جامعة الإمام عبدالرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY
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Smart Home

PREBARED BY

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1. Introduction

Technologies to support the development of smarter energy systems and enhance opportunities for home energy management have been on the rise in recent years. Through the addition of sensing, communication, and actuation components, household devices and appliances are made “smart”, such that they can communicate wirelessly with each other, transmit data to end users, and facilitate remote operation and automation. This project is aimed to create a smart Home and provide effective services using IoT technology and other connections for hardware such as printers and PCs.

2. Problem statement

Our vision is to improve the idea of a smart home that can provide people an efficient, save, and secure environment.

Some smart home devices can be dangerous in many ways, in our smart model we will focus on the challenges that may appear in the network design within the smart home devices using Cisco Packet Tracer. Challenges like poor network performance, and security.

3. Project goals

1- Designed independent network systems for each room

2-Communications between the smart home and the main smart home device are encrypted including all passwords. Your privacy and data, helps to increase the level of security.

3-the control will also be beneficial, given the ability that devices can be controlled by the end-user smart device remotely. After we manage to build the network design in our smart home devices, people will be able to have a real-life simulation without being threaten by the lack of network security.

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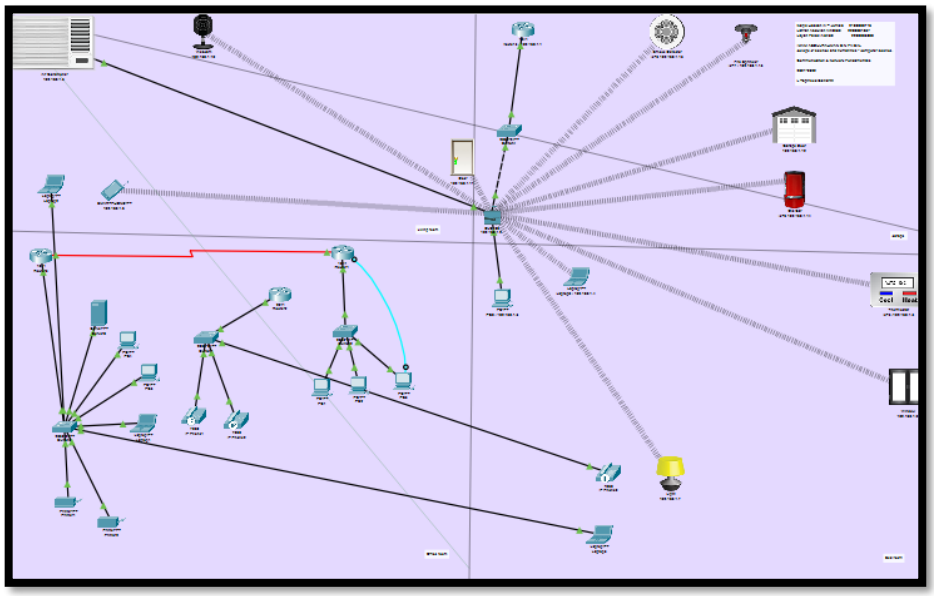
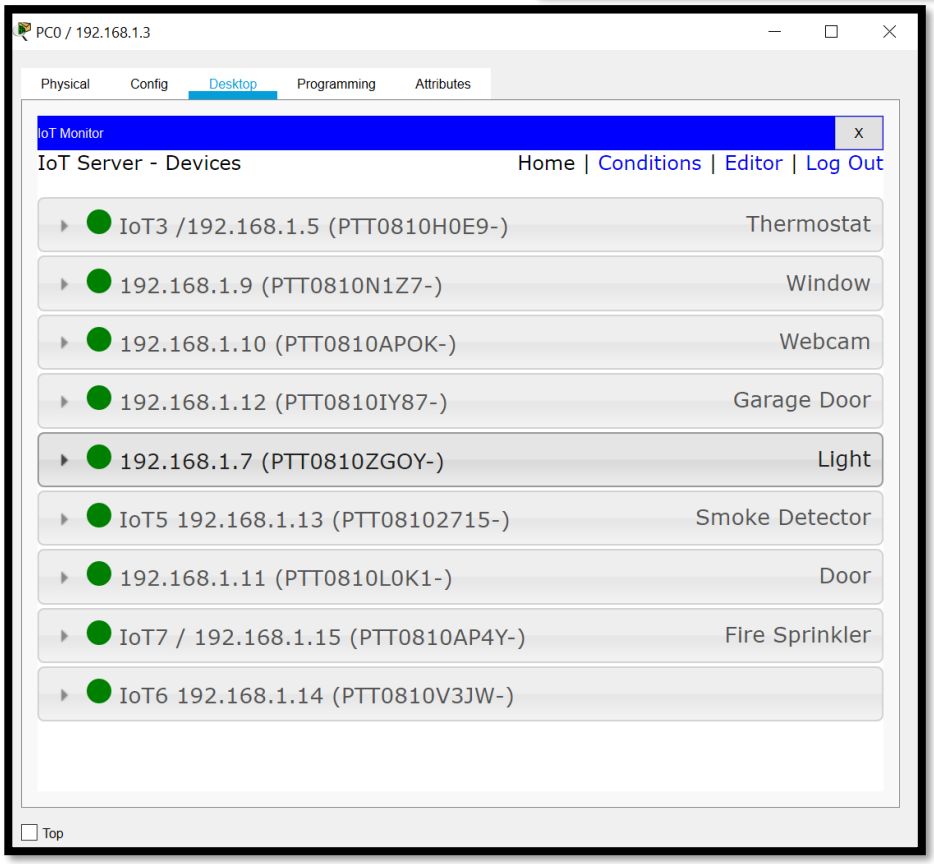
4. the networks and the IoT devices





5. Important configuration

The office room:

- **2 routers Configuration**
  - Router 1

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#ip address 10.1.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#exit
Router(config)#ip route 192.168.0.0 255.255.255.0 10.1.1.1
Router(config)#exit
Router#
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#reload
Proceed with reload? [confirm]
```

- Router 3

```
Router>enable
Router#
Router#configure terminal
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 10.1.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#ip address 10.1.1.2 255.255.255.0
Router(config-if)#exit
Router(config)#ip route 192.168.1.0 255.255.255.0 10.1.1.2
Router(config)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#reload
Proceed with reload? [confirm]
```

- Rename switch

- Switch 0

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname SW
SW(config)#end
SW#
SW#copy running-config startup-config
Destination filename [startup-config]?
Building configuration…
[OK]
SW#reload
Proceed with reload? [confirm]
```

- **IP phone Configuration**
  - **Router2:**

```
Router>ena
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fas0/0
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#ip dhcp pool phone
Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Router(dhcp-config)#option 150 ip 192.168.10.1
Router(dhcp-config)#exit
Router(config)#telephony-service
Router(config-telephony)#max-dn 5
Router(config-telephony)#max-ephones 5
Router(config-telephony)#ip source-address 192.168.10.1 port 2000
Router(config-telephony)#auto assign 4 to 6
Router(config-telephony)#auto assign 1 to 5
Router(config-telephony)#exit
Router(config)#ephone-dn 1
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN 1.1, changed state
to up

Router(config-ephone-dn)#number 45001
Router(config-ephone-dn)#exit
Router(config)#ephone-dn 2
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN 2.1, changed state
to up

Router(config-ephone-dn)#number 45002
Router(config-ephone-dn)#exit
Router(config)#ephone-dn 3
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN 3.1, changed state
to up

Router(config-ephone-dn)#number 45003
Router(config-ephone-dn)#exit
```

Router(config)#%DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged 192.168.10.1.

%IPPHONE-6-REGISTER: ephone-1 IP:192.168.10.2 Socket:2 DeviceType:Phone has registered.

%IPPHONE-6-REGISTER: ephone-2 IP:192.168.10.3 Socket:2 DeviceType:Phone has registered.

%IPPHONE-6-REGISTER: ephone-3 IP:192.168.10.5 Socket:2 DeviceType:Phone has registered.

Router#
%SYS-5-CONFIG_I: Configured from console by console

- **Switch1:**

Switch>ena
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport voice vlan 1
Switch(config-if-range)#exit
Switch(config)#exit
Switch#

- **Configuration the router**
  - **Router 2**

Router>ena
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fas0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#reload

5. Ip Addresses of the devices

The end devices	Ipv4 Address	Subnet Mask	Default Gateway
Server	192.168.4.2	255.255.255.0	192.168.4.1
PC1	192.168.4.3	255.255.255.0	192.168.4.1
PC2	192.168.4.4	255.255.255.0	192.168.4.1
PC3	192.168.4.5	255.255.255.0	192.168.4.1
PC4	192.168.4.6	255.255.255.0	192.168.4.1
PC5	192.168.4.8	255.255.255.0	192.168.4.1
Laptop1	192.168.4.9	255.255.255.0	192.168.4.1
Laptop2	192.168.4.10	255.255.255.0	192.168.4.1
Laptop3	192.168.4.12	255.255.255.0	192.168.4.1

Smart Home devices	Ipv4 Address	Subnet Mask	Default Gateway
PC0	192.168.1.3	255.255.255.0	192.168.1.1
Laptop0	192.168.1.4	255.255.255.0	192.168.1.1

In PC0:

IoT Server Address: 192.168.25.1

Username: admin

Password: admin

6. References

1- Rosslin John Robles, Tai-hoon Kim. Vol. 15, February, 2010. Applications, Systems and Methods in Smart Home Technology: A Review.

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2- Freddy K Santoso, Nicholas C H Vun. 2015. Securing IoT for Smart Home System.

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