>>> Unravelling the Web of Things
>>> Exploring Mozilla Things Framework

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>>> Current Situation

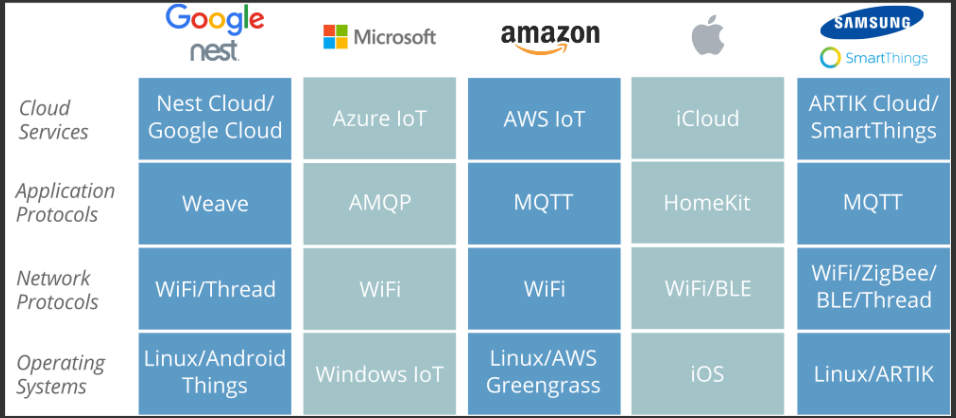


Figure: Vertical silos everywhere.

>>> Web of Things: A possible solution?

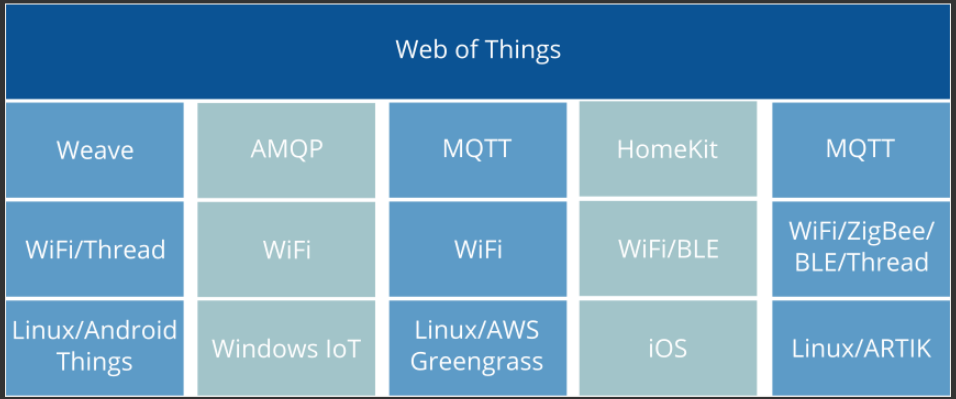


Figure: An unification layer.

>>> Web of Things

The Web of Things is about creating a decentralized Internet-of-Things by giving Things URLs on the web to make them linkable and discoverable, and defining a standard data model and APIs to make them interoperable.

>>> Project Things

* Things Gateway (with Adapters)
    * Built in Rust
    * Raspberry Pi images available
* Things Framework
    * Available in Node.js, Python, Java, Rust and Arduino
* Things Cloud
    * Remote *gateway*

* Web Thing API Specification
    * Common data model and API for the Web of Things.
    * Thing Description, REST API and WebSocket API

* https://iot.mozilla.org/

Web Thing API

W3C Member Submission 30 May 2017

Member Submission

This version:
https://www.w3.org/Submission/2017/Member-SUBM-WoT-20170530/

Latest published version:
https://www.w3.org/Submission/WoT/

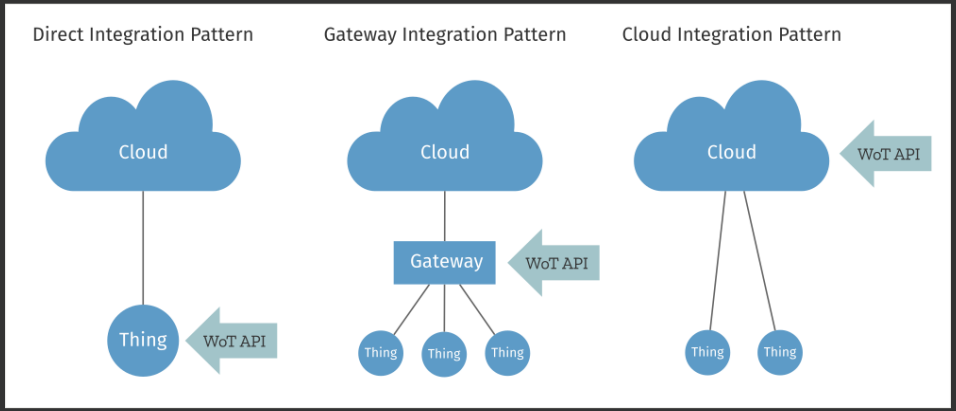
Latest editor's draft:
https://moziot.github.io/wot/

Editor:
Ben Francis, Mozilla Corporation

Abstract

This document describes a common data model and API for the Web of Things. The Web Thing Description provides a vocabulary for describing physical devices connected to the World Wide Web in a machine readable format with a default JSON encoding. The Web Thing REST API and Web Thing WebSocket API allow a web client to access the properties

>>> Things Integration Patterns

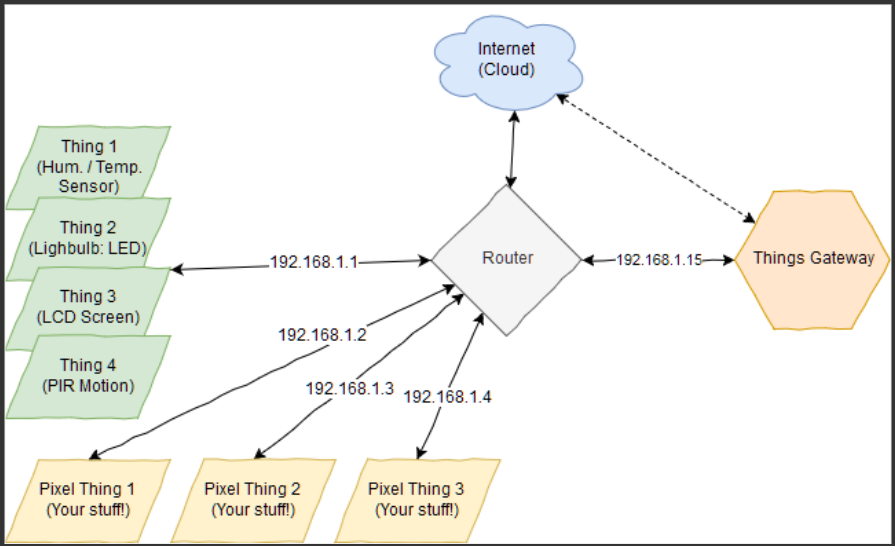


>>> Workshop Time!

Disclaimer:

> *"Anything that can go wrong, will go wrong."*
>
> Murphy's Law

>>> THE PROJECT


Internet
(Cloud)
Thing 1
(Hum. / Temp.
Sensor)
Thing 2
(Lighbulb: LED)
Thing 3
(LCD Screen)
Thing 4
(PIR Motion)
192.168.1.1
Router
192.168.1.15
Things Gateway
192.168.1.2
192.168.1.3
192.168.1.4
Pixel Thing 1
(Your stuff!)
Pixel Thing 2
(Your stuff!)
Pixel Thing 3
(Your stuff!)

>>> What is simplified by Project Things?

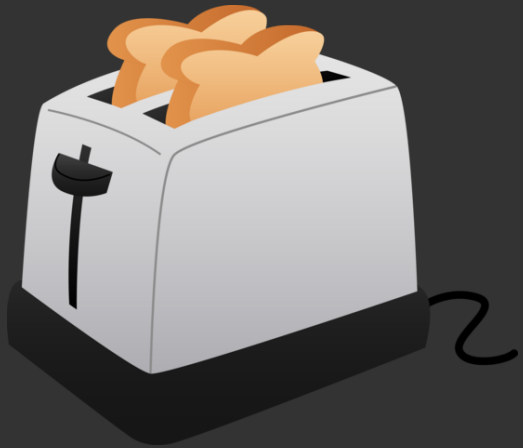
* No IP configuration needed => mDNS.
* Several Things can be part of the same device.
* Each Thing exposes an REST API to local network.
* Thing Gateway:

  Gateway Domain subdomain.mozilla-iot.org (with certificate)
  Rules Engine "if this then that" style rule system
  Things UI Monitor and control all devices via a unified web interface.
  Floorplan All the devices on an interactive floorplan.
  Adapter Manager Zigbee, Homekit, Z-wave, ...
  Smart Assistant Control with voice or written commands.

>>> Web of Things Smart Toaster

EXAMPLE

```
{
  "@context": "http://iot.schema.org",
  "@type": "Toaster",
  "name":"Acme Toaster",
  "description": "A web connected toaster",
  "properties": {
    "on": {
      "type": "boolean",
      "description": "Whether the toaster is currently heating bread",
      "href": "/properties/on"
    },
    "timeRemaining": {
      "type": "number",
      "unit": "seconds",
      "href": "/properties/timeRemaining"
    }
  },
  "actions": {
    "pop": {
      "description": "Pop up the toast"
    }
  },
  "events": {
    "ready": {
      "description": "Your toast is ready!"
    }
  },
  "links": {
    "properties": "/properties",
    "actions": "/actions",
    "events": "/events",
    "websocket": "wss://toaster.smith.home"
  }
}
```



>>> How to make my thing?

* Each physical thing is a WebThingAdapter (Arduino) or a WebThingServer (other languages).
* WebThingAdapter/WebThingServer can be composed by several ThingDevice.
* Each ThingDevice can have several ThingProperty.

* ThingProperty: Specifies the behavior and characteristics of a certain device.
* LED example (Arduino):
    * ThingProperty lampOn("on", "Whether the lamp is turned on", BOOLEAN, "OnOffProperty");
    * ThingProperty lampLevel("level", "The level of light from 0-100", NUMBER, "BrightnessProperty");

HAMMER TIME! 

* https://iot.mozilla.org/things/
* https://github.com/iotlivinglab/indoorsensinghub
* https://jpdias.me/hardware/iot/2018/12/19/indoorsensing.html

>>> Is it a *silver bullet?*

Internet-of-Things is broken:

* Security-wise: https://2000.shodan.io
* No interoperability
* Broken development toolchain
* Too much buzz and keywords: Web of Things, IIoT, Cyber(!) Physical Systems, Industry 4.0, Smart-everything,...
* ...?

* Project Things is no silver-bullet, but its pretty cool, mostly-coherent, designed with the web in mind and open-source!

>>> The End

Thank you for attending.
Go make and break *things!*

Come get your stickers, you deserve them.

You can find me during the event or: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