

**SYSTEM AND NETWORK ADMINISTRATION USING MIKROTIK AND
LINUX**

BY

Md. Rakib Hasan

ID:172-15-9869

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

Supervised By

GAZI ZAHIRUL ISLAM

Assistant Professor

Department of Computer Science and Engineering

Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

JULY 2020

APPROVAL

This Project/internship titled “**SYSTEM AND NETWORK ADMINISTRATION USING MIKROTIK AND LINUX**” submitted by Md. Rakib Hasan, ID No: 172-15-9869 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfilment 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 08th July 2020.

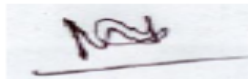
BOARD OF EXAMINERS



Dr. Syed Akhter Hossain
Professor and Head

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Chairman



Dr. Md. Ismail Jabiullah
Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



Nazmun Nessa Moon
Assistant Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



Dr. Mohammad Shorif Uddin
Professor

Department of Computer Science and Engineering
Jahangirnagar University

External Examiner

DECLARATION

I hereby declare that, this project has been done by me under the supervision of **Mr. Gazi Zahirul Islam, Assistant Professor, Department of CSE**, Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:



Gazi Zahirul Islam
Assistant Professor
Department of CSE
Daffodil International University

Submitted by:



Md. Rakib Hasan
ID: 172-15-9869
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First, I express my heartiest thanks and gratefulness to almighty God for His divine blessing makes me possible to complete the final year project/internship successfully.

I really grateful and wish my profound my indebtedness to **Mr. Gazi Zahirul Islam, Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of my supervisor in the field of “*Computer Networking and Information Security*” to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

I would like to express my heartiest gratitude to **Dr. Syed Akhter Hossain, Professor and Head, Department of CSE**, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

I would like to thank my entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

If two and more computers are interconnected and able to exchange data or information then we call network. We want to increase the number of PC's and exchange data or information from one to another that time we need some special PC's are called Server. MikroTik is a minimal effort and simple accesses Router that can be utilized for little and building an ISP centre. Particularly this systems administration gadget suits for little system from each viewpoint like customer administration and security. MikroTik RouterOS is the working arrangement of MikroTik Router Board which may likewise introduce in a standard PC also, the PC will transform into a MikroTik Router. Linux Server Administration is a well-known method for dealing with the system correspondence as far as its execution, dependability and security. This Internship shows the entire setup procedure of an ISP server Administration alongside the different administrations offered in Linux working framework. There is different kind of work in the system that is the reason additionally unique sorts of server and how to design different administration. For Example- DSN Server, Web Server, Mail Server, Proxy Server, FTP Server, Firewall.

TABLE OF CONTENTS

CONTENTS	PAGE
Board of examiners	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
CHAPTER	
CHAPTER 1: INTRODUCTION	1-3
1.1 Introduction	1
1.2 Inspiration	1
1.3 Material	2
1.4 Induction to the company	2
1.5 Report Layout	3
CHAPTER 2: ORGANIZATION	4-7
2.1 Introduction Note	4
2.2 Target Fellowship	4
2.3 Comprehend Analysis	4
2.4 Organization Formation	6
CHAPTER 3: TASKS, PROJECTS AND ACTIVITIES	8-13
3.1 Daily tasks and Activities	8
3.2 Linux Basic Commands	8
3.3 All kind of Tasks	9
CHAPTER 4: SERVERS IN LINUX	14-21
4.1 Static Configuration	14
4.2 DHCP Configuration	14
4.3 Nagios Server Configuration	15
4.4 Web Server Configuration	19
Chapter 5: CLASSIFICATION OF IP ADDRESSES	22-24
5.1 About IP Address	22
5.2 Classes of IP Address	22
5.3 The Range of Private IP Address and Their Class	23

5.4 Subnet of IP Addresses	23
Chapter 6: MIKROTIK ROUTER CONFIGURATION	25-35
6.1 MikroTik Router	25
6.2 Features	25
6.3 Static Routing	26
6.4 DHCP Configuration	28
6.5 WLAN Configuration	29
6.6 PPOE Server	30
6.7 Mangle for Facebook and You Tube	32
CHAPTER 7: CONCLUSION AND FUTURE CARRER	36-37
7.1 Discussion	36
7.2 Conclusion	36
7.3 Scope for Future Career	36
REFERENCES	38
APPENDICES	39

LIST OF FIGURES

FIGURES	PAGE NO
Figure 3.1 Directory Create	10
Figure 3.2 Create a file	10
Figure 3.3 Copy file	10
Figure 3.4 File read	11
Figure 3.5 Edit file	12
Figure 3.6 Create Group	12
Figure 3.6 User add in group	13
Figure 4.1 Edit network port	14
Figure 4.2 Static configuration	14
Figure 4.3 DHCP configuration	14
Figure 4.4 Basic network configuration	15
Figure 4.5 SELINUX disabled	15
Figure 4.6 Host Name Setup	15
Figure 4.7 Yum install	16
Figure 4.8 Nagios plugin install	16
Figure 4.9 Nagios package install	16
Figure 4.10 Nagios and httpd enable	17
Figure 4.11 LAN block allow	17
Figure 4.12 CFG directory server enable	17
Figure 4.13 Edit clients	18
Figure 4.14 Nagios server and active hosts	18
Figure 4.15 SELINUX disabled	19
Figure 4.16 HTTPD file install and download	19
Figure 4.17 Bitwise SSH Client login	20
Figure 4.18 Copy html file	20
Figure 4.19 Web page Hosting	21
Figure 6.1 Mikrotik Router	25
Figure 6.2 Router Network Diagram	26
Figure 6.3 Ethernet port rename.	26
Figure 6.4 LAN-WAN ethernet-port IP addresses	27

Figure 6.5 Gateway of Static Routing	27
Figure 6.6 IP firewall configuration	28
Figure 6.7 DHCP Configuration -start	28
Figure 6.8 DHCP Configuration Finish	28
Figure 6.9 WLAN bridge create and Bridge port assign	29
Figure 6.10 WLAN configuration finish.	29
Figure 6.11 Pool for PPPoE Servers	30
Figure 6.12 PPPoE Service and PPP Profile	30
Figure 6.13 PPP Profile's limits and secret configure.	31
Figure 6.14 NAT for PPPoE servers	31
Figure 6.15 Address List	32
Figure 6.16 Mangle for Facebook	32
Figure 6.17 Mangle for YouTube	33
Table 6. 18 PCQ for Facebook	34
Figure 6.19 PCQ for YOU Tube	34
Figure 6.20 Simple queues for You Tube	35
Figure 6.21 Simple queues for Facebook	35

LIST OF TABLES

TABLES	PAGE NO
Table 3.1 Table of Linux commands	9
Table 6. 1 PCQ for Facebook	33
Table 6.2 PCQ for YouTube	34

CHAPTER 1

INTRODUCTION

1.1 Introduction

This technology represents a Networking “Router” and another part of this technology is an operating system which is called Linux. The router which I mentioned is called a MikroTik router. You can easily configure this router by taking a short training. This training is called MTCNA. The Company is known as “DOL” in which I got training on MTCNA. “DOL” provides some training on MikroTik router and cambium networks.

As a student of a BSc in CSE at daffodil international university, I started here with some of the basic networking knowledge. Then I listen to “DOL” which is another part of Daffodil International University. To manage a networking system, you need to know about how to manage PC and their maintenance, server configuration, routing based on MikroTik router configuration. For all of this networking knowledge, I chose Daffodil Online Limited as my internship company.

Here I am presenting an Internship report on “SYSTEM AND NETWORK ADMINISTRATION USING MIKROTIK AND LINUX” is all about how to configure MikroTik router, Linux basic commands and server configuration in Linux. The report is also containing about MikroTik firewall and Linux networking system.

1.2 Inspiration

I selected Daffodil online limited to listing previous senior student satisfaction on Networking site. The told me that, to gain your success on networking site you need to start with a routing device called MikroTik and also need to know about linux and various server configuration on Linux operating system.

In Bangladesh, I searched for the top ISP carrier company and found a lot of experienced employees who are trained by Daffodil online Limited. After finished a new batch on networking at daffodil online Limited some of fresher’s student has got a new job in different ISP company. In DOL the trainers are very attractive and they teach

about how to do cabling and also giving train about cisco switching, routing, cambium network, Linux kernel version on centos six and seven's server's configuration. After that, they will give you a real device to do routing on your pc. You can do work in their lab at any time. DOL will teach you how to manage a MikroTik router and their whole network, server administration. They will make you a perfect IT supporter. They also provide a vendor exam on Mikrotik called MTCNA exam. You have also a certificate on MTCNA during the Internship.

1.3 Material

If I say about objective on my Internship It could be selected as "LINUX". Now a days Linux is known as highly secure and good for server security. In Linux there are many versions. During my Internship I got train about centos six and seven in Linux. The serial number of the objectives are:

- Install a new OS (centos-6/ centos-7).
- Static or Dynamic networking in Linux.
- Different users and group create for different users.
- Basic Networking.
- File edit, ether port configuration, set new line etc.
- Web server hosting and configuration.
- Nagios, samba, HTTP etc server configuration.

1.4 Induction to the company

It declares that Daffodil Online is a Top ISP company which is beginning their journey in 2002 in Bangladesh. They have their employees who are highly educated and they have a good skill in networking and have experienced on MTCNA, MTCRE, LINUX. If you preview their cv then you can rely on their skill. They have new technology and a good administration system. They selected their work in a different category. They have owned their Networking administrator, Linux operator, Server maintainer, cabler, and street worker who are doing cabling in different street pools. Kazi Mahbubul Alam who is the Assistant Director and has to run the DOL.

1.5 Report Layout

This report is made by the following chapters:

Chapter 1: Introduction, Inspiration, Material and Induction to the company.

Chapter 2: Introduction Note, Target Fellowship, Comprehend Analysis and the Organization Formation.

Chapter 3: Daily Task and Activities, Linux Basic Command and all kind of tasks.

Chapter 4: Network (Static, DHCP) and server configuration (Nagios and Web Server).

Chapter 5: Classification of IP address, Subnet of private and public IP.

Chapter 6: MikroTik router configuration (Static, DHCP, WLAN, MANGLE, PPOE)

Chapter 7: Conclusion, Discussion, Scope for Future Career.

CHAPTER 2

ORGANIZATION

2.1 Introduction Note

As an Organization, DOL's reputation is very clear and high quality. As a top ISP service provider, Daffodil Online increasing its reputation by satisfied their customer and services. They have their own server and they provide all kinds of internet connection to Daffodil International University's both permanent and main campus. For all of that quality, I thought Daffodil Online will be a good ISP company where I will start my career by their training or Internship.

2.2 Target Fellowship

Daffodil Online provides a lot of services. As a student at Daffodil International University, you can gain your target Fellowship by get training under Daffodil Online. The group is given below:

- A. Internet Solution at the corporate level.
- B. They will give a solution to all kinds of security.
- C. If you need Domain registration & amp, they will give with hosting.
- D. They will provide you training on website development.
- E. Networking courses (MTCNA, MTCRE, MTCNA, Cambium network).
- F. Utility solution with open sources.
- G. All kinds of internet providers.

2.3 Comprehend Analysis

However, you can talk about Comprehend or SWOT analysis, for all of this matter you need a lot of strength of mind to bear this. First, you need to a mind set-up for attending all classes in a timely. After that, you need to write down all kinds of lectures and notes in your notebooks. Then it's up to write your internship report daily by serial in doc file by part to part. If you did all of this work then you can present a good report otherwise it's quite impossible. Now I am writing all of those Comprehend analysis's part in below:

Strengths:

Characteristic of the strengths of the organization to a student are given below:

- At first, you need a fresh mind-setup.
- Secondly, you need to find out your time for training or Internship.
- You should attend your all classes.
- You should write down your notes properly.
- You should practice all kinds of tasks in classes and at home.
- You should write your report at home daily.

Weaknesses:

Characteristic of weakness of the organization are given bellow:

- Our organization has a little market place in Dhaka city.
- The organization have a little staff for work.
- The organization is powerless in the direction of the imperative physique by staff tacking off.
- The organization income will be decrees if customer will not satisfy.

Opportunities:

The opportunities of the organization are given bellow:

- You can get a good train on networking with some investment.
- You can get certificate by doing some vendor exam.
- The organization will be reference to get a job in different ISP company.
- The organization will help you to get a job in proper training.

Threats:

An organization always have some threats and they are given below:

- An organization have always a threat about financial attachment.
- Sometimes an organization have threats from outside ISP company.
- Other reason is about bad services.
- Lacking of innovation thinking is also affected on market place.

2.4 Organization Formation

➤ Combined Internet Solution:

At opening time Daffodil online starts their service with a new administration of networking. After that, they follow the challenge of the twenty-first-century and they bring a huge change in their internet security with innovation ideas. At first, they started their services with some of the employees after that they join some of the developers for their work.

➤ Internet Security Solution:

Nowadays Daffodil Online affords the most highly secure services to its customers. Daffodil online has a lot of developers who maintain their servers and give the most security panel on their internet connection.

➤ Web Domain Registration:

On the world wide web, there has a rule for domain registration. If you want to host a web site then at first you should do domain registration. Daffodil online has the opportunity for domain registration. If you need to register for the web domain then they will do it for you.

➤ Web hosting:

Daffodil online has their own hardware device for web hosting. The hardware devices are: super micro server, RAM 32Gb, 4Tb HDD, operating system Linux.

Location of data centre: capital of Bangladesh, Dhaka.

Their Control under Panel: C-panel for work, ISP Configuration for networking.

➤ Web Development for basic level:

Daffodil online offers static, dynamic and other internet connection for the web page. They have also some trainers for web development. They teach HTML, Laravel, etc.

➤ Professional Courses

Daffodil online has some professional courses on networking. Basically

Daffodil Online is an ISP center for that they have some trainers for professional courses. Daffodil Online is the one and only ISP center who have cambium devices and they also give training on cambium network.

- The offers Daffodil Online are given Bellow:
 - They train and arrange vendor exam on MTCRE.
 - They train and arrange vendor exam on MTCNA.
 - They also arrange vendor exam on CCNA.
 - They also train and arrange vendor exam for MTCWE.
 - They train on Linux – RHCE.
 - They teach centos-6 and centos-7 both in Linux.
 - They tech how to do servers in Linux

At the end of this chapter, you can rely on the importance of DOL which is the Top ISP company in Bangladesh. That's all about Daffodil Online Ltd. As a fresher, I will suggest you do a basic networking course on MTCNA in Daffodil Online.

CHAPTER 3

TASKS, PROJECTS AND ACTIVITIES

3.1 Daily tasks and Activities

During Internship on Daffodil Online Limited, there was a lot of tasks and I was work with a project which was on Linux based. There was so may responsibility on me. The responsibility is bellowed:

- I need to attend the class at the right time.
- For improving the system, I need to join.
- Performing all of the general systems maintains and all kinds of support.
- Troubleshoot all of the hardware and software problems.
- Working with other members for improving the project.

Task and Activities:

There was a lot of activities and Task. The tasks are given bellow:

- Make Directory in Linux Operating system.
- need to create a lot of files to work properly.
- create users for giving them access.
- create groups to add all of the users in a group
- edit file's line, insert id number and set up lines.

3.2 Linux Basic Commands

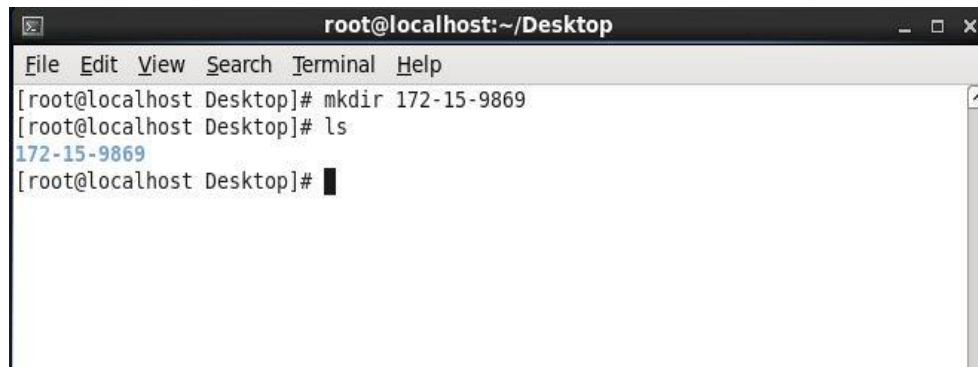
There are many commands in the Linux operating system. Linux is based on the command. In bellow, the commands are showing in commands table:

Table 3.1 Table of commands

Command	Example	Description
whoami	Root	Showing the user of Linux
hostname	localhost.localadmin	Showing the host of Linux
ls	Desktop, Documents	Showing the list of Directory
clear	Terminal clear	Clear the history of terminal
history	All history of terminal	Showing all history of terminal
cat /etc/redhat-release	CentOS release 6.4 (Final)	Showing the release of version
Ctrl + n	Shortcut clear	Clear all history with shortcut
Init6	Restarting	Restarting Linux Operating System
Init0	Shutdown	Shut downing Linux Operating
cp source destination	Coping file	Copy file from source to Destination
mkdir Dol	Dol (Directory)	Creae Directory
Touch Batch-32	Batch-32(File)	Create File
Cd Desktop	Desktop (Directory)	Change of Directory
Cd ..	Previous directory	Change to previous directory
Cp source desstination	copy to Destination	Copy with Rename
mv source destination	Move to destination	Move with rename
! history number	! history number	Total number of History of Terminal
uname	Uname	Current user name
Shutdown -r now	Shutdown	Shout downing window

3.3 All kind of Tasks

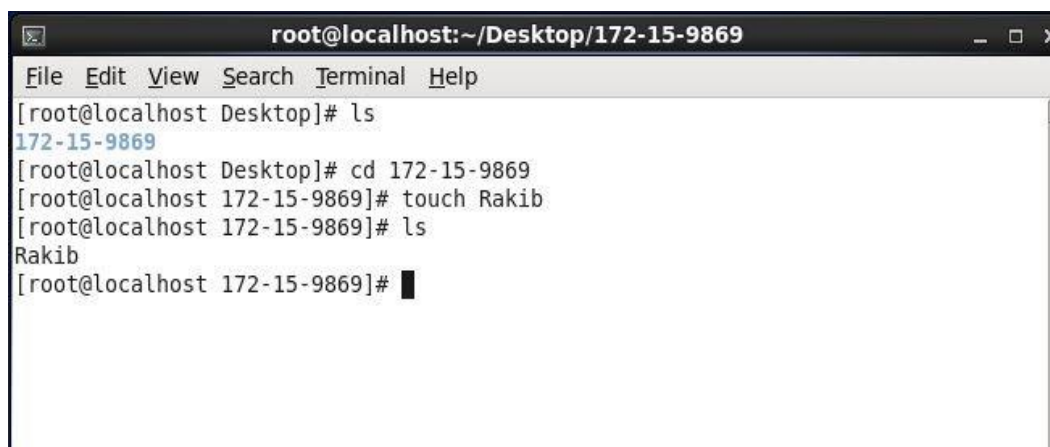
to make directory first I have to open a Terminal. Then Make a command of “mkdir” and type a “Directory name”. in bellow given that:

A terminal window titled "root@localhost:~/Desktop" with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
[root@localhost Desktop]# mkdir 172-15-9869
[root@localhost Desktop]# ls
172-15-9869
[root@localhost Desktop]#
```

Figure 3.1 Directory Create


Then create a file in directory “172-15-9869”. For creating this file, I have to give a command “touch <<space>> File-name. In bellow given an example:

A terminal window titled "root@localhost:~/Desktop/172-15-9869" with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
[root@localhost Desktop]# ls
172-15-9869
[root@localhost Desktop]# cd 172-15-9869
[root@localhost 172-15-9869]# touch Rakib
[root@localhost 172-15-9869]# ls
Rakib
[root@localhost 172-15-9869]#
```

Figure 3.2 Create a file

After that I need to copy a file from one folder to another folder. For this I have to use a command “cp <<space>> source <<space>> Destination <<space>> new file. In bellow given that:

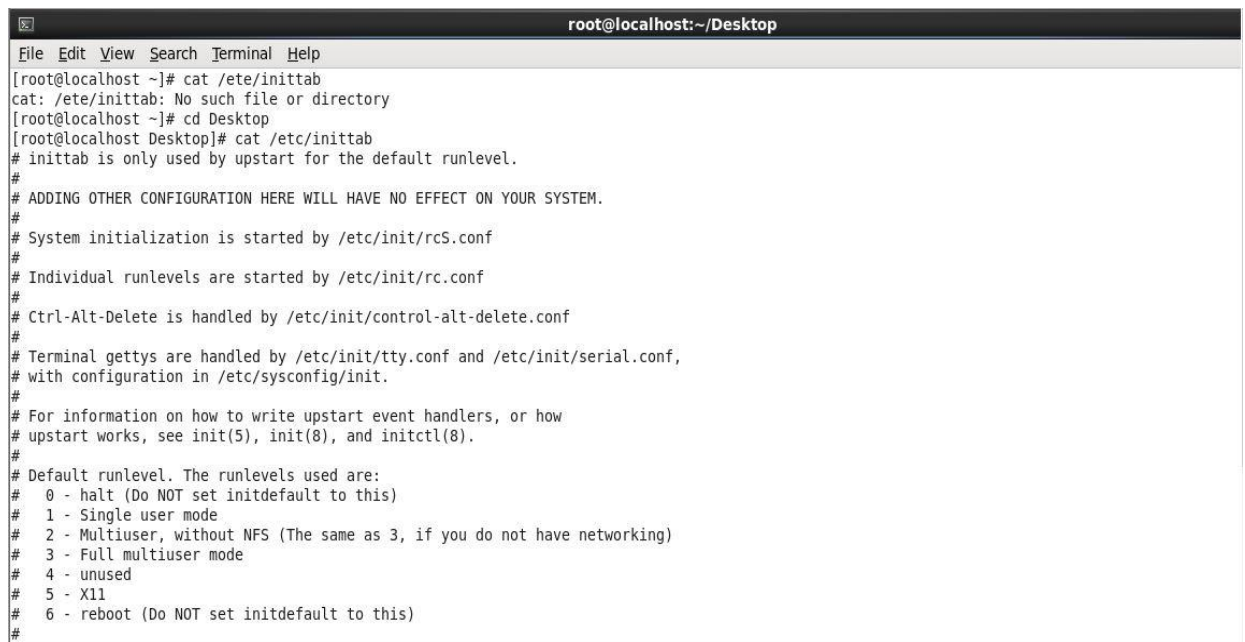
A terminal window titled 'root@localhost:~/Desktop/Rakib' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
[root@localhost 172-15-9869]# cd Desktop
bash: cd: Desktop: No such file or directory
[root@localhost 172-15-9869]# cd ..
[root@localhost Desktop]# mkdir Rakib
[root@localhost Desktop]# cp 172-15-9869 Rakib/abid
cp: omitting directory `172-15-9869'
[root@localhost Desktop]# ls
172-15-9869  Rakib
```

Figure 3.3 Copy file

To read a file I have to give a command. the command is “cat <<space>> /etc/inittab.

In bellow given that:

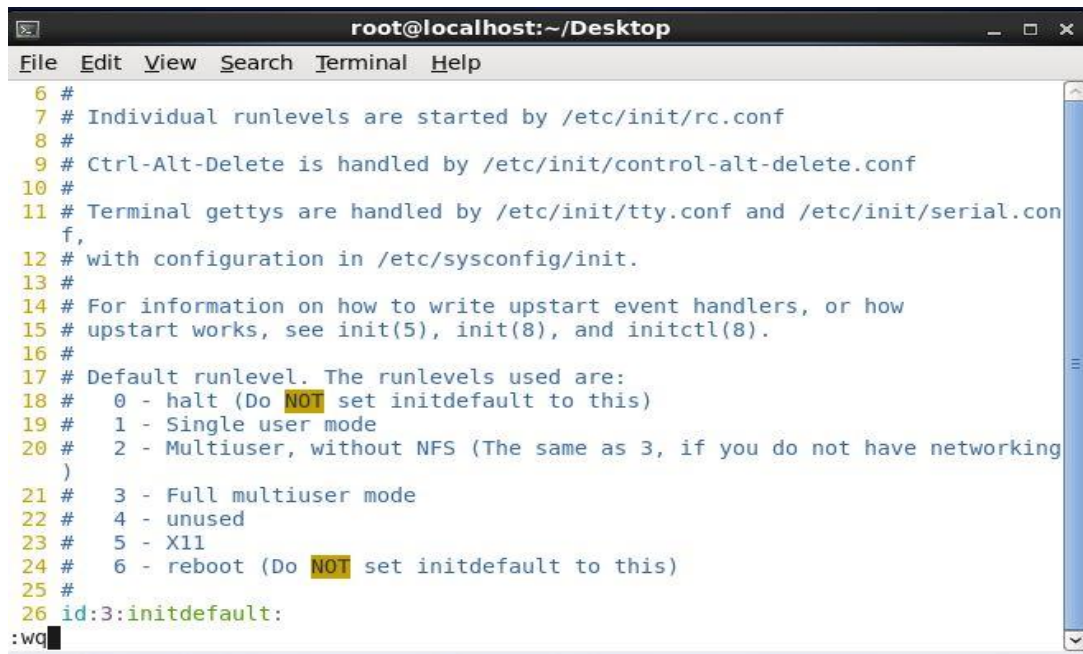
A terminal window titled 'root@localhost:~/Desktop' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
[root@localhost ~]# cat /ete/inittab
cat: /ete/inittab: No such file or directory
[root@localhost ~]# cd Desktop
[root@localhost Desktop]# cat /etc/inittab
# inittab is only used by upstart for the default runlevel.
#
# ADDING OTHER CONFIGURATION HERE WILL HAVE NO EFFECT ON YOUR SYSTEM.
#
# System initialization is started by /etc/init/rcS.conf
#
# Individual runlevels are started by /etc/init/rc.conf
#
# Ctrl-Alt-Delete is handled by /etc/init/control-alt-delete.conf
#
# Terminal gettys are handled by /etc/init/tty.conf and /etc/init/serial.conf,
# with configuration in /etc/sysconfig/init.
#
# For information on how to write upstart event handlers, or how
# upstart works, see init(5), init(8), and initctl(8).
#
# Default runlevel. The runlevels used are:
# 0 - halt (Do NOT set initdefault to this)
# 1 - Single user mode
# 2 - Multiuser, without NFS (The same as 3, if you do not have networking)
# 3 - Full multiuser mode
# 4 - unused
# 5 - X11
# 6 - reboot (Do NOT set initdefault to this)
#
```

Figure 3.4 File read

- 0-halt (in this level “0” Linux Operating system will be going off)
- 1- Single user mood. (root password will break in level 1)
- 2 – multiuser (Do not use network)
- 3- Full multiuser mode
- 4- unused (level 4 cannot use)
- 5 – XII (Desktop Mood)
- 6- reboot (By run level 6 system will be reboot)

To edit a file there will be need a command. the command is “vim <<space>> etc/inittab” in bellow given that:

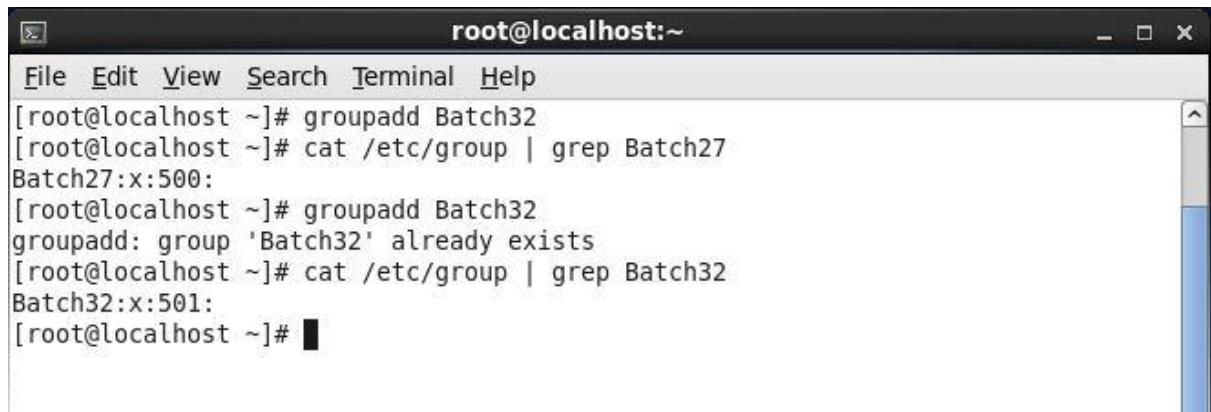


```
root@localhost:~/Desktop
File Edit View Search Terminal Help
6 #
7 # Individual runlevels are started by /etc/init/rc.conf
8 #
9 # Ctrl-Alt-Delete is handled by /etc/init/control-alt-delete.conf
10 #
11 # Terminal gettys are handled by /etc/init/tty.conf and /etc/init/serial.conf,
12 # with configuration in /etc/sysconfig/init.
13 #
14 # For information on how to write upstart event handlers, or how
15 # upstart works, see init(5), init(8), and initctl(8).
16 #
17 # Default runlevel. The runlevels used are:
18 # 0 - halt (Do NOT set initdefault to this)
19 # 1 - Single user mode
20 # 2 - Multiuser, without NFS (The same as 3, if you do not have networking
21 # )
22 # 3 - Full multiuser mode
23 # 4 - unused
24 # 5 - X11
25 # 6 - reboot (Do NOT set initdefault to this)
26 id:3:initdefault:
:wq
```

Figure 3.5 Edit file

- 1st command cat <<space>> /etc/inittab
- 2nd command vim <<space>> /etc/inittab
- For line set, at 1st press “Esc” then press “:”
- Then press “I” for insert and edit the “id”.
- Finally give a command to “: wq and press “Enter”
- Here I changed the id “3” for minimal mood.

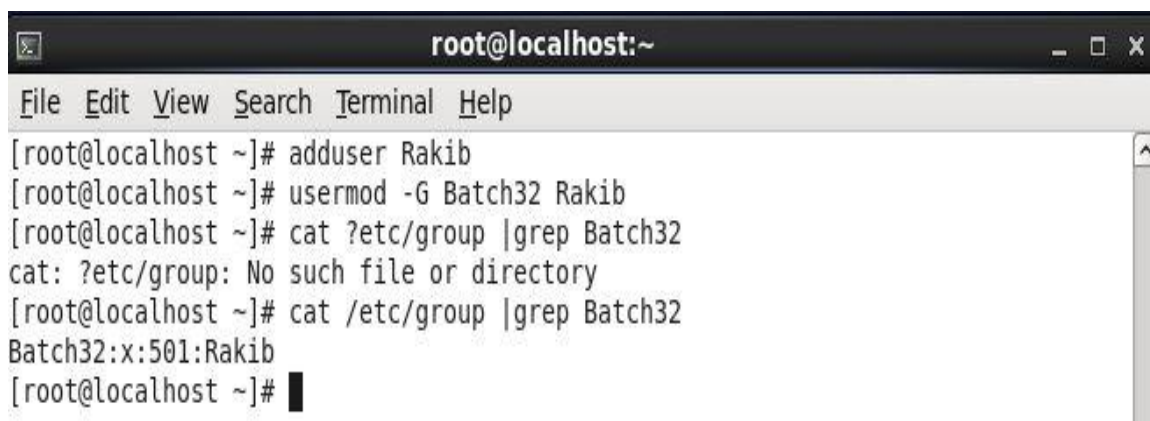
For creating a group for a user, I needed to create a group. The Command for creating a group and show the group is “groupadd <<space>> Group name” and another command for showing the group is “cat <<space>> /etc/group | grep group name” given bellow:



```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# groupadd Batch32  
[root@localhost ~]# cat /etc/group | grep Batch27  
Batch27:x:500:  
[root@localhost ~]# groupadd Batch32  
groupadd: group 'Batch32' already exists  
[root@localhost ~]# cat /etc/group | grep Batch32  
Batch32:x:501:  
[root@localhost ~]# █
```

Figure 3.6 Create Group

For creating a user, I needed to using a command. The command is “useradd <space> username “and another command is adding a user in a group “usermod <space> -G <space> groupname <space> username”



```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# adduser Rakib  
[root@localhost ~]# usermod -G Batch32 Rakib  
[root@localhost ~]# cat ?etc/group |grep Batch32  
cat: ?etc/group: No such file or directory  
[root@localhost ~]# cat /etc/group |grep Batch32  
Batch32:x:501:Rakib  
[root@localhost ~]# █
```

Figure 3.6 User add in group

Linux basic command are here. End of this chapter I will discuss about Network and Servers Configuration in Linux.

CHAPTER 4

SERVERS IN LINUX

4.1 Static Configuration

First, I need to change the directory to “network-scripts” then edit the ethernet port “ETH0”.

```
[root@localhost network-scripts]# cd /etc/sysconfig/network-scripts/
[root@localhost network-scripts]# vi ifcfg-eth0_
```

Figure 4.1 Edit network port

Now I need to configure the “ETH0” port [ifcfg-eth0].

```
DEVICE=eth0
HWADDR=08:0C:29:48:99:F0
TYPE=Ethernet
UUID=dce9a5e7-f673-4c87-adc2-ada085601cdd
ONBOOT=yes
NM_CONTROLLED=yes
BOOTPROTO=static
IPADDR=192.168.0.102
NETMASK=255.255.255.0
GATEWAY=192.168.0.1
DNS1=8.8.8.8

"ifcfg-eth0" 11L, 215C
```

Figure 4.2 Static configuration

4.2 DHCP Configuration

First, I have to edit “ETH0” port and configure it to DHCP.

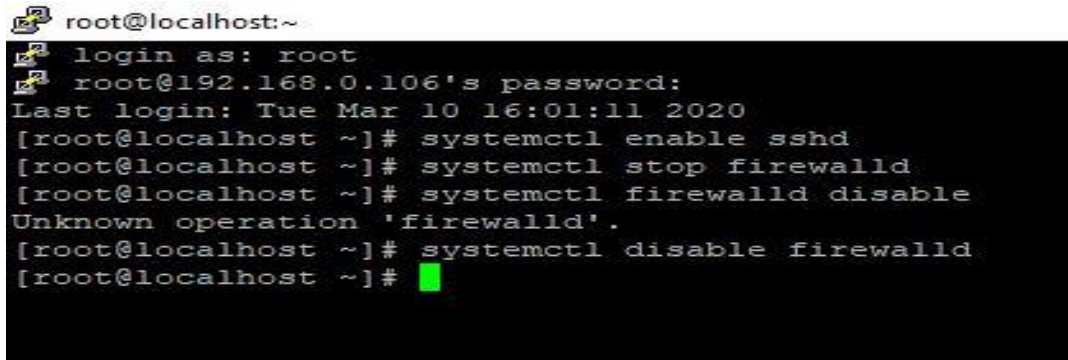
```
DEVICE=eth0
HWADDR=08:0C:29:48:99:F0
TYPE=Ethernet
UUID=dce9a5e7-f673-4c87-adc2-ada085601cdd
ONBOOT=yes
NM_CONTROLLED=yes
BOOTPROTO=dhcp
```

Figure 4.3 DHCP configuration

4.3 Nagios Server Configuration

Step-01: Basic Network Configuration:

1. New Minimal OS installation
2. DHCP configuration. [cd /etc/sysconfig/network-script/, vi ifcfg-eth0]
3. systemctl restart sshd [for PuTTY longing]
4. systemctl enable sshd.
5. systemctl stop firewalld.
6. systemctl disable firewalld.

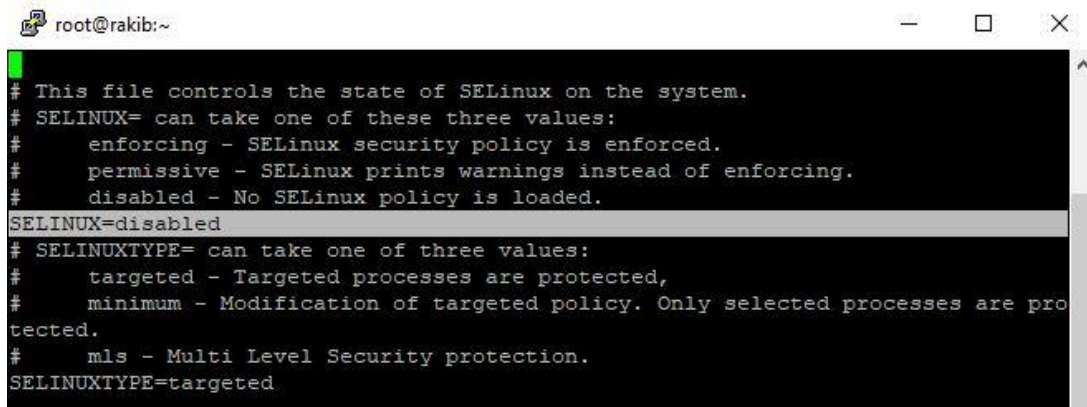


```
root@localhost:~#  
login as: root  
root@192.168.0.106's password:  
Last login: Tue Mar 10 16:01:11 2020  
[root@localhost ~]# systemctl enable sshd  
[root@localhost ~]# systemctl stop firewalld  
[root@localhost ~]# systemctl firewalld disable  
Unknown operation 'firewalld'.  
[root@localhost ~]# systemctl disable firewalld  
[root@localhost ~]#
```

Figure 4.4 Basic network configuration

Step-02: SELINUX= Disabled

- Vi /etc/sysconfig/selinux

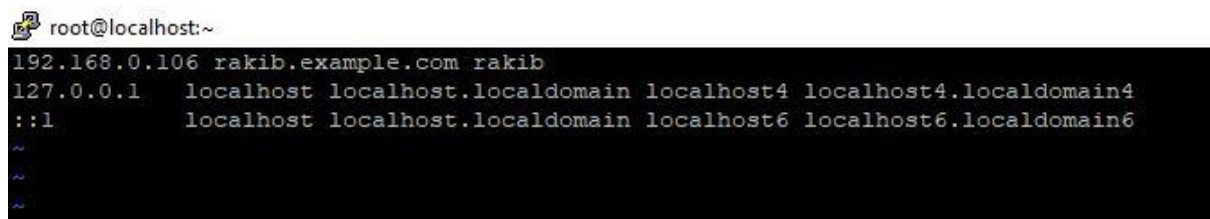


```
root@rakib:~  
# This file controls the state of SELinux on the system.  
# SELINUX= can take one of these three values:  
#   enforcing - SELinux security policy is enforced.  
#   permissive - SELinux prints warnings instead of enforcing.  
#   disabled - No SELinux policy is loaded.  
SELINUX=disabled  
# SELINUXTYPE= can take one of three values:  
#   targeted - Targeted processes are protected,  
#   minimum - Modification of targeted policy. Only selected processes are pro  
#   mls - Multi Level Security protection.  
SELINUXTYPE=targeted
```

Figure 4.5 SELINUX disabled

Step-03: Host Name Setup

- vi /etc/hosts [192.168.0.10 rakib.example.com rakib]



```
root@localhost:~#  
192.168.0.106 rakib.example.com rakib  
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4  
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6  
~  
~  
~
```

Figure 4.6 Host Name Setup

Step-03: Installation Packages

- yum install epel-release -y

```
root@localhost~
[root@localhost ~]# yum install epel-release -y
Loaded plugins: fastestmirror
Determining fastest mirrors
epel/x86_64/metalink
 * base: mirror.vanehost.com | 7.1 kB 00:00:00
 * epel: mirror.xeonbd.com
 * extras: mirror.vanehost.com
 * updates: mirror.vanehost.com
base | 3.6 kB 00:00:00
epel | 5.3 kB 00:00:00
extras | 2.9 kB 00:00:00
updates | 2.9 kB 00:00:00
(1/4): epel/x86_64/updatesinfo | 1.0 MB 00:00:00
(2/4): extras/7/x86_64/primary_db | 1.6 kB 00:00:00
(3/4): updates/7/x86_64/primary_db | 6.7 MB 00:00:09
(4/4): epel/x86_64/primary_db | 6.7 MB 00:01:34
Package epel-release-7-12.noarch already installed and latest version
Nothing to do
[root@localhost ~]#
```

Figure 4.7 Yum install

- Yum install nagios nagios-plugins -y

```
root@localhost~
[root@localhost ~]# yum install nagios nagios-plugins -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirror.vanehost.com
 * epel: mirror.xeonbd.com
 * extras: mirror.vanehost.com
 * updates: mirror.vanehost.com
Package nagios-4.4.3-1.el7.x86_64 already installed and latest version
Package nagios-plugins-2.3.1-3.el7.x86_64 already installed and latest version
Nothing to do
[root@localhost ~]#
```

Figure 4.8 Nagios plugin install

- Yum install nagios* -y

```
[root@localhost ~]# yum install nagios* -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirror.vanehost.com
 * epel: mirror.xeonbd.com
 * extras: mirror.vanehost.com
 * updates: mirror.vanehost.com
```

Figure 4.9 Nagios package install

Step-04: nagios and httpd enable

1. systemctl start nagios
2. systemctl enable nagios
3. systemctl start httpd
4. systemctl enable httpd
5. systemctl restart httpd nagios

```

root@localhost~
[root@localhost ~]# systemctl start nagios
[root@localhost ~]# systemctl enable nagios
Created symlink from /etc/systemd/system/multi-user.target.wants/nagios.service to /usr/lib/systemd/system/nagios.service.
[root@localhost ~]# systemctl start httpd
[root@localhost ~]# systemctl enable httpd
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[root@localhost ~]# systemctl restart httpd nagios
[root@localhost ~]#

```

Figure 4.10 Nagios and httpd enable

Step-05: LAN block allow

1. vi /etc/httpd/conf.d/nagios.conf
2. Allow from 127.0.0.1 (gateway) 192.168.0.1/24 [line no 30 enable]

```

30 Allow from 127.0.0.1 192.168.0.1/24

```

Figure 4.11 LAN block allow

Step-06: vi /etc/nagios/nagios.cfg [line no 51 enable]

```

51 cfg_dir=/etc/nagios/servers
52 #cfg_dir=/etc/nagios/printers
53 #cfg_dir=/etc/nagios/switches
54 #cfg_dir=/etc/nagios/routers

```

Figure 4.12 Cfg directory server enable

Step-07: make server directory and change to the server directory

1. Cd /etc/nagios
2. Mkdir servers
3. Cd /etc/nagios/servers/

Step-08: Edit Clients

- Vi clients.cfg

```

root@localhost:/etc/nagios/servers
define host {
    use                linux-server
    host_name          Rakib
    alias              Vlan-12 (01767968526)
    address            192.168.0.107
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
}

define host {
    use                linux-server
    host_name          Nazmul
    alias              Vlan-12 (01767968526)
    address            192.168.0.102
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
}

define host {
    use                linux-server
    host_name          PC
    alias              Vlan-12 (01767968526)
    address            192.168.0.104
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
}

```

Figure 4.13 Edit clients

Step-09: Create Nagios admin and password

- htpasswd /etc/nagios/passwd nagiosadmin
- password: *****

Step-10: Login into the page and show the hosts

The screenshot shows the Nagios web interface at 192.168.0.106. The 'Current Network Status' section indicates the system is up and updated every 90 seconds. The 'Host Status Totals' table shows 4 hosts up, 0 down, 0 unreachable, and 0 pending. The 'Service Status Totals' table shows 7 services OK, 1 warning, 0 unknown, 0 critical, and 0 pending. The 'Host Status Details For All Host Groups' table lists the following hosts:

Host	Status	Last Check	Duration	Status Information
Nazmul	UP	03-10-2020 17:05:14	0d 0h 5m 59s	PING OK - Packet loss = 0%, RTA = 75.92 ms
PC	UP	03-10-2020 17:01:27	0d 0h 6m 1s+	PING OK - Packet loss = 0%, RTA = 0.53 ms
Rakib	UP	03-10-2020 17:02:42	0d 0h 6m 1s+	PING OK - Packet loss = 0%, RTA = 300.71 ms
localhost	UP	03-10-2020 17:01:17	23d 18h 43m 15s	PING OK - Packet loss = 0%, RTA = 0.06 ms

Figure 4.14 Nagios server and active hosts

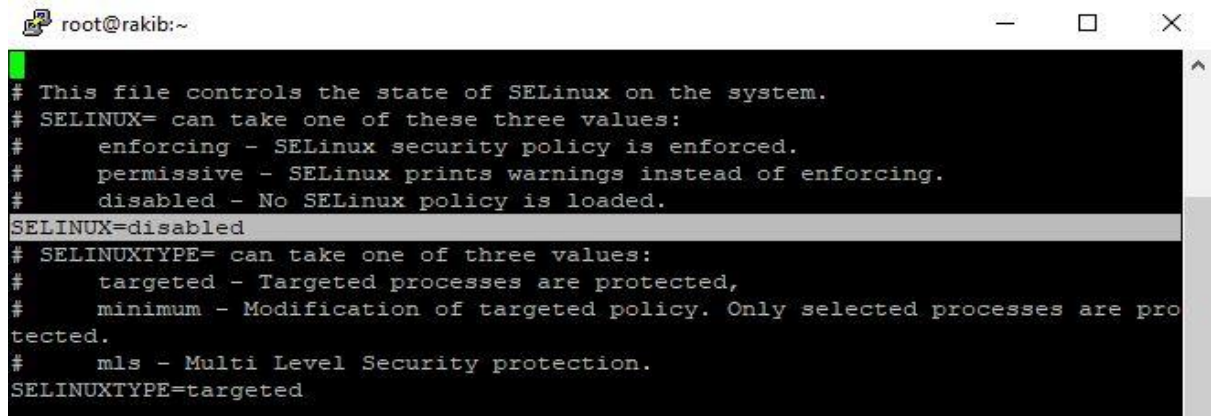
4.4 Web Server Configuration

Step-01: Basic Network configuration.

1. New minimal OS installation.
2. DHCP configuration. [cd /etc/sysconfig/network-script/, vi ifcfg-eth0]
3. systemctl restart sshd.
4. systemctl stop firewalld
5. systemctl disable firewalld

Step-02: SELINUX= Disabled.

- vi /etc/sysconfig/selinux



```
root@rakib:~  
# This file controls the state of SELinux on the system.  
# SELINUX= can take one of these three values:  
#   enforcing - SELinux security policy is enforced.  
#   permissive - SELinux prints warnings instead of enforcing.  
#   disabled - No SELinux policy is loaded.  
SELINUX=disabled  
# SELINUXTYPE= can take one of three values:  
#   targeted - Targeted processes are protected,  
#   minimum - Modification of targeted policy. Only selected processes are protected.  
#   mls - Multi Level Security protection.  
SELINUXTYPE=targeted
```

Figure 4.15 SELINUX disabled

Step-03: HTTPD file download and install

- yum install httpd* -y



```
[root@rakib ~]# yum install httpd* -y  
Loaded plugins: fastestmirror  
Loading mirror speeds from cached hostfile  
Could not get metalink https://mirrors.fedoraproject.org/metalink?repo=epel-7&arch=x86_64&infra=stock&content=centos error was  
14: curl#6 - "Could not resolve host: mirrors.fedoraproject.org; Unknown error"  
* base: mirror.vanehost.com  
* epel: mirror.xeonbd.com  
* extras: mirror.vanehost.com  
* updates: mirror.vanehost.com
```

Figure 4.16 HTTPD file install and download

Step-04: work on httpd

1. rpm -qa grep httpd
2. systemctl start httpd
3. systemctl enable httpd
4. systemctl restart httpd

Step-05: Log in into Bitwise SSH Client

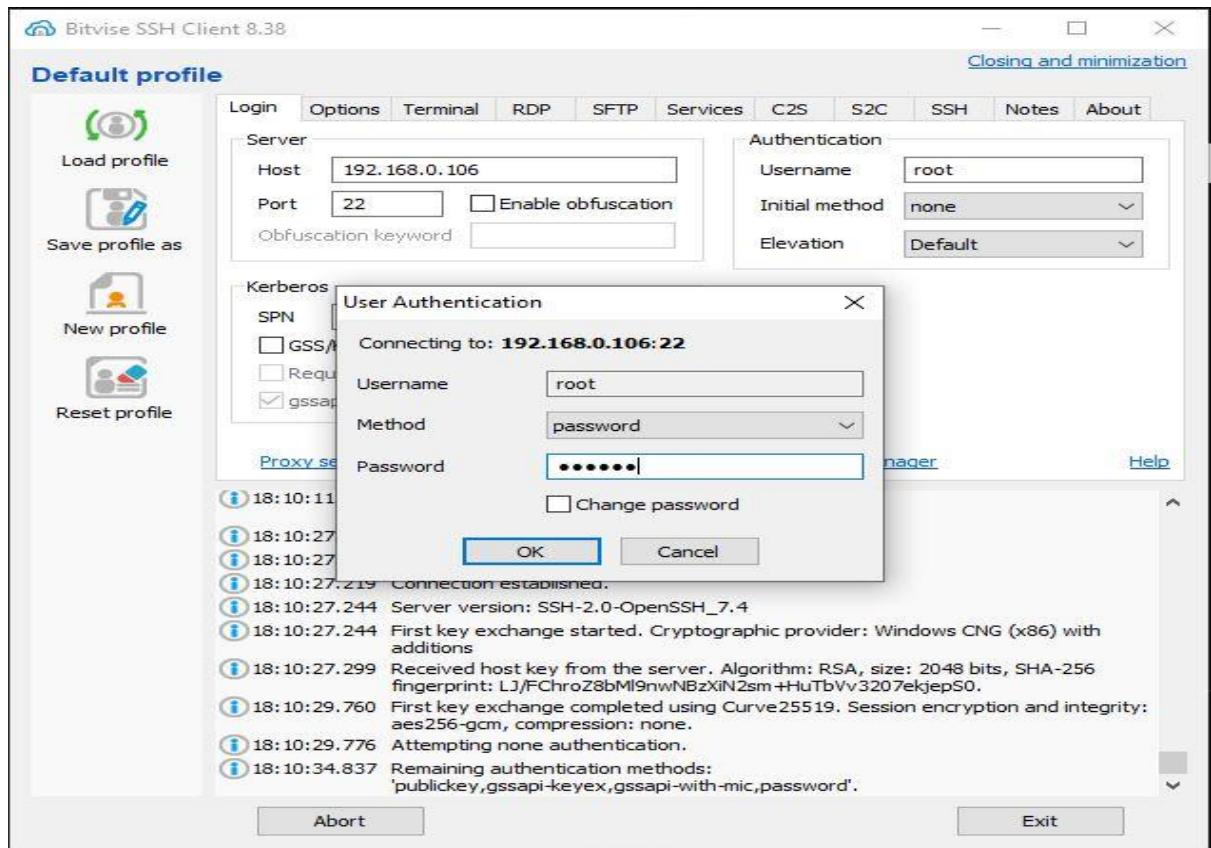


Figure 4.17 Bitvise SSH Client login

Step-06: Copy all html file to [var/www/html] directory

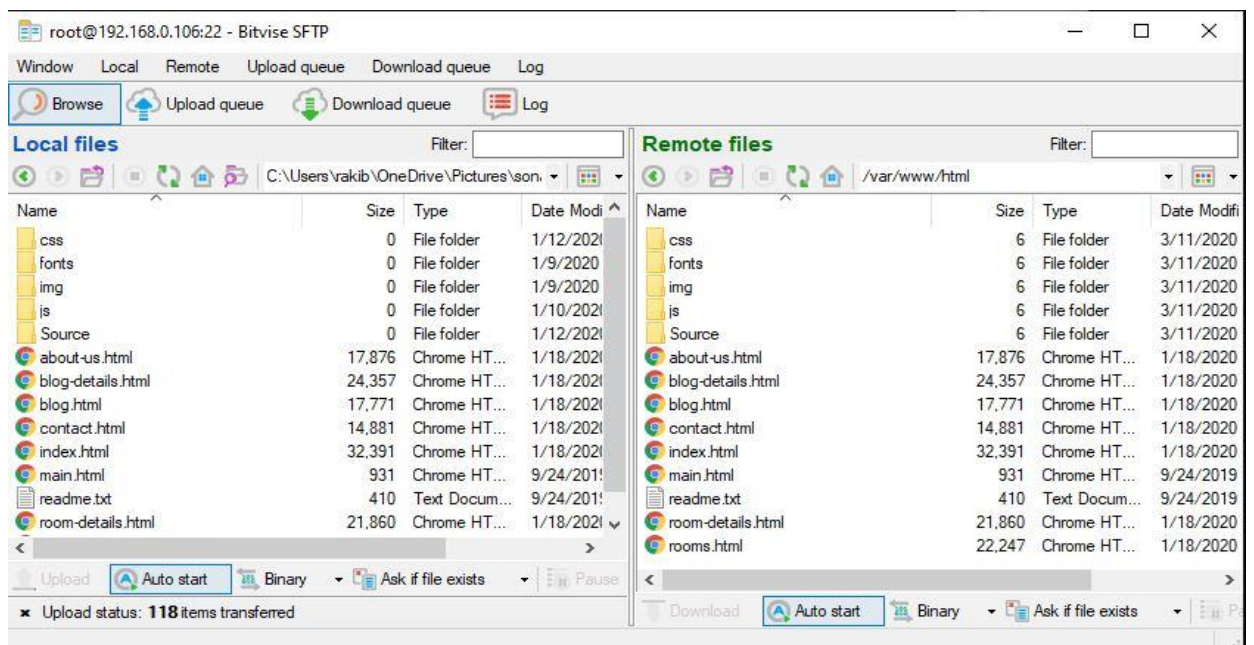


Figure 4.18 Copy html file

Step-07: Open your browser and enter your ip address [192.168.0.106]

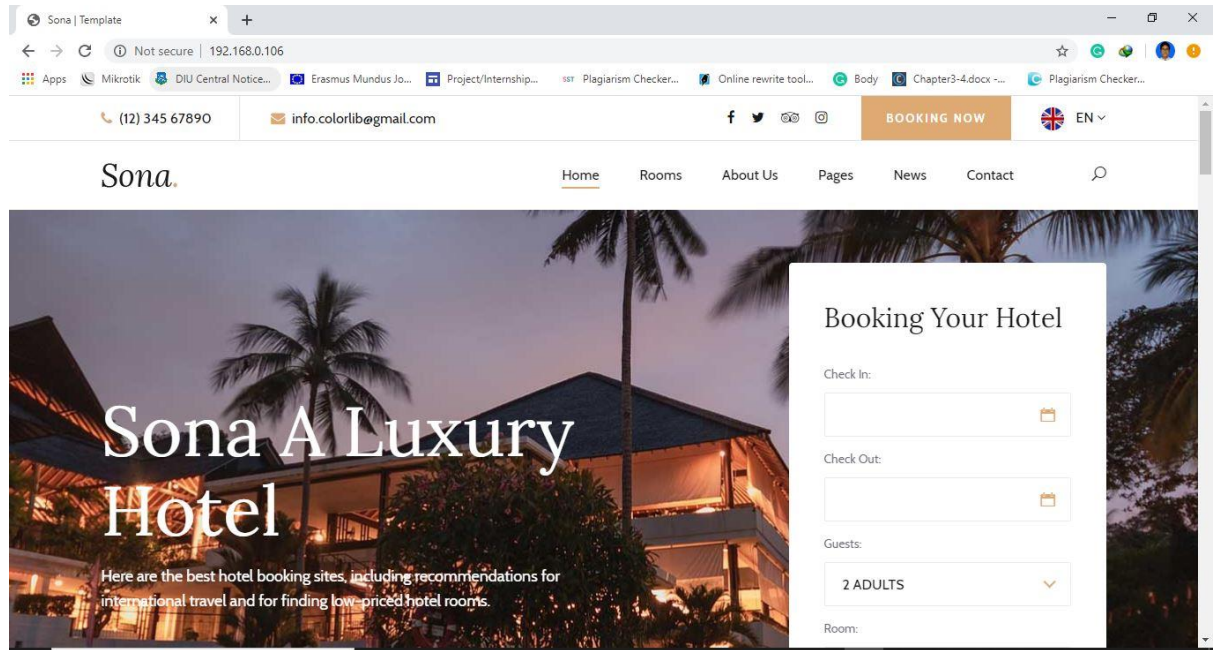


Figure 4.19 Web page Hosting

CHAPTER 5

CLASSIFICATION OF IP ADDRESSES

5.1 About IP Address

An Internet protocol identifies a different user's destination address. Nowadays the number of traffic is increasing on the internet. It is difficult to identify each traffic on the internet. Ip addresses are helping to identify each traffic on the Internet. traffic on the internet is maintained by IP subnetting.

Two types of protocols are used on the internet. They are IPv4 and IPv6. Generally, Ipv4 is representing a 32-bit user address and IPv6 represents a 128-bit user address. the 32 bits are divided into three octets. Each octet contains 8 bits. An IP address of IPv4 contains a maximum number of 230 bits host addresses. But day by day the number of hosts on the internet is increasing for that the new protocol of IPv6 is invented. An IP address of IPV6 represents 2126 bits host on the Internet. For this reason, the technicians are going to use IPv6. For example, 172.16.254.1 in IPv4, and 2001:db8:0:1234:0:567:8:1 in IPv6. The measure of the guidance prefix of the tackle is assigned in CIDR documentation via suffixing the tackle with the range of necessary bits, 192.168.1.15/24, which is similar to the verifiably utilized subnet cowl 255.255.255.0.

5.2 Classes of IP Address

➤ Class A:

1st Octet is 1-126. Network(N)/ Host ID (H)= N.H.H.H. Default subnet mask = 255.0.0.0. Number of networks = $(2^7 - 2) = 126$ and useable host per Network is $= (2^{24} - 2) = 1,67,77,214$.

➤ Class B:

Decimal range of 1st Octet is 128-191. Network(N)/ Host ID (H)= N.N.H.H. Default subnet mask = 255.255.0.0. Number of networks = $(2^{14} - 2) = 16,382$ and useable host per Network is $= (2^{16} - 2) = 65,534$.

➤ Class C:

Decimal range of 1st Octet is 192-223. Network(N)/ Host ID (H)= N.N.N.H.
Default subnet mask = 255.255.255.0. Number of networks = $(2^{21} - 2) = 20,97,150$ and useable host per Network is = $(2^8 - 2) = 254$.

➤ Class D:

Decimal range of 1st Octet is 224-239. This Class is reserved for multicasting.

➤ Class E:

Decimal range of 1st Octet is 240-254. This Class is used for research.

5.3 The Range of Private IP Address and Their Class

- Private Network of class A = 10.0.0.0. The range of private Network of class A= 10.0.0.0 – 10.255.255.255 and Subnet mask is 255.0.0.0
- Private Network of class B = 172.16.0.0 The range of private Network of class B= 172.16.0.0 – 172.31.255.255 and Subnet mask is 255.240.0.0
- Private Network of class C = 192.168.0.0 The range of private Network of class B= 192.168.0.0 – 192.168.255.255 and Subnet mask is 255.255.0.0

5.4 Subnet of IP Addresses

➤ Subnet of Class A:

In class A there are 8 bits are Network portion and another 24 bits are hosts portion. If I want to make for 8 subnets for the class A network then the calculation is = Number of subnets: $2^3=8$. The Bit of the network will be 11111111.11111111.00000000.00000000. Subnet mask will be: $128+64+32+16+8+4+2+1= 255$. The subnet mask for 8 subnets of class A = 255.255.0.0. The number of Useable hosts per network will be $(2^{16} - 2) = 65,534$.

➤ Subnet of Class B:

In class B there are 16 bits are Network portion and another 16 bits are hosts portion. If I want to make for 8 subnets for the class B network then the calculation is: Number of subnets: $2^3 = 8$. The Bit of the network will be 11111111.11111111.11111111.00000000. Subnet mask will be: $128+64+32+16+8+4+2+1 = 255$. The subnet mask for 8 subnets of class B = 255.255.255.0. The number of Useable hosts per network will be $(2^8 - 2) = 254$.

➤ Subnet of Class C:

In class C there are 24 bits are Network portion and another 8 bits are hosts portion. If I want to make for 4 subnets for the class A network then the calculation is = Number of subnets: $2^2 = 4$. The Bit of the network will be 11111111.11111111.11111111.11110000. Subnet mask will be: $128+64+32+16 = 240$. The subnet mask for 4 subnets of class C = 255.255.240.0. The number of Useable hosts per network will be $(2^4 - 2) = 14$.

In this mathematical way, I can calculate 1 to 30-bit subnet of classes A, B, and C.

CHAPTER 6

MIKROTIK ROUTER CONFIGURATION

6.1 MikroTik Router

MikroTik router is used to configure various connection mood from ISP to the user. It looks like a simple router. The router has a various shape. Students use the small size of MikroTik router for their work and It is 2200 taka only. The professional Engineers are used 900Mhz, 2.4 GHz, 5.8 GHz. The ports are used for WLAN connectivity and LAN connectivity and also VLAN connectivity.

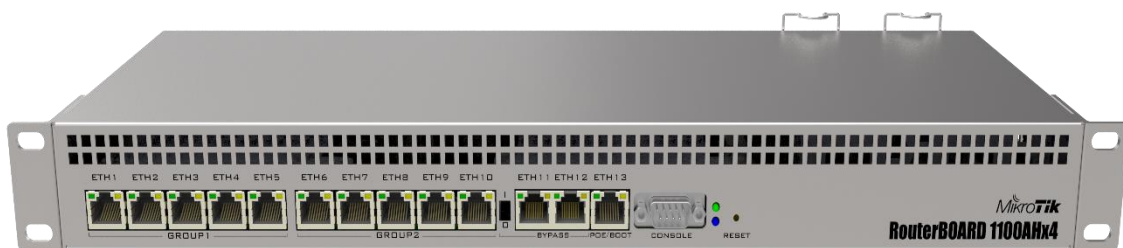


Figure 6.1 Mikrotik Router

6.2 Features

the features of the MikroTik router are:

- MikroTik routers are used as a router.
- It also used as a bridge or switch.
- It can provide PPOE clients-server.
- It also provides VPN- Virtual networks.
- It contains firewall rules.
- It can be providing DHCP server services.
- Provides WLAN or WIFI hotspot network services.
- Its bandwidth management system is very easy.
- Easy to network administration.
- IPv4 and Ipv6 both are supported.

OSPF, BGP, Multiprotocol Label Switching (VPLS/MPLS) and many other services are provided by MikroTik Router.

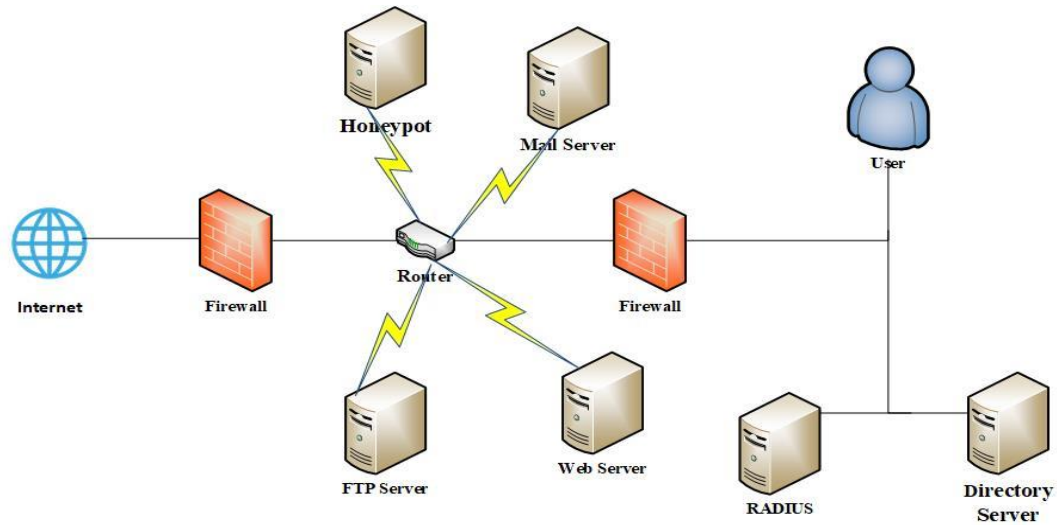


Figure 6.2 Router Network Diagram

6.3 Static Routing

Now click on “Interface”. Rename the Interface to ensure the Ether-port. I selected Ethernet port-1 as “WAN” port and port-4 for “LAN”.

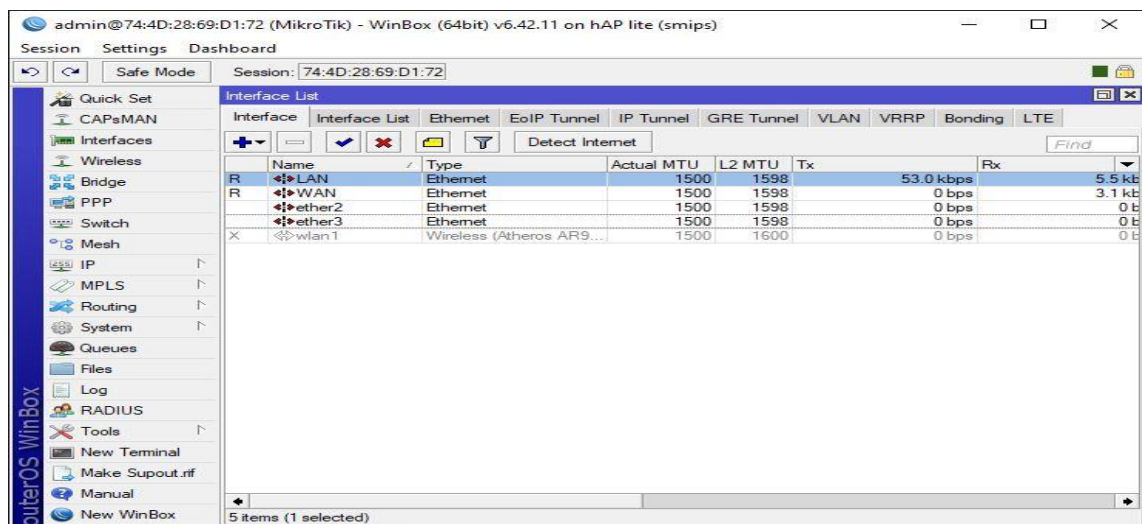


Figure 6.3 Ethernet port rename.

Now click IP > Addresses + LAN-IP and WAN-IP.> Click OK.

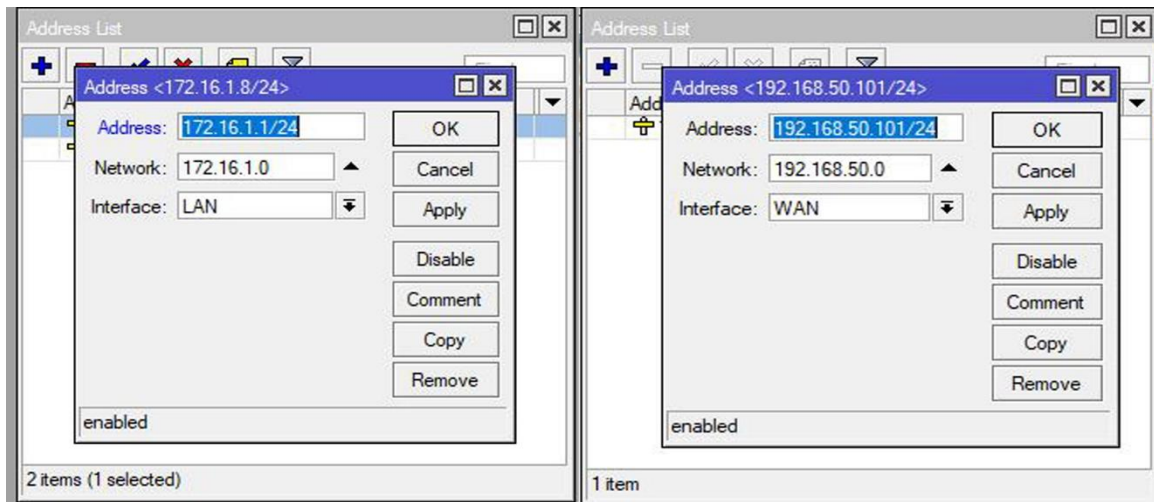


Figure 6.4 LAN-WAN ethernet-port IP addresses

Now click IP > Routes>

By default, DST address: 0.0.0.0/0

Gate Way: 192.168.50.1 > ok

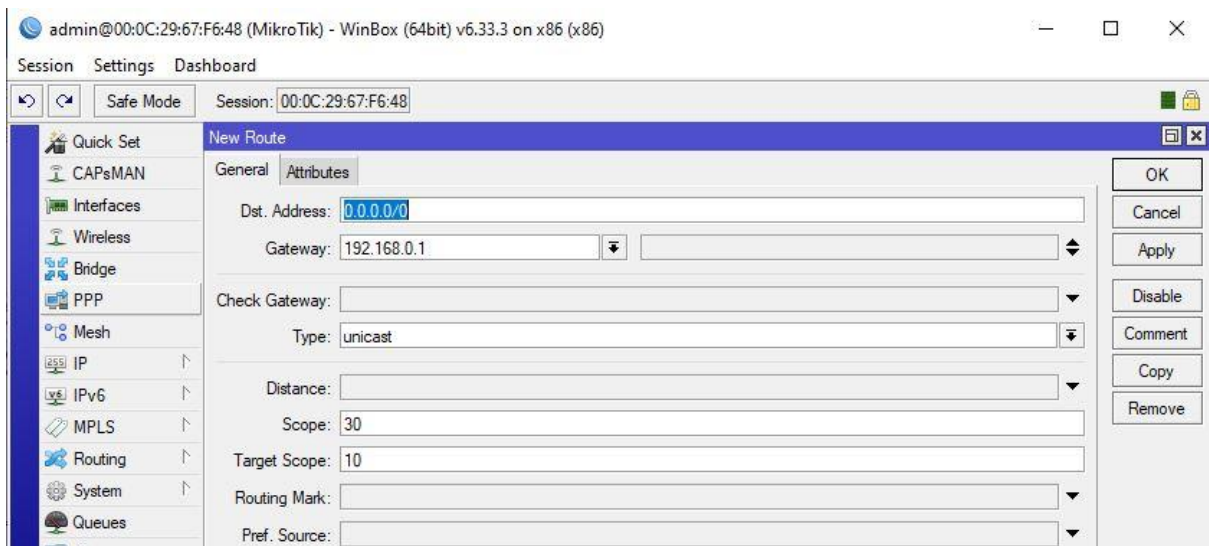


Figure 6.5 Gateway of Static Routing

Now click IP > Firewall > NAT + General > Chain > SRCNAT

SRC ADDRESS: 172.16.1.0/24 and go to Action > Masquerade > apply > ok.

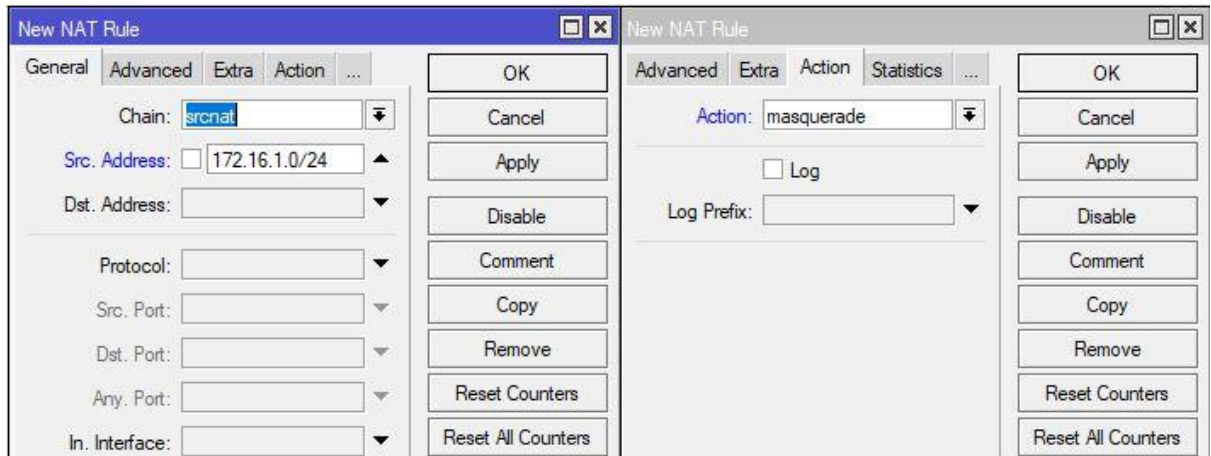


Figure 6.6 IP firewall configuration

6.4 DHCP Configuration

Now click IP > DHCP-SERVER > DHCP-SETUP > Select-Etherport-LAN > Next > Next > Next > ok.

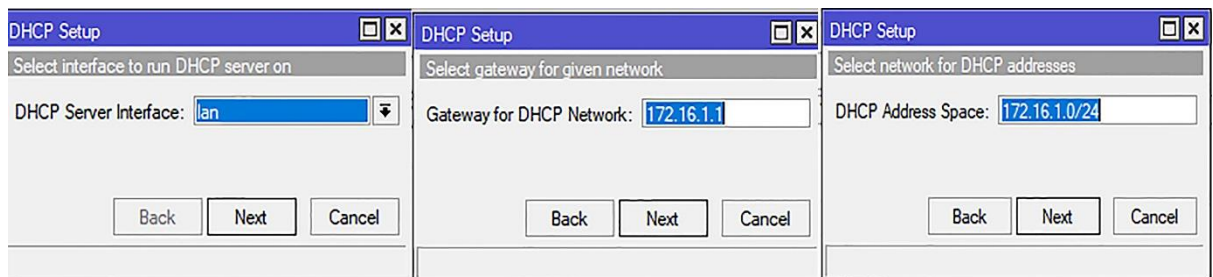


Figure 6.7 DHCP Configuration -start

Now click again Next > Next > OK

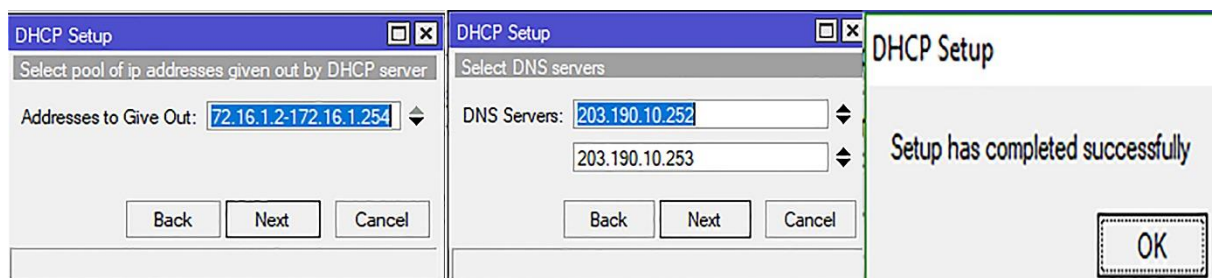


Figure 6.8 DHCP Configuration Finish

6.5 WLAN Configuration

Now click on Bridge > + Name: bridge1 > click ok.

Now click on Port > + Interface: WLAN1 > click ok

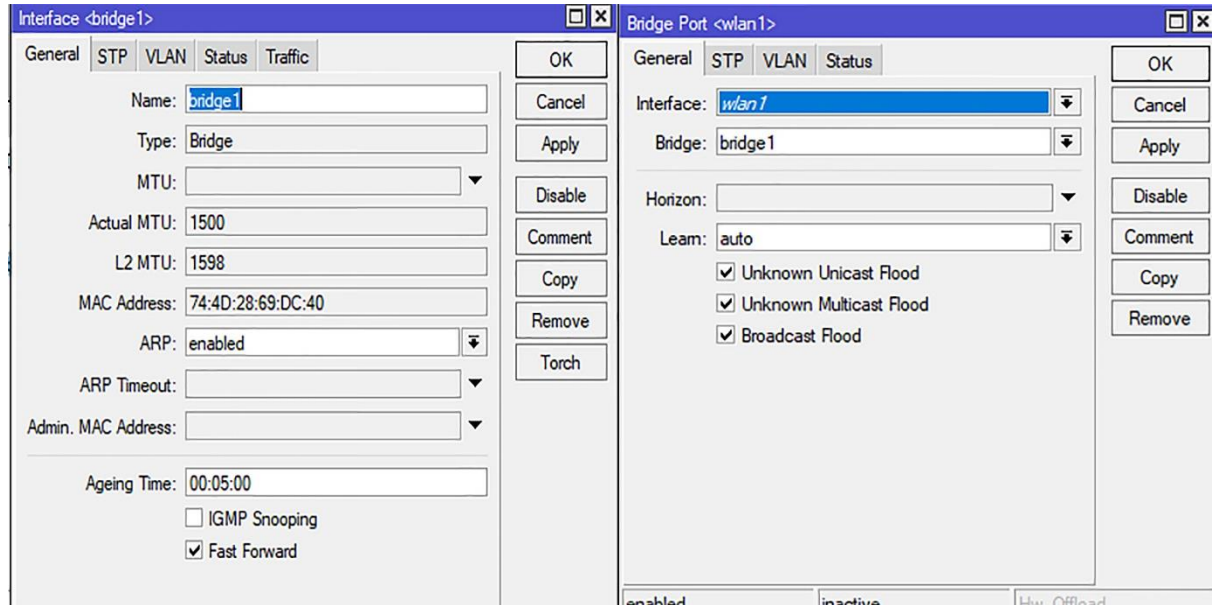


Figure 6.9 WLAN bridge create and Bridge port assign

Now double click on Wireless > Enable. Wireless > Mode: ap bridge, Band: 2ghz-B/G/N, Frequency: Auto, SSID: Rakib. Now going to Security profile > Name: default, Mode: dynamic keys, Authentication Type: WPA PSK, WPA2PSK and type their password.

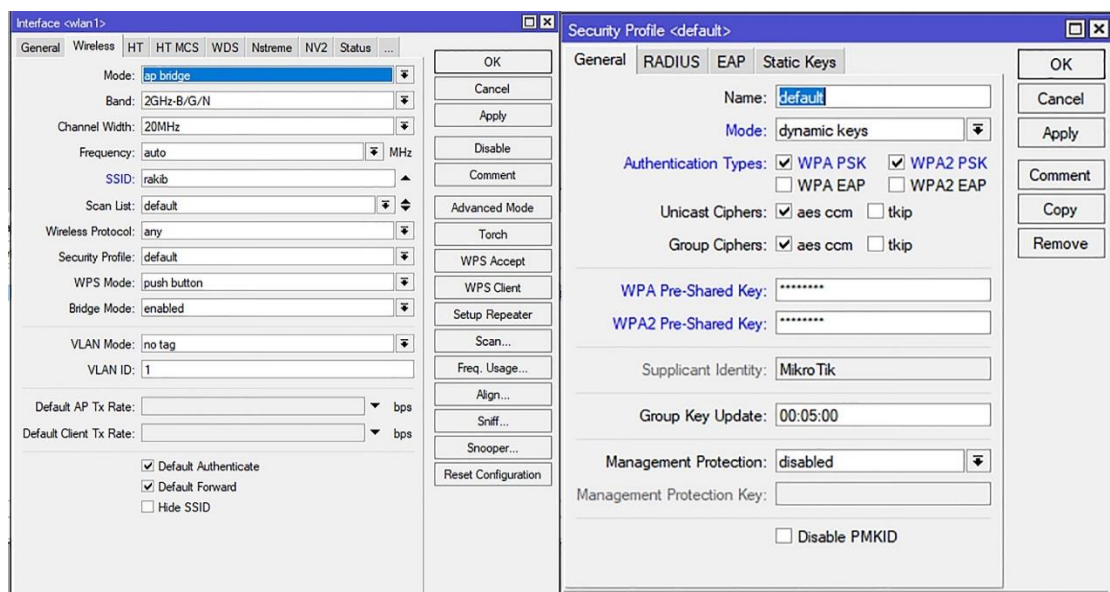


Figure 6.10 WLAN configuration finish.

6.6 PPOE Server

Now click on IP > Pool > Name: 1Mbps. Addresses: 172.20.1.0/24. Apply/ ok.

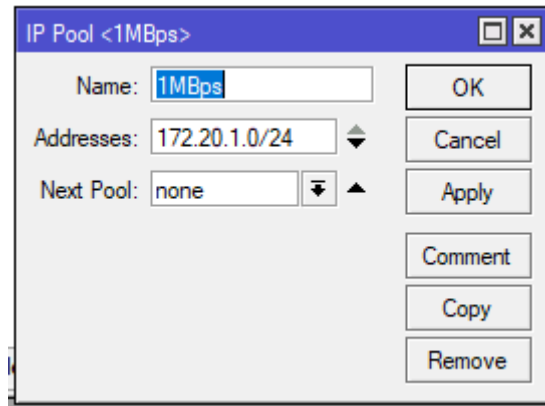


Figure 6.11 Pool for PPPoE Servers

Now click on PPP > PPPOE servers + Name: Rakib, Interface: Ether-3.

Now click on PPP > Profile > + Name: 1Mbps, Local Address: 172.20.1.1,

Remote address: 1M

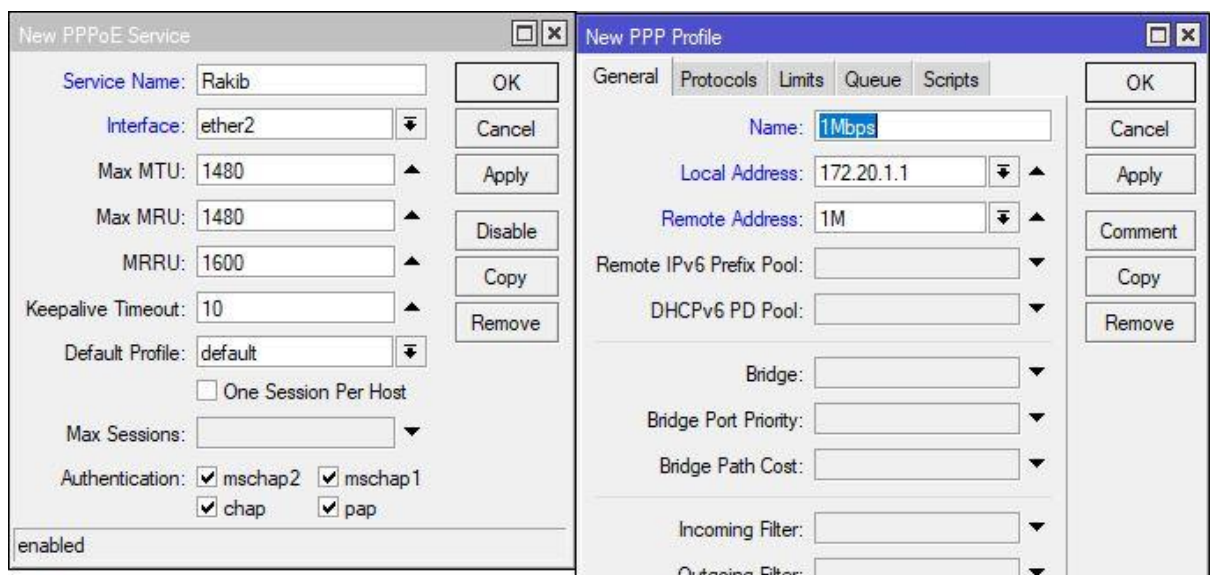


Figure 6.12 PPPoE Service and PPP Profile

Now click on PPP > Profile > Limits > Rate limit (rx/tx): 1M/1M, Only One: yes.

Now click on PPP > Secret > + Name: Rakib, Password: Enter your password, Service: PPPoE, Profile: 1Mbps.

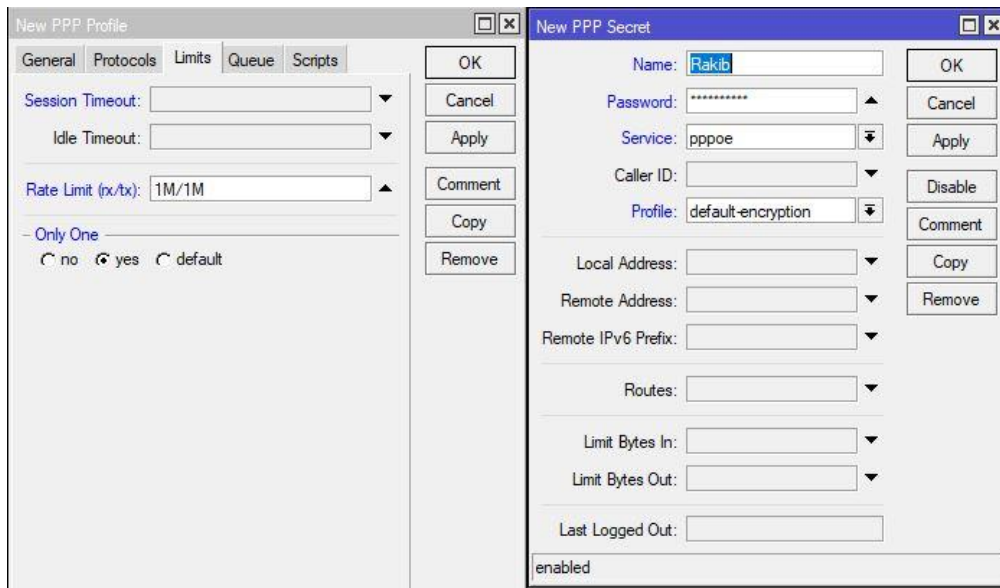


Figure 6.13 PPP Profile's limits and secret configure.

Now go to IP > Firewall > NAT + > Chain: srcnat, Src Address: 172.20.1.0/24.

Now go to Action > Action: masquerade and click ok.

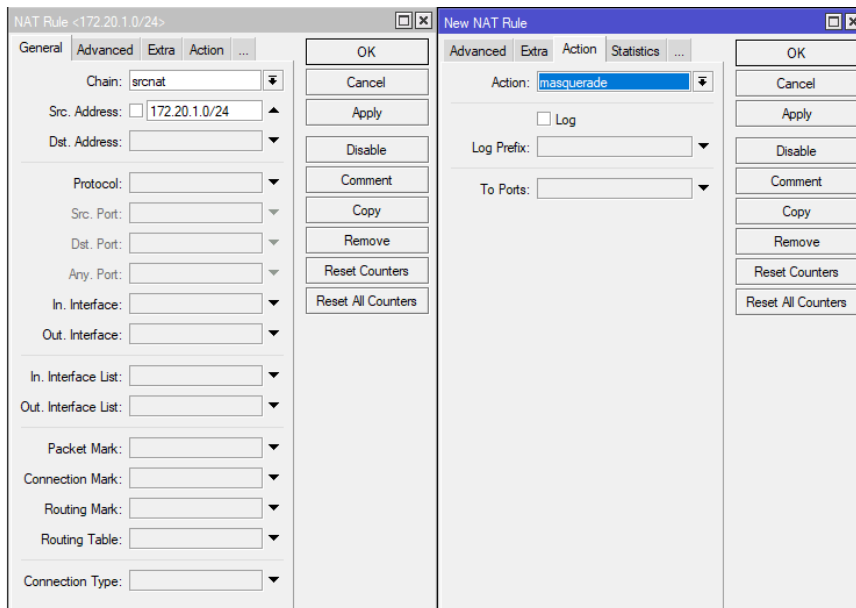


Figure 6.14 NAT for PPPoe servers

6.7 Mangle for Facebook and You Tube

Now click on IP > Firewall > address List “+” Name: Facebook and YouTube

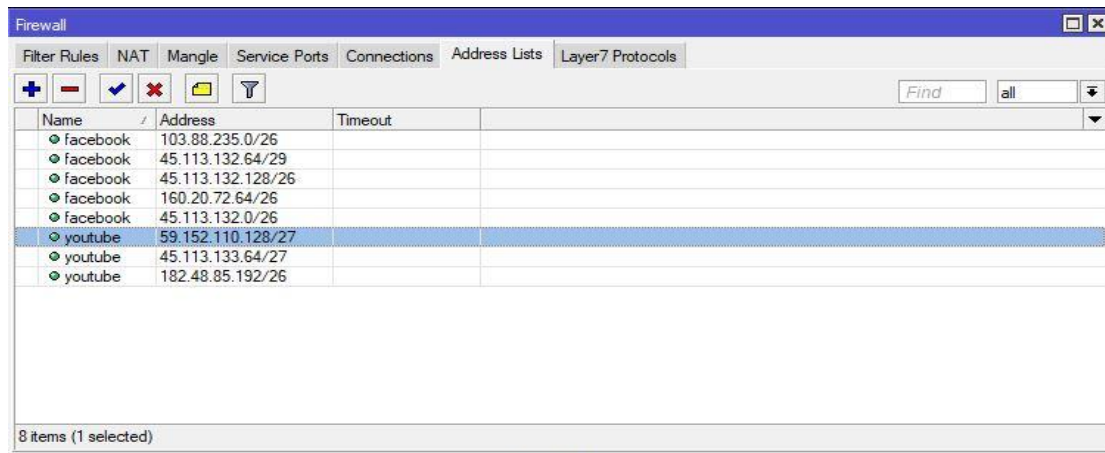


Figure 6.15 Address List

IP > Firewall > Mangle > +

General: chain: prerouting

Advance: Dst. Address List: Facebook

Action: mark connection

New connection Mark: Facebook

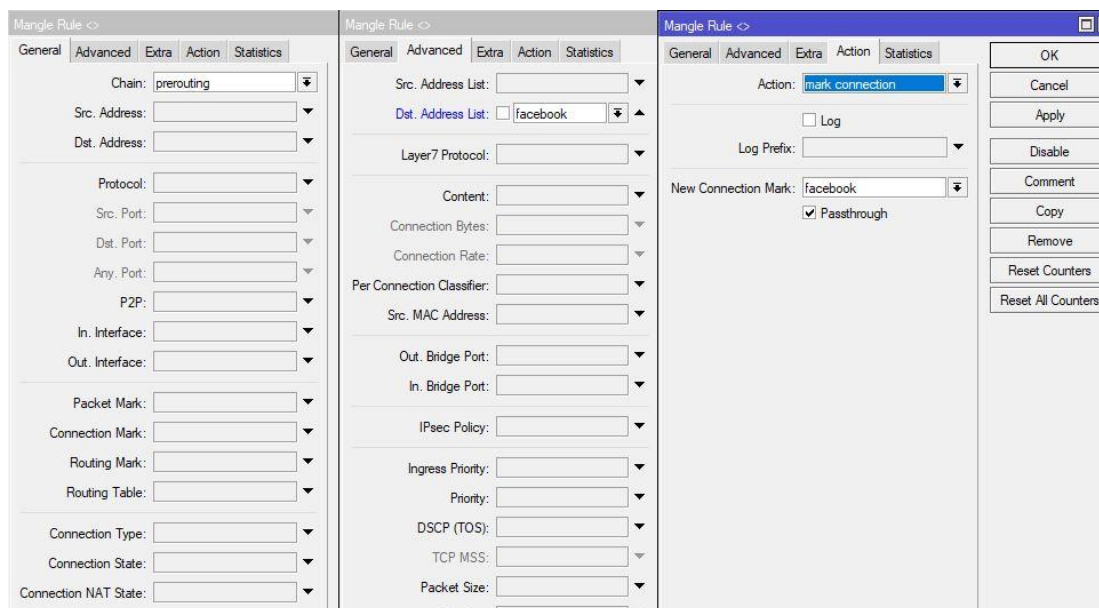


Figure 6.16 Mangle for Facebook

IP > Firewall > Mangle > +

General: chain: prerouting

Advance: Dst. Address List: YouTube

Action: mark connection

New connection Mark: YouTube

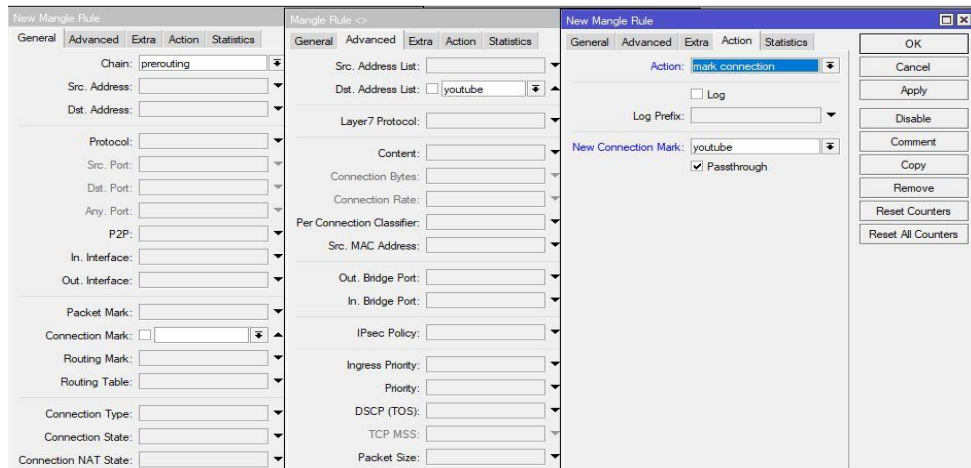


Figure 6.17 Mangle for YouTube

➤ **PCQ for Facebook and YouTube**

Now click on Queues > Queue types > Type Name: Facebook-DW Kind: pcq Rate: 20M Classifier: - Dst. address	Now click on Queues > Queue types > Type Name: Facebook-DW Kind: pcq Rate: 20M Classifier: - src. address
---	---

Table 6. 1 PCQ for Facebook

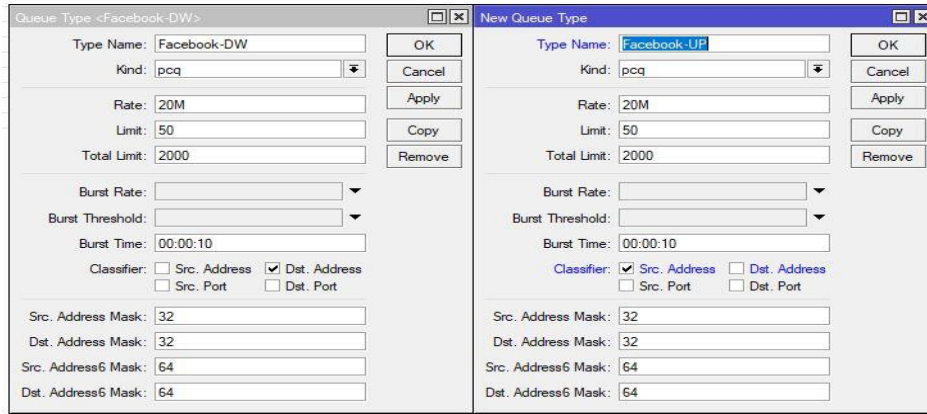


Figure 6.18 PCQ for Facebook

<p>Now click on Queues > Queue types > Type Name: YouTube -DW Kind: pcq Rate: 20M Classifier: - Dst. address</p>	<p>Now click on Queues > Queue types > Type Name: YouTube -UP Kind: pcq Rate: 20M Classifier: - Src. address</p>
--	--

Table 6.2 PCQ for YouTube

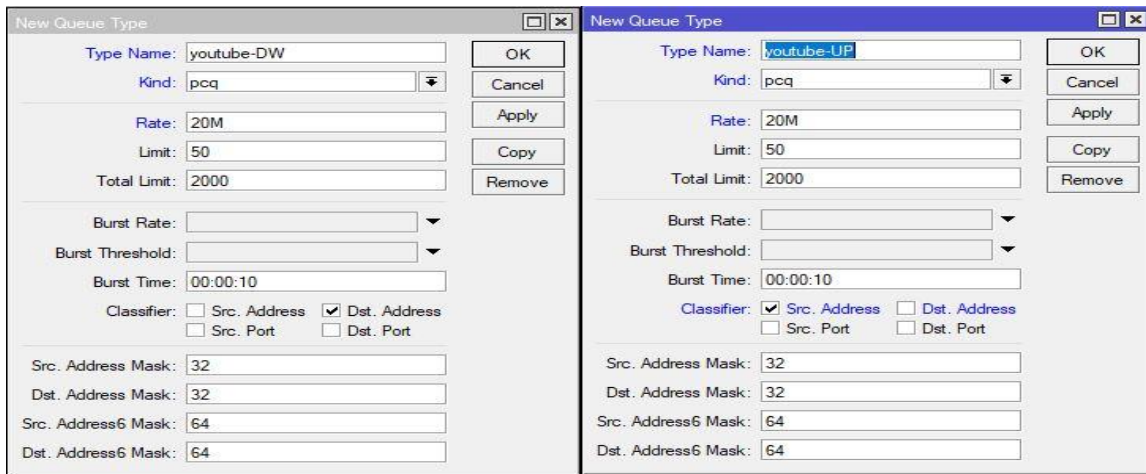


Figure 6.19 PCQ for YOU Tube

➤ **Simple Queues for Facebook And YouTube**

Now click on Queues > Simple Queues > +

General: Name: you tube, Target: 172.16.1.0/24

Advance: Packet Marks: YouTube

Queue Type: Upload: YouTube-UP, Download: Youtube-DW

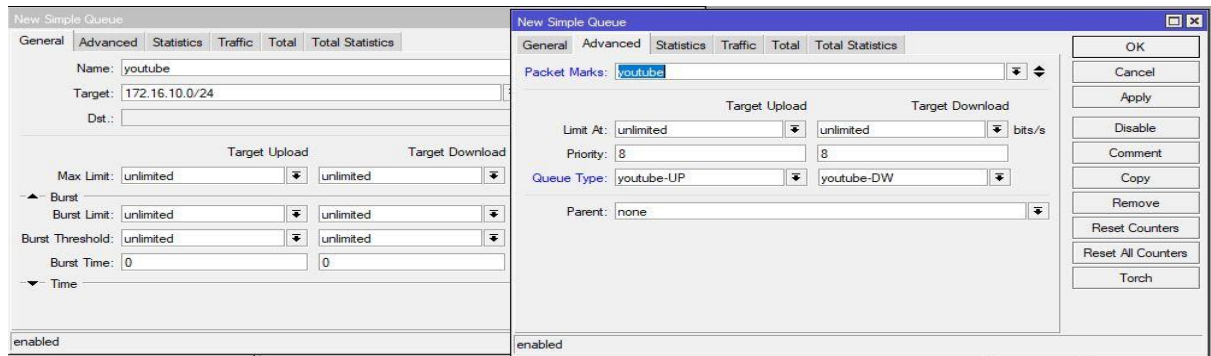


Figure 6.20 Simple queues for You Tube

Now click on Queues > Simple Queues > +

General: Name: Facebook, Target: 172.16.1.0/24

Advance: Packet Marks: Facebook

Queue Type: Upload: Facebook-UP, Download: Facebook-DW

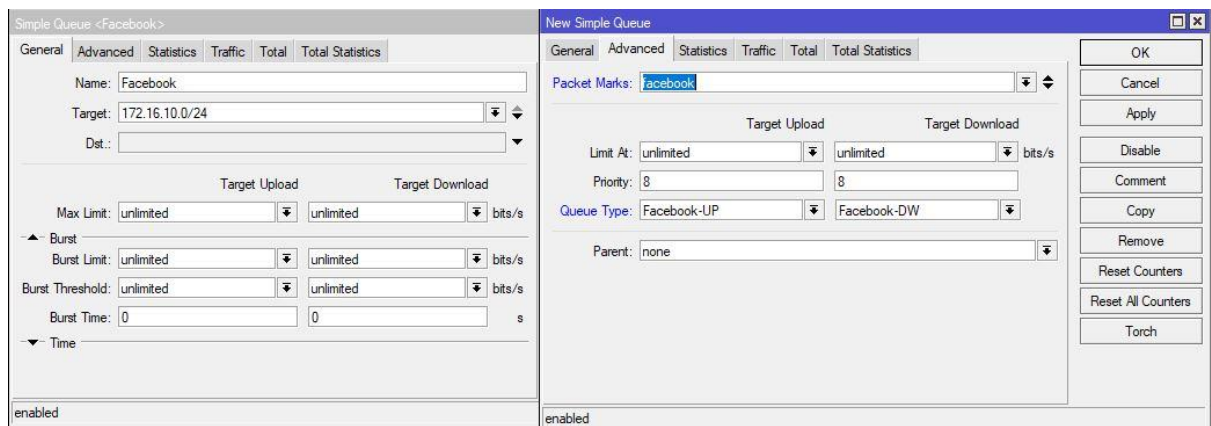


Figure 6.21 Simple queues for Facebook

CHAPTER 7

CONCLUSION AND FUTURE CARRER

7.1 Discussion

Okay, now I can give a good review of my internship. If you visited top to bottom of the report then you can see it's a report of a networking internship. The report contains the face value of the training center, their training process, about MTCNA, Linux version (centos-6, centos-7). MikroTik network configuration, Linux base server configuration. To become a network administrator the requirement of information is present in the report. At present in our country, all kinds of connections in university, college, industry, and house are configured with MikroTik router. In the end, I can say that MikroTik is another important part of networking in our daily life.

7.2 Conclusion

Let's talk about Linux. During my training session, I get a touch of the Linux operating system. Linux Operating system has a great security system and "putty" gives you a great remote logging system. You can easily edit the Linux line command and changes port numbers. By changing the port number, you can give good security for your server. Nowadays If you are an expert in MTCNA and Linux then you can get easily a job as a network administrator. In worldwide web, all network engineer is selected for their server security as Linux. Actually, there have seven steps for your server security using Linux. At first update your server, 2ndly create a new user account, 3rdly upload your SSH key, 4th part is secure your SSH, 5th part is enabling a firewall, 6th part is installing fail2ban and last part is removing un-used network-facing service. So, you can see the importance of Linux for your Internet security and all servers.

7.3 Scope for Future Career

If you Complete the MTCNA training and Linux basic course then there is a lot of scopes are waiting for you. In the future, you can gain success in networking sites. Nowadays in our country, the usage of the MikroTik router is increasing day by day, so if you are trained on MTCNA then your future will bright. The scopes for future Career are:

- You can become an operator in the ISP platform.
- You can easily work with an IT company.
- Become an IT Administrator.
- Become a system engineer.
- Become a server administrator
- Become a Linux administrator
- Work with a local Broadband connection center.

REFERENCES

- [1] About the company: << <http://www.daffodilnet.com/> >> Last accessed on 2nd February 2020 at 8pm.
- [2] About the Linux: << <https://opensource.com/resources/what-is-linux/> >> Last accessed on 10th February 2020 at 11pm.
- [3] SWOT at: << https://www.mindtools.com/pages/article/newTMC_05.htm/ >> Last accessed on 15th February 2020 at 10:00pm.
- [4] Learn About Everything at: <<<https://en.wikipedia.org/wiki/> >> Last accessed on 20 February 2020 at 10:00pm.
- [5] MikroTik router .jpeg collection: << <https://www.google.com/search?q=mikrotik+router.jpeg> >> Last accessed on 25th February 2020 at 1pm.
- [6] MikroTik: << <https://mikrotik.com/> >> last accessed on 25 January 2020 at 3pm.
- [7] Get help from a project report at << <http://dspace.library.daffodilvarsity.edu.bd> >> last accessed on 5th February 2020 at 9:30 pm.
- [8] Learn About the book in Linux at: <<<https://www.takeyoursuccess.com/> >> Last accessed on 5th march 2020 at 10pm.
- [9] Learn about Linux Server at: << <https://help.ubuntu.com/lts/serverguide/serverguide> >> last accessed on 8th march 2020 at 4pm.
- [10] Centos-6 book: <<https://www.techotopia.com/index.php/CentOS_6_Essentials>> last accessed on 1st may 2020 at 10:33 am.
- [11] Centos-7 book << <https://forums.centos.org/viewtopic.php?t=54669>>> last access on 10th may 2020 at 11 pm.

APPENDICES

Appendix A: Internship Reflection

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

Appendix B: Company Detail



Head Office

Name	Daffodil Online Limited
Address	102, Shukrabad (3rd floor), Mirpur Road, Dhanmondi, Dhaka - 1207, Bangladesh
Telephone	02-9143258-60
Fax	880-2-8116103
E-mail	info@daffodilnet.com
Website	www.daffodilnet.com
Type of Organization	Nationwide Internet Service
Provider (ISP) Employees	1

SYSTEM AND NETWORK ADMINISTRATION USING MIKROTIK AND LINUX

ORIGINALITY REPORT

14%

SIMILARITY INDEX

8%

INTERNET SOURCES

1%

PUBLICATIONS

13%

STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Daffodil International University Student Paper	8%
2	ian-mars.blogspot.com Internet Source	1%
3	www.itlampung.com Internet Source	1%
4	Submitted to National Tertiary Education Consortium Student Paper	1%
5	www.jasasettingmikrotik.web.id Internet Source	<1%
6	Submitted to University of Bedfordshire Student Paper	<1%
7	Submitted to Kaplan University Student Paper	<1%
8	Submitted to Kingston University Student Paper	<1%

9	multidict.net Internet Source	<1 %
10	Submitted to CSU, Chico Student Paper	<1 %
11	www.spy-69.com Internet Source	<1 %
12	Submitted to University of Patras Student Paper	<1 %
13	ernatrisnawati-albahri.blogspot.com Internet Source	<1 %
14	Submitted to University of London External System Student Paper	<1 %
15	www.michna.com Internet Source	<1 %
16	www.callsupportnumber.com Internet Source	<1 %
17	answers.launchpad.net Internet Source	<1 %
18	www.ukessays.com Internet Source	<1 %
19	tekno-kompas-digital.blogspot.com Internet Source	<1 %

20

indrianiin.wordpress.com

Internet Source

<1%

21

Submitted to SIM Global Education

Student Paper

<1%

22

fuadkp.blogspot.com

Internet Source

<1%

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off