exposure to the latest technologies and the practical skills gained will help me to work as an IT in any organization because now I understand and have experienced what it takes to be a good IT and have learnt from the best ones.

Because more practical works done during this internship, I now have self-confidence and ability to solve different technological problems, to install, configure, troubleshoot and maintain different electronic devices and this internship gave me an experience for life.
During my internship period at RDB in IT Operation Division I have increased my theoretical and practical knowledge in a number of things and in different areas such as follows:

- **Interpersonal Skills**

Interpersonal skills, which are the life skills and used day to day to communicate and interact with other people, individually and in groups are very important and thanks to RDB staffs who helped

me to develop such important skills. Not only how I communicated with others, but also, I got confidence and my ability to listen and understand has also improved.

Through this internship, I gained many new perspectives, such as problem-solving skill, effective communication, teamwork, giving good services, giving attention to detail, time management, personal empowerment, self-confidence and taking responsibility.

- **Technical Skills**

During the internship I gained a lot of technical knowledge which was added to what I have learnt in class like understanding how computers, printers, routers, switches and others electronics devices are used to make every day work made easy and done correctly and fast. analytical skills

I developed new skills like analytical thinking, computer programming, troubleshooting different problems, maintenance of different electronic devices and networking which deals with knowing how to set up and configure internet and connect people and their devices to internet.

CHAPTER FOUR: CONCLUSION AND RECOMMENDATION

4.1 Conclusion

This internship carried out at RDB was very fruitful to me because class theories alone are not enough unless they are put into practice and RDB had given me the opportunity to do that and gaining new knowledge and skills while doing that internship.

The practical training, I performed during this internship is of the great value in my life and it helped to know more about my career in information technology and it introduced me to new technologies and technics hence internship is of great importance to me.

4.2 Recommendations

The whole internship period at RDB was very interesting, instructive and challenging, through this internship period I was able to gain new insight and more comprehensive understanding about how work is done in the real-world company.

I would like to recommend RDB to provide more accurate and updated information on its website and carry out surveys and ask for feedbacks in order to hear what they customers have to say to them. The organization should also continue to provide more internship opportunities to students in order to help them to put in practice what they have learned in Class.

My recommendations to AUCA is that it should help students to get internship because it’s very difficult to find organization to do internship in. AUCA should also follow up of the students to find out how their internship training is going and the challenges they may be facing.

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