FINAL YEAR INTERNSHIP REPORT ON
NETWORK MANAGEMENT USING 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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DHAKA, BANGLADESH

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APPROVAL

This Project/internship titled "**Network Management with Mikrotik** ", submitted by **RUBEL AHAMED**, ID No:152-15-6174 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 date 07.04.2018.

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DECLARATION

I hereby declare that, this Internship has been done by us under the supervision of **MS. AFSARA TASNEEM MISHA, Lecturer, Department of CSE** Daffodil International University.

We also declare that neither this Internship or any part of this Internship has been submitted elsewhere for award of any degree or diploma.

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

I would 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 patience of my parents.

ABSTRACT

This Internship is on **"**Network Management Using MikroTik**"**, Actually This is aMikroTik is a very low cost and easy access Router that can be used for small and big network management And Especially this networking device suits for small network from every aspect like client management and security. MikroTik Router OS is the operating system of MikroTik Router Board, which may also install in a standard PC and the PC will turns into a MikroTik Router. The aim of this internship is to create virtually a MikroTik Router to manage a small network. For this I studied on different MikroTik Router OS features-routingIPv4 & firewall, IP and bandwidth management, wireless access point, bridge, hotspot gateway, NAT, Pool, DHCP and more. But I did not have to apply all of those features to manage our considerable network. I do some basic configuration like Interfaces, Routes, DNS, DHCP, and Bridge. Besides those, We have also a discussion on MikroTik Router OS upgrade process which may require adopting new version in future. Finally, to manage and provide bandwidth security in our network. we use some special features of MikroTik Router OS like NAT, Filter Rules, ARP Bandings, Queue Management etc.

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Introduction

1.1Introduction

Bangladesh is development country of Technology. Each out of them Internet is the most important of global world And Internet becomes very essential part of our daily life. Now a day's not only big organization but also internet has been using small organizations and its demand bin creasing day by day. As a result secure, reliable and proper management of network becomes an important issue. Again cost is another big factor for this kind of project. As a result low budge, secure and easily manageable networking device will be beneficial for many organizations. MikroTik is that kind of networking device. MikroTik provide very reliable and secure network. It provides easy features to manage a network and cost very low. In our local market So, we can design and manage both small and big network with this device. But MikroTik device is consider perfect for small network because this kind network design budget usually kept low. MikroTik is a Linux-based operating system known as MikroTik Router OS. MikroTik Router main operating system is called Router OS which turns a regular PC or MikroTik Router Board hardware into dedicated router. MikroTik Router OS is based on Linux Kernel. MikroTik features Routing, Firewall, Bandwidth Management, Backhaul Link, Wireless access point, Hotspot gateway, VPN and more. We can manage network using easy MikroTik command line or winbox.

1.2 Motivation

Networking is the development of relationships that can benefit my internship or career exploration. It is an opportunity to gather information about the skills necessary to succeed in the various types of jobs, careers, and industries of the people you meet. This can help me clarify my career interests and next steps. Day by day the whole world Is becoming depend on computer system. Networking is a big part of faster communication now a days worldwide market place build because of networking. I am currently pursuing my Bachelors in Computer Science Engineering at Daffodil International University, I understand the importance of gaining practical knowledge which will complement the textbook knowledge and help a student gain a wider perspective of the subjects. During the internship I have found that I am perfectly skilled in the details of Mikrotik network. As an internet service provider I've getting my point across very well communicating with people, understanding their needs and providing them better service. My skills lie in my ability to comprehensively read and understand the situation and act quickly and yet smartly .

1.3 Internship Objectives

The main objectives of the report are as follows:

1. Learn details about the networking components,

2. MikroTik Configuration

3. How to communicate with Clients.

4.How to provide better service to Clients.

5.To obtain a wide knowledge about the networking.

6.To learn how to install and configure the different server and other software.

1.4 Introduction to the Company

Daffodil Online Ltd. (DOL) is one of the most importance company for internship and providing ICT services and solution since July 2002. It has its own Fiber Optic & Radio Link WAN infrastructure to serve corporate, SME and individual clients. The institute worked with many national projects and international organizations with high appreciation from all concerned. It using the latest technologies and upgrading the services wherever it is required.

Head Office	
Name	Daffodil Online Limited
Address	102, Shukrabad (3rd floor), Mirpur Road, Dhanmondi, Dhaka - 1207, Bangladesh
Telephone	02-9143258-60
Fax	880-2-8116120
E-mail	info@daffodilnet.com
Website	www.daffodilnet.com
Type of Organization	Nation wide Internet Service Provider (ISP)
Employees	14

The centers Corporate Network Solution department is capable of providing state-of-art network and telecommunication solutions with a group of highly efficient technical experts. DOL has a very strong professional engineering and management team certified and associated with SUN, Cisco, Microsoft, Linux, and Oracle and actively involved with

world leading computing associations. As a Group concern, DOL promotes 3 major platforms e.g., education, nation-building and environment, through its programs and services. [1]

1.5 Report Layout

In the chapter (1) I even have described goal of internship, Motivation of internship and Introduction to the corporation.

In the chapter (2) I have defined the technique of my internship. And this chapter givesthe information about wherein the internship has been connected to adopt this application. Alsoincluded approximately how did perform the internship works, approximately the employer, what are the ITservice provided in DOL and what are the roles of in jobs market of Mikrotik

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

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

In the chapter (5) I actually have defined is Conclusion and Future Scope. I discuss Future Scopes of Mikrotik and write end.

CHAPTER 2

Organization

2.1 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 has its own Fiber Optic & Radio Link WAN infrastructure to serve corporate, SME and individual clients. The institute worked with many national projects and international organizations with high appreciation from all concerned. It using the latest technologies and upgrading the services wherever it is required. The centers Corporate Network Solution department is capable of providing state-of-art network and telecommunication solutions with a group of highly efficient technical experts. DOL has a very strong professional engineering and management team certified and associated with SUN, Cisco, Microsoft, Linux, and Oracle and actively involved with world leading computing associations including IEEE, ACM, ACS, BCS, and PMI. Its Corporate Social Responsibility ethos strengthens the sense of responsibility on Community, Workstation, Location and Market place. As a Group concern, DOL promotes 3 major platforms e.g., education, nation-building and environment, through its programs and services [1].

2.2 Product and Market Situation

Daffodil online limited is providing of products and services to meet customer demand. actually Daffodil online limited company linkage of many other company. I ensure Daffodil Online Limited is the most important of IT sector for market situation and they service high quality of other IT sector. Daffodil Online Ltd. Prides itself as one of the main nationwide Internet Service

Provider (ISP) in Bangladesh. They are the maximum experienced and oldest agency in the ICT discipline where they're simple enterprise ethics is Long Term Relationship with the are customers. As they examine the growth over the decade in view that our inception, they may be extremely pleased with what we've executed, or even greater enthusiastic about our outlook for an equally promising future. Daffodil Online Ltd also provides one-of-a-kind IT Services and Professional Training services. These are given underneath. [1]

➢ **IT Services**

    (1) Corporate Internet Solution

    (2) Security solution.

    (3) Domain registration and web hosting.

    (4) Website development.

    (5) Open source application solution.

    (6) Internet Service Provider

    (7) State of the Art Data Centers.

    (8) Hi speed Wi-Fi Zone.

    (9) Data Connectivity, Data center& Co-Location.

    (10) Bulk SMS Service**.**

    (11) Proxy & DNS Server solution, Mail Server Solution.

    (12) And All computer accessories

    (13) Professional course and trainings:

➢ **Professional Training Services**

    (1) ISP Setup and administration using Linux.

    (2) Training Course on Certified Ethical Hacking (CEH).

    (3) ISP Setup and Administration the use of MikroTik.

    (4) Web web page Development with Joomla.

    (5) PHP and MYSQL for Website Development.

    (6) E-commerce & Open source Joomla Virtue Mart.

    (7) Red Hat Certified Security Specialist (RHCSS).

    (8) Red Hat Certified Engineer (RHCE)

2.3 Target Group

The employer's patron base includes all purchasers and all small- to medium-sized agencies, consisting of start-ups. The organization plans to pay attention on show customers, as those are perfect targets for our new high-velocity offerings, and maintain the greatest growth ability for the company. Web Solutions feels that those marketplace segments have special pricing and carrier needs, and make more committed, reliable clients.

2.4 SWOT Analysis

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

Strengths

- Communication between people separated by distance (at home and with in the place of business)
- Working from home with no trouble
- Setting up an online enterprise
- Gathering facts (treasured asset in enterprise)

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 UK increasing

- Introduction of easier tariffs

- Revision of regulatory framework

Threats

The Economic Crisis Householders less likely to increase their 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

2.5 Organizational Structure

Organogram Structure of Daffodil Online Ltd. shows in fig 2.1

Figure 2.1 Organizational Structure of Daffodil Online Limited

CHAPTER 3

Tasks, Projects and Activities

3.1 Daily Task and Activities

3.1.1 IP Management

An Internet Protocol address (IP address) is a numerical label assigned to each device participating in a computer network that uses the Internet Protocol for communication. An IP address serves two principle functions: host or network interface identification and location addressing. The designers of the Internet Protocol defined an IP address as a 32-bit number and this system, known as Internet Protocol Version 4 (IPv4), is still in use today. However, due to the enormous growth of the Internet and the predicted depletion of available addresses, a new addressing system (IPv6), using 128 bits for the address, was developed in 1995. IP addresses are binary numbers, but they are usually stored in text files and displayed in human-readable notations, IP address are five classes, class A, class B, class C, class D, and class E.

Table-1: IP address classes

Class	1st Octet Decimal Range	1st Octet High Order Bits	Network/Host ID (N=Network, H=Host)	Default Subnet Mask	Number of Networks	Hosts per Network (Usable Addresses)
A	1 – 126*	0	N.H.H.H	255.0.0.0	126 ($2^7 - 2$)	16,777,214 ($2^{24} - 2$)
B	128 – 191	10	N.N.H.H	255.255.0.0	16,382 ($2^{14} - 2$)	65,534 ($2^{16} - 2$)
C	192 – 223	110	N.N.N.H	255.255.255.0	2,097,150 ($2^{21} - 2$)	254 ($2^8 - 2$)

Class							
D	224 – 239	1110	Reserved for Multicasting	Reserved for Multicasting	Reserved for multic.	Reserved for Multicasting
E	240 – 254	1111	Experimental; used for research	Experimental; used for research	Experimental; used for research	Experimental; used for research

3.1.2 Private IP Addresses

Early network design, when international quit-to-quit connectivity was expected for communications with all Internet hosts, supposed that IP addresses be uniquely assigned to a specific pc or device. However, it was found that this turned into not usually necessary as personal networks developed and public cope with space needed to be conserved. Computers now not connected to the Internet, which includes manufacturing facility machines that speak most effective with each different through TCP/IP, need now not have globally particular IP addresses. Three levels of IPv4 addresses for non-public networks were reserved in RFC 1918. These addresses are not routed on the Internet and for that reason their use want now not be coordinated with an IP cope with registry.

Table-2: Private IP Addresses

Class	Private Networks	Subnet Mask	Address Range
A	10.0.0.0	255.0.0.0	10.0.0.0 - 10.255.255.255
B	172.16.0.0 - 172.31.0.0	255.240.0.0	172.16.0.0 - 172.31.255.255
C	192.168.0.0	255.255.0.0	192.168.0.0 - 192.168.255.255

Address: 192.168.5.1   11000000.10101000.00000101 .00000001

Netmask: 255.255.255.0 = 24   11111111.11111111.11111111 .00000000

Wildcard: 0.0.0.255   00000000.00000000.00000000 .11111111

Network: 192.168.5.0/24   11000000.10101000.00000101 .00000000 (Class C)

Broadcast: 192.168.5.255   11000000.10101000.00000101 .11111111

HostMin: 192.168.5.1   11000000.10101000.00000101 .00000001

HostMax: 192.168.5.254   11000000.10101000.00000101 .11111110

Hosts/Net: 254   (Private Internet)

3.1.3 History of MikroTik

MikroTik is a Latvian corporation which was founded in 1995 to develop routers and wi-fi ISP structures. MikroTik now affords hardware and software for Internet connectivity in most of the nations around the sector. The enjoy in using enterprise standard PC hardware and complete routing systems allowed us in 1997 to create the Router OS software gadget that gives sizeable stability, controls, and versatility for all forms of facts interfaces and routing. In 2002 MikroTik decided to make their very own hardware, and the Router BOARD emblem turned into born. They resellers in most parts of the world, and customers in all likelihood each use on the earth.

3.1.4 Other Software Used to Management

VMware

VMware is program which runs under Linux and emulates the hardware of a well known PC to provide one or greater digital machines. Many operating systems can be set up on this virtual device in order that it's far feasible to run [6]. For example Windows XP Professional can deploy inner Windows 8.1 Pro. Three As Router OS may be deploy in regular general PC which flip computer to a regular router. So, in our task we use VMware to put in MikroTik Router OS to create a virtual gadget of MikroTik Router. As a end result we did not need to buy any Router BOARD from market. Installing Router OS in VMware virtually create a MikroTik to put into effect MikroTik capabilities.

Winbox

The MikroTik Router OS can configure remotely using Telnet, SSH or Command Line Interface. But it is also feasible to manipulate Router OS the usage of Winbox or Webbox. The winbox provide a graphical consumer interface for MikroTik Router Configuration and control capabilities. As a end result it will become very easy to configure and manage community the use of winbox. All winbox features are as near as viable to console chara cteristic and precisely in same hierarchy in Terminal Console. We can download winbox software program from MikroTik internet site comply with this link .

http://www.Winboxmikrotik. Com/2018/03/download-winbox.Html.

3.1.5 Downloading and Installation of MikroTik Router OS

The download and installation of MikroTik Router OS is described in the following diagram (Figure 3.1).
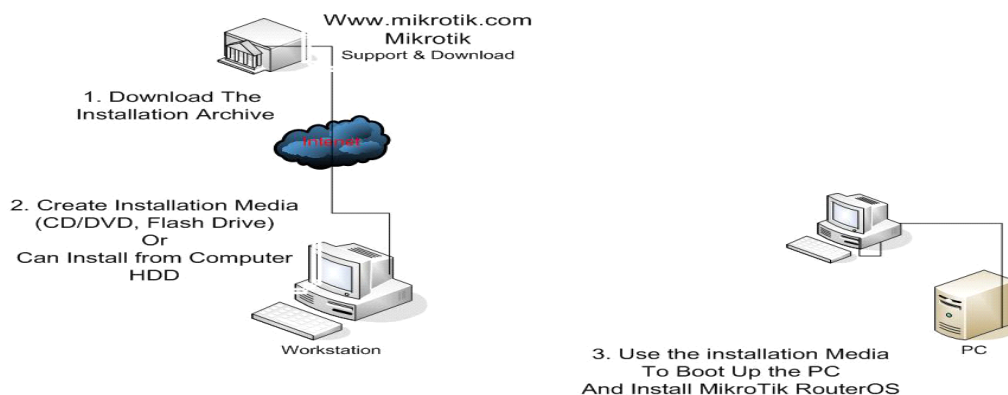
Figure 3.1 MikroTik

At first Download the MikroTik Router OS ISO file from www.mikrotik.com. Create bootable Flash Drive or CD/DVD with the ISO file. Then use the installation media to boot up the PC and install MikroTik Router OS in Dedicated PC Router. But in our

project we use "VMware" to create a virtual machine of MikroTik Router. We didn't make any bootable media but store MikroTik Router OS ISO in Computer HDD. [7]

3.1.6 VMware insatallation steps:

Step1

Open VMware Workstation and click on "Create New Virtual Machine". NewVirtual Machine Wizard window will open. Figure3.2 giving a VMware startview
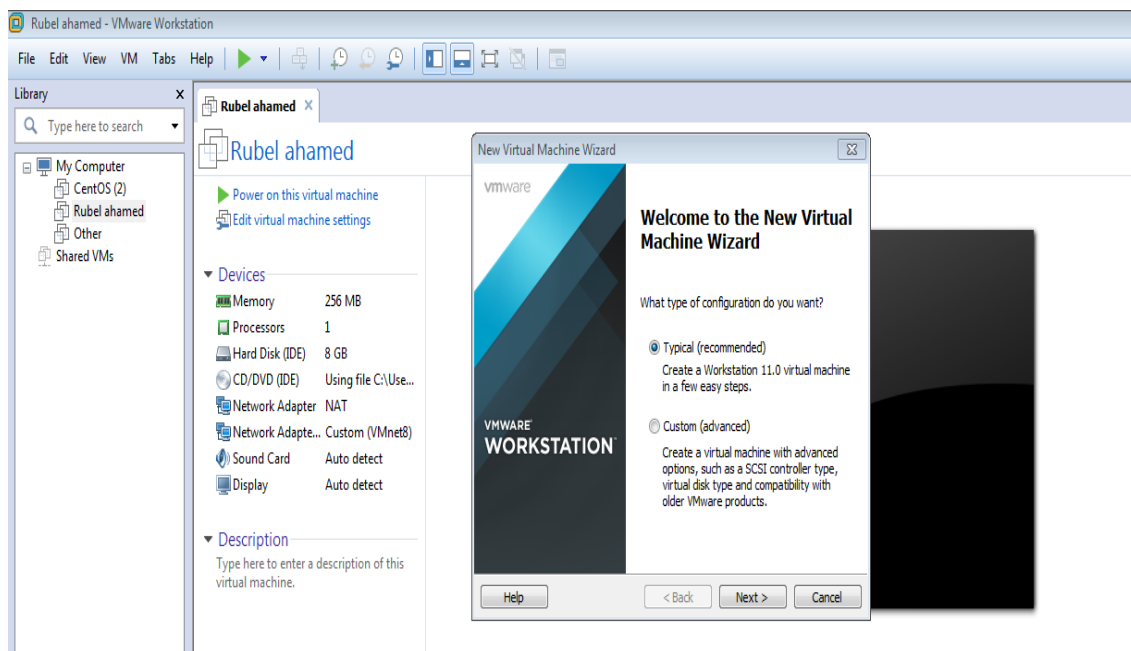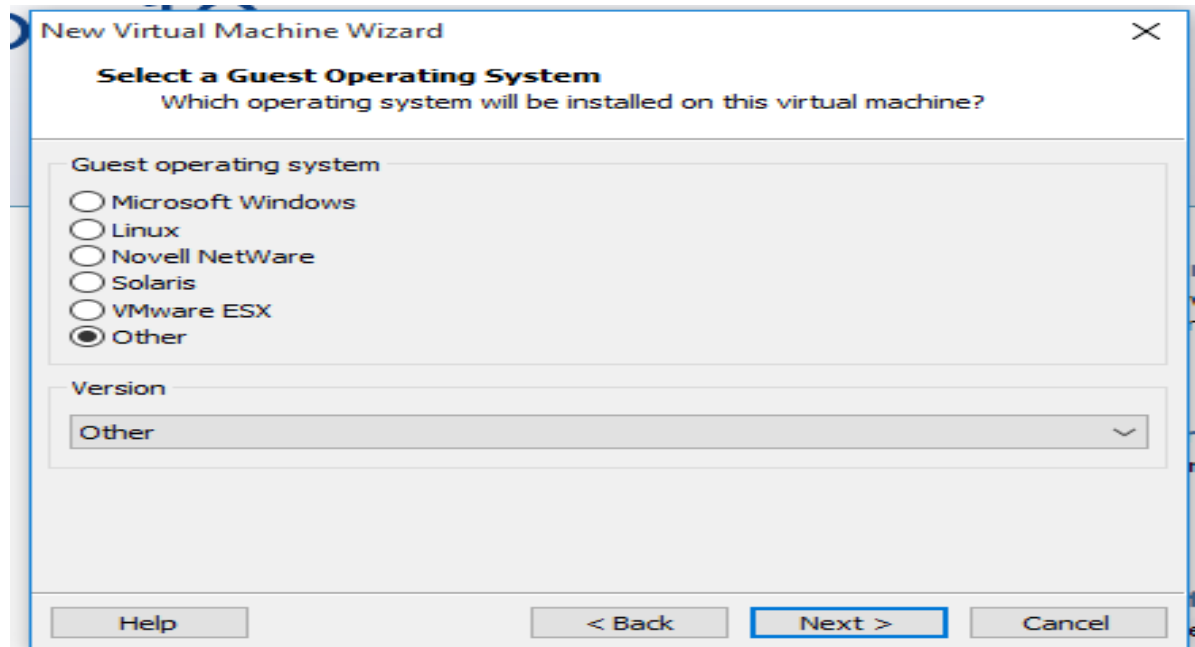

Figure 3.2 VMware start view

Step2 Click 'Next' -> 'Next'-> Select "I will install operating system later".
 Select Guest Operating System Other. Click Next

Figure 3.3 VMware Installation process

Step3

Give Virtual Machine Name "Rubel ahamed" and show installation location

Click 'Next'. Click 'Next'. Increase Memory for Virtual Machine at least 256 MB. Click'Next' and select "Use host-only networking" because we will connect to virtual private network on the host computer. Click 'Next' -> 'Next' ->must select Virtual Disk Type – IDE .
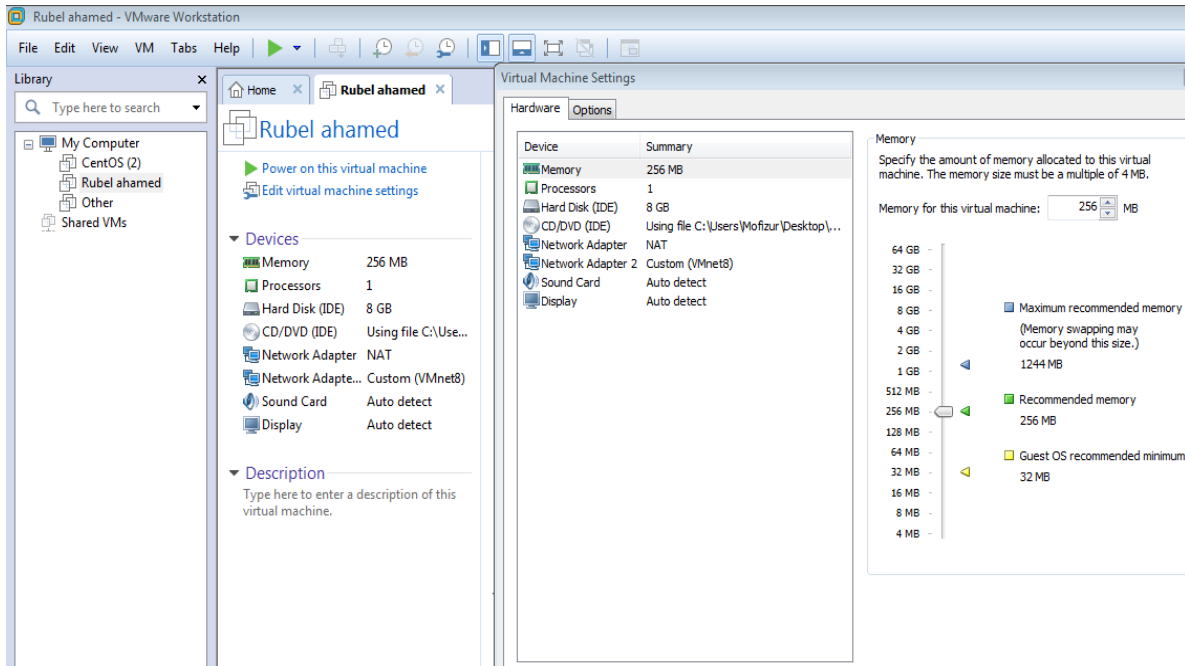
Figure 3.4 VMware Installation process

Step4

1. Click 'Next' -> Select "Create a new virtual disk".

2. Click Next -> Increase virtual disk size if possible and select "Split virtual diskinto multiple file". Click Next.

3. Click Next. Click on "Customize Hardware" will open a window.

4. Addadditional Network adapter for Ethernet interface according to our need and give ISO location in our hard drive clicking on "New CD/DVD-> Use ISO image file .
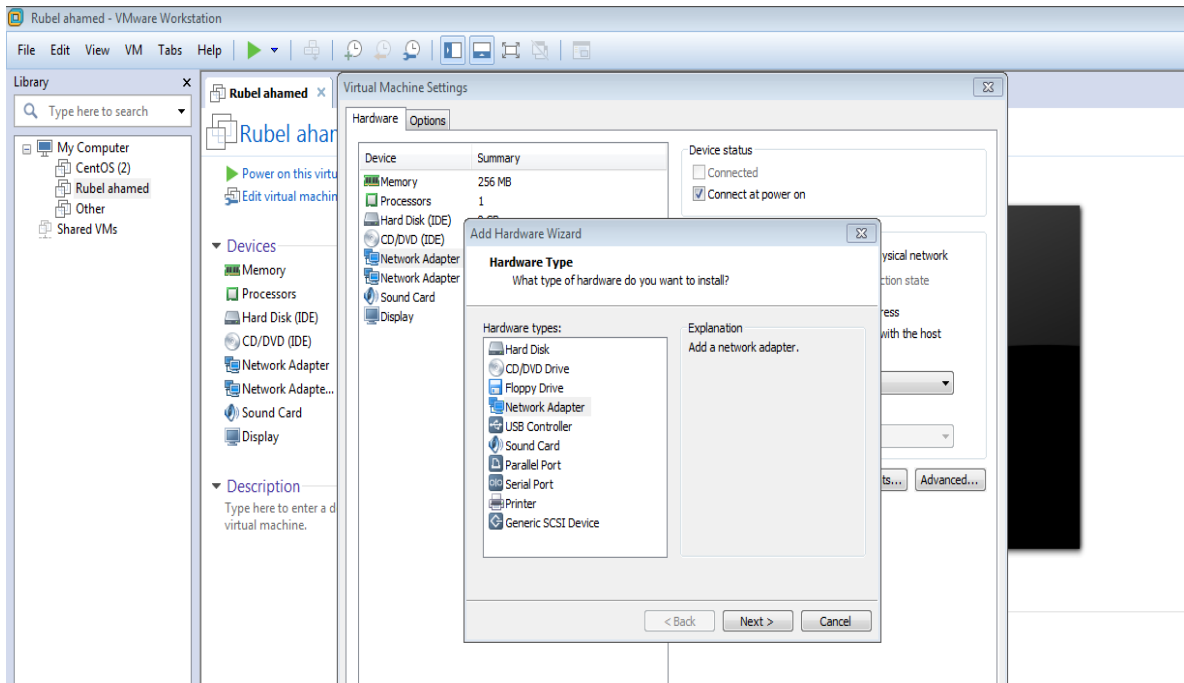
Figure 3.5 VMware Installation process

Step5

Now click on "Finish".

 Power on the recently created virtual machine
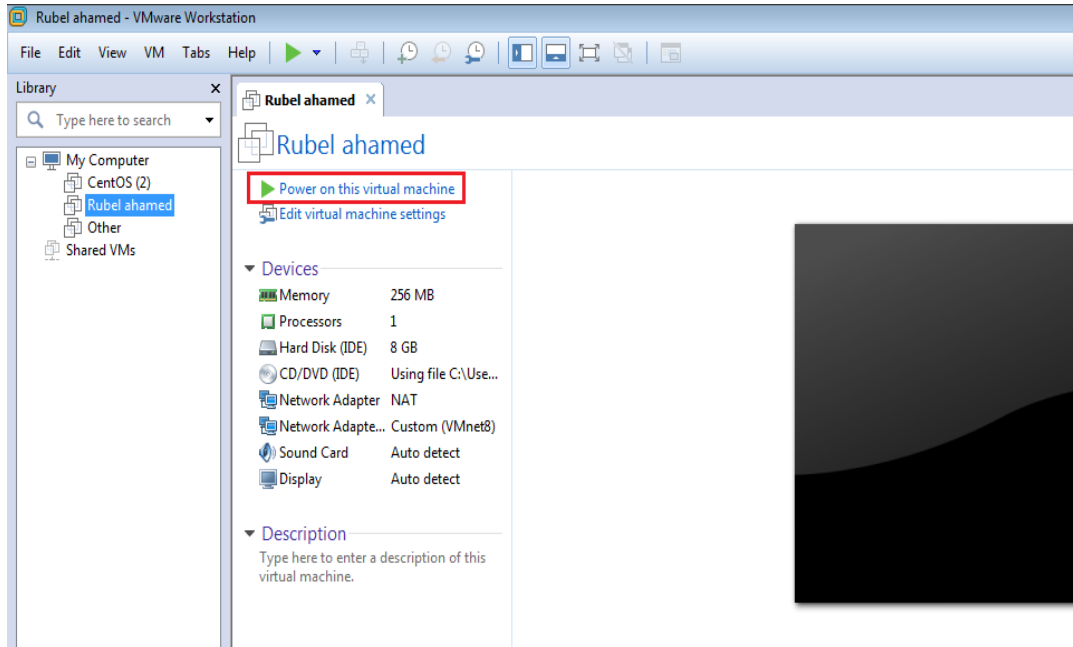
Figure 3.6 VMware Installation process

3.1.7 Mikrtik Installation steps:

Step1:

After new virtual machine created When file load will complete selects all the option by pressing 'a' and click on 'i' to start RouterOS installation.
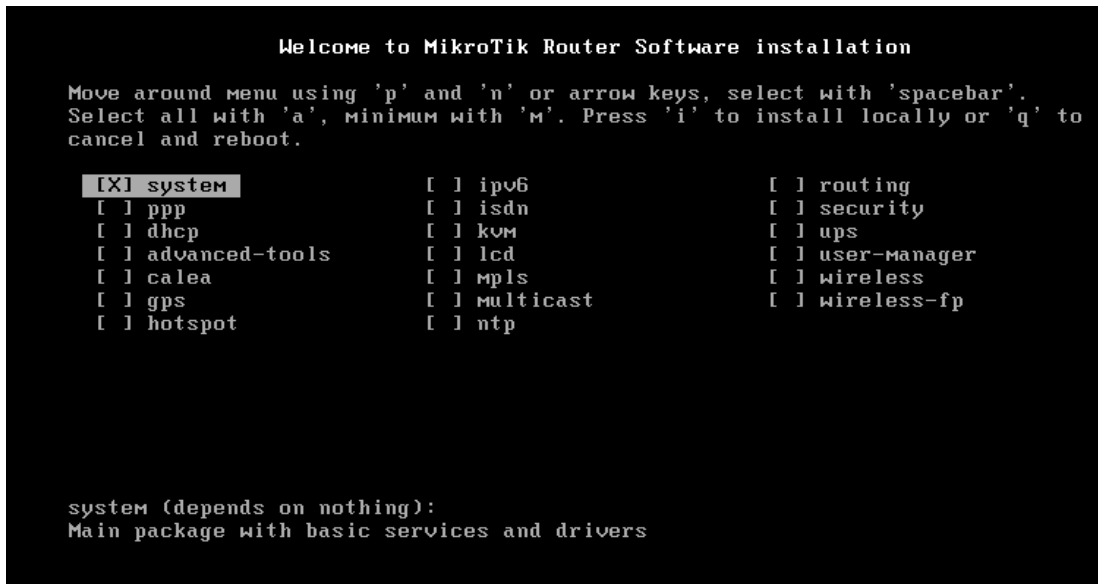
Figure 3.7 Mikrotik Installation Process 1

Step2:

Press 'y' to process disk format.

Figure 3.8 Mikrotik Installation Process 2

Step3:

Then machine will take restart and will come a login interface. In MikroTik Router Login interface Provide default User name: admin and Password:

"Keep blank" and hit Enter. Now router is now ready for further network management configuration.

Figure 3.9 Mikrotik Installation Process 3

Step4:

After complete installation of MikroTik Router OS,

Then type the following command "ip address add address=192.168.100.1/24

interface=ether1". So the interface ether1 will have IP address 192.168.100.2 for router

connectivity.

```
ROUTER HAS NO SOFTWARE KEY
---------------------------
You have 23h48m to configure the router to be remotely accessible,
and to enter the key by pasting it in a Telnet window or in Winbox.
Turn off the device to stop the timer.
See www.mikrotik.com/key for more details.

Current installation "software ID": 8H13-P27V
Please press "Enter" to continue!
mar/20/2018 15:25:00 system,error,critical router was rebooted without proper sh
u
tdown

[admin@MikroTik] > /ip address set address=192.168.100.1/24 interface=ether1
numbers:
[admin@MikroTik] > interface print
Flags: D - dynamic, X - disabled, R - running, S - slave
 #    NAME                                TYPE       ACTUAL-MTU L2MTU
 0  R  ether1                             ether          1500
 1  R  ether2                             ether          1500
[admin@MikroTik] > ip address print
Flags: X - disabled, I - invalid, D - dynamic
 #    ADDRESS            NETWORK          INTERFACE
[admin@MikroTik] > /ip address add address=192.168.100.2/24 interface=ether2
[admin@MikroTik] > _
```

Figure 3.10 Command mode

3.1.8 Network Management using Mikrotik

1.Give Power to the MikroTik Router

2.Plug in a UTP cable in mikroTik LAN port and the opposite port to the PC.

3.Browse with Winbox.

4.Click to icon and hare show a IP cope with and MAC cope with. Click to Mac cope

with then write 'admin' in login box and don't want to offer Password

5.Then go to new Terminal & system reset –cnfiguratin.
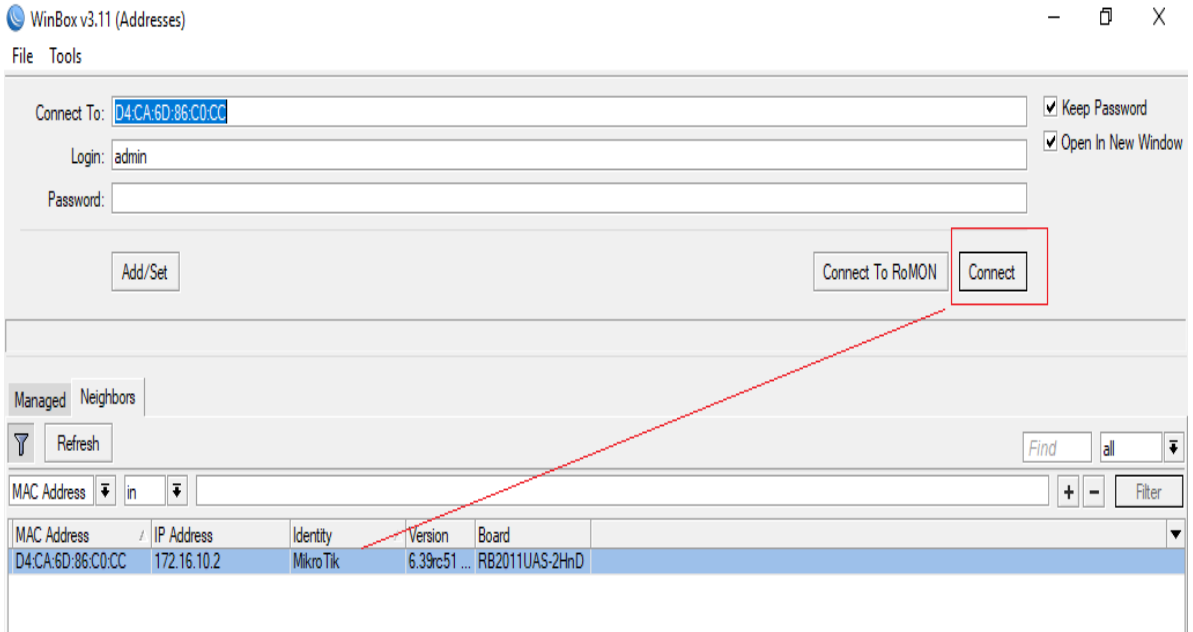
Figure 3.11 MAC address connect winbox
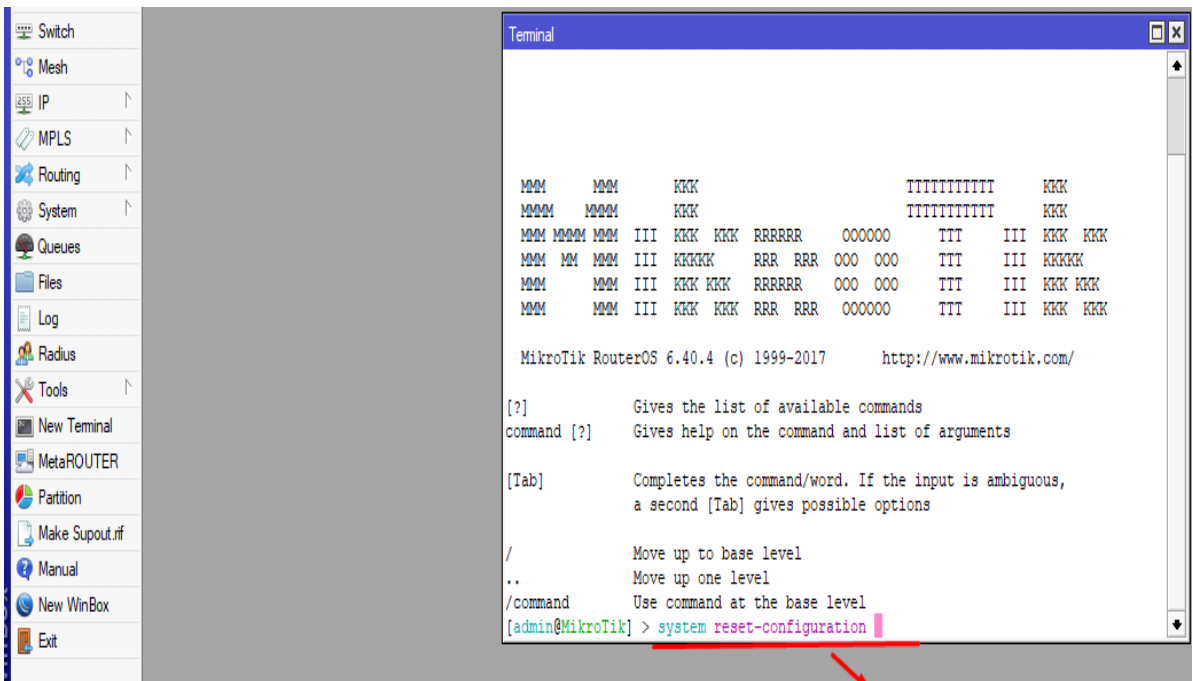
Figure 3.12 Screen Print Reset MikroTik Router

Interface Menu

MikroTik Router is now manageable via winbox. Now we need to add a LAN address to other ether interfaces because either1 is already configured for WAN connectivity. To add a network provide an IP address in address field which will consider as gateway for that interface and network address in Network Field. Then must have to select a interface from MikroTik Router interfaces and set IP address for WAN.
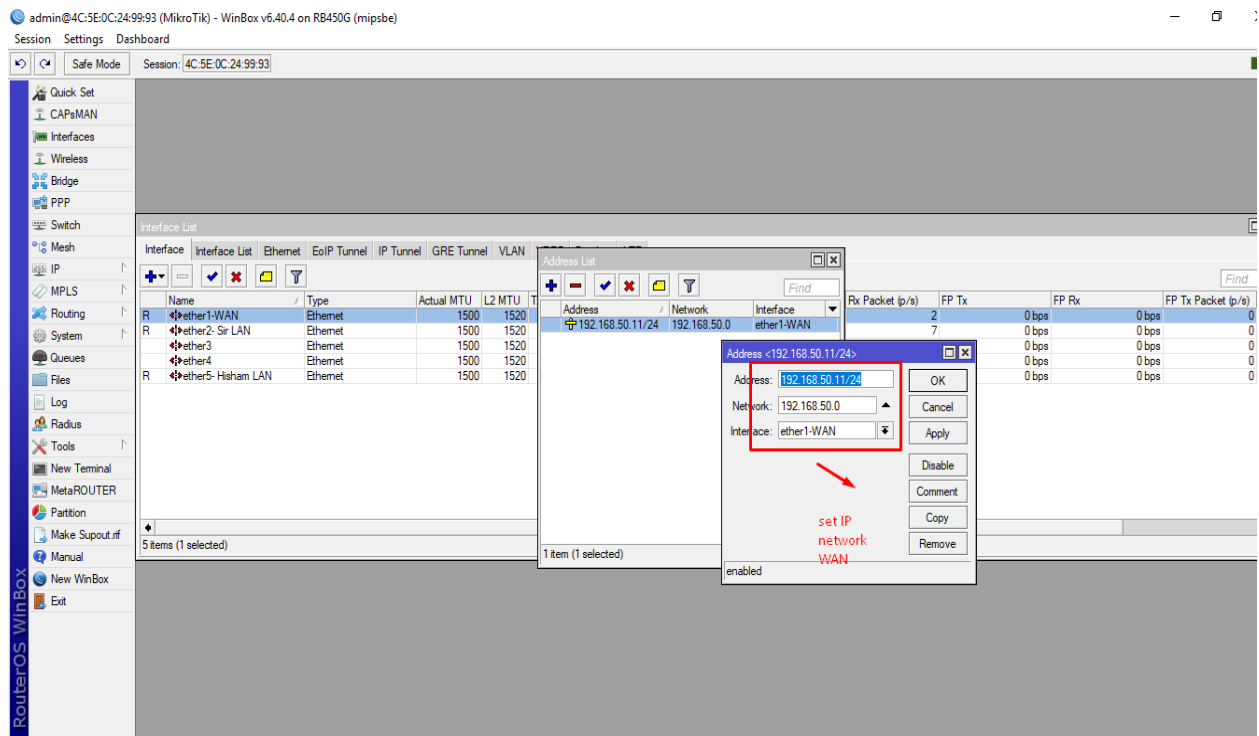

Figure 3.13 Add Address for Interface

In Figure3.13 showing us needs to go IP -> Address->then click on '+' sign to add an address. Now a window will open name 'New Address'. Provide IP address with subnet mask in address field (Example 192.168.50.11/24), its network in network field (Exam. 192.168.50.0) and need to show the interface (Exam. ehter2) for the network.

Routes

Next thing is need to do is to configure routes for internet connection. So that LANuser can have access over internet. In MikroTik we can RIP, or others but here we have done default routing configure. For this in winbox go to IP-> Routes a new window will open name "Route List". Click on '+' button to add a route another window will open name " Route". Keep Dst. address 0.0.0.0/0 and default gateway address will be 192.168.50.1. We do not need to do anything here, click Ok. A new Route will add to Route List. Figure3.14 will show process to create new route.
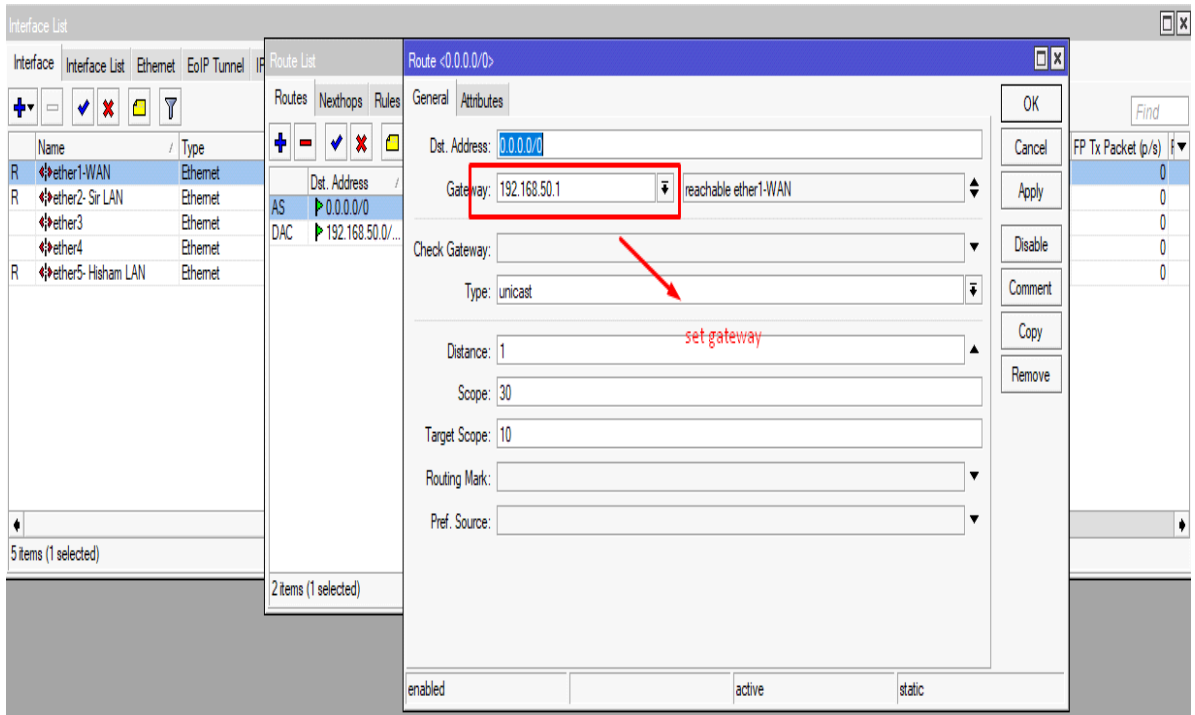

Figure 3.14 Create Route

DNS Server Setting

 Now Our next step is to set up DNS Server. Not only MikroTik router resolves DNS but we can also provide the DNS resolution for host that in our network using the router by using caching DNS. Caching DNS speed up the network because MikroTik Router OS allow linking the particular domain names with respective IP address and this links.

advertise to the DNS client using the router as their DNS server. To set up DNS server we need to go IP-> DNS-> Click on 'Setting' as a result a DNS setting window will open. The following Figure3.15 shows DNS Setup process.[6]
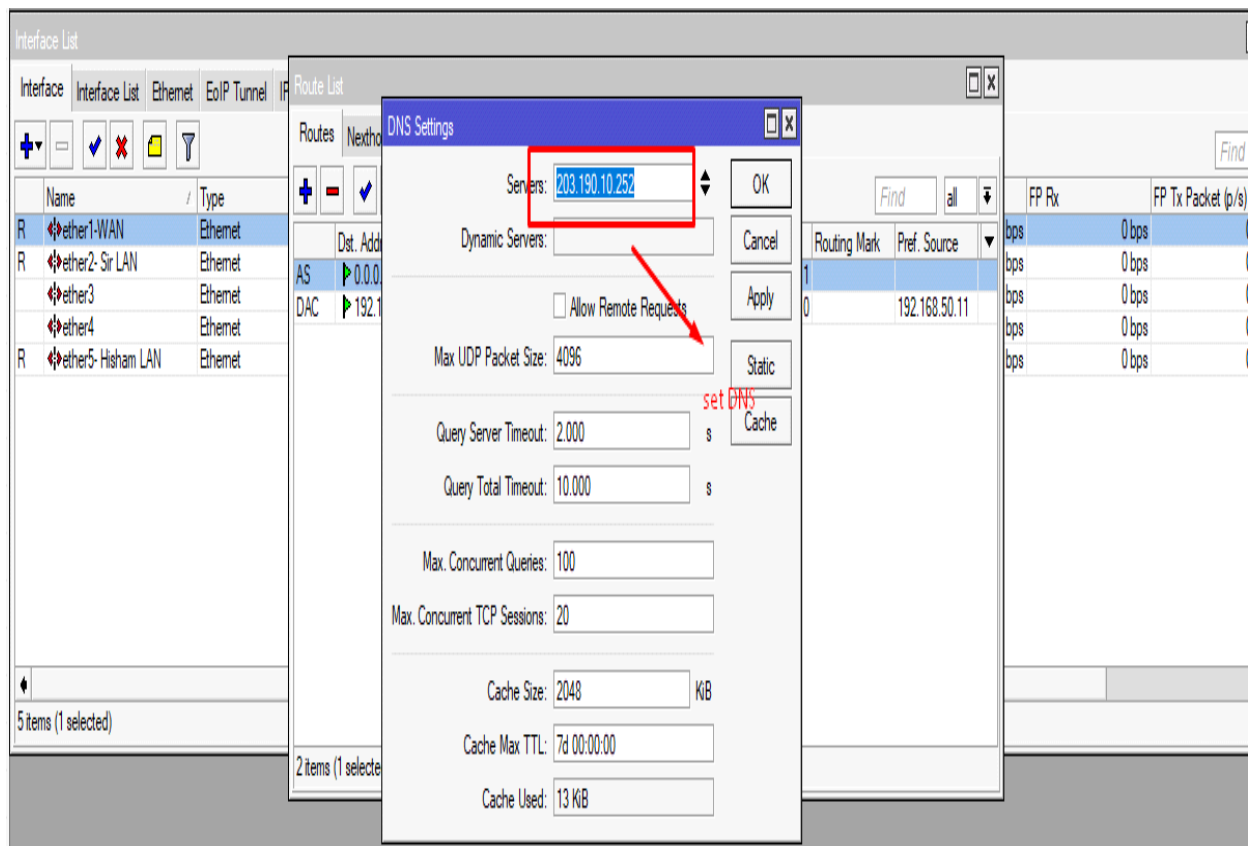
Figure 3.15 DNS Setup

After opening DNS Setting window add server. Here, we add Google public DNS server 8.8.8.8 and 203.190.10.252. Click on check mark of 'Allow Remote Requests'.

This will allow TCP and UDP requests .

Firewall & NAT

Now we will configure NAT for our Local Network. Go to IP > Firewall, go to NAT table press the plus sign which will allow you to add new firewall rules. Select chain=srcnat, then set Srcnat

Process:
IP > Firewall > NAT > "+'
General:
Chain: srcnat
Src. Address: local block/IP with subnet mask of the network.
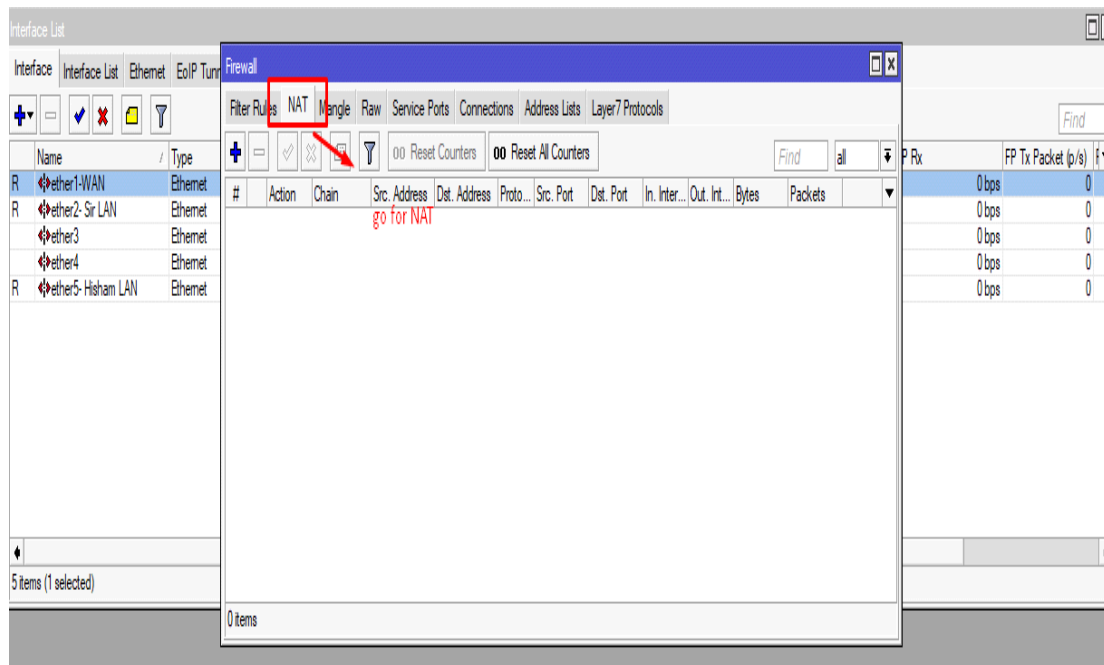Action:
Masquerade
Apply>Ok.

Figure 3.16 Select Firewall & NAT Rule

Masquerade

Now go to Action Tab in the same window, then select Action=Masquerade, then Apply and OK.
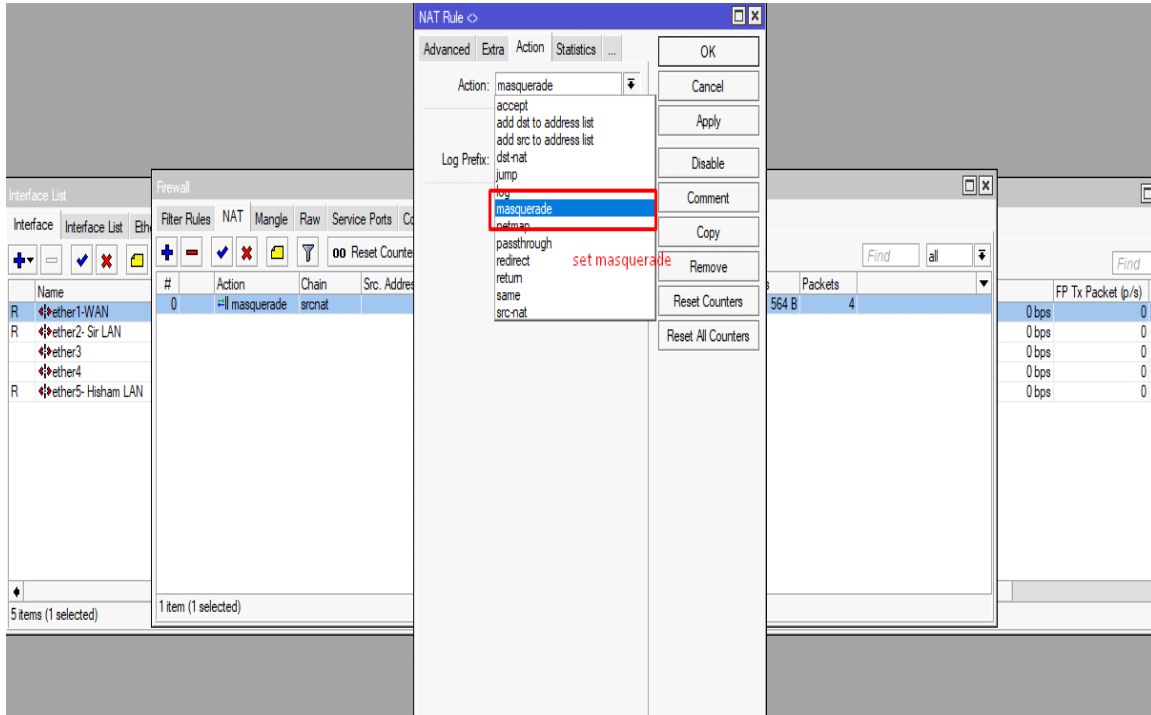

Figure 3.17 Set Masquerade

DHCP Configuration

DHCP Means Dynamic Host Configuration Protocol(DHCP) is also featured by MikroTik. .MikroTik Router to easy distribution of IP address for the client in a network. The MikroTik Router OS DHCP provides IP address/Mask to requested client, default gateway, domain name and DNS server. In MikroTik DHCP implementation includes both server and client part. Following figure 3.18 provide a quick view of DHCP configuration.
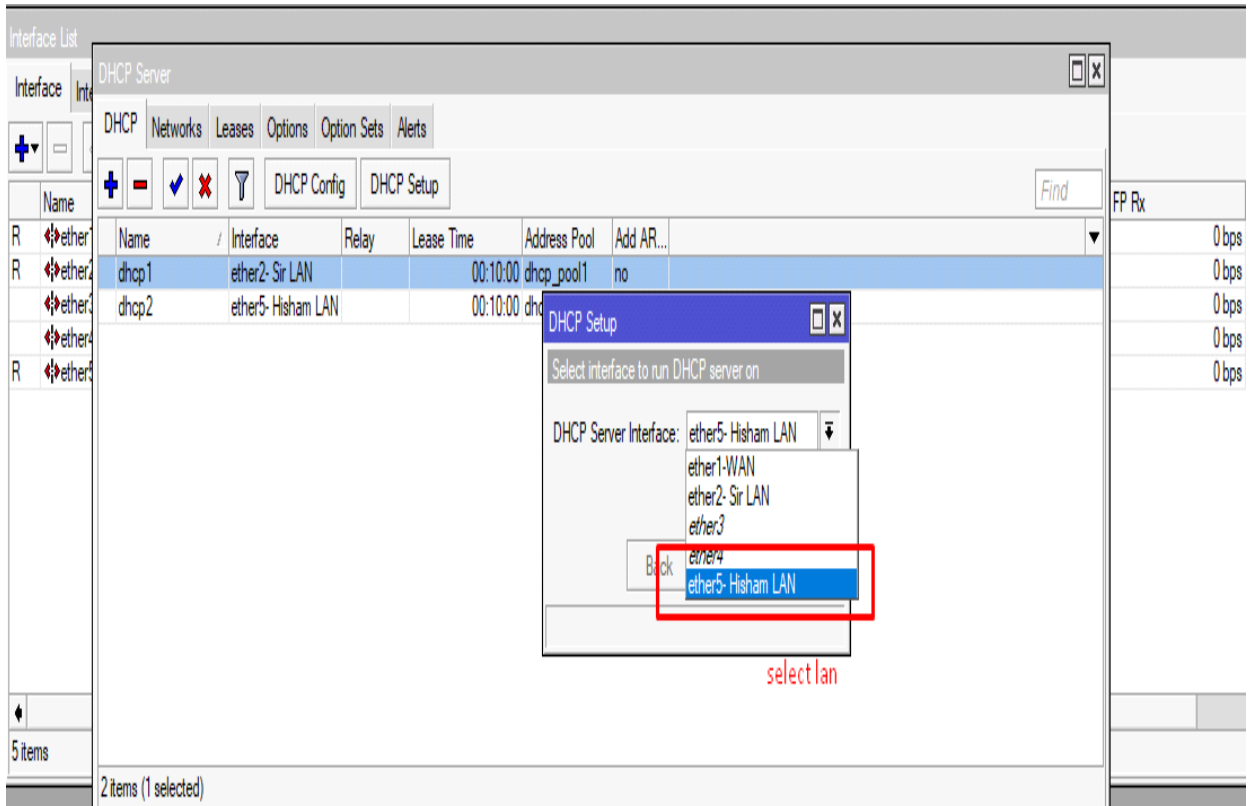
Figure 3.18 DHCP Configuration

To configure DHCP go to IP-> DHCP Server. Then click on "DHCP Setup"(Showingin Figure 3.18) which will open a DHCP Setup window.

(a)At first select DHCP server interface. Here in figure 3.18 we are doing DHCPfor interface ether5. So we select ether5-LAN. Then click on 'Next'.

(b)Now need to provide expected network address with mask for DHCP client.Then click on 'Next'.

(c)Give gateway IP address for the configuring DHCP. Click on 'Next'.

(d)Then need to select pool of IP address range given out by the DHCP Server. Click on 'Next'.

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Bridge

Bridges are using to connect network segments together in layer . almost switches acting as bridges today and don't need to configure anything on them. But a Mikrotik router (unlike a cisco switch) won't work as bridge automatically and need to be configure. It's so simple in Winbox, you make a bridge interface then drop the physical or logical interfaces on it Bridge allows creating logical interface. This bridge interface enables to combine two or more physical interfaces or combine between physical and logical interfaces. To create bridge connection click on "Bridge". Then on bridge tab click on "+" a new window will open.Give a name for the new interface and click ok. So this will create a new interface with the given name. Following figure 3.19 will give a clear understanding.
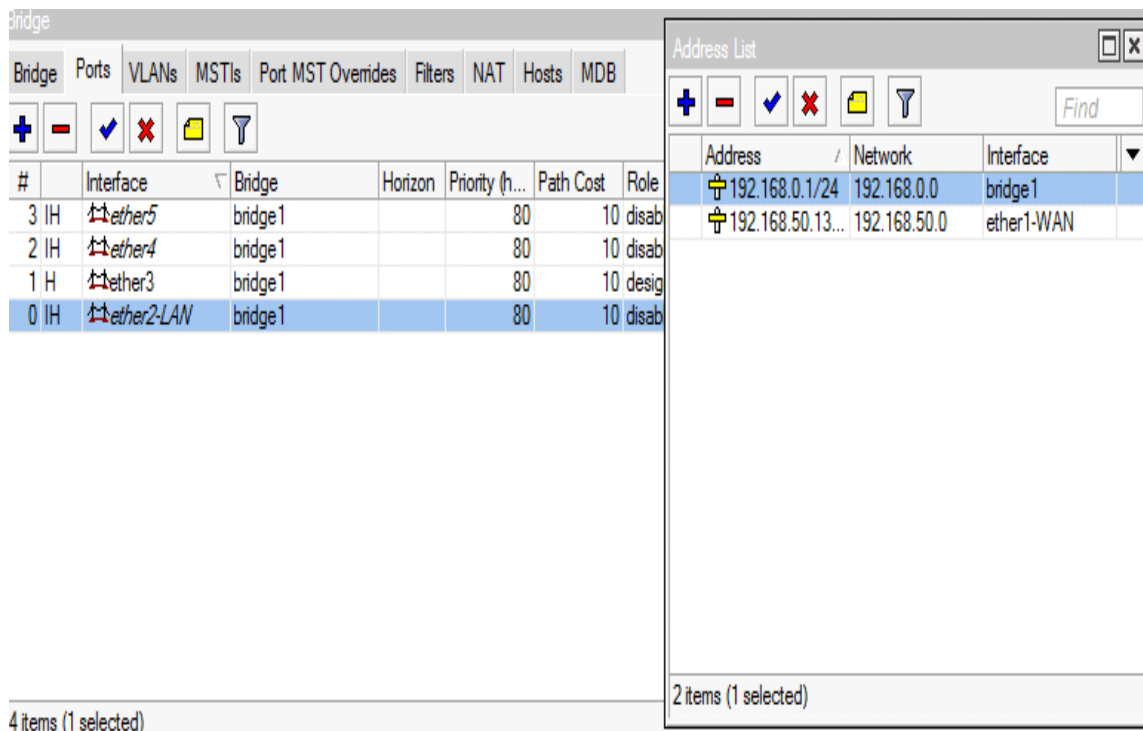
Figure 3.19 Bridge Ports Assign

After enter bridge name and click on OK or Apply Button we made our bridge Interface. And now we can add interfaces to bridge which we want to act as bridge-ports, one by one Now we need to add interfaces under this bridge interface. For this, click on "Port"

tab and click on "+" icon. A new window will open where select the interface we need to add under bridge interface in 'Interface' field and then select the bridge interface in'Bridge' field. Here we can add as many as physical or logical interface we want to add under the bridge interface. Now an IP address is need to add to the bridge interface. To do that we have to go to IP> Address> click on '+' sign and add the IP address as we done previously. Following this way we can configure bridge connection. now our simple bridge is ready.
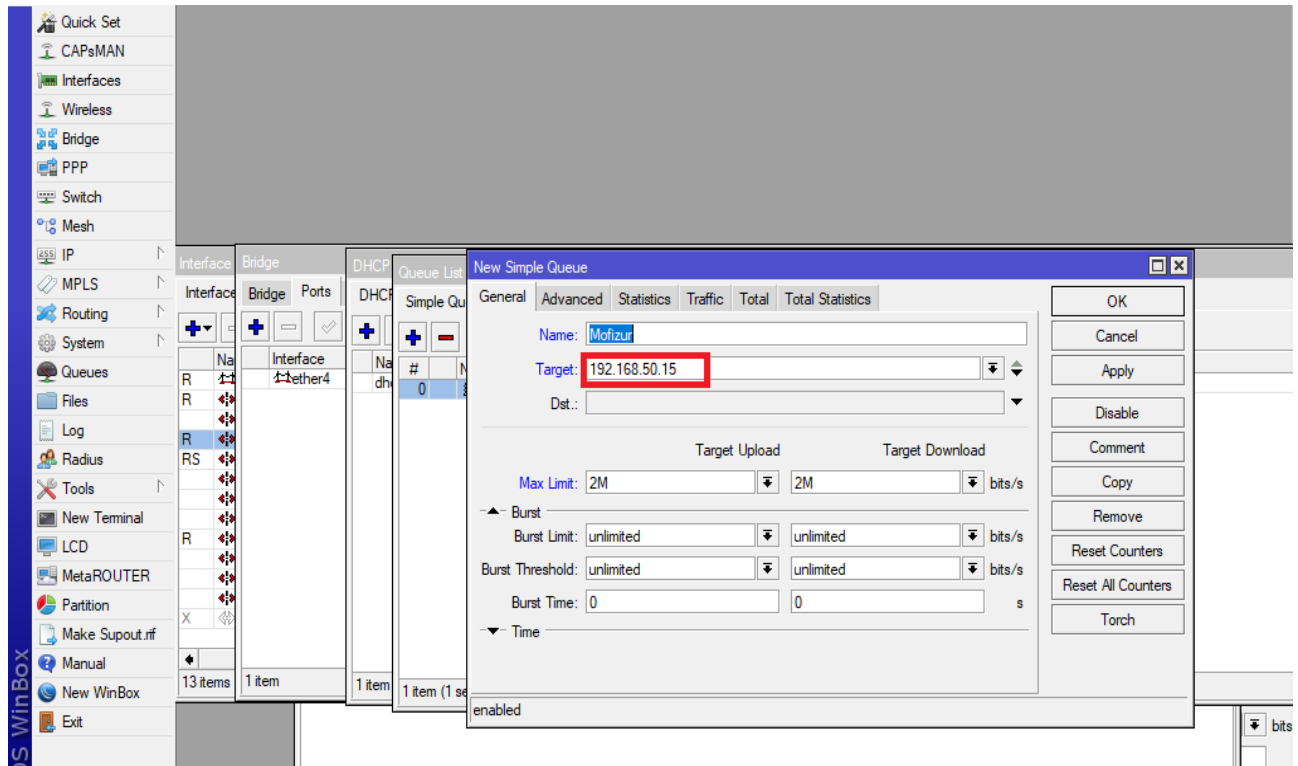
Simple Queue Bandwidth Management

Now we will setup Bandwidth restriction (10kbps per IP in 192.168.50.13/24 range). Goto Queues, then goto Queue Types, then press the plus sign to add a custom Queue Type. In the name field enter your desired name, select kind= pcq
Now goto Settings Tab in the same window, and enter the Rate to (10 M) also select Dst. Address .
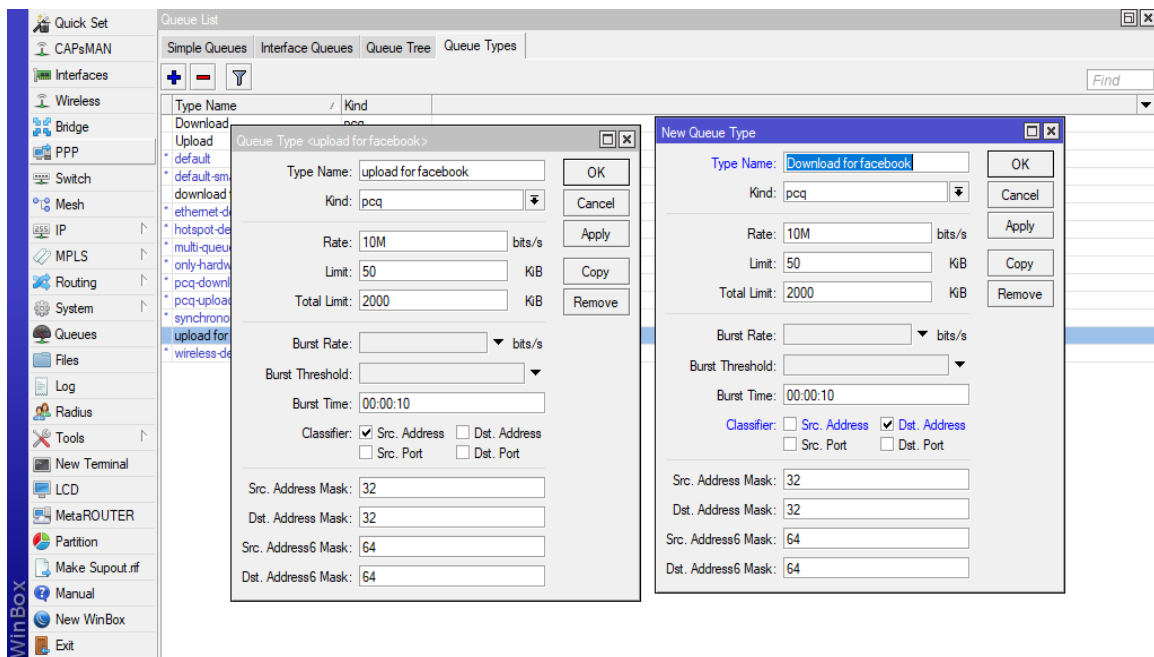Now in the Queues window goto Simple Queues Tab, and add a new simple queue by pressing plus sign. Enter your desired name, then add a Target
Address=192.168.50.15/24 the IP Range of your local network.
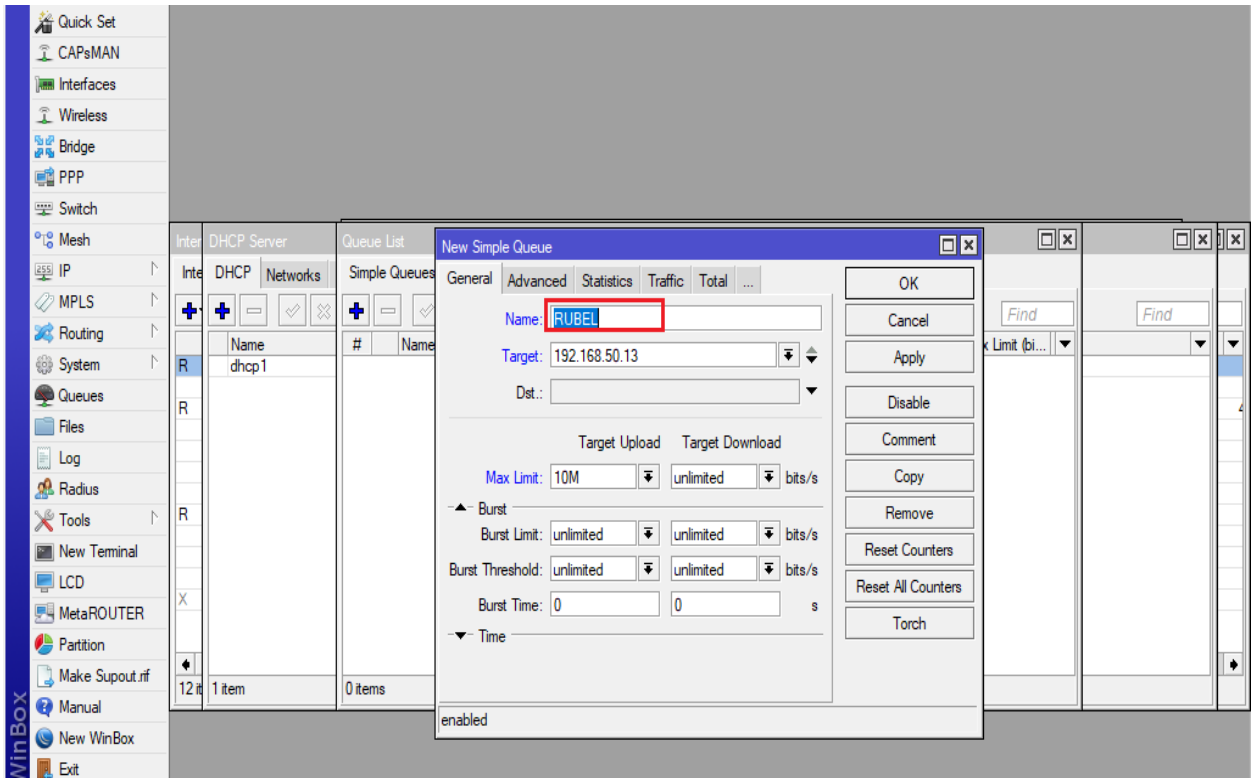
Figure 3.20 Simple Queue Bandwidth Management

Figure 3.21 Simple Queue Bandwidth Management Target Ip

Figure 3.22 Simple Queue List Upload & Download

3.2 Events and Activities

Events and Activities: One of the primary steps in troubleshooting a laptop hassle (or some other programmable device hassle) is to determine whether the trouble is due to a hardware failure or to faulty software program. Errors that occur, or are displayed, earlier than this beep suggest that a hardware trouble of some type exits. Up to now within the operation of the machine, best the BIOS and the primary gadget hardware had been active. The working machine aspect of the system does not come into play until after the beep occurs. I can nonetheless institution mistakes that occur earlier than the beep into awesome classes.

• Hardware screw ups

• Hardware failure (physical problem with the boot drive)

• Corrupted or lacking boot files.

• Non system Disk or Disk Error

• Corrupted or lacking operating system documents [9].

3.3 Challenges

No paintings has now not demanding situations, however 4 months of my internship enjoy and to share friends after listening to approximately the satisfied hour, I've found that there's a few not unusual challenges intern. I think it's far that interns three matters: unpaid / underneath, transient, and they are in a race to advantage experience. Challenges Although the officers had been so busy, they gave me whole hearted cooperation within the time of my internship and also in getting ready this document. While amassing information, I had restricted get right of entry to   some data for confidentiality motive. As I had to spend enough time to analyze the sorts of activity assigned to me and also scope up with the newer sort of professional work surroundings with new people and the technique of operating clearly this sector is very touchy and competitive by using its nature.

CHAPTER-4

Competencies and Smart Plan

4.1 Competencies Earned

Networking side have many field of workstation such Network engineers are chargeable for implementing, maintaining, helping, developing and, in some cases, designing conversation networks within an corporation or among enterprises. Their purpose is to ensure the integrity of high availability community infrastructure to offer most overall performance for his or her users. Users may be personnel, clients, customers and suppliers. Network engineers may match internally as a part of an company's IT support team, or externally as a part of an outsourced IT networking consultancy firm working with some of customers. Duties might be inspired by the scale and sector of the using enterprise. For instance, in a large investment financial institution you can have particular duty for one place of the machine. In a small employer, the engineer may additionally need to problem-shoot for any IT-related hassle that arises. Salary relies upon on the scale, type and sector of the organization you work for, and the size and scope of its computer and network installations.[3].

4.2 Smart Plan

My smart plan is internet provider (ISP) distribute from all enterprise s. Each commercial enterprise company provide from bandwidth the use of mikrotik. Actually it's far use for effortlessly quicker net carrier at the speed of the excessive bandwidth use of Mikrotik Router . Smart bandwidth manage with Router OS,. Best practices of Mikrotik bandwidth control. Because of it is easily configure for LAN, WAN and DHCP server .Actually if each business enterprise wants to provider of ISP or DHCP server then I am use of bandwidth using Mikrotik. That is my smart plan in my destiny life.

4.3 Reflections

MikroTik is a useful service to any ISP Company for coping with client bandwidth. Mikrotik router can the way to sufficient space used to many nearby region community distribute the same Length of bandwidth .While the we are able to distribute bandwith

first off connect to computer from WAN Daffodil Online Ltd. Started they may be operation within the year 2002. During the beyond years, they extended they are operation and provider portfolio in step with the client's recommendation and thinking about demands of time. They labored with many national initiatives and worldwide agencies and finished the recognition. They are using the latest technology and upgrading the offerings anywhere it's far required. They are Corporate Network Solution department is capable to offer kingdom-of-art network and telecommunication solutions with a tremendously green technical understanding organization.

CHAPTER-5

Conclusion and Future Career

5.1 Discussion and Conclusion

Now a day's most of the organizations are highly depending on internet for their work and service management. But without proper network design it is not possible to manage their network perfectly and achieve organizations goal. As a result a network designer needs to have knowledge about network design. MikroTik is a very low cost router which may suitable for small network. MikroTik can access through winbox. As a result MikrTik Router OS can be managed easily. MikroTik also featured filter rules, layer 7 protocols, bandwidth shaping etc. to provide enough security for the network. MikroTik can provide strong wireless access point and web proxy server management. So, our project is to know about basic network design and mainly to learn about MikroTik Router OS features and configuration which may able us to design a network using MikroTik Router. Review this internship has been a wonderful and rewarding experience. I have seen the future and I will be able to help me with the opportunity to network with a lot of people have been able to confirm that. Through this internship, I have learned that one of the main issues and time management skills as well as self-motivation. When I first started I was five hours a day, five days a week is going to be able to sit in an office and did not think that. Once I found out what I had to do my hours of overlapping is not broken, so I organize my day activity. Organized and it was the right time, after I get a reaction organized for questions that need to be learned. This internship and time control of the workplace for lots hours, I had to learn how to inspire my self via. I'm nevertheless searching out the use of the enterprise came up with the diverse proposals and ideas. I'm still retaining my alternatives open to new possibilities, but, are continuing to paintings for the University of Bangladesh inside the world. I'm taking part in this line of labor. I retain to work tough for my position and hope to continue to learn about the industry and meet new humans will. It became an outstanding experience, and I desire the other intern got loads out of it.

5.2 Scope for Further Career

Our main objective of this Internship was to use our gathered knowledge in real field. In this Internship I learnt about different concepts and models of network design which may help to design a network later. Again, MikroTik Router OS offers lots of features which may suitable to fulfill any network requirements. Here in this Intern I configure almost every feature and worked on MikroTik firewall features also. As a result we will able to design a network using MikroTik device and can manage that network properly.

References

[1] Get idea about Daffodil online limited (DOL), Available at:
<http://www.daffodilnet.com>/index.php?option=com_content&view=article&id=54&Itemid=112, last accessed on 12 Feb 2018, 11.30pm.

[2] About Configuring DNS, Available at:
<http://www.linuxhomenetworking.com>/wiki/index.php/Quick_HOWTO_:_Ch18_:_Configuring_DNS#.
VTK2KPA0-1k, last access on 15 Mar 2018, 10.00am

[3] About Recommended Partitioning Scheme, Available
at:<www.centos.org>/docs/5/html/5.2/Installation_Guide/s2-diskpartrecommend-ppc.html, last accessed on
05Mar 2018, 4.00pm.

[4] About internship, Available at: http://ashleydotson.blogspot.sg/2009/08/in-review-this-internship-has-
been.html, last access on 18Mar 2018, 10.20am

[5] Get Concept about File and directory details, Available at<< http://www.bitpapers.com/2012/12/linux-
working-with-files.html last access on 18Mar 2018, 11.20pm

[6] Get Concept about DNS server, Available at <<
http://compnetworking.about.com>>/od/dns_domainnamesystem/f/dns_servers.htm,last access
On03 May 2018, 11:00am

 [7]Get Concept about MikroTik Router,
https://en.wikipedia.org/wiki/MikroTik12March 2018, 11:00am

[8]Get Concept about RouterOS,
http://www.revolvy.com/main/index.php?s=MikroTik 29 Feb 2017, 11:00am

[9]Get Concept about Release history,
http://www.revolvy.com/main/index.php?s=MikroTik6March 2017, 11:00am

[10] RouterOS Features, http://download2.mikrotik.com/what_is_routeros.pdf), last accessed

On 04.March.18

Appendices

Appendix A: Internship Reflection

The primary intention of my internship in a professional placing, sensible answers to actual-international troubles is to use the understanding gained inside the classroom. And professionally applicable skills and relationships in a professional placing, studying to deal with new know-how, competencies, and the capability to decide the way to sharpen and expand plans. Add to community with different professional's supervisors and expert relationships. I am a professional inside the discipline publicity with clients and expert etiquette and expert supervisors and different employees to learn from watching an understanding of the behavior, as well as to benefit via interaction. To satisfy the obligations of my internship, I'm exercise proper enterprise etiquette. I am an enterprise's undertaking / vision is implemented, a way to contact colleagues, how power is shared, how it's miles structured, how choices are made, a way to apprehend the subculture of a expert corporation, and what diploma of duty and feedback to the enterprise. With an assessment at the give up of my internship supervisor and internship enjoy running thru character conferences provides an opportunity to take a professional opinion. Internship studies to prepare for life in a global society, leadership and service, my present in order to positioned it to apply.

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	NationwideInternet Service Provider (ISP)
Employees	12

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