

According to **InternetOfThingsWiki.com**, the community of IoT users wants to have an open market for utilizing consumer technology devices and not to be dominated by a single vendor. Another reason is to encourage an ecosystem where the IoT devices and the applications can be integrated without causing much hassles.

“IF WE HAD COMPUTERS THAT KNEW EVERYTHING THERE WAS TO KNOW ABOUT THINGS—USING DATA THEY GATHERED WITHOUT ANY HELP FROM US—WE WOULD BE ABLE TO TRACK AND COUNT EVERYTHING, AND GREATLY REDUCE WASTE, LOSS AND COST. WE WOULD KNOW WHEN THINGS NEEDED REPLACING, REPAIRING OR RECALLING, AND WHETHER THEY WERE FRESH OR PAST THEIR BEST.”- KEVIN ASHTON

Image Credits : internetofthingswiki.com

Before we get to the specifics of the open source platforms, let us first understand what is actually meant by an ***IoT Platform*** –

An IoT device connects with other IoT devices and applications to facilitate information using different internet transfer protocols.

The gap between the device sensors and data networks is filled by an ***IoT Platform***. This platform connects the data network to the sensor arrangement and provides insights using multiple backend applications to analyze abundant data that is generated by hundreds of sensors.

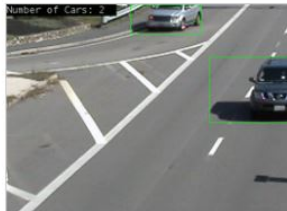
Let us have a look at some of the interesting open source platforms of IoT which can be used by anyone for integrating their IoT applications –

- **ThingSpeak** :
ThingSpeak is an open source IoT application to store and retrieve data from things using HTTP protocol over the internet. ThingSpeak enables the creation of sensor

logging applications, location tracking applications, and a social network of things with status updates.

ThingSpeak, launched in 2010, has integrated support from the computing software MATLAB from MathWorks, Inc.

Featured Projects



Car Counter

Using a webcam and a Raspberry Pi device, we built a car counter and aimed it at a busy highway. We deployed a car-counting algorithm to the Raspberry Pi and used ThingSpeak and MATLAB to analyze and visualize the traffic patterns.



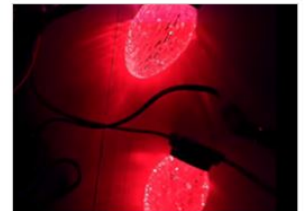
Weather Station

We built our own Arduino-based weather station and hooked it to ThingSpeak to collect and store weather data. One year later, we share how to deal with bad data and how to analyze and visualize data using ThingSpeak and MATLAB.



Tide Level Alerts

Getting your boat stuck in a shallow bay is easy if you do not know how deep the water is. Accurate tide predictions and real-time water levels are not available for most bays and estuaries, but you can build your own low-cost, real-time tweeting tide gauge.



CheerLights

The CheerLights project demonstrates a way to connect physical things through social networking. People around the world synchronize lights to the same color set by Twitter. Anyone can change the color. Go ahead—spread some cheer!

Image Credits : thingspeak.com

- **ThingBox – An IoT Development Tool :**

ThingBox is an IoT Development Tool i.e. a set of software already installed and configured, which allows anyone to graphically create new unlimited applications interacting with connected objects from a simple web-browser.

The idea

The Internet of Things technologies installed and running on a Raspberry Pi, easy to use with a graphical interface

The ThingBox provides the **Internet of Things** technologies to all of us, ready and easy to use.

What is the Thingbox
The ThingBox is a set of software already installed and configured. The ThingBox allows anyone to graphically create new unlimited applications interacting with connected objects from a simple web-browser.

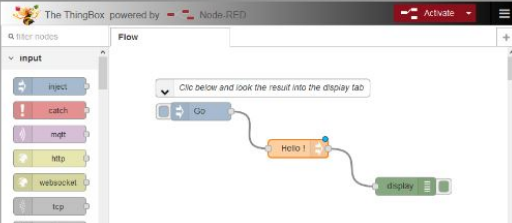


Image Credits : thethingbox.io

- **Eclipse SmartHome – Home Automation Software :**

Eclipse SmartHome is an IoT framework to build end user solutions on top of it in the home automation space.

Eclipse SmartHome focuses on the following areas of services –

The project focuses on services and APIs for the following topics:

1. *Data Handling*: This includes a basic but extensible type system for smart home data and commands that provides a common ground for an abstracted data and device access as well as event mechanisms to send this information around. It is the most important topic for integrating with other systems, which is done through so called bindings, which are a special type of extension.
2. *Rule Engines*: A flexible rule engine that allows changing rules during runtime and which defines extension types that allow breaking down rules into smaller pieces like triggers, actions, logic modules and templates.
3. *Declarative User Interfaces*: A framework with extensions for describing user interface content in a declarative way. This includes widgets, icons, charts etc.
4. *Persistence Management*: Infrastructure that allows automatic data processing based on a simple and unified configuration. Persistence services are pluggable extensions, which can be anything from a log writer to an IoT cloud service.

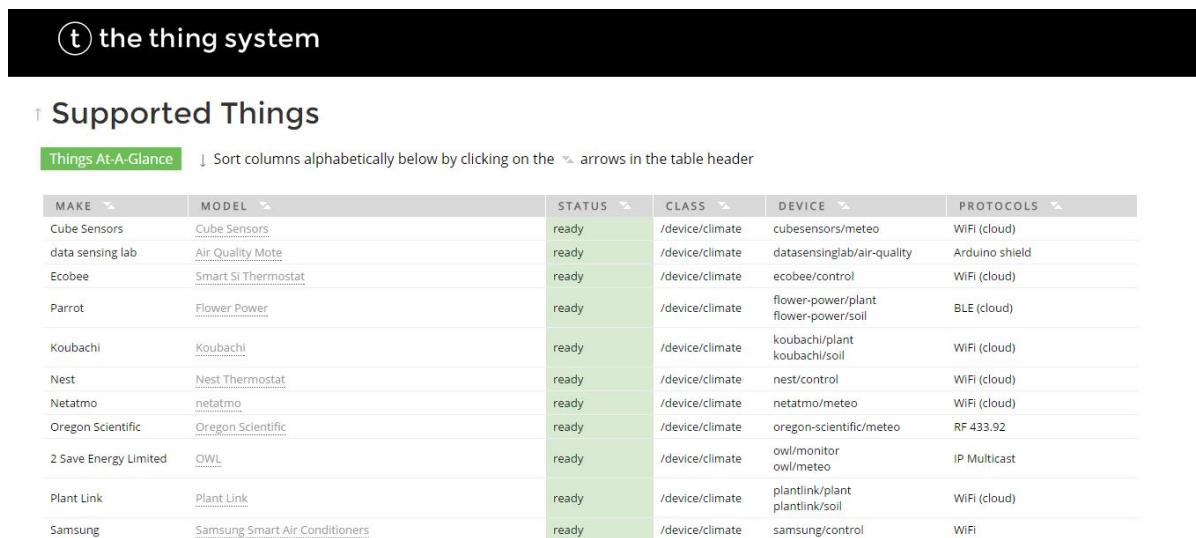
Image Credits : eclipse.org/smarthome

• The Thing System – Home Automation Software :

The Thing System is a set of software components and network protocols that aims to fix the Internet of Things. The open source software can run seamlessly on your laptop, or fit into a single board computer like the Raspberry Pi.

For more details about this product, check out an interview with the Co-founder of The Thing System [here](#).

Out of the many “Things” supported by The Thing System, a partial list is shown in the image below –



t the thing system

Supported Things

Things At-A-Glance | Sort columns alphabetically below by clicking on the ↕ arrows in the table header

MAKE	MODEL	STATUS	CLASS	DEVICE	PROTOCOLS
Cube Sensors	Cube Sensors	ready	/device/climate	cubesensors/meteo	WiFi (cloud)
data sensing lab	Air Quality Mote	ready	/device/climate	datasensinglab/air-quality	Arduino shield
Ecobee	Smart Si Thermostat	ready	/device/climate	ecobee/control	WiFi (cloud)
Parrot	Flower Power	ready	/device/climate	flower-power/plant flower-power/soil	BLE (cloud)
Koubachi	Koubachi	ready	/device/climate	koubachi/plant koubachi/soil	WiFi (cloud)
Nest	Nest Thermostat	ready	/device/climate	nest/control	WiFi (cloud)
Netatmo	netatmo	ready	/device/climate	netatmo/meteo	WiFi (cloud)
Oregon Scientific	Oregon Scientific	ready	/device/climate	oregon-scientific/meteo	RF 433.92
2 Save Energy Limited	OWL	ready	/device/climate	owl/monitor owl/meteo	IP Multicast
Plant Link	Plant Link	ready	/device/climate	plantlink/plant plantlink/soil	WiFi (cloud)
Samsung	Samsung Smart Air Conditioners	ready	/device/climate	samsung/control	WiFi

Image Credits : thethingsystem.com

You can find the entire list [here](#).

Before we continue the list of open source IoT platforms, let's understand what is meant by the term **Middleware** –

Middleware is that mechanism which enables **smooth communication** among all the different components.

Middleware is the software that bridges the “**Internet**” and “**Things**”, so essentially it is “**Of**” in the **Internet Of Things**!!

Now let's take a look at some of the open source Middleware for IoT –

- **Kaa (I guess the name was inspired from The Jungle Book!!) :**

Kaa is a production ready, multipurpose IoT middleware platform for building complete IoT solutions, connected applications and smart products. The Kaa platform provides an open-source **feature-rich** toolkit for the IoT product development thereby reducing associated cost, risks and time-to-market.

Following infographic shows the working of Kaa..



Image Credits : kaaproject.org

How does it work?

Kaa enables data management for connected objects and your back-end infrastructure by providing the server and endpoint SDK components. The SDKs get embedded into your connected device and implement real-time bi-directional data exchange with the server. Kaa SDKs are capable of being integrated with virtually any type of connected device or microchip.

The Kaa server provides all the back-end functionality needed to operate even large-scale and mission-critical IoT solutions. It handles all the communication across connected objects, including data consistency and security, device interoperability, and failure-proof connectivity.

The Kaa server features well-established interfaces for integration with data management and analytics systems, as well as with your product-specific services. It acts as a foundation for your back-end system that you are free to expand and customize to meet the specific requirements of your product.

Image Credits : kaaproject.org

The following video shows a glimpse of the future of IoT via Kaa Smart City Demo..

- **Device Hive :**

Device Hive is an open source IoT data platform with a wide range of device integration options. It is supported commercially by DataArt's (a world leading technology consulting company) Internet of Things R&D practice.

Easy to deploy and scale for proof-of-concept, development and production volumes. Device Hive also works in public and private clouds – Microsoft Azure, Amazon Web Services, Apache Mesos, OpenStack or your own datacenter.

The Device Hive cloud platform comes with Apache Spark and Spark streaming support, which means you can run batch analytics and machine learning on top of your device data, as well as implement real time event processing.

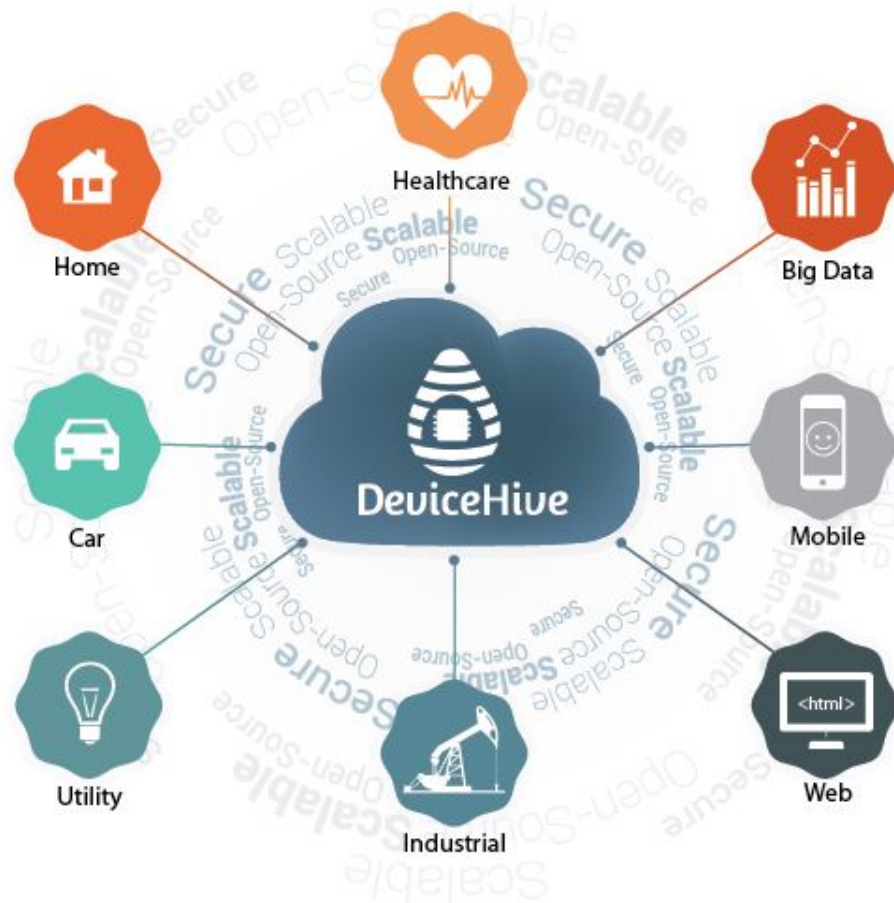


Image Credits : dataart.com

Following video shows an example demo of smart TV using Device Hive..

- **OpenIoT :**

OpenIoT is a novel open source platform for the IoT, which includes unique functionalities such as the capability to compose non-trivial IoT services, following a cloud-based utility paradigm.

It is a joint effort of prominent open source contributors towards enabling a new range of open large scale intelligent IoT (Internet-of- things) applications according to a utility cloud computing delivery model.

The OpenIoT infrastructure will help in –

- Collecting and processing data from virtually any sensor in the world, including physical devices, sensor processing algorithms, social media processing algorithms and more.
- Streaming the data of the various sensors to a cloud computing infrastructure.
- Dynamically discovering/querying sensors and their data.
- Composing and delivering IoT services that comprise data from multiple sensors.

- Visualizing IoT data based on appropriate mashups (charts, graphs, maps etc.)
- Optimizing resources within the OpenIoT middleware and cloud computing infrastructure.

This video showcases a demo of OpenIoT integrated platform –

For more details on OpenIoT, check [here](#).

In addition to the above mentioned open source IoT software, you can check out some more like IoTSyS, OpenRemote, openHAB, etc.

Some of the best IoT operating systems are AllJoyn, Raspbian, Spark etc.

So what are you waiting for? Start strengthening the IoTivity..

Do connect with us if anything specific needs to be covered from the IoT



space

Original article — <http://techstory.in/open-source-iot/>