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**Department of Computer Science and Engineering**  
**(CSE)**

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**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

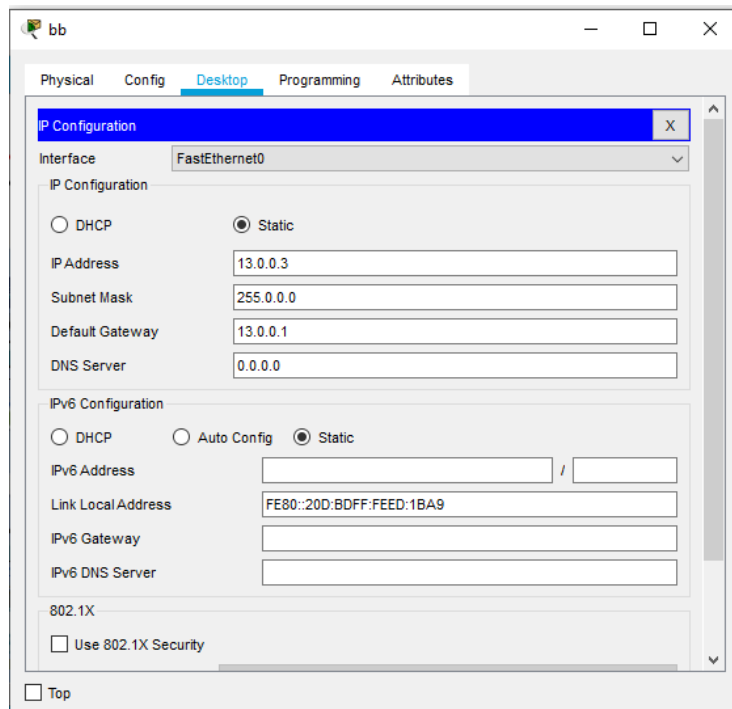
### 2.1 Procedure

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

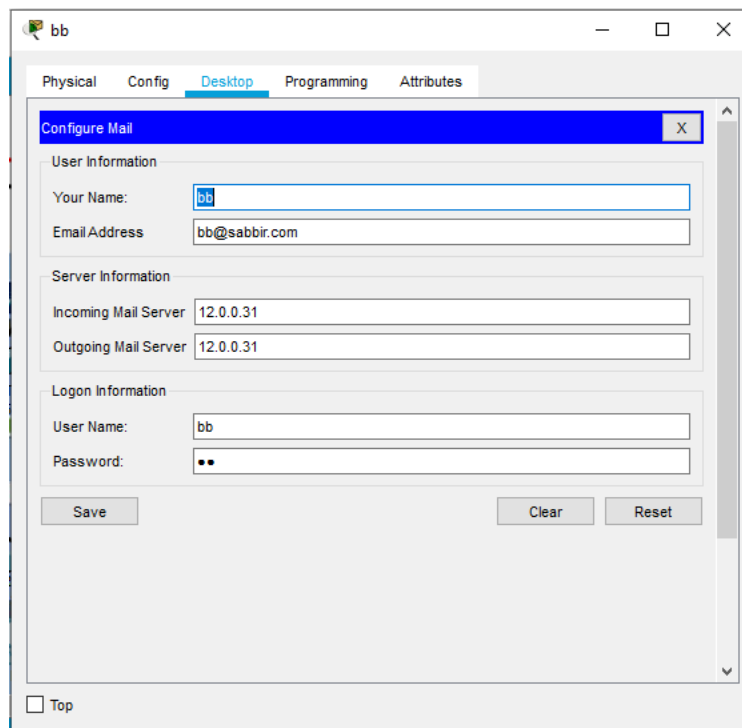
### IP Configuration:



The screenshot shows the 'IP Configuration' window in the 'bb' configuration tool. The window has tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Config' tab is selected, and the 'IP Configuration' sub-tab is active. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with: IP Address: 13.0.0.3, Subnet Mask: 255.0.0.0, Default Gateway: 13.0.0.1, and DNS Server: 0.0.0.0. Under 'IPv6 Configuration', the 'Static' radio button is selected. The fields are: IPv6 Address (empty), Link Local Address: FE80::20D:BDFE:FEED:1BA9, IPv6 Gateway (empty), and IPv6 DNS Server (empty). At the bottom, there is a checkbox for 'Use 802.1X Security' which is unchecked, and a 'Top' button.

Figure-01: User IP address Configuration

### Mail Configuration:



The screenshot shows the 'Configure Mail' window in the 'bb' configuration tool. The window has tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Config' tab is selected, and the 'Configure Mail' sub-tab is active. The 'User Information' section contains: Your Name: bb, and Email Address: bb@sabbir.com. The 'Server Information' section contains: Incoming Mail Server: 12.0.0.31, and Outgoing Mail Server: 12.0.0.31. The 'Logon Information' section contains: User Name: bb, and Password: ••. At the bottom, there are three buttons: 'Save', 'Clear', and 'Reset'. A 'Top' button is also present at the bottom left.

Figure-02: User Mail Configuration

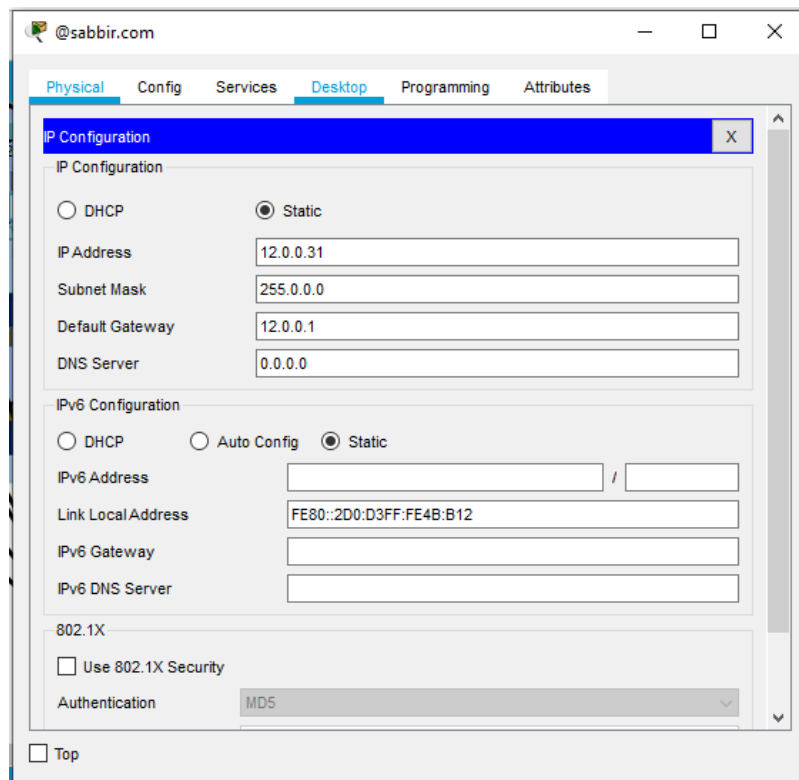


Figure-03: Mail IP address Configuration

## SMTP Configuration:

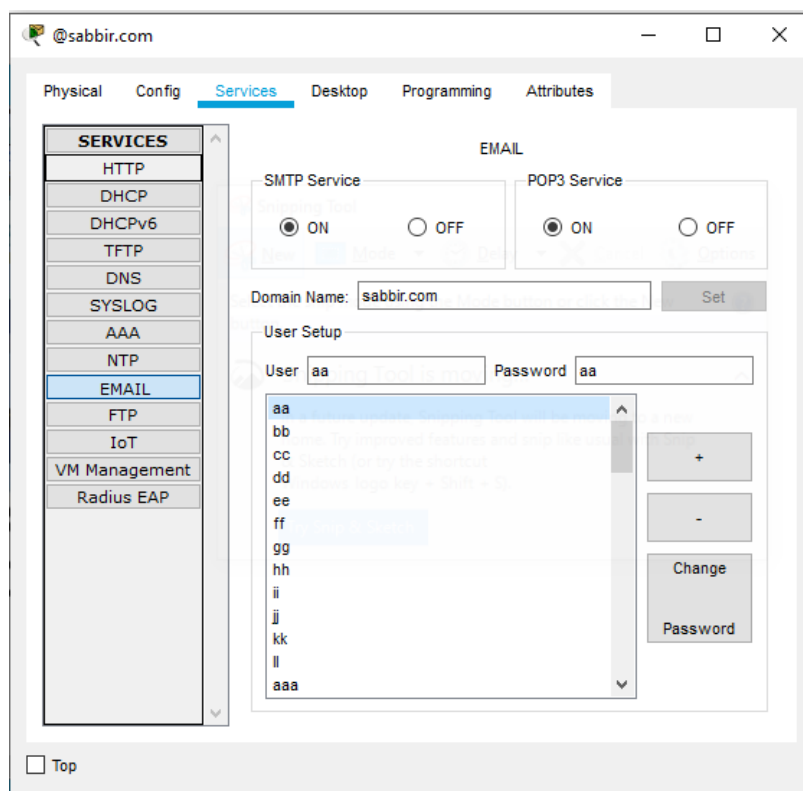


Figure-04: SMTP Configuration

## FTP Configuration:

The screenshot shows the 'Services' tab in a configuration utility. On the left, a list of services includes HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, **FTP**, IoT, VM Management, and Radius EAP. The main area is titled 'FTP' and shows the service is 'On'. Under 'User Setup', there are fields for Username and Password, both set to 'a'. Below these are checkboxes for Write, Read (checked), Delete, Rename, and List (checked). A table lists three users:

	Username	Password	Permission
1	a	a	RL
2	a1	a1	RL
3	a10	a10	RL

Buttons for 'Add', 'Save', and 'Remove' are present. Below the table is a 'File' list with three entries:

- asa842-k8.bin
- asa923-k8.bin
- c1841-advipservicesk9-mz.124-15.T1.bin

A 'Remove' button is at the bottom right of the file list.

Figure-05: FTP configuration

## DNS IP Configuration:

The screenshot shows the 'Desktop' tab in a configuration utility. A sub-window titled 'IP Configuration' is open, showing settings for IP and IPv6. Under 'IP Configuration', 'Static' is selected. The fields are:

- IP Address: 12.0.0.30
- Subnet Mask: 255.0.0.0
- Default Gateway: 12.0.0.1
- DNS Server: 0.0.0.0

Under 'IPv6 Configuration', 'Static' is selected. The fields are:

- IPv6 Address: (empty)
- Link Local Address: FE80::207:ECFF:FE77:1897
- IPv6 Gateway: (empty)
- IPv6 DNS Server: (empty)

At the bottom, under '802.1X', 'Use 802.1X Security' is unchecked, and 'Authentication' is set to 'MD5'.

Figure-06: DNS IP configuration

## DNS Server Configuration:

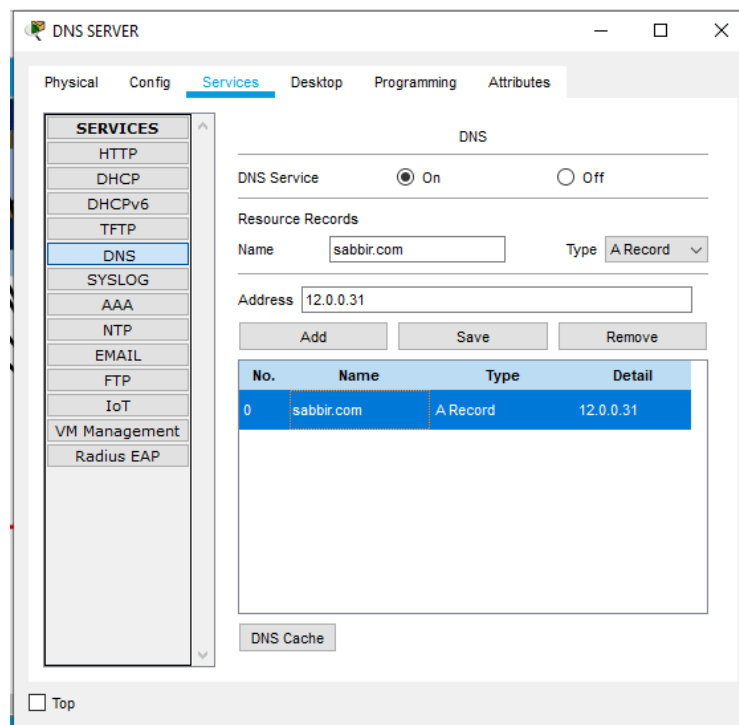


Figure 7: DNS server Configuration

## Fast Ethernet Configuration:

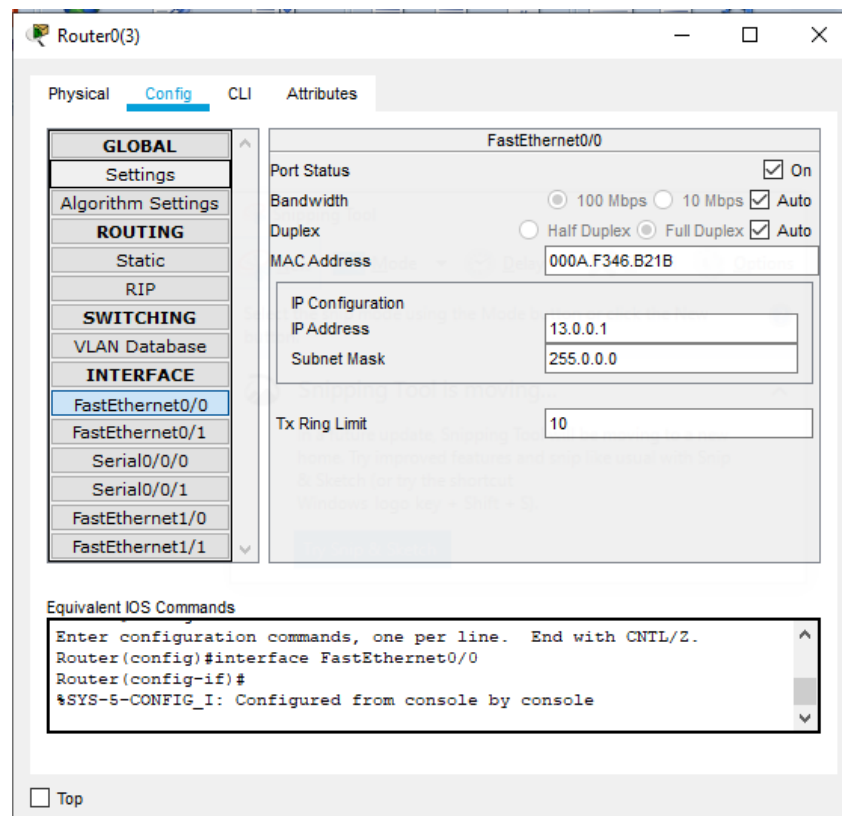


Figure-08: Fast Ethernet



## Serial Number:

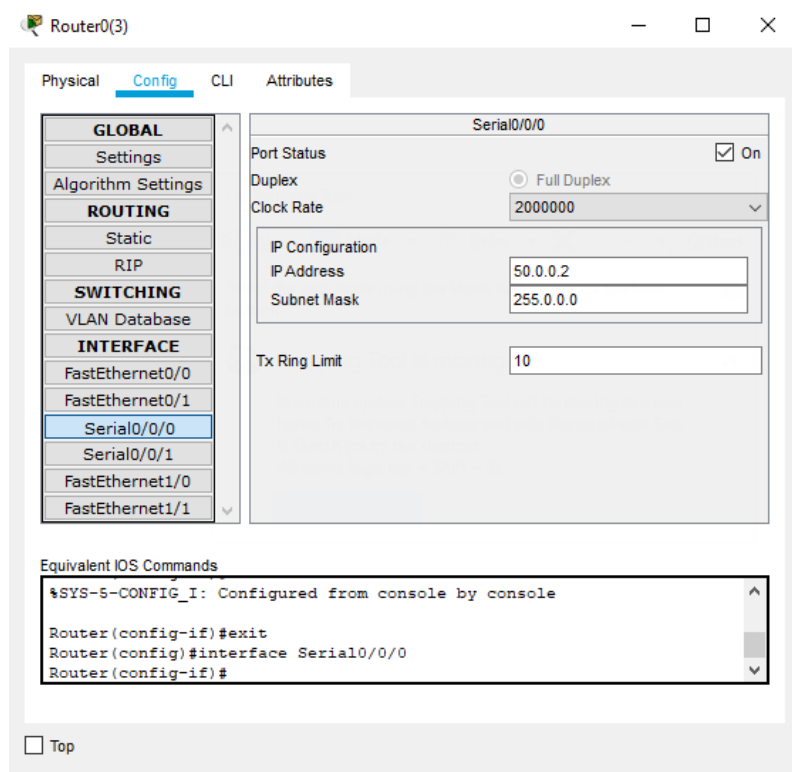


Figure-9: Serial port

## RIP:

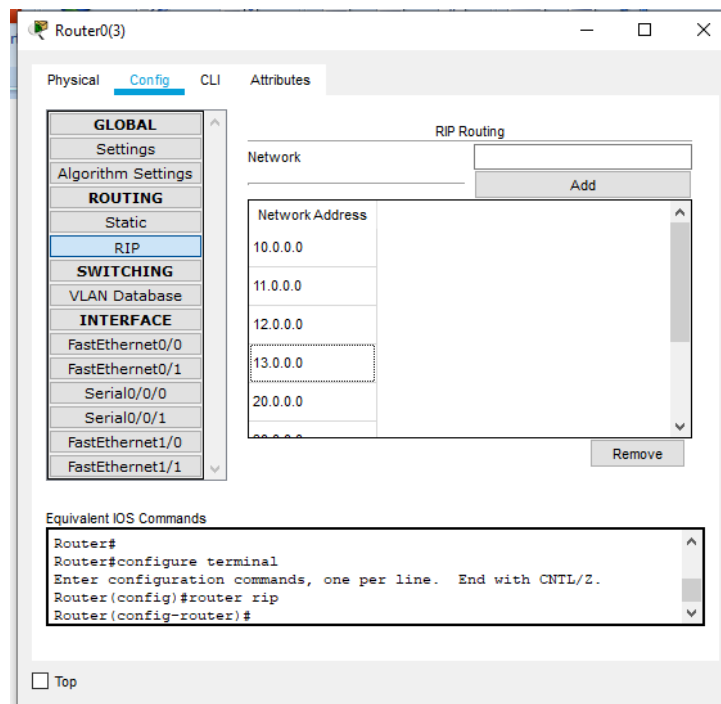


Figure 10: RIP

## 2.2 IOT Manager

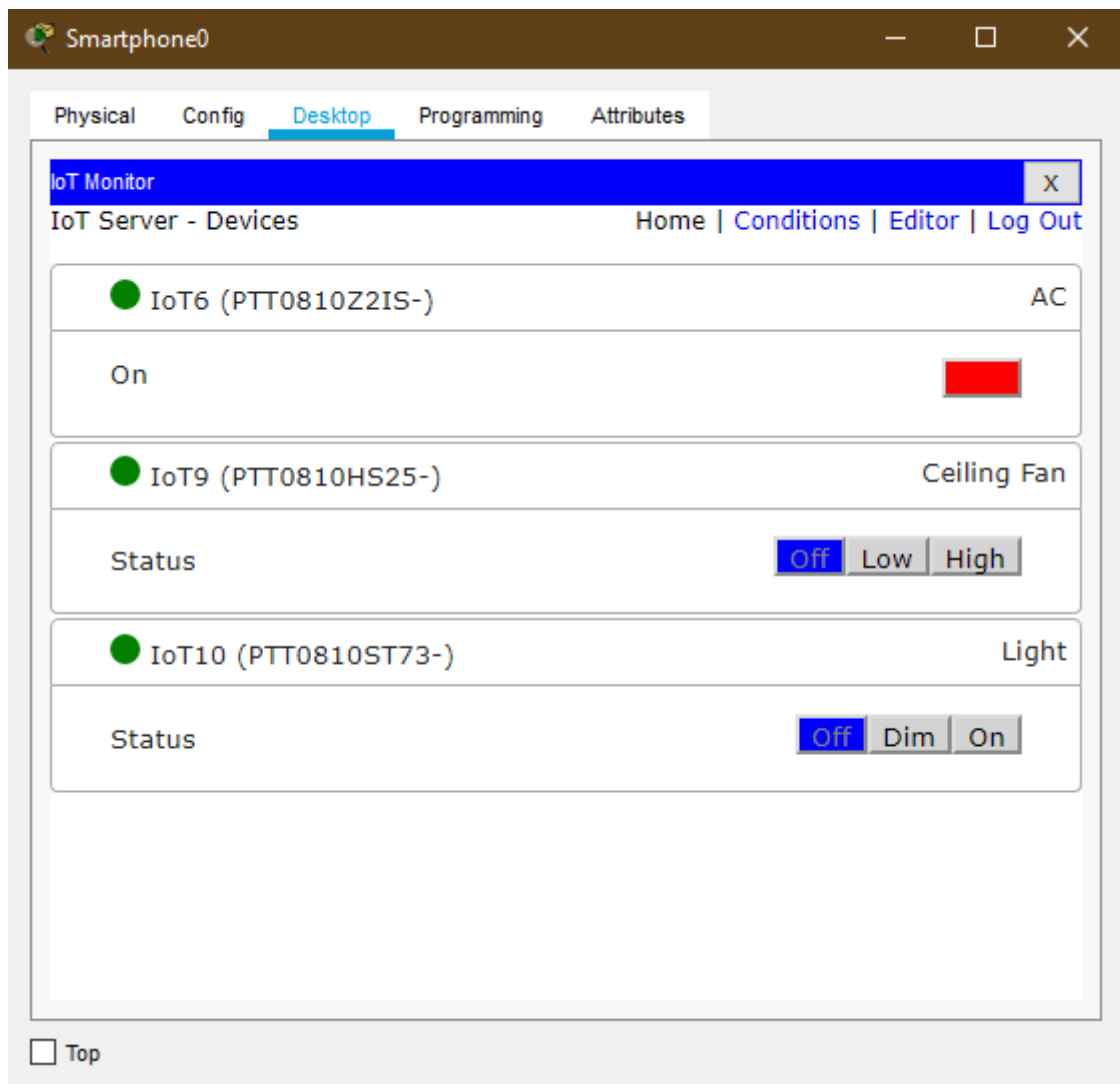
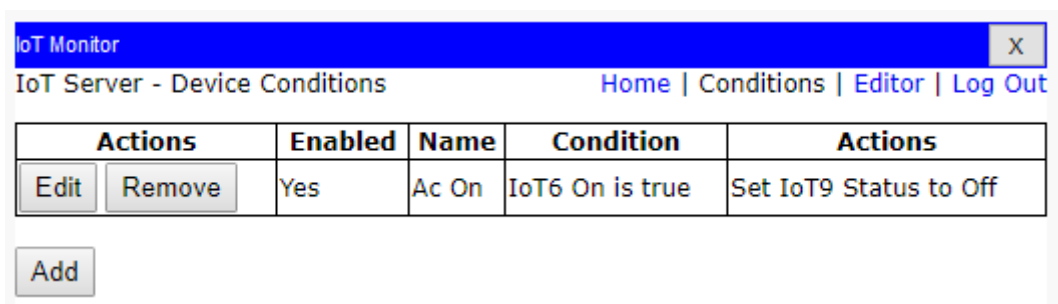


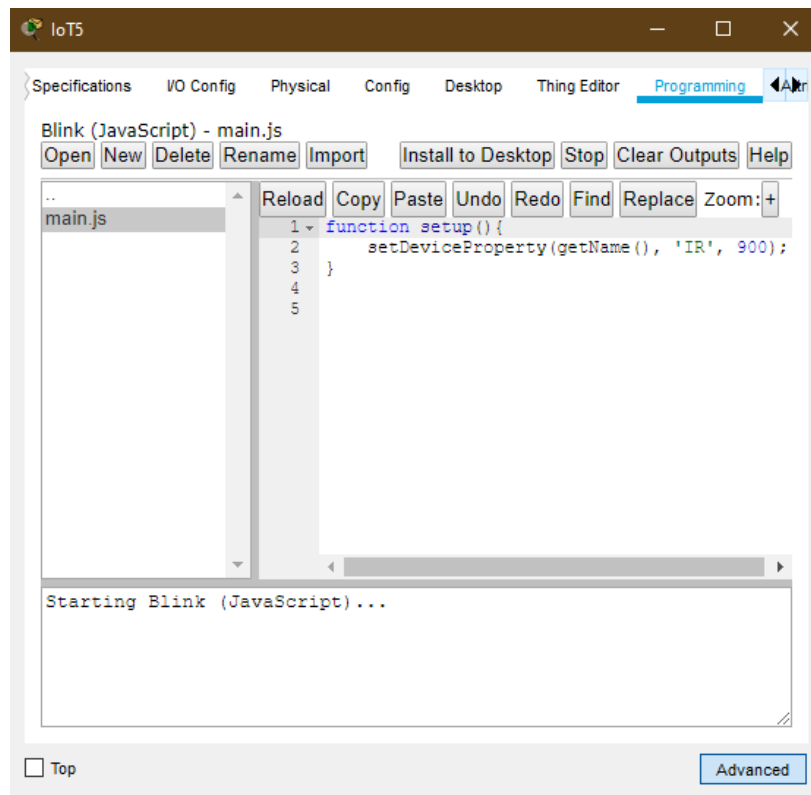
Figure 11: Controlling with a smartphone



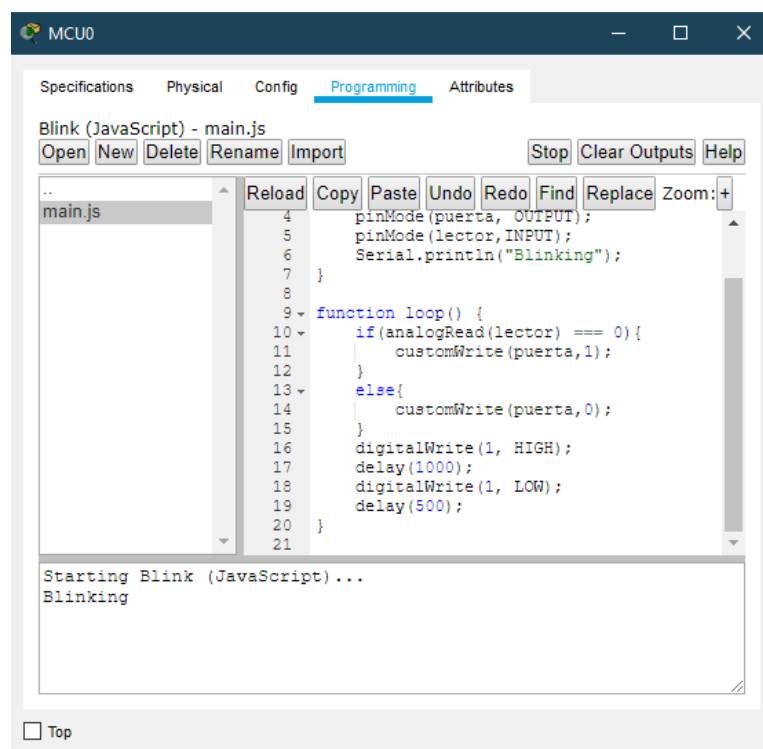
### Condition

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

## Coding for Fire

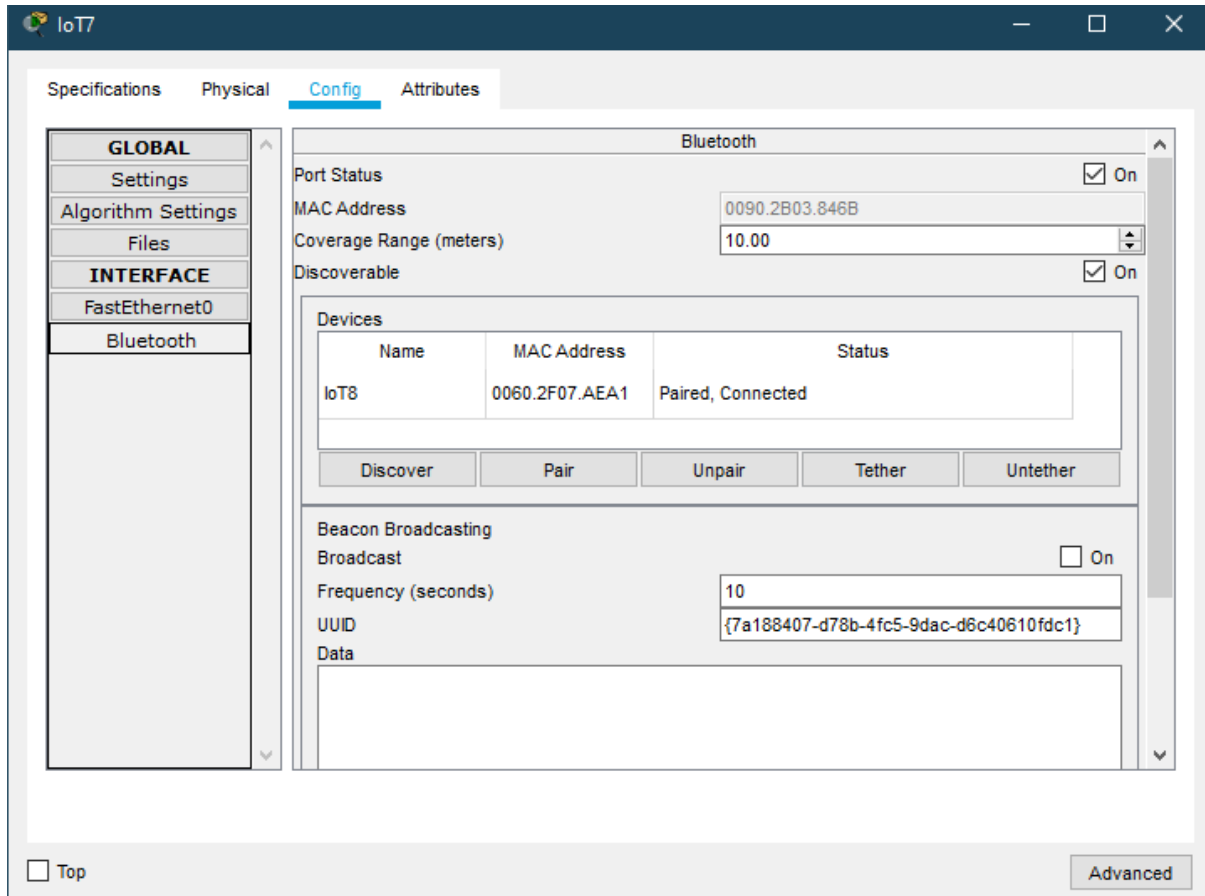


## Coding for MCU (Locking System)



**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



The screenshot shows the IoT7 configuration window with the 'Config' tab selected. The left sidebar contains a tree view with 'GLOBAL' (Settings, Algorithm Settings, Files) and 'INTERFACE' (FastEthernet0, Bluetooth). The main panel displays the 'Bluetooth' configuration. The 'Port Status' is 'On'. The 'MAC Address' is '0090.2B03.846B'. The 'Coverage Range (meters)' is '10.00'. The 'Discoverable' status is 'On'. A table lists the paired device 'IoT8' with MAC address '0060.2F07.AEA1' and status 'Paired, Connected'. Below the table are buttons for 'Discover', 'Pair', 'Unpair', 'Tether', and 'Untether'. The 'Beacon Broadcasting' section has 'Broadcast' set to 'On', 'Frequency (seconds)' set to '10', and a 'UUID' field containing '{7a188407-d78b-4fc5-9dac-d6c40610fdc1}'. A 'Data' field is also present. At the bottom, there is a 'Top' button and an 'Advanced' button.

Name	MAC Address	Status
IoT8	0060.2F07.AEA1	Paired, Connected

Beacon Broadcasting	
Broadcast	<input checked="" type="checkbox"/> On
Frequency (seconds)	10
UUID	{7a188407-d78b-4fc5-9dac-d6c40610fdc1}
Data	

# Chapter 3

## Performance Evaluation

### 3.1 Simulation Procedure

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

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	bb	ICMP
	0.000	--	IoT2	IoT
	0.001	bb	Switch5	ICMP
	0.001	IoT2	MCU0	IoT
	0.002	Switch5	Switch16	ICMP
	0.003	Switch16	Router0(3)	ICMP
	0.004	Router0(3)	Router0(2)	ICMP
	0.005	Router0(2)	Switch15	ICMP
	0.006	Switch15	Switch1	ICMP
	0.007	Switch1	a13	ICMP
	0.008	a13	Switch1	ICMP
	0.009	Switch1	Switch15	ICMP
	0.010	Switch15	Router0(2)	ICMP
	0.011	Router0(2)	Router0(3)	ICMP
	0.012	Router0(3)	Switch16	ICMP
	0.013	Switch16	Switch5	ICMP
	0.014	Switch5	bb	ICMP
	0.120	--	MCU0	IoT
	0.121	MCU0	IoT2	IoT
	0.121	--	IoT2	IoT
	0.122	IoT2	MCU0	IoT
	0.245	--	Switch3	STP

Reset Simulation

☒ Constant Delay

Captured to:  
0.245 s

Play Controls

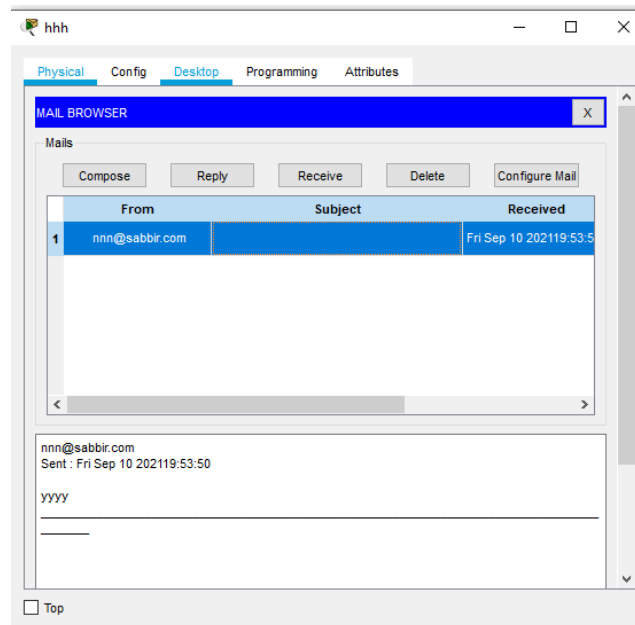
Event List Filters - Visible Events

ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

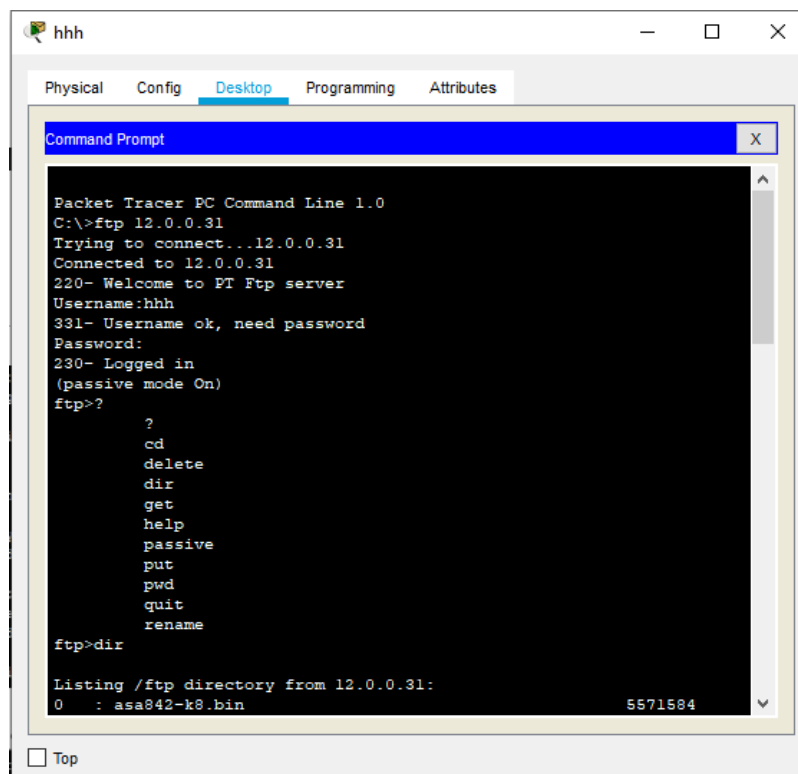
## 3.2 Results and Discussions

### 3.2.1 Results

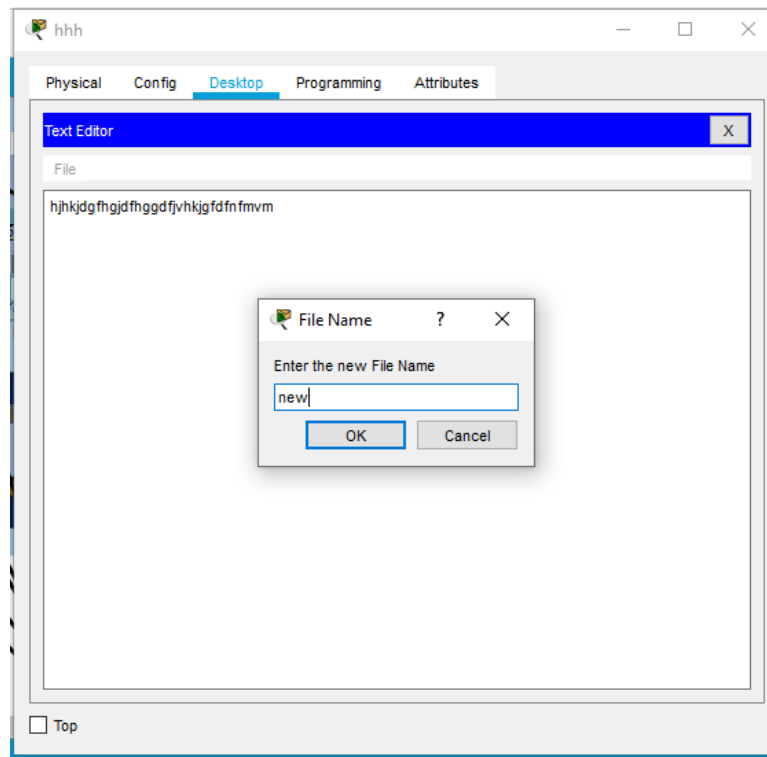
The SMTP work properly. And the output of SMTP is:



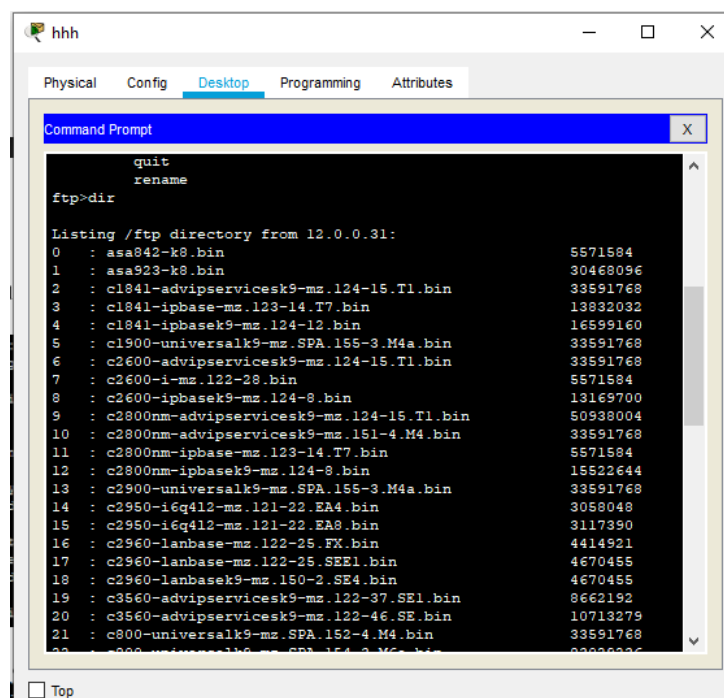
FTP server work properly. And the output is: Open ftp & directory



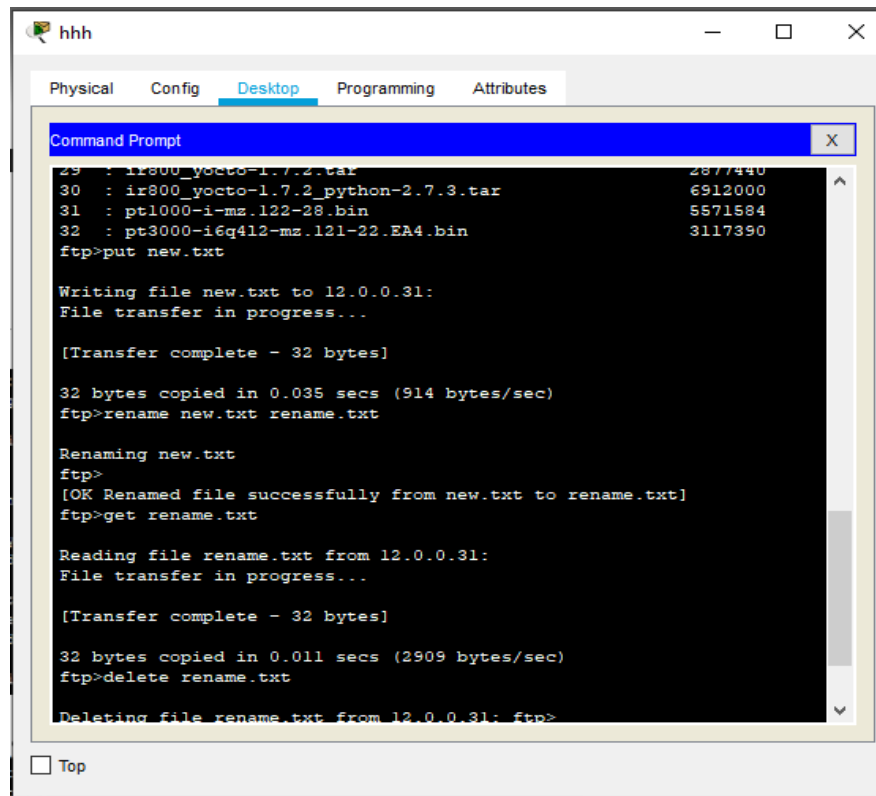
New file create:



Directory:



New file put, read, delete :



```
hhh
Physical Config Desktop Programming Attributes
Command Prompt
29 : lr800_yocto-1.7.2.tar                2877440
30 : lr800_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>put new.txt

Writing file new.txt to 12.0.0.31:
File transfer in progress...

[Transfer complete - 32 bytes]

32 bytes copied in 0.035 secs (914 bytes/sec)
ftp>rename new.txt rename.txt

Renaming new.txt
ftp>
[OK Renamed file successfully from new.txt to rename.txt]
ftp>get rename.txt

Reading file rename.txt from 12.0.0.31:
File transfer in progress...

[Transfer complete - 32 bytes]

32 bytes copied in 0.011 secs (2909 bytes/sec)
ftp>delete rename.txt

Deleting file rename.txt from 12.0.0.31: ftp>
☐ Top
```

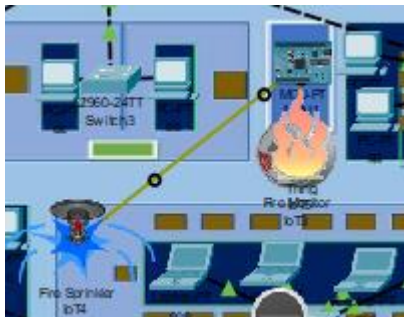
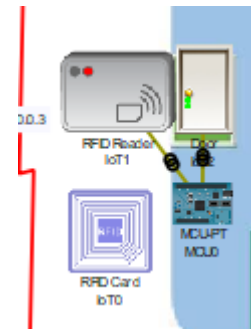
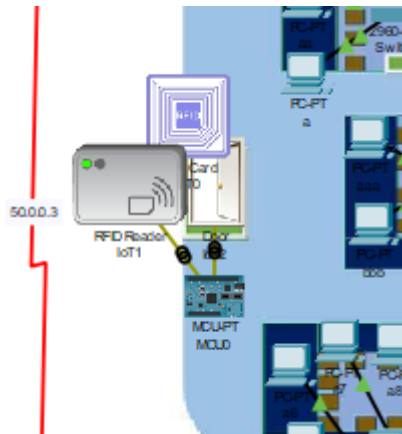
```
32 bytes copied in 0.011 secs (2909 bytes/sec)
ftp>delete rename.txt

Deleting file rename.txt from 12.0.0.31: ftp>
[Deleted file rename.txt successfully ]
ftp>quit

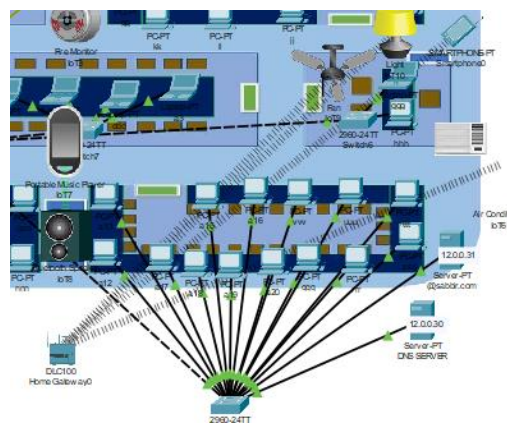
221- Service closing control connection.
C:\>|
```



## IOT OUTPUT:



30



### **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.