IoT Packet Tracer Practicals
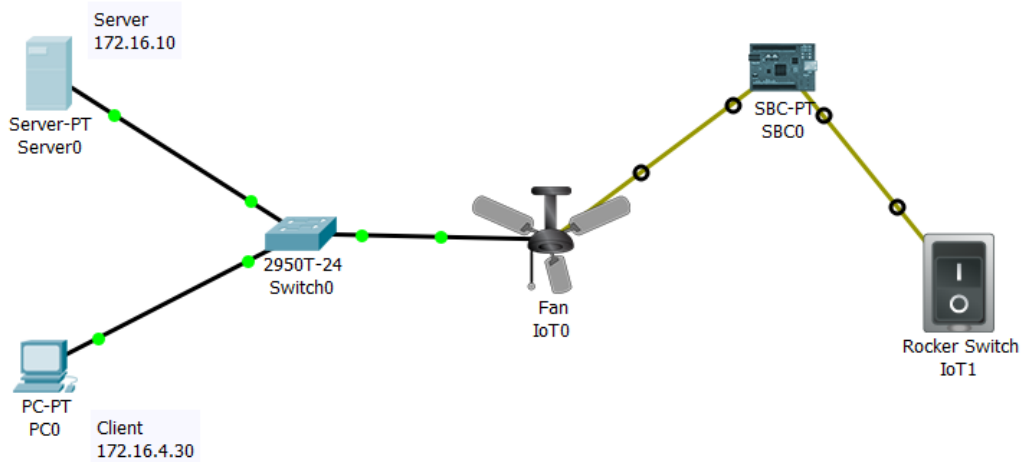
Practical 1:-Controlling the ceiling fan.

Figure 1

1. The basic setup is shown above in Fig 1.
2. The fan can be controlled from client side by registering the fan on server first.
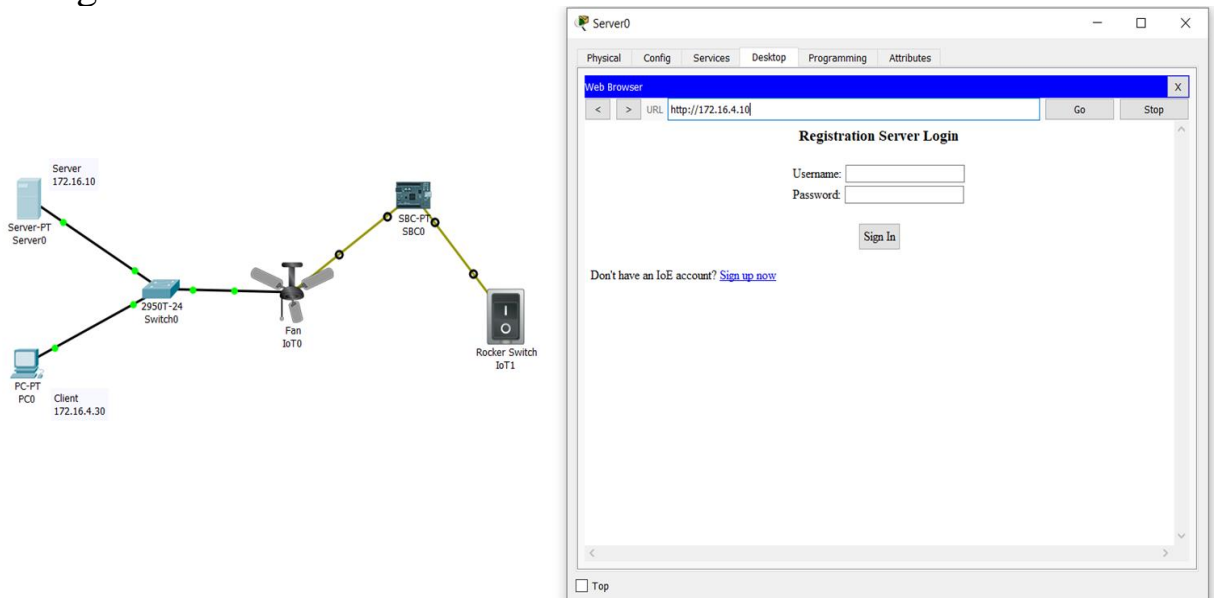3. We register the server first.

Figure 2

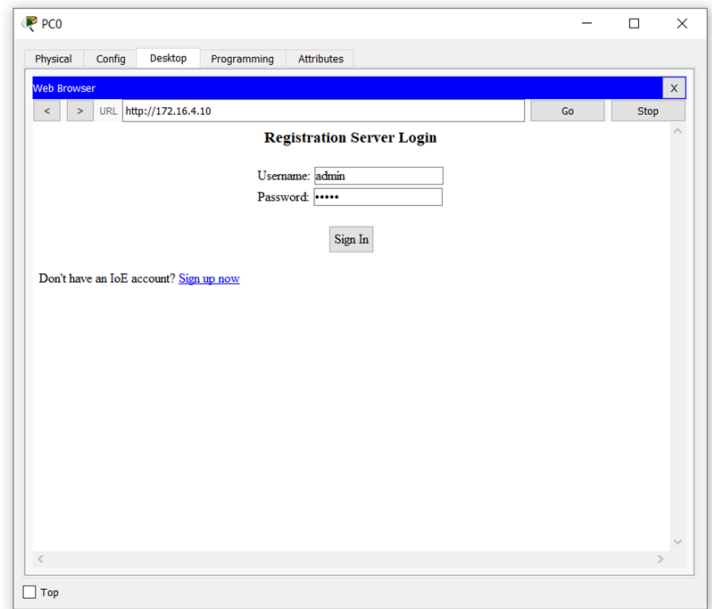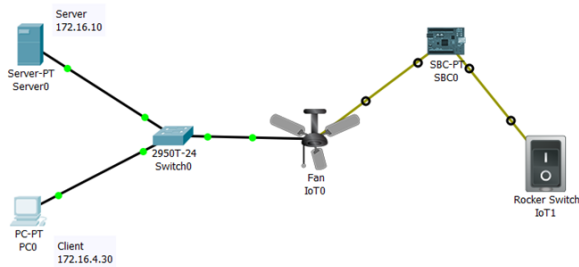4. Click on "<u>Sign up now</u>" if registering for the first time.

Figure 3

5. Here we have provided username and password as admin.
6. Now we can check the status of the fan on client side as shown in below figure 4 by using 172.16.4.10 address in web server (IP address of server) and login with the credentials as set above in Figure 3.
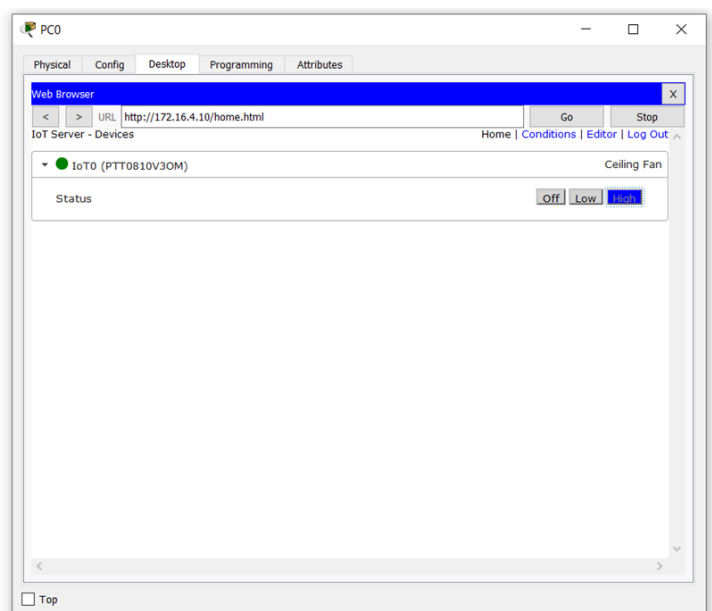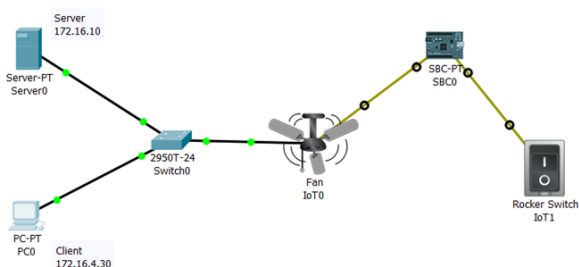

Figure 4

7. We can control fan speed and set it as OFF, LOW or HIGH.

8. Then we make use of SBC and connect it to a switch through which we can control the operation of fan.

9. A python code is run on the SBC as shown below in figure 5.

10. DigitalRead() takes in parameter as 2 because we used digital slot D2 of SBC and connected it with D0 of switch.

11. CustomWrite() takes in input 0 and 2 for OFF state and HIGH speed state respectively.
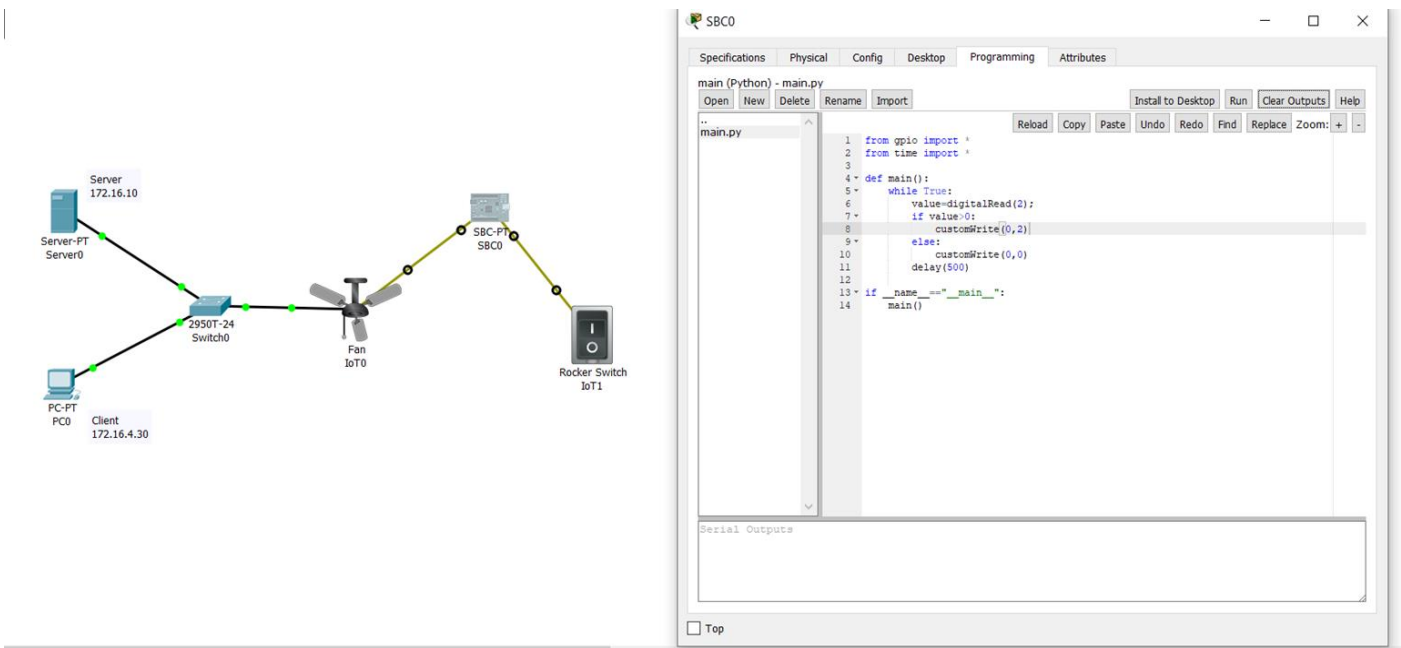

Figure 5

12. After running the above code and turning on the switch we get HIGH speed state of the fan as we mentioned in the code earlier.
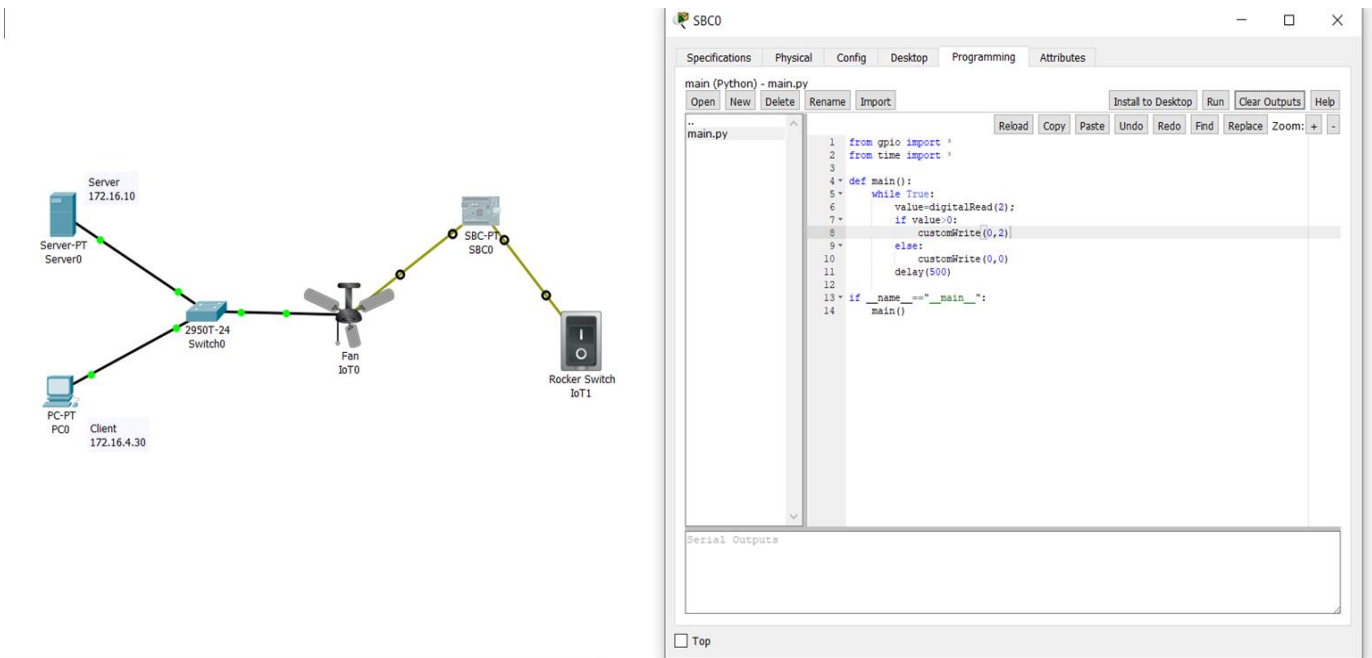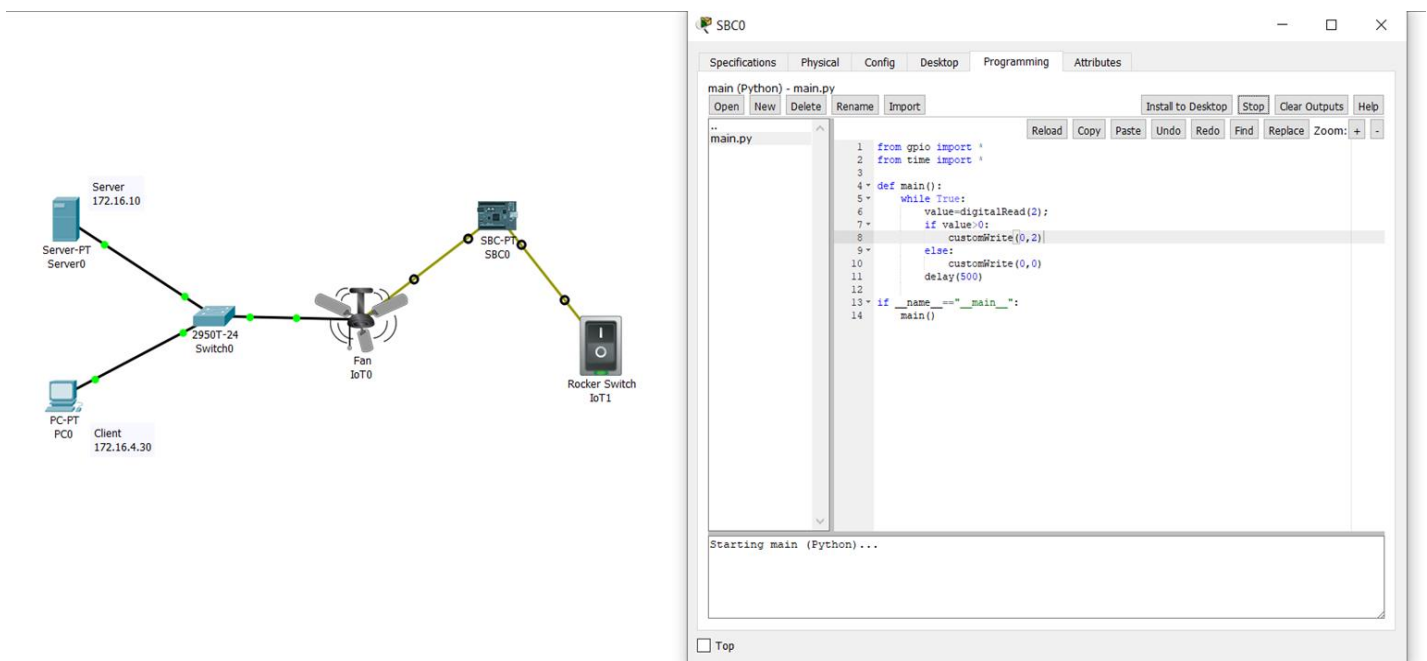
Figure 6

Figure 7

Practical 2:-Building a smart home

In this practical, a smart home is built using devices like thermostat to monitor the temperature of room,fan and window connected to a home gateway. These can be controlled and monitored with a smart phone which is also connected to the gateway. Along with this a garage comprises of sprinkler,siren and smoke detector.

When the smoke level detected by smoke detector exceeds the limit set, siren turns on. If the smoke level still keeps on rising ,a fire sprinkler is activated.

1. We configure the home gateway as shown in figure 1.This gateway is through which all our smart devices will be connected and the status of each of them will be visible on smart phone which is also connected to the iot network home gateway.
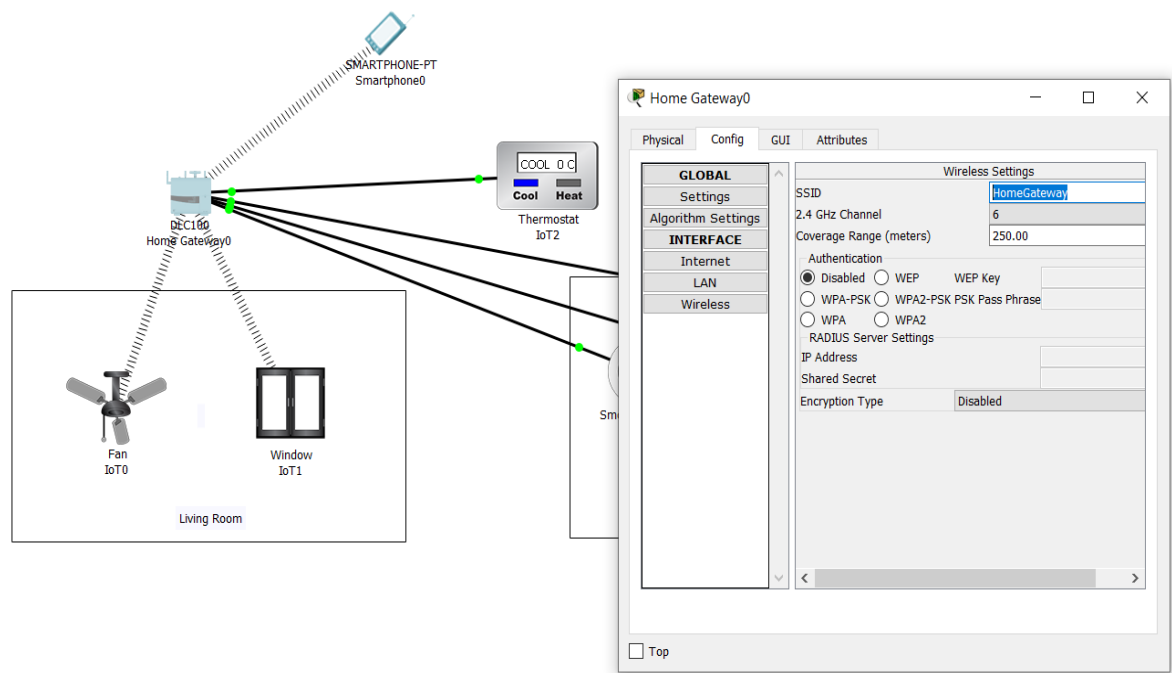

Figure 1

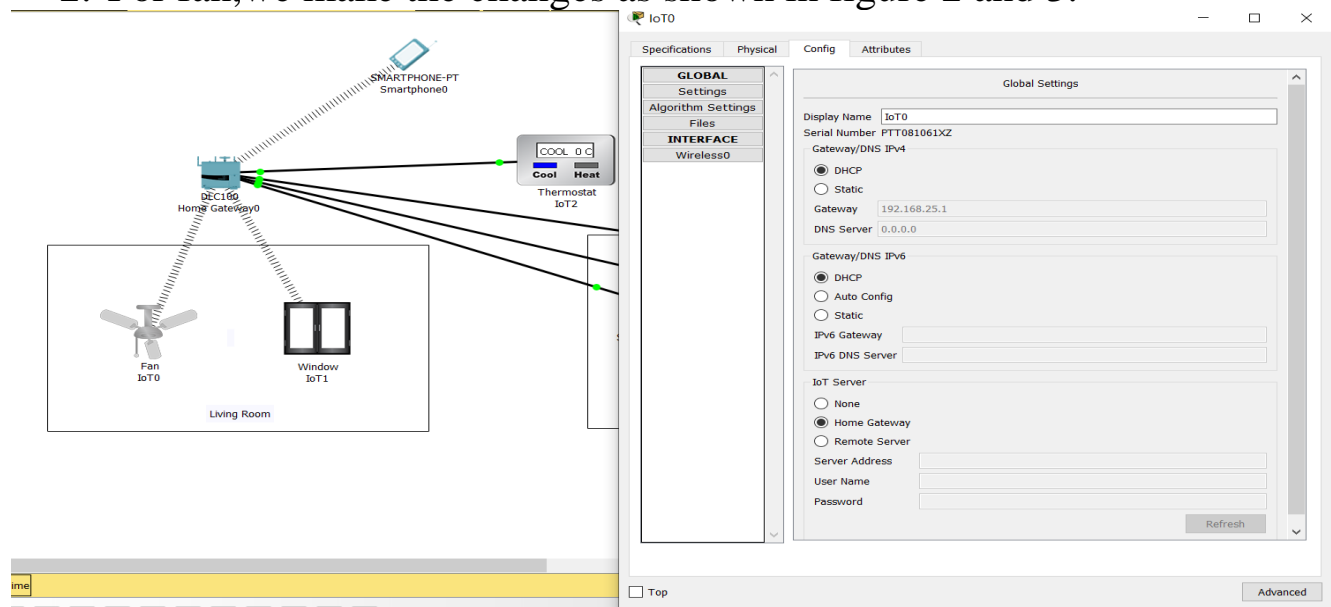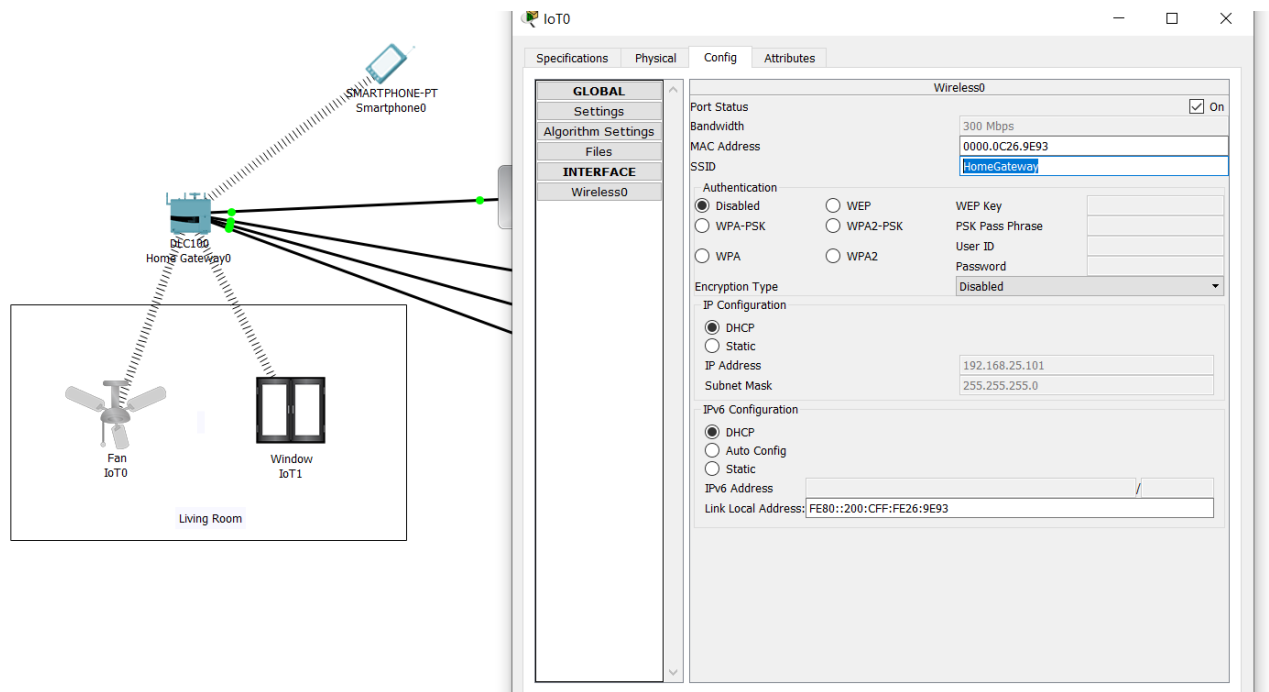2. For fan,we make the changes as shown in figure 2 and 3.

Figure 2

Figure 3

3. Similarly for other devices we make the same changes and set SSID for each as 'HomeGateway'.
4. We set the conditions for fan, alarm and sprinkler. For fan we impose simple conditions like turning on/off the fan, raise an alarm when the level rises and sprinkler activates when the smoke detected level is too high.
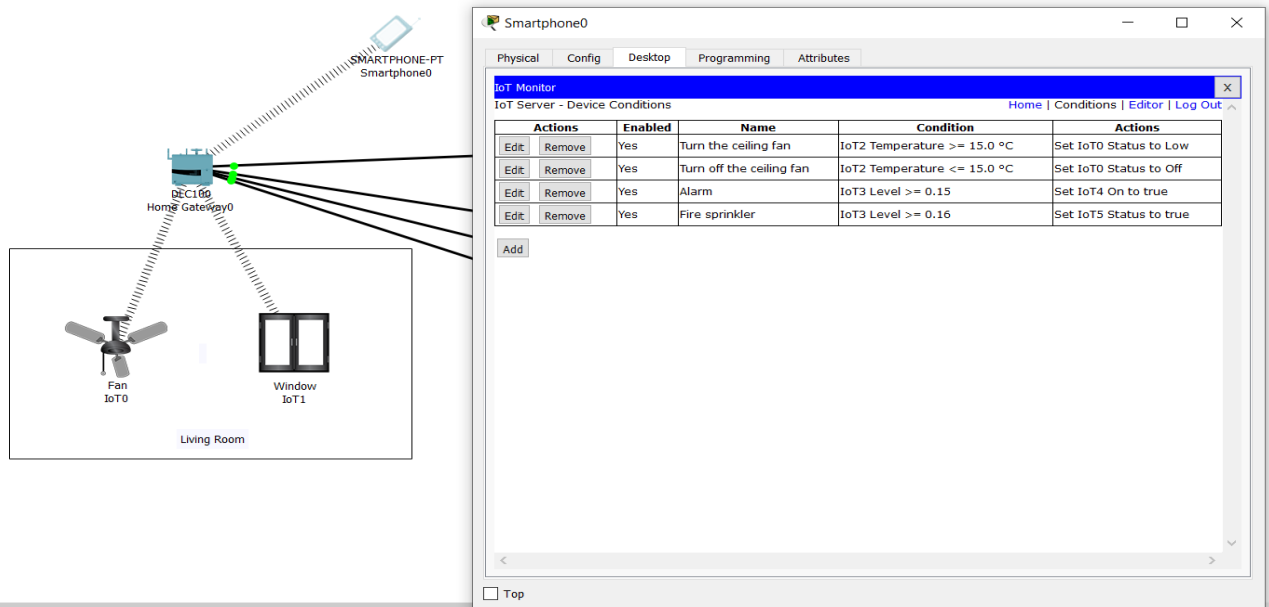

Figure 4

5. After setting up all the conditions, the car is turned on for a while as the smoke builds up. After smoke level reaches a certain point, alarm is turned

for warning the user. If the situation worsens, the sprinkler is activated in the garage.
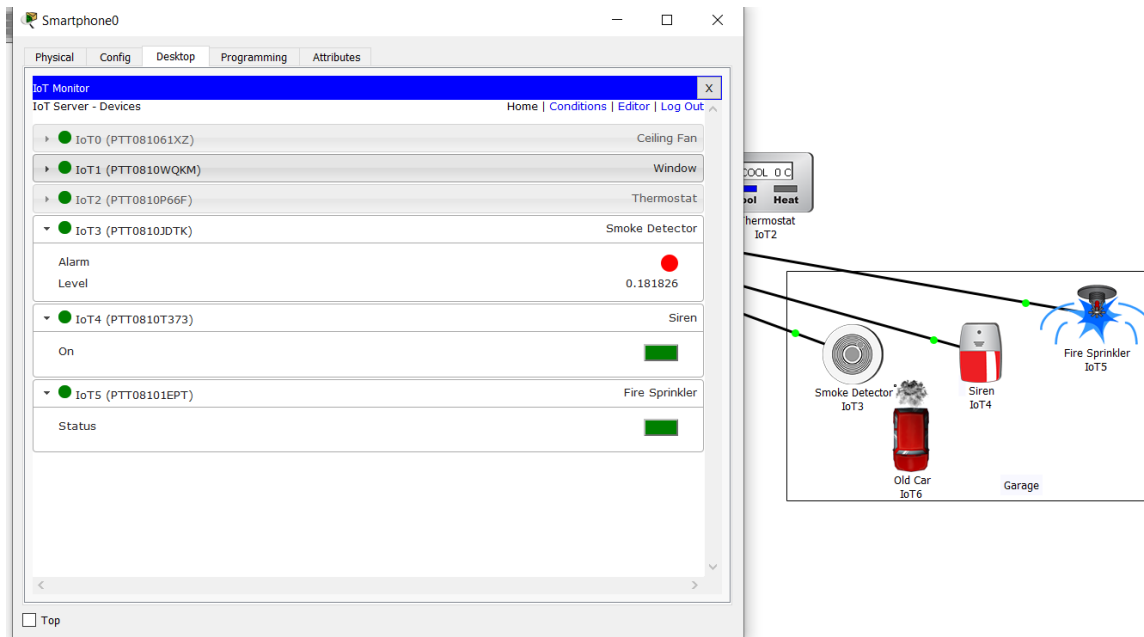

Figure 5

Practical 3:-Detecting CO2 levels in garage

1. This experiment consists of Carbon Dioxide detector which is placed in a garage, a window which is set to open when the CO2 level rises and it closes when the levels are low enough. These devices are configured and connected to server. Also the status of each devices can be monitored and controlled by clients themselves.
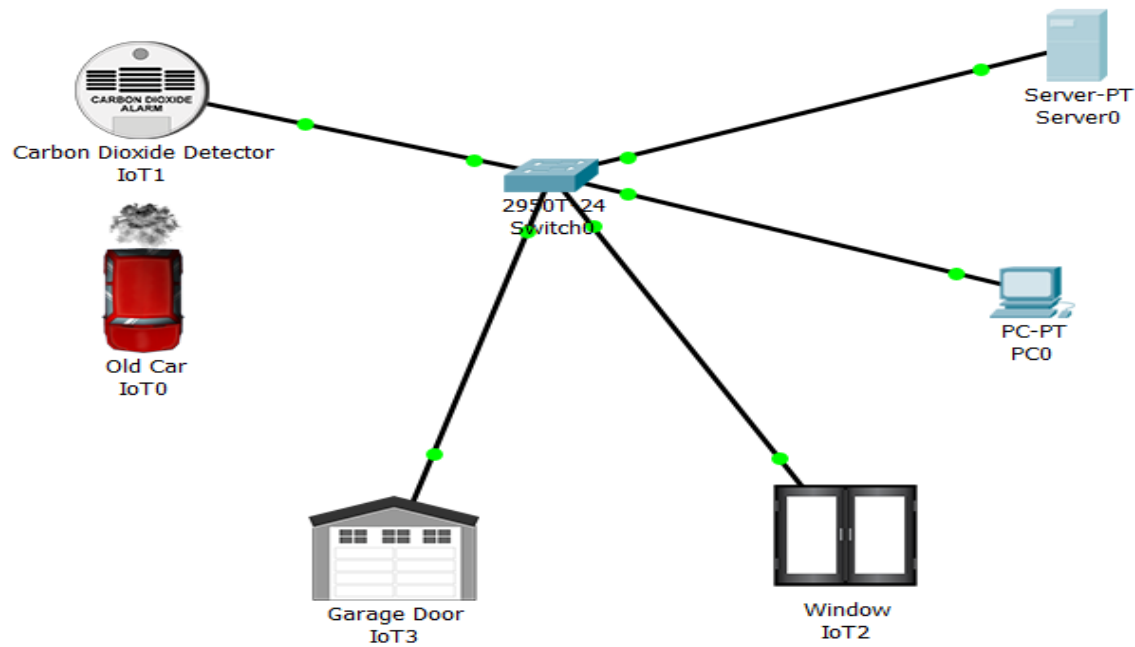
2. The basic setup is as shown in the figure 1.

Figure 1

3. Each of the devices shown above are configured as shown below. The figure 2 explains how garage door was set up.

Figure 2

4. The condition were imposed such as opening and closing of the garage door and window as per the CO2 levels.

Actions		Enabled	Name	Condition	Actions
Edit	Remove	Yes	Garage close	IoT1 Level < 0.13	Set IoT3 On to false
Edit	Remove	Yes	Garage open	IoT1 Level >= 0.13	Set IoT3 On to true
Edit	Remove	Yes	Window close	IoT1 Level < 0.13	Set IoT2 On to false
Edit	Remove	Yes	Window open	IoT1 Level >= 0.13	Set IoT2 On to true

Figure 3

5. When the CO2 levels rise, the garage door as well as windows are opened so that the CO2 level inside the garage is controlled and is same as outside.
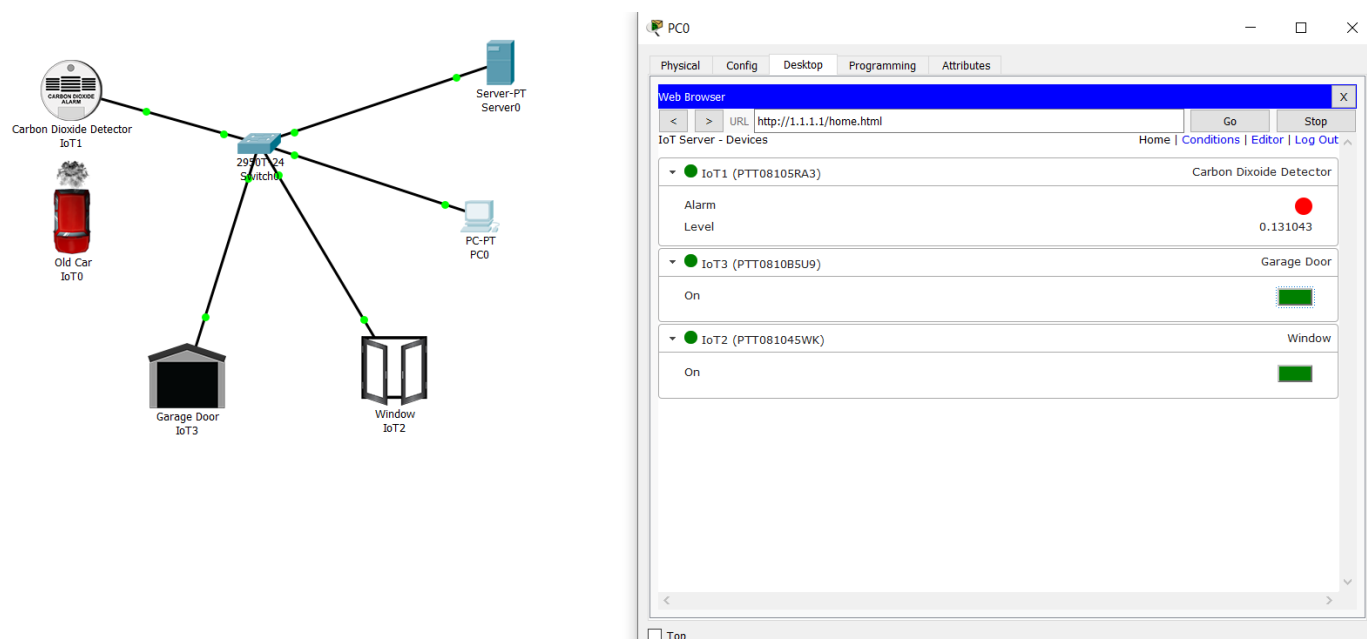

Figure 4

Practical 4:-Diabetic Patient Healthcare IoT solution

1. If a user has trouble keeping his glucose within a healthy range,he/she and his healthcare provider can implement an IoT solution to continuously monitor important indicators of his/her condition and send help if necessary. The user will wear a smartwatch to monitor his respiration and exercise level. He/She will also use a Continuous Glucose Monitor (CGM) that will report his/her glucose levels. The data from these devices will be sent to his/her Health Monitoring Company (HMC), which will send medical assistance should his/her condition become life threatening. The setup is shown in figure 1.
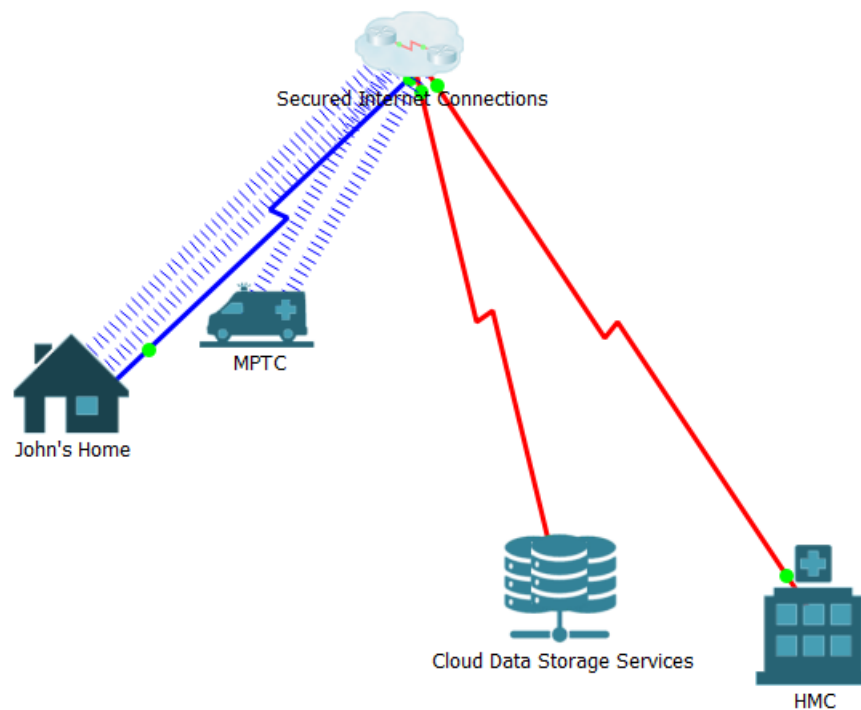

Figure 1

2. An environment window with name of user as John is provided in this case so that we can influence his glucose readings and observe the changes in the smart devices.
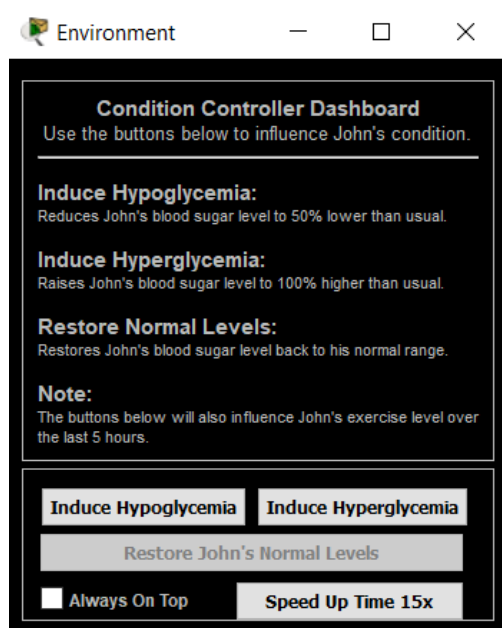
Figure 2

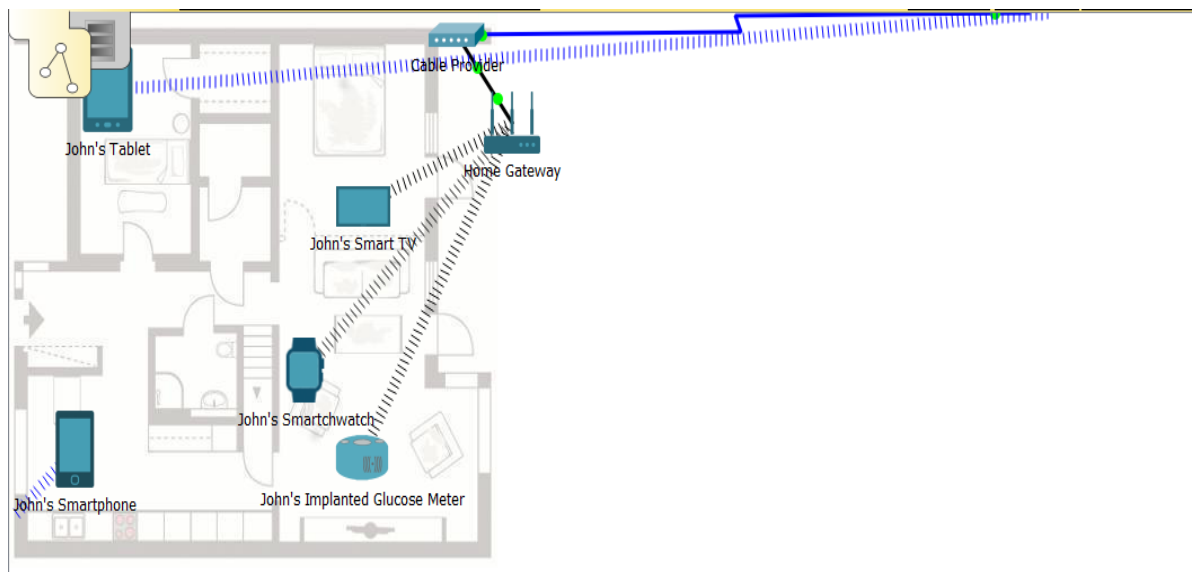3. Inside John's home the following setup is followed.

Figure 3

4. Smartphone, glucose meter, smartwatch, table and the TV can monitor John's readings and notify him when the glucose levels are too low or high. These devices are connected to the home gateway. The following figures show how the GUI is setup on various smart devices.
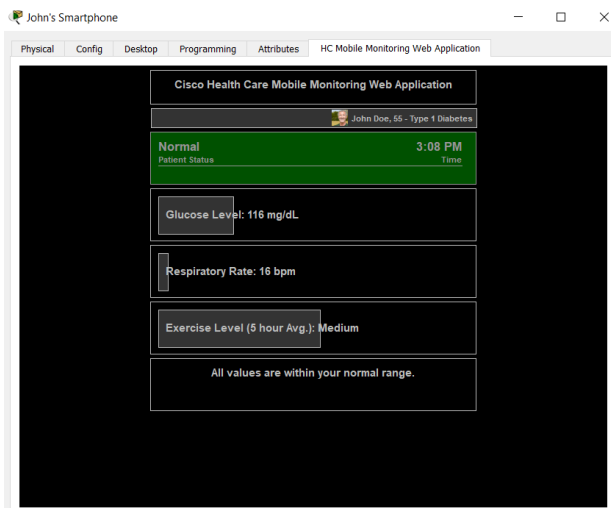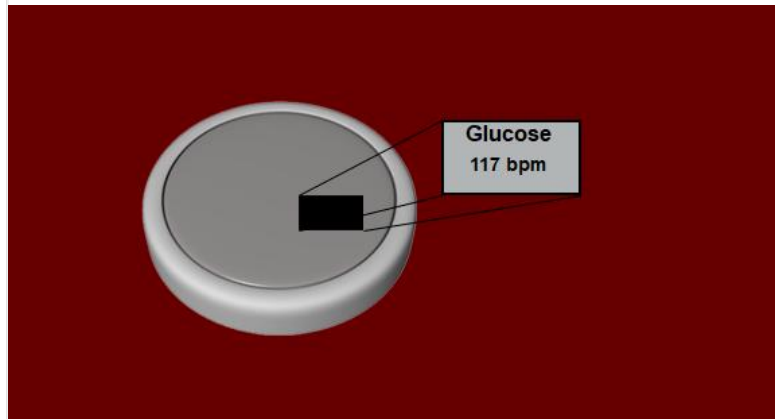
Figure 4: Smart phone

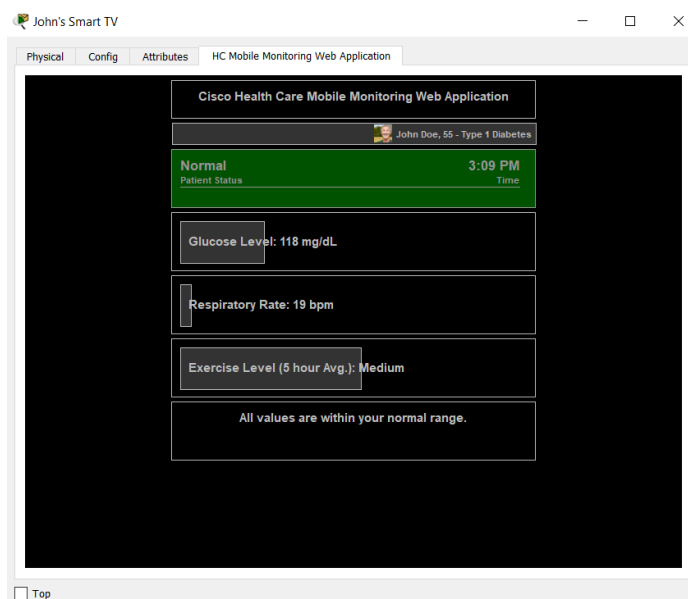*Figure 5: Glucose meter*

Figure 6:Smart watch

Figure 7:TV and tablet

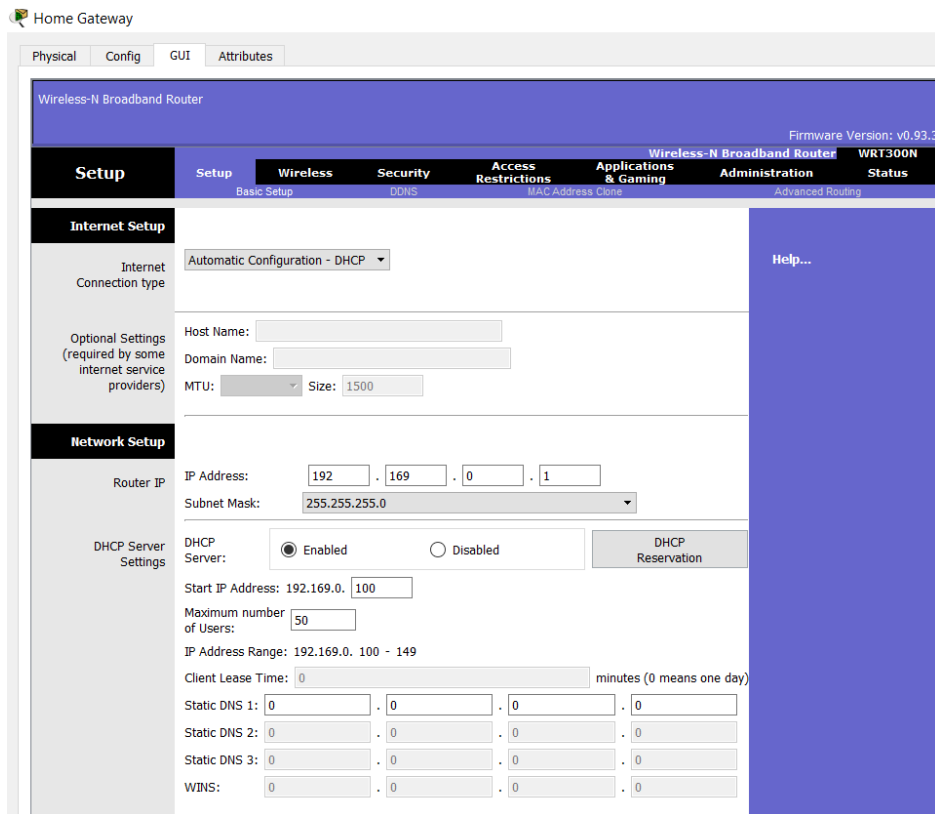5. The gateway is configured as follows.

Figure 8

6. We try inducing hypoglycemia through the environment window and observe the changes reflected in various devices like john's smart devices and mptc's tablets(Medical Patient Treatment Center).
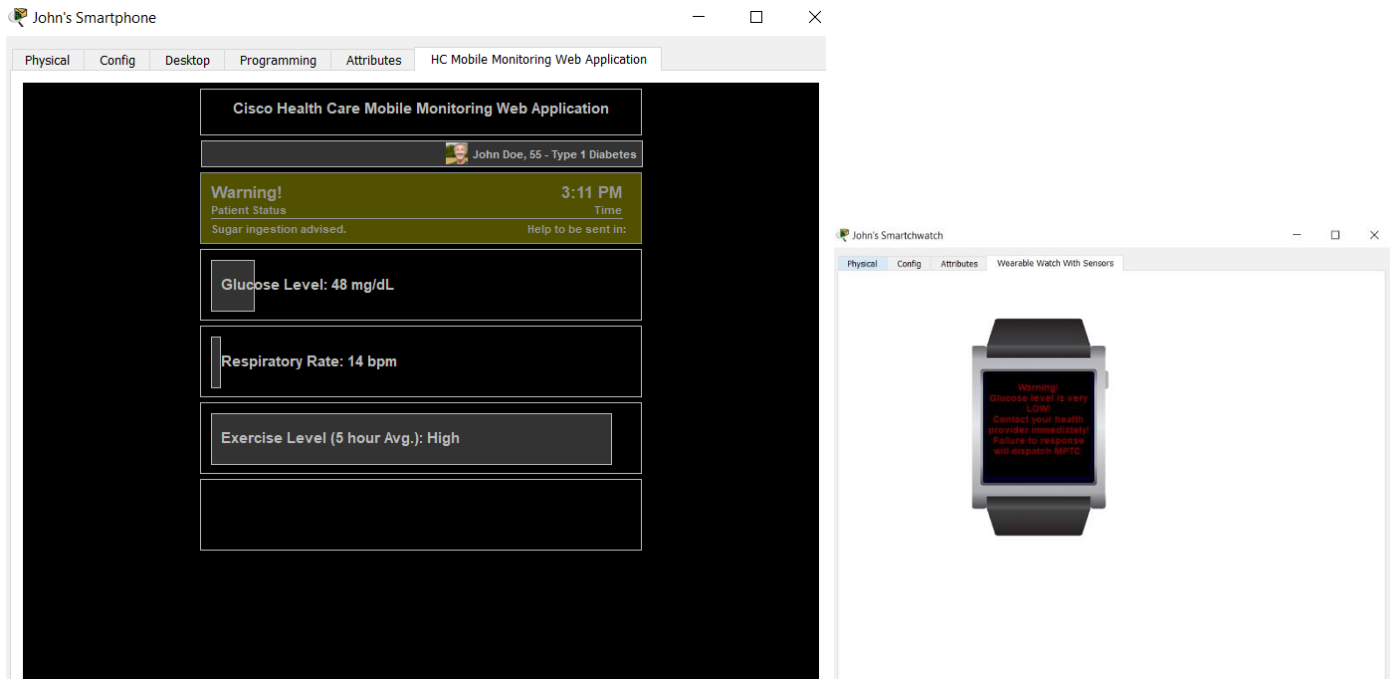

Figure 9

7. At the mptc side the tablet also warns them about john's condition and then sends assistance at john's house if the glucose levels aren't restored back to normal after certain time.
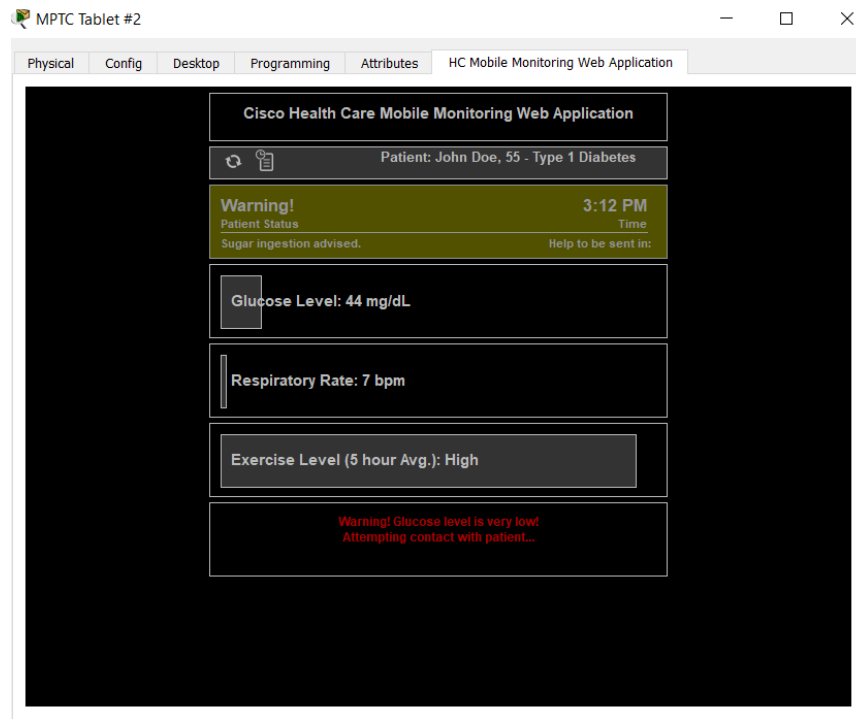

Figure 10