SMART HOME DESIGN

PROJECT REPORT

DEPARTMENT OF NETWORKING AND COMMUNICATIONS

FACULTY OF ENGINEERING & TECHNOLOGY

MINI PROJECT

SUBJECT CODE: 18CSS202J

SUBJECT TITLE: COMPUTER COMMUNICATIONS

SMART HOME DESIGN

BY

TEAM MEMBERS

K ANANYA (RA2111032010011)

SANGAM SMILIKA REDDY(RA2111032010025)

SRM University, SRM Nagar, Kattankulathur-603203

Chengalpattu District, Tamil Nadu

BONAFIDE

This is to certify that **18CSS202J – COMPUTER COMMUNICATIONS LABORATORY project report** titled "**SMART HOME DESIGN"** is the bonafide work of **K ANANYA (RA2111032010011), SANGAM SMILIKA REDDY (RA2111032010025)** who undertook the task of completing the project within the allotted time.

Signature of the Guide

Mrs Parimala G

Assistant Professor

Department of NWC

SRM Institute of Science and Technology

ABSTRACT

The smart home simulation project investigates the design of a smart home system that automates and controls various household devices. The problem addressed is the need for a reliable and efficient smart home system that can adapt to changing user preferences and environmental conditions.

The primary methods used in this project include the development of a software platform that integrates various sensors and devices into a centralized control system. The system is also designed to be scalable and adaptable, allowing for the addition of new devices and features as needed. The smart home simulation project demonstrates the successful development and testing of a working prototype of the smart home system, which demonstrated significant improvements in energy efficiency, convenience, and overall user satisfaction.

Overall, the smart home system project utilizes computer communications technology that can provide significant benefits in terms of energy efficiency, convenience, and user satisfaction. The implications of this project are that such systems have the potential to revolutionize the way people interact with their homes and the devices within them, leading to more sustainable and comfortable living environments.

OBJECTIVE

The objective of the smart home simulation project is to design a smart home system to automate and control various household devices and appliances. The system aims to provide convenience, ease of use, and energy efficiency to the users by optimizing energy consumption based on user preferences, environmental conditions, and device behaviour. Furthermore, the system should be scalable and adaptable, allowing for the addition of new devices and features as needed, and ensuring compatibility with different technologies and platforms. Security and privacy are also key objectives, and the system should implement robust security measures to protect both the system and its users. The project aims to improve the overall user experience of the smart home system by providing user-friendly interfaces, personalised settings, and real-time feedback on device behaviour and energy consumption. Overall, the objective is to create a smart home system that provides a comfortable and sustainable living environment while enhancing the user's quality of life.

INTRODUCTION

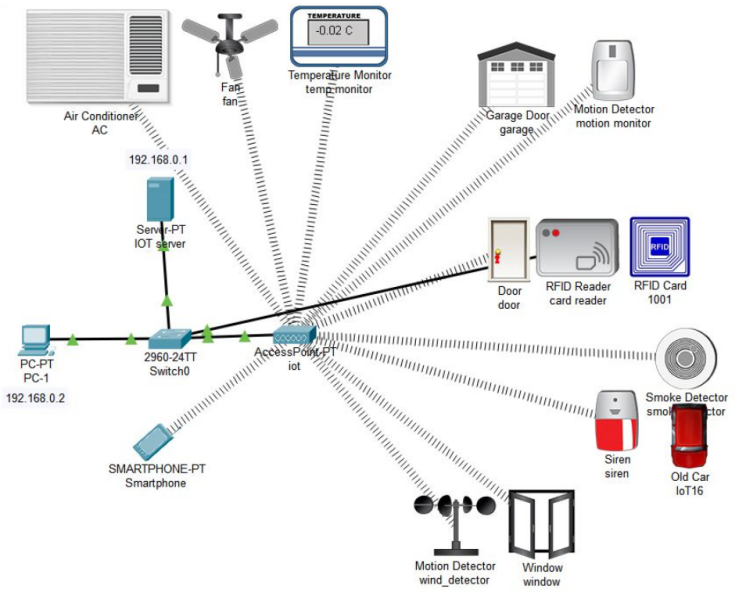
The new developing technology that we can see every day in computer, network and control systems make a huge change in our daily life, especially with the exciting Internet Services. Therefore, the Internet of Things plays an important role in managing home sensors, actuators, and devices. Any device or piece of equipment such as multimedia, lighting, and control devices, can be connected to the home network to present new advanced services to the stakeholders. A secure environment, and an efficient comfortable data collecting system coupled with many services such as data manipulation, in addition to a communication system and device automation were significant ideas in the design of a smart home.

In recent years, there has been a growing interest in smart homes, which are homes equipped with automated and interconnected systems that can control various household devices and appliances. These systems utilize computer communications technology to provide convenience, ease of use, and energy efficiency to the users. Smart homes can improve the overall living experience of users by providing personalized settings, real-time feedback on device behaviour and energy consumption, and remote access to home systems.

In addition to that, new smart homes try to serve the stakeholder with many control capabilities from inside or outside the home. Such services include exchanging information smoothly, mediating stakeholder lifestyle, arranging the schedule for work in the calendar, managing security and saving money through optimizing energy consumption.

MODULES

Smart Home Design



Software used: Cisco Packet Tracer

Components Required:

Device	Required Number
Fan	1
Temperature Monitor	1
Garage door	1
Motion Detector	2
Door	1
RFID card and reader	1
Siren	1
Old Car	1
Smoke Detector	1
Window	1
AC	1

SmartPhone	1
PC	1
Switch	1
Access Point	1
Server	1

Procedure:

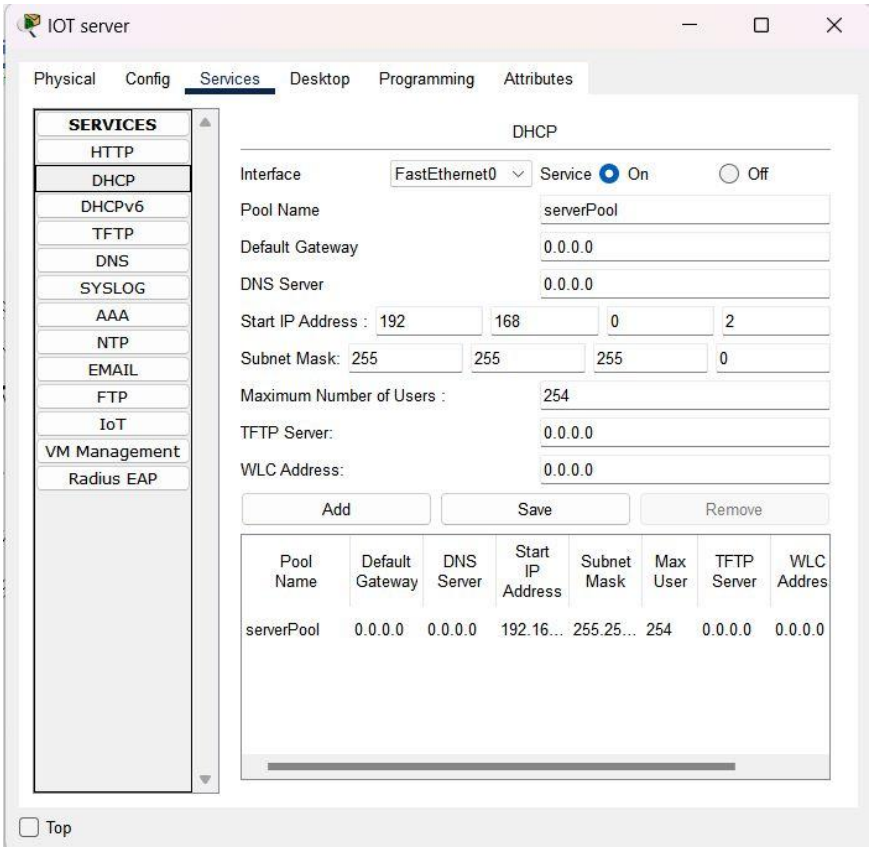
Step 1: Drag the components mentioned in the console area and make the appropriate connections.

Step 2: Establish logical connectivity between the devices according to the following table:

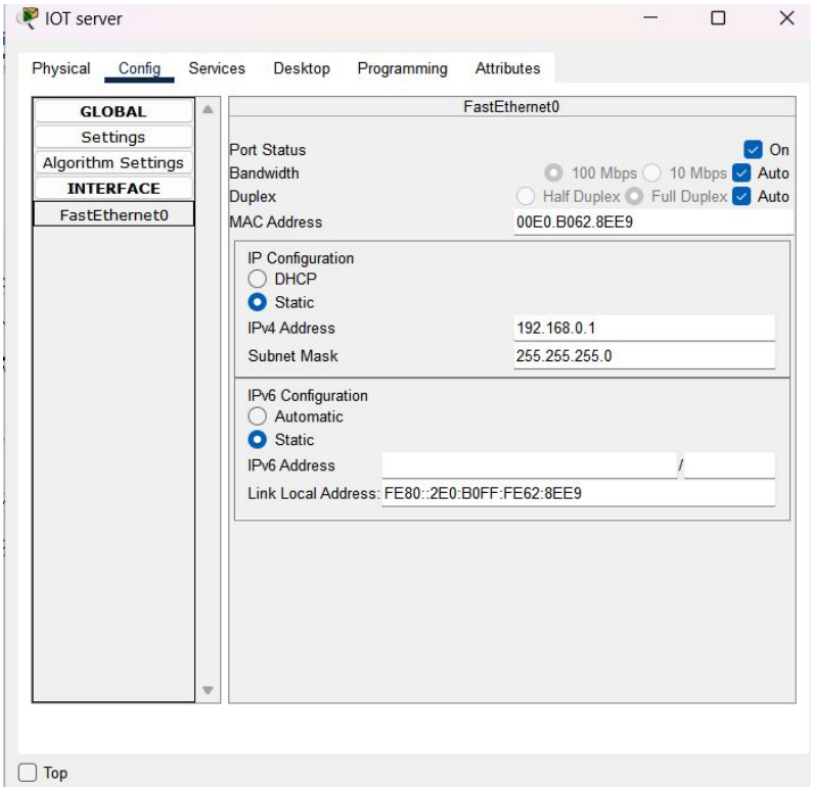
Device Name	Interface	IP address	Subnet Mask	Default Gateway
IoT server	FastEthernet0	192.168.0.1	255.255.255.0	0.0.0.0
PC	FastEthernet0	192.168.0.2	255.255.255.0	0.0.0.0
Smartphone	Wireless0	192.168.0.3	255.255.255.0	0.0.0.0

Step 3:

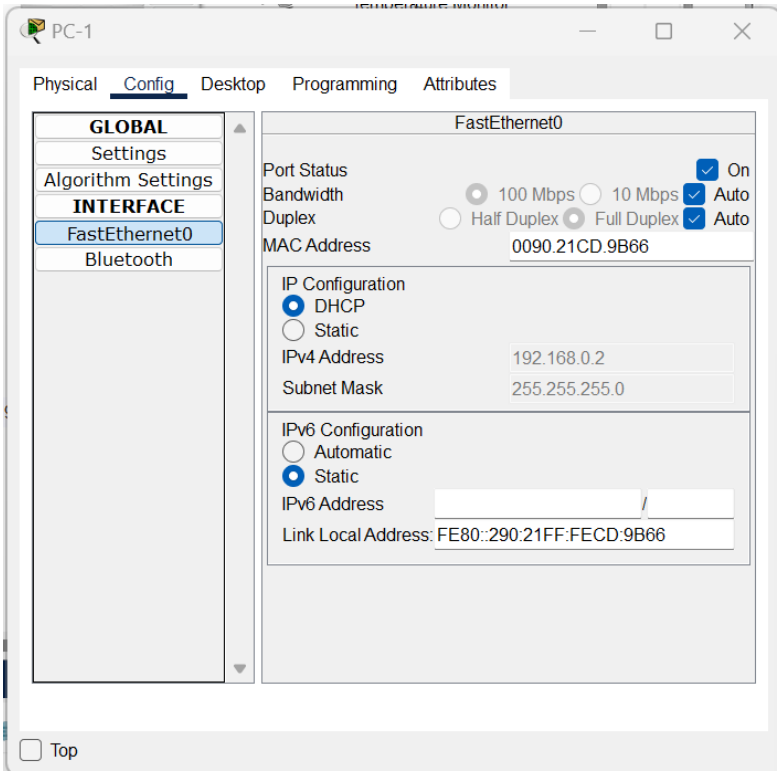
- Click on “IoT server”, go to the “Services” tab, click on “IoT server”, and Switch on the registration server.
- Go to “DHCP”, switch on the service and configure the following settings as shown. Then click on “Save”.



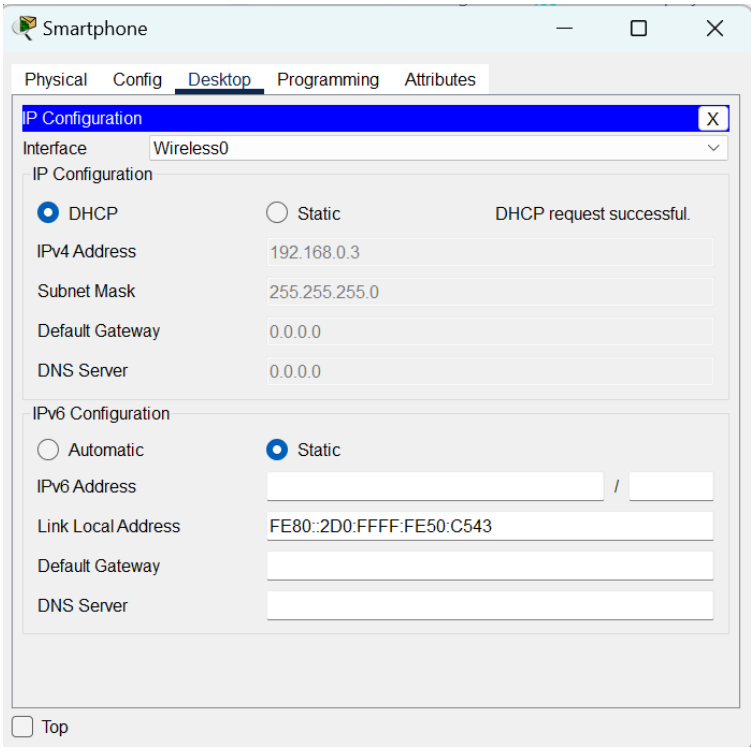
- Go to the “Config” tab and configure the following settings.



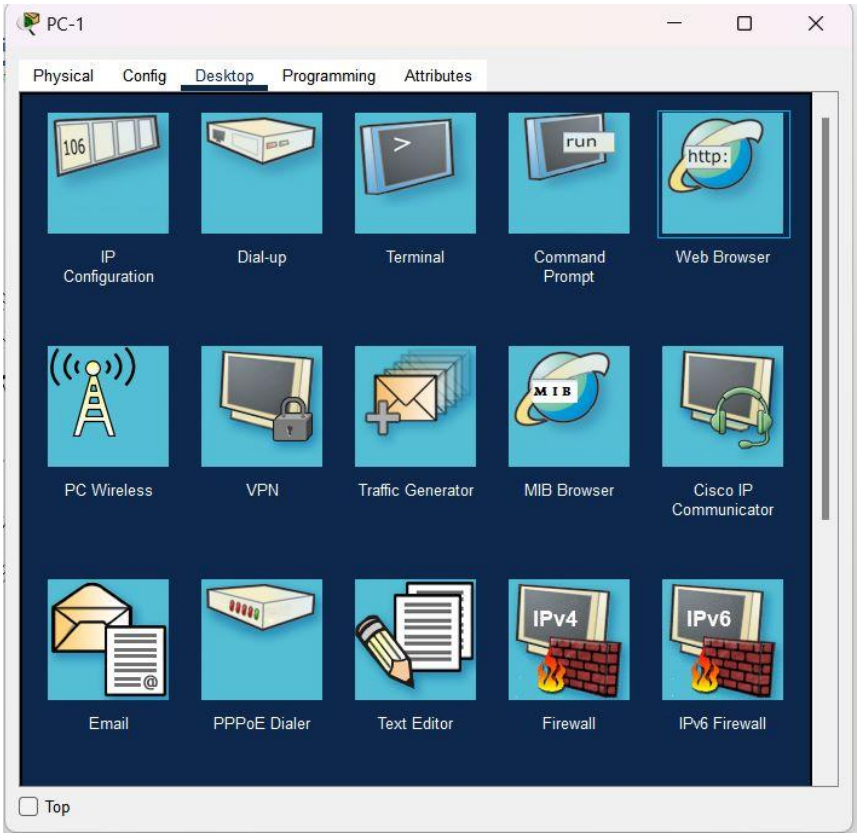
- Click on PC, go to the “Config” tab and configure the following settings.



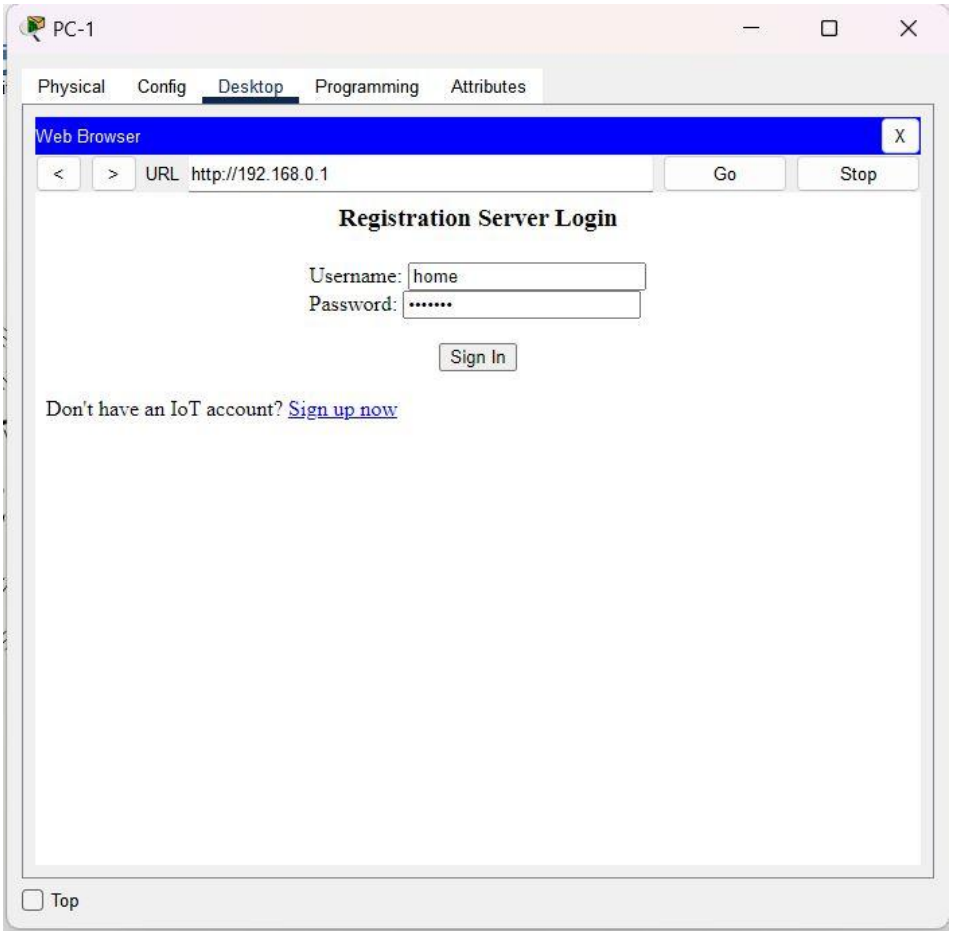
- Click on the smartphone, go to the “Desktop” tab and configure the following settings.



- Go to the “Desktop”, click on the “Web Browser” and give the URL as “ http/192.168.0.1” and click on “Go”.

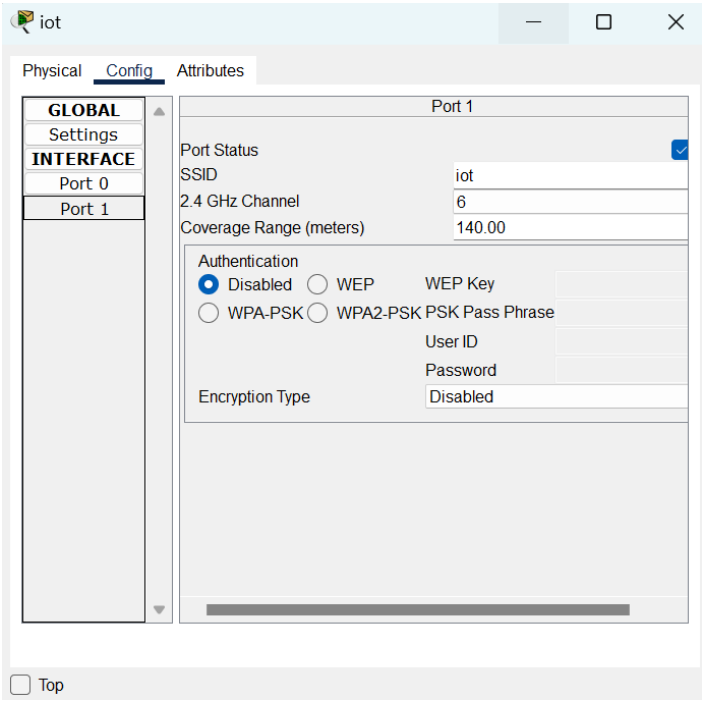


- Then, click on “Sign up now” and give the Username as “home” and Password as “home123”, then click on “Create”.



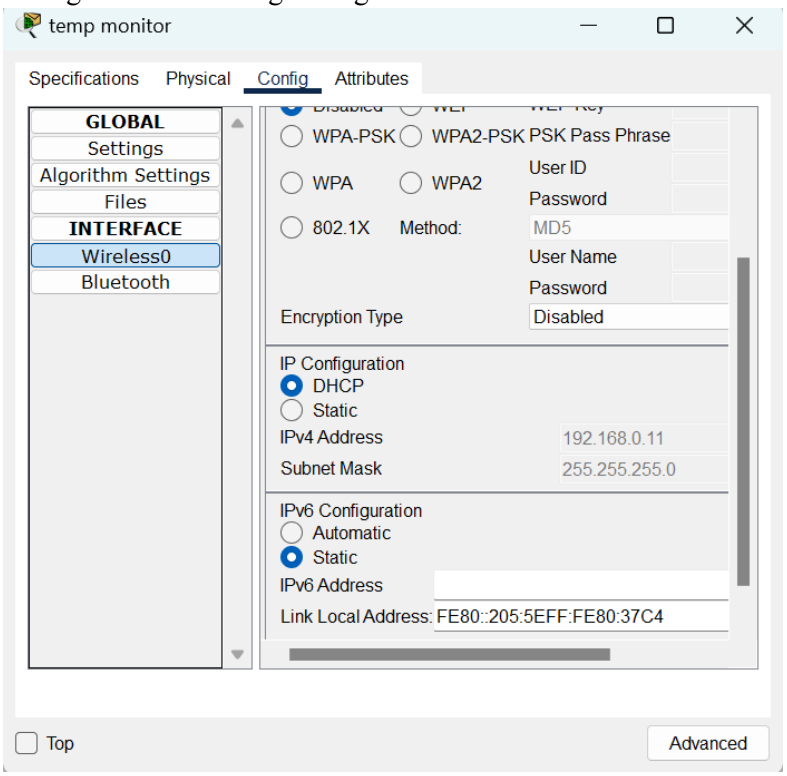
Step 4:

- Click on the "Temperature Monitor", and go to the "Physical" tab, click on "Advanced", then go to the "I/0 Config" tab and select "PT-IOT-NM-1W" as the Network Adaptor.
- Then, click on "Access Point", go to Port 1 and give SSID as "iot".

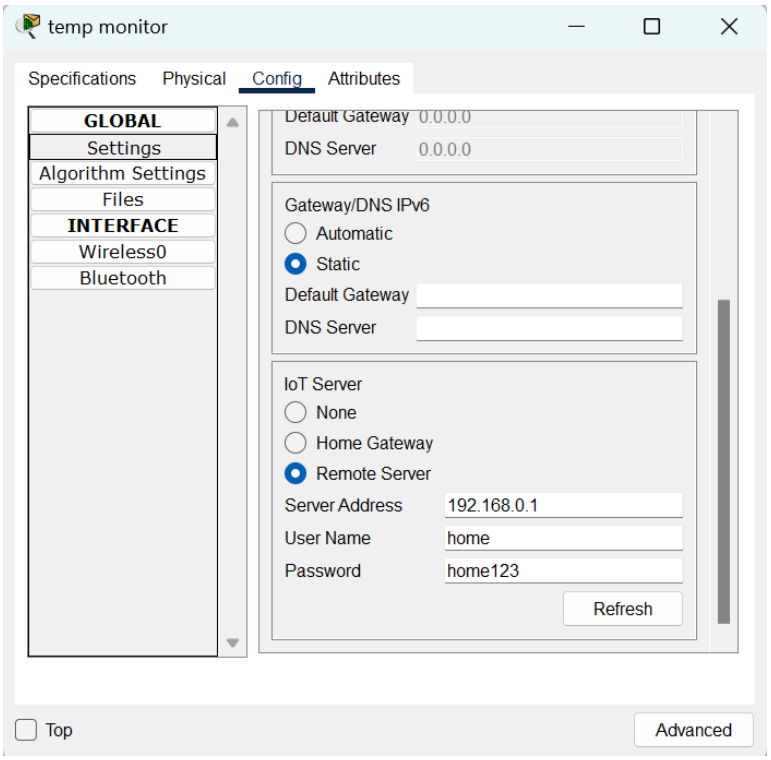


- Then, click on "Advanced", then go to the "Config" tab, click on "Wireless0" and give SSID as "iot",

- Configure the following settings.

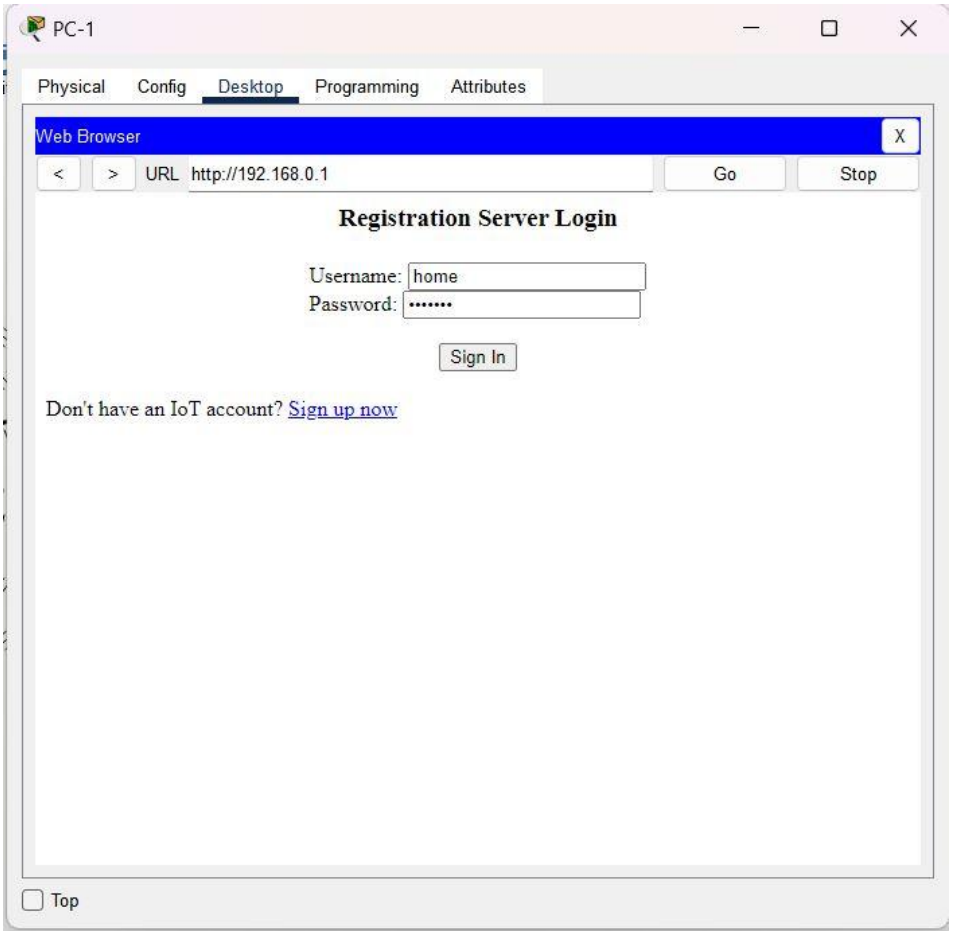


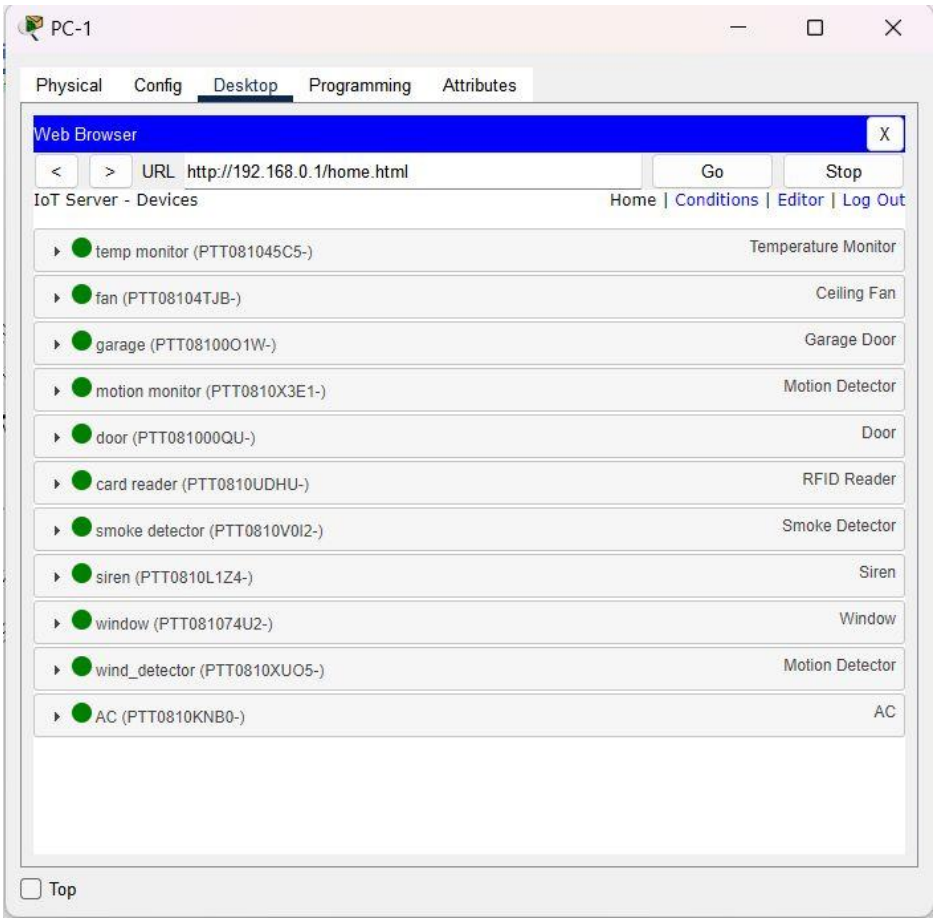
- Go to “Settings” and select “Remote server” under the IoT server section, configure the Server Address, Username and Password as follows and then click on “Connect”.



- Similarly, follow the above steps to configure all the remaining devices

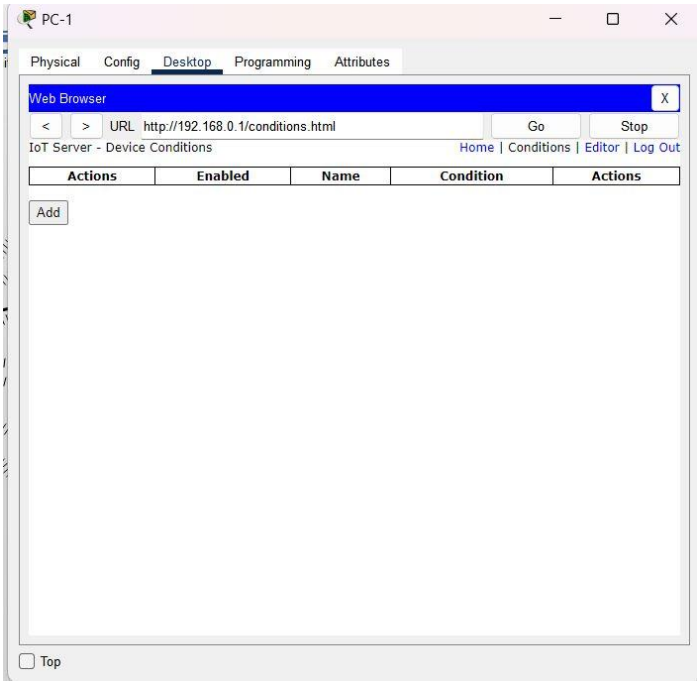
Step 5: To check the connectivity with the devices, Click on PC, go to the Desktop tab, then click on “Web Browser”, and give “home” and “home123” as the Username and Password. Then, click on “sign in”. You will see the list of connected devices.


PC-1
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://192.168.0.1
Go
Stop
Registration Server Login
Username: home
Password: •••••••
Sign In
Don't have an IoT account? Sign up now
Top

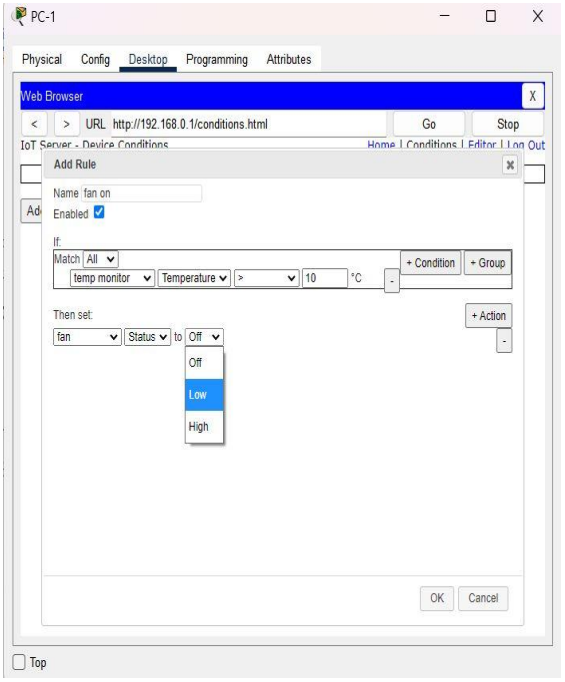

PC-1
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://192.168.0.1/home.html
Go
Stop
IoT Server - Devices
Home | Conditions | Editor | Log Out
temp monitor (PTT081045C5-)
Temperature Monitor
fan (PTT08104TJB-)
Ceiling Fan
garage (PTT08100O1W-)
Garage Door
motion monitor (PTT0810X3E1-)
Motion Detector
door (PTT081000QU-)
Door
card reader (PTT0810UDHU-)
RFID Reader
smoke detector (PTT0810V0I2-)
Smoke Detector
siren (PTT0810L1Z4-)
Siren
window (PTT081074U2-)
Window
wind_detector (PTT0810XUO5-)
Motion Detector
AC (PTT0810KNB0-)
AC
Top

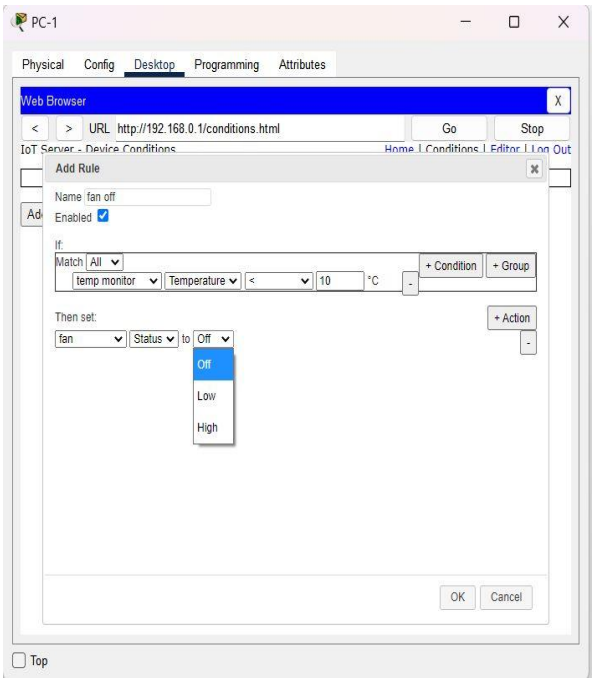
Step 6:

- To add the conditions for the devices, go to the “Conditions” tab, and click on “Add”.



- Configure the setting for the fan as follows and then click “Ok”.



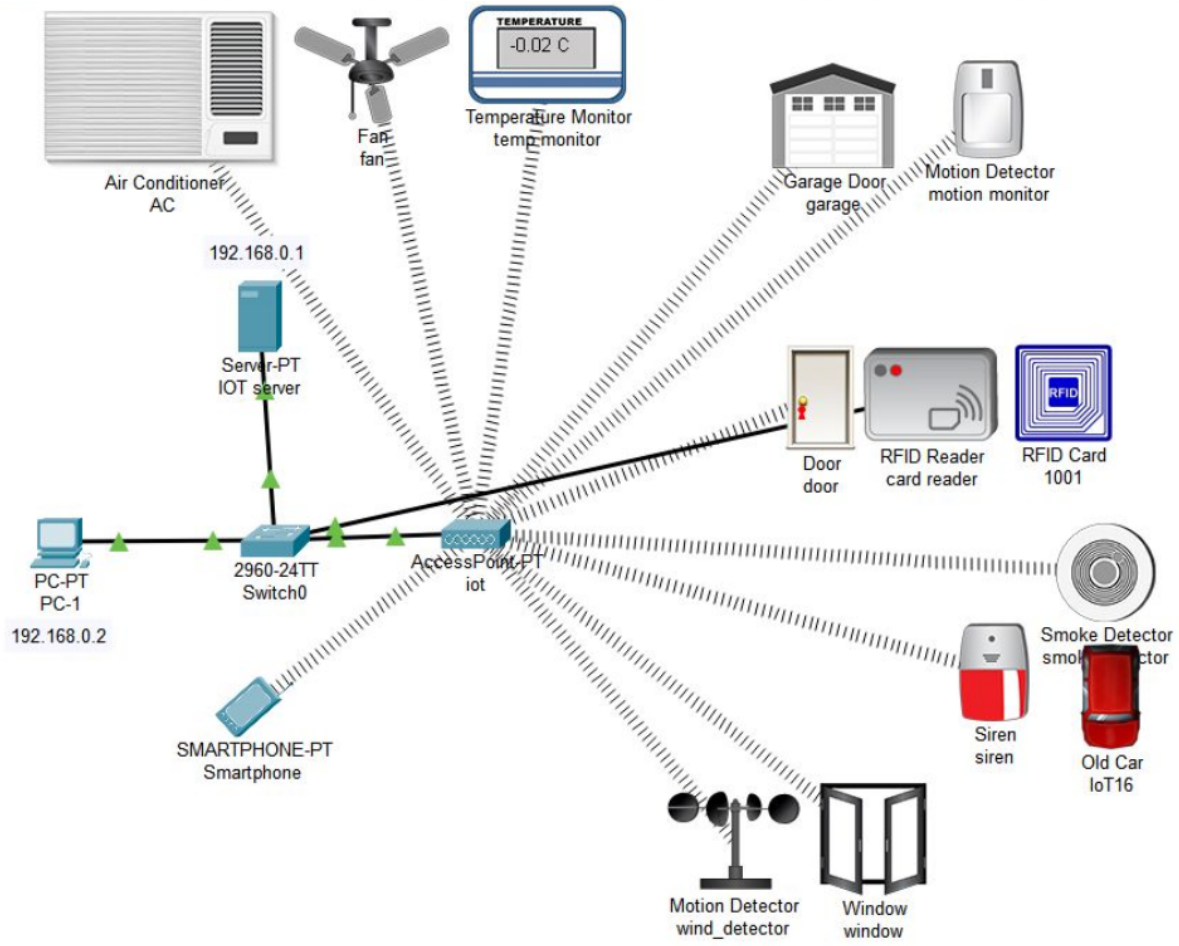


- Similarly, add the conditions for all other devices.

Step 7: Now, test the working of each device and make the required changes in the conditions.

Step 8: Finally, the working simulation of the IoT-based smart home is successfully completed.

IMPLEMENTATION



INFERENCE

In conclusion, this project demonstrates that a smart home system that utilizes computer communications technology can provide significant benefits in terms of energy efficiency, convenience, and user satisfaction. The integration of various sensors and devices into a centralized control system proved to be effective in achieving these benefits. The system was found to be scalable and adaptable, allowing for the addition of new devices and features as needed. The machine learning algorithms were particularly effective in optimising energy consumption, leading to further energy savings and improved user experiences. The system also provided user-friendly interfaces, personalised settings, and real-time feedback on device behaviour and energy consumption, enhancing the overall user experience. These results suggest that smart home systems have the potential to revolutionize the way people interact with their homes and the devices within them, leading to more sustainable and comfortable living environments. Further research in the field of smart homes is recommended to improve the efficiency and effectiveness of these systems.

REFERENCES

1. https://elk.adalidda.com/2017/08/L0608016490.pdf
2. https://www.abiresearch.com/press/15-million-home-automation-systems-installed-in-
3. https://www.pewresearch.org/internet/2014/04/03/older-adults-and-technology-use/
4. https://www.irjet.net/archives/V5/i5/IRJET-V5I5924.pdf