# Comparison of OSS

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To understand the strength of Node-RED
through the survey of visual programming tool similar to Node-RED

- OSS which we surveyed
  - Apache Airflow https://airflow.apache.org/
  - Apache NiFi https://nifi.apache.org/
  - NoFlo https://noflojs.org/
  - Flogo https://www.flogo.io/
  - KNIME https://www.knime.com/

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Apache Airflow

OSS for monitoring and scheduling for workflow

- After coding processing in Python, the relations of the processes (workflow) are managed by DAG (Directed Acyclic Graph).
- Google Cloud provides commercial service which uses Apache Airflow
- Since 2016, the project has been under Apache incubator
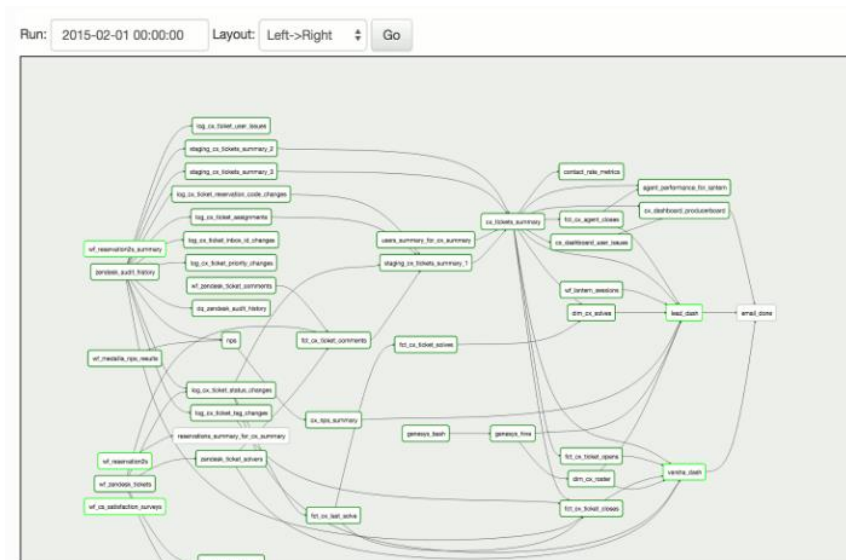


DAG view
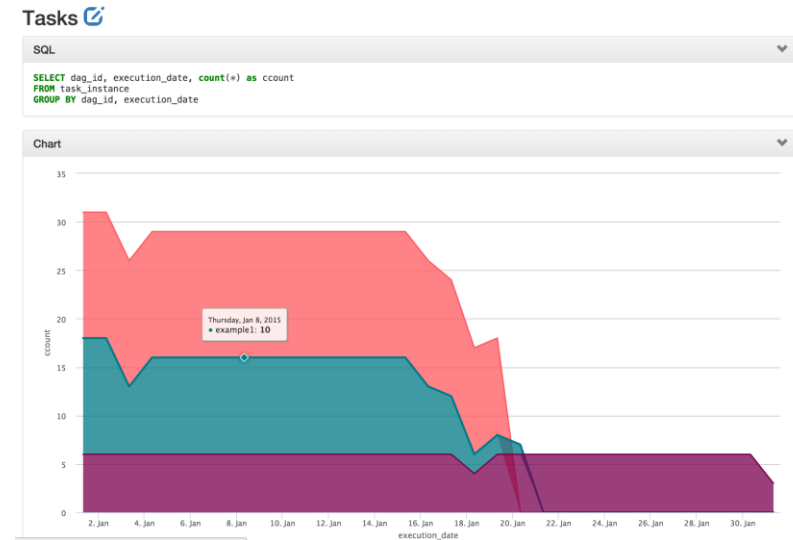
Visualization in Airflow

Apache NiFi

Flow-based programming environment
to connect systems and to transform data

- Nifi supports huge data processing with HDFS, Hive, Spark, and Kafka

- It has been popular in commercial use because Cloudera (previously Hortonworks) has focused it as their main product
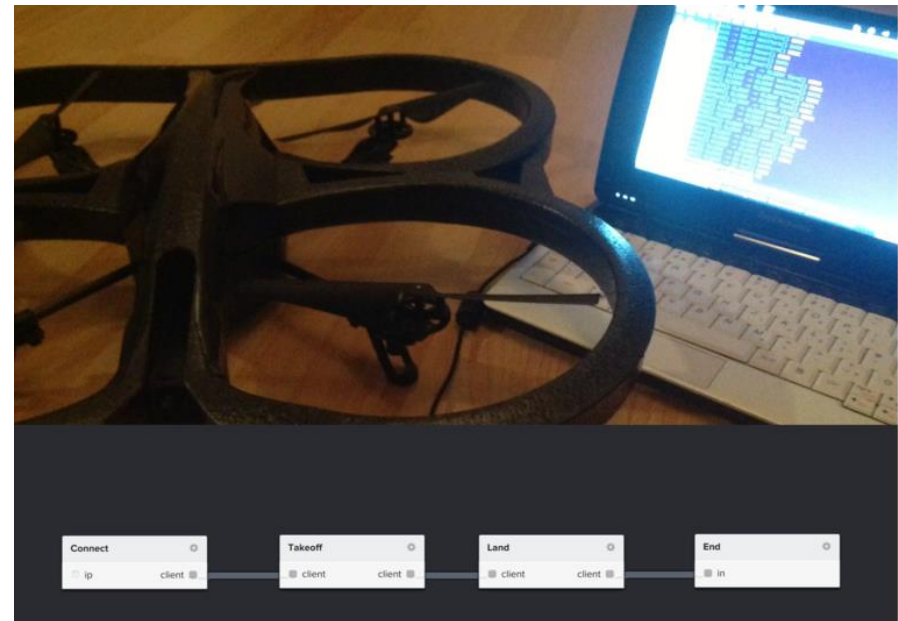

Apache NiFi

NoFlo
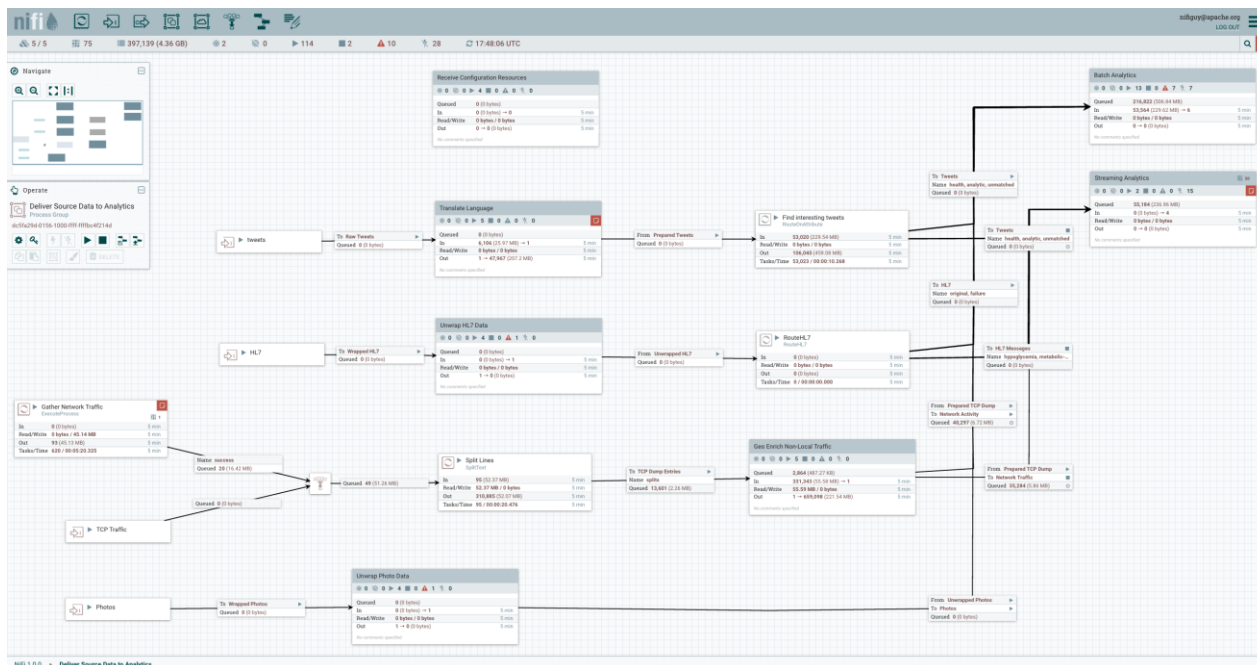
Flow-based programming environment developed by JavaScript

- Variety of usages (for example, animation processing for front end UI, and data processing as ETL tool)
- Functionality to create test cases of developed flow and to support the distributed environments
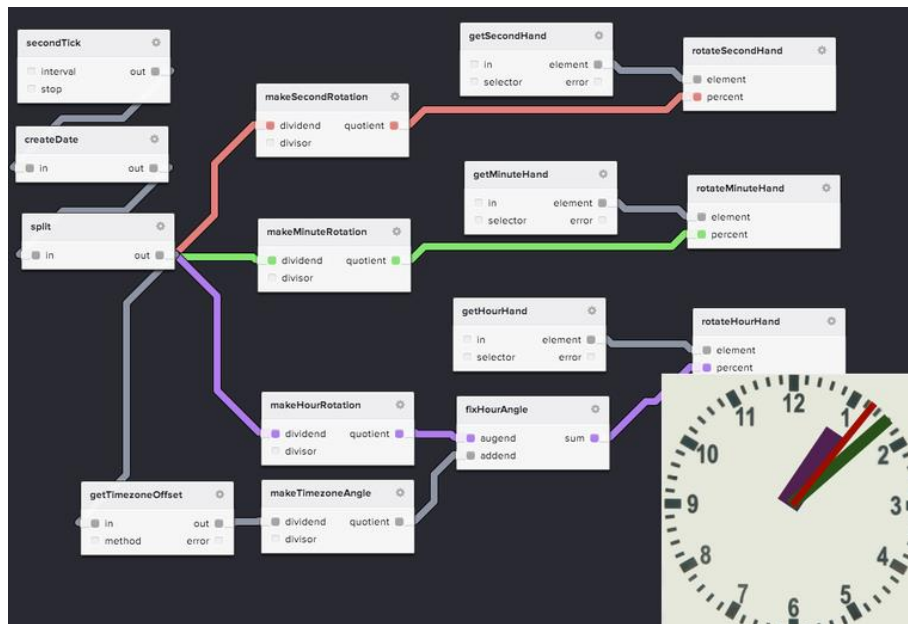
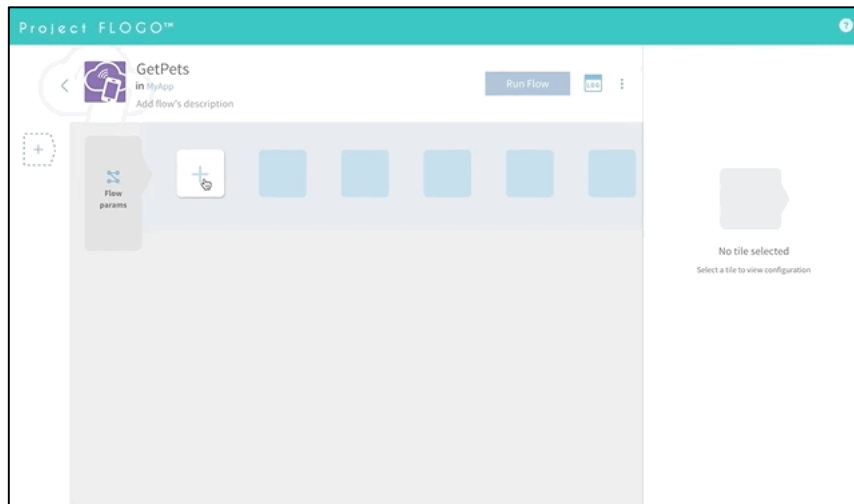Animation of the clock

Drone control

Flogo

A flow-based programming environment for IoT application development

- Faster than Java and Node.js because of the Go implementation
- Deployment as a static binary for the serverless, container, IoT device
- Integration with TensorFlow
- Showcase website to share components and developed applications

Development environment

Showcase website

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KNIME

Data analytics tool using processing blocks to handle data flow
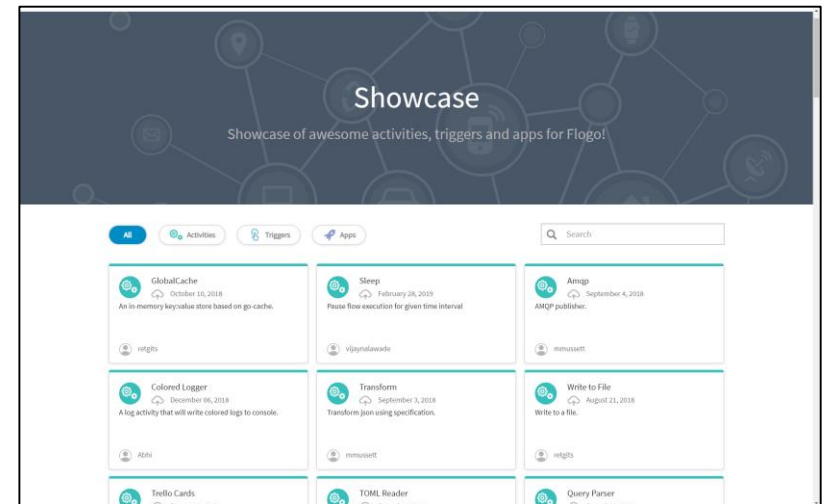
- Stable software with long enhancement period from 2006

- Add-ons to add new functions like machine learning

- Meetups and online courses

Development environment

Comparison

Node-RED has advantages in terms of the following points
- One of the default software in Raspberry Pi
- The number of add-ons

#	Software	Management	License	Language	Companies who use	Companies who develop	Add-ons	Features	用途
1	Node-RED	OpenJS Foundation	Apache -2.0	Java Script	Siemens, GE, Accenture, Fujitsu, NEC, NTT, IBM, Panasonic, Hitachi and others	IBM, Hitachi and others	2202	Default in Raspberry Pi, Dashboard	Event processing, Front end development
2	Apache Airflow	Apache Software Foundation	Apache -2.0	Python	Blue Apron, Demand Base, Google	Airbnb	28	Service in GCP	Large data processing
3	Apache Nifi	Apache Software Foundation	Apache -2.0	Java	Micron, Macquarie Telecom Group, Dovestech	Cloudera	293	Distribute processing	Large data processing
4	NoFlo	-	MIT License	Java Script	-	OSRAM	123	iOS support	Event processing, Front end development
5	Flogo	-	BSD 3-Clause License	Go	-	TIBCO Software	71	Lightweight with Go	Event processing
6	KNIME	-	GPL	Java	Abeam, Atos	KNIME	Over 2000	Add-ons for analytics	Large data processing

Comparison in development communities

HITACHI
Inspire the Next

We compared the development communities on GitHub as of September.

- In terms of the developers and releases in the survey,
  Apache Airflow is the most active development

#	Software	The first release	Commits	Developers	Releases	v1.0 release	The latest release
1	Node-RED	September 2013	4545	106	87	September 2019	September 2019 (v0.20.8)
2	Apache Airflow	October 2014	7025	936	121	June 2015	August 2019 (v1.10.5)
3	Apache Nifi	December 2014	5317	255	75	August 2016	April 2019 (v1.9.2)
4	NoFlo	June 2011	2186	24	67	November 2017	November 2017 (v1.0.3)
5	Flogo	July 2016	397	34	25	-	February 2019 (v0.5.8)
6	KNIME	February 2006	17109	35	105	July 2006	August 2019 (v4.0.1)

https://github.com/node-red/node-red   https://github.com/apache/airflow   https://github.com/apache/nifi
https://github.com/noflo/noflo   https://github.com/TIBCOSoftware/flogo   https://github.com/knime/knime-core

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