Tecnologie per IoT
Lab Software Part 3

Exercise 1. Extend the sketch developed in Exercise 3.3 Lab Hardware – part 3 to register to the Catalog. The main tasks are:

i. to retrieve information of the Catalog available subscriptions via REST
ii. to register itself as a new device through MQTT communicating the topic for temperature measurements and for led command
iii. to renew each 1 minute the subscription

Exercise 2. Develop an MQTT subscriber to receive the temperature values sent by the Arduino Yun (refer to Exercise 3.3 Lab Hardware – part 3 for topics and data format). Test this software by using the Arduino Yun, which must be registered on Catalog. During its boot, the MQTT subscriber must invoke web services provided by the Catalog:

i. to retrieve information of the Catalog available subscriptions via REST
ii. to register itself as a new service through REST,
iii. to retrieve information about the endpoint (i.e., the MQTT topics in this case) used by the Arduino Yun to communicate applying a discovery (GET devices, GET devices/{deviceID}).
iv. to retrieve the temperature measuremets subscribing to the MQTT endpoint

Exercise 3. Develop an MQTT publisher to send actuation commands to switch on and off a led managed by the Arduino Yun (refer to Exercise 3.3 Lab Hardware – part 3 for topics and data format). Test this software by using the Arduino Yun, which must be registered on Catalog. During its boot, the MQTT publisher must invoke web services provided by the Catalog:

i. to retrieve information of the Catalog available subscriptions via REST
ii. to register itself as a new service through REST,
iii. to retrieve information about the endpoint (i.e., the MQTT topics in this case) used by the Arduino Yun to communicate applying a discovery (GET devices, GET devices/{deviceID}).
iv. to send turn on and off a led each 15 seconds

Exercise 4. Develop the remote version (i.e., running on a remote server) of the Smart home controller defined in Exercise 2.1 Lab Hardware – part 2. This Remote Smart home controller must implement MQTT functionalities to work as publisher and subscriber. The main task to implement are:

i. to retrieve information of the Catalog available subscriptions via REST
ii. to register itself as a new service through REST,
iii. retrieve information from the Catalog about the endpoint (i.e. the topics in this case) used by the Arduino Yun to communicate,
iv. Implement the functionalities described in bullets 1 - 6 and 8 in Exercise 2.1 Lab Hardware – part 2

The Arduino sketch must be modified accordingly to perform the following tasks:

i. to retrieve information of the Catalog available subscriptions via REST
ii. to register itself as a new service through REST,
iii. send information about temperature, presence and noise via MQTT
iv. receive actuation commands via MQTT
v. receive messages to be displayed on the LCD monitor via MQTT