

FOUR WEEKS SUMMER TRAINING REPORT

on

(NETWORK & Network Security)

Submitted by

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(30/05/2019 to 29/06/2019)

Annexure-II

DECLARATION

I hereby declare that I have completed my four weeks summer training at Zoom Technologies, Ameerpet, Hyderabad from 30/05/2019 to 29/06/2019 under the guidance of A. Navya. I hereby undertake that the project undertaken by me is the genuine work of mine.

(Signature of student)

Name of Student: Abdiweli Mohamed
Farah
Registration no:11719176

Date: 20/07/2019

ACKNOWLEDGEMENT

This internship opportunity gave me a great chance for learning and developing my knowledge on Networking. Therefore I consider myself as a very lucky individual as I was provided the opportunity to interact with Zoom Trainers who led me to think more on networking. I *am* very grateful for having a chance to meet wonderful professionals who led me through this internship period.

I express my deepest thanks to my trainer for taking part in useful decisions and gave me necessary advice, guidance and keep me on the correct path and allowing me to carry out my project at his deepest guidance. I choose this moment to acknowledge his contribution gratefully.

I perceive as this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way.

I will continue improving in order to attain my desired career objectives.

Sincerely,

ABDIWELI MOHAMED

Date: 25/07/2019

NETWORK & Network Security

Table of Contents

1. Introduction	
2. Profile of the Problem	
3. System Analysis.....	
-Identification of Needs.....	
-Preliminary Investigation	
-Scope of the Project.....	
4. Hardware and Software Requirements	
5. Implementation and Maintenance	
- Implementation:	
-Maintainance.....	
6. Design	
7. Coding	
8. Testing	
9. Deployment	
10. Gantt chart (Describing a timeline of how did you act in six weeks of training?)	
11. Project Legacy: Technical and Managerial lessons learnt.	
12. Bibliography	

INTRODUCTION

Objective

The aim of this project is to build a university collage which will help communications between different Local Area Networks both inside and outside the Campus.

Each Local Area Network provides complex services, including online and offline classes, wireless services for communication and retrieval purposes which helps staff, students, managements and guests to pass information to one another and ease their communication therefore also stores their data in the servers of the network administrators.

Profile of the Problem

Every organization or company needs to get access to information and reach out people who desire to access their information. To help both sides reach each other it's very unnecessary to get media that can help link both reach other and this can happen only with the help of internetworking.

In addition to this every organization or company needs protection and security for their data/information since the number of dangerous hacking software are increasingly day after the other it's very unnecessary to get method of protection from those harmful effects.

To help fix those problems we need to get strong networking tools which can secure our networks. Here we can also use firewall to restrict who can reach your network and also AAA servers (authentication, authorization, and accounting) to limit the services that can be working in a particular network.

Here we will our problem statement is; how can we make a productive and strong University network.

System Analysis

This is a brief specification of what the required system must do.

This basically includes system requirement analysis and the study of the system itself.

After deep research I decided to design a wide area network for a University campus.

Identification of Needs

Such a wide area network will help university management to communicate, retrieve and manage university system. It also helps to protect their network from security attack in and outside the campus.

Each department will have the authority to maintain and manage its network. The routers in this network will help each local area network to communicate each other.

Preliminary investigation

After I have studied deeply in many network systems I got some effective guides towards visualizing the features that were needed to be put together in the system and the desired output of the campus as well the clients to ensure the system become functional. These specifications that I have got from the observations and deep studies i made from the network systems guided me on how the system should look like; it helped me in understanding some of the basic structures of both Local and Wide area networks which I was supposed to build.

Scope

My project focuses on developing a very secure and protected network that will help throughout the process of the communication.

S/W & H/W Requirement Specification

Every application has specific goals and provides services for some particular purposes. For each goals and purpose, the application performs a process or several processes that the application provides to the clients. The following are the Software and Hardware requirements for the network system

Software Requirements:

Operating System: Windows

Technology: Cisco Packet Tracer

Networking Technology: CCNA V 3.0

Hardware Requirement:

Hardware : Laptop, Desktop, Mobile devices (Android, IOS)

Speed : 1.1 GHz

RAM : 500MB

Storage : 480MB

Input devices : Keyboard, Mouse, and Touch Screen.

Output device : Display Screen

Implementation and Maintenance

Implementation:

Implementation is the stage where the theoretical design is change to the practical system. First, I am going to gather the requirements. Before starting the implementation all, the requirements about your project must know. After the requirements gathering, I am going for the designing stage of my project where I am going to make the theoretical design of my project. I specify all the modules of my project and their relationship between the modules. Once the designing stage is complete then I start the implementation stage. In implementation, I am going to start the coding part of my project. In implementation, I convert the theoretical design of my project to the practical system. It is the most critical stage in which a new system is going to implement for achieving the goal successfully and it will be confirming that the system will work effectively. In this stage, I give the new system to the user or client for practical use.

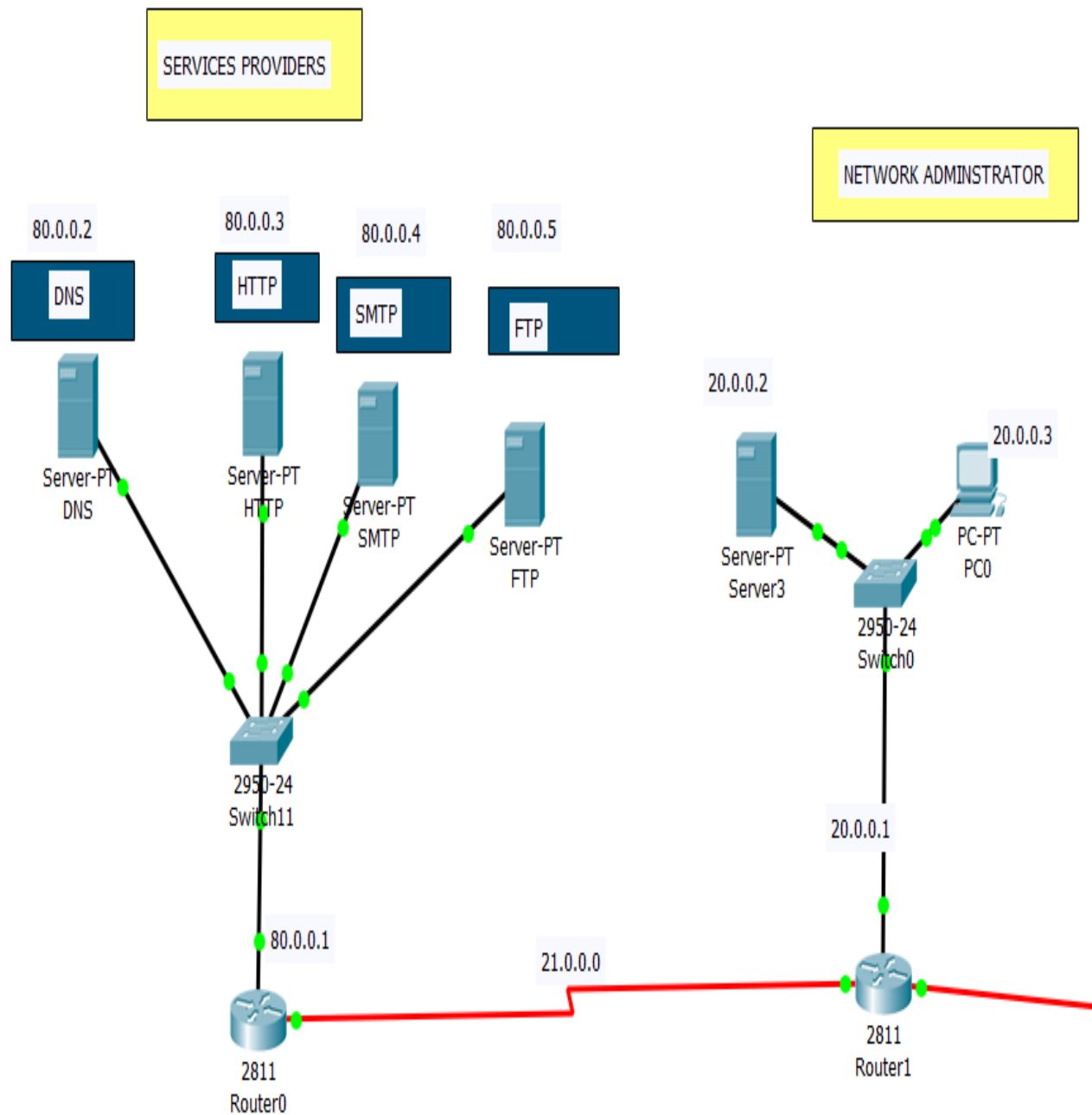
Maintenance:

After implementation stage, the next phase is the maintenance stage. In maintenance, I am going to take care of the system. When the system is given to the client for the practical use, after some times the user find some bugs or the system is not capable to provide the desirable output for the client.

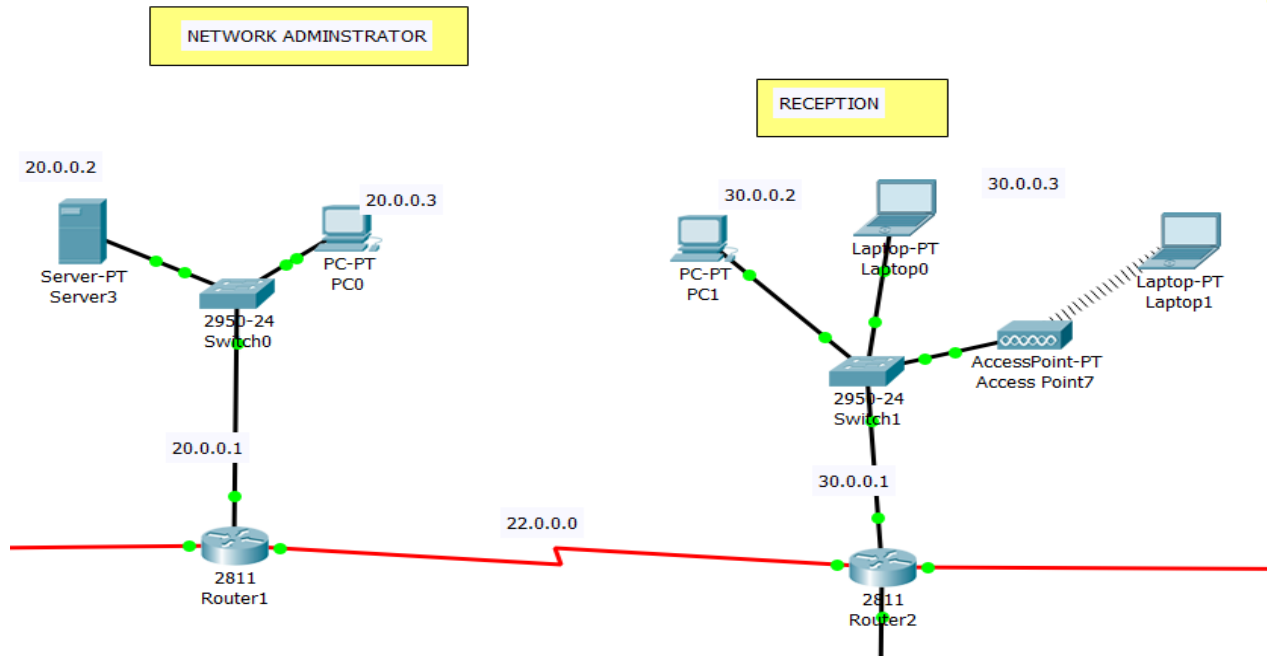
The system is going to the maintenance stage. The developer tests the system again if it is possible that the bugs are solved in maintenance. If the bugs are not solving in maintenance, then the developer again go back to the designing stage. They are working on the designing stage once they fix the error in that stage. After fixing it there then again, the implementation stage is going to start and they bring changes in the system. After completing the implementation, the system in given to the client for the practical use, After some time, the system will need some updates or upgrade so in maintenance stage all these issues are going to be solve in the future.

Design

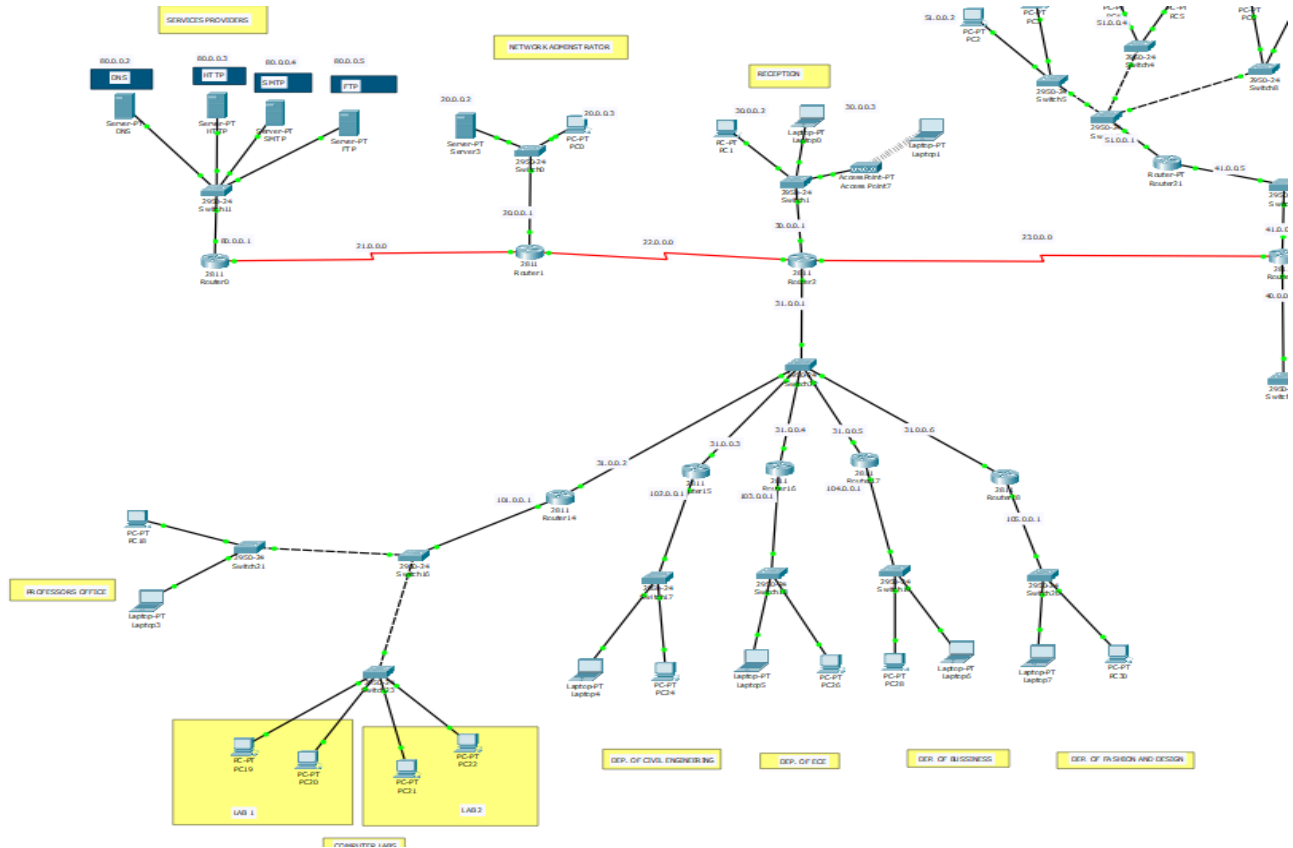
Level 1



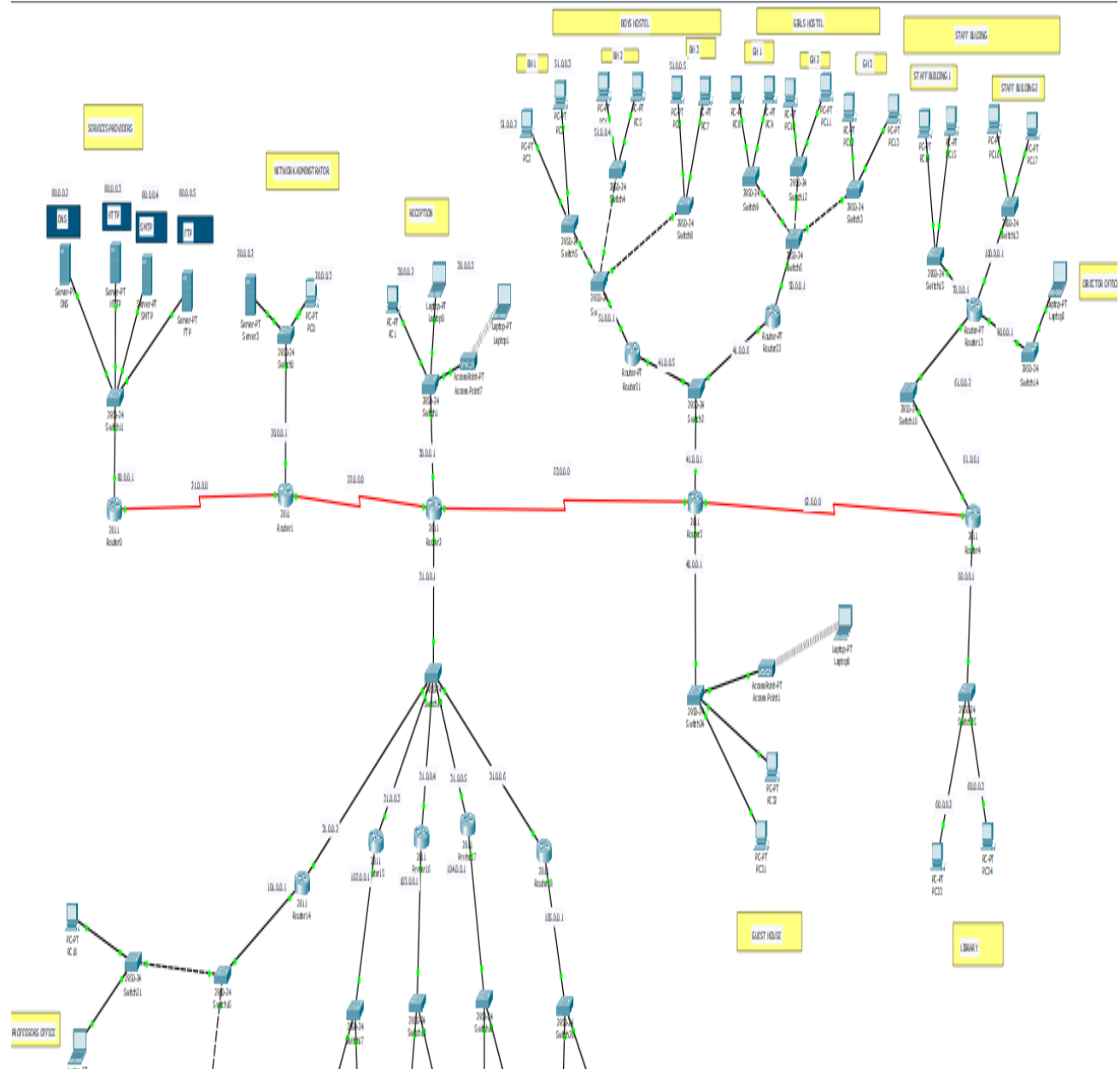
Level 2



Level 3



Level 4



Coding

Router configuration

```
Router>enable
```

```
Router#
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#router rip
```

```
Router(config-router)#network 101.0.0.0
```

```
Router(config-router)#network 102.0.0.0
```

```
Router(config-router)#network 103.0.0.0
```

```
Router(config-router)#network 104.0.0.0
```

```
Router(config-router)#network 105.0.0.0
```

```
Router(config-router)#
```

```
Router(config-router)#end
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#
```

```
Router(config)#
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
ip route 0.0.0.0 0.0.0.0 31.0.0.2
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 31.0.0.2
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 101.0.0.1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 102.0.0.1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 103.0.0.1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 104.0.0.1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 105.0.0.1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 105.0.0.1
```

```
Router(config)#
```

```
Router(config)#router rip
```

```
Router(config-router)#
```

```
Router(config-router)#end
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#

%SYS-5-CONFIG_I: Configured from console by console

ip route 0.0.0.0 0.0.0.0 31.0.0.1

Router(config)#ip route 0.0.0.0 0.0.0.0 31.0.0.1

Router(config)#ip route 0.0.0.0 0.0.0.0 31.0.0.2

Router(config)#ip route 0.0.0.0 0.0.0.0 101.0.0.1

Router(config)#

Router(config)#router rip

Router(config-router)#

Router(config-router)#end

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#

%SYS-5-CONFIG_I: Configured from console by console

ip route 0.0.0.0 0.0.0.0 102.0.0.1

Router(config)#ip route 0.0.0.0 0.0.0.0 102.0.0.1

Router(config)#ip route 0.0.0.0 0.0.0.0 103.0.0.1

Router(config)#ip route 0.0.0.0 0.0.0.0 104.0.0.1

Router(config)#ip route 0.0.0.0 0.0.0.0 105.0.0.1

Router>enable

Router#

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface Serial0/3/1

Router(config-if)#

Router(config-if)#exit

Router(config)#interface Serial0/3/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface Serial0/3/1

```
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface Serial0/3/0  
Router(config-if)#
```

Router con0 is now available

Press RETURN to get started.

```
Router>enable  
Router#  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#router rip  
Router(config-router)#  
Router(config-router)#end  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#  
Router(config)#  
%SYS-5-CONFIG_I: Configured from console by console  
ip route 0.0.0.0 0.0.0.0 31.0.0.2  
Router(config)#ip route 0.0.0.0 0.0.0.0 31.0.0.2  
Router(config)#ip route 0.0.0.0 0.0.0.0 31.0.0.1  
Router(config)#ip route 0.0.0.0 0.0.0.0 101.0.0.1  
Router(config)#  
Router(config)#router rip  
Router(config-router)#network 101.0.0.0  
Router(config-router)#  
Router(config-router)#end  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#router rip  
Router(config-router)#
```



```
%SYS-5-CONFIG_I: Configured from console by console
network 31.0.0.0
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
%SYS-5-CONFIG_I: Configured from console by console

Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
%SYS-5-CONFIG_I: Configured from console by console
ip route 0.0.0.0 0.0.0.0 102.0.0.1
Router(config)#ip route 0.0.0.0 0.0.0.0 102.0.0.1
Router(config)#ip route 0.0.0.0 0.0.0.0 103.0.0.1
Router(config)#ip route 0.0.0.0 0.0.0.0 104.0.0.1
Router(config)#ip route 0.0.0.0 0.0.0.0 105.0.0.1
Router(config)#
Router(config)#router rip
Router(config-router)#network 102.0.0.0
Router(config-router)#network 103.0.0.0
Router(config-router)#network 104.0.0.0
Router(config-router)#network 105.0.0.0
Router(config-router)#
```

DNS

DNS Service on

Resource Records Name www.somalia.com type A Record

Address 80.0.0.2

Subnetmask 255.0.0.0

Default Gateway 80.0.0.1

DNS Server 80.0.0.2

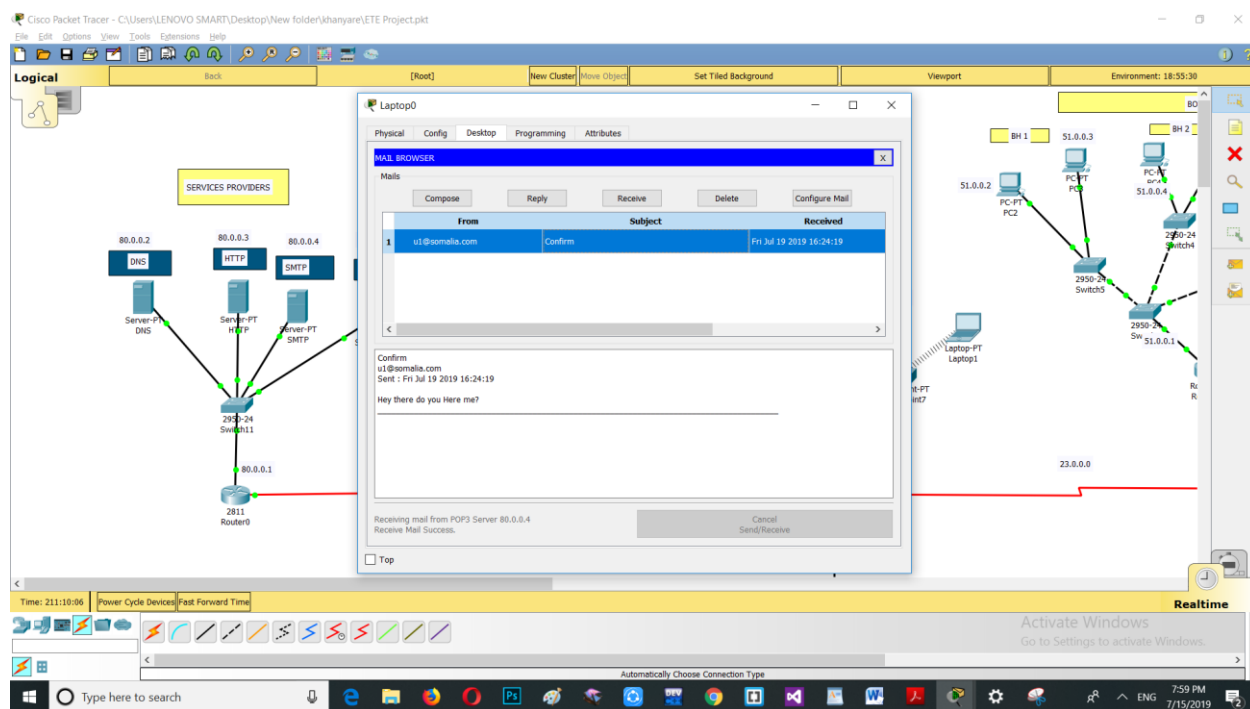
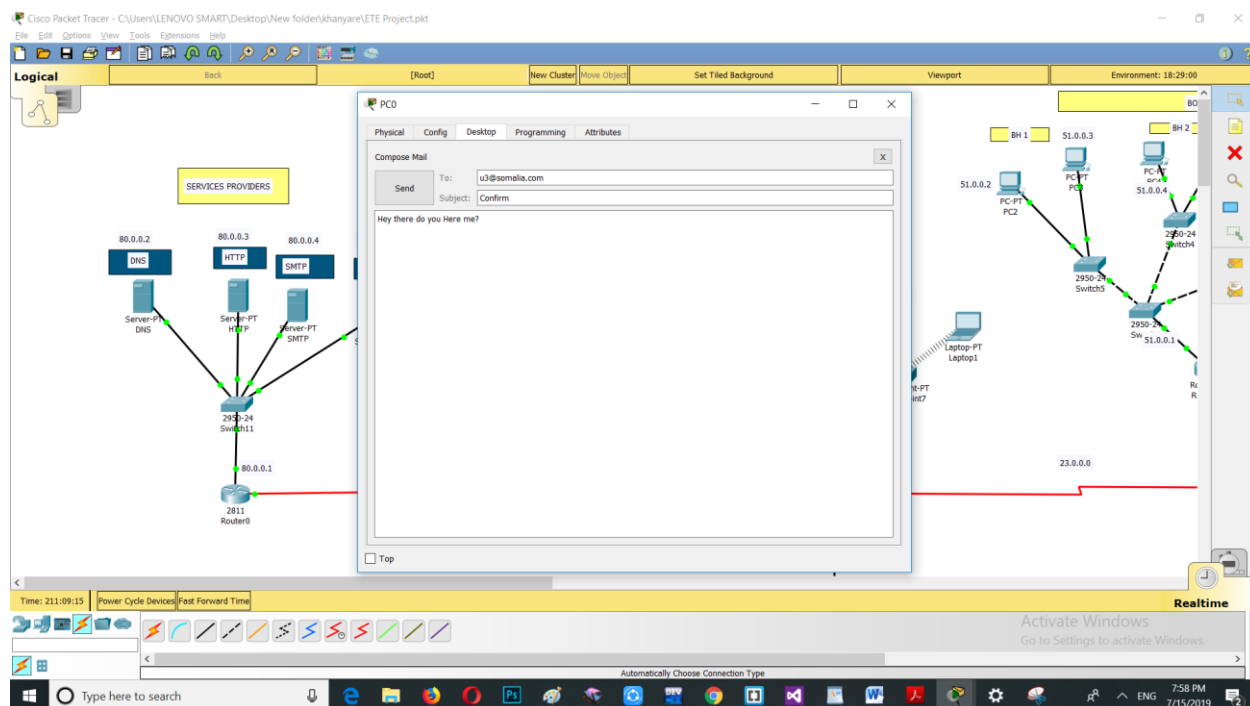
EMAIL

SMTP Service on

Domain Name: somalia.com

User <username> password <password>

+<Add>



FTP

Service on

User Setup

Username <username> password <password>

Check box Write Read Delete Rename List

Add

PC Configuration

Desktop -> IP Configuration -> 20.0.0.3

Desktop -> Command prompt

C:\> ping 80.0.0.2

Pinging 80.0.0.2 with 32 bytes of data:

Replay from 80.0.0.2: bytes=32 time= 112 ms TTL=128

Replay from 80.0.0.2: bytes=32 time< 1ms TTL=128

Replay from 80.0.0.2: bytes=32 time< 1ms TTL=128

Ping statistics for 80.0.0.2:

Packets: sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, maximum = 12ms, Average = 3ms

C:\> ping 100.0.0.2

Pinging 100.0.0.2 with 32 bytes of data:

Replay from 100.0.0.2: bytes=32 time= 112 ms TTL=128

Replay from 100.0.0.2: bytes=32 time< 1ms TTL=128

Replay from 100.0.0.2: bytes=32 time< 1ms TTL=128

Ping statistics for 100.0.0.2:

Packets: sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms,maximum = 12ms, Average =3ms

C:\> ping 90.0.0.2

Pinging 90.0.0.2with 32 bytes of data:

Replay from 90.0.0.2: bytes=32 time= 112 ms TTL=128

Replay from 90.0.0.2: bytes=32 time< 1ms TTL=128

Replay from 90.0.0.2: bytes=32 time< 1ms TTL=128

Ping statistics for 90.0.0.2:

Packets: sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms,maximum = 12ms, Average =3ms

C:\> ping 60.0.0.2

Pinging 60.0.0.2with 32 bytes of data:

Replay from 60.0.0.2: bytes=32 time= 112 ms TTL=128

Replay from 60.0.0.2: bytes=32 time< 1ms TTL=128

Replay from 60.0.0.2: bytes=32 time< 1ms TTL=128

Ping statistics for 60.0.0.2:

Packets: sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms,maximum = 12ms, Average =3ms

C:\>ftp 51.0.0.1

Trying to connect ...51.0.0.1

Connected to 51.0.0.1

220- Welcome to PT Ftp server

Username: <username>

Password: <password>

230- Logged in

(passive mode On)

ftp> dir

```
Listing /ftp directory from 80.0.0.5:
0  : asa842-k8.bin                    5571584
1  : asa923-k8.bin                    30468096
2  : c1841-advipservicesk9-mz.124-15.T1.bin  33591768
3  : c1841-ipbase-mz.123-14.T7.bin    13832032
4  : c1841-ipbasek9-mz.124-12.bin     16599160
5  : c1900-universalk9-mz.SPA.155-3.M4a.bin  33591768
6  : c2600-advipservicesk9-mz.124-15.T1.bin  33591768
7  : c2600-i-mz.122-28.bin           5571584
8  : c2600-ipbasek9-mz.124-8.bin      13169700
9  : c2800nm-advipservicesk9-mz.124-15.T1.bin  50938004
10 : c2800nm-advipservicesk9-mz.151-4.M4.bin  33591768
11 : c2800nm-ipbase-mz.123-14.T7.bin    5571584
12 : c2800nm-ipbasek9-mz.124-8.bin      15522644
13 : c2900-universalk9-mz.SPA.155-3.M4a.bin  33591768
14 : c2950-i6q412-mz.121-22.EA4.bin     3058048
15 : c2950-i6q412-mz.121-22.EA8.bin     3117390
16 : c2960-lanbase-mz.122-25.FX.bin     4414921
17 : c2960-lanbase-mz.122-25.SEE1.bin    4670455
18 : c2960-lanbasek9-mz.150-2.SE4.bin    4670455
19 : c3560-advipservicesk9-mz.122-37.SEE1.bin  8662192
20 : c3560-advipservicesk9-mz.122-46.SE.bin  10713279
21 : c800-universalk9-mz.SPA.152-4.M4.bin  33591768
22 : c800-universalk9-mz.SPA.154-3.M6a.bin  83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin  505532849
24 : cgr1000-universalk9-mz.SPA.154-2.CG   159487552
25 : cgr1000-universalk9-mz.SPA.156-3.CG   184530138
26 : ir800-universalk9-bundle.SPA.156-3.M.bin  160968869
27 : ir800-universalk9-mz.SPA.155-3.M     61750062
28 : ir800-universalk9-mz.SPA.156-3.M     63753767
29 : ir800_yocto-1.7.2.tar               2877440
30 : ir800_yocto-1.7.2_python-2.7.3.tar  6912000
31 : pt1000-i-mz.122-28.bin              5571584
32 : pt3000-i6q412-mz.121-22.EA4.bin     3117390
ftp>
```

ftp> get asa842-k8.bin

Reading file asa842-k8.bin from 80.0.0.5:

File transfer in progress...

[Transfer complete – 55701584 bytes]

5571584 bytes copied in 24.844 secs (51385 bytes/sec)

ftp> put asa842-8k.bin

Writing file asa842-8k.bin to 80.0.0.5

File transfer in progress ...

[Transfer complete- 5571584 bytes]

5571584 bytes copied in 24.364 secs (52397 bytes/sec)

DHCP

DHCP Configuration

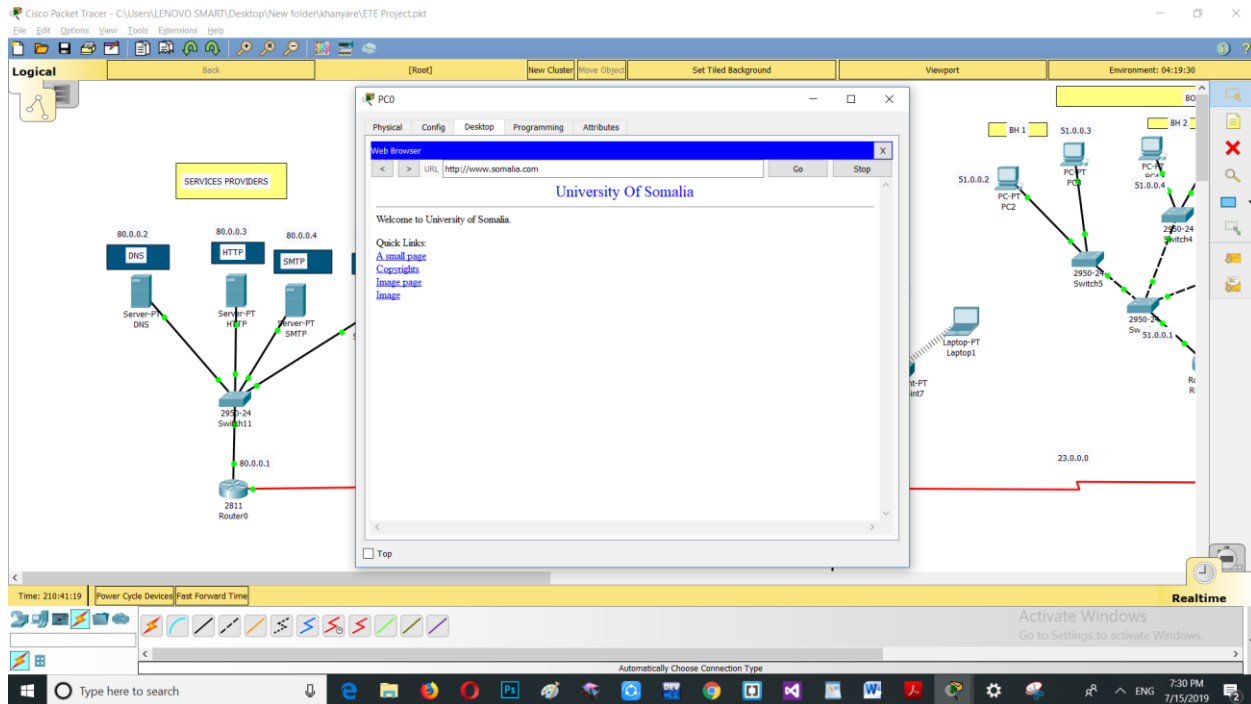
Config -> Click on DHCP

IP Address 80.0.0.3

Gateway 80.0.0.1

DNS Server 80.0.0.2

Accessing to HTTP server from PC0

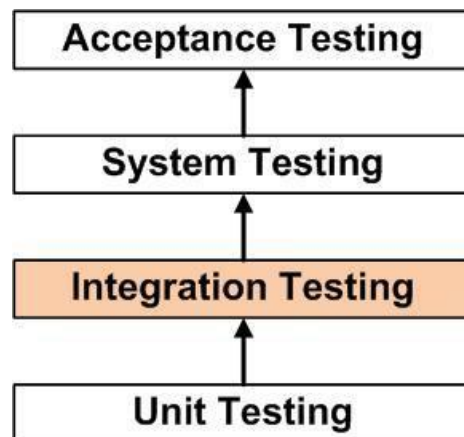


Testing

System Testing

The main objective of testing is to find the bugs within the system. Testing is a lengthy and costly phase of system development. The system must be tested whether the user requirements have been full filled or not? Whether the expected outputs of the system are the same as the actual outputs or not?

It takes different aspect in consideration like checking, the functionality of different modules in the system the, dependency of each module, the overall interoperability of subunits. Initially, I will start testing process from unit testing, then I integrate the units and performing integration testing later on functional testing at the end testing process is going to end with overall system testing.



Definition by ISTQB (International Software Testing Qualifications Board)

There are different methodologies of testing a work product and types of the testing process on work product.

Unit testing

In unit testing, the testing is done by the developer itself rather than tester because an individual component or module of the system/software will be tested. It will perform basic tests on the small parts of the system whether its functions are accurate or not. That is why it is done by the developer he produces the system unit by unit.

Integration testing

After each integration of unit, the system should be tested to verify

the system is working as one piece or not. The objective of this test is to find out the fault in communication or interaction among different modules of the system.

Functional testing

In the functional testing phase, the functional requirements of these are going to check. In this part testing, I will work on test design. I am going to design test cases and test suits. Like:

Functional testing is determined on the basis of the below items:

Valid Input : classes for the valid must be defined and accepted.

Invalid Input : classes for the invalid must be defined and rejected.

Functions : functions must be well defined and exercised.

Output : classes of application outputs identified must be exercised.

Systems/Procedures : interfacing procedures or systems must be called.

System Test

In this phase of testing the tester ensures the entire system

comprises of different parts or modules meet the requirements. It tests the complete functionality of the system to ensure known and predictable outputs.

Acceptance Testing

It is the last stage of testing which is done by the clients or the user of the system. It verifies whether the business requirements are fulfilled or not. The clients will accept the system or software only when all the functions and features are working as it was expected.

Project Testing

1. After I have completed the designing and coding phase , I started through the project testing in which I followed all the above testing procedures.
2. I started connecting pcs to their respective switches, and then to the routers and servers.
3. Then I have given ip addresses to every pc, server and router.
4. I then started configuring router to both the Ethernet ports of both sides of the network.
5. I then checked if each pc is communicating to each other and also to the routers.
6. I have checked if every side of the network is able to access to every service provided by the server.

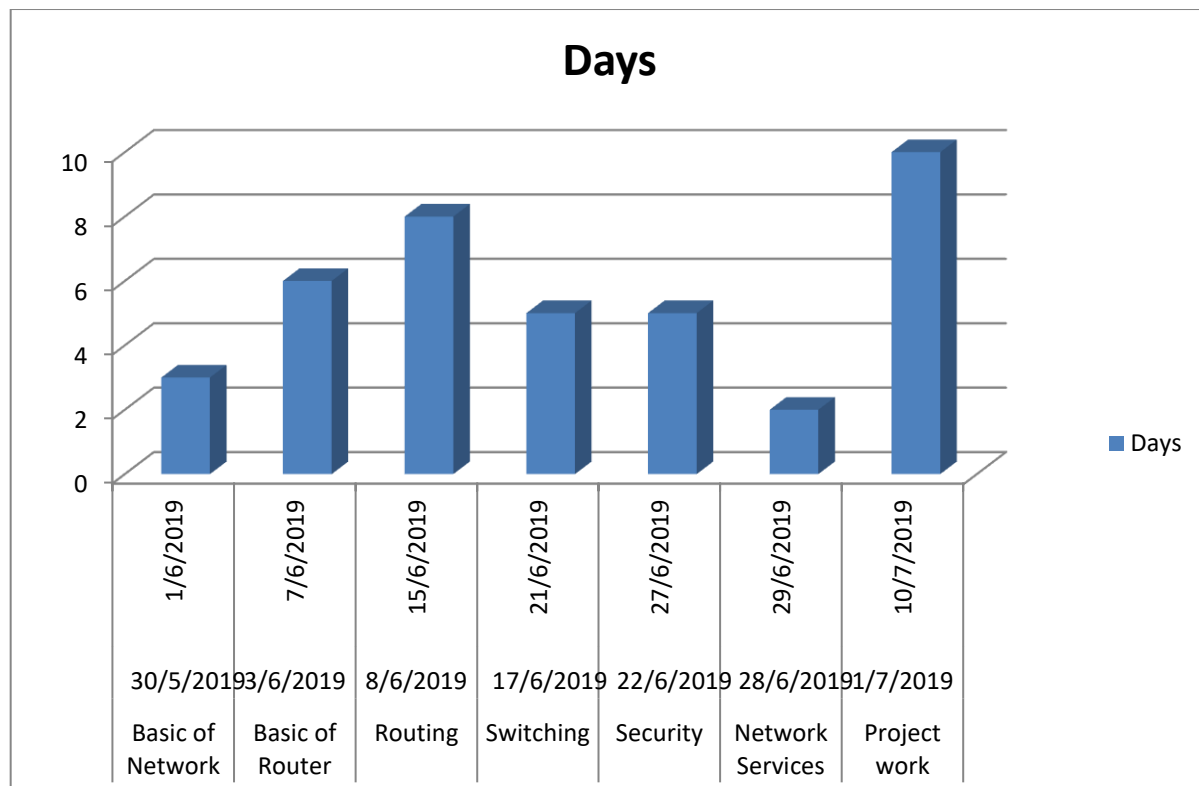
System and Security Measures

Security is one of the most difficult issues when it comes to hacking and breaking into systems that are connected to networks. It is mandatory for the network managers to give safe and secure environment to the systems that are connected to them.

In order to make sure the systems are secure from theft and hacking I make sure that I give unique user name and password to every user in each domain for the purpose of login.

For the clients and system users not to access and other information other than the recommended one, I will have to restrict some services from each system based on the required work to be performed for each.

Gantt chart



Project Legacy: Technical and Managerial lessons learnt.

Throughout this research/training of CCNA and CISCO Security I have gained a perfect training both in managerial side by exercising and maintaining different systems; like routers, switches and pcs.

In the technical side I gained the knowledge on how to configure and connect different networks; what internetwork is all about?

How to connect two networks from different locations?

How to restrict some services from a certain system?

How AAA server works?

Bibliography

Text Book:

1. CISCO CERTIFIED NETWORK ASSOCIATE GUIDE
PREPARED BY ZOOM TECHNOLOGIES.
2. CISCO CERTIFIED NETWORK ASSOCIATE LAB
MANUAL PREPARED BY ZOOM TECHNOLOGIES.

Website:

1. <https://study-ccna.com/>
2. <https://www.guru99.com/introduction-ccna.html>
3. <https://zoomgroup.com/training/india/ccna.asp>