

Empirical Study on Network System Administration with Mikrotik Platform

**Submitted in partial fulfillment of the requirements for the degree of
Bachelor of Science in Electronics and Telecommunication Engineering**

by

**SAJIB BISWAS
[181-19-2034]**

Under the Supervision of

**Engr. Md. Zahirul Islam
Assistant Professor
Department of Electronics and Telecommunication Engineering**



Daffodil International University

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APPROVAL

Mr. Sajib Biswas, bearing student ID 181-19-2034, submitted a project titled 'Empirical Study on Network System Administration with MikroTik Platform' to the Department of Electronics and Telecommunication Engineering at Daffodil International University. The project has been deemed satisfactory for the partial fulfillment of the requirements for a B.Sc. degree in Electronics and Telecommunication Engineering. It was approved both in terms of its content and style. The project presentation took place on January 5, 2025.

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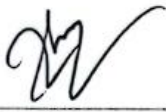
Prof. Dr. Quamruzzaman
Professor & Head
Department of EEE
World University of Bangladesh

Internal Examiner

DECLARATION OF AUTHORSHIP

I affirm that this internship report has been authored by me, Sajib Biswas (ID: 181-19-2034), for submission to the Department of Electronics and Telecommunication Engineering at Daffodil International University. The report was completed under the esteemed guidance of Engr. Md. Zahirul Islam, Assistant Professor in the same department. I further acknowledge that I gathered information from multiple sources, including my internship organization, Atova Technology, as well as books, the internet, and discussions with friends.

Supervised By



Engr. Md. Zahirul Islam

Assistant Professor

Department of ETE

Daffodil International University

Submitted by



Sajib Biswas

181-19-2034

sajib19-2034@diu.edu.bd

Department of ETE

Daffodil International University

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ABSTRACT

An extensive summary of my network system administration internship experience is given in this report, with particular attention to the usage of MikroTik as a platform for network infrastructure design, configuration, and management. By providing practical experience in setting routers, switches, and firewalls to enable safe and effective data transfer inside an organizational setup, the internship sought to close the knowledge gap between theory and practice. The study describes the design of MikroTik devices, their use in contemporary networking systems, and the basic ideas of network system administration. I was introduced to a variety of network design topics throughout my internship, such as traffic management, VLAN setup, IP addressing, subnetting, and troubleshooting network problems. I was able to comprehend sophisticated networking features like Quality of Service (QoS), Virtual Private Networks (VPNs), and network security measures by using MikroTik's RouterOS. The report also outlines certain projects and activities completed during the internship, including network topology configuration, firewall deployment to reduce security risks, and bandwidth optimization to improve network performance. These assignments highlighted how crucial it is to keep up a strong and expandable network infrastructure in order to satisfy organizational demands.

Keywords: MikroTik, Virtual Private Networks (VPN), VLAN, IP addressing, Troubleshooting.

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Chapter 1

INTRODUCTION

1.1 Introduction

During my internship, I gained valuable experience in a professional work environment. One critical aspect of internet service provision is managing data transmission limits. This can be achieved through devices like the MikroTik router, which offers efficient speed control and a reliable system for creating switches. These routers are essential tools for maintaining seamless network connectivity.

1.2 Motivation

To nurture my profession in a very difficult and testing climate where I am get the best chance to use my insight. I think I can maintain and maintain the new existing structure. I am dedicated and skilled in managing people and communicating my plans to other people. I accept this large number of virtues and morals of information.

Also, ability to master new ideas, strategies and innovations easily. Dedicated, imaginative and self-motivated cooperative individual/developer with hard working attitude. Strong interpersonal, innovative, hierarchical, directive and initiative abilities. Dominance in both free and cooperative conditions. Outgoing person, friendly, empathetic, self-assured and self-motivated. I'm equipped to take on any employed recruiting difficulties. I can cope optimistically and adequately perform various work occupations.

From my temporary position preparation program, I was exposed to a lot of significant data and capabilities to set up and advance the MikroTik system and organization.

1.3 Objectives

- Record Internship Experience: To give a thorough description of the assignments, events, and projects completed within the network system maintenance internship.
- Emphasize Learning Outcomes: To demonstrate the useful knowledge, technical proficiency, and problem-solving skills acquired when working with MikroTik devices and Router OS.
- Examine Network Solutions: To talk about how networking solutions are implemented and configured, with a focus on how they affect organizational security and efficiency.
- Exchange Ideas and Suggestions: To provide ideas for improving network infrastructure and to provide insights into the difficulties encountered throughout the internship.
- Bridge Theory and Practice: To illustrate the applicability of academic knowledge in practical contexts by showing how networking theory was applied to actual situations.

Chapter 2

Organization

2.1 About the company

Atova Technology stands out as a professional training institute in Bangladesh. Located in Shat Gambuz market, Mohammadpur, Dhaka-1207, Bangladesh, Atova Technology specializes in IT administration and offers expert training services. Their core values emphasize building long-lasting relationships with clients. The institute boasts highly experienced instructors and skilled developers committed to delivering exceptional results.

2.2 Product and market situation

The extensive use and usability of MikroTik devices in the networking industry are largely due to their production and marketing aspects. The production process of MikroTik is distinguished by its emphasis on developing high-quality hardware and integrating reliable software solutions like Router OS. These devices are made to serve a variety of market segments, from small businesses to large enterprises, with a focus on cost and success. MikroTik has a strategic marketing approach that focuses on network administrators, IT professionals, and businesses looking for dependable and reasonably priced networking solutions. Global distribution networks, alliances with authorized resellers, and a robust online presence via training initiatives and discussion boards are all part of their marketing plan. Through the development of an informed user base skilled in the deployment and administration of their products, MikroTik's certification programs further enhance their market appeal. Because of its adaptability, scalability, and user-friendly interface, MikroTik devices are in high demand among both inexperienced users and seasoned experts. Marketing campaigns also emphasize Router OS's many features, which significantly enhance the value of their products. These features include strong security choices, VPN compatibility, and sophisticated routing capabilities.

2.3 Professional training services

In order to satisfy organizational goals, network infrastructures must be designed, implemented, managed, and optimized. Professional services in network system administration cover a broad variety of tasks. In a variety of settings, these services are essential for guaranteeing the dependability, security, and effectiveness of network operations. The following are the primary components of professional services in this field:

1. Architecture and Design of Network constructing unique network architectures that satisfy the scalability needs and objectives of the company.
2. Acquisition and Implementation setting up and implementing network devices to create smooth user, device, and application connectivity.
3. Security of Networks putting in place security measures to safeguard private information and assets, such as intrusion detection systems, firewalls, and techniques for encryption.

2.4 SWOT Analysis

Organizations use a SWOT analysis as a tool for strategic planning. It entails assessing both external opportunities and dangers as well as internal strengths and shortcomings. Here is a brief summary.

- **Strengths (S):** These represent an organization's positive attributes—things like a strong brand reputation, skilled workforce, or unique resources.
- **Weaknesses (W):** Internal factors that hinder performance, such as operational challenges or skill gaps.
- **Opportunities (O):** External factors an organization can capitalize on, like emerging markets or technological advancements.
- **Threats (T):** External risks, such as competitive pressures or regulatory changes.

2.5 Why Is SWOT Analysis Important?

Strategic Decision-Making: A well-executed SWOT analysis informs resource allocation and growth strategies.

- **Growth Identification:** Organizations leverage strengths and seize opportunities.
- **Risk Mitigation:** Recognizing weaknesses and threats allows proactive risk management.

2.6 Strength

Numerous chances and strengths were presented by the network system administration internship, both personally and professionally. The practical expertise obtained in setting up and maintaining MikroTik devices was one of the main advantages. I was able to improve my technical abilities because to this hands-on experience, especially in areas like network security,

VLAN management, and routing—all of which are essential for contemporary network administration. The opportunity to experience real-world networking issues was another advantage of the internship. I improved my critical thinking, problem-solving, and high-pressure troubleshooting skills as a result of the assignments and projects I completed. Throughout the internship, I received tremendous coaching and direction that helped me better comprehend intricate networking principles and best practices.

2.7 Opportunities

Since MikroTik's Router OS is a popular platform in the business, the chance to work with it was very noteworthy. My marketability as a networking specialist has grown as a result of my mastery of this software, which has also created opportunities for me to specialize in more complex networking features like bandwidth control, VPNs, and QoS. On a larger scale, the internship gave the chance to network with industry professionals and more seasoned colleagues during the internship. Future professional development and prospects in the field of network system management may benefit from these relationships.

2.8 Company Structure



Figure 1: Company Structure

Chapter 3

ACTIVITIES AND TASKS

3.1 Daily Task and Activities

I learn about MikroTik system. I am here take challenge yourself to understand the entire process. Like; Set up. Configuration and total system. I also deal with DHCP system configuration, PPPoE, sub-netting and others. I finished in four months. The idea of training helps me to activate the organization.

1st month:

- Introduction and orientation to the network infrastructure of the company.
- Familiarity with the RouterOS interface and MikroTik devices.
- Basic MikroTik router configuration, which includes DHCP server and IP address setup.
- Understanding and putting into practice subnetting and IP addressing for network segmentation.
- Involvement in training sessions on the fundamentals of network security and VLAN setup.
- Observing and recording current network architecture and procedures.

2nd month:

- Advanced MikroTik device setup, such as configuring dynamic routing protocols like OSPF and static routes.
- practical knowledge of inter-VLAN routing and VLAN configuration to improve network segmentation.
- protecting network resources by setting up firewalls and putting fundamental security rules into place.
- QoS is used in bandwidth management to provide priority to important network traffic.
- diagnosing network faults and helping to fix connection difficulties.
- Taking part in team meetings to design and debate solutions for network improvement.

3rd month:

- Using MikroTik devices to design and execute a small-scale network architecture.
- Virtual Private Network (VPN) configuration and administration for safe remote access.

- Analyzing network performance and suggesting methods for optimization.
- Putting in place sophisticated firewall setups and NAT rules, among other security elements.
- Recording all network setups and modifications for future use.
- Delivering a final report along with suggestions for enhancing the network infrastructure of the company.

3.2 Events and Activities

The preparation can be settled different sorts of ideas. Some are given:

- Kick-off Meeting: A team-building exercise to learn about the objectives of the internship and the expectations of the business.
- Workshops for training: lessons on the fundamentals, sophisticated setups, and troubleshooting methods of MikroTik Router OS.
- Events for networking: A chance to talk to other experts and discover market trends.
- Practical exercises that mimic real-world network circumstances, such as routing, switching, and security setups, are known as hands-on labs.
- Weekly Progress Meetings: Consistent conversations with the supervisor to discuss issues, evaluate progress, and establish objectives for the following week.
- Firewall Deployment Activity: A cooperative endeavour to create and put into place network security measures for the company.
- Network Optimization Project: An assignment to assess network performance and make recommendations for efficiency enhancements.
- Final Presentation: An extensive presentation that highlights the work completed, important lessons learned, and suggestions for future development.

3.3 Web Server

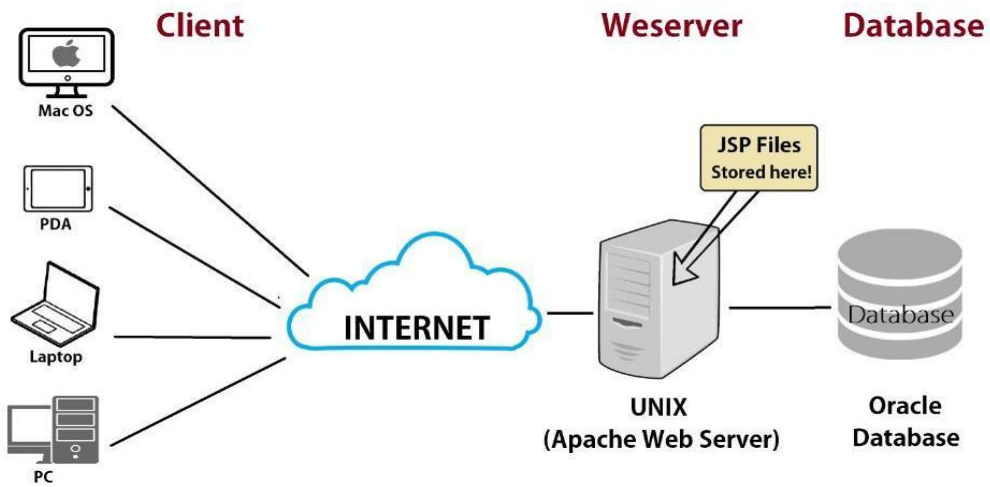


Figure 2: Web Server

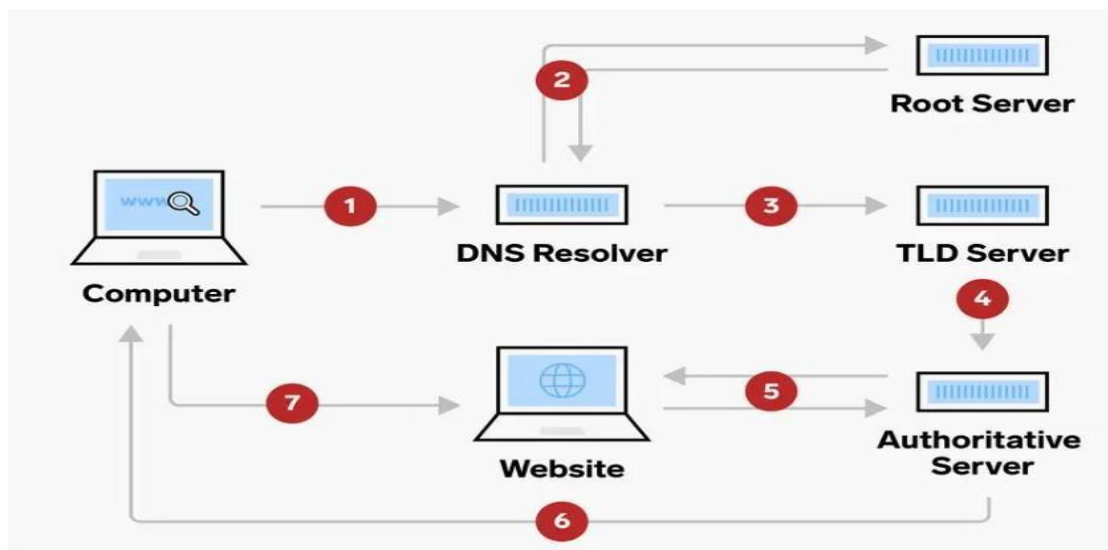


Figure 3: DNS process step-by-step

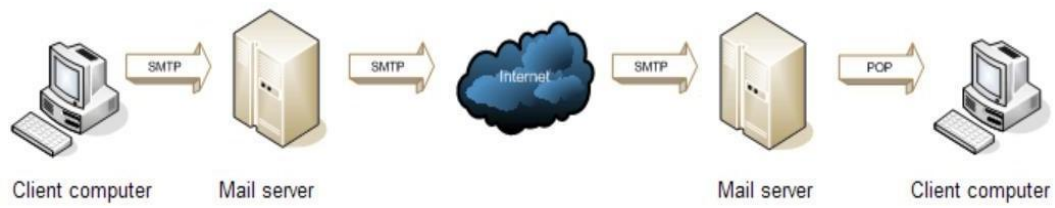


Figure 4: Mail Server

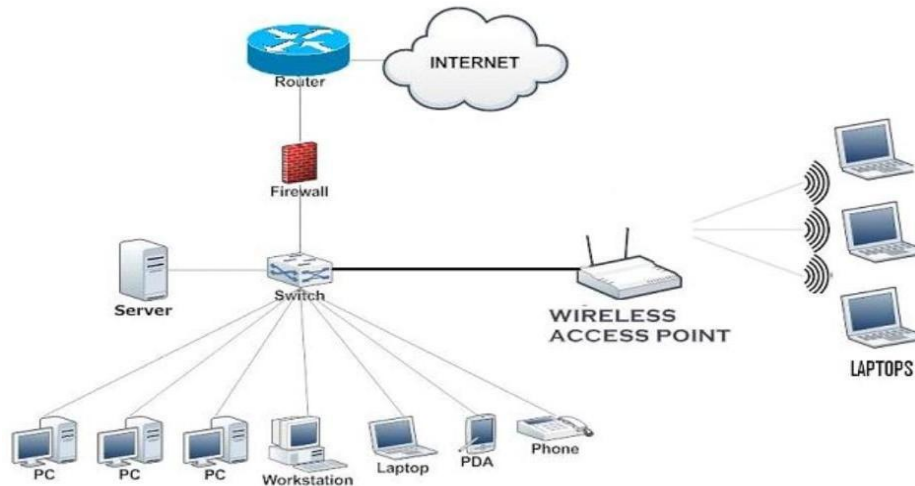


Figure 5: Switch investigating

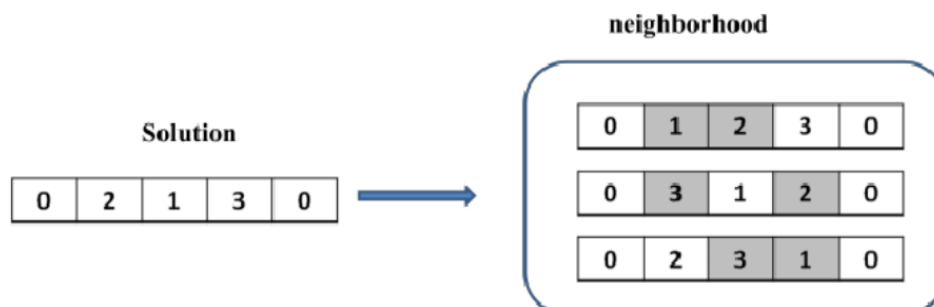


Figure 6: Neighborhood and switches

3.4 IP address & Class range

IP Addresses: These numerical labels uniquely identify devices on a network. There are two main versions:

- **IPv4:** The most common version, with 32-bit addresses (e.g., 192.168.1.1). However, the limited address space (approximately 4.3 billion) led to the development of IPv6.
- **IPv6:** Uses 128-bit addresses (e.g., 2001:0db8:85a3:0000:0000:8a2e:0370:7334), allowing for an enormous number of unique addresses.

Address Classes:

In the past, IP addresses were divided into classes (A, B, C, D, E). Commonly used classes:

- **Class A:** Large networks (1.0.0.0 to 126.255.255.255).
- **Class B:** Medium-sized networks (128.0.0.0 to 191.255.255.255).
- **Class C:** Smaller networks (192.0.0.0 to 223.255.255.255).

CIDR replaced fixed classes, allowing flexible subnetting.

Private vs. Public IP Addresses:

Private IPs (used locally) vs. public IPs (globally unique).

3.5 Networking

Networking is the connection of two computer systems, either by a wired or wireless connection. It is the exchange of data between sharing devices.

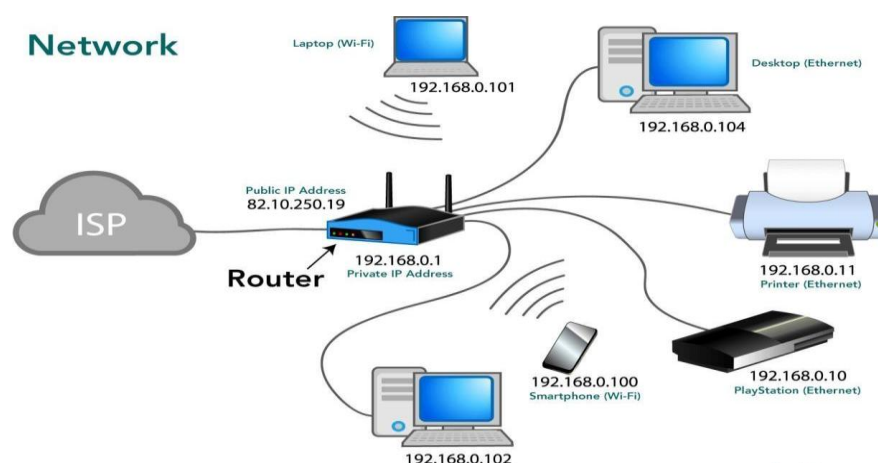


Figure 7: Network LAN

3.5.1 A Local Area Network (LAN) is an arrangement of computers and related equipment connected to a particular site, like a home, office, research institution, or school. This well-supported organization allows the sharing of records, printers, games, and other applications. The simplest kind of LAN network consists of a PC and printer at the user's home or place of employment. LANs are frequently used as a means of communication type.

3.5.2 Characteristic of LAN

- **Geographic Scope:** Local area networks (LANs) are limited to a certain geographic region, such a college, building, or office.
- **High-Speed Connectivity:** Local area networks (LANs) offer fast data transmission speeds, usually between 10 Mbps and several Gbps.
- **Ownership:** A single company or person typically owns, operates, and maintains a LAN's infrastructure.
- **Media Access Control:** To control data transfer, LAN devices connect with one another via certain protocols, such as Ethernet or Wi-Fi.
- **Shared Resources:** LANs allow several devices to share resources including storage devices, printers, and internet connections.

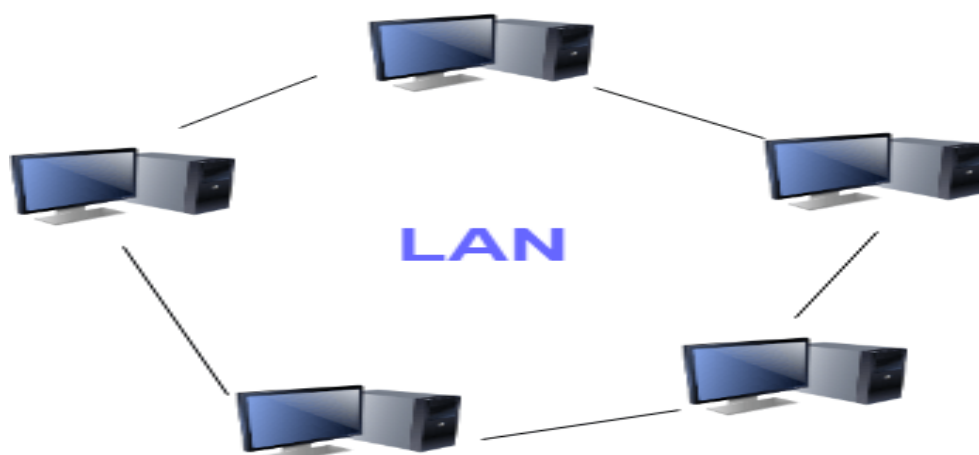


Figure 8: Local area network

3.5.3 WAN (Wide area network)

WAN (Wide Area Network) is another important computer network that span a vast geographic area. A WAN organization structure can be an association of LANs that interface with other LANs using phone lines and radio waves. It is usually limited to an effort or an association.

3.5.4 Characteristics of WAN

- **Geographic Scope:** Wide area networks (WANs) typically span cities, nations, or even continents.
- **Connectivity:** To enable communication across great distances, WANs link several LANs and other networks.
- **Ownership:** Several companies or service providers, as opposed to a single organization, usually oversee a WAN's infrastructure.
- **Speed:** Because of the larger distances and complexity involved, WANs are often slower than LANs, even if they can offer high-speed connections.
- **Technology Used:** To provide connections, WANs employ a variety of technologies, including satellite links, leased lines, MPLS, and the internet.
- **Cost:** Because WANs require a lot of infrastructure and service provider costs, they are costly to set up and operate.

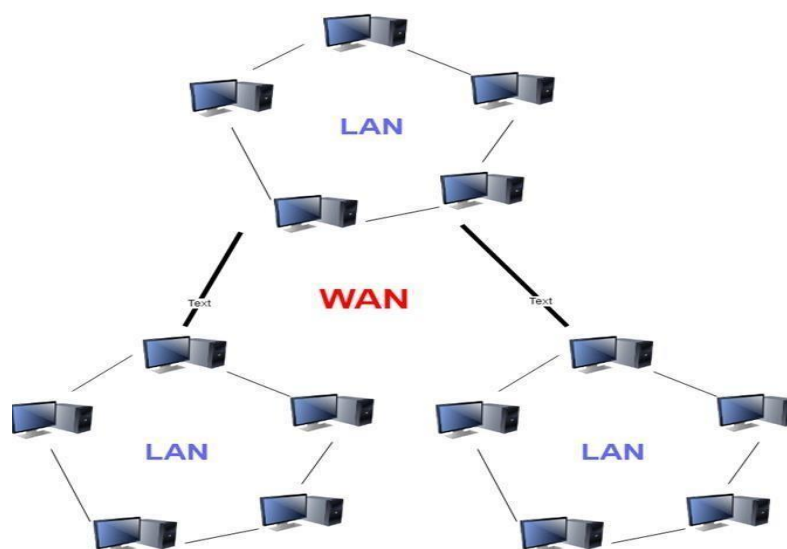


Figure 9: Wide area network

3.5.5 MAN (Metro area network)

A computer network that spans a whole city, a school, or a small region is known as a metropolitan area network, or MAN. Compared to a LAN, which is often limited to a single building or location, this kind of organization is bigger. You can cover an area of a few to several miles with this kind of organization, depending on the plan.

3.5.6 Characteristics of MAN

- **Moderate Geographic Coverage:** This type of MAN usually covers an urban or metropolitan area, which is larger than a LAN (Local Area Network) but smaller than a WAN (Wide Area Network).
- **High-Speed Connectivity:** MANs are appropriate for real-time applications because they offer faster data transfer rates than WANs.
- **Network Interconnection:** It facilitates effective communication and resource sharing across organizations, offices, or campuses by connecting many LANs within a metropolitan region.
- **Use of Fibre Optics:** To provide dependable and fast communication, MANs frequently employ fibre optic cables.
- **Common Infrastructure:** To cut expenses without sacrificing performance, a MAN may make use of common infrastructure, such as public telephone lines.

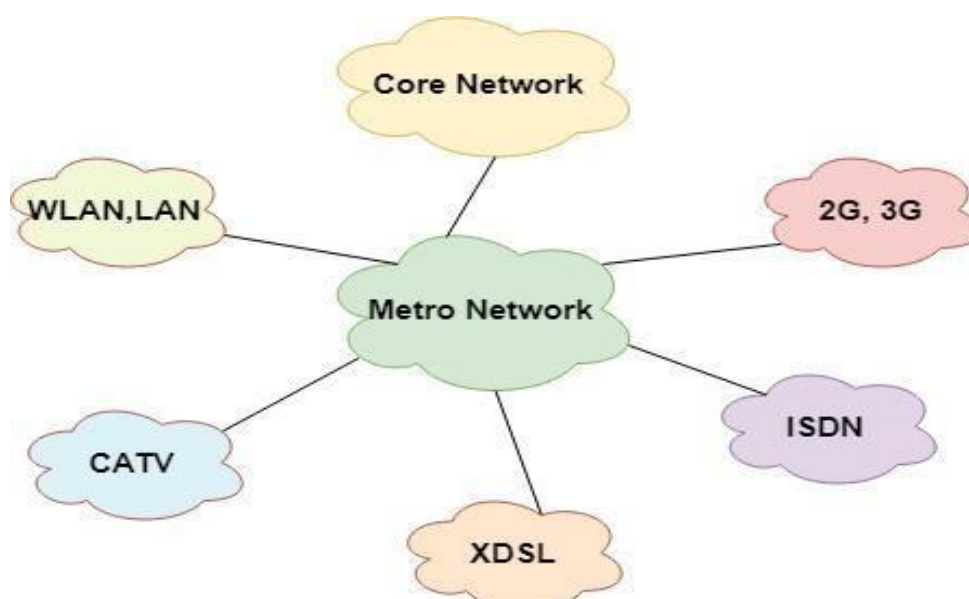


Figure 10: Metro area network

3.5.7 About MikroTik

MikroTik, a well-known network device manufacturer, is the brainchild of MikroTik Ltd., a Latvian company established in 1996. Their primary focus lies in developing routers and wireless ISP systems. Over the years, MikroTik has expanded its reach, providing both hardware and software solutions for internet connectivity across numerous countries worldwide.

3.5.8 Installing Winbox & MikroTik

MikroTik OS is an operating system designed for routers. Its licensing structure ranges from level 0 to level 6, with level 0 being a trial version that lasts for 24 hours. During this trial period, users can explore all the features of the router OS without any cost. Each license level has distinct characteristics and limitations.

Installing the router OS is quite straightforward and can be done in two primary ways:

- Download the ISO image, burn it onto a CD, and then boot from that CD.
- Alternatively, install the router OS directly onto any secondary drive on your Windows PC via the internet, then boot your router using that drive.

3.5.9 MikroTik Router

The MikroTik Switch Board is part of MikroTik's line of switches that run the SwitchOS operating system. Developed by a Latvian company, it represents an advancement in integrated circuit technology. The ISP 750G series of MikroTik switches is specifically designed for broadband wireless access in remote areas. These switches are suitable for short and medium-distance connections. The ISP 750G is a compact, pre-assembled solution often used in small office or workspace (SoHo) environments. Notably, it features smaller-than-usual PCI slots and appropriately scaled memory PCI Express connectors for switch board applications.



Figure 11: MikroTik Router Board

3.5.10 Router login

- Physical Bond: Apply an Ethernet cable to link your PC to the MikroTik router. Make sure your computer is configured to use DHCP to automatically get an IP address.
- To access the router: use a web browser and type in the address bar the router's default IP address, which is usually 192.168.88.1.
- Default login information: Make use of admin, the default login. Use the default password if it is supplied, or leave the password box empty (for the first login).
- Changing the Password: For further protection, it is strongly advised to create a new password after the initial login.
- Setting Up Network Configuration: After logging in, set up the required network configurations, such as firewall rules, IP addresses, and other parameters, according to your needs.

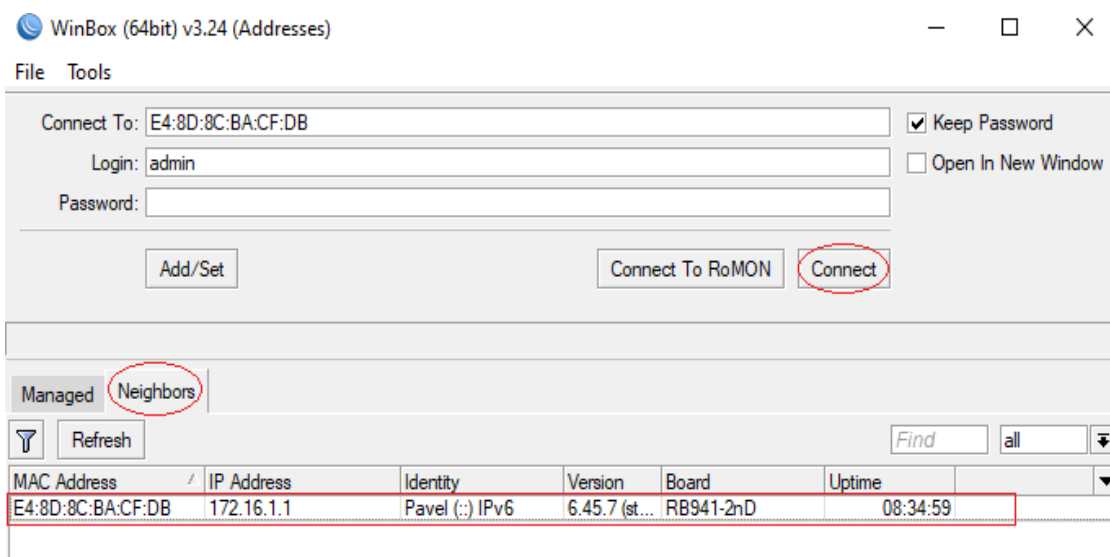


Figure 12: MikroTik Router Login 1

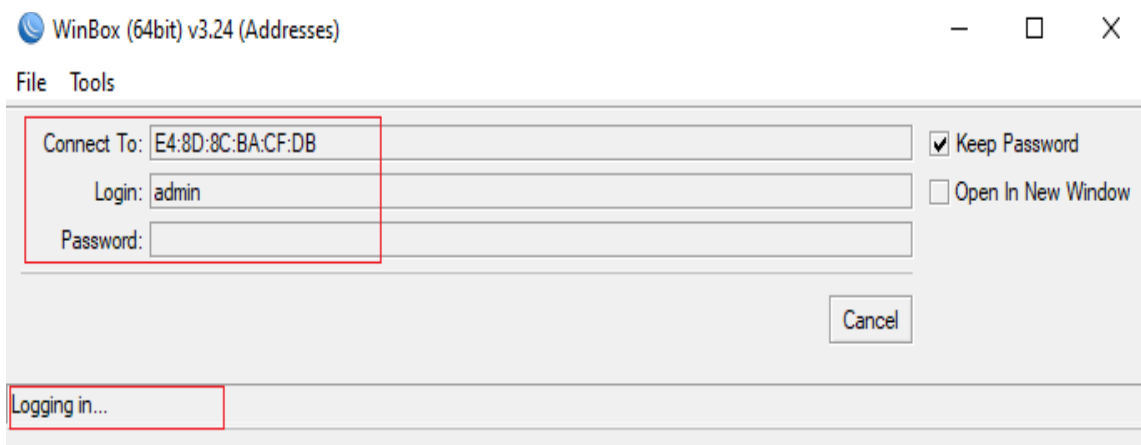


Figure 13: MikroTik Router login 2

3.5.11 Network Address Translation (NAT)

Network Address Translation (NAT) refers to a process that changes network address information within the headers of Internet Protocol (IP) datagram packets as they move through a router. The main function of NAT is to convert one range of IP addresses into another. Essentially, this allows a single device, such as a router, to facilitate communication between the public internet and a private local network. As a result, only one unique public IP address is necessary to represent all devices in the local network when they connect with external networks.

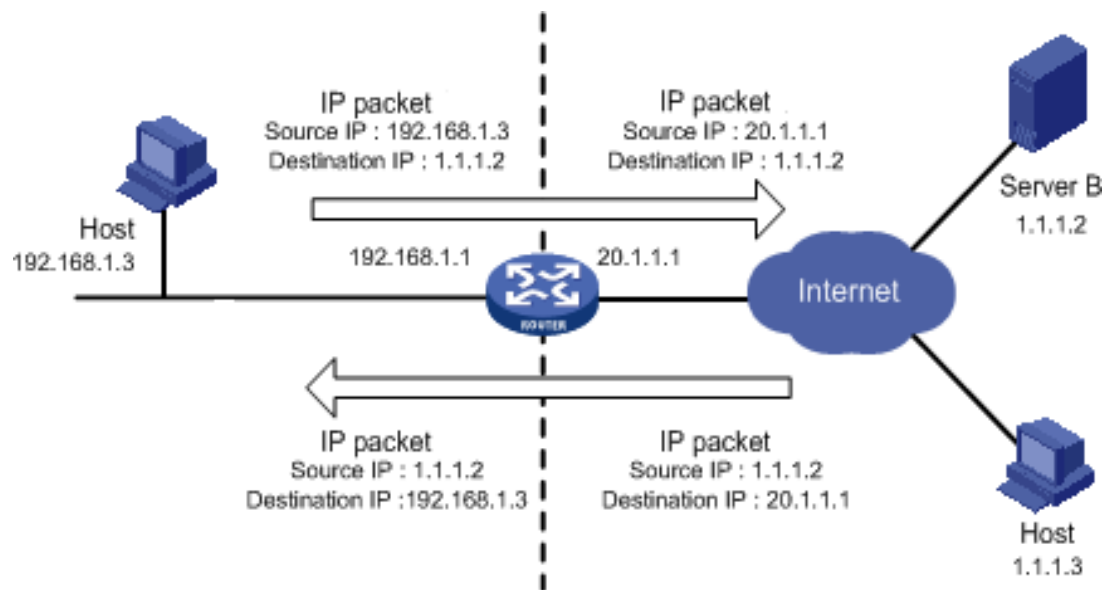


Figure 14: How NAT works

3.5.12 DHCP Setup

By dynamically allocating IP addresses to devices within the designated range, the DHCP server simplifies network administration and minimizes the need for manual configuration work. The procedures listed below can be used to configure DHCP (Dynamic Host Configuration Protocol) on a MikroTik router:

3.5.13 DHCP Server Setup

Router will learn about the DHCP Interface from the DHCP server option, the LAN subnet with the appropriate mask, and other parameters such as the default gateway and DNS address. On the DHCP server, DHCP is an option where we tell the router about the DHCP interface (usually the LAN) and introduce the IP pool. In order for the router to deliver IP details to the DHCP client in accordance with the option, it will acquire information about the LAN subnet from another network variable in the DHCP server, including the default gateway, network mask, and DNS address. The steps to configure a DHCP server are:

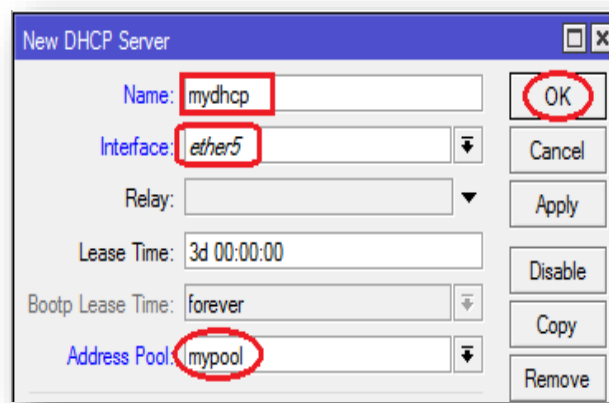


Figure 15: DHCP server setup

First, turn on DHCP. Access the Router: Use WinBox or a web browser to log into your MikroTik router. Open the DHCP Settings page:

In the RouterOS menu, select IP > DHCP Server.

Establish a DHCP server in step two.

Establish a DHCP network:

Click Add after selecting the Networks tab.

Establish the gateway (e.g., 192.168.88.1) and the network region (e.g., 192.168.88.0/24).

If necessary, set more options like DNS servers and lease duration.

To save, click OK.

Install a DHCP server:

Click Add under the DHCP tab.

Choose the interface (such as Ethernet 1) on which the DHCP server will operate.

Click OK after configuring the DHCP parameters to meet your network's needs.

Configure the DHCP relay in step three (optional).

Go to IP > DHCP Relay and set up the relay to forward requests between several subnets if your network needs one.

Step 4: Confirm the functionality of DHCP

Verify the status of your lease: To keep an eye on active IP assignments, select the Leases tab.

Test Client Connectivity: Attach a device to the router and confirm that the specified DHCP server is automatically providing it with an IP address.

Save Configuration in Step Five

Click on the Save or Update icon to make sure all of the changes are saved.

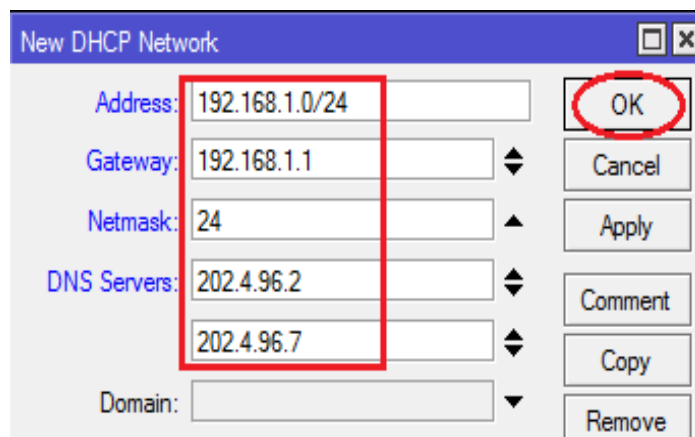


Figure 16: DHCP server configuration

3.5.14 Configuring a PC/Laptop as a DHCP Client

The steps are:

1) Access the Control Panel:

Open the “Start” menu on your computer.

Navigate to the “Control Panel.”

2) Network Settings:

Within the Control Panel, select “Network and Internet.”

Choose “Network and Sharing Center” for a comprehensive overview.

3) Adapter Settings:

Click “Change adapter settings” on the left-hand side of the window.

Identify your active connection (Ethernet or Wi-Fi) and double-click to view its properties.

4) Edit TCP/IPv4 Properties:

In the Properties window, find “Internet Protocol Version 4 (TCP/IPv4).”

Select this protocol and click “Properties.”

5) Ensure the following options are selected:

“Obtain an IP address automatically” (enables DHCP address acquisition).

“Obtain DNS server address automatically” (facilitates domain name resolution via DHCP).

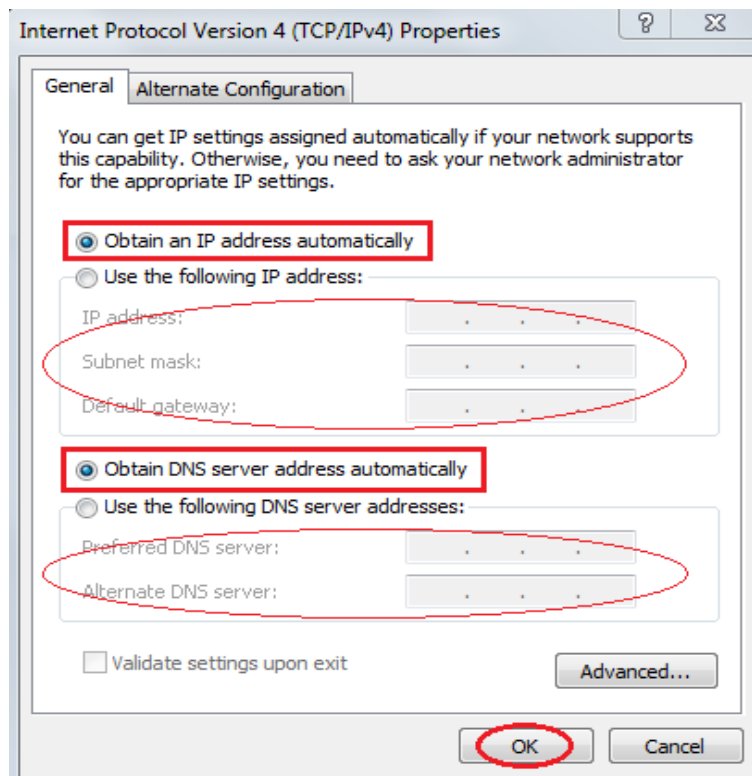


Figure 17: Configure DHCP in a Laptop/PC

3.5.15 PPPOE

PPPoE is a networking protocol that orchestrates a harmonious union between PPP and Ethernet. It encapsulates the PPP packets within Ethernet frames, thereby enabling a secure and efficient data transmission across a DSL network. This protocol serves as a guardian of your internet connection, much like a loyal sentinel, maintaining the integrity and confidentiality of your digital correspondences. It's the unsung hero that allows your device to waltz gracefully through cyberspace, ensuring every step is in time with the rhythm of the internet's vast symphony.

3.5.16 PPPoE Server

To establish a PPPoE Server configuration, please follow these steps:

Access the 'Network Connections' panel within your system's control settings.

Within the PPP section, you will encounter an option to configure 'PPPoE Servers'.

Upon selecting 'Add', you are prompted to define a 'Service Name'.

Choose the appropriate 'PPPoE Interface' where your clients will join.

Ensure the 'One Session Per Host' box is selected to maintain order.

Finally, specify the 'Authentication Parameters' to protect from uninvited guests.

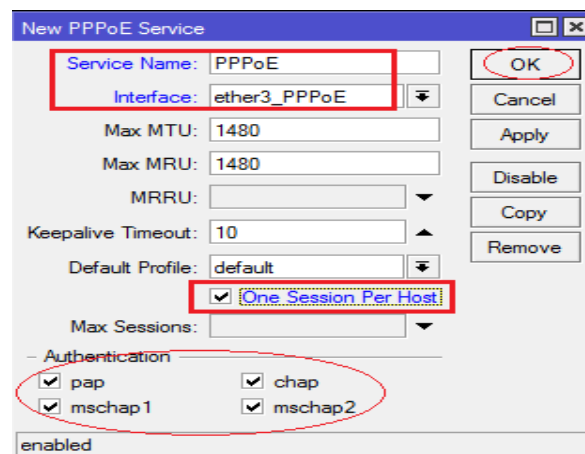


Figure 18: Set up DHCP on a PC or laptop.

3.5.17 Bandwidth Management

Bandwidth represents the data transfer capacity of an internet connection, akin to the number of lanes on a royal highway. It dictates the swiftness with which information can journey from a digital source to your computer, influencing activities such as web page rendering and file downloads. This vital metric is typically quantified in 'bits per second' or 'bytes per second'.

The regal art of bandwidth management is the strategic oversight of these digital thoroughfares, ensuring that no carriage overwhelms the road, thereby preserving the integrity and efficiency of your network. It's akin to orchestrating a grand ball, where each guest (data packet) is elegantly guided to prevent congestion and maintain a harmonious flow of traffic, thus upholding the dignity of the internet experience.

3.5.18 VLAN in MikroTik

A Virtual Local Area Network, or VLAN, is a sophisticated network configuration that logically groups together various network devices, workstations, and servers, providing them with the functionality of a single LAN, despite their potentially disparate physical locations. The creation of a VLAN involves the following steps:

- Access the 'Interface' section within your network management software.
- Select 'VLAN' to proceed to virtual networking.
- With a click, add a new VLAN, bestowing upon it a name.
- Assign an identifier, or VLAN ID, to this new domain.
- Define the 'VLAN Interface' that will serve as the conduit between your router and switch

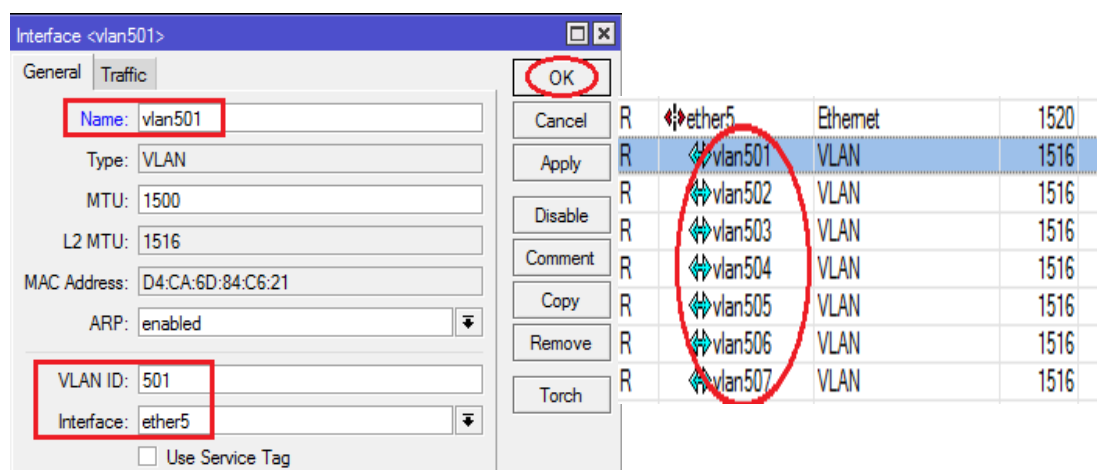


Figure 19: Configure VLAN in MikroTik

3.5.19 Firewall

A firewall is an essential component of network security, acting as either a software or hardware-based sentinel that meticulously manages the ingress and egress of network traffic according to a rigorous set of predefined rules. It constructs a formidable rampart between the secure, internal network and the external internet, which is presumed to be a less trustworthy domain.

MikroTik RouterOS boasts a firewall of unparalleled potency, equipped with features such as: It employs Stateful Inspection of Data Packets, a sophisticated method that scrutinizes the context of each piece of data to validate its authenticity and purpose.

Its Layer-7 Protocol Filtering ability is akin to reading the very soul of each digital message, discerning its true intent and permitting or denying passage accordingly.

The Peer-to-Peer Protocols Filtering is a finely tuned mechanism that orchestrates the symphony of file sharing, ensuring it plays in harmony with the rest of the network's operations.

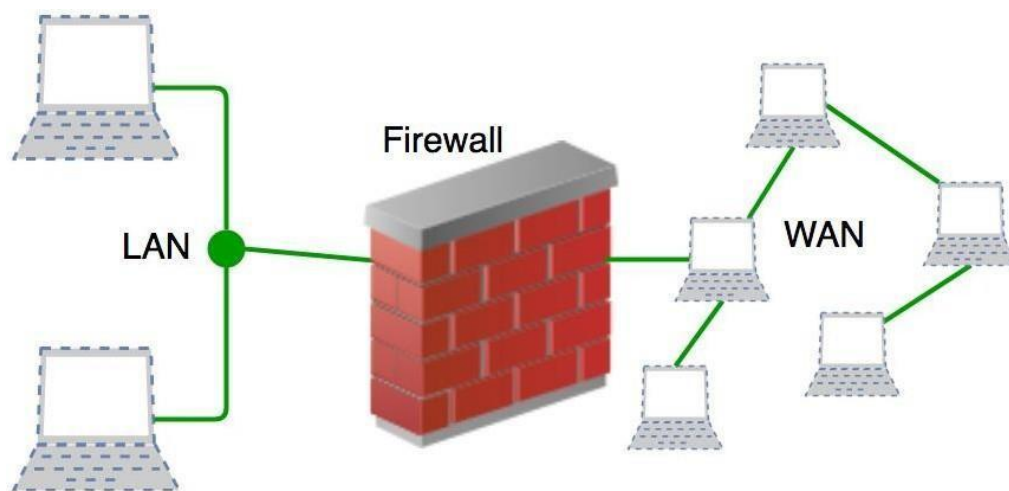


Figure 20: Firewall

3.5.20 VPN

A Virtual Private Network (VPN) is an application that ensures confidentiality, security, and anonymity by establishing an encrypted, safe link between a user's device and a distant server. A VPN shields data from hackers, ISPs, and surveillance by hiding the user's IP address and directing their internet traffic through a secure "tunnel," particularly on public Wi-Fi networks. It enables users to access prohibited information, get around geographical limitations, and stay anonymous online. Businesses use VPNs to communicate securely, people use them to protect their privacy, and distant workers use them to access company resources. Notwithstanding its advantages—such as increased security and liberty—VPNs may slow down internet connections because of encryption and may need a membership fee for dependable services.

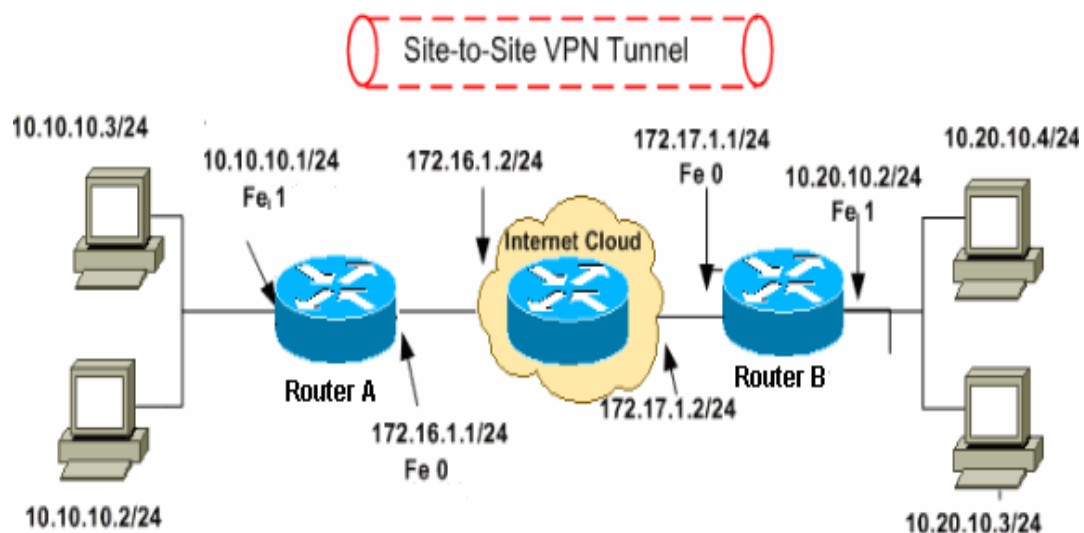


Figure 21: VPN

3.5.21 MikroTik User Administration

MikroTik RouterOS has a neighborhood client data set which characterizes how to make Login User and how to assign them permission. Since a greater portion of Mikrotik router cases will operate on public networks and many hackers will attempt to remove your Mikrotik router set up, it is challenging to maintain organization level and security without proper user administration. Accordingly, your primary responsibility as a Mikrotik router network administrator is to learn how to effectively manage Mikrotik RouterOS users.

3.5.22 Setting up the "admin" Password in Router

The default Username of MikroTik is "admin" with void Password. After initial Login into MikroTik you should set the "admin" Password for your own Security. It is feasible to permit Router Access for the particular IP Address or Subnet. It is additionally conceivable to permit Router Access for quite a long time Address or Multiple Subnet.

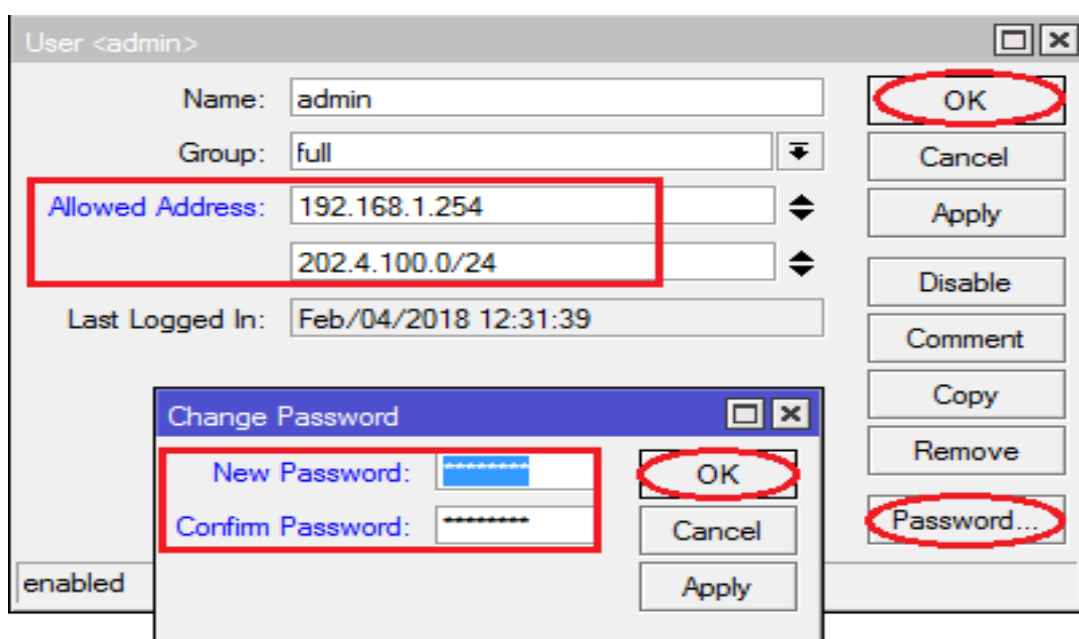


Figure 22: Setting up the "admin" Password in Router

3.5.23 Challenges

Each work has difficulties. There is no work without difficulties. I have faced a few difficulties in the same way. However, upon hearing from my other study mates at another institution, I realized that I was more experienced than them. The principle difficulties of my temporary job are given underneath:

- Impermanent.
- Neglected.
- Challenge

During my temporary position, there were different kinds of difficulties I would confront. Also

1. I would attempt to tackle every one of the issues.

Comprehending Complicated Network Architectures. It took a lot of time and labor to navigate through complex network installations and configurations, especially when examining pre-existing infrastructure.

2. Problems with Compatibility

Delays occasionally resulted from making sure that various hardware and software versions were compatible, particularly when merging outdated equipment with contemporary MikroTik devices.

3. Debugging and troubleshooting

Under pressure, it was difficult to pinpoint the underlying reasons of network difficulties, such as misconfigurations or connection issues.

4. Time Limitations

Effective time management and prioritizing were necessary to balance several responsibilities within the internship's constrained time frame.

5. Security Issues

It was necessary to have a thorough grasp of firewall setups and methods of encryption in order to set up strong security measures that would shield the network from potential attackers.

Chapter 4

COMPETENCIES AND REFLECTIONS

4.1 Reflections

This(ATOVA) platform between my singular life and job sector. This association provides me a lot of data to further develop my passion for work. My work patterns are clear and sort open correspondence. All individuals in this association constantly need relationships between them. When the level of organizing is high, Atova Technology gives me advice on how to sort and hone my talents. Any association must be abreast of local developments. Supporting members without doing their research is also essential, particularly when a problem is hard to monitor and handle properly. At its core, support is a matter of character.

4.2 Competencies

After completing my temporary placement program from the institution. I have different representations of different problems or explorations face different tasks. During the length of my entry level position, named a few qualifications I required. The ones I collected I tried to accomplish vigorously.

Those Competencies Earned are given:

- Network setup is the ability to effectively set up and configure MikroTik switches, routers, and firewalls to create safe and effective network structures.
- Advanced knowledge and use of IP addressing schemes and subnetting for optimal division of networks is required for IP addressing and subnetting.
- RouterOS Proficiency: Practical knowledge of MikroTik RouterOS, including DHCP server administration, VLAN configuration, and VPN deployment.
- The ability to identify and fix network problems, such as connection difficulties and configuration incompatibilities, is known as troubleshooting.

Network security: The ability to safeguard network resources by putting firewall rules, NAT setups, and other security measures into operation

Chapter 5

CONCLUSION

5.1 Place for Further Career

Finding work can be a real challenge. A successful internship can help me turn an experience into a career opportunity.

Configuration and maintenance server for our real life.

For safe and effective networking in real-world applications, such homes, workplaces, or educational institutions, MikroTik servers must be configured and maintained. Setting up LAN and WAN connectivity interfaces, establishing IP addresses, and turning on a DHCP server for automated IP distribution are all part of the configuration process. Turning up the WAN interface and usual routing provide internet connection, while Network Address Translation (NAT) and firewall rules improve security. Setting up wireless networks for Wi-Fi connectivity, virtual private networks (VPNs) for remote access, and bandwidth management to properly distribute resources or prioritize important traffic are examples of further setups. The goal of management is to make sure the server runs safely and properly. This entails utilizing built-in tools to analyze traffic, keeping an eye on system performance, and routinely updating RouterOS to the most recent version. Logs must be examined to identify any problems, and configuration backups should be made on a regular basis to protect against failures. It's critical to follow security best practices including creating strong passwords, turning off unnecessary services, and limiting remote access. Frequent audits of network configurations and firewall rules aid in compliance maintenance and performance optimization. A MikroTik server may offer a dependable, safe, and effective networking solution for a range of real-world situations by following these procedures.

5.2 Conclusion

This training program give me a lot of important information and knowledge to share on ISP setup on the Linux platform and Mikrotik router configuration. The linux operating system with MikroTik is a reliable board-based startup. Stable and productive organization. Every framework architecture models web servers, DNS, FTP, SS, and other things. Everyone can use this short-term setup or place to work on the most recent platform and server security. You can see programming office parts or features and changes or transitions. Today the web is similar to the oxygen of most association and they are deeply influenced by the beauty of the web. Without a proper organization plan, it is beyond the realm of possibility to expert management oversight. A valid network configuration can built their organizations and help organizations reach their goals. So network configuration is an important part of this entry level position.

APPENDICE



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