DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COLLEGE OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE &TECHNOLOGY

Kattankulathur- 603203

PROJECT REPORT

On

Smart Security System using Cisco Packet Tracer

Submitted for partial fulfilment for the award of the degree

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE ENGINEERING (B.D.A)

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BONAFIDE CERTIFICATE

Certified that this project report titled "**Smart Security System using Cisco Packet Tracer"** is the Bonafide work of **DIKCHA SINGH (RA2011027010096), KARAN SHARMA (RA2011027010077), PARAG MAHAJAN (RA2011027010088) , SIDDHANT MANDAL (RA2011027010079), SWAGAT S KALITA (RA2011027010092)** who carried out the Minor Project **(18CSS202J**) work under my supervision as a batch. Certified further, that to the best of my knowledge the work reported herein does not form any other project report on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

Project guide

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Head of the Department

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Date:

Submitted for University Examination held in _____at SRM IST, *Kattankulanthur-603203.*

Date: Internal Examiner-I Internal Examiner-II

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ABSTRACT

With many cases of theft and robbery in the whole world, the number of robberies reached around 35,456 last year, including 24 armed robberies and those numbers are increasing every year so we decided to use Cisco Packet Tracer to establish a high-security system for homes.

The advancement in the Internet of Things for electronic devices and applications has attracted people, especially younger generations, to move into the interconnected world. A smart home is an example of an application that is highly in demand. Together with the rise are cyber security issues. By being connected, many users are exposed to security threats without their knowledge. This paper presents a security analysis on the smart home environment using Packet Tracer Simulation Software. A testbed of a basic smart home set consisting of electronic appliances, gadgets, and surveillance system is set up in the Cisco Packet Tracer software version 7.1. Possible vulnerabilities issues were simulated at the network and application layers. The vulnerabilities and possible attacks on the smart home network environment were successfully identified. Mitigation techniques on the attack were proposed to reduce the probability of the network attacks.

At the end of this scientific poster, we want to mention that the discussed method is considered one of the most important ways of protection that the majority of society seeks to own in their homes and use because it is one of the latest ways of protection for homes and the easiest use has been established the system of protection of the home using Cisco Packet Tracer.

OBJECTIVE :

Establishing a system aimed at providing protection and safety and reducing exposure to common hazards and alertness as soon as they occur.

INTRODUCTION :

With the increase of thefts and the speed of their spread, people's fear and anxiety increased, concern and afraid of being psychologically or physically harmed by the robber, the developers of computer technologies began to create different and diverse protection systems to protect houses by informing owners that a stranger in their house or alarm them when danger occurs.
All home security systems work on the same basic principle of securing entry points, like doors and windows, as well as interior space containing valuables like art, computers, guns, and coin collections. Regardless of the size of your home, or the number of doors and windows or interior rooms a homeowner decides to protect, the only real difference is in the number of security components deployed throughout the home and monitored by the control panel.
Numerous studies show homes without security systems, when compared to those with professionally monitored systems, are up to three times more likely to be burglarized because burglars are opportunistic by nature and are on the hunt for easy targets.

What Is A Home Security System?

A home security system is a group of physical electronic components that all work together to protect a home

Security camera: smart security camera hooks up to Wi-Fi, enabling us to livestream footage of our system remotely and receive notifications when our cameras detect movement,

people, or packages. Many cameras include infrared or color night vision, cloud or local storage, and two-way audio, which allows us to speak to whoever is on camera. Some cameras also have smart platform integrations such as Amazon Alexa or Google Assistant.

- **Motion sensor:** Motion sensors should be placed in a main entryway or hallway on the ground floor of a home so that they can detect motion and alert us when our system is armed. Some motion sensors are sensitive to pets, so they don't go off every time our dog walks by.

- **Entry sensor:**

  Also known as contact sensors, entry sensors have two parts: one that goes on the window or door and another that goes on the frame. These sensors use magnets to determine when one of these entrances is opened or closed. If the sensor thinks an entry point is opened, it alerts us. We suggest placing entry sensors on windows or doors on the ground floor. The majority are battery-operated, and many even have adhesive backings for easy installation.

- **Glass break sensor:** Sometimes, instead of opening windows the old-fashioned way, intruders will simply break them open to avoid setting off the entry sensors. However, a glass break sensor also detects the sound of glass breaking and alerts us via mobile notification.

- **Siren:** Sirens exist in home security systems both on their own and as part of other devices, such as the base station (which we'll get to below). Sires often go off at the same time as other alarms and are intended to scare intruders away or alert our neighbors.

1.Protects valuables

This is, of course, the benefit most people immediately think of. We likely all know someone who has lost electronics, jewelry, or other high-value items due to a home invasion. The tragedy is compounded when the item is an irreplaceable family heirloom. While using a home sa can help protect irreplaceable items, a home security system has an alarm that can scare off many would-be burglars and can notify real authorities if someone does attempt a break-in.

2. Deters crime

A 2009 study by Rutgers found that, as the number of home security systems increased in an area, the number of residential robberies decreased in that area, even for people who didn't have their own security system. Having a security system not only protects you, but helps deter crime and creates a safer neighborhood for everyone.

3. Allows remote access to your home

Modern security systems now allow you to remotely monitor what's happening in your home from your phone when you're not there. Depending on your provider, you can monitor security cameras installed throughout your home, as well as control, and other smart devices in every room of your home.

4. Lowers homeowner's insurance

Yes, you may be paying a monthly fee for your security system, but having the system in your home can lower your homeowner's insurance by up to 20%. That, combined with instant access to police and emergency responders, makes an alarm system a pretty good deal.

5. Notifies you of fire or gas problems

You can opt to receive notifications if your smoke alarms or carbon monoxide detectors go off when you're away from home. Depending on the provider, you can even set it up so authorities are instantly notified of these emergencies.

6. Helps keep tabs on kids

This is another great aspect of home automation. If you're at work, you can use your provider's mobile app to watch what's happening in your home via video doorbells and other security cameras, so you'll know who your teens are inviting over when you're away. If you have

electronic door locks, you can even remotely unlock them to let the kids in after school, so they don't have to worry about carrying (and potentially losing) a key to the house.

7. Improves electricity management

Many security companies, such as Vivint, offer top quality smart home products like smart locks, video doorbells and smart thermostats, as part of their systems.. If you've forgotten to change your thermostat before leaving on a trip, these gadgets allow you to control the thermostat on any web-enabled device. Likewise, if you think you left your curling iron plugged in, you can turn it off the outlet right from any of your devices. This works as a great tool to turn lights on and off while you're on vacation to help give the home the appearance that someone is there.

8. Makes room for peace of mind

The sense of security and comfort you gain with an alarm system is perhaps the greatest benefit of all. Next to being safe, the confidence of feeling safe will help you be a more productive, healthy, and focused person.

Adding a security system to your home gives you an extra layer of defense against any potential intruders. Whether you rent or own, you can enjoy the benefits that come with having a security system. Explore your options by comparing the best home security systems in the country and find the right provider for your security needs and goals.

MODULES OF THIS PROJECT :

1. Perception
2. Network
3. Application

MODULE DESCRIPTION :

1. PERCEPTION MODULE

The perception layer consists of sensors and actuators connected to a specific location or place. Depending on the applications, the number of devices can vary from below 10 to millions of connected devices. For home security applications, these sensors include a camera for a surveillance system.Motion detector is used to detect whether someone is at the door.Then the motion detector is connected to home gateway and configured and password is set.

0. NETWORK MODULE

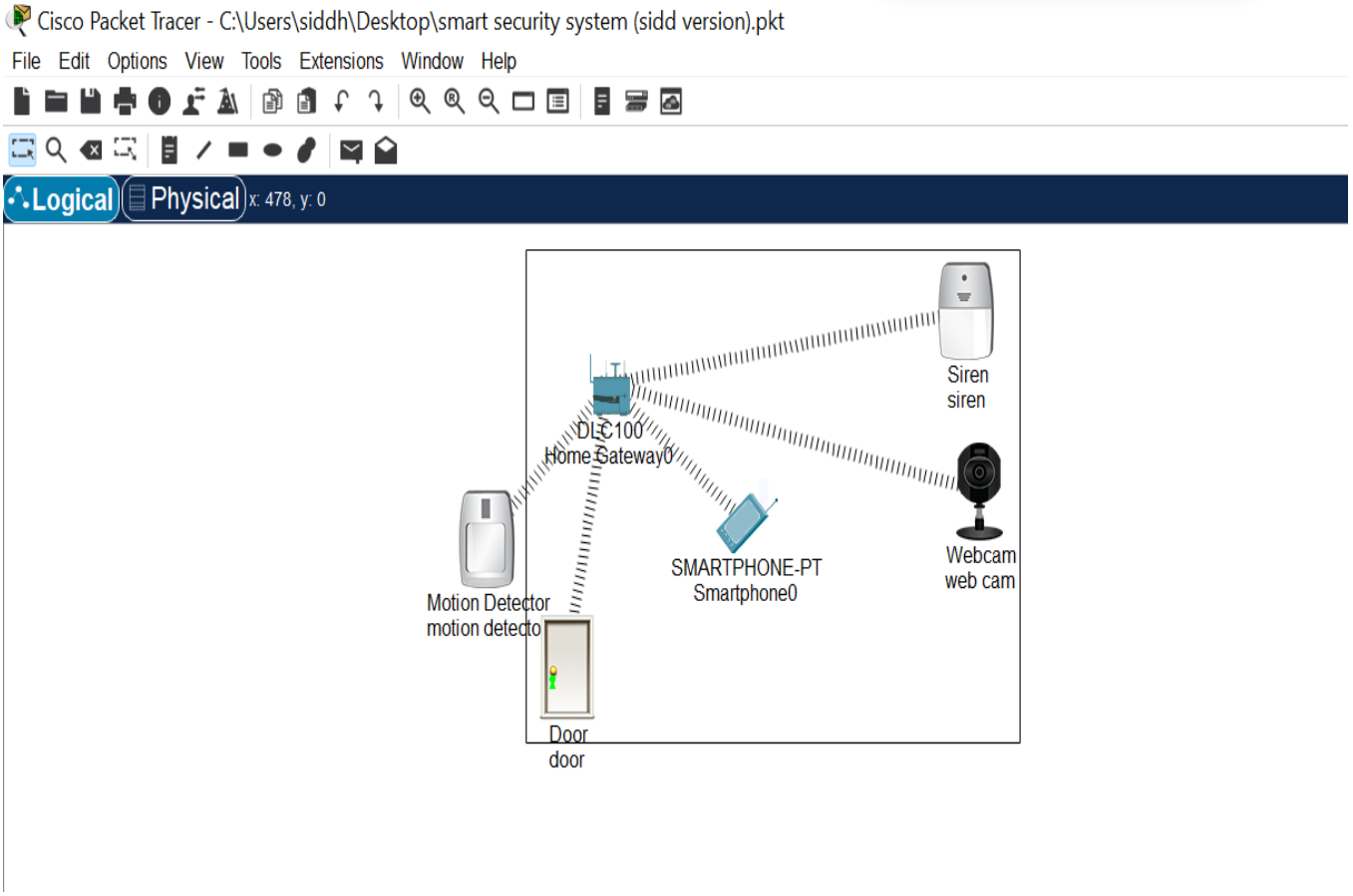
One of the vulnerabilities that exist in the smart security system is through a gateway. A simulation study conducted by a group of a researcher using few network analysis tools such as Wireshark, Cain & Abel and NetworkMiner based on Kampung Wi-Fi network has shown the vulnerability of the gateway that enables attackers to further conduct another attack such as brute-force and identify open ports on the network . Home router and gateway is also vulnerable to authentication and password attack especially when the owners are using default device password and never change the password for a long time after sharing it with visitors. Considering the two types of attacks which are service interruption and information gathering, the impact of the second type of attack is much more brutal compared to the first. Information gathering attacks will lead to a far more serious consequence where the attacker might be able to get into the house network and expose the privacy of the homeowner.

0. APPLICATION MODULE

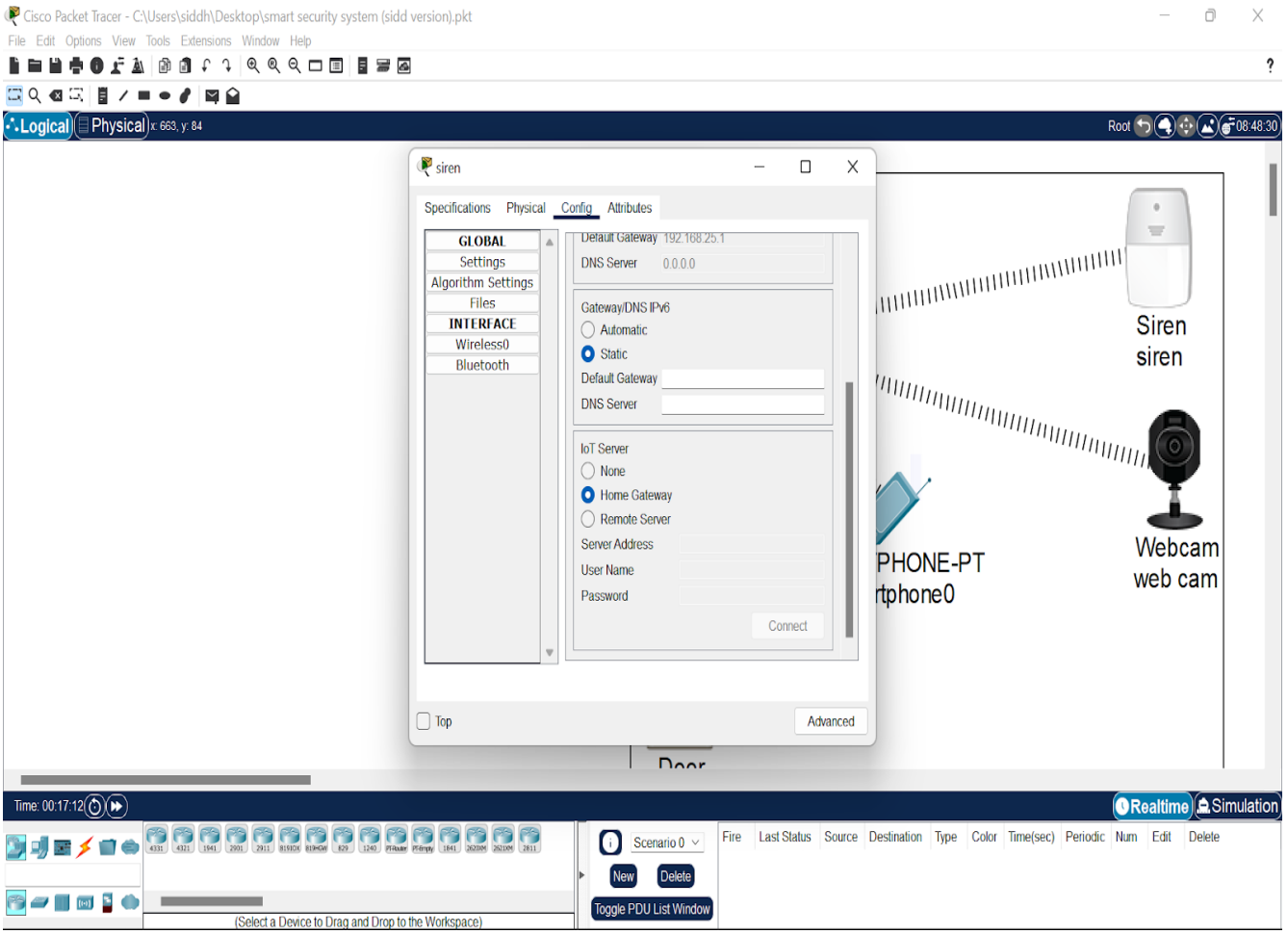
Another source of vulnerabilities is cloud servers and mobile devices that are used to remote control and monitor the home. Communication between mobile apps, servers, and sensors increases the security challenges. Mobile apps are directly exposed to the public network, which makes it one of the vulnerable points for the smart home system. Therefore, the encryption for outbound and inbound of sensitive data flows in and out of the app is very crucial. DDOS attacks, Man-In-TheMiddle (MITM) attacks, session hijacking are examples of attacks at the application layer.

SCREENSHOTS :

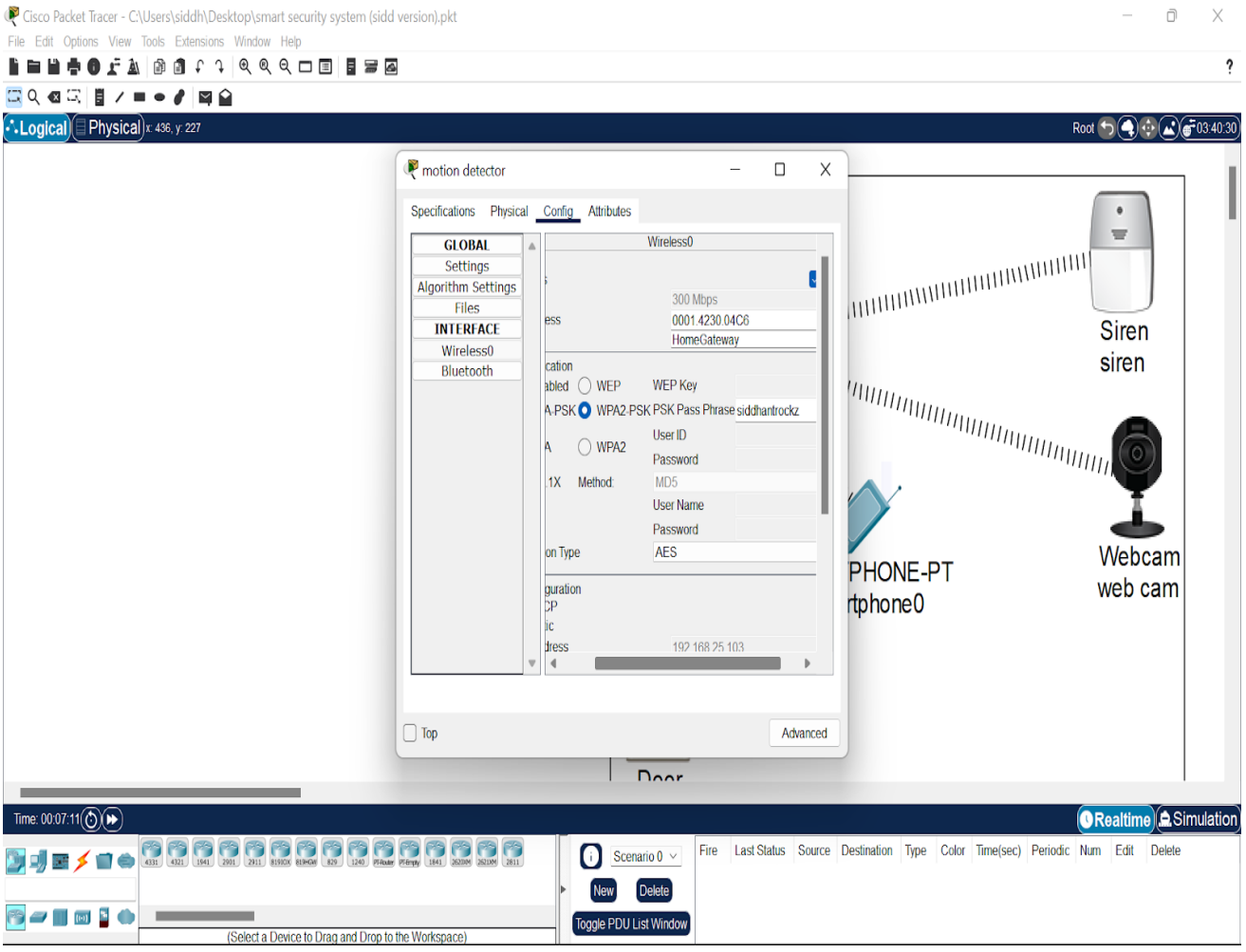
Overall view of the system-

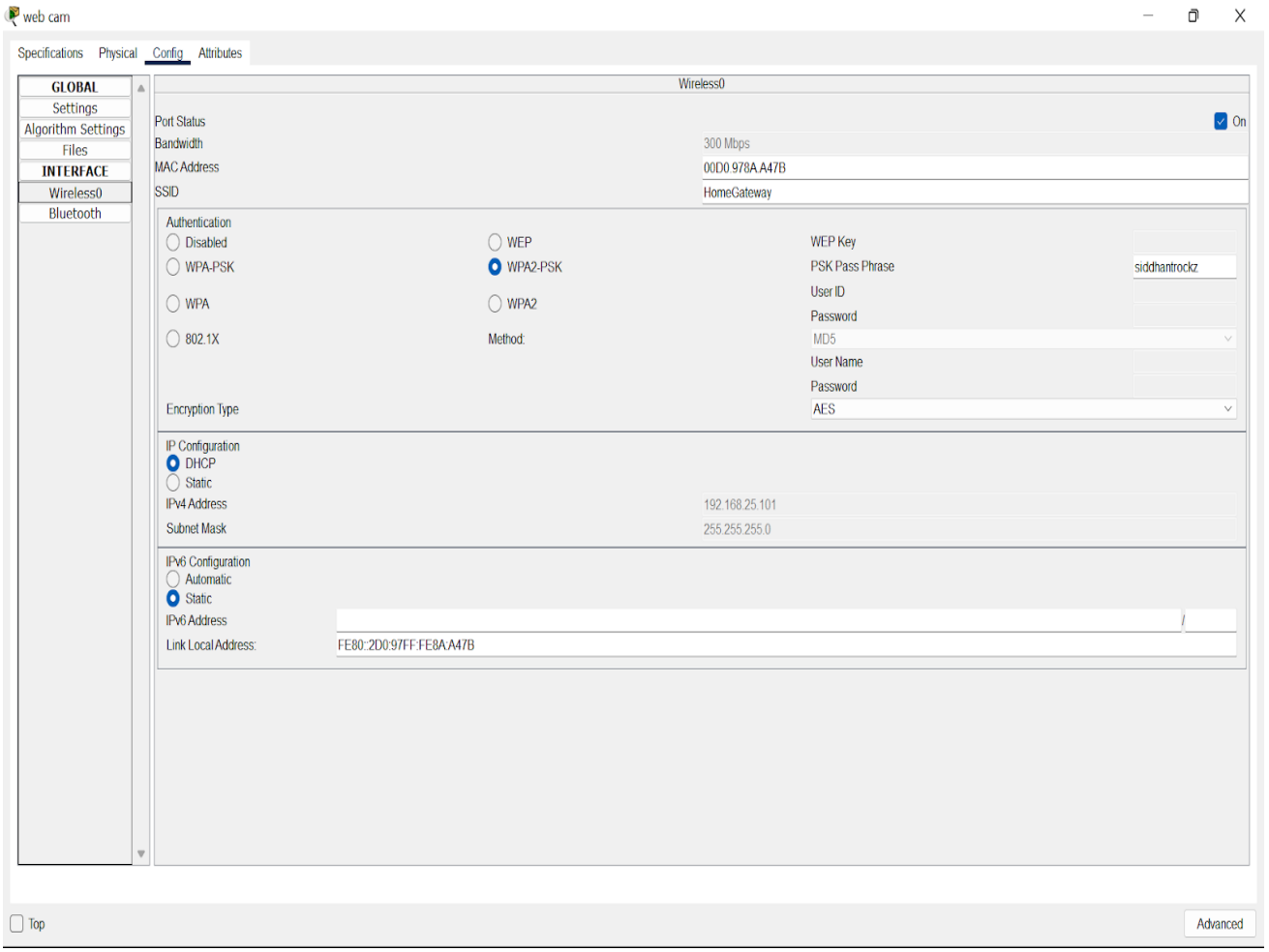


Choose Default Gateway in each and every device as IoT Server-

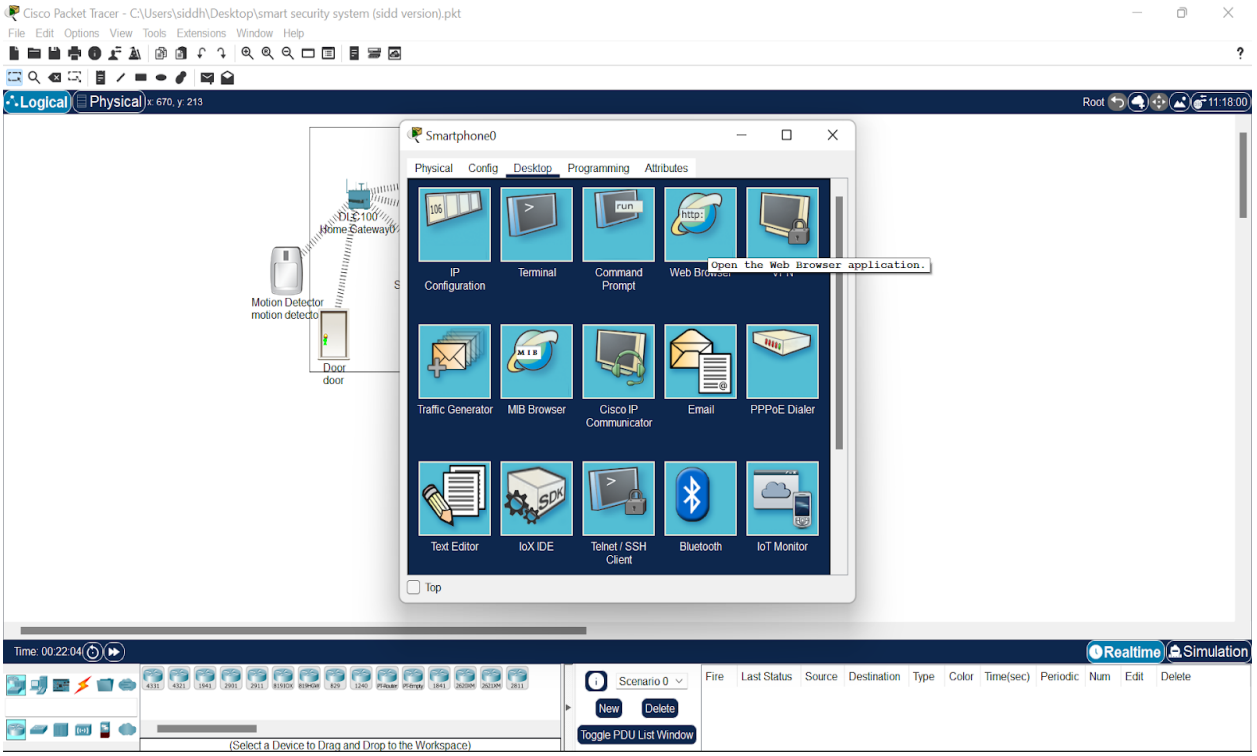


Put the password as your requirements at each and every device-
Click on Config tag and put the password as shown in the picture below

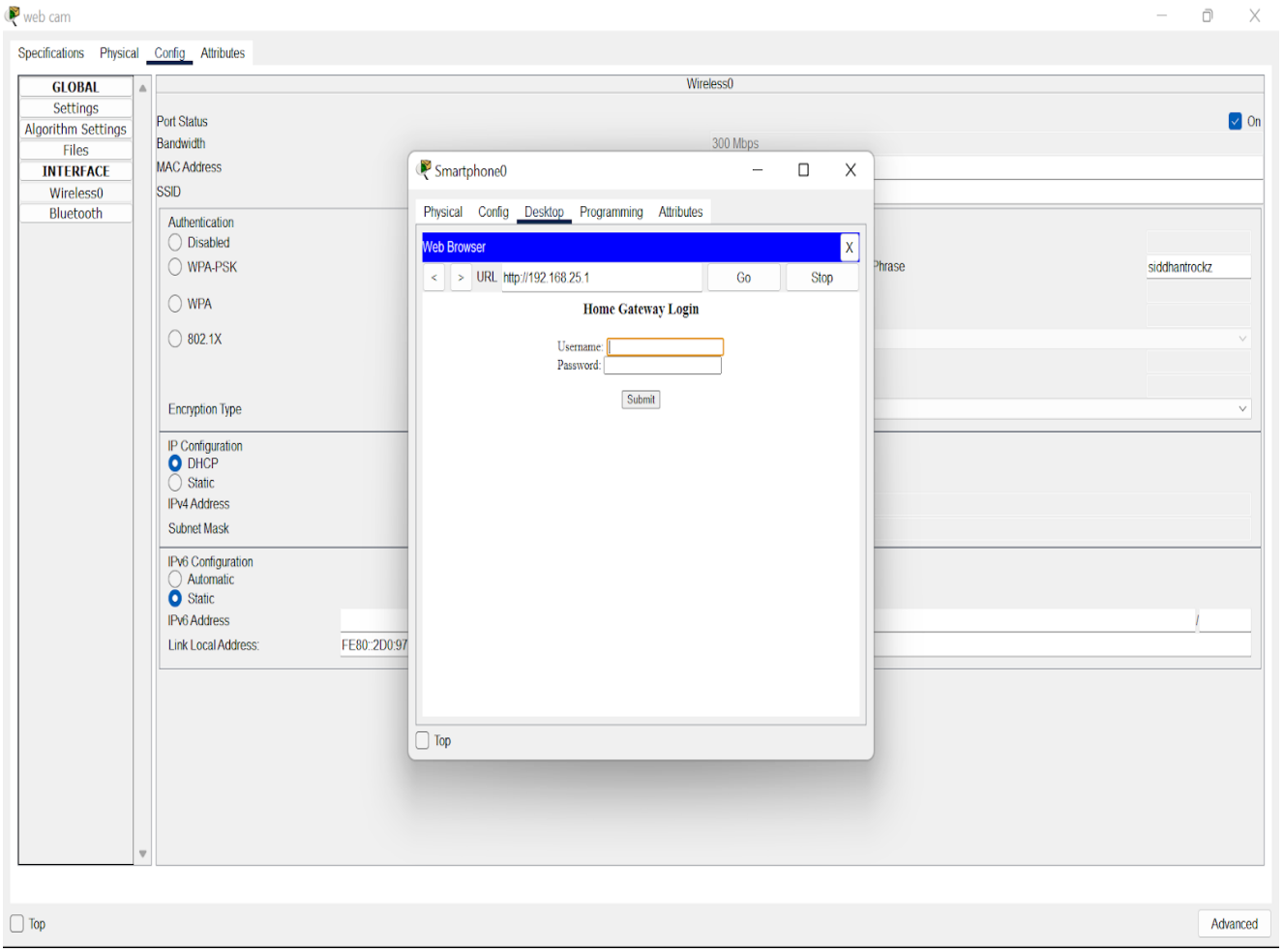




To see the view of webcam go to SmartPhone and click on Web browser



Now put web address as shown in the image-


web cam
Specifications
Physical
Config
Attributes
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
On
Bandwidth
300 Mbps
MAC Address
SSID
Authentication
Disabled
WPA-PSK
WPA
802.1X
Encryption Type
IP Configuration
DHCP
Static
IPv4 Address
Subnet Mask
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address:
FE80:2D0:97
Top
Advanced
Smartphone0
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
URL
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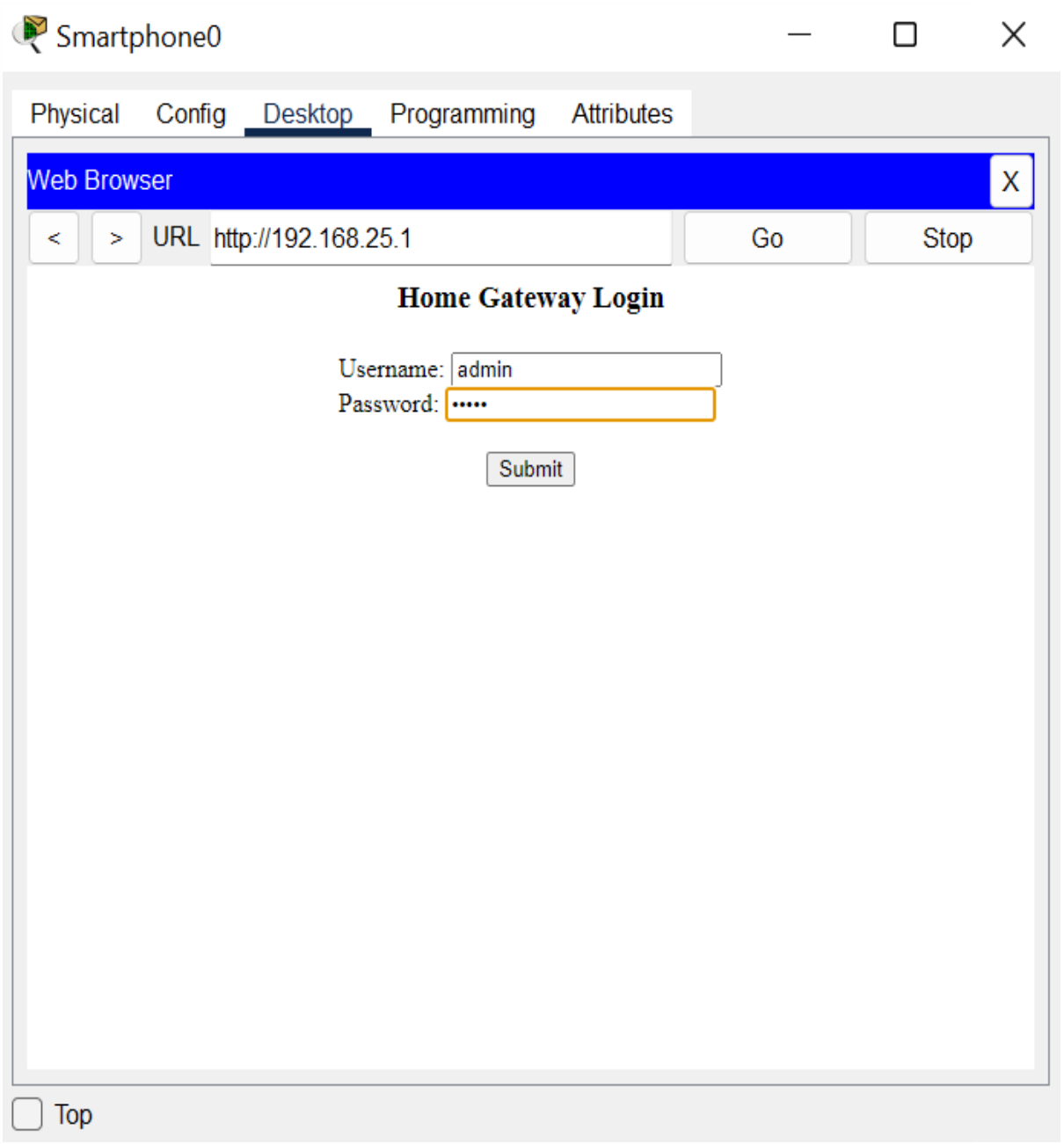
Go
Stop
Home Gateway Login
Username:
Password:
Submit
Top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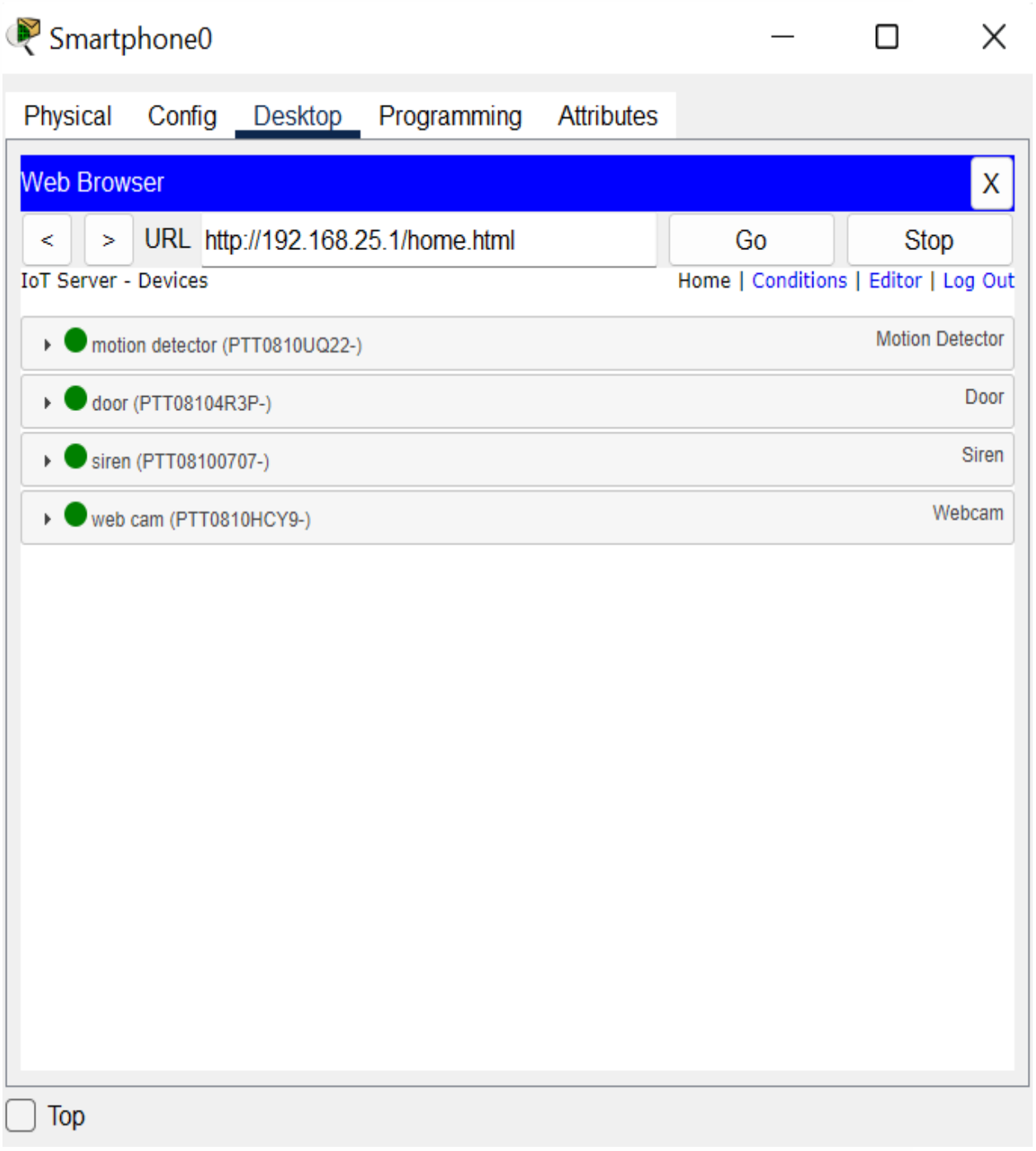
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IoT Server - Devices
Home | Conditions | Editor | Log Out
motion detector (PTT0810UQ22-)
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Door
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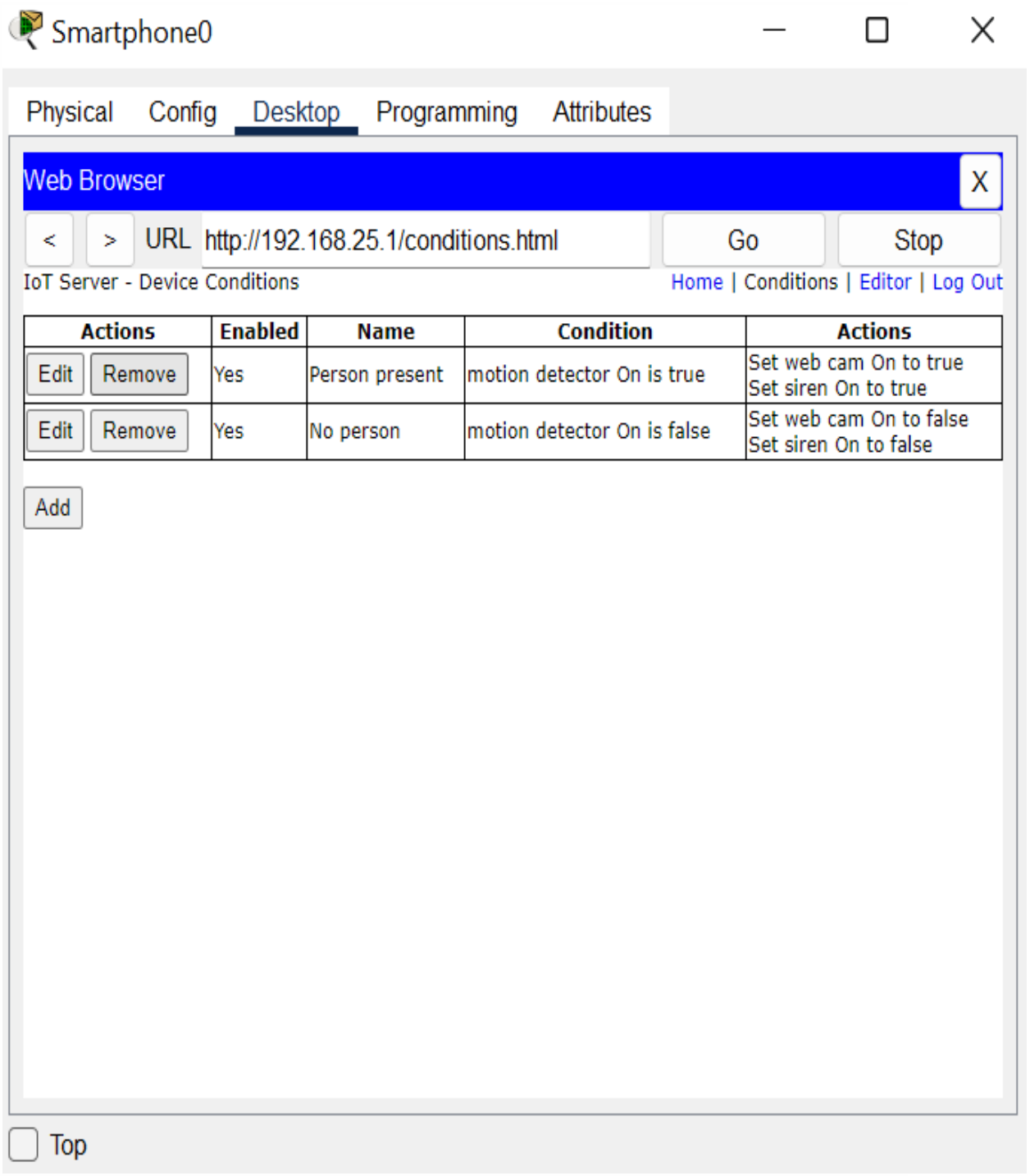
Siren
web cam (PTT0810HCY9-)
Webcam
Top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Home | Conditions | Editor | Log Out
Actions
Enabled
Name
Condition
Actions
Edit
Remove
Yes
Person present
motion detector On is true
Set web cam On to true
Set siren On to true
Edit
Remove
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motion detector On is false
Set web cam On to false
Set siren On to false
Add
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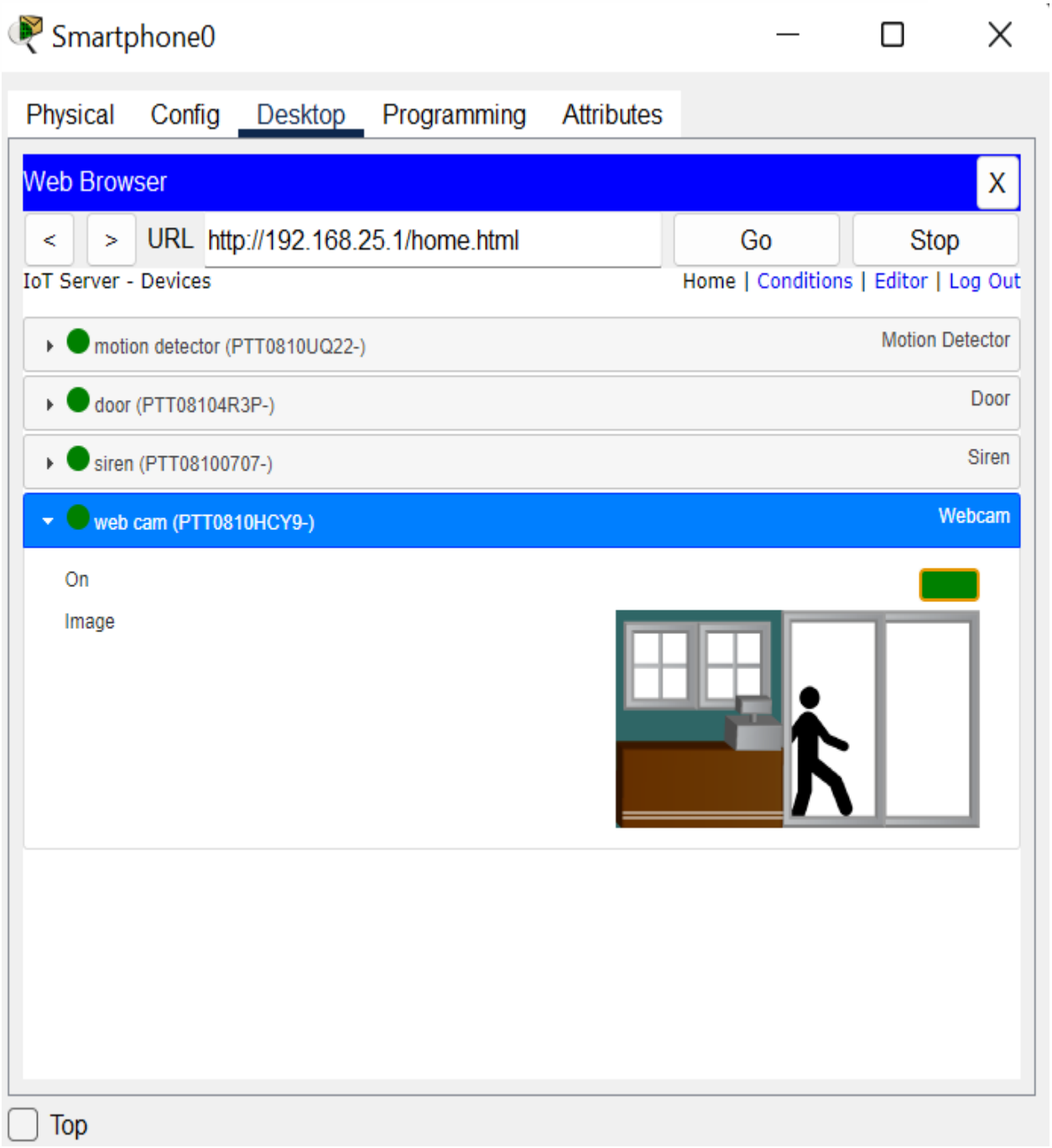

RESULT :

We successfully created a smart security system using Cisco packet tracer.

INFERENCE FROM THE RESULTS :

We designed a smart phone system for smart homes using Packet Tracer 7.2. We tried to make it as secure as possible by linking it to the owner of the house , all information of anything happening at the house through text messages or phone alarms.

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