ISP SETUP & MAINTAINANCE WITH 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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13TH SEPTEMBER 2022

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APPROVAL

This Internship titled **"ISP SETUP & MAINTAINANCE WITH MIKROTIK "**, submitted by **Milon Sarker, ID NO: 191-15-12327** 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.

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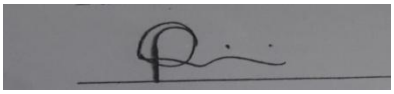

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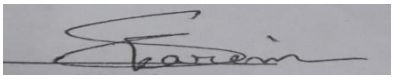

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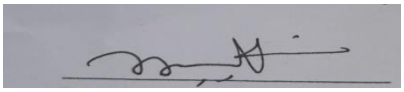

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I hereby declare that, this report has been done by me under the supervision of **Most. Hasna Hena, Assistant Professor, Department of CSE** Daffodil International University. I also declare that neither this report nor any part of this report has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

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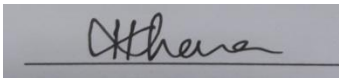

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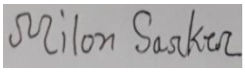

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Finally, I must acknowledge with due respect the constant support and patients of my parents.

ABSTRACT

The number one equitable of documents is to configure and keep community and bandwidth with the aid of using the Mikrotik. The goal is because of the reality that the maximum attractive first-class net issuer of the people. Mikrotik router layout is obtain the usage of Winbox. After implementation of all service, this gadget is examined in distinctive degrees and it really works correctly as a model. Network Design, Analysis and Troubleshooting-Tunneling and Network Security, PPPoE, DHCP, Static routing, Firewall, DNS, NAT, ARP, Bridges and so forth are all of the remember a Mikrotik router in Winbox. This guide may be designed with RB941 Wi-Fi get admission to factors and consumer consolation will increase at the same time as community management and preservation fees decrease. This gadget is advanced reliability and protection higher community.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

In this modern era internet are so much useful everyone. In this world internet plays vital role & maximum devices need to access internet. In this internship thesis I will experiment ISP setup and maintenance in RB450 MikroTik router in this lab. In many corporate company & ISPS uses in this MikroTik devices and increase their network day by day.

1.2 Motivation

The foremost cause for the hobby in Mikrotik device is to make sure the higher and quicker networking supply for the human beings in Bangladesh. I changed into observed the crucial of expand country wide facts for you to retain the pathway book getting to know and allow a stand-in to get an often-huge prospect of the subjects. During the impermanent activity, I might have admitted that I changed into flawlessly professional withinside the humble additives of MikroTik. As an internet receives to the supplier, I actually have speaking what's on the lead of my mind to an excellent fine sound, speaking with human beings, for attentive their necessities and giving them higher organization. My motility gag in my capacity to broadly examine and cowl this situation and regulation quick but then precisely.

1.3 Objectives

Today, ICT is one of the most important aspects required to build a career. The goal of this work on the MikroTik network. Manage bandwidth for user success. MikroTik OS is designed as a network router. It is the operating system and software that can be used to turn a computer into a positive network router. Your computer has a variety of IP networking and wireless networking features. To run a Linux based OS router system

intended to be installed on MikroTik Router Board routers. It can also be installed on a PC, making it a firewall router, VPN server and client, and access point. The system can serve as a captive portal based on a wireless access system. These network security systems are very high. For this reason, I chose this topic for an internship.

1.4Expected Outcome

We will attempt to increase a Design of An Enterprise Network wherein inner gadgets can percentage statistics easily; statistics packet will ship without visitors and they may stay secure. User can use net server. Another essential final result is theIT Sectors may be advantage from our challenge; they are able to use our challenge as a right guiding principle for upgrading their network.

1.5Report Layout

In the Chapter-1 I have described Introduction, objective and Motivation of internship. In the Chapter-2 In this section I will describe the thesis background. In the Chapter-3 I have described the Networking, types of networking which is using for Mikrotik, Introduction of Mikrotik and types of so many routers. In the Chapter-4 Displayed preparing went to, doled out obligations, Mikrotik fundamental charge and portrayed about various kind of steering setup (DHCP, PPPoE, ARP, and Firewall) goal. In the Chapter-5 Depict about my report decision and future extent of MikroTik.

CHAPTER 2
ORGANIZATION

2.1 Introduction

Networking is also an important means of communication these days. Without networks, we cannot imagine sharing data from one place to another. Networks now make it easy to move data from one place to another. network by managing data between multiple computers. MikroTik could be a Latvian company founded in 1996 to develop wireless routers and ISP systems. MikroTik currently offers hardware and software systems for net capital in most countries around the world. The focus on victimizing industry-standard portable hardware and complete routing systems enabled the United States in 1997 to create the Router-OS computer code, which offers intense balance and control over all types of knowledge. Combination and routing. In 2002 we set about developing our own hardware and the Full BOARD Router was born. There are resellers in most parts of the world and customers in most countries around the world.

Daffodil online Ldt.is leading isp company in Bangladesh. Their main service is to deliver good quality of internet connection to user. They have also several services as well. They are Domain Hosting, G suit, Corporate Office Networking, Etc.

2.2 Product and Market Situation

In our daily life there are digital devices everywhere and to communicate with each other more quickly we need network. In the sector of IT networking play a vital role to connect everything together. By the help of networking we are doing our daily task lot faster than ever before. Currently in our Bangladeshi IT market there are numerous job opportunities of network specialist who are good at configuring network as well as troubleshooting problems.

2.3 Target Group

Daffodil Online Ldt. is an internet service provider company, their main goal is to serve good quality internet connection to the end user. Their main focus on people who are looking for network support and Domain hosting. They are good at these services, therefore in recent years they have achieved such a good number of customers in Dhaka. They are also expanding their services to other cities as well.

2.4 SWOT Analysis

SWOT means Strength, Weakness, Opportunity and Threat. They are important terms for a business and for a job as well.

- Strength: This means the difference between a business or job from its competitor.
- Weakness: This stands for the disadvantages have the company of a job.
- Opportunity : Opportunity helps a company to grow faster than its competitor, if a business has competitive advantage then a company can use it as opportunity.
- Threat : Threat means the bad things for a business or a job.

2.5 Organization Structure

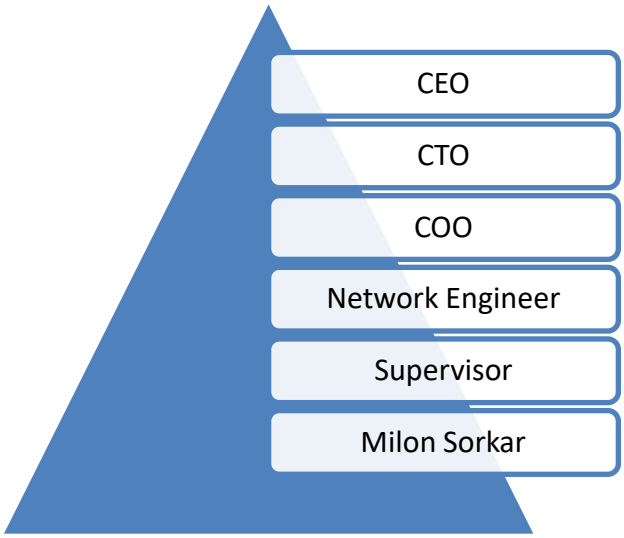


Fig 2.1 : Organization Structure

CHAPTER 3

TASKAND ACTIVITIES

3.1 Daily Tasks and Activities

We can use our task as commercial purpose. In this internship season I will work step by step and complete this project. At first, I will gather knowledge in MikroTik devices. Secondly, I will install the VMware simulator in my pc to practice MikroTik. In day by day, I will configure many routings, switching, ISP can use our task concept to put into effect their community and they could offer provider in house, workplace building, PPPoE, static or DHCP provider.

3.2Events and Activities

I choose Daffodil Online Ltd for my internship. There are four months of training and the configuration of the Cisco Networks Micro Touch Switch, MikroTik Router is done here. I have no idea about Cisco networks. First, let's learn about IP configuration. We receive various data about the sublease and the IP agreement. Next, let's start installing the micro-router on the virtual box. And we collect all kinds of information about the micro router. First, if a MikroTik router can forward a new configuration, it needs to be rebooted to give it first. On the MikroTik router, it is necessary to connect to the Internet first, to scan the IP on the interface, and then the DNS, and it is necessary to provision the gateway. We have no idea about the various settings of the Mikrotik router, then we have the DHCP settings. Configure and block Facebook and YouTube bandwidth through MikroTik router you don't know through our master. Having learned all kinds of configurations, we did not tremble again when testing. After completing a four-month course, we gained a comprehensive overview of setting up MikroTik routers and Cambium routers for indoor and outdoor use. In the first month we learn about networks and sub-IP. Proper netting and configuration of VLAN switches and switch management.

3.3 Task, Project and Activities

- Training Easy setup and installation of MikroTik OS on VMware
- MikroTik OS installation
- IP addressing concept.3rd Month We learn the complete MikroTik configuration which is very important for MikroTik router management.
- IP Configuration
- Subnets
- Network Connection
- VLAN
- PPPOE Last month we relearned the same topic for good preparation MikroTik Route Static and DHCP
- Bridge
- Bandwidth Management
- ARP/AP
- PPPOE
- Wireless Configuration
- Firewall

3.3.1OS of Mikrotik

MikroTik OS is an operating system. The operating system comes with different license levels ranging from 0 to 6, where 0 is a 24-hour trial version. In trial mode, you can test all features of Router OS free. We can compare the different license level features here. Installing Router OS is very easy. Either download the ISO image, burn it to CD and boot from it. Willingly, Net install will write Router OS to any secondary drive you have attached to our Windows PC. Move the drive to our Router PC and boot it. Both installation methods, plus upgrade files and more can be found here.

3.3.2Mikrotik Router

There are many kinds of MikroTik Router. I will brief some MikroTik router in my internship paper.

HEX lite

HEX lite can be a tiny five port LAN router in the course of a pleasant plastic case. Its fee is below the Router OS license alone — there simply isn't any exceptional as soon as it joins handling your stressed-out domestic network, not simplest it’s reasonably-priced, small, realistic attempting and easy to use.

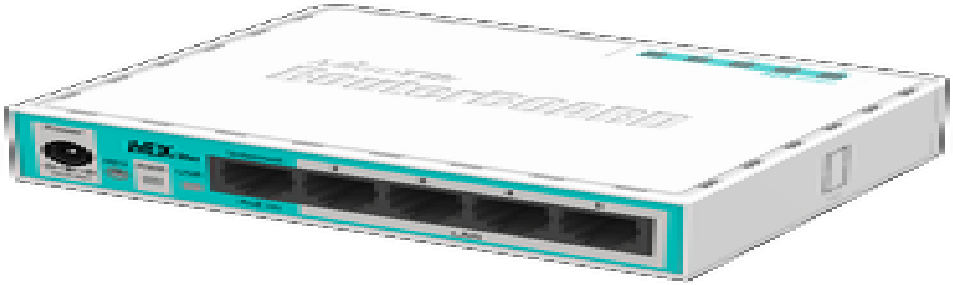


Fig 3.3.1: HEX lite

HEX PoE

Fig3.3.2: HEX PoE

3.3.3Winbox setup VMware simulator

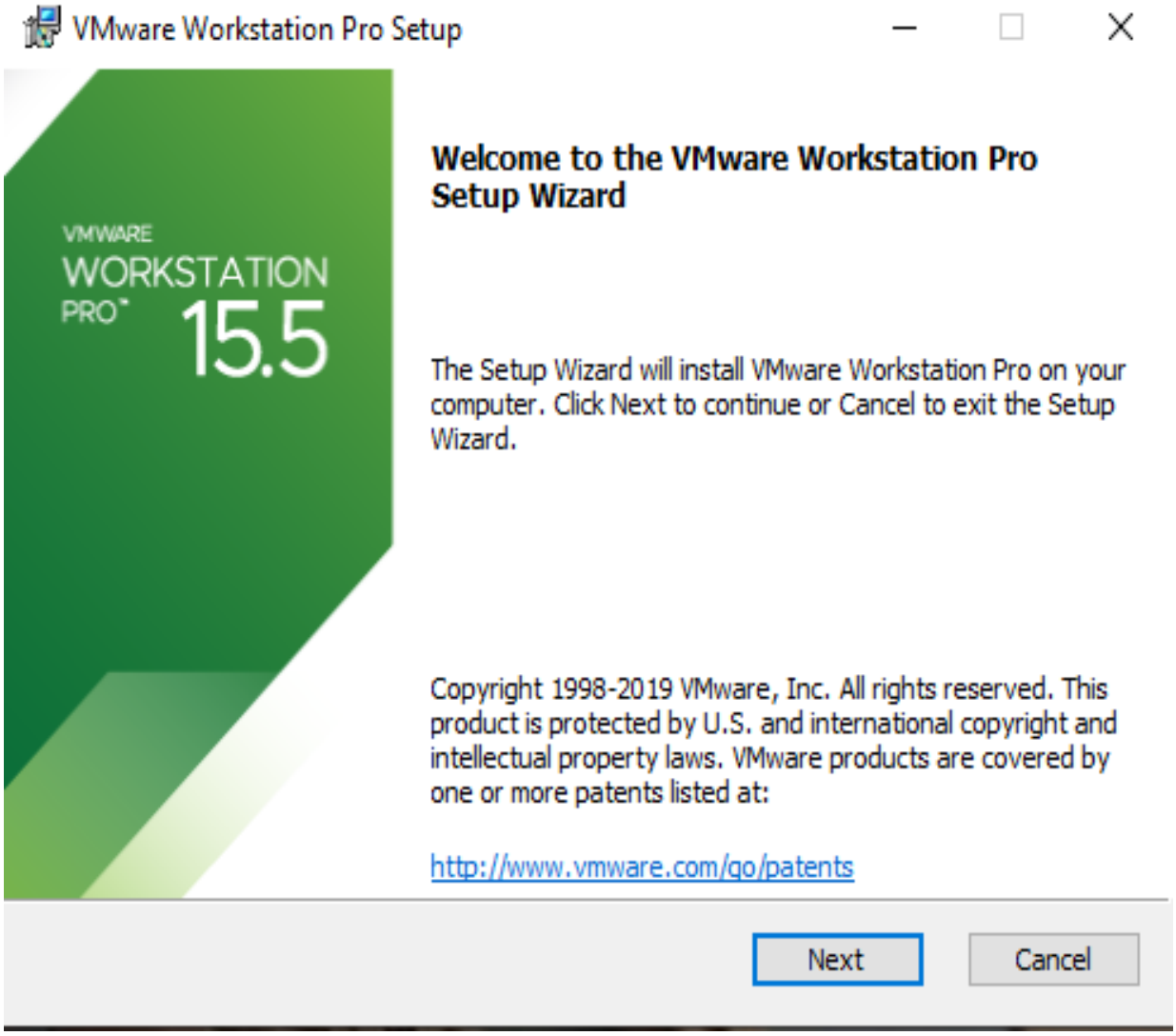
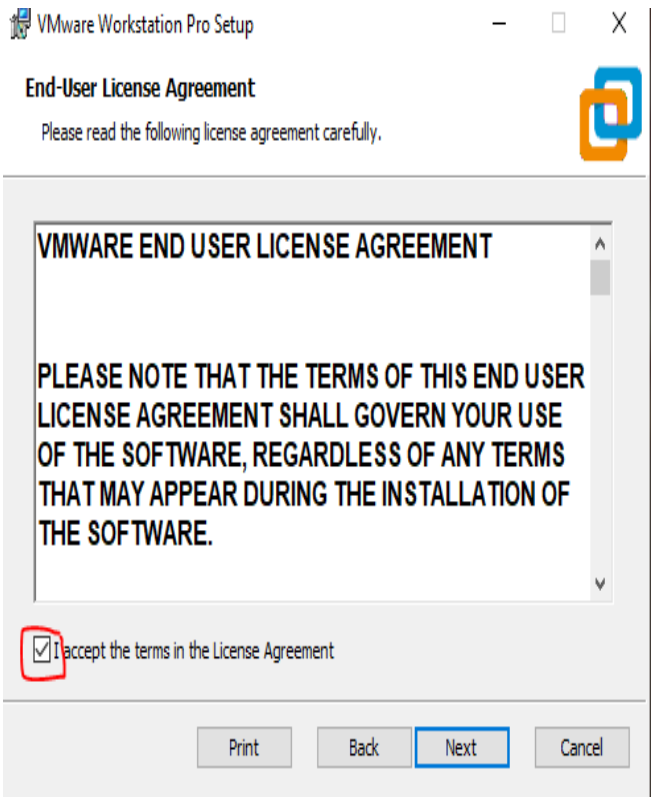
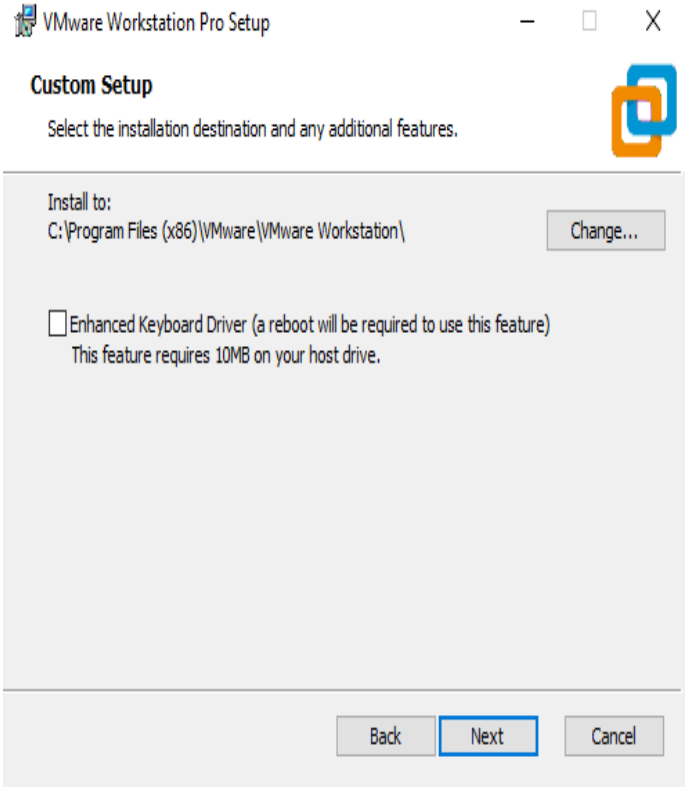
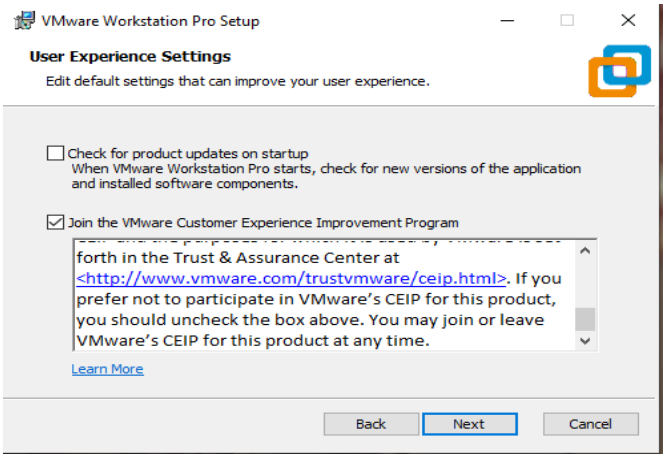


Fig 3.3.3 : PC Based VMware Installation Process (1)







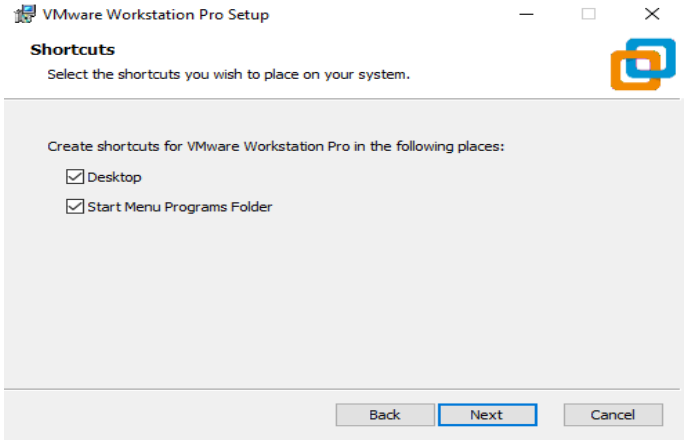
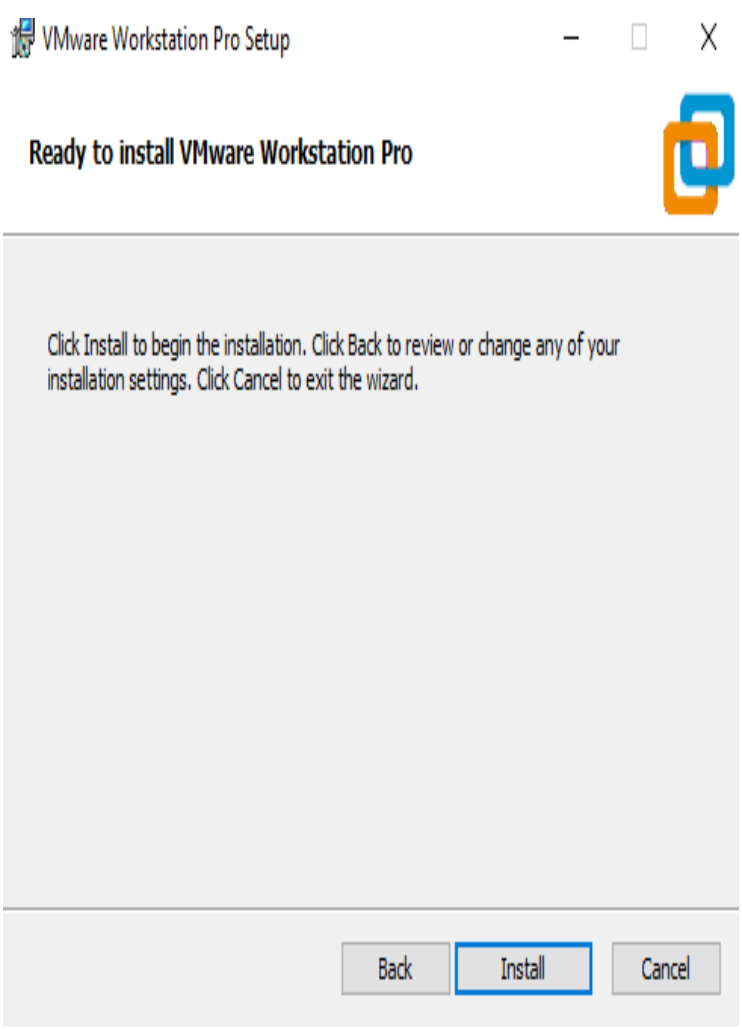


Fig 3.3.4 :PC Based VMware Installation Process (2)



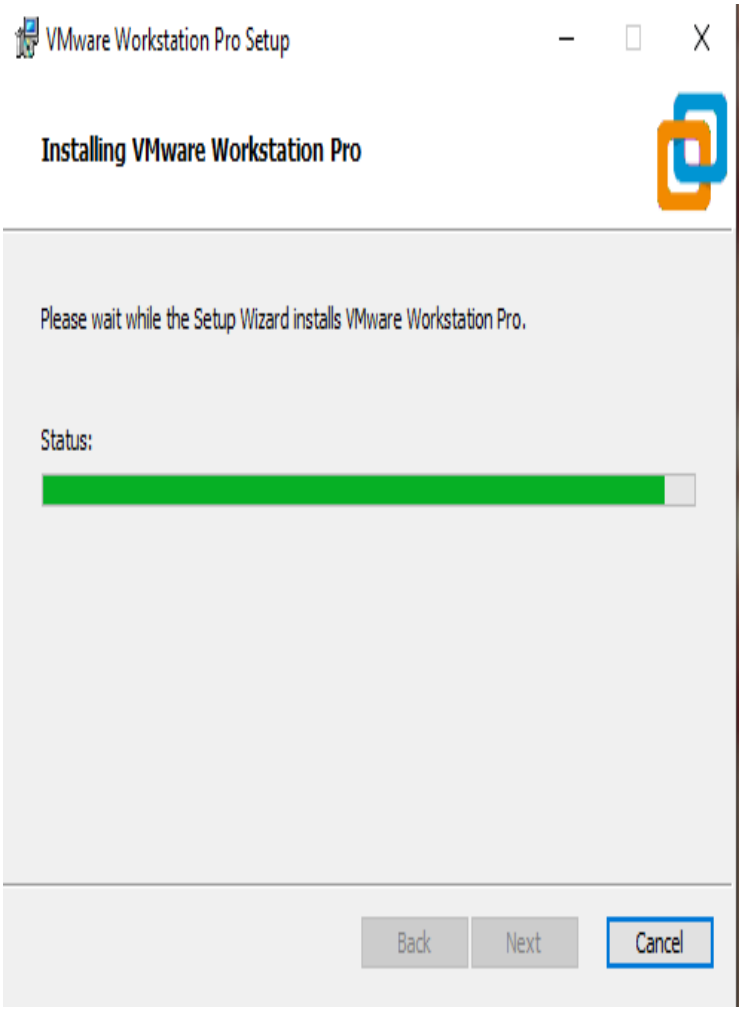


Fig 3.3.5 :PC Based VMware Installation Process (3)

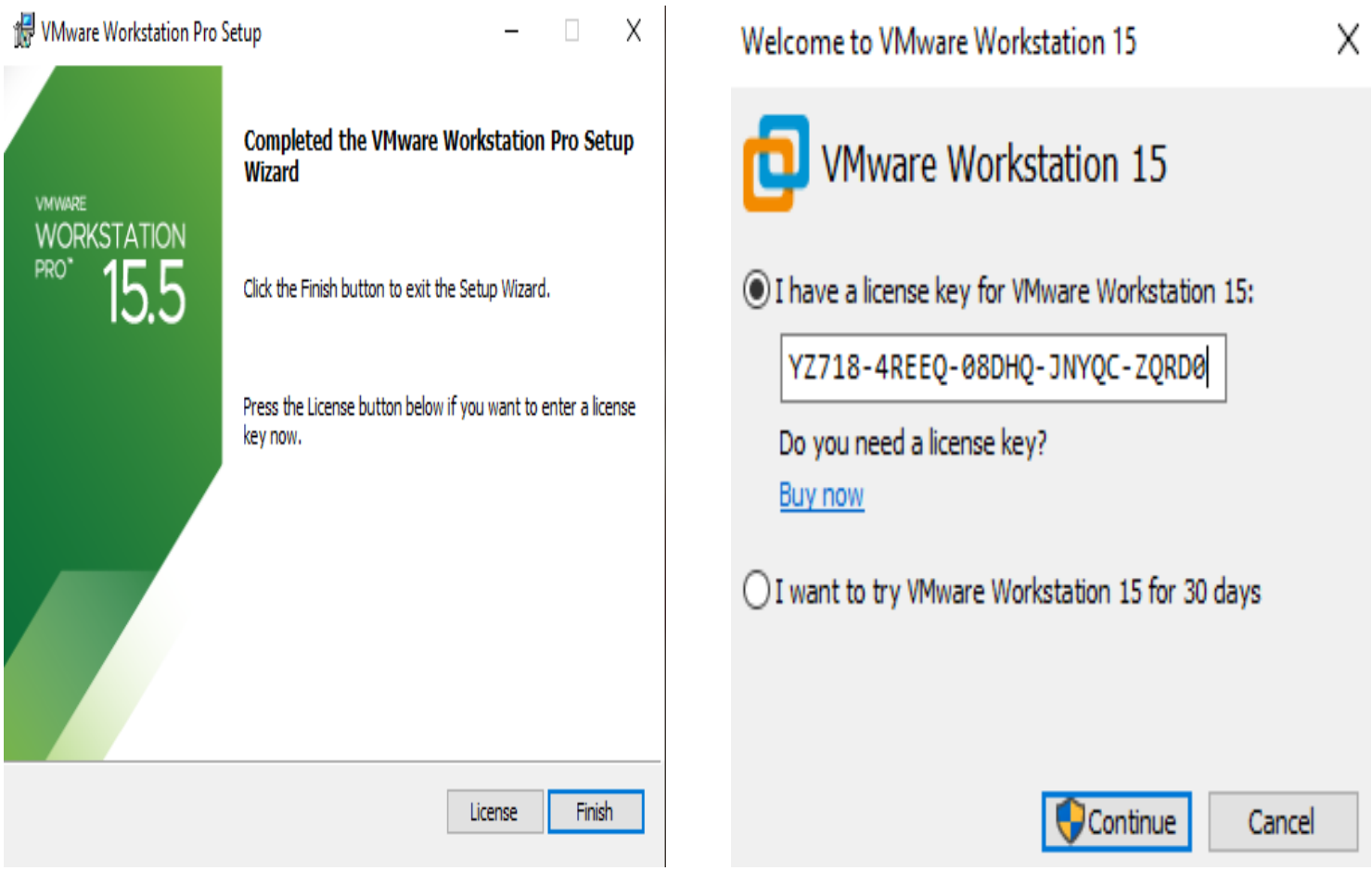
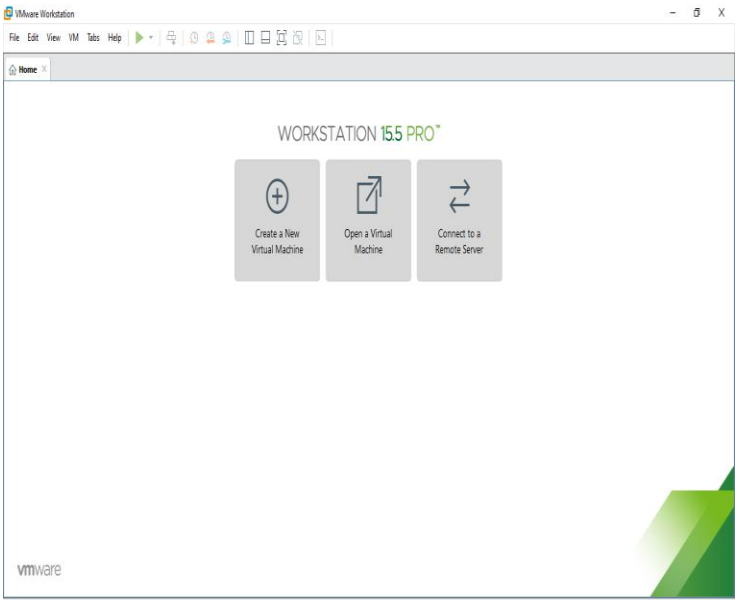


Fig 3.3.6 :PC Based VMware Installation Process (4)



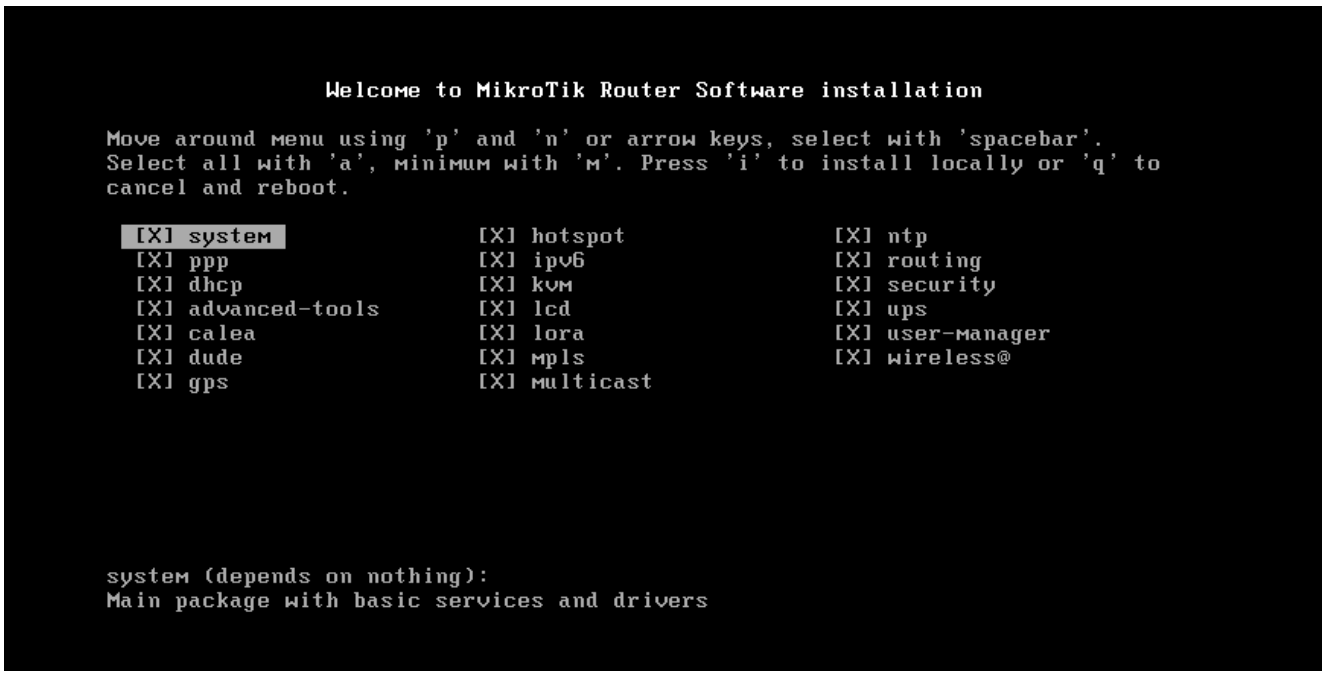


Fig 3.3.7 :PC Based VMware Installation Process (5)

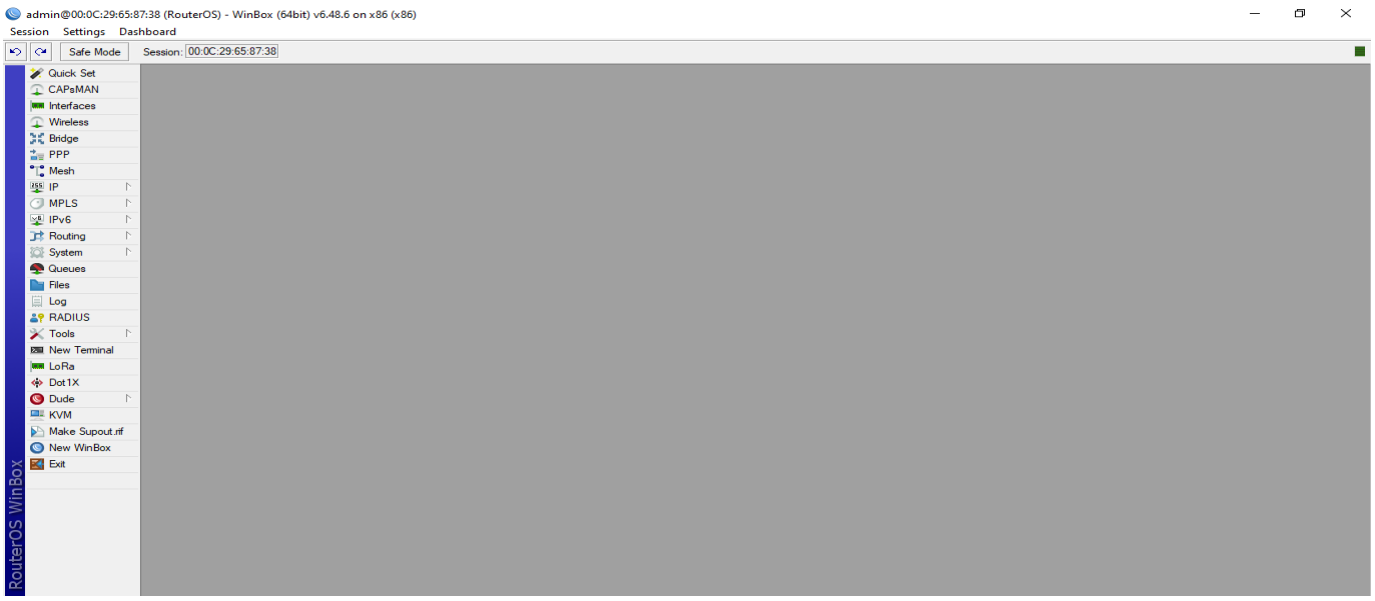


Fig 3.3.8 :Interface of Router OS

3.3.4Basic Mikrotik Configuration

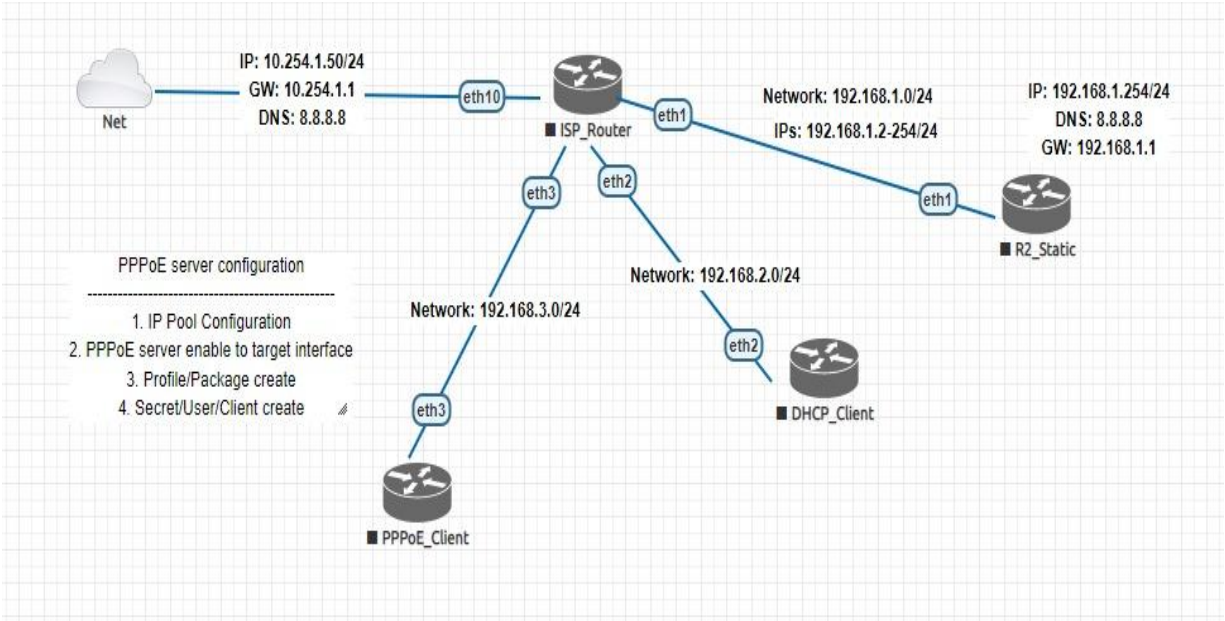


Fig 3.3.9 :Basic Mikrotik Configuration

In Basic MikroTik Configuration step by step below,

- Router Identity.
- IP address assign.
- Gateway.
- DNS.
- Routes.

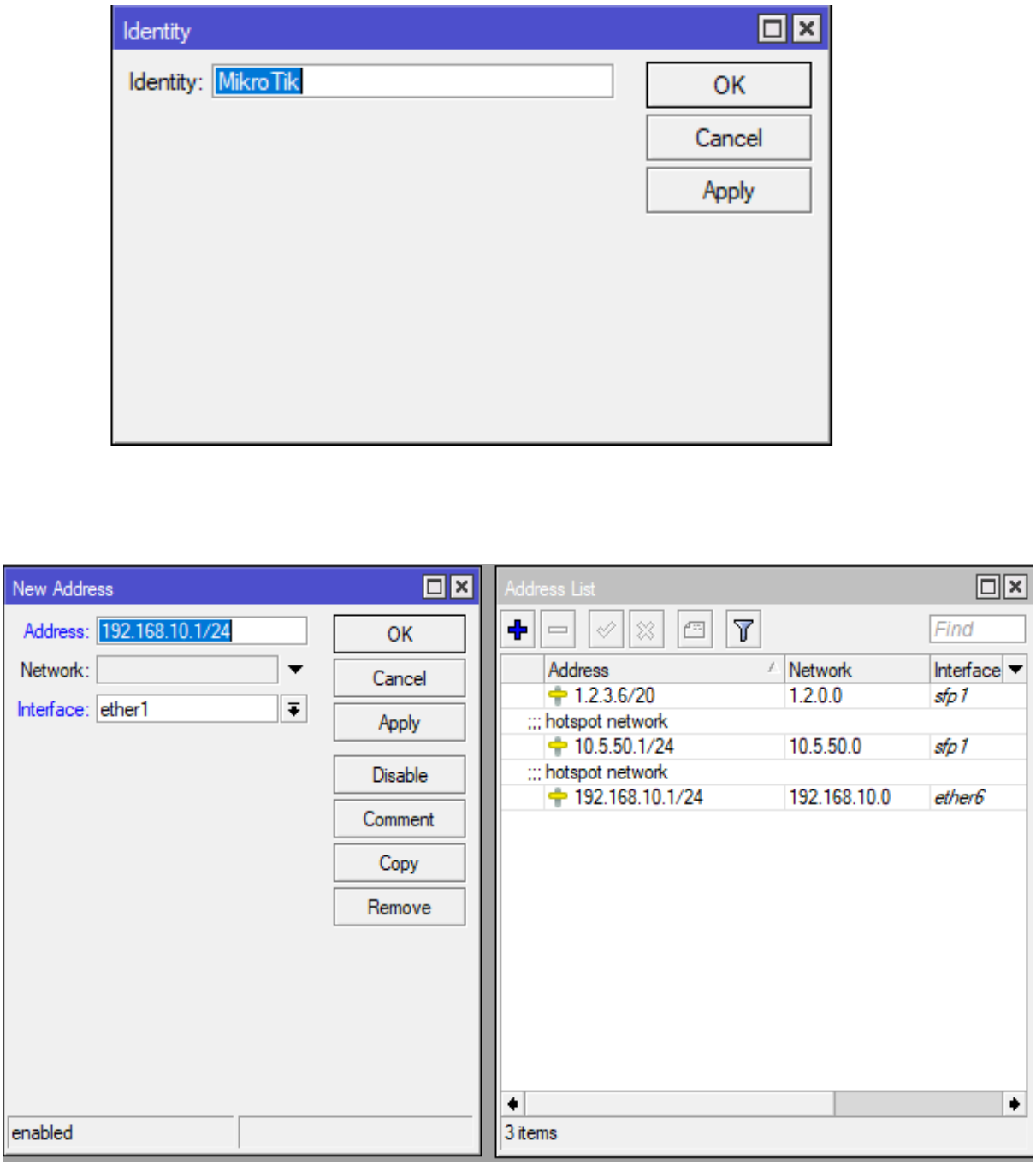


Fig 3.3.10 :Basic Mikrotik Configuration (1)

DNS

- By default, DHCP client asks for a DNS server IP address.
- It can also be entered manually if another DNS server is needed or DHCP is not used.

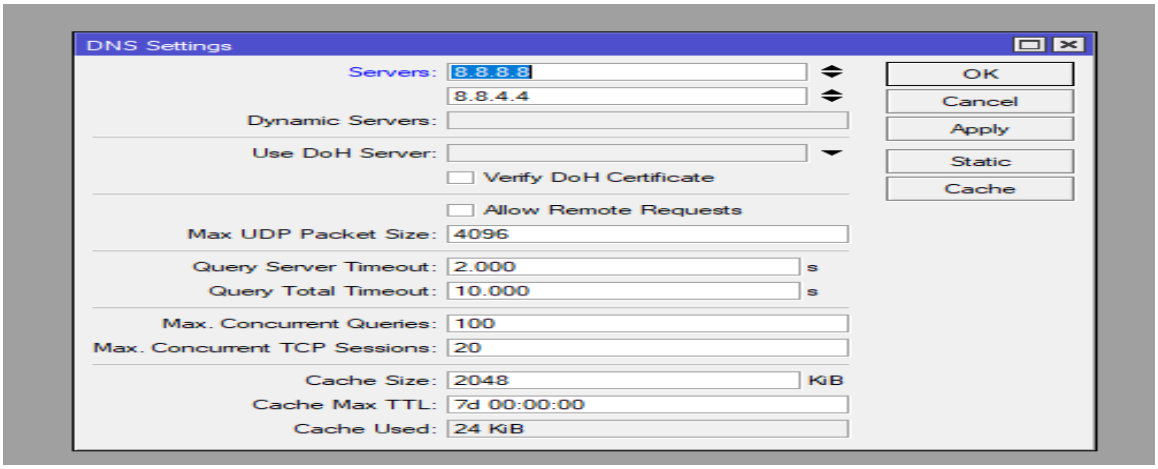


Fig 3.3.11 :Basic Mikrotik Configuration (2)

Routes

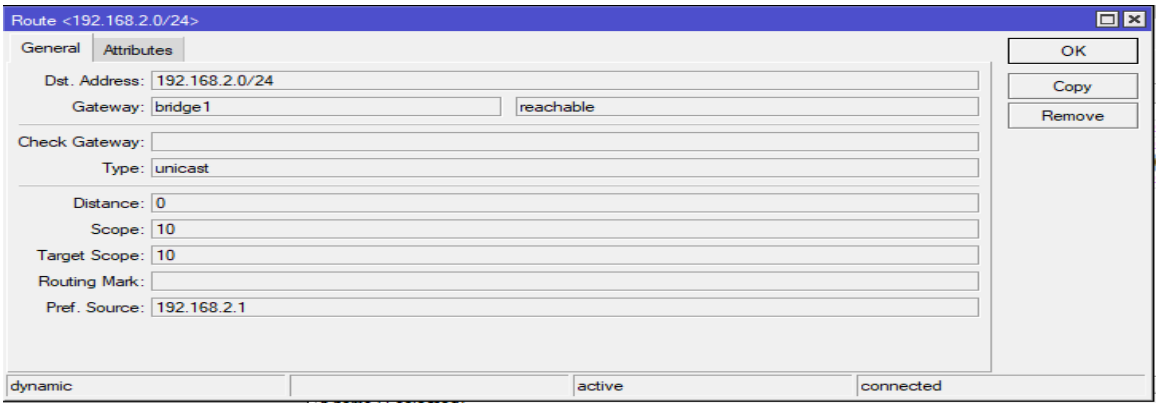


Fig 3.3.12 :Basic Mikrotik Configuration (3)

ISP Setup with MikroTik device:

ISP provides their services in three system. I will describe below now,

- Static Configuration.
- DHCP Server Configuration.
- PPPoE Server Configuration.

3.3.5 DHCP CONFIGURATION

The DHCP (Dynamic Host Configuration Protocol) is used for the smooth distribution of IP addresses in a network. The MikroTik Router OS implementation consists of each server and purchaser parts.

I will configure step by step below,

IP Address Asian WAN

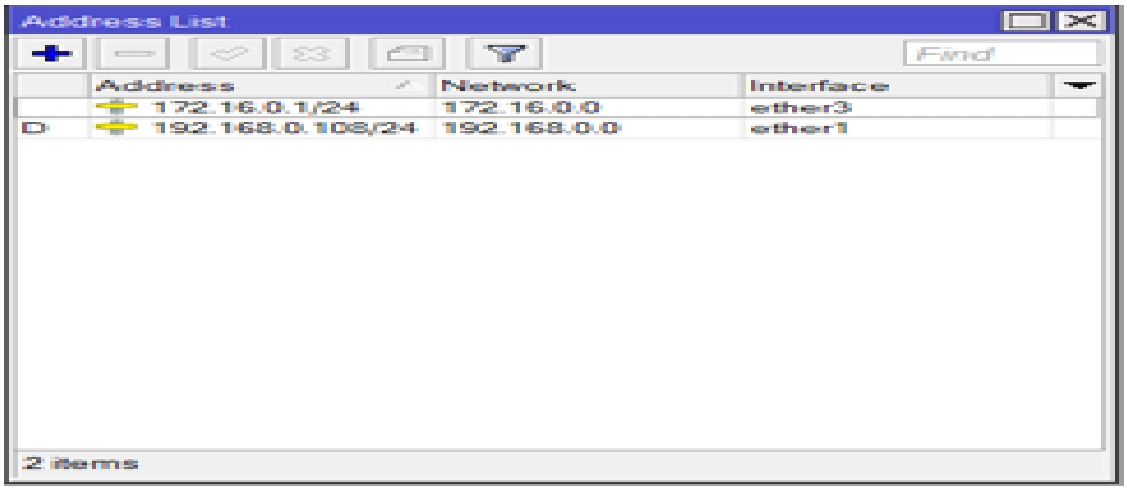
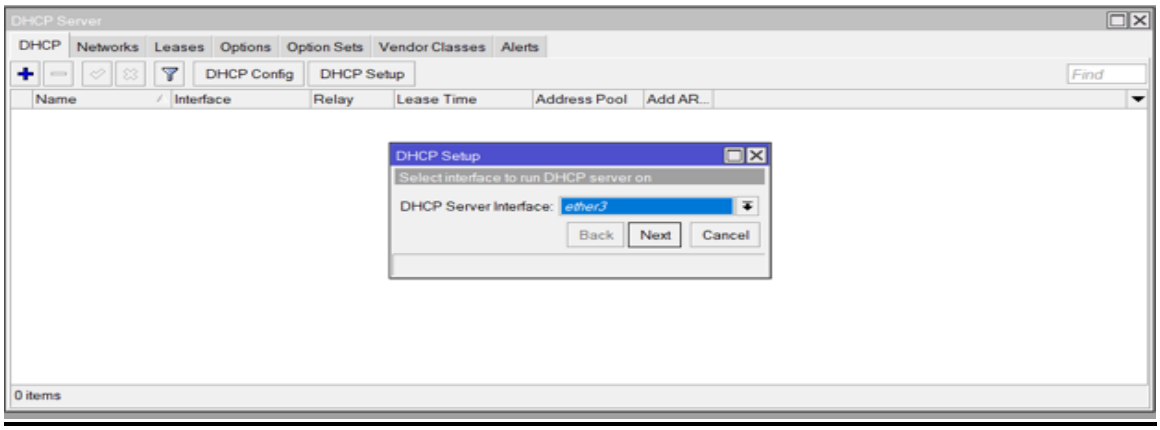
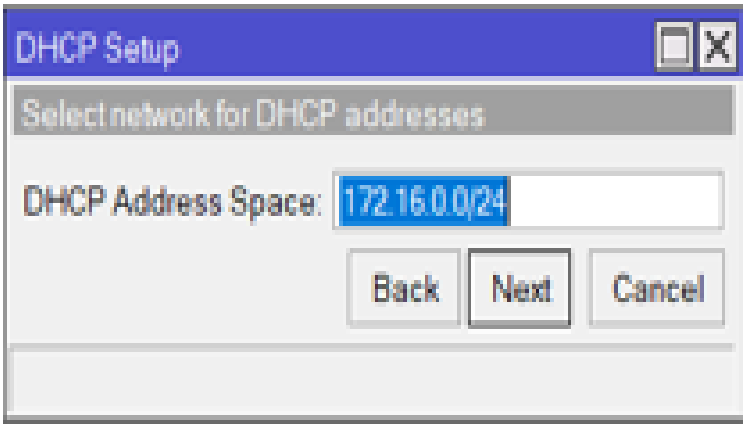
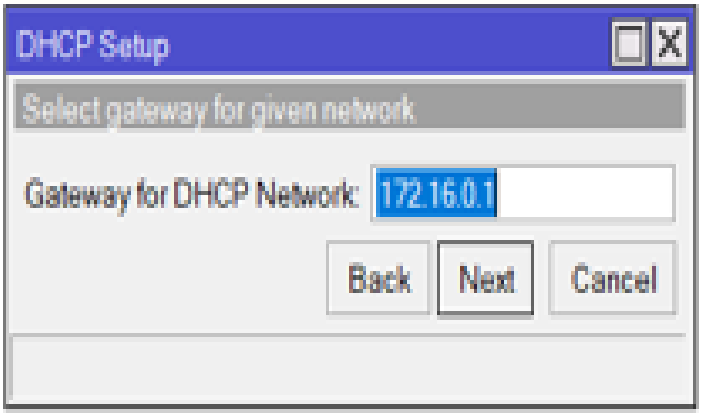


Fig 3.3.13 :DHCP Server Configuration (1)







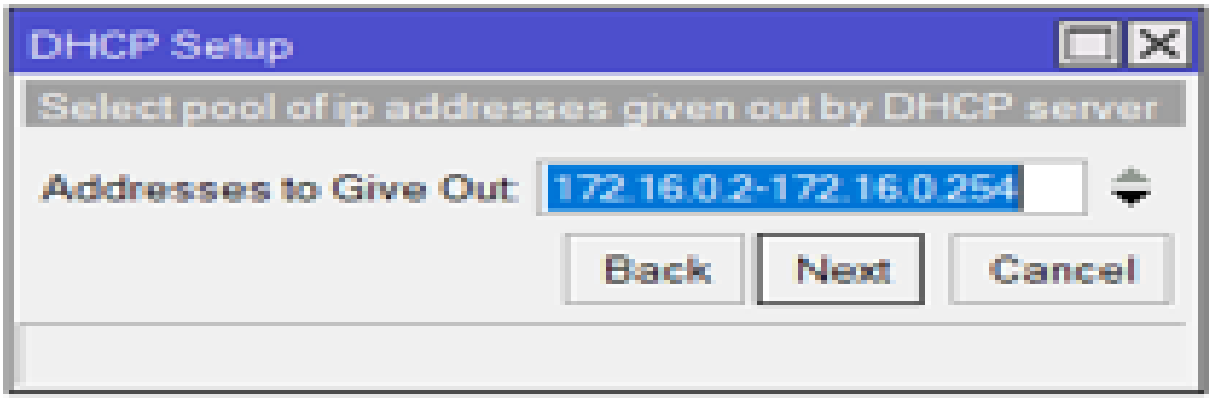
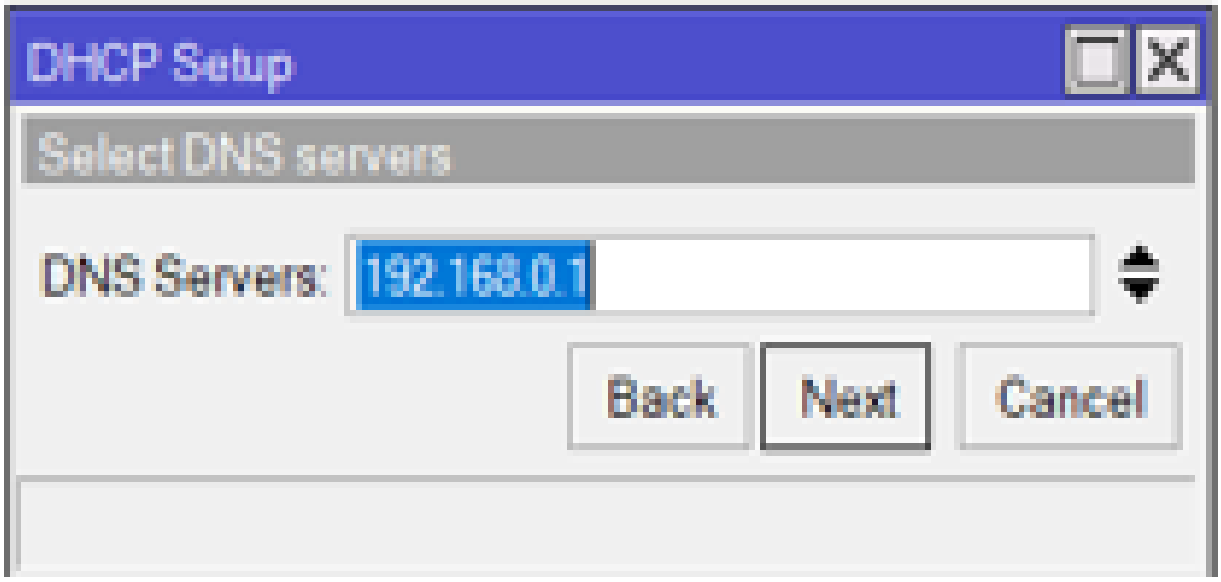
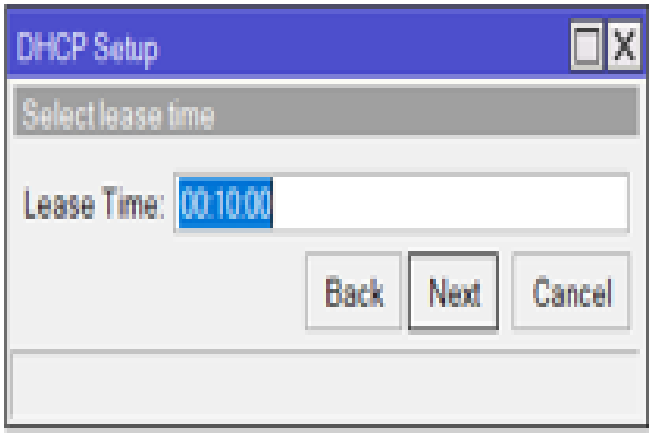


Fig 3.3.14 :DHCP Server Configuration (2)





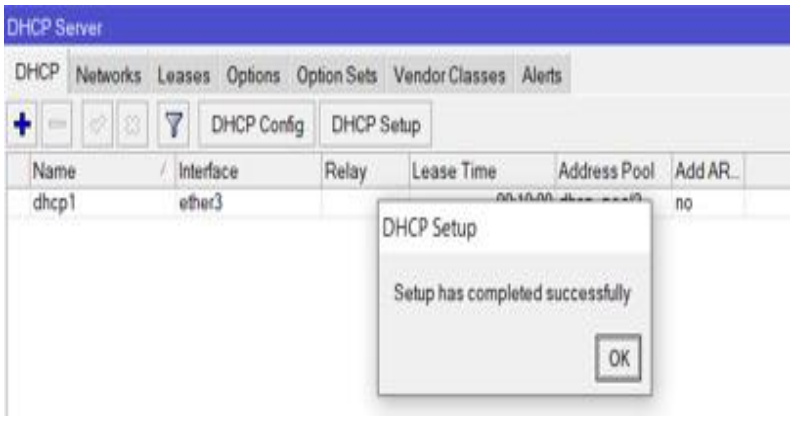


Fig 3.3.15 :DHCP Server Configuration (3)

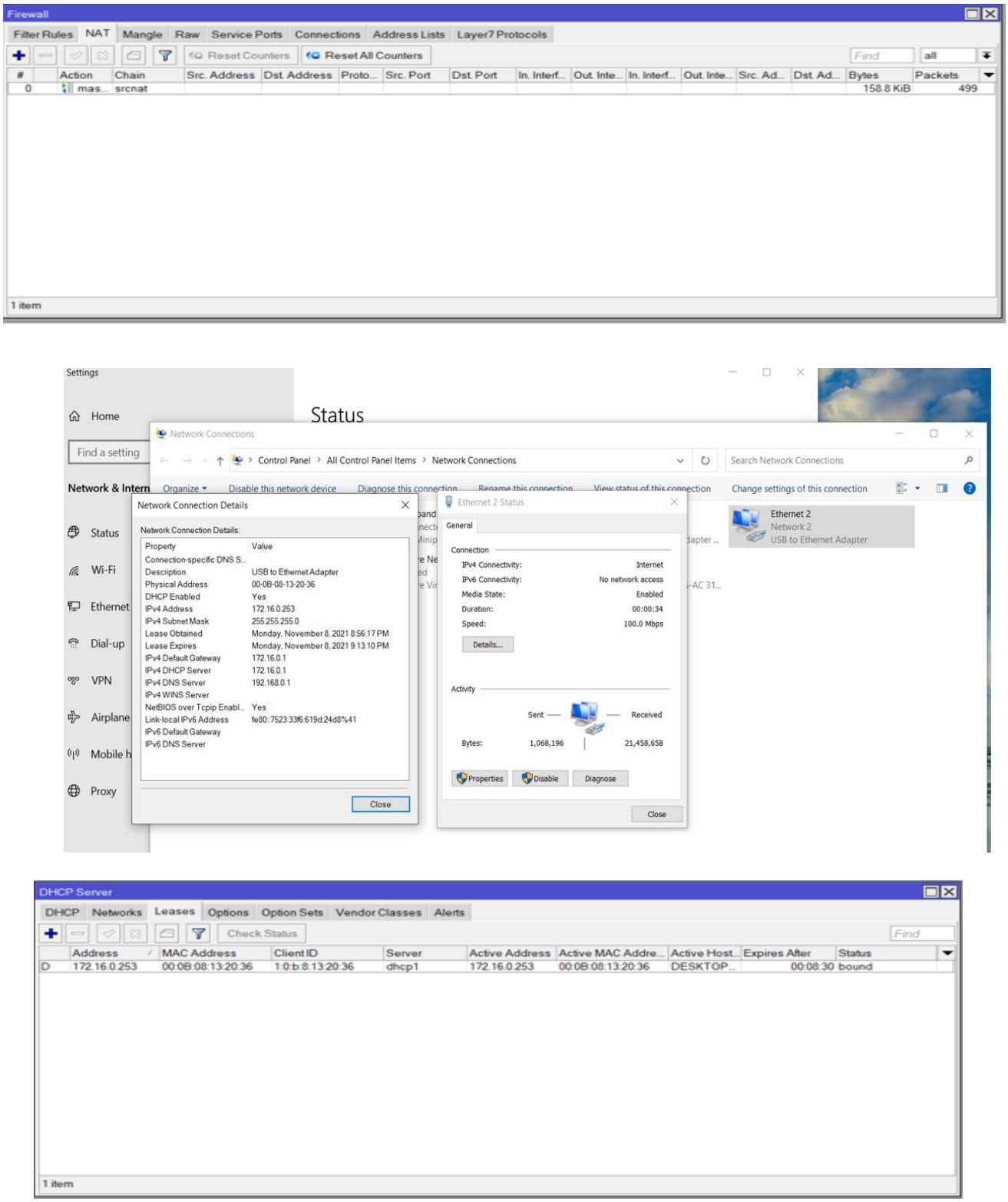


Fig 3.3.16 :Successfully Complete DHCP Server Configuration

3.3.6PPPoESERVER CONFIGURATION:

In PPPoE server configuration ISP can provide User Name & Password in client. Client can use the user's name & password they can use internet.

I will show the PPPoE server Configuration Step by Step below now,

- IP Pool Configuration.
- PPPoE server setup.
- PC internet setup in dialup option.

IP POOL CONFIGURATION

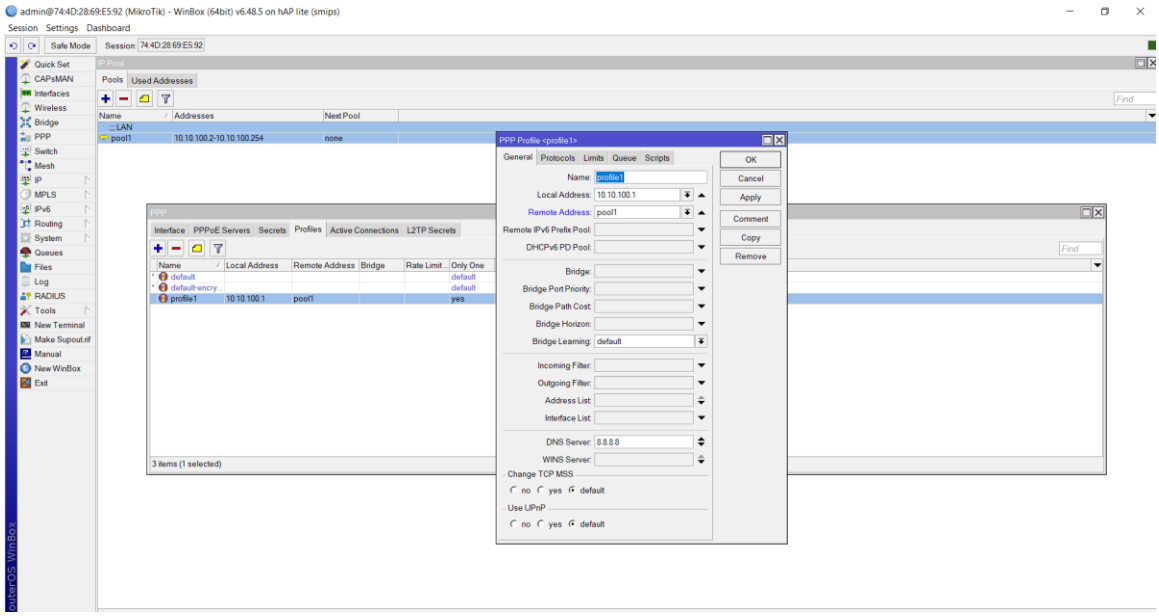


Fig 3.3.17 :PPPoE Server Configuration (1)

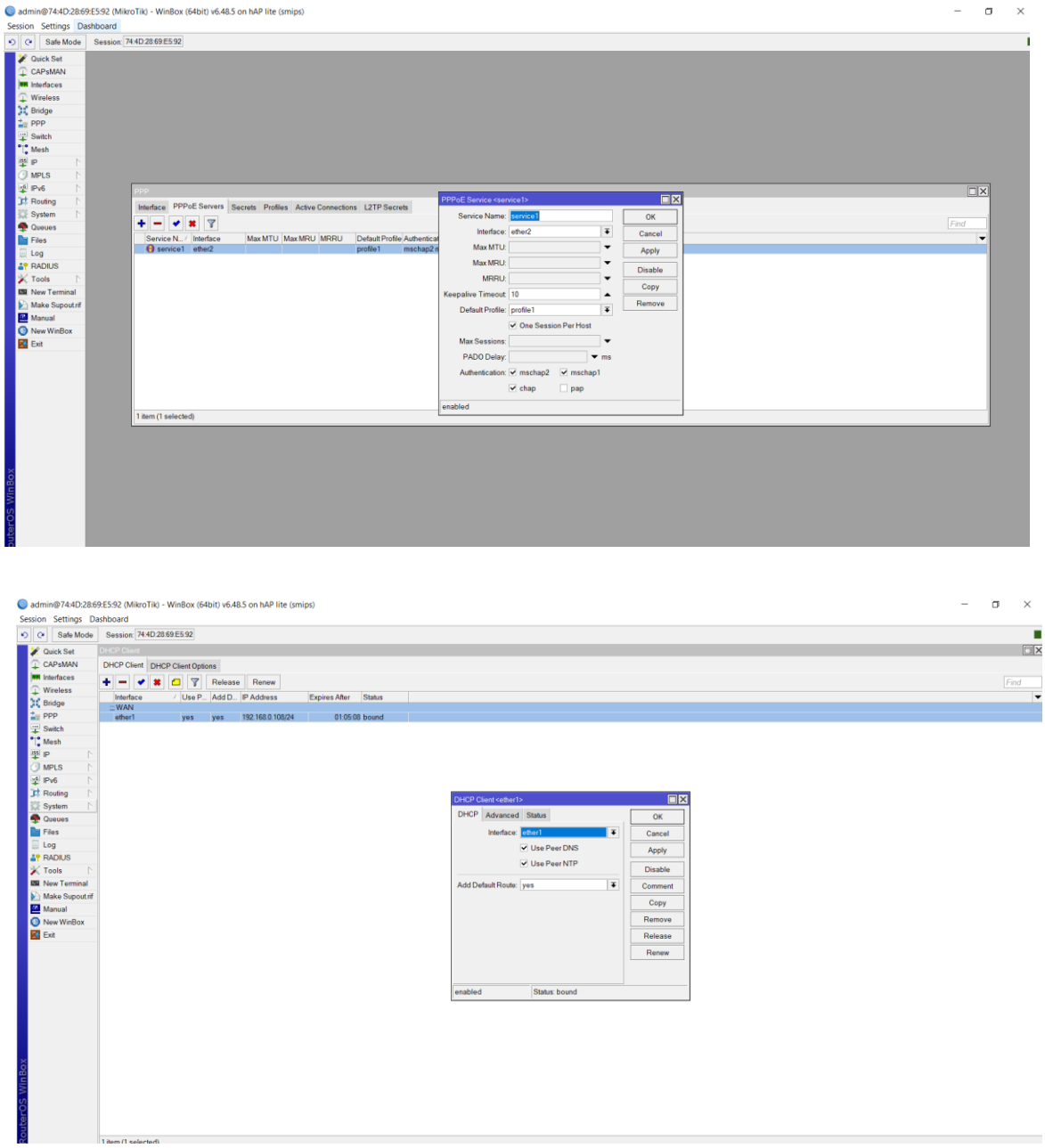


Fig 3.3.18 :PPPoE Server Configuration (2)

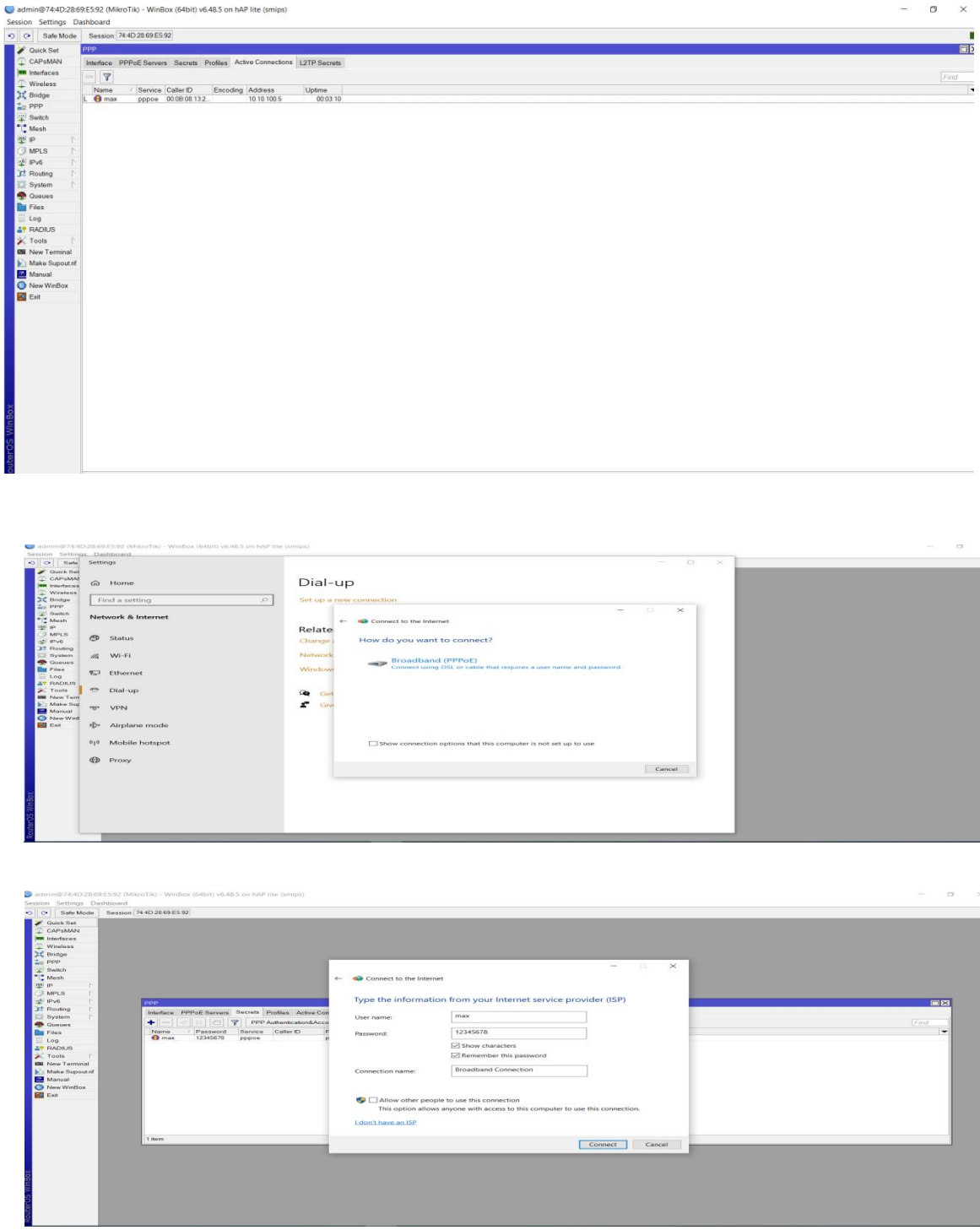
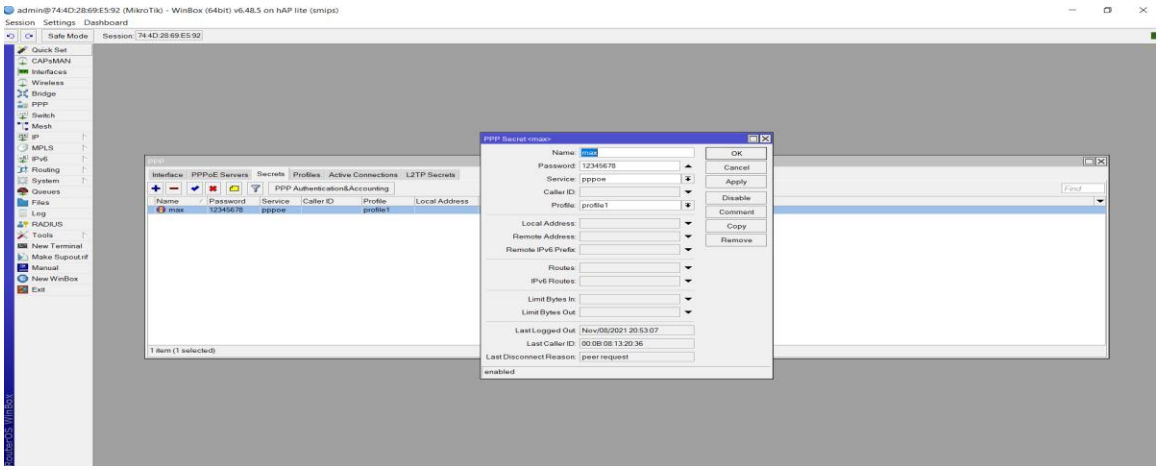


Fig 3.3.19 :PPPoE Server Configuration (3)



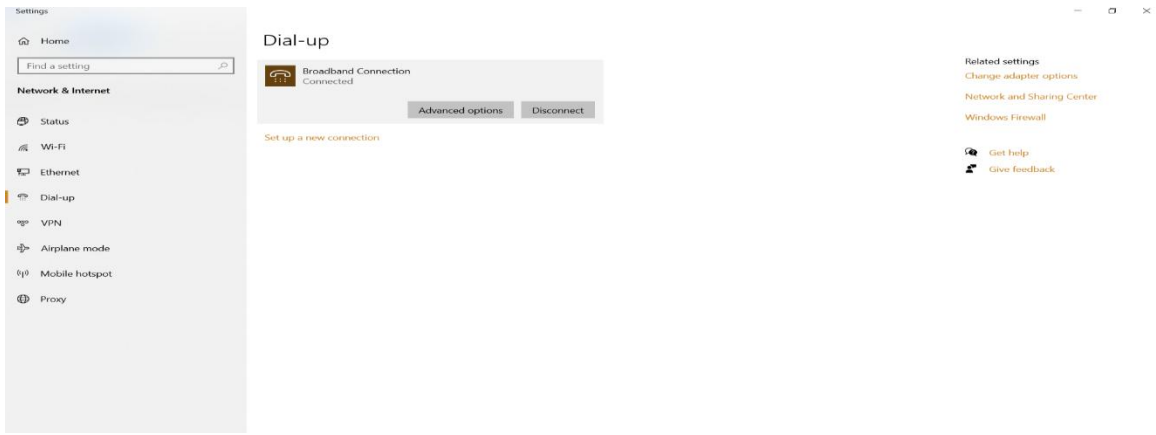


Fig 3.3.20 :PPPoE Server Configuration (4)

3.3.7 Bandwidth Management

Some theoretical concept of bandwidth management system. I will be described below now,

- Bandwidth Management Concept.
- Simple Queues.
- PCQ Based Queues.
- Dedicated & Shared.
- Dst. Based Queue.
- Burst Limit Details.

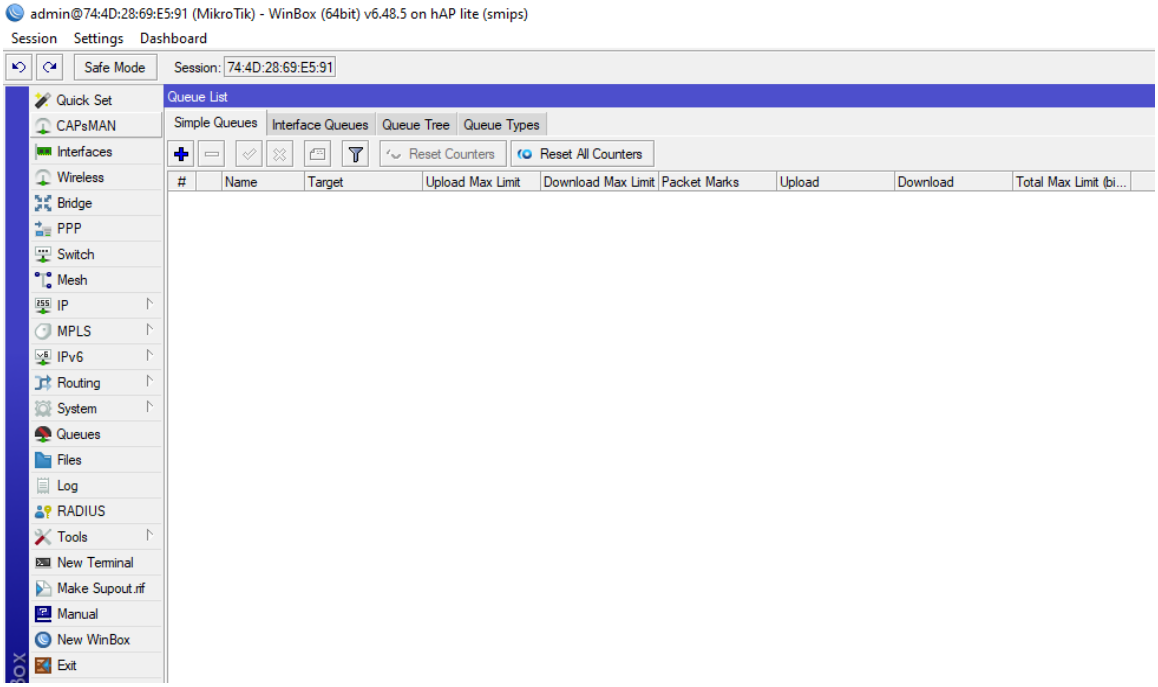


Fig 3.3.21 : Router Interface

Simple queue:

- Can be used to easy limit the data rate of:
- Client's download () speed.
- Client's upload () speed.
- Client's total speed (+).

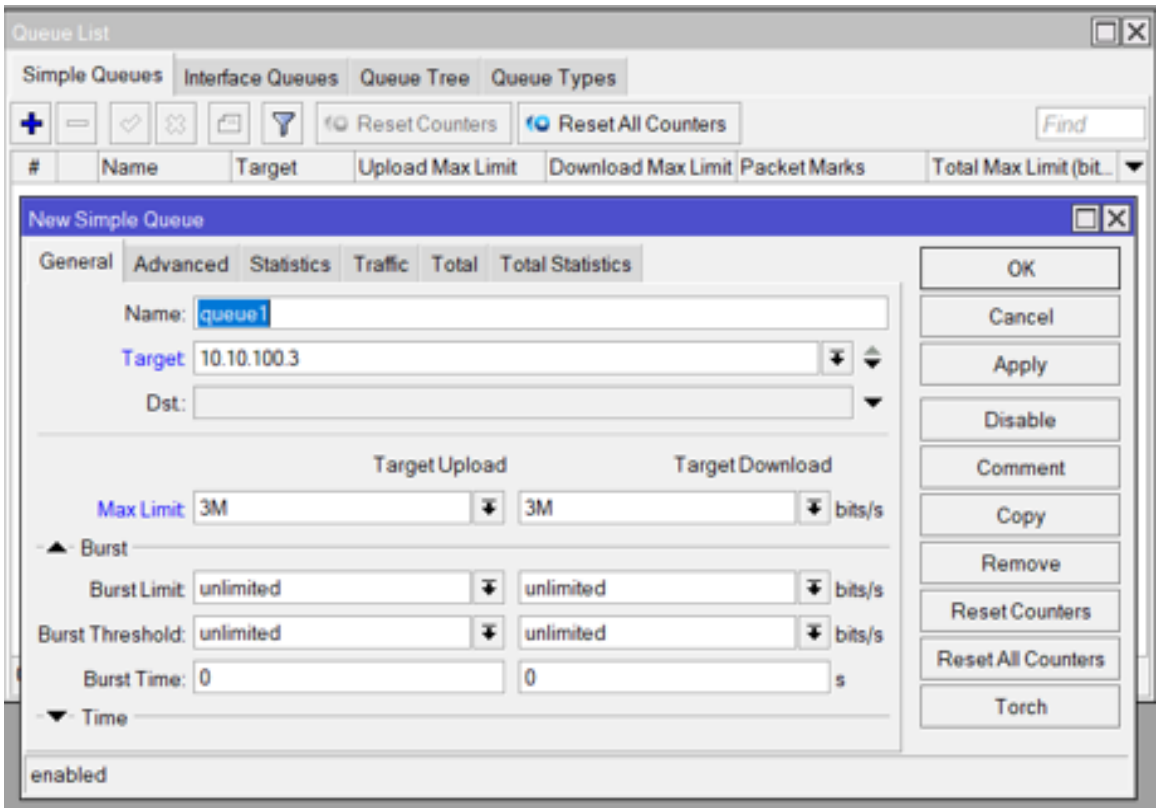


Fig 3.3.22 : Creating User

Per Connection Queue

- Queue type foe optimizing large QoS deployments by limiting per ‘sub-stream’
- Substitute multiple queues with one.
- Several classifiers can be used.
- Source/destination IP address.
- Source/destination port.

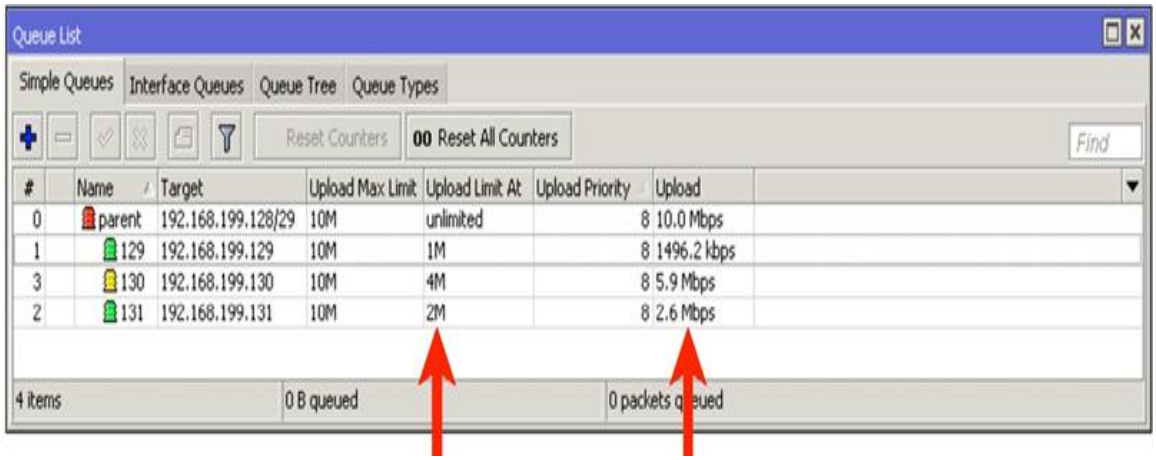


Fig 3.3.23 : Monitoring Connections

3.4 Challenges

The field of IT includes lots of real life problems therefore there are lots of challenges in this field. Trouble shooting is one of way to identify what is going on. There might be software problem also hardware issues too. In the time of internship I had faced some problems as well, where my supervisor helped me to overcome these issues. I have learned how can we resolve an issue by trouble shooting.

CHAPTER 4

COMPETENCIES AND SMART PLAN

4.1 Competencies Earned

During my internship period I have learned lots of ne things which are really important in the field of networking. I have earned organization work experiences by working with a team within the organizations. They internship opportunity helped me to learn these things, they are given below :

- MikroTik OS installation
- IP addressing
- IP Configuration
- Subnets
- Network Connection
- VLAN
- PPPOE Connection
- Bandwidth Management
- ARP/AP
- Wireless Configuration
- Firewall

4.2 Smart Plan

To work in the field of IT there are need of good knowledge about networking. Therefore I am practicing these things which I have learned throughout the internship. I am also playing around with my own networking devices so that I can trouble shoot problems.

4.3 Reflection

This internship helped me in different ways, I was able to learn about the organizational environment as well as got the chance to developed my skill in the networking sector. I was able to configure and implemented my learning on my own with my network devices. I have learned new technologies and worked with various hardware devices.

CHAPTER 5

CONCLUSION AND FUTURE CAREER

5.1 Discussion and Conclusion

The adventure is to increase our task is high-quality. we increase a task named “Design of An Enterprise Network Infrastructure for A Company Using CISCO PACKET TRACER". To increase this task, we ought to face many troubles many demanding situations including drawing. We are acquainted with ipv4 became new subject matter for us, so we ought to lot of look at approximately it. we additionally face project to pick but we've a high-quality painting as a consequence we conquer all the ones demanding situations and correctly put into effect the task. we suppose our task could be greater powerful.

5.2 Scope for Further Development

Those,

- Increase Area in this project.
- Add protocols
- Add Security.

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APPENDICES

Appendix A: Internship Reflection

Internship is a great opportunity to learn practical knowledge by working with an organization. Its teach many things including organizational behavior, practical skills, team work, work under pressure, etc. Throughout my bachelor study I have learned lots of theoretical knowledge, but by the help of internship I was able to relate these theoretical knowledge to the practical work. To start a career for fresh graduate, internship is a great opportunity to sharpen their practical skills.

Appendix B: Company Details

Introduction

Daffodil Online Ldt. is a private company who provides internet services to the user. It also offer different services as well. There are many employee work together to provide good quality of services to the customer. In this competitive market, they are always ready to take challenges and fulfill their commitment. They are currently trying to expand their working area and services.

Services

Daffodil Online Ltd. has different services, they are

- Dedicated Internet Bandwidth
- Domain Hosting
- Pearson VUE
- G Suite
- Indoor & Outdoor WiFi Solution
- Corporate Office Networking

Clients

For their quality services they got lots of clients, they are

- ❖ Skill Jobs
- ❖ Walton
- ❖ Income Tax
- ❖ Daffodil International University
- ❖ MST Group
- ❖ Daffodil Institute of IT
- ❖ Iqbal Catering
- ❖ Amin Mohammed Group

Mission

- Providing absolute satisfaction in term of ISP solution
- Build up relation with customer
- Adopt new technology to provide up to date services
- They want to grab a good position on the market share

Head Office

Organization Name : Daffodil Online Limited

Organization Address : 102, Shukrabad(3rd floor), Mirpur Road, Dhanmondi,

Dhaka- 1207, Bangladesh.

Mobile : +8802-48119586

Email :info@daffodilnet.com

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