CS 361 Computer Networks Lab

Assignment 9

Samanway Maji
Student ID – 202151136
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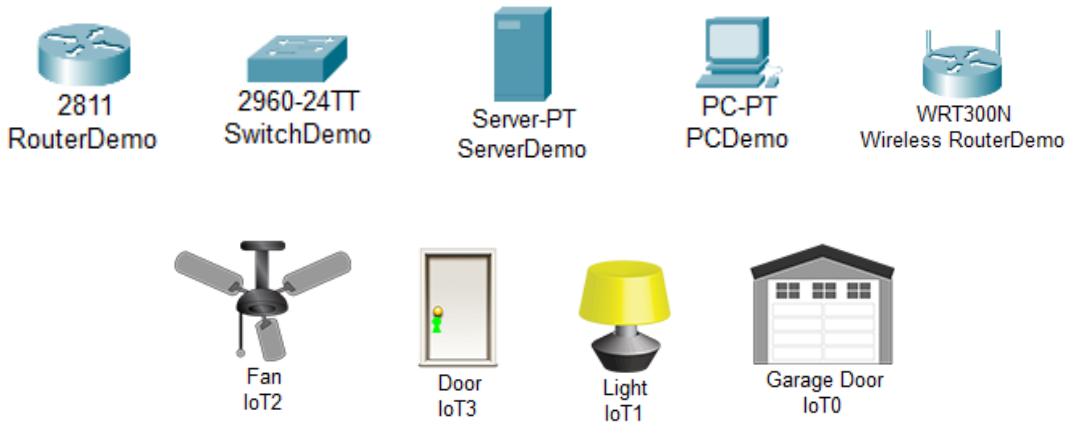
Questions:

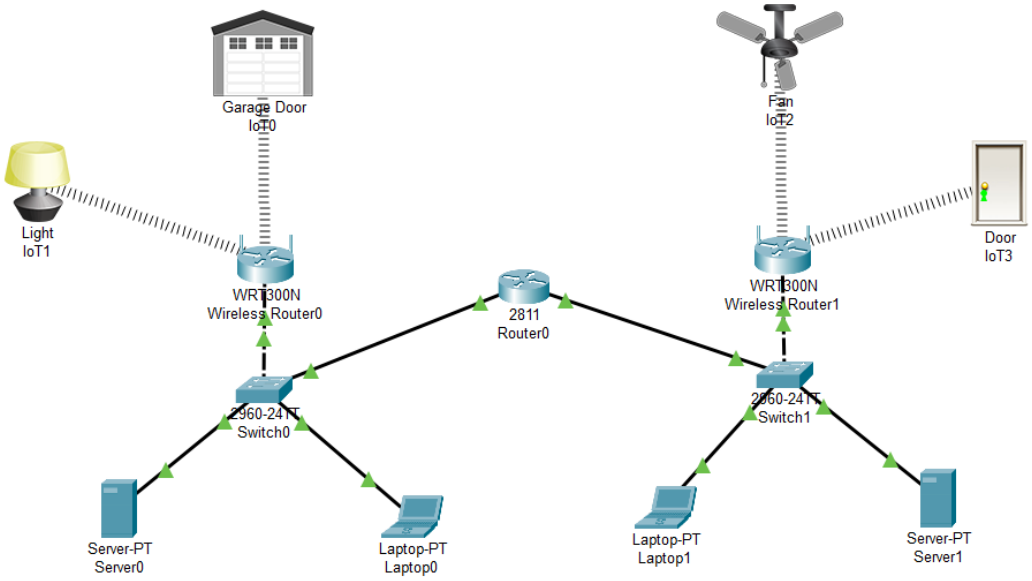
1. Consider that you have two different houses with multiple IoT devices. The two houses are in different subnets and have different IoT servers. Demonstrate the following:

(1) IoT devices of one house can be controlled from the Laptop/PC of another house.

Components used:



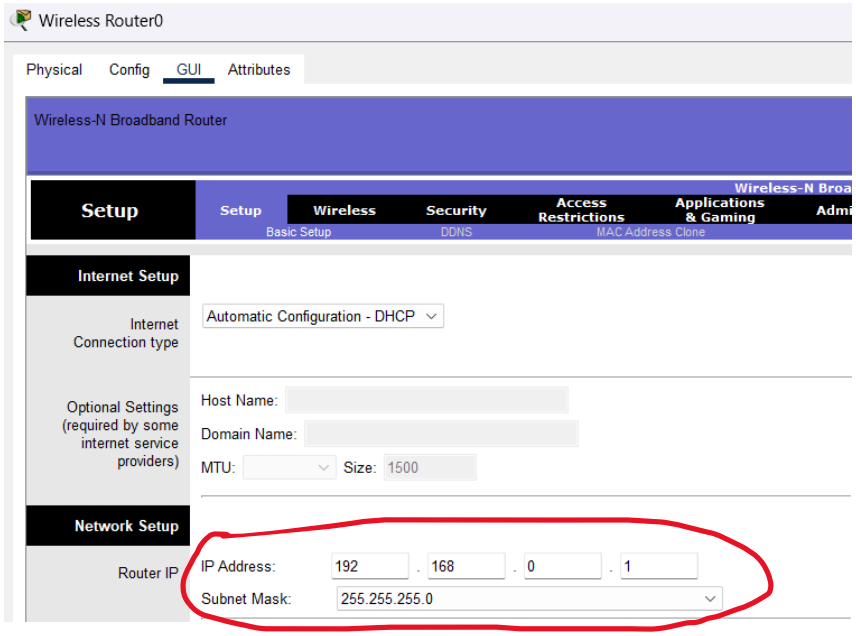
Network Diagram:

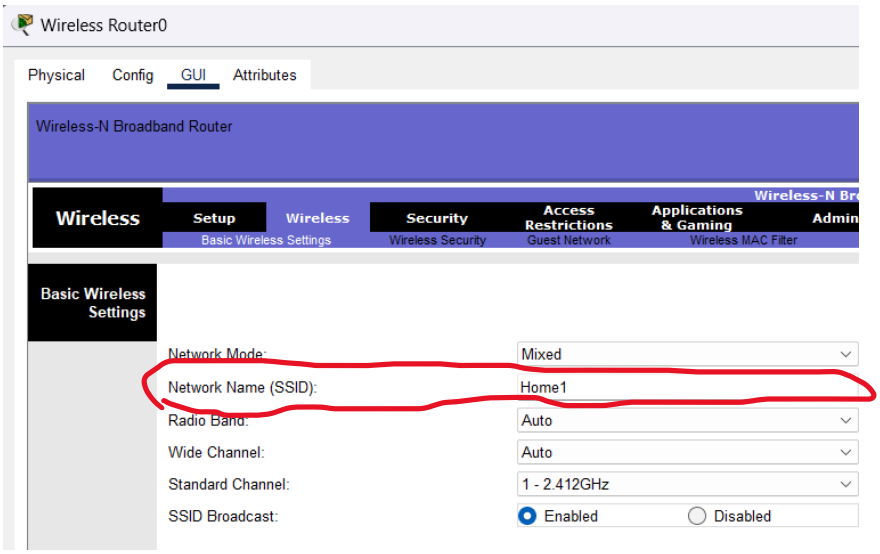


Steps followed:

The first step is setting up the individual networks. This is done by connecting the wired components to the switch. The **Wireless-Router is connected to the switch using a copper cross-over wire.**

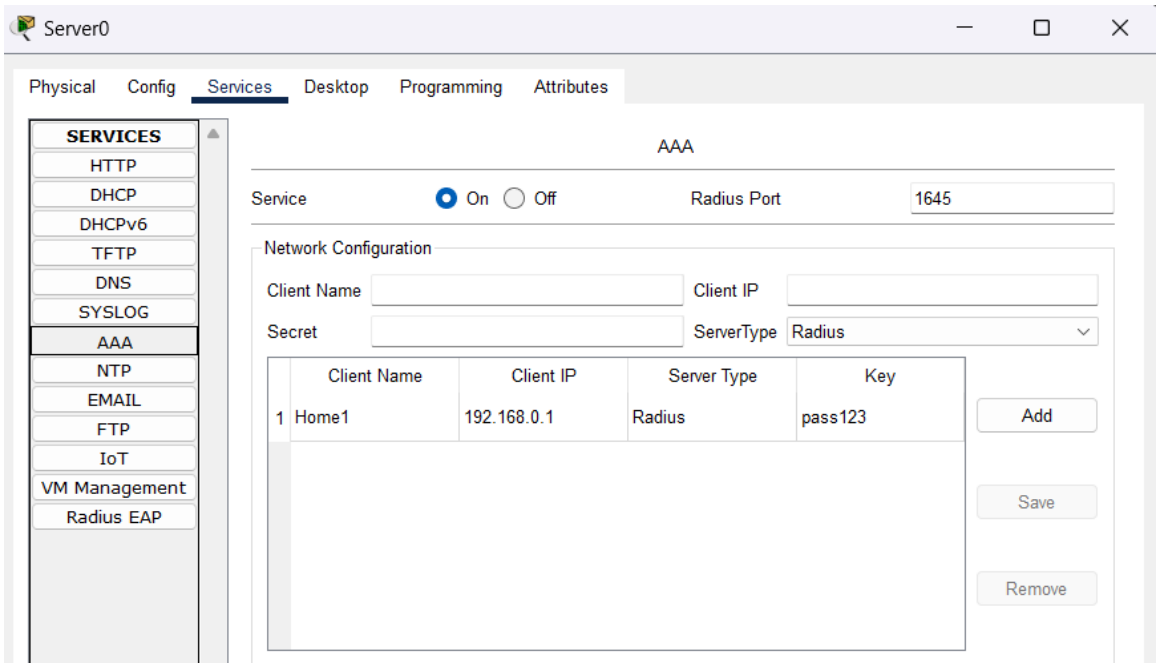
The next step is setting the IPV4, subnet and SSID of the wireless router.



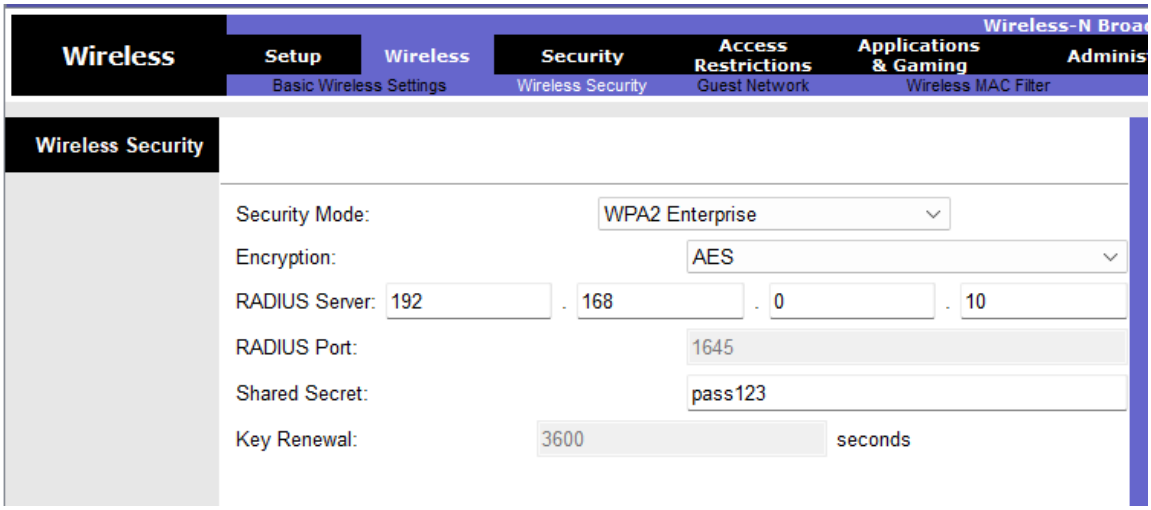


The same has been done in the image.

Next steps include, enabling the AAA (Authentication, Authorization, and Accounting) service of the server, and adding the wireless router's SSID along with a password which is to be added in the security portion of the same as well.

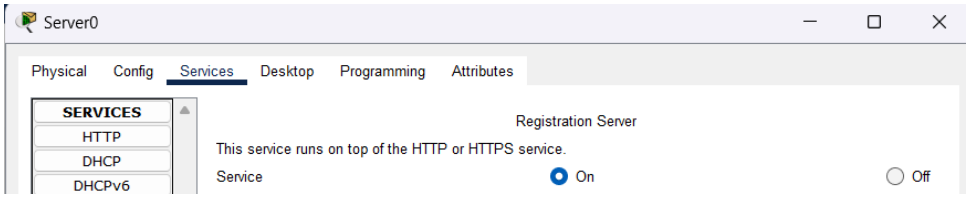


The router's SSID, IP and a passkey have been added to AAA service.

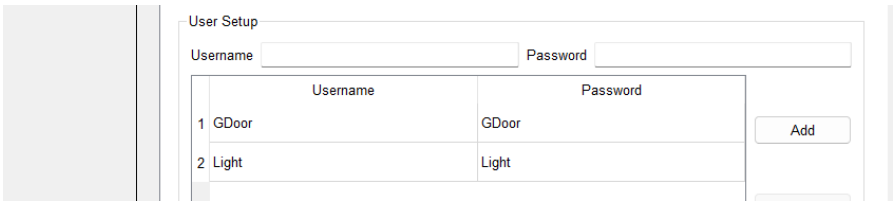


The passkey, and the server's IP are added to the wireless router to recognize the server it needs to connect to.

Next steps include switching on the IoT services of the server and adding the IoT devices that are to be connected to the wireless router.

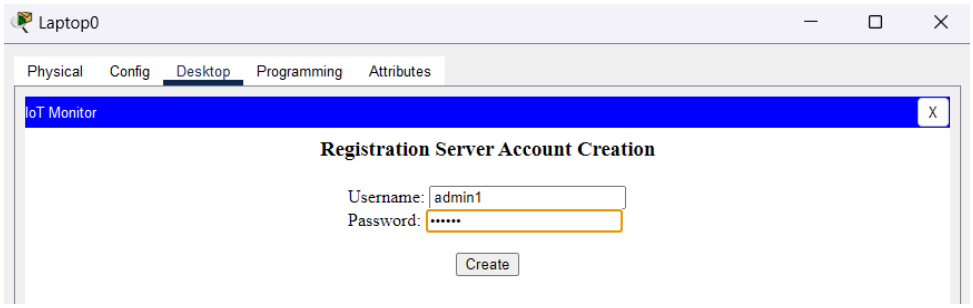


The IoT service is enabled.

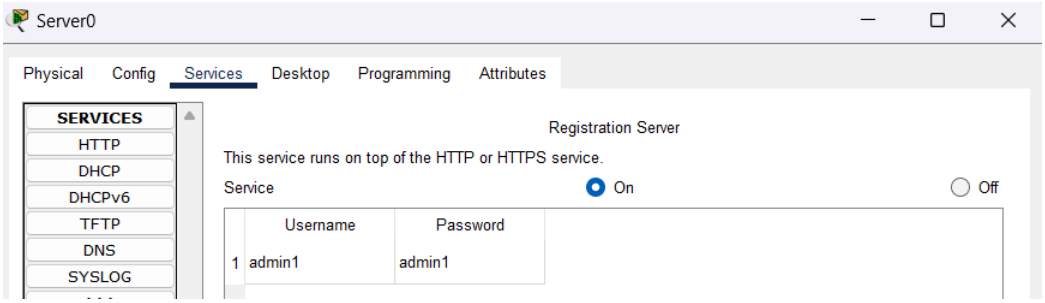


Considering, I am currently setting up the left side of the network diagram, so I have added, **two devices, as shown, i.e., a light and Garage door**, both of which are IoT devices.

The next step is setting the IPV4 of the laptop, and then creating an account to control the IoT devices. This can be done by using the **IoT monitor** application of the laptop.

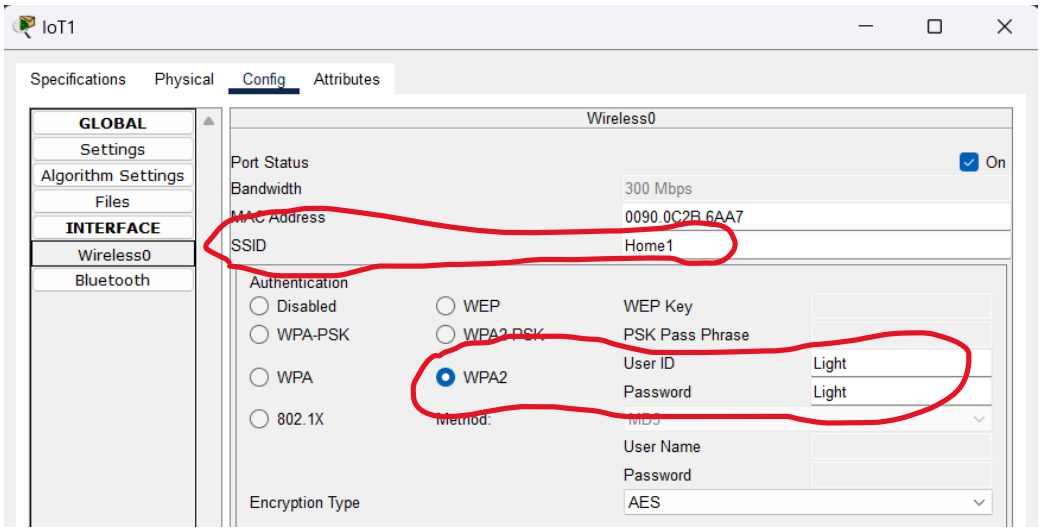


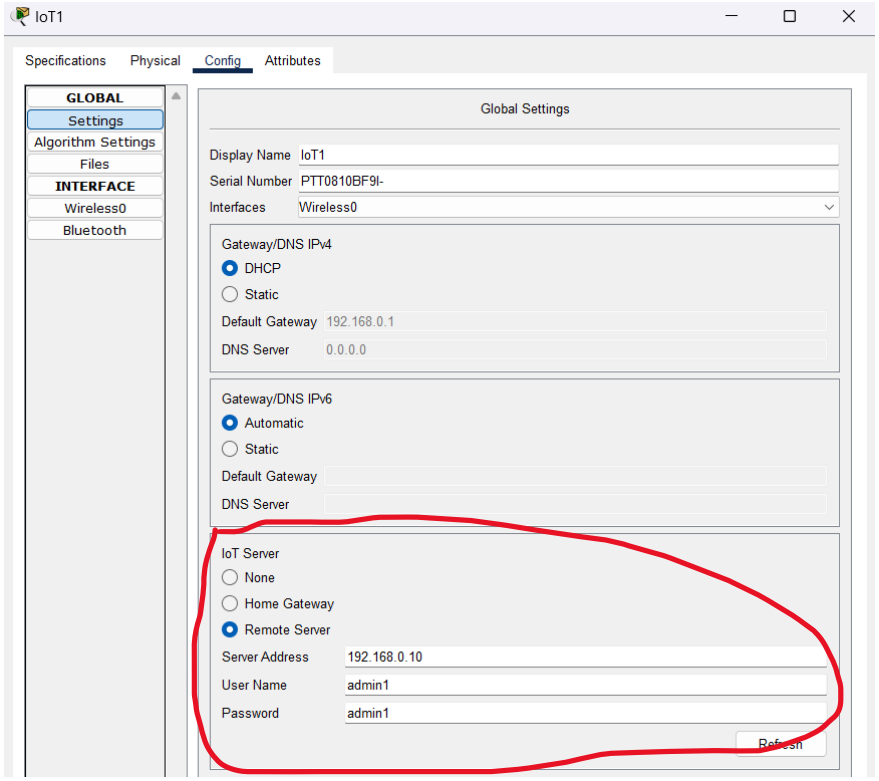
On clicking create, an account gets created, which is also shown in the IoT service of the server.



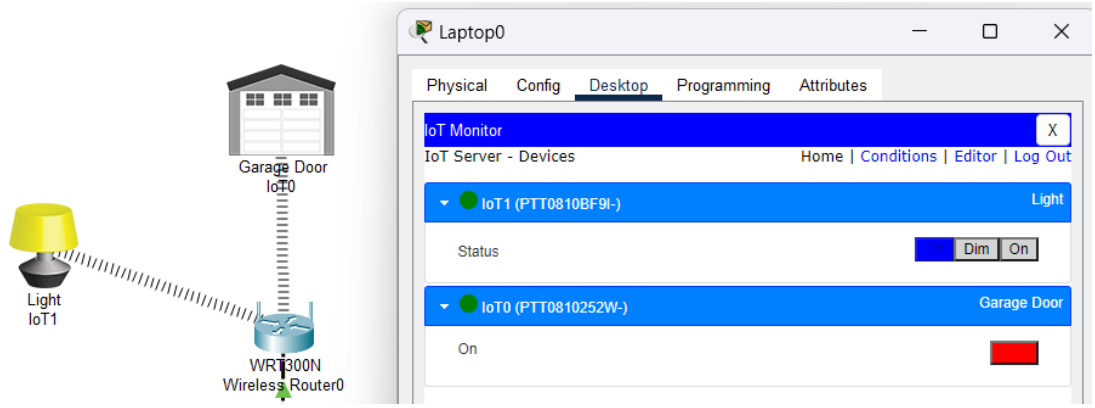
The next step is to configure the IoT devices, by providing the SSID of the router to connect to and the username and password accordingly. Also, since it's a remote server, we also need to provide the necessary credentials.

An example for configuring the Light has been shown below.

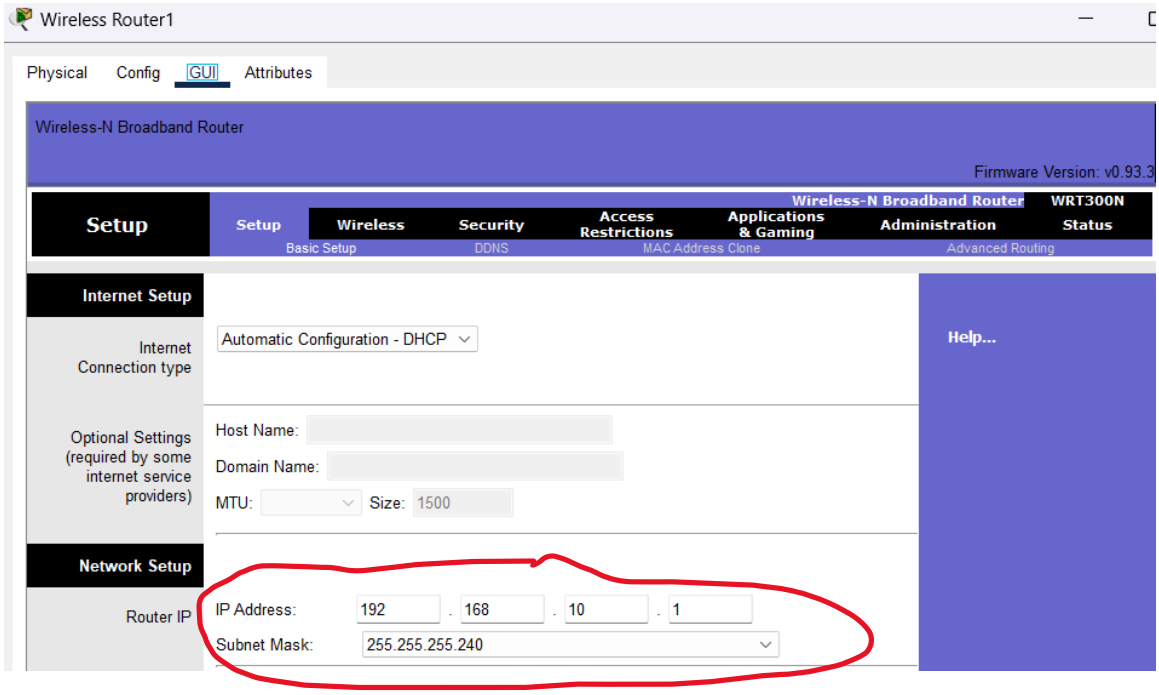




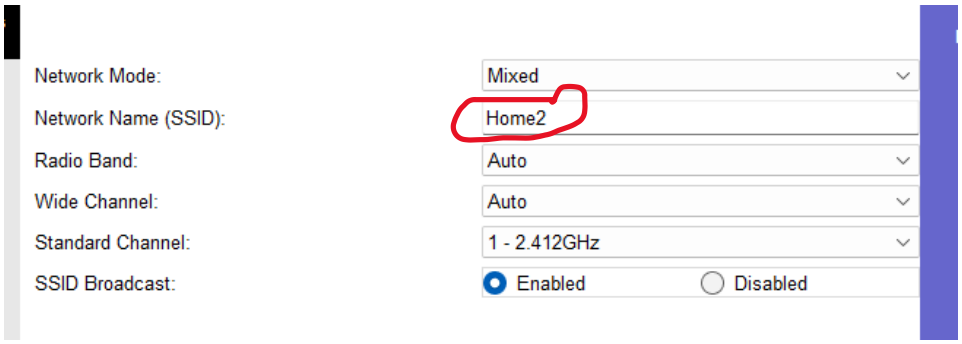
Now we can login with the username and password in the IoT Monitor application, and find that devices are visible there, and can be controlled as well.



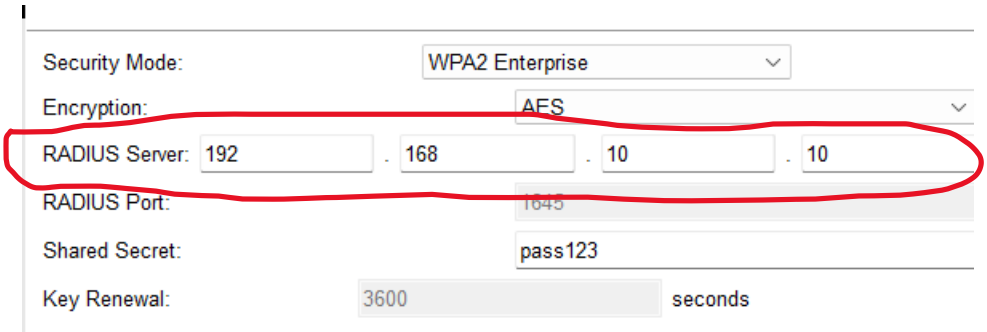
Similarly, the right side of the network diagram is done as well. Few configurations have been shown.



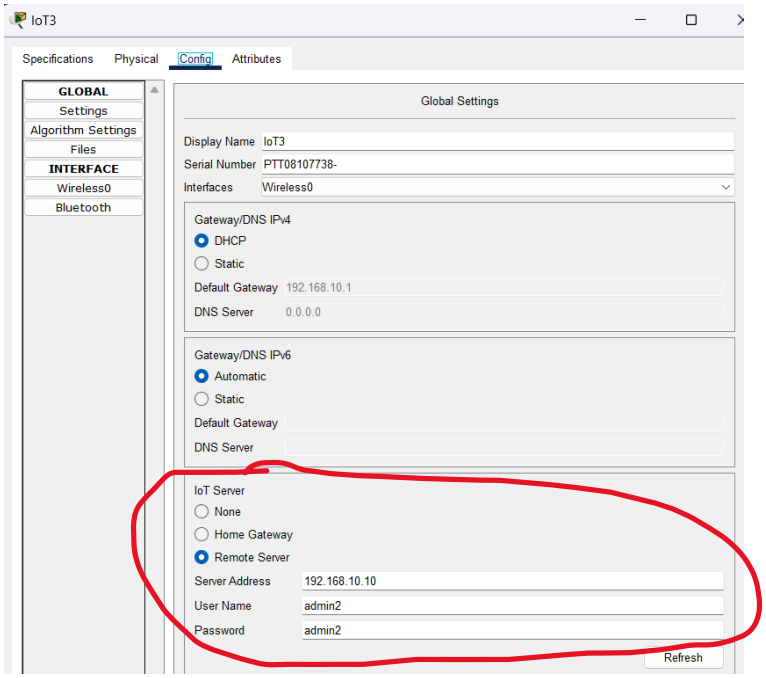
A different subnet mask has been used in this wireless network, as asked in the question. The subnet of the other one was 255.255.255.0.

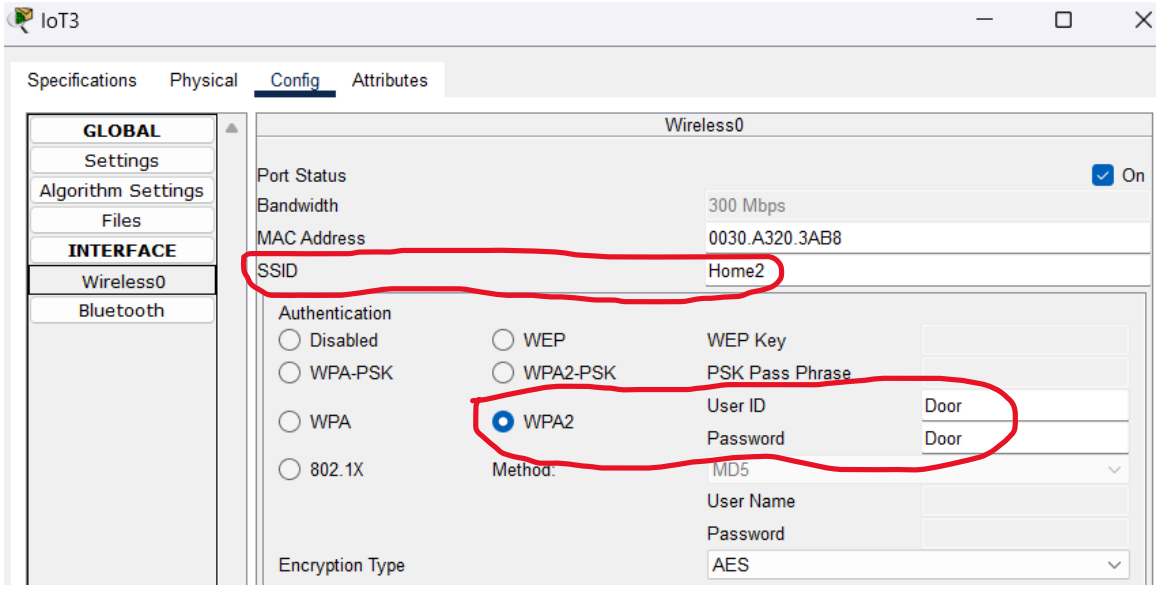


A different SSID has been assigned. Also, the server IP is different as well, as can be seen in the next diagram. (Previous: 192.168.0.10)



And configuration of an IoT device as well:



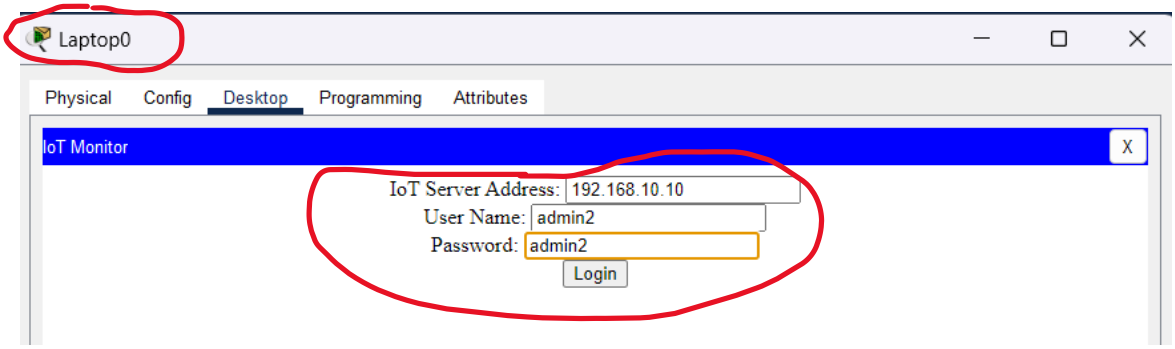


The two networks relate to the router, the steps of which have been covered in previous labs.

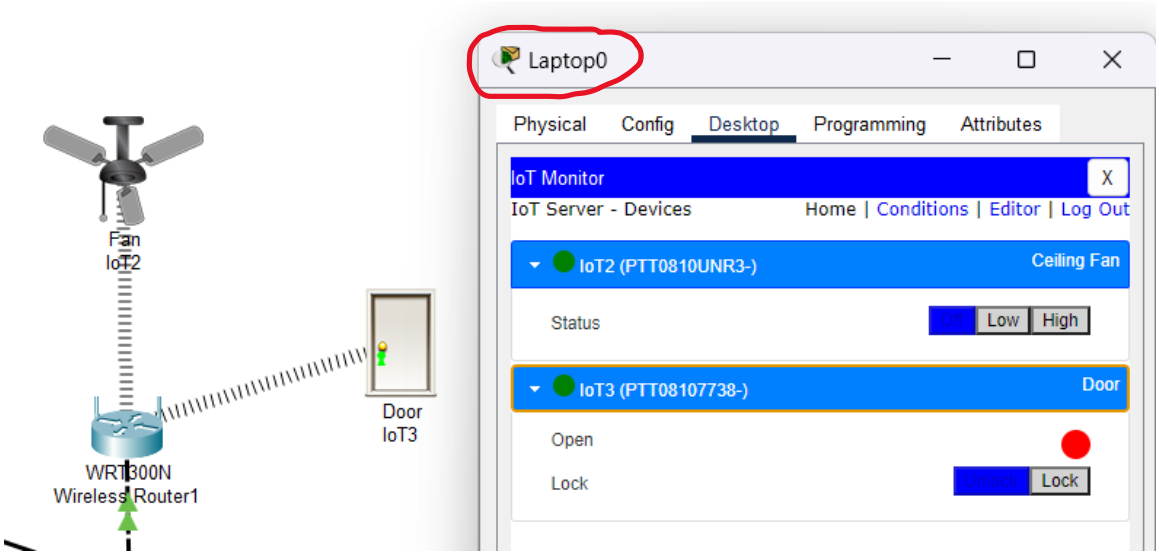
Observation:

I will try to access the Door and Fan (present on the other network, right hand side) from Laptop 0 (present on left hand side).

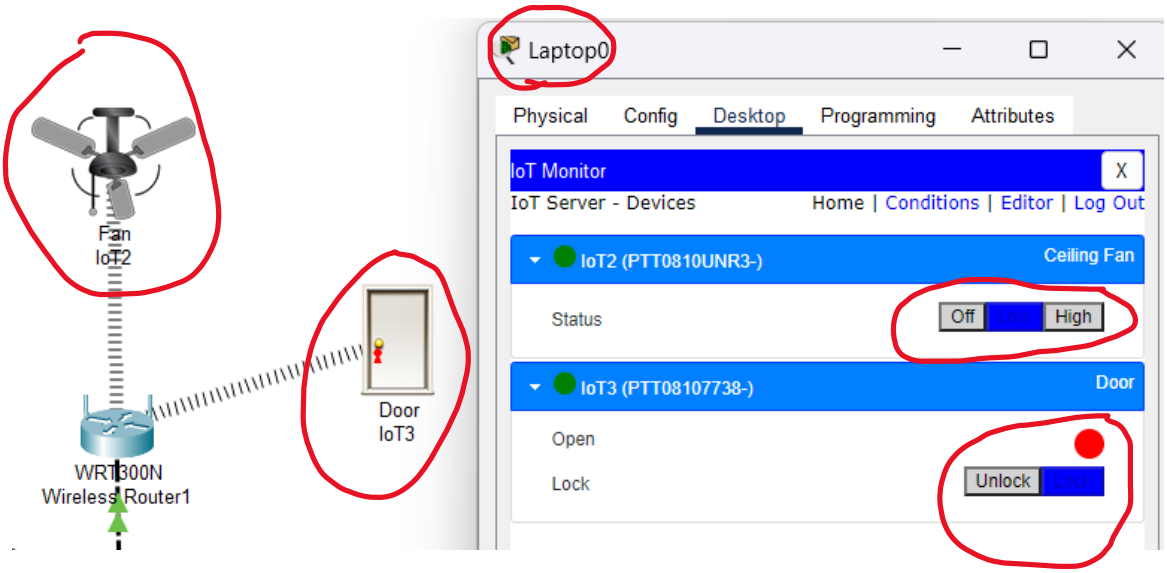
For that, inside IoT Monitor, the username and password of the account associated with the right-hand side, needs to be put.



The devices associated with that side shows up:



Controlling the device:



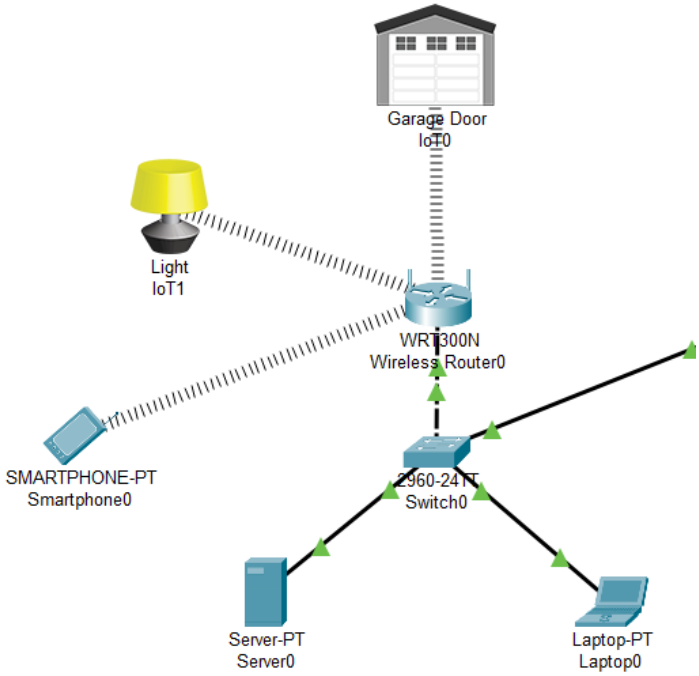
So, the devices of other networks can be controlled from a device of different network from the former.

2. Connect at least 10 wireless devices (wireless desktop, laptop, printers, wireless mobile, tabs & etc..) to each access point. Consider that you have two different houses with multiple IoT devices. The two houses are in different subnets and have different IoT servers. Demonstrate the following:

(2) Use a mobile phone to communicate with IoT devices.

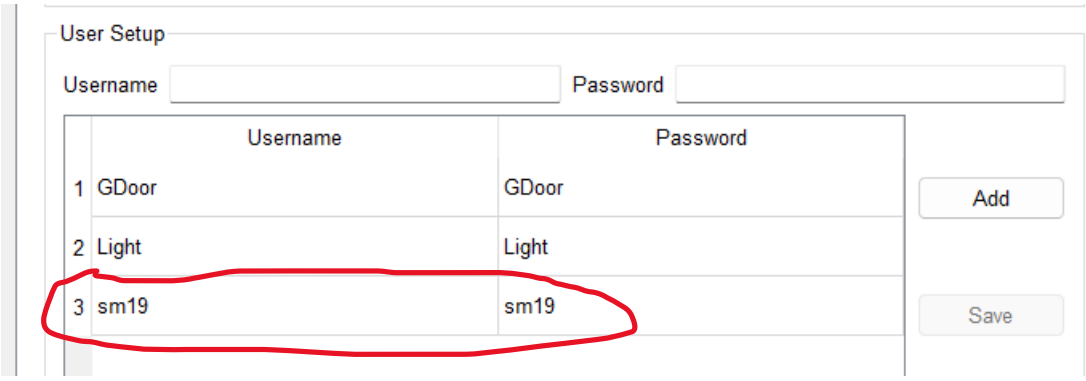
Components used:

Network Diagram:

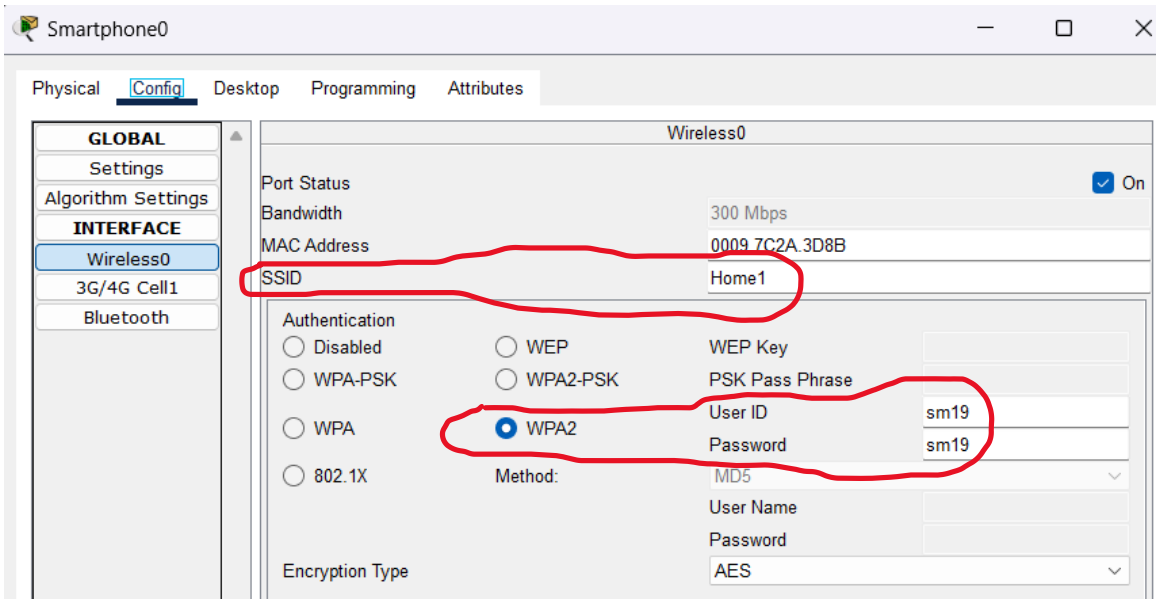


Steps followed:

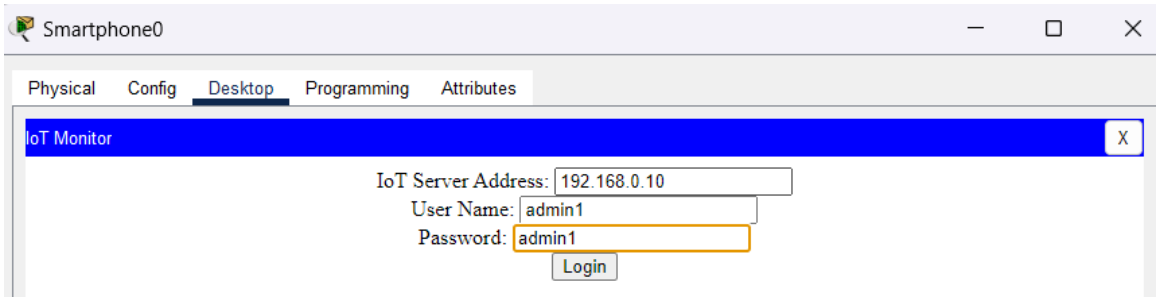
The way we added the IoT devices, in the same way smartphone needs to be added as well.



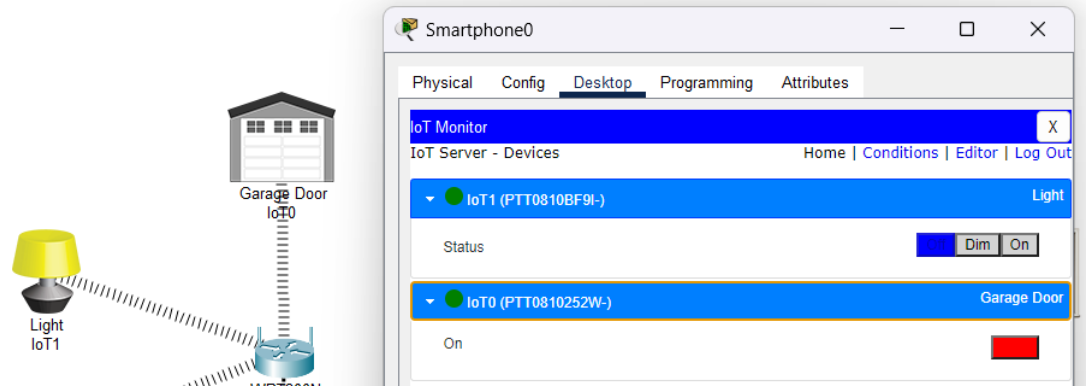
Then the smartphone is configured accordingly:



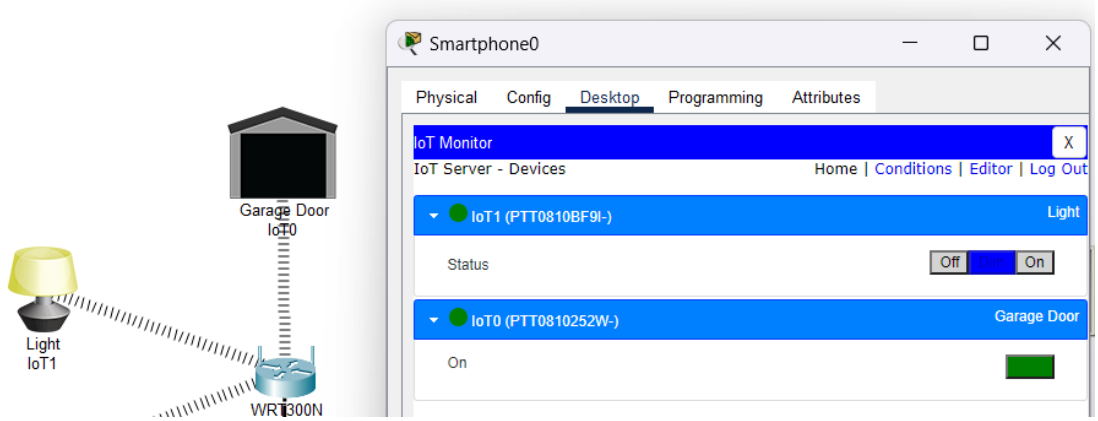
Next, we open IoT Monitor, and login with the credentials:



The devices are shown:



They are also controlled by the smartphone:



Hence, the IoT devices can be controlled by smartphones.