

SERVER CONFIGURATION USING LINUX AND MIKROTIK

BY

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

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APPROVAL

This Project/internship titled “**SERVER CONFIGURATION USING LINUX AND MIKROTIK**”, submitted by ANISUR RAHMAN SHANTO, ID No: 143-15-4602 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 12 December, 2018.

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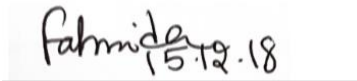
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DECLARATION

I hereby declare that, this project has been done by me under the supervision of **Fahmida Afrin**, Lecturer, Department of CSE, Daffodil International University. I also declare that neither this Internship nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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I really grateful and wish our profound our indebtedness to **Fahmida Afrin, Lecturer**, Department of CSE, Daffodil International University, Dhaka. Deep Knowledge & keen interest of my supervisor in the field of “*Linux OS & networking*” 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 should like to express my heartiest gratitude to the Almighty Allah 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 should like to thank our 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 my parents.

ABSTRACT

This internship occurs on Daffodil online limited. An Internet specialist organization (ISP) is an association that gives administrations to getting to, utilizing, or taking part in the Internet. It assumes an essential job in current day correspondence. It has made the data correspondence less demanding and reasonable for the average folks. ISP includes diverse sorts of servers to help distinctive kinds of need of the customers. In this Internship, a wide range of servers utilized in ISP have been arranged utilizing Linux working framework. After usage everything being equal, the framework is tried in various stages and it works effectively as a model. It helped me gain the hand on skill to design these servers. By the way, this task report can be utilized as the manual for new ISP engineers.

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CHAPTER 1

INTRODUCTION

The entry level position offers functional work involvement and a prologue to supporting PC Install, refresh, keep up and give client support to equipment, programming applications, some system issue. This entry level position will include testing openings, genuine specialized framework bolster tasks, and cooperation with staff. This is an extraordinary chance to pick up hands-on involvement in the PC IT field. This entry level position furnishes a chance to pick up involvement with the framework support of a Daffodil Online Limited.

1.1 OBJECTIVES

Have to understand the importance of the network and server management. Also understood the information of networking architecture. Internship will update my sense and responsibility also make it higher and good work habits. I can improve my technical and interpersonal skills for gaining the target and developing the best performance. I would like to apply my creative ideas, creativity and performance for attaining the internship for develop my career in IT sector.

1.2 MOTIVATION

Currently I'm completing my Bachelors in Computer Science Engineering at Daffodil International University, I am able to understand that the value of gaining practical knowledge which will complement the textbook knowledge and it helps a student to gain a wider perspective of the subjects. By this time in internship I have already found that I am perfectly skilled in the details of Linux network and server management. As an internet service provider, I've getting my point across very well, communicating with people, understanding their needs and providing them better service.

1.3 GOALS

After complete my internship I have to do something.

- Learn insights about the systems administration parts,
- Setup Linux Ubuntu,
- Network the board,
- Server arrangement,
- How to speak with customers.
- How to give better administration to customers.

1.4 Introduction to the Company

Daffodil Online Ltd. prides itself as one of the leading ISP Service Provider in Bangladesh. They are the most experienced and oldest company in the ICT field where their basic business ethics is Long Tern Relationship with customer.

Why Daffodil Online is best: They give one of the best solutions for my and our business. They have everyday backups what we done. They also have 24 hour & 7 days' support. They also have High Quality equipment and also have cPanel hosting.

Which service they provide: They provide best and reliable service for my business organization. This company has Internet service (broadband internet), Domain & Hosting, Training, Pearson View test center, Colocation service & Networking solution.

Table 1.1: Information of the company

Company Name	Daffodil Online Ltd
Type of Organization	(ISP) Internet Service Provider
Address	102, Shukrabad (3rd floor), Mirpur Road, Dhanmondi, Dhaka - 1207, Bangladesh
Cell Phone	9143258, 9143259
Internal IP Phone	+8801713493097
E-mail	info@daffodilnet.com
Website	https://www.daffodilnet.com/

CHAPTER 2

ORGANIZATION

2.1 Introduction

In this part I will depict around an Organization where I finished my Internship. I'll additionally depict their working arrangement, showcase strategy, about the item. Programming strategy and how the handle their hierarchical structure and the procedure of work.

2.2 Product and Market Situation

Daffodil Online Ltd. Given Nationally ISP, IT Training and Professional Training. Some of are Given Bellow:

- Corporate Internet Solution.
- Security Solution.
- Area Registration and web Hosting.
- Site Development.
- Proficient Courses and Training
- Open Source application arrangement.
- Network access supplier.
- Best in class Data Centers.
- Speed Wi-Fi Zone.
- Information availability, Data focus, Co-Location.
- Proficient course and trainings:

- ISP Setup and Administration Using Linux.
- Training Course on Certified Ethical Hacking
- ISP Setup and Administration Using Mikrotik.
- Web Site Development with Joomla.
- PHP and MYSQL for site Development.
- E-business and Open Source Joomla Virtue Mart

2.3 Target Group

The company's principle goal to focus on SOHO customers, with respect to their new uncommon contributions, for their better administrations they make more committed, dependable clients.

2.4 SWOT Analysis

SWOT Analysis is an arranging strategy for understanding a man and associations qualities, Shortcoming, opportunities and dangers they look at business or any venture arranging.

Table 2.1: SWOT analysis of the company

Strengths	Weakness
<ul style="list-style-type: none"> • Good communication skill • Good poison on market • It's a famous company • Produce good service 	<ul style="list-style-type: none"> • Lack of experience • Crisis of employ • Low assets • Lake of management
Opportunities	Threats
<ul style="list-style-type: none"> • At the point when contenders are ease back to embrace new advancements. • Extending the business division with different future chances. • Empowering of nearby business 	<ul style="list-style-type: none"> • The Eco Crisis Householders less as increment their broadband memberships securities exchanges absence of trust in computerized correspondence showcase.

2.5 Organizational Structure

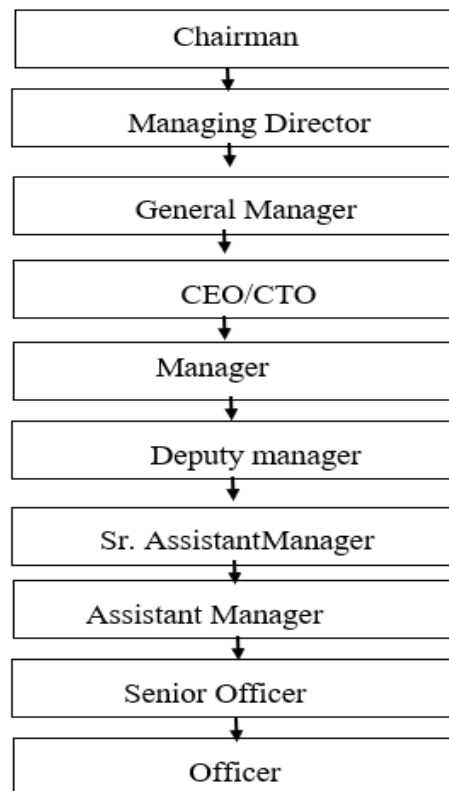


Figure 2.1: Organizational Structur

CHAPTER 3

INTERNSHIP ROLES AND RESPONSIBILITIES

3.1 Daily Task and Activities

Entry level position Period is the incomplete satisfaction for finishing my Bachelor of Science in Computer Science and Engineering. It was the multi month Linux Administration course in Daffodil Online Limited. It diminishes a standout amongst the most IT proficient preparing and courses on the day when I visit. So, I partook in this undertaking for better preparing and consummation of my temporary job program advanced correspondence showcase.

Month 1

- In my internship period what am I learn in given below their:
- How to install and run virtual machine.
- How win box is work.
- Introduce with mikro-tik router
- How to configure a mikro-tik router in isp
- Access control and upgrading firmware

Month 2

- Creating multiple SSIDs
- Configuring an NTP Server
- Managing configuration backups
- Bandwidth Management Using Simple Queue
- Creating Bridges (LAN)
- Creating multiple DHCP Servers

Month 3:

- Full Bandwidth Management
- How to fix Simple Queue and Queue Tree issues
- Enhancing Mangle rules (Winbox, DNS, Google Paly Service) 4.Block Bit Torrent & P2P traffic
- How to Configure VPN and Dynamic DDNS

Month 4:

- Try to create a simple project on isp server.

3.2 Event and Activities

In the Education Sector Skilled and Educated Manpower is vital issues for best quality training. Daffodil Online Limited lean toward the Best quality Teacher for expert preparing and Courses. Daffodil Online Limited keep up an efficient methodology for enlistment. To begin with, the applicants need to sit for a composed test, and afterward a meeting is taken. Finally, the hopeful needs to give 2/3-show class from which we take the criticism from the understudies. Lastly, the competitor is chosen or rejected. Daffodil Online Ltd (DOL) is an exceptionally time bound activity of Daffodil Education Network which has been working since 2002 to create proficient Human Resources in various fields of instruction and preparing. DOL has totally changed the customary idea of polytechnic, specialized and proficient aptitude improvement preparing establishments in Bangladesh. Today DOL is exceptionally notable establishment for science, designing, expressions ponder and furthermore for expert and initiative advancement preparing programs. Daffodil Online Limited is likewise extremely prevalent name in Corporate Training Industry which has earned worldwide affirmation in a brief span. Then again Daffodil Online Limited given best quality expert preparing. Daffodil Online Limited Provided the Training for Diploma Engineers, Corporate line proficient and Human Resource.

3.3 Project Virtualized by Oracle VM virtual Box

Virtual machine basically what the software that it allows an entire operating system which is referred to as the host there several reasons why I want to run a virtual machine on my computer. Some of those might include my need access to software that is not available on my host operating system. By this software I can run other OS on this same time when my main system is running.

3.4 VM Virtual Box setup

Virtual box is an open source software. It is a free software. At first download the virtual box from Filippo. Download the latest version. After download install it. It's a simple user interface. Go to file, give a Name and select the version of the windows. Select the memory size. Recommend memory size is 2048MB. Create a Virtual Hard drive. Hard drive type is VDI. And it's a dynamic allocated. And give the file location size. Now it's ready. Go to the setting, make general-Advanced make shared Clipboard and Drag 'Drop Bidirectional. Now it's ready to install OS.

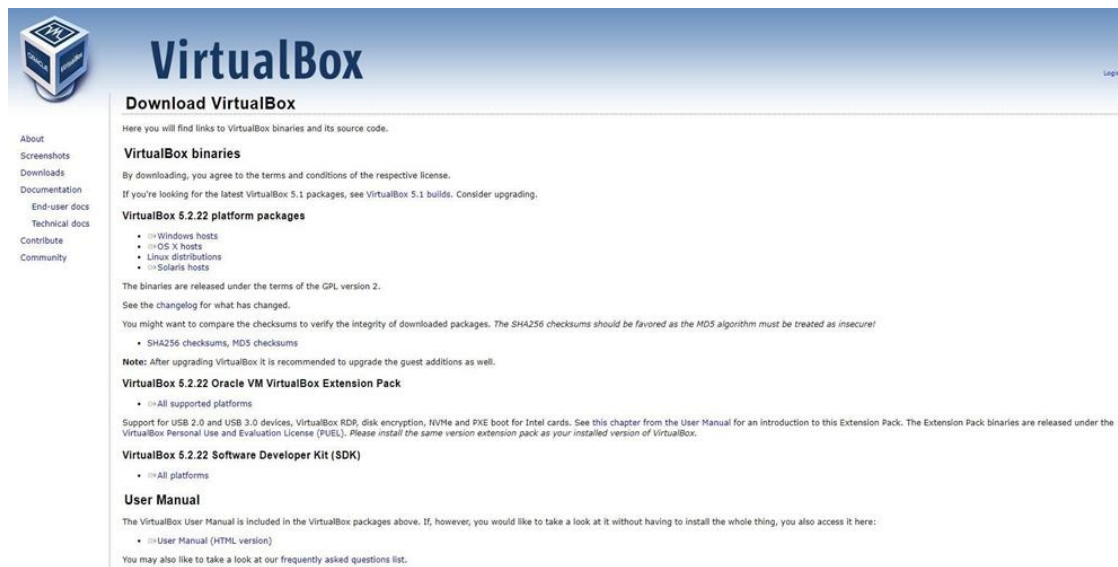


Figure 3.1: Downloading virtual Box

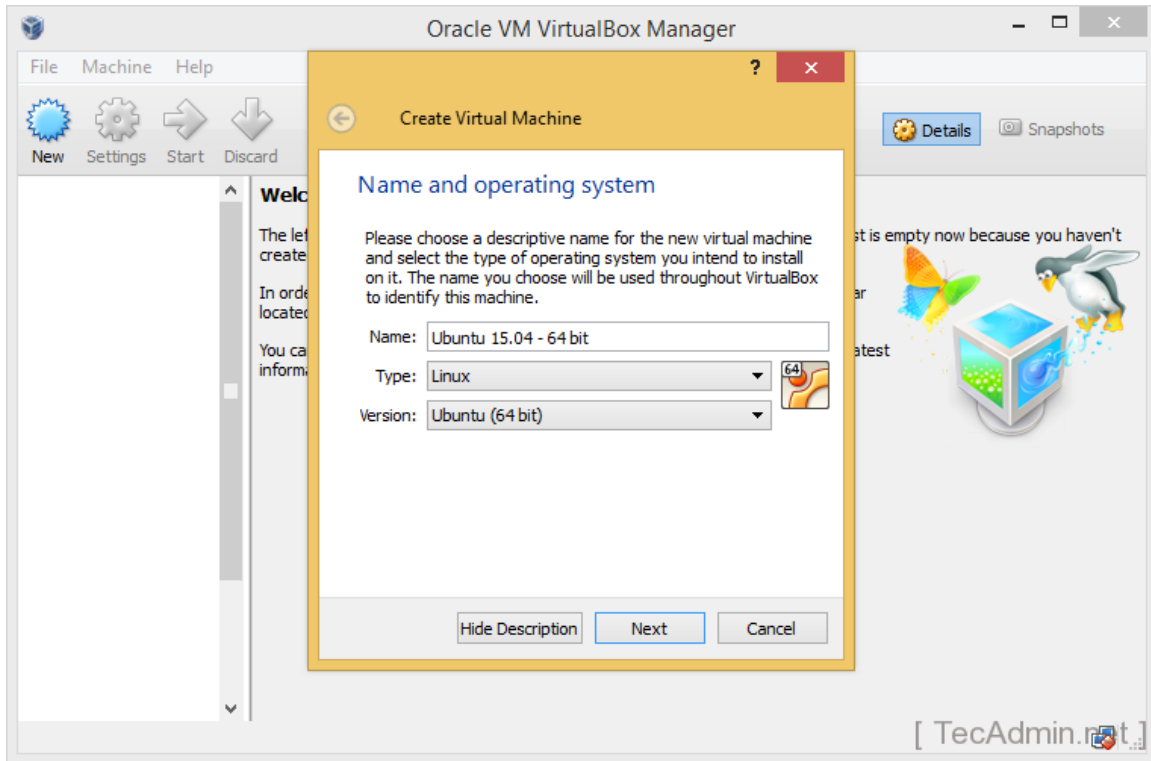


Figure 3.2: OS Version type

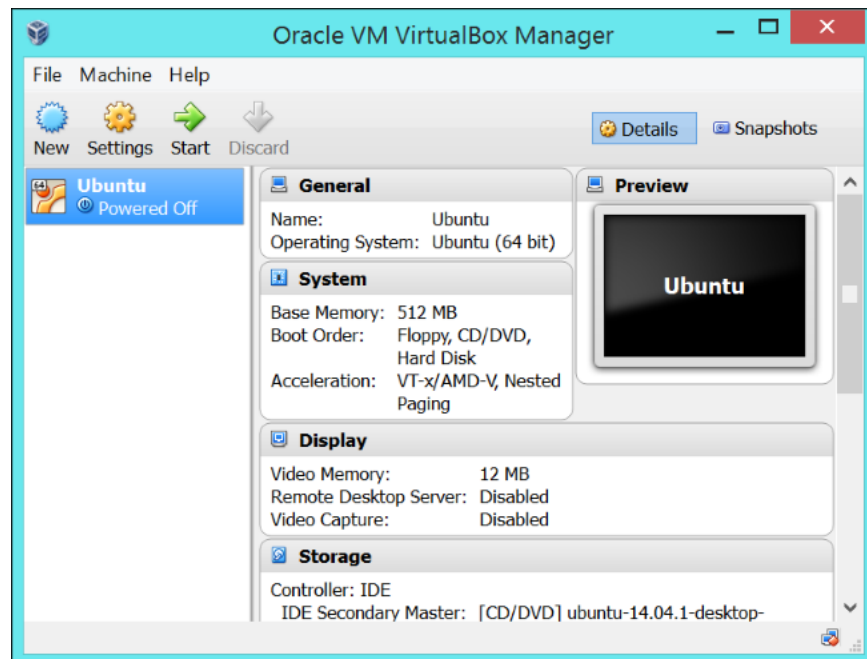


Figure 3.3: Virtual Box environment

3.5 Basic Command of Linux

Here is some basic command of Linux.

- Pwd- its show my directory.
- Ls- ls command is show my file location.
- Cd-cd command is use for go to the directory
- Mkdir & rmdir- mkdir is use to make or create a folder. And rmdir is use for delete a folder.
- Rm- rm command is use for delete files and directories. And rm-r is only use to delete the directory.
- Touch- the touch command is to use for create a file. For example, touch file. Text
- Man & --help-for know about more command use man.and for use help. For example, man- cd or cd-help.
- Cp- cp is use for copy a file by command line.
- Mv- mv command is use for move a file.
- Locate-locate is use for locate a file in a linux system.

CHAPTER 4

TASKS AND ACTIVITIES

4.1 Events and Activities

Started Basic Configuration

First take a MikroTik router. And there we can see some port. Now we are taking port 2. And I have to also download from MikroTik website a Winbox application. And install it. After opening this application refresh Neighbors. Which is showing a MAC address. Hear I have a connect my pc with router via Ethernet cable. Here on the logging page I will give username admin. And no password. AND click connect. First, I have to remove configuration from default configuration. Now I am clicking quick Set menu. And quick set is YES. Change CAP to Homepage And YES. Address Acquisition is Automatic. And give a local network ip address like 192.168.5.1 or any. Select a Net mask. Click DHCP server. Give ip address on dhcp server range. Select NAT. And Apply and Ok. Click Wireless Tables. Select a wireless network like wan. And Interface it. Go to wireless tab. Make frequency auto. And go to Security Profile Mode is dynamic keys. Authentication Types WPA2 PSK. And reboot.

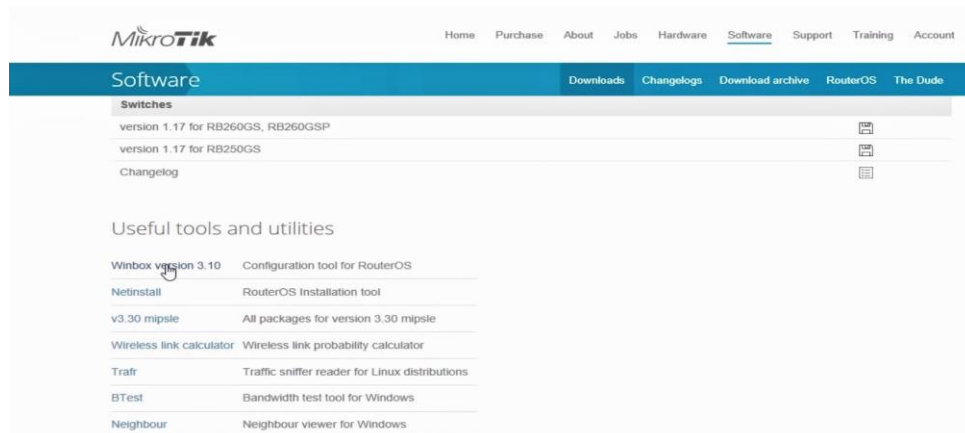


Figure 4.1: MikroTik Software

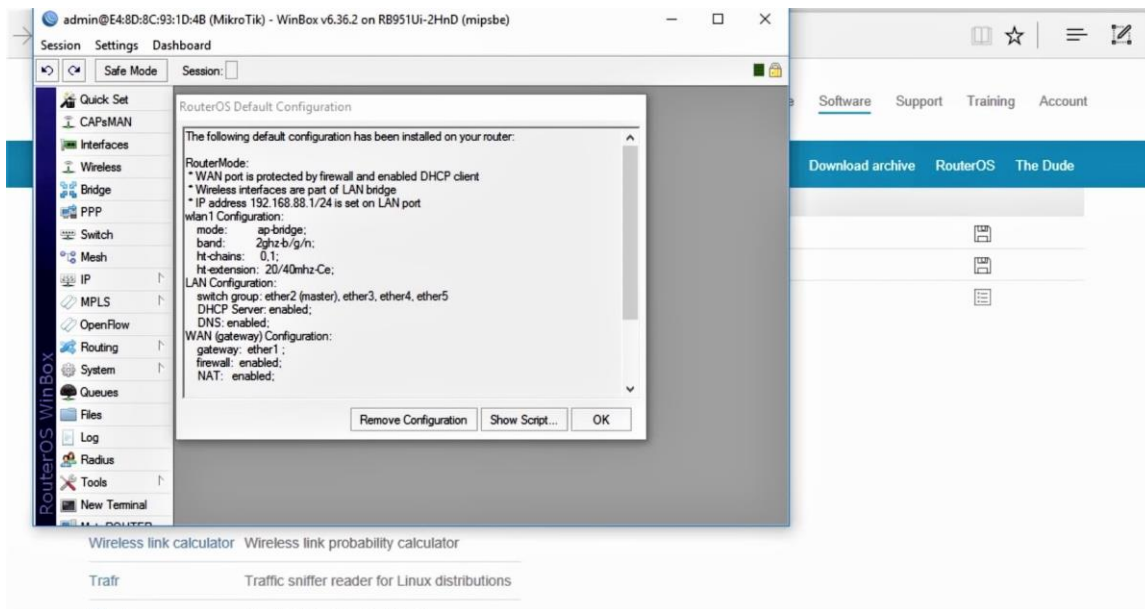


Figure 4.2: Remove old configuration

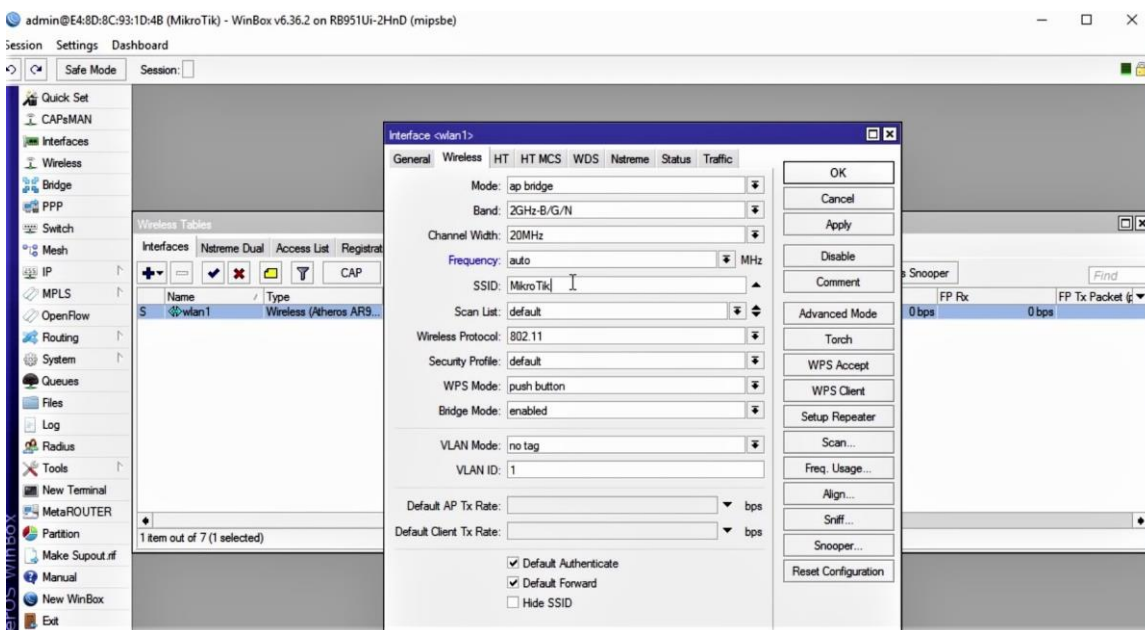


Figure 4.3: Configuring wlan

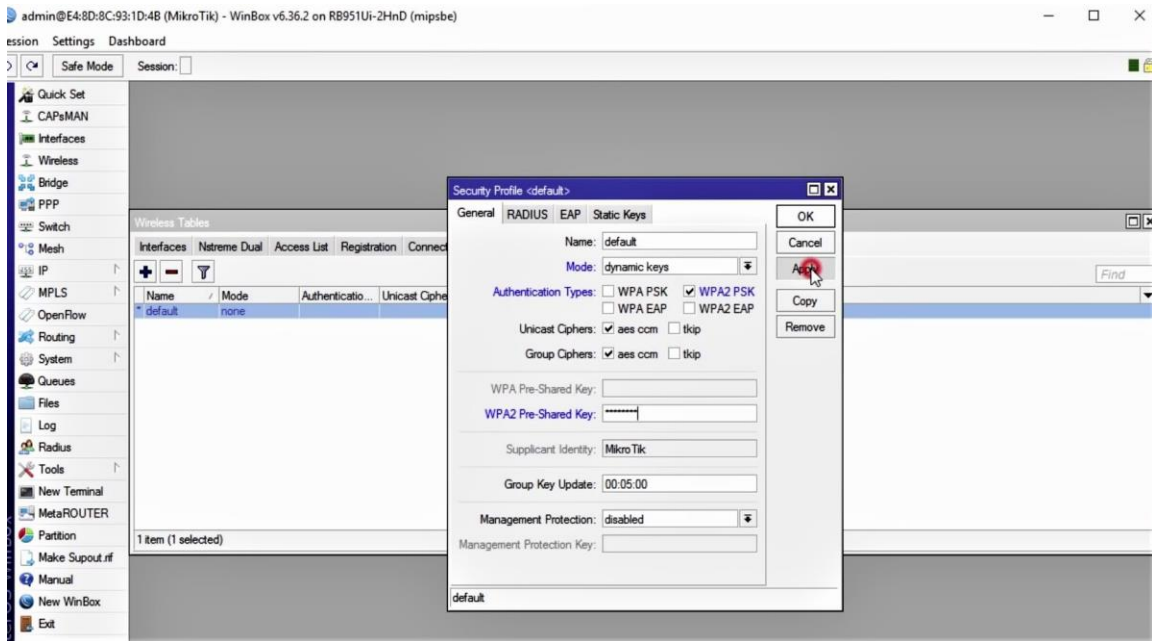


Figure 4.4: Select additional authentication

Using Winbox

First open the Winbox. Given an ip address on the Connect To like 192.168.5.1. Its showing on managed tab. On the neighbor tab select the Mac Address and Connect. On the Session is showing ip address. Now go to the Session and save as. Close WinBox and open again. Open Interface List. Create a comment for bridge for separate.

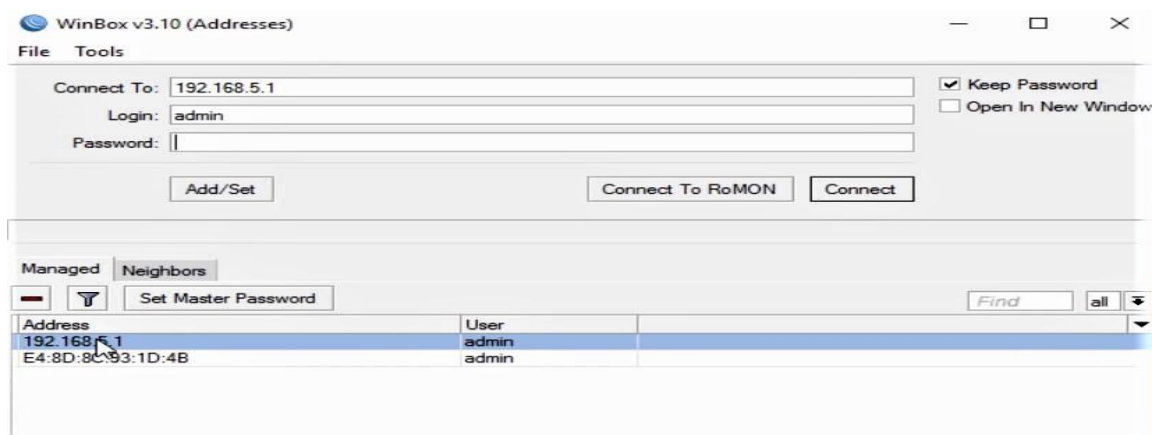


Figure 4.5: IP configuration

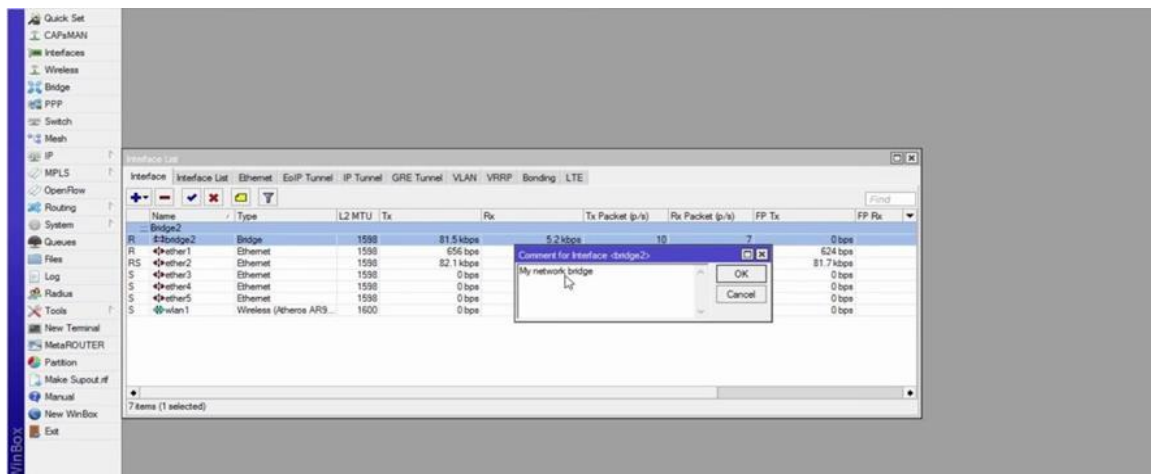


Figure 4.6: Bridge setup in MikroTik

Installing Packages

For install packages go to MikroTik web site. Go to software download Any Packages what am I want. And save it is on my computer. Open Winbox go to System =>Packages. Open Package List move download package.

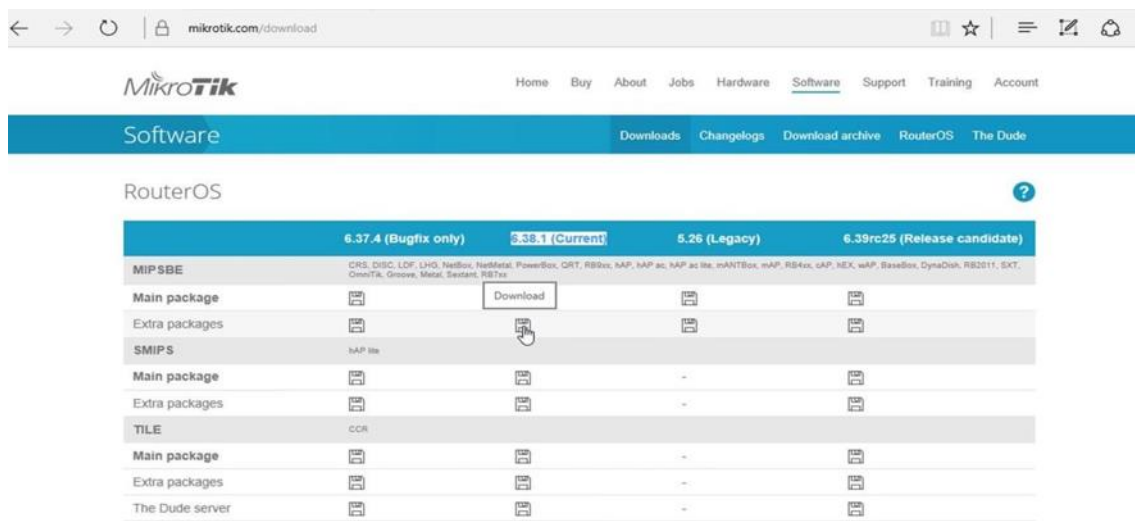


Figure 4.7: MikroTik package setup

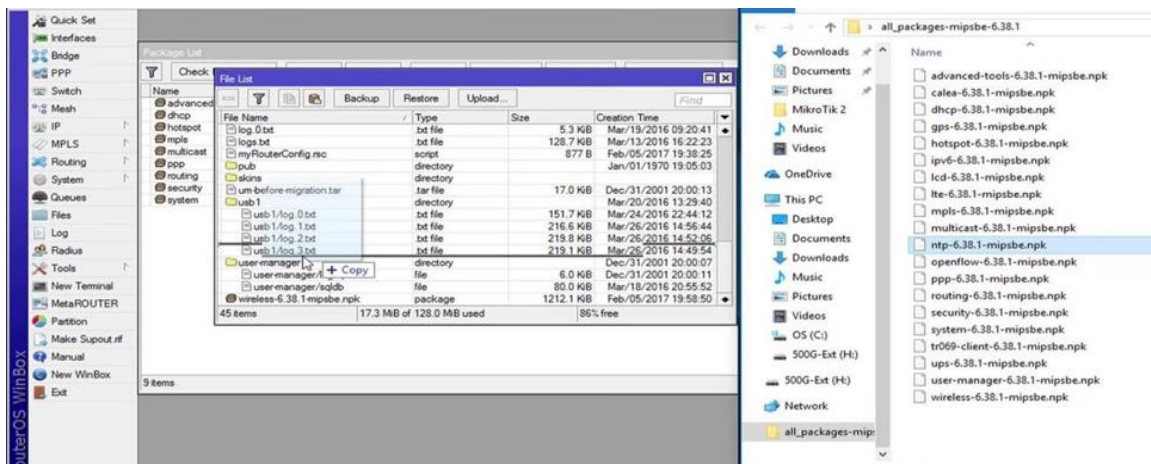


Figure 4.8: Package installing in MikroTik

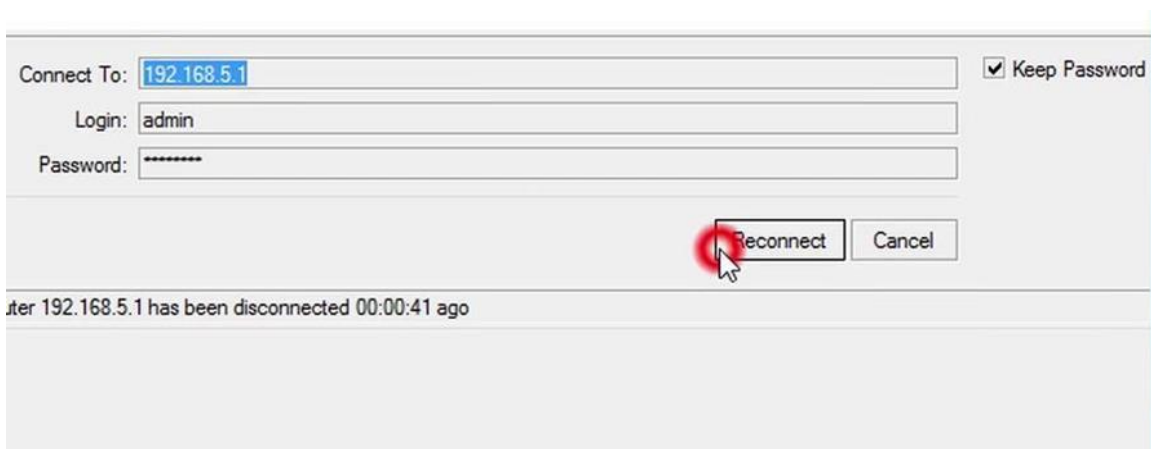


Figure 4.9: Reconnecting after installing package

Using WebFig

Web fig is a version which is use in a web browser. For using Web Fig Go to the browser. Type the IP Address (192.168.5.1) which is uses on router. After that just give Logging User name and password. Now I can see everything is similar with like Winbox.

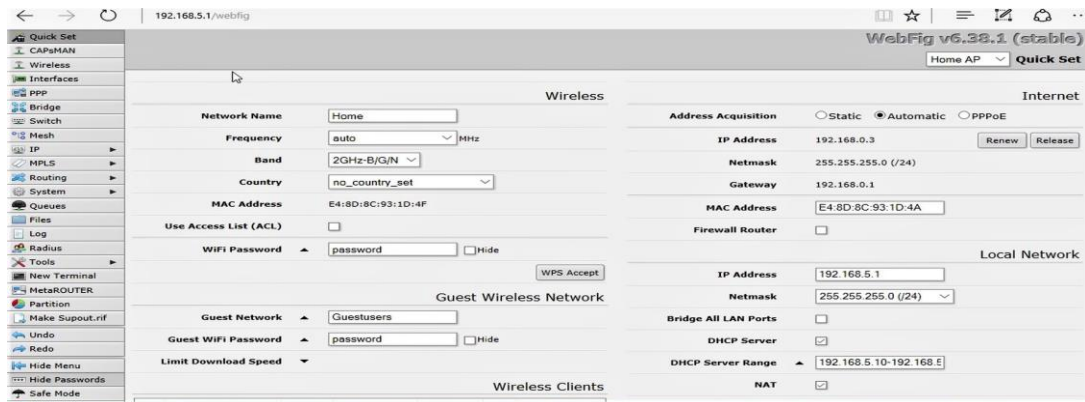


Figure 4.10: Webinar Interface of Mikrotik

Creating Multiple SSIDs

For creating Multiple ssid go to Wireless Tables. Go to + Virtual. New Interface select Wireless=> SSID =>guest. And in a another wlan which is wlan2. Select wlan2=>Wireless make SSID name kids and apply and ok.

Now I am assigning security profile to each of these access point so clicks on the security profile tab and I am going to click the plus sign and I am going to creating a security profile which name is guest. And the authentication type mark WPA PSK, WPA2 PSK. Now give a WPA Pre-Shared Key: and also WPA2 Pre-Shared Key now apply and ok . Now create another one and I am give this name is mykids . And I set a password for it. Now select wlan2 and change the security profile default to change. After that select wlan3. Change the security profile default to mykids. In the wlan2 go to the general tab change the name to guest and ok. And the another wlan3 change the name.

Now go to the bridge. Add new bridge port and change the Interface name to guestAP . Add another new bridge port and change the Interface name is kidsAP . Now we can see there is a the network one is kids and another is guest . Now the configuration of the mikrotik router is done.

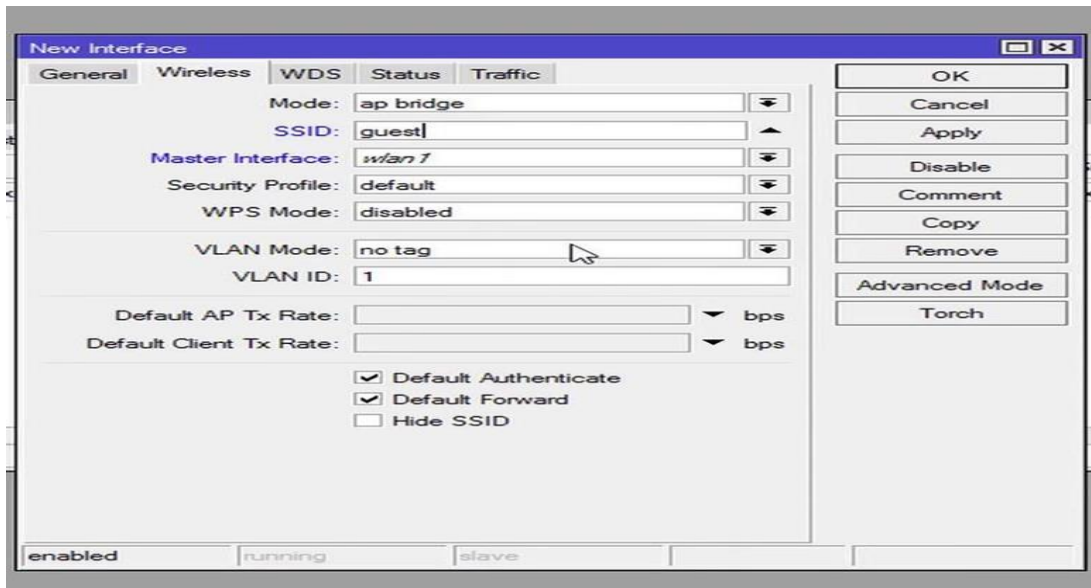


Figure 4.11: SSID profile creation

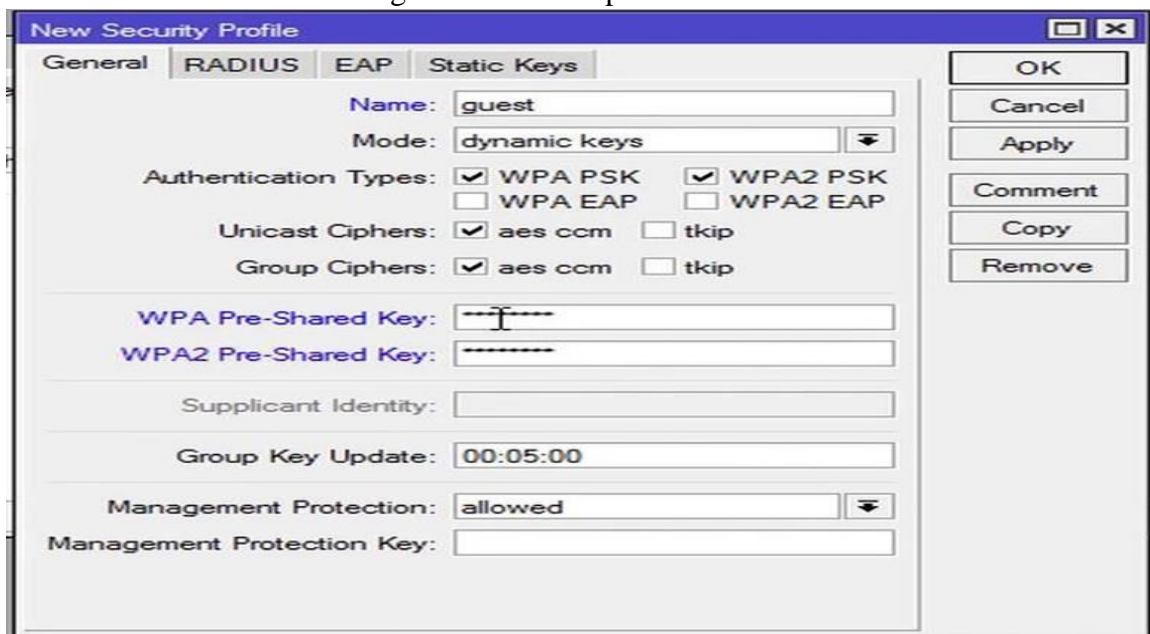


Figure 4.12: SSID Authentication

Managing configuration backups

I have to first go to the Winbox and open it. Go to the Files. Click Backup, give a name and password. I use name 1st_backup. And I am not using any password for it. Now click backup and then create a backup. After that go to the terminal, write.

- export file=1st_export
- ip pool> add name=drop ranges=192.168.5.2-192.168.5.254

Now it's done.

```

MMM      MMM      KKK      TTTTTTTTTT      KKK
MMMM     MMM     KKK      TTTTTTTTTT      KKK
MMM MMMM MMM III  KKK KKK RRRRRR   OOOOOO   TTT   III  KKK KKK
MMM MM  MMM III  KKKKKK   RRR RRR   OOO OOO   TTT   III  KKKKKK
MMM      MMM III  KKK KKK RRRRRR   OOO OOO   TTT   III  KKK KKK
MMM      MMM III  KKK KKK RRR RRR   OOOOOO   TTT   III  KKK KKK

MikroTik RouterOS 6.38.1 (c) 1999-2017      http://www.mikrotik.com/

[?]          Gives the list of available commands
command [?]  Gives help on the command and list of arguments

[Tab]        Completes the command/word. If the input is ambiguous,
              a second [Tab] gives possible options

/            Move up to base level
..          Move up one level
/command     Use command at the base level
[admin@MikroTik] > /ip pool
[admin@MikroTik] /ip pool> add name=dhcp ranges=192.168.5.2-192.168.5.3
failure: pool with such name exists
[admin@MikroTik] /ip pool> add name=dhcp2 ranges=192.168.5.2-192.168.5.3
[admin@MikroTik] /ip pool>

```

Figure 4.13: Configuration Backup settings

Backup

Name:

Password:

☒ Don't Encrypt

Figure 4.14: Backup file Identification

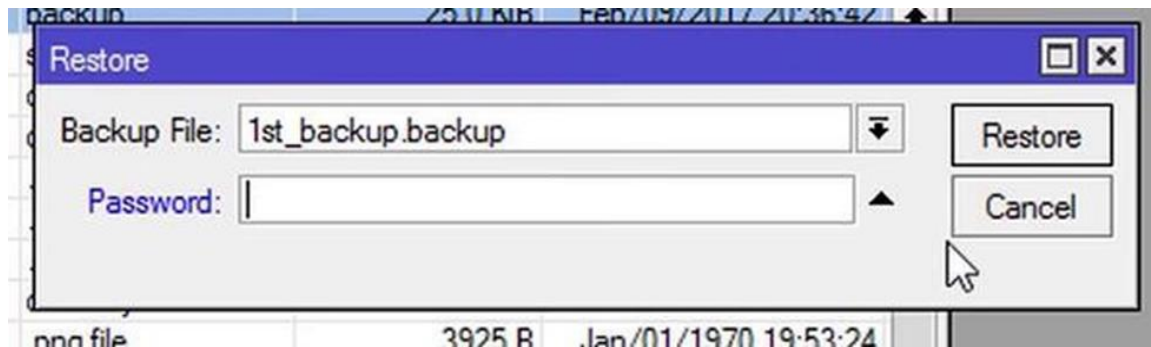


Figure 4.15: Backup file restoring

Static Configuration

In the time of making the static configuration, first I have to go in the Interface list. There is 10 interface. I am choosing ether1, go to the ether1 and make it ether1Wan. And after that make ether2 to ether2Lan. Then go to Address List add new address 192.168.50.201/24 And select the interface to ether1Wan and network 192.168.50.0. And add another address 10.10.101/24 network 10.10.10.0 and ether2Lan than ok. Then go to ip => Route List add new router gateway is 192.168.50.1. Now I have to go ip => DNS. Given an ip address on Servers 203.190.10.252 and 8.8. 8.8 apply ok. Then go to firewall add new Nat rule select action masquerade. Now go to the terminal ping 8.8.8.8 now it's work. After doing this given a ip address on network and internet setting. Given ip address 10.10.10.2 subnet mask is 255.255.255.0 and default gateway is 10.10.10.1 and ok. Now internet connection is ok. For the connecting testing go to cmd and check ping 8.8.8.8.

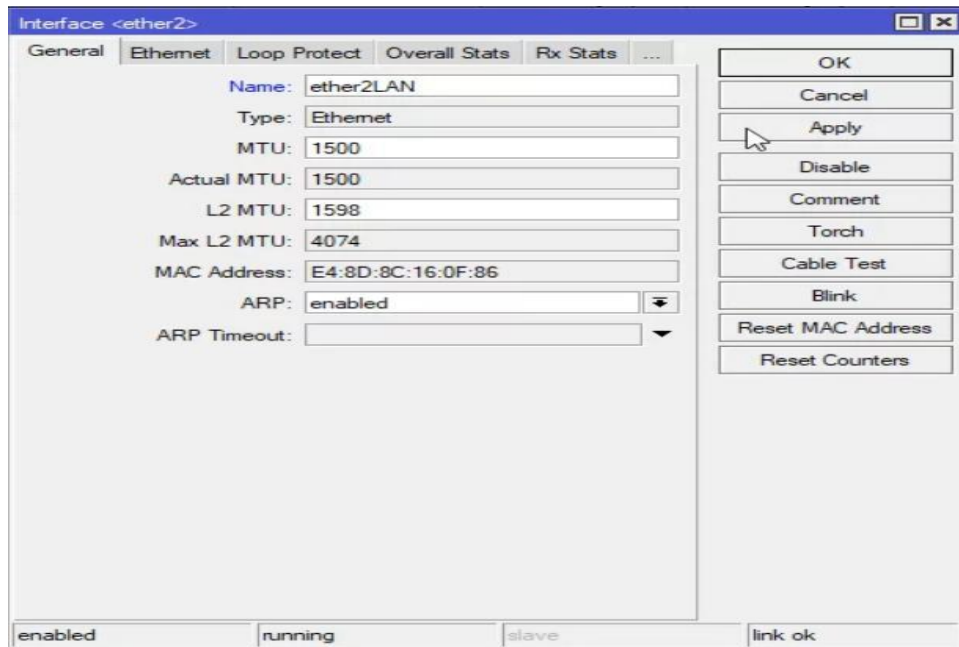


Figure 4.16: Given the name of the ether

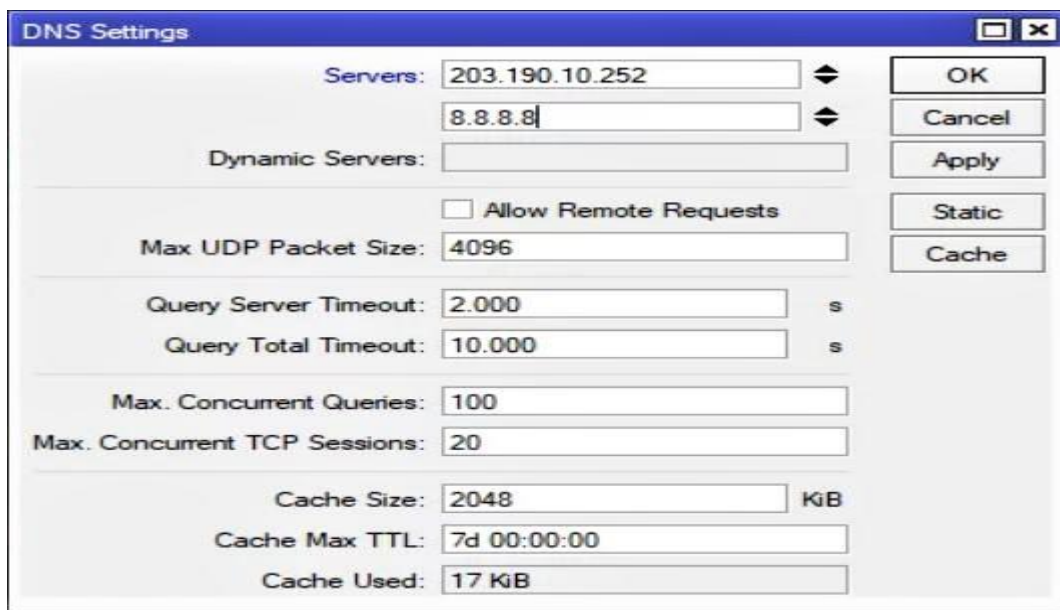


Figure 4.17: Servers ip address assign

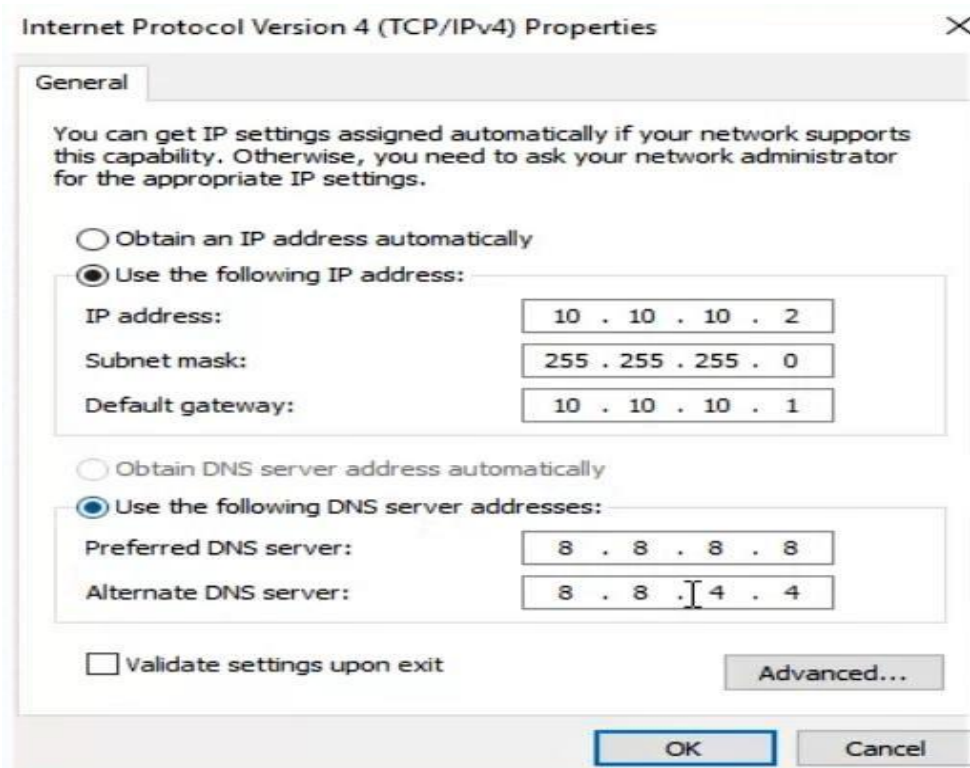


Figure 4.18: Connecting the internet by assign ip address

DHCP Wan Client

Now go to ip DHCP client, new DHCP client and select interface ether1Wan. Now go to address list. Add new DHCP client make new interface, have to go in terminal. Ping 8.8.8.8. Now internet connection is ok.

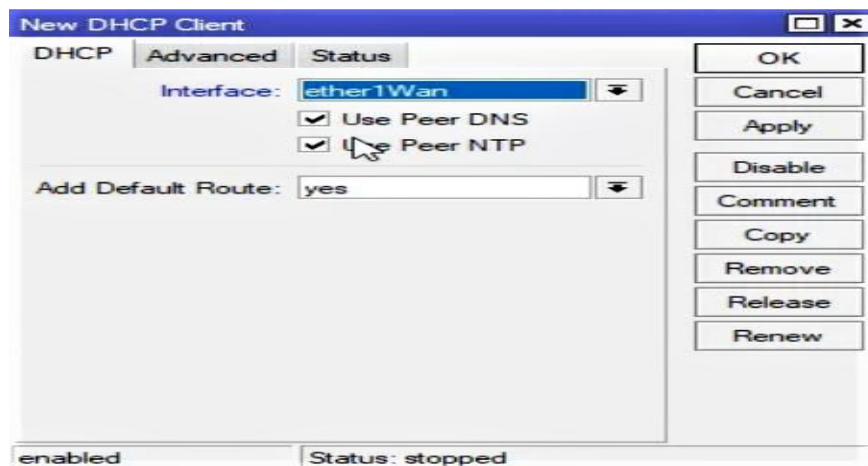


Figure 4.19: DHCP client and select interface ether1Wan

DHCP Server Setup

Open Address list. Open DHCP server, go to DHCP setup. Select DHCP Server Interface in ether2LAN. DHCP address space is default. Gateway for DHCP network is 10.10.10.1, Addresses to Give Out default, DNS servers is 203.190.10.252 and 203.190.10.253 select any lease time, I am select 24:10:0 And the DHCP Setup has completed successfully. Now check the ping 8.8.8.8 and connection is ok.

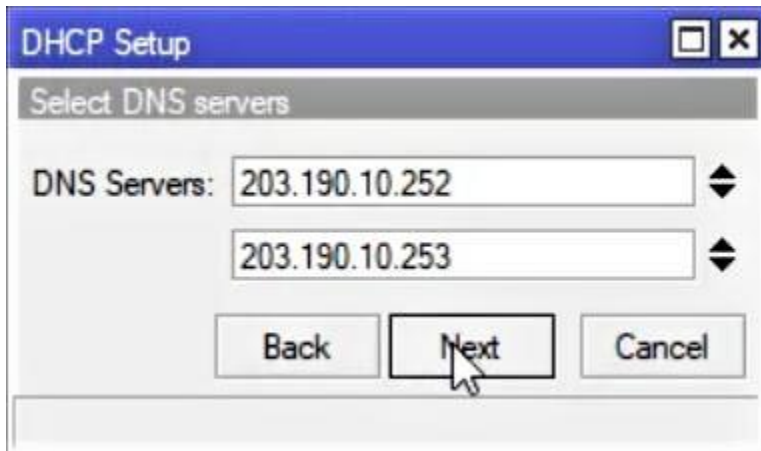


Figure 4.20: DHCP Setup by select DNS server

PPP Client

For ppp client connect Mikro-Tik router. Open ppp add new interface PPPoE Client. Make interface ether1Wan, given a username in Dial out marked Use Peer DNS then apply ok.

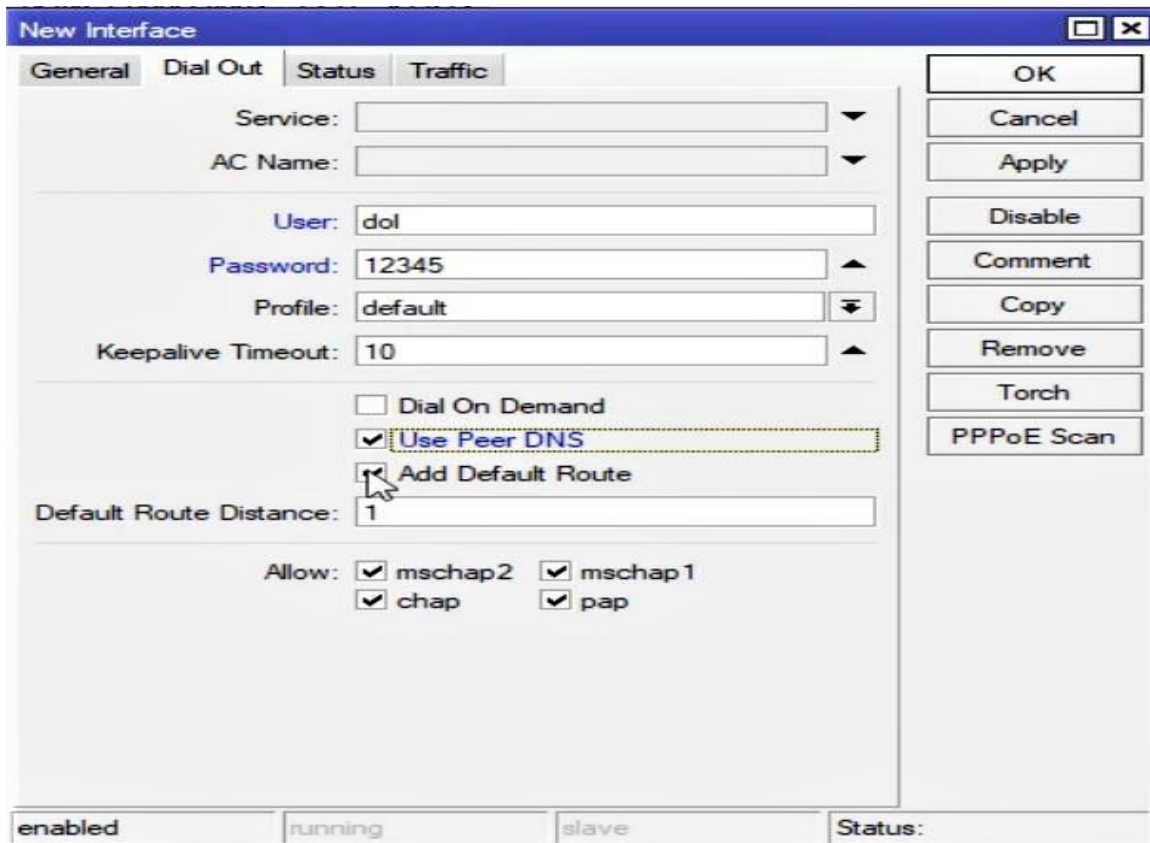


Figure 4.21: Enter user and password for ppp client

Point-to-Point Protocol over Ethernet

For PPPoE connection open Interface List, make ether5 to ether5pppoe. Add new pool name pppoe & address 20.20.20.1-20.20.20.254. And add another new pool name Pppoe Gateway & Addresses 30.30.30.1-30.30.30.254. In PPP delete old configure and make new PPPoE Server Binding. On PPPoE Server make new PPPoE service, Service Name is service1 & Interface is ether5pppoe mark One Session Per Host. Make New PPP Profile, Name is profile1M local address is pppoe and remote address is Pppoe Gateway DNS Server is 203.190.10.252 & 8.8.8.8. And Rate Limit is 1M/M and copy this. Change the Limit 5M/5M and profile name is profile5M. Give the secret name and password Service pppoe and Profile is profile 1M. Now make another New PPP Secret now I can see that internet connection is gone. Now make a new Dial-up, make a new connection give first username and password now internet connection is ok. Now copy the Caller ID

from PPP Active User go to the Secrets Manu and past the caller id into the first one. Here on the Queue List is showing the internet speed. I can also edit VPN connection and check the 2nd username and password. Now pppoe connection is ok.

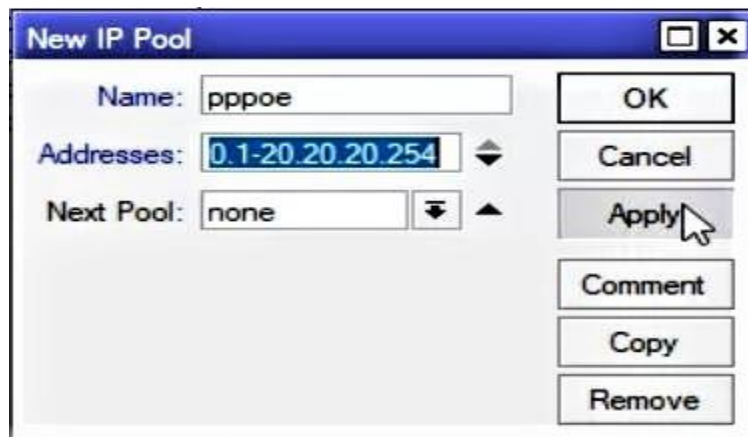


Figure 4.22: Adding new pool

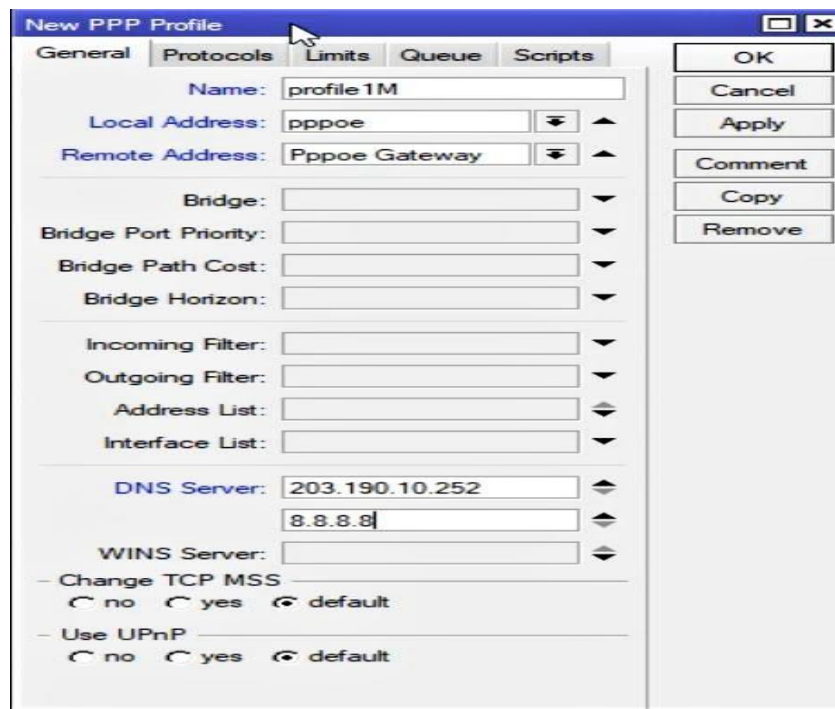


Figure 4.23: Selecting new ppp profile

PPP Active User <Mahfuz>

General

Name: Mahfuz

Service: pppoe

Caller ID: 00:E0:4C:98:6E:4C

Encoding:

Address: 30.30.30.254

Uptime: 00:00:40

Session ID: 81200000 hex

Limit Bytes In:

Limit Bytes Out:

OK

Remove

Ping

local

Figure 4.24: Create ppp new active user

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ [icon] 00 Reset Counters 00 Reset All Counters

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks	Download
0 D	<pppoe-Sadi>	<pppoe-Sadi>	5M	5M		5.0 Mbps

Figure 4.25: In queue list showing connection speed

CHAPTER 5

Conclusion and Future Career

5.1 Conclusion

We accumulate a considerable measure of involvement and this is an incredible open door for us to finish this temporary job on Linux. Amid this temporary position we considered to actualize and test the working framework by prophet virtual machine. Presently we can make or keep up various kinds of servers which is extremely useful for our future. It allows us to meet the genuine systems administration framework which is extremely viable for us in future.

5.2 Problems

- There are distinctive kinds of issues must be faces amid the Installation and kept up the virtual machine. Generally, normally
- The server PC has diverse kinds of issues amid the server establishment.
- The organize does not work legitimately amid the bundle establishment.
- The power has gone a few times amid the establishment and dealing with the server.
- In virtual machine diverse sorts of code does not work legitimately.
- We must be so watchful amid work, on the grounds that the directions are exceptionally case delicate.

5.3 Future Scope

Any individual can design DNS and DHCP server effortlessly and can-do server checking with server reinforcement which are clarified in this book.

- Configuration and upkeep all the Linux server for our reality.
- To work in ISP stage
- Network executive into the activity condition.

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