

**ISP SERVER INSTALLATION AND CONFIGURATION OF MICROTIK IN
LINUX ENVIRONMENT**

**SUBMITTED
BY**

**Most. Fahamida Yasmin
ID: 171-15-9199**

This study addressed the criteria for the Bachelor of Science degree in
Computer Science and Engineering in partial compliance.

Supervised By

Mr. Saiful Islam
Lecturer (Senior Scale)
Department of CSE
Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY
DHAKA, BANGLADESH
DECEMBER, 2019**

APPROVAL

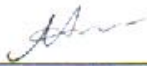
This internship titled “**ISP Server Installation and Configuration of MicroTik in Linux Environment**”, submitted by Most. Fahamida Yasmin, ID No: 171-15-9199 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment 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 December 5, 2019.

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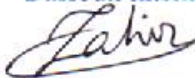
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Faculty of Science & Information Technology
Daffodil International University

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Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



Gazi Zahirul Islam
Assistant Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



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Department of Computer Science and Engineering
Jahangirnagar University

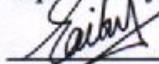
External Examiner

DECLARATION

I hereby declare that, this internship report is prepared by me, Most.Fahamida Yasmin, ID No: 171-15-9199 to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of Mr. Saiful Islam, Lecturer (Senior Scale), Department of CSE, Daffodil International University.

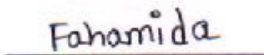
I also declare that neither this internship report nor any part of this internship report has been submitted elsewhere for award of any Degree or Diploma. I also declare that, I collect information from Daffodil Online Limited (DOL), Data Center and Internet Service Provider (ISP) Based Company, Books and Internet.

Supervised by:



Mr. Saiful Islam
Lecturer (Senior Scale)
Department of CSE
Daffodil International University

Submitted by:



Most.Fahamida Yasmin
ID: 171-15-9199
Department of CSE
Daffodil International University

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ABSTRACT

If two or more computers are connected and able to exchange data or information we call network. We want to increase number of PC's and exchange information from one to another time we need some special PC's are called Server. There is various type of work in network that is also different types of server have. For Example- DNS 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. Network is connected to the Internet and we want to secure information they must setup server Linux Operating System. That I choose this subject of my report "Server Installation and Configuration on ISP (Linux Platform)". The report discuss about purpose of the specific server using ISP, hardware requirement for the server, choosing software and installation process of the software, step by step server configuration process and simple troubleshooting in the server.

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CHAPTER-1

INTRODUCTION

1.1 Introduction:

This is the age of information technology. Today, a large number of people around the world are using Internet infrastructure and servers, which are part and parcel, and they can't do anything about internet connection. Nowadays, any company is about software-based interaction and Web software. Each company is currently engaged in software-based communication and Internet technology.

Internet Banking, SMS Alert Banking, Mobile Banking, Transfer of Digital Funds, etc. are not possible without the use of servers and one of them is Linux. It has evolved into a business, educational and personal productivity operating system.

1.2 Motivation:

After my Bachelor of Computer Science Engineering degree at Daffodil International University, I realized the importance of gaining practical knowledge in the textbook Knowledge Complements and helps the student gain a wider point of view of the subject. I was able to manage Linux networks and servers perfectly and learn Mikrotik's knowledge. I consider my case very well as an internet service provider, communicating with, knowing and providing better service to people. My expertise is that I can read and understand the situation in a broad manner and act quickly and quickly.

1.3 Internship Objectives:

My internship program's ultimate goal is to train myself for the competitive job market as a competent person. It is therefore very active in the growth of skills. I want to gather some extraordinary qualities in order to be able to provide myself. The internship in computing is planned to coordinate work experience with academic training and support students in the transition from classroom to work.

1.4 Introduction to the Company:

Daffodil Online Ltd. is proud to be a leading national Internet service provider (ISP) based in Bangladesh. They are the oldest and best organization in the ICT world. These are fundamental corporate practices are long-term consumer relationships. They are immensely proud of what these have when they look at the success over the decade since our inception. These are fundamental corporate practices are long-term consumer relationships. They are immensely proud of what these have when they look at the success over the decade since our inception. These are fundamental business activities that are long-term partnerships with customers. As they look at the success over the decade since our inception, they are immensely proud of what they have

You may be pleased to know that they began operating in 2002. In recent years, they have expanded their range of operations and products according to the customer's requirements. Recommendation and consideration of time requirements. They worked and gained credibility with many national initiatives and international organizations. They use the new Technologies and services upgrading wherever necessary. Corporate Network Solutions Department is a network and telecommunications solution capable of supplying groups with a high level of technical expertise.

1.5 Report Layout:

In Chapter (1) the purpose of the internship, the motivation of the internship and the introduction of the organization. I described my internship method in Section .

In Chapter (2). And this section provides information on how this course is related to the internship. The internship also includes how the company works, what the DOL IT services offer, and their role in the Linux job market.

In the chapter (3) I define the day-to-day duties, activities, events and challenges.

In the chapter (4) I have described that competition is achievable competition.

CHAPTER-2

INTERNSHIP ENTERPRISE

2.1 About the Company:

Daffodil Online Limited (DOL) has been proud to be one of the oldest trailblazers and oldest ISPs / ASPs in Bangladesh since July 2002. It has its own Fiber Optic and Radio Link WAN infrastructure for corporate, small and medium-sized enterprises and individual customers. The organization has been highly praised by many national projects and international organizations. The Corporate Network Solutions Division of Centers can provide state-of-the-art solutions. With a group of highly trained technical experts, network and telecommunications solutions.

DOL has a very good technical and management team running SON, Cisco Affiliated with Microsoft, Linux and Oracle and with leading IEEE, ACM, ACS, BCS and PMIA actively involved computing associations worldwide. The strategy on corporate social responsibility reinforces the notion of transparency through neighborhoods, workstations, locations and retail sites.

2.2 Product and Market Situation:

Daffodil Online Ltd also offers a variety of IT services and professional training programs. Daffodil Online Limited is Bangladesh's leading national internet service. Supplier (ISP). They are the most experienced and oldest ICT companies where they have long-term relationships with close customers as their basic business ethics.

IT Services

- Web Business Solution.
- Creation of the website.
- Hi Wi-Fi Zone speed.
- Connectivity of data, data center and co-location. Internet Service Provider.
- Security solution.

Professional Training Services

- Setting up and managing ISP using Linux.
- Certified Ethical Hacking (CEH) training course.
- Using MikroTik, ISP setup and administration.
- Development of the Joomla website.

2.3 Target Group:

The customer base of the company includes both buyers and start-ups, small to medium-sized companies.

Web Solutions claims that these market segments require special pricing and service and generate more loyal and reliable customers.

2.4 SWOT Analysis: SWOT Analysis is a useful strategy to recognize the strengths and weaknesses and to identify the benefits and challenges you face.

➤ **Strengths:**

- Establishing an online business
- Operating comfortably from home
- Collecting data

➤ **Weaknesses:**

- Small reseller competition
- Numerous price tariffs and service options
- New entrants underestimate the level of expertise required for market survival

➤ **Opportunities:**

- Simplifying tariffs
- Review of the regulatory framework

➤ **Threats:**

- Economic crisis-households are less likely to increase their broadband subscriptions in the digital communications sector because the stock market lacks confidence.
- Whether convincing customers can achieve Internet access remains to be seen

2.5 Organizational Structure:

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



CHAPTER-3

INTERNSHIP ROLES AND RESPONSIBILITIES

3.1 Daily Task and Activities

1: I learned and performed the following tasks of Daffodil Online Limited's internship.

- Linux Basics Learning and Understanding.
- Learn and understand the components of the network.
- Understanding partitions for Linux HDD.
- Linux run level learning and understanding.
- Installing Linux.

2: I learned and performed the following tasks during of Daffodil Online Limited's internship:

- Basic CentOS command.
- Manage Linux users and passwords.
- Get Learn about logged in users.
- Access files and directories.
- Copy and move files and directories.
- Compressed and compressed files and directories.
- The crontab changes as follows.
- Mount Unmount Drive.

3: In 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.

3.2 Events and events:

- Track and control networks and computer systems.
- Create user accounts, passwords and permissions.
- Servers and routers to troubleshoot.
- Replace networks and switches in the local areaFix network errors.
- Technical support for network users.
- Monitor daily admin and network usage.
- Suggest IT solutions to business problems.
- Client support over the phone or the client is the physical step towards the end.
- Fiber optical media converter and fiber optic transmission devices are being tested.

3.3 Project Task and Activities:

Centos Install

3.3.1 Creating Linux Partition:

To install Linux, we should create at least 3 root (/), boot, and swap partitions.

Division of root: /

A root partition where on all files (except the / boot) the root directory is located in the root partition. Needs a room with a minimum HDD of 5 GB.

Boot Partiton: /boot

Because of limitations, native ext3 partitioning is sufficient for most users to maintain these filesA 200 MB boot partition.

Partition of SWAP: SWAP

Partition swaps support virtual memory. In other words, if the computer does not have sufficient RAM to store the information it collects, the data will be shared skillfully. The partition swap should be equivalent to 2x physical RAM for up to 2 GB of physical RAM, then 1x physical RAM for 2 GB, but not less than 32 MB.

3.3.2 Linux Run-Level Used by Centos:

Init0= Shut down.

Init1= Client with single mode.

Init2= Client with multiple mode.

Init3= Complete Mode multi-user.

Init4 = Useless.

Init5 = init6 = X-Window reboot (GUI mode)

3.3.3 Linux Centos ' Basic Command:

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

Reboot = reboot or 6.

Logout = log out of the current user's program.

Create a blank file (name of the file) = touch fahamida.

Construct a folder = mkdirfahamida(directory name).

List the file = ls working directory. Modification = cd / root / desktop.

3.3.4 Creating users and managing passwords:

Attach a user = adduserfahamida(user's name).

Set password for new user = passwdfahamida(user name).

Disable / Remove password= fahamidapasswd-d(user name).

Check user data = fahamidafinger(name of user).

Locking an account username = fahamidapasswd -l.

Open a passwd = passwd -u fahamida account.

Delete a user (user name) = userdefahamida.

3.3.5 To Know About the Logged In User:

w

who

whoami

3.3.6 To Copy or Move a File:

Copy = cp filename destination example: cp file1 /home/fahamida/yasmin

Move = mv filename destination example: cp file1 /home/fahamida/yasmin

3.3.7 Vi Editor:

To edit a file = vi fahamida(file name)

To insert text = press a or I

To delete character = press x or dd

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

To paste = press p for paste.

To set line number =: set nu

To delete line number = set nonu

Search something = /abc to search abc

To go to the top of line = :0

To go to the bottom of line =:

3.3.8 Install/Update/Remove Packages in Centos:

- Install a Yum install package (package name), e.g. yum insallmysql
- Uninstall a package using yum
yum remove (package name)
e.g yum remove mysql
- Update a package using yum
yum update (package name)
e.g yum update firefox
- Search a package using yum
yum search (package name)
e.g yum search firefox
- Display Additional Information about a Package
yum info (package name)
e.g yum info firefox
- View All Available Package
yum list | less
 - View Installed Package yum list
 - List of all available group yum grouplist software

3.3.9 Compress and Decompress A Directory Using Tar and Untar:

Shows in tar and untar by figure 3.1.1:

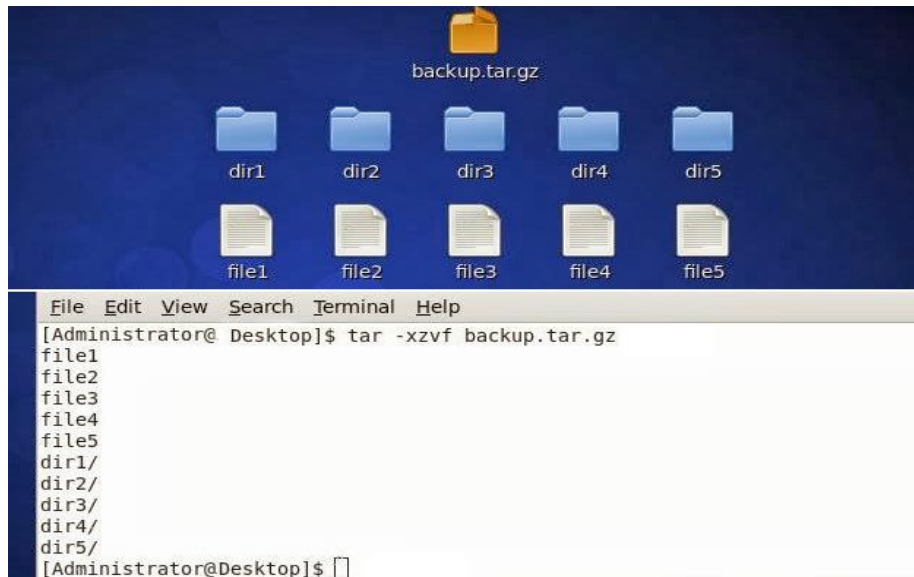


Figure 3.3.1: Shows in tar and untar

3.3.10 How to Add Change Delete and Display IP Address In Centos:

To see ipaddress:ifconfig or ifconfig eth0 3.3.2 show in interface ip address

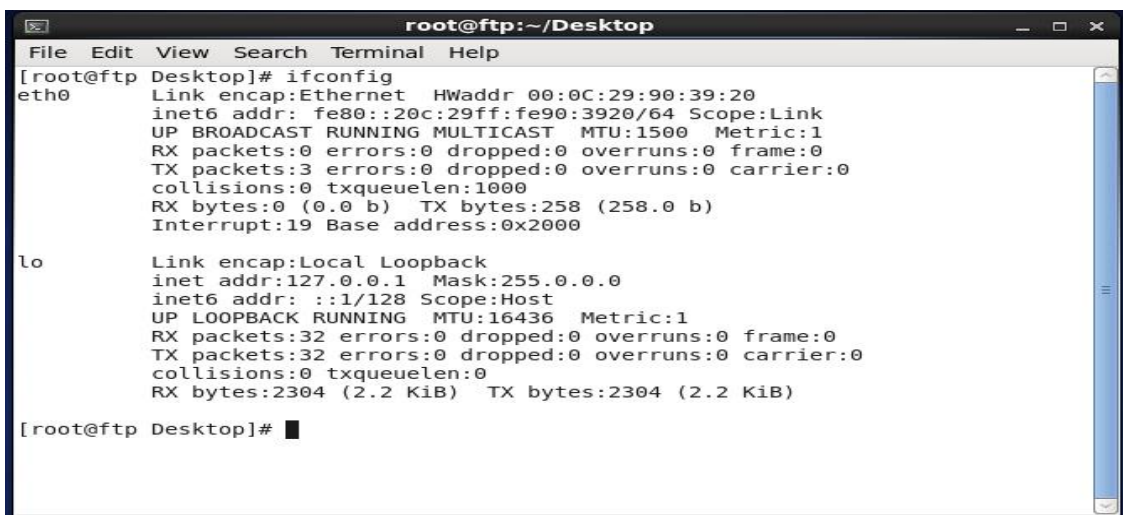
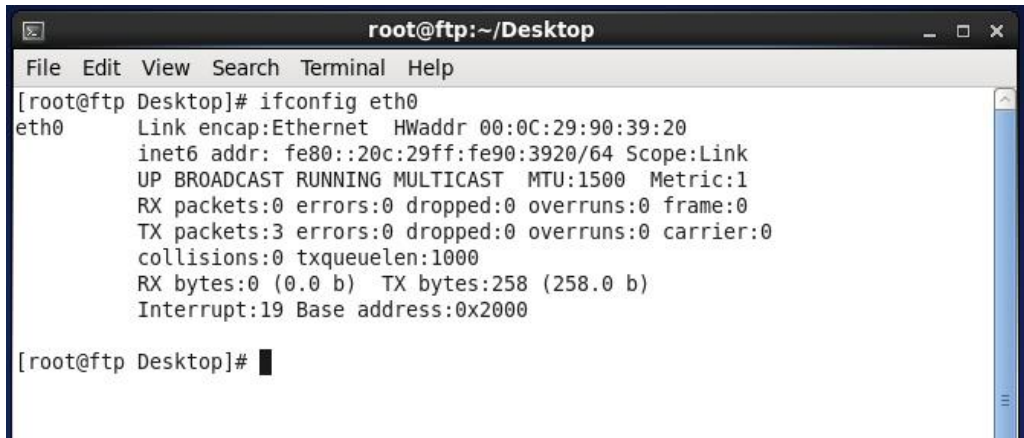


Figure 3.3.2: Showsip address in CentOS

IP address and Mac address in command ifconfig eth0 by Shows Figure 3.3.3 :



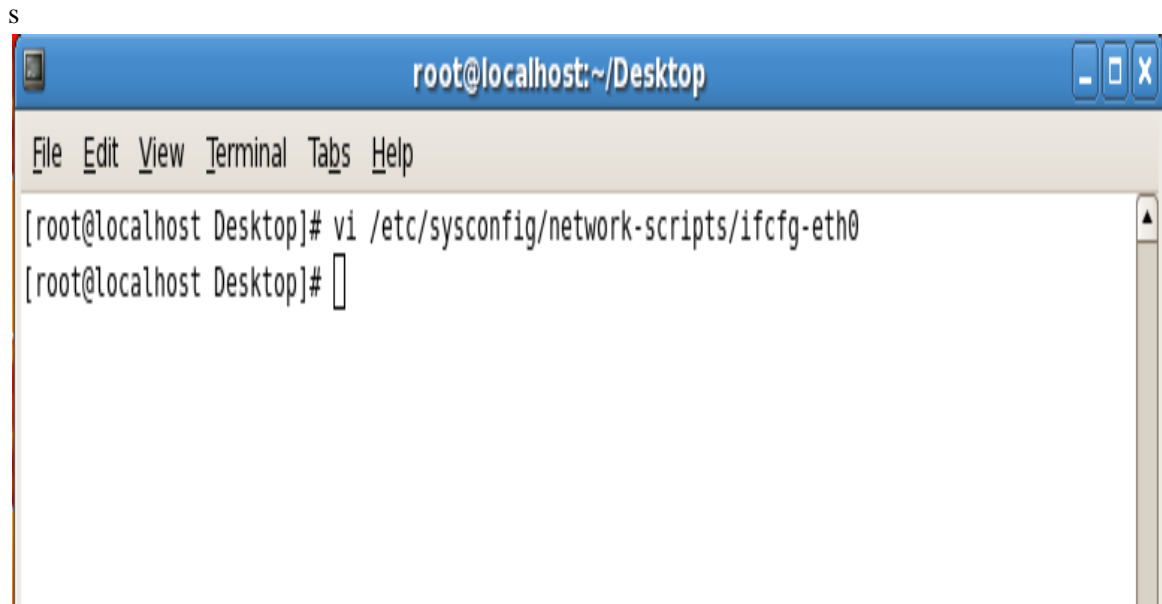
```
root@ftp:~/Desktop
File Edit View Search Terminal Help
[root@ftp Desktop]# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:0C:29:90:39:20
          inet6 addr: fe80::20c:29ff:fe90:3920/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 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 3.3.3: Shows address in eth port

Setup IP Address Permanently Show by figure 3.3.4:

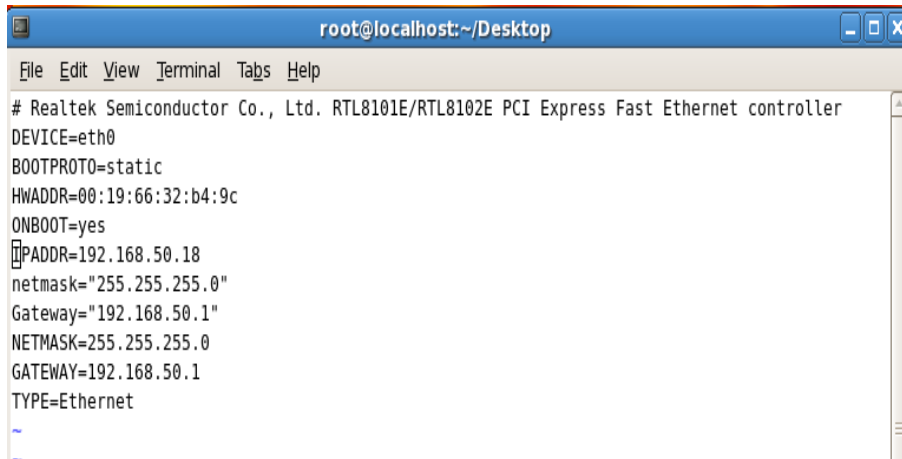
S



```
root@localhost:~/Desktop
File Edit View Terminal Tabs Help
[root@localhost Desktop]# vi /etc/sysconfig/network-scripts/ifcfg-eth0
[root@localhost Desktop]# █
```

Figure 3.3.4: Shows set ip address in eth port permanently

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



```
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 3.3.5: Shows set ip address insysconfig file ethernet port permanently

3.3.11 Server Configuration:

Configuration of servers in Internet service providers [ISPs] is a very important goal. Selection of servers is important for each service. There are many servers that have an operating system for Linux. Those servers can be built on the DNS server, DHCP server, FTP server, NFS server, proxy server, mail server, web server, Internet service provider Samba server [ISP].

➤ Web Server

Web servers are internet pages-providing machines. Web server may have an IP address with a domain name. For example, when you enter your browser with the URL <http://facebook.com> You must send a request to a web server with a Facebook.com domain name. The server then picks up the index.html file and sends it to your browser.

➤ **Centos 6.3 Web Server Configuration Requirements:**

Requires a software IP address, an operating system, a web server, a domain name, and a name server to set up your own website. On any machine, the computer will run Linux. The operating system's words, of course

CentOS 6.3 should be used. Centos ' operating system, which the Apache Web server can easily install and support, is up and running once mentioned earlier.

➤ **System of domain names (DNS):**

Specifying a host by the computer's IP address that is convenient for them, but not always easy for named individuals. Therefore, no need to turn the IP address of the host name into a translation list. Millions of new machines are popping up every day on the Internet, making it impossible to keep everyone up to date on the table. This is where the DNS of the domain name network. A net-wide DNS server. Look what we've been doing. We are rubbish, then we get it out of the garbage, along with others. DNS is sophisticated and consistent, and we'll get better service from that. Debug it, learn it, and we arranged the administration so that it would be another good administrator to protect the net from falling to their knees. This is part of the "binding" package, featuring an Internet software consortium, to serve as a program called Unix. Most Linux distributions have names and are usually installed, /usr /sbin/, usually binding The top or bottom of the package depends on the package size..

WORKS For DNS SERVER CONFIGURATION:

It converts name to IP address.

And IP Address to Name.

ZONE FILES:

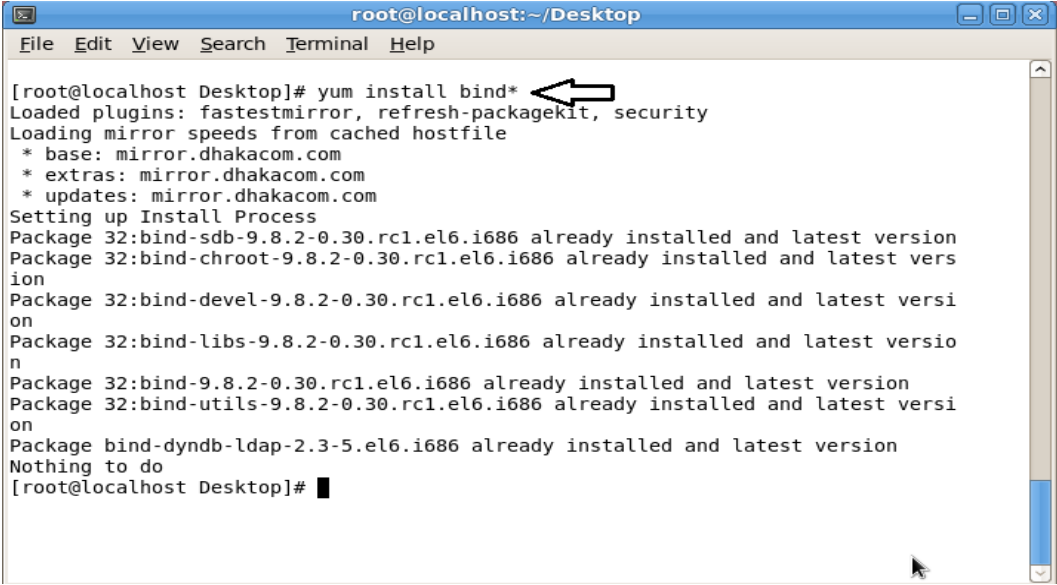
Forward Zone File: IP address name.

IP address to name PACKAGE NAME: bind DEFAULT PORT: 53 FILE NAME CONFIGURATIONS: named.config

➤ **STEP: 1**

At first we need to install dns name bind package: yum install bind * There Show Already install due to its already installed in my computer.

Show 3.3.6 in install DNS in command yum install bind*



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

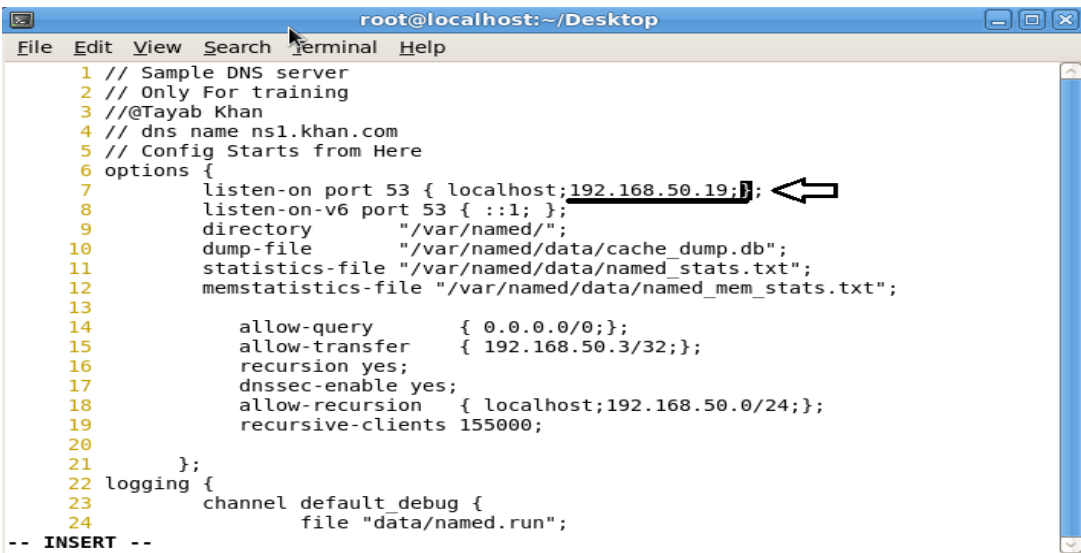
[root@localhost Desktop]# yum install bind*
Loaded plugins: fastestmirror, refresh-packagekit, security
Loading mirror speeds from cached hostfile
 * base: mirror.dhakacom.com
 * extras: mirror.dhakacom.com
 * updates: mirror.dhakacom.com
Setting up Install Process
Package 32:bind-sdb-9.8.2-0.30.rc1.el6.i686 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 3.3.6: 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 3.3.7 My pc ip address is 192.168.50.19



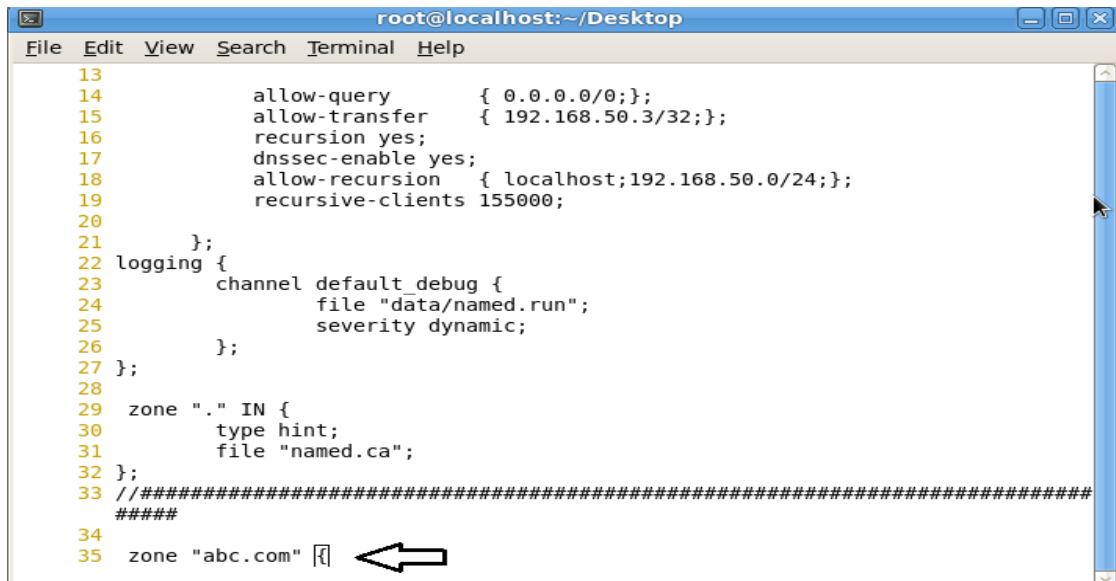
```
root@localhost:~/Desktop
File Edit View Search Terminal Help

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

➤ **STEP: 3**

Enter the forward zone web address. I've been testing abc.com. Figure 3.3.8 Shows



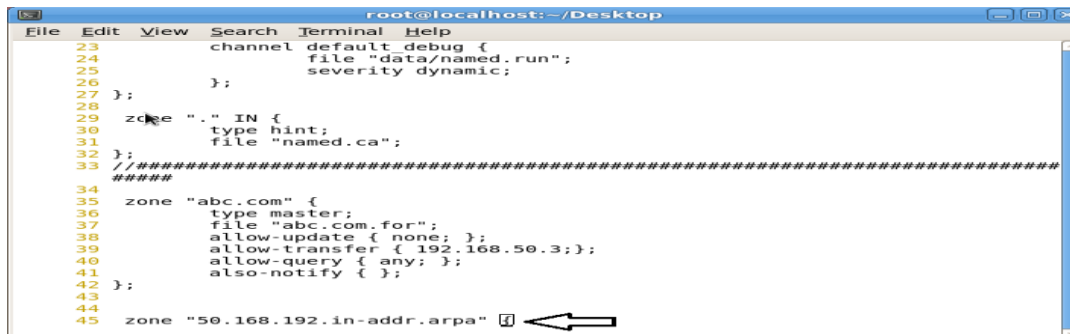
```
root@localhost:~/Desktop
File Edit View Search Terminal Help
13
14     allow-query      { 0.0.0.0/0;};
15     allow-transfer  { 192.168.50.3/32;};
16     recursion yes;
17     dnssec-enable yes;
18     allow-recursion { localhost;192.168.50.0/24;};
19     recursive-clients 155000;
20
21 };
22 logging {
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     zone "abc.com" [ ] ←
35
```

Figure 3.3.8: Shows Screen Print Edit Enter a web address of forward zone

➤ **STEP: 4**

Join AN's IP address in the reverse area.

Figure 3.3.9 IP Address Without Network Portion must be written:192.168.50.19as
50.168.192.



```
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     zone "abc.com" {
35         type master;
36         file "abc.com.for";
37         allow-update { none; };
38         allow-transfer { 192.168.50.3; };
39         allow-query { any; };
40         also-notify { };
41     };
42
43
44
45     zone "50.168.192.in-addr.arpa" [ ] ←

```

Figure 3.3.9: Shows Screen Print Enter an IP Address For Reverse Zone

➤ **STEP: 5**

Display Figure 3.3.10 in the command `vi / var / named / chroot / var / named / abc.com` for forward zone directory.

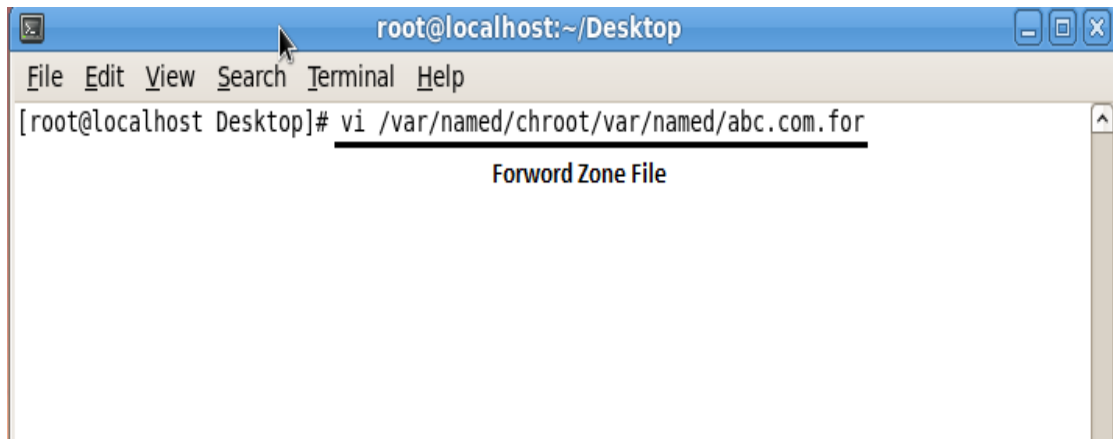


Figure 3.3.10: Shows Screen Print edit Forward Zone File for abc.com

Forward zone file create Shows in figure 3.3.11

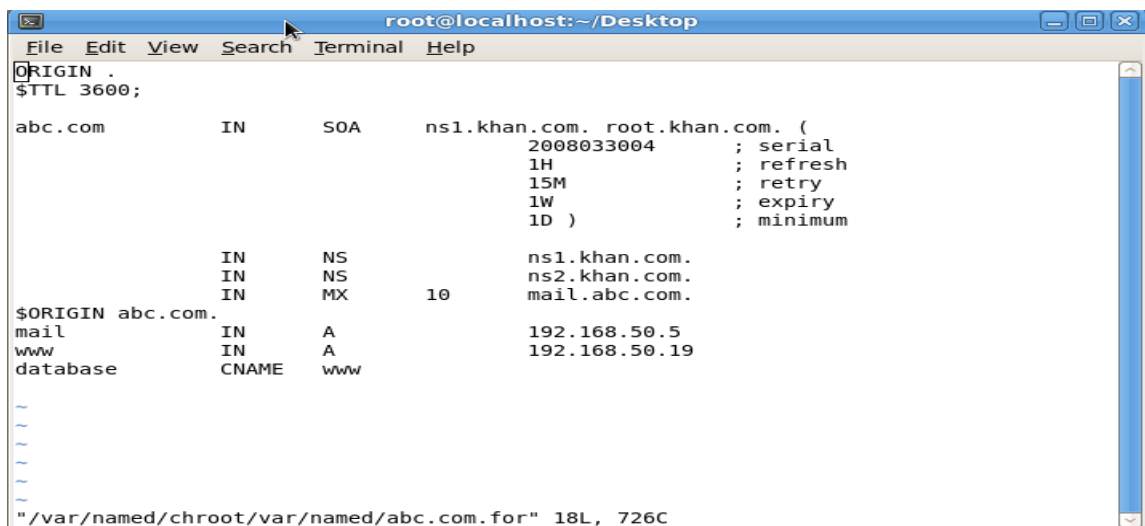


Figure 3.3.11: Shows Screen Print edit Forward Zone File for abc.com

➤ **STEP: 6**

Show 3.3.12 figure reverse zone file command

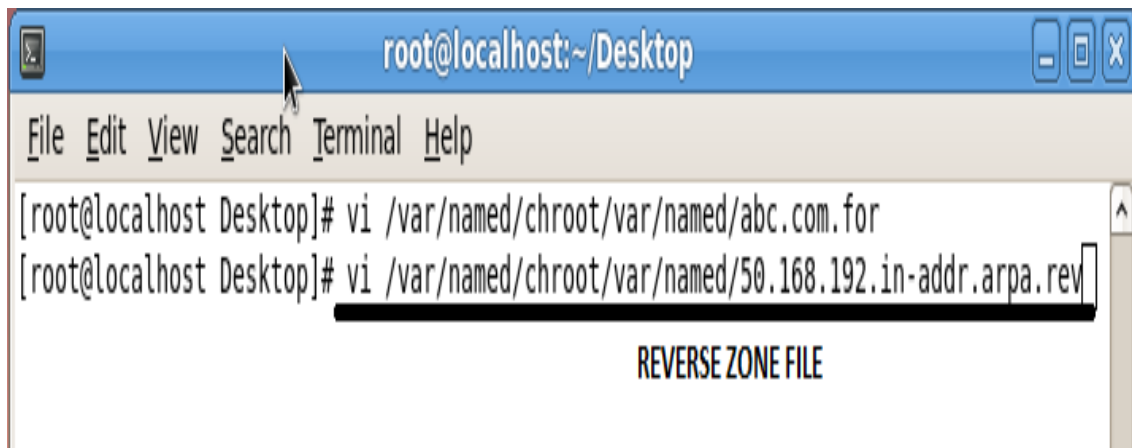


Figure 3.3.12: Shows Screen Print edit Reverse Zone File

Show 3.3.13 figure edit reverses zone file full configuration file

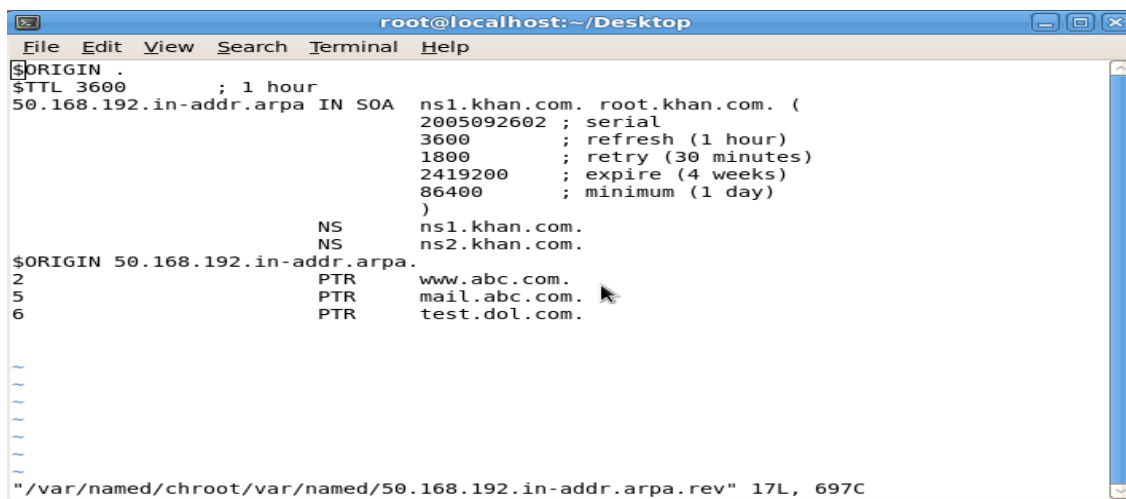
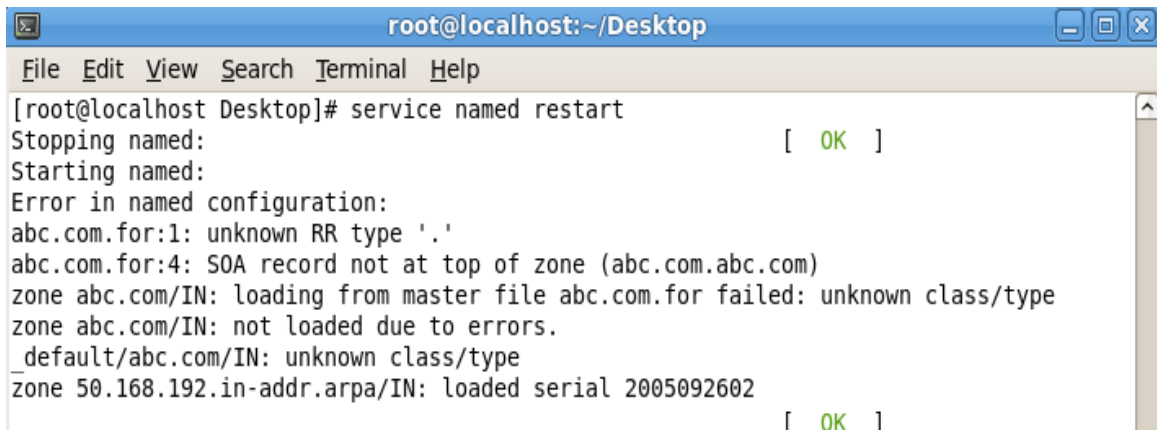


Figure 3.3.13: Shows Screen Print edit Reverse Zone File

➤ **STEP: 7**

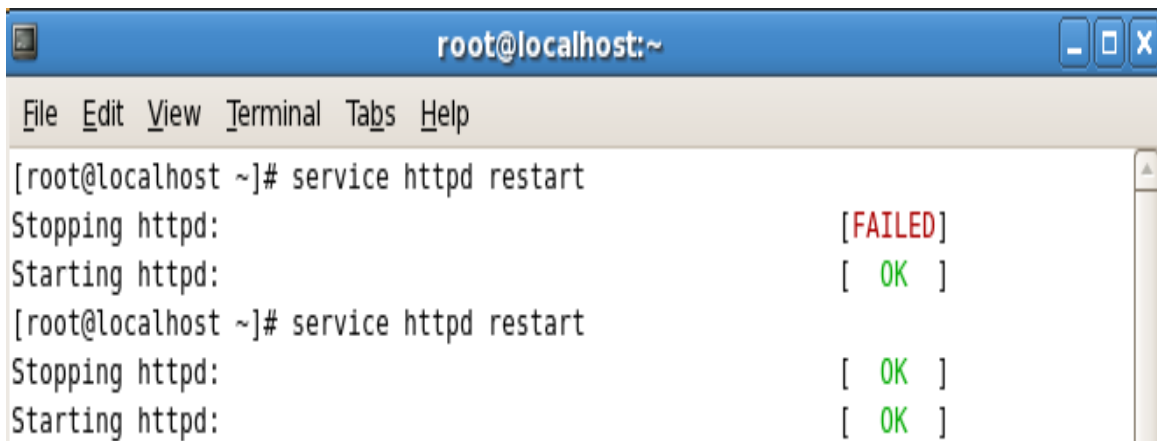
❖ Restart the Service show 3.3.14 figure



```
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 3.3.14: Shows Screen Print service named restart

Display 3.3.15 Web Server System restart



```
root@localhost:~
File Edit View Terminal Tabs Help
[root@localhost ~]# service httpd restart
Stopping httpd: [ FAILED ]
Starting httpd: [ OK ]
[root@localhost ~]# service httpd restart
Stopping httpd: [ OK ]
Starting httpd: [ OK ]
_
```

Figure 3.3.15: Shows the status of the Screen Print service

- **STEP: 8** Go to the abc.com website in Figure 3.3.16



Figure 3.3.16: Shows abc.com open in browser window printing

Mail Server

According to the email server that acts as the computer digital post office on your network, you often have to respond to the destination of a particular message by emailing to a local server as a "mail server" for local users in a storage area where the mail server. Must decide what is specified by user K is a set of rules, a local user account database server will identify the mail, handle the other, and help handle the mail server and email client transferring messages that is the communication module material.

➤ **Mail Server Configuration**

MUA = mail clients manager. Ex: Ms. Outlook, Eudora, Pine, Outlook.

MTA = Mail Transfer Manager. Ex: Gmail, Exim, Post, Mail Download.

MDA= Agent for the distribution of mail. Ex: Mail for pros, fall for cons.

SMTP = Simple Protocol for Mail Transfer. Default port used to send: 25.

POP3=Post Office Protocol 3.Port by default: 110 used to receive.

IMAP = Protocol for Internet Message Access. Default Port used to receive: 143.

I used their popular packages here that are very easy to set up.

➤ **Setup mail server in centos 6**

- Dovecot installation and configuration
 - Mail installation and configuration
 - User development and testing
-
- ❖ **Step 1:** Assign and assign a host entry for your domain to a static IP before deployment.
 - ❖ The IP in the directory /etc / hosts as: 192.168.0.15 daffodil.com
 - ❖ **Step 2:**Use the following to install sending mail: yum -and install sending mail.
 - ❖ **Step 3:** · Install the following dovecot: yum-and install Dovecot.
 - ❖ **Step 4:** Use yum -and Install Telnet to install Telnet.
 - ❖ **Step 5:** Edit the Sendmail Configuration File Now: vi /etc/mail/sendmail.mc
 - ❖ **Step 6:** Service to resume sending mail.
 - ❖ **Step 7:** telnet localhost 25.
 - ❖ **Step 8:**Setting up the dovecot.

 - ❖ **Step 9:**· Open the /etc / dovecot / dovecot.conf file after installation and add the bottom line to the end of the folder. Make sure home mailbox uses the same name in the setup for Mail place and Send Mail.
 - ❖ **Step 10:**The dovecot service ends with the dovecot service.
 - ❖ **Step 11:**Now test the connectivity of the pop3.
 - ❖ **Step 12:**3.17 figure my configuration by usingthunderbird.

Configuration details.



Figure 3.3.17: Shows Screen Print POP3 and SMTP host and Port configuration

STEP 13: Now I can use this server to send and receive mail. In the event of a problem.

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

3.4 Challenges:

I have found that there are some common challenge interns. I think it's one of three things: unpaid / under, temporary and they're in the running to gain experience. Though organizations are moving more towards flexibility nowadays, some offices do have some strict policies. Then again, there are some internal differences too. During my first weeks of socializing struggles, trying to observe the organizational behavior is a challenge here too. my perception is very important here since according to that i progress on socializing.

3.5 RouterOS:

MikroTik's main product is an Linux-based operating system, known as the MikroTikRouterOS. Installed either on the company's proprietary hardware (Router board series) or on standard x86-based computersIt transforms a computer into a network router and incorporates a number of additional features such as firewalling, Virtual Private Network (VPN) support and customer service, bandwidth shaping and service quality, wireless access point functions and other widely used network interconnection apps.. The system is also able to serve as a captive-portal-based hotspot system [10]

3.6 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 client-server PPPoE
- Provides Private Virtual Network VPN.
- Provides guidelines for the firewall
Provides 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

MikroTik supports the brand by presenting numerous and thematic examples of configurations through a forum and wiki. RouterOS supports version 4 of the Internet Protocol (IPv4) and version 6 of the Internet Protocol (IPv6).

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

3.7 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]

3.8 Router Board:

The company produces a range of integrated circuit boards, which are sold as router boards, as well as accessory modules that incorporate a full hardware operating system for RouterOS..

Combined with RouterOS, the Router board line is sold to wireless Internet service providers of small to medium size 3.18, usually offering wireless broadband connectivity in remote areas.

Options include pre-assembled small office / home office (SOHO) routers, 802.11n wireless MIMO and TDMA systems for indoor and outdoor use, as well as bare routers for incorporation into custom solutions in the form of printed circuit boards (PCBs).The router board line also contains a series of wireless Mini PCI and Mini PCI Express adapters that support a variety of IEEE 802.11 protocols and are intended to be used in combination with the router board lineup.

750G Series MikroTik Router Shows Figure 3.3.18:



Figure 3.3.18: Shows MikroTik Router 750G Series

3.9 Propose Network Diagram (MikroTik Configuration):

Network Diagram shows in fig 3.3.19 :

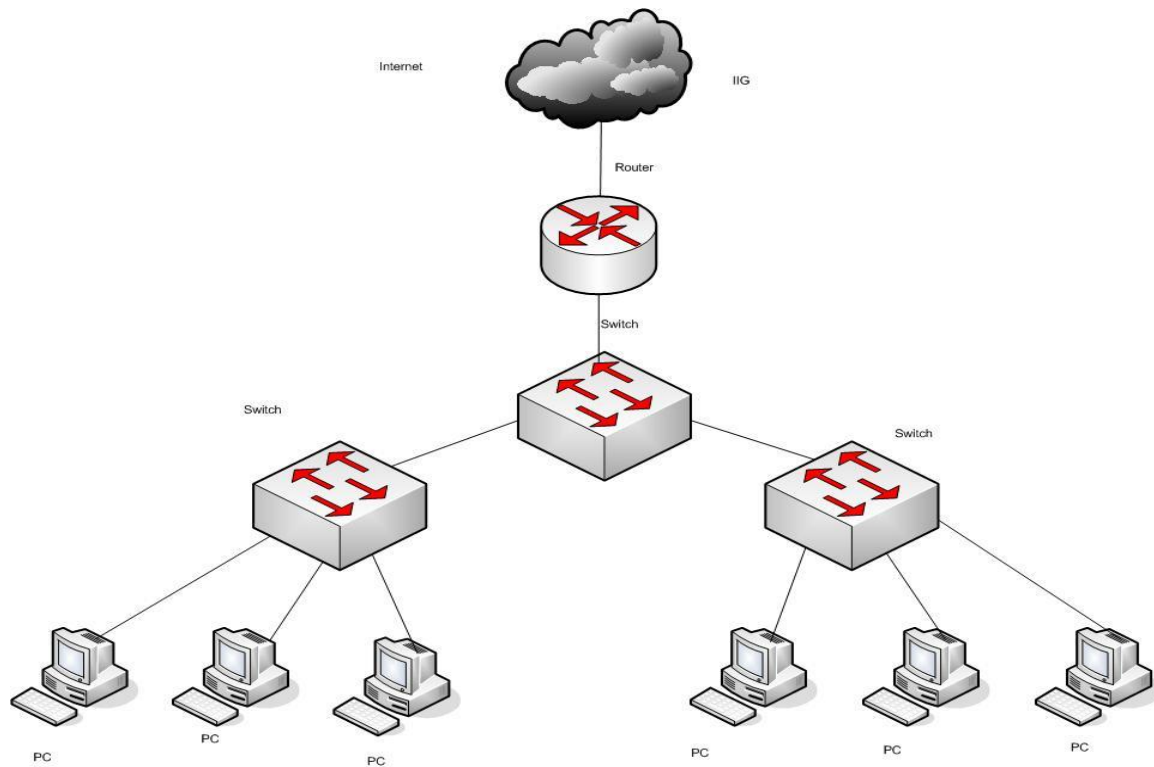


Figure 3.3.19: Shows Network Diagram

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 3.3.19 network diagram.

➤ 3.9.1 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 3.3.20mikroTik reset command

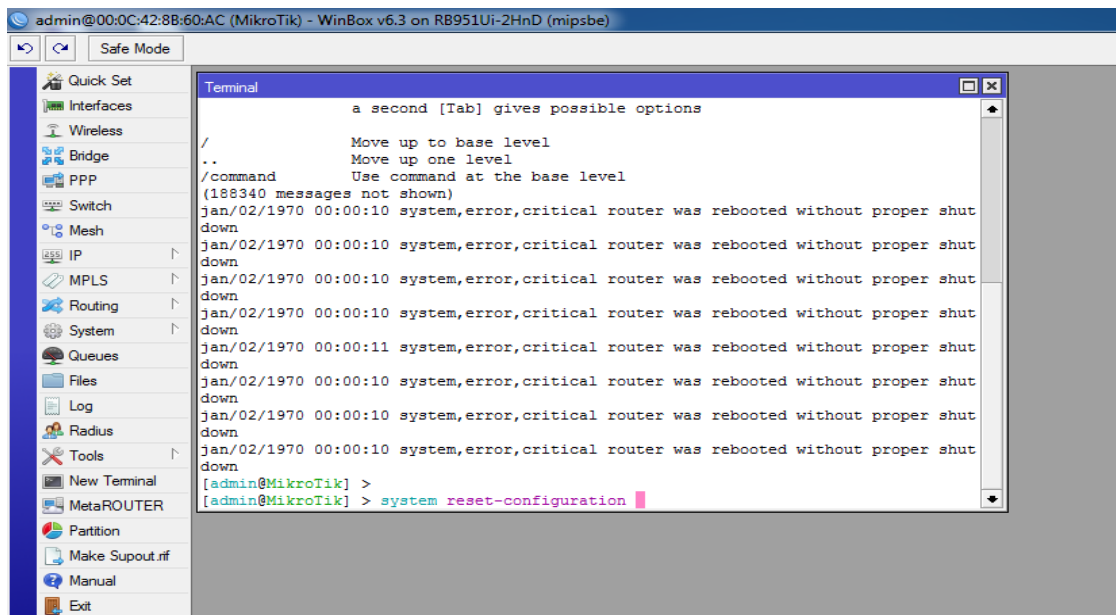


Figure 3.3.20: Shows Screen Print Reset MikroTik Router

✓ 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 3.3.21:

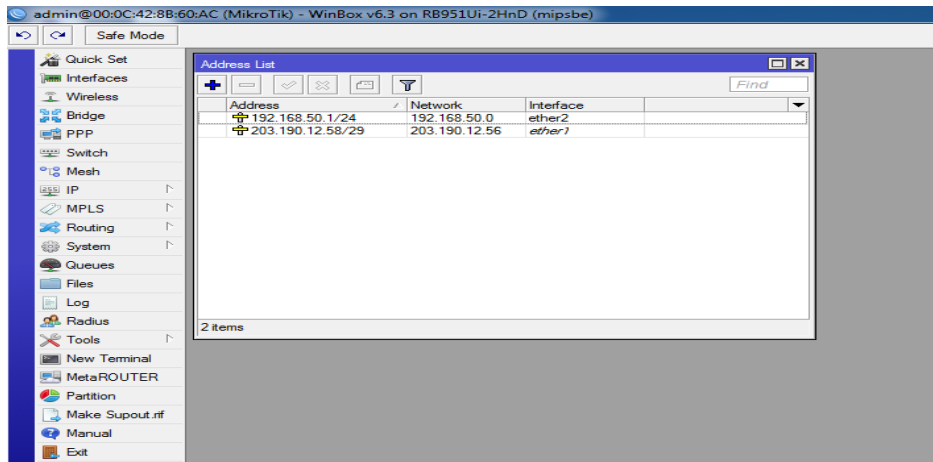


Figure 3.3.21: Shows Screen Print IP Address

Setup route ip add in figure 3.3.22 show:

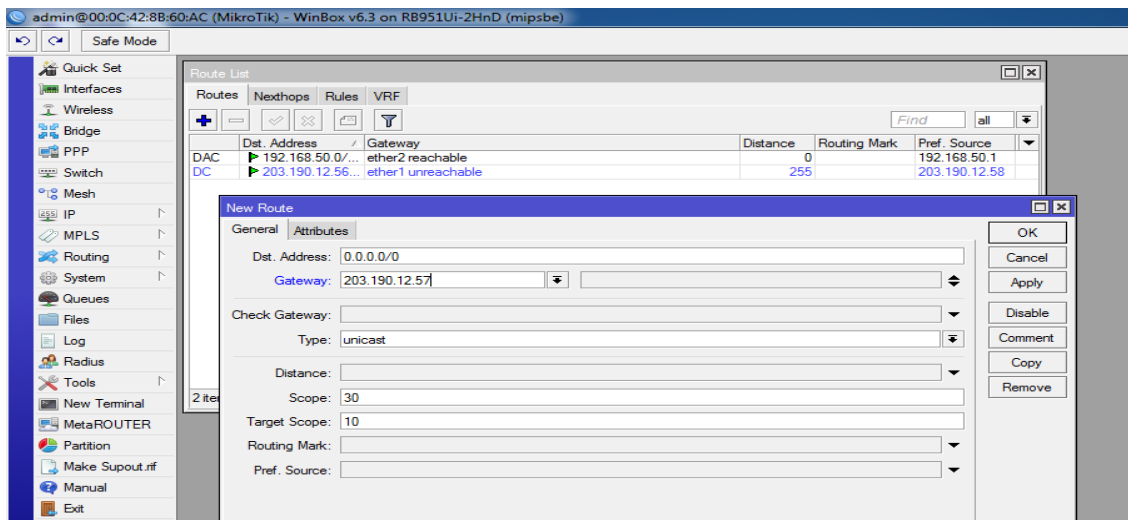


Figure 3.3.22: Shows Screen Print Gateway

✓ **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 3.3.23 shows:

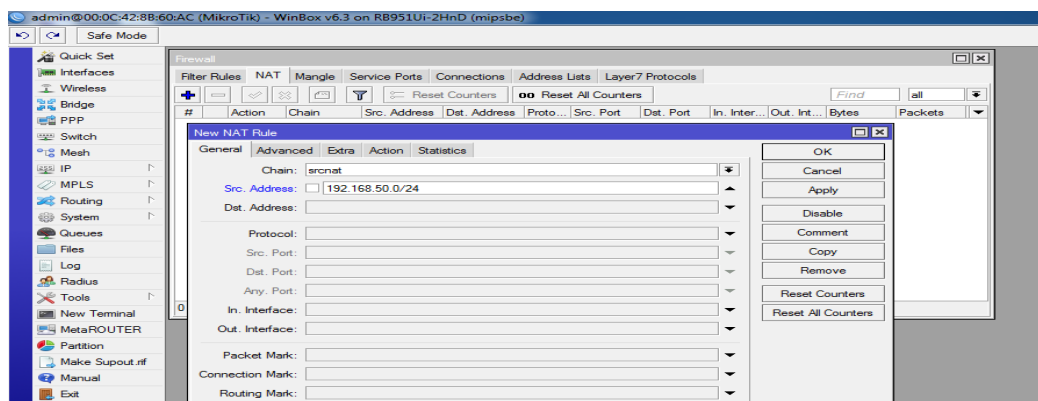


Figure 3.3.23: Shows Screen Print NAT Rule

✓ **Step 4:**

Doing the task of bridging the related ports with each other 3.24 in figure

Process:

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

Settings:

- ✓ Tick mark to 3 options

Bridge Settings Screen Print shows in fig 3.3.24

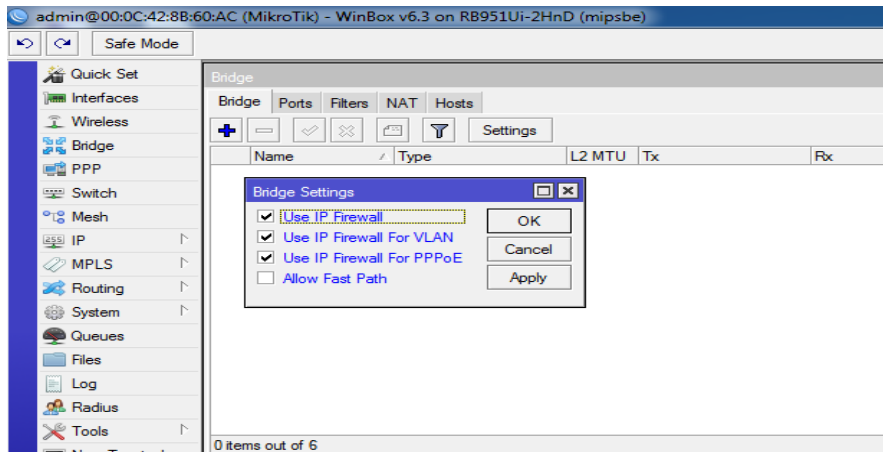


Figure 3.3.24: Shows Screen Print Bridge Settings

Ports:

- ether2
- ether3_LAN
- ether4
- ether5
- wlan1

Router interface port in graphically 3.3.25 show:

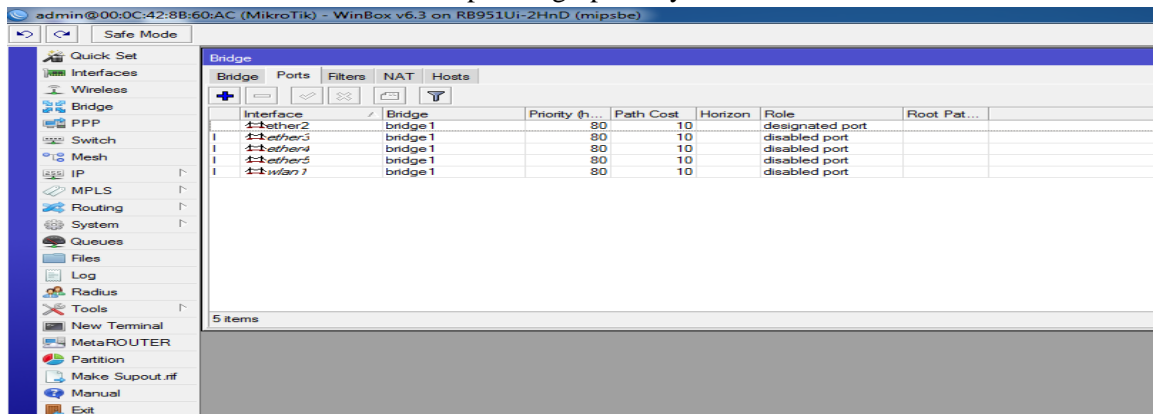


Figure 3.3.25: Shows Screen Print Bridge Ports Assign

✓ **Step 5:**

Knowing the profile of bridge with the DHCP Server 3.26 figure

Process:

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

DHCP Setup Screen Print show in fig 3.3.26

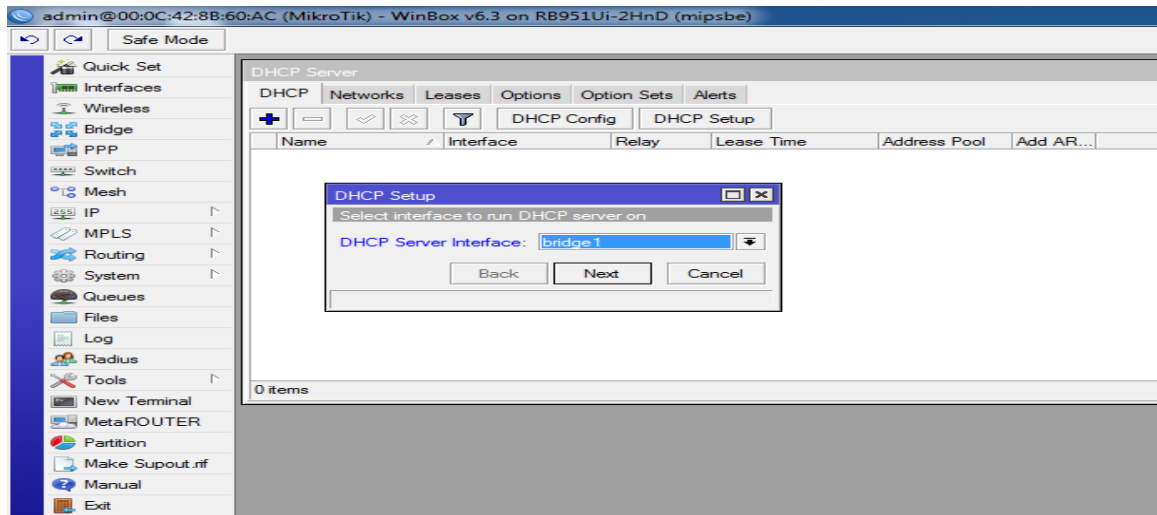


Figure 3.3.26: Shows Screen Print DHCP Setup

3.10 Challenges:

I found some common challenge interns are there. I think it's one of three things: unpaid / under, temporary, and they're gaining experience in running. Although organizations are now moving towards more flexibility, Many companies have strict policies. Then again, there are also some internal differences. Here too, trying to observe the organizational behavior is a challenge during my first weeks of socializing struggles. My experience here is very important because I'm socializing accordingly.

CHAPTER-4

COMPETENCIES AND SMART PLAN

4.1 Competencies Earned:

The statement of what a student expects to be able to do will result in the learning process as a result of learning the skills. Install and cancel both network and server machines on the two datacenters. Lead to the implementation of advanced Linux software, for example, LDAP HA, program learning outcomes, linked to internship evaluation. The Student Association Office funds the results of many student intern learning: information Collecting and Organizing Internship Project Details: Take part in the redesign of the Linux Lab Web site. Learning Outcomes. Install and configure software and upgrades; Install, configure, and test network employer services.

4.2 Smart plan:

If you develop your company goals and goals to meet these requirements your marketing plan will have a good chance of success.

4.3 Reflections:

Daffodil Online Ltd. has started operating in 2002. Over the past few years, they have extended their portfolio of operations and services according to the recommendation of the customer and taking into account time demands. They worked with many national projects and international organizations and achieved the reputation.

CHAPTER-5

CONCLUSION AND FUTURE CAREER

5.1 Discussion and Conclusion:

Career development is the progression of a lifetime of my work in its simplest terms. A number of issues, including mine, affect it. My experiences at work, in the office and outside of me, the success I have achieved at every stage of my career, the formal and informal education and training I receive, and the feedback I provide. I am still keeping my options open for new opportunities, however, Bangladesh around the world I'm working on behalf of the university. I enjoy this line of work. I worked hard for my position and I look forward to learning about it.

5.2 Scope for Further Career:

Linux career opportunities are only on the Linux platform. Not to mention, its various areas such as: desktop application development, kernel and device drivers development today include developers and network engineers of their huge demand open source software and open source software. demand for skilled professionals in LINUX, MICROTIK etc.

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- [14] Get Concept about Cloud Core Router,
<https://en.wikipedia.org/wiki/MikroTik> 10 November 2019, 11:00am

Appendices :

➤ Appendix A: Internship Reflection

Real learning comes at the end of the work period when I was given the opportunity to think about what I saw and what I experienced in experimental teaching and internships. I use the proper business etiquette to learn by observing clients and professional etiquette and learning how to communicate with professional caregivers and other staff, as well as a specialist in the field. I'm implementing the strategic vision of an organization, how to connect with colleagues, how to share resources, how to organize, how to make decisions, some technical awareness of the organization's environment and the organization's duty and responsiveness. The internship experience at the end of my internship supervisor through an assessment and individual meetings offers an opportunity to seek professional opinion.

➤ Appendix B: Company Details



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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| 1% match (student papers from 28-Jul-2015)
Submitted to Universiti Teknologi Petronas on 2015-07-28 |
| 1% match (student papers from 07-Apr-2018)
Submitted to Daffodil International University on 2018-04-07 |
| 1% match (student papers from 10-Dec-2012)
Submitted to Leyton Sixth Form College, London on 2012-12-10 |
| < 1% match (student papers from 10-May-2018)
Submitted to Colorado Technical University Online on 2018-05-10 |
| < 1% match (student papers from 17-May-2012)
Submitted to University of Bedfordshire on 2012-05-17 |
| < 1% match (student papers from 02-Apr-2018)
Submitted to Daffodil International University on 2018-04-02 |
| < 1% match (student papers from 09-May-2016)
Submitted to Pathfinder Enterprises on 2016-05-09 |