

EMPIRICAL STUDY ON ISP OPERATION AND MAINTENANCE WITH MIKROTIK

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This Internship Report is presented in partial fulfillment of the requirements of
the Degree of Bachelor of Science in Electronics and Telecommunication
Engineering.

Supervised By

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**DAFFODIL INTERNATIONAL UNIVERSITY Dhaka,
BANGLADESH September, 2023
CERTIFICATE**

Ref: AT/HR/016/2023

Date: Aug 25, 2023

INTERNSHIP CERTIFICATION

This is to certify that MD. J.M. Akbar khan, ID: 191-19-2064, a student of ETE, Daffodil International University, Dhaka, Bangladesh has successfully completed 04 (Four) months (From 27th June 2022 to 25th October 2022) long internship program at this company. During the period of his internship program with us she was found punctual, hardworking, and inquisitive.

We wish him every success in life.


Ferdosh Alam
Founder & CEO
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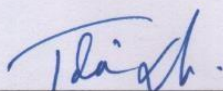
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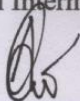
This Project titled “ **Empirical Study on Network Configuration Using Mikrotik Router**”, submitted by MD J.M. Akbar Khan ,ID: 191-19-2064 the Department of Electronics and Telecommunication Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Electronics and Telecommunication Engineering and approved as to its style and contents. The presentation has been held on 24th September,2023.

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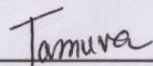
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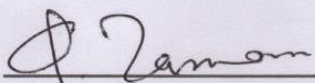
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DECLARATION

I hereby declare that this thesis Report has been done by me under the supervision of **Engr. Md. Zahirul Islam, Assistant Professor**, Department of ETE, Daffodil International University. I also declare that neither this report nor any part of it has been submitted elsewhere for the award of any degree or diploma.

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I would have never thrived in effecting my task without the teamwork, help, and support provided to me by many personalities. This internship report would not have been possible without the provision and direction of **Engr. Md. Zahirul Islam, Assistant Professor**, Department of Electronics and Telecommunication Engineering, Daffodil International University, Dhaka, under whose direction I chose this topic, for his kind help to surface our thesis and also to other faculty participants, the staff of the ETE Department of Daffodil International University must grant with due esteem the perpetual support and endurance of my family members for final this internship.

ABSTRACT

The main objective of this study is to provide an elucidation on the establishment and upkeep of a network and bandwidth utilizing Mikrotik, a network management software. The objective is to establish oneself as the most captivating and reputable internet merchant for clients. Winbox produces the design of the Mikrotik router. Once all the services have been deployed, this system undergoes incremental testing and serves as a successful exemplar. Utilizing a Mikrotik router within the Winbox platform encompasses various functions, including network design, analysis, and troubleshooting. Additionally, it serves as a tool for VPN and tunneling, network security, PPPoE implementation, network monitoring, and consulting purposes. In addition, it offers functionalities such as firewalls, Domain Name System (DNS), Network Address Translation (NAT), Address Resolution Protocol (ARP), bridges, and various other features. Utilizing cnPilot access points for Wi-Fi with cnMaestro management can enhance consumer comfort and reduce network management and maintenance expenses.

TABLE OF CONTENTS

CHAPTERS	PAGE
Certificate	ii
Declaration	iii
Acknowledgment	iv
Abstract	v
Table of Content	vi-vii
List of Figure	Viii

CHAPTER 1 INTRODUCTION

1.1 Introduction	1
1.2 Motivation of Report	
1.3 Objectives	
1	
2	
1.4 Report Layout	2

CHAPTER ¹ INTRODUCTION OF MIKROTIK

2.1 Networking	3
----------------	---

2.2 Types of Networking	
2.2.1 Local Area Network (LAN)	
3	
3	
2.2.2 Metropolitan Area Network (MAN)	4
2.2.3 Wide Area Network (WAN)	5
2.4 OS of Mikrotik	
2.5 Mikrotik Ethernet Route	
	8
	8
2.5.1 HEX lite	8
2.5.2 HEX POE	9
2.5.3 RB2011	9
2.5.4 CC1036-8G-2S	
	10
CHAPTER 3 CONFIGURATION OF MIKROTIK	
3.1 Winbox Interface Menu	11
3.2 Basic Configuration of Mikrotik	12
3.3 DHCP Configuration	13
3.4 Bandwidth Management	15
3.5 PPPoE Configuration	15
3.6 Wireless Configuration	19
3.7 ARP/AP Configuration	21

3.8 Firewall Configuration	22
3.9 IP Service	24
3.10 User ID	24

CHAPTER 4 CONCLUSION AND FUTURE SCOPE

5.1 Conclusion	36
5.2 Future Scope	37

Reference	38
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LIST OF FIGURES

FIGURES	PAGE
Figure 2.1: Local Area Network	4
Figure 2.2: Metropolitan Area Network	5
Figure 2.3: Wide Area Network	6
Figure 2.4: HEX lite	8
Figure 2.5: HEX PoE	9
Figure 2.6: RB2011	10

Figure 2.7: CC1036-8G-2S	10
Figure 3.1: Winbox Interface Menu	12
Figure 3.2 Basic Configuration of MikroTik	12
Figure 3.3 Basic Configuration of MikroTik	13
Figure 3.4 Basic Configuration of MikroTik	13
Figure 3.5 Basic Configuration of MikroTik	13
Figure 3.6 DHCP Configuration	15
Figure 3.7 Bandwidth Management	15
Figure 3.8 PPPoE Configuration	17
Figure 3.9 PPPOE Configuration	18
Figure 3.10 PPPOE Configuration	18
Figure 3.11 Wireless connection	19
Figure 3.12 Wireless Configuration	19
Figure 3.13: Wireless Configuration	20
Figure 3.14: Wireless Configuration	20
Figure 3.15 ARP/AP Configuration	21
Figure 3.16 Firewall Configuration	22
Figure: 3.17 Firewall Configuration	23
Figure: 3.18 IP Service	24
Figure 3.19 User ID	24
Figure 4.1 E400 Router	27
Figure 4.2 System Configuration	28

Figure 4.3 Network Configuration	28
Figure 4.4 WLAN Configuration	29
Figure 4.5 Advance Configuration	30
Figure 4.6 E500 Outdoor Router	31
Figure 4.7 System Table	32
Figure 4.8 Radio Configure	33
Figure 4.9 WLAN Configuration	34
Figure 4.10 VLAN Configuration	34

CHAPTER 1

Introduction

1.1 Introduction

Now the ever-changing digital landscape, Internet Service Providers (ISPs) are the linchpins of modern communication. This report embarks on an experiential study into ISP operation and maintenance, spotlighting MikroTik Networks. These technologies, fundamental to network efficiency, demand practical understanding. As we navigate this study, we unveil the intricate role these solutions play and the real-world impact they bear. Through hands-on exploration, we bridge the gap between theory and practice, equipping readers with tangible insights to navigate the realm of ISP operation.

Motivation of the Project

In an era where digital connectivity is the cornerstone of modern life, the role of Internet Service Providers (ISPs) has never been more crucial. As society relies increasingly on the Internet for communication, commerce, and information, the efficiency and reliability of ISP networks become paramount. This project is motivated by the imperative to delve into the intricate operation and maintenance of ISP networks, with a special focus on the technologies provided by MikroTik Networks. Through hands-on exploration and experiential learning, this study aims to uncover practical insights and empower individuals to navigate the challenges of ISP management effectively. By understanding the motivation behind this project, we set the stage for a comprehensive exploration of ISP networks in action.

1.2 Motivation of Report

The importance of ISPs (Internet Service Providers) in guaranteeing smooth access has been highlighted by the exponential rise of digital exchanges and the broad integration of online services. ISPs confront increasing operational and maintenance difficulties as demand for fast internet and dependable networks rises. This study is driven by the need to thoroughly investigate the operational complexities of ISP networks with a focus on MikroTik Networks. Everyone aims to close the theoretical and practical gaps through experiential learning, empowering experts and amateurs alike to successfully navigate the changing ISP management landscape.

1.3 Objectives

The Internet has become one of the most crucial mechanisms of starting a career. This project's aim is to gain more knowledge about Mikrotik Network:

In order to maximize user success, bandwidth organization must be done effectively. As a router, the MikroTik OS is designed to be used. The software and operating system on a computer is what enables it to serve as a network router. Numerous IP and wireless network functionalities are built into the PC.

To operate the Linux-based Router OS system proposed for use with MikroTik Router Board routers. It can also be installed on a PC and used as a router, firewall, VPN server client, and access point. Based on a wireless access system, the system can be used as a captive gateway. To get knowledge about installing, configuring, managing, and optimizing their solution on Mikrotik Network. those network security systems.

1.4 Report Layout

In Chapter-1, I outline the internship's setting, objective, and purpose.

In Chapter -2, I covered networking, the many networking technologies that Mikrotik employs, a general overview of Mikrotik, and various router types.

In Chapter-3 Setting up various steering setups (such as DHCP, PPPoE, ARP, and Firewall) and delegating tasks were demonstrated.

The conclusions of my report and the probable effects of MikroTik Network are detailed in Chapter 4.

CHAPTER 2

Introduction of Mikrotik

2.1 Networking

MikroTik, established in 1996, is a pioneering Latvian company specializing in networking and telecommunications solutions. With a focus on routers, switches, and wireless technologies, MikroTik offers a versatile range of products that empower network administrators and service

providers. Their RouterOS operating system, known for adaptability and robust features, transforms compatible hardware into powerful network devices. MikroTik's solutions cater to a diverse array of sectors, from enterprises to ISPs, delivering affordability and quality to various scales of deployments. MikroTik's distinguishing feature lies in its RouterOS operating system, a versatile platform that transforms compatible hardware into feature-rich network devices. RouterOS offers an array of functionalities, from dynamic routing and firewall capabilities to bandwidth management and VPN support. This adaptability allows network professionals to tailor configurations to the specific needs of their environments.

2.2 Types of Networking

2.2.1 LAN (Local Area Network):

A Local Area Network (LAN) serves as the foundation of modern interconnected environments, enabling seamless communication and resource sharing among devices within a confined geographical area. This network configuration empowers organizations, homes, and institutions to establish efficient digital ecosystems where computers, devices, and peripherals can interact and collaborate. LANs rely on wired or wireless connections, with Ethernet cables and Wi-Fi technology being common mediums for data transfer.

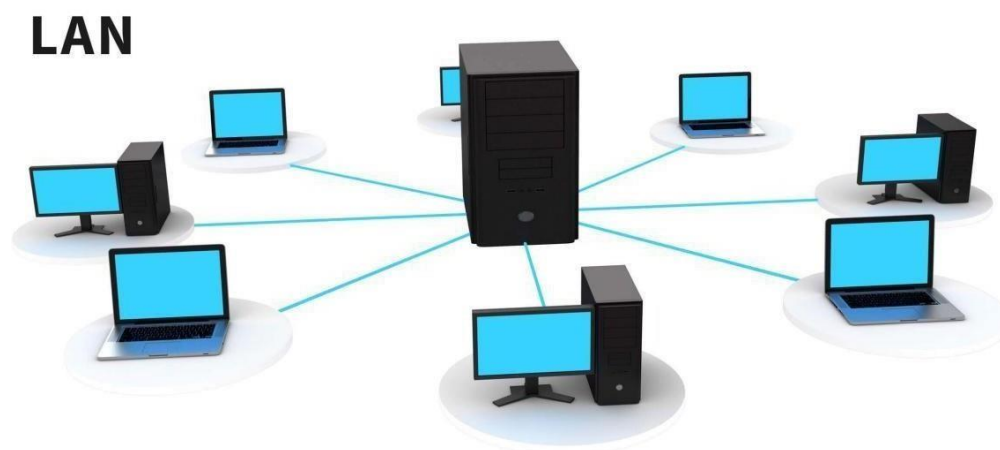


Figure 2.1: Local Area Network

2.2.2 MAN (Metropolitan Area Network):

A Metropolitan Area Network (MAN) bridges the gap between Local Area Networks (LANs) and Wide Area Networks (WANs), covering a larger geographical expanse such as a city or town. MANs facilitate efficient data exchange and communication between various locations within a metropolitan area, making them ideal for businesses, educational institutions, and government entities that require interconnectedness on a broader scale. MANs cover a range of several kilometers to tens of kilometers, making them suitable for connecting geographically dispersed locations within a city or metropolitan area. MANs can employ various network topologies, including ring, mesh, and star configurations, depending on the specific requirements of the network and the locations being connected. MANs can be owned and operated by telecommunication companies, ISPs, government entities, or private enterprises. These providers offer MAN services to businesses and organizations that require reliable communication between different sites. MANs are designed to provide high-speed and reliable communication services to businesses, organizations, and institutions operating within the covered region [1].

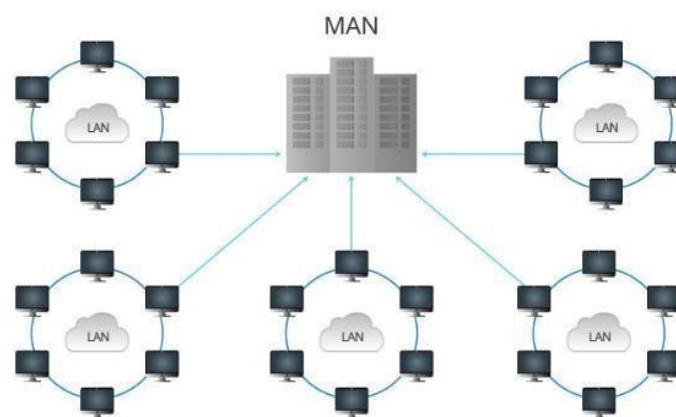


Figure 2.2: Metropolitan Area Network

2.2.3 WAN (Wide Area Networks):

A Wide Area Network (WAN) is a type of computer network that covers a large geographical area, often spanning across cities, countries, or even continents. WANs are designed to facilitate communication and data exchange between distant locations, connecting multiple Local Area Networks (LANs) and Metropolitan Area Networks (MANs) together. WANs play a crucial role in enabling global communication, remote access, and sharing of resources for businesses, organizations, and individuals [2].

The characteristics of a wide area network are as follows:

Large Scale: WANs cover vast geographic areas.

Diverse Technologies: Employ various tech for long-distance data transmission.

Global Connectivity: Enable real-time communication worldwide.

Cloud Integration: Integrate with cloud services for efficient access.

Security Measures: Implement encryption and firewalls for data protection.

Scalability: Expand easily to accommodate growing needs.

Redundancy: Ensure reliability with backup mechanisms. **Bandwidth**

Management: Optimize resources for different applications.

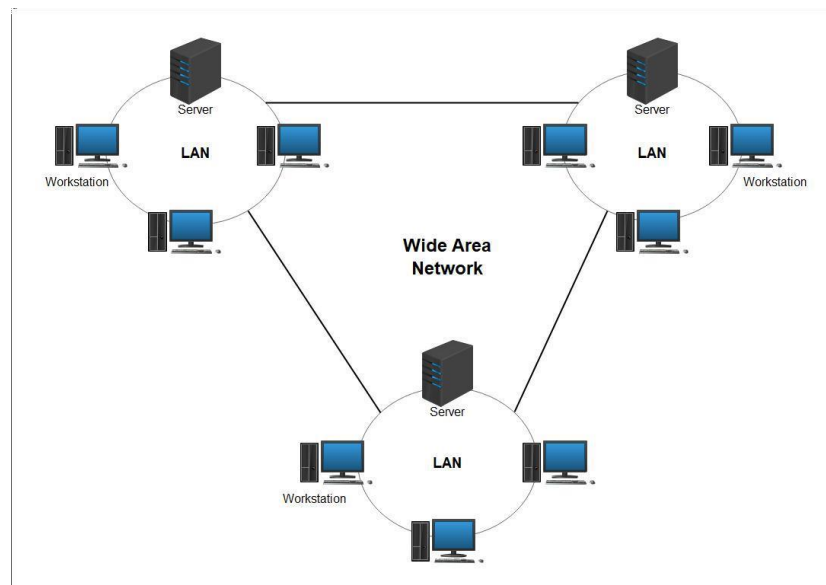


Figure 2.3: Wide Area Network

2.3 Training Served

Atova Technology is where I've chosen to intern. Cisco networking MicroTouch switch configuration is taught over the course of four months. The training for MikroTik routers is now complete. I arrived, got accepted, and enrolled in school a month later. We had no prior knowledge of Cisco networking when we first started. We'll start by learning how to set up an IP address. We compile information on IP subnetting and agreements from various sources. We then began configuring a microrouter in the virtual box. Additionally, we compile general data about micro-routers. A system reset is necessary before a MikroTik router can forward a fresh configuration. Before entering the DNS and gateway on the MikroTik router, scan the IP address in the interface to create a connection. Networking, IP subnetting, switch configuration, VLAN, and switch management are all topics we cover in the first month.

- Learning about the various network components.

- Learn and comprehend the fundamental ideas of MikroTik.
- A Guide to Centos Commands for Beginners

The following month, Atova Technology provides us with commands on how to configure MikroTik Simple and install an OS in VMware.

- MikroTik OS installation
- Faltering Web Sit
- IP Addressing is a concept.

The third month will cover the complete MikroTik setup, which is necessary for handling MikroTik routers.

- Configuring IP
- The term "sub-netting" refers to a specific type of netting that

Binding for Networking

- Cisco
- VLAN
- PPPOE

We went over the same subject one more last month in order to correctly prepare. Microtik Static and DHCP for routers

- Firewall
- Firewall security
- Bridge
- Bandwidth Management
- ARP/AP
- PPPOE
- Wireless Configuration

2.4 OS of Mikrotik

MikroTik routers utilize an exclusive operating system called RouterOS. This custom OS is designed to optimize routing functions and network management on MikroTik hardware. It boasts a wide range of features including advanced protocol support, robust security measures,

user management tools, quality of service controls, wireless capabilities, scripting for automation, and a package-based system for customization. Regular updates are provided to enhance functionality and security. RouterOS is favored for its versatility and control, though it may require technical expertise for effective configuration and management [3]

2.5 Mikrotik Ethernet Route

2.5.1 HEX lite

Mikrotik Ethernet Route HEX lite is an easy-to-use networking solution designed to help you get your data where it needs to go quickly and efficiently. With a built-in router, four gigabit Ethernet ports, and advanced routing protocols, Mikrotik Ethernet Route HEX lite simplifies the process of connecting different parts of your network. Whether you're setting up a home network or a large corporate system, Mikrotik Ethernet Route HEX lite simplifies the process of getting your devices connected with reliable performance. And thanks to its intuitive user interface, you'll be able to configure and manage your network in no time at all. Get started today and see just how simple networking can be with Mikrotik Ethernet Route HEX lite [4]

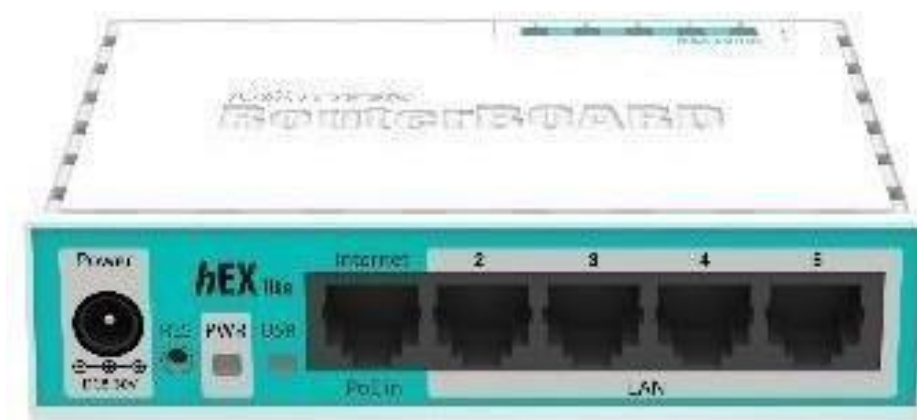


Figure 2.4: HEX lite

2.5.2 HEX PoE

The MikroTik HEX PoE router is a versatile networking solution that combines robust routing capabilities with the convenience of Power over Ethernet (PoE) support. Designed by MikroTik, a renowned networking company, this router offers a compact design and advanced features. Powered by MikroTik's RouterOS, the HEX PoE router provides advanced routing

features, dynamic protocols, and VPN support, ensuring efficient data flow across networks. The router's PoE support eliminates the need for separate power sources for compatible devices, like IP cameras and wireless access points, streamlining installations. Multiple Ethernet ports enable seamless data transfer, and PoE-enabled ports add the convenience of delivering power alongside data.

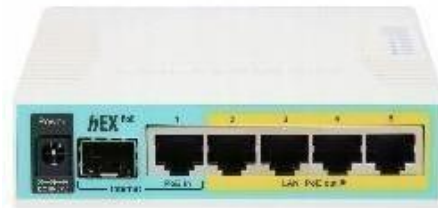


Figure 2.5: HEX PoE

2.5.3 RB2011

The MikroTik RB2011 router is a versatile networking device known for its multi-port design, advanced features, and flexibility. It runs on MikroTik's RouterOS, offering robust routing capabilities, wired and wireless connectivity options, network management tools, security measures, and customization features. Its compact form factor, reliability, and cost-effectiveness make it suitable for various network setups. The RouterOS provides an array of tools for network management, including bandwidth monitoring, traffic shaping, and user access control, contributing to efficient resource usage. With built-in firewall functionality, the router ensures network security by controlling data flow and safeguarding against unauthorized access. The router includes QoS features, enabling the prioritization of critical network traffic for smooth performance of essential applications. The RB2011 router provides a balance between features and affordability, making it a valuable choice for small to medium-sized networks.



Fig: 2.6 RB2011

2.5.4 CC1036-8G-2S

It is designed for small to medium businesses and enterprise networks. The switch features a variety of features, including:

- 8 Gigabit Ethernet ports
- SFP slots
- Layer 2 and Layer 3 switching
- VLAN support
- QoS support
- IGMP snooping
- Port mirroring
- 802.1x authentication
- SSH and HTTPS management



Figure 2.7: CC1036-8G-2S

CHAPTER 3

Configuration of Mikrotik

3.1 Winbox Interface Menu

The Winbox application is a compact software tool designed to facilitate the effective management of the MikroTik Router OS. The provided binary adheres to the Win32 specification. Due to the absence of Winbox sections in the provided instructions, all Winbox combined functions adhere as closely as possible to the assuage functionalities. Several of the most contemporary and advanced systems.

Quick Setup: This menu allows you to quickly configure basic settings for your MikroTik router.

Interfaces: This menu allows you to configure the network interfaces on your router, such as the Ethernet ports, wireless interfaces, and loopback interfaces.

IP: This menu allows you to configure the IP addressing and routing on your router, such as the IP address, subnet mask, and gateway.

PPP: This menu allows you to configure PPPoE, PPTP, and L2TP clients and servers on your router.

DHCP: This menu allows you to configure the DHCP server on your router, which assigns IP addresses to devices on your network.

DNS: This menu allows you to configure the DNS settings on your router, which is used to resolve hostnames to IP addresses.

Routing: This menu allows you to configure static routes and routing protocols on your router, which is used to route traffic between networks.

Switch: This menu allows you to configure the switch ports on your router, which allows you to connect devices to your network.

Wireless: This menu allows you to configure the wireless interfaces on your router, which allows you to create a wireless network.

Security: This menu allows you to configure the security settings on your router, such as firewall rules and VPNs.

Administration: This menu allows you to configure the administrative settings on your router, such as user accounts and logging.

3.14 Or above.

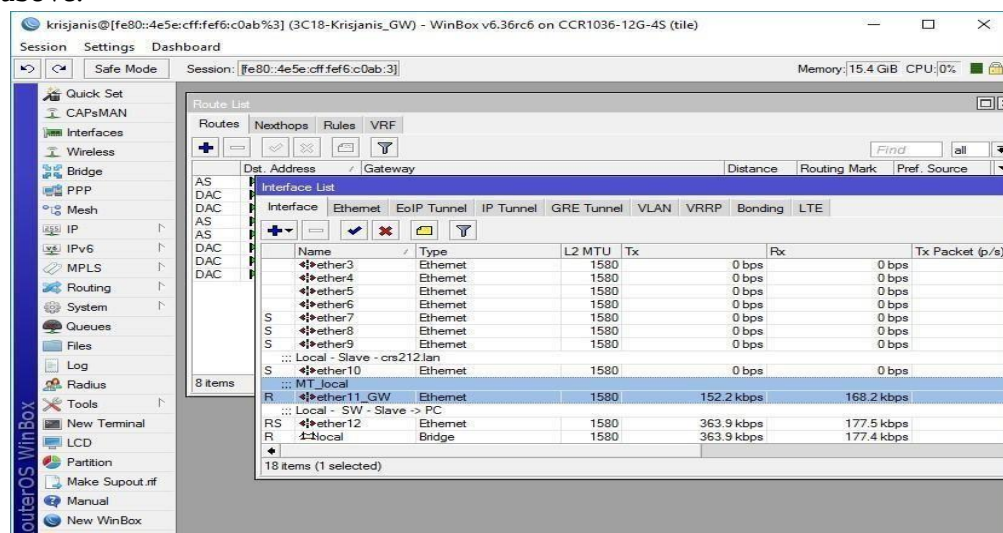


Figure 3.1: Winbox Interface Menu

3.2 Basic Configuration of Mikrotik

On a MikroTik router, we go to the dashboard first, then to IP, and then to the address to execute Basic Configuration.

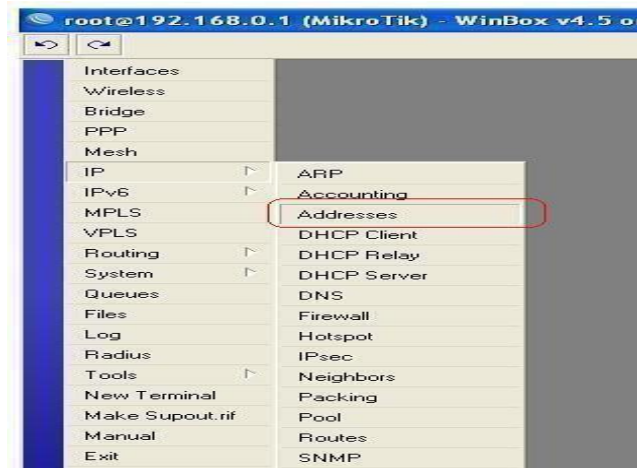


Figure 3.2 Basic Configuration of MikroTik

The user will get a window similar to the one shown below when the Address Book dialogue is started. The IP address window can be accessed by clicking the location marker.

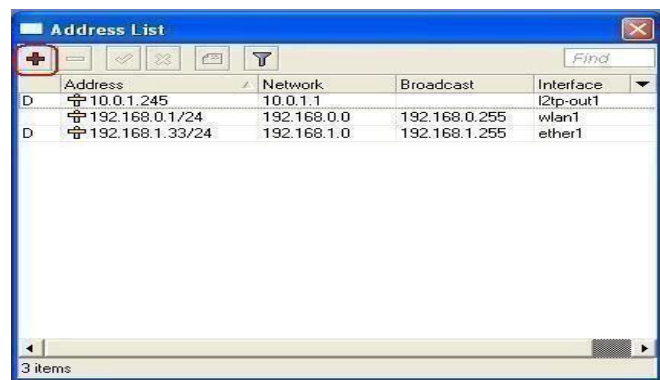


Figure 3.3 Basic Configuration of MikroTik

When the user first accesses the IP address dialogue, they are obligated to provide the pertinent address data before moving on to click the "ok" button.

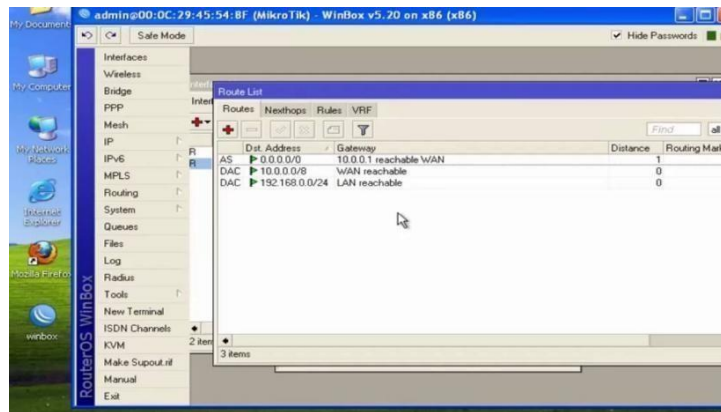


Figure 3.4 Basic Configuration of MikroTik

This instructional parade illustrates the process of arranging the password for the existing Mikrotik Winbox user. Please select the designated menu item as illustrated in the following image:

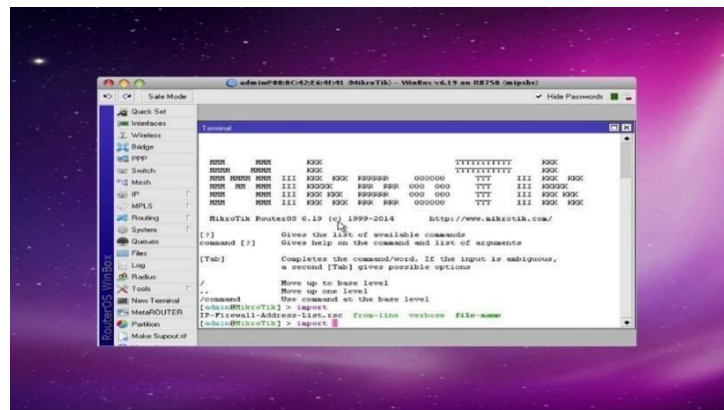


Figure 3.5 Basic Configuration of MikroTik

Please provide the former or existing password, followed by the desired new password that you intend to utilize.

3.3 DHCP Configuration

Step 1: Launch the Winbox software and log in to your MikroTik router.

Step 2: Navigate to the "IP" menu, then choose "DHCP Client" from the dropdown options.

Step 3: A new window will appear displaying DHCP client settings.

Step 4: To add a new DHCP client, simply click the "Add" button.

Step 5: Upon clicking the red Plus button, a new window will open.

Step 6: Return to the first field labeled "Interface." For instance, if you're using an Ethernet LAN port (let's say, Ethernet port 1), you would configure this interface. Imagine this interface as your wireless card linked to the board's WAN. In scenarios where you're connecting your MikroTik Ethernet port 1 to an ADSL router using an Ethernet connection, you'd set up the MikroTik Ethernet port 1 as a DHCP client. This is because it will obtain its IP address from the ADSL router. To proceed, select "ether1" under the Interface section and then click "Apply" followed by "OK."

Step 7: Now, you'll observe that the configuration is in progress for "ether1" as it seeks an IP address. In the illustration below, you can also see "ether2."

Is the procedure of coordinating and overseeing communications such as traffic and packets on a network link to avoid overwhelming the link?

Step 8: Launch Winbox to get things started. After that, proceed to read each of the following sections: Click the "Plus" button after selecting "Concatenation" then "Basic Concatenation." In this section, the name "Concatenation 1" should be assigned, and the Target Address should be set to 192.168.0.5. Take note that if you want to control the bandwidth for a certain computer or IP address, you must use the IP address of the LAN site [5].

Proceed by applying the following configurations:

- For Target Upload, set the maximum limit to 512k.
- For Target Download, also set the maximum limit to 512k.

After configuring these settings, confirm changes by selecting "Apply" and then "OK."

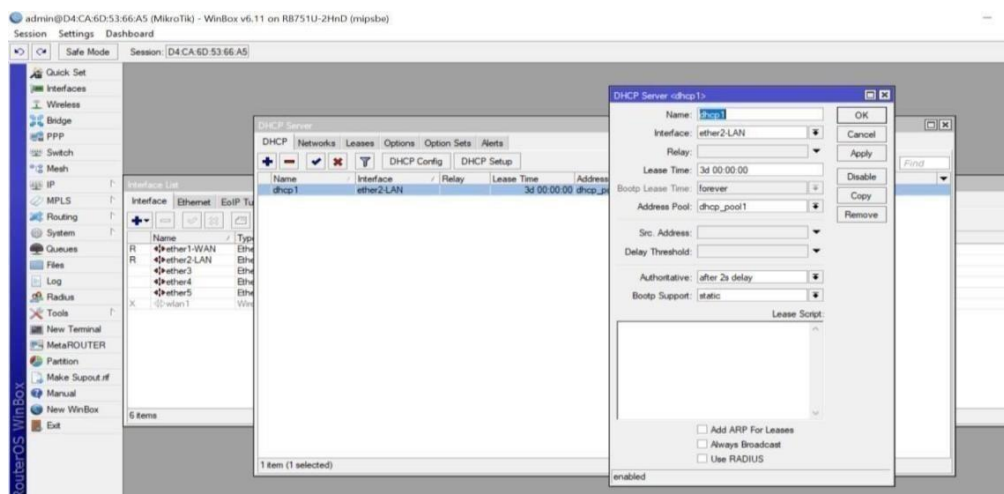


Figure : 3.6 DHCP Configuration

3.4 Bandwidth Management

Simple Queue is an easy way to set up basic bandwidth limits for individual users or devices.

To create a simple queue:

- Go to "Queues" in the main menu.
- Click on the "+" button to add a new queue.
- Configure the target address (IP or subnet), upload and download limits, and other relevant settings.

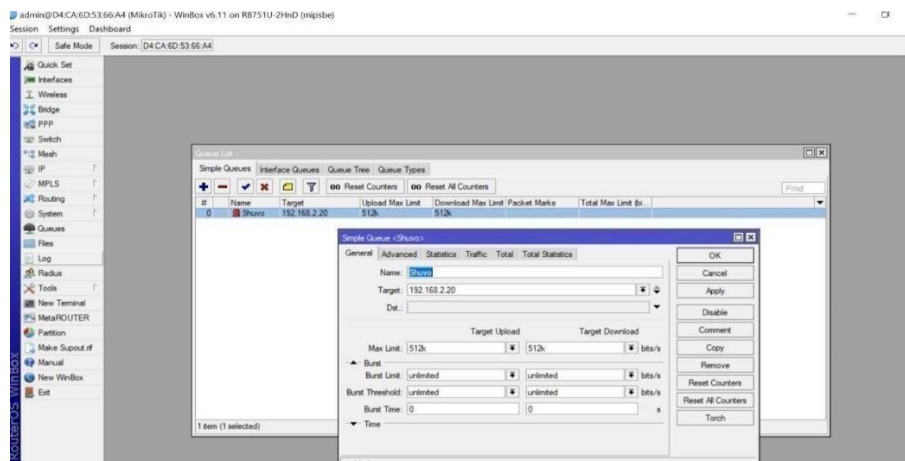


Figure : 3.7 Bandwidth Management

PCQ (Per Connection Queue):

PCQ is used to divide bandwidth equally among multiple connections, providing a fair distribution of available bandwidth:

Create mangle rules to mark packets.

Set up a PCQ queue with defined limits. PCQ will ensure that each connection gets a fair share of the total bandwidth.

Queue Prioritization (QoS):

Prioritize critical traffic over less important traffic to ensure quality of service:

Create mangle rules to mark packets for different traffic types (e.g., VoIP, video streaming, web browsing).

Set up separate queues for each traffic type and assign appropriate priorities.

Bursting and Burst Limits:

Bursting allows temporary usage of extra bandwidth when it's available. Set burst limits for queues to control how much extra bandwidth can be used:

Configure burst settings for queues using the "Burst Threshold," "Burst Time," and "Burst Limit" parameters [6].

3.5 PPPOE Configuration:

Configuring PPPoE on a MikroTik router allows you to establish a secure and efficient connection between your router and your Internet Service Provider (ISP) using Ethernet technology. PPPoE is commonly used for DSL and cable modem connections, providing a way to authenticate and manage connections for individual users or devices within a network. This guide will walk you through the process of setting up PPPoE on a MikroTik router, enabling you to establish a reliable internet connection while ensuring the privacy and security of your network.

To get access to the web interface of the router: To begin the process, please use a web browser and proceed to input the IP address of your MikroTik router into the designated address box.

Please authenticate using your administrator credentials.

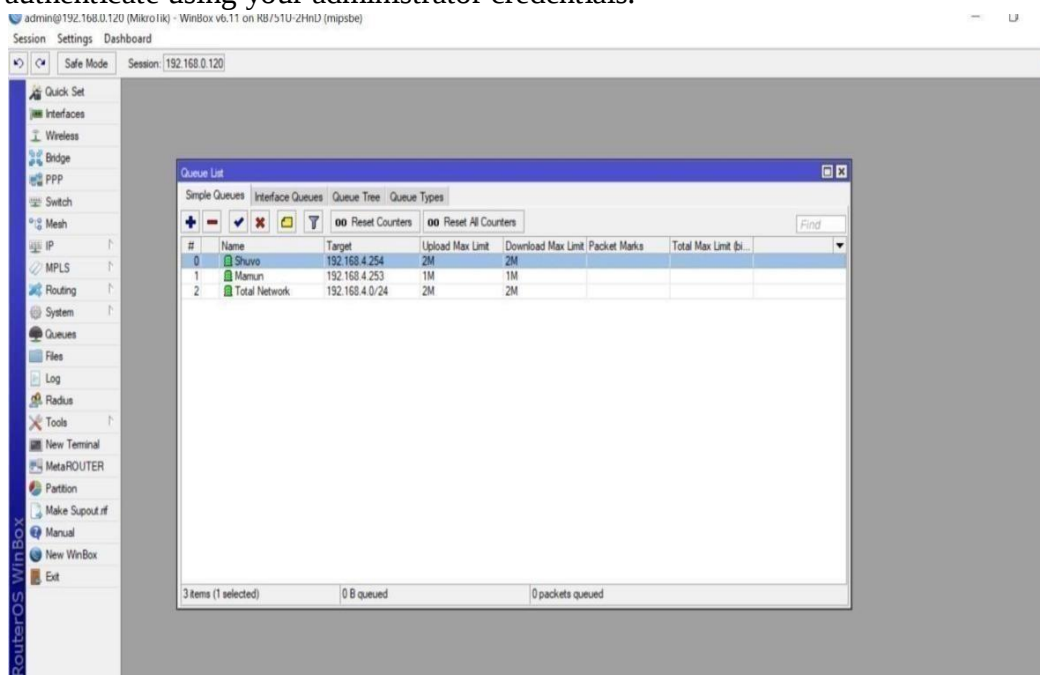


Figure : 3.8 PPPoE Configuration

Create PPPoE Interface:

- Go to the "Interfaces" section of the router's web interface.
- Click on the "+" button to add a new interface.

- Select "PPPoE Client" from the list of available interfaces. PPPoE Client Configuration:
- Provide a name for the interface in the "Name" field.
- Set the "User" field to your PPPoE username provided by your Internet Service Provider (ISP).
- Set the "Password" field to your PPPoE password.
- Select the relevant "Interface" (usually an Ethernet port) to which your modem or DSL line is connected.

Advanced Settings (if needed):

- You can usually leave most settings at their default values. However, if your ISP requires specific settings, consult their documentation.
- Some ISPs use a specific Service Name (often called "AC Name") for authentication. If required, you can set this in the "Service Name" field.

Firewall/NAT Configuration (if needed):

If your MikroTik router has a firewall or NAT rules, make sure to configure them to allow the PPPoE traffic to pass through.

DNS Configuration (optional):

By default, your MikroTik router will obtain DNS server addresses repeatedly from your ISP. If you want to use custom DNS servers, you can configure them in the "IP" -> "DNS" settings.

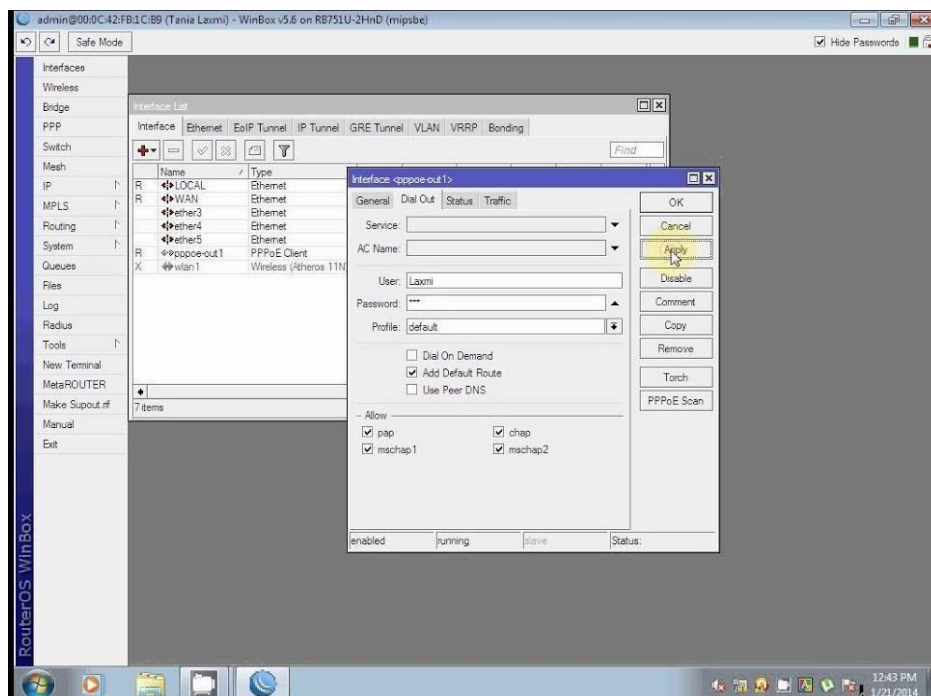


Figure : 3.9 PPPOE Configuration

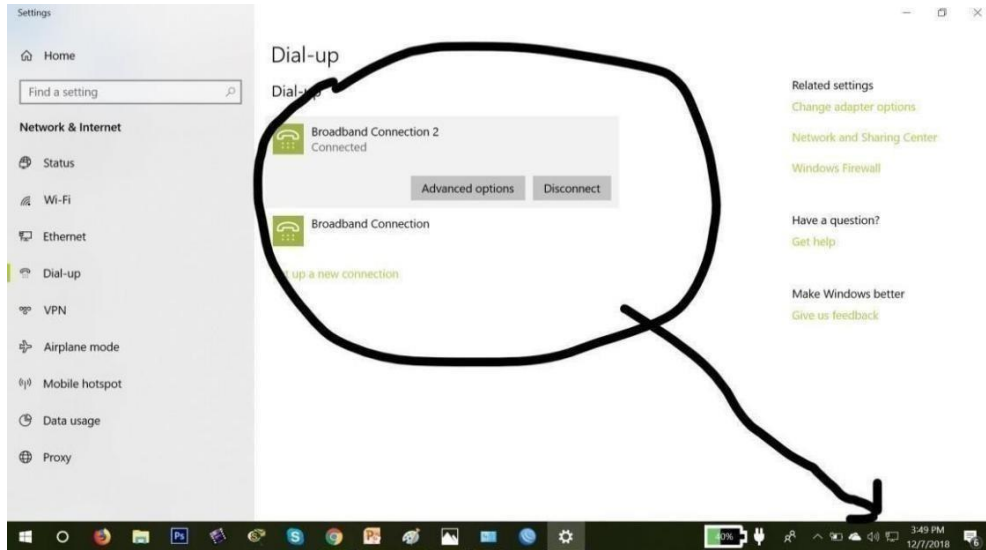


Figure: 3.10 PPPOE Configuration

3.6 Wireless Connection:

Wireless connectivity has become an integral part of modern networking, offering the convenience of connecting devices without the constraints of physical cables. Configuring a wireless connection on a MikroTik router allows you to create a wireless network (Wi-Fi network) that enables devices such as smartphones, laptops, tablets, and IoT devices to communicate and access the internet wirelessly. This guide will walk you through the essential steps to establish a secure and efficient wireless connection using a MikroTik router. MikroTik routers offer robust wireless features, allowing you to tailor your wireless network to your specific needs. From setting up the wireless interface to securing the network and optimizing performance, each step contributes to a seamless and reliable wireless experience for users [6].

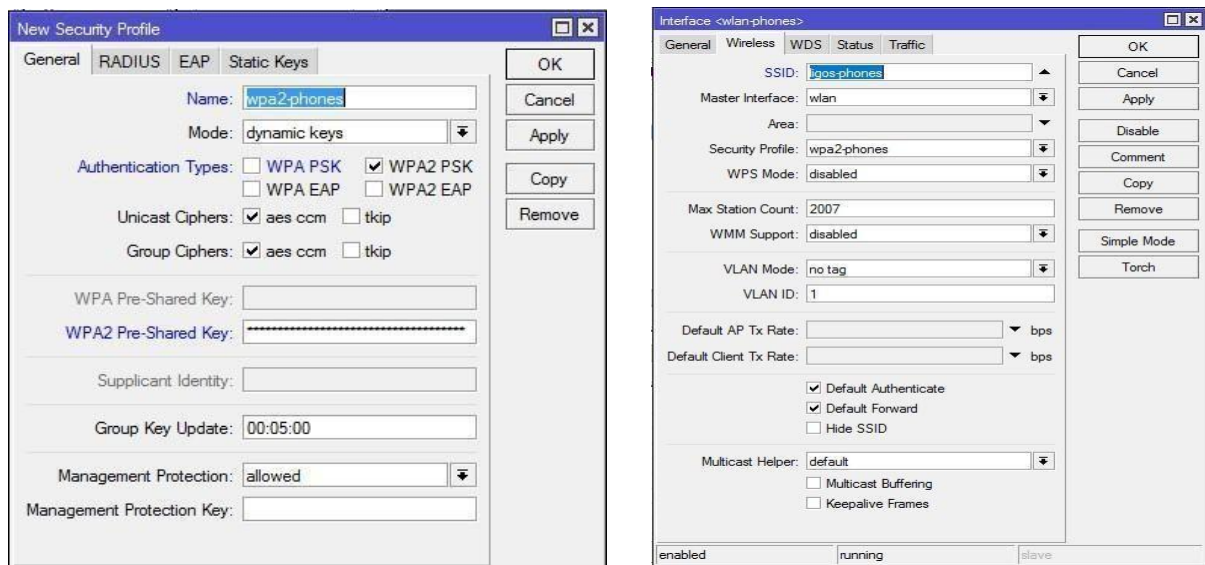


Figure : 3.11 Wireless connection

Step-1

Without an IP address, a network interface is of little use.

Add a new address by selecting IP -> Address first. Add a new pool by going to IP -> Pool and doing so.



Figure 3.12 Wireless Configuration

Step-2

When a device joins a Wi-Fi network, DHCP is used to allocate addresses to the connected devices. They'll make use of the pool we just made. Furthermore, designate a few other unique addresses. Add a new DHCP Server by going to IP -> DHCP Server - DHCP Tab.

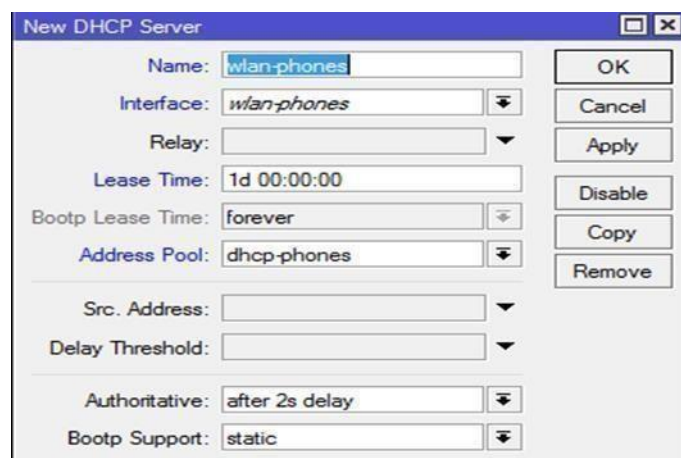


Figure 3.13: Wireless Configuration

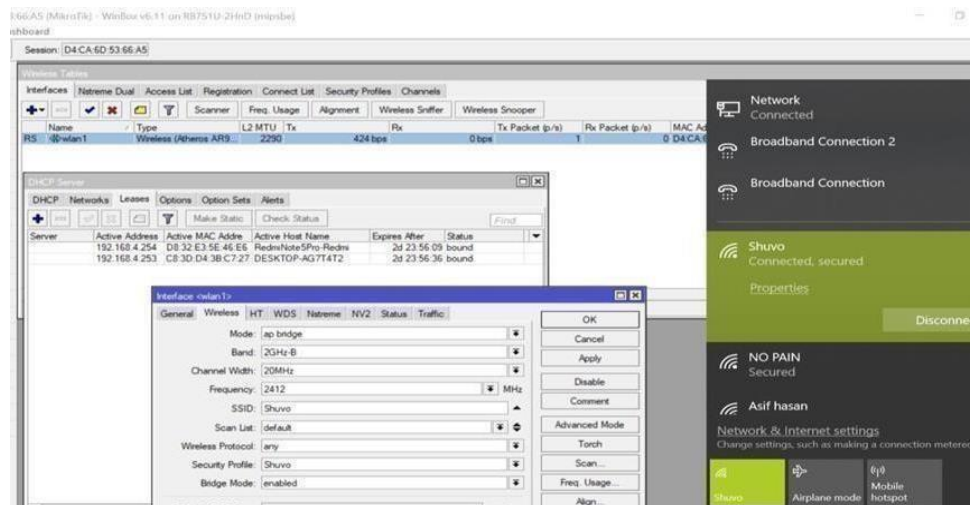


Figure 3.14: Wireless Configuration

3.7 ARP/AP Configuration

A static IP to MAC address record is created via ARP binding in a device's ARP table. DHCP limits make a guarantee that a device on the network always receives the same IP address when it submits a DHCP request. They are unrelated to one another.

Step

Go to IP, choose ARP, click the plus sign, and then enter the information as it appears on the screen before pressing OK. Select Device MAC Address and Static IP Address (which need to bind), and then choose Ether2 LAN as the border. Select IP first, then DHCP Server, then repeat the same steps on that device.

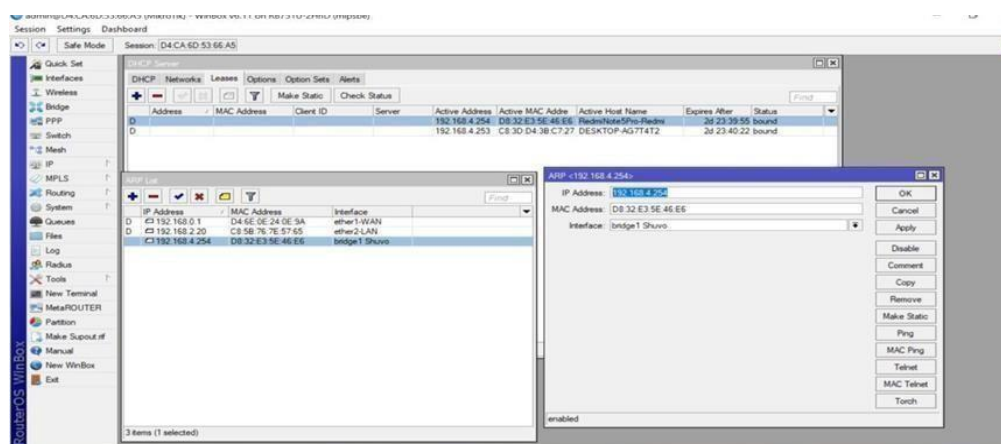


Figure 3.15 ARP/AP Configuration

After that, click the Plus sign next to Static IP Address and MAC Address on the DHCP Server page and enter the required instructions. And lastly, tick Employed a Static IP Server:

dhcp1 in the comments, please explain the username.

3.8 Firewall's configuration

Data flow to, from, and via the router is controlled by security features that are established by the firewall's packet filtering implementation. In addition to Network Address Translation, the router itself serves as an outbound traffic filter as a comprehensive solution for preventing unauthorized access to directly mounted networks.

Rule-1:

Chain: The source address should be specified as 203.99.15.100/30 (the IP / IP Block on your WAN Side). On the next page, choose Accept, and after that, touch the OK button. As a direct consequence of this, a filter rule will be produced. Because of this rule, you will be able to connect to your router using either that IP address or that IP block.

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Interface	Out. Interface	In. Bytes	Out. Bytes	Src. Ad...	Dst. Ad...	Bytes	Packets
0	defconf: masquerade	srcnat	192.168.0...											0 B	0
1	defconf: masquerade	srcnat	192.168.11...											0 B	0
2	NOLink	srcnat												572.9 MB	2 498 325
3	NVR-NOL	dstnat		43.225.148.90	6 (tcp)		6060							12.0 KB	236
4	NVR-MNet	dstnat		119.148.101.3	6 (tcp)		6060							676 B	12
5	IT-PC-RD	dstnat		43.225.148.90	6 (tcp)		8082							2492 B	48
6	IT-PC-RD	IT-PC-RD-...		119.148.101.3	6 (tcp)		8082							0 B	0
7	Server Home-RD	dstnat		43.225.148.90	6 (tcp)		8083							3460 B	64
8	Server-RD-NOL	dstnat		43.225.148.90	6 (tcp)		8084							39.6 KB	802
9	Server-RD-MNet	dstnat		119.148.101.3	6 (tcp)		8084							15.7 KB	308
10	Asf-Sir	dstnat		43.225.148.90	6 (tcp)		8085							258.3 KB	5 083
11	SQL Server 2012	dstnat		43.225.148.90	6 (tcp)		49170							0 B	0

Figure 3.16 Firewall Configuration

Rule-2:

The network address 192.168.1.0/24 is a commonly used private The IP address 192.168.1.0/24 is a Class C private The IP address 192.168.1.0/24 is a Class C private The IP block of the local area network (LAN) is represented by the address 192.168.1.0/24. The user is requesting assistance with the process of accepting and applying for something. The action to do is to proceed with the task. The router is currently accessible from both the wide area network (WAN) side's IP or IP block, as well as the local area network (LAN) side's IP block. In addition to the aforementioned, it is possible to obtain access to many resources on the Internet. However, in order to safeguard routers from unauthorized IP access, it is imperative to establish

two specific regulations. In order to prevent accessibility from the router, it is necessary for the device to possess an IP block distinct from the IP. Similarly, select the option to Add (+), and thereafter.

Rule-3:

Procedure: Eliminate advertisements by Tec Tunes Ads by submitting an application. The input source address provided is 203.99.15.100/30.

Rule-4:

192.168.1.0/24 192.168.1.0/24 192.168.1.0/24 192.168.1.0/24 192.168.1.0/ Drop Apply> OK is the action to take.

Our router can no longer be accessed from IP / IP blocks other than 203.99.15.100/30 and 192.168.1.0/24. More filter rules can be created, such as a brute force attack on your router, a port block for various virus-spamming ports, and a custom ports block for any specified network or networks. The screenshots below show various virus-spamming port barriers. This IP block's 192.168.1.0/24 3129 ports have been restricted using rule 14. As a result, those

3131 ports will not be able to be used in the port. This port is typically used by a proxy server. If a network controller wants to prohibit their users from utilizing a proxy server, they can do so by blocking the necessary ports. The IP address 192.168.1.0/24 is a commonly used private The IP address 192.168.1.0/24 is a private network address The IP address 192.168.1.0/24 is a private network address The IP address 192.168.1.0/24 is a private network address The IP address 192.168.1.0/ has been designated for dropping or discarding network traffic. The appropriate course of action is to select the "Apply" button and then click "OK".

The accessibility of our router has been restricted to specific IP addresses or IP blocks, namely 203.99.15.100/30 and 192.168.1.0/24. Additional filter rules can be devised, including the implementation of a brute force attack prevention mechanism for your router, the imposition of port blocking measures targeting certain ports commonly exploited for virus-spamming activities, and the establishment of a customized ports block to restrict access for designated networks or network ranges. The above screenshots depict a range of port barriers utilized for the dissemination of computer viruses via spam. Rule 14 has been implemented to restrict access to the 3129 ports within the IP block 192.168.1.0/24. Consequently, the utilization of the aforementioned 3131 ports will be rendered infeasible within the designated port. The utilization of this port is commonly observed in the context of a proxy server. In order to restrict users from accessing proxy servers, network controllers can employ port-blocking techniques.

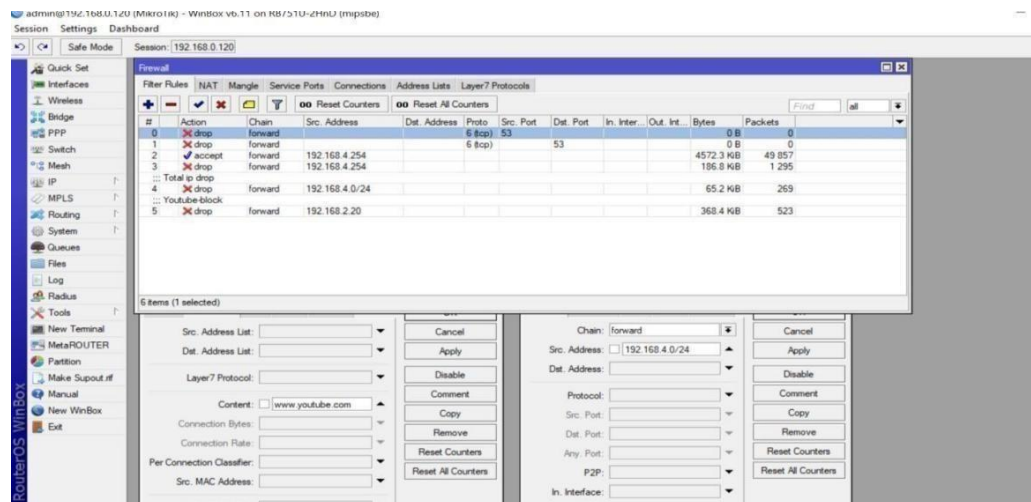


Figure : 3.17 Firewall Configuration

3.9 IP Services:

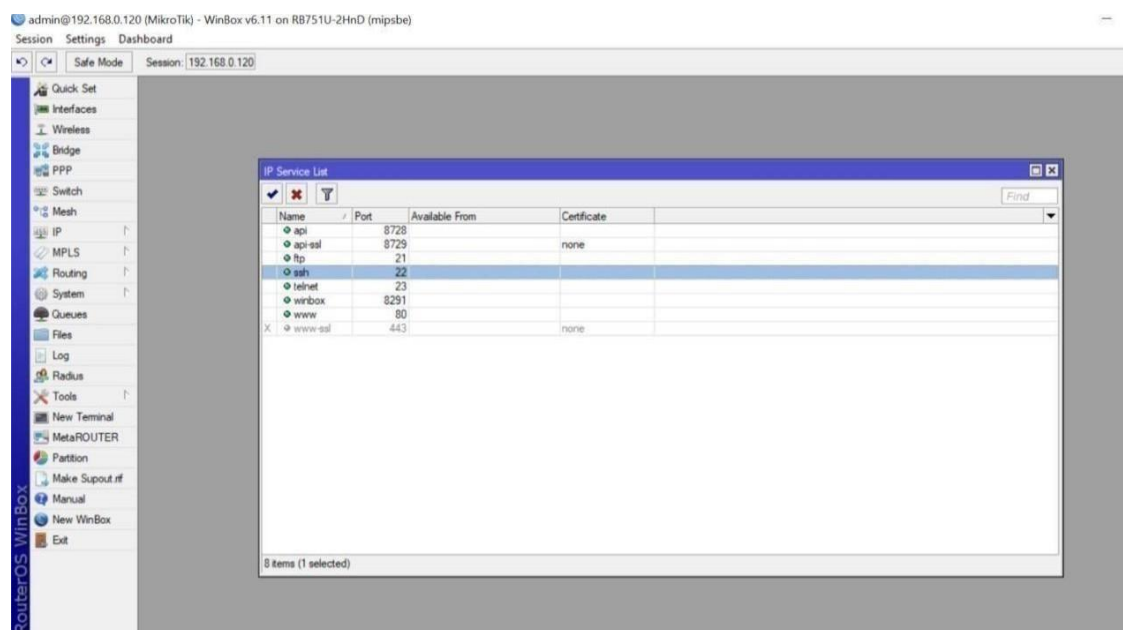


Figure : 3.18 IP Service

3.10 User ID

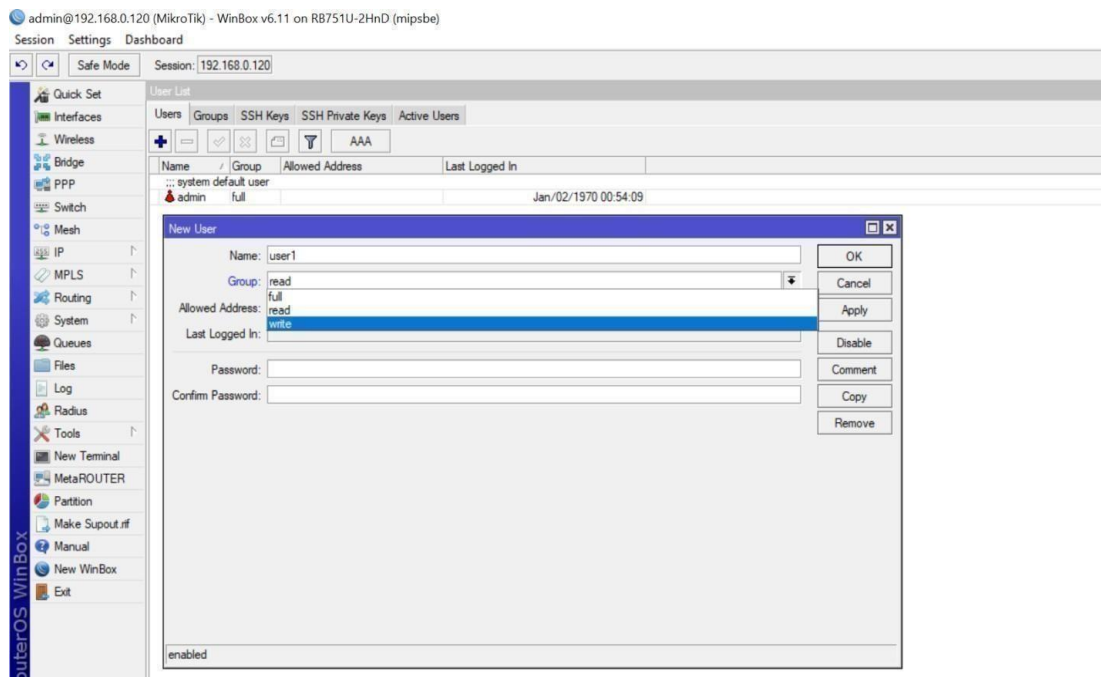


Figure 3.19 User ID

CHAPTER 4 Conclusion

5.1 Conclusion:

The file undergoes rotation inside the designated section-level region. The subjects of study include Network Security and Services, among other related areas. Based on my internship experience, it can be said that individuals who have undergone training at Atova Technology are equipped with the necessary skills to proficiently run Mikrotik routers. Furthermore, they are capable of effectively managing many work responsibilities on a consistent basis, owing to their comprehensive preparations. Upon the successful completion of my internship, I acquired proficient skills in running a Mikrotik Router. Due to my proficiency in configuring several types of microcontroller routers, I have acquired the ability to independently run the Mikrotik router. In the course of this seminar, I acquired knowledge on the establishment of a network enterprise using the services of an Internet service provider. The gift I possess will enable me to use my internal experiences in order to contribute to the world community, enhance my leadership skills, and prepare for a life of service.

5.2 Future Scope:

Internet provides a wide array of career advantages. This paper examines the evolution of desktop applications, kernels, and device drivers. Currently, there exists a significant need for open source software and developers, with a requisite proficiency in network understanding. The quantity of enterprises in Bangladesh offering specialised solutions in information technology infrastructure, data centre management, network solutions, software and database administration, information security (IS), backup solutions, equipment distribution, and information technology intelligent services (ITES) is experiencing a notable expansion. Currently, this expansion is occurring on a daily basis. Both the MikroTik systems are sophisticated and comprehensive infrastructures that may be easily acquired via training, leading to a substantial impact. Customers are provided with the opportunity to promptly activate their discrepancy by using the MikroTik condition that is now shown inside the system. In the present context, it is presumed that a technological instrument facilitating enhanced convenience in using the Internet will be accessible.

Make it possible for consumers to access the web without first entering the Windows operating system on their computers. Now, you may get MikroTik on convertible Internet gadgets (MIDs). It provides cheap wireless broadband access to empower individuals, businesses, and neighborhoods to have a positive impact on the world. This includes mobile phones and other stationary devices as well as netbooks, which are miniaturized desktop computers that compress the functionality of their larger counterparts into a portable form.

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