Node-RED

A visual tool for wiring the Internet of Things

Presented By:
Greg Gorman, Director
IBM Watson Internet of Things Chief Developer Advocate
@gregorygorman

Inventors:
Nick O’Leary : @knolleary
Dave Conway-Jones : @ceejay

What's the Problem ?

The Internet of Things does not have a one-size-fits-all solution.

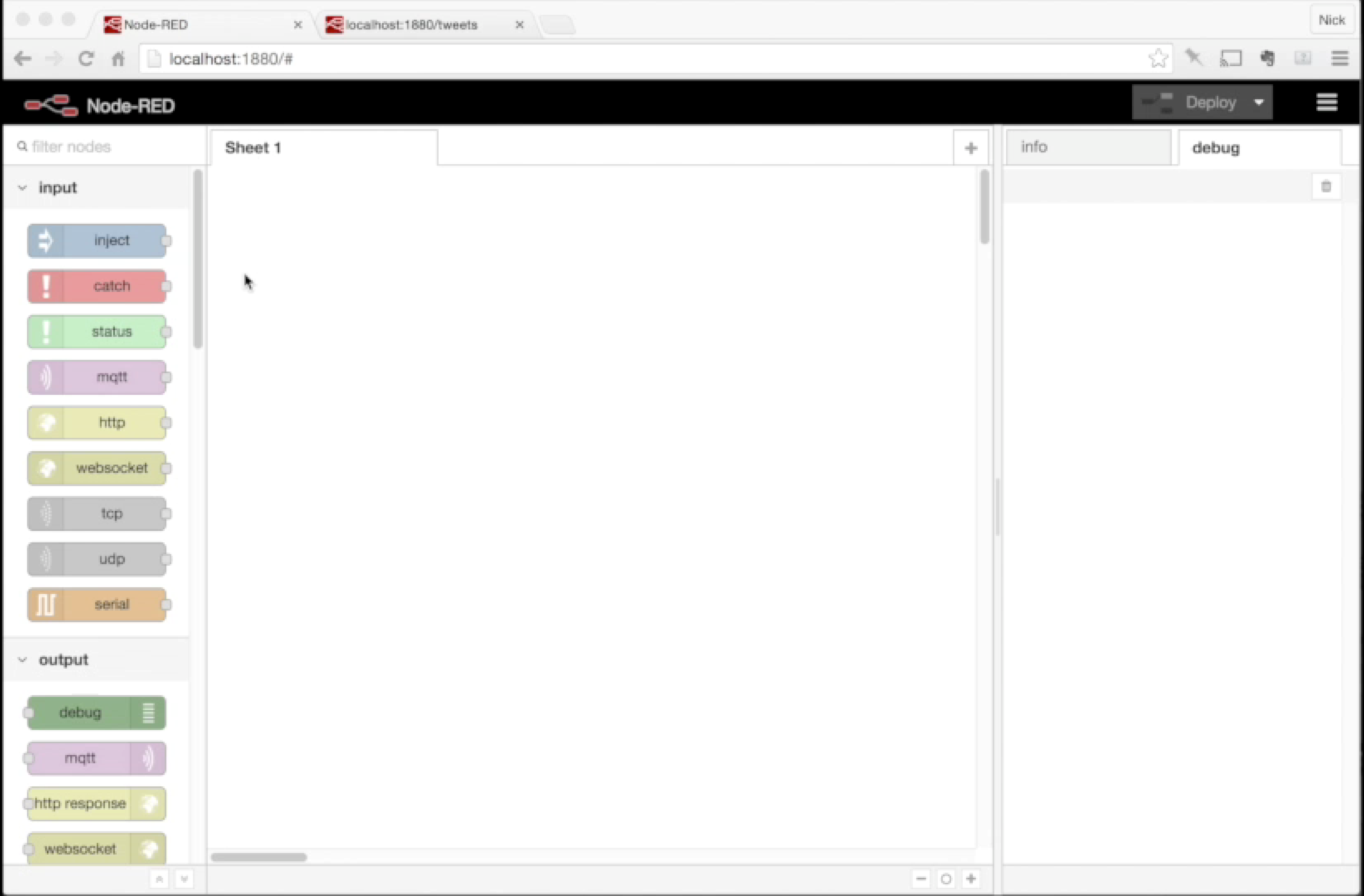
Internet of Things solutions often require pulling together different device APIs and online services in new and interesting ways.

Time spent figuring out how to access a Serial port, or to complete an OAuth flow against Twitter is not time spent on creating the real value of a solution, and is not easy for anyone but dedicated programmers.

We need tools that make it easier for developers at all levels to bring together the different streams of events, both physical and digital, that make up the Internet of Things.

Standards are great – but rarely only need just one…

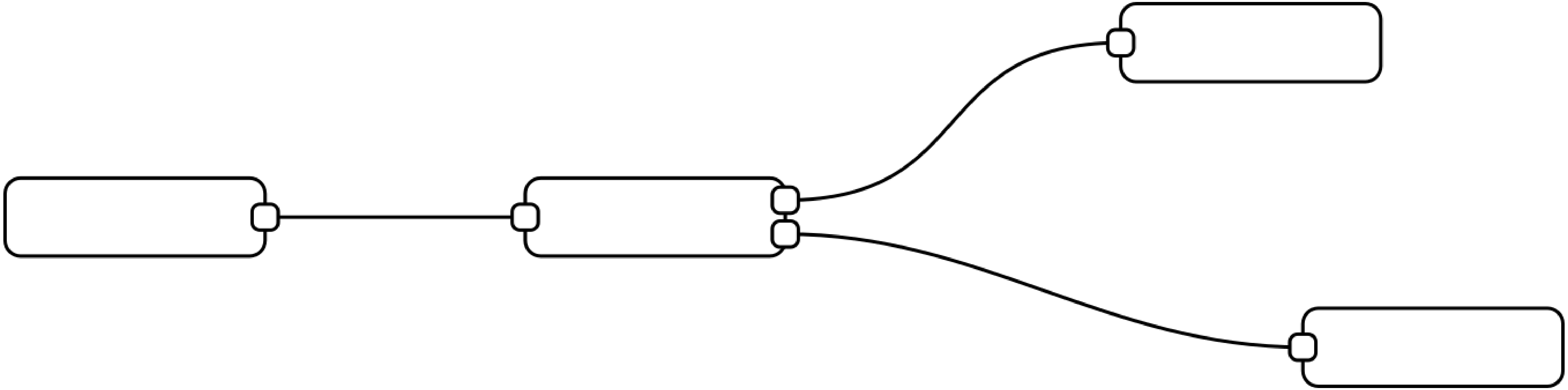
Wouldn’t it be handy if, when X happens over there, it can alert the team, kick-off that business process or just go ping!

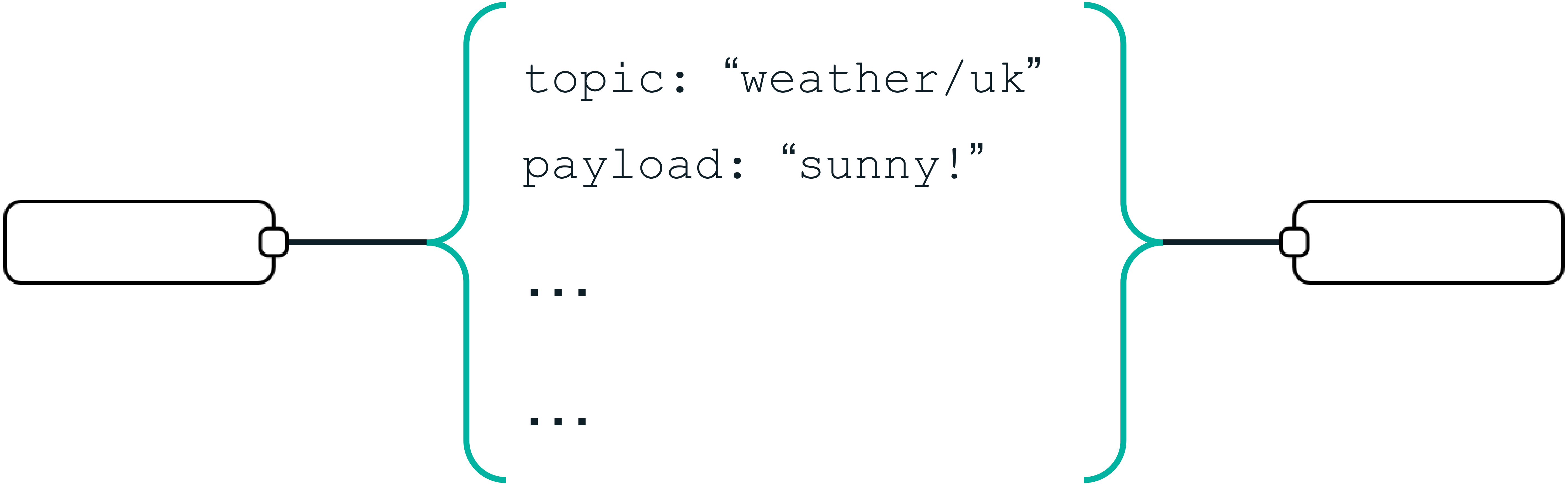
Node-RED
localhost:1880/tweets
Nick
localhost:1880/#
Node-RED
Deploy
filter nodes
Sheet 1
info
debug
input
inject
catch
status
mqtt
http
websocket
tcp
udp
serial
output
debug
mqtt
http response
websocket

What is a Node-RED flow ?

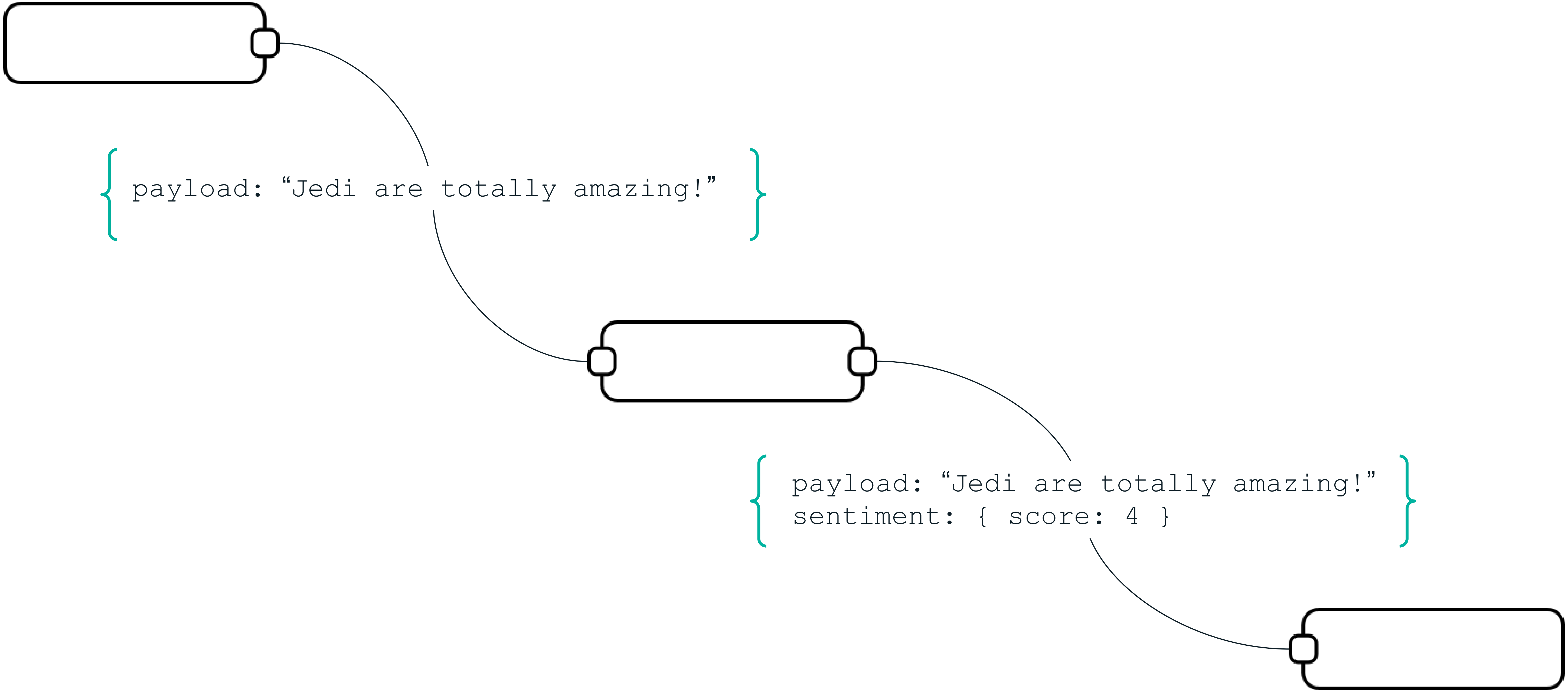
Flow-based Programming

- Invented by J. Paul Morrison at IBM in the early 1970’s
- A network of asynchronous processes communicating by means of streams of structured data chunks
- Each process is a black box – it doesn’t know what has come before it, or what comes after it; it just acts on the data it receives and passes the result on



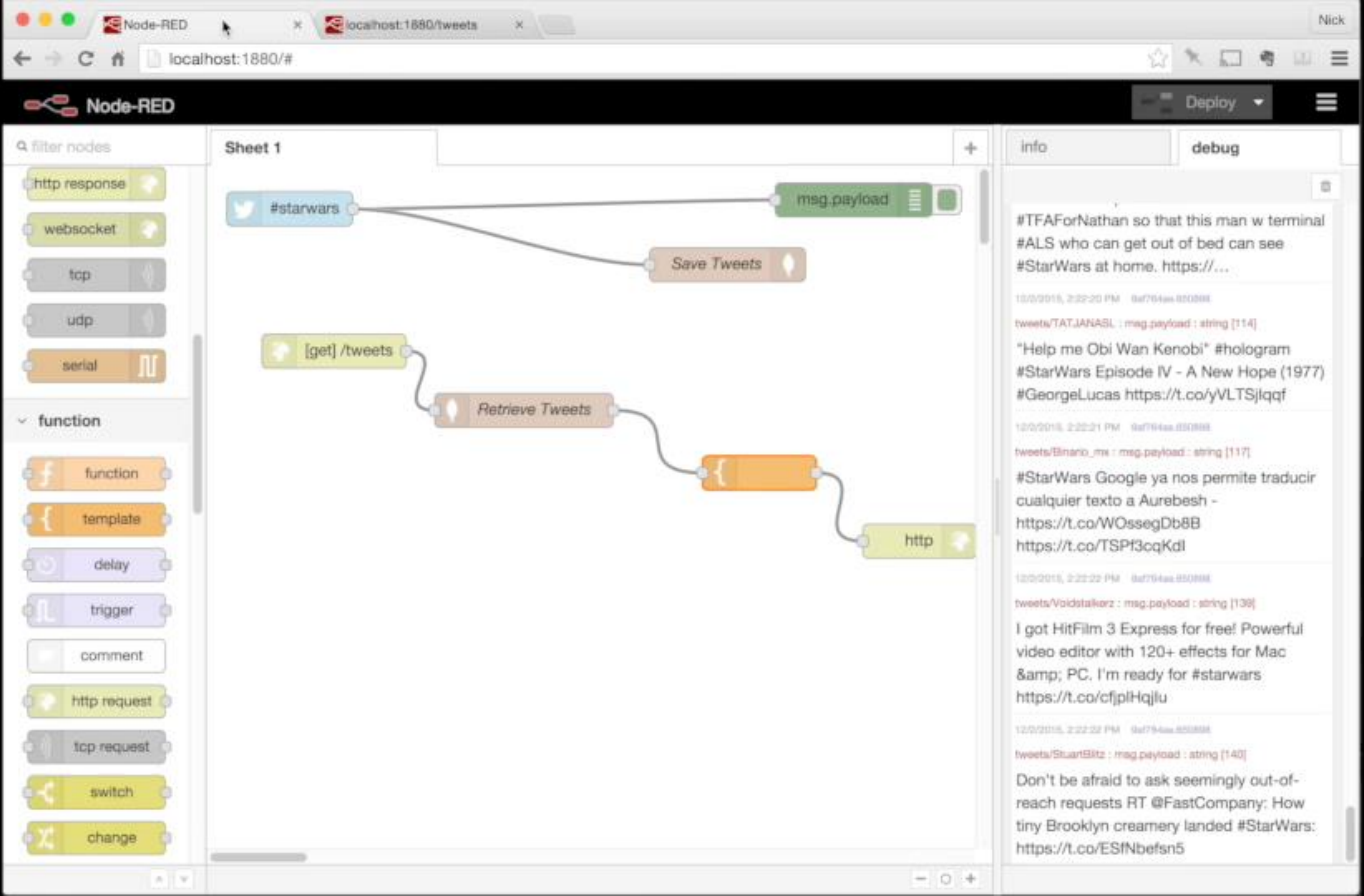


```
topic: "weather/uk"
payload: "sunny!"

...

...
```



```
{ payload: “Jedi are totally amazing!” }
```

```
{ payload: “Jedi are totally amazing!”
  sentiment: { score: 4 } }
```



#TFAForNathan so that this man w terminal #ALS who can get out of bed can see #StarWars at home. https://…

12/2/2015, 2:22:20 PM 8af764ae.850888

tweets/TATJANASL : msg.payload : string [114]

"Help me Obi Wan Kenobi" #hologram #StarWars Episode IV - A New Hope (1977) #GeorgeLucas https://t.co/yVLTSjlqqf

12/2/2015, 2:22:21 PM 8af764ae.850888

tweets/Binario_mx : msg.payload : string [117]

#StarWars Google ya nos permite traducir cualquier texto a Aurebesh - https://t.co/WOssegDb8B https://t.co/TSPf3cqKdl

12/2/2015, 2:22:22 PM 8af764ae.850888

tweets/Voidstalkerz : msg.payload : string [139]

I got HitFilm 3 Express for free! Powerful video editor with 120+ effects for Mac &amp; PC. I'm ready for #starwars https://t.co/cfjplHqjlu

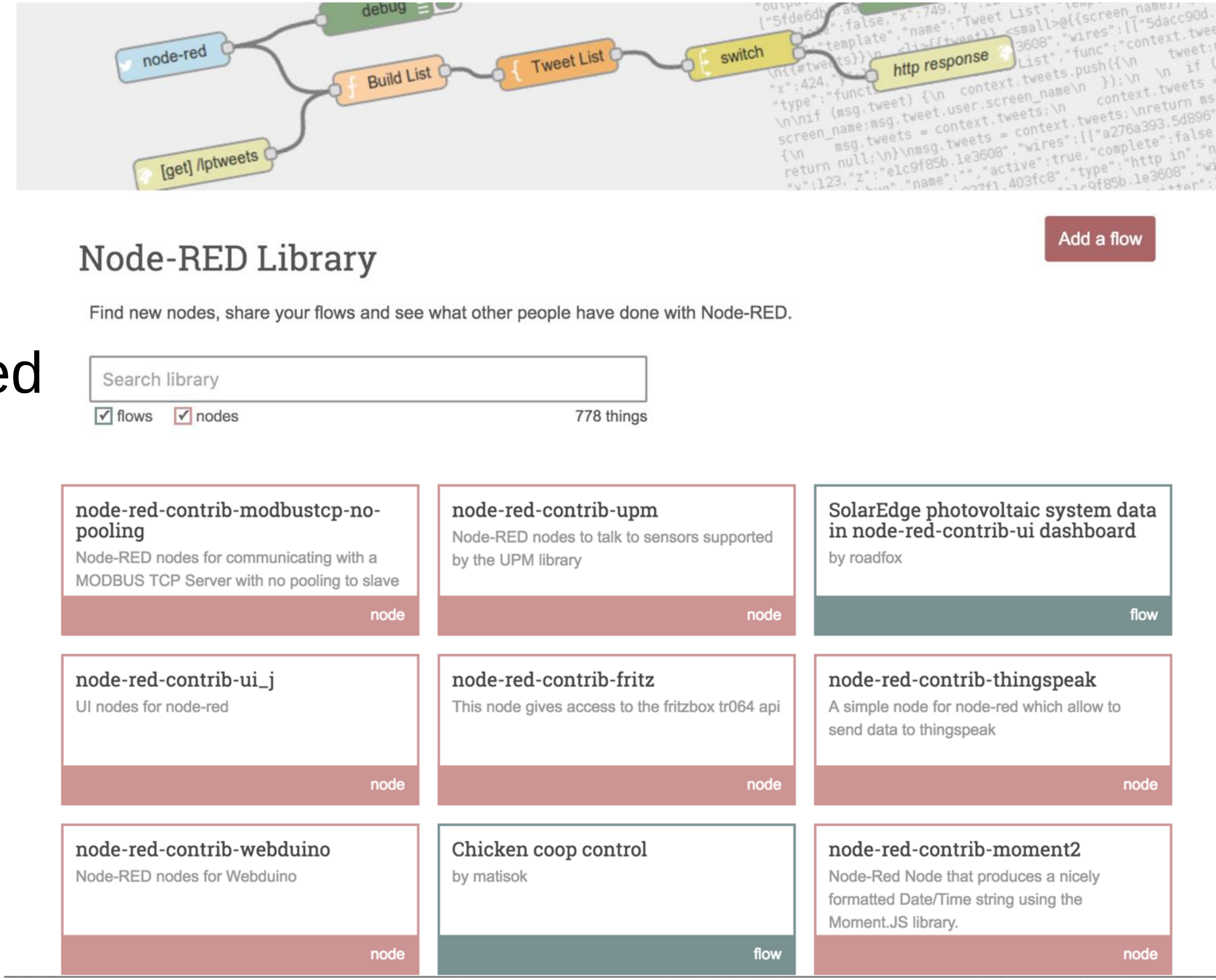
12/2/2015, 2:22:22 PM 8af764ae.850888

tweets/StuartBlitz : msg.payload : string [140]

Don't be afraid to ask seemingly out-of-reach requests RT @FastCompany: How tiny Brooklyn creamery landed #StarWars: https://t.co/ESfNbefsn5

flows.nodered.org

- Index of all available nodes
- Collection of user-contributed flows
- 1000+ modules available



Node-RED Library

Find new nodes, share your flows and see what other people have done with Node-RED.

Search library

☑ flows ☑ nodes 778 things

node-red-contrib-modbustcp-no-pooling
Node-RED nodes for communicating with a MODBUS TCP Server with no pooling to slave
node

node-red-contrib-upm
Node-RED nodes to talk to sensors supported by the UPM library
node

SolarEdge photovoltaic system data in node-red-contrib-ui dashboard
by roadfox
flow

node-red-contrib-ui_j
UI nodes for node-red
node

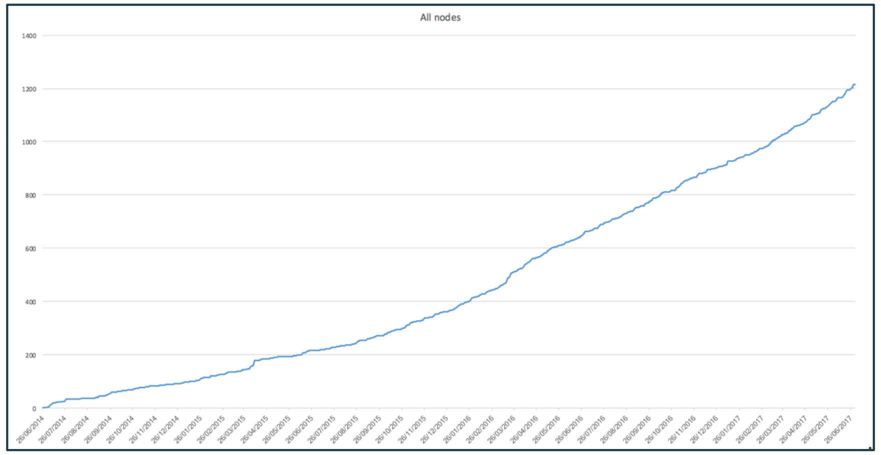
node-red-contrib-fritz
This node gives access to the fritzbox tr064 api
node

node-red-contrib-thingspeak
A simple node for node-red which allow to send data to thingspeak
node

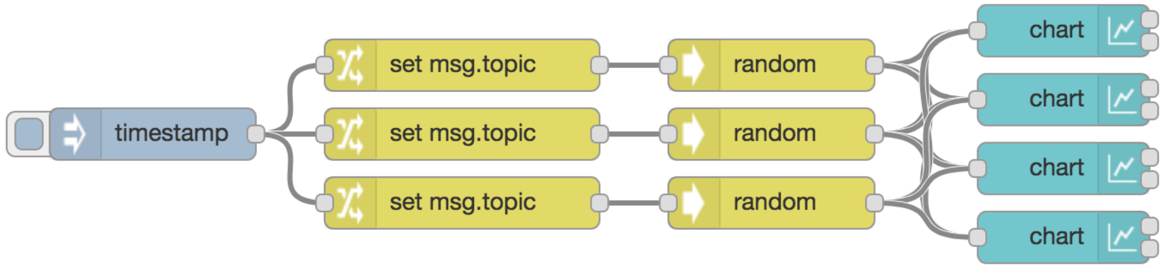
node-red-contrib-webduino
Node-RED nodes for Webduino
node

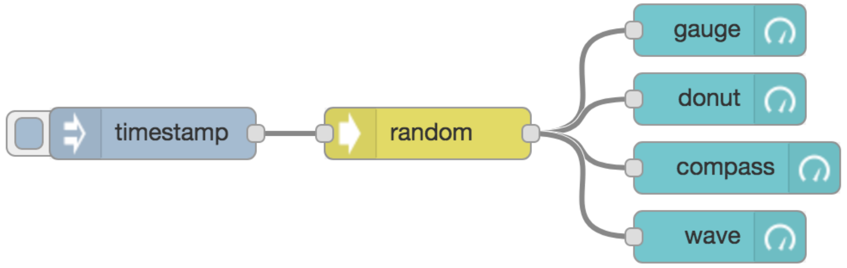
Chicken coop control
by matisok
flow

node-red-contrib-moment2
Node-Red Node that produces a nicely formatted Date/Time string using the Moment.JS library.
node



Node-RED Dashboard





Provides a set of nodes that represent a variety of UI widgets.

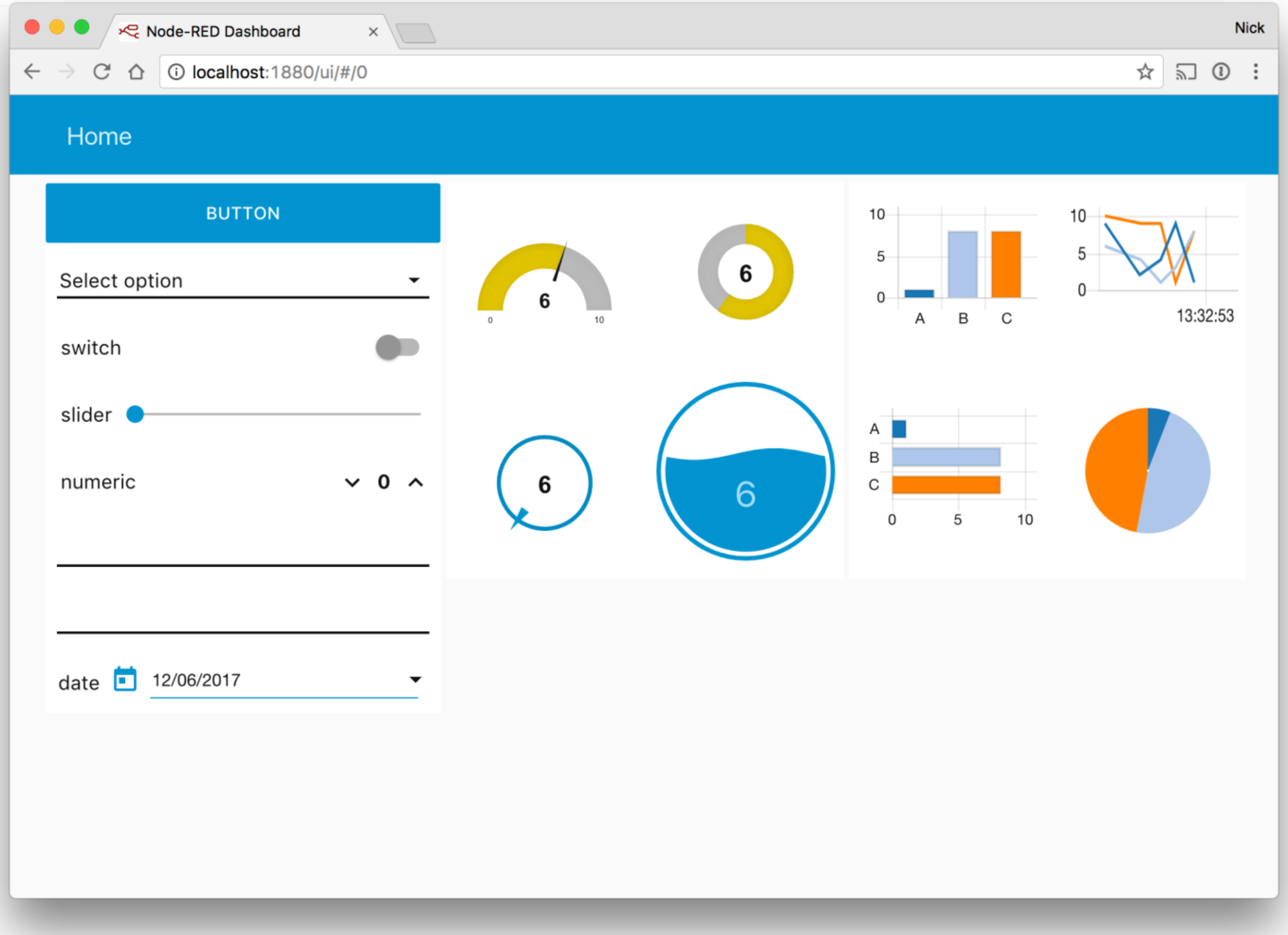
They can be wired into flows to:

send data to the dashboard – eg charts

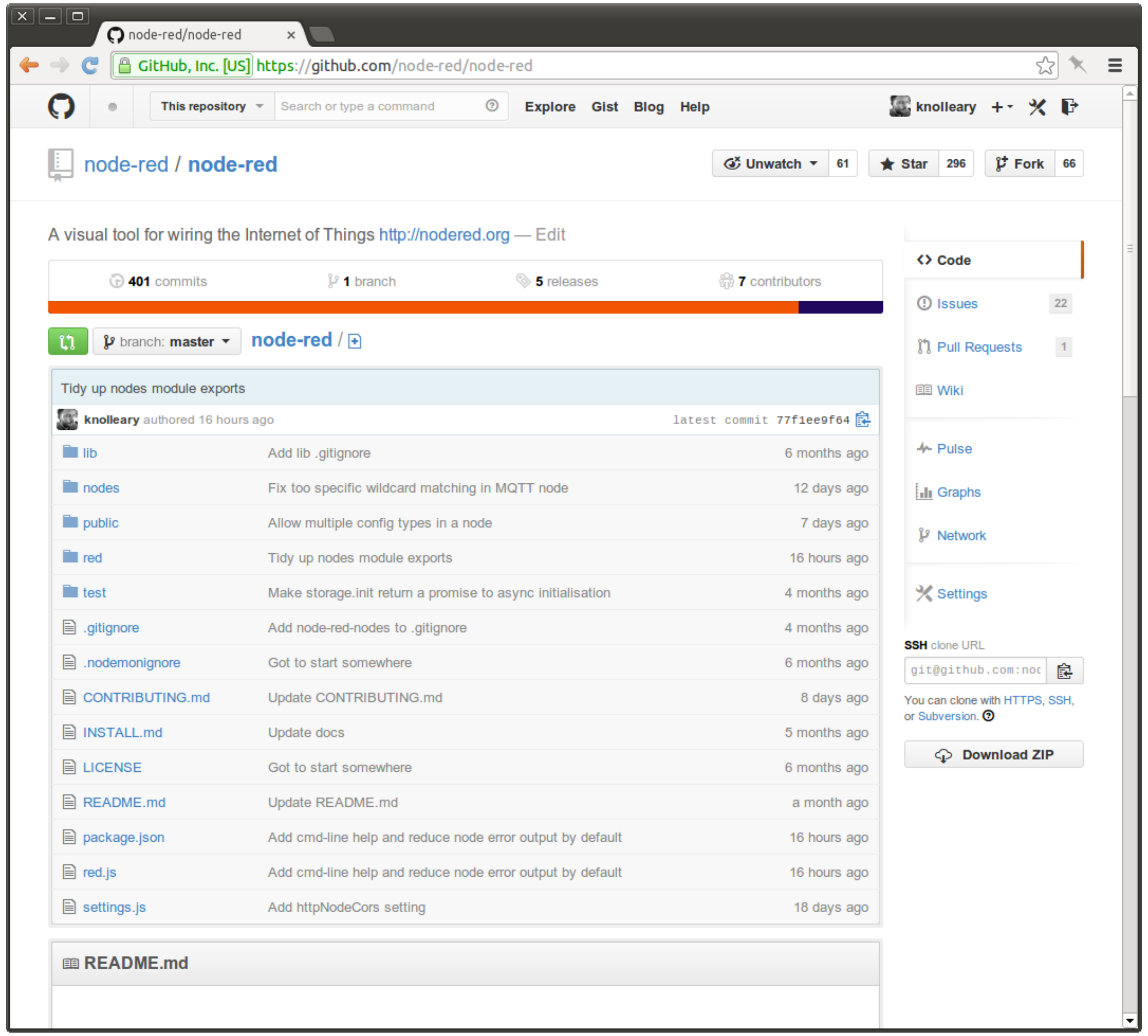
respond to events on the dashboard – eg buttons

Opinionated dashboard style with some customization options

Ideal for quickly producing an interactive dashboard



Open Source Development



node-red / node-red

A visual tool for wiring the Internet of Things http://nodered.org — Edit

401 commits · 1 branch · 5 releases · 7 contributors

node-red /

Tidy up nodes module exports

knolleary authored 16 hours ago · latest commit 77f1ee9f64

lib	Add lib .gitignore	6 months ago
nodes	Fix too specific wildcard matching in MQTT node	12 days ago
public	Allow multiple config types in a node	7 days ago
red	Tidy up nodes module exports	16 hours ago
test	Make storage.init return a promise to async initialisation	4 months ago
.gitignore	Add node-red-nodes to .gitignore	4 months ago
.nodemonignore	Got to start somewhere	6 months ago
CONTRIBUTING.md	Update CONTRIBUTING.md	8 days ago
INSTALL.md	Update docs	5 months ago
LICENSE	Got to start somewhere	6 months ago
README.md	Update README.md	a month ago
package.json	Add cmd-line help and reduce node error output by default	16 hours ago
red.js	Add cmd-line help and reduce node error output by default	16 hours ago
settings.js	Add httpNodeCors setting	18 days ago

SSH clone URL

git@github.com:noc

You can clone with HTTPS, SSH, or Subversion.

README.md

- Released on GitHub September 2013
- Made a project of the JS Foundation in October 2016
- Apache 2 License
- Pull-requests accepted under **Contributor License Agreement**
- Active Google Group and Slack channel
- http://nodered.org
- http://flows.nodered.org
  - Online flow library for examples
  - Encourages sharing and reuse of flows within the community

Get started today

Install it locally and get wiring

```
$ sudo npm install -g --unsafe-perm node-red
$ node-red
```

Recommend: node.js 4.x & npm 2.x

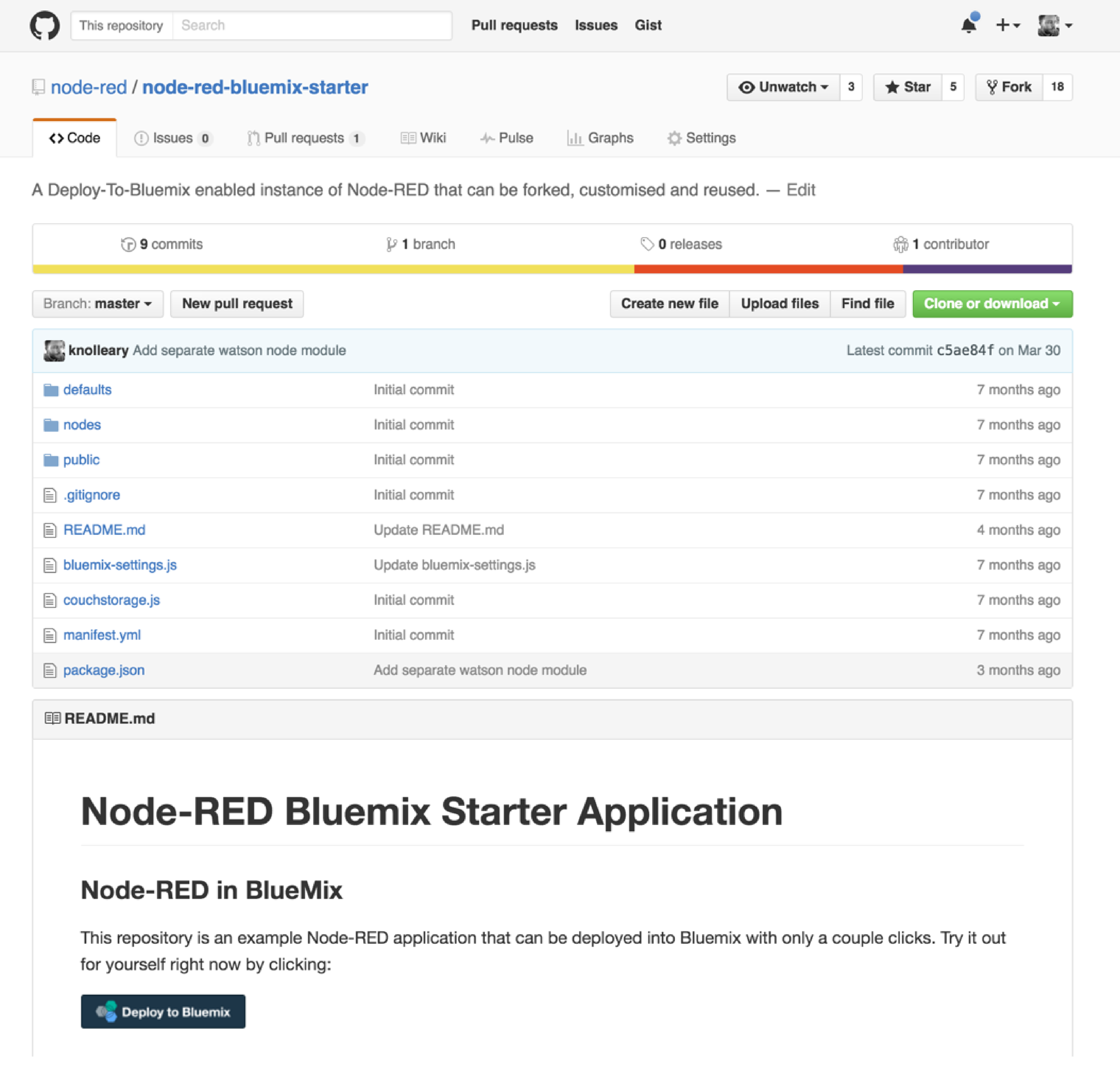
```
$ docker run -p 1880:1880 nodered/node-red-docker
```

Deploy to Bluemix enabled

1. Clone
2. Customise
3. Deploy

https://github.com/ibmets/node-red-bluemix-starter

IBM



node-red / node-red-bluemix-starter

A Deploy-To-Bluemix enabled instance of Node-RED that can be forked, customised and reused. — Edit

9 commits · 1 branch · 0 releases · 1 contributor

knolleary Add separate watson node module — Latest commit c5ae84f on Mar 30

defaults	Initial commit	7 months ago
nodes	Initial commit	7 months ago
public	Initial commit	7 months ago
.gitignore	Initial commit	7 months ago
README.md	Update README.md	4 months ago
bluemix-settings.js	Update bluemix-settings.js	7 months ago
couchstorage.js	Initial commit	7 months ago
manifest.yml	Initial commit	7 months ago
package.json	Add separate watson node module	3 months ago

README.md

Node-RED Bluemix Starter Application

Node-RED in BlueMix

This repository is an example Node-RED application that can be deployed into Bluemix with only a couple clicks. Try it out for yourself right now by clicking:

Online resources

https://cookbook.nodered.org

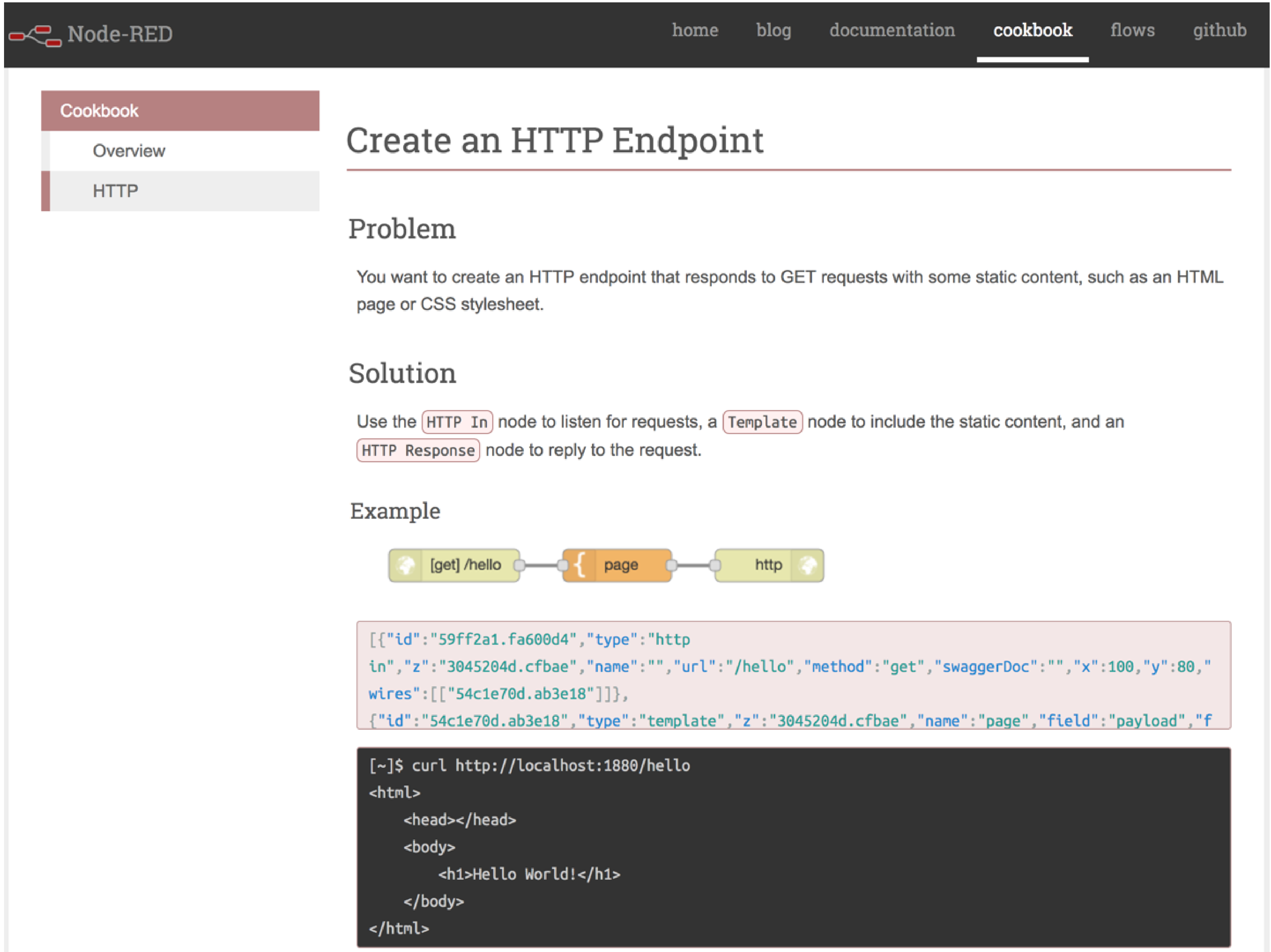
Node-RED Cookbook

New initiative for 2017.

Task-oriented documentation.

Starting with HTTP based recipes.

Lots of content still to write – contributors welcome! Join the #docs channel on Slack



Create an HTTP Endpoint

Problem

You want to create an HTTP endpoint that responds to GET requests with some static content, such as an HTML page or CSS stylesheet.

Solution

Use the `HTTP In` node to listen for requests, a `Template` node to include the static content, and an `HTTP Response` node to reply to the request.

Example

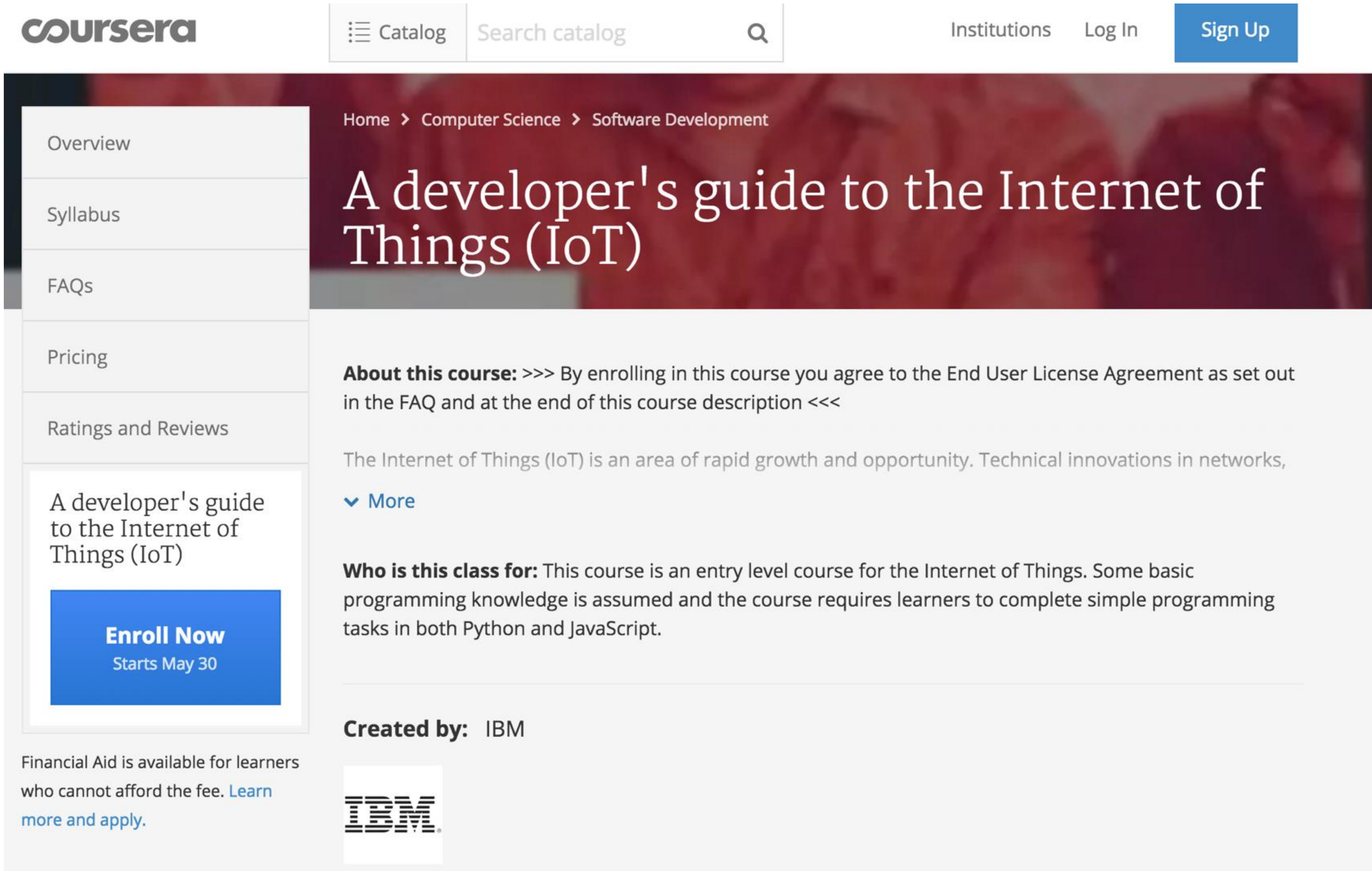
```
[{"id":"59ff2a1.fa600d4","type":"http
in","z":"3045204d.cfbae","name":"","url":"/hello","method":"get","swaggerDoc":"","x":100,"y":80,"
wires":[["54c1e70d.ab3e18"]]},
{"id":"54c1e70d.ab3e18","type":"template","z":"3045204d.cfbae","name":"page","field":"payload","f
```

```
[~]$ curl http://localhost:1880/hello
<html>
    <head></head>
    <body>
        <h1>Hello World!</h1>
    </body>
</html>
```

https://www.coursera.org/learn/developer-iot

Coursera – A developer’s guide to the Internet of Things

Learn about IoT and Node-RED over a 4 week online course



A developer's guide to the Internet of Things (IoT)

A developer's guide to the Internet of Things (IoT)

Financial Aid is available for learners who cannot afford the fee. Learn more and apply.

About this course: >>> By enrolling in this course you agree to the End User License Agreement as set out in the FAQ and at the end of this course description <<<

The Internet of Things (IoT) is an area of rapid growth and opportunity. Technical innovations in networks,

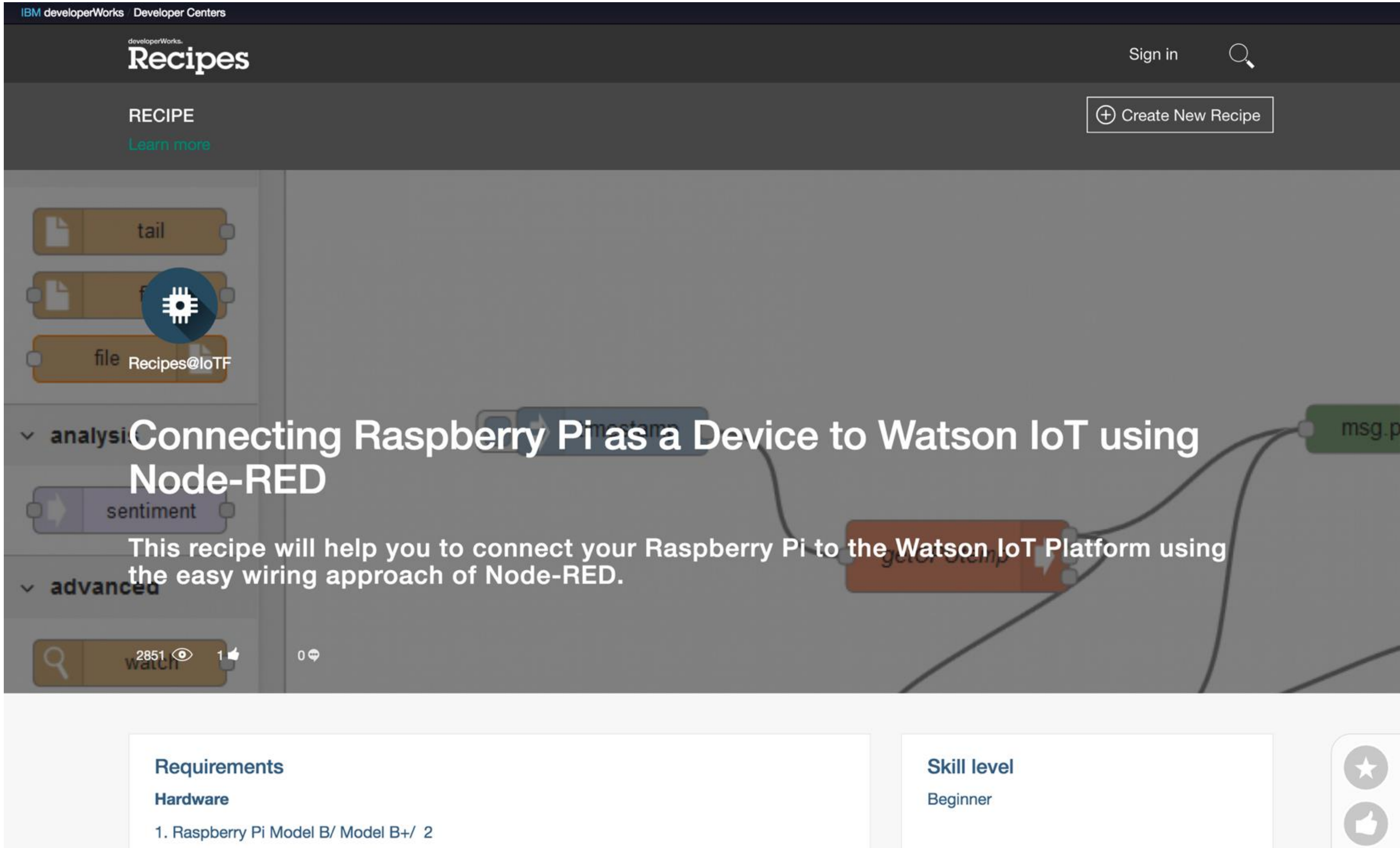
Who is this class for: This course is an entry level course for the Internet of Things. Some basic programming knowledge is assumed and the course requires learners to complete simple programming tasks in both Python and JavaScript.

Created by: IBM

https://developer.ibm.com/recipes/

IBM developerWorks Recipes

Lots of contributed recipes for connecting things to Watson IOT platform - many using Node-RED



IBM developerWorks Developer Centers

developerWorks Recipes

Sign in

RECIPE

Learn more

Create New Recipe

Recipes@IoTF

Connecting Raspberry Pi as a Device to Watson IoT using Node-RED

This recipe will help you to connect your Raspberry Pi to the Watson IoT Platform using the easy wiring approach of Node-RED.

2851 1 0

Requirements

Hardware

1. Raspberry Pi Model B/ Model B+/ 2

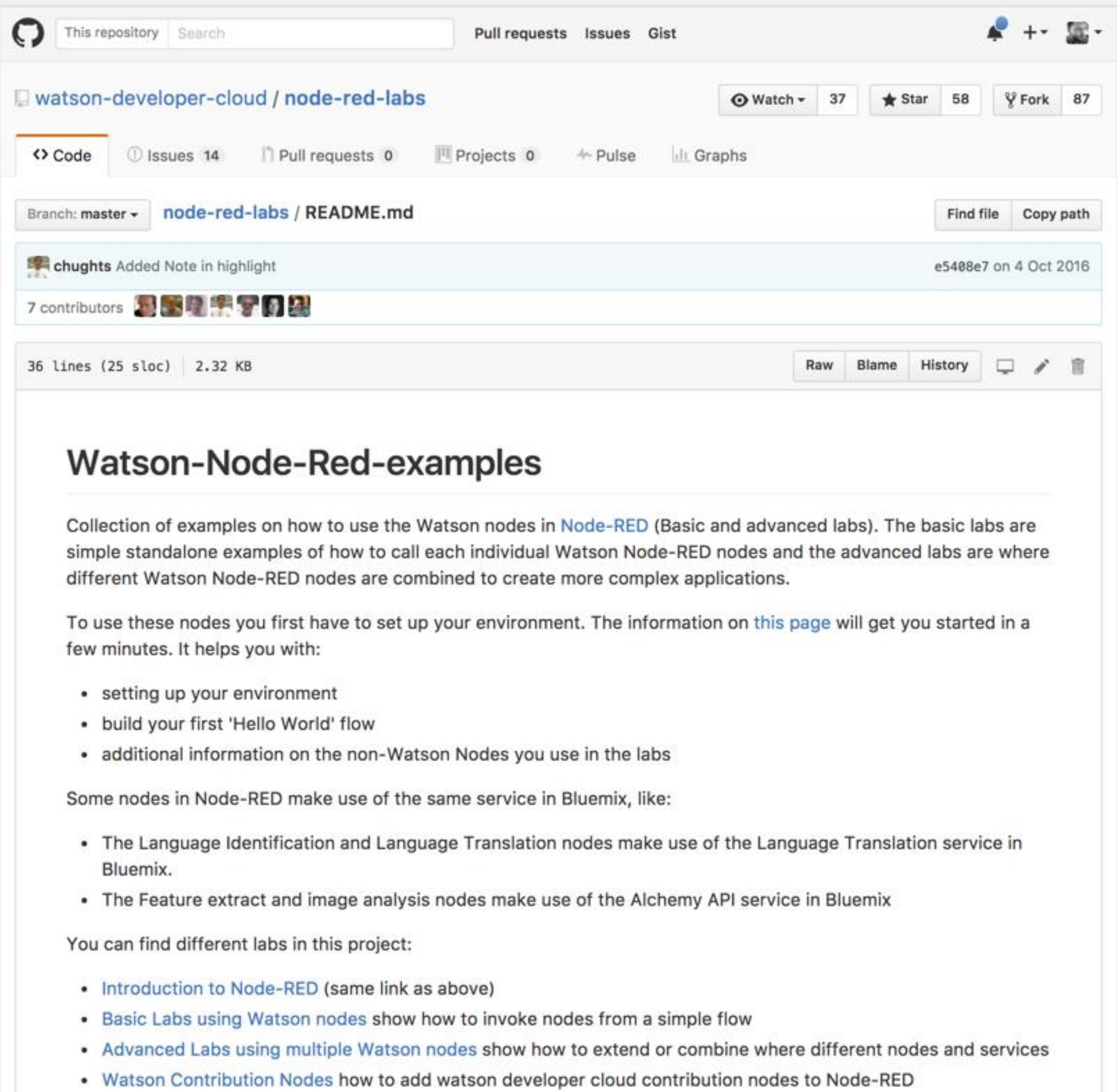
Skill level

Beginner

https://github.com/watson-developer-cloud/node-red-labs

Watson Developer Cloud
- Node-RED Labs

Worked examples for many of the IBM Watson services available in Bluemix



Watson-Node-Red-examples

Collection of examples on how to use the Watson nodes in Node-RED (Basic and advanced labs). The basic labs are simple standalone examples of how to call each individual Watson Node-RED nodes and the advanced labs are where different Watson Node-RED nodes are combined to create more complex applications.

To use these nodes you first have to set up your environment. The information on this page will get you started in a few minutes. It helps you with:

- setting up your environment
- build your first 'Hello World' flow
- additional information on the non-Watson Nodes you use in the labs

Some nodes in Node-RED make use of the same service in Bluemix, like:

- The Language Identification and Language Translation nodes make use of the Language Translation service in Bluemix.
- The Feature extract and image analysis nodes make use of the Alchemy API service in Bluemix

You can find different labs in this project:

- Introduction to Node-RED (same link as above)
- Basic Labs using Watson nodes show how to invoke nodes from a simple flow
- Advanced Labs using multiple Watson nodes show how to extend or combine where different nodes and services
- Watson Contribution Nodes how to add watson developer cloud contribution nodes to Node-RED

www.nodered.org

@NodeRED