Project 1

TinyOS, Cooja, Node-RED, IFTTT

Diego Costanzelli
diego.costanzelli@mail.polimi.it
ID number: 10527966 - 928941

Francesco Maffezzoli
francesco.maffezzoli@gmail.com
ID number: 10576556 - 944914

Marco Passera
passera.marco@alice.it
ID number: 10531470 - 944947

TinyOS

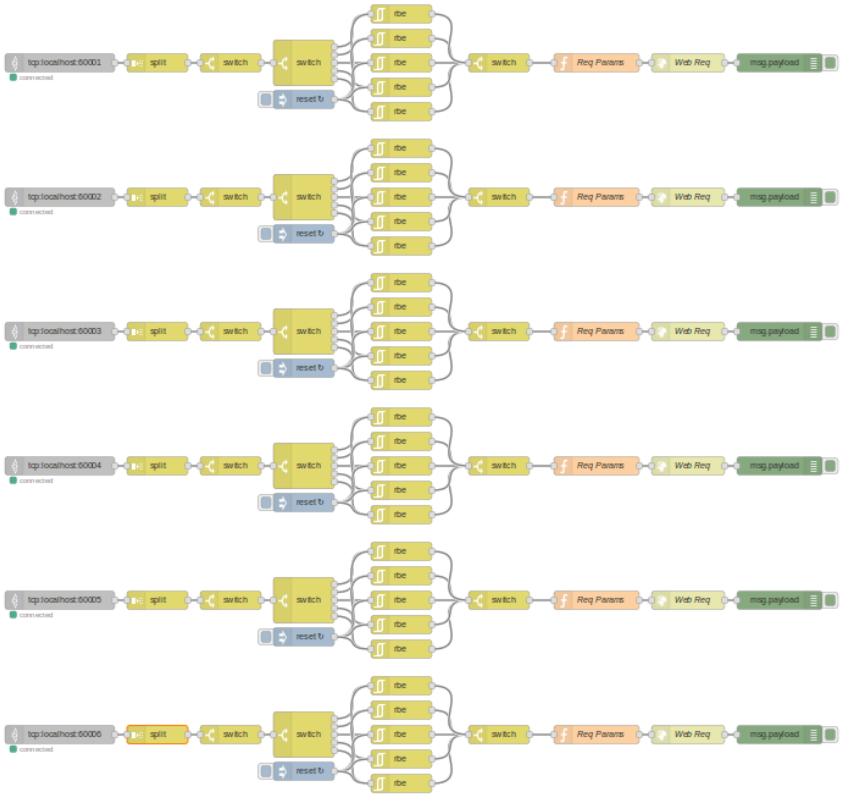
In Cooja we created a topology with six sky motes. Each mote broadcasts a message every 500ms, containing its ID. When two motes are close enough, each one will send a TCP message (on his own socket) to Node-RED, containing the ID of the nearby sensed mote.

Node-RED

Every mote is associated to a different flow, slightly different from the others but overall similar. For every mote, the flow contains:

- TCP CONNECTION: the node creates a connection to the serial server of the motes
- (port 60001-60006).
- SPLIT: a split node is used to isolate different fields of the message, in order to keep only the useful information for later.
- SWITCH1: this switch is used to select only the right message field (the one containing the sensed mote ID).
- SWITCH2: this switch divides messages containing different mote IDs on different flows in order to correctly enable the function of RBE. In this way 5 new flows are created, each one containing always the same message associated with the same mote ID.
- RBE: this function forwards a message only if it is different from the previous one. In this way every further message that contains the same mote ID is ignored.
- INJECT: this inject is used to send a “reset” message in every RBE. This message will refresh the buffer of RBE node, enabling him to send a new message again. The purpose of this function is to let Node-RED be able to send a new notification message when two motes are pulled together again a second time after the first.
- SWITCH: this switch is used to ignore “reset” messages that will be fired every 30 seconds, since their purpose is only to enable the RBE node again.
- FUNCTION: the function node assembles the message to be sent to the IFTTT applet. The message contains two values: sender mote ID and sensed mote ID.
- WEB REQUEST: creates a web request to our IFTTT applet.

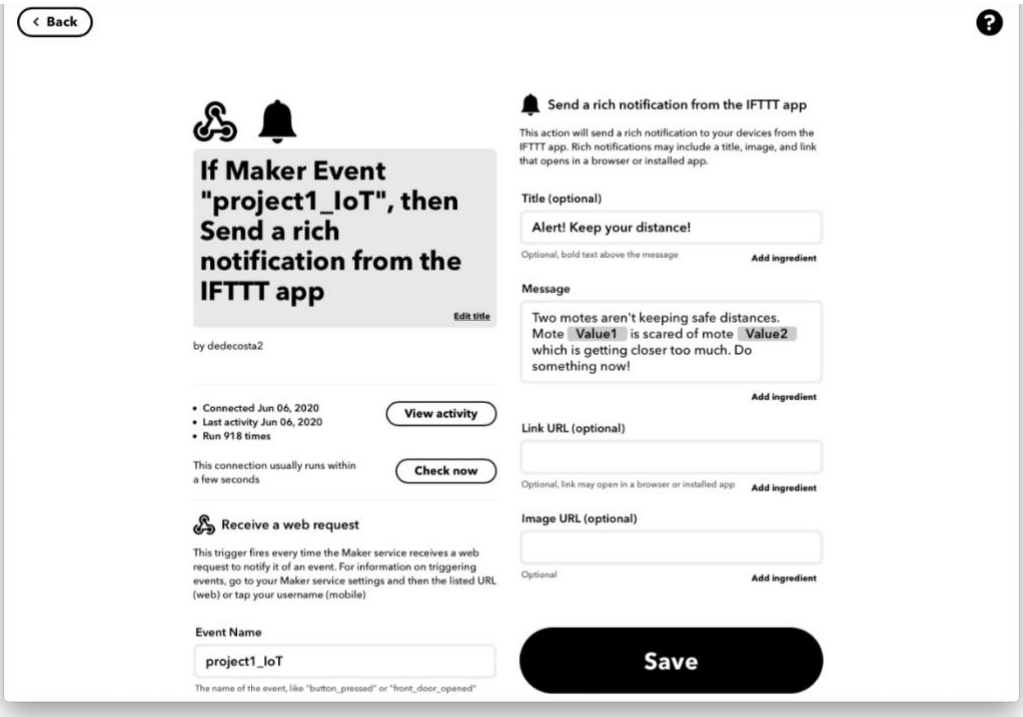
In this way we have a total of 6 flows, one per mote, that handles motes messages independently.



IFTTT Applet

The IFTTT applet sends a smartphone notification every time a new message is received from Node-RED. The applet is composed of:

- Webhook: receives POST messages.
- Notification: push a notification to IFTTT mobile app.



GitHub repository with all the activities + project: https://github.com/FraMaffezzoli/IoT_Project