Mini Project Report

on

SMART SECURITY SYSTEM

Submitted to

Jawaharlal Nehru Technological University Anantapur, Ananthapuramu

in partial fulfillment of the requirements for the award
of the degree of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

Submitted by

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Department of Information Technology

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

(Affiliated to JNTUA, Ananthapuramu, Approved by AICTE, Accredited by NBA & NAAC)

Sree Sainath Nagar, Tirupati – 517 102, A.P., INDIA

2022-2023

Institute Vision and Mission

VISION

To be one of the Nation's premier Engineering Colleges by achieving the highest order of excellence in Teaching and Research.

MISSION

- To foster intellectual curiosity, pursuit and dissemination of knowledge.
- To explore students' potential through academic freedom and integrity.
- To promote technical mastery and nurture skilled professionals to face competition in ever increasing complex world.

DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

To become a nationally recognized quality education center in the domain of Computer Science and Information Technology through teaching, training, learning, research and consultancy.

MISSION

- The Department offers undergraduate program in Information Technology to produce high quality information technologists and software engineers by disseminating knowledge through contemporary curriculum, competent faculty and adopting effective teaching-learning methodologies.
- Igniting passion among students for research and innovation by exposing them to real time systems and problems
- Developing technical and life skills in diverse community of students with modern training methods to solve problems in Software Industry.
- Inculcating values to practice engineering in adherence to code of ethics in multicultural and multi discipline teams.

PROGRAM EDUCATIONAL OBJECTIVES

After few years of graduation, the graduates of B. Tech. (IT) Program will be:

1. Enrolled or completed higher education in the core or allied areas of Computer Science and Information Technology or management.
2. Successful entrepreneurial or technical career in the core or allied areas of Computer Science and Information Technology.
3. Continued to learn and to adapt to the world of constantly evolving technologies in the core or allied areas of Computer Science and Information Technology.

PROGRAM OUTCOMES

On successful completion of the Program, the graduates of B. Tech. (IT) Program will be able to:

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Function effectively as an individual, and as a member or leader in

diverse teams, and in multidisciplinary settings.

10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

On successful completion of the program, the graduates of B.Tech. (IT) program will be able to:

PSO1: Design and develop database systems, apply data analytics techniques, and use advanced databases for data storage, processing and retrieval.

PSO2: Apply network security techniques and tools for the development of highly secure systems.

PSO3: Analyze, design and develop efficient algorithms and software applications to deploy in secure environment to support contemporary services using programming languages, tools and technologies.

PSO4: Apply concepts of computer vision and artificial intelligent for the development of efficient intelligent systems and applications.

Smart Security System using Packet Tracer

Smart security systems are connected to the internet, allowing the user to view live footage from a mobile app, receive notifications when alarms go off and control the system remotely.

In today's rapidly advancing technological landscape, security has become a paramount concern for individuals, businesses, and organizations alike. With the proliferation of interconnected devices and the internet of things, traditional security measures are no longer sufficient to protect against modern threats. This is where the concept of smart security systems comes into play, leveraging cutting-edge technologies to enhance security and provide comprehensive protection.

Packet Tracer, a network simulation and visualization tool developed by Cisco, offers a practical platform to understand and implement smart security systems. By simulating networks and devices, Packet Tracer allows us to design, configure, and test security solutions in a virtual environment. This enables users to gain valuable hands-on experience and explore the intricacies of smart security systems without the need for physical hardware.

Fig.1: Smart Security System

'Smart' originated as an acronym for Self-Monitoring Analysis and Reporting Technology, coined by IBM for a computer failure monitoring tool they developed a few decades ago. IBM added the **S.M.A.R.T**. tool to hard drives-the computer part where all the data is stored—to monitor for impending failures.

Smart home is a living home that contains smart objects that can automate home tasks in advance without engaging users such as tracking home environment condition by

different sensors(temperature, humidity, smoke, wind, sound) then ventilate the air depending on sensor details. Instead of providing protection security, smart home can have different functions by providing more automatic security using different alarm systems such as siren sound, LCD monitor and sending email to legitimate users if sensor detects security problems. Automation is common because it offers convenience, reliability and a safe environment. All smart devices are registered and operated by a legal entity at the home gateway.

By using various sensors in home automation, smart home decreases user engagement in tracking home settings and managing home appliances.

Managing all your home gadgets from a single venue: - The convenience factor here is enormous. Being able to keep all of the technology in your home connected through one interface is a massive step forward for technology and home management. In principle, what you'll have to do is learn how to use one app on your smartphone and tablet, and throughout your home, you'll be able to tap into myriad features and gadgets. For novice customers, this cuts down on the learning curve, making it easy to use the features you really want for your home.

Flexibility for modern appliances and computers: - When it comes to accommodating modern gadgets and appliances and other technologies, smart home solutions seem to be wonderfully versatile. No matter how state-of-the-art your appliances seem today, as time goes by, newer, more amazing versions will be created. Beyond that, when you upgrade the older ones, you will potentially add to your suite of gadgets or find new technologies to accompany your indoor and outdoor spaces. Being able to easily absorb these new comers would make your work much simpler as a homeowner and enable you to continue updating to the latest lifestyle technologies.

External Home Feature Power: - Do not underestimate the strength of being able to control the operations of your home from a distance. You will order your house to become cooler in just enough time on an unusually hot day before you get home from work. You should make your oven start to preheat whilst you're already on your way home if you're in a rush to have dinner started but you're already in the shop. And if you leave the lights on, you should check who's at your front door, or make sure you switched all the media off while you're gone.

Insights into Home Management: - There's also plenty to be said for your desire to think about how your house works. You will log how much you watch TV (and what you watch),what kind of foods you prepare in your microwave, what kind of foods you have in your freezer, and over time, your energy consumption patterns. You will be able to evaluate your

everyday routines and activities from these observations, and make changes to live the lifestyle you want.

Improved functionality for appliances: - Smart homes will help you properly operate your appliances, too. To locate your favourite programming, a smart TV will help you search better applications and channels. Without ever thinking about overcooking or undercooking, a smart oven will help you to cook your chicken to perfection. When hosting friends, an intelligently built home theatre and audio system will make handling your movie and music collection simple. Connecting your appliances and other systems with automation technologies would inevitably boost the efficacy of your appliance and make your home life much simpler and more fun overall!

Insights into Home Management: - There's also plenty to be said for your desire to think about how your house works. You will log how much you watch TV (and what you watch),what kind of foods you prepare in your microwave, what kind of foods you have in your freezer, and over time, your energy consumption patterns. You will be able to evaluate your everyday routines and activities from these observations, and make changes to live the lifestyle you want.

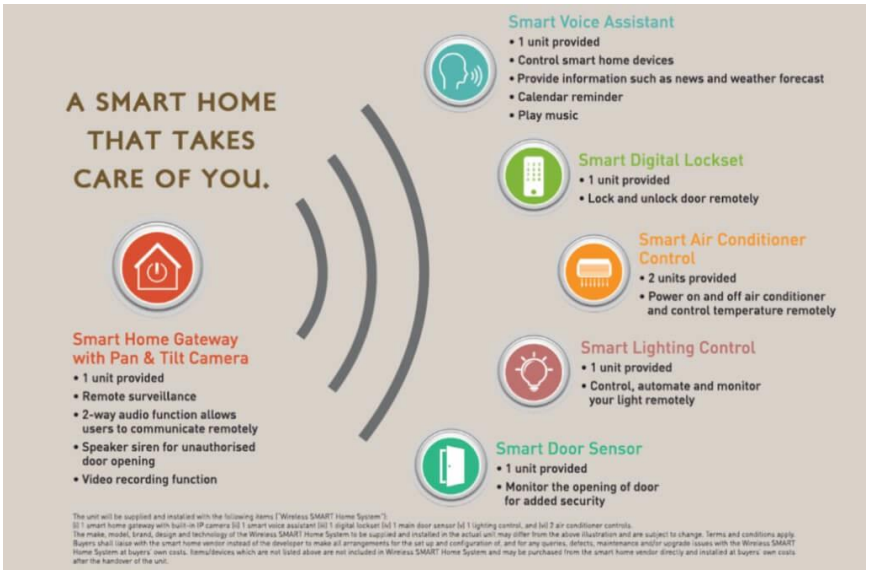


Fig.2: Features of Smart Home

Realistic simulation: Packet Tracer provides a realistic environment for simulating network scenarios, allowing users to design and test security systems without the need for physical hardware. This reduces costs and simplifies the testing process.

Learning and training: Packet Tracer is often used for educational purposes, allowing students and professionals to learn and practice network security concepts in a safe and controlled environment. It provides a hands-on experience and promotes understanding of Security protocols and configurations.

Energy Efficiency: Smart home alert systems enable energy-efficient practices by allowing you to monitor and manage your energy usage. You can receive alerts about unusual energy consumption patterns, track usage data, and control devices remotely. This helps you identify energy-wasting appliances and adjust settings to optimize energy efficiency, leading to cost savings and reduced environmental impact.

Customization and Automation: Smart home alert systems offer customization and automation features. You can create personalized schedules, rules, and routines to automate various tasks and actions. For example, you can set up alerts to remind you to turn off lights when you leave, or automatically lock the doors when everyone is away. These features enhance convenience, save time, and simplify daily routines.

How Do Smart Systems Work?

Smart systems require a few different components:

- **Sensors**

  By definition, a smart system needs some kind of sensing or self-monitoring component to collect data about itself. That is often handled by a wireless communication standard in security systems, like radio frequency identification (RFID). This is a short-range wireless standard most often used for computer-to-computer communication. One great thing about RFID is that it lets each tagged device have a unique identity in the smart system so that you can track each asset from 'the cradle to the grave.'

- **Computer Management**

  Information collected from the sensor network of a smart system feeds back to a computer that analyzes and makes decisions according to your instructions. The management system can relay this information to human operators or make independent decisions when you allow.

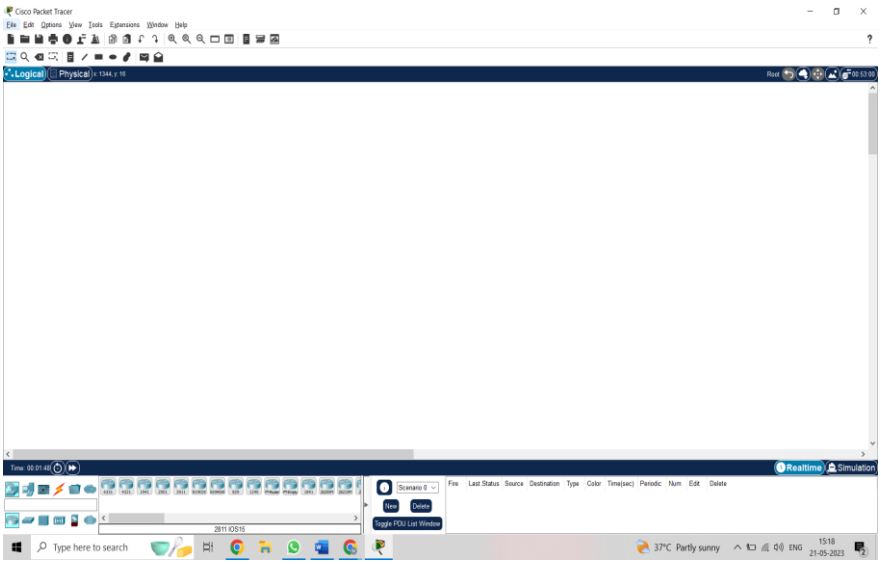
- **Controllers**

  These parts of the smart system take action in response to the management computer's decisions. For example, in a smart Internet of Things security system, this could be the compartments in an asset management system that locks if a user has let a certification expire. Or it could be the locking slot in a key cabinet that won't release if a user has tried to sign out the same vehicle repeatedly every shift instead of rotating usage.

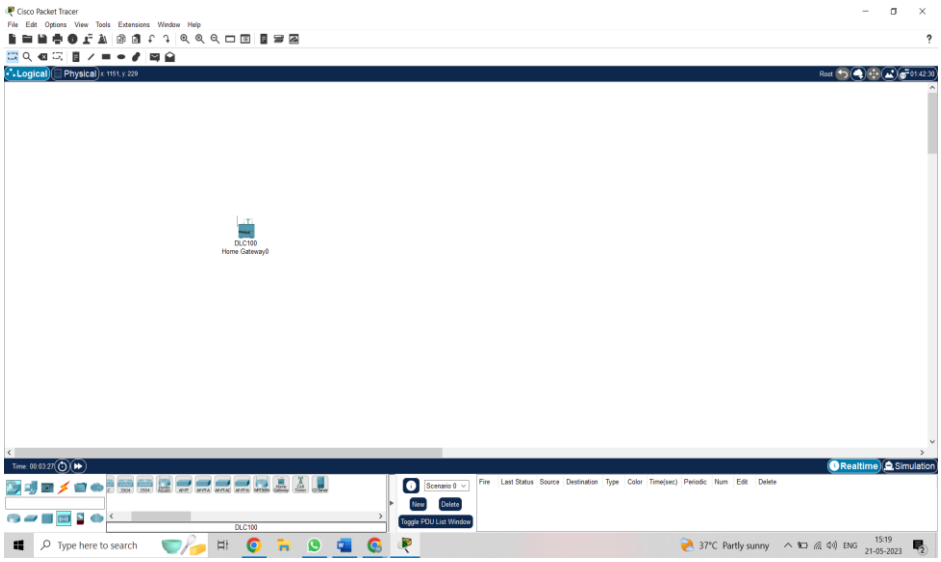
  Overall, while Packet Tracer is a valuable tool for simulating and testing security systems, it is important to supplement it with real-world testing and validation to ensure the robustness and effectiveness of the implemented security measures.

Step wise Procedure for Implementation of Smart Security System

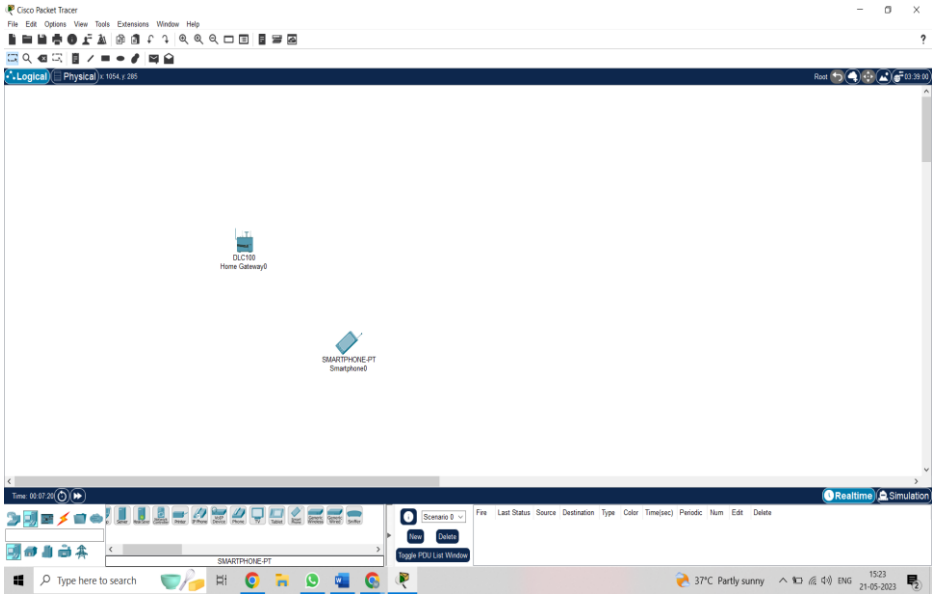
1. Click on Cisco Packet Tracer and login.



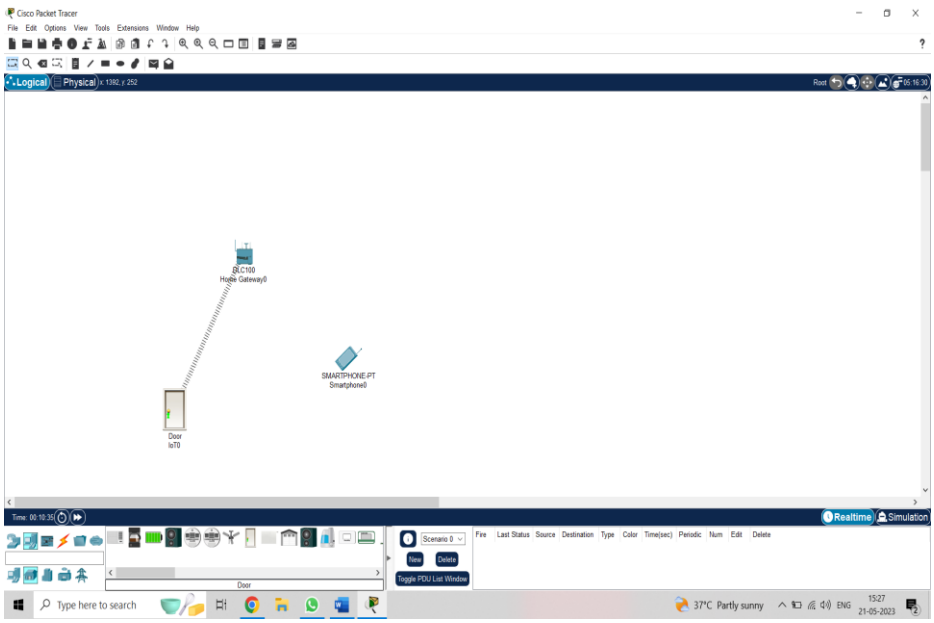
2. Go to Network devices and select wireless devices there you choose Home Gateway which helps to connect all IOT devices.



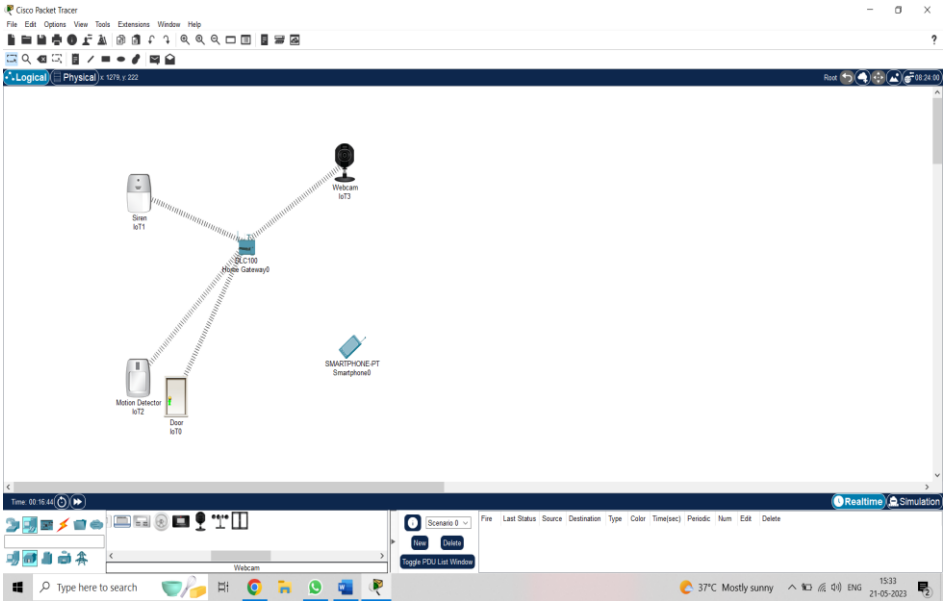
3. Click on End Devices choose the Smartphone and place it on the workspace. Smart phone which helps to access the connected components.



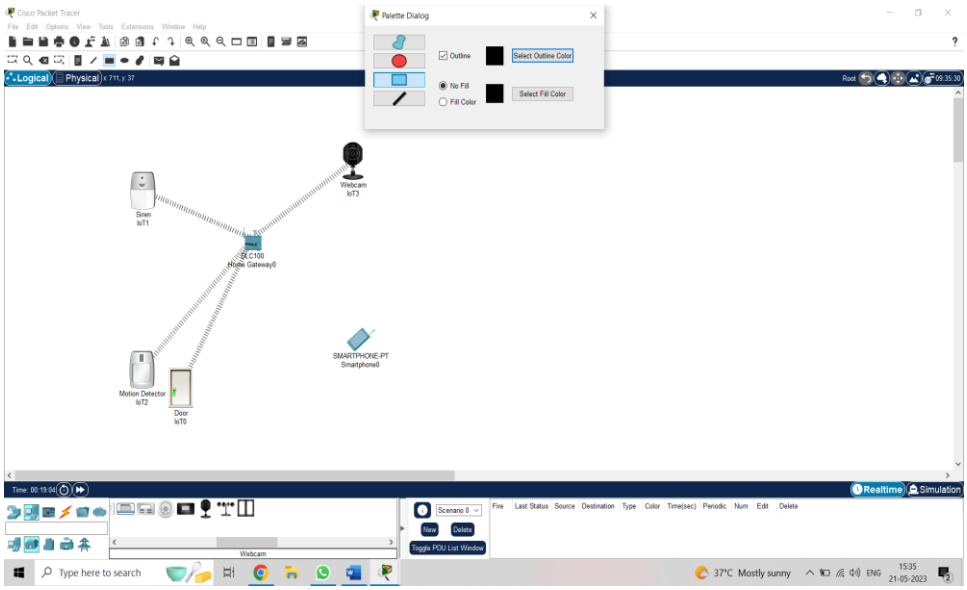
4. Choose a door from end devices -Home and drop on workspace.



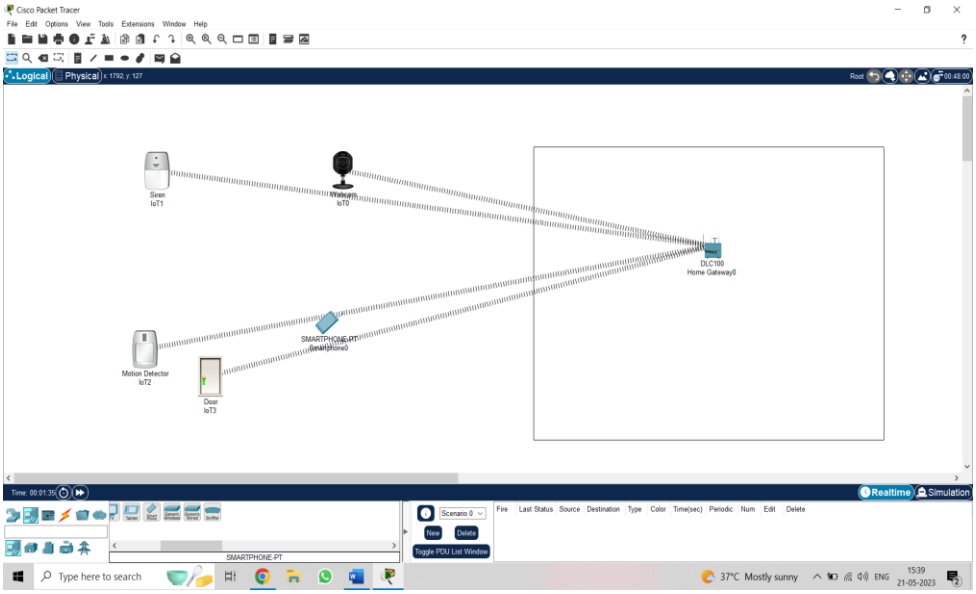
5. Choose a siren, motion detector and web camera from end devices and click on home symbol.



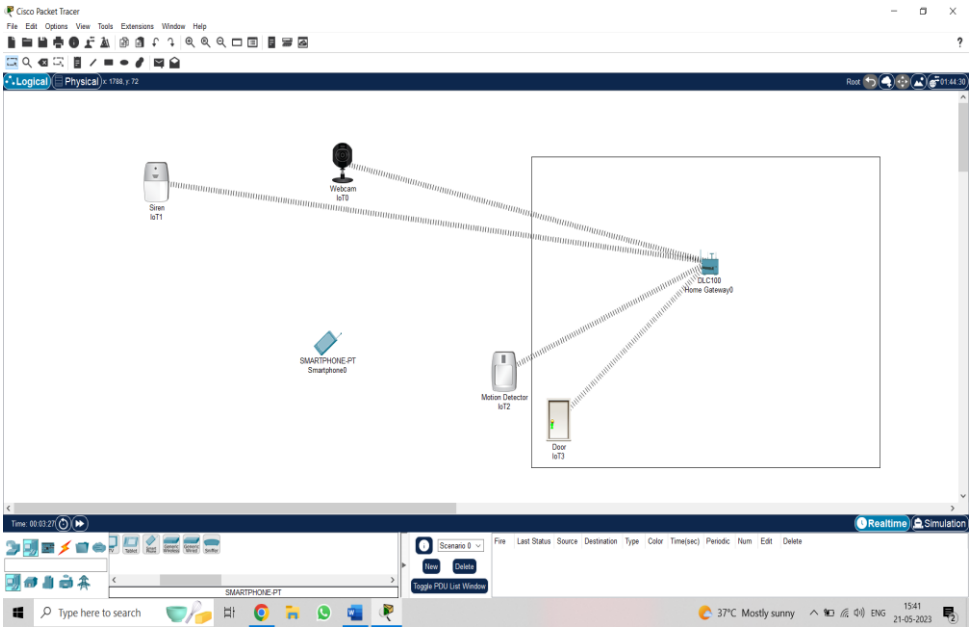
6. To get a better view to the security system ,we will create a home .For that draw a rectangle, To draw rectangle choose rectangle symbol on top



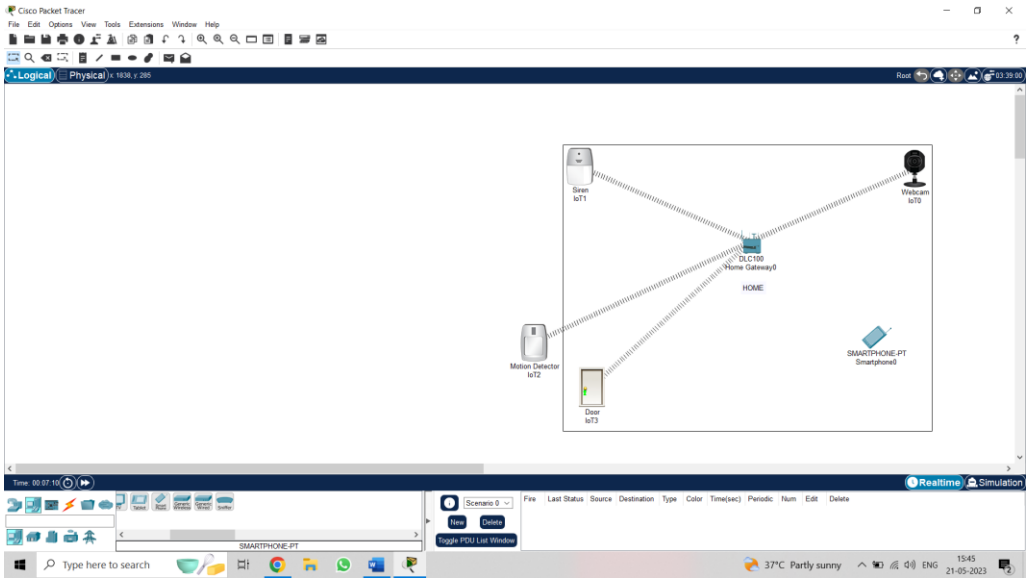
7. We will place the home gateway in middle of rectangle(called home) .



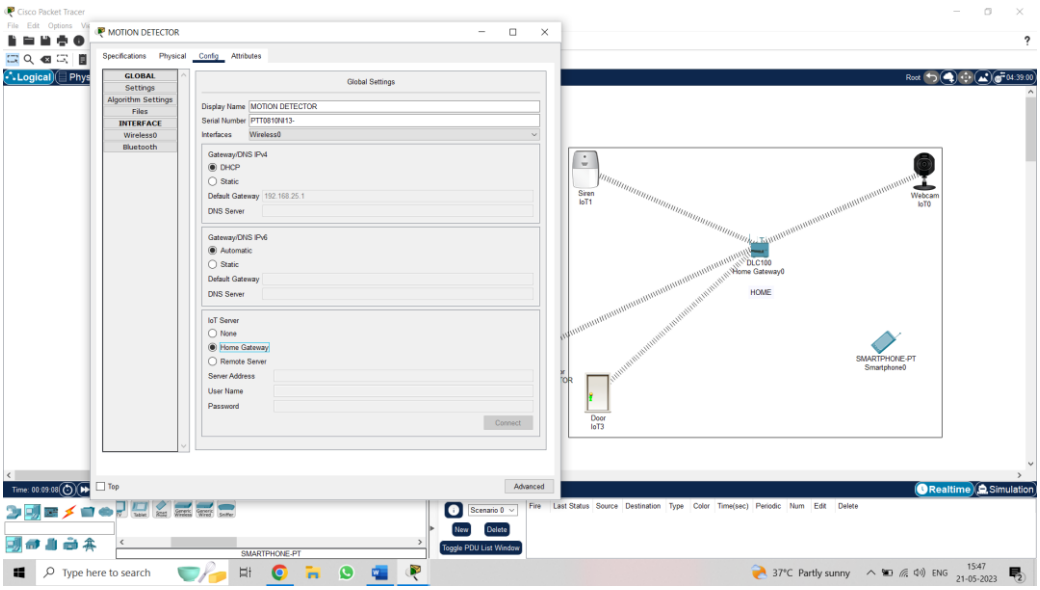
8. At entrance we will fix the door and outside we will place motion detector.



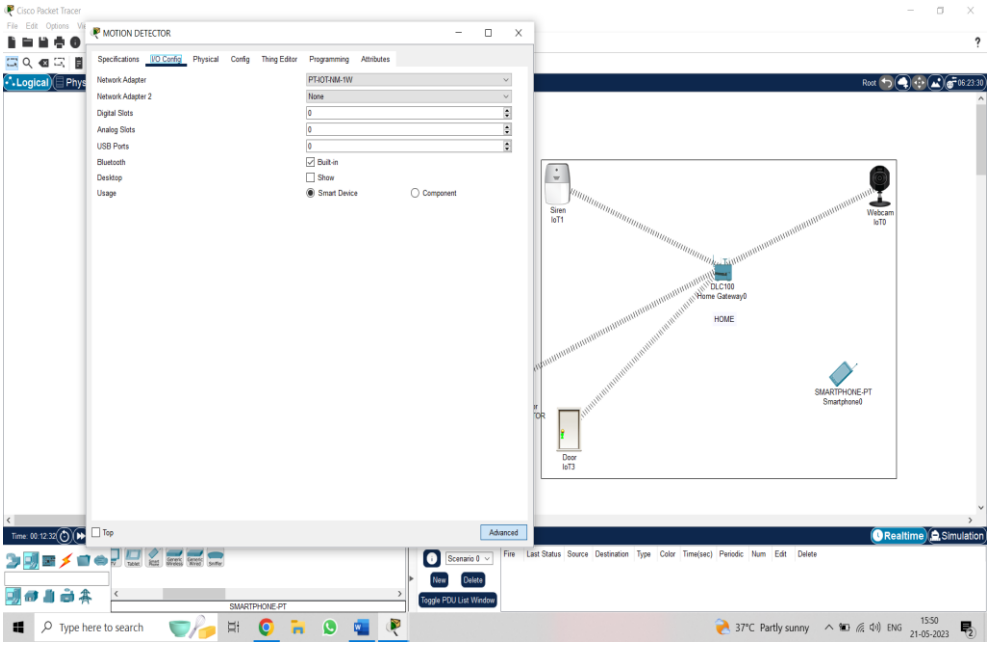
9. The Web cam, Smartphone and Siren are moved inside of the home. Double click inside rectangle and name it as home.



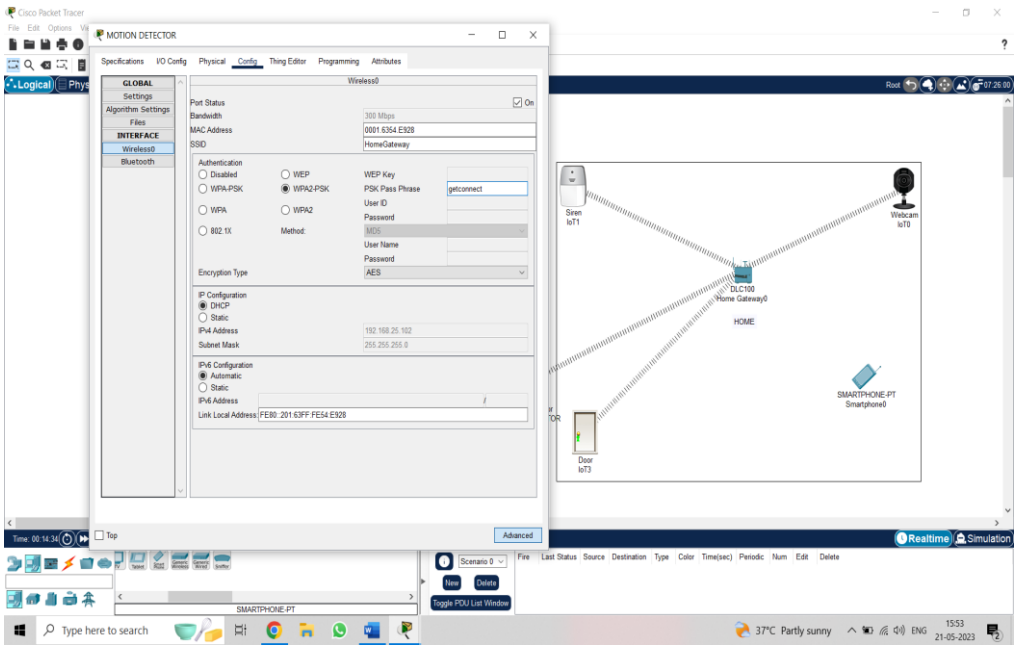
10. Now click on motion detector and go to CONFIG change the display name as" MOTION DETECTOR." In IOT server change to Home gateway from None.



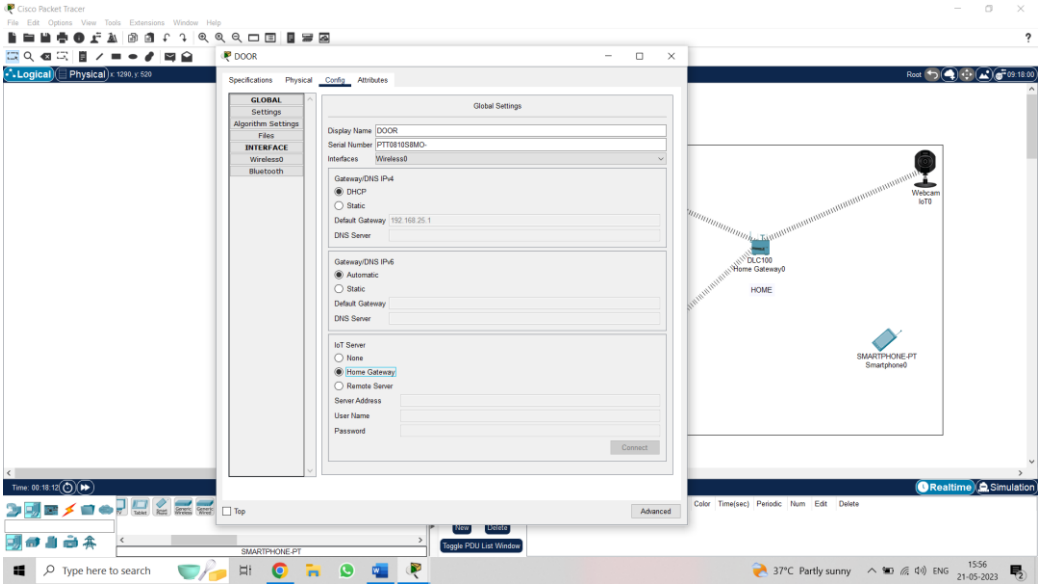
11. Click on Advanced, go to I/O Config and check whether it is connected to PT-IOT-NM-1W.



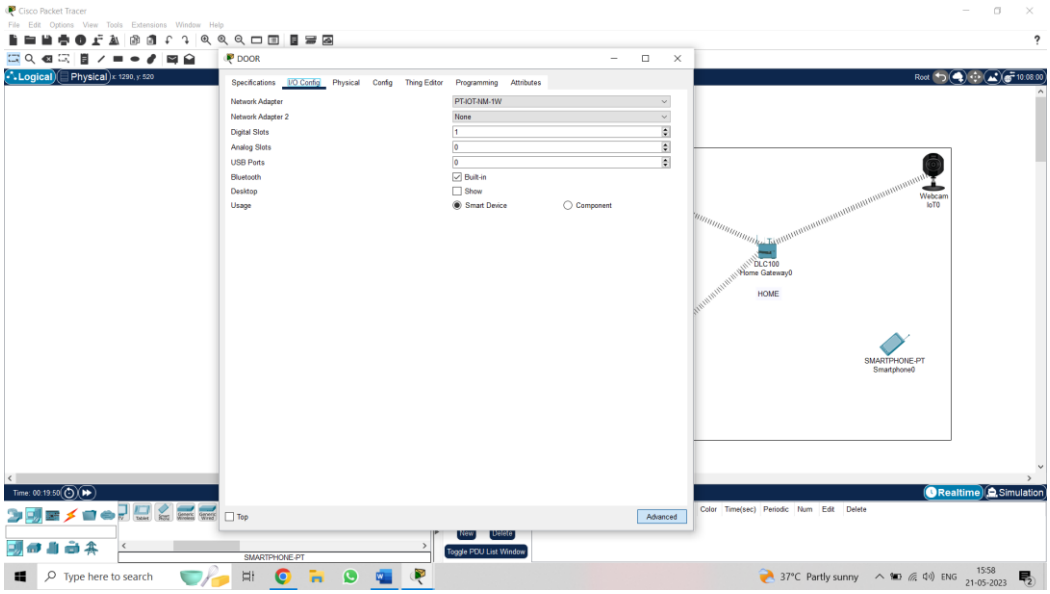
12.Click on config, go to wireless0 and select WPA2-PSK and give the password. You can specify any password here my password is get connect and close it.



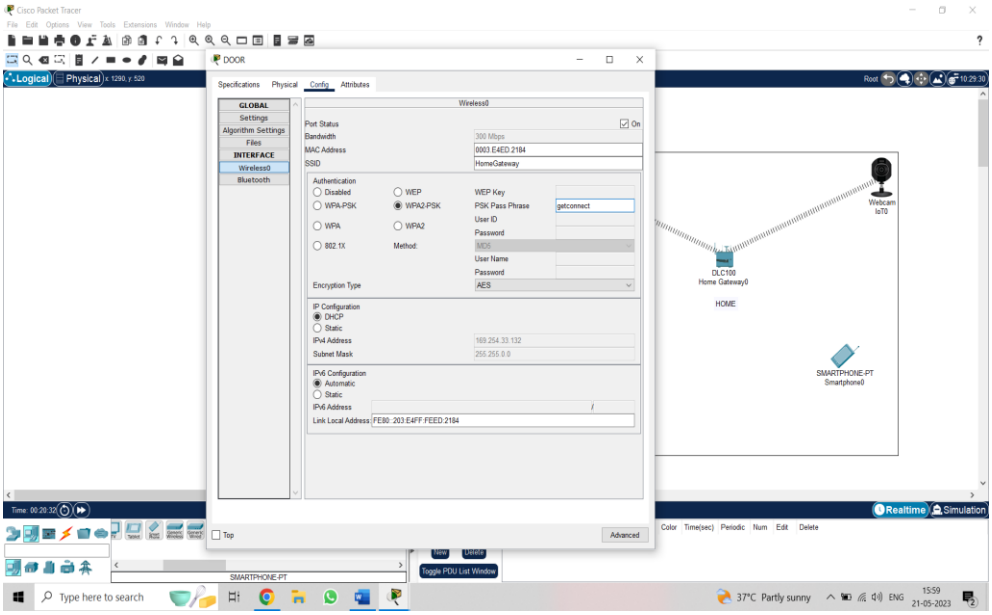
13. Click on door, go to CONFIG change the display name as DOOR. In IOT server change to Home gateway from none.



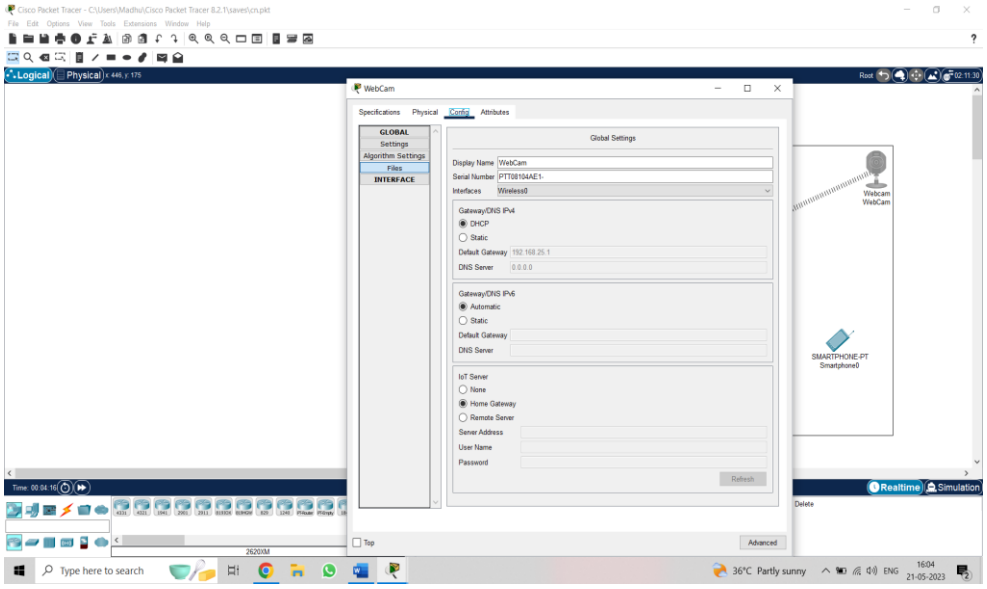
14. Click on Advanced, go to I/O Config and check whether it is connected to PT-IOT-NM-1W.



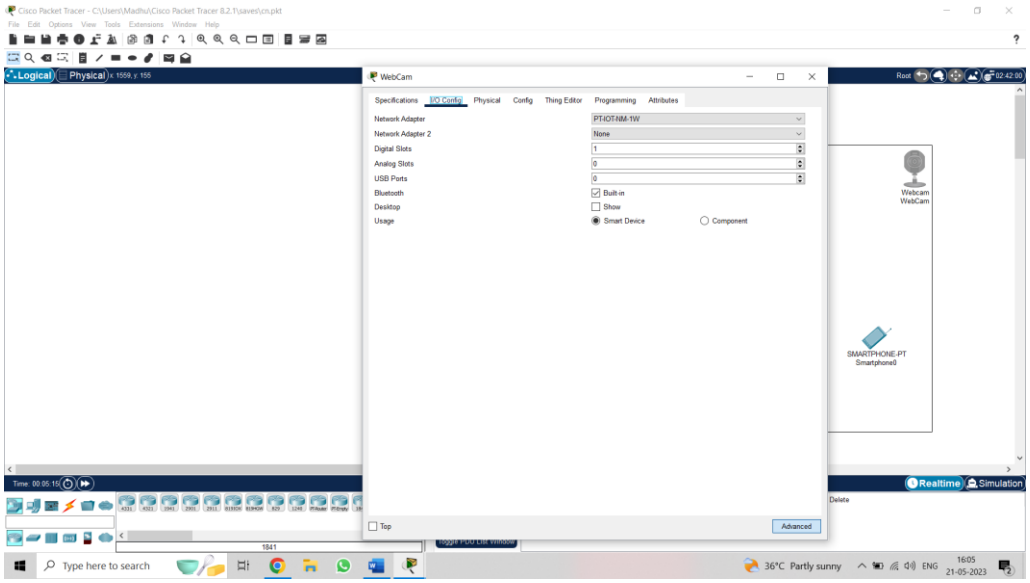
15. Click on config, go to wireless0 and select WPA2-PSK and give the password. You should specify the password which has been given to motion detector i.e get connect and close it.



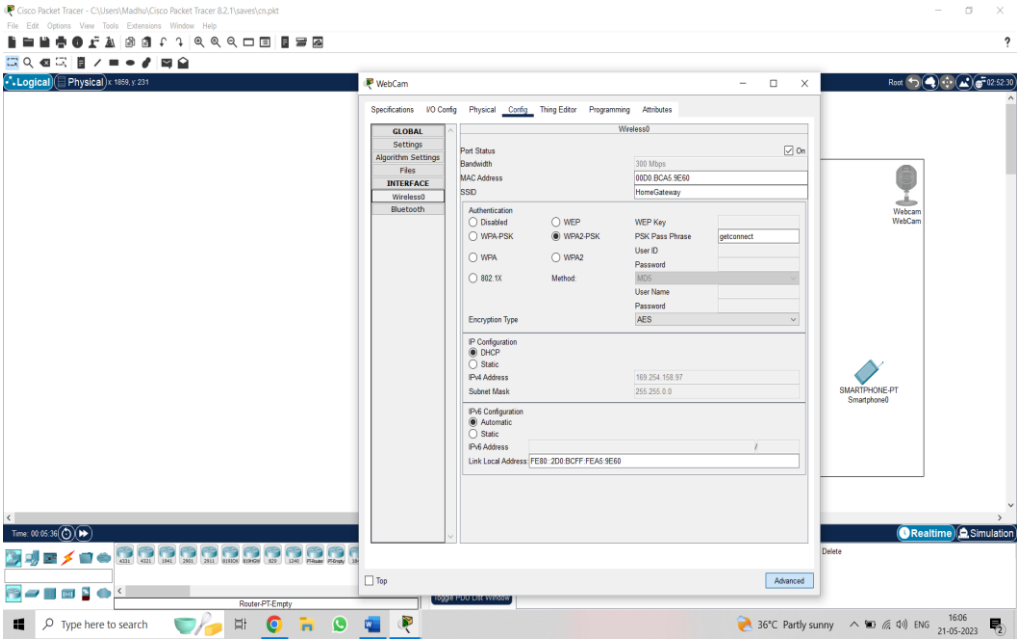
16. Click on Web camera, go to CONFIG change the display name as WebCam. In IOT server change to Home gateway from None.



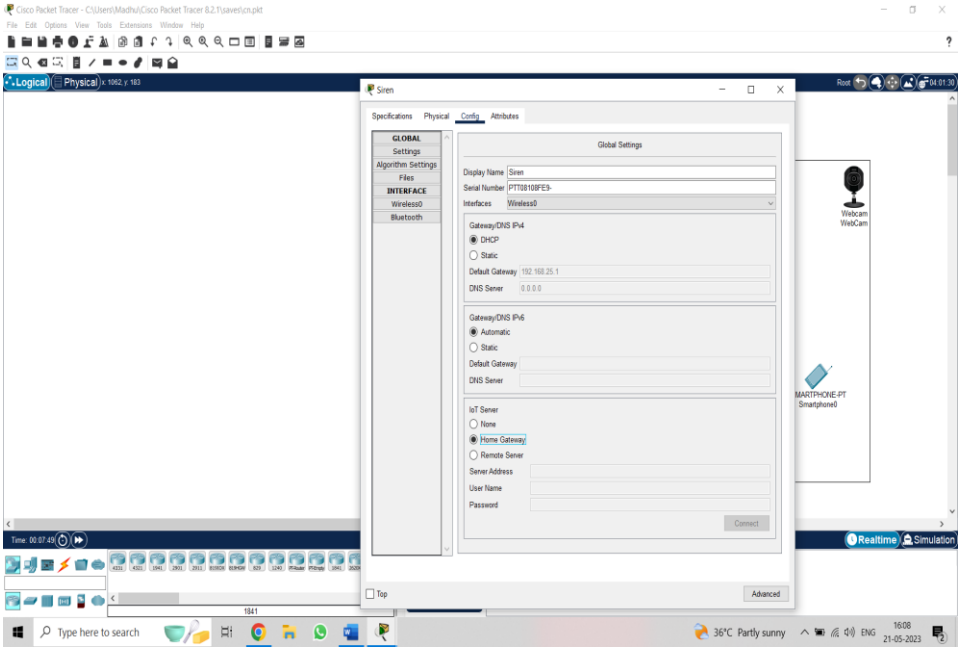
17. Click on Advanced, go to I/O Config and check whether it is connected to PT-IOT-NM-1W.



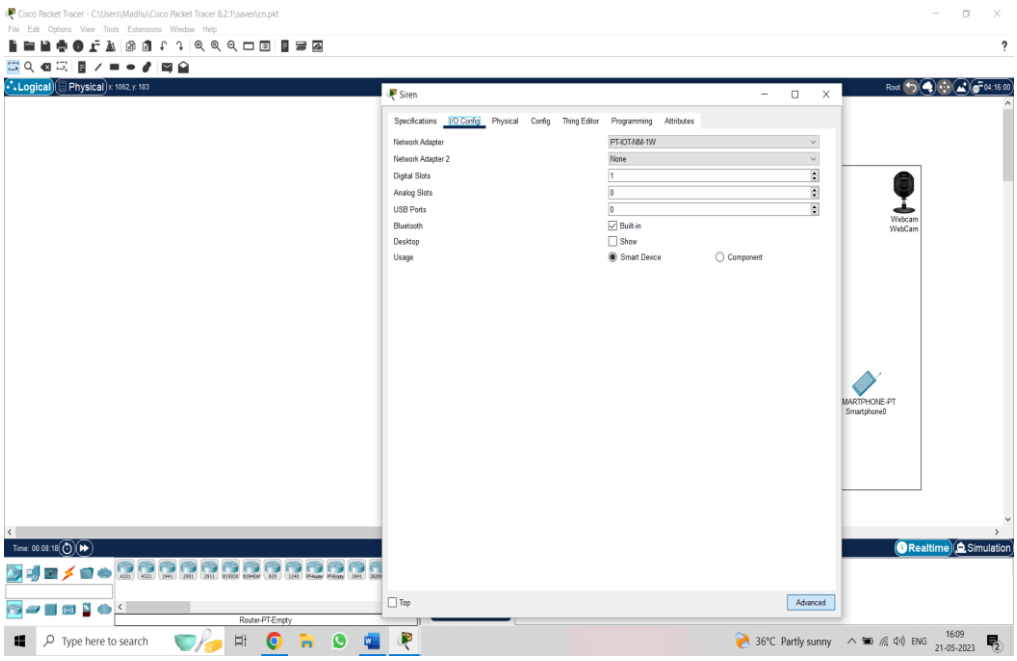
18. Click on config, go to wireless0 and select WPA2-PSK and give the password as get connect and close it.



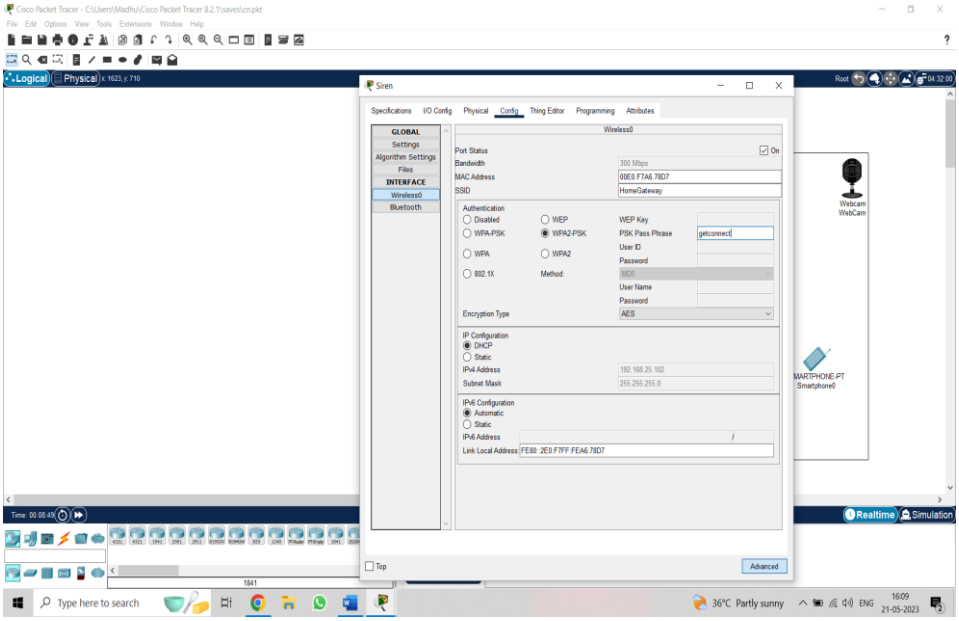
19. Click on Siren, go to CONFIG change the display name as Siren. In IOT server change to Home gateway from None.



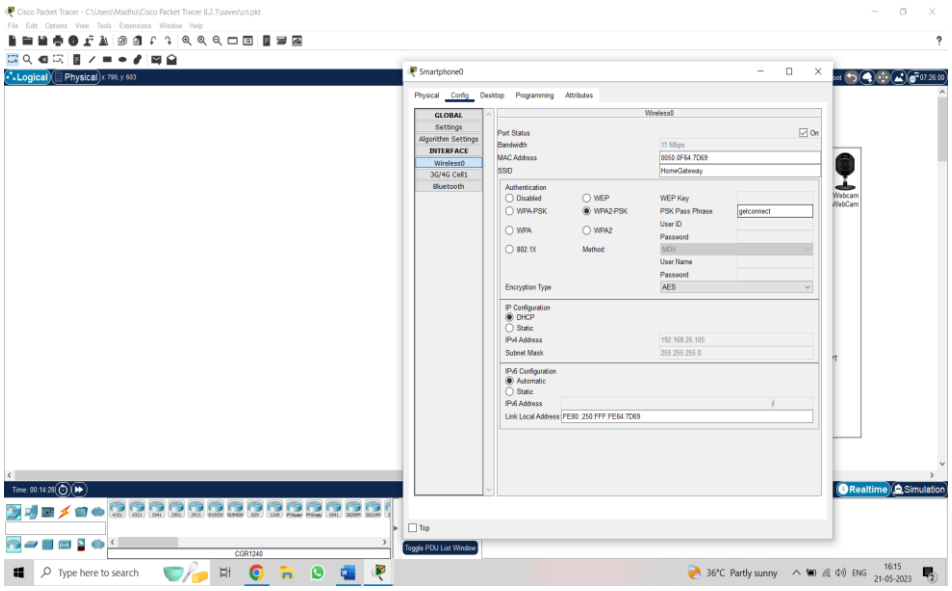
20. Click on Advanced, go to I/O Config and check whether it is connected to PT-IOT-NM-1W.



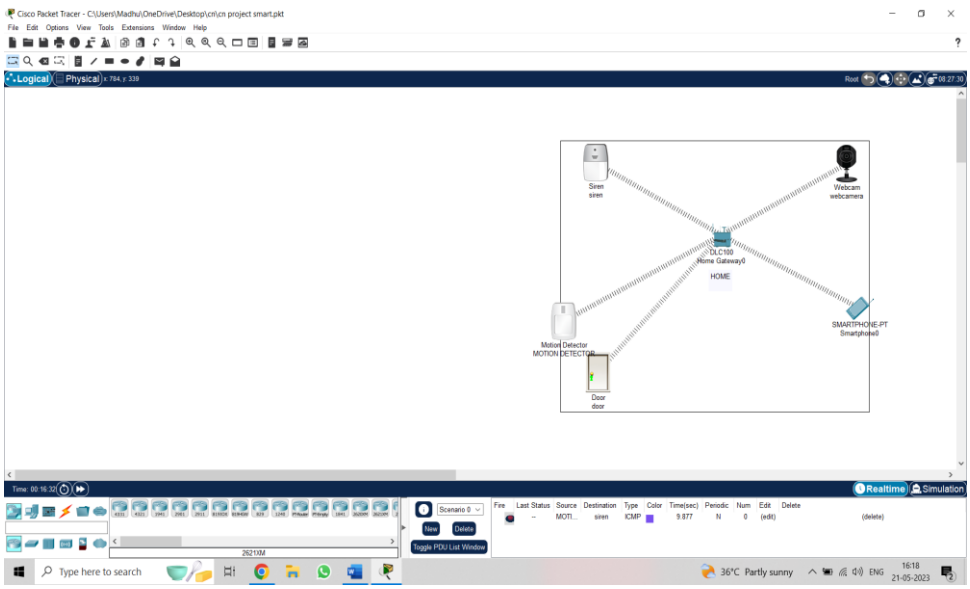
21. Click on config, go to wireless0 and select WPA2-PSK and give the password, my password is get connect and close it



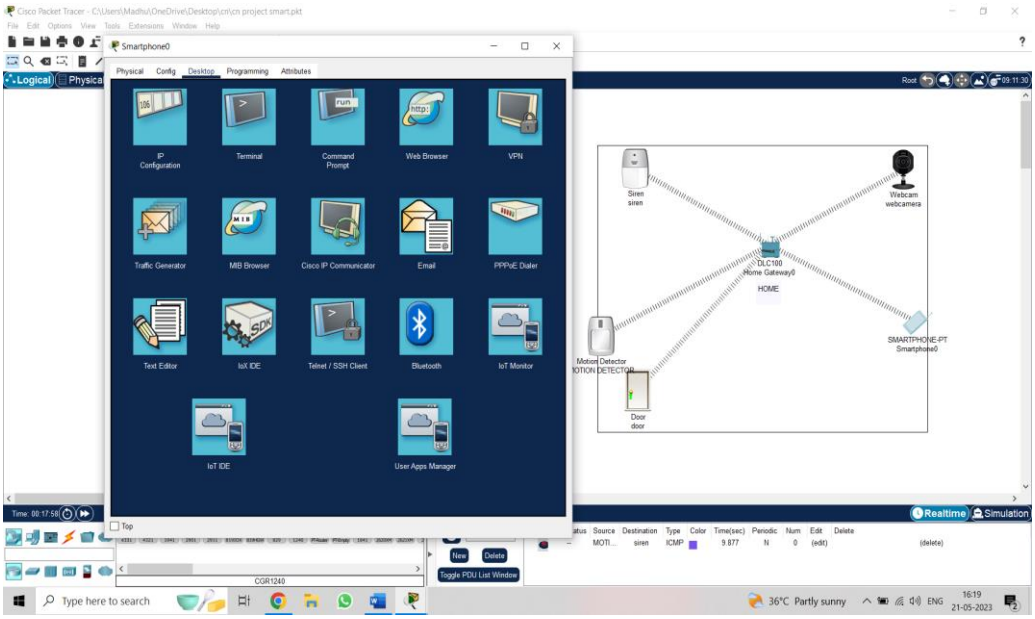
22. Click on Smart phone, go to Config ,change the SSID as HomeGateway . Select WPA2-PSK and give the password as get connect.



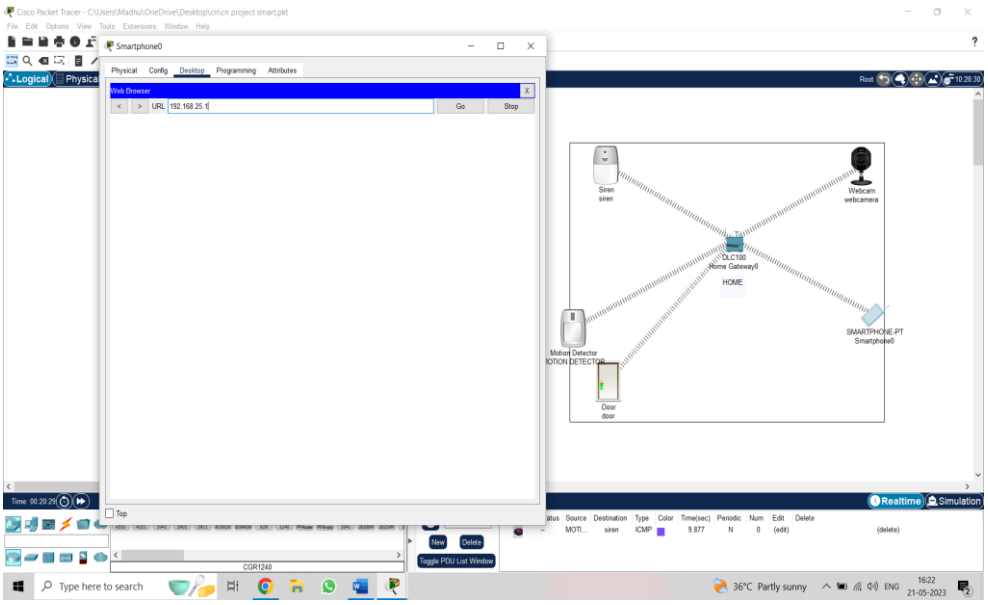
23. Now all are connected to home gateway.



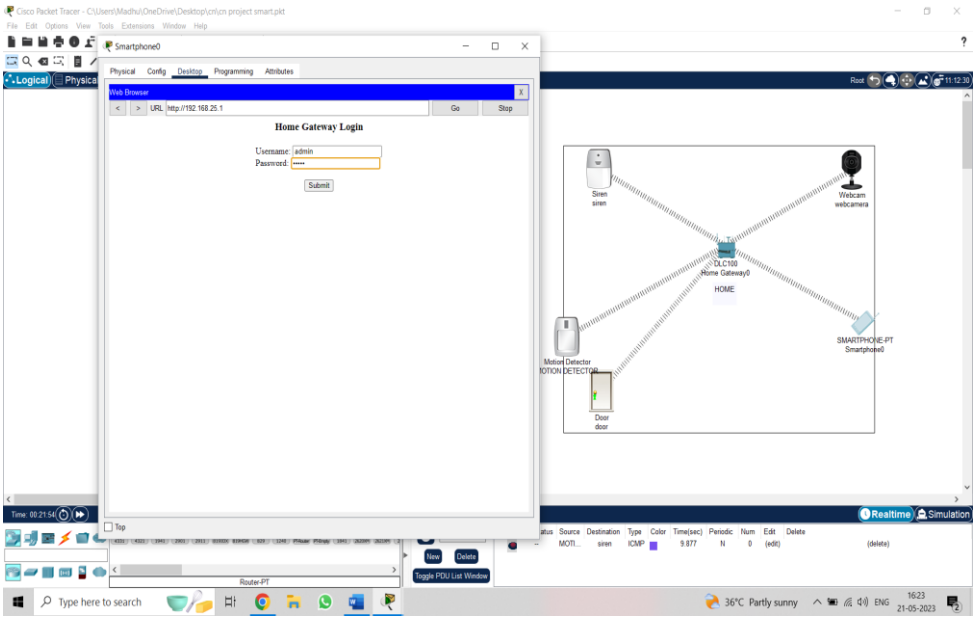
24. Click on the smart phone, go to desktop and select web browser.



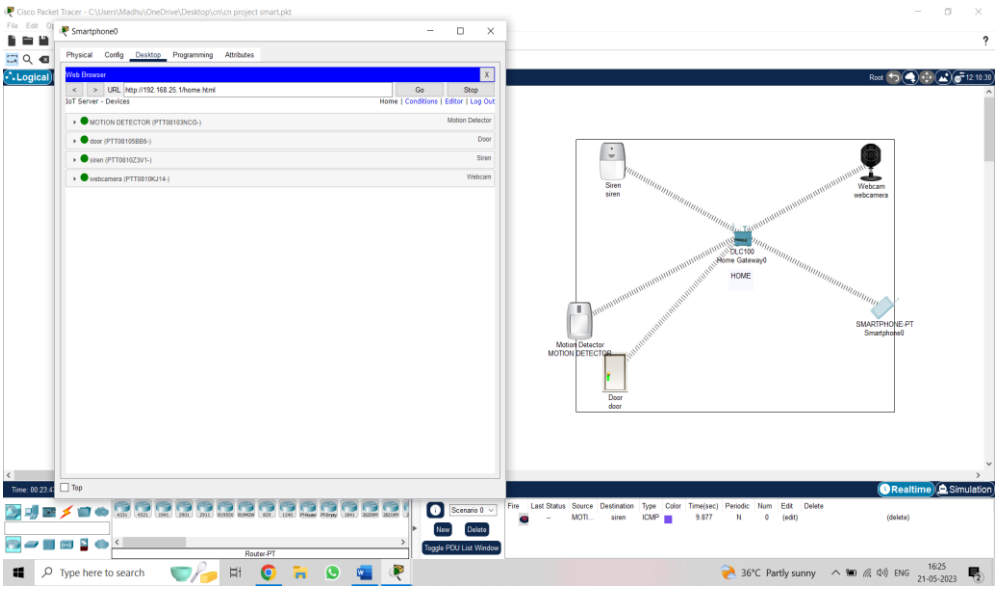
25. By selecting web browser, give the URL-192.168.25.1 and click go.



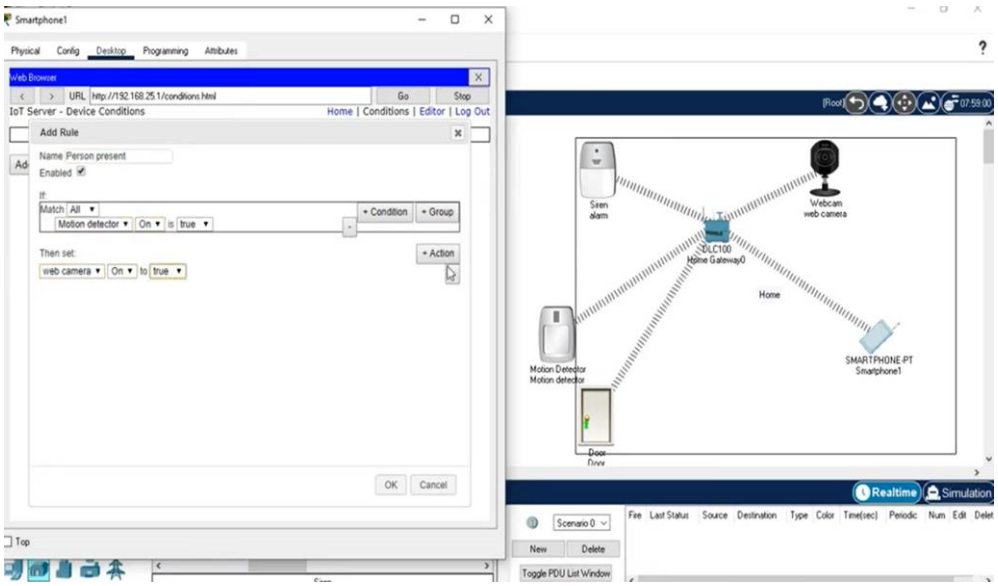
26. Give the username and password as admin .Click on Submit .



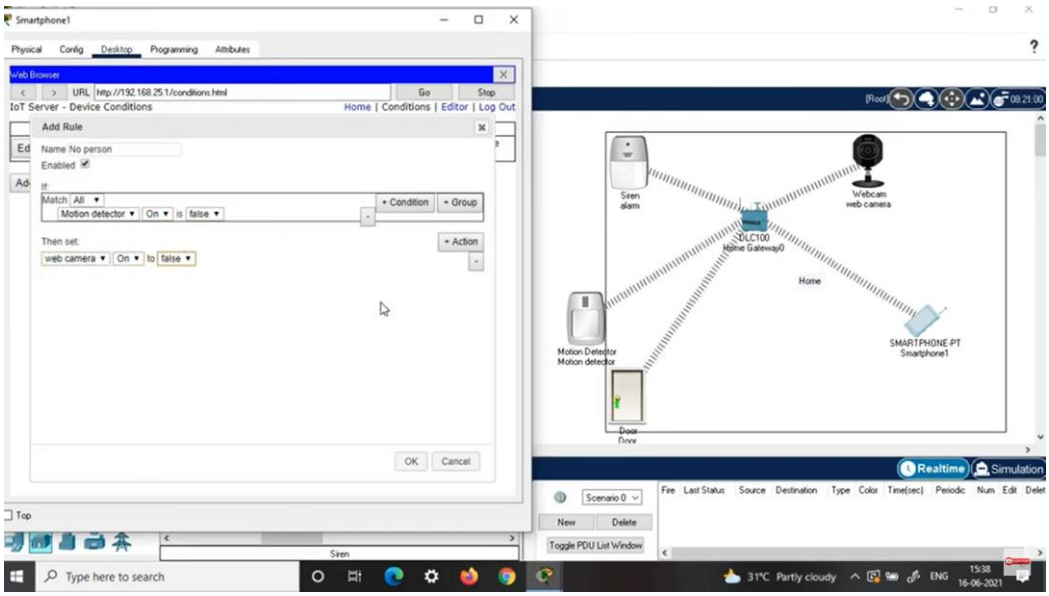
27. Now you can see the all components are connected to system that are visible in smart phone.



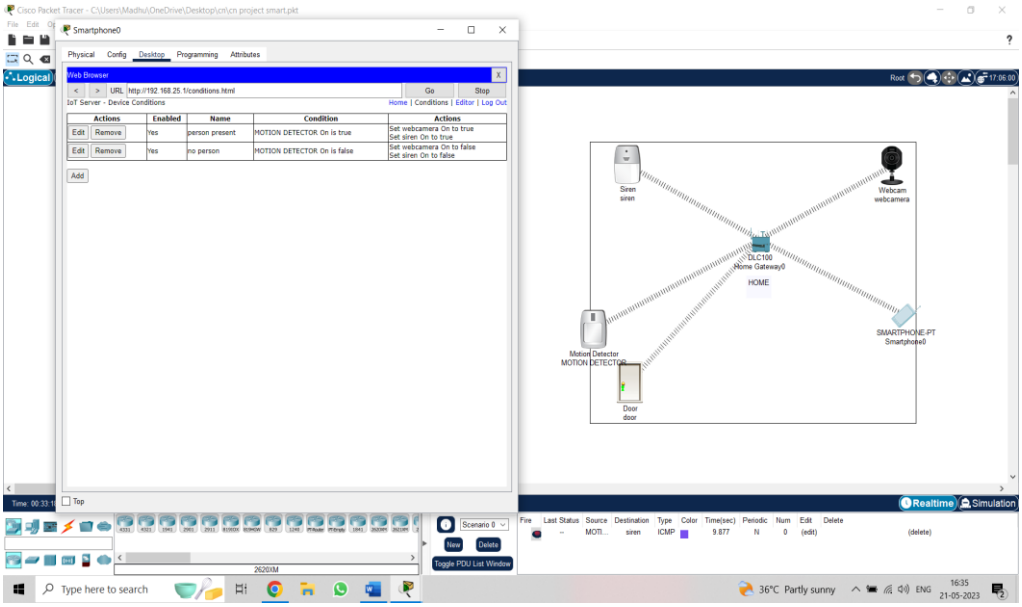
28. Select conditions, in name give person present .When someone present at door step : MOTION DETECTOR On is true and the actions to be set are Set web camera On to true, Set siren On to true. You can add some more actions by clicking +action .



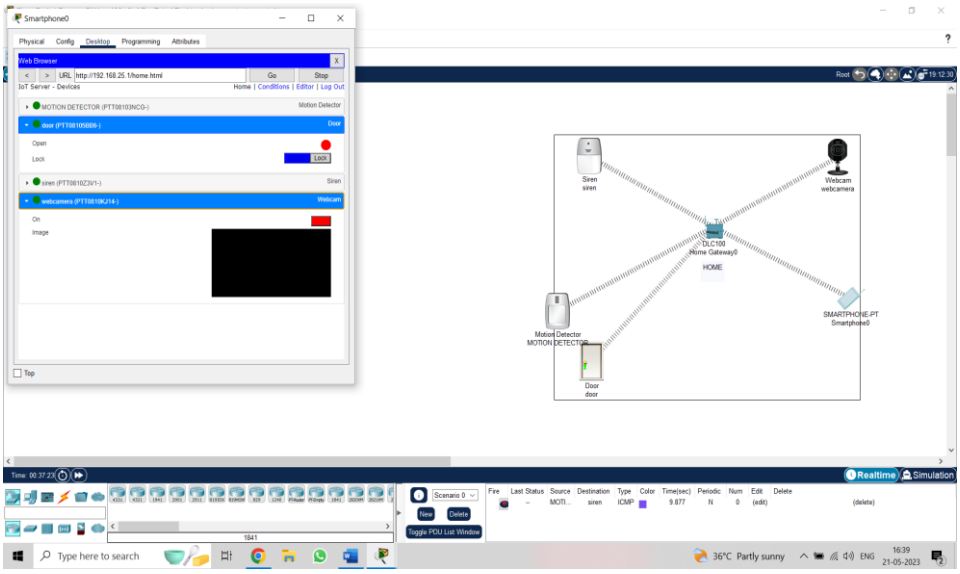
29. Add another condition ,when no one present at door step : MOTION DETECTOR On is false and action are Set web camera On to false, Set siren On to false.



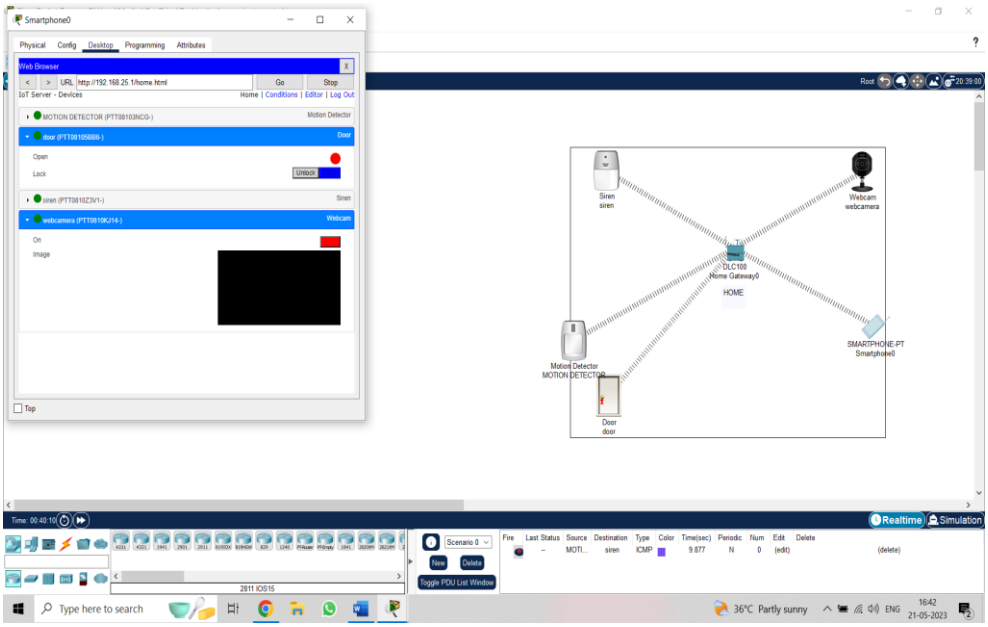
30. We can see the both conditions . when someone is present at doorstep ,motion detector goes on, siren & webcam turned on. When there is no person at door step ,motion detector turns off, siren and webcam turned off.



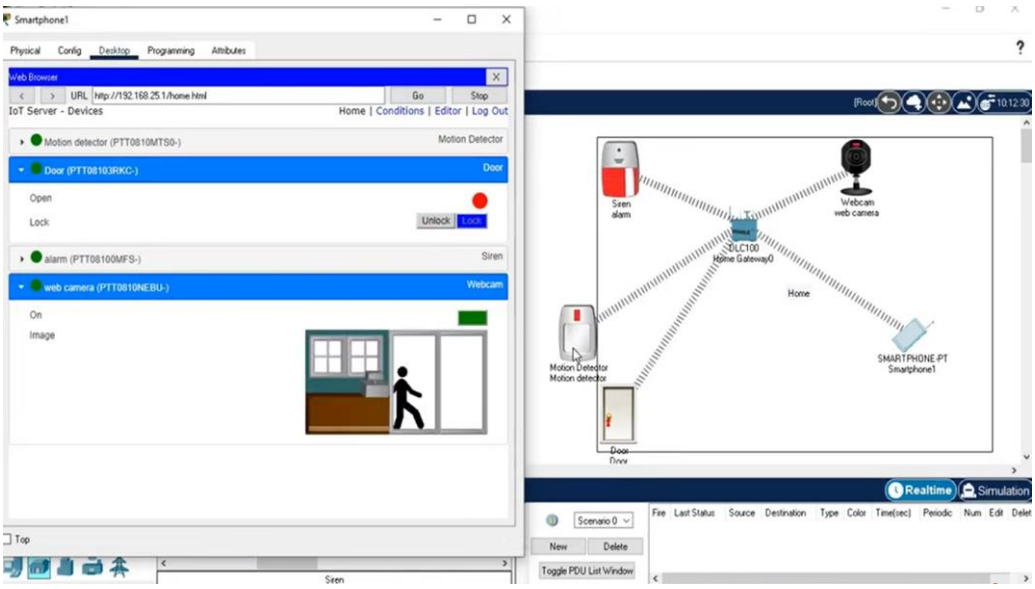
31. Click on Home. After hearing the alarming sound and verifying from the web camera we can either open or close the door. If the door is in open then it is in green colour.



32. If the door is in open then it is in red colour.



33. In order to enable the motion detector, just press the alt button in keyboard and mouse over the motion detector. Now the webcam and siren turned on and The person inside the home can look in web camera through smart phone ,the person is seen in webcam as the door is in lock state.



34. If you know that person you can click just unlock the door.As there is no person in front of door the siren and webcam turned off.