ISP SERVER CONFIGURATION ON LINUX AND MIKROTIK PLATFORM

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Internship titled **"ISP Server Installation and Configuration on Linux Platform MikroTik**", submitted by Rubaita Sharmin to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 09 July, 2020.

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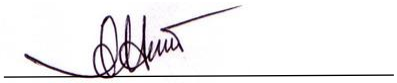

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ABSTRACT

If two and more computers are interconnected and able to exchange data or information, then we call network. We want to increase the number of PC's and exchange data or information from one to another that time we need some special PC's are called Server. There is various type of work in the network that is why also different types of server have. For Example- DSN Server, Web Server, Mail Server, Proxy Server, FTP Server, Firewall. Each of them works differently and without them it is impossible to maintain a network. If network is connected to the Internet and we want to secure your information they must setup server using Linux Operating System. That's why I choose this subject of my report is "Server Installation and Configuration on ISP (Linux Platform)". The report discussed about the purpose of the specific server using on ISP, hardware requirement for the server, choosing software and installation process of the software, step by step server configuration process and simple troubleshooting of the server.

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CHAPTER 1

Introduction

1.1 Introduction

All these luxuries that we are able to afford are a resultant of modern technology. Even we can't imagine our daily life without technology. Most importantly, how we can do all this in a short time are because of the advancement of technology only. Even we can't move an inch without technology. In that modern era, most of the people communicate via internet and sever is another part of it. Linux which is very essential open source software achievement since the past era and most recently. Server is the main thing when we want to connect with internet. For that reason, Domain Name System(DNS) sever is very essential for all internet technology. In that modern era, most of the business company is very essential for software based communication and internet things. Internship which is the oldest approach and also a good practice for student because in Internship student can learn and understand the practical working environment and also learn how to challenges while in real life job sectors. Before degree program every company has their own importance of internship. Without Server Connection SMS Alert in Banking sectors, Mobile Banking in every sectors, Internet Banking, Electronic Fund Transfer system, Online marketing etc. We can operate different types of service using server and in every online communication DNS server is very important. Today people like to view the internet as a cloud, people put data on the server and use these data when they need. We can able to exchange data such text, audio and videos because of internet. Today all kind of Banking system and business company hardly depends on different type of technology where sever system is very important. In banking software like bill card, praise card and all kind of online money transaction deeply depends on software besides various kinds of system and Linux most important from them.

1.2 Motivation

I am running mine BSc in CSE at Daffodil International University. The value of real-world information which is better than classic information and assistance a pupil to increase the practical understand of those several subject. For the duration of my internship period, I abstain learned Configure Network Diagram with Mikrotik, server management and details of Linux networking. In this modern era, near 4.48 billion people are use Internet in the world. That's why there is a

huge opportunity to working on Mikrotik. Now a day's, Most of the Network are designed by Mikrotik. The demand of using Mikrotik is increasing day by day. Even in future, Mikrotik maintain best performance to configure network diagram. Like an internet provision worker, I am doing mine work nicely. I also learned how to communicate with people very friendly, try to understand their need and also try to provide them a better service in future life. I also learned how to handle critical situation in quickly and smartly.

1.3 Internship Objectives

My internship platform makes myself as a well-suited person for the current work sector. That's why it is very essential for skillfulness enlargement sector. I'd really approximating to gain the best excellence to serve me as an expert one. It is an important challenge to the network administrator or network engineer to follow the transport or data within the shortest time.

People access data service using server based computing system. Servers are networked which is connected with a traditional cable or with a wireless connection. If a server is same as a personal computer in different respects and its primary task is to serve data to a group in lieu of an individual. The growth and use of internet become popular because of servers and data.

The internship in CSE is planned to serve effort knowledge and also make them skilled, communicative and also prepare them with current job status.

1.4 Introduction to the Company

[1] Daffodil Online Ltd. arrogance that one by means of one of the greatest Internet Service Provider company in BD. They are the maximum experted and primogenital firm in the ICT sectors wherever their rudimentary commercial is to maintain extensive period connection using every customer. As they look at the enhancement from the beginning of their journey, they are enormously satisfied of whatever they take gained and extra eager near their viewpoint for an similarly best upcoming forthcoming.

It might be proud them to distinguish that they in progress their journey in 2002. During the few years, they enhanced their performance and facility in line with the client's needs and demands of period.

They deal by means of various nationwide and worldwide developments after that they easily gained their popularity. They maintain upgraded machineries and the facilities whenever it is essential. Their Complex explanation squad is always ready to deliver all types of solution during the users face problems.

1.5 Report Layout

The procedure of layout is accumulation a little in a small method to display the full method in a tiny phase. I've expenditure outline for the reason that I neediness to display entirely of mine effort in a little system. So as to the viewers be able to easily take a look of my full report. The introduction is describing in **Chapter 1**. Internship Enterprise refer to in **Chapter 2**. Internship roles and responsibilities is described in **Chapter 3**. Competencies and Smart Plan is refer to **Chapter 4**. The Conclusion and Future Scope is described in **Chapter 5**.

CHAPTER 2

Internship Enterprise

2.1 Introduction

I've done mine internship from Daffodil Online Ltd.(DOL). Daffodil Online IT Limited is one and only of the finest ISP facility earner in BD from 2000. They are very experted and from the past firm in the ICT sectors wherever their main industry is to maintain lengthy tern connection by their every customer. The main expectance of this company is to provide best service to the customer. Daffodil Online Limited is one and only of the oldest ISP company in BD and they try to link to every person, anyplace to bring first-class Data and Communication Expertise (ICT) facilities at a lowest price. Daffodil Online Limited practice the up-to-date machineries and best services.

Daffodil Online Limited has a qualified engineering team. Daffodil Online Limited accompanying with SUN and actively convoluted through creation top calculating relations counting IEEE, -BCS, or PMI. Their Commercial Public Responsibility is off the Open, Workplace, Place and Marketplace.

2.2 Product and Market Situation

Market Situation is a developing market economy in BD. After all I want to say that, finding a new job is a burning question in every industry today. But in information technologies Linux skills are a little bit less overwhelming. There are additional than 21,000 Linux and IT works on every while. The increasing percent of IT and Linux based job is 40% which is much better than before. The demand for Linux skills is increasing day by day. In another words, every company find their stuff according to their task. After that the corporate company will be able to overcome Linux problems.

They remain the greatest skilled and from the past company in the ICT sectors where their elementary industry is to maintain lengthy duration link through every customer. The main expectance of this company is to provide best service to the customer. The main mission is providing right solution. And maintain long term relationship. They also maintain new technologies to maintain growth in recent market place. Daffodil Online Ltd.(DOL) is also

providing different kind of IT and professional training services. The IT Service and Professional Training Service is given bellows-

IT Services:

1. **Dedicated Internet Bandwidth Services**
    i. Corporate Dedicated Internet.
    ii. Indoor and Outdoor Wi-Fi Solution.
    iii. Network Infrastructure.
    iv. Corporate Office Networking.
2. **Domain and Hosting**
    i. Domain Registration
    ii. Web Hosting (c-Panel)
    iii. Dedicated Hosting
    iv. Shared Hosting Packages
3. **Colocation**
    i. Dedicated Server
    ii. Shared VM Server
    iii. Server Packages
    iv. Amazon Cloud Servers
    v. Network and Multiple IP
    vi. Custom Configuration
4. **G Suite**
    i. Google Business Account Overview
    ii. Existing Local Clients
    iii. Benefits of Client Organization
5. **Others Services**
    i. Security Solution
    ii. Substance SMS Facility
    iii. DNS Server Solution
    iv. Mailing Server Explanation
    v. Entirely PC Equipment

Professional Training Services:

i. ISP System Administration and Configuration with Linux
ii. ISP Setup, Administration and Configuration with Mikrotik
iii. Cisco Switch and Wi-Fi Router Configuration
iv. Working out Progression on Certificate Moral Hacking.
v. Web Improvement using Joomla
vi. Online market place and Built-up Foundation Joomla Asset Market.

2.3 Target Group

The main fact of a business company is Target Group. Target group means a specific consumer at which a company aims its products and service. In a word, Target group are those who are the most likely to buy from company. Ethics is the main thing for this business company sectors. So, you should deliver the best product and give facilities to any client and any company. So during my internship period I learned this mark block up maintenance and be able to worker efficiently to succeed maintainable outcomes in our corporate. So, target group can be all consumers, small and medium size business company and start-ups firm. The firm schedule to effort on SoHo customers, so it can be the appropriate target of our fresh extraordinary rapidity contributions and the biggest development possible aimed at the firm. There are many business targets company like Education area, Hospital Clinic area, Cement Industry area, Lather Industry area, Garments area and also Landed Property Company.

2.4 SWOT Analysis

SWOT is an abbreviation in lieu of Strengths, Weaknesses, Opportunities and Threats. [2] A SWOT analysis is a tactical equilibrium piece of a group, that is the assets of the institute, the faintness of the institute, the occasions in front of the association and the intimidations in front of the institute. The determination of the SWOT investigation is to make available evidence taking place assets and faintness in family member to the occasions and intimidations.

When to use a SWOT analysis:

A SWOT investigation be able to proposition obliging viewpoints at in the least phase of an exertion. It strength usage to:

- Discovering streets for innovative creativities.

- Making decision about execution strategies for a new policy.
- Identifying possible areas in lieu of variation in a package.
- Purifying and pass on hard work middle strategy.

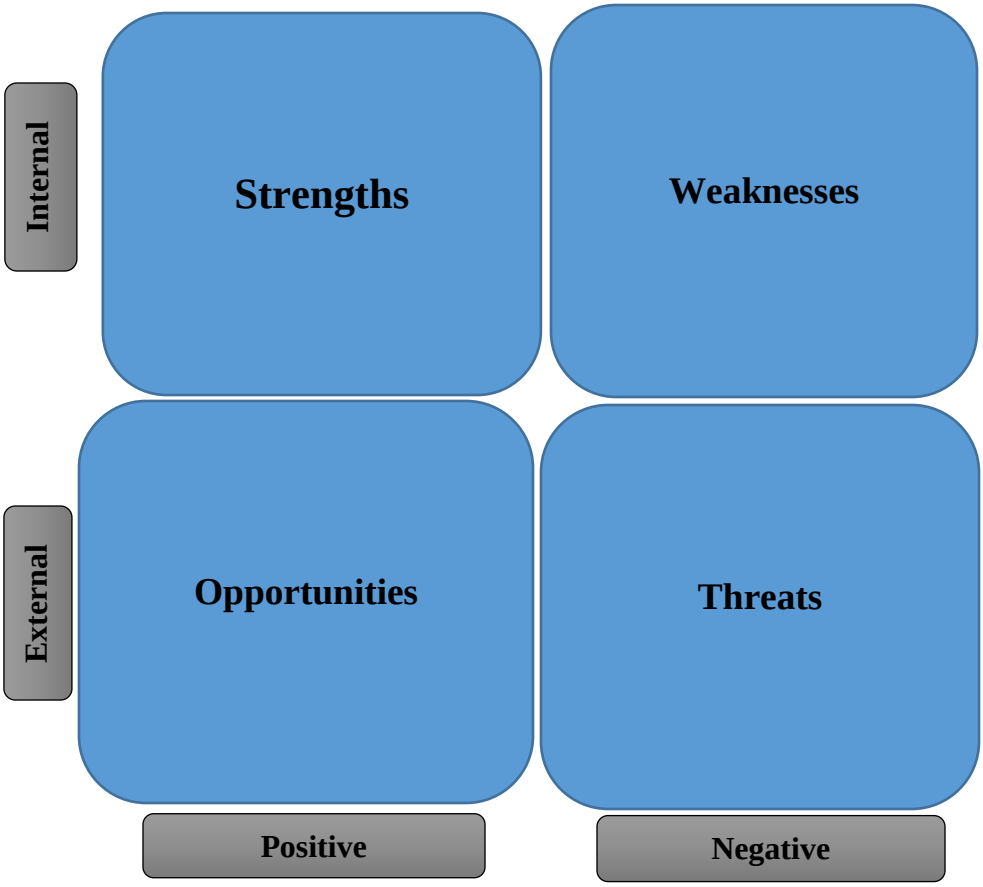

Fig 2.4: SWOT Analysis

- **Strengths:**
  - Communicate with different types of people from different places.
  - Online business Settings
  - Gathering information
  - Low financing cost in the current environment and long term horizon
  - Strong community support for enhanced ability of high speed connection
  - Website which is in high visible.
  - Startup risk is limited.
- **Weaknesses**
  - In order to set up business large number of money is required.

- In similar products Competitors can offer
- Numerous pricing tariffs and service option
- Competition for small resellers
- Limited flexibility in pricing
- Insufficient infrastructure
- Lack of quality education

➢ **Opportunities**

- Development of proprietary products
- Additional stores should be able to develop
- Continued expansion for online sale
- Acquisition of additional funds of capital
- Wholesale distribution relationship should be maintaining.
- Affiliate relations with related vendors
- Structure of the population changing
- Availability of labor

➢ **Threats**

- Can be impact in business if regulations are changed
- Major competitors are able to sell products
- Insurance cost is increasing day by day.
- Upward pricing is caused in order to increasing prices.
- Political instability
- Corruption

2.5 Organizational Structure

Organizational Structure of Daffodil Online Ltd. Is given bellows-

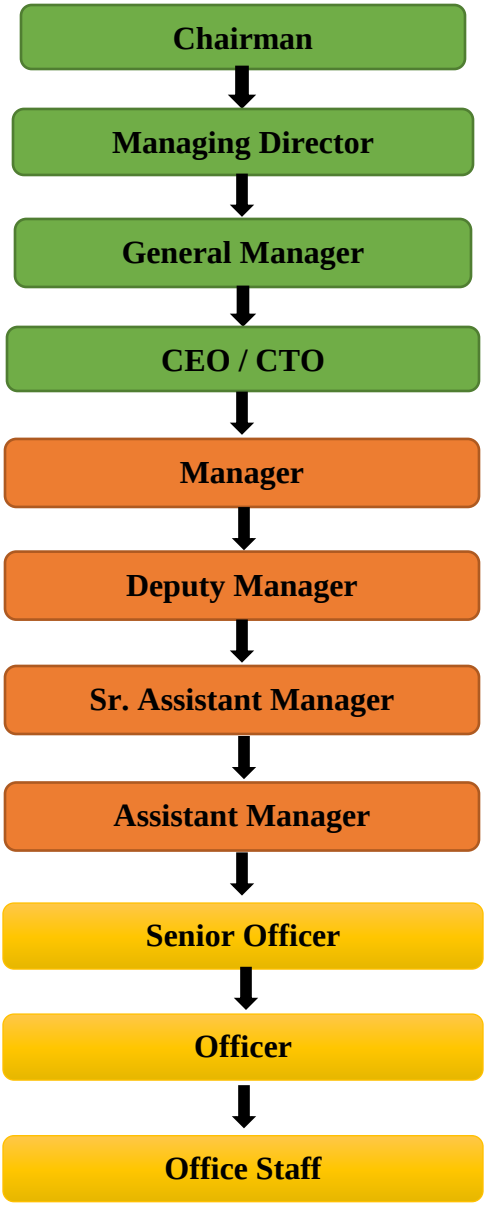

Fig 2.5: DOL Organization Structure diagram.

CHAPTER 3

Internship Roles and Responsibilities

3.1 Daily Task and Activities

[5] In Daffodil Online Ltd.(DOL), I have learned many things. In my internship period, every task given by my instructor, I have done all task in timely manner. In 4-month internship period I have done the following things-

- **Month – 1:** In my 1st month internship, I've knowledgeable also perform the basic fundamental things approximately my course. The following are given bellows-
  - Basic Understanding and Learning of Linux.
  - Learn About Network Components.
  - Learn Clear concept of Linux HDD Partitions.
  - Basic Sympathetic about Linux Run Level
  - Learn how to install Linux.

- **Month – 2:** In 2nd Month of mine internship, I've knowledgeable many new thins. I my 2nd month internship, I have completed the following things-
  - Maintain user and password management.
  - Basic Centos Commands.
  - Ty to approximately registered operators.
  - Maintain folder and almanac access.
  - Try towards know duplicate and transfer file directories.
  - Mount and Unmount Determination.
  - Crontab.

- **Month – 3:** In my 3rd month internship, I've knowledgeable the following things-
  - Using YUM Learn how to update, remove and install package.
  - Learn how to find directory and file permission.
  - Clear thought of IP Addressing.
  - Learn how to organize IP address in CentOS.

- **Month – 4:** In the 4th month of my internship, I've knowledgeable the following task and things-
  - Remote Login Service.
  - Learn, understand and configure NFS Server.
  - Learn, understand and configure WEB Server.
  - Learn, understand and configure FTP Server.
  - Learn, understand and configure Mail Server.
  - Learn, understand and configure DNS Server.
  - Learn, understand and configure PROXY Server.
  - Firewall
  - Mikrotik.
  - Backup and Monitoring.

3.2 Events and Activities

In mine internship, I have done many activities and event. It makes a better practical placement for job market. The following events and activities are given bellows-

- Fixing Network faults.
- Try to know how to maintain and monitor computer network and system.
- Lean how to setting users password, accounts and permission.
- Search problem on local area networks and switches.
- Learn how to support people using network
- Troubling servers and routers.
- Maintain every day admin and monitoring of network use.
- Checking Fiber Optical Media Convertor.
- Try to support user via phone.
- Go to the client in order to solve their problem.

3.3 Project Task and Activities

Install Centos

3.3.1 Making Linux Partition

[4] In order to fix a Linux, we have to generate at least three dividers and this three partition are given bellows:

- **Root Partitions: /**

The root partition is representing through an onward laceration (/). This is the highest almanac sapling and contain all which you install through Linux. This is same as "C" drive under windows. In root partition, you have to maintain partitions between 2 GB to 8GB.

- **SWAP Partition: swap**

While installing a Linux, you need one partition that will remain rummage-sale such as a swap partitions. This is able to be rummage-sale as a simulated recollection. Virtual memory helps you to run big program and perform critical task even it does not have enough physical RAM. SWAP memory size should be 50% to 100% the dimensions of the corporeal RAM in your system.

- **Home Partition: /home**

The third and final partition is in your /home-based almanac. In home almanac wherever completely the operator explicit records are put in storage. It is same as "My Documents" file happening a MS Windows pc. For every worker, each worker will take him individual directory below /home. It is not necessary to a separate partition for /home. Home divider grips worker and formation records distinct as of the operating system records.

3.3.2 Linux Run Level Used by Centos

Run Level	Mode	Action
0	Halt	System will shut dejected.

1	Single User	permits non-root logins.
2	Multi User	Network interface is not configure.
3	Multi User with Networking.	System will start normally.
4	Undefined	Not used.
5	X11	Run level 3 + display manager (X).
6	Reboot	System will reboots.

3.3.3 The Basic Command of Linux Centos

Command	Description
sudo	Runs a command as Super User.
ls	Current directory List.
cd	Change directory.
pwd	Current pathname will display.
mv	Move and renames file.
cp	Copy files or directory.
mkdir	Make directory.
rm	Delete file or folders.
who	Checks logged user.
clear	Clear terminal window.
firewall	Centos Firewall
chmod	File permissions will change.

chown	file or folder will changes.
Shutdown -h	Shutdown the system.

3.3.4 Generate and Password Management of an operator's

Command	Description
Add_user sarmin(sarminproma)	Adding user name.
passwd proma(proma)	Fixed a new PIN.
passwd -d	Key Restrict or Eliminate.
finger sarmin	Authenticate operator info.
passwd -l	Lock up an account.
passwd -u	Unlock an account.
userdel sarmin	Delete current user.
userdel -r	Delete home directory of a user's.

3.3.5 Know About Logged User

There are 4 ways to check current user in Linux system.

1. Using **w** command get current process logged users.
2. User using **who** command get user name and process of logged in details
3. Using **whoami** command get current logged users.
4. Using **last** command get users login history.

3.3.6 To Copy or Move a File

[6] In order to copy or movie file, you have to follow the following instruction.

Copy = cp destination of a file ex: cp file10 /home/sarmin/proma

Move = mv destination of a file name ex: mv file11 /home/sarmin/proma

3.3.7 Vi Editor

vi sarmin (sarminproma) need when you want to edit a file.

Press ‘a’ or ‘I’ in order to insert text.

Press ‘x’ or ‘dd’ in order to erase any charisma.

type 5yy for duplicate 5 line.

‘p’ for paste in order to paste a stroke.

Use ‘: set’ nu command in order to established streak quantity

=Use set ‘nonu; in order to erase streak quantity

In order to pursuit somewhat, use ‘/proma’ for pursuit proma

Use ‘:0’ in lieu of vigor to highest of any specific line.

Use ‘: $’ use this command for in order to go bottom of any line.

Use ‘: wq’ for protect the present change and departures vi editor

Use ‘: w’ for apart from the present vagaries nonetheless does not leaving vi editor

Use ‘: q’ for exits vi editor without saving any changes

3.3.8 Install/Update/Remove Packages in Centos

The process of Install, Update and Remove Packages in Centos using YUM command is given bellows.

- **Installing Packages:**

Command Options	Description
install	Install package and resolve dependencies.
install/path/to/file	Install package according to given file.
localinstall	Install a package from local le, http or ftp

reinstall	Current version package should be reinstall.
groupinstall	In selected group all package should be install.

Removing Packages:

Command Options	Description
remove	In order to remove a package.
swap	Install another package after remove one.
erase	In order to delete a package permanently.
autoremove	As well as erase command and also remove additional unneeded.

Updating Package:

Command Options	Description
update	Update all packages.
update-to	Use this command to update one or specific packages.
upgrade	Upgrade package of a accounts.
downgrade	Download a newer version package.

3.3.9 Compress and Decompress a Directory Using Tar and Untar

Compress a directory:

Use the bellows command to compress a single directory.

Tar_czvf stuff-of-acchive.tar.gz Let's you have a directory name "stuff". Then track the subsequent knowledge.

Tar_czvf archive.tar.gz stuff

Or, tar xvzf file_my.tar.gz. Shows in tar and Untar through figure 3.1

Figure 3.1: Displays in Tar and Untar

3.3.10 How to Enhance Modification Erase and Show IP Address in Centos

To see your IP address, you have to run this command and this command is ifconfig. 3.2 is showing the interface of IP address.

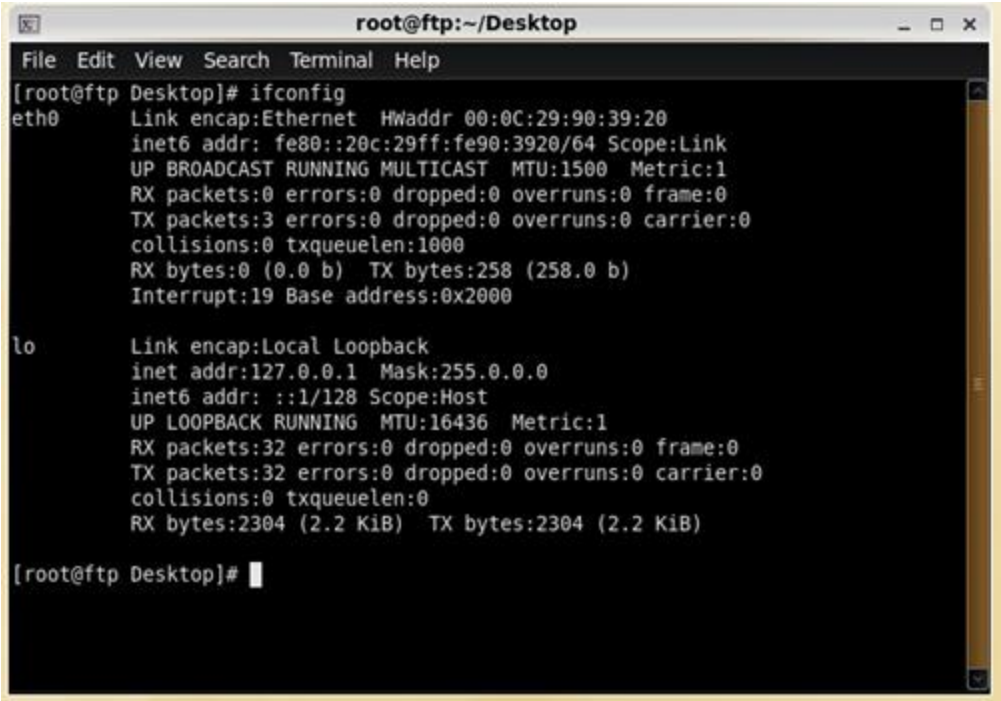

Figure 3.2: Shows IP address.

Figure 3.3. displays ifconfig in eth0 port.

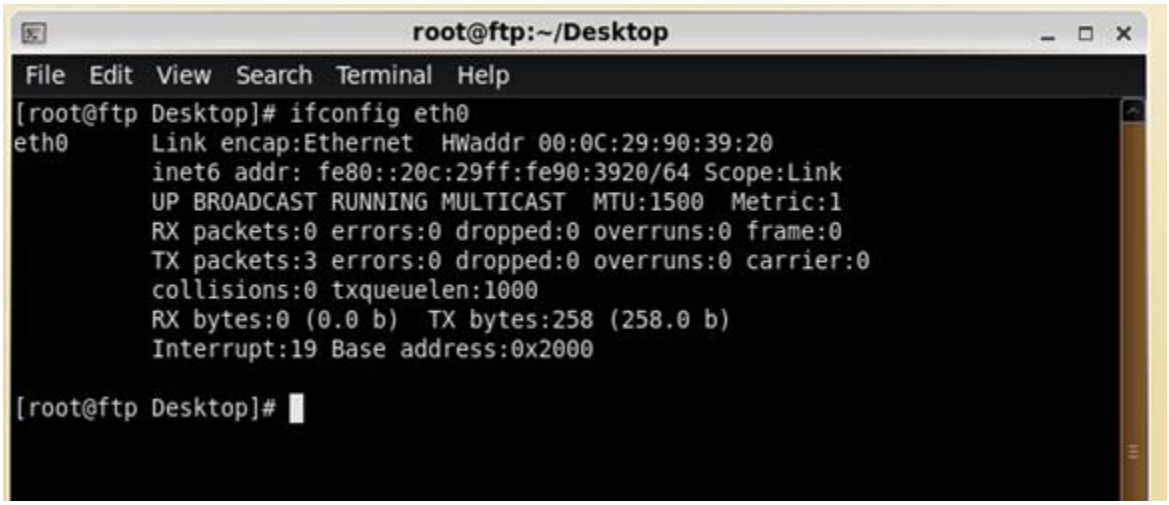

Figure 3.3: Displays address in eth0 port.

Setup IP Address Perpetually Show by figure 3.4.

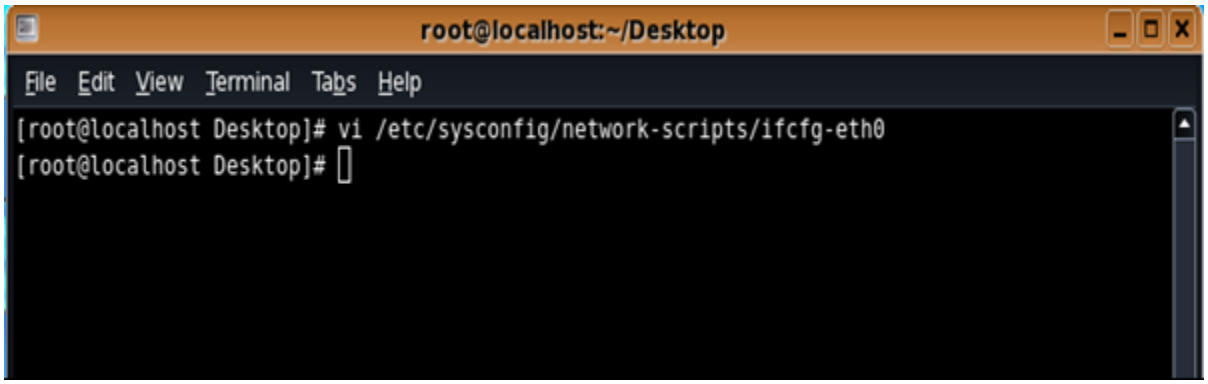

Figure 3.4: Displays set IP address in eth0 port.

vi/etc/sysconfig/network-scripts/ifcfg-eth0 and that shows in figure 3.5.

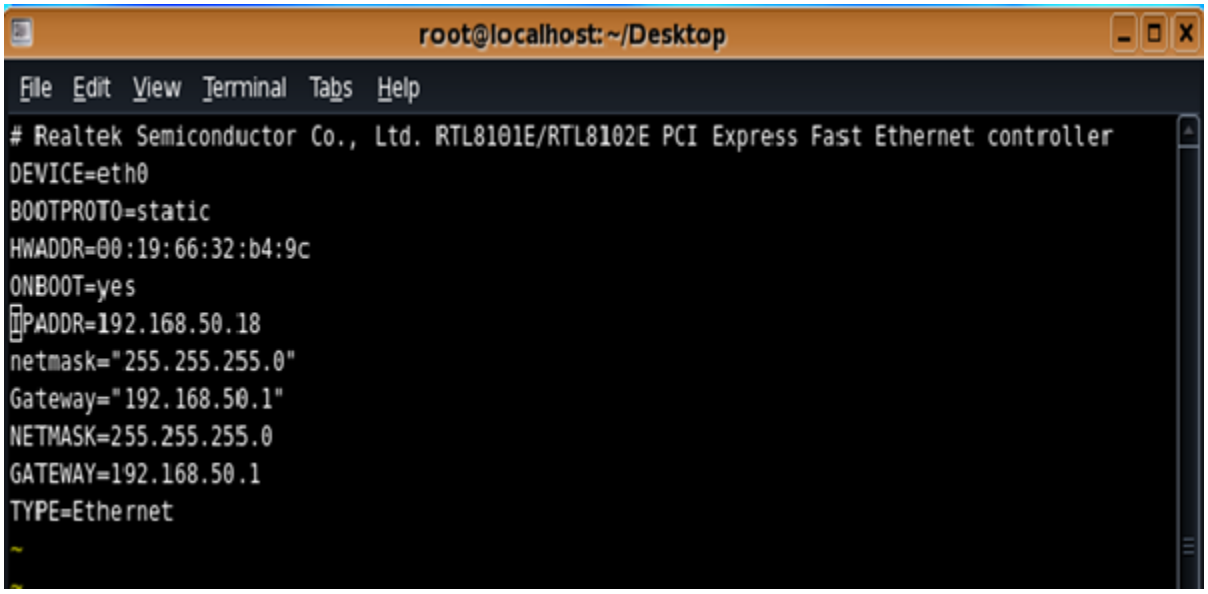

Figure 3.5: Displays fixed IP address in sysconfig file eth port.

3.3.11 Server Configuration

The main purpose of a computer server is save data, recover data and also send file to the other computer on a network. Server configuration is very important in internet service provider. For every server service, Server selection is the main task and it's also very important. In Linux functioning scheme, they have many servers.

- **Web Server**

[7] Web servers mainly serves Web Pages. In each Web Pages there have a ip address and domain name. In lieu of instance, doubt you go in the URL http:/sarminproma.com in your web browser, then it's refers a call to the Web server and whose domain name is sarminproma.com. Then the server gets the web page named index.html and refers it to your web browser.

- **Centos Web Server Conformation Desires**

In order to set up a web site, at first you need a computer or a laptop, operating system(OS), domain, server and also a ip address. The laptop or computer are able to run a Linux operating system. After installing Apache server, Centos can easily be consecutively. A domain name is itemized through somewhat domain name registering facility.

In case of static IP addresses, after that your domain should be with static ip address. This is gained by means of a server name.

- **Domain Name System (DNS)**

[3] The Domain Name Scheme is a classified and dispersed naming scheme in lieu of PCs, service or other source linked to the Internet or a personal system.

People be able to entree info available over domain names, like sarminproma.com. We browsers interact through Internet Protocol (IP) addresses. DNS interpret domain names to IP address thus browsers be able to shipment Internet properties. The DNS ensures your query will be sent to a server that isn't too far away.

- **CONFIGURATION OF DNS SERVER:**

DNS Server working procedure:

[8] It alters IP address to name and vice versa.

- **Step 1:**

Firstly, setup bundle of DNS name bind that is known as yum install bind*. That is shown because I already installed it into my pc. Figure 3.6 shows install procedure of yum bind.

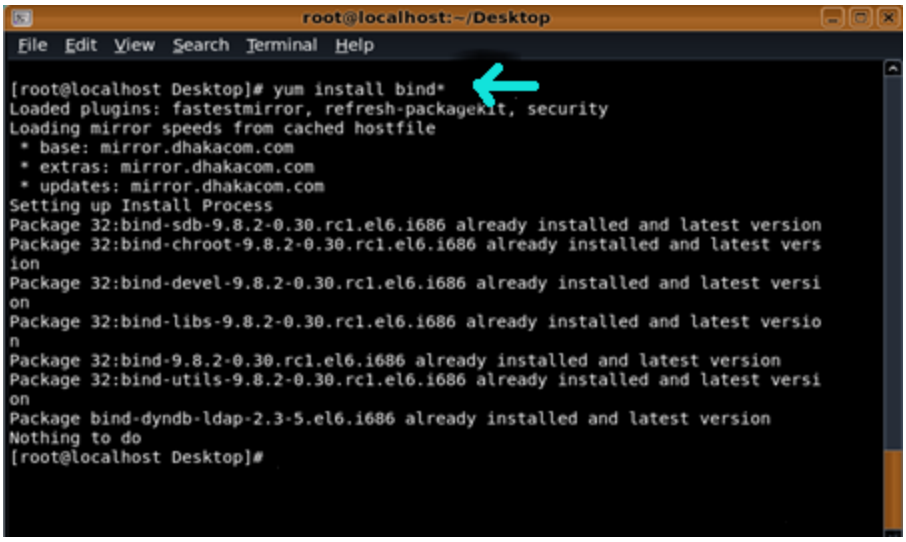

Figure 3.6: Displays yum install bind.

Step 2:

After that just correct the structure sleeve by means of vi editor: Show figure 3.7 displays my pc IP address 192.168.56.1.

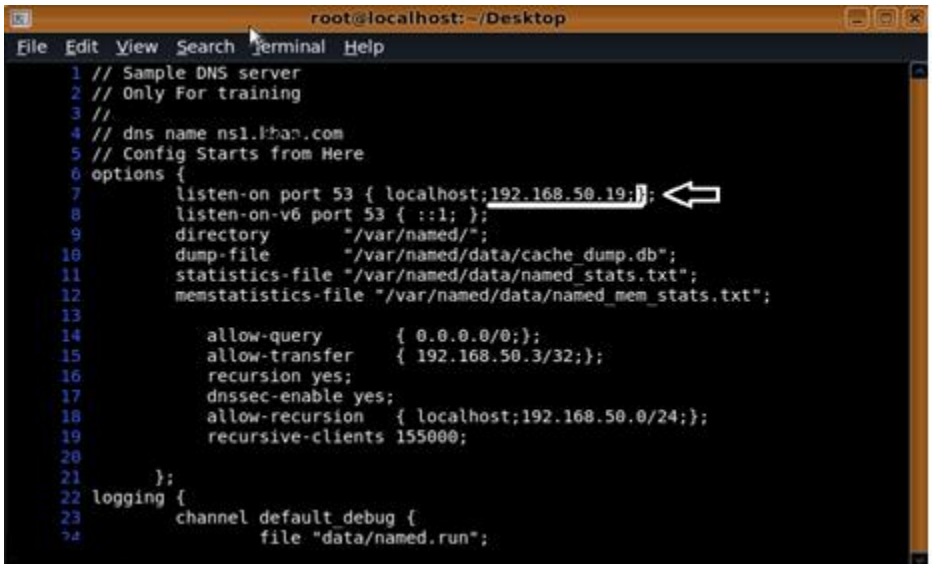

Figure 3.7: Displays Revise conformation sleeve by means of vi editor.

Step 3:

Then go in a web address. I used sarminproma.com in order to my testing purpose. This is displays in Figure 3.8

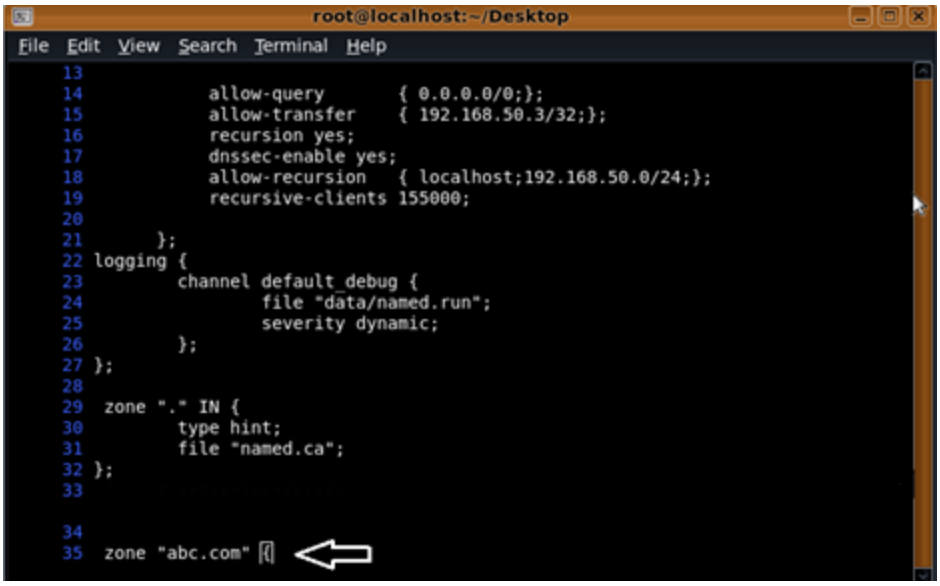

Figure 3.8: Displays Go in a web address from forward zone.

Step 4:

Next go in IP address into reserve zone That means that I use 192.168.50.19 as 50.168.192 without network part. This is displays in figure 3.9.

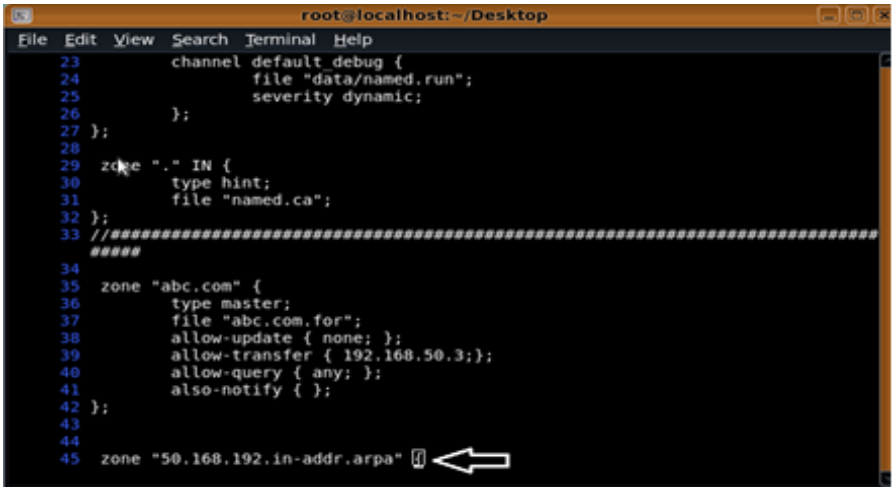

Figure 3.9: Displays Enter IP Address into Reverse Zone.

Step 5:

Now forward zone file command in command is vi/var/named/chroot/var/named/abc.com. This is displays in figure 3.10.

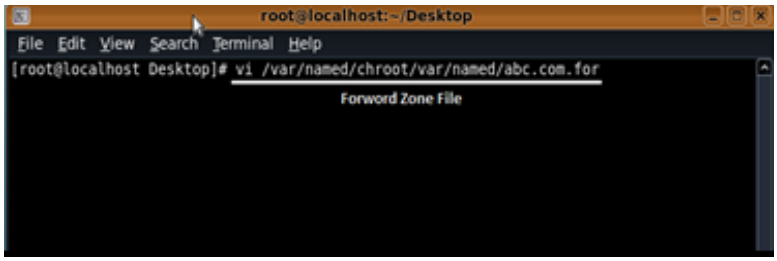

Figure 3.10: Displays Correct Forward Zone File for sarminproma.com

And forward zone file create that is displays in figure 3.11.

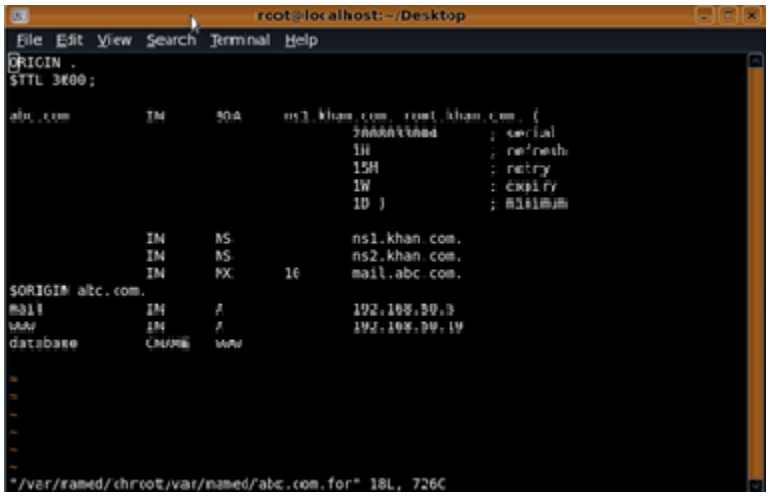

Figure 3.11: Displays Correct Forward Zone File for abc.com

Step 6:

Reserve zone file command is displays in figure 3.12. and figure 3.13 displays correct reserves zone file full structure file.

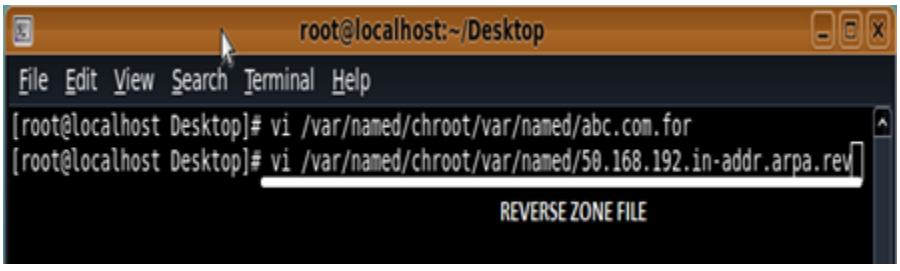

Figure 3.12: Displays Screen Print Correct Reverse Zone File

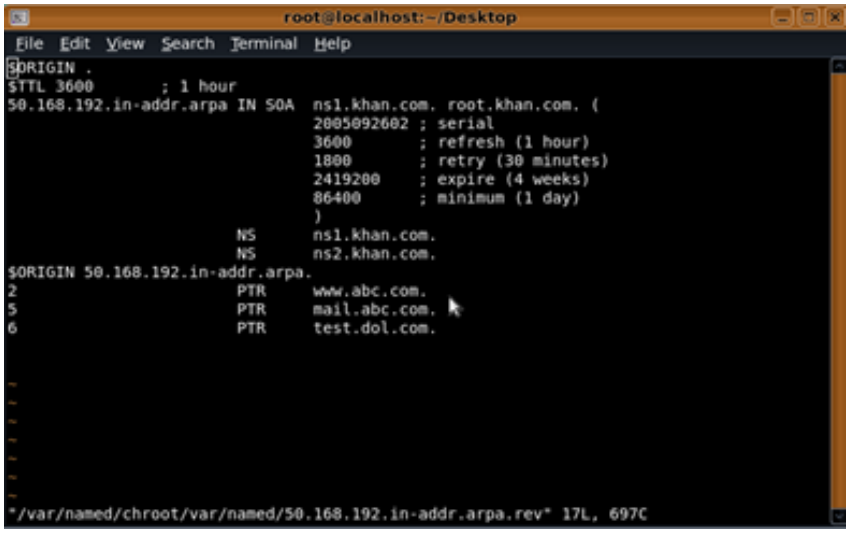

Figure 3.13: Displays Screen Print Correct Reverse Zone File

Step 7:

Then Restart the service and all kinds of procedure. Figure 3.14 displays in restart the service and Figure 3.15 displays the restart web server service.

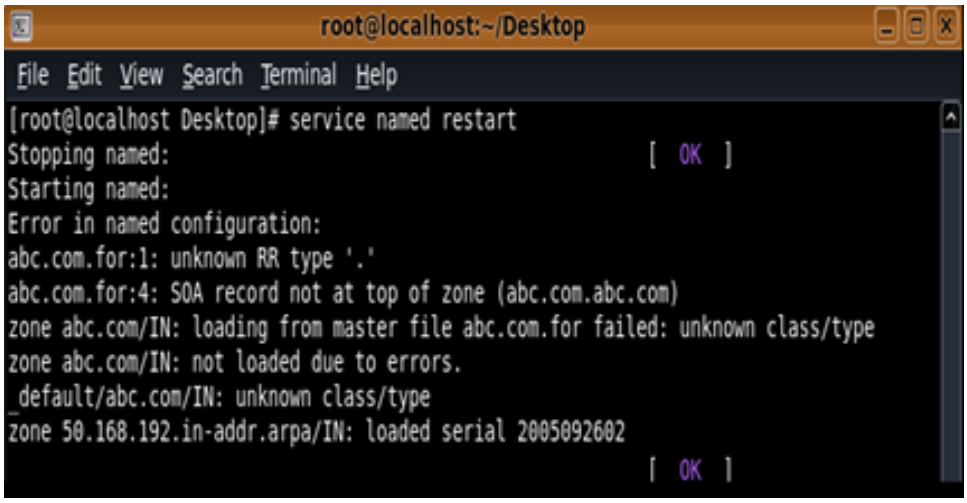

Figure 3.14: Displays service named restart

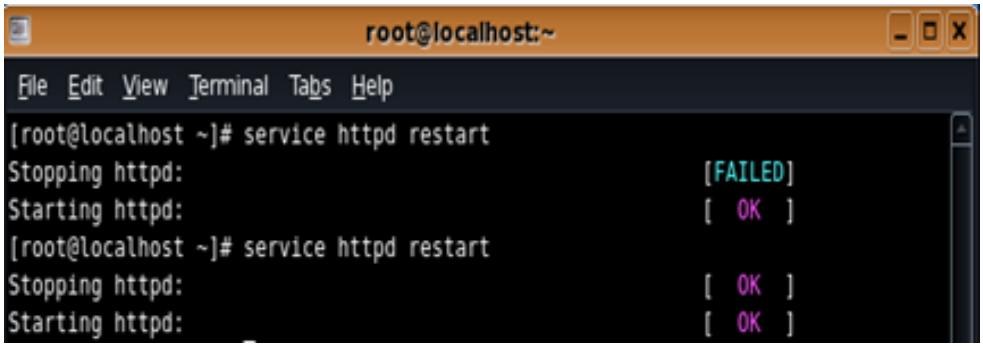

Figure 3.15: Displays service named status

Step 8:

Now go to the web browser and just type sarminproma.com in figure and this is shows in figure 3.16.

Figure 3.16: Displays sarminproma.com open in browser.

- **Mail Server**

[9] A mail server is a request that obtains received e-mail after native operators and distant despatchers and forwards outward-bound e-mail for distribution.

➢ **Setup mail server in Centos**

1. Install all packages.
2. Dovecot and Postfix configuration.
3. Creation of user.

Mail server is prepared now, arrange operator in your mail client and test send/Receive.

This is displays in figure 3.17.

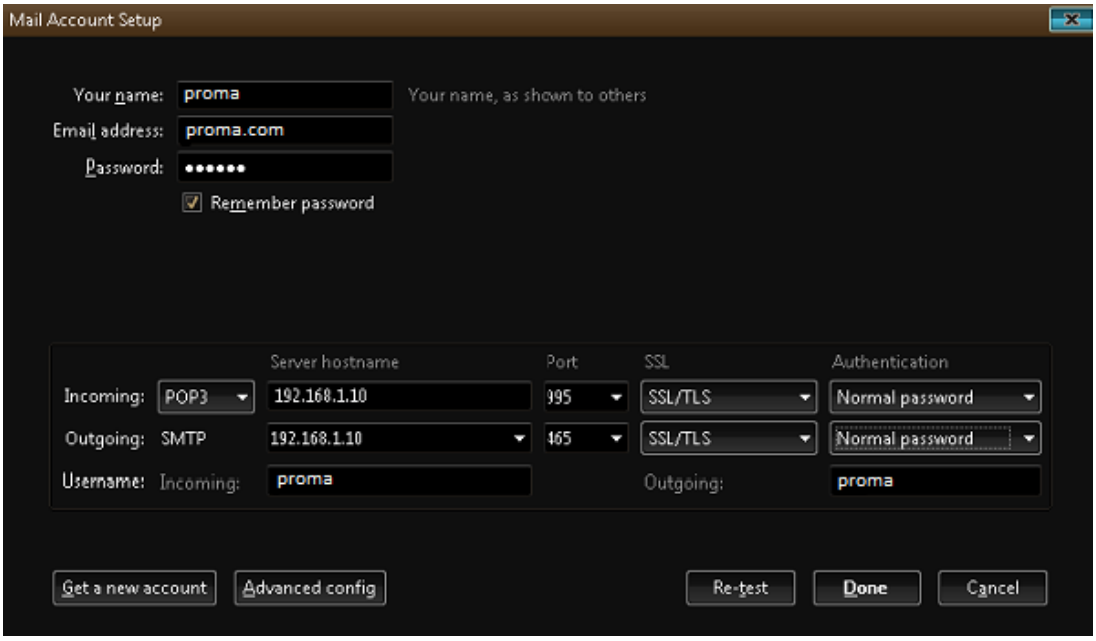

Figure 3.17: Displays POP3 and SMTP host and Port configuration

- **Mikrotik Router:**

[10] Mikrotik is a Latvian firm which remained set up in 1996 to improve routers and wireless ISP schemes. In present era, Mikrotik router is used by most ISP company. Most of the company used Mikrotik router in order to its advantage and smallest size.

- **RouterOS:**

Mikrotik RouterOS an operating system of Mikrotik RouterBOARD hardware. This be able to be used in personal computer and also use as a real router. This is made by Linux based kernel and its version is 2.6. The main goal is used this as a real router and make every task easier and smallest and try to do all task as soon as possible.

All kinds of information, package is available in www.mikrotik.com for download.

- **RouterOS Features:**
    - Use in hardware support, as a Router and also a Switch or Bridge.

- Easy to installation.
- Provides DHCP server services.
- Provides Firewall services.
- Provides POPoE client server.
- Provides VPN (Virtual Private Network)
- Bandwidth management is very easy.
- Provide Proxy services.
- Provides MPLS services.
- Used for Backup and restore.
- Real time configuration and monitoring.
- WinBox GUI and Web Admin.
- Powerful QoS control.
- P2P traffic filtering.

- **Release History:**

  [12] Mikrotik has different release version of RouterOS at different times. This are given bellows.

  - RouterOS version 6.46.2: January 2020.
  - RouterOS version 6.46.1: December 2019.
  - RouterOS version 6.45.7: October 2020.
  - RouterOS version 6.45.6: September 2019.
  - RouterOS version 6.45.5: August 2019.
  - RouterOS version 6.45.2: July 2019.
  - RouterOS version 5.25: April 2013.
  - RouterOS version 4.17: October 2011.

- **Router Board:**

  [13] RouterOS is the operating system of RouterBOARD hardware. It's completely the essential landscapes for an ISP – routing, firewall, bandwidth management, wireless access point etc.

- **Mikrotik Cloud Core Router:**

  [14] Mikrotik cloud core routers are carrier grade with Tilera multicore CPUs. Referred to as Mikrotik new flagship device, these products can reach a throughput of almost 51.5 million packets per second; which is almost 20 times faster their previous top models.

  The CCR1036-12G-4S is now being shipped with double fired control provisions, filled scope sort A USB, high speed M.2 storage connector and onboard 4GB of RAM. Figure 3.18 shows MikroTik Cloud Core Router 1036 Series.

Figure 3.18: Mikrotik Cloud Core Router.

Product Features:

- Network CPU is 36 core.
- Chip cache is 12 Mbytes.
- Standard forward is 8 mpps.
- Fastpath forward is 24 mpps.
- Throughput is 16 Gbit/s.
- Color LCD display which is touch screen.

Product Specification:

- Speed of CPU is 1.2 GHz.
- Ports 4 is used for SEP.
- Ports 12 is used for LAN.
- Gigabit is present.
- MiniPCI is 0.

- Type A USB is used.
- Yes. PoE is present.
- RouterOS v6 is used our operating system.
- Level 6 is used in RouterOS.
- 60W is max power for consumption.

- **Propose Network Diagram (Mikrotik Configuration):**

WinBox is the graphical formation efficacy for Mikrotik RouterOS. At first we should transfer WinBox. After that it be able to track conventional absent such as no set up is mandatory 3.20 network diagram. Figure 3.19 displays propose Network Diagram.

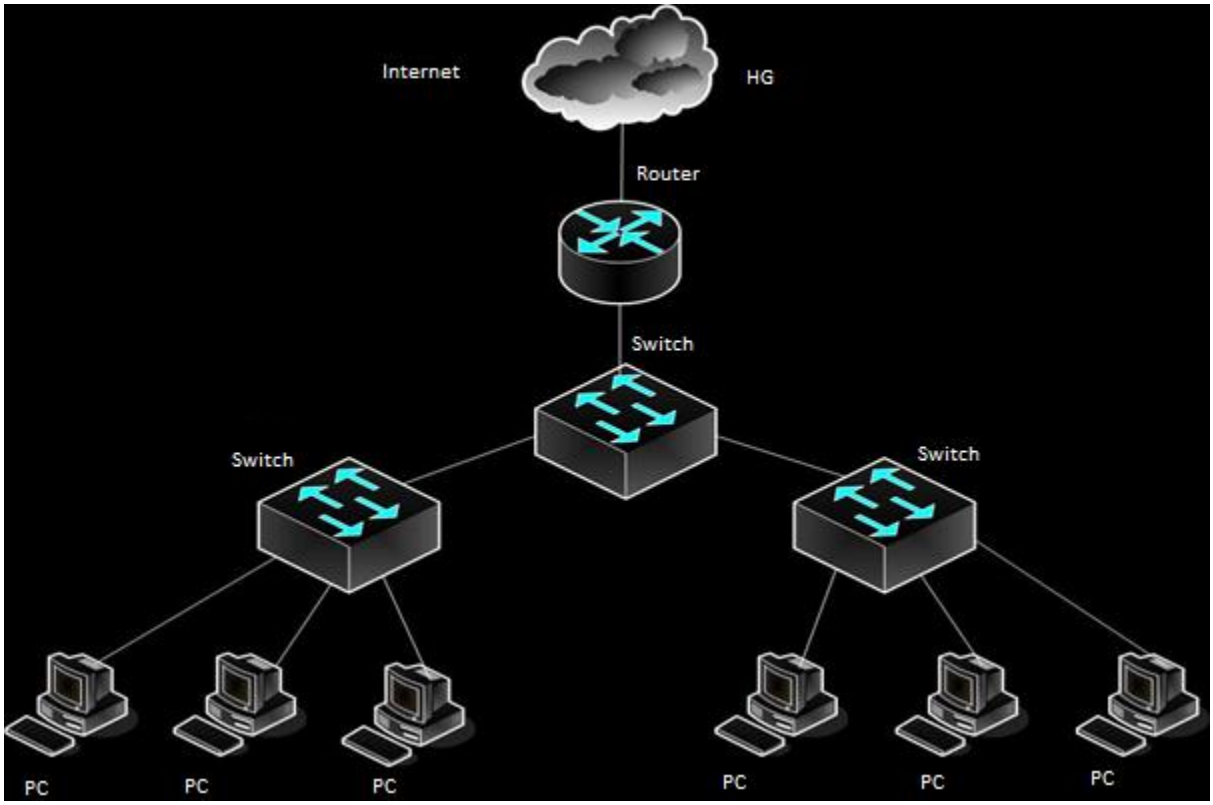

Figure 3.19 Network Diagram

Initial Step:

Step 1:

- At first provide power to the Mikrotik Router.
- Then padding a UTP cable in Mikrotik LAN seaport and fixed other port to the PC.
- Browser through WinBox.
- After that clack to the image and display an IP and MAC address. Then clack to MAC address then transcribe “admin” in login box and don’t essential to provide password. Figure 3.20 displays screen print reset Mikrotik Router.

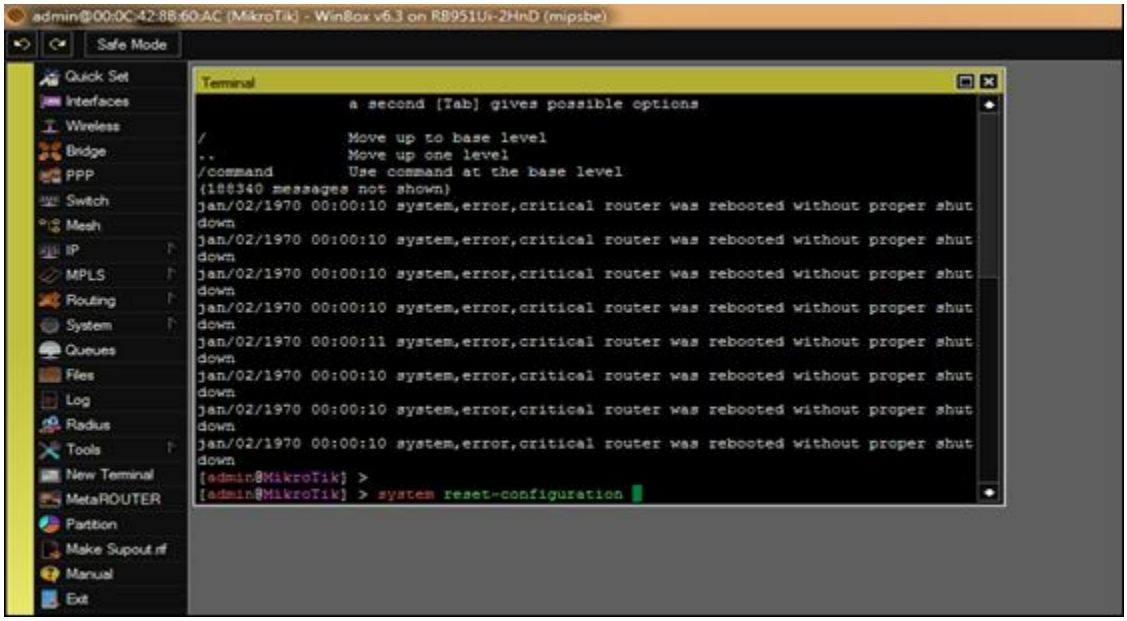

Figure 3.20: Displays Reset MikroTik Router

Step 2:

Set up Gateway and the procedure is assumed bellows.

IP > Route > “+ “> Gateway.

Now unique object necessity be notice that the Dist. Address determination be 0.0.0.0/0. Apply>Ok. IP add established in Mikrotik Router displays in figure 3.21 and structure route IP add shows in figure 3.22.

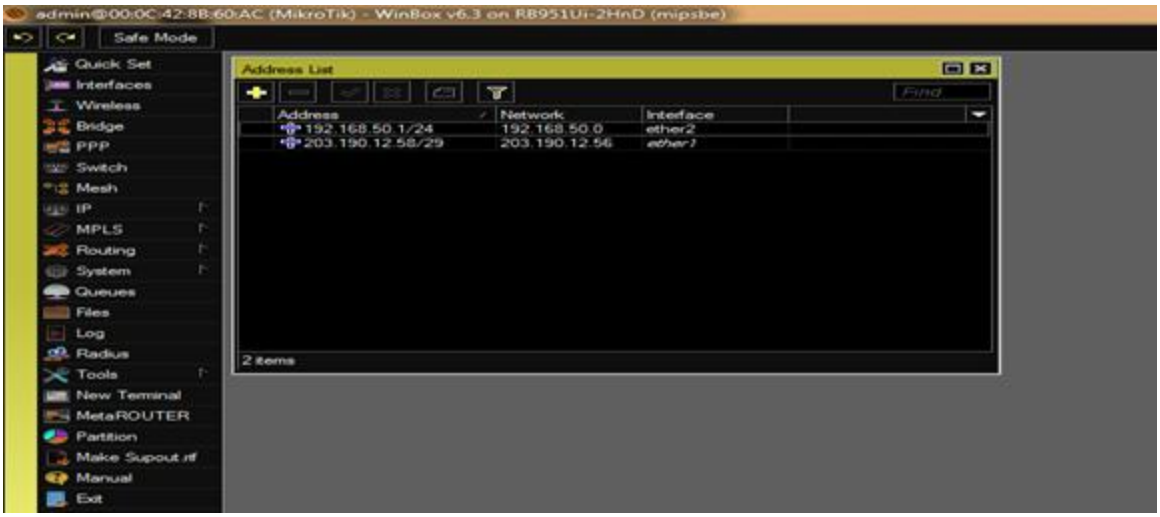

Figure 3.21: Displays IP Address

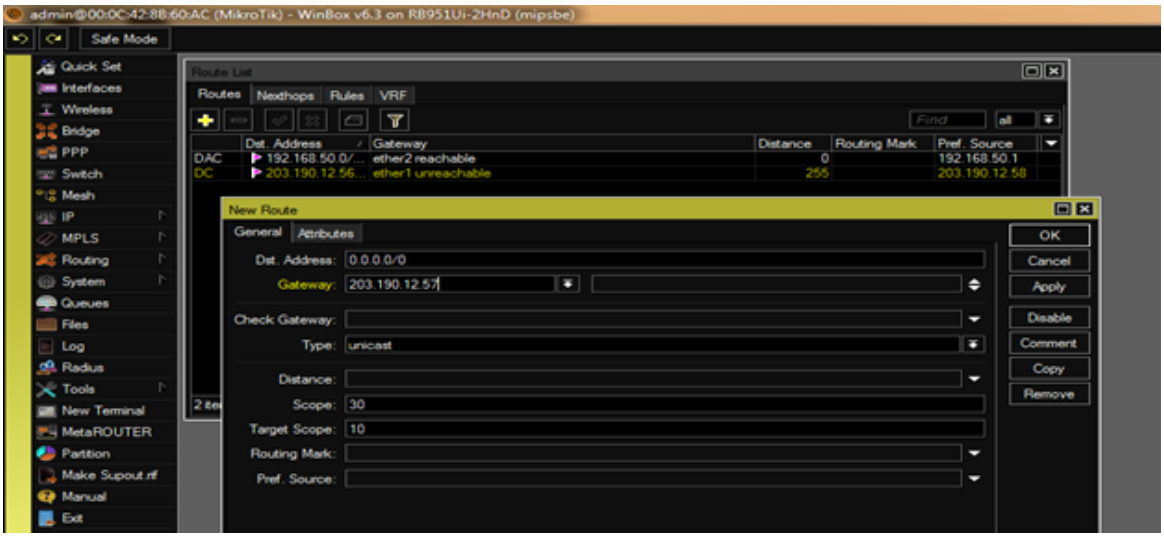

Figure 3.22: Displays Gateway.

Step 3:

In this step the working process is given below.

IP, Firewall and NAT>" +" and in common Cable is srcnat. Src. Address: local block/IP through subnet cover of the network and act Pretense is Apply>Ok.

Local network IP address NAT law displays in figure 3.23 and displays in Screen Print Firewall in figure 3.24.

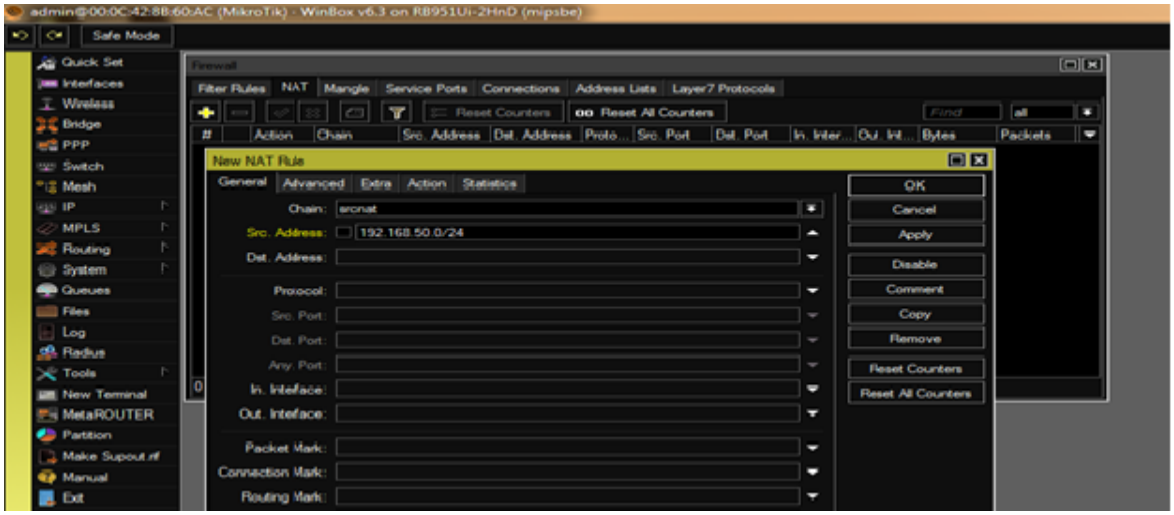

Figure 3.23: Displays NAT Rule.

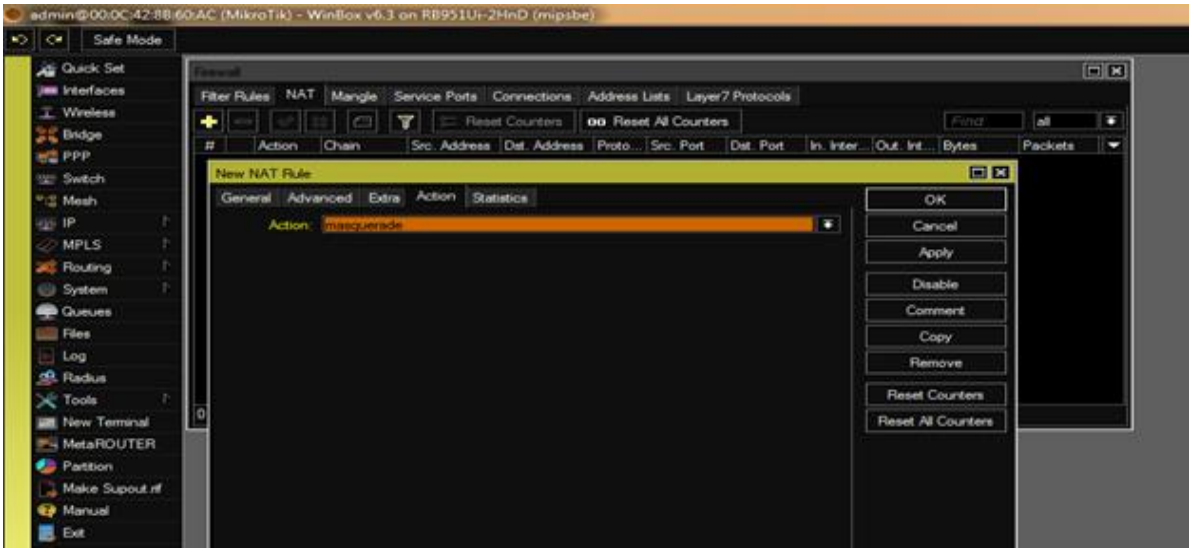

Figure 3.24: Displays Firewall.

Step 4:

In this step responsibility the duty of linking the connected harbors through respectively additional 3.25 in figure. And the procedure is Bridge>" +"> and in location Impulse spot to 3 choices. Bridge Settings Shade Pattern displays in figure 3.25

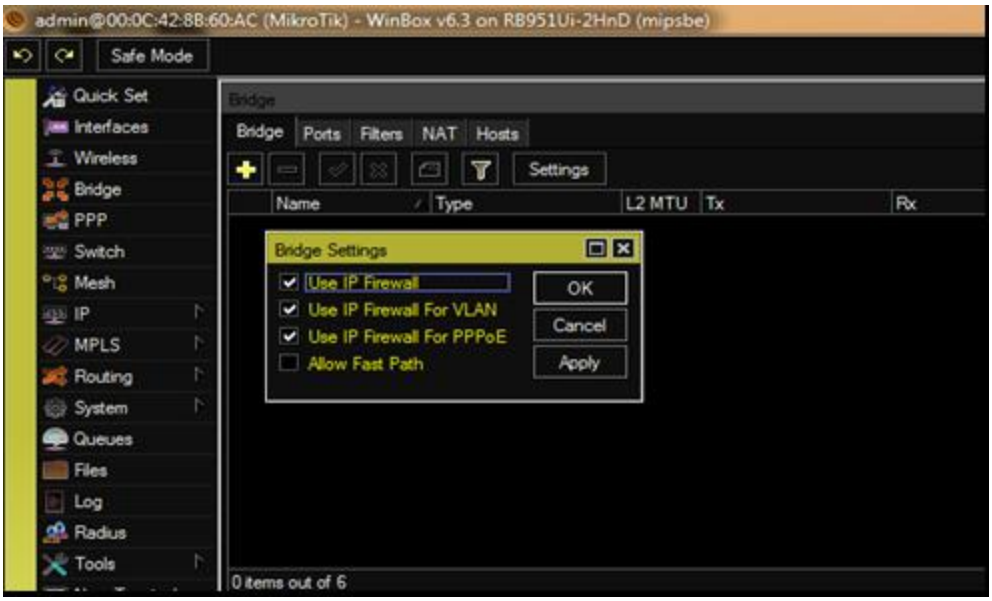

Figure 3.25: Displays Bridge Settings

Ports: either 2> either3>either 4>either 5>WLAN1 and router interface port graphically shows in figure 3.26.

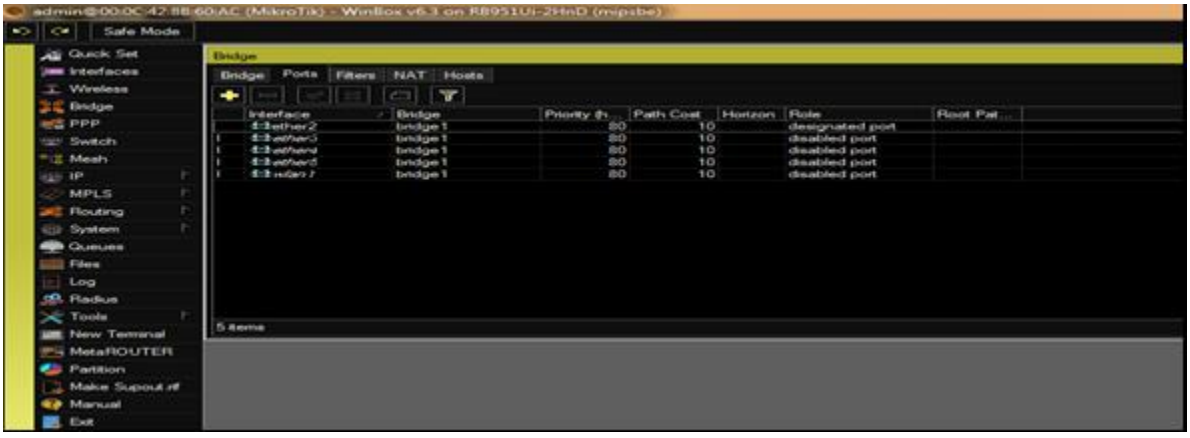

Figure 3.26: Displays Bridge Ports Assign

Step 5:

Meaningful the shape of link through the DHCP Headwaiter which is displays in figure 3.27 and the procedure is IP, DHCP Server and Border: bridge 1 and DHCP Setup is displays in figure 3.27.

Local Network pool address displays in figure 3.28 and DNS System IP address displays in figure 3.29.

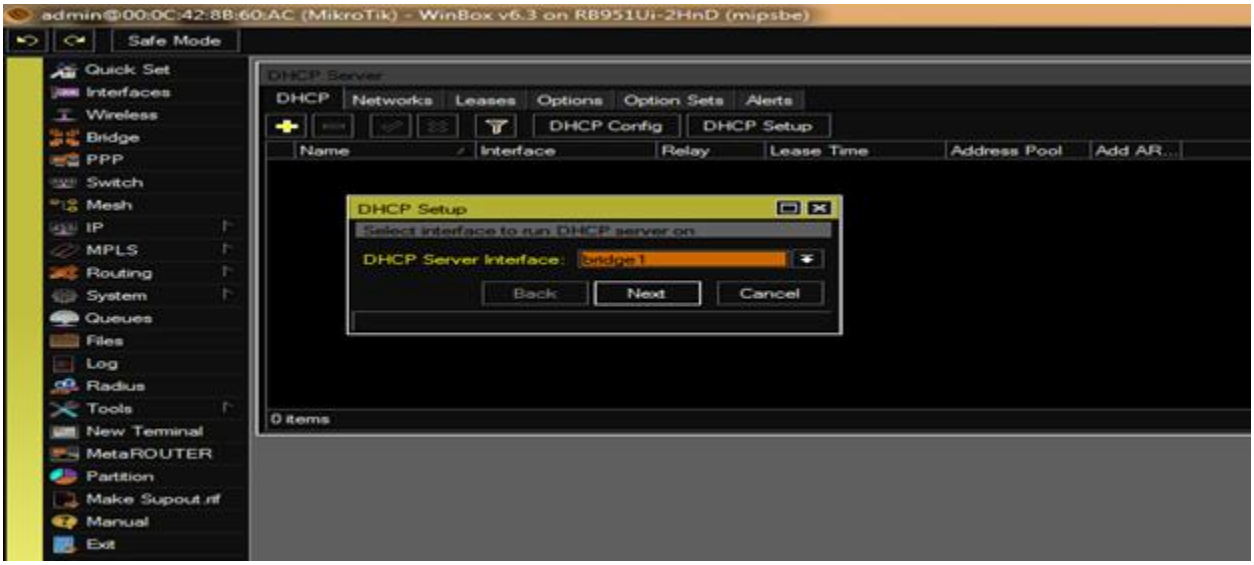

Figure 3.27: Displays DHCP Setup.

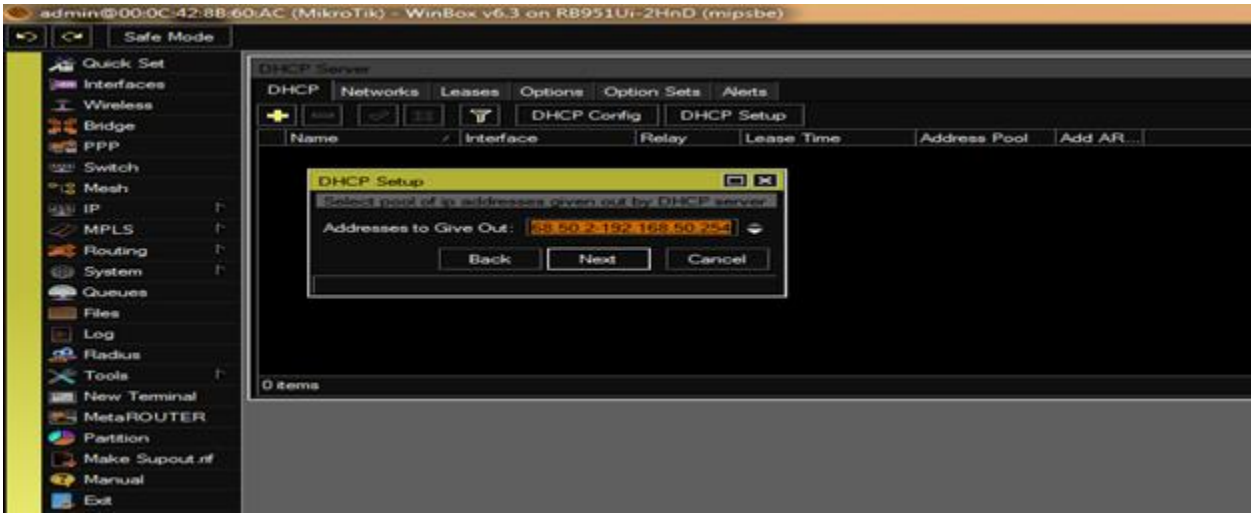

Figure 3.28: Displays IP address pool of the local LAN.

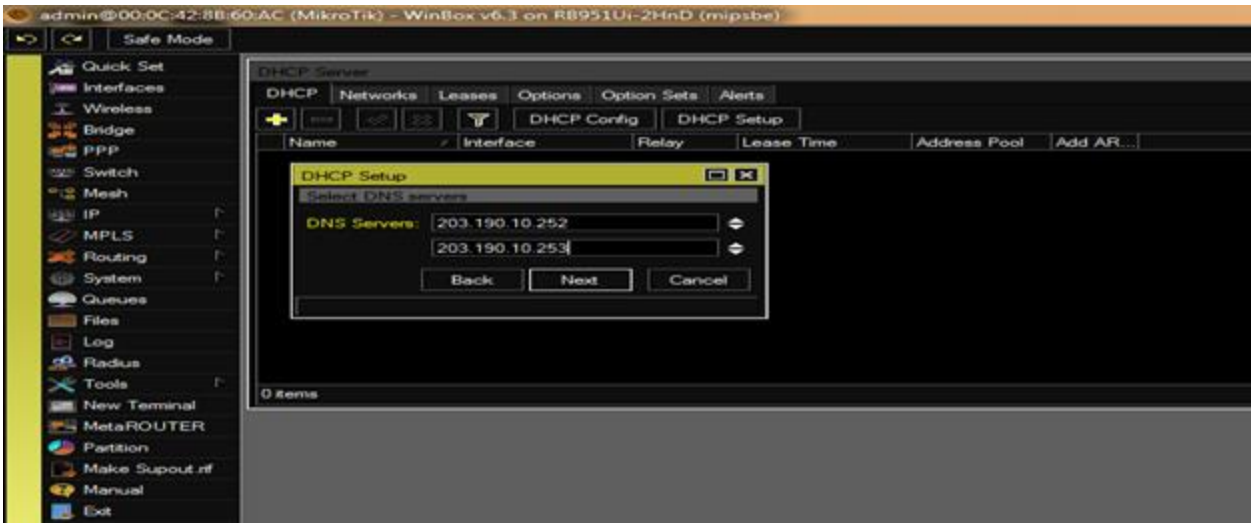

Figure 3.29: Displays DNS Service and DHCP Setup.

Step 6:

Wireless LAN shape process is assumed bellows.

Wireless>WLan > Mode: ap bridge. Wireless set SSID Mode displays in figure 3.30 and wireless password set shows in 3.31.

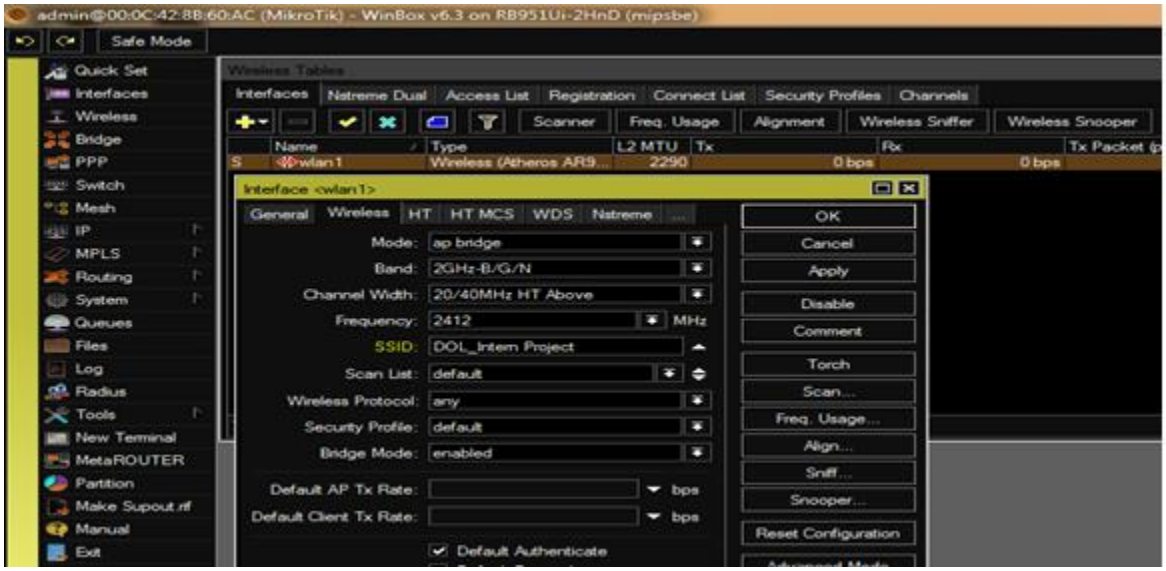

Figure 3.30: Displays Wireless Setting

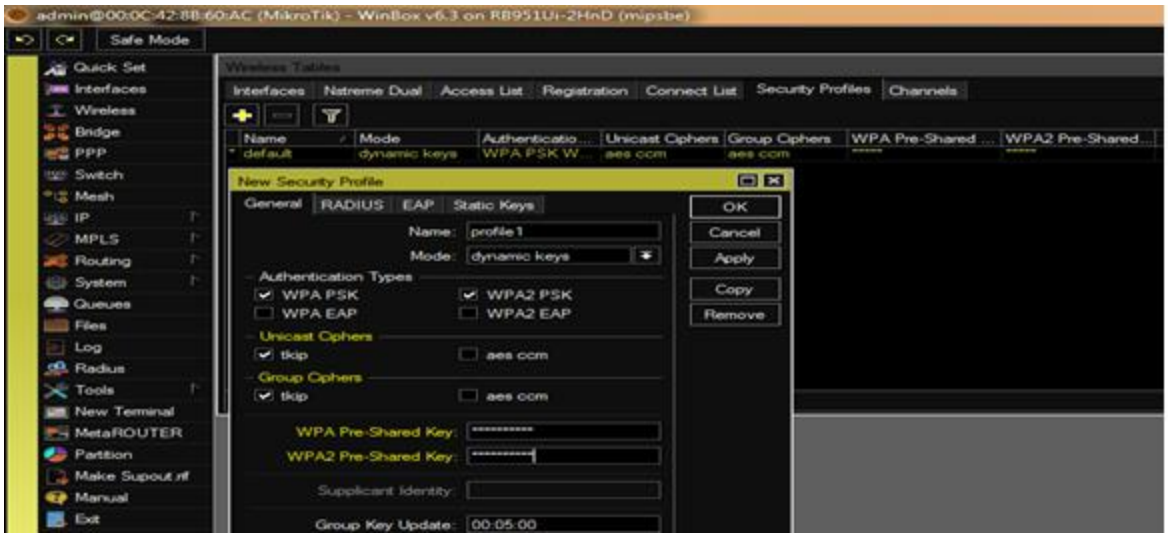

Figure 3.31: Displays Wireless Security Set

3.4 Challenges

I've faced many types of challenges during my Internship. During my internship I have learned my hard task. At first, I couldn't understand something easily but after some days of my training I understood more than before. I face some hard time during installing CentOS into my pc. It is very time consuming that's why I felt bored. Sometimes I stuck with while configuring Mikrotik Router.

Sometimes my trainer takes extra time to teach us. This is helpful for us but sitting on ling time and continue leaning without any break, it's really boring for everyone. That's why I felt bored. Sometimes I afraid to ask question to my trainer. I think this a common problem of maximum student in our country. But During of my Daffodil Online Limited (DOL) training I try to ask question to my trainer. And finally have the chance to improve myself to ask question in public. It is possible because our trainer is very friendly to us.

During my intern, I have found some helpful friend. We ask question each other and easily team up with others and discuss many hard topics.

During my internship, sometimes not enough work assign to me. That's way I felt bored, sitting on my desk and waste my time. In that time, I waste time by watching YouTube and scrolling my Facebook and gossiping with my friends. My internship is a paid internship in Daffodil Online Limited (DOL). After wall, I tried my best to learn everything.

CHAPTER 4

Competencies and Smart Plan

4.1 Competencies Earned

When ending mine internship, I've knowledgeable so many things. Competence Earned or learning outcome is the same thing. So competencies earned is a thing of what a knowledge seeker is want to know and gained all practical knowledge in real life or practical field. Learners also able to install together web and server machineries at two datacenters. From my internship I learned so many things that can be used in practical field and also able to implement in every real life. So one can easily find a suitable job after completing his internship. If a knowledge seeker is serious in his internship period, then he can easily prosper in his real practical job life gained a huge experience in this sector. In my internship period, I learned so many things that can be implement in my real life. I have gained how to maintain good manner with customer, how to deal with customer. I have also learned ISP server configuration, note customer complain and try to solve their problems immediately. So at last, in a word, in my internship period, I have gained a lot of real life experience and I hope, I am able to implement it in my real job life.

4.2 Smart Plan

Smart plans mean a set of goals and objectives. Smart plan has five characteristics and these five characteristics are Specific, Measureable, Attainable, Relevant, and Time-bound. My internship smart plan is given below.

- **Specific:** This sector has a target and the target is developed the system and also exact solution of that system.
- **Measurable:** This goal should be countable and should have a minimum afflicted development of that system.
- **Attainable:** This aim must be original and gain able.
- **Relevant:** This object measure relation with other business and their client.
- **Time bound:** This sector defines a time limit of any system.

4.3 Reflections

Daffodil Online Limited (DOL) begin their journey in 2002. In last few years, they extended their operation according to the client recommendation and their demand including a timely manner. They effort through numerous nationwide and worldwide company and also gained many reputations. They use latest technology and their Commercial Network Solution section is highly capable to deliver best service and provide every technical server line solutions with a friendly manner.

CHAPTER 5

Conclusion and Future Career

5.1 Discussion and Conclusion

In my 4 month's internship program, I lean many thing and get helps from my friend. My internship trainer was very helpful. Review my internship is very wonderful and very experience able. I have planned my future during my internship to work on Network and ISP site to help a lot of people. In my internship, I have gained some of the major think like time management, sell skills and also self-motivation. When I first start my internship, I didn't think that I have learned many advance things about ISP company. In the meantime, I prepare myself as a worker of any ISP company in Bangladesh. Recently I am starting to drop my CV in different ISP company. Actually I am enjoying my work. That's why I think I can cope up myself for my professional life. So My Internship, it was a great and wonderful experience to me and my future job life.

5.2 Scope for Further Career

Now-a-days opportunities in one's career are very available in every area under Linux filed and MikroTik sector in every ISP company. And after all my internship is completed to Daffodil Online Limited (DOL) company requirements, there are some features that I could add or improve if time allowed. IP Support system implementation must should be revised. The market is good for Linux and MikroTik based work in every ISP company, so I will make myself more advance and profession for my future career. My career opportunities are not only Linux platform but also pc Application, Kernel and scheme driver Application. Now a day, most of the ISP company migrated them to Linux and open source software's. So here is a high request in lieu of the expert experts in Linux and Mikrotik.

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[13] Get Concept about Router Board, https://en.wikipedia.org/wiki/MikroTik 04 April 2020, 08:00am

[14] Get Concept about Cloud Core Router, https://cloud.google.com/router/docs/concepts/overview, 20 May 2020, 12.05 am.

Appendices

- **Appendix A: Internship Reflection**

The primary goal of my internship in a professional setting, practical solutions to real-world problems is to apply the knowledge gained in the classroom. And professionally relevant competencies and relationships in a professional setting, learning to deal with new knowledge, skills, and the ability to determine how to sharpen and develop plans. Add to network with other professional's supervisors and professional relationships. I am a professional in the field exposure with clients and professional etiquette and professional supervisors and other employees to learn from watching an understanding of the behavior, as well as to gain through interaction. To fulfill the duties of my internship, I'm exercising proper business etiquette. I am an organization's mission / vision is implemented, how to contact colleagues, how power is shared, how it is structured, how decisions are made, how to understand the culture of a professional organization, and what degree of accountability and feedback to the organization. With an assessment at the end of my internship supervisor and internship experience running through individual meetings provides an opportunity to take a professional opinion. Internship experiences to prepare for life in a global society, leadership and service, my gift to be able to put it to use.

➢ Appendix B: Company Detail

Head Office

Name	Daffodil Online Limited
Address	102, Shukrabad (3rd floor), Mirpur Road, Dhanmondi, Dhaka - 1207, Bangladesh
Telephone	02-9143258-60
Fax	880-2-8116103
E-mail	info@daffodilnet.com
Website	www.daffodilnet.com
Type of Organization	Nationwide Internet Service Provider (ISP)
Employees	12

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