

Cisco Networking & System Administrator for Linux Based Server

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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APPROVAL

This Project/internship titled CISCO NETWORKING & SYSTEM ADMINISTRATOR FOR LINUX BASED SERVER, submitted by MD ARIF HOSSAIN, ID No: 173-15-10274 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 27-01-2021.

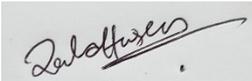
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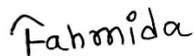
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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Ms. Fahmida Afrin, Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

This Internship represents an organizational hand on experience in Networking and Security. The main objective of the report is a summary of gaining knowledge and practical working experience about Network Device & Server configuration and maintenance for the IT Department at Amin Mohammad Group. For any kind of user requirement in the organization, I have to work with many different Network Devices such as Switches, Router, Firewall, Wireless Access Point, Media Converter, Gateway, etc. Also for a different kind of service, I have to work with Servers like DNS, MAIL, PROXY, WEB, DATABASE, etc. Working with Amin Mohammad Group is a great experience in Configure and Troubleshoot problems in Network Devices and Servers. In there I got a chance to gather knowledge to deal with a technical problem and give a smart solution with my skill. In my internship period, there are many things I achieved from the organization and I think in the future it will help me to work with any other organization professionally.

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CHAPTER 1

INTRODUCTION

1.1 Introduction:

Nowadays every device is connected through Networking. All type of communication and every data transfer on the internet is a part of Computer Networking. All of the things can do on the internet as Accounts Transaction or Fund Transfer, Weather Update and many more happening in just a few seconds. For this type of communication, there is a need to be strong data connectivity and Powerful Bandwidth of Internet Connection. To use this technology people, need some support from Experts who have deep knowledge about Information Technology. Because A system needs to be monitored and maintained all the time for better performance and to stealthy. Also, a lot of attack from hacker can interrupt the daily basis work on an organization System which need to analysis, detect, and prevent the system by IT Expert. In one way we can say an IT person's responsibility is to secure and maintain the System and Network Devices of an Organization. Internship on computer networking focused on how to maintenance and face troubleshooting for network devices.

1.2 Motivation:

Computer Networking has become the most important part of our life. we cannot think about our daily communication without any social platform and all those social platforms connected via networking. Now without the right networking of a system, it cannot work properly, and also it needs to be maintained regularly. because networking devices and system servers cannot be worked alone and they need instruction, security, monitoring, and maintenance by an Administrator (Network or System). working in IT can be more challenging than it looks, cause any disaster can make it worse for an Engineer.

Through Computer networking, not just some computer devices connected here, there are a lot of devices (or nodes) like Laptop, Printer, IP Camera, IP Phone, Smart Door Lock System, many kinds of Servers. So for an organization more or, fewer devices can be connected in the network and all devices in the network should be working fine. This is the primary responsibility of the IT department. Here I got my motivation for an internship working with IT to become a Network Administrator. As a Network

Administrator there some responsibilities like Monitoring NOC, ensure the security of the device in the network, and many more. and that responsibility highly motivates me to work in IT. so that my Internship can be more useful when I use my skill and knowledge to implement in the organization and make me more compatible for my future career.

1.3 Internship Objective:

Information Technology has become more helpful to business growth and it's evolving day by day. Technologies using smart devices for networking and security to share information efficiently. Devices like router, wireless Access Point, controller, switch, firewall, gateway are the main focal point in my Internship. That device has some features which are done by the manufacturer like CISCO, MIKROTIK, DELL, etc. This internship is gone through our knowledge of what and how the device can perform in the real world. The Main Goals are following-

- Achieving Knowledge about Networking Devices like a router, switch, firewall, gateway, etc.
- Design a Network like LAN, MAN, and also WAN for Large Organization.
- Installation and Maintenances of Networking Devices.
- Configure and Monitoring System Server through Networking.
- Establishing Connectivity to Remote from Head Office.
- To Secure the network for any private data transmission from one office to another via VPN.
- Conceive the knowledge about Server Administration as per needed in the organization.

1.4 Introduction to The company:

As per my objective of Networking and security to build my knowledge and skill I choose my internship with Amin Mohammad Group under the IT Department. This organization has done many businesses like real estate, development, and telecommunication through activities of Information Technology.

The IT department of this organization heavily relies on it to get sharing data and important information across essential channels. There is an overall 50 plus project over the nationwide and online activity maintained by the IT department. All the projects are

covered by CCTV and the organization has its Own Network Data connectivity over all the Bangladesh through different ISP providers. The Company's business work process is also done in Enterprise Resource Management System which also develops and maintained by IT & MIS.

1.5 Report Layout:

The first chapter of this report shows networking and security Introduction and motivation of this internship and also objective, the introduction of company is briefly discussed.

In the second chapter for the organization introduction, about product and market, target group, swot analysis, and the organization structure.

In chapter three shown the organization's tasks and activities during the Internship period. Also, discuss their device and equipment for providing services.

In chapter four discussed the proposed networking and security structure. Also shown situation based proposal or plan suggested for implementing the best solution to achieve the organization goal.

In chapter five shows performance, results, and also discussion about internship conclusion.

CHAPTER 2

ORGANIZATION

2.1 Introduction:

As an internship for Networking and security, I have joined the IT Department of Amin Mohammad Group. Besides every other Organization, I choose Amin Mohammad Group because this organization has a good environment for learning my required skills. The Company has many activities through information technology like High Bandwidth Internet Connection with Redundancy, Enterprise Resource Management System, Wi-Fi Coverage for whole H/O office, All Project under Data connectivity, CCTV coverage for all offices and playback from anywhere, Network Area Storage for dynamically backup files, VPS Hosting Mail Server, etc. To ensure maximum efficiency and productivity for the organization the management has taken all over the thing to the digital system. There are different kind of servers which has used for a different purpose, those servers are Zimbra Mail, Apache, SQL, DNS, AD, Cache, ERP, Hosting, Antivirus, etc. The whole organization network is secured and it has good management for building the organization and its people career.

2.2 Product and Market Situation:

As for the different type of Network user's requirement and remote location servers Amin Mohammad Group have using updated technology. In my internship period, I have work with many devices for networking as storage, the network for a wireless system which is manufactured by a different company, and the product has a smart feature for any kind of task. Networking Devices of Cisco, Mikrotik, Sophos, Juniper, Qsan are essential technology solutions for the organization. Networking devices also include inexpensive setups to anywhere and maximum utilization of available resources done within any time.

There also Servers manufacture by Dell, Hp, IBM that are deliberately used for multipurpose. The servers are customized for services and privileged with security to protect them from any kind of outsider. Information Technologies has to face some real issue into the global market, the new product is always being updated and a new version of any software or application need to be also updated. The more an IT Engineer of an organization updates his system with global the more they will be a chance to survive in any situation.

2.3 Target Group:

The Organization always need to be set a group of targets and need to accomplish the targets with all dedication. In my internship organization, all of the targets were distributed to every level of management employee. As per the IT department, the targets are to accomplish more with technologies to future.

2.4 SWOT Analysis:

By SWOT analysis a business can have more development than before. SWOT analysis means that a company's four things which are strengths, weaknesses, opportunities, and threats. The main objective of this analysis is making a business decision to help the organization develop a full awareness of all the factors involved. I have to use swot analysis for my internship company to recommendations and strategies, focusing on leverage strengths and discover opportunities to overcome weaknesses and threats.

2.5 Organizational Structure:

An Organization Structure is said to be a structured system where a hierarchy is run within an organization. There can be any type of structure we can see in an organization. My Internship Organization also has and structure from Top Management to officer positions which are given below.

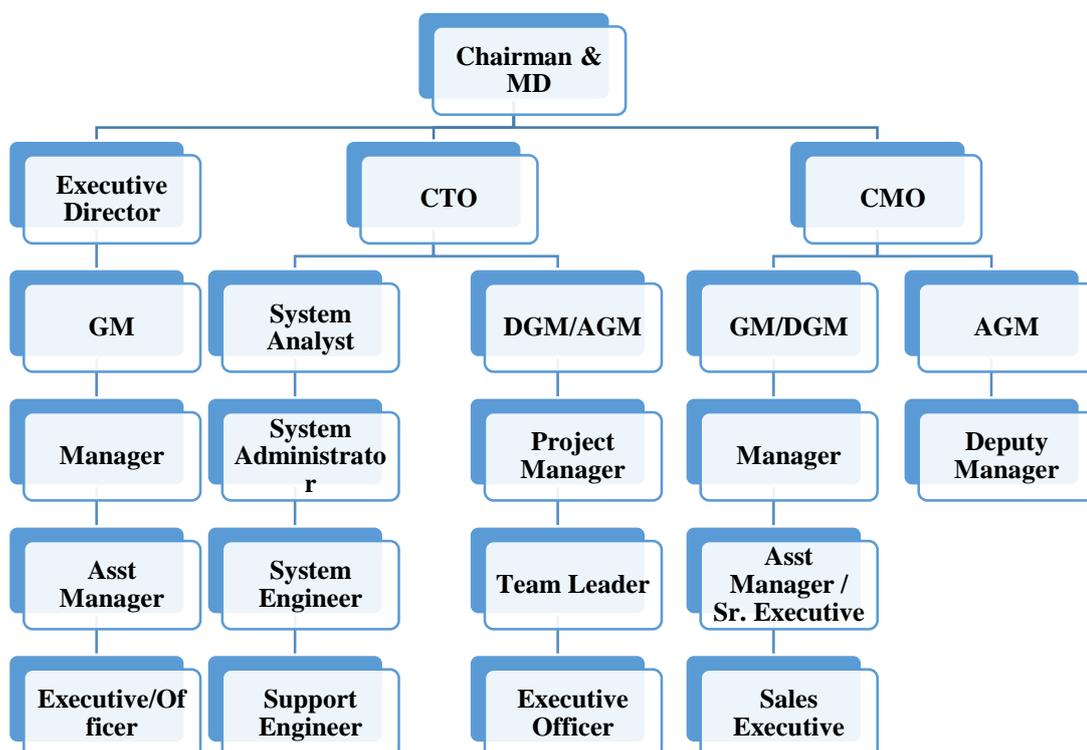


Figure 1 : Organizational Structure

CHAPTER 3

TASK, PROJECT AND ACTIVITIES

3.1 Daily Task and Activities:

An organization has some daily routine of work that needs to do on scheduled time. The management of the organization has distributed work to every Department. As like as IT department has dedicated task, activities for team members.

As for four months of internship in the IT department, I also have to work on the daily task, activities as given by my instructor. My daily task was given weekly so I can gain my knowledge and implement skills to the work step by step. Some activities when feel to be difficult to me then my Instructor show me how to make the best decision at that time. Also in my internship period, I have learned how to complete given tasks and activities and report to the instructor daily. As per my Four-month internship period, I have participated in daily task and activities which are given below:

3.1.1 First month of my internship I have learned about basic fundamental along with lot of orientation and I have performed many tasks under the IT Dept. of Amin Mohammad group which are briefly mention in following:

3.1.1.1 Network Components that used in the organization

In Computer Networking there is lot of device used in different topology for an organization purpose. The components are mostly manageable so that engineer can customize as per organization requirement. As an internship to the organization I learned when and where which device we need to use for computer networking. In the

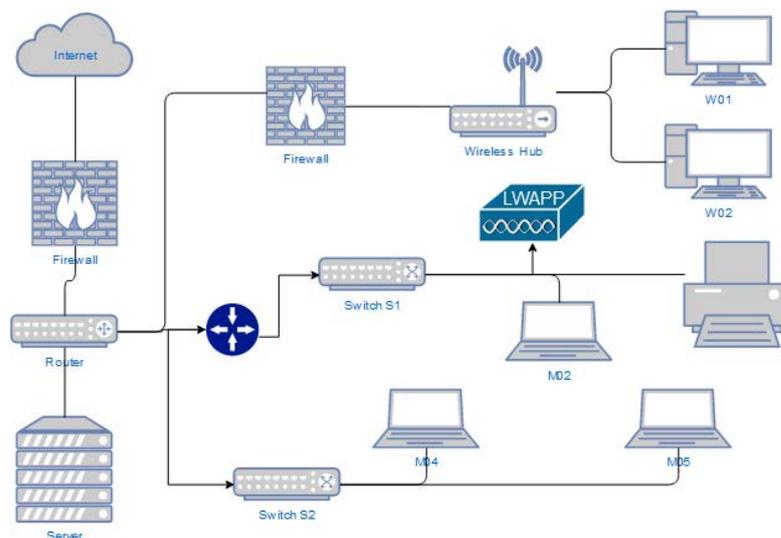


Figure 2: Computer Networking Components

following I have demonstrated a short summary for the components that I have work with:

- **SWITCH:** Switch is a multiport bridge along with a buffer that has working in data link layer in the OSI model. It's mainly forward the data one to another, in the transmission of data it can check error.
- **ROUTER:** Router is a device similar feature like switch that work in the network layer in the OSI model. Routers can transfer data from one network to another using routing protocol.
- **GATEWAY:** Gateway can work in any network layer and its more than advance from router or switch. It's mainly work like transfer the data from one system model after interpret it then it sends it to another system.
- **FIREWALL:** Firewall is a security device or software that uses for network security and protect private network from any kind of breach which means unauthorized access.
- **Wireless Access Point:** Wireless AP is a device that creates a WLAN aka wireless local area network. Its create a portal for the user to the network through wireless connection using. In the other side all the AP are connected to a switch or router.

3.1.1.2 Networking Media

In Computer Networking the transmission media is the pathway for data transmission in a network. We have used different types of cable or media to transmit data. There are two type of transmission media one is bound transmission media which is cable or physical existence and another one is unbound transmission media which without cable using microwave or radio wave. In my internship company we have seen the uses of this media in many sites for computer networking.

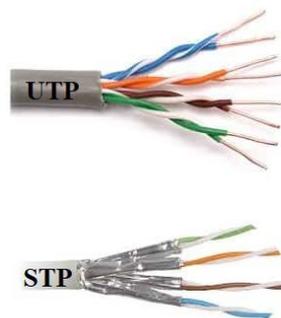


Figure 3: UTP & STP

Twisted Pair Cables: Twisted pair cable is two types; Unshielded and shielded. STP is protected against electromagnetic interference(EMI) and UTP is not shielded against

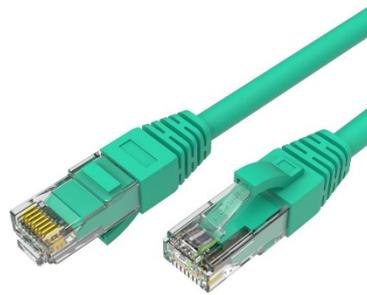


Figure 4: RJ 45 Connector

EMI.

Co-axial Cable: Co-axial cable is a solid central conductor surrounded by insulating materials and along with woven of cylindered shield of fine wires. It has broader bandwidth and used for audio, video data transmission.

Fiber-Optics Cable: Fiber optics cable using its photons to transmit data, it is covered with protected shield of central glass tube. Its free from EMI as well as wiretapping.

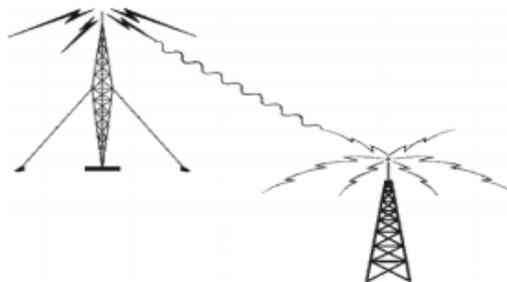


Figure 5: Radio Wave

Radio Wave: Radio Waves transmit the data in process of a single or multiple frequency.

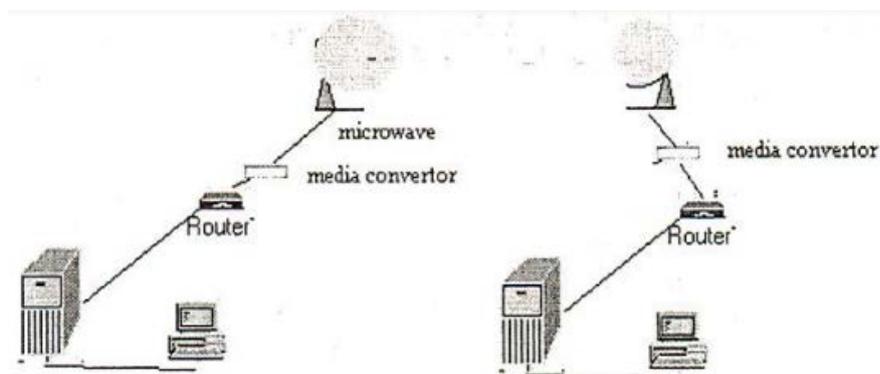


Figure 6 Micro Wave

Microwave: It has higher frequency than radio waves and it can handle large amounts of data.

Infra-Red: Infra-red communication uses light like fiber cable which offer great unbound photonic solution.

3.1.1.3 Understanding TCP/IP Protocol and Ip Address Subnetting

In computer Networking TCP/IP (Transmission Control Protocol/Internet Protocol) is used to interconnect network devices on the internet. it also used in a private computer network and it known as a communication protocol suit. The entire internet protocol suit is a set of rules and procedures is defined as TCP/IP, these are the two main protocol beside many others.

Table 1: Demonstrating TCP/IP Layer & Protocol in different Layers

Application	HTTP	FTP	TELNET	SMTP	DNS
Transport	TCP			UDP	
Network	IP		ARP	ICMP	IGMP
Network Interface	Ethernet	Token Ring		Other Link-Layer Protocols	

3.1.1.4 L2 and L3 Switches and Switching concept

I have learned various features and application of switches at L2 and L3 of the OSI Model. The basic concept of the L2 or Layer 2 switches use mac address and the L3 or Layer 3 switch uses routing algorithm. I will demonstrate the concept of L2 and L3 switches with basic functionality.

Table 2: Functional Different Between Computer Network Switch Layer 2 & Layer 3

L2 Switch	L3 Switch
It's basically operated on Data Link Layer (Layer 2) of OSI Model	It's operated on Network Layer (Layer 3) of OSI Model
On the basis of MAC address it send frames to destination	Using ip address routing the packet to destination
L2 switch only work with MAC address	It has combine feature of L2 and L3
L2 Switch has single broadcast domain	L3 has multiple broadcast domain
Communication happens within network	Communication happens within or outside network.

Next-Generation Firewalls and IPS

A Next-Generation Firewall (NGFW) provides network security, functions with intrusion detection (IDS) and intrusion prevention system (IPS). It's part of third generation firewall technology. Also next generation firewall includes like Application and User Control and it also has Advanced malware detection such as sandboxing.

3.1.2 In the 2nd month of my internship I have learned and gained my skill about the equipment and infrastructure of entire network that used in an organization. This section I have described that how an IT Engineer fulfill its daily task and activities on Cisco Devices like switch, router etc.

Know about VLAN and Configure VLAN

In this task I have configure VLAN in cisco switch. Before configuring VLAN we need to understand the value of this. VLAN needed when there is multiple sub network and different activities to apart from each other, like an organization department has different activities.

Step 1: Now from the switch console cable we can enter its Command Line Interface

```
Switch# configure terminal
```

(CLI) so we configure VLAN. Now write command for enter into config mode

```
Switch(config)#
```

```
(config)# line console 0
```

```
(config-line)# password :
```

```
(config-line)# login
```

```
(config-line)# exit
```

Step 2: Then we will configure a line console password for security purpose.

Step 3: Given command is for VLAN setup for specific Department or Identity (name)

```
(config)# vlan 2
```

```
(config-vlan)# name
```

```
(config-vlan)# exit
```

```
(config)# interface range fe 0/1-2
```

```
(config-if-range)# switchport mode access
```

```
(config-if-range)# switchport access vlan 2
```

```
(config-if-range)# exit
```

```
(config)# interface range fe 0/3-4
```

```
(config-if-range)# switchport mode access
```

```
(config-if-range)# switchport access vlan 3
```

```
(config-if-range)# exit
```

Step 4: After VLAN specified we can assign the interface port or interface range to the

VLAN

3.1.3 In the Month Three I have gained very important part of my internship. In this section I have discussed about Linux server and demonstrate about its very basic part. Also the following part will be seen as step by step.

- Introduction of LINUX kernel.
- Installation of Linux CentOS 8.
- Managing User Accounts and passwords.
- User and Group Add and Modification.
- File and Directory creating, Control, and permission.
- Ownership, Group and User Permission.
- ACL Permission Configuration.

3.1.3.1 Introduction of Linux Kernel and Centos 8 Installation

The Linux kernel is a free software (also call open source), it has multitasking similar as Unix OS kernel. It is the main component of Linux operating system and its the core

interface between a computer hardware and its process. Linus Torvalds first created and introduce the concept in 1991. Linux kernel operating system is called Linux distribution that provided free.

CentOS is a community supported platform Linux distribution that compatible for its upstream source with Red Hat Enterprise Linux (RHEL).

Most of the software is free and open source software available in internet both as compiled binaries and in source code which allow to modification to the original software.

Now Centos 8 Installation can be done by two methods, one in personal computer either duel boot or single and other one is at virtual machine application like Oracle Virtual box or in VMware workstation. I am using VMware workstation pro 15 for installing Centos 8.

Installation Process > After system completed loading the boot media, the boot menu will display Grand Unified Bootloader (**GRUB2**). Then using arrow key to selecting the **Install Centos 8** option and press **Enter**.

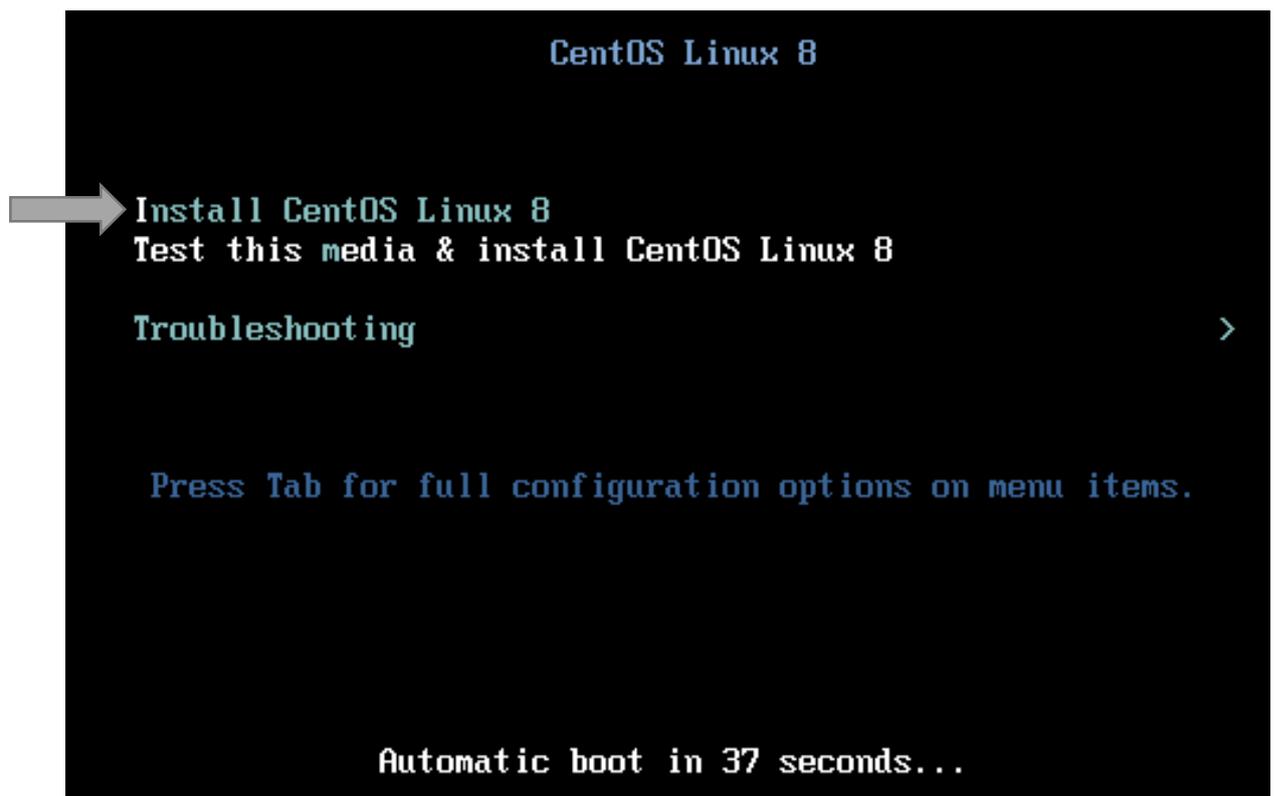


Figure 7: CentOS 8 Installation



Figure 8: CentOS 8 Installation Summary

Now from the **Installation Summary** need to configure installation source, software selection and finally partition the hard disc.

In Localization **Keyboard** will set as English(US), **Language** as English(US), **Time & Date** Time zone will be **Asia/Dhaka**.

In software selection I am selecting the **Server with GUI** >

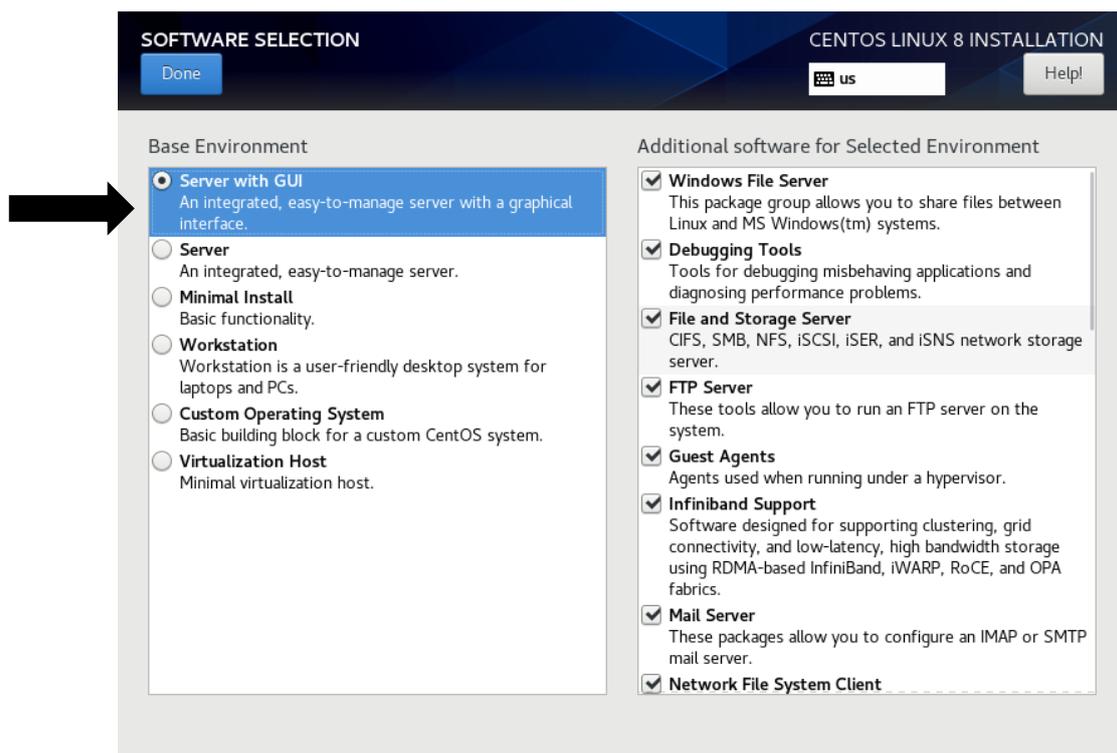


Figure 09: Software Selection

Manual Partitioning >

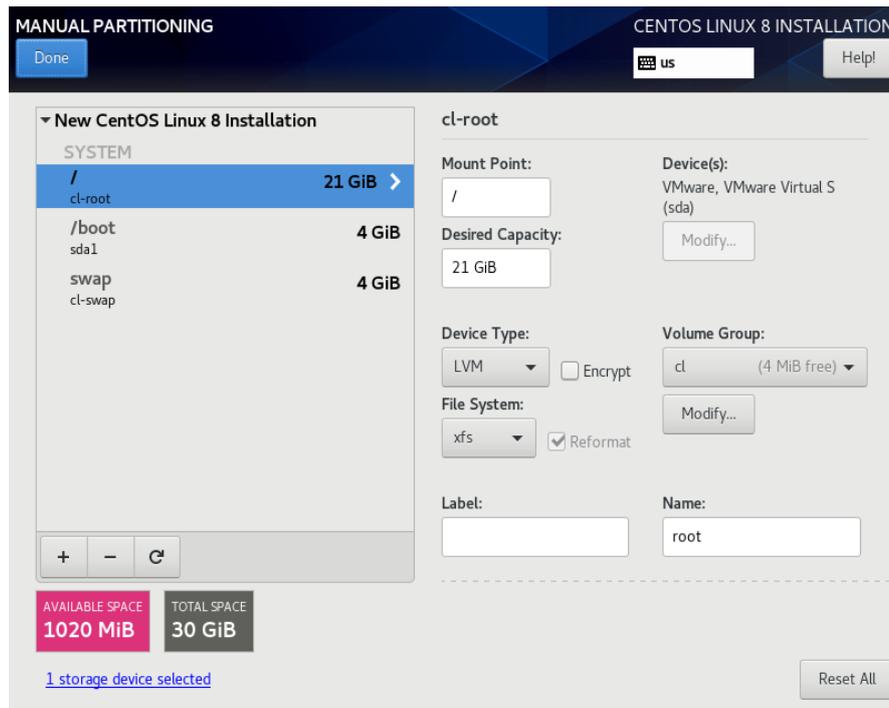


Figure 10: Manual Partition

User Create & root password set >

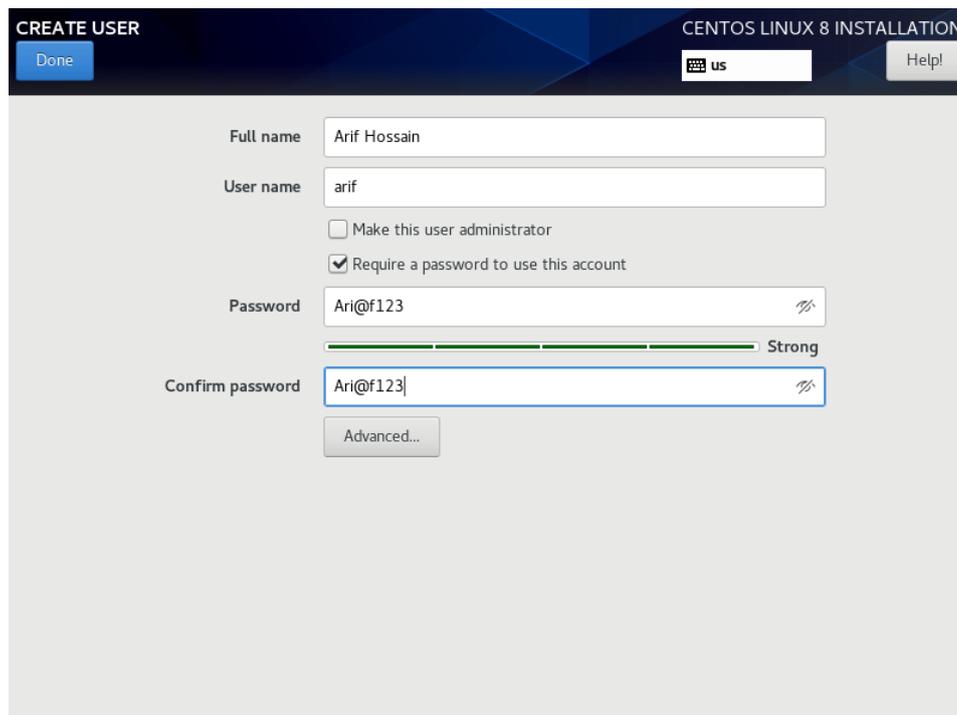


Figure 11: User & Password Creation

Begin Installation>

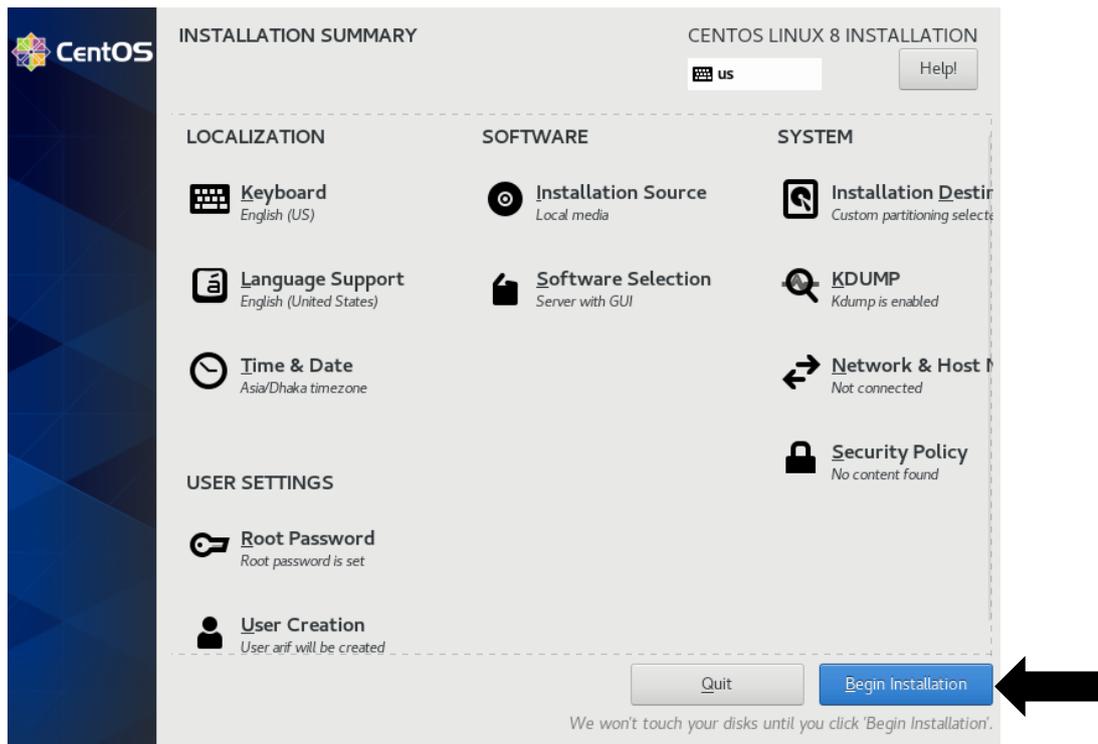


Figure 12: Installation Begin

Centos 8 Login Screen > Installation Process has been complete



Figure 13: Login Screen of CentOS 8

3.1.4 In the Month Four of my internship I have learned the Apache Web server. This server has various type of configuration and most of Web server we see are based on this. I have demonstrated step by step my learning things in following.

- Installing and Configuring Apache Webserver on CentOS 8
- Checking Webserver
- Managing Apache Process
- virtual Hosting on the server.
- Adjusting SELinux Permissions.

3.1.4.1 Installing Apache Webserver

CentOS software or package repositories by default available name Apache, **dnf** the software package manager that provides the install, remove or updates are needed for packages based on rpm.

The installation command for http server: `root@amgbd ~]# dnf install httpd`

- For secure http service we need open up the HTTPS **443 port** permanently.
- into effect the new rules firewall need to **reload**

```
[root@amgbd ~]# firewall-cmd --permanent --add-service=https
success
```

```
[root@amgbd ~]# firewall-cmd --reload
success
```

3.1.4.2 Checking Web Server status

Initially the web service (httpd) does not start its process after the installation. So we will start the httpd process with following command by manually:

```
[root@amgbd ~]# systemctl start httpd
[root@amgbd ~]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Mon 2020-12-28 23:42:47 +06; 10s ago
     Docs: man:httpd.service(8)
   Main PID: 12295 (httpd)
   Status: "Running, listening on: port 80"
```

By default, its disabled

- Also on CentOS start the httpd.service stayed disabled. We need to enable it for by default start the process on OS start:
- The status after enabled the httpd service

```
[root@amgbd ~]# systemctl enable httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor prese
   Active: active (running) since Mon 2020-12-28 23:58:43 +06; 30s ago
```

Now with the ip address <http://192.168.122.1> of server's it shows default index of CentOS 8 an Test web page:

3.1.4.3 Managing Webserver

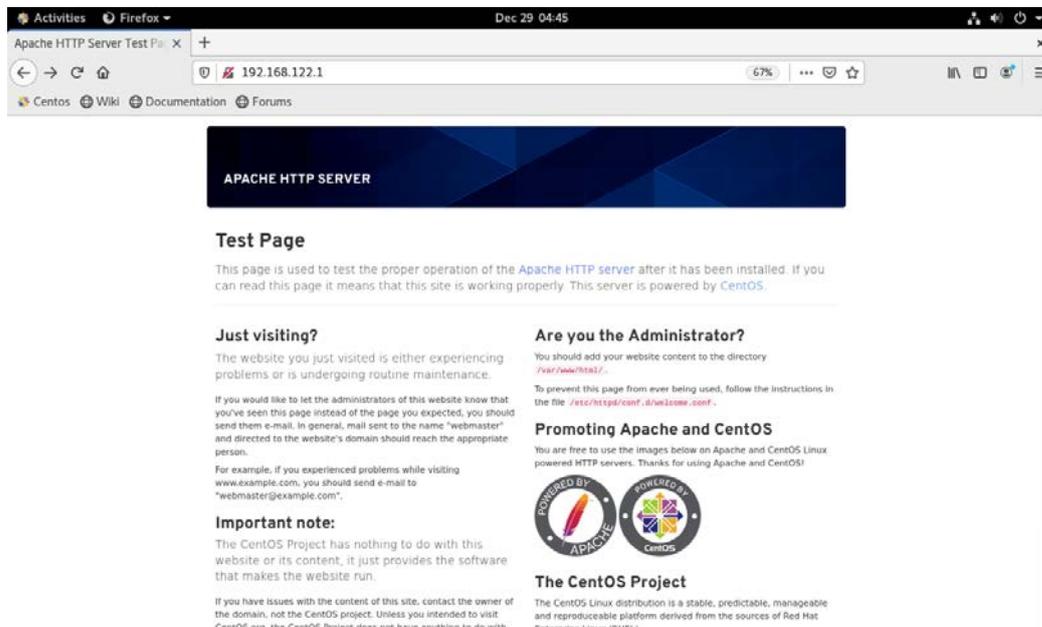


Figure 14: HTTP Web Server view

Apache configuration files structure and how to Manage it as a System Administrator.

- Directory has the All Apache configuration files.
- Although the main configuration file of Apache is here
- Configuration files end with .conf which located in the directory and it contain

3.1.4.4 Virtual Hosting for Webserver

We can use virtual hosts to encapsulate configuration details and from a single a server we can host more than one. Now I am setup up a domain called `amgitbd.com`

as we know by default one virtual host is enabled in which is configured to the directory. `/var/www/html/` It can work as well for one single site, but it can be difficult for hosting more than several websites.

Instead of modifying `/var/www/html/` here we are making new directory within `/var/www` for the web as `amgitbd.com` website, `/var/www/html/`

unchanging the directory as it is will be default so if a request from any other site won't match.

Creating the html for `amgitbd.com` directory as follows

```
[root@amgitbd ~]# mkdir -p /var/www/amgitbd.com/log
```

Creating the log for domain as an store log log for the site:

```
[root@amgitbd ~]# mkdir -p /var/www/amgitbd.com/html
```

Then need to assign ownership for html directory with `$root` environmental variable

```
chown -R root:root /var/www/amgitbd.com/html
```

Default permission for root, so it can access web

```
chmod -R 755 /var/www
```

Then using vi editor, creating as a sample for index.html page.

```
root@amgitbd ~]# vi /var/www/amgitbd.com/html/index.html
```

in INSERT mode of vi Editor we are going to add the following html code:

```
<html>
<head>
  <title>Welcome to amgitbd.com!</title>
</head>
<body>
  <h1>Success!
      The amgitbd.com
          virtual host is working!
</h1>
<h2>All right reserve to Md. Arif Hossain</h2>
</body>
</html>
```

by a **sites-available** as a directory it will uses for store the virtual host **conf** files.

And also need to making **site-enabled** directory so that it can acknowledged the server that it'll be serve by a virtual host to the given visitor. Now as for virtual host to publish a symbolic links will hold for the directory of the **sites-enabled**.

```
mkdir /etc/httpd/sites-available /etc/httpd/sites-enabled
```

Then web service need to look for virtual hosts which is situated at the **sites-enabled** directory. To gain this, we need to include the command in main config of Apache's using vi editor.

```
[root@amgitbd ~]# vi /etc/httpd/conf/httpd.conf
```

Now in vi Editor we will insert the command at end of the file as follows:

```
# Supplemental configuration
#
# Load config files in the "/etc/httpd/conf.d" directory, if any.
IncludeOptional conf.d/*.conf
IncludeOptional sites-enabled/*.conf
```

After saving the file we have virtual host directory in place and finally we need to create the virtual host file. So we will create the file in **sites-available** directory:

And then we have to define and show our domain configuration directories and files path into the **.conf** file. As for documents which publicly accessible by root directly

```
# vi /etc/httpd/sites-available/amgitbd.com.conf
```

should be acknowledge by web server. And it will also tell the server as in where the particular site log for error and request are located:

```
<VirtualHost *:80>
  ServerName www.amgitbd.com
  ServerAlias amgitbd.com
  DocumentRoot /var/www/amgitbd.com/html
  ErrorLog /var/www/amgitbd.com/log/error.log
  CustomLog /var/www/amgitbd.com/log/requests.log combined
</VirtualHost>
```

The virtual host file now need to enable so that apache knows that its ready for serving to them. For every virtual host that are in sites-enabled directory that we need to create a symbolic link:

```
# ln -s /etc/httpd/sites-available/amgitbd.com /etc/httpd/sites-enabled/amgitbd
```

3.1.4.5 Adjusting the SELinux Permission

SELinux is a kernel security module. We use it for heightened the security for any Linux System. SELinux is configured by default to operate it's process the web service with default config on CentOS.

For setting up a custom made log directory in the virtual hosts configuration file the default configuration has been changed. For that reason, we will get error in attempting of Starting the httpd. Determine this, we can allow the required files by updating the SELinux policies.

```
[arif@amgitbd ~]$ systemctl status httpd
● httpd.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; e>
  Active: failed (Result: exit-code) since Tue 2020-12-29 >
  Docs: man:httpd.service(8)
  Process: 1422 ExecStart=/usr/sbin/httpd $OPTIONS -DFOREGR>
  Main PID: 1422 (code=exited, status=1/FAILURE)
```

SELinux permit to change its security level by given the necessary setting policies are in based on environments need. Since there are many ways to setting policies, now I will illustrate two method of adjusting policies, one is universally and another is on a specific directory.

- **Universally SELinux policies**

It uses the Boolean name **http_unified** so that SELinux act towards all the web server process identically

```
[root@amgitbd ~]# setsebool -P httpd_unified 1
```

- **On a specific Directory**

This will set an individual setting of SELinux permission for directory, which can more control over the Apache policies. In the virtual host configuration, a context type should be modifying in newly log directory.

```
[root@amgitbd ~]# ls -dlZ /var/www/amgitbd.com/log/
drwxr-xr-x. 2 root root unconfined_u:object_r:httpd_sys_content_t:s0 6 Dec 29 04:54 /var/www/amgitbd.com/log/
[root@amgitbd ~]# semanage fcontext -a -t httpd_log_t "/var/www/amgitbd.com/log(/.*)?"
[root@amgitbd ~]# restorecon -R -v /var/www/amgitbd.com/log
Relabeled /var/www/amgitbd.com/log from unconfined_u:object_r:httpd_sys_content_t:s0 to unconfined_u:object_r:httpd_log_t:s0

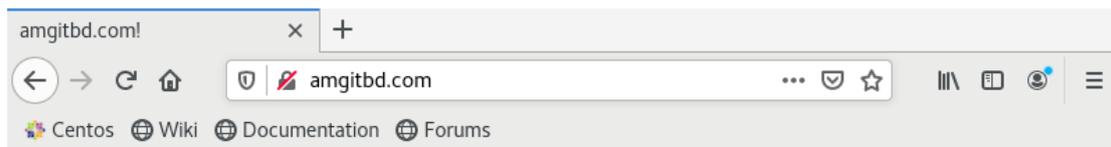
[root@amgitbd ~]# ls -dlZ /var/www/amgitbd.com/log/
drwxr-xr-x. 2 root root unconfined_u:object_r:httpd_log_t:s0 6 Dec 29 04:54 /var/www/amgitbd.com/log/

[root@amgitbd html]# ls -lZ /var/www/amgitbd.com/log/
total 4
-rw-r--r--. 1 root root system_u:object_r:httpd_log_t:s0  0 Dec 29 21:47 error.log
-rw-r--r--. 1 root root system_u:object_r:httpd_log_t:s0 614 Dec 29 21:52 requests.log
```

httpd_sys_content_t was current context and after changing the context type of the log directory it will be **httpd_log_t**. this type will allow web service to generate and append

Checking the Virtual Host for Webservice

```
[root@amgitbd html]# systemctl restart httpd
```



Success! The amgitbd.com virtual host is working!

All right reserve to Md. Arif Hossain

3.2 Event and Activities

During the internship period, I have to work regularly to complete my achievements. For a different type of requirement in the organization, we need smart plans and different methods to apply in the system. A System can give its output efficiently and productively when it's organized and managed through well planned. Without planning or managing any problem can arise and that particular can be a nightmare for IT Engineers. We need to be more active in such events and properly work on activities.

In IT dept. of AMG I have active with many events and done activities which are given below.

3.3 Project Task and Activity

Since the start, an Organization develops its business day by day for a better future. A company always needs to work on the project and complete it to make an organization a better portfolio. Projects are distributed to management for accomplishing the target in due time. The project director distributes the task to the project manager and to the manager it goes to the team coordinator and member as follows.

As an internship, a project has been assigned to me, and I have work on the project task and doing some regular activity. I have designed an SNMP server for my organization. Simple Network Management Protocol as known as SNMP is a protocol that used for health or welfare monitoring of network equipment like a router, switch or any device that connected. it is mostly used in a large organization computer equipment and even devices like UPSs. Following are my project task and activity are given.

- To know about the SNMPc Enterprise Application.
- Installing the SNMPc v 7.0 Enterprise Server
- Configuring the Local Console Session
- Then design required Network Area in graphical view
- Configure the device and connected to the core network.
- Also, connect the pc or server to SNMP

3.3.1 To know about the SNPC Enterprise Application.

The SNMPc Enterprise is used for secure an organization distributed Network Management System which delivers approximately real-time monitoring. Product key features are:

- Monitoring SNMP Devices on the network, wan/lan links through devices, servers, and devices on the network.
- This application support SNMP v1, v2c, and secure SNMP v3.
- The status of the server will be shown live/standby in automatic failover.
- Automated Network Discovery.

3.3.2 Installing the SNMPc Enterprise Server and Local Console

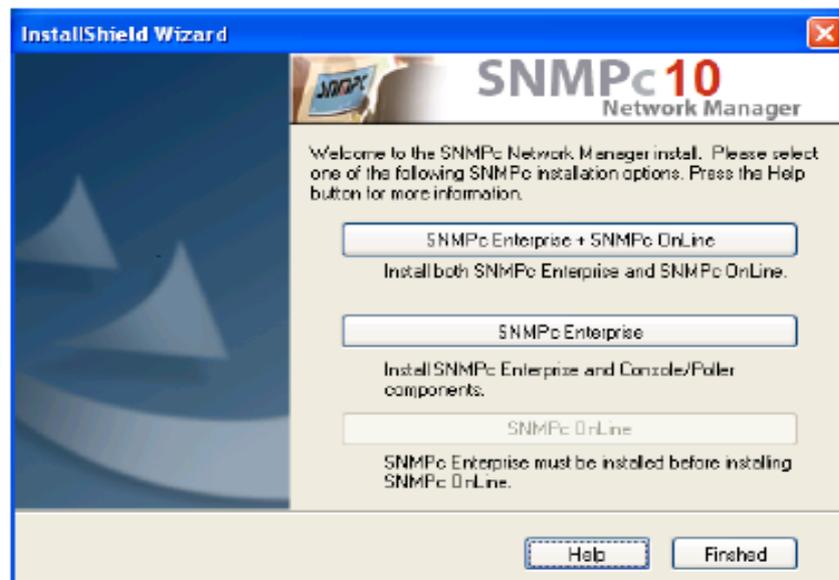


Figure 15: SNMP Server Setup

- **Run as Administrator** the setup.exe file of SNMPc Network Manager.

In the dialogue box, we have to choose **SNMPc Enterprise and choose Server button.**

- In the next, it will show a Discovery Seed dialog will be displayed.

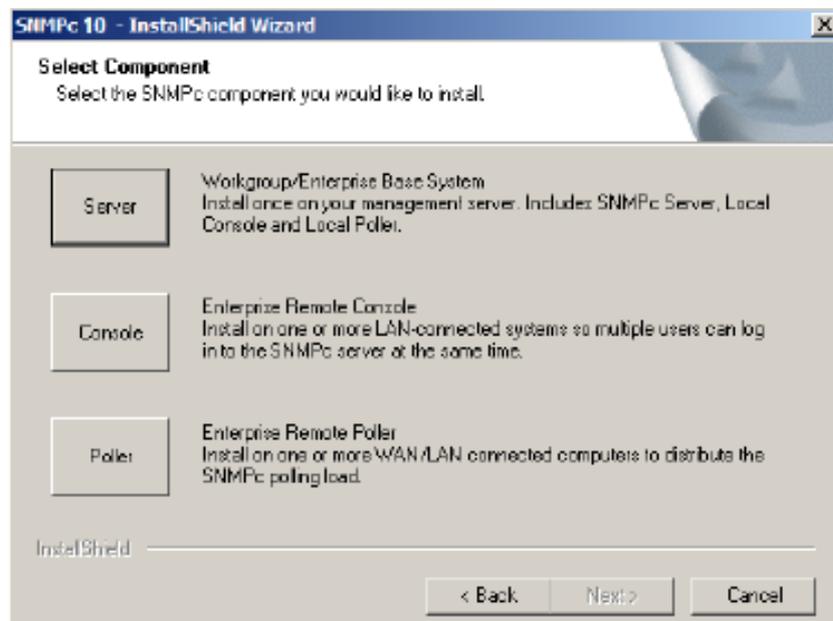


Figure 16: SNMP Setup Process

- There we have to put IP of a seed device (router, switch, server) on our network.

- And then we have to put subnet mask for seed device.

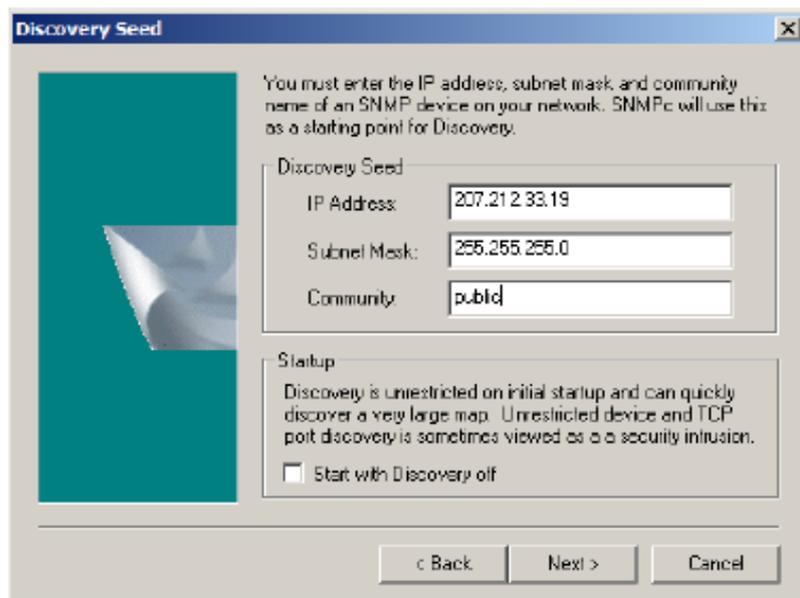


Figure 7: SNMP IP Address Assign

- For the Seed Device we have to enter v1, v2 or public into community
- The SNMPc program installation is finished. Now After Restart we can use it for configuration.

3.3.3 Configure Local Console Session

- Start from windows menu the programs “SNMPc Network Manager”
- After a command box of **Login Console Menu** will appear.
- Initially the user name is default as Administrator with no password.
- We need disable the automatic console startup and login from task setup.

3.3.4 Creating Object of Network

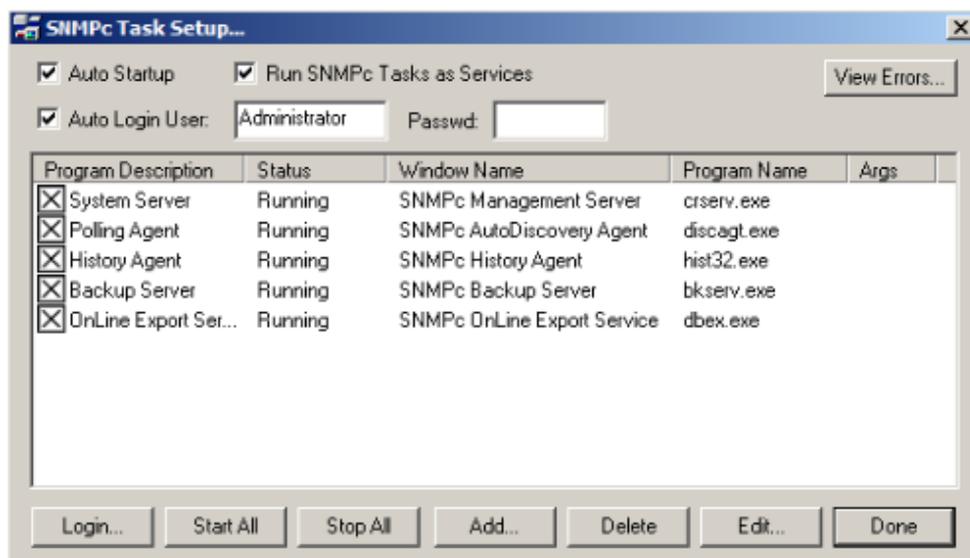


Figure 8: SNMP Task Setup view

From Side menu new object can be created, and it has to be defined and configured with ip addresses.

The Object Configuration for Network Switch or Router:

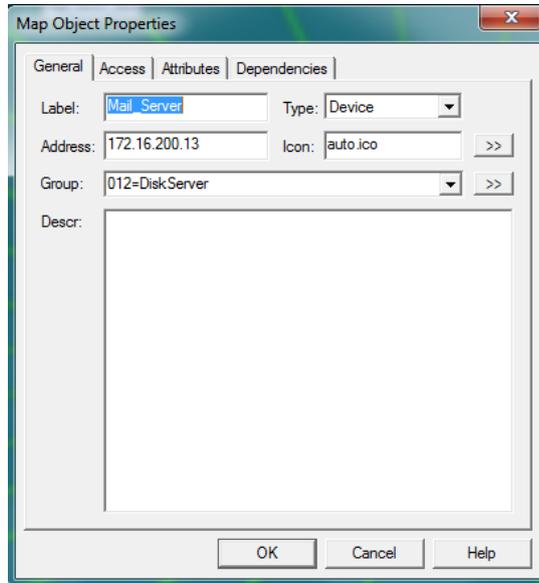


Figure 9: Object Configuration Switch Or Router

The Object Configuration for Server or PC in the network:

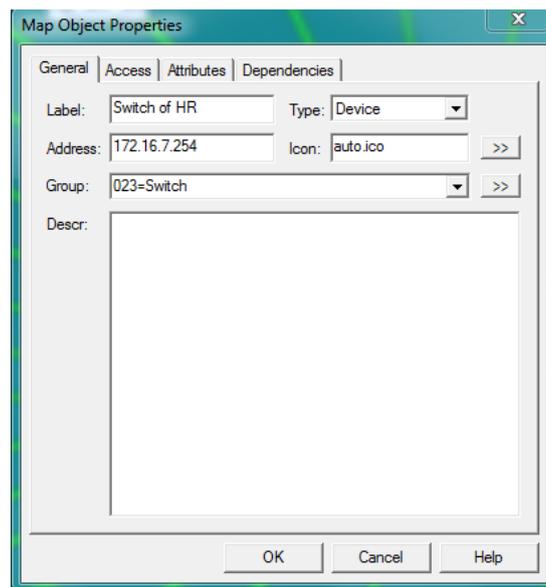


Figure 10: Object Configuration Switch Or Router

3.3.4 Design the MAP View

Map view window have all the object in the network. The objects are equipment like switch, firewall, router, gateway etc. the equipment is connecting with a pipeline to network from core router or switch.

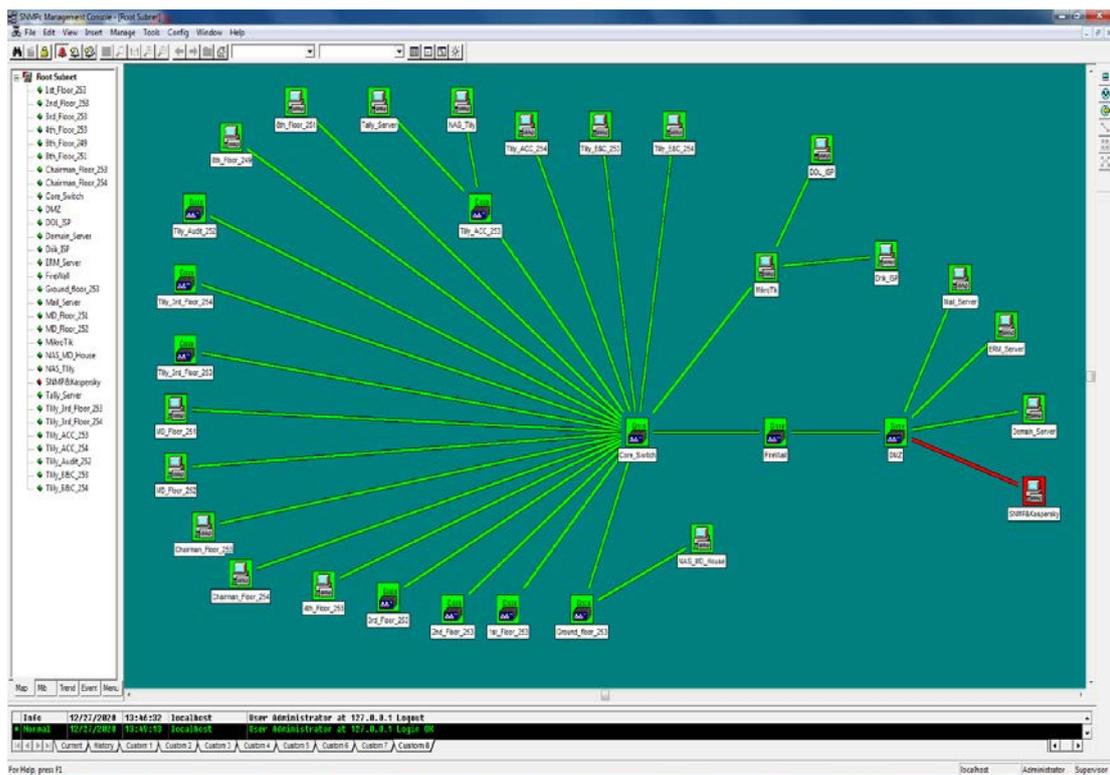


Figure 11: SNMP Map View

3.4 Challenge

The Internship Experience at Amin Mohammad Group was great for me. The first time when I join with the IT department for an Internship, I was not very comfortable with my daily task and activities.

But I have adjusted with the help of my instructor and teams. In daily tasks sometimes I need to face some issues with user end support but with the analysis of the problem I have overcome it.

There always has been a different kind of requirement from every type of area that has been assigned to me, I have given solution with the proper strategic idea and my best tactics.

The challenges I have faced during my internship period will be helpful to my upcoming task and guideline for my future career.

CHAPTER 4

Competencies and Smart Plan

4.1 Competencies earned

An Internship is a great opportunity for students to get experience in workplace. Its bring beneficial knowledge with networking aspect of meeting real professions. In my internship period I have gained lot of competencies beside knowledge like interpersonal skill, communication development, Team Work and many more that cannot be learned in student's life.

I have learned lot of soft skill that will help me in professional career along with the basic work routine. There is some part of soft skill I'm demonstrating in the following points:

- **Communication Skills**

As an Internship I have to collaborate with the other intern and employee of the organization. This is an important part that I have to dealt with my ability to communicate with others. As a Team member I have to understand my own strength's and weakness to give best contribute with others towards a common goal.

- **Time Management**

Time is highest priority for an organization to achieve goal. The management of the organization rely on the time for every task, events and activities. There is always a deadline come to a project delivery, like that I have learned lot of responsibility about the time management.

- **Interpersonal Skills**

This is an important part as a person to any organization or community. As a member to the team or as an employee to the organization a person has to build a relationship with many others, like co-workers, manager, clients and vendor etc. I have learned how to interacting with them when it comes to serve the purpose or any kind of necessary for the individual or organization.

- **Responsibility**

To ensure the most perfection as a person we must take responsibility for everything. In my internship experience I have learned what decision I should make and how to execute that. And it's the responsibility I have taken as an internship that will help me in the future job area.

- **Team Work**

By Team work we can achieve many things within time that is the first thing that I have learned when I have taken my internship experience. This is the important part about learning professional work that can be done with a team hard work and strategy.

4.2 Smart Plan

Smart Plan for an internship is a learning part of developing how and which we can take our best decision. In my internship organization I have work with my skill and some time I take guideline from my instructor for solving problem.

As a part of team some time I have given my opinion or suggestion to my supervisor. Everything in organization should go according to plan as for accomplish the target.

About any problem solving I have learned that, if any issue arises to concern department then the support team should give solution with proper plan.

4.3 Reflection

I have learnt lot of things from Amin Mohammad Group as an intern under IT Department. The experience during my internship not only just basic work but also gaining all the knowledge and skill which is a development for me.

As an intern to my work I have experience the perspective of a professional role. For my internship main objective as a network administration at Cisco and Linux server administration was an achievement for my future career also.

I have come to know that we can develop ourselves in practically in workplace after my graduation complete. As a final year student with all my knowledge from my university I can take it to the next level for my career.

CHAPTER 5

Conclusion and Future Career

5.1 Discussion and Conclusion

There are many things that I have done throughout my Internship at Amin Mohammad Group so far. In my internship at the organization I have learned to work through the new tools, communicate with others in different perspective, connected with the people of different section like accounts, marketing and many more. I have been able to develop a network through this internship.

Amin Mohammad Group is a group of company, so working with various kind of project the organization has lot of things to dealt with and therefore people get more scope to build the career. I have gained lot of skills under the Department of IT and I have experienced the profession. As an intern I have the opportunity know the organization structure and its process of work. My instructor at my internship was extremely helpful, he supports me at my critical problem. The most enjoyable part also is working with a team and being a part of it.

Although this experience is a huge honor for me and I appreciated that through this opportunity I have learned a lot of practical things before my graduation. I am looking forward to it, and I want to used my network for my career, so I can pull together all my learning knowledge and this amazing experience.

5.2 Scope for Future Career

An Internship lead us to the practical knowledge and conceiving exposure of working in the real world. I have taken this internship to create my scope for future career in my area of skill.

In my internship period I have gained the practical knowledge of my required area. and I also learned that in future which path I should take for developing my career. Following are the list will be Scope for Future Career:

- Working as a System or Network Engineer for IT and Telecommunication Company
- Working as a System or Network Administrator at ISP Organization
- Working as a System or Network Specialist.
- Working as a System Analyst.

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