

INTERNSHIP ON COMPUTER NETWORK AND SECURITY

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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 “**Computer Network and security**”, submitted by **Md. Mamun Or Rashid** 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 July 2018.

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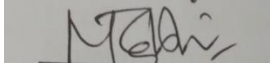
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DECLARATION

I hereby declare that, this internship report is prepared by me, **Md.Mamun Or Rashid**, ID No: **153-15-6413** to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of **Masud rabbani, Lecturer, Department of CSE**, Daffodil International University.

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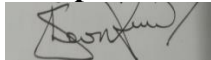
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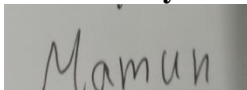
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ABSTRACT

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.

INTERNSHIP REPORT FOR NETWORK AND SECURITY

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CHAPTER 1

Introduction

Introduction. The name of this is Daffodil Online liited. Now a day's a large number of people all over the world use internet technology and server is a part and parcel. Linux is quite possibly the most important free software achievement since the original Space War, or, more recently. We cannot do anything relating to internet communication without server. So DNS server is very important for internet technology. Internship is an old practice to make students understand the real working, environment and challenges of jobs. Medical Science, Engineering and Accounts all branches have their own importance of internship before degree award. Today every business and commerce is very much related to software based communication and internet technology. This is called E-Commerce. Internet Banking, SMS Alert Banking, Mobile Banking, EFT (Electronic Fund Transfer) etc. are not possible without server. DNS (domain name system) is also very useful server and we can operate different types of services by using this system. Internet technology, E-mail, E- Business, Telecommunication, Mobile technology etc. are not possible without server and DNS is one of them. Today, Banking industry and other business organization totally depends upon different types of Software and Online Technology and Server is very essential. ATM Technology(Switching Software),.

Motivation

Intern to get the practical experience in the field in computer engineering. It is important that use our theoretical knowledge with the practical field to increase our professional experience in engineering job market.

I am currently pursuing my Bachelors in Computer Science Engineering at Daffodil International University, I understand the importance of gaining practical knowledge which will complement the textbook knowledge and help a student gain a wider perspective of the subjects.

Internship Objectives

Main objective of my internship program is to prepare myself as a skilled person in the competitive job market. So internship is very essential for skill development. I would like to achieve some special quality in order to prove myself as a skilled one. It covers advanced skills for the Linux professional that are common across all. This objective includes the ability to managing a running server and configuring. Linux file hierarchy with clear understanding of services to be used. It covers basic skills for the Linux professional that are common to major Objectives with higher weights will be covered in the exam with more questions.

Introduction to the Company

Daffodil Online Ltd. prides itself as one of the leading nationwide Internet Service Provider (ISP) in Bangladesh. They are the most experienced and oldest company in the ICT field where they are basic business ethics is Long Term Relationship with they are customers. As we look at the growth over the decade since our inception, they are extremely proud of what they have achieved, and even more excited about they are outlook for an equally promising future.

It may please you to know that they started they are operation in the year 2002. During the past years, they extended they are operation and service portfolio according to the customer's recommendation and considering demands of time. They worked with many national projects and international organizations and achieved the reputation. They are using the latest technologies and upgrading the services wherever it is required.

REPORT LAYOUT:

In the chapter (1) I have described objective of internship, Motivation of internship and

Introduction to the company.

perform the internship works, about the company, what are the IT service offered in DOL and what are the roles of in jobs market of Linux.

In the chapter (2) I have described the methodology of my internship. And this chapter gives the information about where the internship has been attached to undertake this program. Also included about how did

In the chapter (3) I have described about daily task and activities, Events and Activities and Challenges.

In the chapter (4) I have described is Competencies Earned, Smart Plan, Reflections.

In the chapter (5) I have described is Conclusion and Future Scope. I discuss Future Scopes of Linux and write conclusion.

CHAPTER 2

Internship Enterprise

About the Company

Daffodil Online Ltd. (DOL) is proud to be one of the trailblazers and oldest ISP/ASPs in Bangladesh and providing one stop integrated ICT services and solution since July 2002. It has its own Fiber Optic & Radio Link WAN infrastructure to serve corporate, SM E and individual clients. The institute worked with many national projects and international organizations with high appreciation from all concerned. It using the latest technologies and upgrading the services wherever it is required.

DOL has a very strong professional engineering and management team certified and associated with SUN, Cisco, Microsoft, Linux, and Oracle and actively involved with world leading computing associations including IEEE, ACM, ACS, BCS, and PMI. Our Corporate Social Responsibility ethos strengthens the sense of our responsibility on Community, Workstation, Location and Market place.

Product and Market Situation

Finding a new job can be an overwhelming prospect in just about any industry today, but for those with Linux skills, Daffodil Online prides itself as one of the leading nationwide Internet Service Provider (ISP) in Bangladesh. They are the most experienced and oldest company in the ICT field where they are basic business ethics is Long Term Relationship with the are customers. As they look at the growth over the decade since our inception, they are extremely proud of what we have achieved, and even more excited about our outlook for an equally promising future. Daffodil Online Ltd also provides different IT Services and Professional Training services. These are given below.

IT Services

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

Professional Training Services

- Training Course on Certified Ethical Hacking (CEH).
- ISP Setup and administration using Linux.
- ISP Setup and Administration using MikroTik.
- Web site Development with Joomla.
- PHP and MYSQL for Website Development.
- E-commerce & Open source Joomla Virtue Mart.

Target Group

The company's customer base includes all consumers and all small- to medium-sized businesses, including start-ups. The company plans to concentrate on SOHO clients, as these are perfect targets for our new high-speed offerings, and hold the greatest growth potential for the company. Web Solutions feels that these market segments have special pricing and service needs, and make more dedicated, reliable customers.

SWOT Analysis

SWOT Analysis is a useful technique for understanding your Strengths and Weaknesses, and for identifying both the Opportunities open to you and the Threats you face.

□ Strengths:

- Communication between people separated by distance (at home and within the workplace)
- Working from home with ease
- Setting up an online business
- Gathering information (valuable asset in business)

● Weaknesses:

- New entrants underestimate levels of expertise needed to survive the market
- Large sums of money required to set up businesses
- Competition for small resellers
- Numerous pricing tariffs and service options

Organizational Structure

Organogram Structure of Daffodil Online Ltd. shows in fig 2.5:



Figure 2.5: Shows Organogram of Daffodil Online Limited.

CHAPTER 3

Tasks, 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 performed the following tasks:
 - 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 CentOS Commands.
 - Linux User and Password Management.
 - Know About logged in users.
 - File and Directory Accessing.
 - To Copy and Move File and Directories.
 - Compressed and Decompressed File And Directories.
 - Crontab.
 - Mount Un mount Drive.

- Month – 3: In the third month of internship on daffodil online limited I have learned and performed the following tasks:
 - File and Directory Permissions.
 - Install, Update and Remove Package Using YUM.
 - Concept of IP Addressing.
 - Configuring IP Address in CentOS.

- Month – 4: The last month of internship on daffodil online limited I have learned and performed the following tasks:
 - Learning, understanding and configuring NFS Server.
 - Learning, understanding and configuring WEB Server.
 - Learning, understanding and configuring FTP Server.
 - Learning, understanding and configuring DNS Server.
 - Learning, understanding and configuring MAIL Server.
 - Learning, understanding and configuring PROXY Server.
 - Remote Login Service.
 - Backup and Monitoring.
 - MikroTik

Events and Activities

- Monitor and Maintain Computer Systems and Network.
- Setting up user accounts, permissions and passwords.
- Fixing network faults.
- Troubleshooting servers and routers.
- Troubleshooting local area networks and switches.
- Technical support for people using the network.
- Day to day admin and monitoring of network use.
- Suggesting IT solutions to business problems.
- Client Support over the phone or Physical move to client Ends.
- Checking Fiber Optical Media Convertor & Fiber Optic Transmission devices.

Project Task and Activities

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 HD Space Required.

- Boot Partition: /boot**

The partition boot (200 MB): the partition mounted on /boot/ contains the operating system kernel (which allows your system to boot Linux), along with files used during the bootstrap process. Due to limitations, creating a native ext3 partition to hold these files is required. For most users, a 200 MB boot partition is sufficient.

- SWAP Partition: swap**

In other words, data is written to a swap partition when there is not enough RAM to store the data your system is processing. Partition Swap should equal 2x physical RAM for up to 2 GB of physical RAM, and then an additional 1x physical RAM for any amount above 2 GB, but it cannot be less than 32 MB ^[4].

Linux Run-Level Used by Centos

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

The Basic Command of Linux Centos

Shutdown = poweroff , init 0, shutdown -h now .
Reboot = reboot or init 6 .
Logout = log the current user off the system.
Display a calendar = Cal , cal 2014, cal 10 1989
Display or change date or time = date .
Present Working Directory = pwd .
Create a blank file = touch mamun1(File name).
Create a directory = mkdir mamun(directory name).
List information about file = ls .
Chang Working Directory = cd /root/Desktop(directory path)

User Create and Password Management

Adding a user = adduser mamun(username).
Set a Password to New User = passwd mamun(username).
Password Disable/Remove = passwd -d mamun(username).
Verify user information = finger mamun(username).
Locking an account = passwd -l mamun(username).
Unlock an account = passwd -u mamun(username)

To Know About the Logged In User

w

who

whoami

To Copy or Move a File

Copy = cp filename destination example: cp file1 /home/mamun/ahmmed

Move = mv filename destination example: cp file1 /home/mamun/ahmmed

Vi Editor

To Edit A File = vi mamun(file name)

To insert Text = press a or i

To delete the character = press x or dd

To copy line = press esc key and type 5yy to copy 5 line.

To paste = press p for paste.

To set line number = :set nu

To delete line number = set nonu

Search something = /abc for search abc

For Go top of the lines = :0

For Go bottom of the lines = :\$

For Go Specific Line = :50 to go 50 no line.

To save the document = :wq {save the current changes and exits vi editor}

= :w {save the current changes but does not exist vi editor}

= :q {exits vi editor without saving any changes}

Install/Update/Remove Packages in Centos

- Install a package using yum install

Yum install (package name)

```
yum insall mysql
```

- Uninstall a package using yum

yum remove (package name)

```
yum remove mysql
```

- Update a package using yum

yum update (package name)

```
yum update firefox
```

- Search a package using yum

yum search (package name)

```
yum search firefox
```

- Display Additional Information about a Package

yum info (package name)

```
yum info firefox
```

- View All Available Package

yum list | less

- View Already Installed Package

yum list installed

- List of all available software group

yum grouplist

- Install a specific soft group

```
yum groupinstall dnsmasq
```

Compress and Decompress A Directory Using Tar and Un tar

Compressing a directory :

```
tar cvf archive_name.tar dir_name/
```

```
: 3.1 tar cvf backup.tar /
```

or , tar cvzf mytarfile.tar.gz /home

Extract A Compressed Directory:

```
Tar xvf backup.tar
```

Or, tar xvzf mytarfile.tar.gz

Shows in tar and untar by figure 3.1:

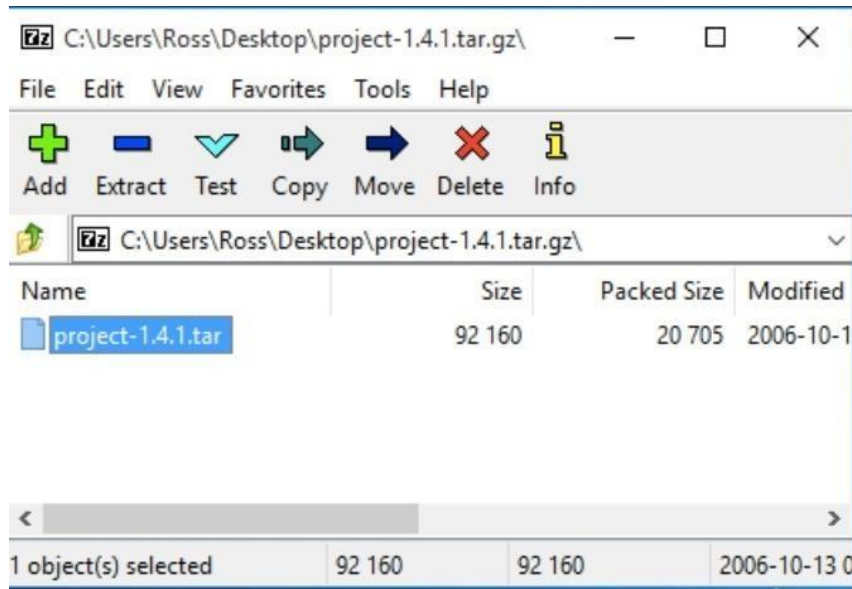


Figure 3.1: Shows in tar and untar.

- **How to Add Change Delete and Display IP Address In Centos**

To see ip address : ifconfig or ifconfig eth0 3.2 show in interface ip address

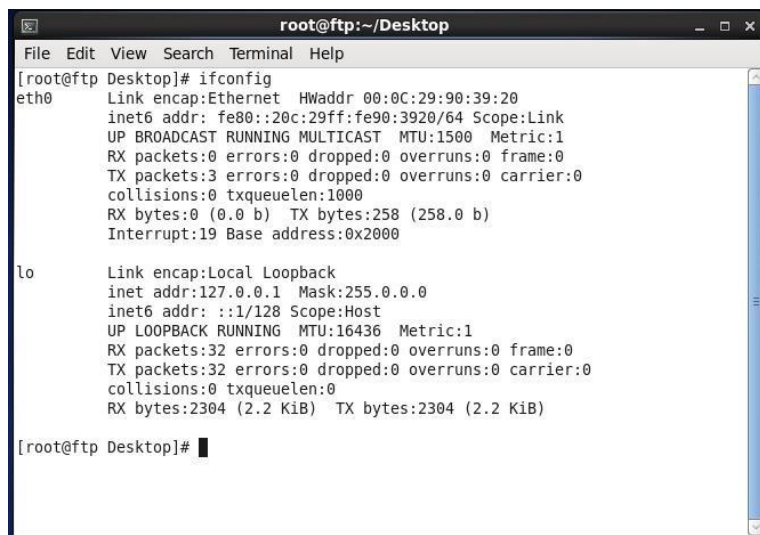
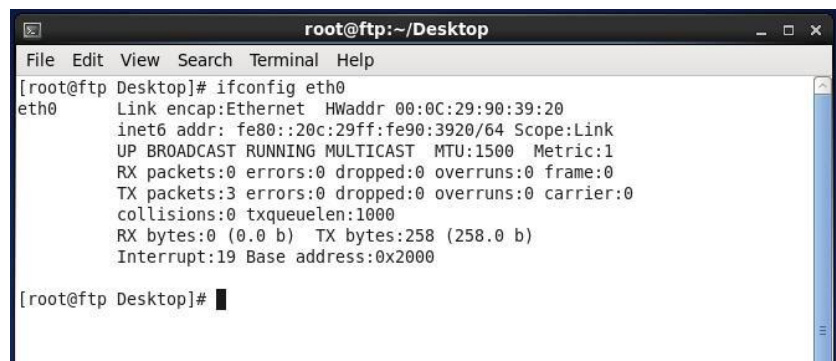


Figure 3.2: Shows ip address in CentOS

IP address and Mac address in command ifconfig eth0 by Shows Figure 3.3

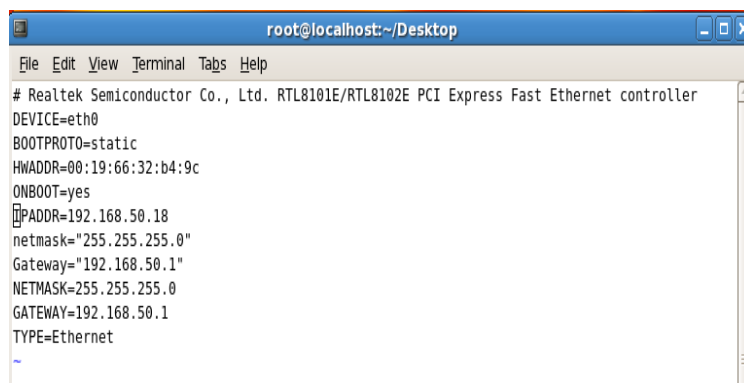


```
root@ftp:~/Desktop
File Edit View Search Terminal Help
[root@ftp Desktop]# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:0C:29:90:39:20
          inet6 addr: fe80::20c:29ff:fe90:3920/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:258 (258.0 b)
          Interrupt:19 Base address:0x2000

[root@ftp Desktop]#
```

Figure 3.3: Shows address in eth port

Edit ip address: vi /etc/sysconfig/network-scripts/ifcfg-eth0 Show figure 3.4



```
root@localhost:~/Desktop
File Edit View Terminal Tabs Help
# Realtek Semiconductor Co., Ltd. RTL8101E/RTL8102E PCI Express Fast Ethernet controller
DEVICE=eth0
BOOTPROTO=static
HWADDR=00:19:66:32:b4:9c
ONBOOT=yes
IPADDR=192.168.50.18
netmask="255.255.255.0"
Gateway="192.168.50.1"
NETMASK=255.255.255.0
GATEWAY=192.168.50.1
TYPE=Ethernet
~
-
```

Figure 3.4: Shows set ip address in sysconfig file eth port permanently

- **Server Configuration**

In Internet Service Provider [ISP] the Server Configuration is very important purpose. Server Selection is important for each server services. Many servers contains in Linux Operating System. Within Those Servers DNS server, DHCP server, FTP server, NFS server, PROXY server, MAIL server, WEB server, SAMBA server Internet Service Provider [ISP] can be configured.

- **Web Server**

Web servers are computers that deliver Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the URL <http://facebook.com> in your browser, this sends a request to the Web server whose domain name is facebook.com. The server then fetches the page named index.html and sends it to your browser. ^[7]

- **Centos 6.3 Web Server Configuration Requirements**

To set up your own web site is a computer, an operating system, a web server, a domain name, an IP address of a name server is required.

The computer is capable of running Linux can be used on any system. The language of the operating system, we, of course, you would assume using Centos 6.3. Centos operating system up and running once the previously mentioned can be easily installed the Apache Web server supports. A domain name can be registered with a domain name registration services.

Your ISP provides static IP address, and then you will need to add your domain with static IP addresses. This is achieved by using a name server. Most domain registration services will provide this service for you.

If you configure your domain name and your name server, the next step is to install and configure your web server.

- **Domain Name System (DNS)**

Host specified by the IP address of the computer that is convenient for them, but it's not always easy for people working with the name. Therefore, the IP address of the host name does not need to convert to a translation table. Every day millions of new machines popping up on the Internet, it would be impossible to keep everyone on the table this sort of up-to-date. This is where it comes in will DNS. DNS- of the Domain Name System. DNS- IP address of the machine on the net for all machines that have changed the name. This translates [or jargon as the "map"] to address the name and address, and some other factors.

As a mapping ftp.linux.org, in this case, is an association between two things is simply the name of a machine, and the machine's IP number [or address] 199.249.150.4. The machine name, IP number DNS- mapping contains the other way; this is a "reverse mapping" is called. [3]

DNS- the uninitiated, the more opaque areas of network administration, either. This is part of project, we have a caching-only server and a primary DNS server for a domain that is going to set up, starting with a simple DNS- describes how to set up the name of the server tries to clean up [8]

A net-wide database of DNS-. Take care of what we have done. We are garbage, then we, and others, it will get out of the garbage. Tidy and consistent in DNS- place and we will get good service from it. Debug it, learn it, and we have admin keeping the net from falling to its knees by mismanagement will be another good admin.

Serving as a program called the Unix. This is coordinated by the Internet Software Consortium, the "binding" on the package, a part of. Most Linux distributions are included in the names and usually is installed, / usr / sbin /, usually from a package called the binding, the top or bottom of the package depends on the whim of the case. Most DNS implementations, including that of Red Hat Linux use BIND, BIND is an acronym for the "Berkeley Internet Name Domain" project which maintains the DNS related software suite that runs under Linux. The most well-known program in BIND is "named", the daemon that responds to DNS queries from remote machines. Currently BIND 8/9 is being used for DNS purposes. To access the database, one needs a DNS server for his/her site. A DNS server is also known as a name server [NS]. These servers come in three varieties; [3]

- Master [also called primary]
- Slave [also called secondary]
- Caching

DNS SERVER CONFIGURATION

WORKS OF DNS:

It converts name to IP address.

And IP Address to Name.

ZONE FILES:

Forward Zone File: name to IP address.

Reverse Zone File: IP Address to Name

PACKAGE NAME: bind

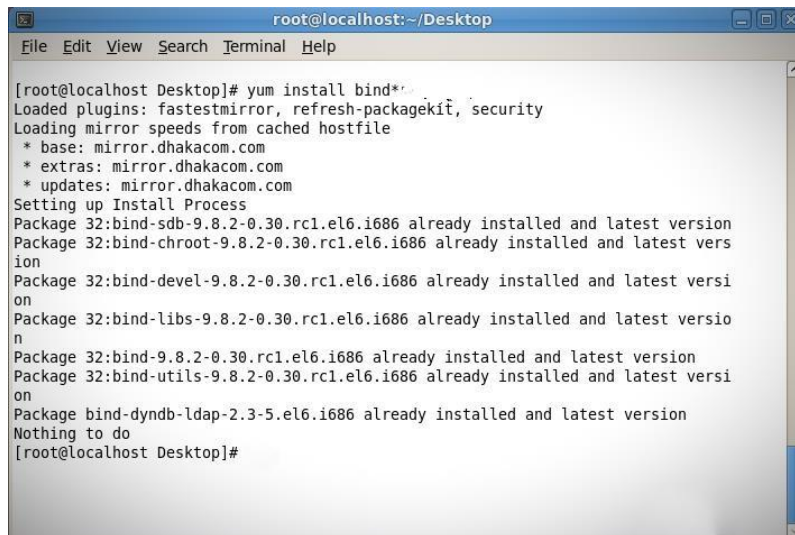
DEFAULT PORT: 53

CONFIGURATIONS FILE NAME: named.config

- **STEP: 1**

At first we have to install package of dns name bind : yum install bind*
There Show Already install because of its already installed in my pc.

Show 3.5 in install DNS in command yum install bind*



```
root@localhost:~/Desktop
File Edit View Search Terminal Help

[root@localhost Desktop]# yum install bind*
Loaded plugins: fastestmirror, refresh-packagekit, security
Loading mirror speeds from cached hostfile
 * base: mirror.dhakacom.com
 * extras: mirror.dhakacom.com
 * updates: mirror.dhakacom.com
Setting up Install Process
Package 32:bind-sdb-9.8.2-0.30.rc1.el6.i686 already installed and latest version
Package 32:bind-chroot-9.8.2-0.30.rc1.el6.i686 already installed and latest version
Package 32:bind-devel-9.8.2-0.30.rc1.el6.i686 already installed and latest version
Package 32:bind-libs-9.8.2-0.30.rc1.el6.i686 already installed and latest version
Package 32:bind-9.8.2-0.30.rc1.el6.i686 already installed and latest version
Package 32:bind-utils-9.8.2-0.30.rc1.el6.i686 already installed and latest version
Package bind-dyndb-ldap-2.3-5.el6.i686 already installed and latest version
Nothing to do
[root@localhost Desktop]#
```

Figure 3.5: Shows Screen Print yum install bind.

- **STEP: 2**

Edit the configuration file using vi editor : vi /var/named/chroot/etc/named.conf
And go to line no 7 enter local host IP address.

Show figure 3.6 My pc ip address is 192.168.50.19



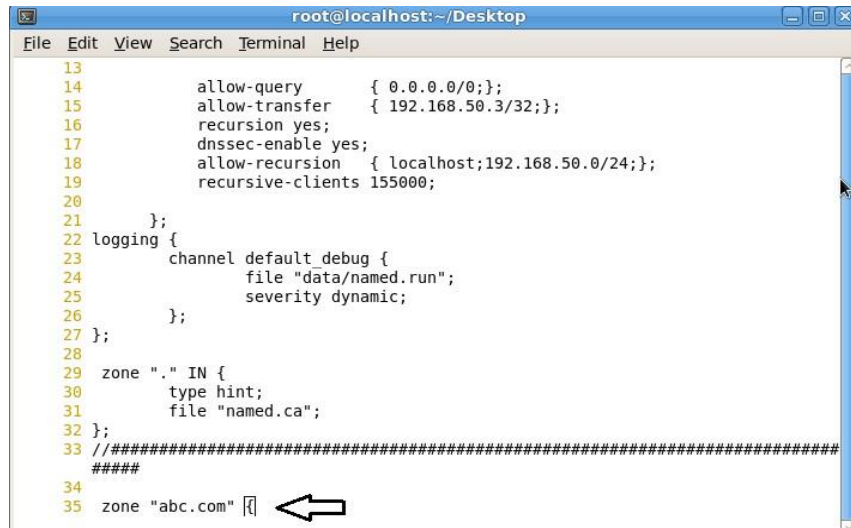
```
root@localhost:~/Desktop
File Edit View Search Terminal Help

1 // Sample DNS server
2 // Only For training
3 //@Tayab Khan
4 // dns name ns1.khan.com
5 // Config Starts from Here
6 options {
7     listen-on port 53 { localhost;192.168.50.19;};
8     listen-on-v6 port 53 { ::1; };
9     directory "/var/named/";
10    dump-file "/var/named/data/cache_dump.db";
11    statistics-file "/var/named/data/named_stats.txt";
12    memstatistics-file "/var/named/data/named_mem_stats.txt";
13
14    allow-query { 0.0.0.0/0;};
15    allow-transfer { 192.168.50.3/32;};
16    recursion yes;
17    dnssec-enable yes;
18    allow-recursion { localhost;192.168.50.0/24;};
19    recursive-clients 155000;
20
21 };
22 logging {
23     channel default_debug {
24         file "data/named.run";
-- INSERT --
```

Figure 3.6: Shows Screen Print Edit using vi editor named.conf file.

- **STEP: 3**

Enter a web address of forward zone. I used abc.com for testing. Shows in figure 3.7



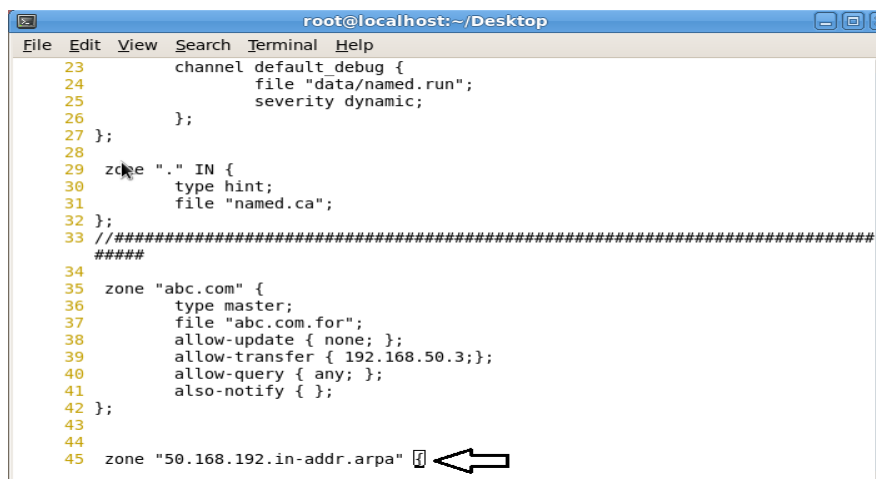
```
root@localhost:~/Desktop
File Edit View Search Terminal Help
13
14     allow-query      { 0.0.0.0/0;};
15     allow-transfer   { 192.168.50.3/32;};
16     recursion yes;
17     dnssec-enable yes;
18     allow-recursion  { localhost;192.168.50.0/24;};
19     recursive-clients 155000;
20
21 };
22 logging {
23     channel default_debug {
24         file "data/named.run";
25         severity dynamic;
26     };
27 };
28
29 zone "." IN {
30     type hint;
31     file "named.ca";
32 };
33 //#####
34 #####
35 zone "abc.com" [ ] ←
```

Figure 3.7: Shows Screen Print Edit Enter a web address of forward zone

- **STEP: 4**

Enter AN IP Address For Reverse Zone. Figure 3.8
We Have To Write IP Address In Backward Method:

as 50.168.192 without Network Portion



```
root@localhost:~/Desktop
File Edit View Search Terminal Help
23     channel default_debug {
24         file "data/named.run";
25         severity dynamic;
26     };
27 };
28
29 zone "." IN {
30     type hint;
31     file "named.ca";
32 };
33 //#####
34 #####
35 zone "abc.com" {
36     type master;
37     file "abc.com.for";
38     allow-update { none; };
39     allow-transfer { 192.168.50.3;};
40     allow-query { any; };
41     also-notify { };
42 };
43
44
45 zone "50.168.192.in-addr.arpa" [ ] ←
```

Figure 3.8: Shows Screen Print Enter an IP Address For Reverse Zone.

- **STEP: 5**

Show figure 3.9 forward zone file command in command

vi /var/named/chroot/var/named/abc.com

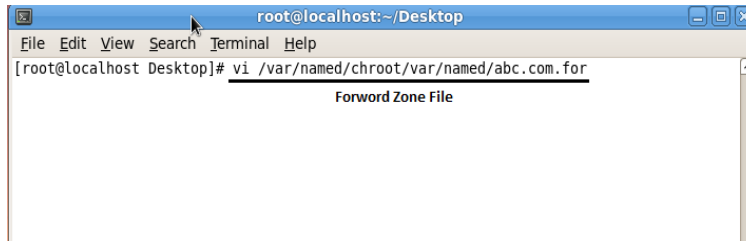


Figure 3.9: Shows Screen Print edit Forward Zone File for abc.com

Forward zone file create Shows in figure 3.10

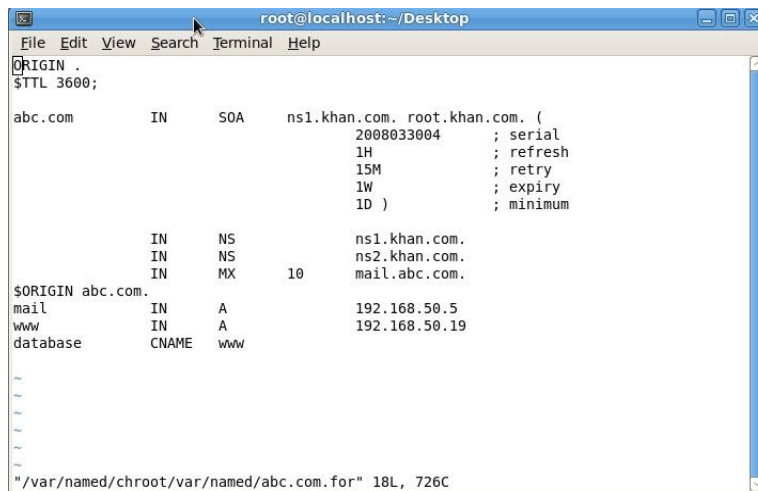


Figure 3.10: Shows Screen Print edit Forward Zone File for abc.com

- **STEP: 6**

Show 3.11 figure reverse zone file command

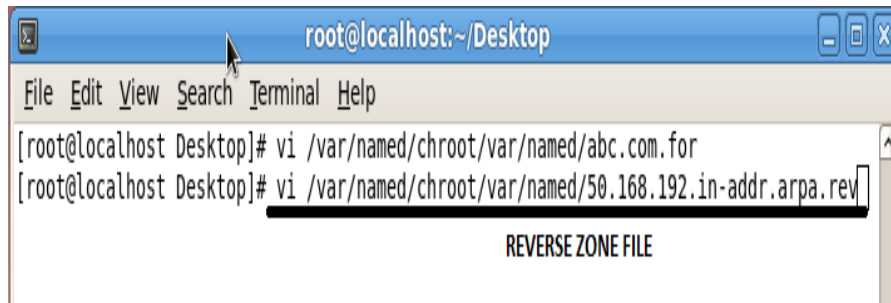


Figure 3.11: Shows Screen Print edit Reverse Zone File

Show 3.12 figure edit reverses zone file full configuration file

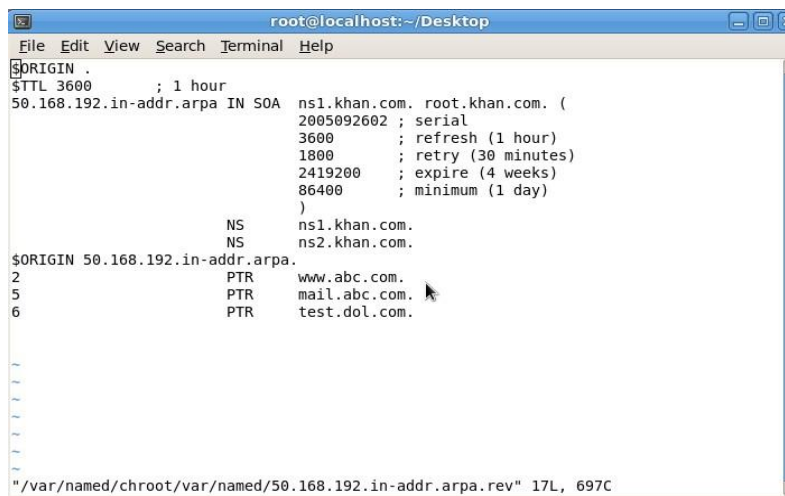
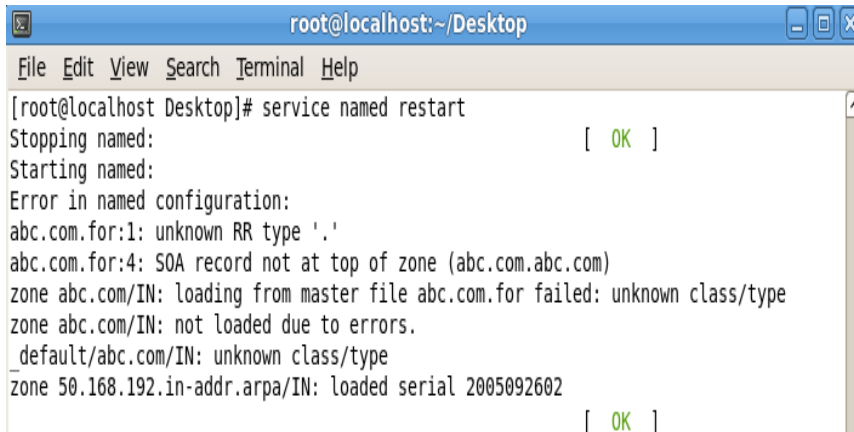


Figure 3.12: Shows Screen Print edit Reverse Zone File

- **STEP: 7**

Restart the Service show 3.13 figure



```
root@localhost:~/Desktop
File Edit View Search Terminal Help
[root@localhost Desktop]# service named restart
Stopping named: [ OK ]
Starting named:
Error in named configuration:
abc.com.for:1: unknown RR type '.'
abc.com.for:4: SOA record not at top of zone (abc.com.abc.com)
zone abc.com/IN: loading from master file abc.com.for failed: unknown class/type
zone abc.com/IN: not loaded due to errors.
_default/abc.com/IN: unknown class/type
zone 50.168.192.in-addr.arpa/IN: loaded serial 2005092602
[ OK ]
```

Figure 3.13: Shows Screen Print service named restart

- **STEP: 8**

Go to Browser and type abc.com in figure 3.14

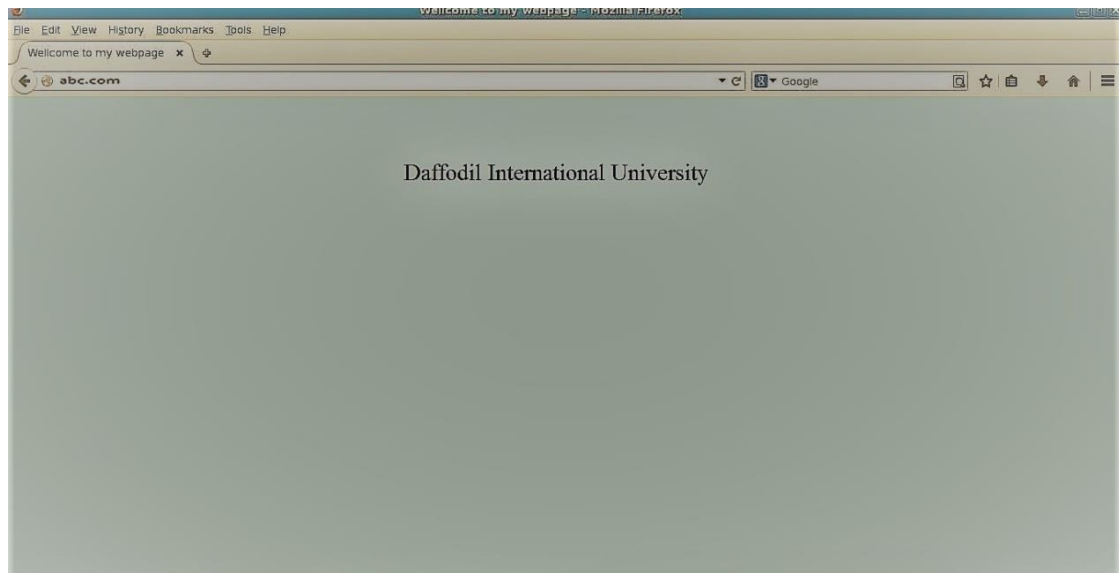


Figure 3.14: Shows Screen Print abc.com open in browser

MAILSERVER

A mail server (also known as a mail transfer agent or MTA, a mail transport agent, a mail router or an Internet mailer) is an application that receives incoming e-mail from local users (people within the same domain) and remote senders and forwards outgoing e-mail for delivery. A computer dedicated to running such applications is also called a mail server. Microsoft Exchange, Gmail, Exim and sendmail are among the more common mail server programs. The system uses SMTP (Simple Mail Transfer Protocol) or ESMTP (extended SMTP) for sending e-mail, and either POP3 (Post Office Protocol 3) or IMAP (Internet Message Access Protocol) for receiving e-mail. [8]

Mail Server Configuration

MUA = Mail user agent. Ex: Outlook, Eudora, Ms Outlook, Pine.

MTA=Mail Transfer Agent. Ex: Gmail, Exim, Sendmail, Post mail.

MDA=Mail Delivery Agent. Ex: Pros mail, Mail drop.

SMTP=Simple Mail Transfer Protocol. Used for sending, default port: 25.

POP3=Post Office Protocol 3.used for receiving, Default Port: 110.

IMAP=Internet Message Access Protocol. Used for receiving, Default Port: 143.

Here i have used their popular packages which are very easy to configure.

- Send Mail (for sending)
- Dovecot (for receiving)

• Setup mail server in centos 6

- Installing and configuring send mail
- Installing and configuring dovecot
- Creating users and testing

- **Step 1:** Before installation assign a static ip and add a host entry for your domain to

That IP in the /etc/hosts file like: 192.168.0.15 daffodil.com

- **Step 2:** Install sendmail by using: yum -y install sendmail.
- **Step 3:** Install dovecot by using: yum -y install dovecot.
- **Step 4:** Install telnet by using: yum -y install telnet.
- **Step 5:** Now Edit the Sendmail Configuration File by Using: vi /etc/mail/sendmail.mc

Now Search the line: /masquerade and edit the line as:

dnl(MASQUERADE_AS(`daffodil.com`)dnl) and then Save the file.

□ **Step 6:** service send mail restart.

□ **Step 7:** telnet localhost 25.

Trying ::1...

Connected to localhost.

Escape character is '^]'.
220 mail.daffodil.com ESMTP Postfix

ehlo localhost {type this command}

250-mail.daffodil.com

250-PIPELINING

250-SIZE 10240000

250-VRFY

250-ETRN

250-STARTTLS

250-AUTH PLAIN LOGIN

250-AUTH=PLAIN LOGIN

250-ENHANCEDSTATUSCODES

250-8BITMIME

250 DSN

quit {type this command}

221 2.0.0 Bye

Connection closed by foreign host.

- **Step 8:** Configuring dovecot
- **Step 9:** After installation open /etc/dovecot/dovecot.conf file and add the below line at the end of the file. please make sure mail_location and home_mailbox in sendmail configuration are using the same name.

protocols = imap pop3

mail_location = maildir:~/mail

pop3_uidl_format = %08Xu%08Xv

- **Step 10:** service dovecot start to starts dovecot service:
- **Step 11:** Now test pop3 connectivity.

telnet localhost 110

Trying ::1...

Connected to localhost.

Escape character is '^]'.
+OK Dovecot ready.

quit

+OK Logging out

Connection closed by foreign host.

- **Step 12:** Creating users and testing

Now create users to test your configuration.

useradd -m mamun -s /sbin/nologin

and create passwords for the users created

passwd mamun

- **STEP 13:** Now I Can Test 3.15 figure my configuration by using thunderbird. Configuration details.

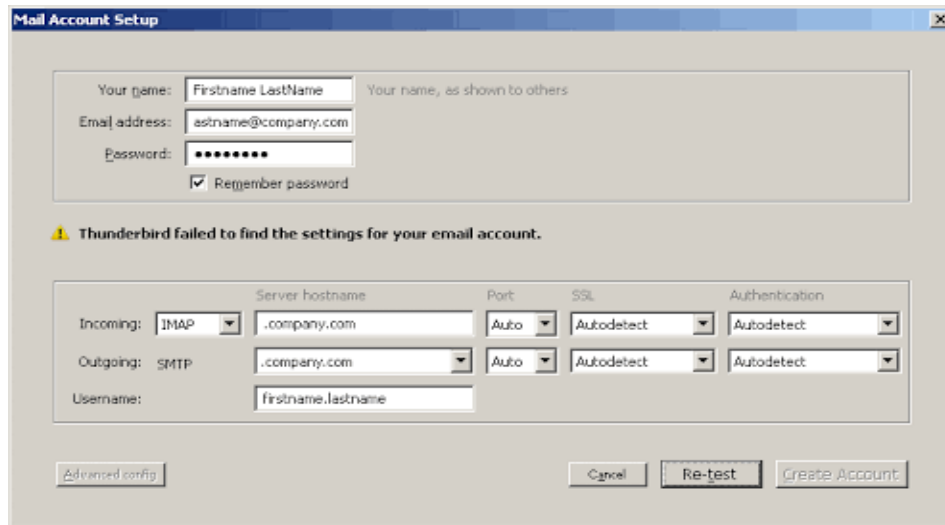


Figure 3.15: Shows Screen Print POP3 and SMTP host and Port configuration

- **STEP 14:** Now I can send and receive mails using this server. In case of any issues

please check the log file /var/log/maillog. now my mail server is ready.

Or Here another Way for testing mail server:

- telnet localhost 25.
- Mail from: mamun08178@gmail.com
- Rept to: mail@yahoo.com or mail@gmail.com
- This is a test mail from mail server testing.
- Enter.

MikroTik Router

MikroTik Ltd. Known internationally as MikroTik is a Latvian manufacturer of computer networking equipment. It sells wireless products and routers. The company was founded in 1995, with the intent to sell in the emerging wireless technology market. As of 2014, the company has more than 100 employees. The company's products are known for being low-priced alternatives to expensive routers and Ethernet radio relay lines ^[10].

RouterOS

The main product of MikroTik is an operating system based on the Linux kernel, known as the MikroTik RouterOS. Installed on the company's proprietary hardware (Router board series), or on standard x86-based computers, it turns a computer into a network router and implements various additional features, such as firewalling, virtual private network (VPN) service and client, bandwidth shaping and quality of service, wireless access point functions and other commonly used features when interconnecting networks. The system is also able to serve as a captive-portal-based hotspot system [10]

Features

RouterOS supports many applications used by Internet service providers. For example

- It can be used as a router
- It provides OSPF, BGP, Multiprotocol Label Switching (VPLS/MPLS), Open Flow etc.
- It can be used as a switch or bridge
- Provides PPPoE Client-Server
- Provides VPN-Virtual Private Network.
- Provides Firewall rules
- Provide DHCP Server service
- Provide Wi-Fi and captive portal based Hotspot System
- Bandwidth management is very easy
- Easy GUI interface
- Easy administration
- Supports both IPv4 and IPv6

The product is supported by MikroTik through a forum and a wiki, providing assorted and thematic examples of configurations. RouterOS supports Internet Protocol Version 4 (IPv4) as well as Internet Protocol Version 6 (IPv6).

The software provides support for virtually all network interfaces that the Linux kernel 2.6.16 supports, except wireless, where the Atheros and Prism chipsets are the only supported hardware, as of 3.x version.

Release history

MikroTik has released different version of RouterOS at different times. Some of them are given below.

- RouterOS version **6**: May 2013
- RouterOS version **5**: Mar 2010
- RouterOS version **4**: Oct 2009
- RouterOS version **3**: Jan 2008 [12]

Router Board

The company manufactures a series of integrated circuit boards, marketed under the name Router board, as well as accessory components which implement a complete hardware operating platform for RouterOS.

The Router board line, combined with RouterOS, is marketed at small- to medium-sized wireless Internet service providers 3.18, typically providing broadband wireless access in remote areas. Products include pre-assembled small office/home office (SOHO) routers, wireless 802.11n MIMO and TDMA devices for indoor and outdoor use, and also bare routers in form of printed circuit boards (PCBs) for integration into custom solutions. Also, the Router board line includes a series of Mini PCI and Mini PCI Express wireless adapters, supporting a range of IEEE protocols, and designed to be used together with the router boards lineup.

Despite the fact that in-house developed Linux kernel patches required for hardware support are not made publicly available by MikroTik, many Router board boards and their versions are well supported by third-party Linux-based firmware's, notably Openwork[13]

750G Series MikroTik Router Shows Figure 3.16:



Figure 3.16: Shows MikroTik Router 750G Series

- **3.10 Cloud Core Router**

In November 2012 MikroTik released the Cloud Core Router 3.19 figure integrated unit which is based on the Tiler CPU supporting 16 to 36 CPU cores, 12 1000Base-T Ethernet interfaces, and up to four SFP (MiniGBIC) interfaces, as well as "fast-path" packet forwarding between interfaces (with claimed 24 million packets per second forwarding rate). This unit targets the medium-sized network providers as well as try to be a well-priced alternative to the other more well-known brands^[14].

MikroTik Cloud Core Router 1036 Series shows in fig 3.17



Figure 3.17: MikroTik Cloud Core Router 1036 Series

Propose Network Diagram (MikroTik Configuration)

Network Diagram shows in fig 3.18:

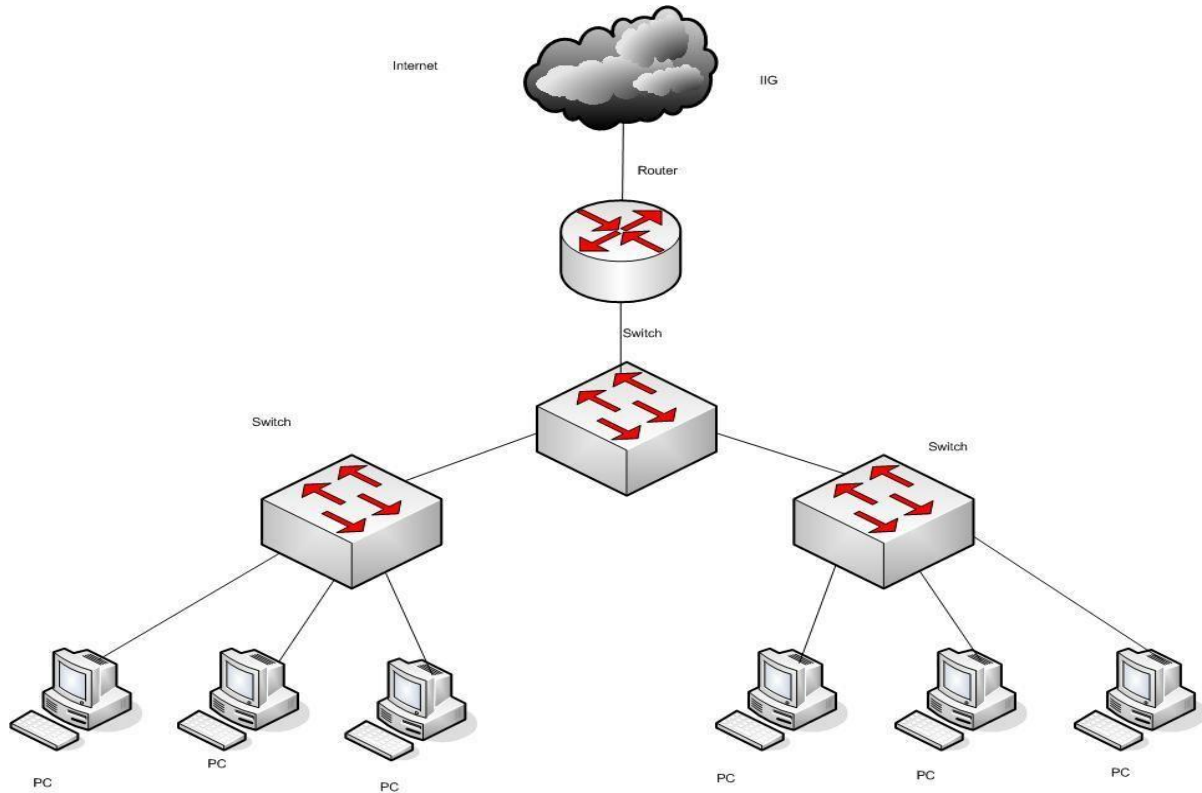


Figure 3.18: Shows Network Diagram

Winbox is the graphical configuration utility for MikroTik router OS. At first we should download winbox. After download the winbox it can be run straight away as no installation is required 3.20 network diagram.

- **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 icon and here show a IP address and MAC address. Click to Mac address then write „admin“ in login box and don“t need to give Password. .

Show in figure 3.19 mikroTik reset command

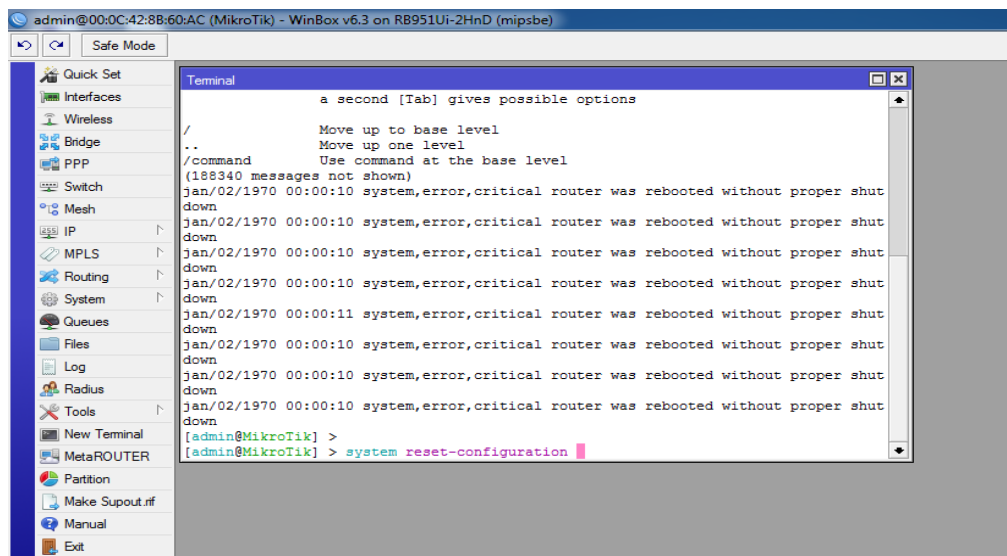


Figure 3.19: Shows Screen Print Reset MikroTik Router

- Step 2:**

Defining routes or Setting up Gateway

Process:

IP > Route > “+” > Gateway

N.B: Here one thing must be noticed 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 3.20

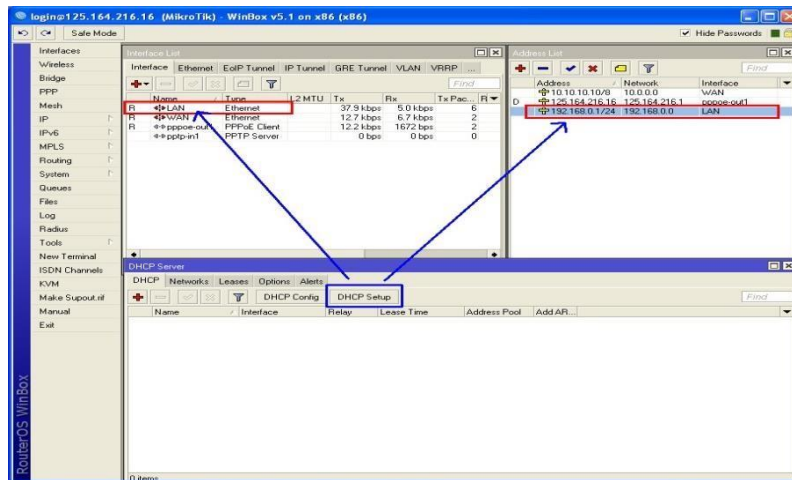


Figure 3.20: Shows Screen Print IP Address

Setup route ip add in figure 3.21 show:

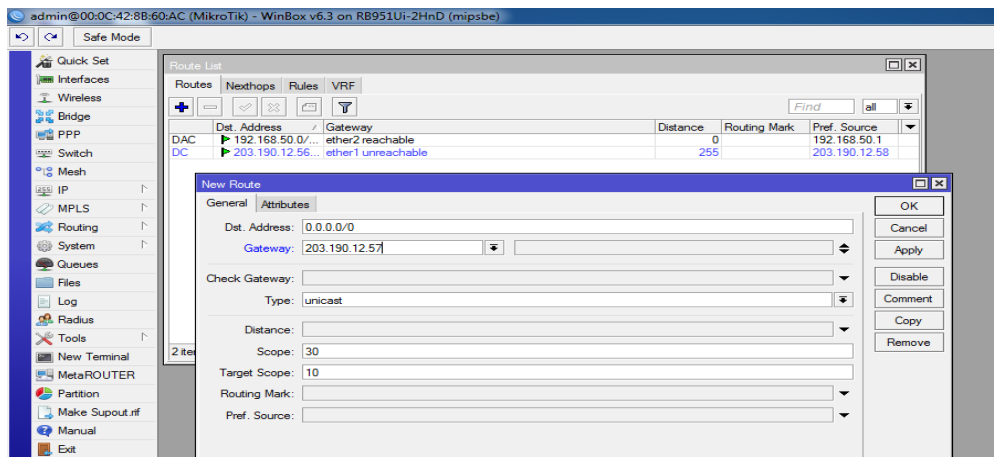


Figure 3.21: Shows Screen Print Gateway

□ Step 3

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 fig 3.22 shows:

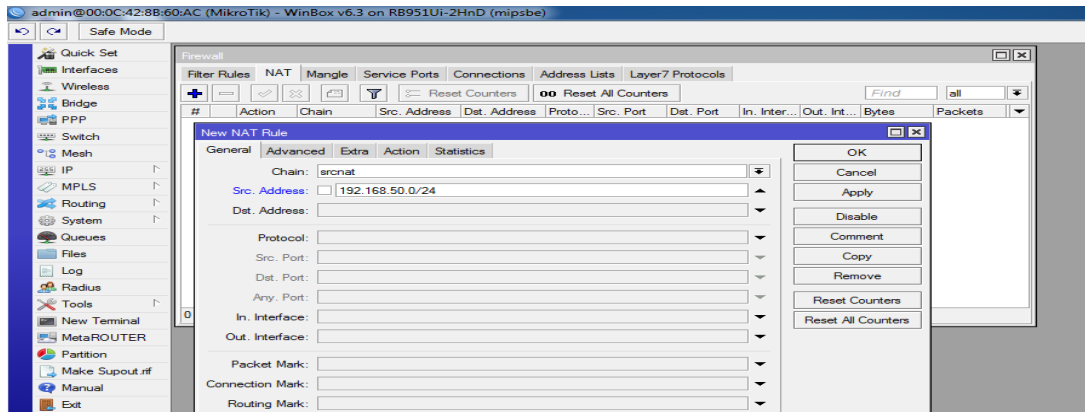


Figure 3.22: Shows Screen Print NAT Rule

Shows in Screen Print Firewall in fig 3.23:

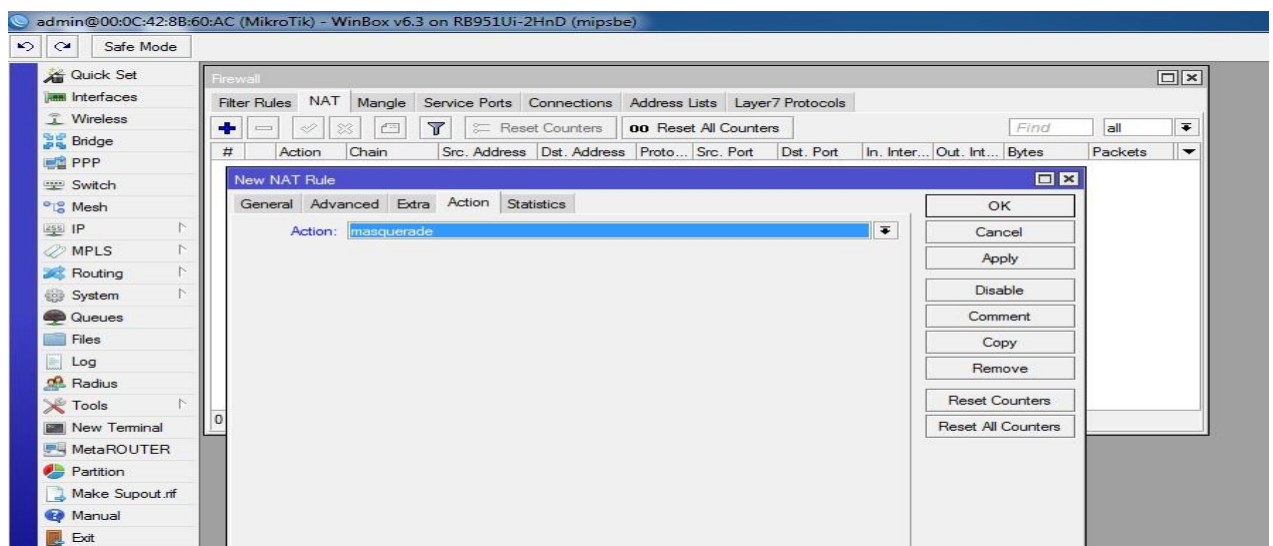


Figure 3.23: Shows Screen Print Firewall

• **Step 4:**

Doing the task of bridging the related ports with each other 3.26 in figure

Process:

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

Settings:

- ✓ Tick mark to 3 options

Bridge Settings Screen Print shows in fig 3.24

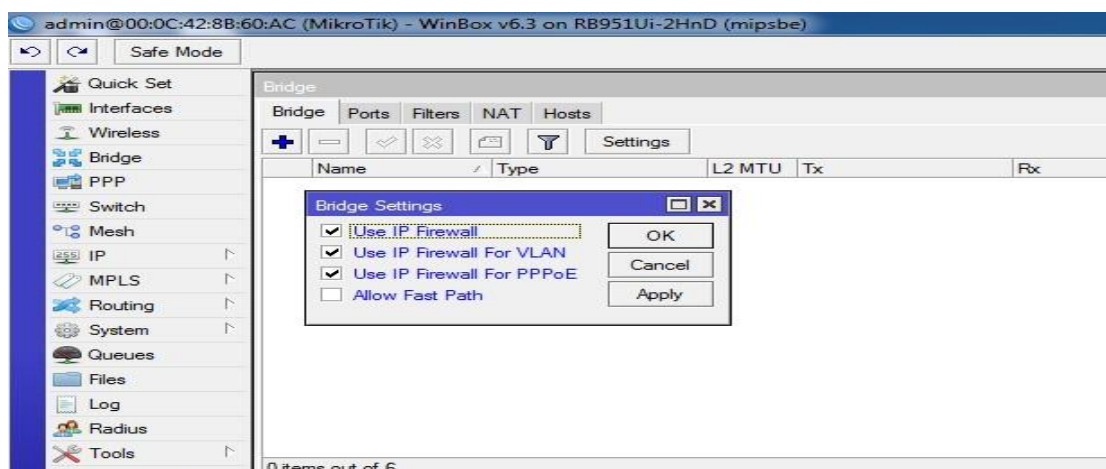


Figure 3.24: Shows Screen Print Bridge Settings

Ports:

- ether2
- ether3_LAN
- ether4
- ether5
- wlan1

Router interface port in graphically 3.25 show

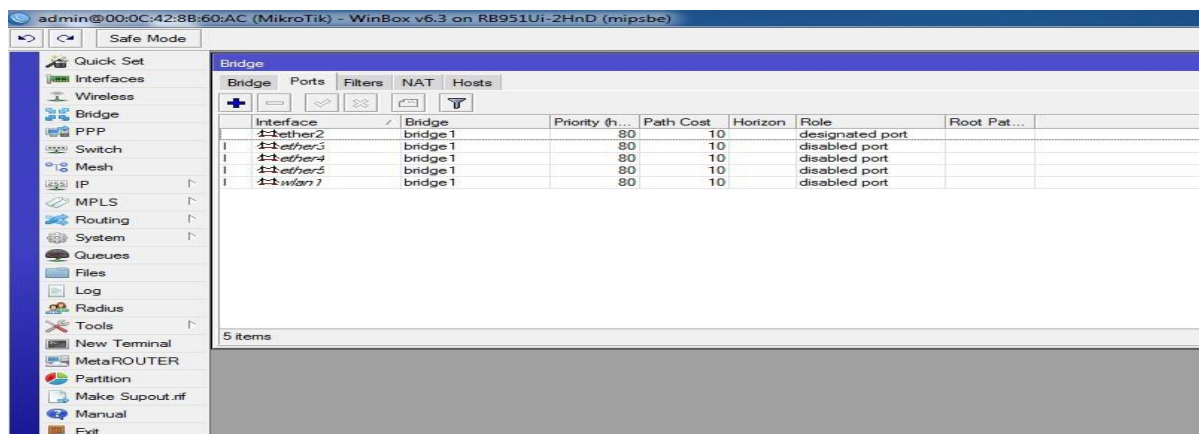


Figure 3.25: Shows Screen Print Bridge Ports Assign

- **Step 5:**

Knowing the profile of bridge with the DHCP Server 3.28 figure

Process:

IP > DHCP Server > Interface: bridge 1 (bridge name)

DHCP Setup Screen Print show in fig 3.26

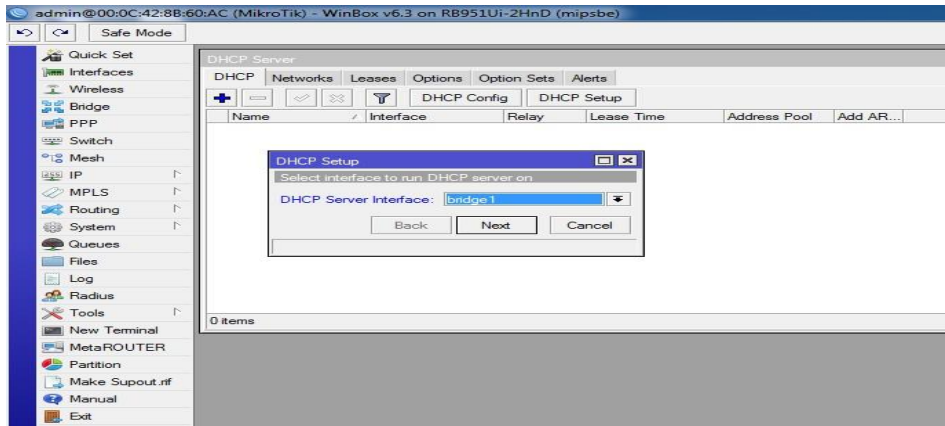


Figure 3.26: Shows Screen Print DHCP Setup

Setup DNS ip address show in 3.27 figure

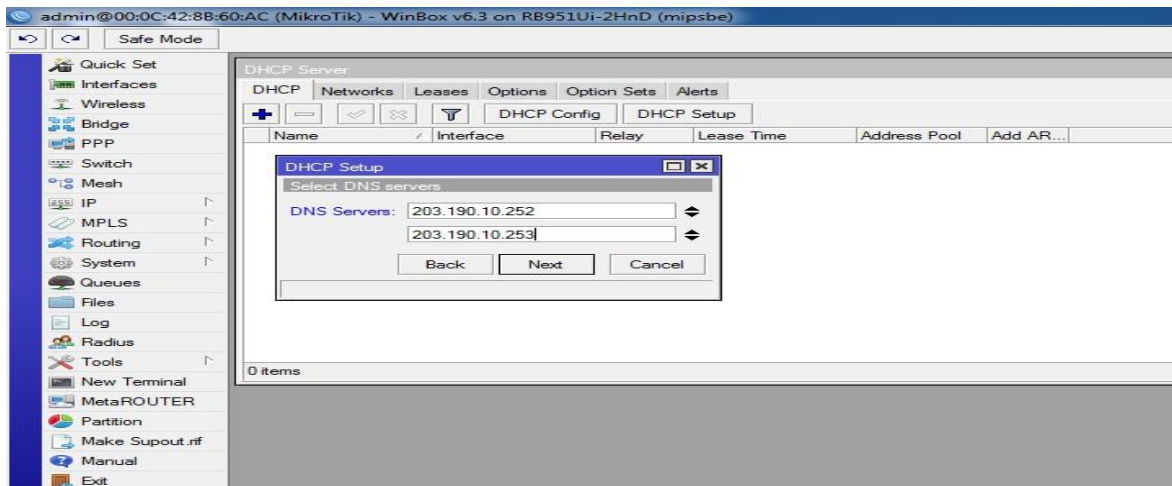


Figure 3.27: Shows Screen Print DNS Service

□ Step 6:

Wireless LAN configuration

Process

Wireless > Wlan1 (enabling it with tick mark) > Mode: ap bridge

Wireless setting SSID Mode show in figure 3.28:

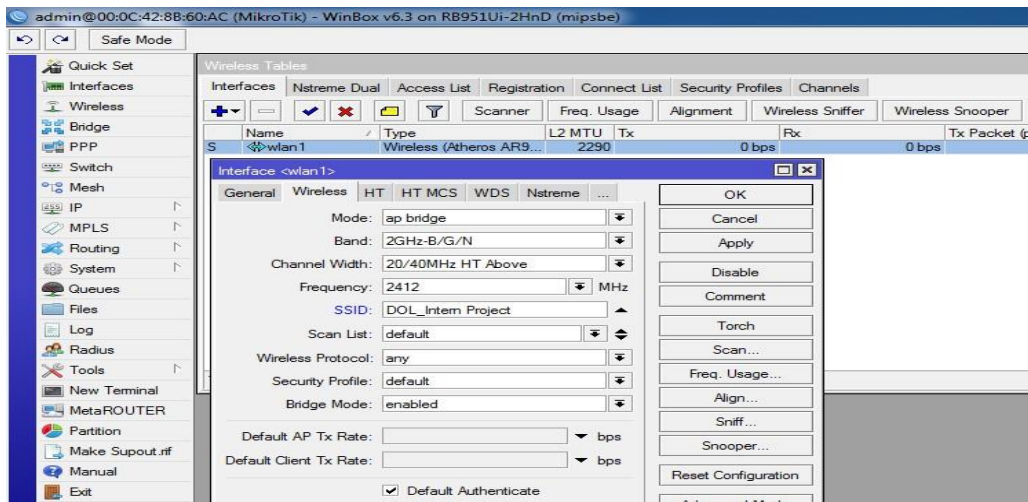


Figure 3.28: Shows Screen Print Wireless Setting

Wireless password setting shows in 3.29 figure :

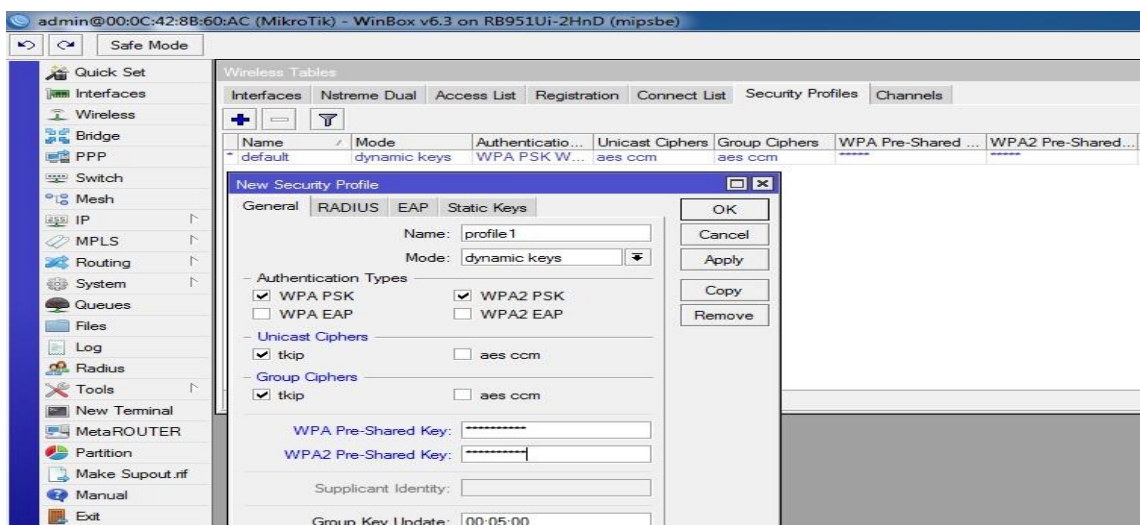


Figure 3.29: Shows Screen Print Wireless Security Settings.

.OSPF Configuration

I have configured OSPF in mikroTik router with an existing OSPF System that is provided from the Juniper router of the Data Centre. As a result it becomes a relative point-to-point OSPF for the network and was easy to configure. The configuration of OSPF in mikroTik router is given below with both GUI and with command line interface.

GUI Configuration;

- SETP 1:

Routing protocol OSPF selecting in shows at figure 3.30

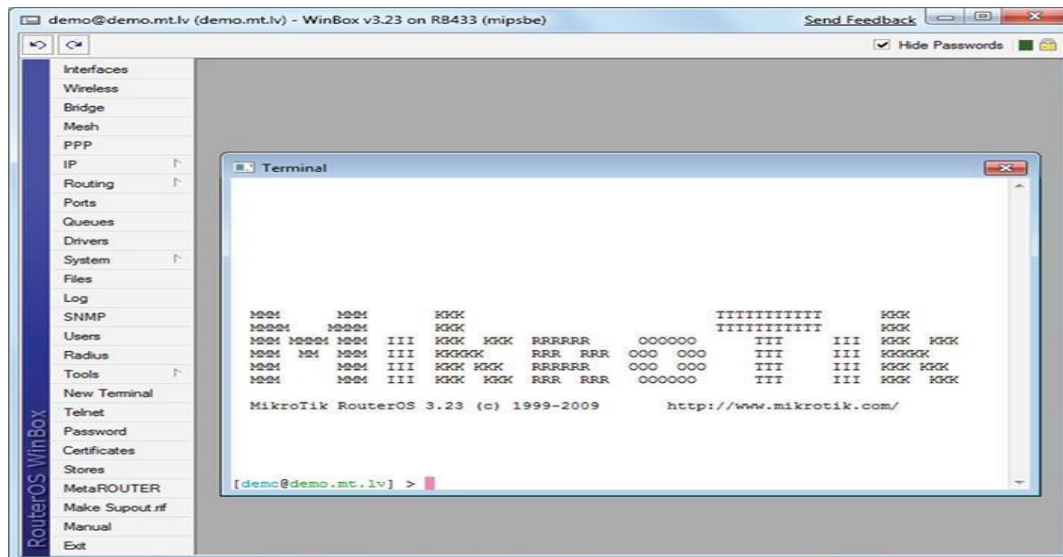


Figure 3.30: Shows Screen Print Router Home Page

- **SETP 2: Network Configuration**

Here I have configured the network for OSPF. At first I have configured the WAN Network and then the LAN network shows in fig 3.31:

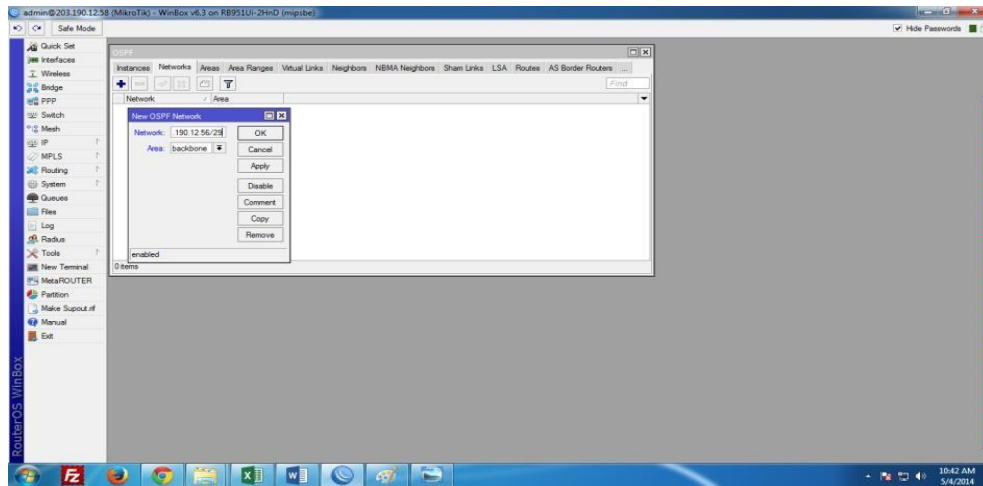


Figure 3.31: Shows Screen Print OSPF Network WAN Configuration

OSPF LAN network configuration in figure 3.32:

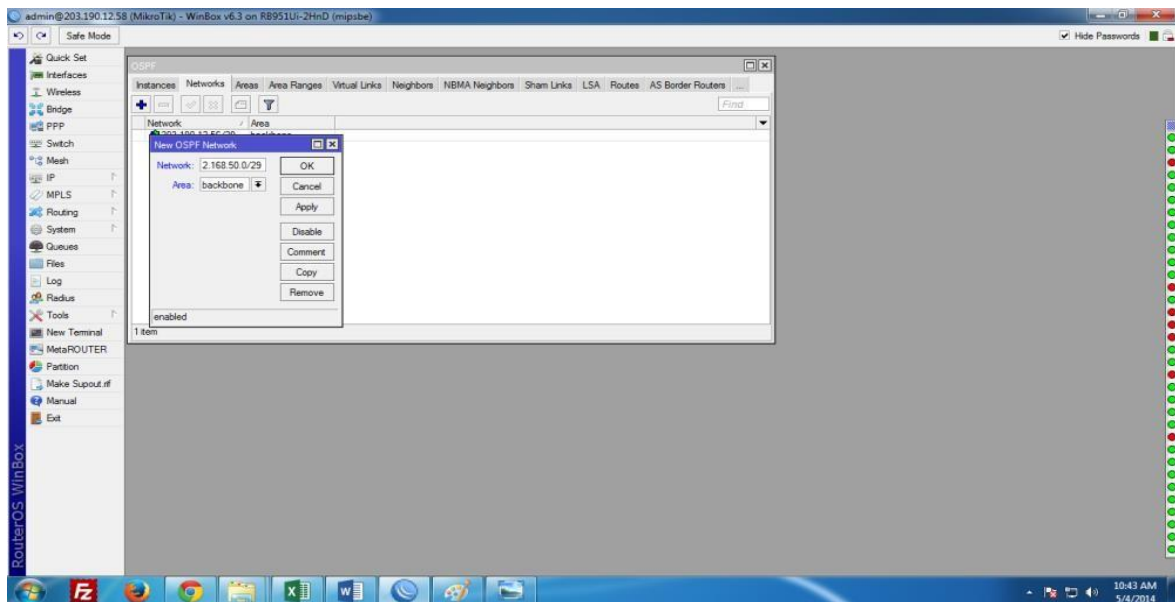


Figure 3.32: Shows Screen Print OSPF Network LAN Configuration

- **STEP 3:**

Area Selection shows in figure 3.33:

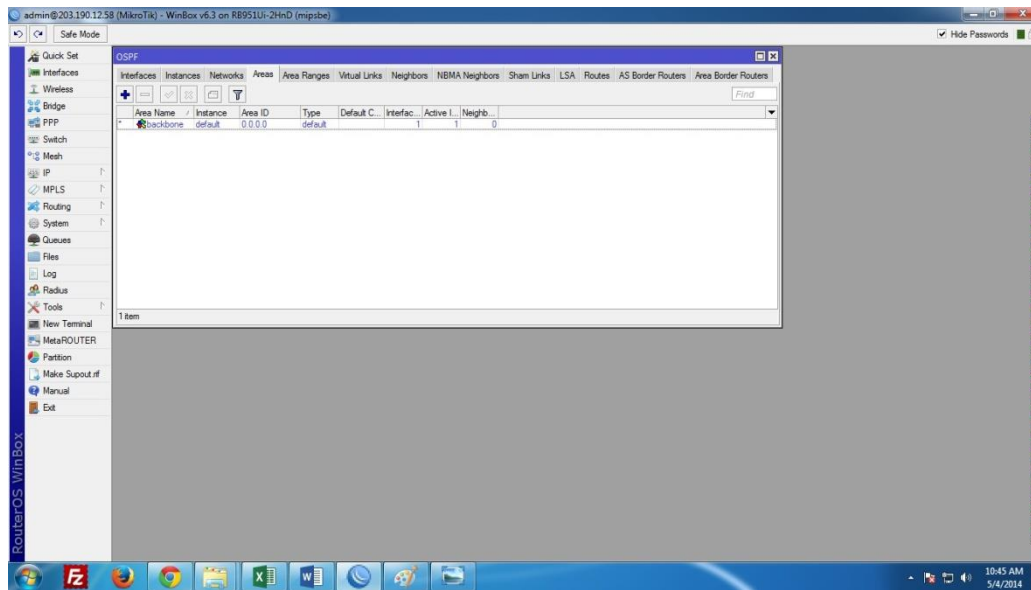


Figure 3.33: Shows Screen Print OSPF Network Area Selection

Challenges

There are different types of challenges have to be faces during my Internship.

- a) In virtual machine execution different types of code does not work properly & I was find the problem and fix it.
- b) I have to be so careful during execution, because the commands are very case sensitive.
- c) Password management challenges faces during working Linux server.
- d) Find Network system problem and fix them.
- e) Find Network Software problem and solve it.
- f) The server execution has different types of challenges during the server installation.

CHAPTER 4

Competency

Competencies Earned

It is a statement of what a learner is expected to know, understand or be able to do as a result of a learning process. Install and decommission of both network and server machines at two datacenters. Lead role in advanced Linux software implementations, for example LDAP HA, aligned to program learning outcomes, field and internship evaluations. The Student Association office funds many student Intern Learning Outcomes: Gathering and organizing information into a Internship Project Description: Participate in the redesign of the Linux Lab web site. Learning Outcomes. Install & Configure software and upgrades; Install, configure & test network Employer Services • Furthermore, consistent with the learning outcomes, the Internship On-Site Supervisor will provide an orientation concerning organizational policies and procedures.

Smart Plan

Each and every company should have a smart plan to gain the success. Basically some common things of combination create a smart plan. My future scope is very exception. A successful internship can help my future scope and turn on an experience into a career opportunity. My future scope is desire.

Reflections

Daffodil Online Ltd. started they are operation in the year **2002**. During the past years, they extended they are operation and service portfolio according to the customer's recommendation and considering demands of time. They worked with many national projects and international organizations and achieved the reputation. They are using the latest technologies and upgrading the services wherever it is required. They are Corporate Network Solution department is capable to provide state-of-art network and telecommunication solutions with a highly efficient technical expertise group.

CHAPTER 5

Conclusion and Future Career

Discussion and Conclusion

Linux is one of the most popular and productive operating systems in the world. Its acceptance is product of the high and potential capacity that Linux offers to many different fields of work. This final chapter will be a summary of my internship where I will discuss the importance of the internship program run through the Operating Systems: Microsoft Windows NT/2000, Linux and UNIX. Linux in Universities" for more about this on that project, read or search through their past discussions, ask new four-year universities for an Open Source programming internship. The actual discussion was relatively unstructured, involving numerous for all practical purposes, an internship program on a massive scale. A resume is a summary of our experience, education, and skills. Its main events attended editorial meetings and internship program development training sessions. Analysis, Management of Extreme Financial Events, Game Theory UNIX, Linux, MSDOS, Windows 95/98/NT, and Macintosh. As an operating system, Linux is completely customizable, from the kernel to the GUI

Scope for Further Career

Career opportunities are available in different areas under Linux. The career opportunities in Linux"s mentioning not only the Linux platform, it covers lot of different areas like:

- a) To be work a Network Administrator.
- b) To be work a Network Engineer.
- c) To be work a Linux Administrator.
- d) To be work Indemnity Engineer.
- e) To be work Industrial Engineer.
- f) To be work ISO stage.

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Appendices

□ Appendix A: Internship Reflection

The main parts 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.

□ Appendix B: Company Detail



Head Office

Name	Daffo dil Online Limited
Address	102, S hukrabad (3rd floor), Mirpur Road, Dhanm ondi, Dhaka - 1207, Bangladesh
Telephone	02-9143 258-60
Fax	880-2-81 16103
E-mail	info@daffodilnet.com
Website	www.daffodilnet.com
Type of Organization	N ationwide Internet Service Provider (ISP)
Employees	