FINAL YEAR INTERNSHIP BASIC LINUX ON MIKTROTIK AND CISCO NETWORKING

SUBMITTED

BY

JAKAREA
ID: 152-15-6200

This Report Presented in Partial Fulfillment of the Requirements for the

Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

Ms. Afsara Tasneem Misha
Lecturer
Department of CSE
Daffodil International University

Co-Supervised By

Ms. Farahana Irin
Lecturer
Department of CSE
Daffodil International University

DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

MAY 2018

APPROVE

This Project titled **"Basic Linux on Miktrotik and Cisco Networking"**, submitted by **Jakarea, ID** No:**152-15-6200**to the Department of Computer Science and Engineering, Daffodil International University has been acknowledged as acceptable for the fractional satisfaction of the necessities for the level of B.Sc. in Computer Science and Engineering and affirmed as to its style and substance. The presentation has been held on **May 2018**.

<u>BOARD OF EXAMINERS</u>

Dr.Syed Akhter Hossain   **Chairman**
Professor and Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Dr. Sheak Rashed Haider Noori   **Internal Examiner**
Associate Professor and Associate Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Md. Zahid Hasan   **Internal Examiner**
Associate Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Dr. Mohammad Shorif Uddin   **External Examiner**
Professor
Department of Computer Science and Engineering
Jahangirnagar University

DECLARATION

I hereby declare that, this project has been done by **Jakarea ID:152-15-6200** department of computer science and engineering Daffodil International University under the supervision **Ms. Afsara Tasneem Misha, Lecturer, Department of CSE** Daffodil International University.

Supervised by:

Ms. Afsara Tasneem Misha
Lecturer
Department of Computer Science and Engineering
Daffodil International University

Co-Supervised by:

Farhana Irin
Lecturer
Department of Computer Science and Engineering
Daffodil International University

Submitted by:

Jakarea

ID: 152-15-6200
Department of Computer Science and Engineering
Daffodil International University

ACKNOWLEDGEMENT

In any case I express heartiest thanks and thankfulness to god-like God for His ideal blessing makes us possible to complete the most recent year temporary job successfully.

I am appreciative to **Kazi Mahbub Alam** Manager of Daffodil Online Limited. I am likewise appreciative to **Mr. Mohammad Abul Basher** System Admin (Network& Training) of Daffodil Online Limited. Without their assistance I can't finish my entry level position in this Company. Other individuals are exceptionally useful they are doing parcel of assistance of my entry level position.

I extremely thankful and wish significant obligation to **Ms.Afsara Tasneem Misha Lecturer**, Department of CSE Daffodil International University, Dhaka. Profound Knowledge and unmistakable fascination of chief in the director in the field **Basic Linux on Miktrotik and Cisco Networking.** To do this expand. His wearisome honesty, Helpful bearing, relief, continuing and dynamic supervision, positive assessment, basic direction, examining heaps of lesser draft and curing them at all stage have made it possible to complete this wander.

I might want to offer our heartiest thanks **to Dr. Syed Akhter Hossain, Professor and Head, Department of CSE,** for his kind help to complete our venture and furthermore to other employee and the staff of CSE division of Daffodil International University.

I would like to thank our entire course mate in Daffodil International University, who participated in this talk about while finishing the course work.

Finally, I ought to perceive with due respect the steady help and patients of watchmen.

ABSTRACT

On the off chance that two and more PCs are interconnected and ready to trade information or data then we call arrange. We need to expand the quantity of PC's and trade information or data starting with one then onto the next that time we require some uncommon PC's are called Server. So I work to fundamental of Linux and Networking in light of the fact that there are different kind of work in organize look like switch arrange essential systems administration IP tending to setup **VLAN** design **NAT,PAT** Routing Static Dynamic **RIP,OSPE,EIGRP,ARP** Mikrotik introduce arrange firewall and **Hardware & Software Troubleshooting** On the off chance that system is associated with the Internet and we need to secure your data utilizing Mikrotik. Well-ordered design process and basic investigating of the system. Firewall Each of them works contrastingly and without them it is difficult to keep up a system. So we ought to arrange firewall here to secure our system.

TABLE OF CONTENTS

CONTENTSPAGE

CHAPTER 3: Tasks projects & Activities

Daffodil International University

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1Introduction

This is the time of Information Technology. By and by a day's endless wherever all through the world use web development and frameworks organization is a vital part. Linux Cisco and Mikrotik is maybe the most basic free programming achievement since the primary Space War, or, all the more starting late. We can't do anything relating to web correspondence without Networking. So Networking is basic for web development. Transitory position is an old practice to impact understudies to appreciate the veritable working, condition and challenges of livelihoods. Restorative Science, Engineering and Accounts all branches have their own noteworthiness of transitory position before degree allow.

Remote systems administration advances (Wi-Fi) enables PCs and different gadgets to conveying over a remote flag. A commonplace Wi-Fi organize incorporates comprise three sections: a wired association with a broadband supplier, an entrance point, and a PC associated by wired and remote associations. It gives a few broadband speeds and actuates in logical, Industrial, and Medical band. Among them correspondence between hubs or PCs is done by means of Access Points. It additionally assumes a part as a remote Ethernet connector. Wi-Fi has picked up nature due to simple to establishment effortlessness and the expanded number of Wi-Fi radio prepared workstations. Living helps when a warless gadget moves outside ideal range with one remote AP and effortlessly to interface another point for more grounded signals. Building Wi-Fi hub that conveys simple to scope to portable or meandering the gadgets might be a huge opponent particularly as scope prerequisites increment. This test has altogether more reasonable when the issue and the arrangement choices are all around figured it out. With handoff you can starts take a shot at one gadget at that point change to other adjacent gadget and get where you picked off.

1.2Motivation

Network administration is the advancement of connections that can profit my temporary position or profession investigation. It is a chance to accumulate data about the abilities important to prevail in the different sorts of employments, vocations, and ventures of the general population you meet.

This can enable me to clear up my vocation advantages and following stages. Step by step the opening scene Is getting to be rely upon PC framework. Systems administration is a major piece of quicker communication these days overall commercial center Build in light of systems administration. For best Networking directing and exchanging are so imperative for trade data.Wi-Fi is the more popular process in recent situation. And it is save a big amount of router and save minimize cost complex with easily. Every Organization is used this technology and they can save a large amount of cost. It is use very easy and user can use friendly without connection less Wi-Fi system. We know every Organization used this system and it is developing Wi-Fi system flow the Mobile cellular system, and given the chart of motivational work.

1.3 Internship Goals

- Learn details about the networking components,
- Setup Linux Centos,
- Network Management,
- Server Configuration,
- How to communicate with Clients.
- How to provide better service to Clients.

1.4Introduction to the Company

Daffodil Online Ltd. prides itself as one of the main across the country Internet Service Provider (ISP) in Bangladesh. They are the most experienced and most prepared association in the ICT field where they are principal business ethics is Long Term Relationship with they are customers. As we look at the advancement during the time since our initiation, they are incredibly satisfied with what they have achieved, and

essentially more amped up for they are viewpoint for an also reassuring future. It may fulfill you to understand that they started they are undertaking in the year 2002. In the midst of the earlier years, they widened they are movement and organization portfolio as demonstrated by the customer's proposition and pondering solicitations of time. They worked with various national endeavors and all-inclusive affiliations and achieved the reputation. They are using the latest developments and overhauling the organizations wherever it is required. They are Corporate Network Solution division can give state of-workmanship framework and media transmission courses of action with an extremely successful specific aptitude gathering.

1.5 Report Layout

In the chapter (1) I have delineated objective of section level position, Motivation of transitory occupation and Prologue to the association.

In the chapter (2)I have delineated the reasoning of my impermanent activity. Likewise, this part gives the information about where the transitory activity has been associated with endeavor this program. Similarly included about how played out the impermanent activity capacities, about the association, what are the IT advantage offered in DOL and what are the parts of in occupations market of Mikrotik.

In the chapter (3)I have portrayed about step by step errand and activities, Events and Activities and Challenges.

In the chapter (4)I have delineated is Competencies Earned, Smart Plan, Reflection.

In the chapter (5)I have delineated is Competencies Earned, Smart Plan, Reflection.

CHAPTER 2
ORGANIZATION

2.1 About the Organization

Daffodil Online Ltd. (DOL) is happy to be one of the pioneers and most prepared ISP/ASPs in Bangladesh and giving one stop facilitated ICT organizations and game plan since July 2002. It has its own specific Fiber Optic and Radio Link WAN structure to serve corporate, SME and individual clients. The foundation worked with various national assignments and general relationship with high gratefulness from all concerned. It using the latest advances and upgrading the organizations wherever it is required. The concentrations Corporate Network Solution division is fit for giving state of-craftsmanship framework and media transmission game plans with a social event of outstandingly profitable specific experts. DOL has an extraordinarily strong master building and organization assemble ensured and associated with SUN, Cisco, Microsoft, Linux, and Oracle and successfully required with world driving enrolling affiliations including IEEE, ACM, ACS, BCS, and PMI. Its Corporate Social Responsibility ethos strengthens the familiarity with other's desires on Community, Workstation, Location and Market put. As a Group concern, DOL propels 3 important stages e.g., direction, nation building and condition, through its tasks and organizations

2.2 Product and Market Situation

Daffodil Online Ltd. prides itself as one of the principle the nation over Internet Service Provider (ISP) in Bangladesh. They are the most experienced and most settled association in the ICT field where they are basic business ethics is Long Term Relationship with their customers. As they look at the improvement during the time since our beginning, they are incredibly satisfied with what we have achieved and significantly more amped up for our point of view for a comparably reassuring future. Daffodil Online Ltd in like manner gives unmistakable IT Services and Professional Training organizations. These are given underneath.

2.3 Target Group

The association's customer base joins all clients and all little to medium-sized associations, including new organizations. The association plans to center around SOHO clients, as these are perfect concentrations for our new quick offerings, and hold the best improvement potential for the association. Web Solutions feels that these market sections have exceptional assessing and organization needs, and make more gave, strong customers.

2.4 Organization Structure

Organization Structure of Daffodil Online Ltd:

Figure 2.1:Organization Structure

2.5: IT Services Offered

- Corporate Internet Solution
- Security solution.
- Domain registration and web hosting.
- Website development.
- Open source application solution.
- Internet Service Provider
- Hi speed Wi-Fi Zone.
- Data Connectivity, Data center& Co-Location.
- Bulk SMS Service**.**
- Proxy & DNS Server solution, Mail Server Solution.
- And All computer accessories
- Professional course and trainings:

(a) ISP Setup and administration using Linux.

(b) Training Course on Certified Ethical Hacking (CEH).

(c) ISP Setup and Administration using Mikrotik.

(d) Web site Development with Joomla.

(e) PHP and MYSQL for Website Development.

CHAPTER 3

TASK PROJECTS AND ACTIVITIES

3.1 Daily Task and Activities

➢ Month - 1: In the first month of internship on daffodil online limited I have learned and played out the accompanying undertakings:

- Learning & understanding About Network Components.
- Learning & understanding Basics of Linux.
- Understanding Linux HDD Partitions.
- Learning & understanding Linux Run Level.
- Linux Installation.

➢ Month - 2: In the second month of internship on daffodil online limited I have learned and performed the following tasks:

- Basic Linux Commands.
- Linux User and Password Management.
- Know About logged in users.
- File and Directory Accessing.
- To Copy and Move File and Directories.

➢ Month – 3: In the third month of internship on daffodil online limited I have learned and performed the following tasks:

- Connecting Optical Cable
- Concept and Classes of IP Address
- Concept of Private IP Address
- Concept of Subnet mask
- Classification of Subnet mask
- Simple switching
- Basic Concept of VLAN and Configuration
- RIP Configuration
- OSPF Configuration

- EIGRP Configuration
- ACL Configuration

➢ Month – 4: The last month of internship on daffodil online limited I have learned and performed the following tasks:
- Basic Concept of MIKROTIK
- Installation MIKROTIK
- Static Routing
- DHCP Routing
- Bridge Configuration
- Firewall Setup
- NAT setup
- Hardware & Software Troubleshooting

3.2 Events and Activities

- Check and Handle Computer Systems and Network.
- Setting up user accounts, Access and passwords.
- Troubleshooting Network and routers.
- Troubleshooting local area networks and switches.
- Handle network Mistake.
- Technical support for people access the network.
- Day to day admin and lookup of network use.
- Suggesting IT solutions to business problems.
- Client help over the phone or Physical move to client.
- Check Fiber Optical Media Convertor & Fiber Optic Transmission devices.

3.3 Project Task and Activities

Linux Install

➢ **3.4.1 Creating Linux Partition**

For Installation of Linux we have to create at least 3 partitions root (/), boot, and swap.

Root Partition: /

A Root Partition there is where "/" The root directory is located all files (except in /boot) are on the root partition. Minimum 5 GB HDD Space Required.

Boot Partition: /boot

The Partition boot (200 MB): the segment mounted on/boot/contains the working framework portion (which enables your framework to boot Linux), alongside records utilized amid the bootstrap procedure. Because of impediments, making a local ext3 Partition to hold these documents is required. For most clients, a 200 MB boot segment is adequate.

SWAP Partition: swap

The Partition swap is utilized to help virtual memory. As such, information is composed to a swap segment when there isn't sufficient RAM to store the information your framework is handling. Segment Swap should approach 2x physical RAM for up to 2 GB of physical RAM, and after that an extra 1x physical RAM for any sum over 2 GB, however it can't under 32 MB [1]

➢ **3.4.2 Linux Run-Level Used by Centos/Ubuntu**

init 0 = Shut Down.

init 1 = Single User Mode.

init 2 = Multi User Mode.

init 3 = Full Multi User Mode.

init 4 = Unused.

init 5 = X-Window (GUI Mode)

init 6 = Reboot.

See current run-level = who –r

➢ **3.4.3 The Basic Command of Linux**

Shutdown = power off , init 0, shutdown –h now .

Reboot = reboot or init 6 .

Logout = log the running user off the system.

Present Working Directory = pwd .

Create a blank file = touch doll(File name).

Create a directory = mkdirdoll(directory name).

List information about file = ls .

Chang Working Directory = cd /root/Desktop(directorypath)

➢ 3.4.4 User Create and Password Management

Adding a user = adduserjakarea(username).

Set a Password to New User = passwd456(username).

Password Disable/Remove = passed jakarea(username).

Verify user information = finger jakarea(username).

Locking an account = passed -l jakarea(username).

Unlock an account = passed –u jakarea(username).

Delete a user = userdejakarea(username).

Delete a user with home directory = user delr jakarea(username)

➢ 3.4.5 To Know About the Logged In User

w

who

who am i

➢ 3.4.6 To Copy or Move a File

Copy = cp filename destination example: cp file1 /home/jakarea/sabbir

Move = mv filename destination example: cp file1 /home/jakarea/sabbir

3.5 Concept and Classes of IP Address

Table1:class and ip address

Class	1st Octet Decimal Range	1st Octet High Order Bits	Network/Host ID (N=Network, H=Host)	Default Subnet Mask	Number of Networks	Hosts per Network (Usable Addresses)

A	1 – 126*	0	N.H.H.H	255.0.0.0	126 ($2^7 - 2$)	16,777,214 ($2^{24} - 2$)
B	128 – 191	10	N.N.H.H	255.255.0.0	16,382 ($2^{14} - 2$)	65,534 ($2^{16} - 2$)
C	192 – 223	110	N.N.N.H	255.255.255.0	2,097,150 ($2^{21} - 2$)	254 ($2^8 - 2$)
D	224 – 239	1110	Reserved for Multicasting			
E	240 – 254	1111	Experimental; used for research			

Note: Class an addresses 127.0.0.0 to 127.255.255.255 cannot be used and is reserved for loopback and diagnostic functions.[2]

3.5.1 Concept of Private IP Address

Table 2: private ip address

Class	Private Networks	Subnet Mask	Address Range
A	10.0.0.0	255.0.0.0	10.0.0.0 - 10.255.255.255
B	172.16.0.0 - 172.31.0.0	255.240.0.0	172.16.0.0 - 172.31.255.255
C	192.168.0.0	255.255.0.0	192.168.0.0 - 192.168.255.255

3.5.2 VLAN Concept

VLAN is the undeniable Local Area Network. Consolidating some system gadgets in a particular land territory that a system is made can be called LAN. All the more particularly, in the event that we interface different PCs in a single office with a change to assemble a system then LAN Each PC associated with this switch is under a similar Broadcast Domain. Then again, VLAN is an innovation that permits PCs associated with a change to be gathered into sensible gatherings and is considered as isolated LAN. That implies the material science will have a switch yet the rationale functions as a numerous

switch. This is VLAN or Virtual Local Area Network. For this situation rationale split subnet works fill in as a different Broadcast Domain. [3]
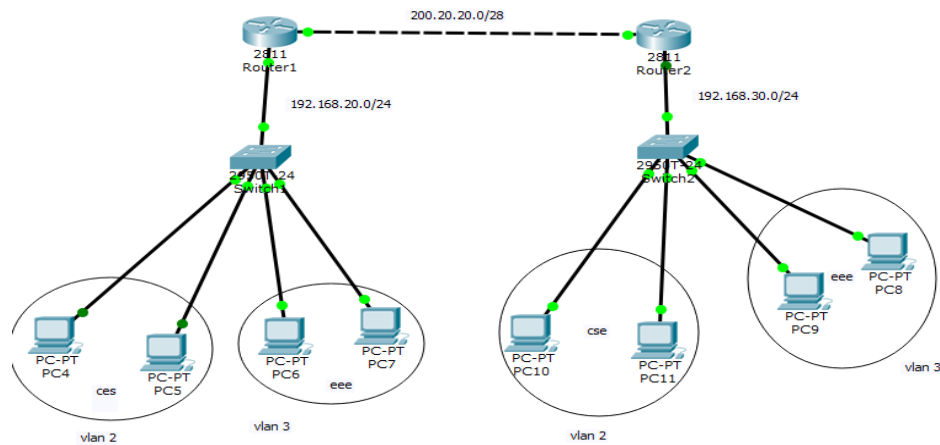

Figure3.10: Topology for VLAN Configuration

3.5.3VLAN Configuration

According to simple diagram this topology contains three switches which are mentioned by the name of BAR-DBBL-SWI, BAR-ABL-SW, BAR-DST-SW and all of the switch are configured sequentially. Please follow the bellow steps:

Step 1: DBBL-Switch Configuration

Switch>Switch>en

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#hos

Switch(config)#hostname DBBL-SWI

DBBL-SWI(config)#vlan 2

DBBL-SWI(config-vlan)#name CSE

DBBL-SWI(config-vlan)#ex

DBBL-SWI(config)#int fa0/2

DBBL-SWI(config-if)#sw

DBBL-SWI(config-if)#switchport mode

DBBL-SWI(config-if)#switchport mode acc

DBBL-SWI(config-if)#switchport mode access

DBBL-SWI(config-if)#sw

DBBL-SWI(config-if)#switchport ac

DBBL-SWI(config-if)#switchport access vlan

DBBL-SWI(config-if)#switchport access vlan 2

DBBL-SWI(config-if)#des

DBBL-SWI(config-if)#description DBBL-BR

DBBL-SWI(config-if)#ex

DBBL-SWI(config)#int fa0/1

DBBL-SWI(config-if)#sw

DBBL-SWI(config-if)#switchport mode

DBBL-SWI(config-if)#switchport mode tr

DBBL-SWI(config-if)#switchport mode trunk

DBBL-SWI(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Step 2: ABL-Switch Configuration

Switch>

Switch>en

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#hostname ABC

ABC (config)#vlan 3

ABC (config-vlan)#name EEE

ABC (config-vlan)#ex

ABC (config)#int f0/2

ABC (config-if)#sw

ABC (config-if)#switchport mode

ABC (config-if)#switchport mode acc

ABC (config-if)#switchport mode access

ABC (config-if)#se

ABC (config-if)#sw

ABC(config-if)#switchportacc

ABC(config-if)#switchport access vlan 3

ABC(config-if)#des

ABC(config-if)#description ABC-Br

ABC(config-if)#ex

ABC(config)#int fa0/1

ABC(config-if)#sw

ABC(config-if)#switchport mode

ABC(config-if)#switchport mode tr

ABC(config-if)#switchport mode trunk

ABC(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Step 3: BAR-DST-Switch Configuration

Switch>

Switch>en

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#hostname Gus-DST-SW

BAR-DST-SW(config)#vlan

BAR-DST-SW(config)#vlan 2

BAR-DST-SW(config-vlan)#name CSE

BAR-DST-SW(config-vlan)#ex

BAR-DST-SW(config)#vlan 3

BAR-DST-SW(config-vlan)#name EEE

BAR-DST-SW(config-vlan)#ex

BAR-DST-SW(config)#int fa0/1

14

BAR-DST-SW(config-if)#sw

BAR-DST-SW(config-if)#switchport mode

BAR-DST-SW(config-if)#switchport mode tr

BAR-DST-SW(config-if)#switchport mode trunk

BAR-DST-SW(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

BAR-DST-SW(config-if)#sw

BAR-DST-SW(config-if)#switchporttr

BAR-DST-SW(config-if)#switchport trunk all

BAR-DST-SW(config-if)#switchport trunk allowed vlan

BAR-DST-SW(config-if)#switchport trunk allowed vlan 2,3

BAR-DST-SW(config-if)#ex

BAR-DST-SW(config)#

BAR-DST-SW(config)#ex

BAR-DST-SW#

%SYS-5-CONFIG_I: Configured from console by console

3.5 4Inter-VLAN Routing Concept

On the typical VLAN-based system, just the same VLAN PCs can impart among themselves. In any case, for an assortment of reasons on one generation organize, one needs to speak with VLAN PCs from other VLAN PCs. Also, instruments that are utilized accurately to make correspondence effective in these VLAN PCs are Inter-VLAN Routing. Between VLAN steering is a technique by which a VLAN activity is sent to another VLAN. On account of Inter-VLAN directing, an extra Layer 3 gadget, for example, Cisco Router, Mikrotik Router, Linux Based Server and so on is utilized. Along these lines, after finishing the vlan setup we have to arrange Inter vlan.
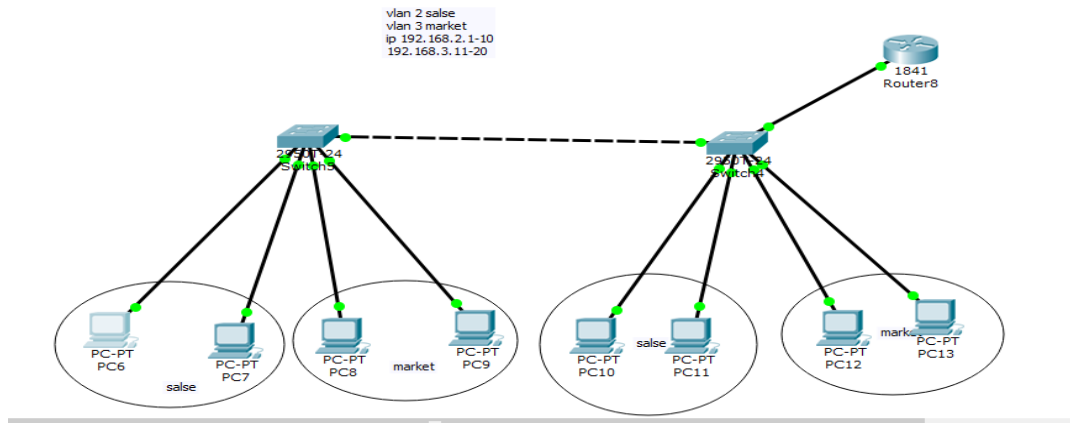
Figure3.11: Inter-VLAN Routing Configuration

3.5.5 Basic Concept of OSPF and Configuration Figure

The OSPF (Open Shortest Path First) convention is one of a group of IP Routing conventions, and is an Interior Gateway Protocol (IGP) for the Internet, used to circulate IP steering data all through a solitary Autonomous System (AS) in an IP organize.

The OSPF convention is a connection state directing convention, which implies that the switches trade topology data with their closest neighbors. The topology data is overflowed all through the AS, so every switch inside the AS has an entire photo of the topology of the AS. This photo is then used to ascertain end-to-end ways through the AS, typically utilizing a variation of the calculation. Hence, in a connection state directing convention, the following jump deliver to which information is sent is dictated by picking the best end-to-end way to the possible goal.[4]
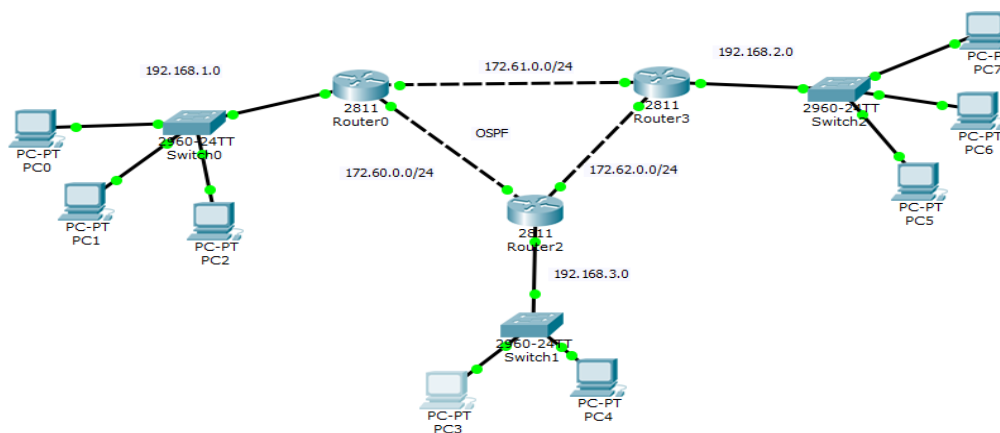

Figure3.12 : Topology for OSPF Configuration

3.5.6 Basic Concept of ACL and Configuration Figure

ACLs can be made for all directed system conventions, for example, IP and Internetwork Packet Exchange (IPX).ACLs can be designed at the switch to control access to a system or subnet. To channel organize movement, ACLs decide whether steered parcels are sent or obstructed at the switch interfaces. The switch analyzes every parcel and will forward or dispose of it in light of the conditions indicated in the ACL. If ACLs are not designed on the switch, all bundles that go through the switch will be allowed to get to the whole system.

Farthest point organize activity and increment arrange execution. Give movement stream control. Give an essential level of security for arrange get to. Choose which kinds of movement are sent or hindered at the switch interfaces. Control which regions a customer can access on a system. Screen hosts to allow or deny access to a system section.
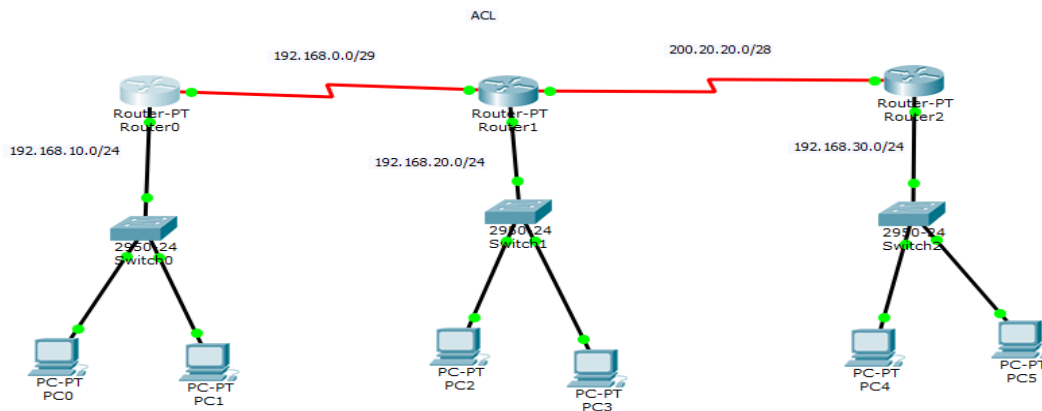

Figure3.13: Topology for ACL Configuration

3.5.7 Basic Concept of DHCP and Configuration Figure

Demonstrate the DHCP server. Dynamic host design convention (DHCP) is a system convention that empowers a server to consequently relegate an ip deliver to PC from a characterized rang of a number The DHCP customer asks for an IP address by communicating a DHCPD is cover message to the neighborhood subnet. The customer is offered an address when a DHCP server reacts with a DHCP Offer message containing an IP address and setup data for rent to the customer. [5]
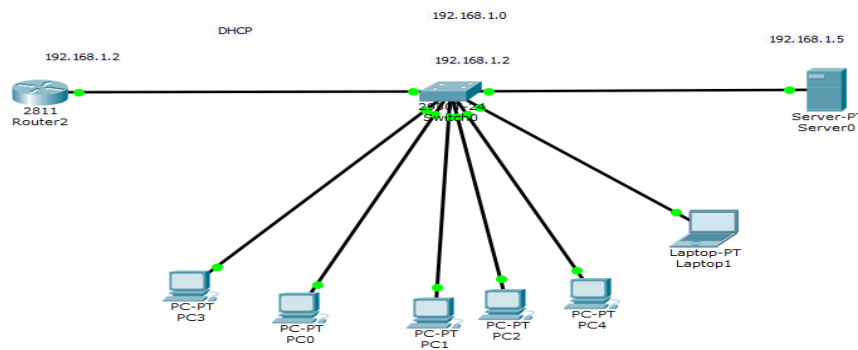
Figure 3.14: Topology for DHCP Configuration

3.6MIKROTIK ROUTER

MIKROTIK Ltd. Alluded to all-inclusive as MIKROTIK is a Latvian maker of PC sorting out apparatus. It offers remote things and switches. The association was built up in 1995, with the arrangement offer in the rising remote development publicize. Beginning at 2014, the association has more than 100 agents. The association's things are known for being low-evaluated differentiating alternatives to exorbitant switches and Ethernet radio exchange lines.

Mikrotik is a standout amongst the most prevalent switch to any framework chairman of any ISP organization or any office as a result of having a ton of systems administration administrations which help to manufacture a steady and smooth system. It is said that any ISP Company or Enterprise Office can't go a solitary day without Mikrotik router. Mikrotik switch is for the most part popular for data transfer capacity control administration and bundle sifting functionalities and also modest cost. Mikrotik switch is additionally prominent to any framework head due to having graphical UI (GUI) named winbox programming which oversees Mikrotik switch so effectively. Before going to start basic configuration of a Mikrotik Router you should have below information.

- Basic knowledge about IP Addressing.
- A Mikrotik Router Board
- Winbox Software.
- PC with windows operating system installed and RJ45 cables.

Mikrotik switch essential arrangement incorporates relegating IP addresses and empowering NAT for getting to web. Mikrotik switch fundamental setup can be partitioned into 4 stages.

- Assigning WAN and LAN IP addresses
- Gateway configuration
- NAT configuration and
- DNS configuration

To arrange a Mikrotik Router legitimately as per the over 4 stages, I'm utilizing underneath data and a basic office organize outline where three clients are associated with MikroTik switch through a system switch and one interface of the switch is associated with web for getting to web data.

- Mikrotik Router Board 1100 AHX2
- WAN IP: 192.168.20.22/25 (ISP provided)
- Public DNS: 8.8.8.8 and 0.0.0.0
- LAN IP Network: 192.168.10.0/24 (Private IP block)
- Gateway: 192.168.10.1 (Private IP block)

Demonstrates a straightforward office network diagram, first interface (ether1 port) is associated with ISP web and this interface is WAN port. Set WAN IP (gave by ISP) in this interface. Second interface (ether2 port) is LAN interface and Set LAN Gateway in this interface. The clients of this system are associated with Mikrotik switch by a switch for get to web.[6]

3.7 Features

Router OS bolsters numerous applications utilized by Internet specialist organizations. For instance

- It can be utilized as a router
- Switching Provides PPPOE Client-Server
- Provides Firewall rules
- It gives OSPF, BGP, Multiprotocol Label
- Provides VPN-Virtual Private Network.
- It can be utilized as a switch or extension

- Provide DHCP Server benefit

- Provide Static routing service

- Bandwidth administration is simple

- Provide Wi-Fi and hostage entry based Hotspot System

Router OS supports various applications used by Internet The thing is maintained by Mikrotik through a social affair and a wiki, giving fluctuating and topical instances of setups. Router OS reinforces Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6).

The item offers assistance in every practical sense all framework interfaces that the Linux piece 2.6.16 sponsorships, except for remote, where the Authentication individual chipsets are the primary reinforced hardware, beginning at 3.x variation. net expert centers. For example

3.8 Router Board

The association creates a movement of facilitated circuit sheets, displayed under the name Router board, and moreover additional parts which execute a whole hardware working stage for Router OS. The Router board line, joined with Router OS, is elevated at little to medium-sized remote Internet master communities 3.18, commonly giving broadband remote access in remote domains. Things consolidate pre-amassed little office/home office (SOHO) switches, remote 802.11n MIMO and TDMA contraptions for indoor and outside use, and besides revealed switches in sort of printed circuit sheets (PCBs) for joining into custom courses of action. In like manner, the Router board line joins a movement of Mini PCI and Mini PCI Express remote connectors, supporting an extent of IEEE 802.11 traditions, and expected to be used together with the switch sheets lineup.

Figure 3.15: mikrotik Router

3.9Cloud Core Router

In November 2012 Mikrotik released the Cloud Core facilitated unit which relies upon the Tiera CPU supporting 16 to 36 CPU focuses, 12 1000Base-T Ethernet interfaces, and up to four SFP (MiniGBIC) interfaces, and what's more "snappy way" package sending between interfaces (with ensured 24 million bundles for consistently sending rate). This unit centers around the medium-sized framework providers and also try to be an especially evaluated differentiating choice to the following more outstanding brands.

Figure 3.16:Mikrotik Cloud Core Router 1036 Series router

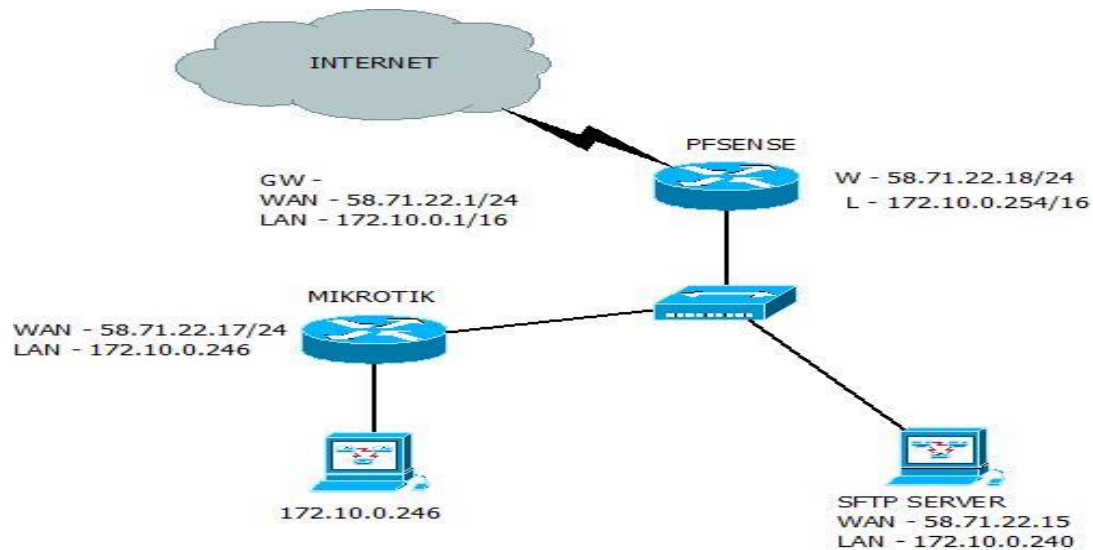## 3.10 Propose Network Diagram (Mikrotik Configuration)

Figure 3.17: Show network Diagram

This is my system chart. I recently connected my MIKROTIK inside my system and I am done setup the WAN and LAN of this gadget which is both static locations. The Problem is that I can't ping the MIKROTIK LAN and the PC connected to the gadget in my set server or even in sense. I am beginner in MIKROTIK and I don't know additionally how to include the portal of MIKROTIK LAN.

➢ 3.11 Initial Step

- Give Power to the Mikrotik Router
- Plug in a UTP cable in mikrotik LAN port and the other port to the PC.
- Browse with **Winbox**.
- Click to symbol and bunny demonstrate an IP address and MAC address. Click to Mac address at that point compose 'administrator' in login box and don't have to give Password.
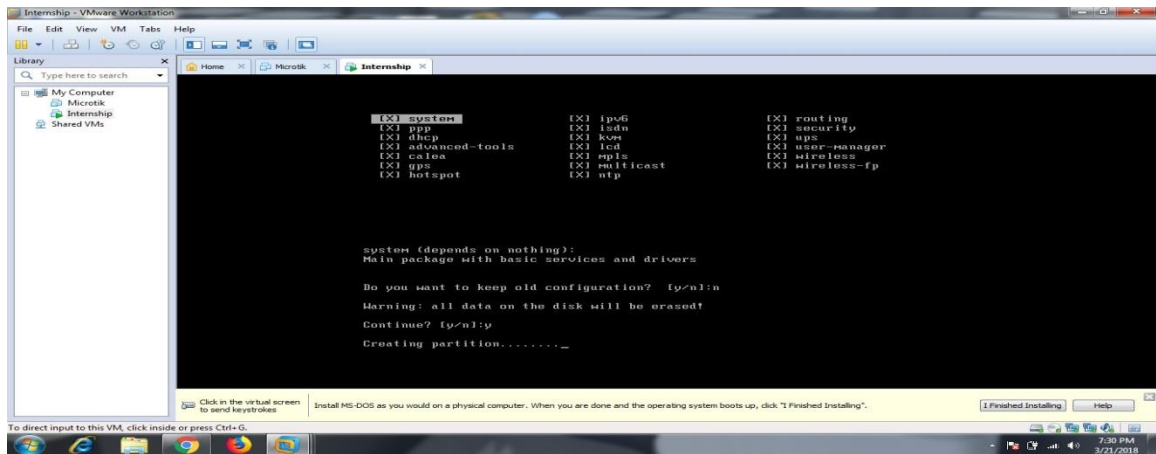
Show in figure Mikrotik Creating Pattern

Figure 3.18: Screen Print creating Partition
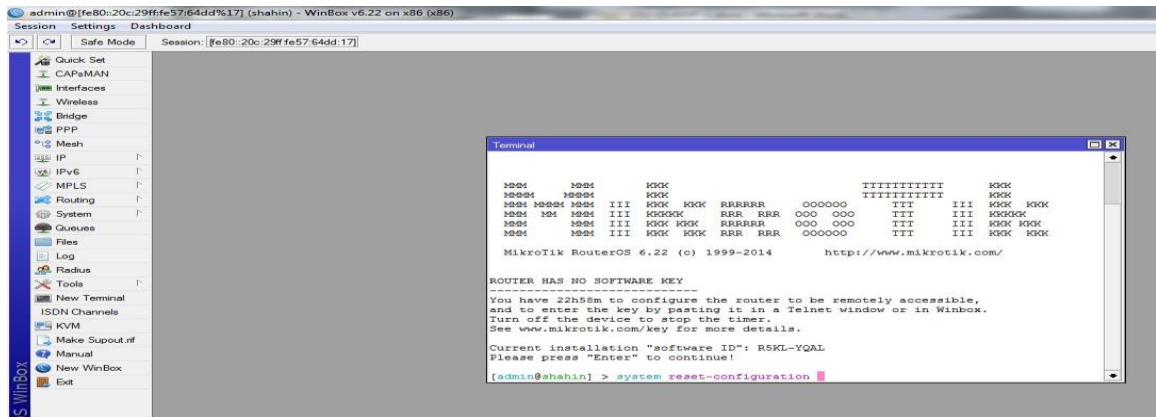
System Reset

Figure 3.19: Shows Screen Print Reset Mikrotik Router

✓ **Step2**:

Defining routes or Setting up Gateway

Process:

IP = Route > "+" > Gateway

N.B: that the Dist. Address will be 0.0.0.0/0 (default route). Then we can set our gateway.

Apply>Ok

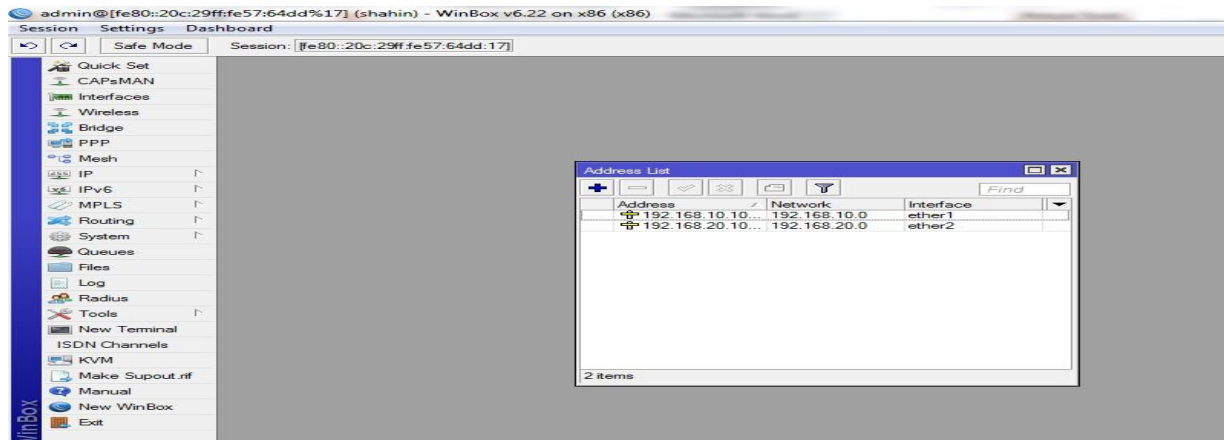IP add set in mikrotik router show in Figure

Figure 3.20: Shows Screen Print IP Address

Setup route ip in figure
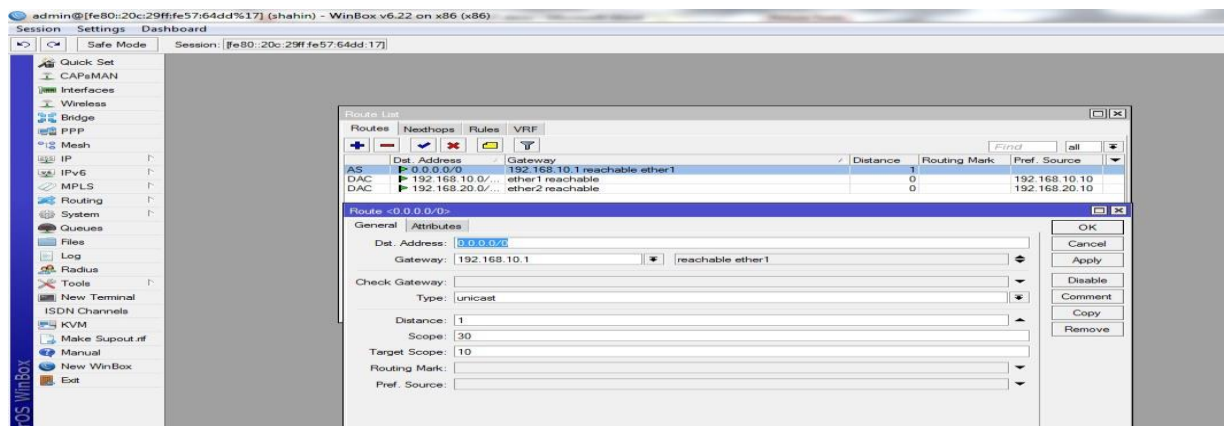
Figure 3.21: Shows Screen Print Gateway

✓ **Step3**

Process:

IP > Firewall > NAT > "+'

General:

Chain: srcnat

Src. Address: local block/IP with subnet mask of the network.

Action:

Masquerade

Apply>Ok.

Local network ip address NAT rule in figure shows:

Figure 3.22:Shows Screen Print NAT Rule

Shows in Screen Print Firewall in figure

Figure 3.23: Shows Screen Print Firewall

✓ **Step 4**

Doing the task of bridging the related ports with each other

Process:

Bridge> "+" > (bridge n, here n=1,2,3,4…...)

Settings:

    ✓ Tick mark to 3 options

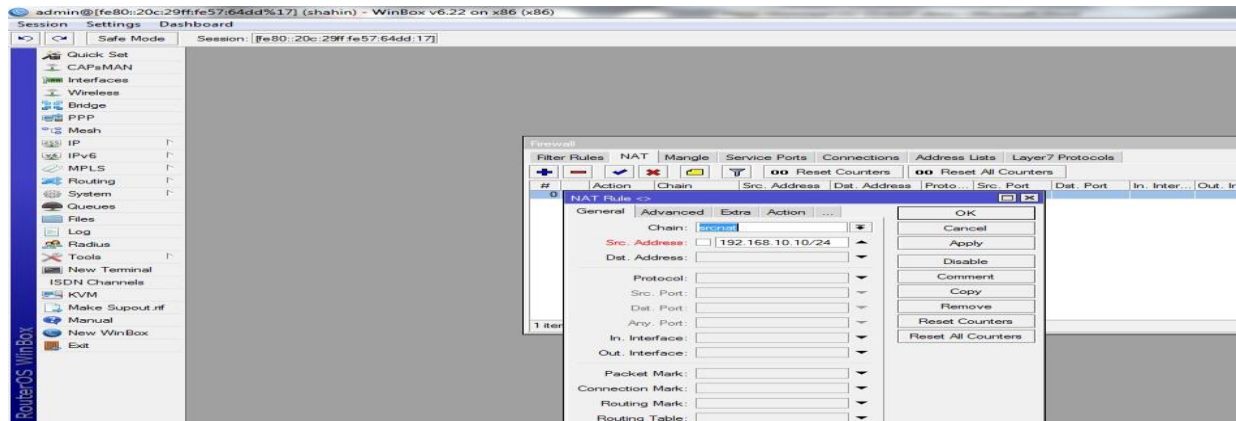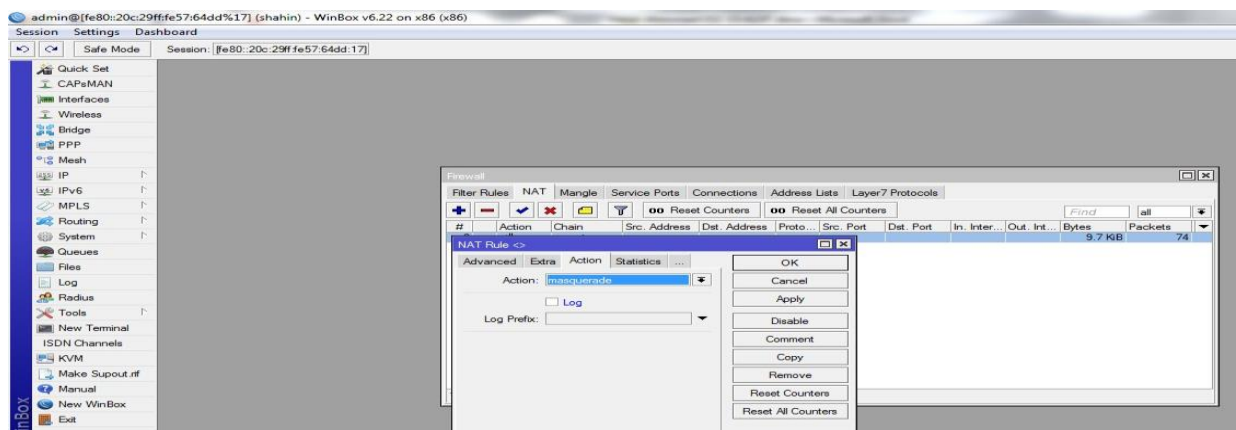Bridge Settings Screen Print shows in fig
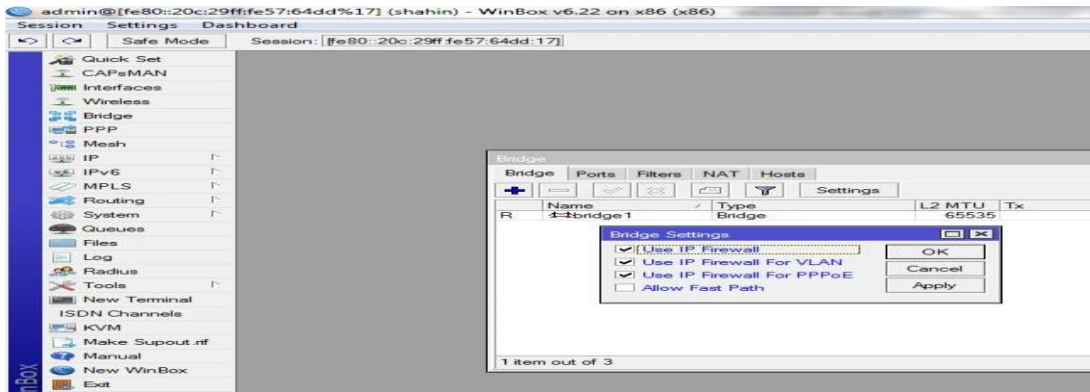
Figure 3.24: Shows ScreenPrint Bridge Settings

Ports

Ether1

Ether5

Router interface port
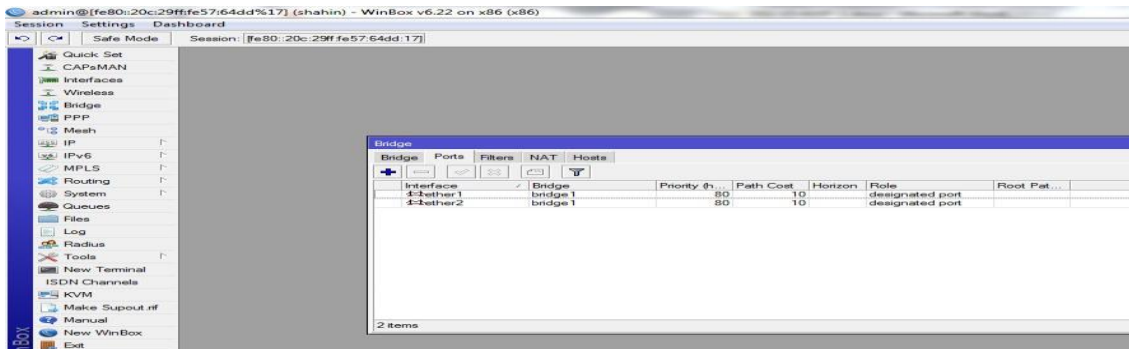
Figure 3.25: Shows Screen Print Bridge Ports Assign

3.12 Hardware & Software Troubleshooting

In this section I examine about equipment and programming issue determination. I talk about Issue write, general arrangement, steps taken to determine this mistake.

Programming mistake: A product bug is the basic term used to portray a blunder, flaw, mix-up, disappointment, or Blame in a PC program or framework that delivers an erroneous or startling outcome. Programming is frequently separated into two classes: Frameworks programming: Includes the working framework and every one of the utilities

that empower The PC to work. Applications programming: Includes programs that do genuine work for clients. For Case, word processors, spreadsheets, and database administration frameworks fall under the class of uses programming. Kinds of Software Error In time of temporary job I was confronted some blunder. Those mistakes are following beneath what is deadly!

3.12.1 Blue Screen error

In computing, a fatal error or fatal exception error is an' error that causes a program toAbort and may therefore return the user to the operating system.

Figure 3.26: Fatal Error Problem

At the point when this happens, information that the program was preparing might be lost. A lethal mistake is typically distinguished from a deadly framework blunder (casually alluded to by the blunder message it creates as a "blue screen of death").

3.12.2 Some characteristics of an Operating System are

Regardless of whether numerous projects can keep running on it all the while: multi-entrusting whether it can exploit various processors: multi-preparing whether different clients can run programs on it at the same time: multi-client whether it can dependably keep application programs from specifically getting to equipment gadgets: secured whether it has worked in help for illustrations. Regardless of whether it has worked in help for systems.

Some working System Problem

Booting issue of system

Tweaking working frameworks

Operating System Not Found

Mistake Loading Operating System

Hard drive/working framework issue

Program running mistake

Partition/Drive Check

3.12.3 Steps taken to resolve this error

It takes care of this issue, should take after beneath specified advances, Change the CMOS battery of the motherboard Clean the motherboard, Cable Slots of Hard circle, RAM Slots, CD Drive Slot and so on inside the CPU box Attach one more fan inside the crate to deplete the hot air from inside the case to outside Install a decent Anti-Virus program on the framework and run full framework examine. Checkout free forms of good Antivirus or Internet Security programs on the off chance that frameworks are as yet restarting every now and again at that point simply ahead and design the hard plate and introduce a fleshduplicate of working framework. [9]

3.12.4 Motherboard Problem

On most PCs, it is conceivable to add memory chips straightforwardly to the motherboard. You may likewise have the capacity to move up to a quicker PC by supplanting the CPU chip. To include extra center. I emanations, you may need to supplant the motherboard totally.

3.12.5 Some Motherboard Problem

Faulty power supply units and boot-up disappointments

Motherboard control up issue causes – Faulty power catch

Investigating motherboard issues

A memory module has fizzled

Something on the motherboard has burnt and is shorting out

An assistant wire [power drove, hard drive movement drove, reset catch, or delicate power button] has shorted out.

BIOS Problem

AGP Problem

Short out

3.12.6 Ram Problem

RAM, also called memory, is temporary storage space on chips in computer. RAM means Random Access Memory.

Figure 3.27: RAM

Subsequent to introducing the new RAM, if the RAM isn't perceived by your framework, or on the off chance that you get long beep or succession of beeps at startup, you'll need to do some investigating. Most issues are caused by acquiring the wrong memory, introducing it inaccurately, or harming the memory module by dealing with it dishonorably.

3.12.7 Process of installing Ram

Turn off the computer, screen, and all embellishments, including printers, speakers, and Outer hard circles. I with the PC connected to, touch a metal piece of the PC case to ground yourself so you don't "stun" any of the PC's inward parts. Open the PC case utilizing the suitable instruments, expel the cover, and evacuate the current memory if important, normally by pushing down on the holding cuts at the closures of the memory module and pulling the module toward you. Expel the new memory module from the counter static pack and hold it by its edges. Find the open memory spaces, and locate the most reduced numbered opening if in excess of one exists. On the off chance that no numbers are appeared, utilize the space nearest to the as of now introduced memory. Open the holding cuts if vital, and put the memory in the open space. The memory

module may go straight in, or it might need to be tilted first and after that introduced by popping it at a 45-degree point. Tim your PC back on, and check the memory is shown on your startup screen. In the event that your startup screen is concealed, right-click My Computer, clicks Properties, tap the General tab, and confirm the memory is perceived. Deliberately supplant the cover if the memory is perceived and the PC is by all accounts working accurately.

3.13 Hard Disk Problems

The hard disk drive 1ST the primary, and generally biggest, information stockpiling gadget in a PC working framework, programming titles and most different files are put away in the hard plate km: There are a few interface principles for passing information between a hard circle and a PC. The most well-known are IDE and SCSI plate drives are in some cases called Winchesters drives, Winchester being the name of cc of the first prominent hard circle drive innovations created by [IBM in 1973]

Some Common Problem of Hard Disk

Drive turns yet the PC won't boot

Frequent drive failures

Drive does not turn up (no drive lights)

Drive turns yet the framework does not perceive the drive

"Mistake perusing drive C" message.

Figure 3.28: Hard Disk Drive

3.13.1 Troubleshooting Port Problems

Disappointments of the serial, parallel and diversion ports tend to end with poor or no task of the fringe. By and large, there are just four conceivable reasons for an issue with a gadget associated with an I/O port:

- The port is defective

- The programming isn't arranged appropriately for the port (that is, the asset allotment, speed, or convention settings don't coordinate).

- The interfacing signal link is terrible.

- The connected gadget isn't practical.

3.13.2 Troubleshooting Network Cards

Cabling is one of the most serious issues experienced in a network establishment. Is it associated? Are every one of the associations great? Is the link composing revise? Has there been any end, and provided that this is true, has it been done effectively? The most proficient approach to test network link is to utilize a line analyzer to check its usefulness.

Figure 3.29: Network Card

3.13.3 Processor Troubleshooting Techniques:

Processors are ordinarily exceptionally solid. Most PC issues will be with others device. Be that as it may, in the event that you speculate the processor, there are a few stages you can take to investigate it. The first processor is imperfect. On the off chance that the issue endures, the issue is likely somewhere else.

CHAPTER 4

COMPETENCIES EARNED

4.1 Competencies Earned

What we do on the technology changes day. The telecommunications industry is always developing. While we will most likely be unable to advise the everyday changes while It's going on, it's simple for us to think back to the previous couple of months and see that a considerable measure of Things. We do now are entirely different than what we've been doing previously. In this short Intern period I learn generally media transmission and Network ability. Media communications Process sorts out a reasonable methodology and approach in Network Development. The accompanying rundown of strategies and recommended reports give a decent framework to a broadcast communications process:

- o Defining Network topology, Purpose, Goals and Direction.
- o Researching and Defining Audience Scope and Security Documents.
- o Creating Functional Specifications or Feature Summary Document.
- o Team Collaboration and Network Management Document.
- o Technology Selection, Technical Specifications, Illustrative topology of system
- o and Structure, Development Methodology, Control, Backups, Upgrades Server.
- o Hardware.
- o Troubleshooting and Maintenances.

4.2 Smart Plan

Presently I would call myself a Network design, despite the fact that I can bounce into a framework expert. In any case, I could never claim to be a bad-to-the-bone top of the line Network design. Presently I am not talking tomorrow - the end is near… I am talking 10-15 years. In any case, as a Network design I am worried to the fate of my vocation as of right now and what other individuals' conclusions of this are? I can see the administrator/framework examiner part expanding or keeping up. As a Network design I

am learning different sort of network technology like IP Sub mesh, VLSM, and Routing Protocol, Switching, Mikrotik Configuration and other Network servers. In understudy period I accumulate down to earth information that is help my future profession in media transmission part. Step by step it is appeal in present day innovation. I completed some undertaking in my temporary position period inside a group. Presently I attempt my best increment media communications information and practice to an ever increasing extent. My future arrangement totally learns broadcast communications, at that point execution in certifiable. I officially embedded numerous system topology which contains OSPF, RIP, EIGRP Protocol and Inter Vlan design in different gadgets. In future, I need to execute an entire broadcast communications organization arrange framework.

4.3 Reflections

An understudy to get the handy involvement in the field of designing. It is help to Increase involvement in building work. In assistant period I learned media transmission innovation. Media communications is a shrewd and dynamic calling at Present. I learned hands-on-aptitude in Network and security framework. This Experience help me to be a solid candidate in work showcase. This understudy helps to give Research and branch checking in web application. Understudy give propel traps and Trips that are rehearsed by the expert. I allot different venture, now I know how to oversee web application task and how to defeat basic circumstance. Last getting the experience to take a shot at an expert group.

CHAPTER 5

CONCLUSION AND FUTURE CAREER

5.1 Discussion and Conclusion

As a creating nation, the legislature of Bangladesh has taken some essential task to build up the Information and Technology segment. IT is huge advance forward for the idea "Computerized Bangladesh". PC related subjects can get unimportant when you ponder them from books as it were. In any case, when we are presented to pragmatic function also, at that point it fortifies learning and give us certainty about our comprehension. I should state that there was a long way to go for me amid my temporary position period. It was a first time involvement in a vocation for me-During the most recent four months that I worked. I attempted my best to get acquainted with the professional workplace and accomplish every last focus on that I had shared. Working other than my chief has helped me to imagine myself in the sort of expert life I ought to prepare to dig into once I move on from my university. The Four month's work encounter that I picked up is greatly important to me and I wish to execute my recently discovered information in future.

5.2 Scope for future career

This internship position objective gives a reasonable idea about commonsense and semantic web base framework. This temporary position actualized a proof of idea for a basic leadership framework utilizing imitated learning. Media transmission Engineering or telecom designing is a very tremendous field which goes under electronic building. The work ranges from fundamental circuit configuration to vital mass improvements; from planning of telecom equipment's, electronic exchanging frameworks, copper phone offices, fiber optics to their establishments. A media transmission build is in charge of outlining and managing the establishment of broadcast communications hardware and offices. Presently, going ahead the extent of media transmission designing, the course is phenomenal and has enormous extension. India has seen remarkable development in the telecom part in most recent 5 years and this has just powered the requirement for more

qualified telecom engineers. On the off chance that you get extra abilities in VLSI and implanted frameworks, it will get more prominent open doors for you.

REFERENCESS

[1] linux install& partition: https://www.wikihow.com/Install-Ubuntu-LinuxLast visited 15,January, 2018, 9.30pm.

[2] Concept and Classes of IP Address:https://en.wikipedia.org/wiki/IP_address Last visited 17, January, 2018, 11.20pm.

[3]VLAN.concept&configure:http://www.pearsonitcertification.com/articles/article.aspx?p=1150803&seqNum=3 Last.visited17,January, 2018, 11.20pm.

[4] OSPF concept:http://www.pearsonitcertification.com/articles/article.aspx?p=1868078 Last visited 3, Mar, 2018,11.00 am

[5] ACL summary & configure :http://www.ciscopress.com/articles/article.asp?p=1697887 Last visited 10, Mar, 2018,10.00 pm

[6] Mikro tik router concept &configure:https://wiki.mikrotik.com/wiki/Manual:Initial_ConfigurationLast visited 21, Mar, 2018,9.40 pm

[7]Cloud Core Router: https://mikrotik.com/product/CCR1036-12G-4S-EMLast visited 21,Mar,2018,9.40 pm

[8] Hardware Troubleshooting:https://www.ccri.edu/it/helpdesk/pc-troubleshooting.html Last visited,23,Mar, 2018,11.15 pm

[9] Steps taken to resolve this error: https://au.reachout.com/articles/a-step-by-step-guide-to-problem-solvingLast visited,25,Mar, 2018,11.30 pm