



UNIT 5-PLATFORMS FOR IOT DEVELOPMENT



INTRODUCTION TO NODE-RED AND APPLICATION DEPLOYMENT

- **NODE-RED IS A STREAM-BASED DEVELOPMENT TOOL** FOR VISUAL PROGRAMMING, PRIMARILY FOCUSED ON **WIRING THE INTERNET OF THINGS (IOT)**. THIS PROGRAMMING TOOL IS DEVELOPED TO WIRE TOGETHER HARDWARE DEVICES, APIS, AND ONLINE SERVICES IN INNOVATIVE WAYS.
- **DEVELOPED BY:**
- INITIALLY DEVELOPED BY IBM EMERGING TECHNOLOGY, NODE-RED IS AN OPEN-SOURCE PROGRAMMING TOOL.
- **DEVELOPERS:**
- NICK O'LEARY
- DAVE CONWAY-JONES
- **LATEST VERSION:**
- V1.0.6 (NPM)
- WRITTEN IN JAVASCRIPT



- **HOW NODE-RED WORK**

- A NODE-RED FLOW OPERATES BY PASSING MESSAGES BETWEEN NODES. THE MESSAGES IN NODE-RED ARE SIMPLE JAVASCRIPT OBJECTS THAT CAN HAVE ANY SET OF PROPERTIES.

- **INSTALLING NODE-RED**

- **INSTALLING WITH NPM (NODE PACKAGE MANAGER)**

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

- **TO UPGRADE TO THE LATEST VERSION:**

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



- **INSTALLING WITH DOCKER**

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

Installing with snap

```
sudo snap install node-red
```

Running NODE-RED

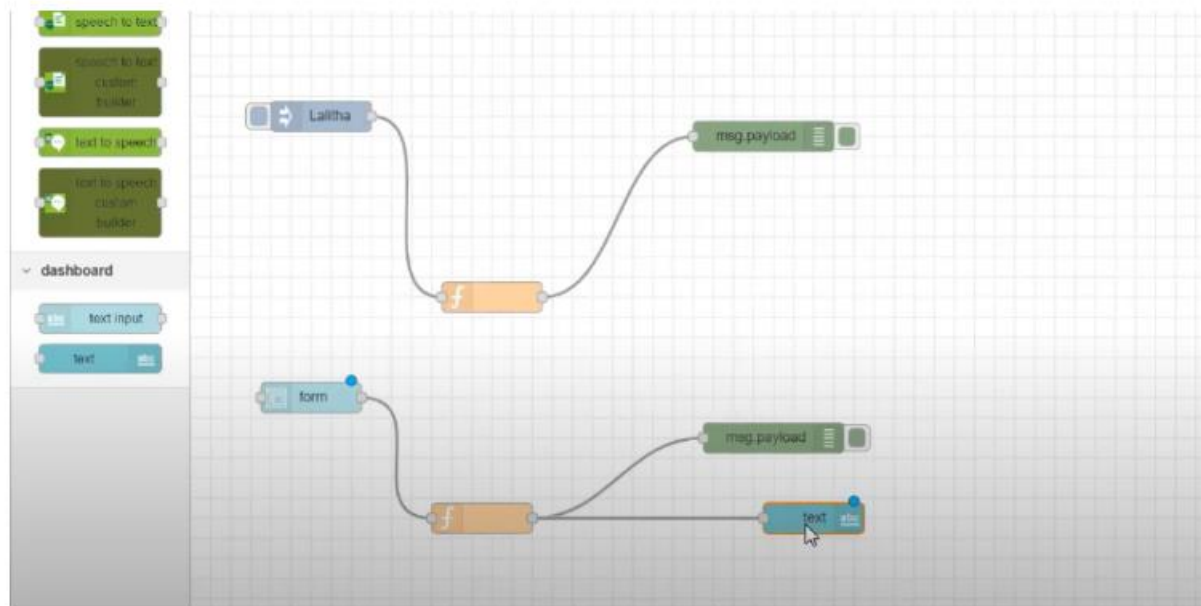
Once Node-RED is installed and set up, it can be run in three ways:

- Locally
- On a device
- In a cloud environment



- TOP REASONS TO USE NODE-RED

Browser-based flow editing:



Browser-based flow editing

It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click.

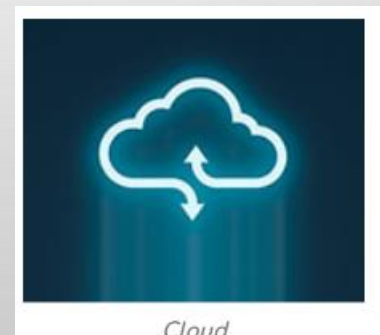


- **WRITTEN IN JAVASCRIPT:**
- **THUS, IT IS BUILT IN JAVASCRIPT THEN NODE-RED TOOK ALL THE ADVANTAGES OF THIS LANGUAGE THAT IS EVENT-BASED PROGRAMMING LANGUAGE, PROCEDURAL PROGRAMMING CAPABILITIES, PLATFORM INDEPENDENT AND BEYOND ALL THIS IT COMPARATIVELY FAST AND EASY TO LEARN.**





- **CROSS-PLATFORM COMPATIBILITY:**
- NODE-RED CAN RUN ON VARIOUS OPERATING SYSTEMS, INCLUDING RASPBIAN, UBUNTU, WINDOWS, DOCKER, DEBIAN, AND MACOS.
- **VERSATILITY BEYOND IOT:**
- WHILE NODE-RED IS HIGHLY POPULAR IN THE IOT SPACE, IT ALSO SUPPORTS MANY READY-MADE NODES FOR DESIGNING CREATIVE FEATURES BEYOND IOT APPLICATIONS.



Cloud



- **SUPPORTED CLOUD PLATFORMS AND PRE-INSTALLED DEVICES**
- **CLOUD PLATFORMS:**
 - IBM CLOUD
 - SENSETECNIC FRED
 - AMAZON WEB SERVICES
 - MICROSOFT AZURE



- **TYPES OF NODES IN NODE-RED**
- **INJECT NODE:** THIS NODE ALLOWS MANUAL TRIGGERING OF FLOWS AND FACILITATES INJECTING EVENTS AT SCHEDULED INTERVALS.
- **DEBUG NODE:** DISPLAYS THE CONTENT OF A MESSAGE, EITHER THE PAYLOAD OR THE ENTIRE OBJECT, WHICH IS USEFUL FOR DEBUGGING.
- **TEMPLATE NODE:** MODIFIES THE OUTPUT BASED ON A MUSTACHE (LOGIC-LESS) TEMPLATE.