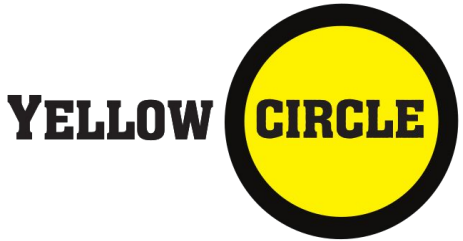


TECHNOLOGY CAMP

IoT Device Inputs & Outputs

Day 4 : Session 4

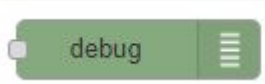
Session Overview

Learning Objectives

- Build an IoT Device to receive input from email and outputs a notification by lighting an LED
- Describe more common nodes and their uses
- Build an IoT device that accepts both manual and cloud controls

Node Review

- The inject node inserts (injects) a message, known as a payload into the flow. When first dropped on the workspace, the node defaults to timestamp, but edited to inject other payloads as selected from the drop down menu



- The debug node displays either the message payload or the complete message object. The message can be output in to several different locations.

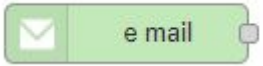
- The rpi gpio output node (note the logo on the right) allows for message payloads (values) to control the state of GPIO pins to control IoT devices.

Node Review

- The function node allows for the addition of JavaScript code. Messages received by the function node can be processed by the JavaScript code and then return a message, message object(s), or nothing (ending the flow).

- The switch node evaluates a received message based on a hierarchy of pre-defined rules. The switch can be set to stop at the first match or run through all the rules in the switch. Once the evaluation is complete, the switch routes message on based on the flow design.

New Nodes



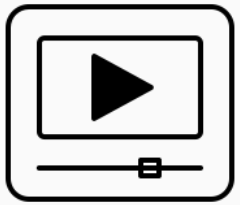
- The email in node polls an email account for an incoming message. If a message is received, msg.topic and msg.payload are populated. Depending on the requirements of the flow, msg.html, msg.from and msg.date are also available. Only 1 message is received per polling period, so multiple polling periods may be necessary to receive all incoming email.

- The trigger node will send a message based when triggered by an input. This node can be triggered by receiving a msg.payload from another node.

Blink a led light on a Raspberry Pi using Node Red

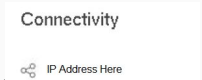
Lets watch it:

- *https://www.youtube.com/watch?v=5Y5yHONKFt4*



Raspberry Pi Set up

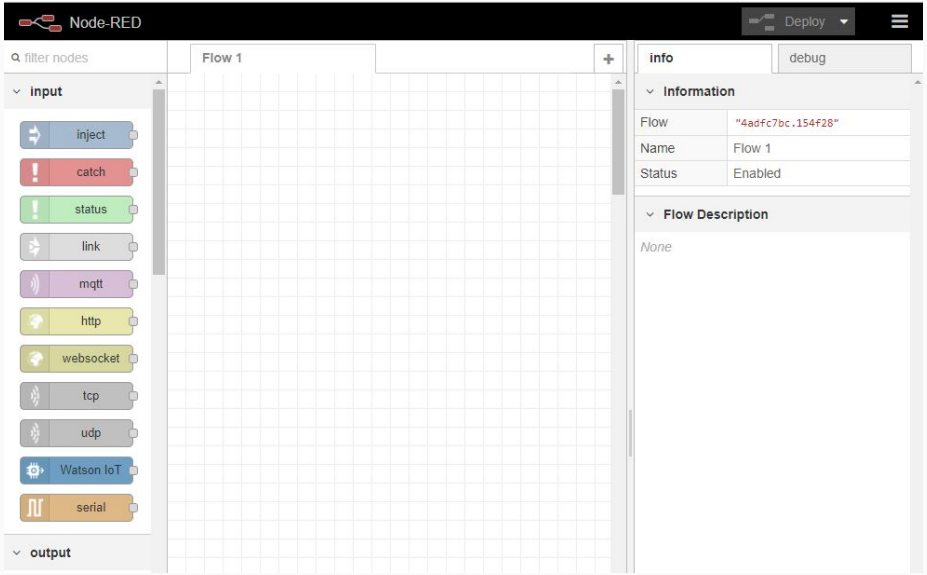
- Please ***do not*** unplug or turn off the PI without shutting it down from the App Menu ( in the upper left corner). Doing so could corrupt the SD card.
- Open your laptop and double click on the VNC Viewer icon. 

- Login using the default credentials:
  - *UserID: pi*
  - *Password: raspberry*
- When the Raspberry Pi desktop appears, click on the VNC icon  in the upper right and note your IP address listed under Connectivity 

- Open a new browser tab and enter http://{Your IP Address Here}:1880 to start Node-Red

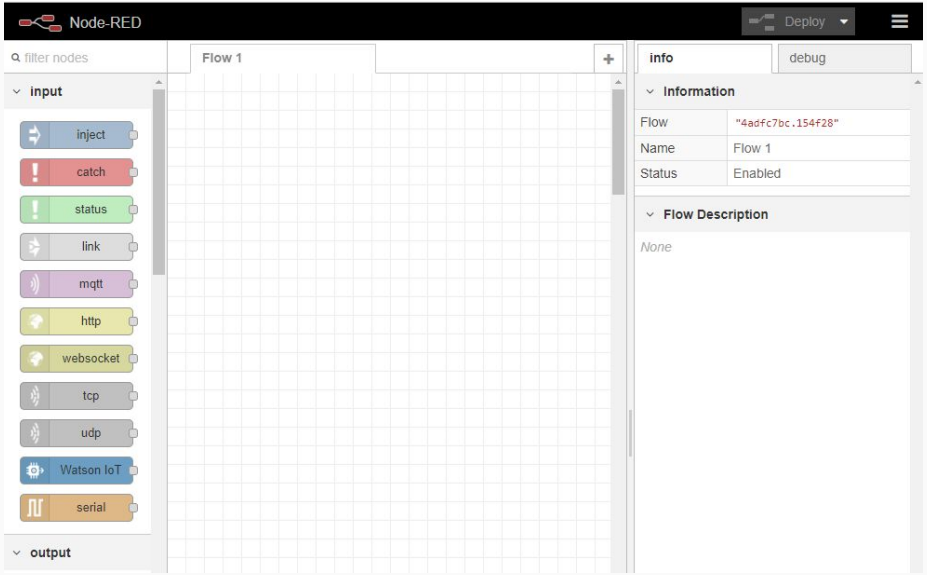
LED Notification – Email Received

- *Follow along with Instructor screen share*



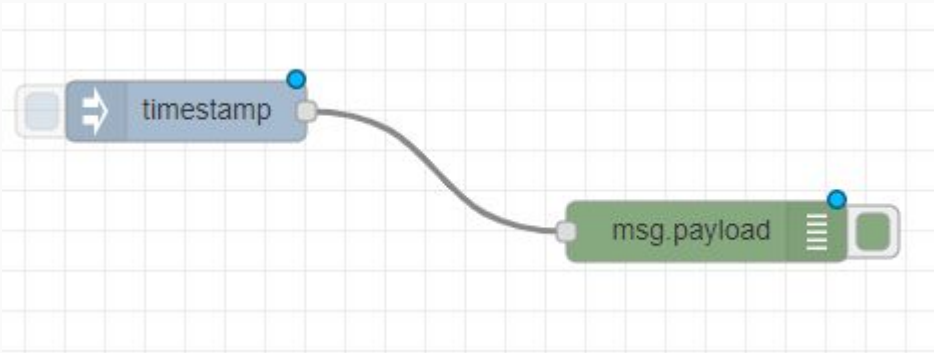
Cloud and Manual Control LED

- *Follow along with Instructor screen share*



Student Activity

Try it



- *Modify the flows you built.*
- *Build your own flows.*
- *Experiment with using different options and note the results.*

Closing / Wrap-up

What we learned?

- Build an IoT Device to receive input from email and outputs a notification by lighting an LED
- Describe more common nodes and their uses
- Build an IoT device that accepts both manual and cloud controls

What's next...

End of Session 4

- Head to cafetaria to be picked up