

Linux Server Configuration and MikroTik Administration

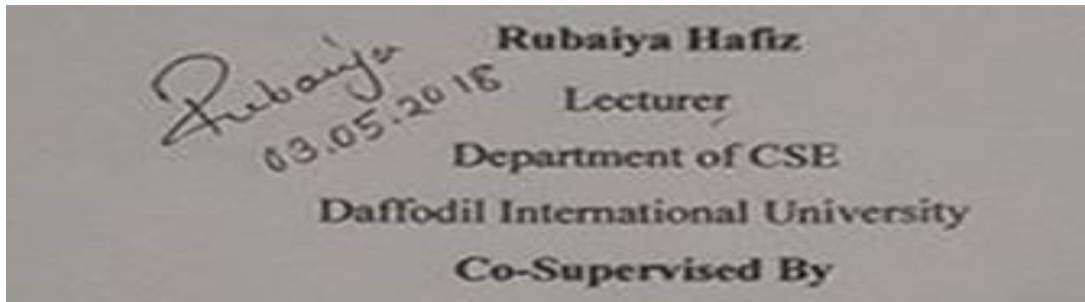
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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering.

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DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

MAY-2018

APPROVAL

This Internship titled “**Linux Server Configuration and MikroTik Administration**”, submitted by Md.Taskilur Rahman 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 07-April 2018.

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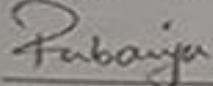
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DECLARATION

I hereby declare that, this internship report is prepared by me, Md.Taskilur Rahman, ID No: 152-15-6322 to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of **Rubaiya Hafiz, Lecturer, 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. I also declare that, I collect information from Daffodil Online Limited (DOL), Data Center and Internet Service Provider (ISP) Based Company, Books and Internet.

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I also thanked to my all classmates and batch mates for their help and supports, they are inspire me to all moments.

Finally, I must respect my honor and respect for my parents to giving the opportunity, and support to me to come this places.

ABSTRACT

I believe the unlimited possibilities of innovation and superiority. As we build our communication strategies, we upgrade our work process on that day. We would like to make other relationships for sharing the resources than following a security of some rules. If I am connected through two or more connections and computers and information then it is called as a network.

We create server to increase the user in a network. Several PC's or user uses the server to exchange information. Sometimes we need different types of servers for different PC's as well. For example - FTP servers, web servers, mail servers, proxy servers, DSN servers, firewalls. All of them have different functionalities and without them it is impossible to maintain a network. If the network is connected to the Internet and we want to keep our information safe, then we have to install the server using the Linux operating system. Linux is an easily maintained operating system. It is software that provides some basic features to each computer to access some other devices to perform custom functions.

Today's media or large companies need server system to maintain their complex IT infrastructure. Peer-to-peer networks are problematic for sharing security and resources for medium or large organizations.

Server is a bit expensive; here I try to design a cost-effective server system of this type of organization. This system improves reliability and security for their networks.

Using this proposed system, a company can easily make their network infrastructure reliable. It can also help them to protect their day to day data. So all these companies need a strong network server to ensure security.

That is why I chose my internship topic as "Linux Server Configuration and MikroTik Administration".

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CHAPTER 1

Introduction

1.1 Introduction:

This is the period of Information Technology. Now a day's a large number of people all over the world use internet technology and server is a part of it. Linux is quite possibly the most important free software that is achieved 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 method is an old practice to make students understand the real working, environment and challenges of jobs. All branches of educational sector have their own importance of internship before degree award.

Now a day every business, commerce, job education is very much related to software based communication and internet technology. We are preferred to take more E-service, that's called E-Commerce. E-government, 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 for example Internet technology, E-mail, E- Business, Telecommunication, Mobile technology. That's facilities are not possible without server and DNS. It's one of them. Today, banking industry, transports, and other business organization totally depends upon different types of Software and Online Technology and Server is very essential.

ATM Technology (Switching Software), Banking Software, Debit Card, Credit Card, Online Transaction etc. are very much depends upon Software and different types of Server, Linux is one of them. It has developed as an operating system for business, education and personal productivity.

1.2 Motivation:

I am currently pursuing my Bachelor in Computer Science Engineering at Daffodil International University. I understand the importance of practical knowledge which is full of knowledge of textbooks and life problem solving. My dream is to establish me as a network security expert. And I enjoyed that networking job very much. During the internship I found that the details of Linux network and server management and MikroTik details are not fully efficient.

As an Internet service provider I've got my points across very well, to communicate with people to understand their needs and to provide them better services. My skills remain in my ability to read and understand the situation and to work quickly and still beautiful. I also saw the work of the server and its responsibility. I think that my work will make me more successful in my life.

1.3 Internship Objectives:

Ultimate objective of my internship program is to prepare myself as an eligible one in the competitive job market. So this is very effective of skill development. I would like to gather some extraordinary quality to provide myself as skilled one, and make my dream true.

The internship in computer science is designed to provide work experience while students are still in school & collage, to coordinate job experience with academic training, and to help student to make the transition from classroom to job who are self-motivated and self-directed and desire to work.

1.4 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. They are Corporate Network Solution department is capable to provide state-of-art network and telecommunication solutions with a highly efficient technical expertise group.

1.5 Report Layout

In the Chapter-1 I have described objective of internship, Motivation of internship and Introduction to the company.

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 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-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 Organization

2.1 Company Introduction:

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 makes corporate, SME and individual clients serve its own fiber optic & radio link in vague infrastructure.

The Institute works with many national projects and all related to high appreciation international organizations.

It uses latest technology and services wherever it is needed to upgrade.

Center is able to provide state-of-the-art network and telecommunications solutions with a group of highly skilled technical experts in the Corporate Network Solutions division.

DOL is a very strong professional engineering and management team certified and will be associated with Sun, Cisco, Microsoft, Linux, and Oracle and is actively involved with the world's leading computing association, including IEEE-ACM, ACS, BCS, and PMI.

Its Corporate Social Responsibility strengthens the sense of responsibility on Community, Workstation, Location and Market place. As a Group concern, DOL promotes 3 major platforms education, nation-building and environment, through its programs and services.

2.2 Services and Market Situation:

Daffodil Online Limited is the leading countrywide Internet Service Provider (ISP) pride itself as one of the Bangladesh. They are the most experienced and oldest organizations in the ICT field where they are the main business policies, with long-term relationships. They look forward to growth in a decade from our beginning, they are highly proud of what we have achieved, and even more excited about our outlook for an equally promising future. Daffodil Online Limited offers various IT services and professional training services. This is given below.

IT Services

- Corporate Internet Solution
- 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.
- Data Connectivity, Data center& Co-Location.
- Bulk SMS Service.
- Proxy & DNS Server solution, Mail Server Solution.
- And All computer accessories
- Professional course and trainings.

Professional Training Services

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

2.3 SWOT Analysis

SWOT analysis, and a useful technique for understanding your strengths and weaknesses for both the opportunities you face and the threats you face.

Strengths:

- Communication between people separated by distance.
- Working from home with ease.
- Setting up an online business.
- Gathering information.

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.

Opportunities:

- Age structure of the population changing.
- Number of households in the Bangladesh increasing.
- Introduction of simpler tariffs.
- Revision of regulatory framework.

Threats:

- The Economic Crisis - Householders less likely to increase them.
Broadband subscriptions Stock Market's lack of confidence in the digital-communications market.
- It remains to be seen how far consumers can be persuaded to embrace Internet access.

2.4 Target Group

The company's customer base, includes all the consumers and all small to medium sized businesses. The company is planning to focus on SOHO clients, because it has the best growth prospects for our new high-resolution proposal and the

maximum growth potential for the company. if company takes right step and focusing customer services then it growth sequence. Web Solutions believes that this market segment has special price and service needs, and create more dedicated, reliable customers. so that it's very important for each.

2.5 Organizational Structure: Organizational Structure of Daffodil Online Ltd.

Shown below in figure.



Figure 2.4 Shows Organogram of Daffodil Online Limited

CHAPTER 3

Projects, Tasks 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.
- Mount Unmounts 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.
- Network cabling systems
- Routing protocols

Month – 4: The last month of internship on daffodil online limited I have learned and performed the following tasks:

- Learning, understanding and configuring FTP Server.
- Learning, understanding and configuring WEB Server.
- Learning, understanding and configuring NFS Server.
- Learning, understanding and configuring Mail Server.
- Learning, understanding and configuring DNS Server.
- Learning, understanding and configuring SAMBA Server.
- Remote Login Service.
- Firewall.
- Backup and Monitoring

3.2 Events and Activities

- Monitor and Maintain Computer Systems and Network.
- Setting up user accounts, permissions and passwords.
- Troubleshooting servers and routers.
- Troubleshooting local area networks and switches.
- Fixing network faults.
- Technical support for people using the network.
- Day to day admin and monitoring of network use.
- Checking Fiber Optical Media Convertor & Fiber Optic Transmission devices.

Project Task and Activities:

3.3 Linux:

Linux is a family of free and open-source software operating systems built around the Linux kernel. Typically, Linux is packaged in a form known as a Linux distribution for both desktop and server use. The defining component of a Linux

distribution is the Linux kernel, an operating system kernel first released on September 17, 1991, by Linus Torvalds.

Linux is popular for its some characteristic. It is an open source operating system. Different operating systems offer different benefits. Operating Systems like Microsoft Windows and Mac OS operating system assemble different software's that is managed on our computer.

.So the big question here is that Windows 10 does everything so why would I be using Linux on my computer operating system? There are some key differences in other operating systems. Windows and Mac operating systems are Linux open source software, which can basically change the operating system, if you do not distribute the waves, by all means, you want to find out the version of Linux for all your operating systems like Windows, Mac OS and I believe in distributing it there. If you just need to fine if you have anything to know about what you are about if you are very little champion with English. It's have lot of facility to other. 1st security, space management, driver disk, hard, disk server facilities is more given by other. Most of the think to this Linux server is obtain low budget and maintains cost. Mostly that purpose Bangladesh ISP and other organization deathly like Linux server. So I think every computer engineer must be known Linux operating system and server.

3.4 Creating Linux Partition:

In Linux operating system is more impotent thing is creating partition. I think that this partition is mainly divide two parts. (1) Installation part (2) Disk partition
In installation part, Linux have to create at least 3 major partitions.

1. root (/). 2. /boot. 3. Swap.

- **Root Partition: /**

A Root Partition is defining where have or see “/”. The root directory is located all files (except in /boot) are on the root partition. Minimum 128mb RAM & 2 GB HDD Space Required. I use as my work station is 1024mb RAM and 80 GB HDD.

- **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. For this the actual is 137.1 MB.

- **Swap Partition: swap**

The partitions swap is used to support virtual memory. 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 less than 32 MB. A swap partition of 2 GB to 4 GB and a root partition that is a minimum of 10 GB. Root partition should of about 20-30 gab, swap partition of about 8gb and home partition of about 20-30gb.

Disk partition:

Disk partition part is mainly depending on two type. Partitioning divides a disk drive into one or more logical disks. Each partition is treated as a separate disk with its own file system. Partition information is stored in a partition table.

1. Primary Partitions

2. Extended Partitions

The original partitioning scheme for PC hard disks allowed only four partitions, called primary partitions. To create more than four partitions, one of these four

partitions can be divided into many smaller partitions, called logical partitions. When a primary partition is subdivided in this way, it is known as an extended partition. The fdisk utility is a common partition table manipulator for Linux. Command 'fdisk /dev/sdb' is used to start the partition and Use 'fdisk -l' to list the partition table. And it will be modified.

3.5 Setup Linux in VMware:

VMware is that interface which is used to make an environment to using Linux operating system and create server in windows. That is virtually, for practices. In that process 1st need a VMware software, and operating system.

In that. IOS we use many name and many installing process. But we use here centos, because it's familiar to other and if we work on it then we can work other.

And it's also help to vendor exam.

So at fist install VMware workstation in desktop. Then click create a new virtual machine.

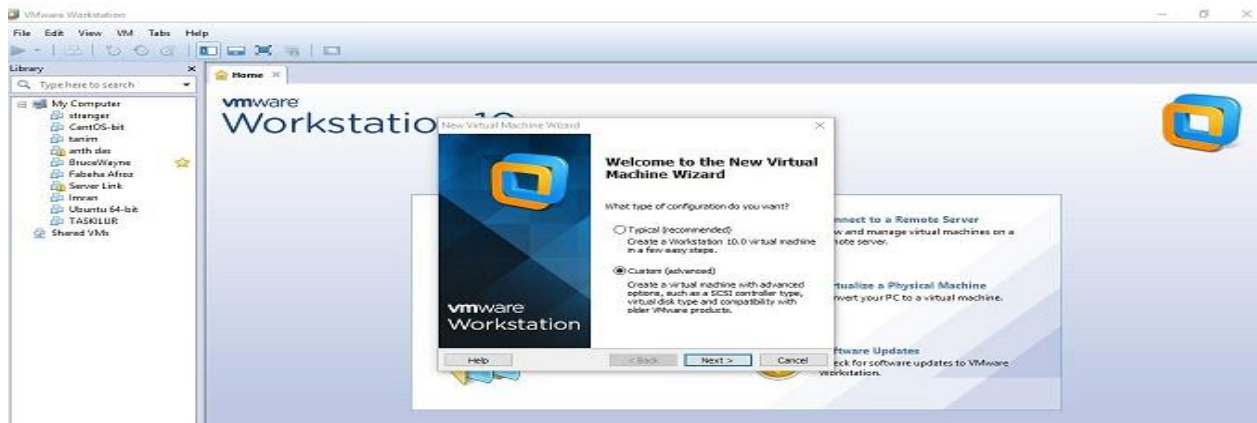


Figure 3.5.1: Shows Screen Print to choose configuration type.

Here we take two type of installation. We can take any other but I take customs, because it is advanced an. I can create may machine as me prefers. Then next,



Figure 3.5.2: Shows Screen Print to add OS location.

Then select operating system and version, that is very important to choose. Because it depends on pc configuration a storage OS. Selecting then next step;



Figure 3.5.3: Shows Screen Print to selecting OS & version.

Here we see 4 option. That is tell what kind of network do. I add. Bridge network, for the gust operating system direct access Ethernet net work.it must have own ip address. 2nd is NAT. NAT access to the dial-up and external connection using ip address. 3rd is use host only, its gives networking access between a private virtual network in host computer, and 4th is do not use net connection. We also try to use 1st and 4th. I use 4th. Then select which controller I like. Here given 3 option. We use LSI logic. And choose disk type which I use. Here selecting I/O controller type. And three disk type here IDE, SCSI, and SATA. I take SATA.



Figure 3.5.4: Shows Screen Print to selecting I/O controller type

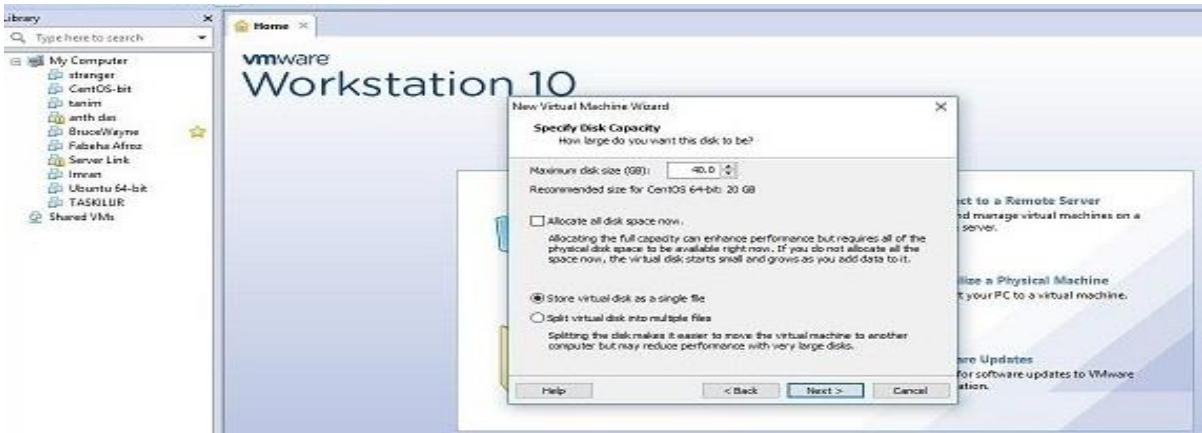


Figure 3.5.5: Shows Screen Print to giving hard disk space for storage.

Given the size of HHD of virtual machine. Select the disk storage file system select disk into multiple file. That's is totally user requirement. Then go next steps;

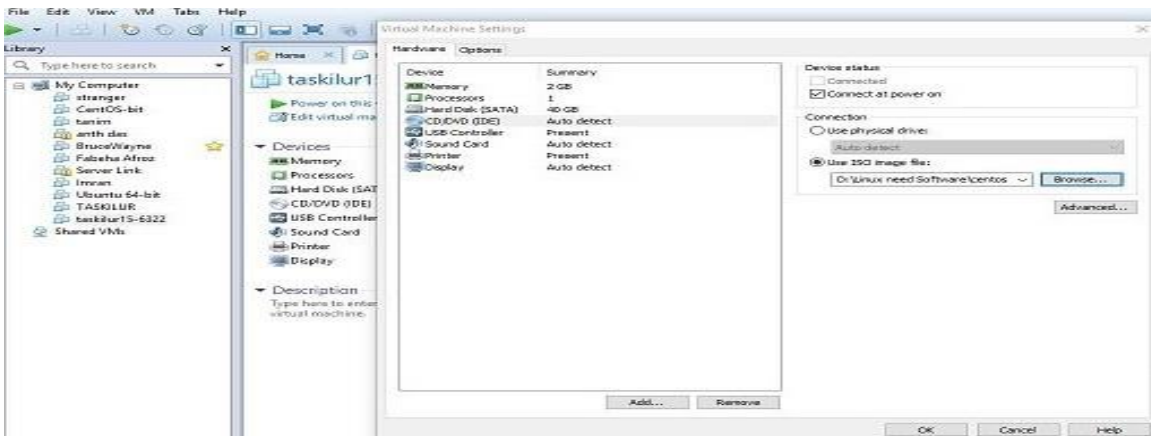


Figure 3.5.6: Shows Screen Print to loading OS in CD/DVD.

Now choose the language as own preferences. I select English. And then select disk partitions type and go to next by clicking next button.



Figure 3.5.7: Shows Screen Print to choosing languages.



Figure 3.5.8: Shows Screen Print to installation OS.

After complete installation then i get a new GUI an my VMware of Linux OS .

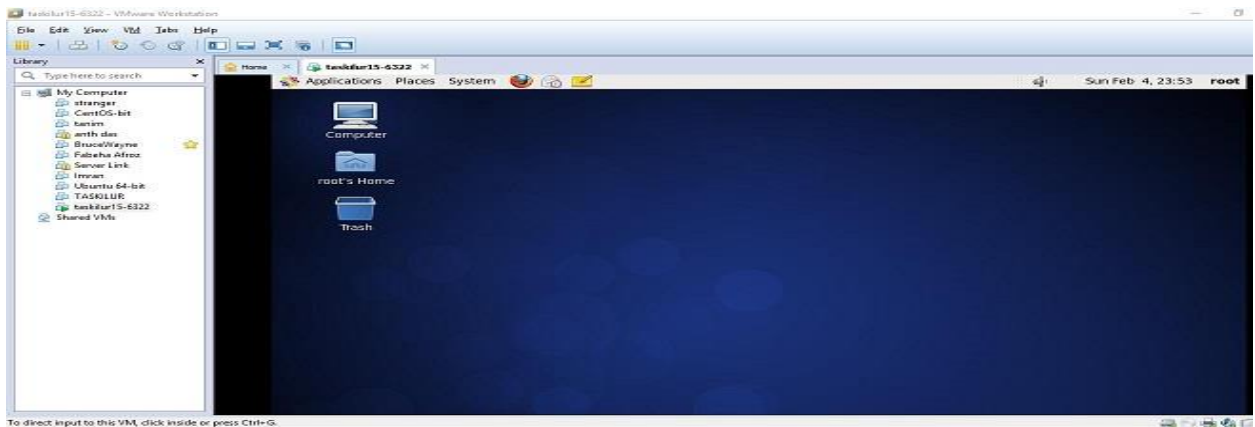


Figure 3.5.9: Shows Screen Print to GUI of Linux OS.

3.6 Linux Run-Level Used by Centos

This run level command is most useful in Linux. Using that command user can break password for root, and any user. Or user can access without password. This command is mainly used solve error. When a Linux system crush, it also show the error, if user can find out that problem, then it will repair Single User Mode.

init 0 = Shut Down.

init 1 = Single User Mode.

init 2 = Multi User Mode. Without NFS

init 3 = Full Multi User Mode. With NFS

init 4 = Unused.

init 5 = X-11, Window GUI Mode

init 6 = Reboot.

3.7 The Basic Command of Linux Centos

Here some basic command to use Linux. That file use where how details there.

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 2017, cal 28 1993

Display or change date or time = date.

Present Working Directory = pwd.

Create a blank file = touch tas1 (File name).

Create a directory = mkdir sweet1 (directory name).

List information about file = ls tas1

Change Working Directory = cd /root/Desktop (directory path).

3.8 User Create and Password Management

Adding a user = useradd sweet57 (username).

Set a Password to New User = sweet123 (username).

Password Disable/Remove = passwd -d sweet57 (username).

Delete a user = userdel sweet57 (username).

Delete a user with home directory = userdel -r 6322(username).

3.9 How to create file, directory, Add user, Delete user, And file permission In Centos:

Create a directory = `mkdir file name (sweet1)`

Create a file = `touch file name (tas1)`

To see the figure to create a directory and file.

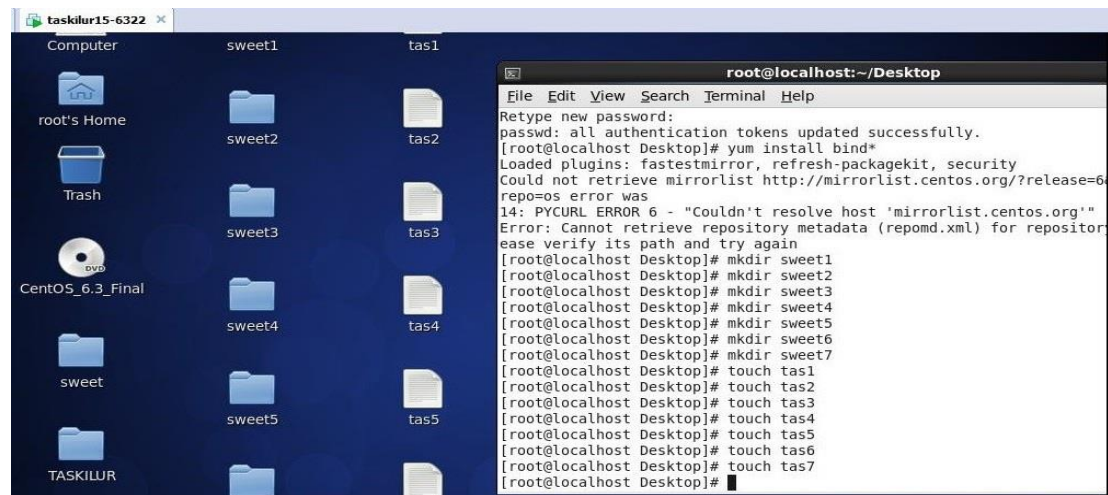


Figure 3.9.1: Shows Screen Print to create a directory and file.

To see the figure to create a user and password;

Adding a user = `useradd username (taskin)`

Set a Password to New User = `passwd username (taskin)`

New password: sweet123

Password Disable/Remove = `passwd -d username (taskin)`.

Delete a user = `userdel username (taskin)`.

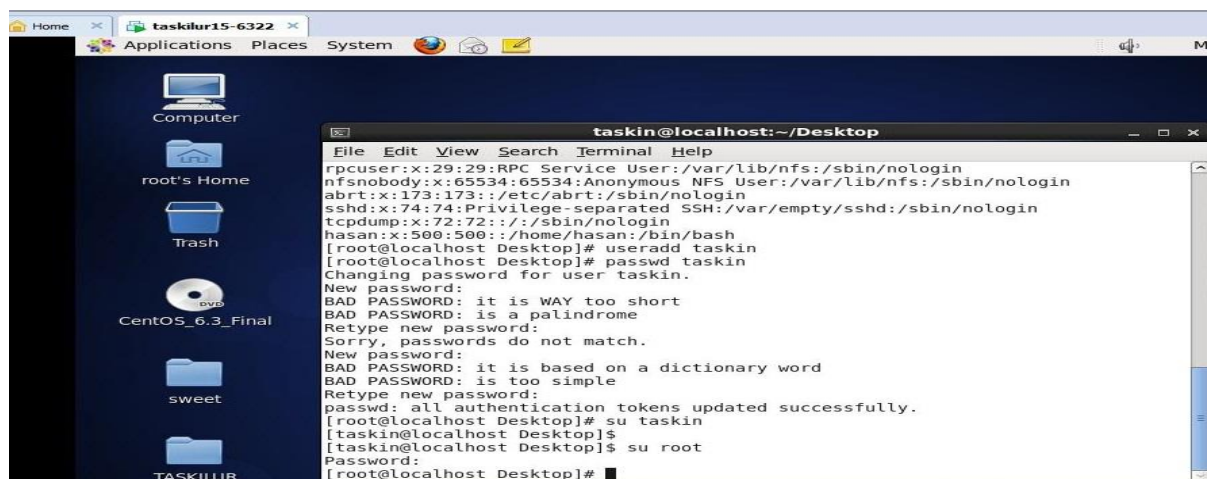


Figure 3.9.2: Shows Screen Print to create or delete a user.

To see the figure to directory file permission for different user. Here i set that what user are perfume what action in each file. Here have 3 major action. There are read write and execute. That think is doing for ownership management of a file.

```

root@localhost:~/File ppermission
File Edit View Search Terminal Help
[root@localhost ~]# ls
6322 Documents install.log Pictures Videos
anaconda-ks.cfg Downloads install.log.syslog Public
Desktop file permission Music Templates
[root@localhost ~]# cd file permission
bash: cd: file: No such file or directory
[root@localhost ~]# cd " file permission"
bash: cd: file permission: No such file or directory
[root@localhost ~]# mkdir "File ppermission"
[root@localhost ~]# ls
6322 Documents File ppermission Music Templates
anaconda-ks.cfg Downloads install.log Pictures Videos
Desktop file permission install.log.syslog Public
[root@localhost ~]# cd "File ppermission"
[root@localhost File ppermission]# mkdir Test
[root@localhost File ppermission]# Touch File
bash: Touch: command not found
[root@localhost File ppermission]# touch file
[root@localhost File ppermission]# ls
file Test
[root@localhost File ppermission]# ls-la
bash: ls-la: command not found
[root@localhost File ppermission]# Ls-La
bash: Ls-La: command not found
[root@localhost File ppermission]# ls - la
ls: cannot access -: No such file or directory
ls: cannot access la: No such file or directory
[root@localhost File ppermission]# ls -la
total 12
drwxr-xr-x  3 root root 4096 Feb  5 23:29

```

Figure 3.9.3: Shows Screen Print to create & show file

```

root@localhost:~/File ppermission
File Edit View Search Terminal Help
bash: Ls-La: command not found
[root@localhost File ppermission]# ls - la
ls: cannot access -: No such file or directory
ls: cannot access la: No such file or directory
[root@localhost File ppermission]# ls -la
total 12
drwxr-xr-x  3 root root 4096 Feb  5 23:29 .
dr-xr-x---  29 root root 4096 Feb  5 23:27 ..
-rw-r--r--  1 root root   0 Feb  5 23:29 file
drwxr-xr-x  2 root root 4096 Feb  5 23:28 Test
[root@localhost File ppermission]# ls -l
total 4
-rw-r--r--  1 root root   0 Feb  5 23:29 file
drwxr-xr-x  2 root root 4096 Feb  5 23:28 Test
[root@localhost File ppermission]# drwxr-xr-x. 2 root root 4096 Feb 5 23:28 test
bash: drwxr-xr-x.: command not found
[root@localhost File ppermission]# drwxr-xr-x. 2 root root 4096 Feb 5 23:28
bash: drwxr-xr-x.: command not found
[root@localhost File ppermission]# chmod 700 Test
[root@localhost File ppermission]# ls -l
total 4
-rw-r--r--  1 root root   0 Feb  5 23:29 file
drwx-----  2 root root 4096 Feb  5 23:28 Test
[root@localhost File ppermission]# chmod 755 Test
[root@localhost File ppermission]# ls -l
total 4
-rw-r--r--  1 root root   0 Feb  5 23:29 file
drwxr-xr-x  2 root root 4096 Feb  5 23:28 Test

```

Figure 3.9.4: Shows Screen Print to giving permission for user

3.10 How to Add Change Delete and Display IP Address in Centos

It takes two ways to change to add or delete ip address. First we see ip and gateway, for loopback and each Ethernet port you have. Here I show that in minimal mode and show each steps. 1st see the Ethernet port and ip, mask. Then go to next steps. And chose any Ethernet port you have. And enter that port.

To see the figure to enable Ethernet port. Here sees enable Ethernet port is enable. And entering port eth0.

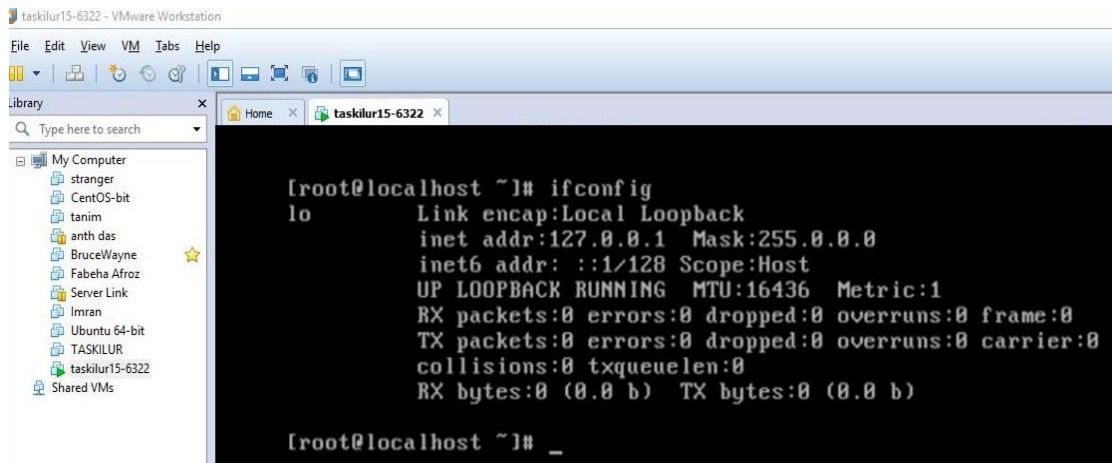


Figure 3.10.1: Shows Screen Print to see enable port

Now write vi command to entering to the Ethernet port to here detail to eth0.

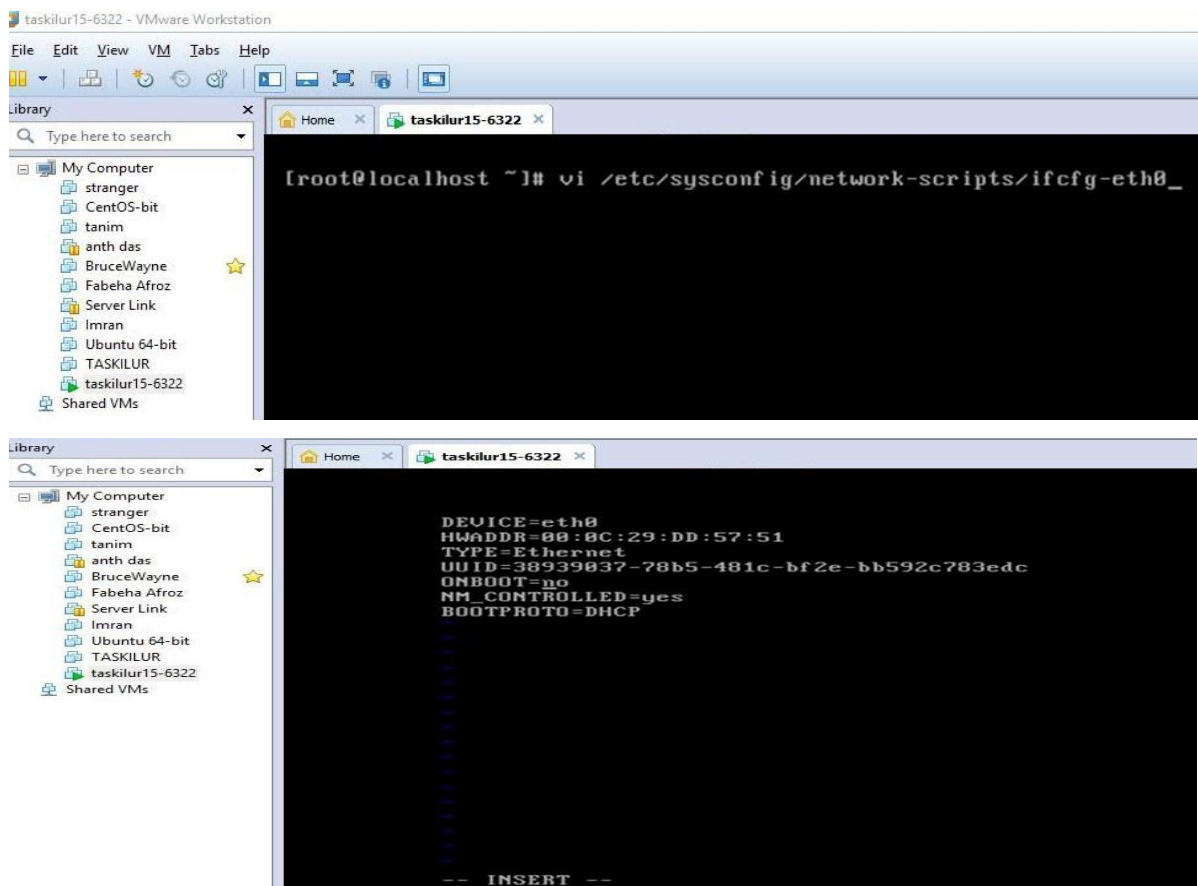
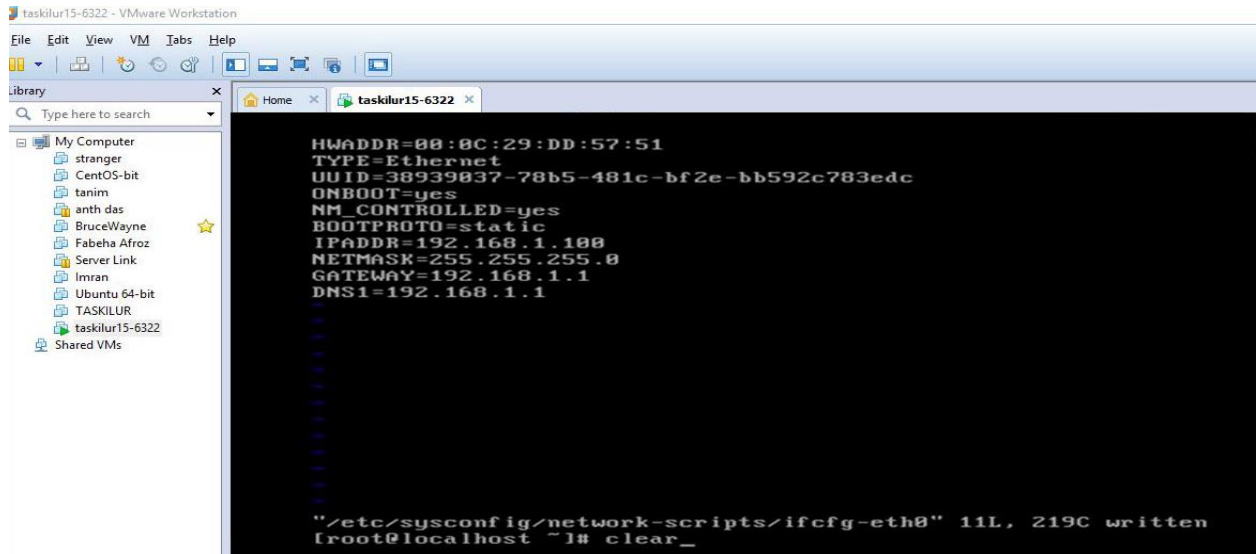


Figure 3.10.2: Shows Screen Print to entering port eth0.

To see the figure to here details to eth0. Now i changing here something to changing ip address. Change on boot status, boot port, giving new ip address, subnet mask, getway, and DNS. After given that, then write clear then press enter.



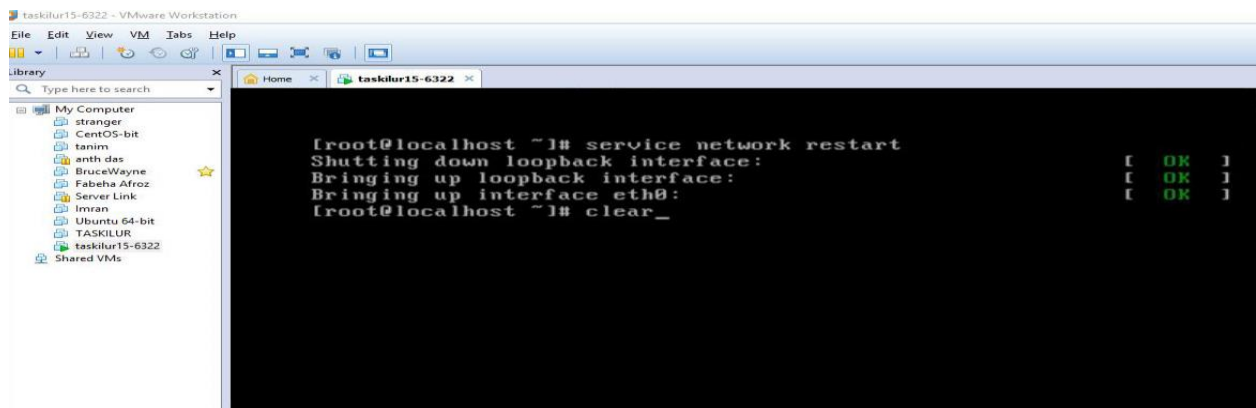
```
taskilur15-6322 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
stranger
CentOS-bit
tanim
anth das
BruceWayne
Fabeha Afroz
Server Link
Imran
Ubuntu 64-bit
TASKILUR
taskilur15-6322
Shared VMs

HWADDR=08:0C:29:DD:57:51
TYPE=Ethernet
UUID=38939837-78b5-481c-bf2e-bb592c783edc
ONBOOT=yes
NM_CONTROLLED=yes
BOOTPROTO=static
IPADDR=192.168.1.100
NETMASK=255.255.255.0
GATEWAY=192.168.1.1
DNS1=192.168.1.1

"/etc/sysconfig/network-scripts/ifcfg-eth0" 11L, 219C written
[root@localhost ~]# clear_
```

Figure 3.10.3: Shows Screen Print to setting ip, Mask, Network, Getaway, and DNS.

To see the figure to given new ip address and others



```
taskilur15-6322 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
stranger
CentOS-bit
tanim
anth das
BruceWayne
Fabeha Afroz
Server Link
Imran
Ubuntu 64-bit
TASKILUR
taskilur15-6322
Shared VMs

[root@localhost ~]# service network restart
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: [ OK ]
[root@localhost ~]# clear_
```

Figure 3.10.4: Shows Screen Print to restart the network

To see the figure to restart the network and reboot the system. Then we can see new ip address. Now ping any web address to assure to working of the network.

To see the figure to ping Google.com to see that.

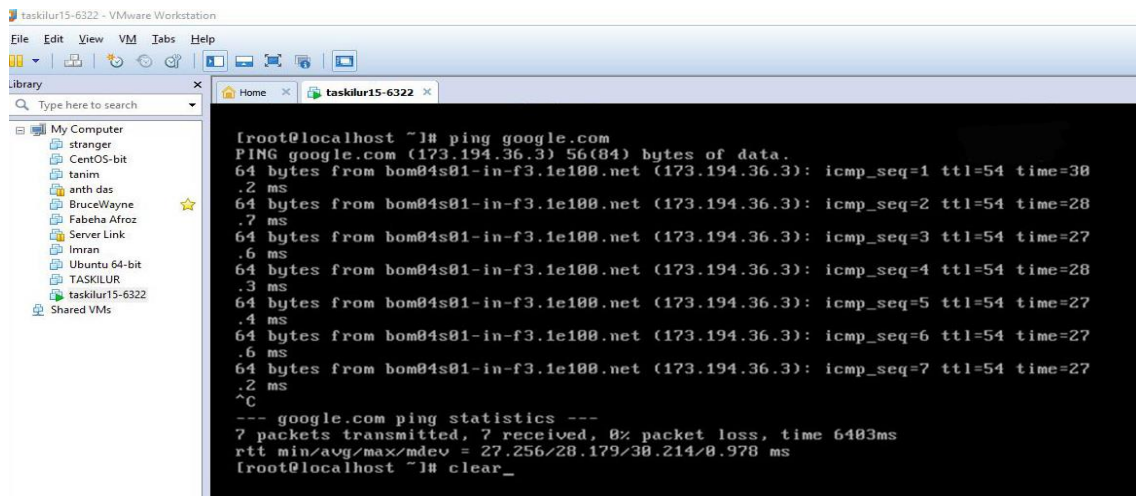


Figure 3.10.5: Shows Screen Print to ping Google.

3.11 Server Configuration:

Server configuration is the most important part in networking system. In that process it takes whole thing to managing the network system to any management and data center system. This process assures the all controlling of user uses, and security. In Internet Service Provider [ISP] the Server Configuration is very important purpose. Different company create their own server to different way and operating system. Many servers contain in Linux Operating System. Within Those Server are FTP server, NFS server, MAIL server, WEB server, DNS server, DHCP server, SAMBA server Internet Service Provider [ISP] can be configured. So the using of a network and storing data, server must be need and important. That purpose a good server configuration one of the important need to networking.

3.12 FTP Server

FTP (File Transfer Protocol)

The FTP server that has a file transfer protocol (FTP) address and has a dedicated computer to get an FTP connection. TCP / IP networks are required for FTP server functionality and dependent on the use of dedicated servers with one or more FTP clients.

In that day that sever using increase. User also like to use it. The connection can always be determined from the client; an FTP server is usually launched.

The FTP server is known as an FTP site. In order to ensure that FTP protocols are widely used in transport and large files are received, network switches and router have been used to send configuration files and software updates. Use that port for communication and also use encrypt. Now FTP users today is heavily used to share file and other ISP websites.

We can create a FTP server two major way.1st using command in Linux server.2nd is use MikroTik router. Here I create a FTP server using Linux command.

Configuring FTP Server Step by Step

Package Name: VSFTPD

Default Port:

- 20 (Port 20 – This is the data transfer port. All the all subsequent data transfers between the client and server are done using this port.)
- 21 (Port 21 – On this port control connection is established. All commands we send and the ftp server's responses to those commands will go over the control connection, but any data sent back will go over the data connection.)

Installing FTP server in Centos

Install vsftpd (very secure FTP daemon) package.

```
#yum install vsftpd ftp
```

Configure vsftpd package. We will edit /etc/vsftpd/vsftpd.conf you can do this with gedit (If installed) or vi command.

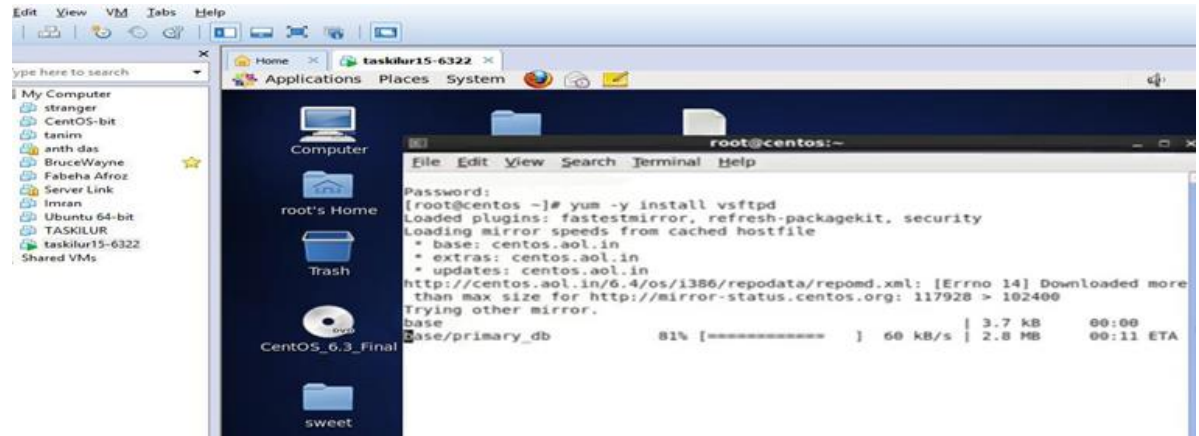


Figure 3.12.1: Shows Screen Print to install vsftpd package

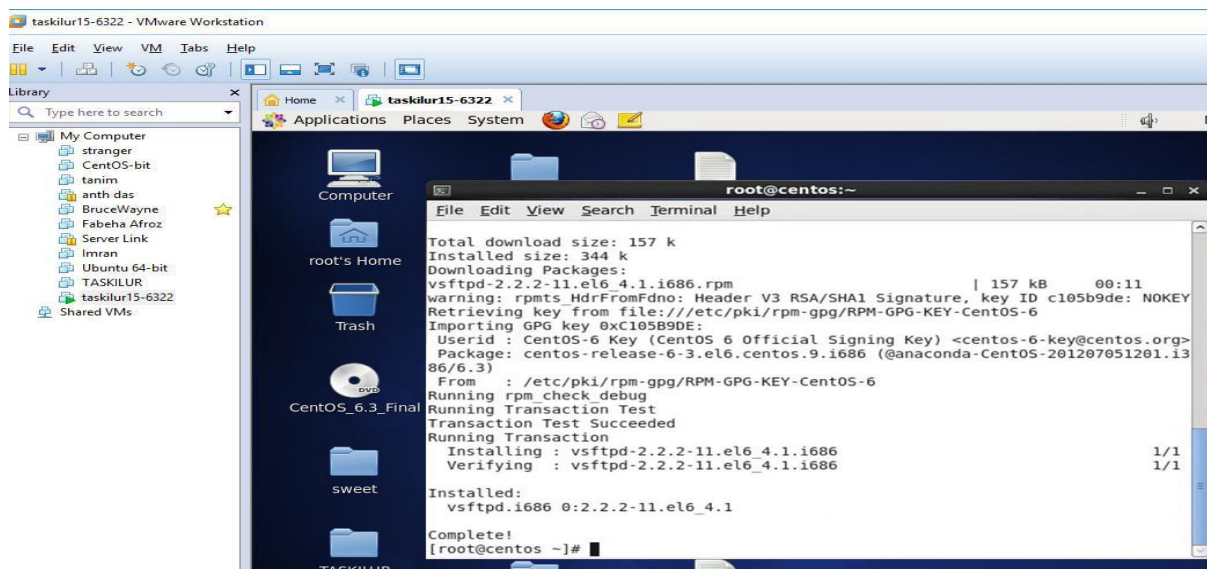


Figure 3.12.1: Shows Screen Print to install vsftpd package.

For the user configuration to enables file to configur, than need to enable to configure vsftpd package.

```
#vim /etc/vsftpd/vsftpd.conf
```

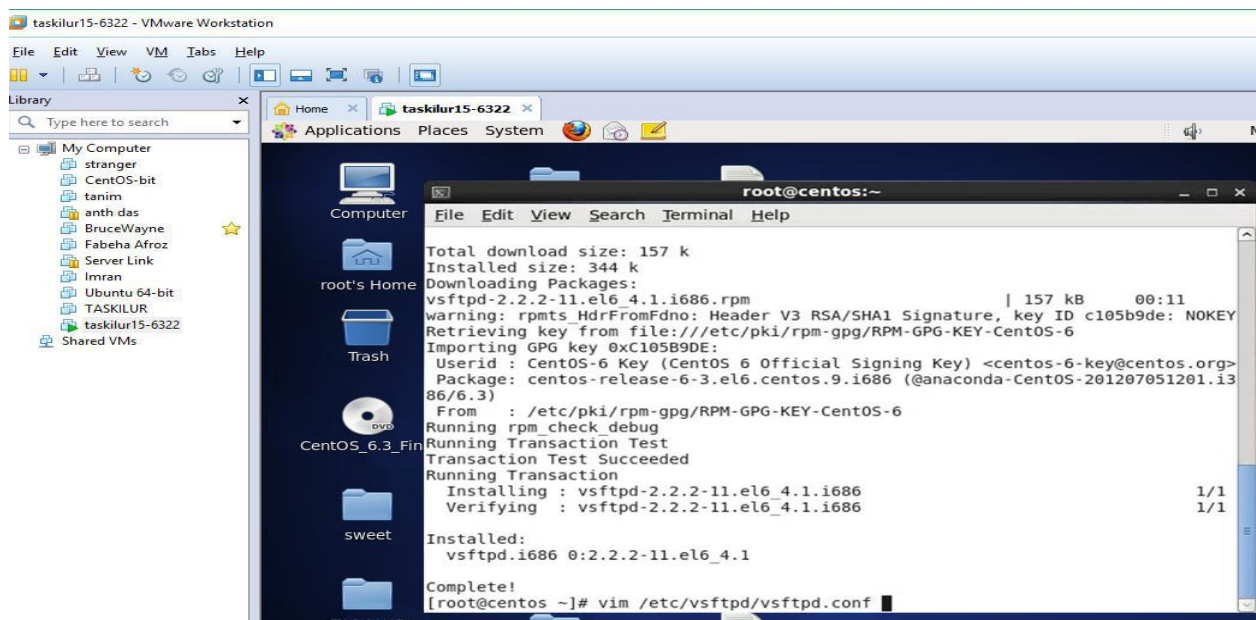


Figure 3.12.2: Shows Screen Print to enable to configuration the package.

Change the line which contain `anonymous_enable=YES` to `anonymous_enable=NO`. This will permit any one to access FTP server with authentication.

```
anonymous_enable=YES
```

Uncomment the following line

```
local_enable=YES; allow users in /etc/passwd to login
```

`write_enable=YES`; allow users to write files. `NO` will permit only to read.

Change the line `chroot_local_user=NO` to `chroot_local_user=YES`. This will permit local user as FTP account. If you add a user, it will be treated as a FTP account as well. The local user directory will be the FTP directory.

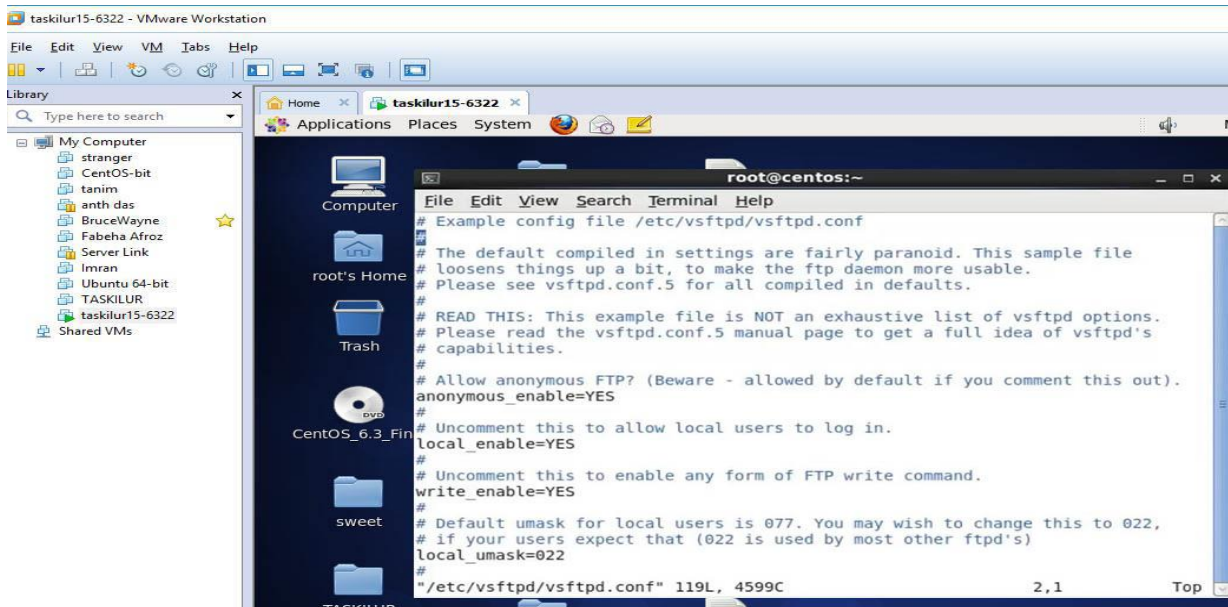


Figure 3.12.3: Shows Screen Print to configuration the package line.

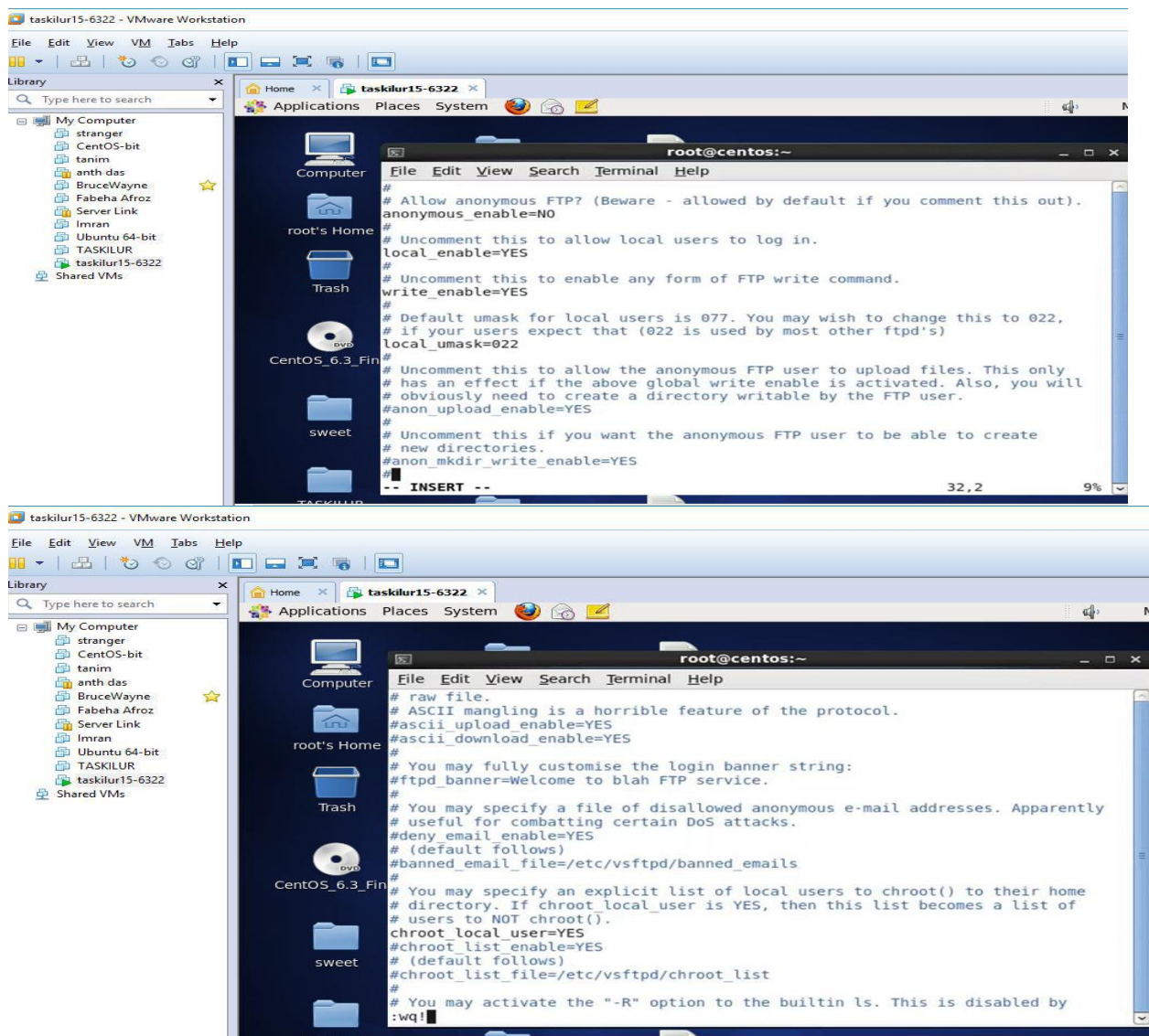


Figure 3.12.4: Shows Screen Print to configuration needed changeable line

Now creating a user and password to entering the ftp server and checking the service of vsftpd

```
# useradd -d/ftp/taskilur and # passwd taskilur
```

```
# Service vsftpd start
```

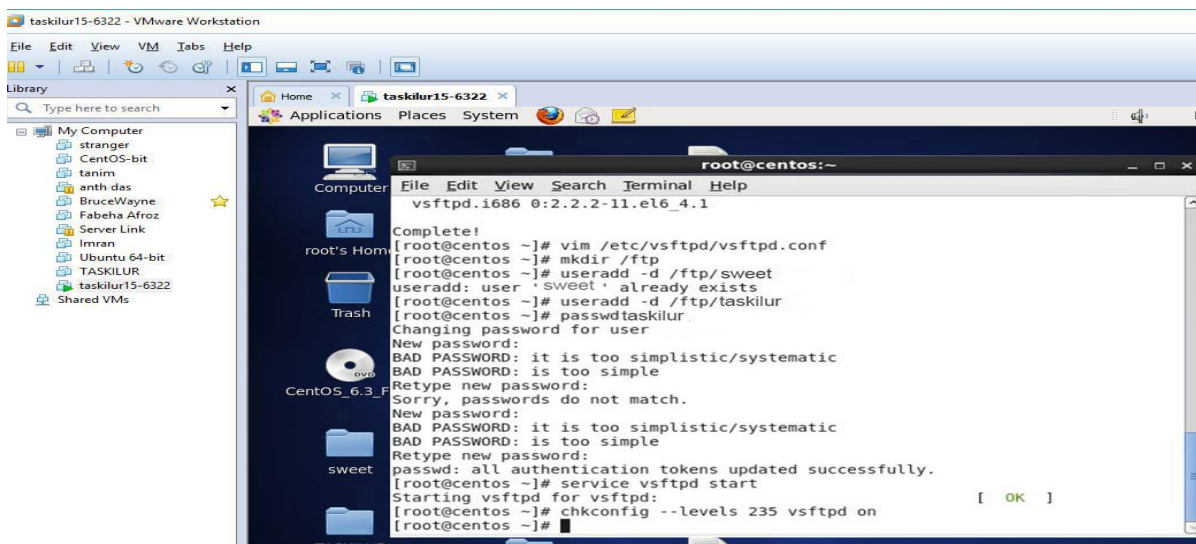


Figure 3.12.5: Shows Screen Print to added user and checking service



Figure 3.12.6: Shows Screen Print to opening browser

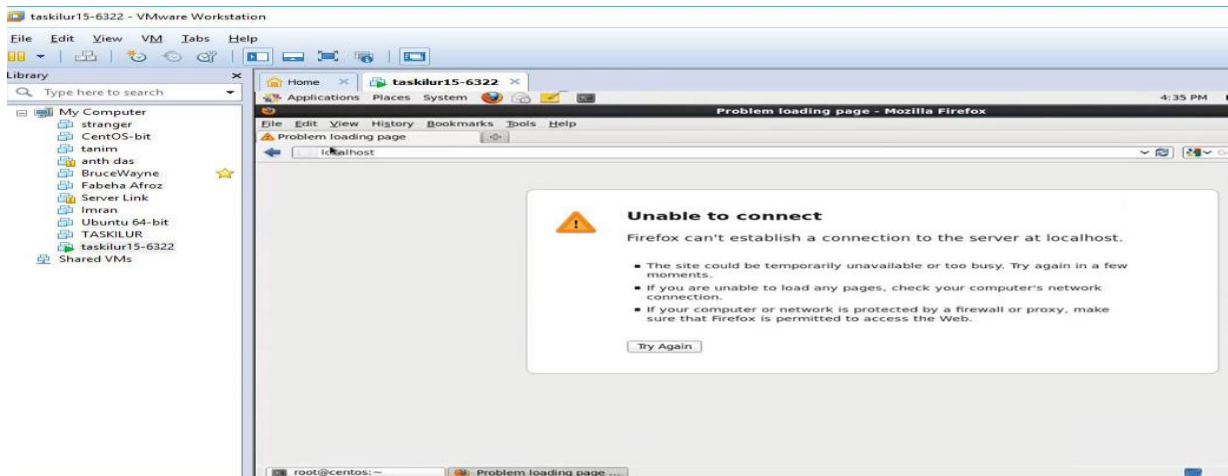


Figure 3.12.7: Shows Screen Print to entering localhost by browser

Now go to terminal and take the ip address, and put in the browser to entering .and giving username and password to entering the FTP server.

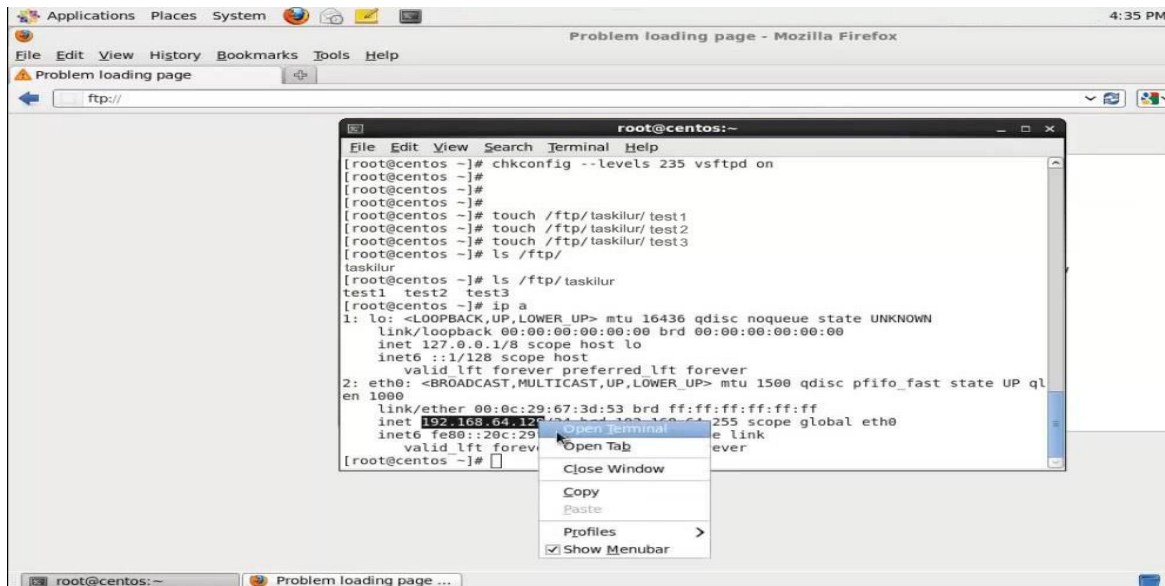


Figure 3.12.8: Shows Screen Print to take ip to enter.

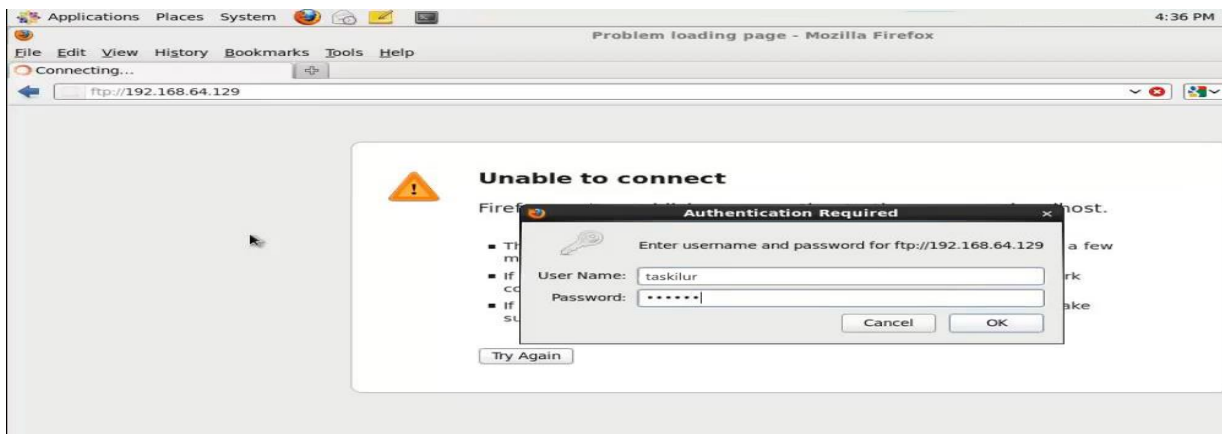


Figure 3.12.9: Shows Screen Print to given authentication of access

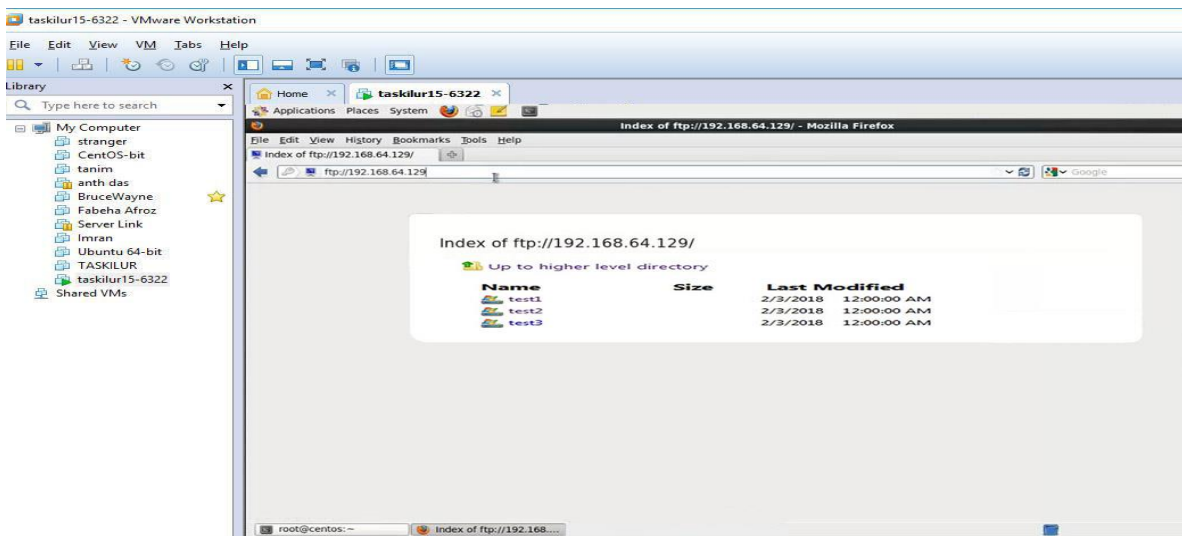


Figure 3.12.10: Shows Screen Print to directory of FTP

Some common important command for use and handling in ftp servers. That command helps to maintain and secure ftp

Enable only limited/allowed users are able to login via ftp

userlist_enable=YES

userlist_file=/etc/vsftpd.user_list

userlist_deny=NO

The file specified by `userlist_file` will now contain users that are able to login.

Set ftp banner

Open the file `/etc/vsftpd/vsftpd.conf` and set the below directive

```
ftpd_banner= "Enter New Banner Here"
```

Data transfer rate, number of clients & connections per ip:

Edit the ftp server's config file and set the below directives:

```
local_max_rate=1000000 # Maximum data transfer rate in bytes per second
```

```
max_clients=50 # Maximum number of clients that may be connected
```

```
max_per_ip=2 # Maximum connections per ip
```

Maximum number of clients that can connect at one time. If set to 0, the number of clients is unlimited.

IP Table update so that our FTP server is accessed

Edit the file `/etc/sysconfig/iptables` and add the line

```
-A INPUT -m state --state NEW -m tcp -p tcp --dport 21 -j ACCEPT
```

3.13 WEB SERVER

Apache HTTP Server is one of the most popular web servers extending around the world. Apache server support for Perl, Python, Tcl and PHP. Most popular authentication modules: cryptography (`mod_ssl`), proxy / gateway server (`mod_proxy`), URL-rewrite `mod_rewrite`, filtering support etc. Apache HTTP Server supports it.

Using Web Server

To host an organization web pages, you need to a web server. Sometimes hosting something locally more reliable and then hosted in other hosting companies is safe. The main advantage of having own web server management, there is a lot of direct control and action through traffic and encryption and there are a lot.

Virtual Hosts

Virtual hosts can serve more than one domain from on same Apache server. There are mainly two type of Apache Virtual host configuration-

1. IP based virtual host
2. Name based virtual host

Configuring Web Server Step by Step

Package Name: httpd

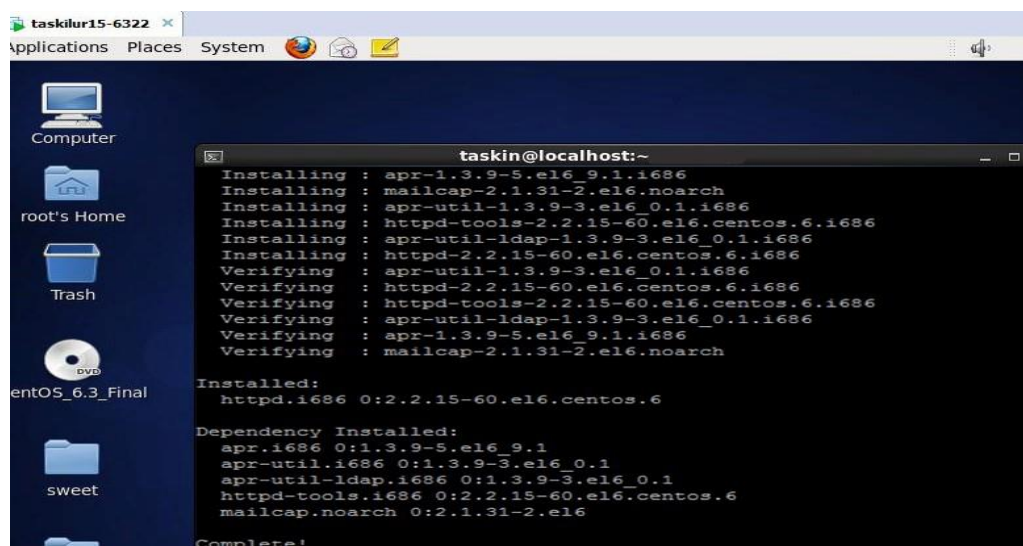
Default http port: 80

Default https port 443

Step 1: At first install a httpd package by yum install- #yum install httpd –y

And checking the services started hhttpd. and check.

Now command of #service httpd start then #chkconfig httpd on



```
taskilur15-6322 x
applications Places System
Computer
root's Home
Trash
entOS_6.3_Final
sweet
taskin@localhost:~
Installing : apr-1.3.9-5.el6_9.1.i686
Installing : mailcap-2.1.31-2.el6.noarch
Installing : apr-util-1.3.9-3.el6_0.1.i686
Installing : httpd-tools-2.2.15-60.el6.centos.6.i686
Installing : apr-util-ldap-1.3.9-3.el6_0.1.i686
Installing : httpd-2.2.15-60.el6.centos.6.i686
Verifying  : apr-util-1.3.9-3.el6_0.1.i686
Verifying  : httpd-2.2.15-60.el6.centos.6.i686
Verifying  : httpd-tools-2.2.15-60.el6.centos.6.i686
Verifying  : apr-util-ldap-1.3.9-3.el6_0.1.i686
Verifying  : apr-1.3.9-5.el6_9.1.i686
Verifying  : mailcap-2.1.31-2.el6.noarch

Installed:
httpd.i686 0:2.2.15-60.el6.centos.6

Dependency Installed:
apr.i686 0:1.3.9-5.el6_9.1
apr-util.i686 0:1.3.9-3.el6_0.1
apr-util-ldap.i686 0:1.3.9-3.el6_0.1
httpd-tools.i686 0:2.2.15-60.el6.centos.6
mailcap.noarch 0:2.1.31-2.el6

Complete!
```

Figure 3.13.1: Shows Screen Print to installation httpd package

Step 3: Now default location and this command is `#cd/var/www/html`
then creating a Static Site command is `#vim index.html`

```
taskin@localhost:~
[root@localhost sweetdol.com] # vi index.html
<html>
<div style="background:white url(http://www.html.am/images/backgrounds/background-image-2.gif) repeat fixed;border:1px solid black;width:900px;height3000px;font-size:18px;">
<body bgcolor="FFFFFF" text="FF0000">
<p style="text-align:center;">
WELCOME TO MY WEBPAGE</p>
<h2>Name: MD. TASKILUR RAHMAN </h2>
<h2> Daffodil International University </h2>
</dev>
</body>
</html>
```

Figure 3.13.2: Shows Screen Print create static sites and write something

Step 4: Now use file location this command is `#cd /etc/httpd/conf`

Then vim configures file location and this command is `#vim httpd.conf`.

```
taskin@localhost:~
[root@localhost~] # vi /etc/httpd/conf/httpd.conf
#
# VirtualHost sweetdol :
# Almost any Apache directive may go into a VirtualHost container.
# The first VirtualHost section is used for requests without a known
# server name.
#
#<VirtualHost *:80>
#   ServerAdmin webmaster@dummy-host.sweetdol.com
#   DocumentRoot /www/docs/dummy-host.sweetdol.com
#   ServerName dummy-host.sweetdol.com
#   ErrorLog logs/dummy-host.sweetdol.com-error_log
#   CustomLog logs/dummy-host.sweetdol.com-access_log common
#</VirtualHost>
#my configuration
<VirtualHost *:80>
#   ServerName www.sweetdol.com
#   DocumentRoot /var/www/html/sweetdol.com
#   ServerAdmin root@sweetdol.com
#   ErrorLog logs/sweetdol.com-error_log
#   CustomLog logs/sweetdol.com-access_log common
#   DirectoryIndex index.html
#</VirtualHost>
```

Figure 3.13.3: Shows Screen Print to configuration sites name or ip

Step 5: At last open browser and write **http://192.168.0.22** and show my web page.

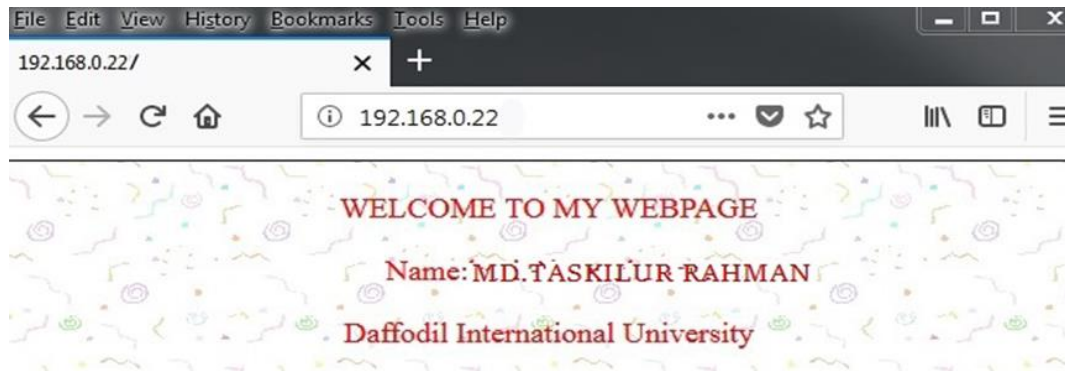


Figure 3.13.4: Shows Screen Print for the web page

3.14 SAMBA SERVER

Samba is a popular free program that allows end users to access, and to use company intranets or files, printers, and other commonly shared resources on the Internet. Samba is often referred to as a network file system and can be installed in a variety of operating system platforms including: Linux, the most common UNIX platform, OpenVMS and OS / 2.

Client software that supports SMB / CIFS, uses the SAMA server client to send a series of requests to another computer, open a shared printer, or access other resources in the other computer in order to open the computer file. Samba servers on other computers were re-implemented to respond to each client's request, deny access to their shared files, and refuse access to resources.

Using SAMBA

Saba Server system introduced to share printers and other important files to all clients like Windows, Linux and UNIX. I've added it to samba passwords by sharing a directory using sba. This directory allows any authorized user to print or refuse access to their users' requests, information, or their shared files and resources. Microsoft's network file system is so good and more usable today. SAMABA clearly works very well with it.

Configuring Samba Server Step by Step

Configuring Samba Server Step by Step

Step 1: At first check ping google.com then installing package #yum install samba

Now package checking this command #rpm -qa | grep samba. Now package is start #service smb start #service nmb start then checking status.

Step 2: Now add two users then one to read/write permission and other user to write permission

```
#useradd -s /sbin/nologin/DOL
```

```
#useradd -s /sbin/nologin/SHARA
```

Then checking the SE Linux enable or disable this command #getenforce.

Step 3: Now I write vim editor and the command is #vim smb.conf and then go to line.

74 and edit workgroup=WORKGROUP then go to line 80 remove (;) and write IP in Network Address like as 192.168.0.1.

Then go to last line write the following command:

[SUMON] then path= /sharedir then valid users=DOL,SHARA then read only=yes

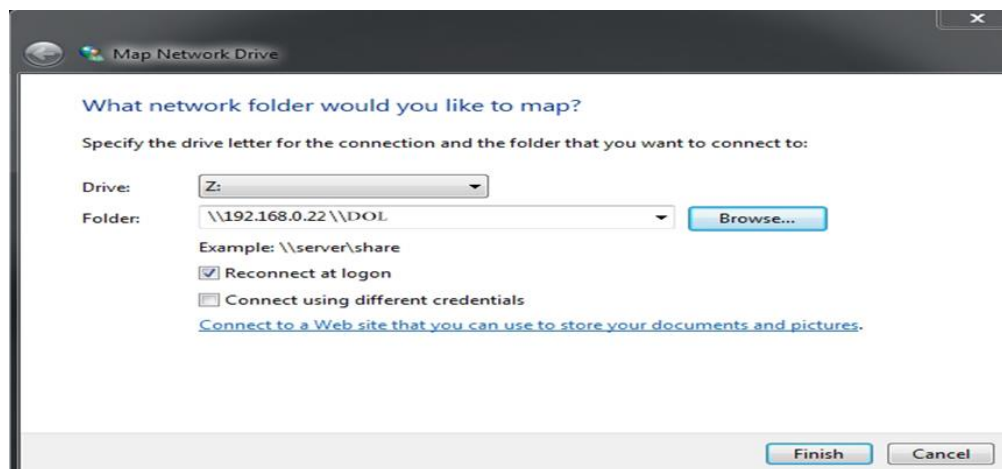
```
A publicly accessible directory, but read only, except for people in
the "staff" group
[public]
comment = Public Stuff
path = /home/samba
public = yes
writeable = yes
executable = yes
printable = no
write list = +staff

[DOL]
comment= linux samba share
path= /sharedir
valid users= DOL,SHARA
read only= yes
write list= DOL
browseable= yes[]

-- INSERT --
```

Figure 3.14.1: Shows Screen Print adding user and path

Step 4: Now #service smb restart then #service nmb restart and then go to my Computer click Map Network Drive. Then IP address then click to finish.



Then show this windows security then write user name and password.

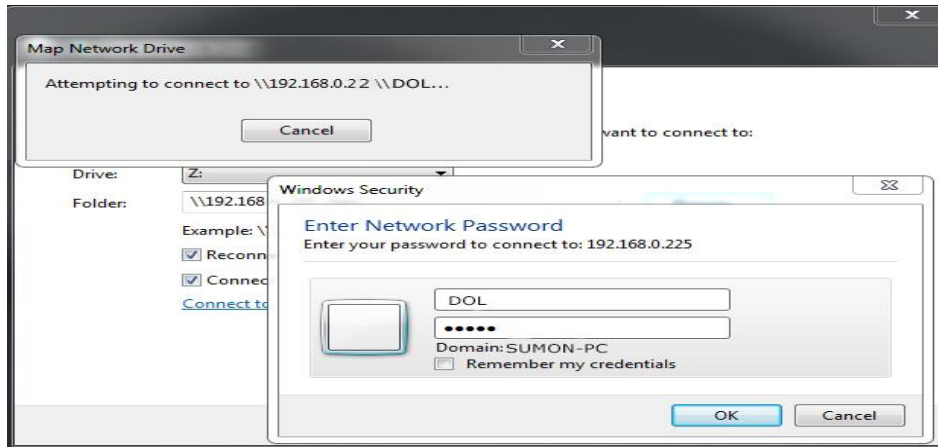


Figure 3.14.2: Shows Screen Print giving i address and enter network

Step 6: Finally completed this step and show the samba driver



Figure 3.14.3: Shows Screen Print to show diver

3.15 MikroTik Router

MikroTik is a Latvian company which was founded in 1996 to develop routers and wireless ISP systems. MikroTik now provides hardware and software for Internet connectivity in most of the countries around the world. The company's products are known for being low-priced alternatives to expensive routers and Ethernet radio relay lines. As of 2016, the company has more than 100 employees.

3.16 RouterOS & Release history

RouterOS is MikroTik's stand-alone operating system based on Linux. 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), used features when interconnecting networks. The system is also able to serve as a captive-portal-based hotspot system.

Release history

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

- RouterOS version **3**, Jan-2008
- RouterOS version **4**, Oct-2009
- RouterOS version **5**, Mar-2010
- RouterOS version **6**, May 2013

3.17 Features

RouterOS is MikroTik's stand-alone operating system based on Linux kernel. The following list shows features found in the latest RouterOS. RouterOS supports many applications used by Internet service providers.

- It can be used as a router
- Partial hardware compatibility list (user maintained)
- Switch chip configuration support
- MAC based access for initial configuration
- Android based configuration tool.
- 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
- Wireless Distribution System
- Access control list
- Wireless client roaming
- Easy GUI interface
- Easy administration
- Supports both IPv4 and IPv6
- complete list of MPLS features
- Static Label bindings for IPv4
- Label Distribution protocol for IPv4

3.18 Useable routers

A lots of router, switch, routing protocol in the network world. Difference Company and ISP are uses different router and routing protocol. That's are uses as there preferred. In Daffodil Online they are use normally Mikrotik Router Rb2011UI, Mikrotik Router RB450, CRC1016 and uses switches is Cisco switches, as like cisco 2800 series.in server station use Juniper EX-Series. And for the Wi-Fi networks here mainly used Cambium.

In Daffodil Online network diagram is very simple use a main router to take bandwidth .and that router giving this a other router. Distribution switch are take connection for them and convert that to different department, then each determent has LAN and Wi-Fi for the user.

Mikrotik Router Rb2011UiAS:

Mikrotik Router Rb2011UiAS has most features and interfaces from all our Wireless Router, it's have 600MHz 70K MIPS network processor.128 mb RAM, SFP cage, 5GB LAN ports and Ethernet ports.it has powerful dual chain 2.4Ghz 802.11 bgn Wireless. RJ45serial port and micro USB port. It is also desktop enclosure, two indoor antennas for wireless power sully and touch screen LCD panel.



Figure 3.18.1: Shows Screen Print to Mikrotik Rouret

Cloud Core Router: Cloud Core RouterCCR1016 is an industrial grade super-fast router with cutting edge 16 core CPU. If need too many millions of packets per sec so Cloud Core Router is best for that work.

In this device is available with a 1U rack mount case, has twelve Gigabit Ethernet ports, a serial console cable and a USB port. The CCR1016-12G has two SODIMM slots, by default it is shipped with 2GB of RAM, but has no memory limit in RouterOS 06 (will accept and utilize 16GB or more). It comes with power supply and 1U rack mount case. 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.



Figure 3.18.2: Shows Screen Print to Cloud Core RouterCCR1016

Cisco 2800 series: The Cisco2800 series of smart, fixed-configuration Gigabit switch provide robust switching capabilities to growing mid-size operations which need an affordable dynamic routing and Layer 3 switching solution that's built for scalability.



Figure 3.18.3: Shows Screen Print to Cisco2800 series

Juniper EX-Series: Starting in February 2017, Junos OS documentation is release independent. This means that for any given guide, you can find all of the content for all supported releases in one place.

To determine if a feature is supported by a specific platform or Junos OS release, refer to the Junos OS release notes, Feature Explorer, the new Release History tables in the documentation, and the release information in the CLI content. This documentation covers the following switches: EX3300, EX4200, EX4500, EX4550, and EX8200.



Figure 3.18.4: Shows Screen Print to the Juniper

3.19 Propose Network Diagram (MikroTik Configuration):

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 network diagram.

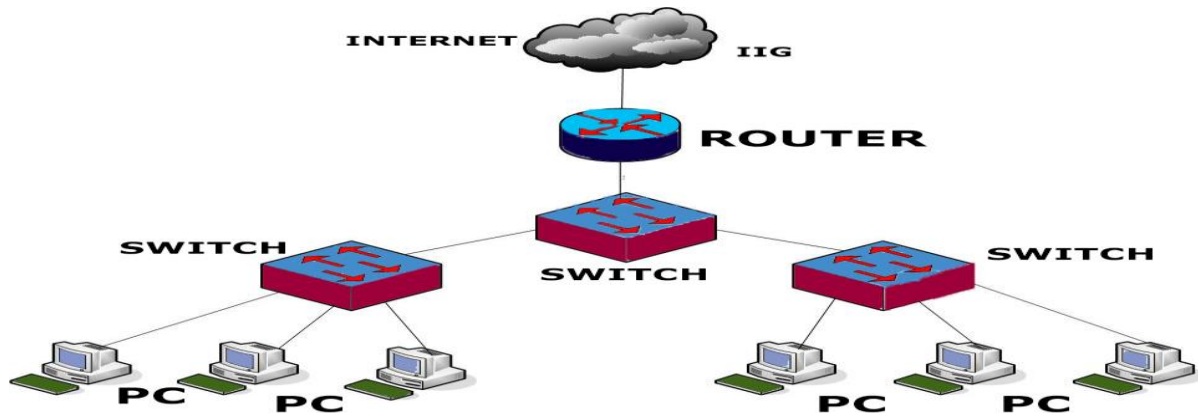


Figure 3.19.1: Shows Screen Print to network diagram

3.20 MikroTik Configuration & Initial Step:

The installation and configuration MikroTik is easy and sequentially. Router has a lot of networking services that help to build a stable and smooth network so easily. MikroTik router basic configuration includes assigning IP addresses and enabling NAT for accessing internet. MikroTik router basic configuration need Assigning WAN and LAN IP addresses, Gateway configuration, NAT configuration and DNS configuration. Her we are working two ways in this.

In Linux server we 1st set up MikroTik OS in virtual box. And then work other working Winbox for assigning WAN and LAN IP addresses.

First step to configure a MikroTik router is to assign WAN and LAN IP addresses in WAN and LAN interface accordingly. So, follow below steps to set WAN and LAN IP addresses in your new MikroTik router.

MikroTik OS Step in Linux:

MikroTik RouterOS is independent Linux-based Operating System for routers and thin routers. It does not require any additional. Here i describes the basic steps of installing and configuring a running MikroTik RouterOS.

Step1: In virtual box open a new machine and go to click next to check custom button. Then selecting option to the disk. And giving the name of machine and select next.

And giving the space for disk drive

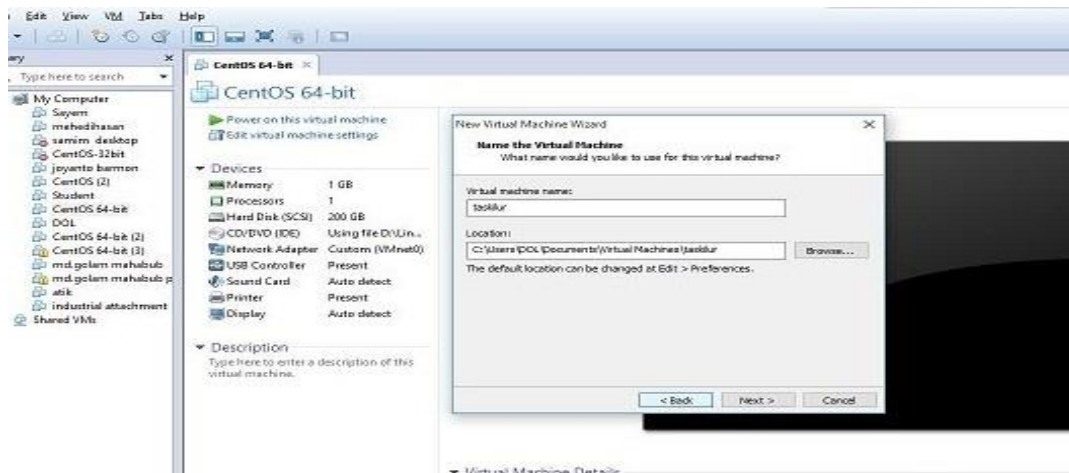


Figure 3.20.1: Shows Screen Print create a new virtual machine

Step2: After complete that go to the virtual machine setting, and add the location of storage IOS in CD/DVD. Then go to Network Adapter and add an extra network adapter. In this network adapter 1, and click the custom and choose Vmnet08 (NAT) & network adapter 2 choose Vmnet0. Then click ok to running install.

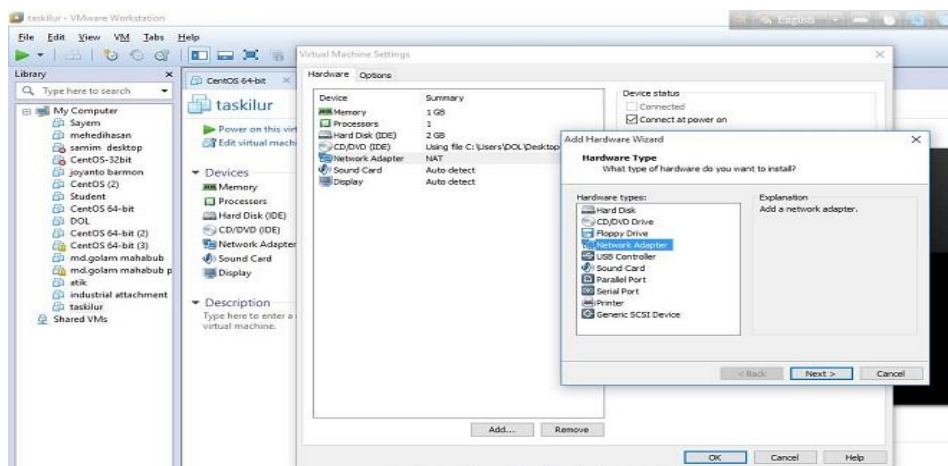


Figure 3.20.2: Shows Screen Print adding network adupter

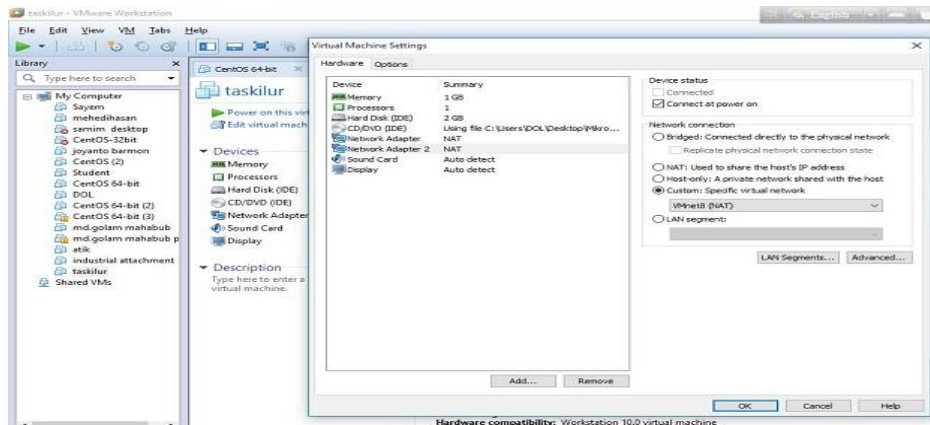


Figure 3.20.3: Shows Screen Print to configuration network adapter 1.

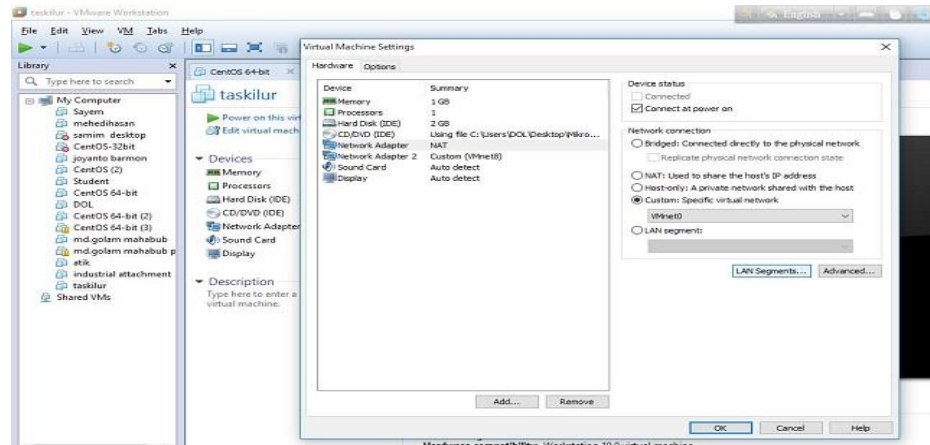


Figure 3.20.4: Shows Screen Print to configuration network adapter 2

Step2: Then completing load installation then check all to type command 'a', move around command 'p' & 'n' and 'q' to cancel and reboot.

Now select all and press an and enter to end setup.

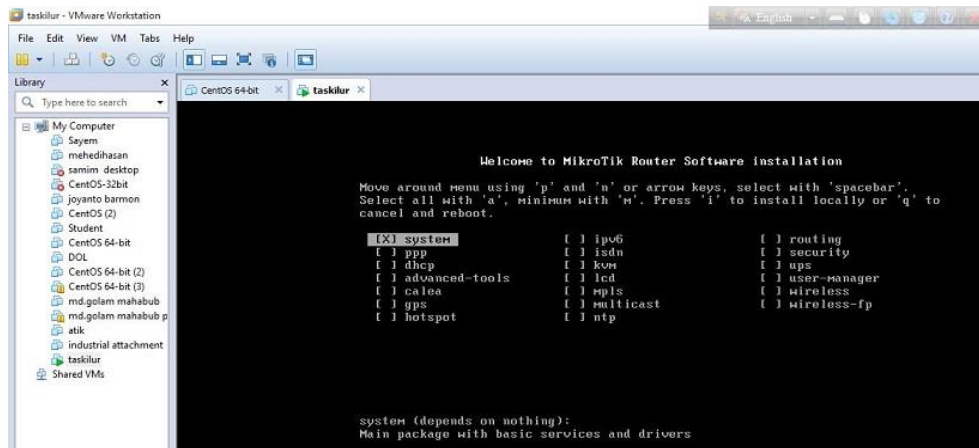


Figure 3.20.5: Shows Screen Print selecting software to install

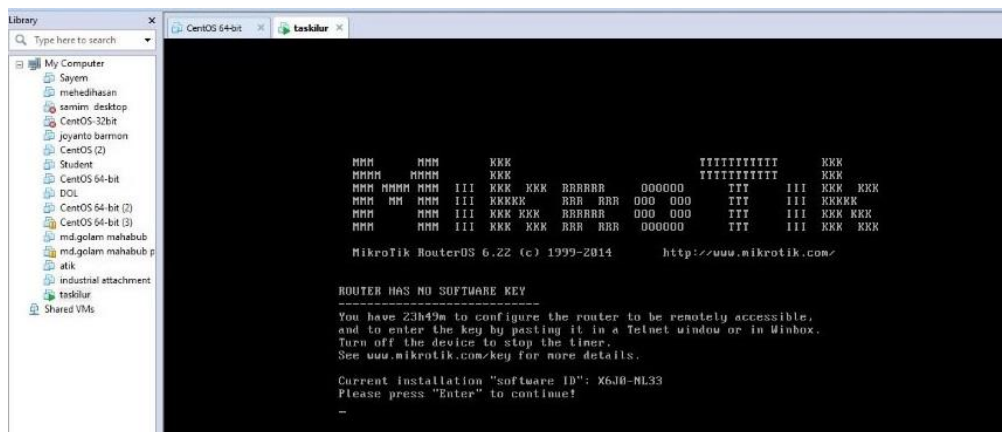


Figure 3.20.6: Shows Screen Print to complete install.

3.21 Static routing:

First step to configure a MikroTik router is to assign WAN and LAN IP addresses in WAN and LAN interface accordingly. So, follow below steps to set WAN and LAN IP addresses in your new MikroTik router.

Set up a MikroTik router give power to the MikroTik router. Then connect in a UTP cable in MikroTik LAN port and the other port to the PC. And Give WAN connection in a port for ISP. Now open Winbox.

Step1: Now open Winbox GUI click to IP address and MAC address. Click to Mac address then write ‘admin’ in login box and don’t need to give Password.

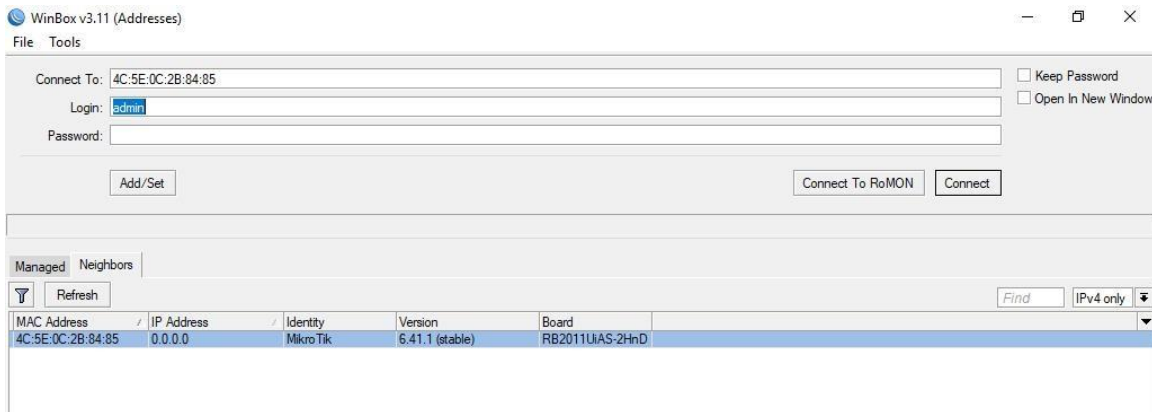


Figure 3.21.1: Shows Screen Print to connecting winbox interface

Step2: Go to the connected interface to changing name and define LAN and wan port. After that giving routes and gateway. Here must be added Dist. Address. Giving the ip address and network address for each interface. Then applying NAT to eatable connection.

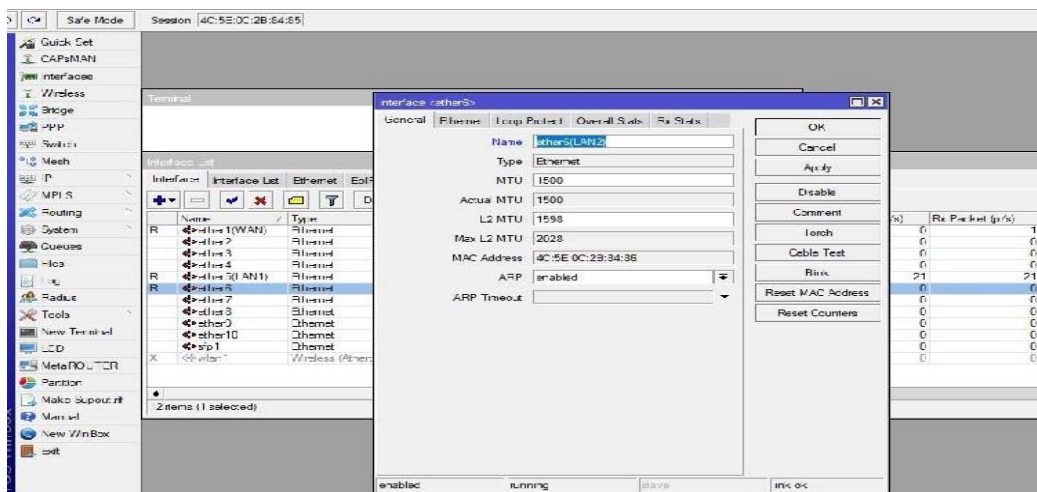


Figure 3.21.2: Shows Screen Print renaming connected port.

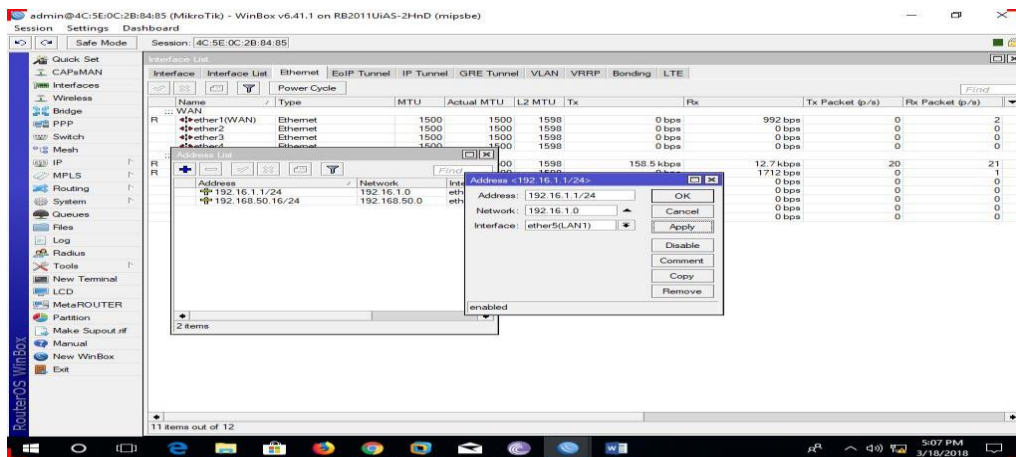


Figure 3.21.3: Shows Screen Print to giving ip for each connection

Step3: NAT; Go to firewall and select NAT. Here editing two option mainly. one is General; Chain: srcnat . Src. Address: local block/IP with subnet mask of the network and click apply and ok. Other is Action; in that choose ‘Masquerade’ and click Apply & Ok.

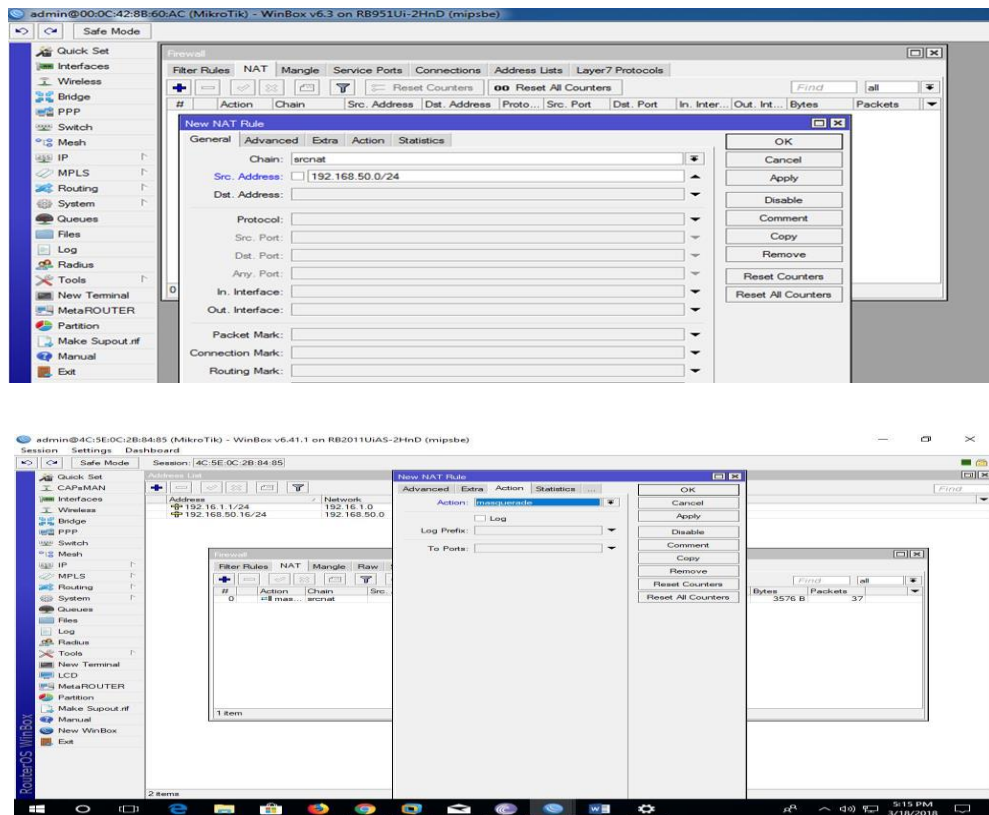


Figure 3.21.4 Shows Screen Print to doing NAT

Step4: After complete that put the ip in the same network in the Ethernet properties of the pc network adapter and give ip gateway and DNS then click ok to start browse.

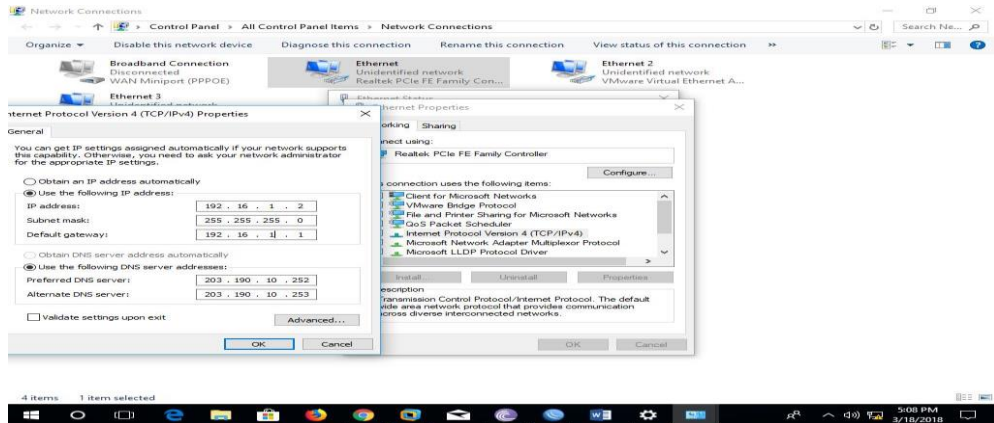


Figure 3.21.5: Shows Screen Print to giving ip Address

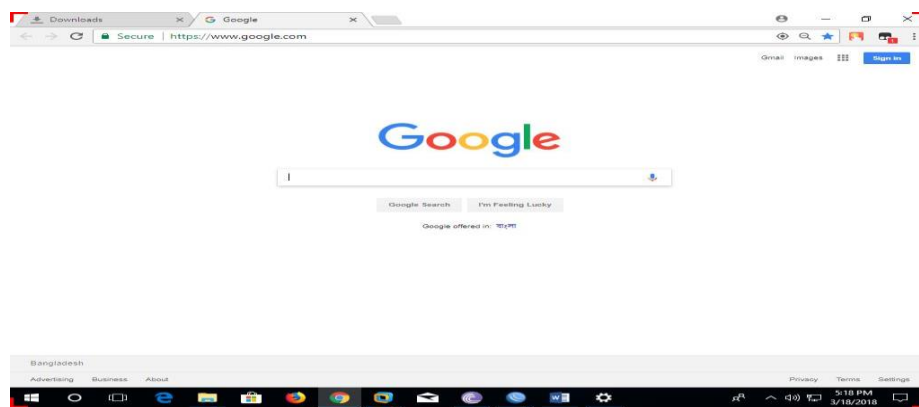


Figure 3.21.6: Shows Screen Print to browse websites

3.22 Dynamic routing:

Dynamic routing, also called adaptive routing, is a process where a router can forward data via a different route or given destination based on the current conditions of the communication circuits within a system. Dynamic routing makes automatic updates to route tables as the configuration of a network changes. For that recess I will show to creating DHCP Serve. DHCP means Dynamic Host Configuration Protocol. This network

protocol that enables a server to automatically assign an IP address to a computer from a defined range of numbers configured for a given network.

Step1: Now open Win box GUI click to IP address and MAC address. Click to Mac address then write 'admin' in login box and don't need to give Password.

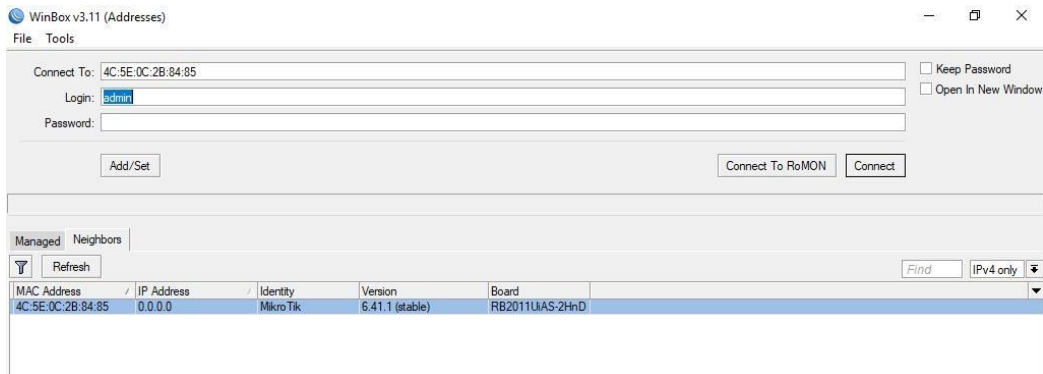


Figure 3.22.1: Shows Screen Print to connecting

Step2: Now go to DHCP server and click DHCP setup. then give network address with CIDR, and click next. then given Getway and click next. then here we can see pool address of DHCP server of that net work and click next.

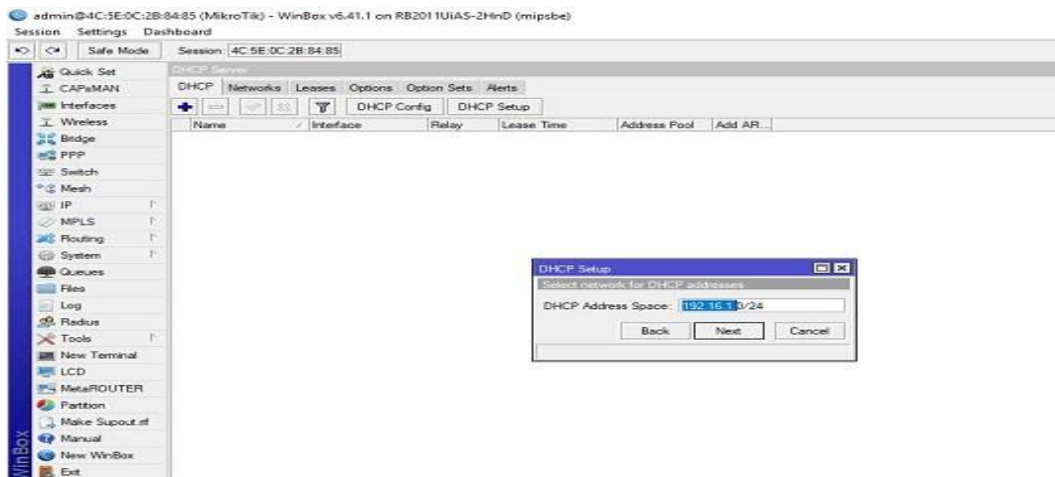


Figure 3.22.2: Shows Screen Print to give network address

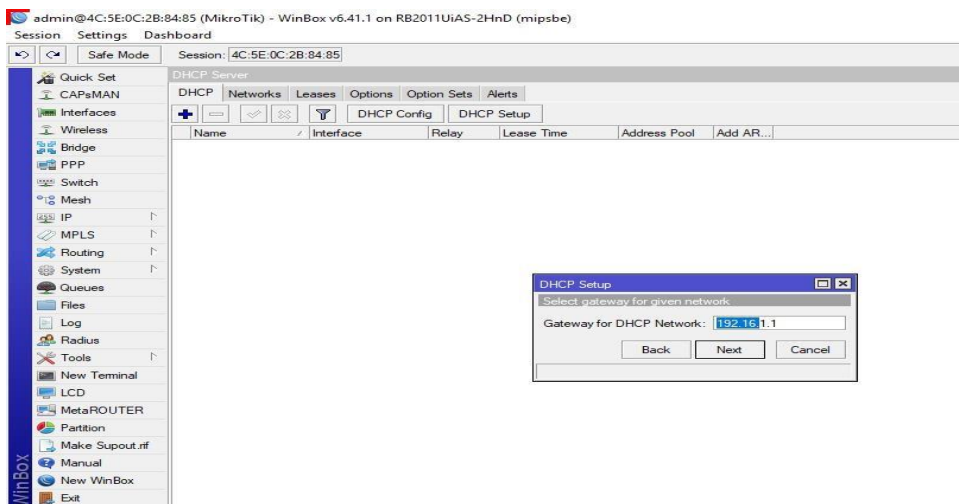


Figure 3.22.3: Shows Screen Print to giving getway.

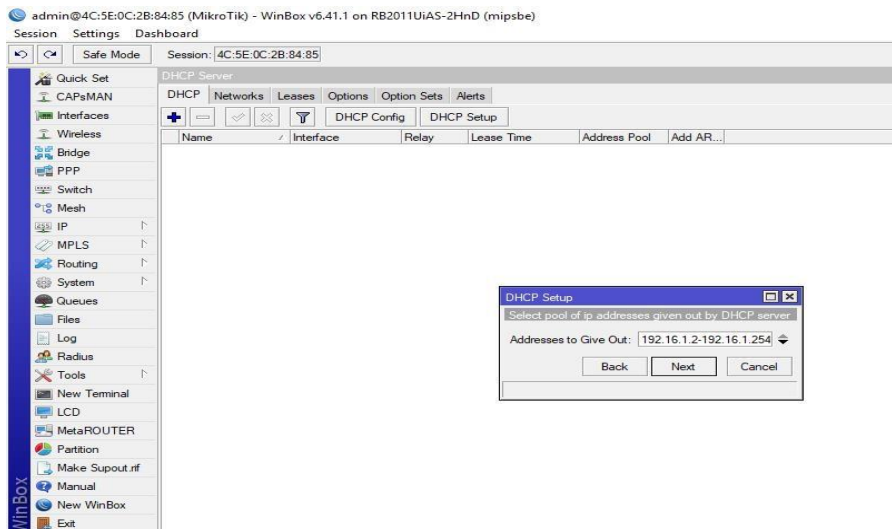


Figure 3.22.4: Shows Screen Print to show all useable ip.

Step3: After complete this then given DNS and Alternative DNS.then click next and DHCP serversetup is complete. Here we can add to many DNS.

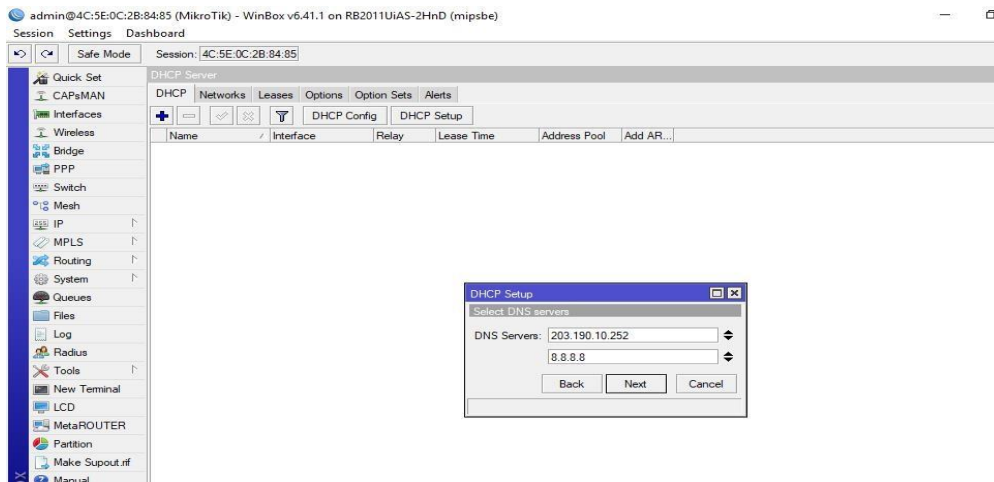


Figure 3.22.5: Shows Screen Print to giving DNS

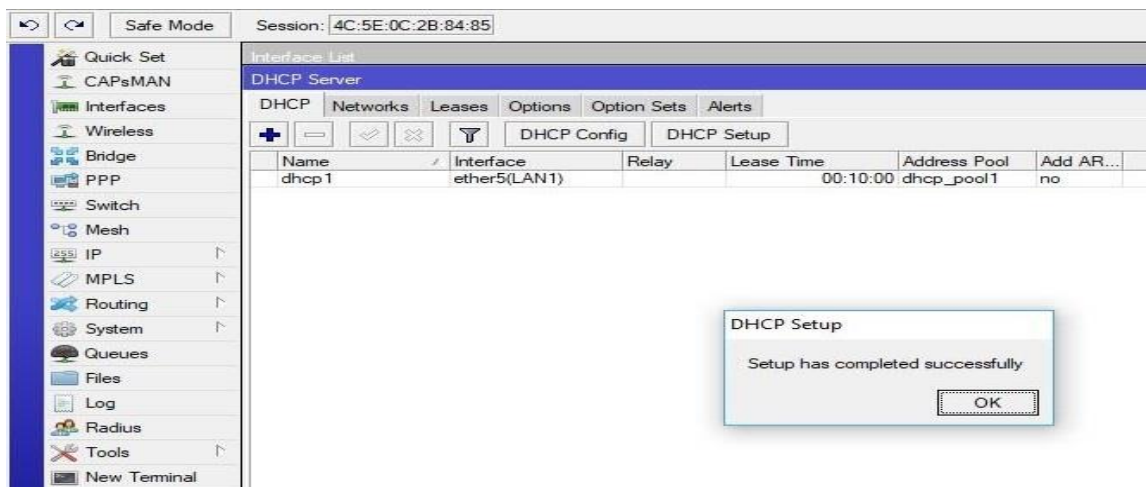


Figure 3.22.6: Shows Screen Print to configure DHCP

3.23 Wireless LAN configuration

Step1: Wireless enable interfaces and create a bridge port. Then Wireless Wlan1 then Mode: ap bridge.an wireless mode ap bridge define a name SSID as like.

Figure show in Wireless sitting SSID Mode;

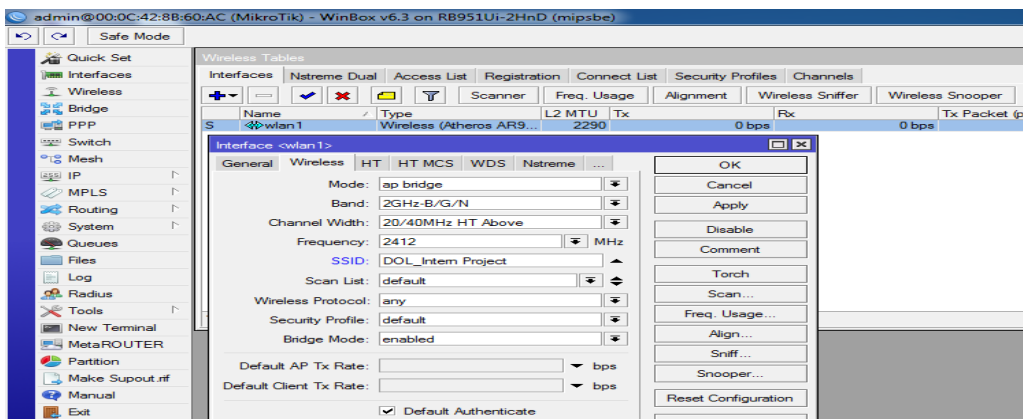


Figure 3.23.1: Shows Screen Print Wireless sitting SSID

Step2: Wireless password setting; renaming the name and change keys mode. In addition, check the useable needed option and give wap shared key or password as my preferred. However, it at least 8 character. And given ip services SSH and telnet.

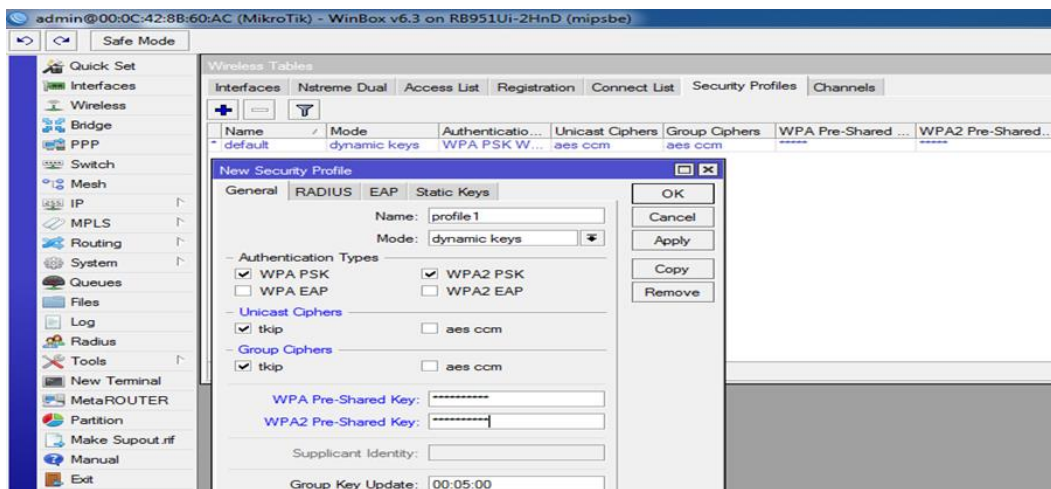


Figure 3.23.2: Shows Screen Print Wireless Security Setting

3.24 Bandwidth handling in Mikrotik:

The most of familiar and useable feature in Mikrotik is bandwidth maintains. It can be defining each or a total network upload and download bandwidth. It also separating bandwidth for different server. That process it can be use Network address, ip address MAC address. Now I show the process of separating bandwidth for different server or site.

Step1: The easiest way to setting bandwidth in a ip or network. So 1st go to queue and create a simple queue. Then giving queue name and ip address in Target address. After

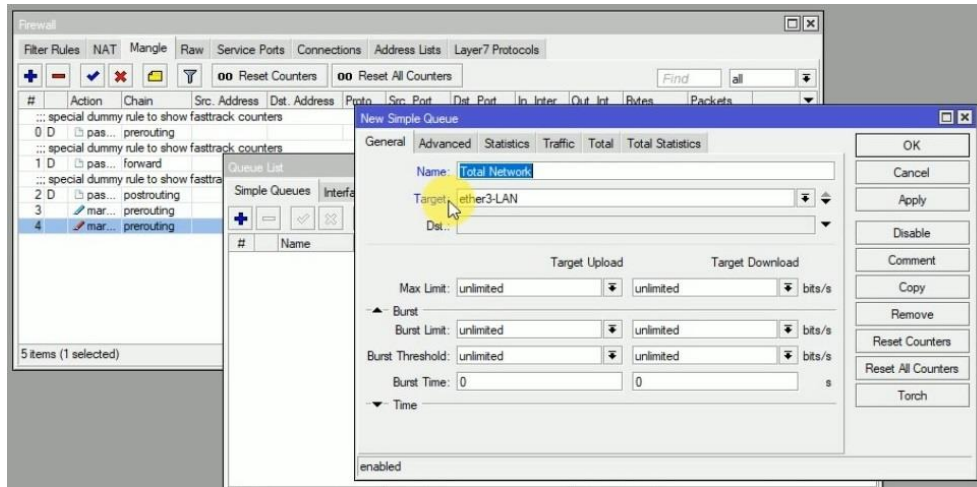


Figure 3.24.3: Shows Screen Print to a new queue with address.

Now create a new queue and giving a name and addressing port. It can be network address, ip or interface port. Then click advance, for changing packet mask option and two queue type. In packet mask given name of server as like YouTube and one queue is upload and one is download and click apply and ok.

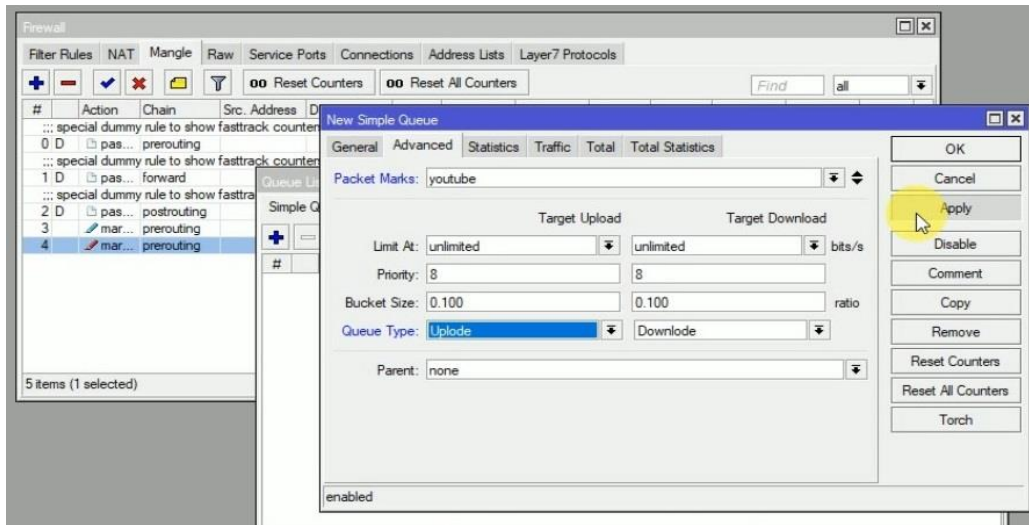


Figure 3.24.4: Shows Screen Print to assigning queue type in YouTube.

Now open YouTube in browser and upload and download speed is shown in Queue list.

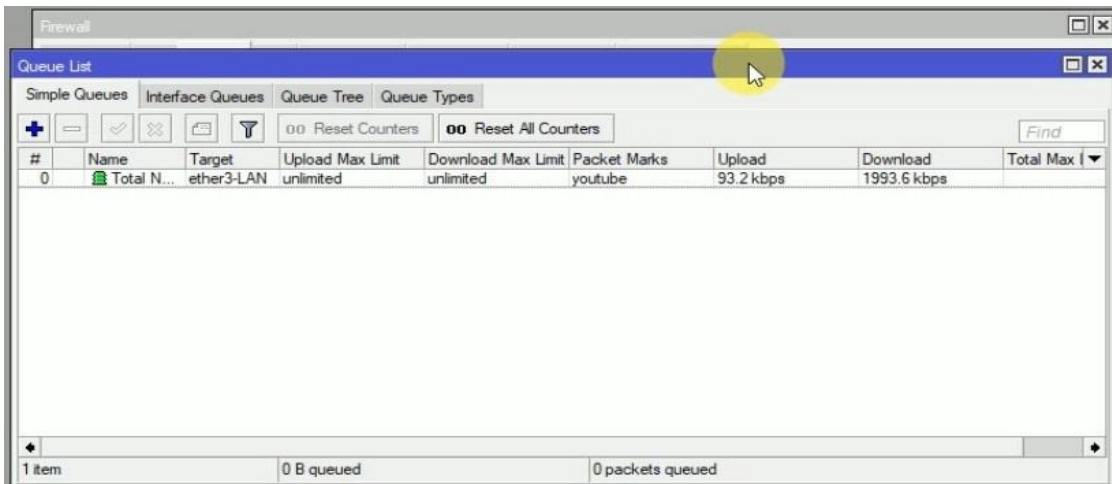


Figure 3.24.5: Shows Screen Print to show bandwidth in queue.

3.25 OSPF Configuration

Step1: Select routing protocol OSPF.

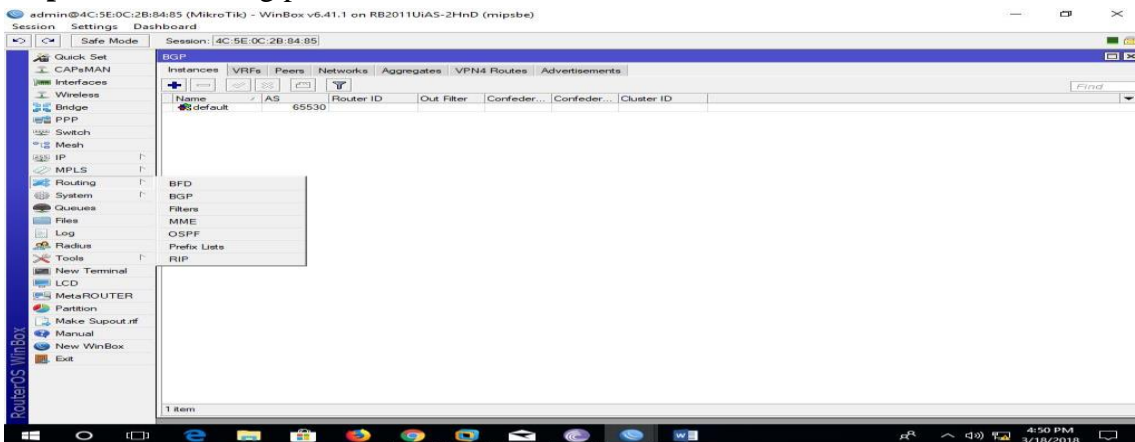


Figure 3.25.1: Shows Screen Print to select OSPF.

Step2: Network Configuration

Here I am configuring the network for OSPF. So at first I have to configure the WAN. And setup ip OSPF LAN and WAN ip address.

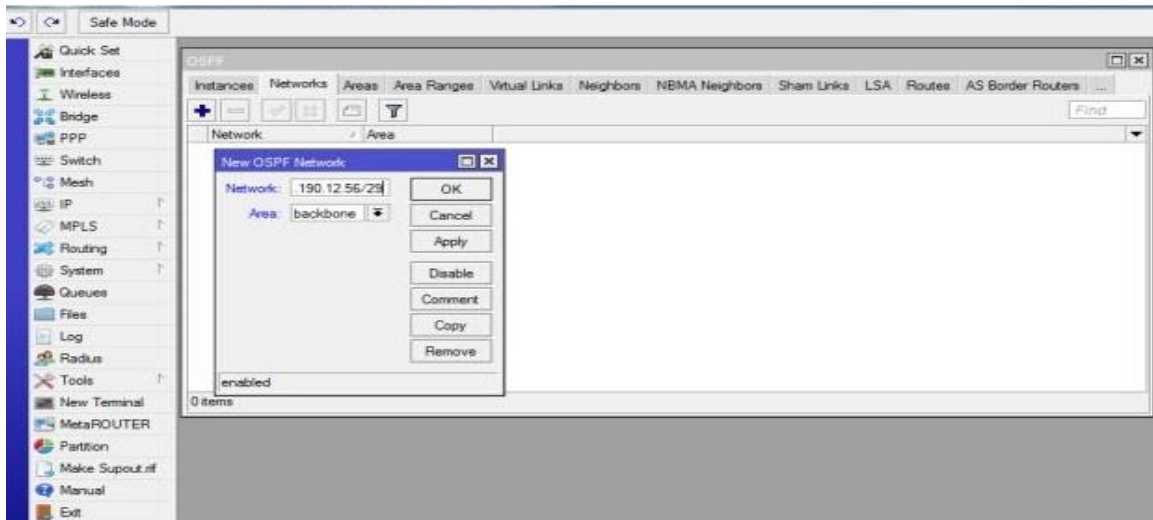


Figure 3.25.2: Shows Screen Print setup network address.

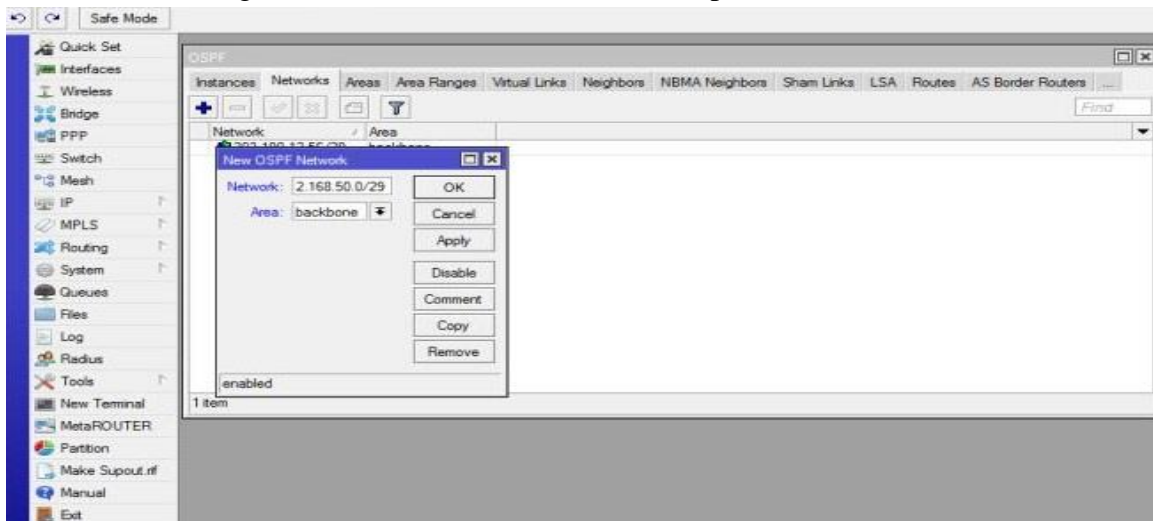


Figure 3.25.3: Shows Screen Print to adding network address.

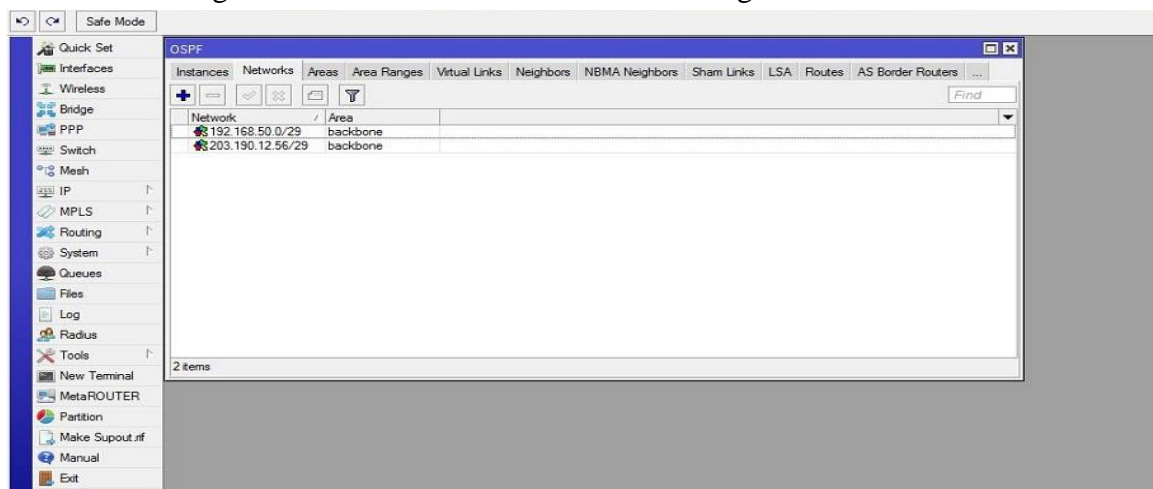


Figure 3.25.4: Shows Screen Print to the network.

Step 3: Here I selection the area and interface. After done that that routing is complete

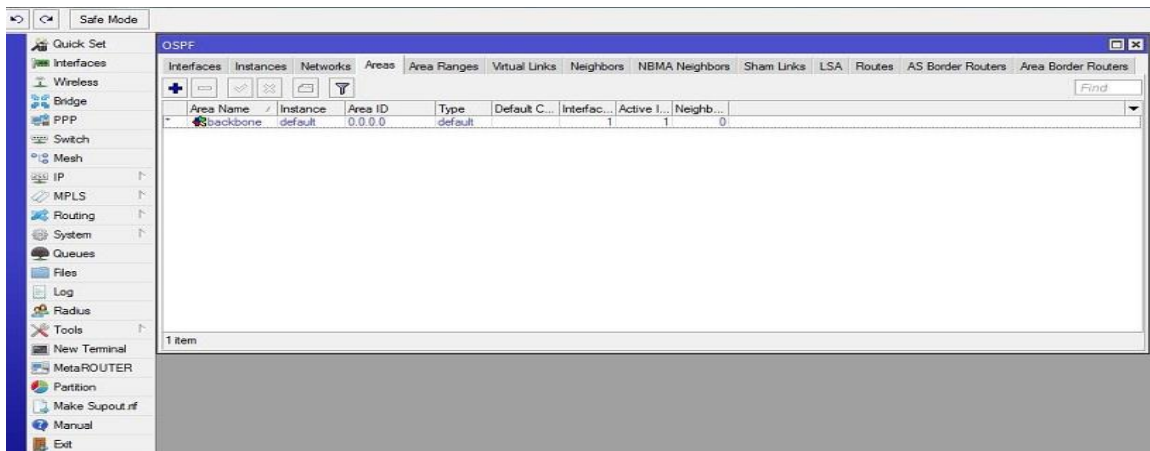


Figure 3.25.5: Shows Screen Print to selection area.

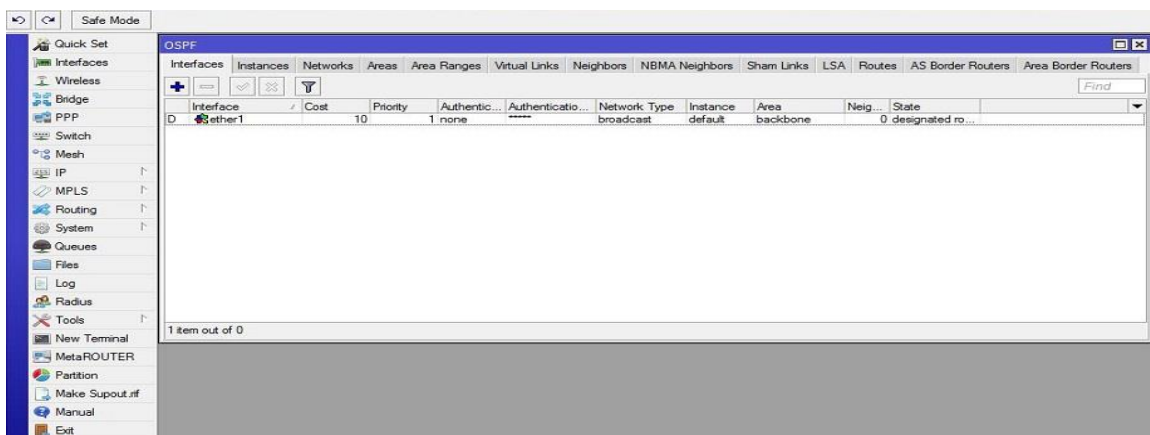


Figure 3.25.6: Shows Screen Print to complete routing

3.26 BGP (Exterior gateway) routing:

BGP is an external protocol, it allows different autonomous system to exchange routes. BGP is the protocol most ISPs use, and it was designed to allow diverse, sometimes competitive organizations to communicate. BGP can filter both routes, minimizing the number of routers exchanged. BGP routers communicate only with manually configured neighbors. Its routing decisions are made based on Path, Network policies, and Rules. BGP is not the only way to use ISP to advertise routes or distribute private routes though the internet.

Now I establish a BGP routing configuration between two routers. I done it with simple 5 steps. AS number, peer, Network, In-filter & Out filter, Add in and out filter in peers.

Steps1: Identify the port and giving network address for each connected port. And add a BGP interface and set AS number.

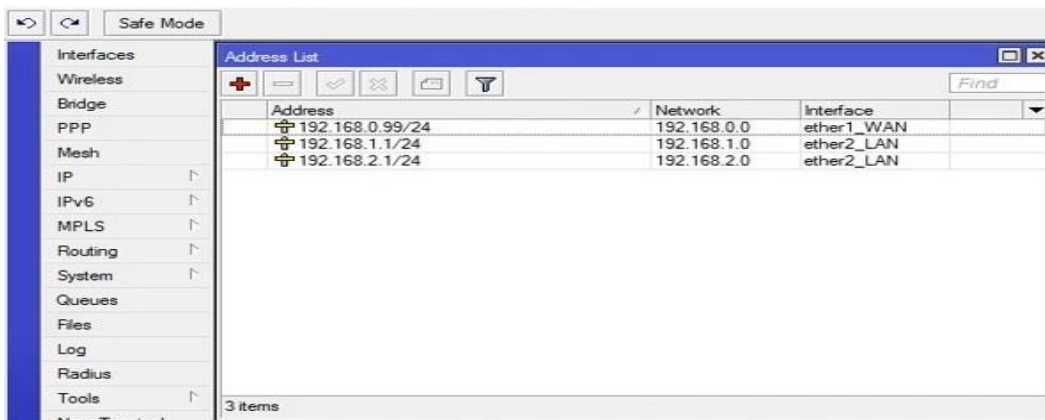


Figure 3.26.1: Shows Screen Print to adding address list

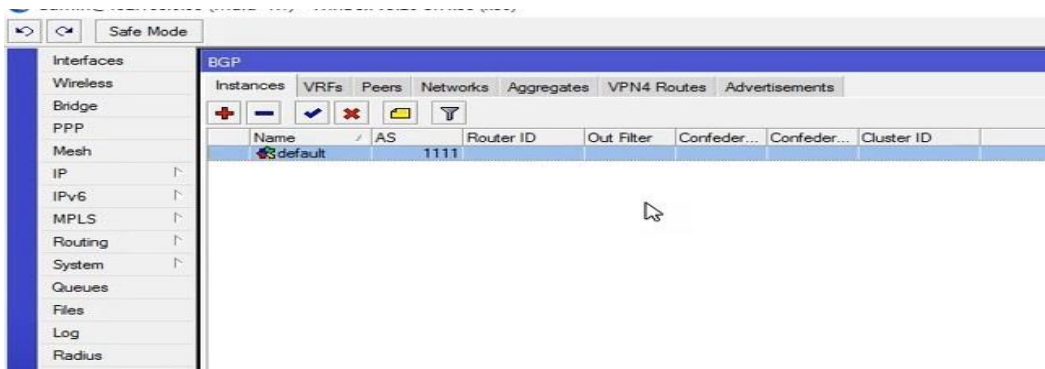


Figure 3.26.2: Shows Screen Print to add BGP routing interface

Steps 2: now I create a new BGP peer. Given name, define interfaces, remote address in the wan network address, new remote AS, and hold time. After given that click apply ok and the new peer is create.

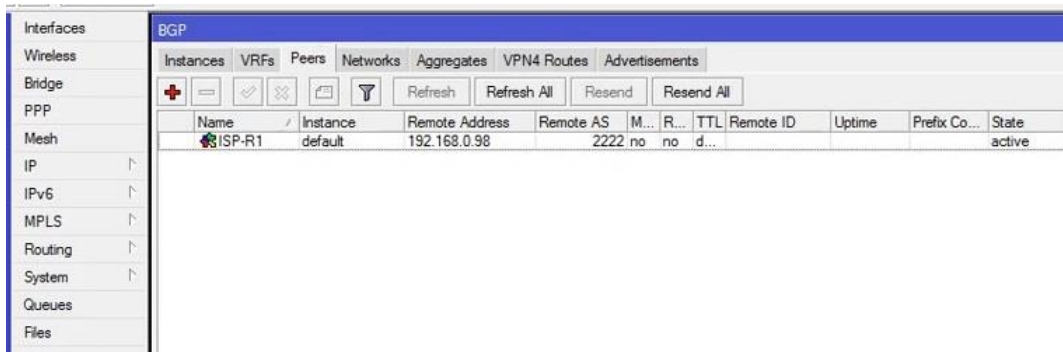
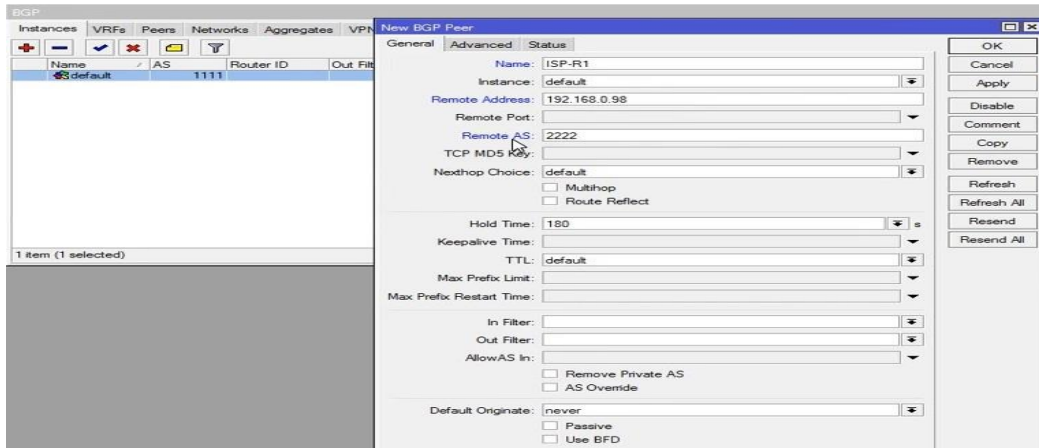


Figure 3.26.3: Shows Screen Print to Configuring Router ISP-R1 peer.

Now create two different network in ISP-R1. For that go to network and click add and give network address and CIDR. then click ok.

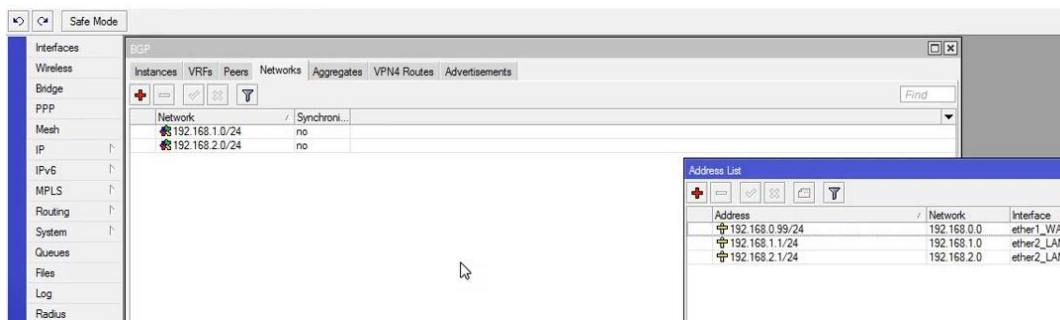


Figure 3.26.4: Shows Screen Print to added network in ISP-R1 peer.

Step3: same process for new peer Muid-R1 and creating two networks on its for doing same in step1 and step2. Only changed network address and remote AS. After completing that we see that's are connected

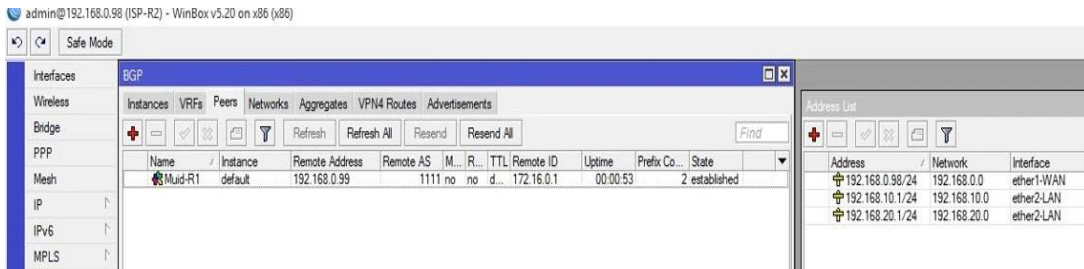


Figure 3.26.5: Shows Screen Print to Configuring Router Muid-R1 peer.

Step4: Now we filtering in and out ip in the router whom are accepted or discard. That processes called router filter. Now 1st go to router filter. here I accept those router filter and the networks that's are accept to inform ISP otherwise network are be discard. Now 1st accept network which are coming ISP. Now giving chin name and prefix, and action mode is accepting. That is create two one is in other is out. And give addresses in prefix. Create an another prefix to discard, which are discard other network addresses. Now define that creating rules in ISP-R1 peer in filter in and out. Then one is complete.

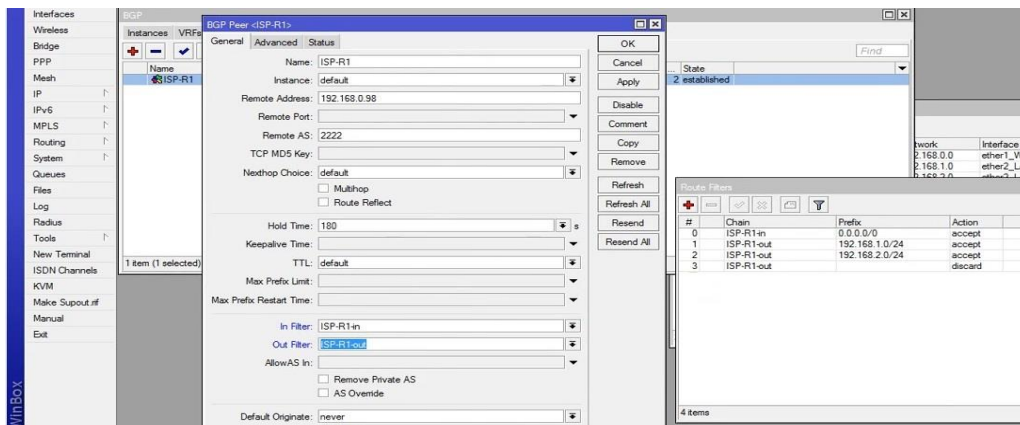


Figure 3.26.6: Shows Screen Print to filtering network in ISP-R1 peer.

Now same in and out filtering process in Muid-R1 for BGP pair. After complete that the process is complete. now I can be pinging for testing router1 to router 2.

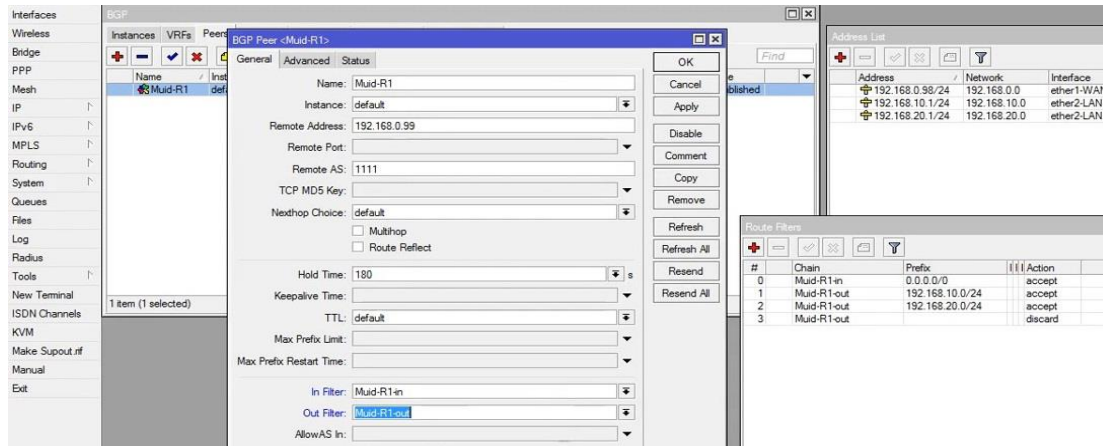


Figure 3.26.8: Shows Screen Print to filtering network in Muid-R1 peer.

3.27 Network cabling systems:

Network Cabling Systems specializes in the design and installation of structured cabling systems with an emphasis on new construction and corporate relocations. Whether your network is ten computers or ten buildings in a campus environment, it's provide the copper and fiber cabling needed to connect voice and data across the LAN. Network cables are used to connect and transfer data and information between computers, routers, switches and storage area networks. There are different types of communications cables, and the appropriate type to use will depend on the structure and topology of the overall architecture of the system. Normally we used twisted pair and Fiber Optics.

Twisted pair:

Twisted pair cable is used in many Ethernet networks. Comprising of four pairs of little wires or conductors, these 'wires' or conductors, are contained inside of the insulation of the cable. Cat5, cat5e, cat6, cat7. Its supports up 100mbps to 10 gbps

speeds and this cable is use RJ45 standard connector .

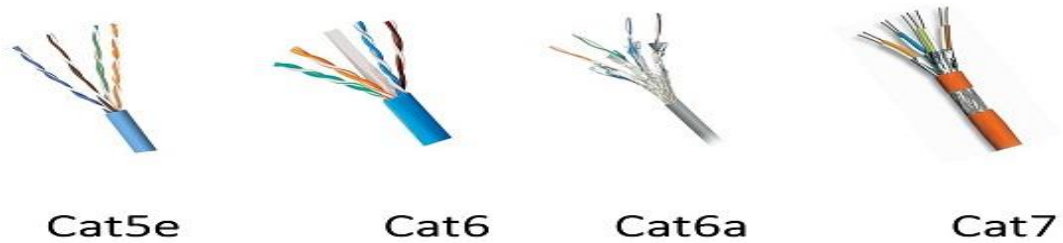


Figure 3.27.1: Shows Screen Print to Twisted pair cable

Fiber optic:

A fiber optic cable is a network cable that contains strands of glass fibers inside an insulated casing. It designs for long distance, very high performance data networking and telecommunications. Fiber optic cables provide higher bandwidth and can transmit data over longer distances. Fiber cables rated at 10 Gbps, 40 Gbps and even 100 Gbps are standard.



Figure 3.27.2: Shows Screen Print in A fiber optic cable

Cabling:

Here generally used cat5 and cat6 and connector is RJ45.and testing that cable to check right connection and noise. Different types of port in different connector.

In cisco 2800 switch port names are Ethernet ports, console port, Aux port. T1 and voice port.

In Cloud Core Router CCR1016 Mikrotik Router ports are SFP port, serial port RJ232, RJ45 ports, microUSB.

Media converter:

The media converters can transform signals among Ethernet, Fast Ethernet, Gigabit Ethernet, T1/E1, DS3, ATM, etc. Fiber tonics networks is the acknowledged specialist in the media converters area, their transition networks media converters take the most part in the world market in this field. A fiber media converter is a simple networking device that makes it possible to connect two dissimilar media types such as twisted pair with fiber optic cabling. It has a pair that called male or female. When we connect or cabling fiber optic.in that it has input way and output and power adapter.



Figure 3.27.3: Shows Screen Print in media converter

3.28 Routing protocols:

In computer networks router and routing is the most important. And all connection is based on that. The routing protocol specifies how routers communicate to select the routes for information or data transfer for that, the routing algorithm is more important. First, the routing protocol informs or shares the information with their associative neighbors and then throughout the network, in which topology is determined. Different type of routing protocol used in the world.

Comparison of RIP, EIGRP, OSPF, IGRP Routing Protocols in Wireless Local Area Network, Interior gateway routing using link state routing protocol. BGP Exterior

gateway routing using path vector routing protocol. That routing protocol helps to understanding us to make idea of routing & routing table.

3.29 IPV6 Basic configuration

IP address serves the purpose of uniquely identifying an individual network interface of a host, locating it on the network, and that's permit the routing of IP packets between hosts. IP addresses are present in fields of the packet header where they indicate source and destination of the packet. IPv6 is the successfully to the first addressing infrastructure of the Internet in IPv4. In contrast to IPv4, which defined an IP address as a 32-bit value, IPv6 addresses have a size of 128 bits. IPv6 has a more address space compared to IPv4. IPv6 is the successor of IPv4 and the main reason we need it is that we are running out of IPv4 address space. IPv4 uses 32-bit addresses and it given us about 4.3 billion addresses, IPv6 offers 128-bit addresses so we have a huge amount of available addresses. This address mainly two formats, Unicast and Multicast address format.

Unicast = 2001::DB8:800:200C:417A

Multicast = FF01::101

Example: giving ipv6 ip in a router interface port.

```
Router(config)#ipv6 unicast-routing
```

```
Router(config)#interface fastethernet 0/0
```

```
Router(config-if) #ipv6 address 2001:db8:3c4d:1: :/64 eui-64
```

```
Router(config-if) #ip address 192.168.255.1 255.255.255.0
```

The basic IPv4 packet header has 12 fields with a total size of 20 octets (160 bits) (see the figure below). The 12 fields may be followed by an Options field, which is followed by a data portion that is usually the transport-layer packet. The variable length of the Options field adds to the total size of the IPv4 packet header. The shaded fields of the IPv4 packet header shown in the figure below are not included in the IPv6 packet header. Cisco

Discovery Protocol support for IPv6 addresses provides IPv6 information to network management products and troubleshooting tools.

The IPv6 ICMP rate limiting feature implements a token bucket algorithm for limiting the rate at which IPv6 ICMP error messages are sent out on the network. The initial implementation of IPv6 ICMP rate limiting defined a fixed interval between error messages, but some applications such as trace route often require replies to a group of requests sent in rapid succession. The fixed interval between error messages is not flexible enough to work with applications such as trace route and can cause the application to fail.

3.30 Challenges

No work is not challenging, but for four months of my internship experience and a happy hour, friends share it, I've found some common challenges are internal. I think it is that three things in intern: unpaid / under temporary, and they are to achieve a nation experience. Not enough work sometimes: Not enough work is determined by me. I am tired under named to strum my fingers in my desk and reading to Facebook and watching YouTube. Too much work: Since interns are just glad to get foot in the door work places may take advantage of young workers by giving them a very long hours of damp repetitive work. Embarrassed to ask questions: Suddenly all the work has an influx, and finally I have the opportunity to prove myself. But I'm not sure about X, Y, Z. I might feel pressure to be independent self-reliant worker, but it's so nice to clarify the uncertainty.

Contest with another interior: Luckily I was an intern; I cannot ask each other questions and easily collaborate with the project team where such a collaborative relationship has worked together. Interns in the future opening a job, or in a recommendation for a good letter, may not be so friendly. It's also helps to competing defers other office environments. Exposure to the working environment in the field attachment the intern learnt how the working environment is and what is required in order to have your set goals accomplished. This boosted the understanding which was mainly theoretical to be

practical. It will be for the task to take long time to work independently and the only decision will be made. Therefore, the student has learned the ability to work in the team for effective performance-based performance. This management policy was in line with the learned classes in intern. So being given a chance to do internship, the student got to experience the different works people do and it equipped the student with more knowledge.

CHAPTER 4

Competencies and Smart Plan

4.1 Competencies Earned

A statement that is expected to be able to understand what a student is learning or learning consequences of compatibility or consequences or is able to work as a learning process is expected. Install and decommission on both network and server machines in two data centers. For example, the role of the implementation of advanced Linux software for LDAP Health Assistant, aligned to learning outcomes, fields and internship evaluation programs. The fund of the student association's office organized many internships project descriptions, object collections and information gathered in internship, participating in a new look at the Linux Lab web site.

Learning Outcomes: Install and configure, install, configure and test services and software related to the results of the employers learning on the network, internship on site supervisors will provide an orientation to organizational policies and procedures.

4.2 Smart Plan

Every company should have a smart plan to succeed. Originally, make a smart plan to make something simple.

A smart plan helps assure our employees to work with respect and confidence. And it believes a great working team uses their full potential for achieving a truly competitive edge. I believe that smart plans are a step in our innovation and excellence.

4.3 Reflections

Daffodil Online Ltd. started the activities in 2002. During the past year, they have improved operation and service portfolio according to customers' recommendations and time consideration. They work with many national projects and international organizations and gain reputation. They are upgraded using the latest technology and wherever it is in the service it is required. These are able to provide state-of-the-art network and telecommunications solutions with a highly skilled technical expertise in Corporate Network Solutions Division.

CHAPTER 5

Conclusion and Future Career

5.1 Discussion and Conclusion:

This internship gives me a wonderful and rewarding experience. The people whom have working this in long period, helped me to understand the future opportunities of that field network & Security. Through this internship I learned about time management skills as well as self-motivation. When I first started I was going to be able to sit in an office for five hours each day, 4 days a week and do not think that. Once I realized I was not overlapping my hour to break, so I did organize my day work. Office of this internship and office for many hours of time, I have learned how to inspire through myself. I have seen different offers and ideas in the company. I am still open to my options new opportunities, and I continue to work for the reputable company in Bangladesh

I'm enjoying this field of work. I continue to work hard for my position and hope to continue to learn about the industry and meet new people. It was a wonderful experience, and I hope that it's helps to come better opportunity to me.

5.2 Scope for Further Career:

There are many career opportunities available in Linux. Desktop Application Development, kernel and Device Drivers Development Today their extensive demand is open source software and developers of open source software and network engineers: Linux not only provides career opportunities in the Linux platform, it covers a lot of different areas like this. Many companies today came to Linux and open source software. Companies like Google, Yahoo, Boeing, Lufthansa, wiki.org, many companies came to cost effective open source solutions. There is a huge demand for skilled professionals in Linux.

In Bangladesh there are many companies based on IT Infrastructure Solutions, Data Center Solutions, Network Solutions, Software and Database Solutions, Information

Security (IS), Backup Solutions, Hardware Distribution and IT Intelligent Services (ITES), and it increased day by day

5.3 Appendices

Appendix A: Internship Reflection

The primary goal of my internship in a professional setting, the real solution to real-world problems is to apply the knowledge acquired in the classroom. And dealing with the professional ability to develop professional development skills and develop professional ideas and relationships, new knowledge, skills, and strategies. Add network with other professionals' supervisors and professional relationships. I will learn about the behavior of the client and about the exposure of field supervisors and field supervisors and other staff's behavior and understanding of profits through learning. To perform my internship duty. I am using the appropriate business policy. I am implementing an organization's mission or attitude, how to communicate with colleagues, how to share power, how to be formed, how to decide, how a culture of a professional organization can be understood and how much responsibilities and responsibilities of the organization? At the end of my internship supervisor and internship experience, I had the opportunity to take professional opinion at different meetings. Internal experience for international society, leadership and preparation of service life, my gift will be able to use it.

Appendix B: Company Detail



Head Office

| | |
|---------|---|
| Name | Daffodil Online Limited |
| Address | 102, Shukrabad (3rd floor), Mirpur Road, Dhanmondi, Dhaka - 1207, Bangladesh |

| | |
|----------------------|---------------------------------------|
| Telephone | 02-9143258-60 |
| Fax | 880-2-8116103 |
| E-mail | info@daffodilnet.com |
| Website | www.daffodilnet.com |
| Type of Organization | Nationwide Internet Service Provider. |

5.4 References

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Plagiarism report

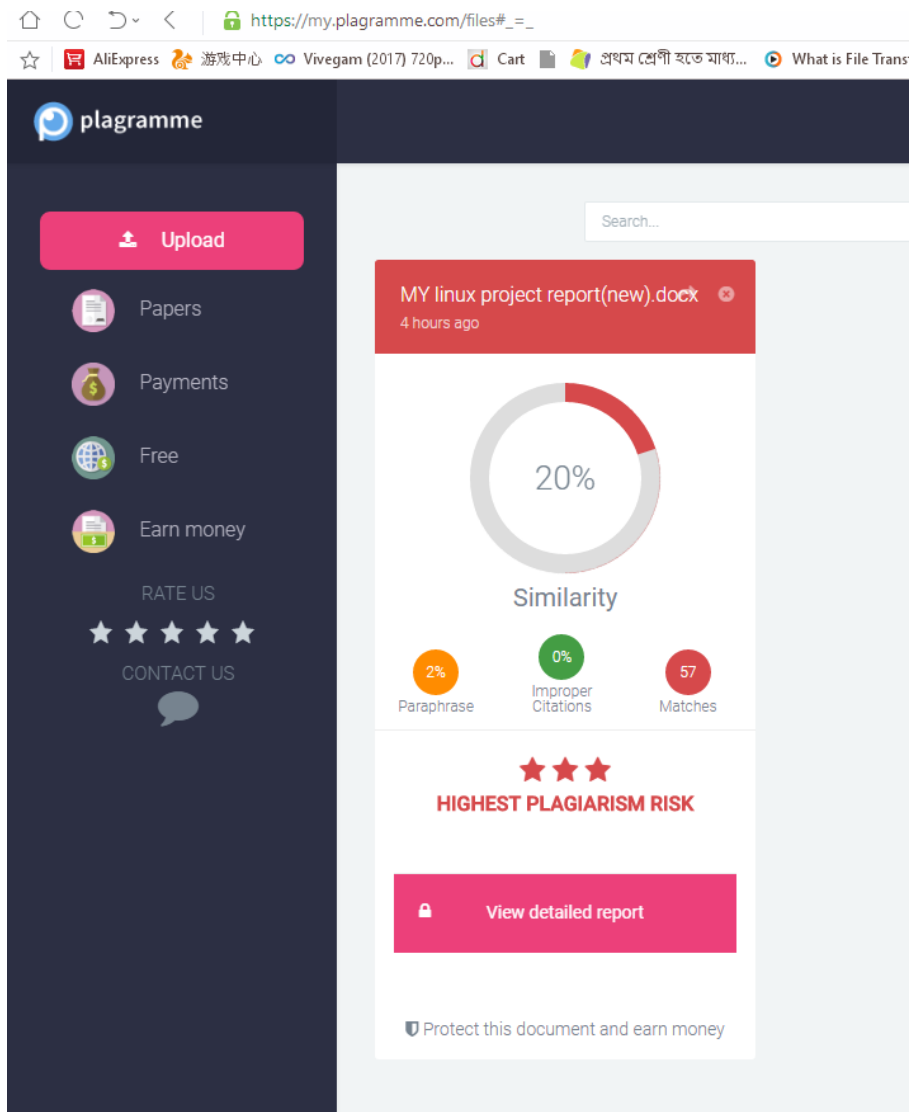


Figure 5.5: Shows Screen Print to the Plagiarism report.