

## 05-2 IoT

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)

- **Internet of Things (IoT)** is when the Internet and networks expand to places such as manufacturing floors, energy grids, healthcare facilities, and transportation
- 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
- The **Internet of Things** represents an evolution in which objects are capable of interacting with other objects.
- Empower your business and gain a competitive edge by connecting data from devices and sensors with the cloud and business intelligence tools

Cisco

Techtarget

IBM

Microsoft

### IoT

Yoder

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

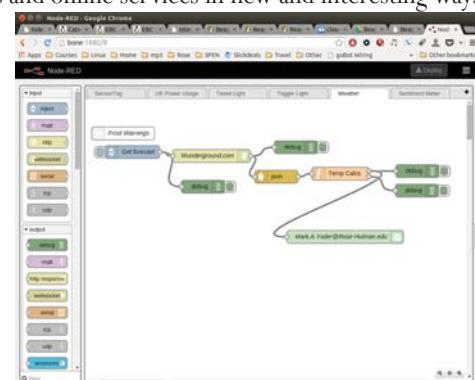
## 05-2 Node-RED

### 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

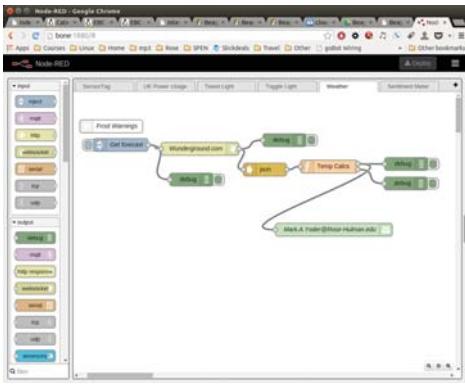
```
bone$ cd # Change to home directory
bone$ git clone https://github.com/node-red/node-red.git
bone$ cd node-red/
bone$ npm install --production
# almost 6 minutes
bone$ cd nodes
bone$ git clone https://github.com/node-red/node-red-nodes.git
# 2 seconds
```

## Running node-RED

```
bone$ cd ~/node-red
bone$ node red.js
Welcome to Node-RED
=====
18 Aug 16:31:43 - [red] Version: 0.8.1.git
18 Aug 16:31:43 - [red] Loading palette nodes
18 Aug 16:31:49 - [26-rawserial.js] Info : only really needed
for Windows boxes without serialport npm module installed.
18 Aug 16:31:56 - -----
18 Aug 16:31:56 - [red] Failed to register 44 node types
18 Aug 16:31:56 - [red] Run with -v for details
18 Aug 16:31:56 - -----
18 Aug 16:31:56 - [red] Server now running at http://127.0.0.1:1880/
18 Aug 16:31:56 - [red] Loading flows : flows_yoder-debian-
bone.json
```

## Accessing node-RED

- Point your browser to **192.168.7.2:1880**



## Node-RED Demo

- See cookbook for installing more nodes

```
bone$ apt-get install libbluetooth-dev
bone$ npm install -g sensortag
bone$ npm install -g badwords ntwitter oauth sentiment wordpos xml2js firmata
bone$ npm install -g fs.notify serialport feedparser pushbullet irc simple-xmpp
bone$ npm install -g redis mongodb node-stringprep
bone$ npm install -g imap js2xmlparser nodemailer arduino-firmata heatmiser wemo
bone$ npm install -g stomp-client wake_on_lan node-dweetio komponist nma growl
bone$ npm install -g node-prowl pusher pushover-notifications snapchat twilio
bone$ npm install -g node-hue-api level pusher-client mysql sqlite3 suncalc
bone$ npm install -g dynamodb-data-types node-postgres-named
```