Internet of Things: Architecture and Programming

2017 - Demo Exercise 7

In this session, we are going to connect two Arduino using nrf module. It is useful when two IOT nodes need to talk to each other. You got familiar with nrf module few week ago, where we used BLE protocol to transfer data between Arduino and smart phone.

In this session, each group has to send data to another group, and get data from them using nrf module.

Connecting NRF24L01+ to Arduino:

CAUTION: this breakout works only with 3.3 v. more voltage will cause permanent damage to this board.

- 3.3V → VCC (breadboard)
- GND → GND (breadboard)
- D8 → IRQ
- D9 → CE
- D10 → CSN
- D11 → MOSI
- D12 → MISO
- D13 → SC

You already have the necessary libraries in your arduino IDE.(you installed them in another session)

A: Test your connection

Download NRF package from https://github.com/nRF24/RF24. In Arduino IDE, from examples, select the NRF24-> usage->LED_remote.

Each two group has to make a 'pipe'. The default pipe address is "0xE8E8F0F0E1LL". Each pair of groups has to have a unique address. So, you will need to change this address, e.g. group A and group B that has to work with each other, have to use ""0xE8E8F0F0E2LL" pipe address, and no other group has to use it.

To make it easier, you can hard code the role of your board by commenting the proper lines of this part of code:

```
if ( digitalRead(role_pin) )
        role = role_remote;
else
        role = role_led;
```

In this test, the remote board will read the digital pins(from 2 to 7), and send the value of it to the other board, which will change the status of the corresponding digital pins (from 2 to 7), and if you connect LED to these pins (by connecting one pin of LED to ground, and the other to the digital pin), you can easily check its status.

Question: what will happen if multiple groups use the same pipe address? Give it a try.

B: Share sensor data

In this part, you have to share the sensor data with the other node. One group has to share the temperature data each one second, and the other group has to share the data of light sensor each two seconds. If temperature or light measurement exceed specific threshold, you have to turn on an LED.