INTERNSHIP ON COMPUTER NETWORKING & SECURITY

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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DAFFODIL INTERNATIONAL UNIVERSITY DHAKA, BANGLADESH SEPTEMBER 2019

APPROVAL

This internship titled "Computer Networking and Security" submitted by Md Rabbi Hasan, ID No: 163-15-8365 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 12 September 2019.

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I hereby announce that, this internship report is prepared by me, Md Rabbi Hasan Id No: 163-15-8365 to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of **Rubaiya Hafiz, Sr. Lecturer, Department of CSE,** Daffodil International University.

I also announce that neither this internship report nor any part of this internship report has been submitted elsewhere for award of any Degree or Diploma. I also declare that, I collect information from Versatile Technology Limited (VTL), Books and Internet.

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ACKNOWLEDGEMENT

First of all, I want to say the most heartfelt thanks to the Almighty God for making me capable of doing this internship. His divine blessing enables a successful completion of the final year of his internship.

I am grateful to **Mr. Shaher Ali**, Managing Director of **Versatile Technology Limited**. I am also grateful to **Mr. Mohammad Raju Islam**, Admin System (Networking Engineer) of versatile technology Limited. I can't continue my internship in the company without their continuous support. Other members of the company helped me a lot to do my internship.

I really grateful and wish profound gratitude to **Ms. Rubaiya Hafiz,** Sr. Lecture Dept. of Computer Science and Engineering, Daffodil International University, Dhaka. Deep knowledge & keen interest of my supervisor in the field of "**Computer Networking & Security**". Her endless patience, academic guidance, constant back-up, constant and energetic supervision, positive analysis, important advice, reading many lower draft and correcting them at all stage have made it possible to complete this internship.

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

I would like to thank whole course friend in Daffodil International University, who took part in this talk about while completing the course work. Finally, I must acknowledge with due high opinion the constant support and patients of parents.

ABSTRACT

If two and more computers are interconnected and able to exchange data or information then we call network. When we want to increase the number of PC's and exchange data or information from one to another that time we need some special PC's are called Server. There is various type of work in the network that is why also different types of server have. For Example- Network Design, Network Server, Router Configuration, IP Addressing, Routing And Configuration.

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CHAPTER 1

Introduction

1.1 Introduction

The main goal of learning is to gain wisdom. I choose a traineeship because I gain the skills that have been handed over. Now there is a huge number of people using information technology and servers all over the world over the internet. The information technology (IT) industry is one of the fastest growing industries in the world. CCNA is a well-known confirmation by PC system engineers. The full type of CCNA is part of the Cisco Ensured System.

It is estimated that more than 1 million CCNA testaments have been granted since it was first proposed in 1998. The CCNA Declaration covers the expansive scope of ideas for system administration. It causes the possibility of getting ready for the most recent advances in the system that they are likely to be dealing with.

1.2 Motivation

I am presently pursuing my Bachelor of Computer Science Engineering degree at Daf fodil International University, I know the significance of acquiring practical understan ding that complements the understanding of the textbook and helps learners achieve a wider view on topics.

I discovered that I was completely skilled for Computer Networking & Security information during my internship. I get my point very well as being an Internet service provider, communicating with individuals, understanding their requirements and providing them with better service. My abilities lie in my capacity to comprehensively read and comprehend the scenario and to behave rapidly and intelligently.

1.3 Internship Objectives

- \checkmark Install interactively and with kick start
- \checkmark Perform use and program administration
- ✓ Study about every networking devices
- ✓ Managing of network system
- \checkmark How to communication between customer
- \checkmark How to all allocate excellent facility to customer

1.4 Introduction to the Company

Versatile Technology limited. It may please you to know that they started they are operation in the year **2010**. Over the past years, they have extended their operating and service portfolio to the recommendation of the customer, taking into account time requirements. This company applies the latest technologies and upgrades to services where necessary. This company is very expert and advanced in the field of information communication technology, where the rules of their initial occupation are a long-standing concern for our customers. Many national projects with international organizations have been completed.

1.5 Report Layout

Chapter-1: I have explained this chapter internship purpose, inspiration, goals of internship And inception to the internship company structure.

Chapter-2: I have explain this chapter about the organization & organization Structure, and also explain this company the offered and roles in job promote of Cisco Switch.

Chapter-3: I have explained & shown this chapter everyday work and activities, Event and Activities, Challenge & Router OS Etc.

Chapter- 4: I have described this chapter Conclusion & Scope for Future Career about Cisco router and Cisco Switch.

CHAPTER 2 Organization

2.1 Introduction about the company

Versatile Technology Ltd (VTL) is proud to be one of the ICT facilities and solutions that have been incorporated one-stop since July 2010. It has its own WAN infrastructure for Fiber Optics & Radio Link to serve corporate, Ip Camera, and SME and individual customers. The Institute has worked highly appreciated from all concerned with many domestic projects and international organizations. It utilizes state-of - the-art technologies and facilities upgrades wherever necessary.

The Centers Corporate Network Solution Department is able to provide a group of highly efficient technical professionals with state-of - the-art network and telecommunications solutions. VTL has a very powerful, certified and linked professional engineering and management team with Cisco, Microsoft. Through its programs and services, VTL encourages three main platforms, such as schooling, nation-building and the environment.

2.2 Product and Market Situation

Versatile Technology Ltd. They are proud to be one of the leading providers of computer networking and security services in Bangladesh. They are the most experienced ICT Company where they are the basic business ethic of long-term relationships with their customers. Looking at growth over the decade since our inception, they are extremely proud of what we have achieved and even more excited about our outlook for an equally promising future.

IT Services

- ✓ Network routing and switching
- ✓ Network administration
- \checkmark Web server administration
- ✓ System administration
- ✓ Security Engineer
- ✓ Technical support
- ✓ Senior network engineer

2.5 Organizational Structure

Organ gram Structure of Versatile Technology Ltd. shows in fig 2.1:



Figure 2.5.1: Shows Organogram of Versatile Technology Limited.

CHAPTER 3 Tasks, Projects and Activities

3.1 Daily Task and Activities

- Month 01: In the first month of the internship on Versatile Technology Limited I have learned and performed the following task:
 - Learning & understanding About Network Components.
 - Learning & understanding Basics of CCNA.
 - Understanding Router Configuration.
 - Learning & understanding Router Run Level.
- Month 2: In the first month of the internship on Versatile Technology Limited I have learned and performed the following task::
 - Router Setup
 - Router Software Setup.
 - Router Password setup
 - Earn the basic knowledge of Router configuration and IP address
- Month 3: In the first month of the internship on Versatile Technology Limited I have learned and performed the following task:
 - All kind of router configuration

3.2 Events and Activities

- Monitor and maintain network and computer systems.
- Create user accounts, passwords and permissions.
- Server and router troubleshooting.
- Local area networks and switches troubleshoot.
- Fixing flaws in the network.
- Technical support to network users.
- Day-to-day network management and tracking. Suggesting IT solutions to business problems.
- Client Support over the phone or Physical move to client Ends.

3.3 Project Task and Activities

Connecting to Cisco devices via console

Objectives:

- Connect the PC to Cisco router or switch using the blue console cable
- Execute putty and connect the cisco router or switch or switch using COM1 or PC respective COM port at the speed of 9600bps
- Power on the cisco devices and verify the console session by the watching the devices boot up on the terminal emulator.
- ✤ Identifying cisco router & switch IOS
- Identify what iOS version and feature set the cisco devices in currently running

3.3.1The textbox blew the shows the dipath of the show version command:

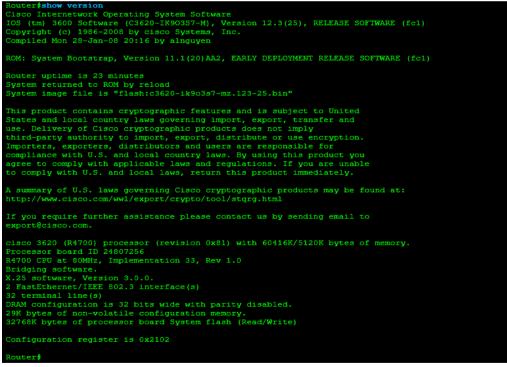


Figure 3.3.1The text box show version command.

The running iOS version is:

System image file is "flash:c3620-ik9o3s7-mz.123-25.bin"

This is the actual image file name that is currently running on the router. This image name is very helpful in identifying this IOS version and feature

3.3.2 Installing graphical network simulator v3:

Step 01: download the GNS3 all in one package.

Step 02: after have complete downloaded the installer and will be presented with installer wizard.[1]



Figure 3.3.2.1: Installation of GNS3 Software.

Step 03: after presented with the installation wizard click next to be continue.

🥝 GNS3 0.6.1 Setup 📃 🖃 💌
License Agreement Please review the license terms before installing GNS3 0.6.1.
Press Page Down to see the rest of the agreement.
GNU GENERAL PUBLIC LICENSE Version 2, June 1991
Copyright (C) 1989, 1991 Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.
Preamble
The licenses for most software are designed to take away your
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install GNS3 0.6.1.
Nullsoft Install System v2,44 — Cancel Cancel

Figure 3.3.2.2

Step 04:		
() GNS3 0.6.1 Setup		
Choose Components Choose which features of GNS3	3 0.6.1 you want to install.	
Check the components you war install. Click Next to continue.	nt to install and uncheck the con	nponents you don't want to
Select components to install:	 ✓ WinPCAP 4.0.2 ✓ Dynamips 0.2.8 RC2 ✓ Pemuwrapper 0.2.3 ✓ GNS3 	Description Position your mouse over a component to see its description.
Space required: 42.0MB		
Nullsoft Install System v2.44		
	< Back	Next > Cancel

Figure 3.3.2.3

Step 05:

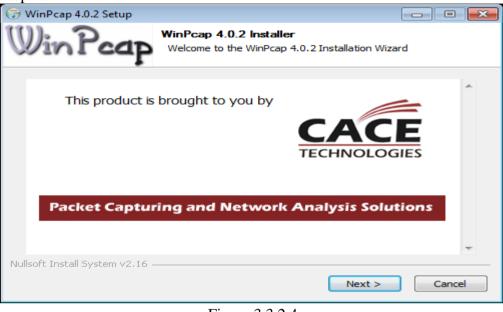


Figure 3.3.2.4

Step 06:



Figure 3.3.2.5

Step 07:

🕞 WinPcap 4.0.2 Setup	×
License Agreement Please review the license terms before installing WinPcap 4.	0.2.
Press Page Down to see the rest of the agreement.	
Copyright (c) 1999 - 2005 NetGroup, Politecnico di Torino (Italy). Copyright (c) 2005 - 2007 CACE Technologies, Davis (California). All rights reserved.	Î
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:	
 Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials 	.
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install WinPcap 4.0.2.	
Nullsoft Install System v2.16	
< Back I Agree Can	:el

Figure 3.3.2.6



Figure 3.3.2.7

3.4: Password reset:

Option 01: once booted, place yourself into privileged mode and copy the startup configure to the running program configure. Afterward, you may change the lone or enable password and write the configuration by the NVRAM by using the command.

```
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>enable
Router#copy start run
Destination filename [running-config]?
506 bytes copied in 3.868 secs (168 bytes/sec)
ARCVRSR01#configure terminal
ARCVRSR01(config) #enable secret NEWENABLEPASSWORD
ARCVRSR01(config) #line con 0
ARCVRSR01(config-if) #password NEWPASSWORD
ARCVRSR01 (config-if) #end
ARCVRSR01#copy run start
Destination filename [startup-config]?
Building configuration...
LOK1
ARCVRSR01#
```

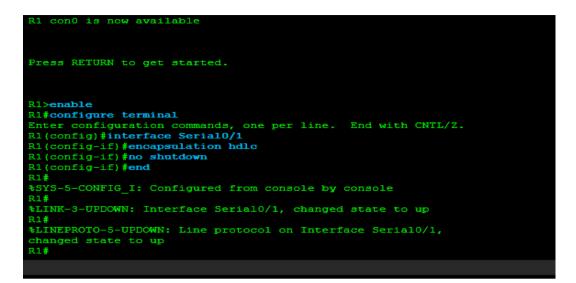
Figure 3.4.1: Password reset configuration

This the code of password reset of the any router. After reset the password then router will be ready for configuration.

3.5 Configuring wide area network links:

• Configuring point to point T1 links

Point to point links between a branch offices and headquarter site is a common architectural deployment. This tab will discuss and demonstrate the configuration of this WAN link using the PP and HDLC layer 2 protocol [2]



• Figure 3.5.1: Configuring point to point T1 links

3.5.1 Configuring point to point frame relay links

Frame relay is a legacy technology however it's still fairly common in developing nations to its simplicity and price. This lab will discuss and demonstrate how to configuration a point to point frame relay circuit.

```
R1 con0 is now available
Press RETURN to get started.
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface Serial0/0
R1(config-if) #no shutdown
R1(config-if)#
%LINK-3-UPDOWN: Interface Serial0/0, changed state to up
R1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed
state to up
R1(config-if) #encapsulation frame-relay
R1(config-if) #frame-relay interface-dlci 122
R1(config-fr-dlci) #end
R1#
$SYS-5-CONFIG I: Configured from console by console
R1#
```

3.5.2 Configuring point to point frame relay

3.5.2 Configuring point to point frame relay interface

We can configure multiple point to point sub interface using a single physical frame circuit. This type of configuration can be used hub and spoke sites where you would to keep the spokes in their own layer 3 subnet. This will be discuss and demonstrate the frame relay point to point sub-interface configuration and verification.

R1 con0 is now available
Press RETURN to get started.
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config) #interface Serial0/0.122 point-to-point
R1 (config-subif) #ip address 172.18.12.1 255.255.255.252
R1 (config subi) #frame-relay interface-dlci 122
R1(config-fr-dlci) #exit
R1(config-subif) #interface Serial0/0.123 point-to-point
R1(config-subif)#ip address 172.18.13.1 255.255.255.252
R1(config-subif)#frame-relay interface-dlci 123
R1(config-subif) #end
R1#
SYS-5-CONFIG I: Configured from console by console
R1#

Figure 3.5.2.1 Configuring point to point frame relay interface

3.5.3. Configuring point to multipoint frame relay WAN

When it come to the hub and spoke technology, that hub is most commonly deployed with a point to multipoint interface. This lab discuss and demonstrate the configuration and verification of multi-point frame relay interface.

R1 con0 is now available
Press RETURN to get started.
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface Serial0/0
R1 (config-if) #frame-relay map ip 10.54.123.2 122 broadcast
R1(config-if) #frame-relay map ip 10.54.123.3 123 broadcast
R1(config-if) #end
R1#
<pre>\$SYS-5-CONFIG I: Configured from console by console</pre>
R1#

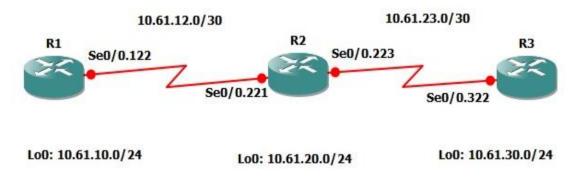
Figure: 3.5.3.1 Configuring point to multipoint frame relay

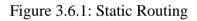
3.6 Configuring the static routing

In the event that you intend to turn into a CCNA, at that point you better arrangement on understanding Static steering. Static steering is a center innovation that any system specialist must get it. It's the capacity to statically design a course from one machine to a system with the following travel way bounce to get to that arrange. [1]

Example:

instance If switch R1 is associated with system 10.61.10.0/24 and PC's on that system need to get to the 10.61.30.0/24 arrange then R1 must know where what switch to send that traffic to that is neighborhood to R1 that can achieve that system





3.7 Code of configuring static routing:

R1#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R1(config)#ip route 10.61.20.0 255.255.255.0 10.61.12.2 R1(config)#end R1#

R2#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R2(config)#ip route 10.61.10.0 255.255.255.0 10.61.12.1 R2(config)#end R2#

Figure 3.7.1: Static routing Configuration Code

3.8 Configuring routing information protocol (RIP):

Routing information protocol known as RIP is a fairly simplistic dynamic routing protocol which can be deployed in a matter of minutes. This lab will discuss and demonstrate the configuration and verification of basic implementation. So the big question of maintains of big network? It might be a static routing cam maintains of big network. If question is you have over 500+ subnets and 50+ router how maintain the network. This is the simple answer, you don't. Of course we can but we would have to maintain hundreds of static routing of static routing if anything wrong any network then we need must new routing.

So we can easily use to the wonderful world of dynamic routing protocol. Routing protocol RIP will be the first of 3 dynamic routing protocol you must knowns CCNA engineering. RIP was deployed in 1982 due to the include of the it's code in the BSD 4.2 UNIX OS then few years later, June 1988 became of an IFT standard. Rip Replaced GGP (Gateway to Gateway) which is protocol we will be hear about again as tit's long gone and turns into such. [1]

3.8.1 Code of Routing Information Protocol Configuration:

R1#show run inc ip route
ip route 10.70.20.0 255.255.255.0 10.70.12.2
ip route 10.70.20.0 255.255.255.0 10.70.21.2 200
ip route 10.70.30.0 255.255.255.0 10.70.12.2
ip route 10.70.30.0 255.255.255.0 10.70.21.2 200
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#no ip route 10.70.20.0 255.255.255.0 10.70.12.2
R1(config)#no ip route 10.70.20.0 255.255.255.0 10.70.21.2 200
R1(config)#no ip route 10.70.30.0 255.255.255.0 10.70.12.2
R1(config)#no ip route 10.70.30.0 255.255.255.0 10.70.21.2 200
R1(config)#end
R1#

Figure: 3.8.1 Code of RIP configuration

3.9 Configuration of RIPv1 and RIPv2

There are two version of RIP first one is RIP version-1 and second one is RIP version-

2. I used the RIPv2

3.9.1Code of RIPv2:

R1>enable R1#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R1(config)#router rip R1(config-router)#version 2 R1(config-router)#end R1#

Figure: 3.9.1.1 RIP V2 configuration

And R12 router

R2>enable R2#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R2(config)#router rip R2(config-router)#version 2 R2(config-router)#end R2#

3.10 Configuring open short path first:

OSPF is the business standard in interior dynamic directing conventions and it's bolstered on almost all merchant stages. So what makes OSPF so exceptional? It's extremely the usefulness and the various leveled nature of the convention in which it fits impeccably with present day systems. [2]

3.10.1Types of OSPF:

Non- Broadcast:

- The Non- Broadcast system type is the default for OSPF empowered edge transfer physical interfaces.
- Non- Broadcast systems requires the arrangement of static neighbors; his are sent by means of unicast.
- The Non- Broadcast system type has a 30 second hi and 120 second dead clock.
- An OSPF Non- Broadcast system type requires the utilization of a DR/BDR [1]

Broadcast:

- The Broadcast system type is the default for an OSPF empowered Ethernet interface.
- The Broadcast system type necessitates that a connection bolster Layer 2 Broadcast abilities.
- The Broadcast system type has a 10 second hi and 40 second dead clock.
- An OSPF Broadcast system type requires the utilization of a DR/BDR. [1]

Point-to-Point

- A Point-to-Point OSPF system type does not keep up a DR/BDR relationship.
- The Point-to-Point system type has a 10 second hi and 40 second dead clock.
- Point-to-Point system types are planned to be utilized between 2 straightforwardly associated switches. [1]

Point-to-Multipoint

- OSPF treats Point-to-Multipoint arranges as a group of point-to-point joins.
- Point-to-Multipoint systems don't keep up a DR/BDR relationship.
- Point-to-Multipoint systems publicize a hot course for all the casing hand-off endpoints.

• The Point-to-Multipoint system type has a 30 second hi and 120 second dead clock. [1]

Point-to-Multipoint Non- Broadcast:

- Same as Point-to-Multipoint yet requires static neighbors. Utilized on Noncommunicate layer 2 topologies.
- Enables you to characterize connection cost on a for each neighbor premise.[1]

3.10.2Configuration of OSPF Routing:

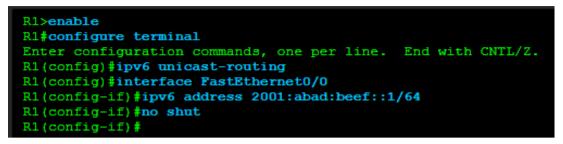
Return the OSPF interface type its default on R1, R2, R4 and R5's edge hand-off center and talked interfaces:



<pre>R2>enable R2#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R2(config)#interface SerialO/O R2(config-if)#no ip ospf network R2(config-if)#end R2#</pre>
R4>enable R4#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R4(config)#interface SerialO/O R4(config-if)#no ip ospf network R4(config-if)#end R4#
R5>enable R5#configure terminal Enter configuration commands, one per line. End with CNTL/Z. R5(config)#interface SerialO/O R5(config-if)#no ip ospf network R5(config-if)#end R5#

Figure 3.10.2.1: Code of OSPF routing configuration

3.11 Configure the ipV6:



Design R2's FastEthernet0/0 interface to auto configure its IPv6 worldwide one of a kind unicast address, hold up a couple of minutes and confirm that this interfaces auto arranges a worldwide novel IPv6 address.

R2>enable	
R2#configure terminal	
Enter configuration commands, one per line. End with CNTL/Z.	
R2(config)#interface FastEthernet0/0	
R2(config-if)#ipv6 address autoconfig	
R2(config-if) #no shut	
R2(config-if) #end	
R2#	
R2#show ipv6 interface FastEthernet0/0	
FastEthernet0/0 is up, line protocol is up	
IPv6 is enabled, link-local address is FE80::C800:7FF:FE14:8	
No Virtual link-local address(es):	
Description: ### LINK TO LAN ###	
Stateless address autoconfig enabled	
Global unicast address(es):	
2001:ABAD:BEEF:0:C800:7FF:FE14:8, subnet is 2001:ABAD:BEEF::/64	
[EUI/CAL/PRE]	
valid lifetime 2591992 preferred lifetime 604792	
Joined group address(es):	
FF02::1	
FF02::2	
FF02::1:FF14:8	
MTU is 1500 bytes	
ICMP error messages limited to one every 100 milliseconds	
ICMP redirects are enabled	
ICMP unreachables are sent	
ND DAD is enabled, number of DAD attempts: 1	
ND reachable time is 30000 milliseconds (using 37387)	
ND advertised reachable time is 0 (unspecified)	
ND advertised retransmit interval is 0 (unspecified)	
ND router advertisements are sent every 200 seconds	
ND router advertisements live for 1800 seconds	
ND advertised default router preference is Medium	
Hosts use stateless autoconfig for addresses.	

Figure: 3.11.1 Configuration of IPV6

CHAPTER 4 Conclusion and Future Career

4.1 Discussion and Conclusion

Reviewing this internship has been a wonderful and rewarding experience. I've seen the future, and I'm going to be able to help me with the opportunity to network with a lot of people to confirm that. Through this internship, I have learned that one of the main issues is time management skills and self-motivation. My internship is basically a course based. I have a three-day internship in a week. The duration of each day was four hours. The name of my internship company was Versatile Technology Ltd. I have had special experience, every Versatile Technology Ltd trainer is very helpful and friendly. They're helping me a lot. I attend every class and practical work at home. If I have any problems, get help on YouTube. In this internship, I'm learning how to build a career in CCNA Computer Networking. It was a wonderful experience, and I hope the other intern got a lot out of it!

4.2 Scope for Further Career

These internship goals provide a clear theory about ISP .this internship knowledge also provide any corporate office Network Diagram designing and it also configuring system. IT section has big opportunities available for the big number of students who want to work in this field, CCNA Course not only improves your information and skill but also a path to success. It implies that once your resume features a CCNA certificate course by a licensed and authorized cisco learning center like Networks Guru, the best international corporations would be glad to have you onboard.

Appendices

> Appendix A: Internship Reflection

The main goal of my internship in a professional environment is to apply the expertise acquired in the classroom, practical solutions to real-world issues. And abilities and interactions in a professional environment that are resourcefully important, learning to handle fresh information, abilities, and capacity to decide how to sharpen and create plans. Add additional professional supervisors and professional interactions to the network. I am a professional on - the-ground contact with customers and professional managers and other employees to learn from behavioral knowledge and interaction gain. I carry out the correct company procedures to meet the responsibilities of my internship. I am the organization's mission / vision, how to communicate with the social group, how to share authority, how to structure it, how to make choices, how to understand a professional organization. The evaluation of my internship manager at the end and the internship experience during personality conferences provide a chance to take a professional view. Experience preparing for life in a worldwide community, management and service, my gift of being talented to use it.

Head Office	-
Head Office	1
Name	Versatile technology Ltd Limited
Address	129 Banker's Row west Nakhalpara, Tejgaon Dhaka-1215
Telephone	02-91
Fax	880-2-8116103
E-mail	vtl.bd@gmailcom
Website	www.versatiletechbd.com
Type of Organization	(Digital multimedia & computer networking
	& security)
Employees	12

\triangleright	Appendix B:	Company Detail
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