IoT is driving Digital Disruption of the Physical World

Accelerating advances in technology

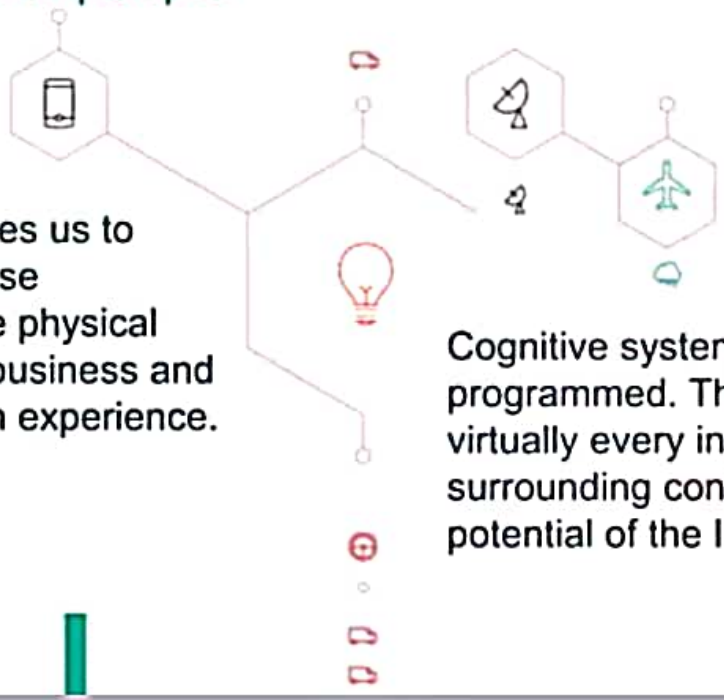
- Advanced analytics
- Cloud computing
- Pervasive connectivity
- Product Lifecycle Management
- Embedded sensors

And transforming every part of business

- Improving operations and lowering costs
- Creating new products and business models
- Driving engagement and customer experience

www.ibm.com/iot

At the Intersection of the Internet of Things with the internet of people



Cognitive IoT enables us to learn from, and infuse intelligence into, the physical world to transform business and enhance the human experience.

Cognitive systems aren't programmed. They learn from virtually every interaction and the surrounding context to unleash the potential of the IoT.

Outthink the limits of what's possible …

IoT

Connects devices, gateways and endpoints

Secures and integrates device data and contextual data

Scales via cloud-based services

Analyzes performance and utilization data

IBM Watson

Applies cognitive technologies to help change how we approach and understand the world's information

Leverages data driven industries and economies to bring cognition to everything and everyone

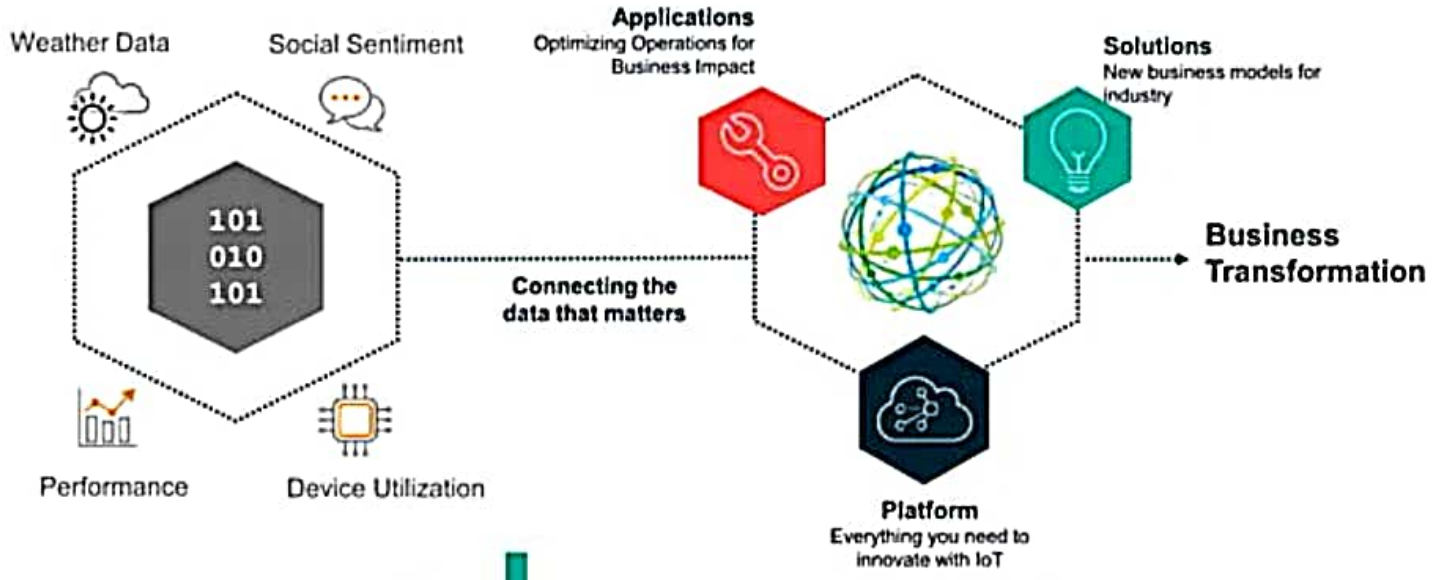
Reason and learns from data

IBM Watson IoT Platform

- **Platform of Platforms** – IBM is committed to integrating with other leading platforms so customers are not forced to chose proprietary tech stacks
- **IoT specific security** – security micro-services built specifically for IoT-based solutions
- **Rich integration of contextual data sources** – leading the industry at partnering with outside data providers (e.g. Weather Company)
- **Deep, industry-specific analytics models**

Ready your business for cognitive IoT

Start by deploying a highly secure, scalable, and open platform that lets you start small, and grow quickly



The IBM Watson IoT Platform Offerings

Everything you need to transform with IoT

IBM Watson IoT Platform - Connect

Connect and manage devices, networks, and gateways

IBM Watson IoT Platform - Information Management

Integrating information, structured and unstructured, from devices, people, and the world around us

IBM Watson IoT Platform - Analytics

Gaining insights from information using Realtime, Predictive and Cognitive analytics

IBM Watson IoT Platform - Risk Management

Ensuring you leverage the right information from the right sources, and the right software runs where you need it

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Uniquely IBM

The Weather Company

Integrate enterprise, device, and 3rd party data
Combining weather data with traditional business data and rich data from an unprecedented number of Internet of Things (IoT) enabled systems and devices will fundamentally transform enterprise decision-making.

Out think the competition with Watson
Gain competitive advantage with Cognitive and Advanced Analytics services, such as natural language processing, machine learning, textual analytics, and video/image analytics.

IBM Bluemix environment for IoT development
Composable services development, runtime and operations for your IoT apps, running on IBM SoftLayer global cloud

www.ibm.com/iot

IBM Watson IoT and Industry Innovation

Enabling new business models with integrated solutions

Transform traditional business with the capabilities of IoT

- Drive customer relationships & experiences
- Improve operational efficiency & reduce costs
- Deliver new product and business models
- Drive better customer engagement
- Leverage Watson for cognitive solutions

IBM Watson IoT Platform - Connect

Connect what matters….

The Hub for IoT Data

Connect and manage your IoT devices, Gateways and Networks from a broad and growing ecosystem

Open standards based communications (MQTT, HTTPS)

Secure communication and management
Globally scalable, starting with a single device

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IBM Watson IoT Platform - Risk Management

Address privacy and manage risk through security and Blockchain capabilities

Leading Security Capabilities

Enforce the appropriate level of security and privacy to your IoT solution from the device through the network to the cloud and beyond

End to end core security features for devices, data and connections

Gain system wide confidence via Security Analytics

Provide support for secure decentralized systems such as Blockchain

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IBM **Emerging Technology**

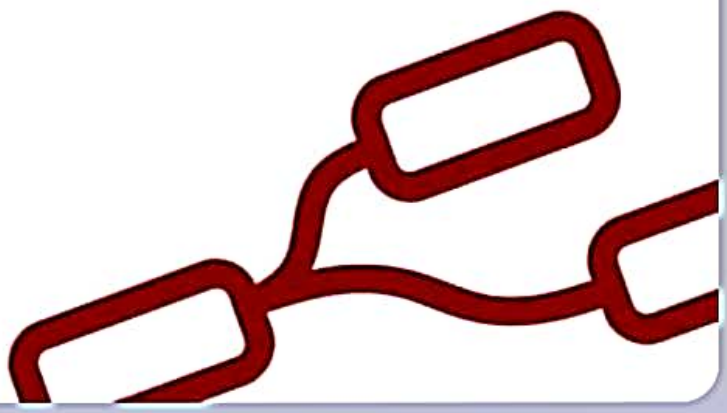
Node-RED

A visual tool for wiring the Internet of Things

Kleber Carvalho
Application Architect – IBM
Professor – Developer School

29-March-2017

IBM



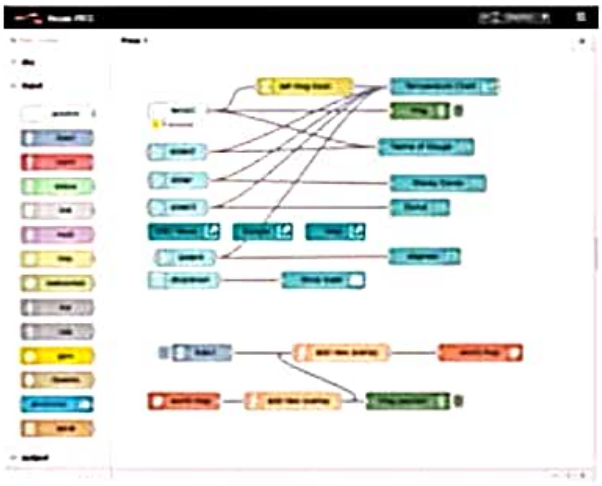
Introducing Node-RED

Node-RED makes it easy to wire together the Internet of Things.

It provides a browser-based drag-drop UI for creating flows of events and deploying them to the runtime.

The light-weight runtime, built in **node.js**, is ideal for edge-of-network environments or running in the cloud.

It can be easily expanded to take add new nodes to the palette - taking full advantage of the node package manager (npm) ecosystem



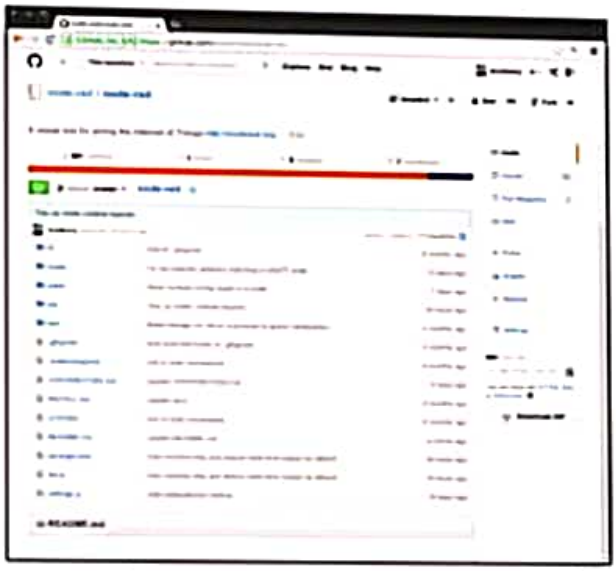
Flow-based Programming

Invented by J. Paul Morrison at IBM in the early 1970's

- A network of asynchronous processes communicating by means of streams of structured data chunks
- Each process is a black box – it doesn't know what has come before it, or what comes after it; it just acts on the data it receives and passes the result on

https://en.wikipedia.org/wiki/Flow-based_programming

Open Source Development



- Released on GitHub September 2013
- Apache 2 License
- 3rd party pull-requests accepted under **Contributor License Agreement**
  - Most contributions direct via NPM
- Active Google Group and Slack channel
- http://nodered.org
- http://flows.nodered.org
  - Online flow library for examples
  - Encourages sharing and reuse of flows within the community

From the edge to the cloud

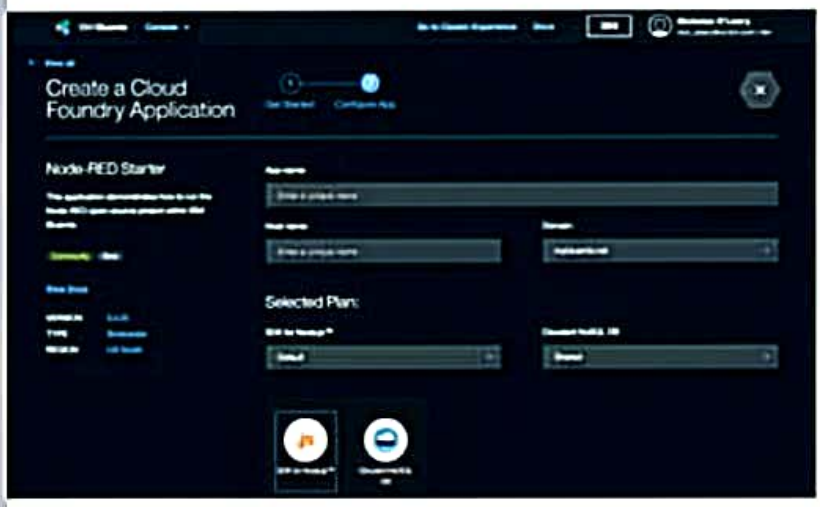
Raspberry Pi

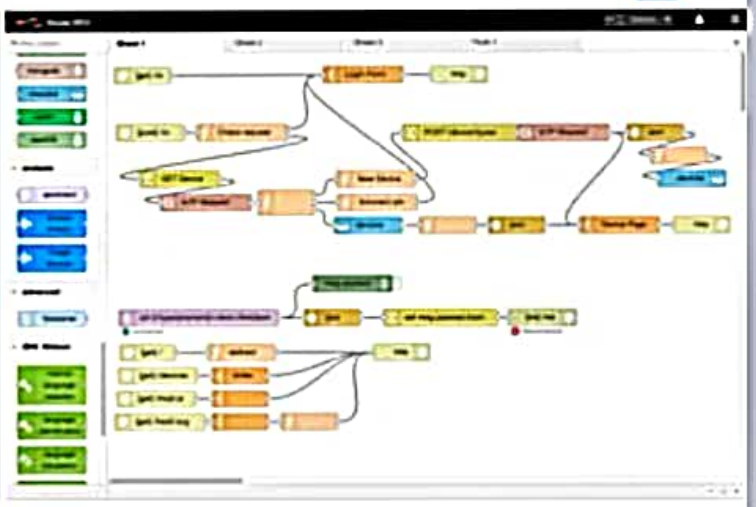
Pre-installed on the default Raspberry Pi image, Node-RED can be used out of the box to begin creating IoT applications.

IBM **Bluemix**

Available in the Bluemix catalog as a Quick Start application, it takes moments to create cloud applications that combine services from across the platform.

Boilerplate Application on IBM Bluemix

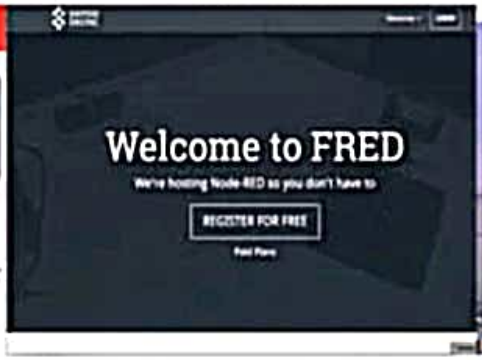




bluemix.net

3rd Party Hosted Node-RED services

redconnect.io



fred.sensetecnic.com

flow.att.com

Install it locally and get wiring

```
$ sudo npm install -g --unsafe-perm node-red
$ node-red
$ You can then access the Node-RED editor at
http://localhost:1880.
```

Recommend: node.js 4.x & npm 2.x

https://www.coursera.org/learn/developer-iot

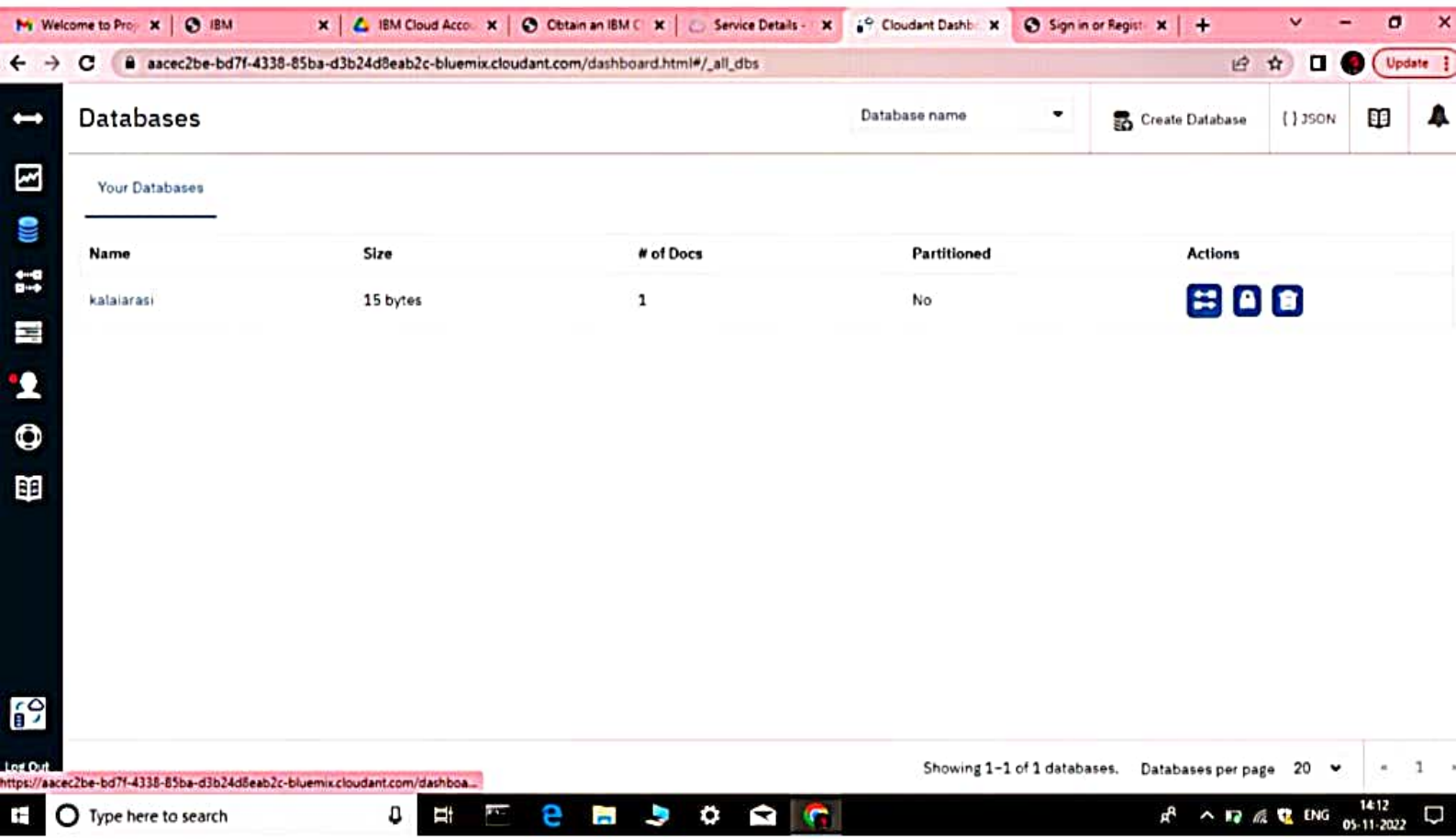
Coursera – A developer's guide to the Internet of Things

Learn about IoT and Node-RED over a 4 week online course

https://developer.ibm.com/recipes/

IBM developerWorks Recipes

Lots of contributed recipes for connecting things to Watson IOT platform - many using Node-RED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Create Database
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Size
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Log Out
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Databases per page
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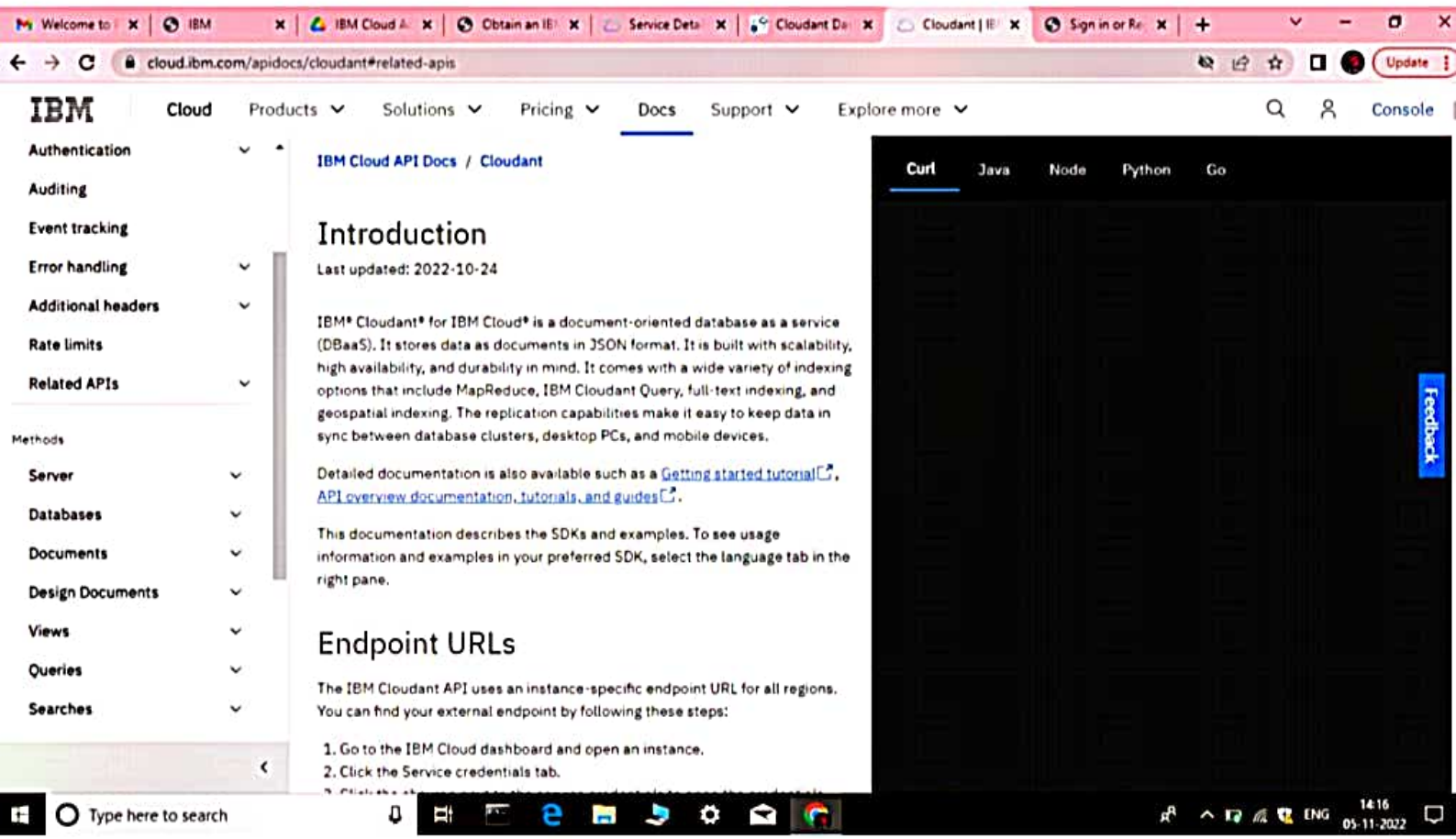
Welcome to
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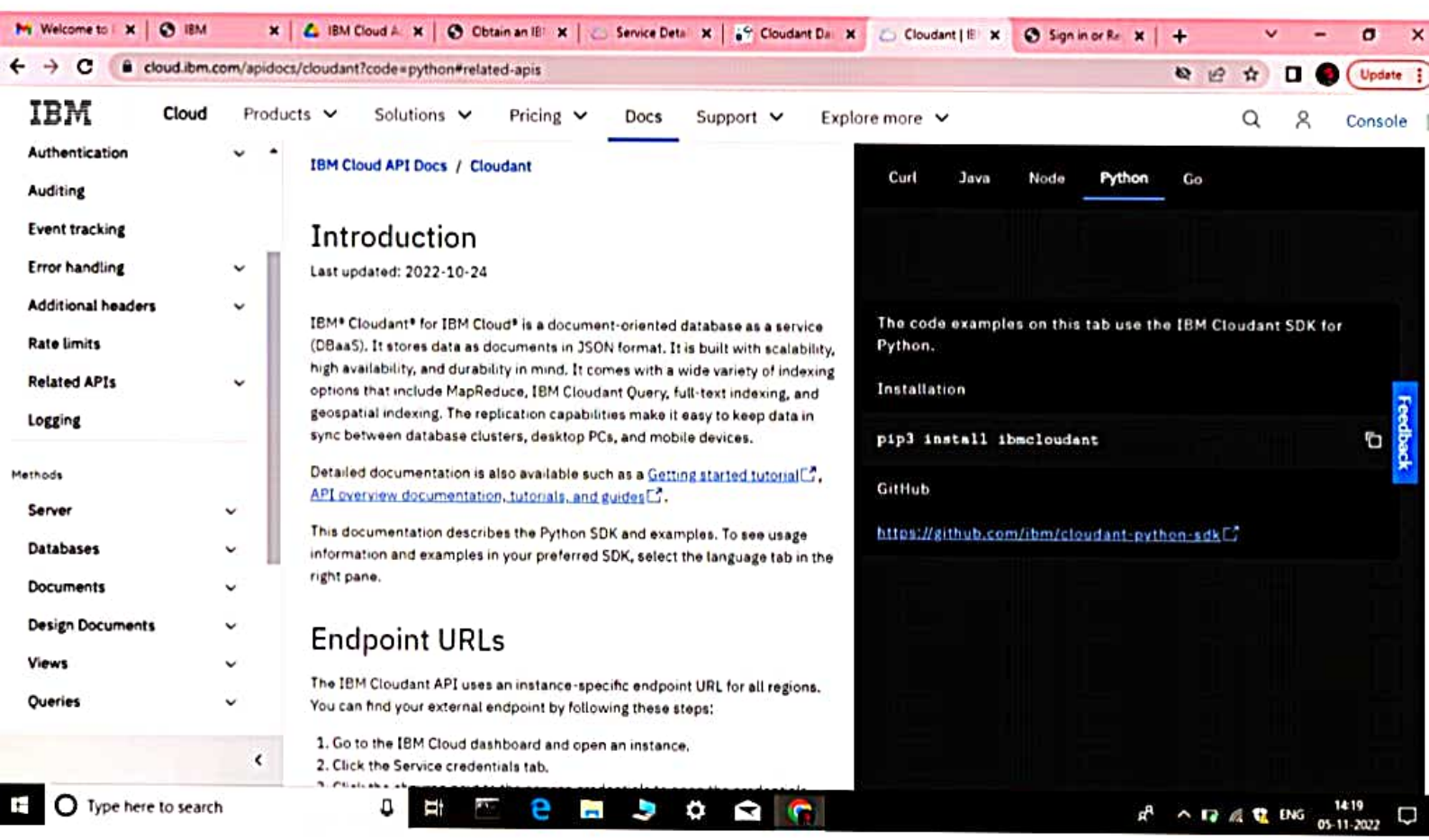
Sign in or Re
cloud.ibm.com/apidocs/cloudant#related-apis
Update
IBM
Cloud
Products
Solutions
Pricing
Docs
Support
Explore more
Console
Authentication
Auditing
Event tracking
Error handling
Additional headers
Rate limits
Related APIs
Methods
Server
Databases
Documents
Design Documents
Views
Queries
Searches
IBM Cloud API Docs / Cloudant
Introduction
Last updated: 2022-10-24
IBM® Cloudant® for IBM Cloud® is a document-oriented database as a service (DBaaS). It stores data as documents in JSON format. It is built with scalability, high availability, and durability in mind. It comes with a wide variety of indexing options that include MapReduce, IBM Cloudant Query, full-text indexing, and geospatial indexing. The replication capabilities make it easy to keep data in sync between database clusters, desktop PCs, and mobile devices.
Detailed documentation is also available such as a Getting started tutorial, API overview documentation, tutorials, and guides.
This documentation describes the SDKs and examples. To see usage information and examples in your preferred SDK, select the language tab in the right pane.
Endpoint URLs
The IBM Cloudant API uses an instance-specific endpoint URL for all regions. You can find your external endpoint by following these steps:
1. Go to the IBM Cloud dashboard and open an instance.
2. Click the Service credentials tab.
Curl
Java
Node
Python
Go
Feedback
Type here to search
ENG
14:16
05-11-2022


cloud.ibm.com/apidocs/cloudant?code=python#related-apis
IBM Cloud Products Solutions Pricing Docs Support Explore more Console
Authentication
Auditing
Event tracking
Error handling
Additional headers
Rate limits
Related APIs
Logging
Methods
Server
Databases
Documents
Design Documents
Views
Queries
IBM Cloud API Docs / Cloudant
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2. Click the Service credentials tab.
Curl Java Node Python Go
The code examples on this tab use the IBM Cloudant SDK for Python.
Installation
pip3 install ibmcloudant
GitHub
https://github.com/ibm/cloudant-python-sdk
Feedback
Type here to search
ENG
14:19
05-11-2022