

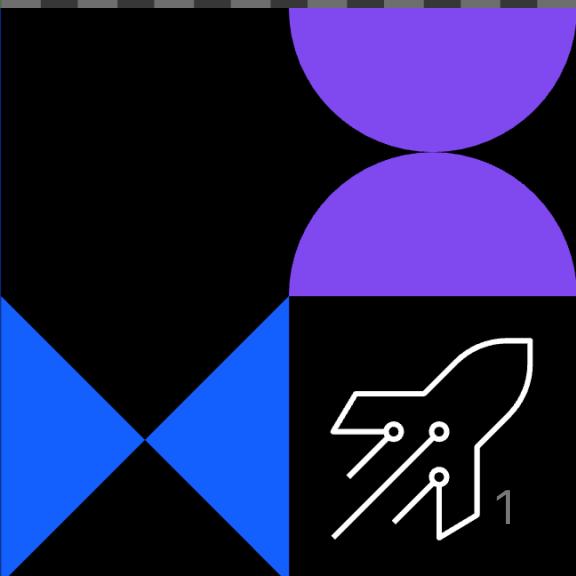
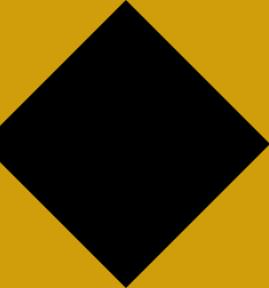
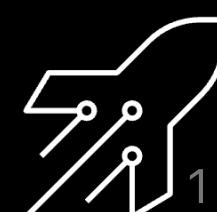
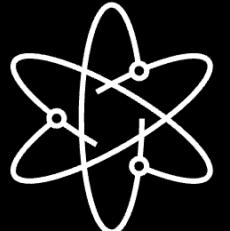
# Node-RED Hands-on: Creating a Node-RED application using the project feature

Kazuhito Yokoi  
Software Engineer,  
Node-RED project

Orlando, FL  
October 6-9

GO/

Explore.  
Build.  
Launch.

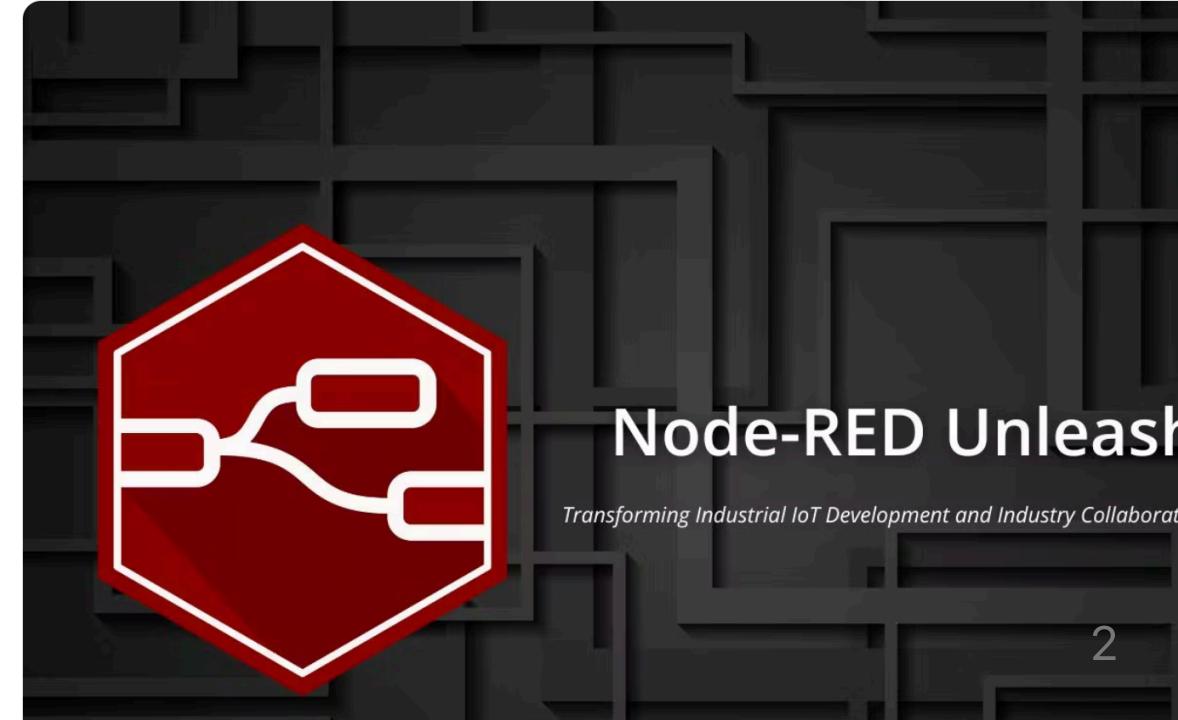


## Projects

# Node-RED Unleashed: Transforming Industrial IoT Development and Industry Collaboration with Hitachi

Posted On: March 27, 2024

Hear from Hitachi's Kazuhito Yokoi to find out more about Node-RED and why it is becoming so popular in Industrial IoT applications.



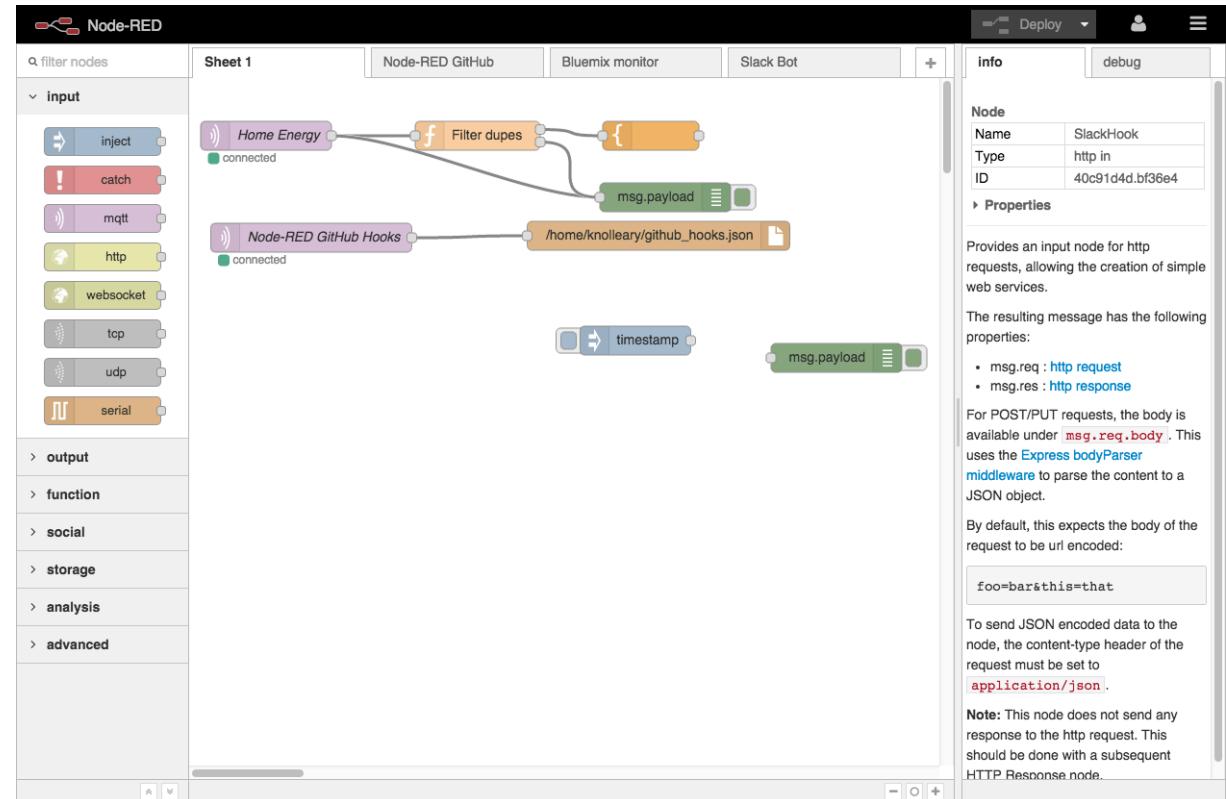
# Kazuhito Yokoi

- Core contributor of Node-RED project
- Organizer of Node-RED User Group
- Member of LF AI & Data Foundation Community

# What is Node-RED?

Low-code development tool from novice users to IT professionals

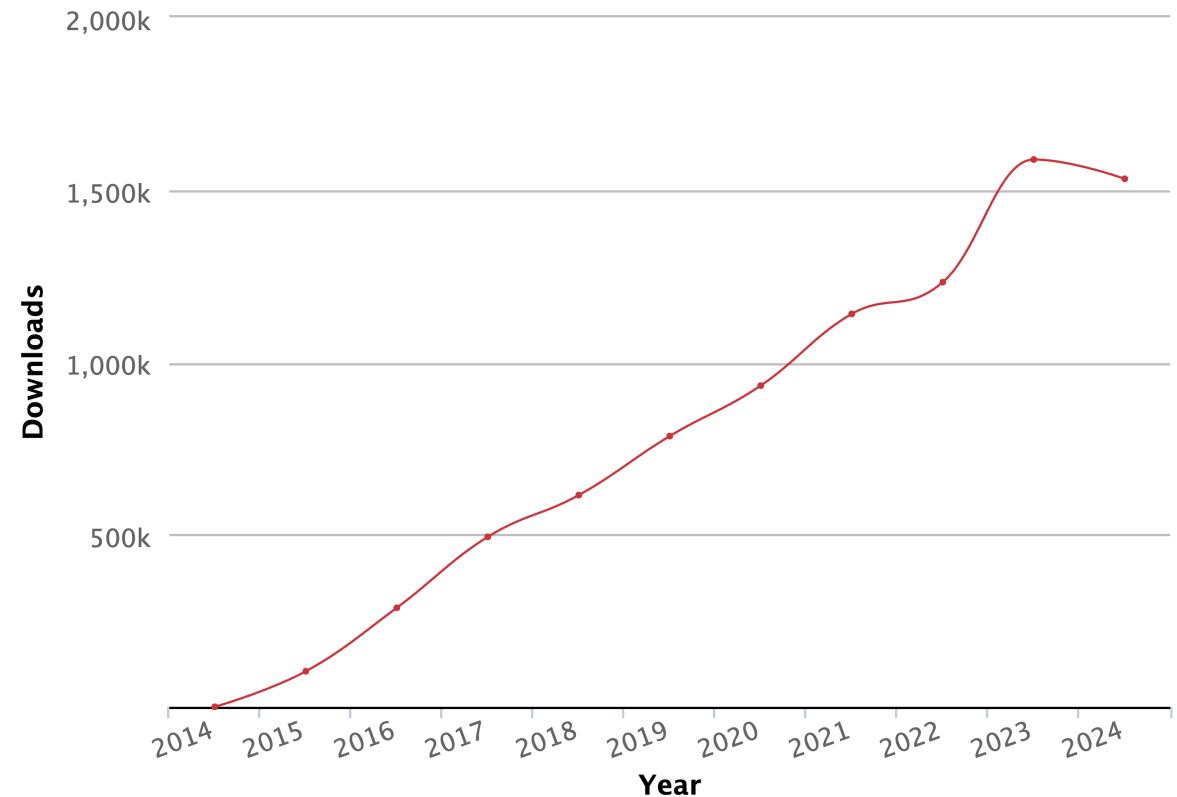
- Released by IBM as an open source software
- Hosted by the OpenJS Foundation
- Used in manufacturing industry to realize industrial IoT



# Node-RED statistics

Node-RED has been widely used for 10 years.

- 155 releases
- 9,802 commits
- 237 contributors
- 22k GitHub stars
- 3B+ Docker pulls
- 5,562 community nodes



# Supported Environments

Node-RED supports environments that can run Node.js.

- Local PC
  - Windows
  - macOS
  - Ubuntu
- Docker
- Raspberry Pi
- Cloud



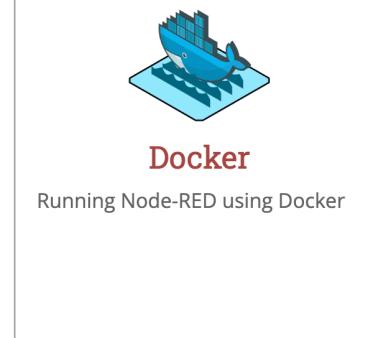
## Running locally

Installing Node-RED on your local computer



## Raspberry Pi

Get started using our all-in-one install script for the mighty Raspberry Pi



## Docker

Running Node-RED using Docker



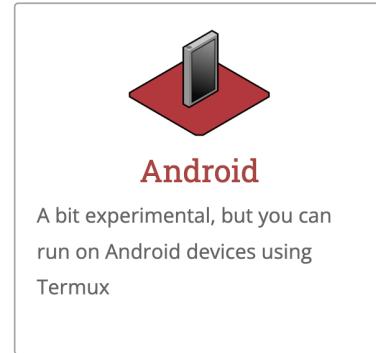
## Install from git

Building Node-RED from source.  
Get the very latest development code and start contributing.



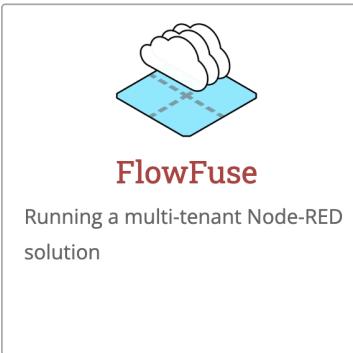
## BeagleBone Boards

Running Node-RED on BeagleBone boards



## Android

A bit experimental, but you can run on Android devices using Termux



## FlowFuse

Running a multi-tenant Node-RED solution



## AWS

Get started running on Elastic Beanstalk or EC2



## Microsoft Azure

Running on an Azure Virtual Machine instance

# How to install

- Local environment

```
sudo npm install -g --unsafe-perm node-red  
node-red
```

- Docker

```
docker run -it -p 1880:1880 --name  
mynodered nodered/node-red
```

- Raspberry Pi

```
bash <(curl -sL  
https://raw.githubusercontent.com/node-red/linuxinstallers/master/deb/update-nodejs-and-nodered)
```

# Node-RED nodes

Many predefined and custom nodes for services and devices

- Data collection
- Machine control
- External server access
- Database connection
- Data analysis
- Visualization

The screenshot shows the Node-RED library page with a dark header containing links for home, about, blog, documentation, forum, flows, and github. A user profile icon is in the top right. Below the header is a search bar labeled "Search library". To the left is a sidebar with "Filter" and "Category" sections. The "Filter" section has checkboxes for Nodes (checked), Flows (checked), and Collections (checked). The "Category" section lists AI, Communication, Data & Analytics, Database, Date & Time, Hardware, Home Automation, Industrial, Security, Storage, Tools, UI, and Utility, each with an unchecked checkbox. The main area displays a grid of 15 node packages, each with a title, description, version, download count, rating, and type. The packages are:

- node-red-dashboard: A set of dashboard nodes for Node-RED. v3.6.6, 19282 downloads, 4.6 rating, node type.
- node-red-node-ui-table: Table UI widget node for Node-RED Dashboard. v0.4.5, 13481 downloads, 4.7 rating, node type.
- node-red-contrib-knx-ultimate: Control your KNX and KNX Secure installation via Node-RED! A bunch of KNX nodes, with integrated Philips HUE control and ETS group address importer. Easy to use and highly configurable. v4.0.10, 12168 downloads, 4.9 rating, node type.
- @flowfuse/node-red-dashboard: FlowFuse Dashboard - A collection of Node-RED nodes that provide functionality to build your own UI applications (inc. forms, buttons, charts). v1.28.0, 9160 downloads, 4.8 rating, node type.
- node-red-contrib-credentials: Provides a credentials node to store one or more private values; preventing export to flows or version control. v0.2.3, 8506 downloads, 4.5 rating, node type.
- node-red-contrib-calc: A Node-RED node to perform basic mathematical calculations. v1.0.6, 8235 downloads, 4.4 rating, node type.
- node-red-contrib-dashboard-average-bars: Calculate and display the average values of msg.payload in a bar chart. v0.0.6, 7805 downloads, 3.0 rating, node type.
- node-red-contrib-moment: Node-RED Node that produces formatted Date/Time output using the Moment.js library. Timezone, dst and locale aware. v5.0.0, 7348 downloads, 4.3 rating, node type.
- node-red-contrib-tableify: Uses npm package tableify to convert json into an html table. Returns the html in msg.payload. v0.0.2, 6538 downloads, 3.7 rating, node type.
- node-red-contrib-string: Provides a string manipulation node with a chainable UI based on the concise and lightweight stringsjs.com. v1.0.0, 5850 downloads, 4.6 rating, node type.
- node-red-node-email: Node-RED nodes to send and receive simple emails. No version, 0 downloads, 0 rating, node type.
- node-red-contrib-modbus: The all in one Modbus TCP, UDP and Serial contribution long term supported package for Node-RED. No version, 0 downloads, 0 rating, node type.
- node-red-contrib-image-tools: A dynamic image editor, image viewer, 1D/2D Barcode Generator and 1D/2D Barcode Decoder nodes. No version, 0 downloads, 0 rating, node type.

Sort by: Downloads

# Pre-installed Devices

Many devices equip Node-RED as a pre-installed software.

- Seeed Studio, reTerminal DM, reCamera
- Advantech, ADAM-6700
- ADLINK, Vizi-AI Devkit
- QNAP, QIoT Suite
- Emerson, PACEdge

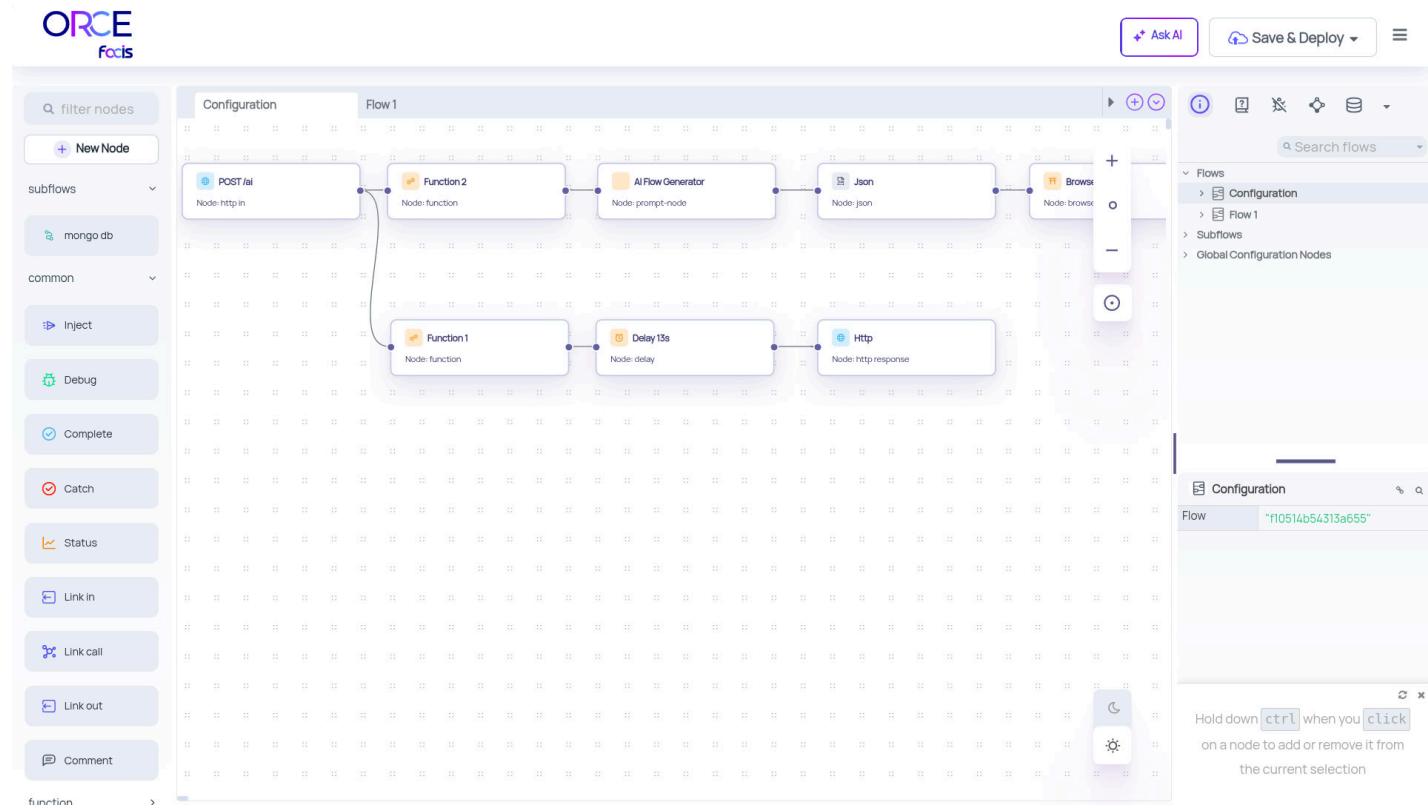


# GAIA-X Federation Services

OSS set for data exchange between companies

- Hosted by the Eclipse Foundation from 2023
- GXFS Workflow Engine based on Node-RED

<https://github.com/eclipse-xfsc/orchestration-engine>

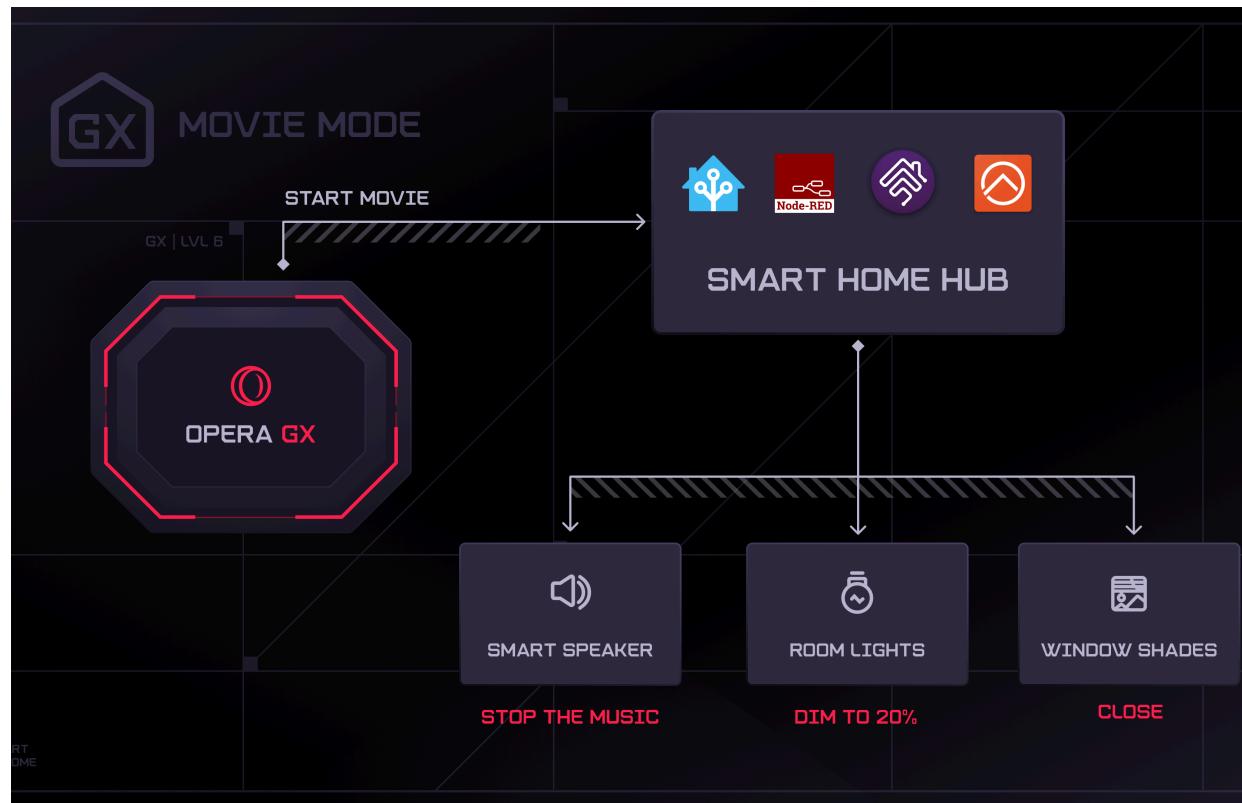


# Opera Browser

Opera Software adopted Node-RED for their browser, Opera GX for smart home use cases

- Getting your room ready for watching movies
- Syncing the colors of smart bulbs with the theme of Opera GX

<https://github.com/operasoftware/opa-smart-home>



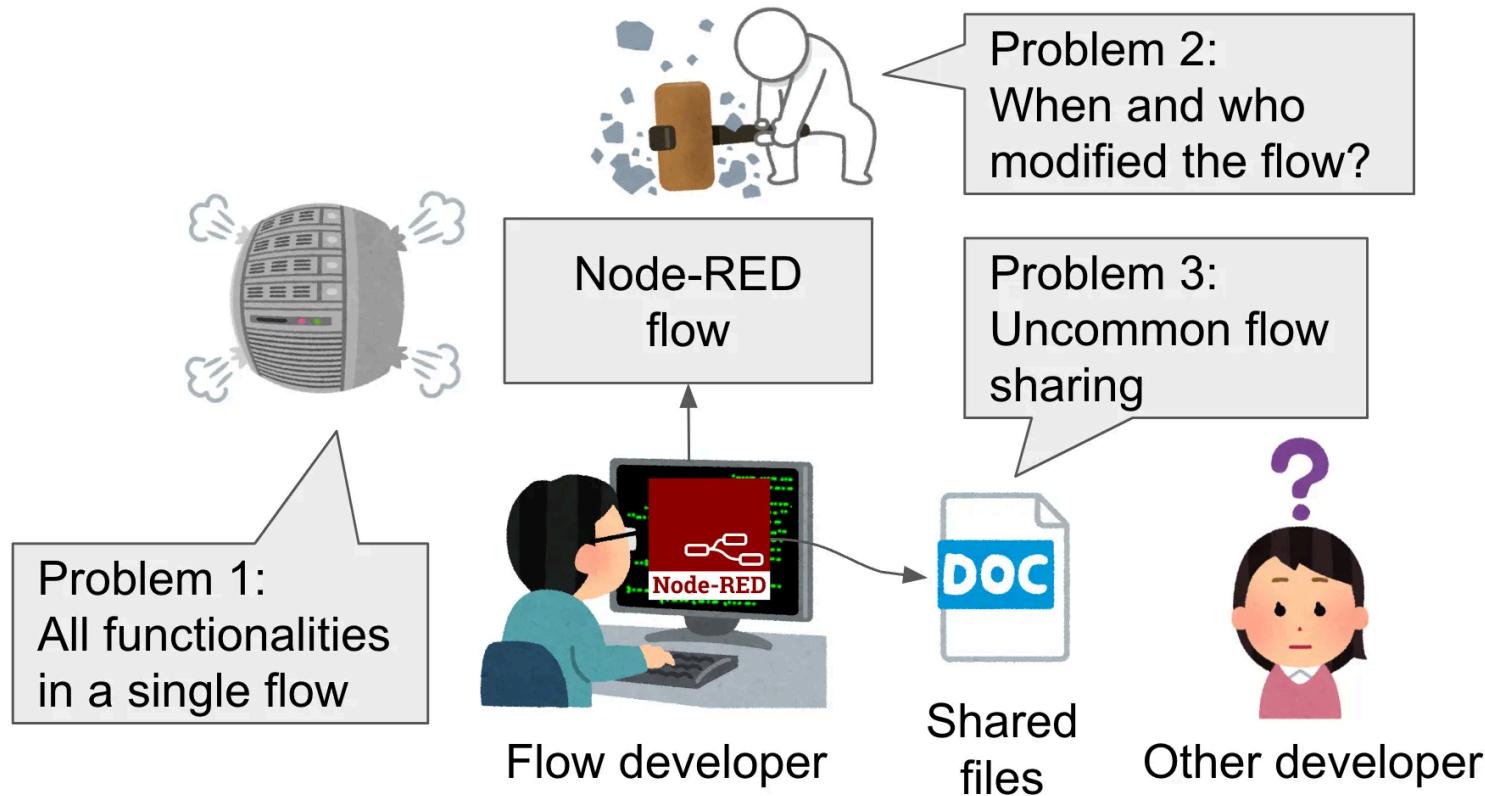
# Advanced features

Features to improve developer experiences

- Project feature (Git functionality)
  - Managing flows
  - Tracking changes
- Flow Linter
- Flow Debugger

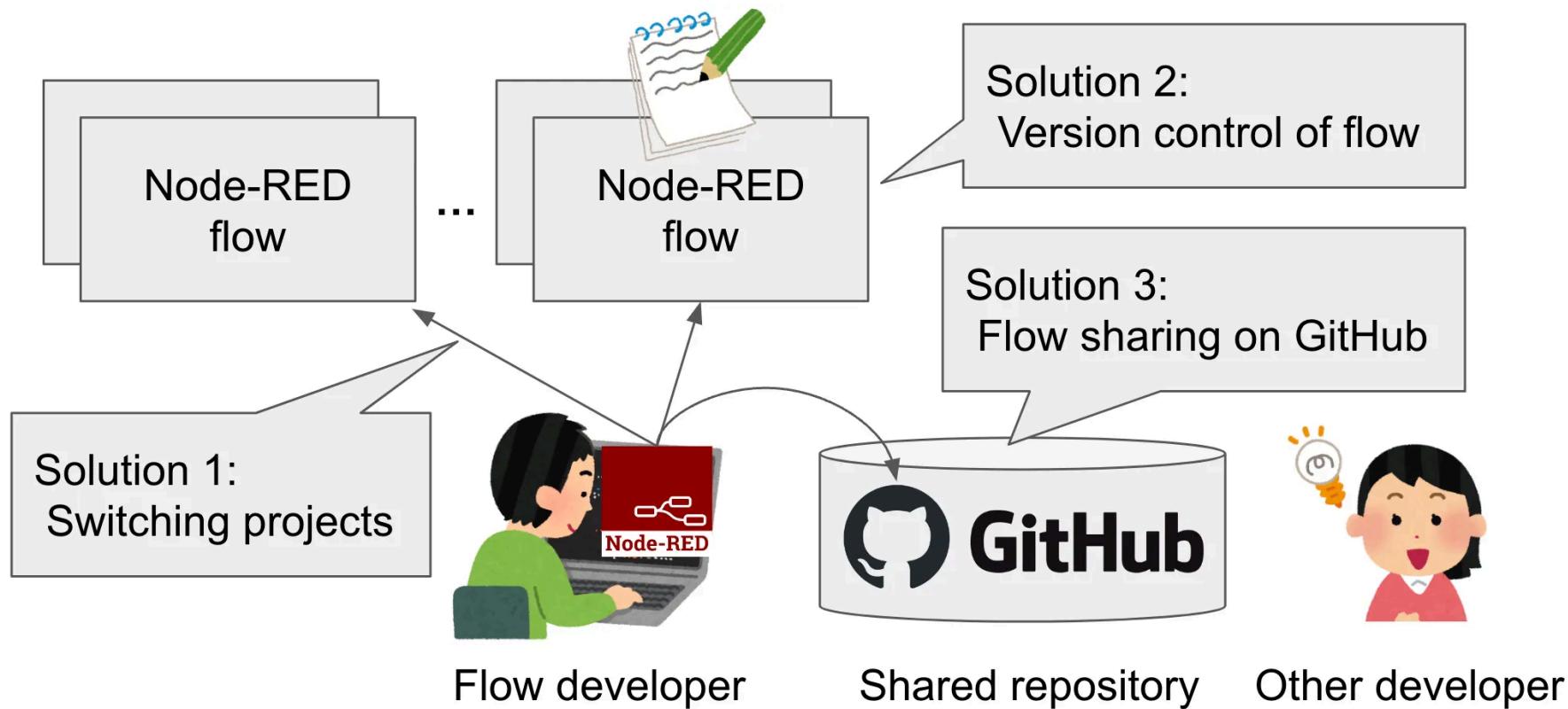
# Issues without project feature

We encounter the following issues in default setting.



# Solution with project feature

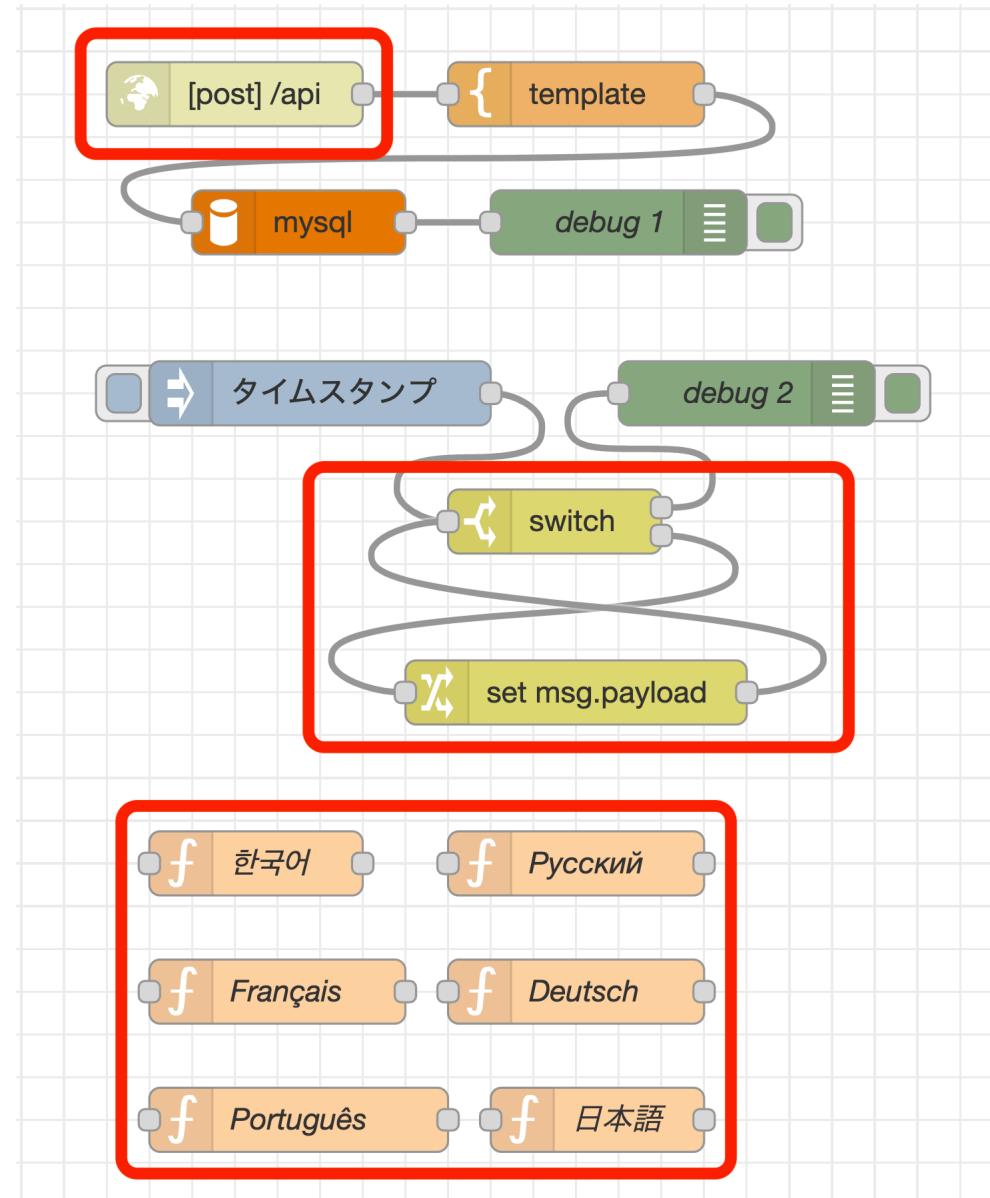
Project feature solves the previous issues.



# Flow Linter

Provides real-time feedback same as code linter

- Supported potential issues:
  - http-in node without http-response node
  - Looping flows
  - Overlapping nodes
  - Unset node names
- Custom rules:
  - Recommendation of English node names



# Flow Debugger

Provides same user experience as code debugger

- Creating breakpoints
- Pausing flows
- Inspecting messages
- Step by step execution

# Conclusion

- We learned the advanced features of Node-RED
    - Project feature
    - Flow Linter
    - Flow Debugger
  - Development example of Chat UI application
- > I believe that you will develop the great flows using these features and example.

# Node-RED Conference 2025

- Date: Tuesday, November 4, 2025
- Location: Online
- Speakers: Intel, FlowFuse, Victron Energy, Fluidy Financial Services, City of Morro Bay / GCIS and more
- Registration: Free  
<https://nrcon.nodered.org/>

## Speakers



Nick O'Leary Node-RED Co-creator / FlowFuse CTO



ZJ van de Weg CEO FlowFuse



Felix Reck IT Application Manager



Zepu Li



Christian Lagerkvist Solutions Architect Fluidy Financial Services



Dirk-Jan Faber Software Engineer Victron Energy



Øivind Hegstrand Technical Project Manager



Alexander Kuesel Operational Technology Software Development Manager Intel



Anton Rodriguez-Dmitriev Operational Technology (OT) Controls Engineer Intel



Nicolas Alvarez Garcia Industrial Control Systems Engineer Intel



Robert Lynch Operational Technology (OT) engineer Intel



Josh Dudley Manufacturing and Automation Engineer



Grant Chase Operational Technology Specialist City of Morro Bay / GCIS