SMART INVENTORY LEVEL SYSTEM

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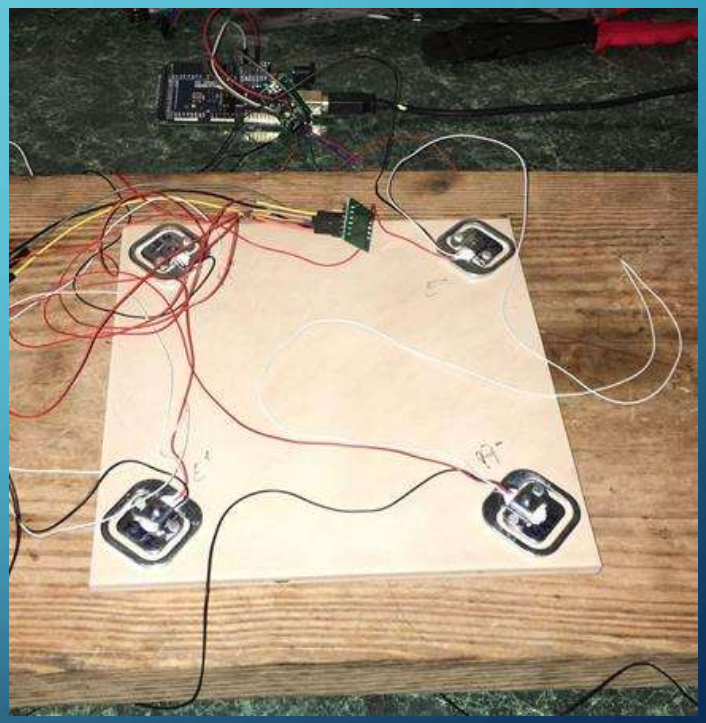
PROBLEM?

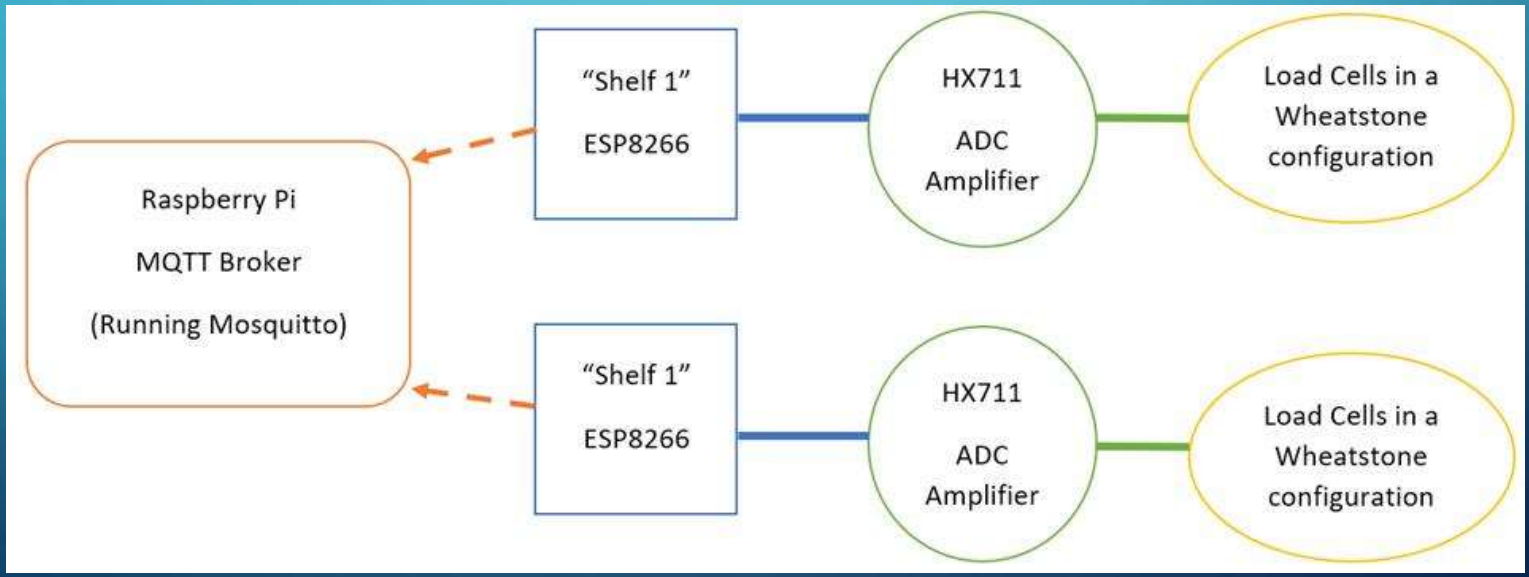
- Retail Store environment
  - Stockroom inventory levels fluctuate daily
  - Inbound shipment units must be monitored manually
  - Help coordinate stockroom management efforts

SYSTEM DESIGN

- Track each shelf with weight sensors
- Report to main system at beginning of day
- Visualize and log data

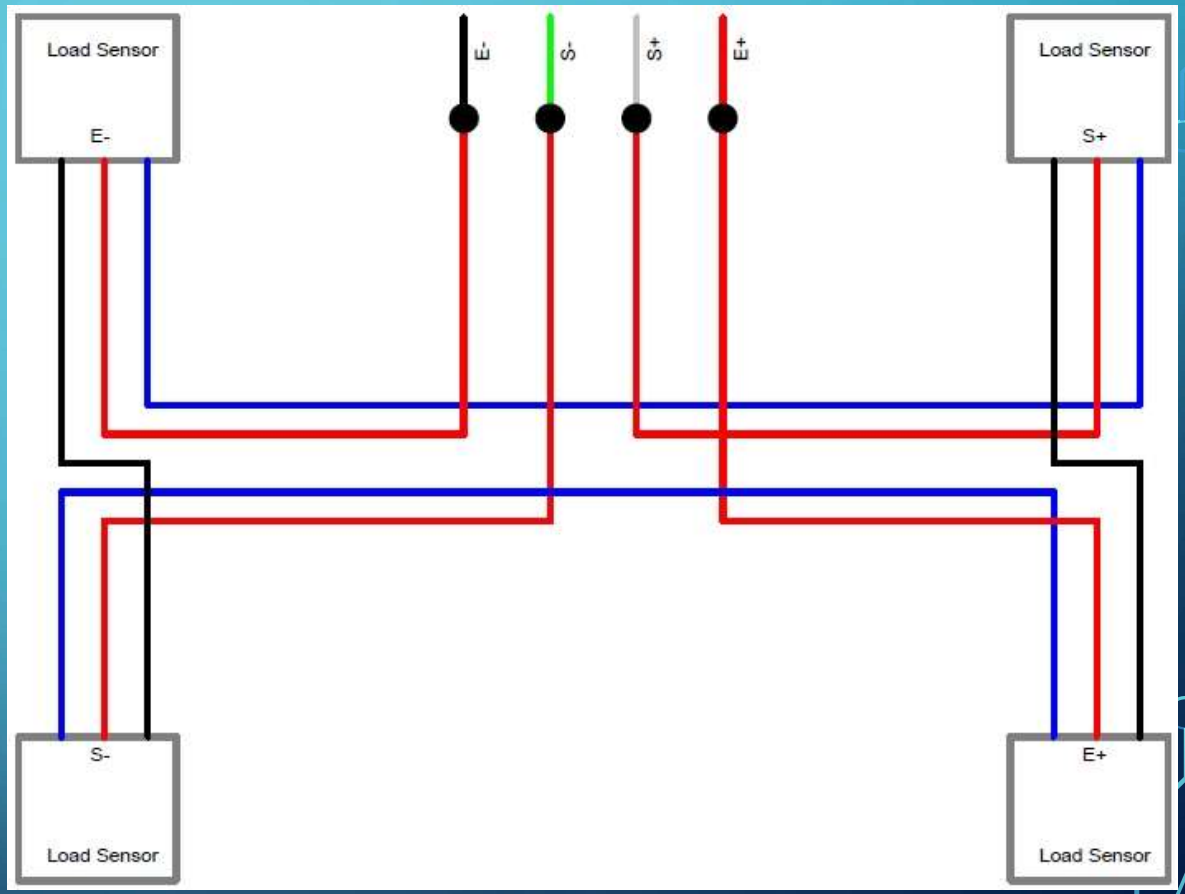


SYSTEM DIAGRAM



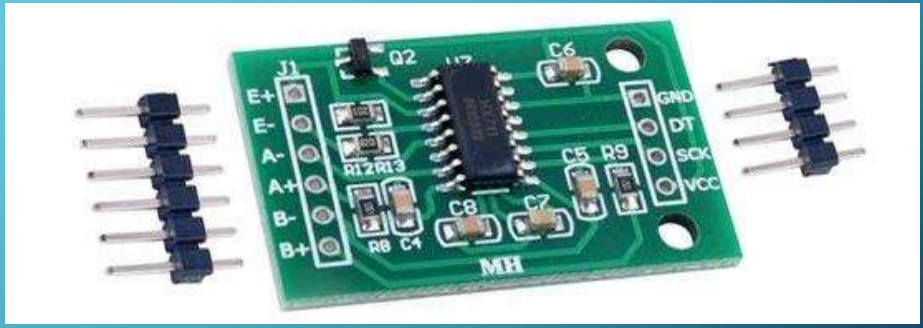
LOAD CELLS

- 3 Wire load cells
- 50kg each
- 200kg = about 440 lbs.



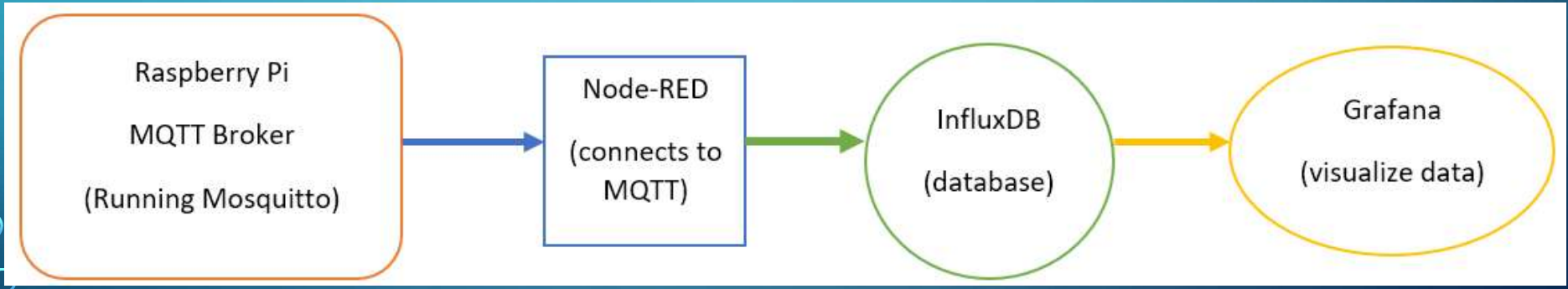
MODULE - MCU - MICROCOMPUTER

- HX711
  - Amplify the analog signals
  - Connected through data pin and clock
- ESP8266
  - Wifi microcontroller
- Raspberry Pi
  - Mosquitto -> Node-Red -> InfluxDB -> Grafana



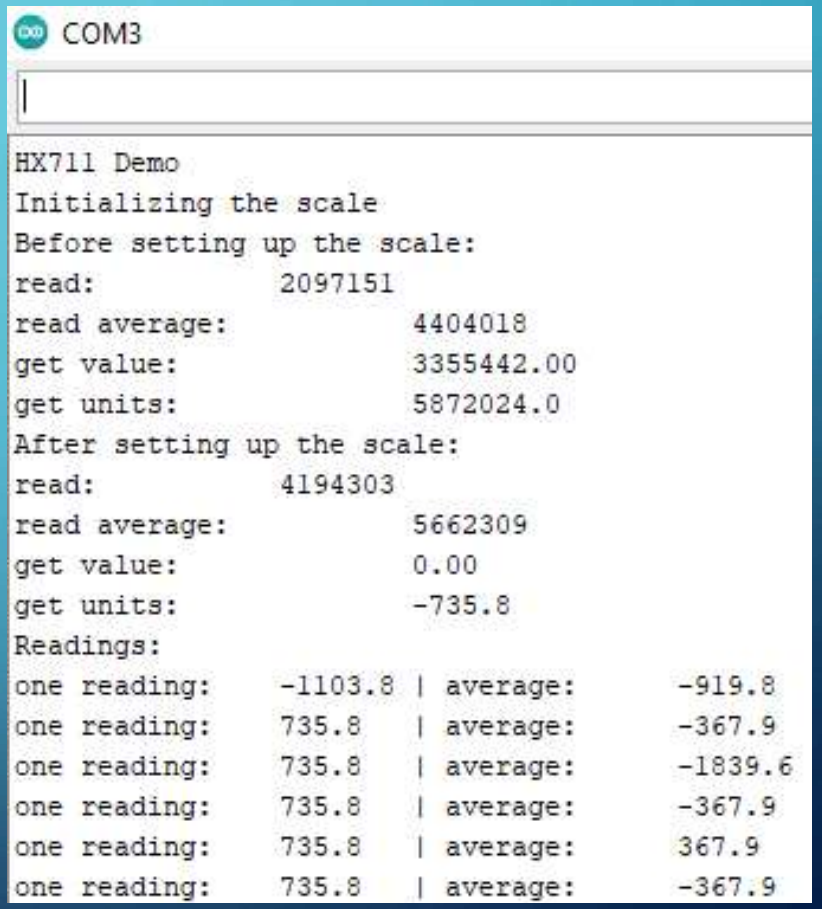
FLOW CHART OF DATA

- All software running on the Raspberry Pi



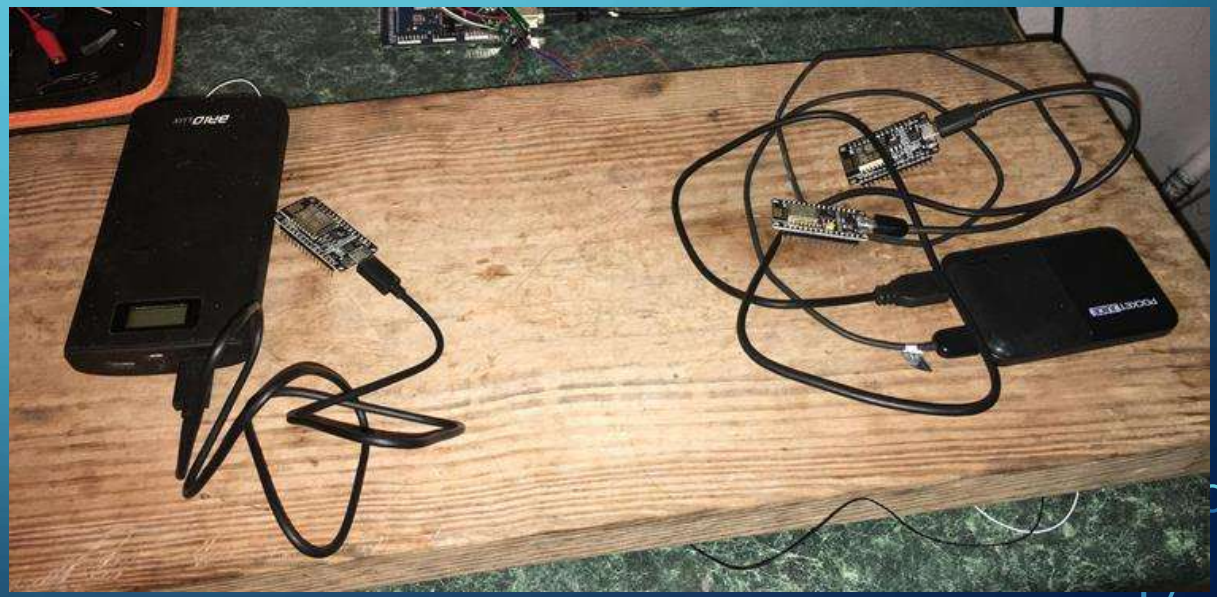
TROUBLES

- HX711 system was not reliable
  - Tried multiple example codes, became confusing fast
  - Fault in module? Fault in 1 sensor? 2 sensors?
    - # of sensors used determine wiring layout



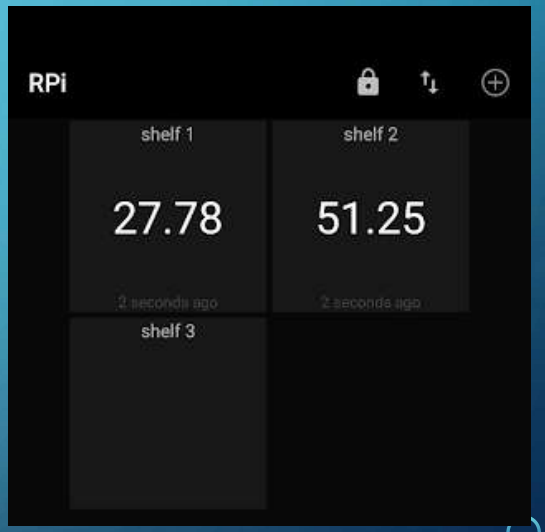
COMPROMISES

- Simulated results of HX711/weight sensors
- No touchscreen
  display for manual control
- No automatic visualization



FUTURE TINKERING

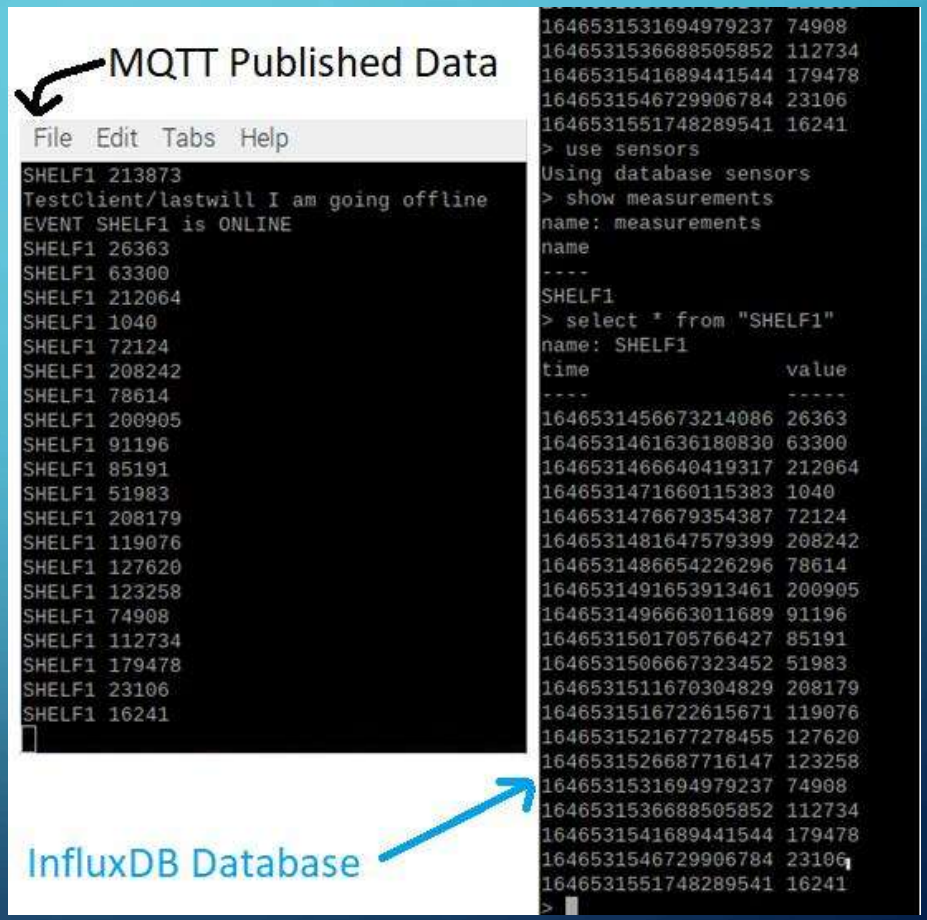
- Get HX711 working, apply to different projects?
- MQTT dashboard/control from android?
- Some functional level of the touchscreen display
- Alternative MQTT broker?
  - Hosted on android or traditional x86/x64 Linux | Windows



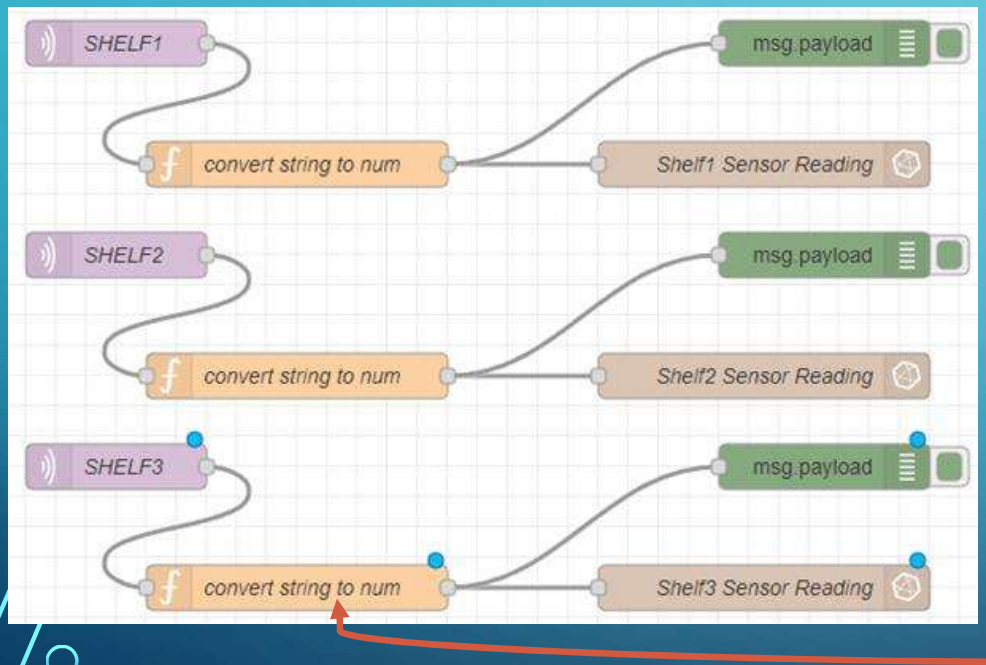
Mosquitto

- MQTT subscription messages being stored by NodeRed and stored into an InfluxDB database

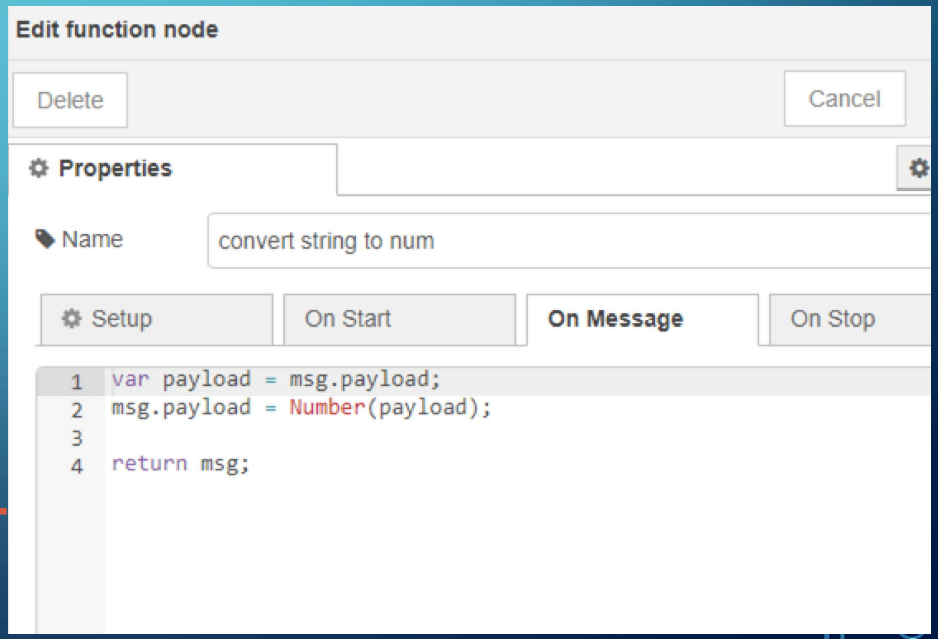
```
SHELF2 123.75
SHELF3 2.50
SHELF2 121.25
SHELF3 26.25
SHELF2 130.00
EVENT SHELF1 is ONLINE
SHELF1 8.33
SHELF3 1.25
SHELF2 51.25
SHELF1 13.89
SHELF3 5.00
SHELF2 15.00
```



Node-RED



- Converting string to num in NodeRed, to then store into InfluxDB, and read as nums and not string by Grafana



Grafana

- Short Live Demo