Green University of Bangladesh
Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering
Semester: (Spring, Year:2021), B.Sc. in CSE (Day/Eve)

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Lab Project Name: Smart Office with IoT

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[For Teachers use only: Don't Write Anything inside this box]

Lab Project Status

Marks: …… **Signature: .....**

Comments: ..... **Date: .....**

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Chapter 1

Introduction

1.1 Introduction

A smart office monitoring system is to be considered with one entity in mind that is of full probable of workforce. It's not rocketry just innovative thinking and new technology that best fits people's needs. Office monitoring among other things facilitates easy documentation and real time communication. smart office monitoring system complete on lighting, door-access, room controlling, fire detection, and SMTP, FTP, Routing is construct for the security and promote the satisfactions of the employees.

1.2 Design Goals/Objective

In this project we have tried to make a smart office with some IOT devices. Our goal was to design a firm where employees and boss are connected through a network protocol. Make a SMTP server. So that employees can use their official mail and boss can access the employer's pc by using FTP server. Implement a routing protocol and by adding some IOT devices make the farm smarter.

Chapter 2

Design/Development/Implementation of the Project

2.1 Procedure

To implement SMTP, FTP and Routing protocol we followed the following steps:

1. First we open the Cisco Packet Tracer and then add a background image.
2. We added all the devices that we need to implement the project.
3. Then we need to configure the IP address of all devices. So figure-01 showed the IP address configuration of a Computer.
4. Then when completed all the IP address configurations, we would configure the IP address of SMTP Server. Figure-03 showed the configuration of IP address of SMTP Server. Figure-04 showed the configuration of SMTP server.
5. We set DNS IP and configuration which show in figure 7 & 8. And then we send message and it showed successes [see figure-05]. Then we set the FTP configuration [see figure 6]
6. Before set this, we at first set the routing. We used 4 router here and use dynamic routing. Static router is complicated that's why we use dynamic routing. To configure this at first we go WIC-2T and add a port for serial port.
7. Then we add the 4router and set their serial port number and at last we add the router with switch by their Fast Ethernet number. We use dynamic router so at first we go to RIP and set the all network IP [see figure 9, 10, 11].
8. And finally we have added IOT device. We have added AC, Fan, Light, Mobile devices by a HomeGateway. Given condition among them and also create a fire detection system and security locking system.

2.1.1 SMTP, FTP AND ROUTING

IP Configuration:

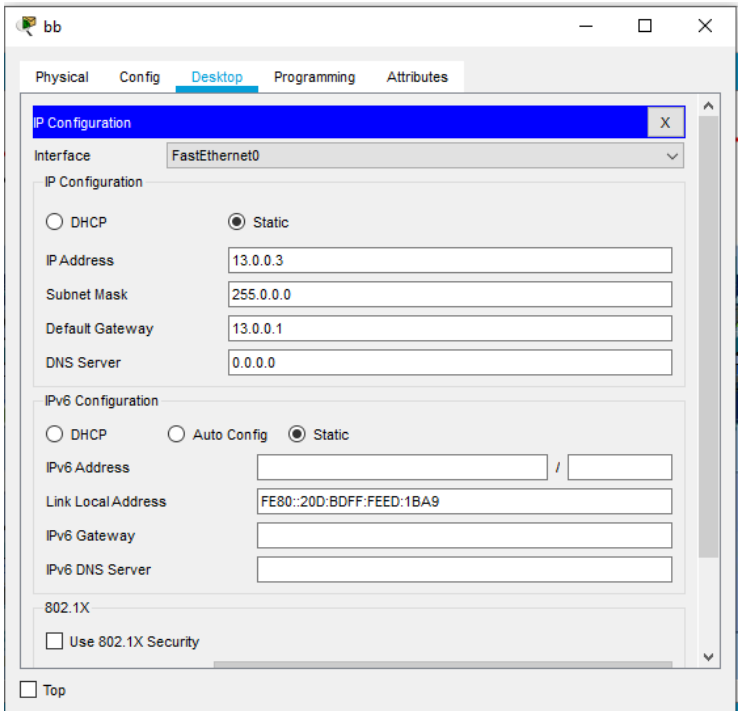


Figure-01: User IP address Configuration

Mail Configuration:

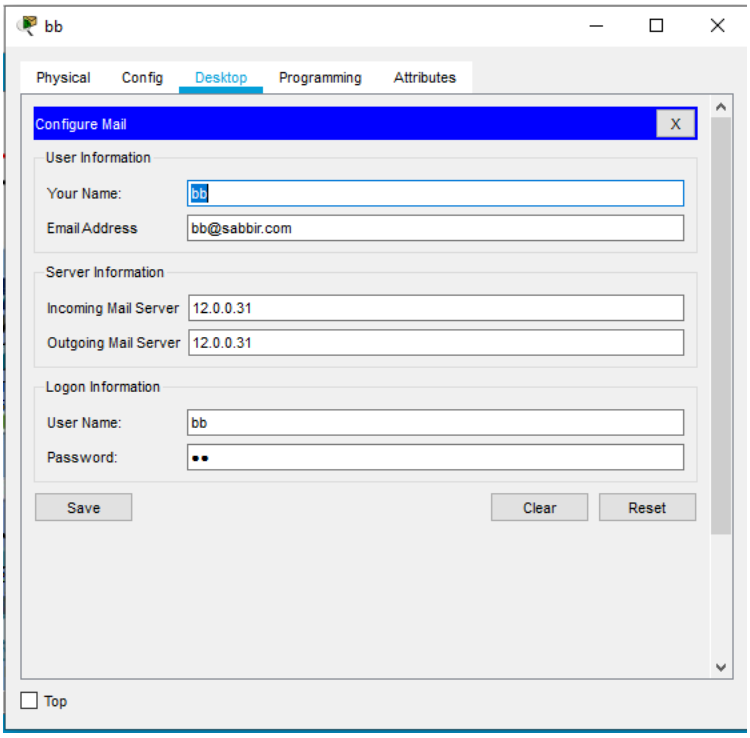


Figure-02: User Mail Configuration

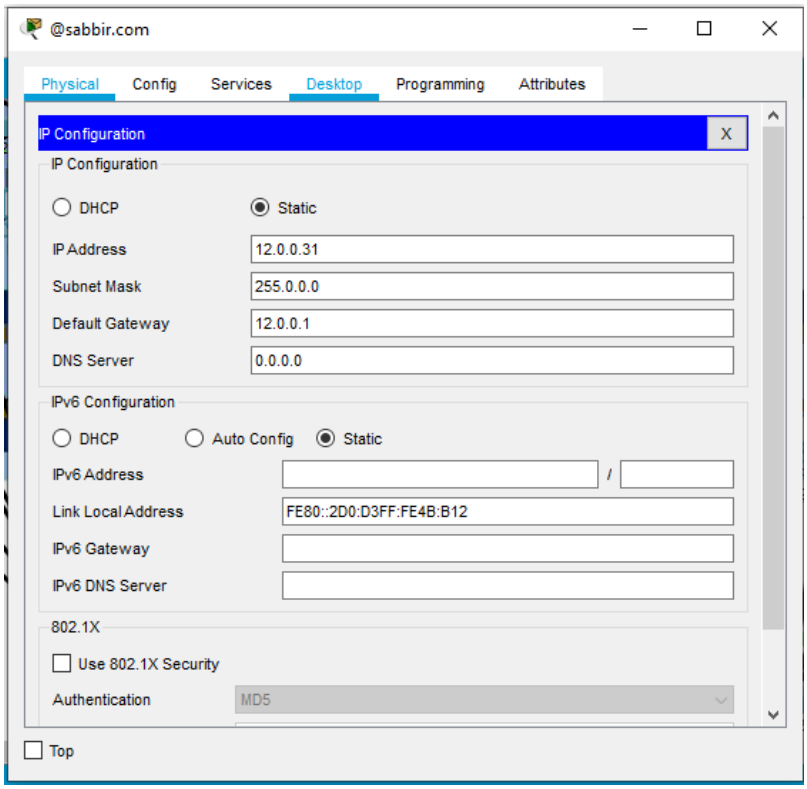


Figure-03: Mail IP address Configuration

SMTP Configuration:

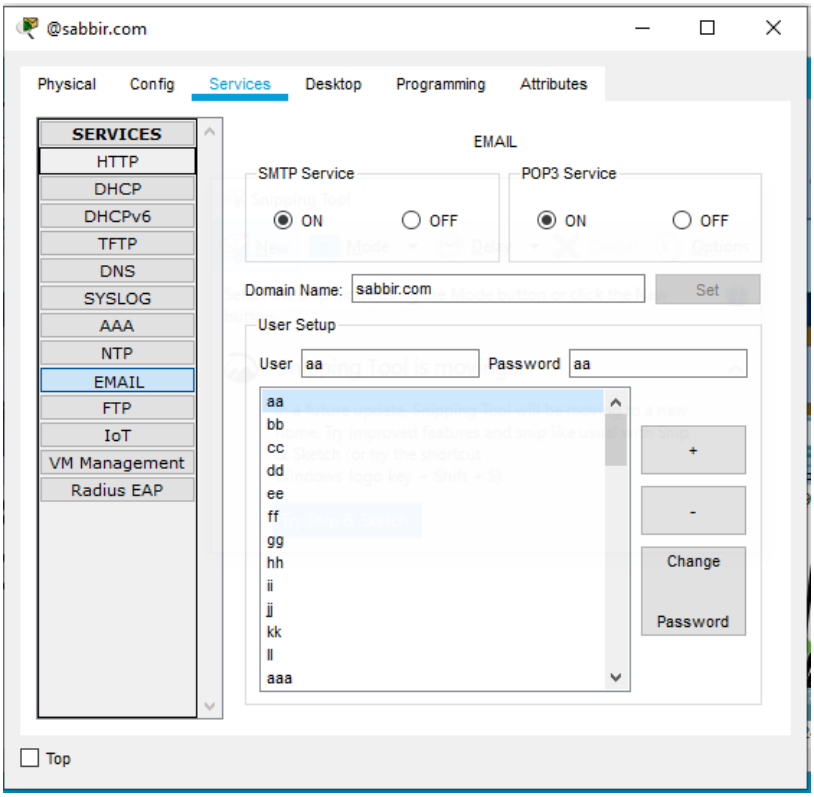


Figure-04: SMTP Configuration

FTP Configuration:

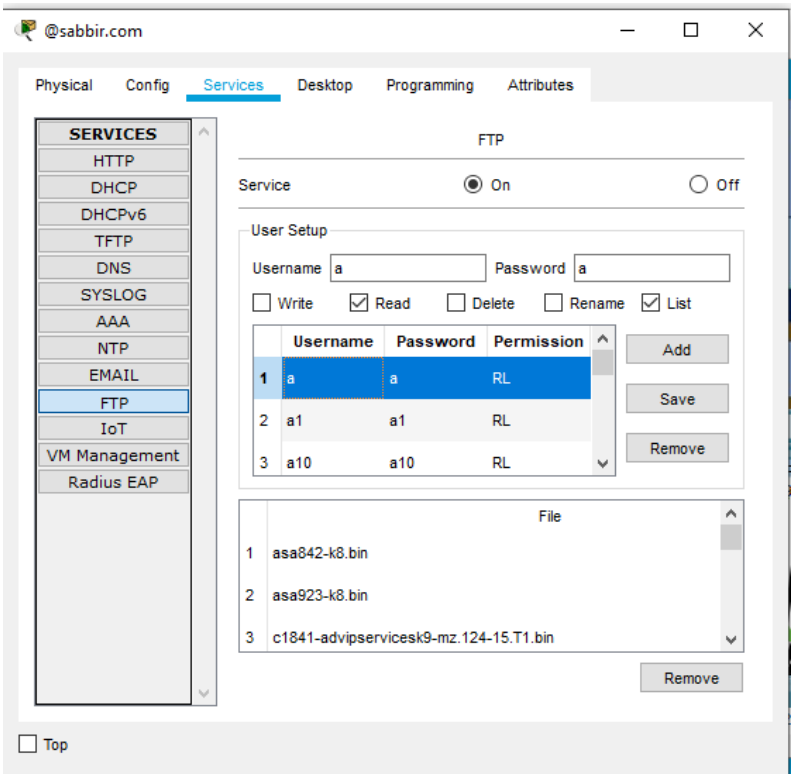


Figure-05: FTP configuration

DNS IP Configuration:

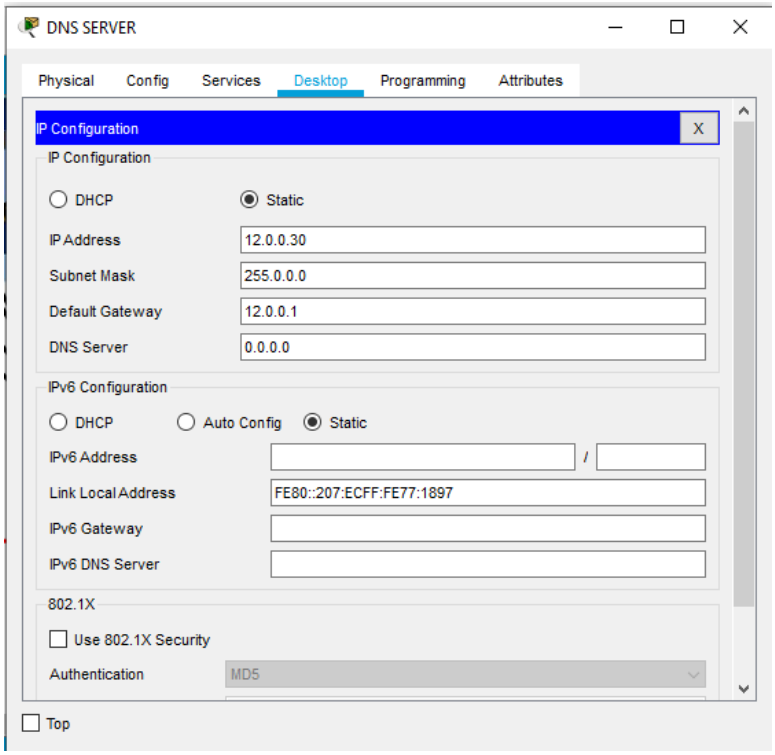


Figure-06: DNS IP configuration

DNS Server Configuration:

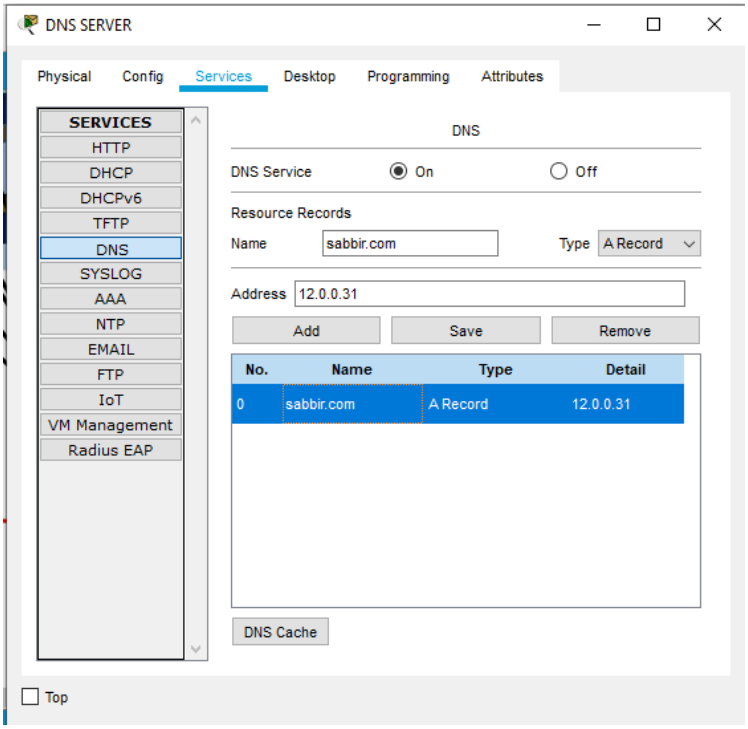


Figure 7: DNS server Configuration

Fast Ethernet Configuration:

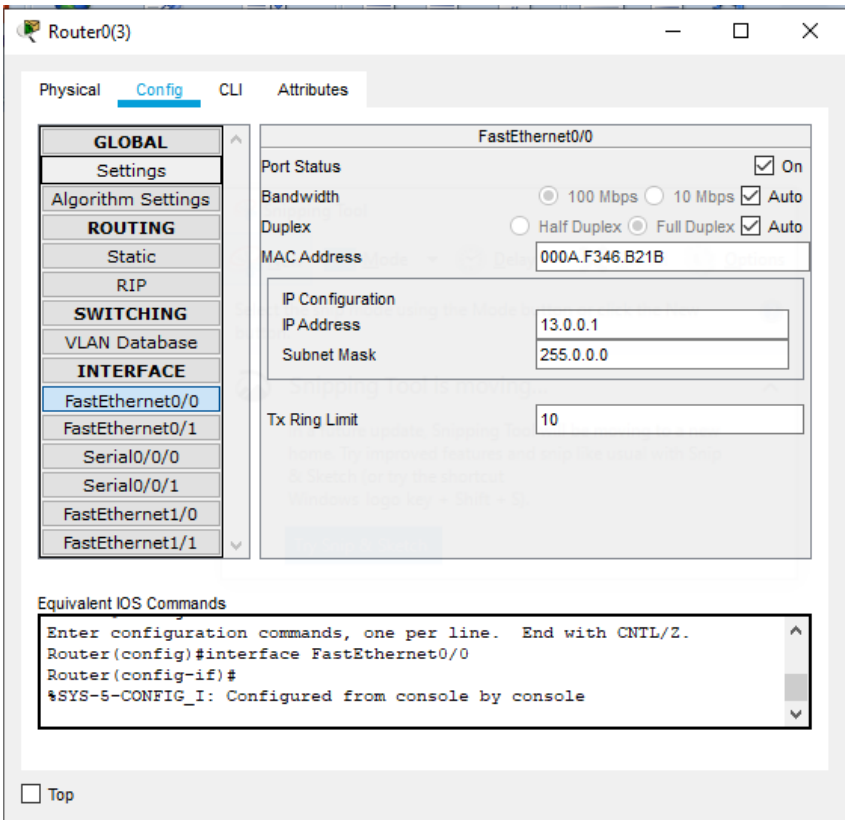


Figure-08: Fast Ethernet

Serial Number:

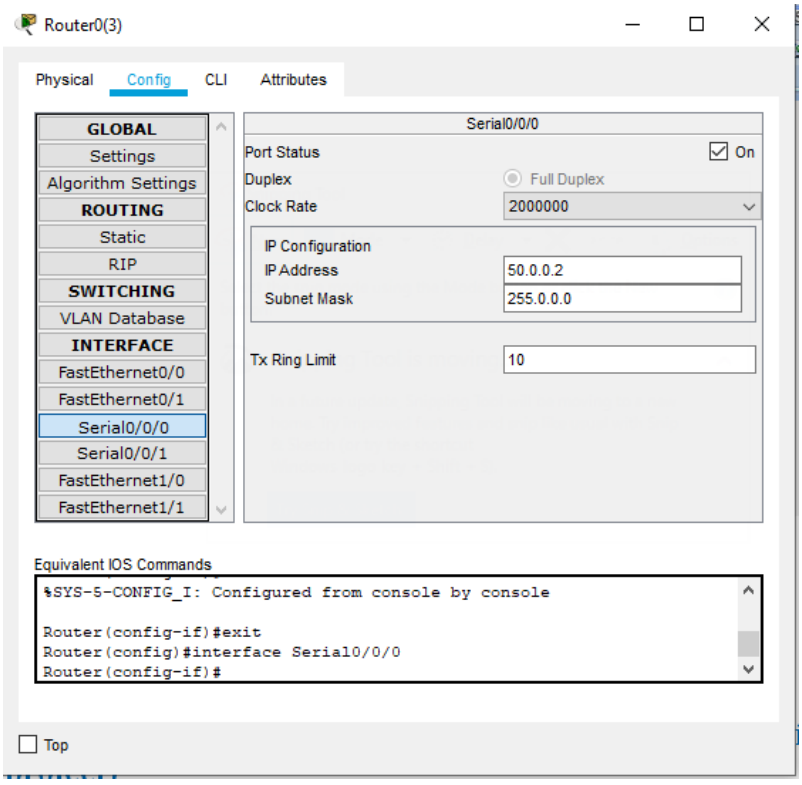


Figure-9: Serial port

RIP:

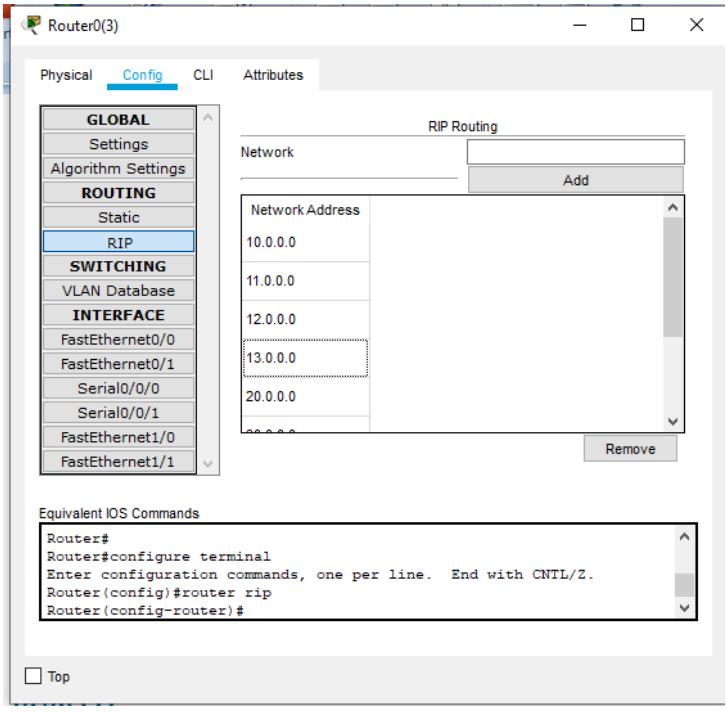


Figure 10: RIP

2.2 IOT Manager

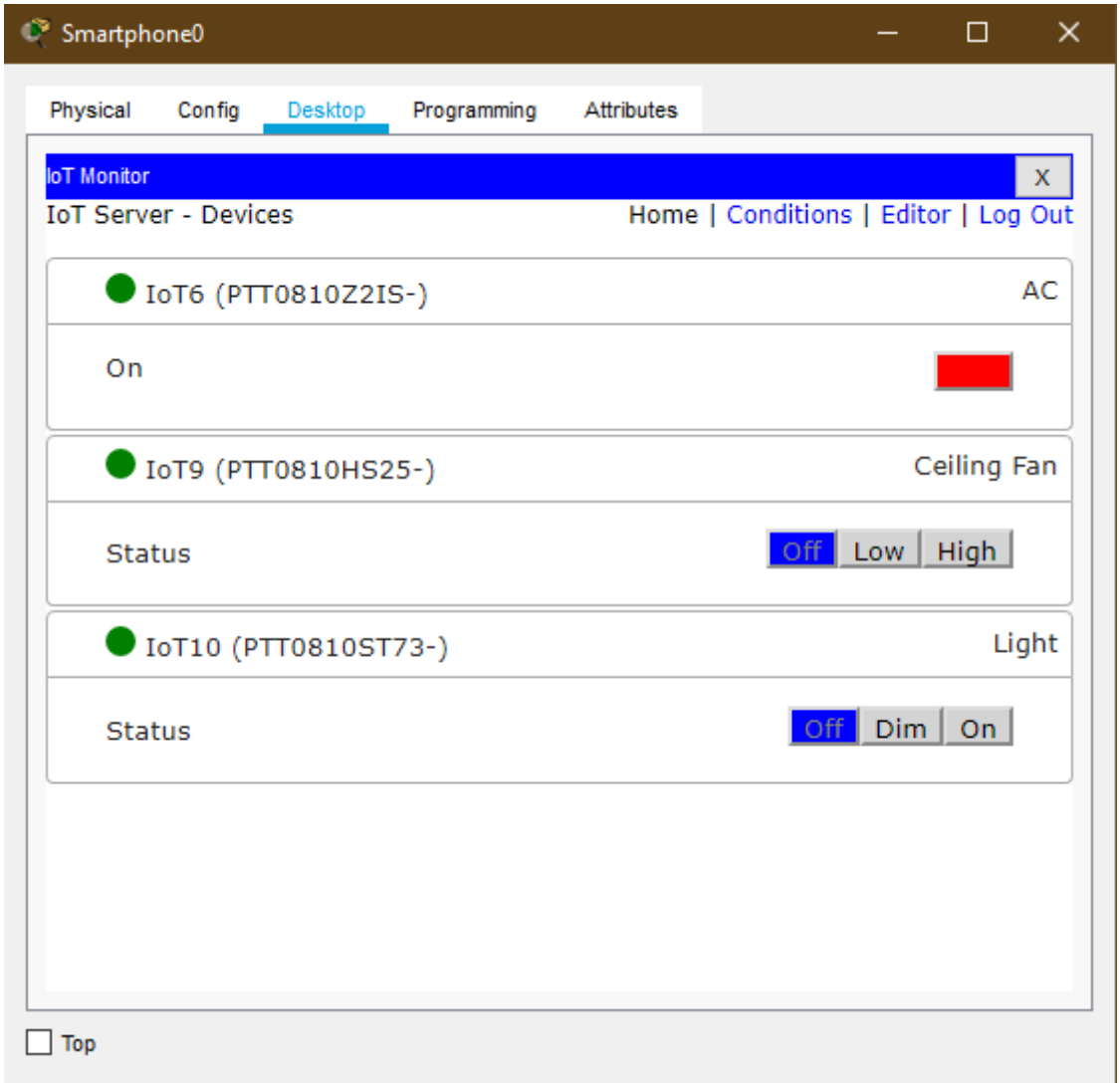
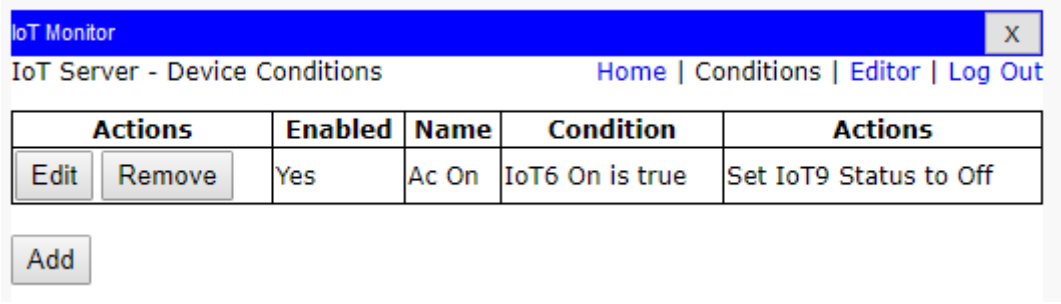


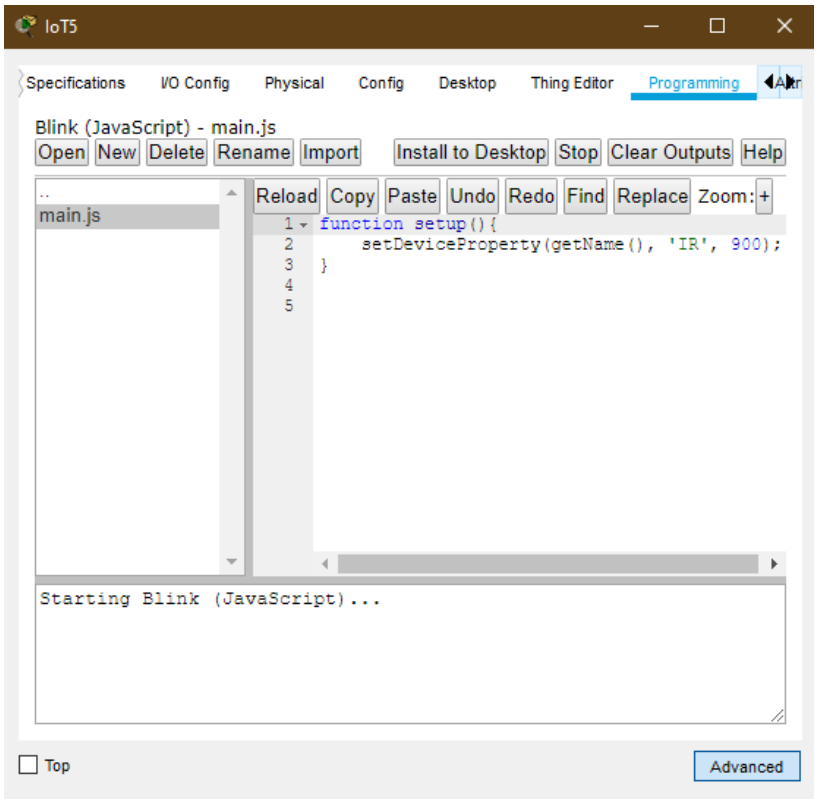
Figure 11: Controlling with a smartphone



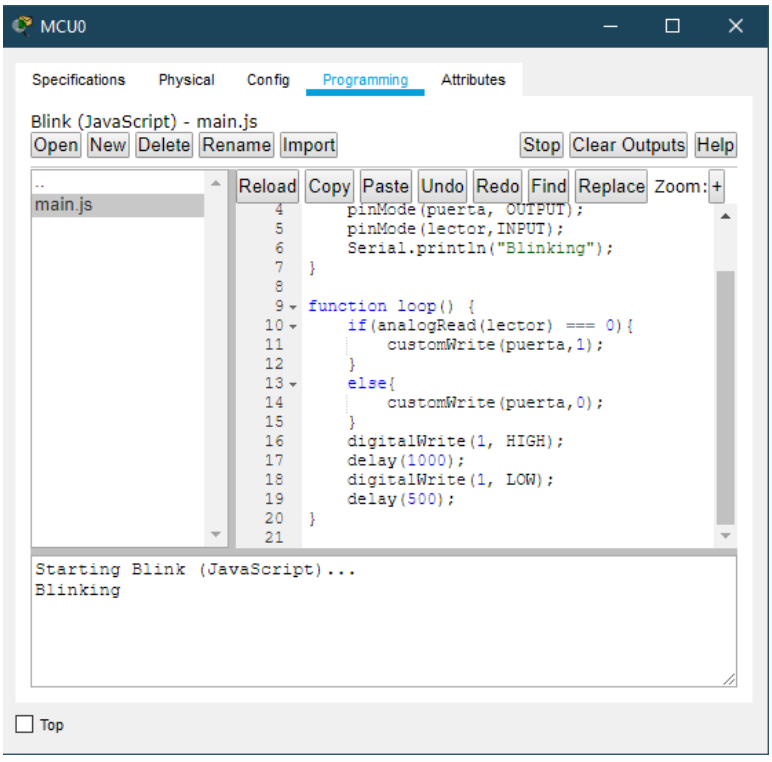
Condition

Fire alarm: If anything catches fire, the fire detector will give siren to alert everyone.

Coding for Fire

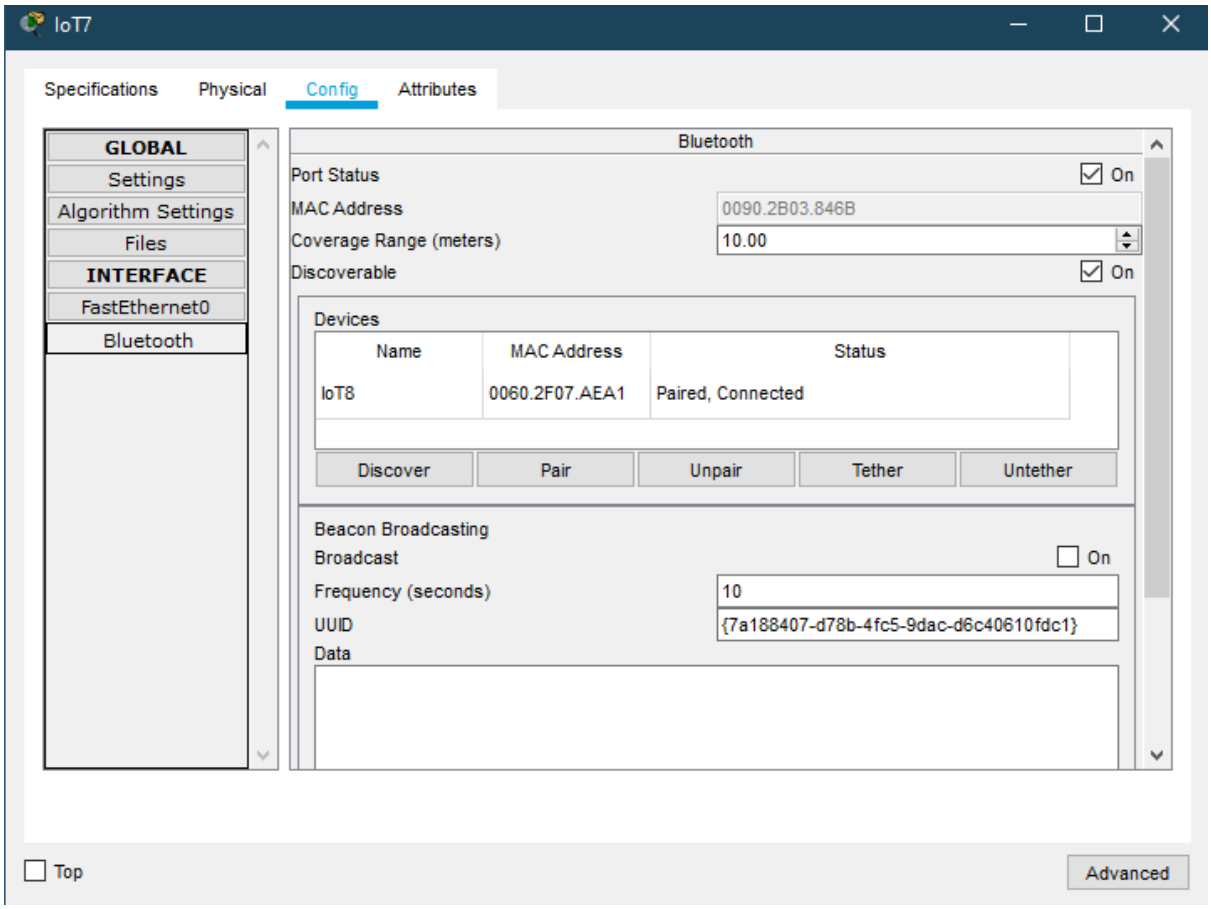


Coding for MCU (Locking System)



RFID Based Door Lock: Door can be unlocked only by using valid RFID card. If anyone wants to enter in the office, he or she has to show RFID. If the RFID is valid, the door will be opened, otherwise not.

Pairing for Portable Music Player

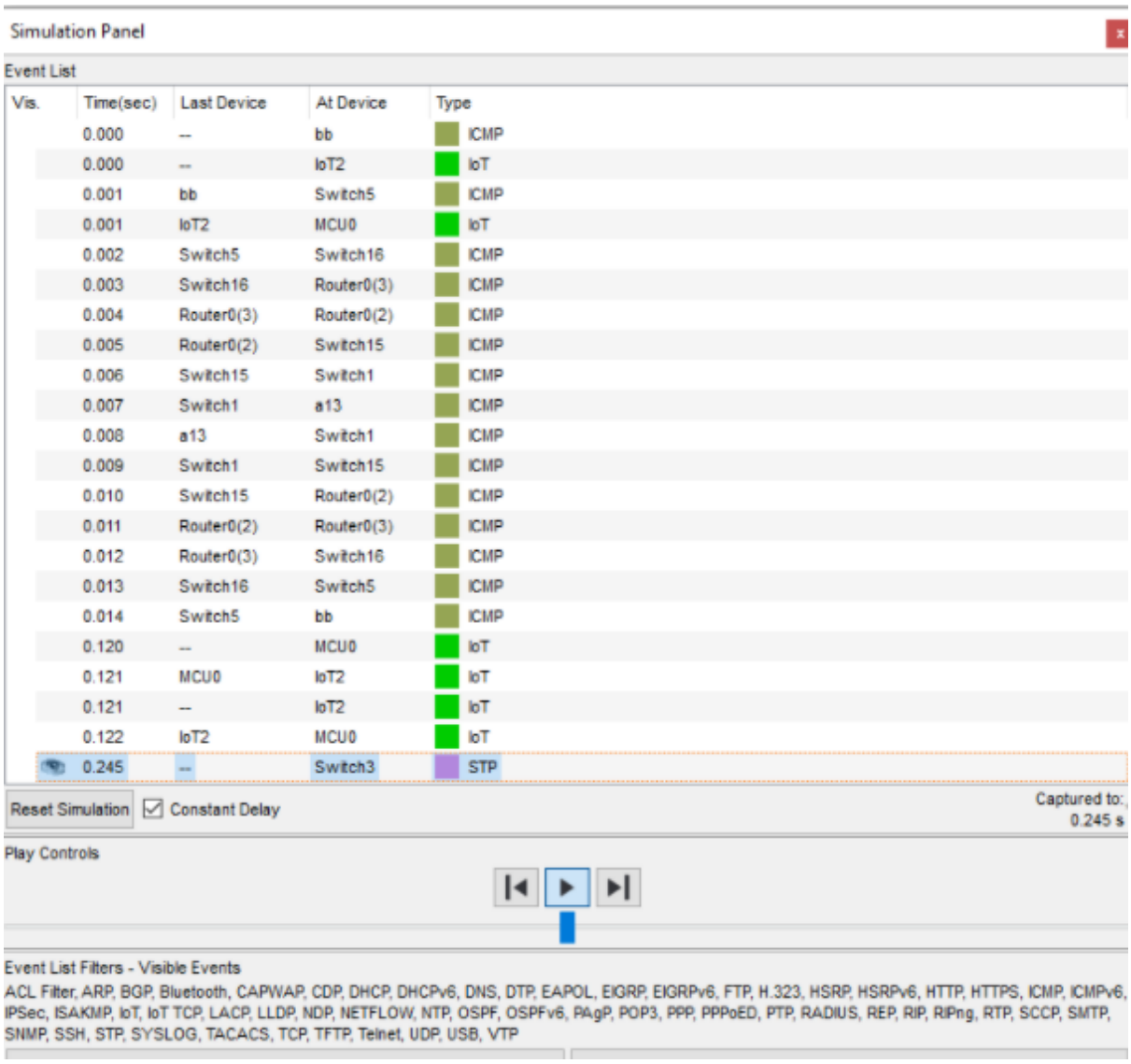


Chapter 3

Performance Evaluation

3.1 Simulation Procedure

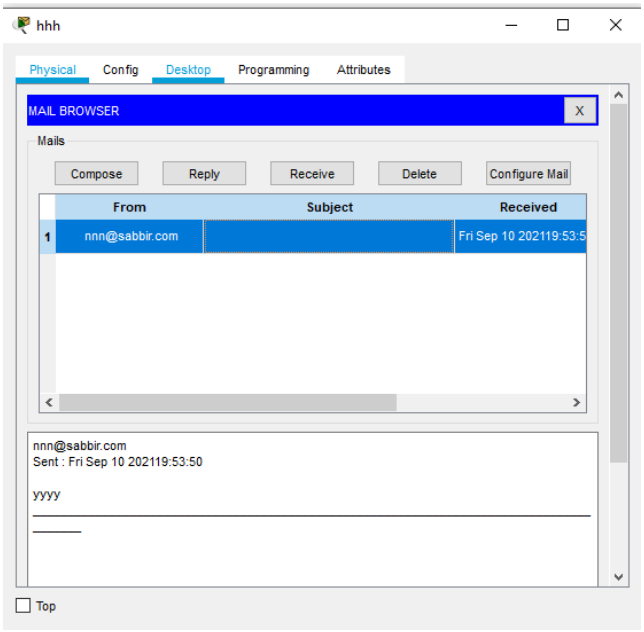
Here is the simulation of the outcomes of this network system:



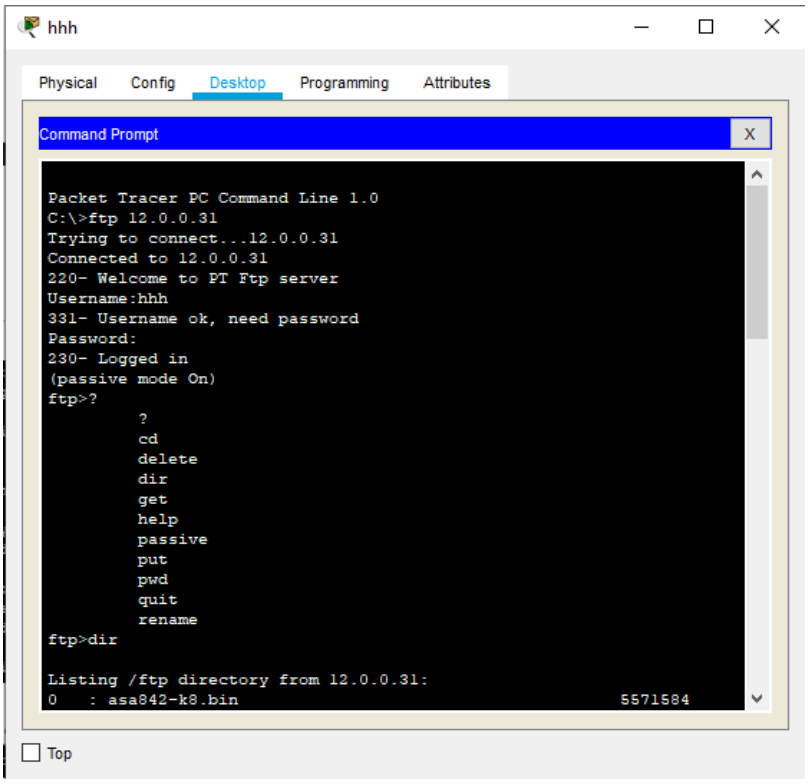
3.2 Results and Discussions

3.2.1 Results

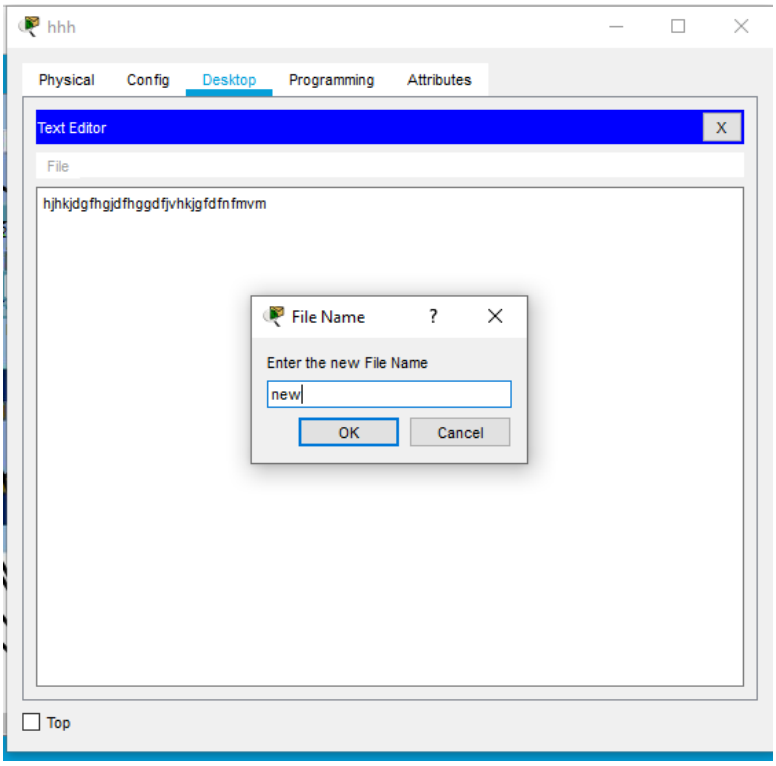
The SMTP work properly. And the output of SMTP is:



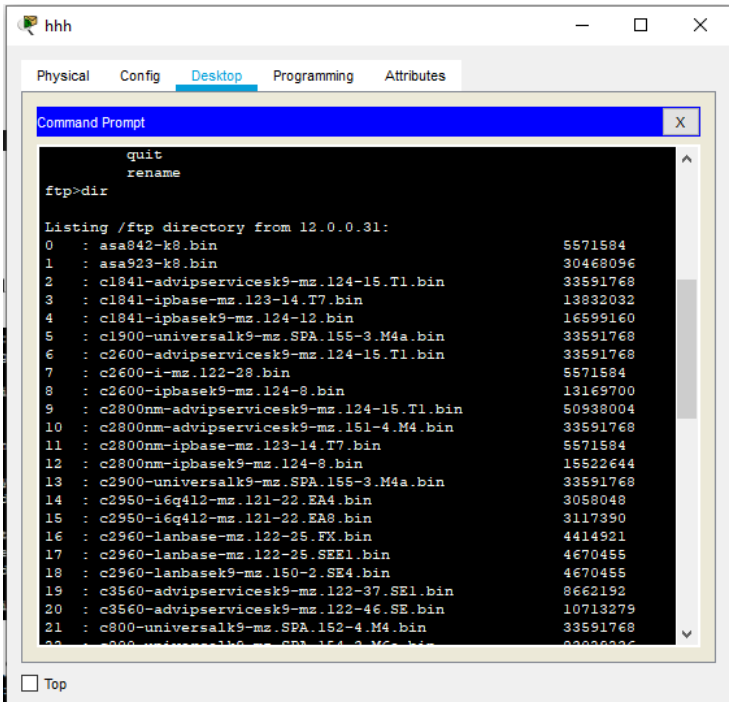
FTP server work properly. And the output is: Open ftp & directory



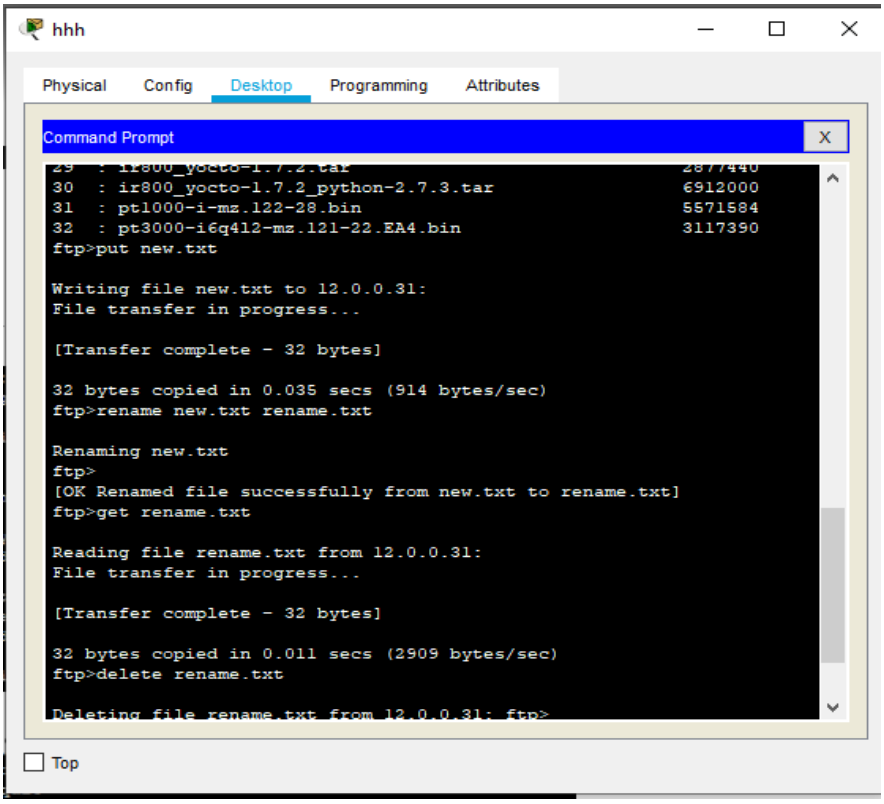
New file create:

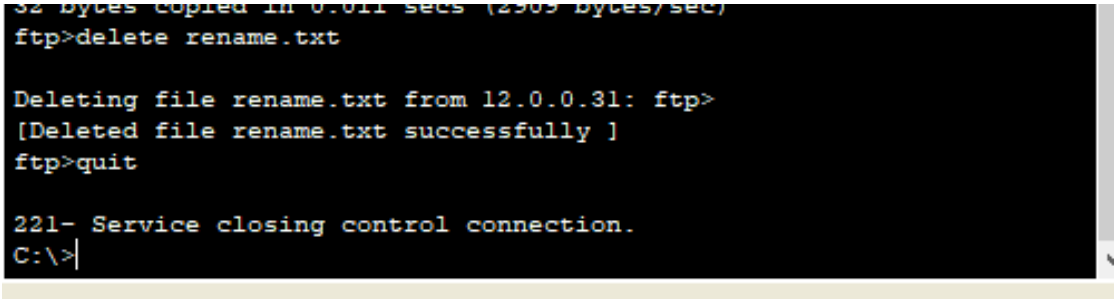


Directory:

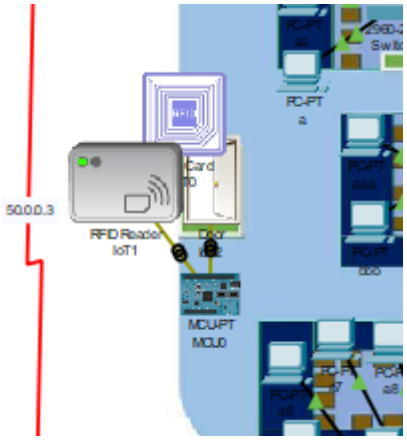


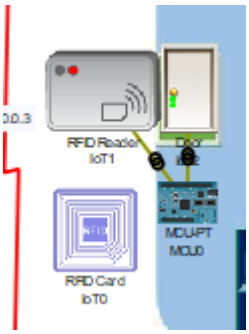
New file put, read, delete :

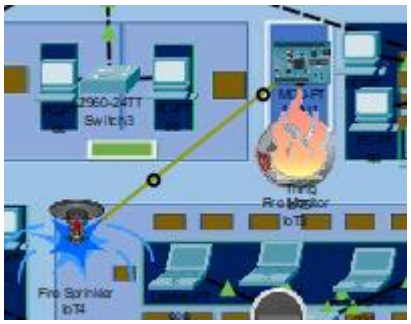


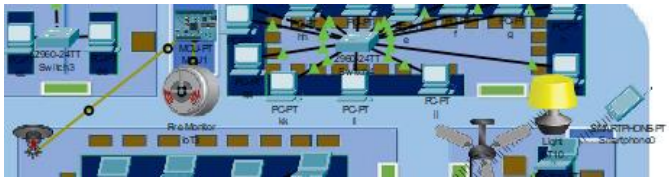


IOT OUTPUT:

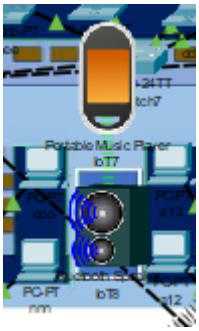

50.0.0.3
RFID Reader
IoT1
MCUPT
MCU0

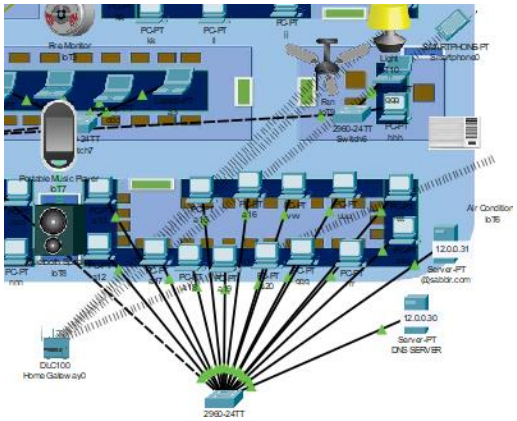

RFID Reader
IoT1
MCUPT
MCU0
RFID Card
IoT0


2960-24TT
Switch3
Fire Sprinkler
IoT4


2960-24TT
Switch3
Fire Monitor
IoT5
PC-PT
Light
IoT10
SMARTPHONE-PT
Smartphone0


Portable Music Player
IoT7
PC-PT
IoT8


Portable Music Player
IoT7
PC-PT
IoT8


Fire Monitor
IoT5
PC-PT
Light
IoT10
SMARTPHONE-PT
Smartphone0
Portable Music Player
IoT7
Air Condition
IoT6
12.0.0.31
Server-PT
12.0.0.30
Server-PT
DNS SERVER
DLC100
Home Gateway0
2960-24TT

3.2.2 Analysis and Outcome

During the implementation of these protocols, the main problems we have encountered are, each and every small step should be thoroughly examined. Otherwise, errors may be found requires a lot of time and patience. So, we didn’t take too many numbers keep connections and projects simple. However, it may be possible to implement it. It turns into a large network and gains benefits.

Chapter 4

Conclusion

4.1 Introduction

This is a simple project constructing network system smart office by implementing the SMTP Server, FTP server and Routing protocol and IOT devices.

4.1 Practical Implications

4.2 Scope of Future Work

This is a simple project constructing network system of Smart Office by implementing the SMTP Server, FTP server, Routing protocol and here dynamic routing & IoT has been used. By the help of this concept, Smart Home IoT, educational institute's, banking networking systems and any kind of networking for internal communication with server can be implemented as well as it can be implemented in networking system of any company or organizations who want to have a network system and internal servers of their own.

References

[1] Kurose, J. F., & Ross, K. W. (2009). “Computer Networking: A Top-Down Approach (Vol. 4)”. Boston, USA: Addison Wesley.7th Edition.