



07-2 Node-RED

The Internet of Things

The Internet of Things (IoT)

Wikipedia

- What is IoT?
- The **Internet of Things(IoT)** is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure.
- The embedded computing nature of many **IoT** devices means that low-cost computing platforms are likely to be used.
- To minimize the impact of such devices on the environment and energy consumption, low-power radios are likely to be used for connection to the Internet

The Internet of Things (IoT)

Cisco

- **Internet of Things(IoT)** is when the Internet and networks expand to places such as manufacturing floors, energy grids, healthcare facilities, and transportation

Techtarget

- The **Internet of Things(IoT)** is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network

IBM

- The **Internet of Things** represents an evolution in which objects are capable of interacting with other objects.

Microsoft

- Empower your business and gain a competitive edge by connecting data from devices and sensors with the cloud and business intelligence tools



IoT



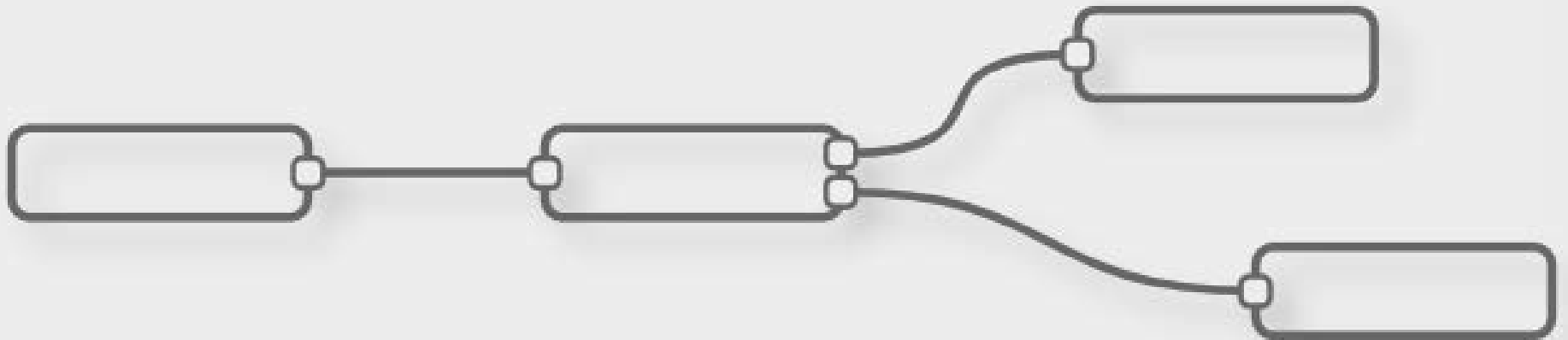
Yoder

- Making BeagleBone talk to other things
- See Cookbook to learn how to
 - Send email
 - Send SMS messages
 - Send and receive Tweets

05-2 Node-RED

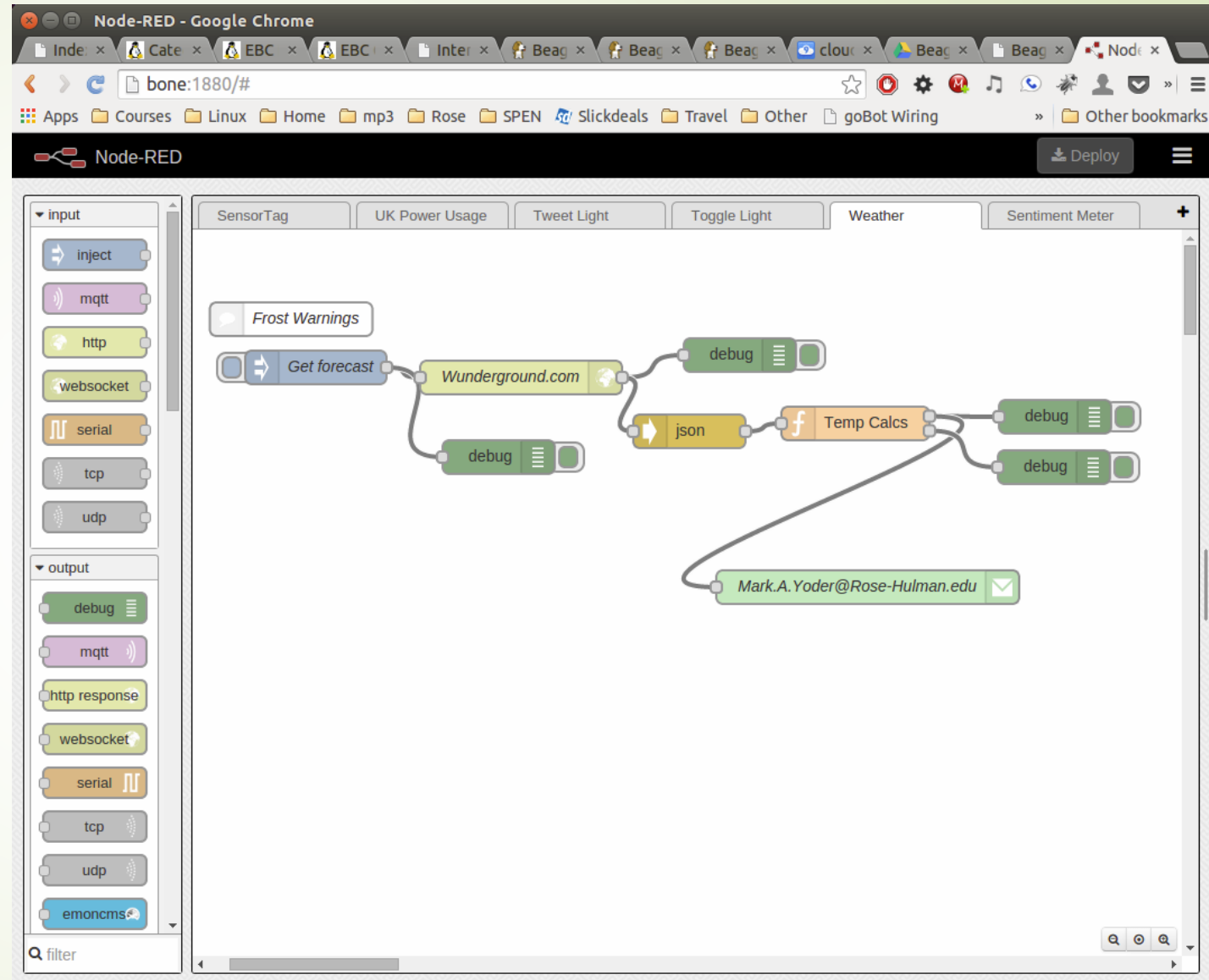
Node-RED

A visual tool for wiring the Internet of Things



Node-RED

- Node-RED is a tool for wiring together hardware devices, APIs and online services in new and interesting ways.



Installing node-RED

Already installed

```
bone$ cd # Change to home directory
bone$ gitclone https://github.com/node-red/node-red.git
bone$ cd node-red/
bone$ npminstall --production
# almost 6 minutes
bone$ cd nodes
bone$ gitclone https://github.com/node-red/node-red-nodes.git
# 2 seconds
```


Running node-RED

```
bone$ node-red
```

```
Welcome to Node-RED
```

```
=====
```

```
29 Sep 10:38:55 - [info] Node-RED version: v0.14.4
```

```
29 Sep 10:38:55 - [info] Node.js version: v0.12.15
```

```
29 Sep 10:38:55 - [info] Linux 4.4.22-bone13.1 arm LE
```

```
29 Sep 10:38:55 - [info] Loading palette nodes
```

```
29 Sep 10:39:13 - [warn] -----
```

```
29 Sep 10:39:13 - [warn] [rpi-gpio] Info : Ignoring Raspberry Pi specific node
```

```
29 Sep 10:39:13 - [warn] -----
```

```
29 Sep 10:39:13 - [info] Settings file : /root/.node-red/settings.js
```

```
29 Sep 10:39:13 - [info] User directory : /root/.node-red
```

```
29 Sep 10:39:13 - [info] Flows file : /root/.node-red/flows_yoder-debian-bone.json
```

```
29 Sep 10:39:14 - [info] Creating new flow file
```

```
29 Sep 10:39:14 - [info] Starting flows
```

```
29 Sep 10:39:14 - [info] Started flows
```

```
29 Sep 10:39:14 - [warn] Communication server error: Error: listen EADDRINUSE
```

```
29 Sep 10:39:14 - [error] Unable to listen on http://127.0.0.1:1880/
```

```
29 Sep 10:39:14 - [error] Error: port in use
```

Already running

Accessing node-RED

- Point your browser to 192.168.7.2:1880

The screenshot shows the Node-RED web interface running in Google Chrome. The browser's address bar displays 'bone:1880/#'. The interface includes a top navigation bar with a 'Deploy' button and a hamburger menu. On the left, there are panels for 'input' and 'output' nodes. The main workspace contains a flow with the following components: a 'Frost Warnings' button, a 'Get forecast' node, a 'Wunderground.com' node, a 'debug' node, a 'json' node, a 'Temp Calcs' node, and an email node for 'Mark.A.Yoder@Rose-Hulman.edu'. The flow is connected to a 'Sentiment Meter' tab in the top right.

Node-RED Demo

- See cookbook for installing more nodes

```
bone$ apt-get install libbluetooth-dev
```

```
bone$ npm install -g sensortag
```

```
bone$ npm install -g badwordsntwitteroauthsentiment wordposxml2js firmata
```

```
bone$ npm install -g fs.notifyserialportfeedparserpushbulletircsimple-xmpp
```

```
bone$ npm install -g redismongodbnode-stringprep
```

```
bone$ npm install -g imapjs2xmlparser nodemailerarduino-firmataheatmiserwemo
```

```
bone$ npm install -g stomp-client wake_on_lannode-dweetiokomponistnmagrowl
```

```
bone$ npm install -g node-prowl pusher pushover-notifications  
snapchattwiliobone$ npm install -g node-hue-apilevel pusher-client  
mysqlsqlite3 suncalc
```

```
bone$ npm install -g dynamodb-data-types node-postgres-named
```