Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
Semester: (Fall, Year: 2022), B.Sc. in CSE (Day)

SMART OFFICE

Course Title: Computer Networking Lab
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Lab Project Status	
Marks:	**Signature:**
Comments:	**Date:**

Contents

Chapter 1

Introduction

1.1 Overview

Using IoT technology for a smart office means that many devices in an office are connected to the IoT, allowing remote control of them. These devices work and collect data without human interaction. With smart technology, offices can be more efficient than ever before, allowing the automation of menial tasks to give the staff more time to work on worthwhile projects.

1.2 Motivation

A Smart Office is a high-tech hybrid workplace with a human touch. Designed to improve the overall office space with the best management tools, they make employees work smarter, better, and faster. A smart office can prove to be a powerful option with visible benefits in more than one aspect of the office. The main motivation for our Smart Office project is given below –

- Improve inter-division communications.
- Faster decision-making process.
- It saves organization resources and expenses.
- This system is effective and saves time.

1.3 Design Goals/Objectives

For several years, organizations started transforming their offices into smart offices and workplaces overall into smart workplaces. The main objective of this project is to create a smart system that integrates the technologies, services, tools, and data analytics for smart office goals plays a central role with sensors and IoT technologies feeding the

platform. Different use cases require different types of smart sensors and other components.The project aims and objectives that will be achieved after completion of this project are discussed in the subchapter. The abjectives are as follow:

- To create a Smart Office Cisco Packet Tracer-based automation system
- To create an FTP server, Routing IP, configure SMTP, DNS Gateway
- To create a system that increases productivity.
- To create a system that can save time and energy.

1.4 Application

The project that we have configured using Cisco Packet Tracer. We can make our office called Smart office.

1.4.1 Smart Office Network Equipment

The devices and items used to design the SmartOffice model are server, switch, Personal Computer (PC), laptop, printer, home gateway, smartphone, motion detectors, light, coffee appliance, AirConditioner (AC), smart doors, Radio Frequency Identification (RFID) Reader, Radio Frequency Identification (RFID) Card, fire,fire sprinkler, and cables.

1.4.2 Connection Setup

The obvious path to connecting devices together. In this model, the PC andlaptop are connected to a switch and the switch is connected to the home gatewayusing copper straight cables. The smart door, RFID Reader, fire monitor, andfire sprinkler are connected with the MCUs by IoT custom cables. The rest ofthe used devices are connected to the home gateway wirelessly.

Chapter 2

Design/Development/Implementation of the Project

2.1 Introduction

So basically to configure our project we used Cisco Packet Tracer. In this project, we divided our rooms with different types of a name such as Main Entrance, Connection(server room), Employee workstation, CEO, and Food Canteen.

2.2 Implementation

We successfully implement our project and the project worked as we plan at the start of project.

2.2.1 Tools and libraries

The tool and libraries that we used in our project is-

- Router
- SMTP, FTP, Protocols
- Cable modem
- Home gateway
- IoT devices.

2.2.2 Implementation details

Main Entrance

At the main Entrance, we have set a condition that people with the right RFID card can enter this room. Without the right card, the door will not open. And we set a feature where the user can on the Smart LED light.

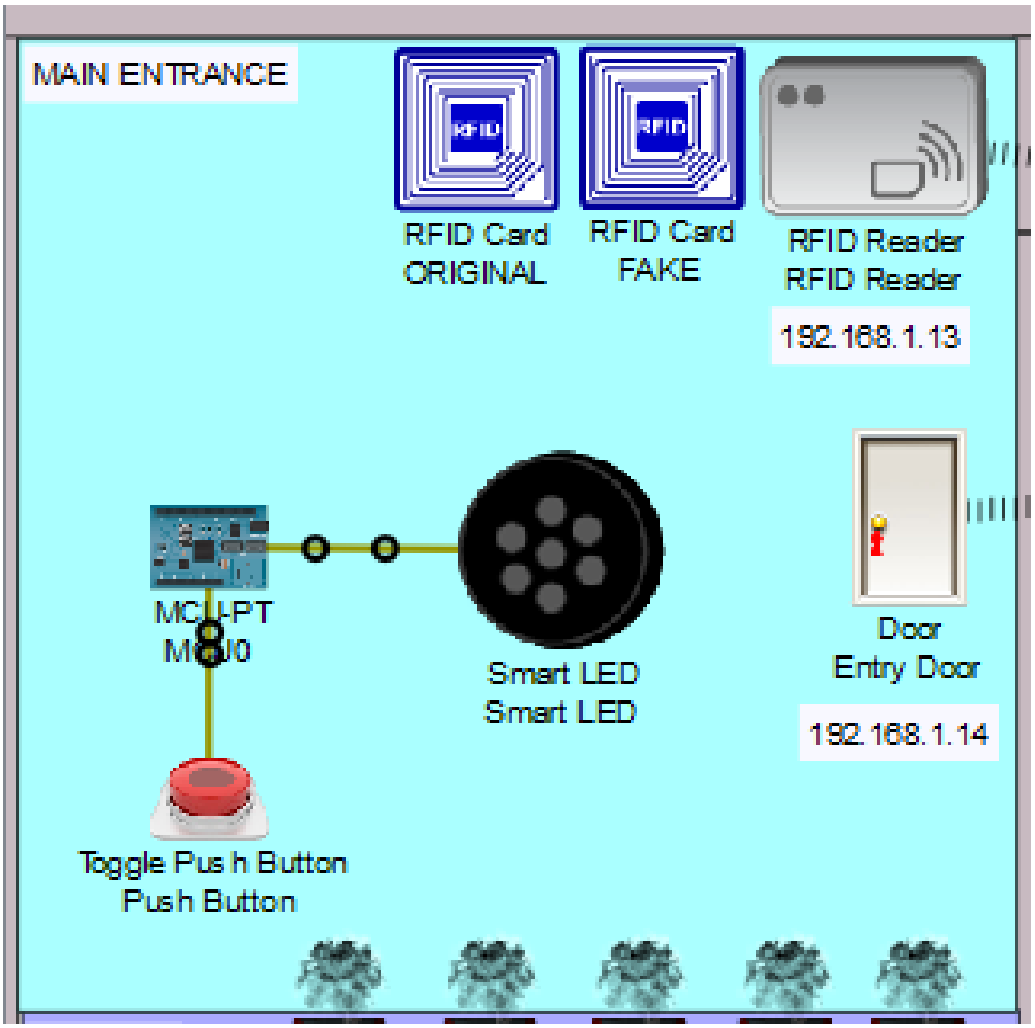

Figure 2.1: MAIN ENTRANCE

Parking

Here we have added a motion detector and a garage door. Set a condition, we can see in the figure2.3 that is detecting the motion and opening the garage automatically.

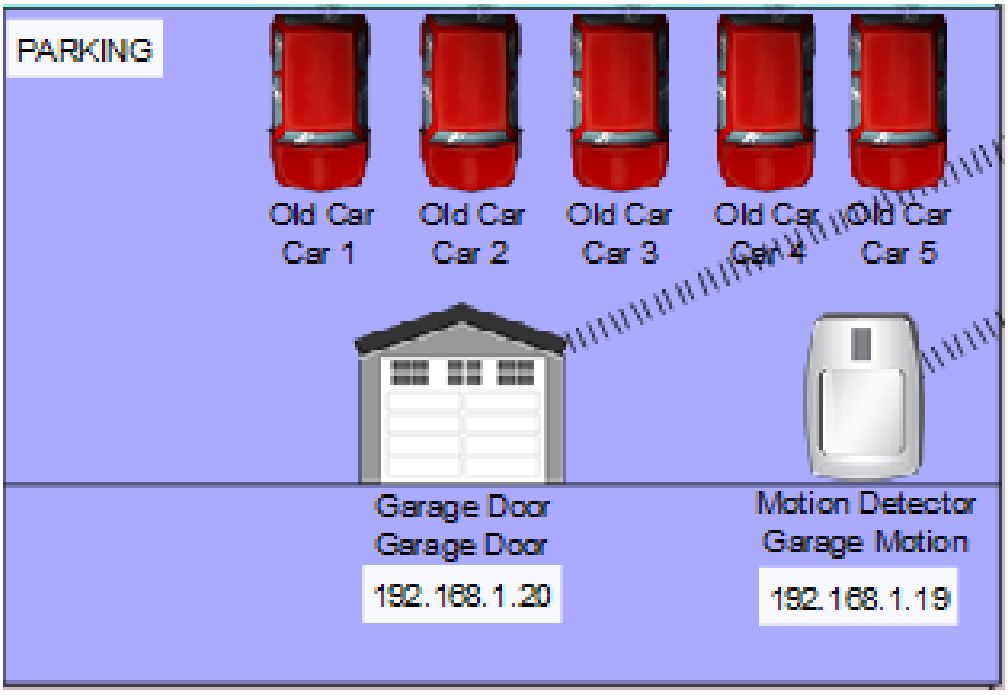

Figure 2.2: Parking

Edit Remove	Yes	Garage Open	PTT081058HY- On is true	Set Garage Door On to true
Edit Remove	Yes	Garage Close	PTT081058HY- On is false	Set Garage Door On to false

Figure 2.3: Parking Conditions

Connection

In the Connection part, we added an FTP server and Mail server for transferring mail pc to pc. Here we also have the RFID card same as the entrance room. We connect the router to each other dynamically.

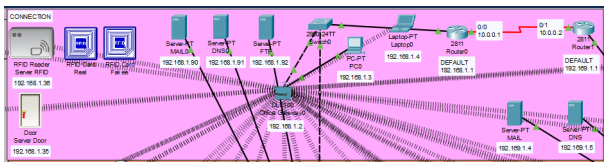

Figure 2.4: Connection

Employee Workstation

In the Employee workstation part, we have added a Fire detection and fire prevention system in this room. When the smoke detector detects fire the siren will go on and the fire sprinkler will turn on to prevent fire. Also, the windows will open. Then after the fire has been turned off siren and sprinkler will be turned off.

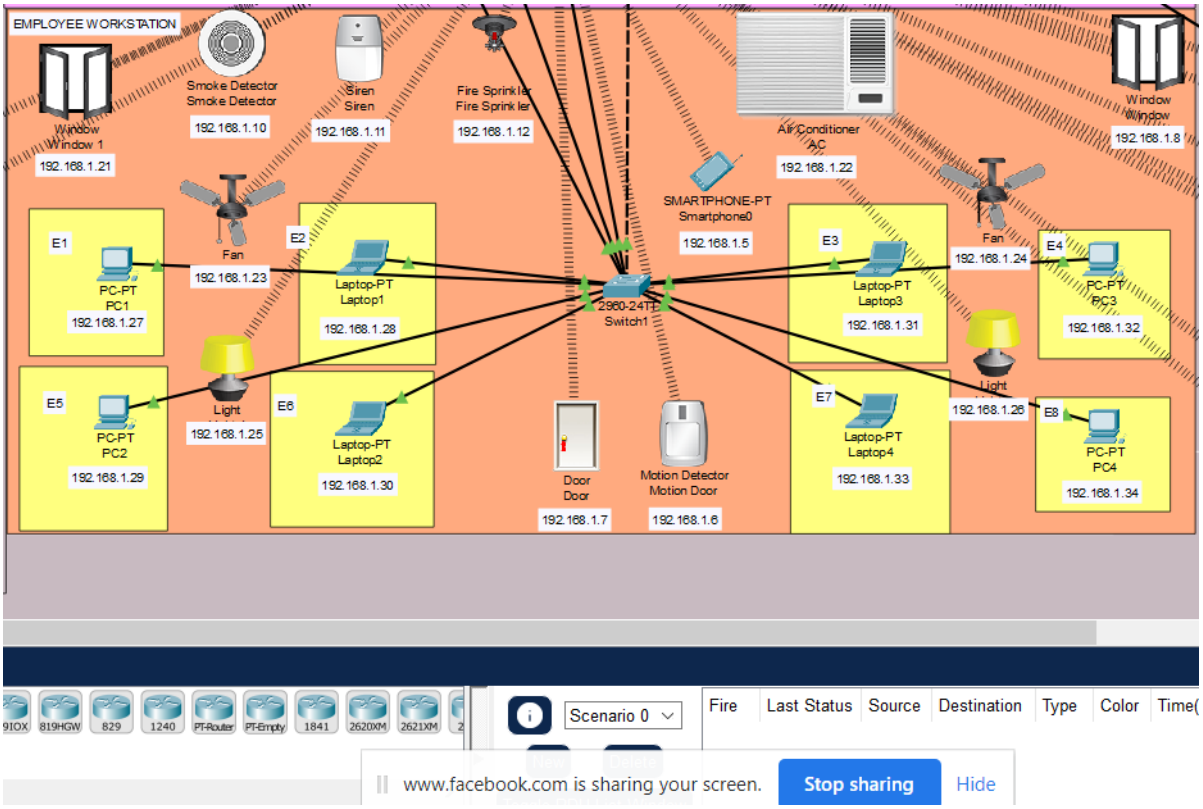

Figure 2.5: Employee Workstation

Food Canteen

In the Food canteen, when the user comes to the door the motion detector will detect the motion and open the door. Here if the user wants coffee then the user has punched the RFID card first. When the user punched the card then the appliance coffee maker will be on.

CEO

[htdp] In the CEO room, we have added another home gateway so that only CEO can access their IoT devices.

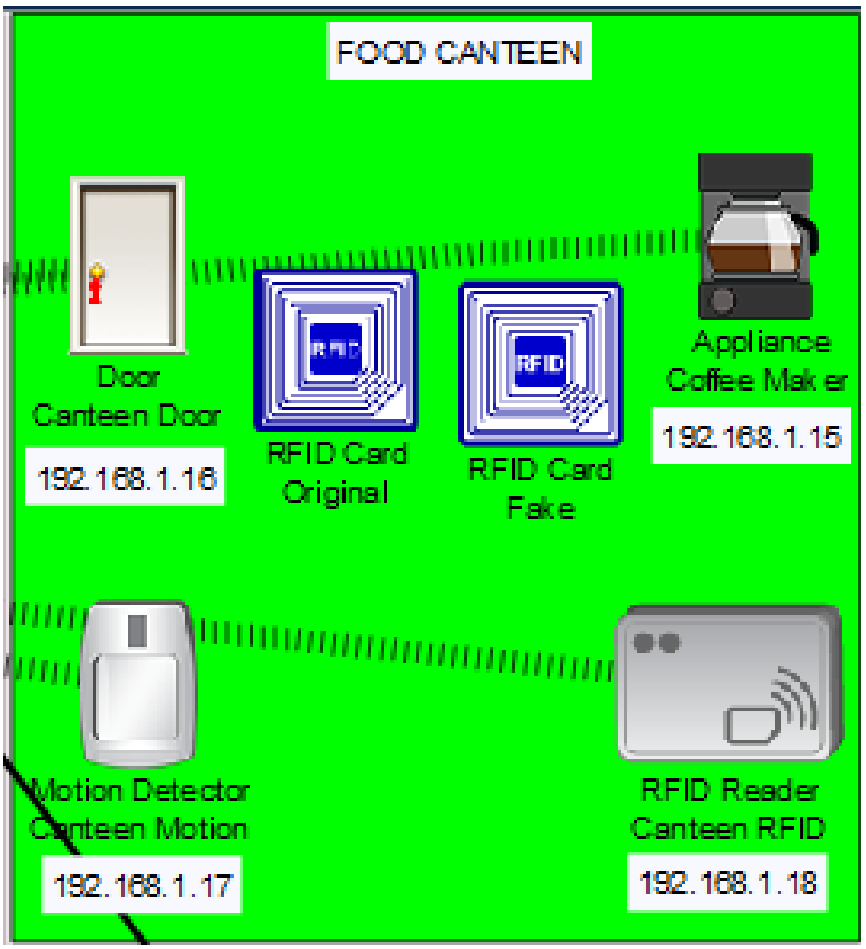

Figure 2.6: Food Canteen

Conference Room

In the Conference room, we added a webcam, a motion application in the door, and added pc, and laptop.

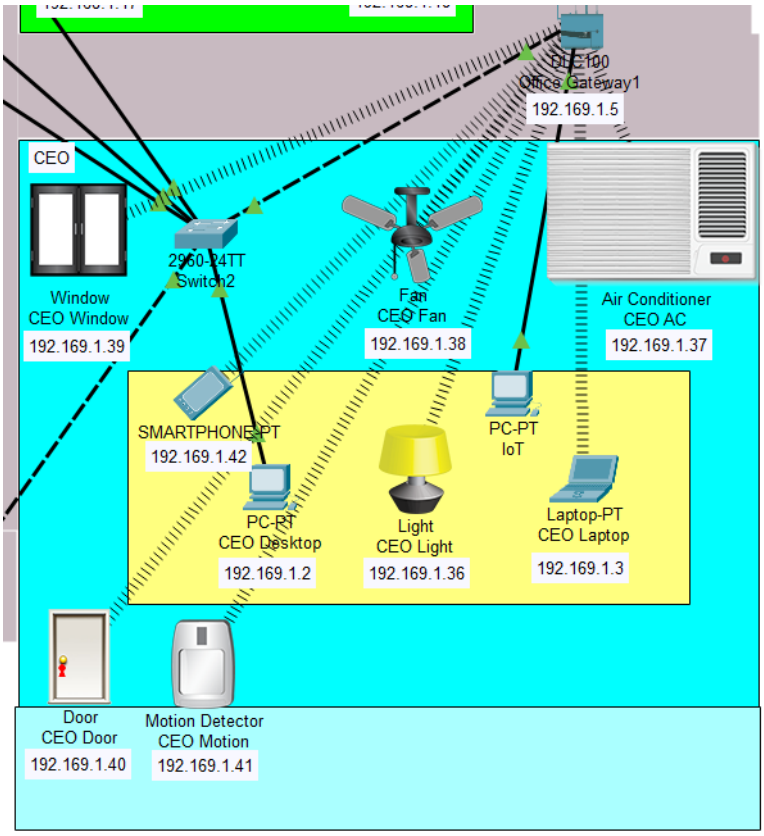

Figure 2.7: CEO

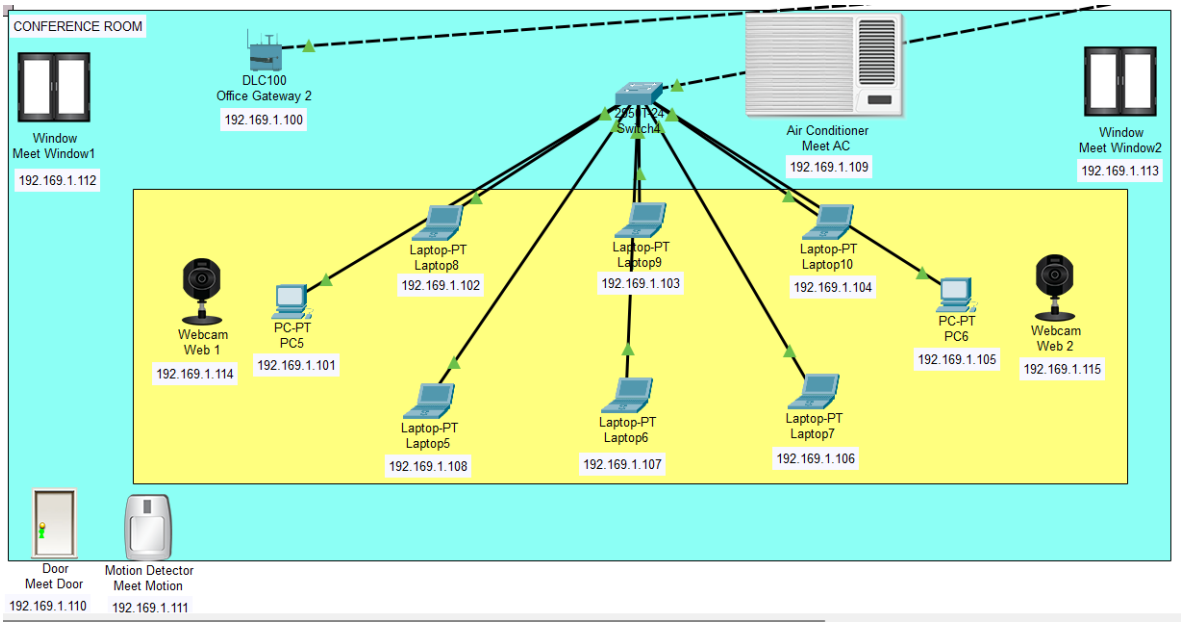

Figure 2.8: Conference Room

Chapter 3

Performance Evaluation

3.1 Simulation Environment/ Simulation Procedure

To implement this project, we installed Cisco Packet Tracer version 8.2. If we want to do something manually suppose opening a door then we have to press alt and click the left side button.

3.2 Results Analysis/Testing

After completing all steps and objectives we got the desired and satisfactory result, We were able to grasp the core requirement of the project and able to configure our project which is Smart Office.

3.2.1 Output of the smoke Dectection

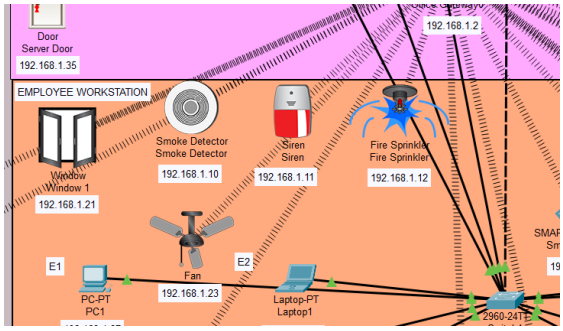

Figure 3.1: Output of the smoke Dectection

3.2.2 Motion Detection check

Each result must include screenshots from your project. In addition to screenshots, graphs should be added accordingly to your project.

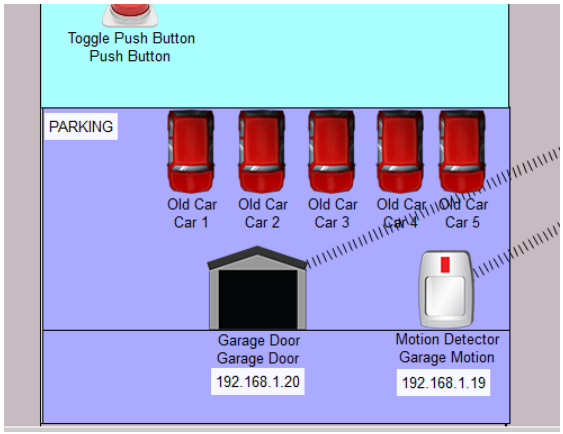

Figure 3.2: Motion Detection check

3.3 Results Overall Discussion

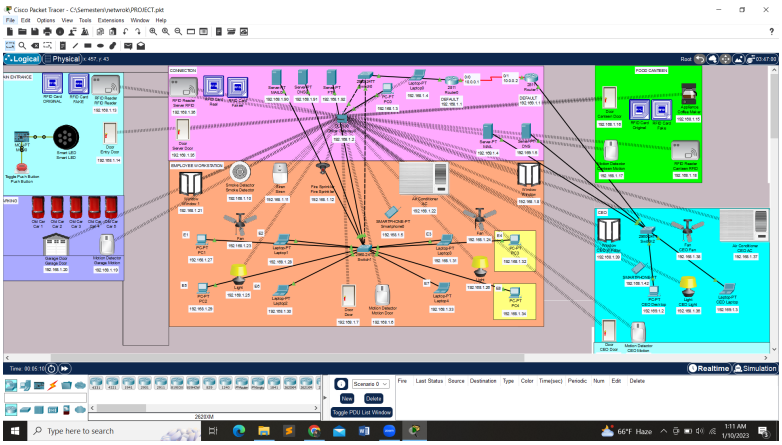

Figure 3.3: SMART OFFICE

Chapter 4

Conclusion

4.1 Discussion

After completing the project we get the desired output. In the future, we want to add more features to this project. And this project helps to make a real-life Smart office.

4.2 Limitations

Because we are just a beginner so we cannot implement many things. We have some limitations for this project. We can make a better configuration than this. We can add a rain detector that when the rain coming automatically window has closed. It will not detect the temperature. So, In the future, we are trying to prevent our project limitations.

4.3 Scope of Future Work

Discuss the future work of the project, This project has a lot of enhancement options. In the future, more features may be added category-wise. Detailed analysis of different functionalities can be added.

4.4 Summary

This project is scalable. A very promising project.Simple and easily understandable for beginners. From this project, we have learned so many things.

Chapter 5

References

- https://www.i-scoop.eu/internet-of-things-iot/smart-office/
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