



# Scaling Node-RED

To Enterprise-class IoT Applications

# About the Speakers



**Pablo Acosta, Ph.D.**

**VP Engineering, Prescient Devices, Inc.**

---

High-speed mixed-signal IC design

---

Signal processing algorithms

---

EDA tool development

---

Authoring industry standards

---

Principal inventor in multiple patents

---

MIT EE Ph.D.



**Ashish Yadav**

**Director of Software Development, Prescient Devices, Inc.**

---

Full-stack development

---

IoT design automation

---

Distributed IoT systems and applications

---

UC Merced MS EE

# Agenda

## Part I Overview

---

What is Node-RED?

---

Scaling Node-RED is complex

---

Node-RED workflow from scratch

---

What is Prescient Designer?

---

Prescient Designer enables agility

---

Distributed programming

---

## Part II Product Demo

---

Prescient Designer Demo

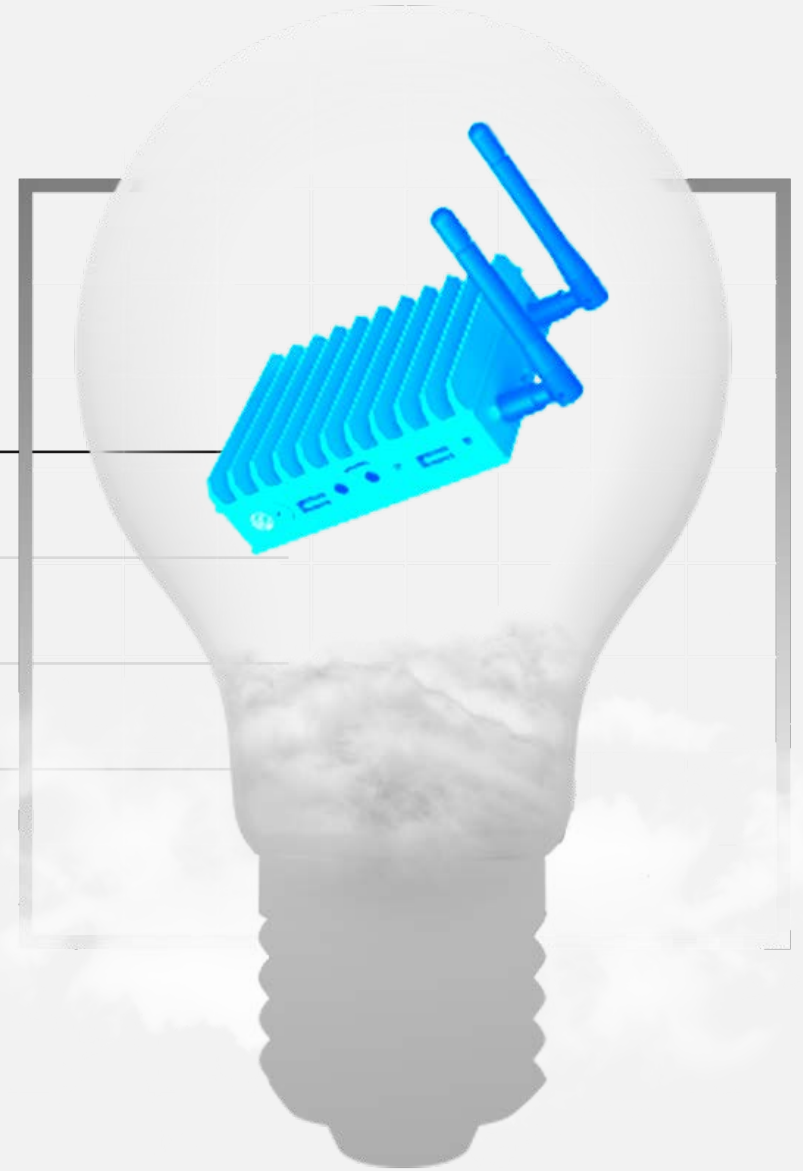
---

Limited Release

---

Q&A

---



# What is Node-RED

Full-spectrum graphical development environment for event-driven applications

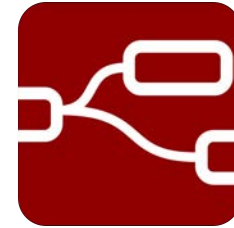
## KEY FACTS



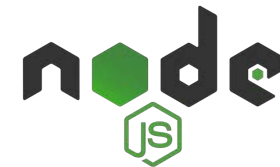
Nick  
O'Leary



Dave  
Conway-Jones



**2M**  
Node-RED downloads (2019)



**98%**  
of Fortune 500 companies use NodeJS

**2013**

Project started in IBM's Emerging Technology Services Group

**11,700**

GitHub stars

**3,162**

Contributed nodes

**1,235**

Pull requests

# What is Node-RED Features

Low

Code



Single device



All development is  
local to the device



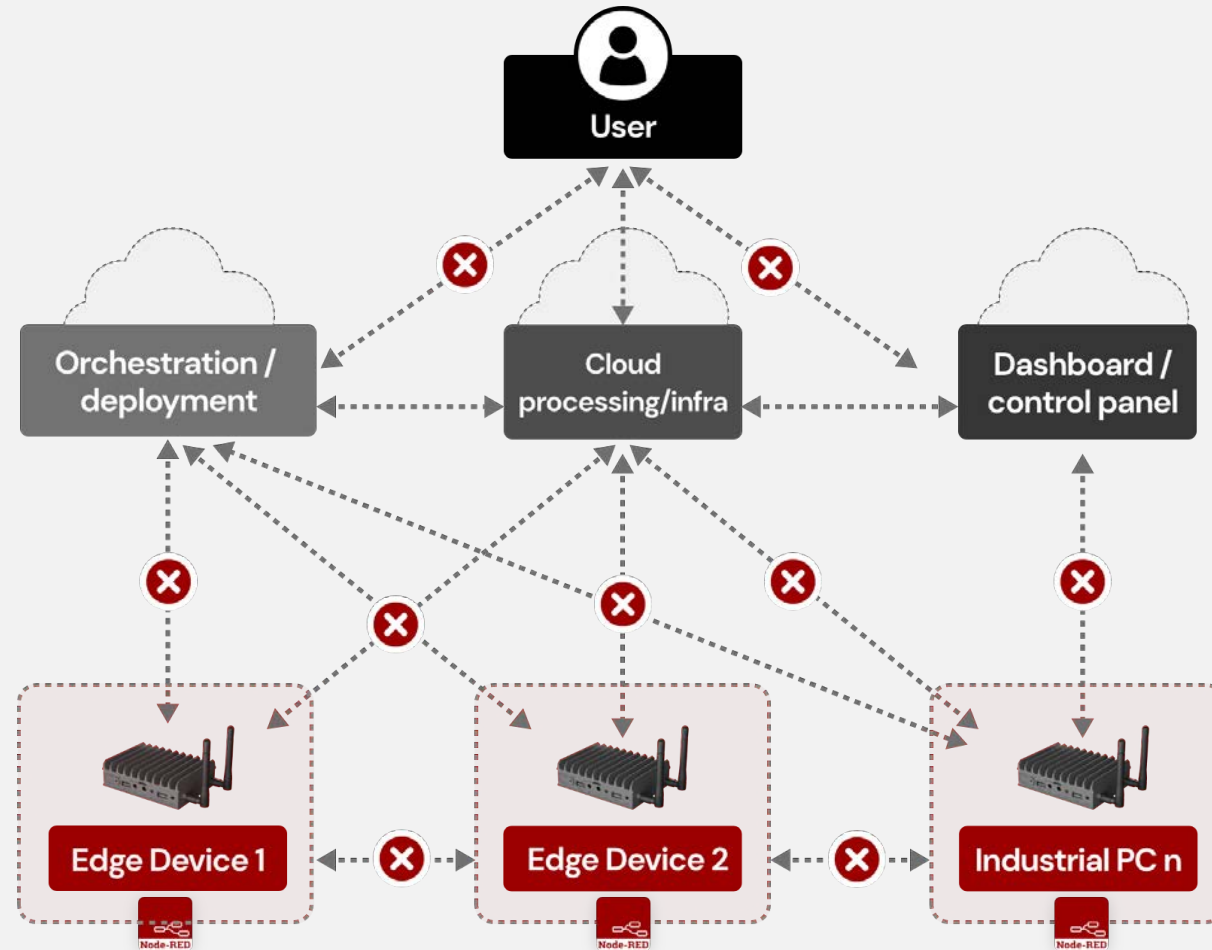
Flow update: copy  
file/HTTP POST/editor login

The screenshot displays the Node-RED web interface in a browser window. The address bar shows the URL `pi3-1:1881/#flow/88a39ba1.651ac`. The interface includes a left sidebar with a node palette containing categories like 'subflows', 'common', and 'function'. The main workspace shows a flow titled 'Example flow' with three nodes connected in sequence: 'Pressure detection', 'Local processing', and 'To cloud'. The 'To cloud' node has a 'connected' status indicator. On the right, there is an 'info' panel showing a search for flows and a list of flows, with 'Example flow' selected. Below the info panel, there is a section for the selected flow with a search bar and a note: 'Hold down `ctrl` when you `click` on a node to add or remove it from the current selection'.

# Scaling Node-RED is complex

“Dealing with virtual environments, containers, connectivity, etc., has been an experience not for the faint of heart”

IOT SYSTEM ENGINEER  
on using an orchestration system  
his company had already built



## Technology Stack Needed

JavaScript

NodeJS

Django

DevOp

Containers, CI/CD

Microservices

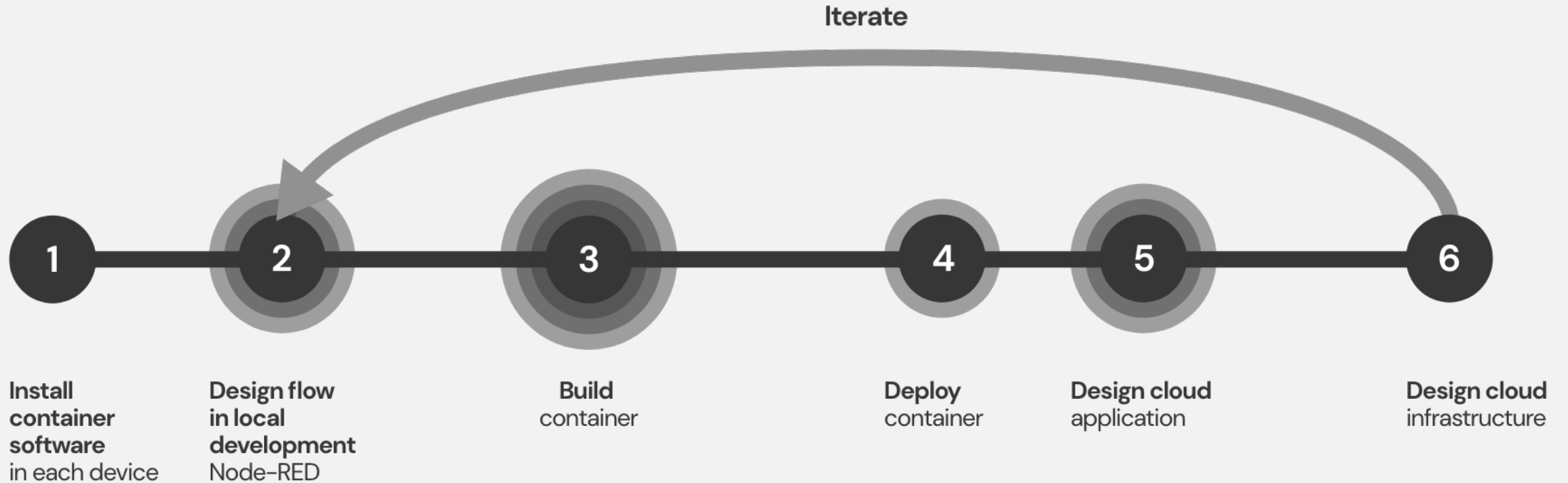
NGINX, Cookies

Orchestration

Comm, I/O, Security

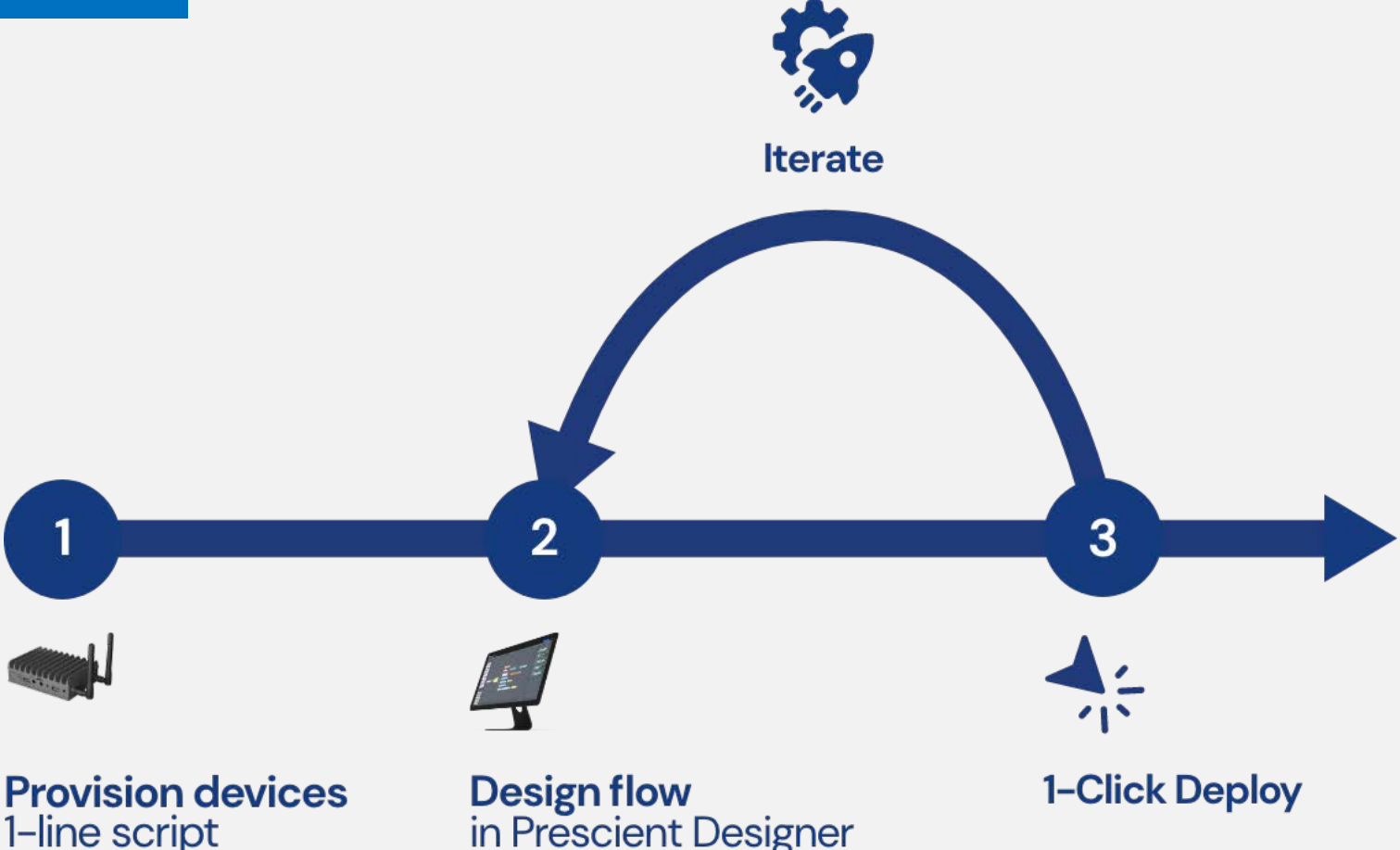
System management

# Node-RED workflow from scratch



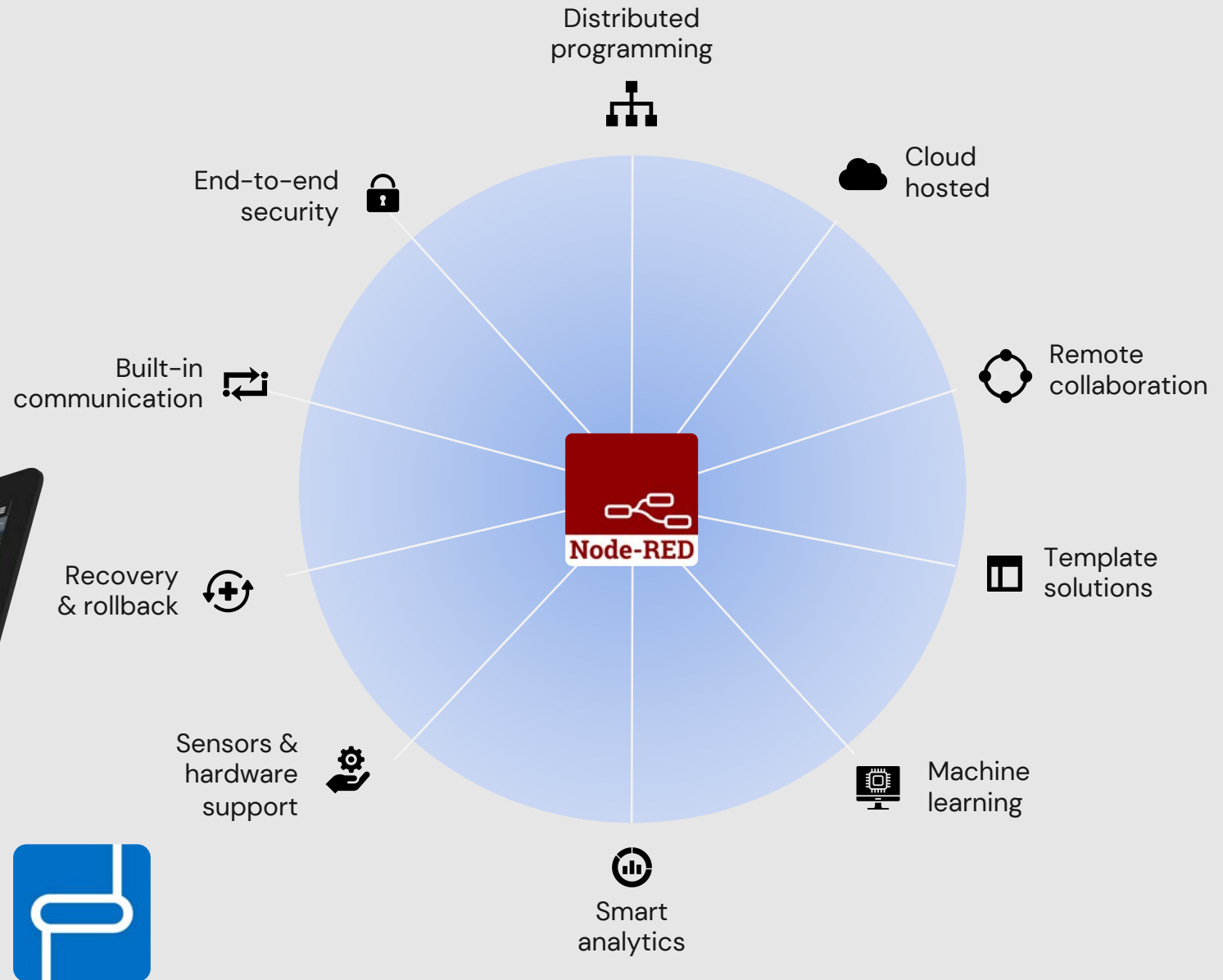
\*Size of bubbles and length of lines correspond to the complexity of each step

**Prescient Designer**  
enables agility





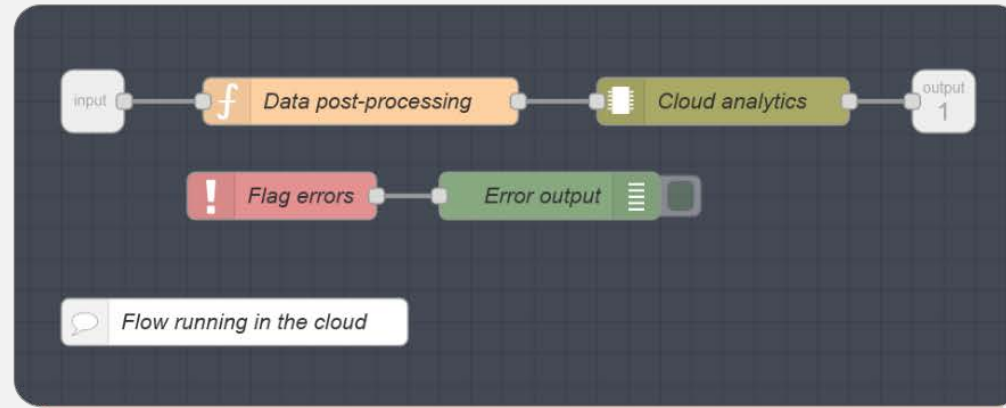
# What is Prescient Designer?



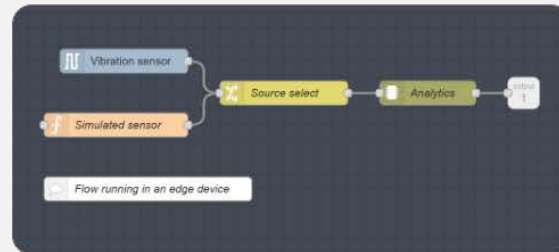
# Distributed programming

Associate blocks to devices in *any* way it makes sense

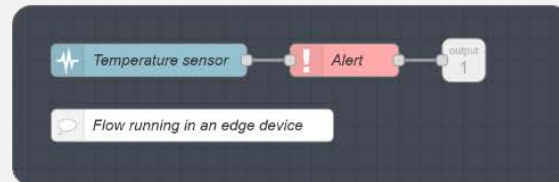
## CLOUD PROCESSING



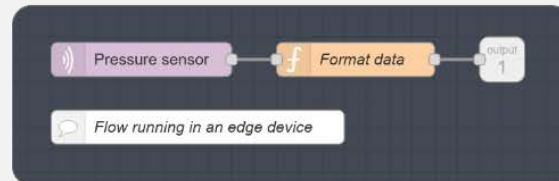
## EDGE DEVICE 1-100



## EDGE DEVICE 101-200

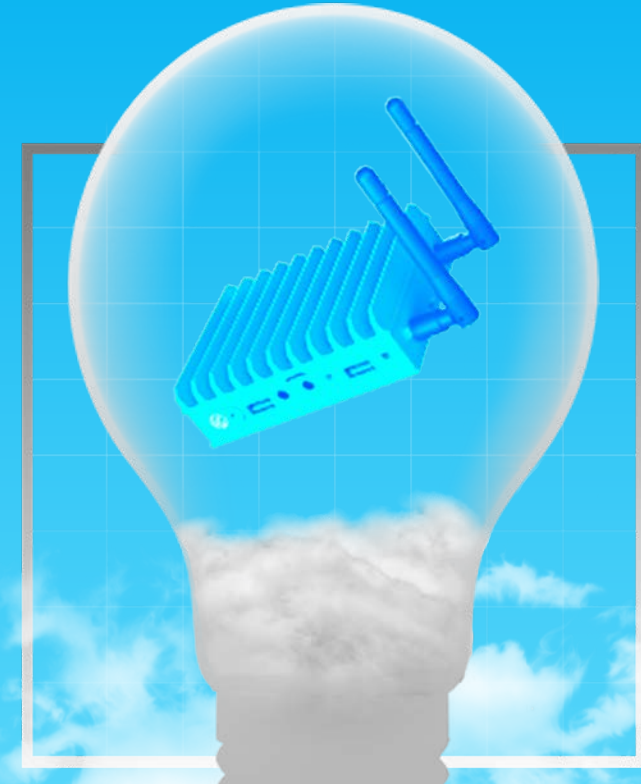


## EDGE DEVICE 201-1000



A screenshot of the Prescient Designer web interface. The browser address bar shows '192.168.23.120:1880/#flow/fa8980aa-19b7d9'. The interface has a dark theme and includes a 'Deploy' button in the top right. The main workspace shows a 'Main flow' with several blocks: 'Vibration detection' (with a server icon), 'Temperature detection' (with a thermometer icon), 'Pressure detection' (with a pressure gauge icon), and 'Cloud processing' (with a server icon). These are connected to a 'Control panel' block (with a server icon) and a 'Debug output' block (with a list icon). On the left, there is a 'filler nodes' panel with categories 'common' and 'subflows'. The 'common' category includes blocks like 'inject', 'debug', 'complete', 'catch', 'status', 'link in', 'link out', and 'comment'. The 'subflows' category includes 'Vibration detection', 'Overtemperature detection', and 'Pressure detection'. On the right, there is a 'devices' panel showing a list of connected devices with their memory and disk usage: 'designer' (pablo-vm, memory 47%, disk 78%), 'iot-gate-ixm8' (connected, memory 87%, disk 78%), 'pi3-1' (connected, memory 85%, disk 95%), and 'snap-dev' (connected, memory 75%, disk 78%).

# Got a project? Get in touch!



Contact Us

Technology  
Assessment

Access Prescient  
Designer

Proof-of-Concept

Deploy & Iterate

Q&A

# Download our Application Note

Download: [prescientdevices.com/en-us/node-red-application-note](https://prescientdevices.com/en-us/node-red-application-note)

App Note  
Download

