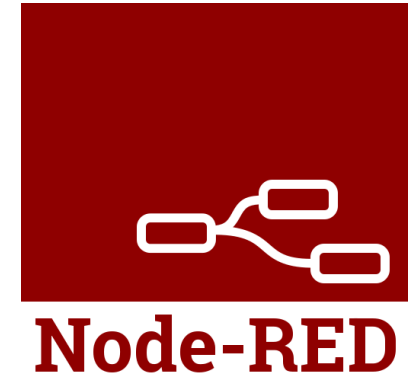


IoT: Node Red, CouchDB, Influx DB, Grafana

IoT Essential Technologies

Mohamed Al Solh

alsolh@alsolh.com



جامعة عجمان
AJMAN UNIVERSITY



Node Red

- `docker run -it --network="host" --name node-red nodered/node-red`
- Reason for host network is many services in node red have different ports, for purpose of experimentation you can run it in host, otherwise if you know the ports better to expose only the ports needed
- Node red runs under node js, you can alternatively download node-js and run npm to install and run node red

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

<https://youtu.be/FHP7qsaz7ZI>

Node Red IDE

- Left panel for pallet containing nodes
- Workspace area for developing with nodes
- Side panel for details on each selected node
- Menu
 - Plugins
 - Global Settings
- Deploy Button

Simple Example

- Time stamp with debug node

Other Important Nodes

- Switch
- Change
- Delay
- Trigger
- JSON Selector

Function Node

- Write javascript logic
- Interact with message object using `js msg.payload`

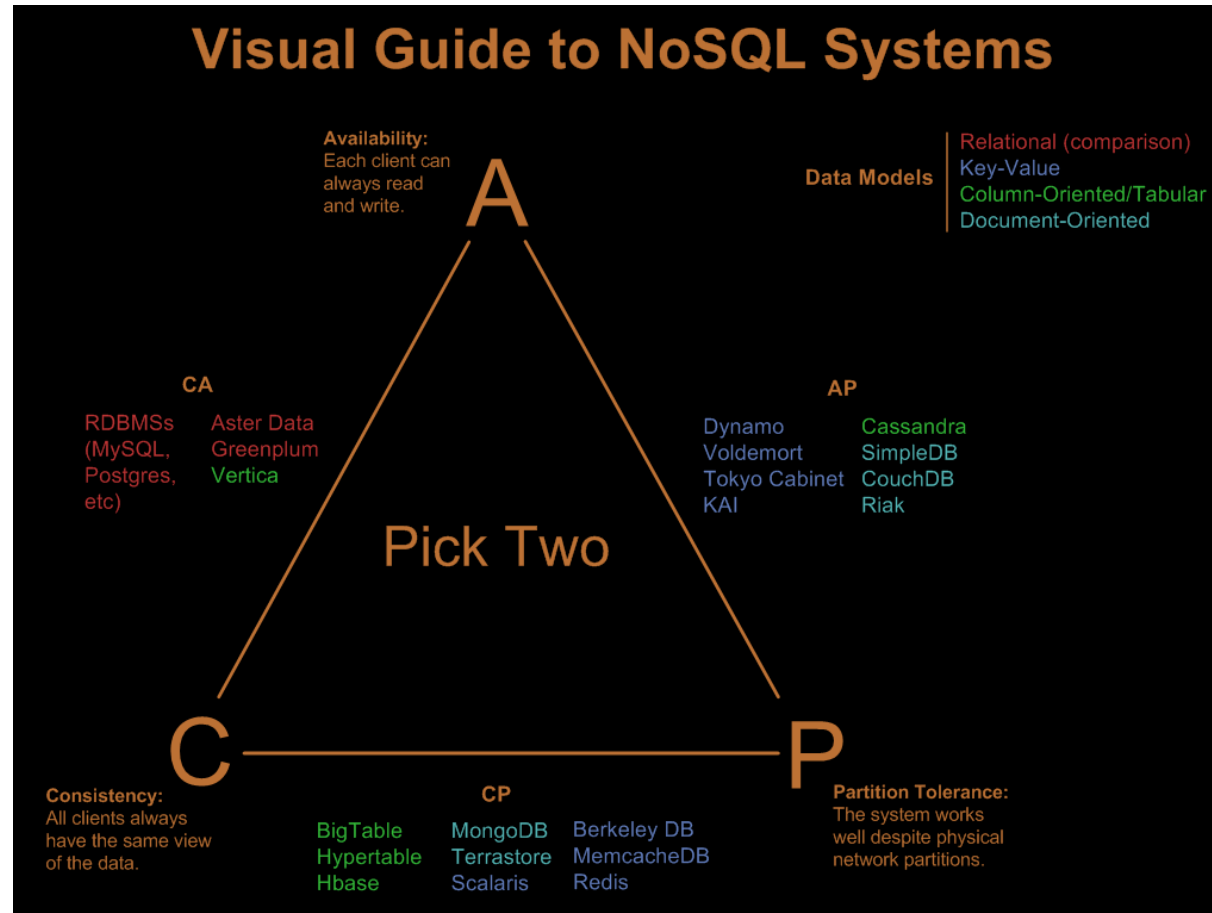
CouchDB

- NoSQL DB
- Specialized in storing document objects
- Has REST APIs out of the box
- Follows Eventual Consistency in CAP Theorem

CAP Theorem

- Consistency: Every read receives the most recent write or an error
- Availability: Every request receives a (non-error) response, without the guarantee that it contains the most recent write
- Partition tolerance: The system continues to operate despite an arbitrary number of messages being dropped (or delayed) by the network between nodes
- When a network partition failure happens should we decide to
 - Cancel the operation and thus decrease the availability but ensure consistency
 - Proceed with the operation and thus provide availability but risk inconsistency

CAP Theorem



CouchDB

- Docker pull
- Creating new DB
- Utilities Page
- Managing records in Utilities
- APIs documentation
- API Trial in postman

Pub-Sub MQTT

Calling REST API

Exposing REST API

Creating Dashboard

Influx DB

- Time Series Data

Many Nodes for IoT

- Control Various Consumer Devices such as TVs
- DLNA Support for Google Home
- Alexa Support
- Ping
- Geofence
- RPI Direct GPIO Control

More Nodes

- Link Node
- Inject Node
- Template
- Email

Scopes

- Node
- Flow
- Global

Next

- We will continue Node Red after Going to Hardware Options
- We will take few hardware examples from nodes we learned to use