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Designing Smart Home Using Cisco Packet Tracer 7.2 Simulator

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Abstract: A smart home is implementing using currently released internet of things technology to automate different types of activity at home.when the devices are automated,they can be used to control the activities being done in smart home.a smart home is considered as the idle place for the creation of smart home environment.an IOT refers to the communication between the things such as actuators,sensor,devices and to the people with distinct identifiers. an IOE devices can be connected to the internet, which further allows the monitoring and controlling of different types of home appliances. This smart home is implemented using the current version of cisco packet tracer 7.2 version with new released and updated version of all IOT devices such as sensors,IOE devices,boards and these all can be programmable.the smart home is designed using different types of IOT device with enabling security,safety and home environment prosperity.

Keywords: Smarthome,IOE,wireless sensors, packet tracer 7.2 simulator.

1. INTRODUCTION

A Smart home is designed using the smart objects to improve the home activities in advance, this can be used to perform automating activities of smart home without users involvement, such monitoring home environment can be condition by different types of the sensors then ventilate based on the sensor information. A smart home is designed not only for the activities to be performed but also implemented with the security.the IOT is new technology it generally refers to make the communication between the things such as technological devices,actuators and different type of sensors .The internet of everything(IOE) and Internet of thing(IOT) are two things which are commonly refers to the new trend to have cheap,small in size and always connected various devices to send data to a back end cloud based oriented applications.in this paper all necessary required home appliances are registered to home gateway service and this can be controlled by the corresponding legitimate person.this paper deals with the designing of smart home with the new released version of cisco packet tracer 7.2 version which has all updated devices.the cisco packet tracer simulator 7.2 is used to design as well as the designing of the Internet of everything devices with classically networking devices.in this paper the smart home is designed by using the home appliances such as smart light,smart door,smart fan and smart window et

The benefits of new released packet tracer are 1.permits user to design,build,configure smart networks using various smart objects. 2.provide the boards further controlling of smart objects in the network 3.provides a realistic simulation features and visualization various devices.

2. MOTIVATION

Smart The tool chosen here for the simulation is cisco packet tracer which has been using for many years to train the students in the field of networking by cisco industry. the versatility of this simulator is that it will offering of a variety of network components which can simulate in real time networks,devices would then need to be interconnected further it is configured to create the desired networking mechanism.the latest version of packet tracer simulator supports IOE devices and controller boards such as SBC-PT and MCU-PT it also supports the micro controllers such as Arudino or Raspberry pi .the main advantages of this simulator is all the IOT devices can be programmed with java.python or blockly.

3. METHODOLOGY

The smart home is implemented with new released version of cisco packet tracer 7.2, which further included with different smart object used for the home automation such as AC,Home speaker,lawn sprinkler, web cam,siren,portable music player, garage door, web cam smart fan, and different sensors are included.

In order to control these all smart objects and sensor, microcontroller (MCU-PT) and Home Gateway used, since it also provide programming environment for controlling smart object connected

to it and to provide a controlling mechanisms by registering a smart device to corresponding Home Gateway respectively

3.1 Cisco Packet Tracer

In the figure below it is possible to see, as an example, the different routers offered by Cisco Packet Tracer, main difference to consider when placing the device in the simula-tions are the possibly hardware limitations that are coming with the devices, in terms of number of ports available, options to change the network interfaces, number of expan-sion slot etc. An extensive list of switch, server, PC and laptop is also available in the tool.

3.2 Home Gateway

Smart home is designed with smart devices were in fact connected to Internet of things in order

Smart home is designed with smart devices were in fact connected to Internet of things in order to simulate full components inter-action and capability to remote and also control the devices. Home user in fact, after connecting through browser and pass the authentication.

Home Gateway consist of 4 Ethernet ports in addition to that a wireless access point configured with the SSID of corresponding "Home Gateway" To secure wireless connection WPA2 /WEP / WPA-PSK

The main categories are: sensors, smart-devices, microcontrollers and actuators.

In the below shown figure there are an examples of a list of home smart devices those can be added into the IoT simulations.

Smart-devices are devices that are fully capable of connecting to a both wired and wireless network and where the behavior and interaction logic can be quickly set up by utilizing pre-loaded Phyton programs or networking commands. These sensors include smart lights, alarm sirens, coffee maker, RFID readers and a long list of other sensors, such as carbon di-oxide, water level, humidity, AC units, temperature etc.

to simulate full components inter-action and capability to remote and also control the devices.3.1 HOME GATEWAY

enterprise can be configured on home gateway server. The figure 3 shows seven internet of Things device connected to a Home Gateway by using Ethernet cable as well as wireless. To connect the Home Gateway to the Internet its Internet WAN Ethernet port available on the corresponding home getaway. The IoE devices can be remotely connected and managed through a web interface hosted by the Home Gateway.

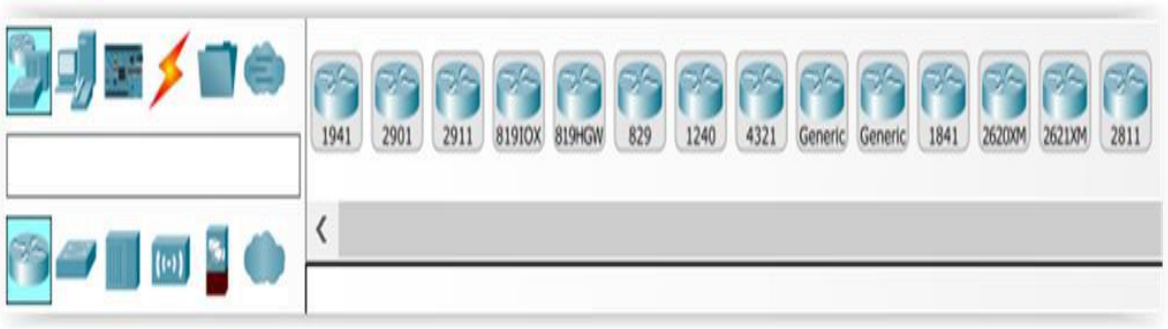

Figure 1 - List of routers in Cisco Packet Tracer

Figure 2 - List of smart device in packet tracer

The figure 2 shows the smart object is connected to the home Gateway using Ethernet cable as well as wireless medium to manage smart devices locally and remotely. Home gateway also works as Dynamic host configuration protocol(DHCP) server by

assigning IP address to each smart device which are connected to Home gateway as shown in figure 3

The Home Gateway internal(LAN) IP address is 192.168.25.1 but it can also be accessed through its Internet facing IP address.

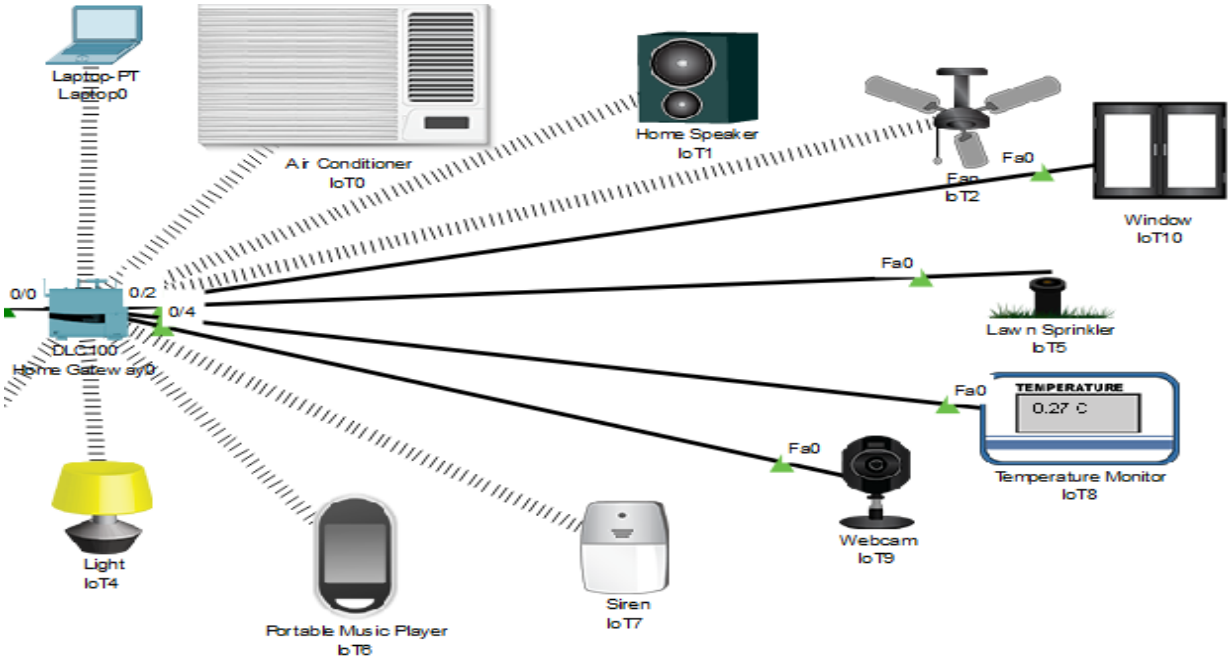

Figure 3. Home gateway with several smart things connected to Home gateway

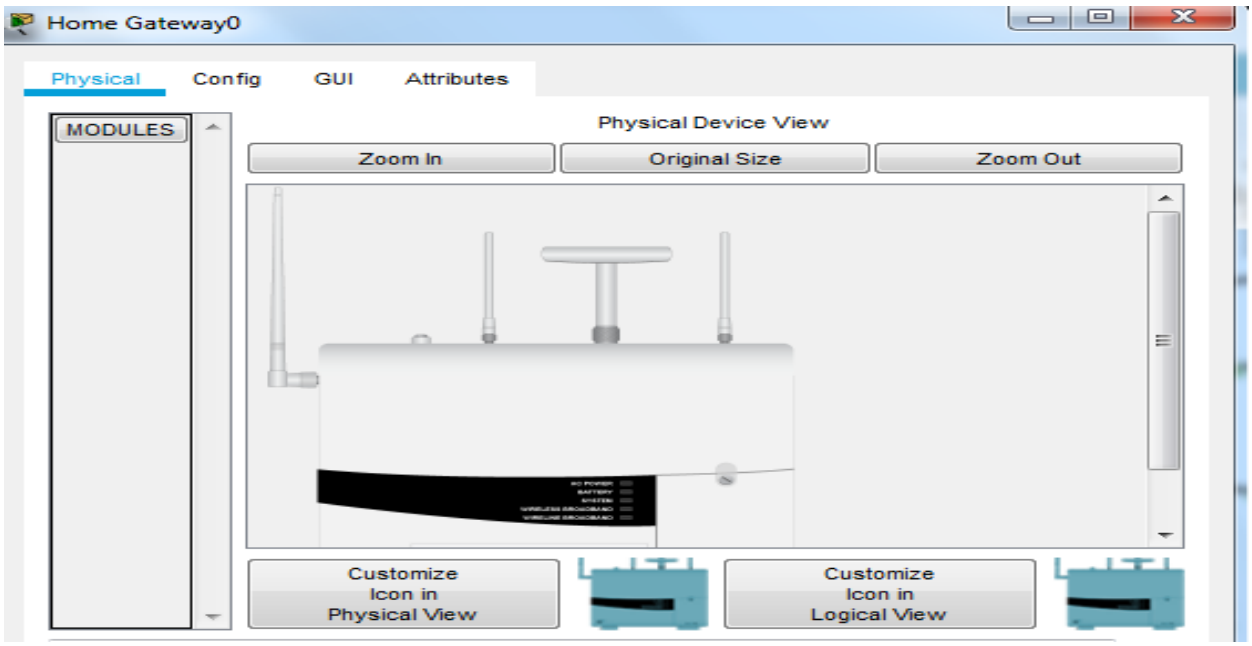

Figure 4 Home gateway Ethernet and internet port

4. IMPLEMENTATION

To implement smart home using cisco packet tracer 7.2. I used different types of smart devices to make home smarter. The figure 5 represent the smart home architecture that connected each other using wired and wireless medium.

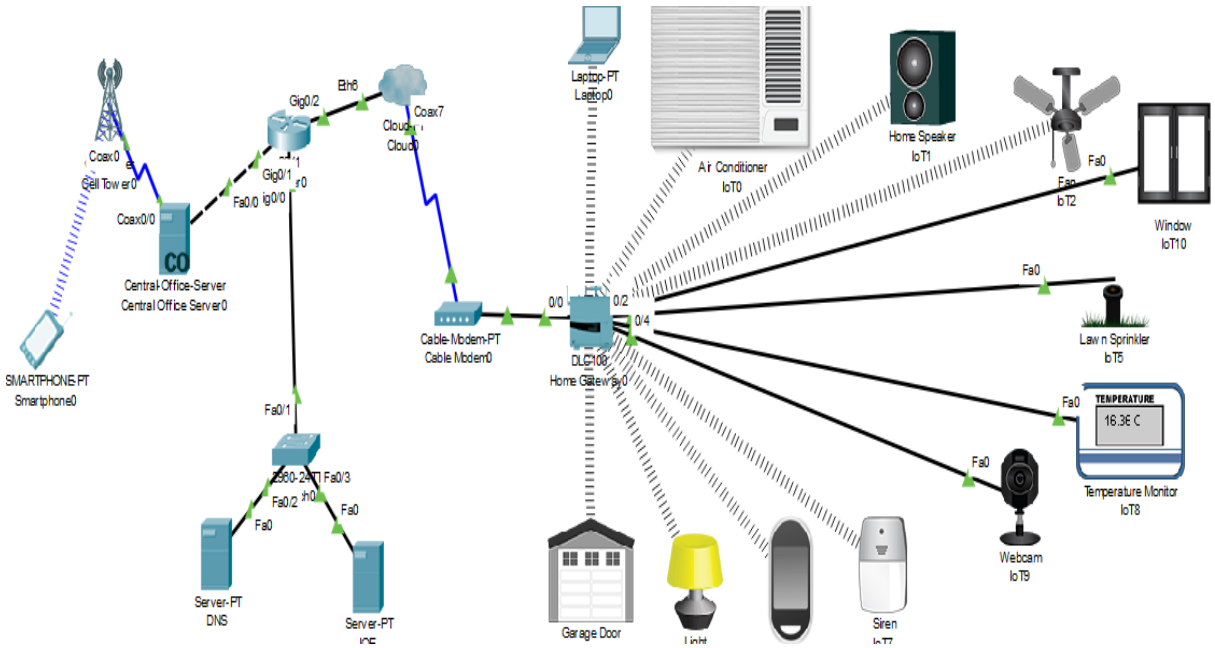

Figure 5 Smart Home Architecture

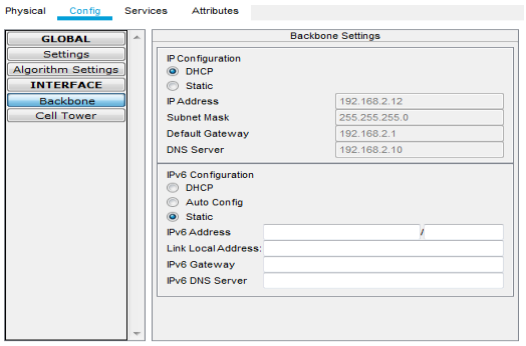

Figure 6 Central office server obtain IP address from ISP server

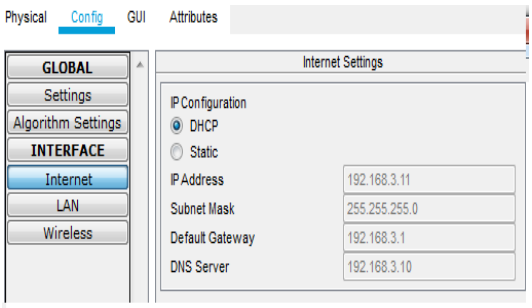

Figure7 Home Gateway obtain IP address from ISP server

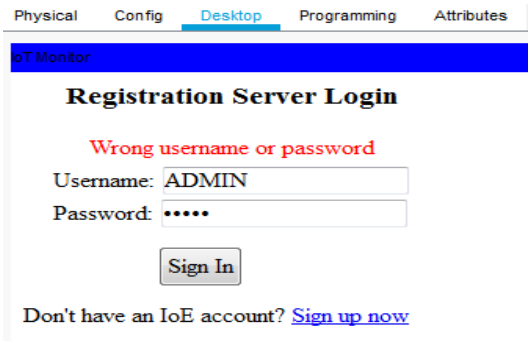

Figure 8: Registration server login

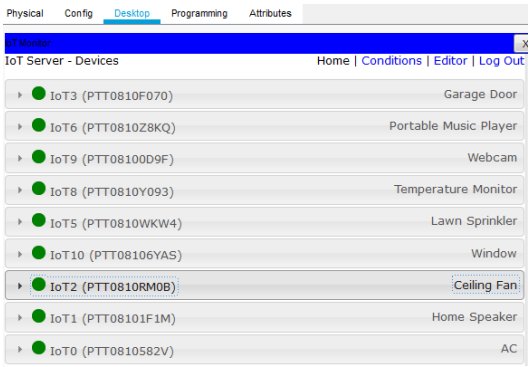

Figure 9 Registering IO device to Home Gateway

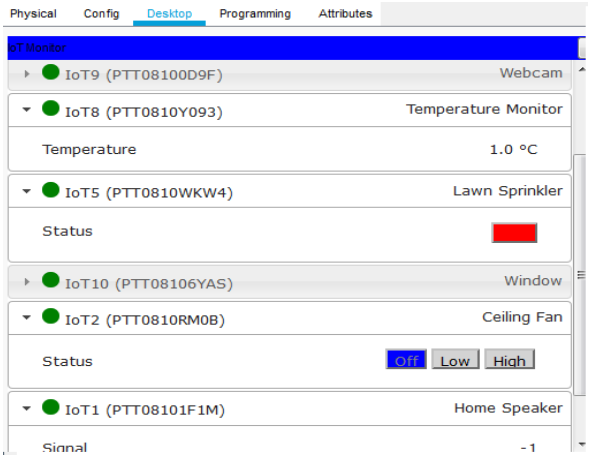

Figure 10 Enable/Disable registering IO device to Home Gateway

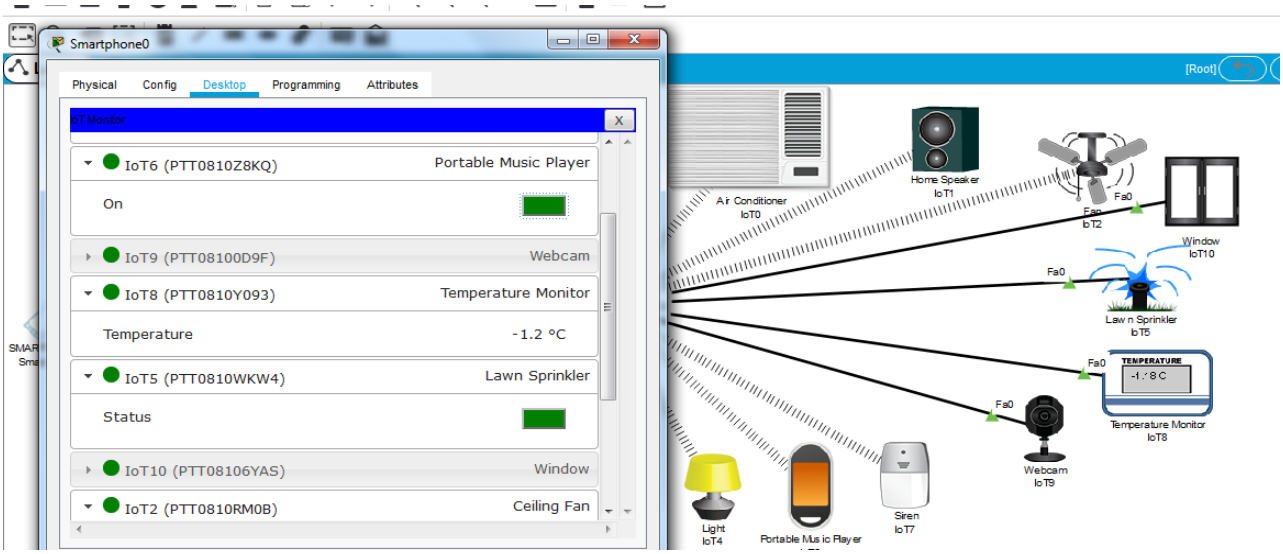

Figure11 Working operation of registering IO device to Home Gateway

5. CONCLUSION

In this paper, we implemented smart home by advanced cisco packet, which includes different IOE device used for home automation which uses Gateway to register smart device on it and then

control the devices. Microcontroller (MCU) used to to interconnect different sensor and IOE devices.

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