

Node-RED

A Visual Tool for Wiring the Internet of Things

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IBM Emerging Technology



Why **Node-RED**

We have

- Processors for editing Words

- Spreadsheets for working with Numbers

- Powerpoint for arranging Pictures and Ideas

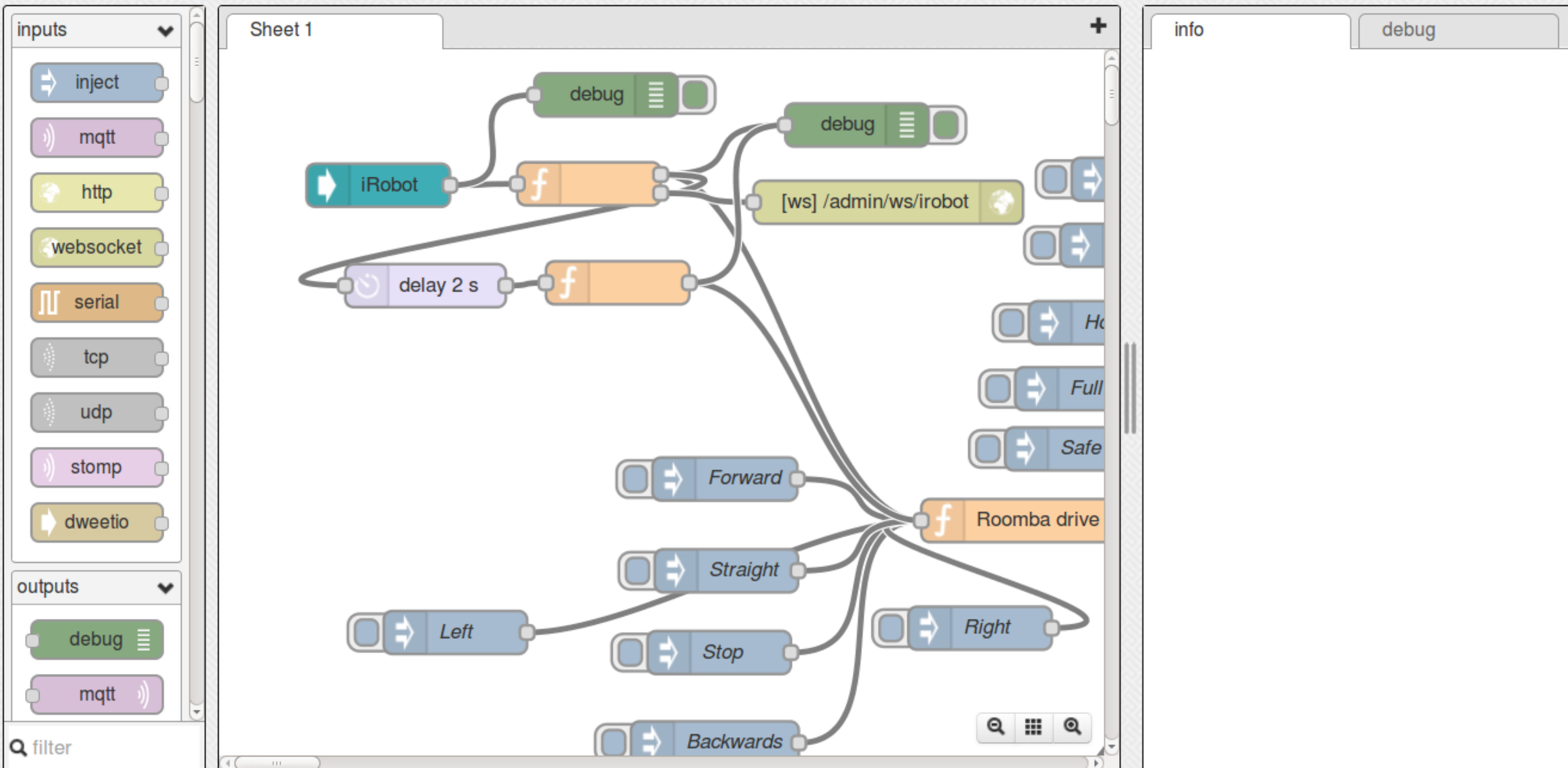
Why **Node-RED**

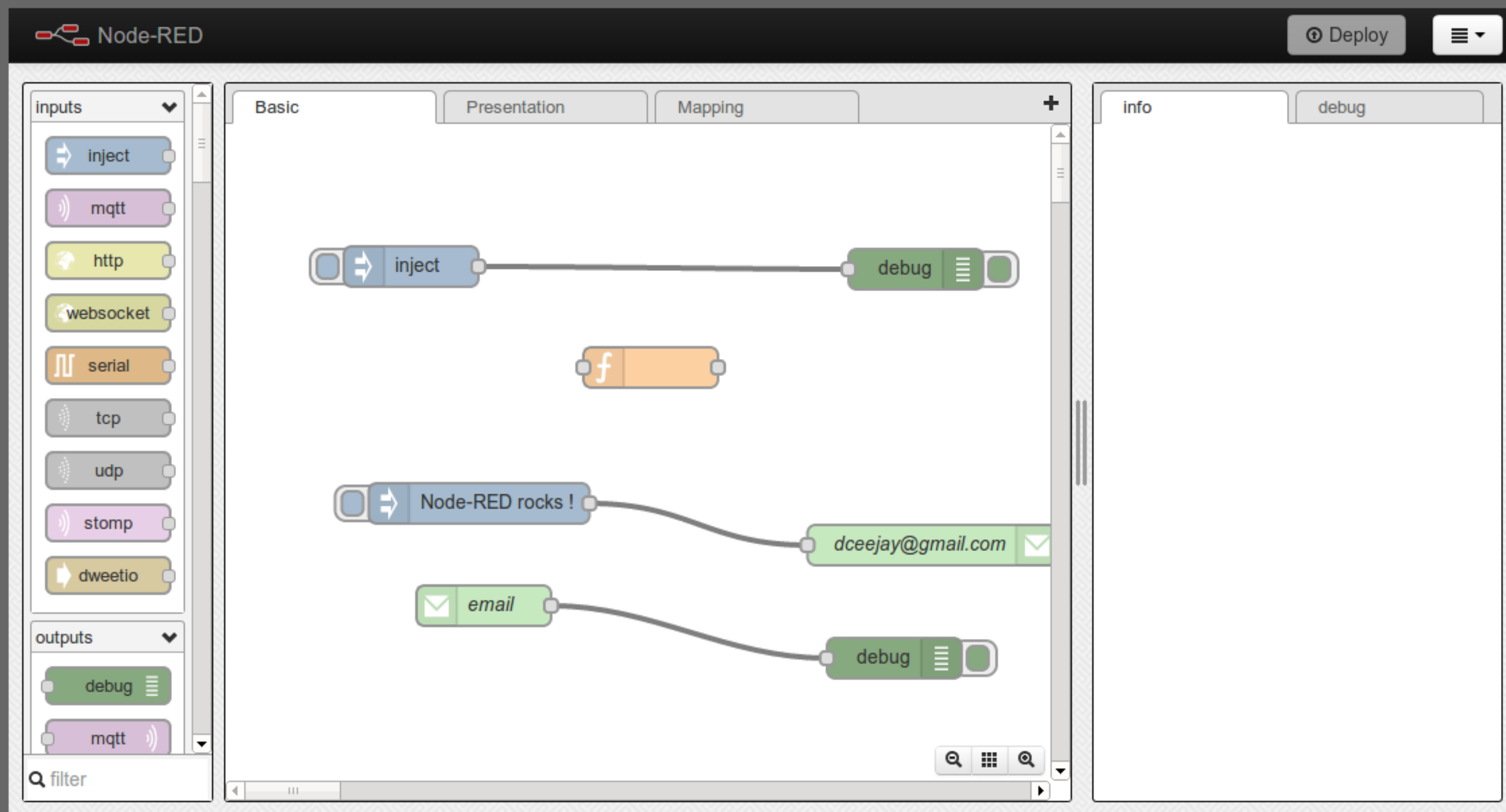
The Internet of Things does not have a one-size-fits-all solution

- Solutions often require pulling together several 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.
- Every new "Thing" has a new API that must be understood.

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.

... **Node-RED** can fill that gap





Node-RED is

an application composition tool.

a lightweight proof of concept runtime.

easy to use for simple tasks.

simple to extend to add new capabilities and types of integration.

capable of creating the back-end glue between social applications.

a great way to try ...

“can I just get this data from here to here ?”

“...and change it slightly on the way”

Node-RED is NOT

an enterprise strength application runtime.

a dashboard with widgets.

a mobile application builder.

the answer to life the universe and everything...

... not yet anyway.

Node-RED is already capable of connecting
to many things, including:

Inject node

Allows manual triggering of flows

Can be scheduled to automatically inject at fixed intervals

Debug node

Shows message content, either just payload or entire object in the debug sidebar

Function node

Runs user-defined js against the messages flowing past

Template node

Renders messages into a `{{mustache}}` template

TCP/UDP nodes

Connects out, or listens for incoming connections

Logic nodes

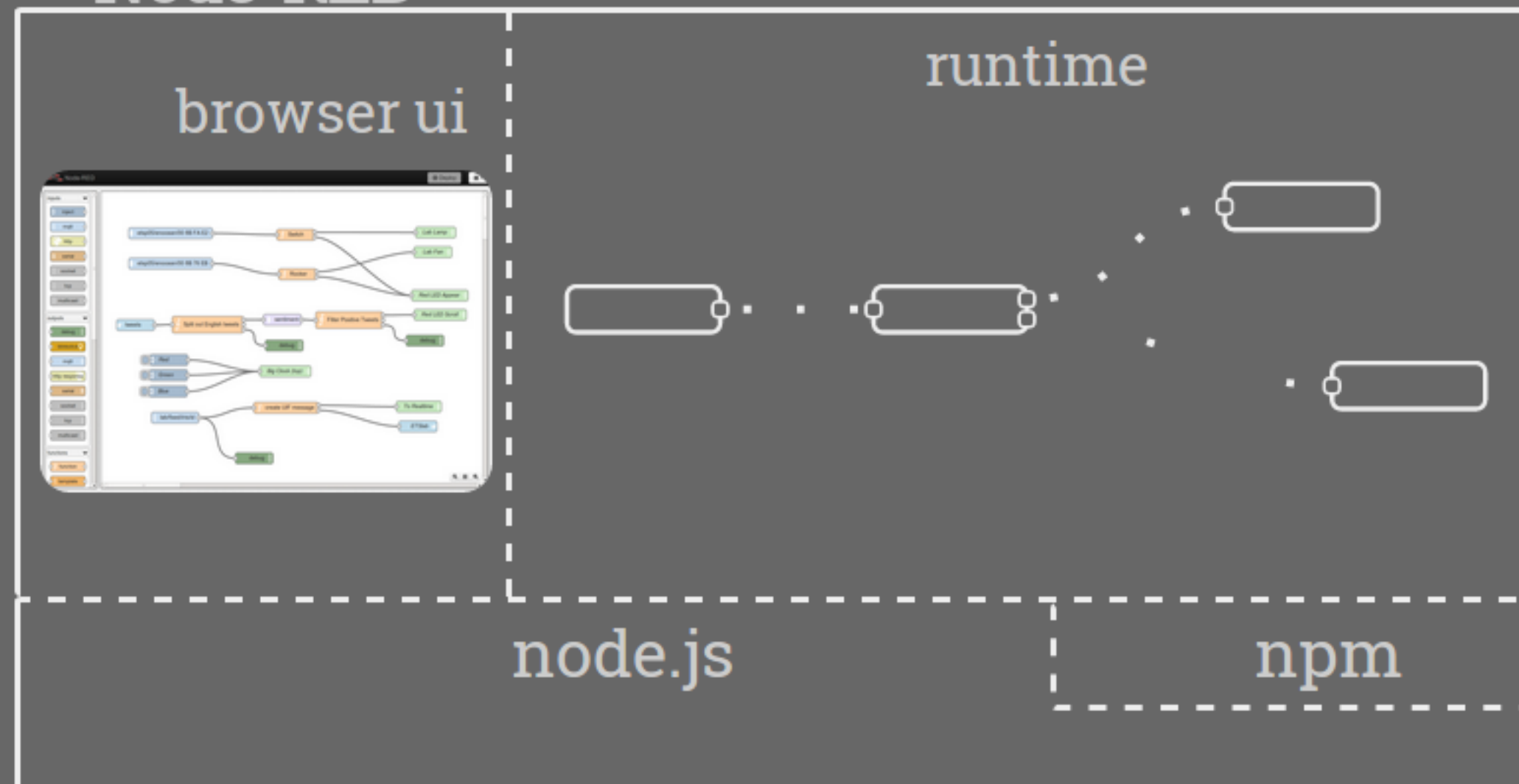
Comparisons, re-scaling, re-mapping

HTTP nodes

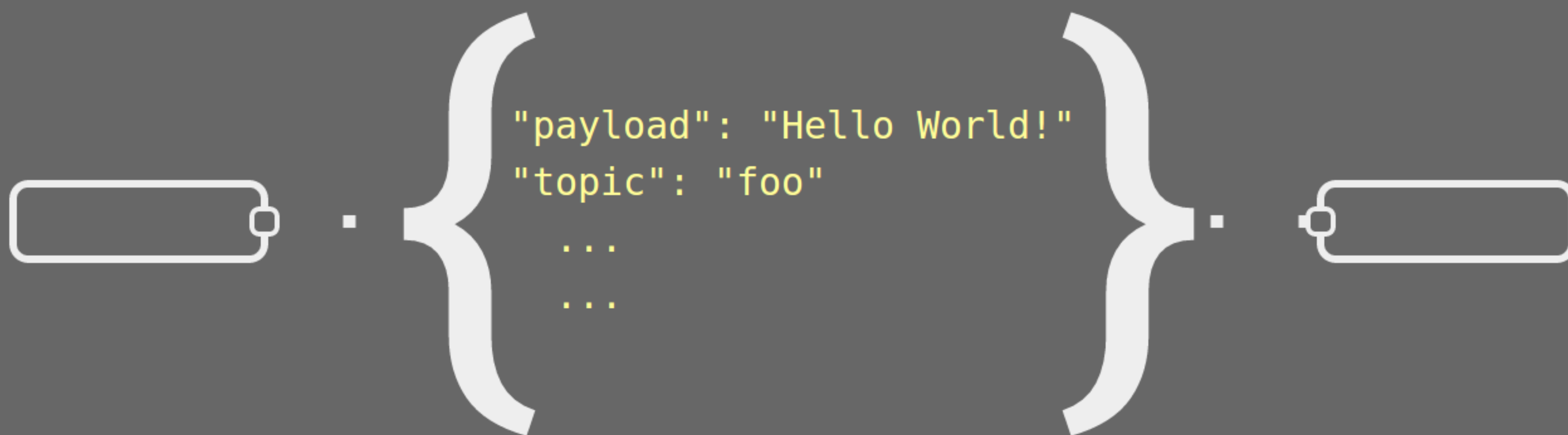
Define http endpoints for incoming requests, or trigger gets of urls in the middle of a flow

MQTT Nodes

Node-RED



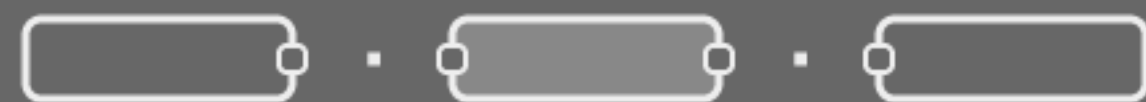
- node.js, v8 engine - fast
- event driven, asynchronous io - it's all about events
- single threaded, event queue - great for fairness
- javascript front and back - only the one language



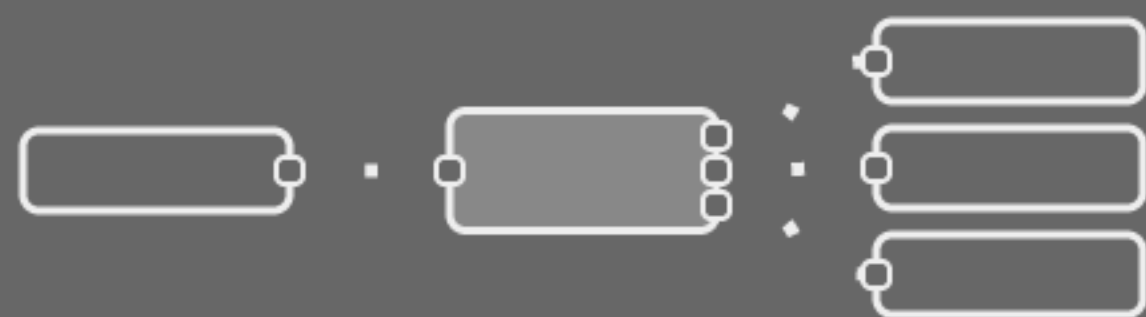
Function Node

Returning messages

```
return msg;
```



```
return [msg1, msg2, msg3];
```



```
return [msg1, [msgA, msgB] ];
```



Easy to wrap any npm module into a palette node*

Each node defined in a pair of files:

`.js` : server-side behaviour

`.html` : appearance in editor & help

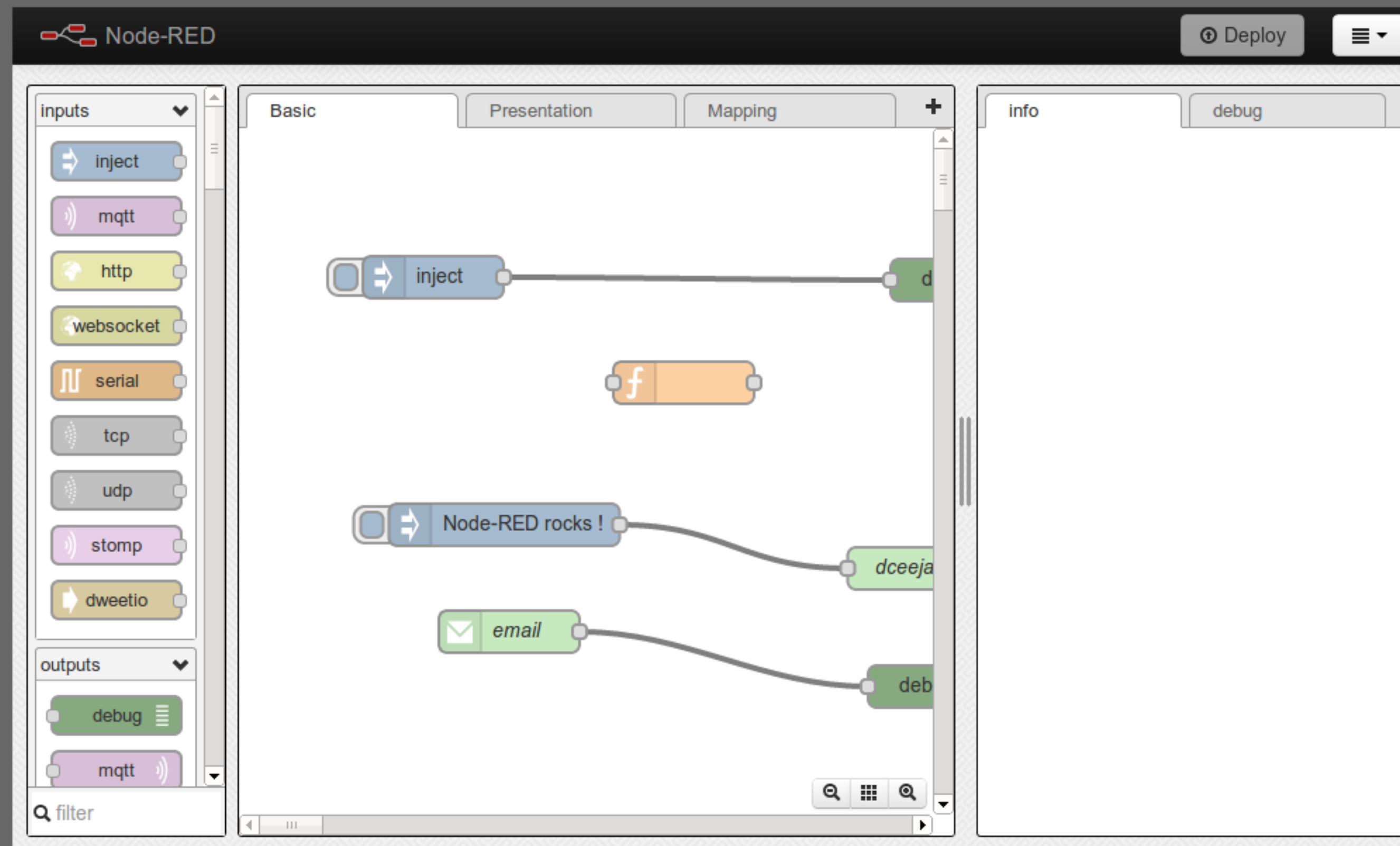
* once we get the API documented

What's this ?

```
{"topic":"PowerMeter/CC/dcj","payload":"261","qos":0,"retain":false}
```

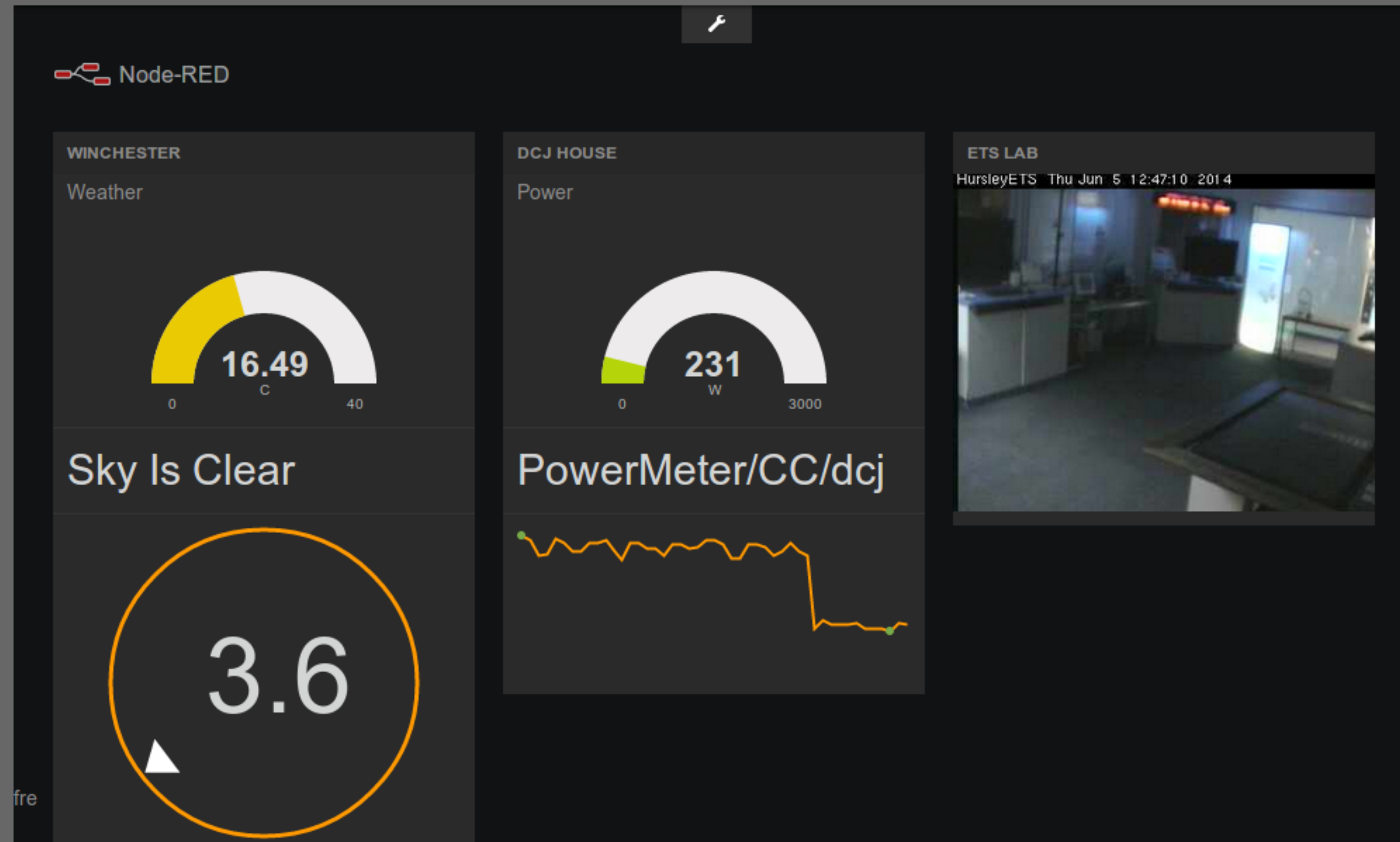
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*pssst - do the next demo

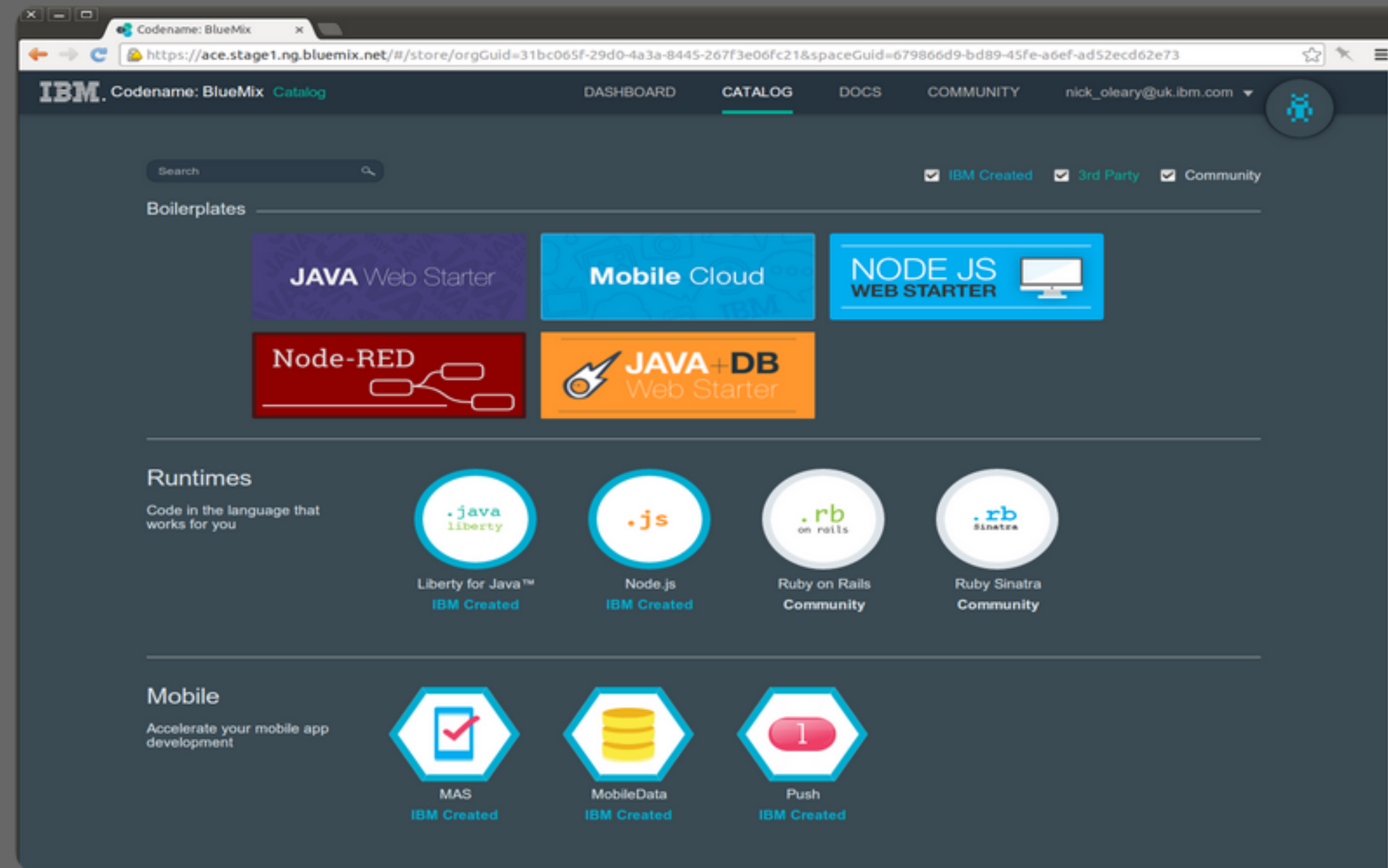


06月05日20時45分現在、IBM大和周辺半径1000メートルでは、2%の地域で並の雨が、78%の地域で弱い雨が降っています。20%の地域で雨が降っていません。<http://t.co/nEkHwt4gqo> #yamato #tenki

Live Dashboards



Node-RED in Bluemix



Wiring the internet of things

App Developers

- Rapid prototyping
- Easy to integrate with existing tools and applications
- Easy to extend with richer/bespoke functionality

New developers and education

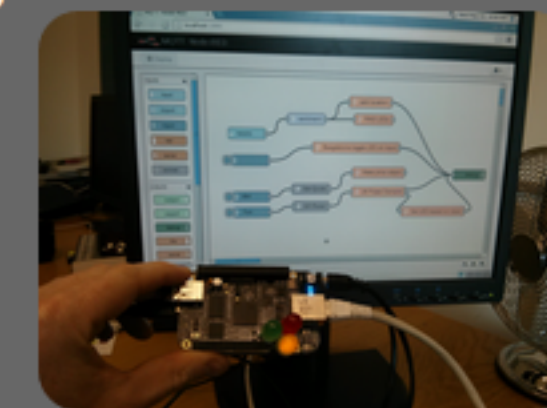
- Short learning curve
- Easy to use
- Low barrier to entry

Hardware Hackers

- Runs on Raspberry Pi, Beaglebone, other low power devices.
- Works with Arduino, etc
- Easy to add devices

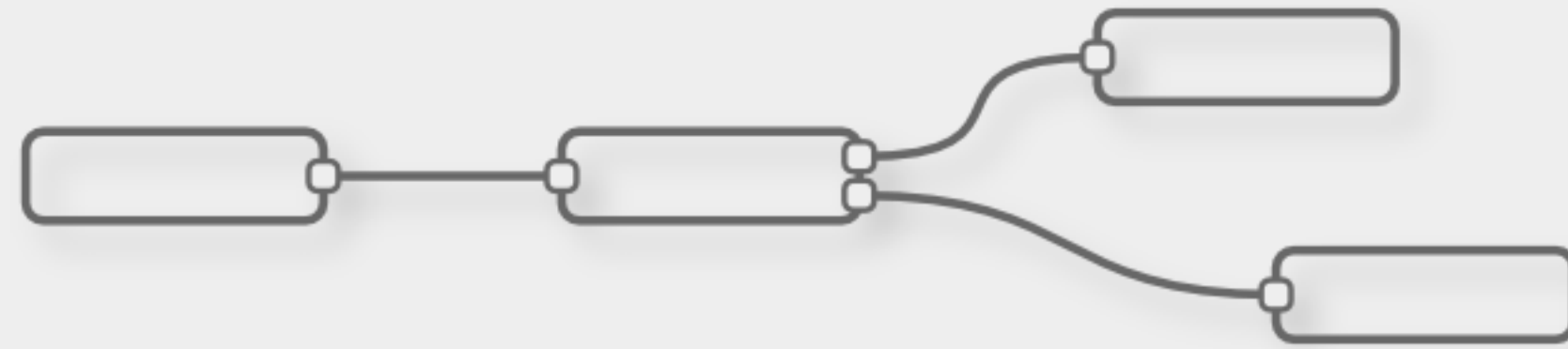
Community Developers

- Open standards
- Flexibility
- Ability to share



Node-RED

A visual tool for wiring the Internet of Things



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



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