

# FileMaker of Things: APIs and IoT Using Node Red

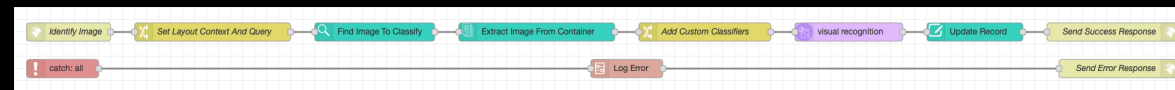
INT08

Lui de la Parra  
SeedCode

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FILEMAKER DEVCON 2019  
AUGUST 5-8 | ORLANDO, FL

# Image Classification Demo



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## Demo Flows

<https://github.com/luidog/devcon19>

## node-red-node-watson

<https://flows.nodered.org/node/node-red-node-watson>

## Getting Started Tutorial

<https://developer.ibm.com/recipes/tutorials/getting-started-with-watson-iot-platform-using-node-red>

# Node-RED

## Built On top of Node.js

- Takes full advantage of its event-driven, non-blocking model.
- Ideal to run at the edge of the network on low-cost hardware.

## Browser Based Deployment

- Provides a browser-based editor that makes it easy to wire together flows.
- Can be deployed to its runtime in a single click.

## Visual & Flow programming techniques

- Create flows that follow closely align with the mapping of business processes.
- JavaScript functions can be created within the editor using a text editor.

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Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It was originally created by Nick O'Leary and Dave Conway-Jones. It is now an open source project at IBM and supported by a community of around 100 developers.

Node-RED

<https://nodered.org>

Node-RED Flows

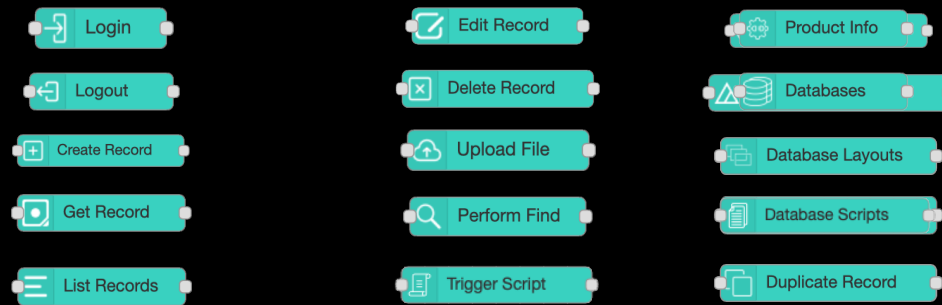
<https://flows.nodered.org>

Node-RED Local Deployment

<https://nodered.org/docs/getting-started/local>

# node-red-contrib-filemaker 2.0

- Abstracts The FileMaker Data API.
- Provides Data API session management.
- Matches v1 Data API functionality while also providing additional utilities.



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Node-red-contrib-filemaker is an open source collection of Node-RED nodes that abstract the FileMaker Data API. Each node exposes an fms-api-client method or utility. Nodes connecting to FileMaker Server depend upon a configurable FileMaker Data API client.

## Node-RED Module

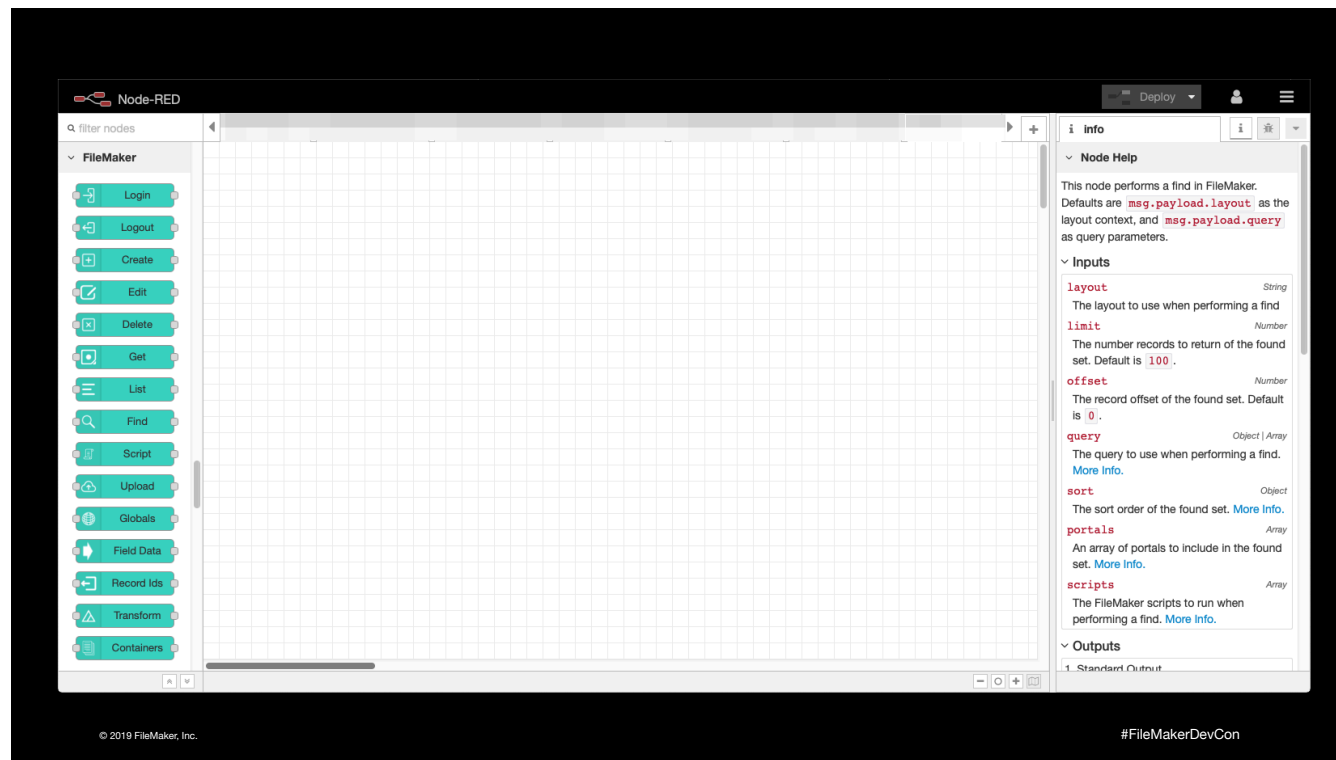
<https://flows.nodered.org/node/node-red-contrib-filemaker>

## Project Repository

<https://github.com/Luidog/node-red-contrib-filemaker>

## Base Client Repository

<https://github.com/Luidog/fms-api-client>



Node-RED uses a browser based editor. The editor is composed of three major sections. The three sections are the node palette, the workspace, and the sidebar.

Node-RED Tutorials

<https://nodered.org/docs/tutorials>


Node-RED FAQ

<https://nodered.org/docs/faq/>

Introduction Video

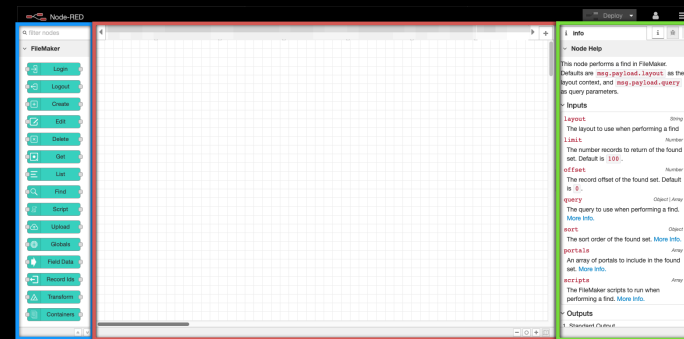
<https://www.youtube.com/watch?v=vYreeoCoQPI>

# Node-RED Anatomy

 Node Palette

 Workspace

 Sidebar



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The node palette contains all nodes installed on the current instance of Node-RED. It contains a search filter along the top that allows users to easily filter and find nodes via the node's name.


The workspace is the main working area. The workspace provides the space to create and store flows. Flows are saved in tabs along the top of the workspace. A new flow can be added via the addition button in the top right corner of the workspace.

The sidebar consists of three distinct areas. These areas are the info pane, the debugger, and the configuration pane. The info pane contains documentation for the currently selected node. The debugger visualizes flow errors or logged node output. The configuration pane provides access to configuration nodes and context data.

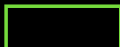
Node-RED Editor Guide

<https://nodered.org/docs/user-guide/editor/>

# Node-RED Anatomy

 Data API Client Configuration

 Node Configuration

 Output Configuration

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The Node-RED configuration pane allows developers to manipulate the input, output, and behavior of the currently selected node. Each configuration pane is unique to the currently selected node. With the exception of the special utility nodes every node-red-contrib-filemaker node has three main configuration sections.

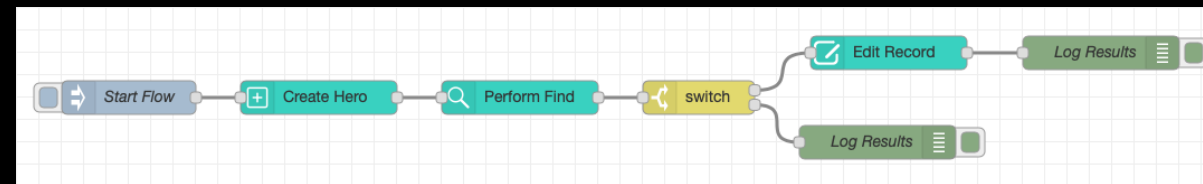
The Data API client configuration section groups properties that are required by the node. With the exception of a select few nodes all node require a Data API client and layout context.

The node configuration section contains the optional configuration fields for each node. These fields modify a node's behavior and where a node will look for input parameters.

The output configuration section allows developers to modify what properties the node will modify when adding data to the message object.

node-red-contrib-filemaker Documentation  
<https://github.com/Luidog/node-red-contrib-filemaker>

# Introductory Demos



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Node-RED Core Node Documentation  
<https://nodered.org/docs/user-guide/nodes>

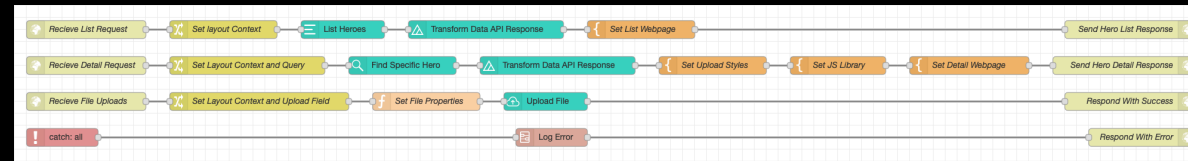
Introductory Demo Flow  
<https://github.com/luidog/devcon19>



- Each Node in a flow accepts specific input parameters from a message and returns an output message.
- Flows are created by linking node inputs and outputs.
- Flows are initiated by events.
- One Node-Red server can host multiple flows.

Demo Flows  
<https://github.com/luidog/devcon19>

# Master / Detail Frontend Demo



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## Demo Flows

<https://github.com/luidog/devcon19>

## Node-RED Core Node Documentation

<https://nodered.org/docs/user-guide/nodes>

# fms-api-client

## Open Source Data API Client

- FileMaker Data API v1 on FileMaker Server 17 & 18.
- Matches the Data API v1 feature set.
- Additional Utilities for working with the Data API responses.
- Fully documented open source Data API client.
- 100% test coverage. 🎉

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fms-api-client is a FileMaker Data API client designed to allow easier interaction with a FileMaker database from a web environment. This project abstracts the FileMaker 17 & 18 Data API into class based methods.

fms-api-client

<https://github.com/luidog/fms-api-client>

# From Javascript to Node-RED

```
27 // #create-many-records
28 const createManyRecords = client =>
29   Promise.all([
30     client.create('Heroes', { name: 'Anakin Skywalker' }),
31     client.create('Heroes', { name: 'Obi-Wan' }),
32     client.create('Heroes', { name: 'Yoda' })
33   ]).then(result => log('create-many-records-example', result));
34 // #
```

fms-api-client is based on javascript classes. The main class of fms-api-client is the client class. All methods on the client class return promises. The use of promises in the client's class methods allow methods to be linked together via promise chains.

fms-api-client

<https://github.com/Luidog/fms-api-client>

# From Javascript to Node-RED



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node-red-contrib-filemaker uses fms-api-client's promise chaining capabilities to send requests and receive responses synchronously in a flow. node-red-contrib-filemaker also provides a UI layer to fms-api-client.

node-red-contrib-filemaker Documentation  
<https://github.com/Luidog/node-red-contrib-filemaker#readme>

## The Challenges of IOT

### Variety of Devices

- Devices are often task specific.
- Hardware endures many iterations of design.

### Require a variety of languages.

- C on the hardware level.
- Python for machine learning for AI.
- Javascript / PHP for handling requests.

### Generate large amounts of data.

- Messages are usually measured per second.



# The Solution is FileMaker

## FileMaker Data API

- Supports many different clients.
- Communicates using JSON.

## FileMaker Pro & Server

- Low cost distributed user interface.
- Perform Script on Server Allows Async Communication

## FileMaker Go

- Allows users to interact with IOT devices directly.



# Particle IOT Devices

- Particle Cloud provides easy subscriptions to device events.
- Provides both a web IDE and a native IDE connector.
- Offers a wide variety of devices with an assortment of configurations.
- Particle Rules Engine provides you with a Node-RED instance.
- Growing IOT community on the web.



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Particle is an IOT hardware / software company that makes low cost IOT devices supported by a cloud infrastructure. Particle offers a branded Node-RED instance called the Particle Rules Engine.

Particle Rules Engine

<https://www.particle.io/iot-rules-engine/>

Particle Community

<https://community.particle.io>

Particle Documentation

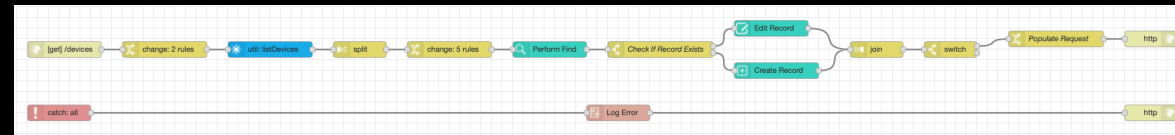
<https://docs.particle.io>

node-red-contrib-particle

<https://github.com/chuank/node-red-contrib-particle>



# IOT Demo



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IOT Demo Flows

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Node-RED Core Node Documentation

<https://nodered.org/docs/user-guide/nodes>

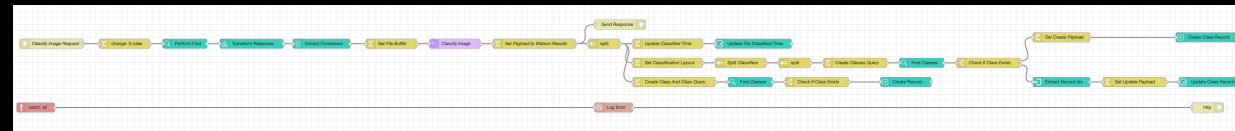
node-red-contrib-particle

<https://www.npmjs.com/package/node-red-contrib-particle>

node-red-contrib-filemaker

<https://github.com/Luidog/node-red-contrib-filemaker>

# Enhanced Image Classification Demo



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## Demo Flows

<https://github.com/luidog/devcon19>

node-red-node-watson

<https://flows.nodered.org/node/node-red-node-watson>

node-red-contrib-filemaker

<https://github.com/Luidog/node-red-contrib-filemaker>

This Presentation is **Open Source**

**FileMaker Data API Client**

<https://github.com/Luidog/fms-api-client>

**Node-RED Node**

<https://github.com/Luidog/node-red-contrib-filemaker>

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fms-api-client and node-red-contrib-filemaker are MIT licensed and open source. The Demo flows used in this presentation are also open source. Additionally, both fms-api-client and node-red-contrib-filemaker are dependent on a flexible NOSQL datastore project called marpat.

Presentation Demo Flows

<https://github.com/luidog/devcon19>

node-red-contrib-filemaker

<https://github.com/luidog/node-red-contrib-filemaker>

fms-api-client

<https://github.com/luidog/fms-api-client>

marpat

<https://github.com/luidog/marpat>

Lui de la Parra



@luidog

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I would like to thank the employees FileMaker Inc. for working tirelessly to build an amazingly extensible platform.

Thank you all very much for your interest in my work.

My name is Lui de la parra. I work at SeedCode and you can find my public work on GitHub by searching for @luidog.

SeedCode

<https://www.seedcode.com>

GitHub

<https://github.com/luidog>

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(This is also listed in DevCon2Go)

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