

OpenSource and Cloud Computing

at Library of National Congress of Chile BCN



Presentation by Luis Armando González

Agenda

- Objectives
- Who we are
- Software and licenses definition
- Open Source used at BCN
- Topics under research

Objetives

- To explain how we use OpenSource at BCN
- To explain the cloud computing model used at BCN
- Shows topics under research
- Practice some applications tools

Everything in 30 min!

Who we are

Library of National Congress of Chile Mission

- To support the Parliament in its constitutional functions.
- Provide products and information services
- Contribute to linking the National Congress of Chile with the citizenship

Information Technology Department at BCN

- We conduct research about the application of new technologies and standards to support the Library Mission
- We develop new systems and applications
- We align the technological projects with the strategic plan of the BCN
- We ensure the continuity of operations and services IT based.

What is SOFTWARE?

Software: Computer programs, procedures, possible associated documentation and data pertaining to the operation of a computer system.

This concept goes beyond the computer programs, involving:

- **Computer programs**

- Source.
- Executable

Source

compilation

Executable

- **Documentation** (How to use the software)
- **The data** to be processed

Software is an intangible in contrast to the physical hardware
Software and hardware require each other for made useful applications.

IEEE Std 610.12-1990

<https://www.ieee.org/index.html/>

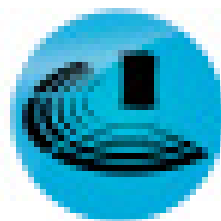
What is Open Source?



open source
initiative

Open source software: Is software that can be **freely used**, changed, and shared **by anyone**.

There is a **community** cooperating and collaborating to improve the software



PARL

The Open Source Definition

Open source software is made by many people, and distributed under [licenses](#) that comply with the [Open Source Definition](#), in:

<https://opensource.org/osd>



®

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initiative

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Some popular Licenses

Open source software is distributed under [licenses](#) like License guarantees openness of the source code



open source
initiative

1. **Apache License**
2. **BSD license**
3. **GNU General Public License (GPL)**
4. **MIT license (MIT)**
5. **Mozilla Public License**
6. **Common Development and Distribution License**
7. **Eclipse Public License**

Advantages of Opensource

- Software is freely distributed (you don't have to pay for it)
- A community of users/developers creating new versions
- Improved features

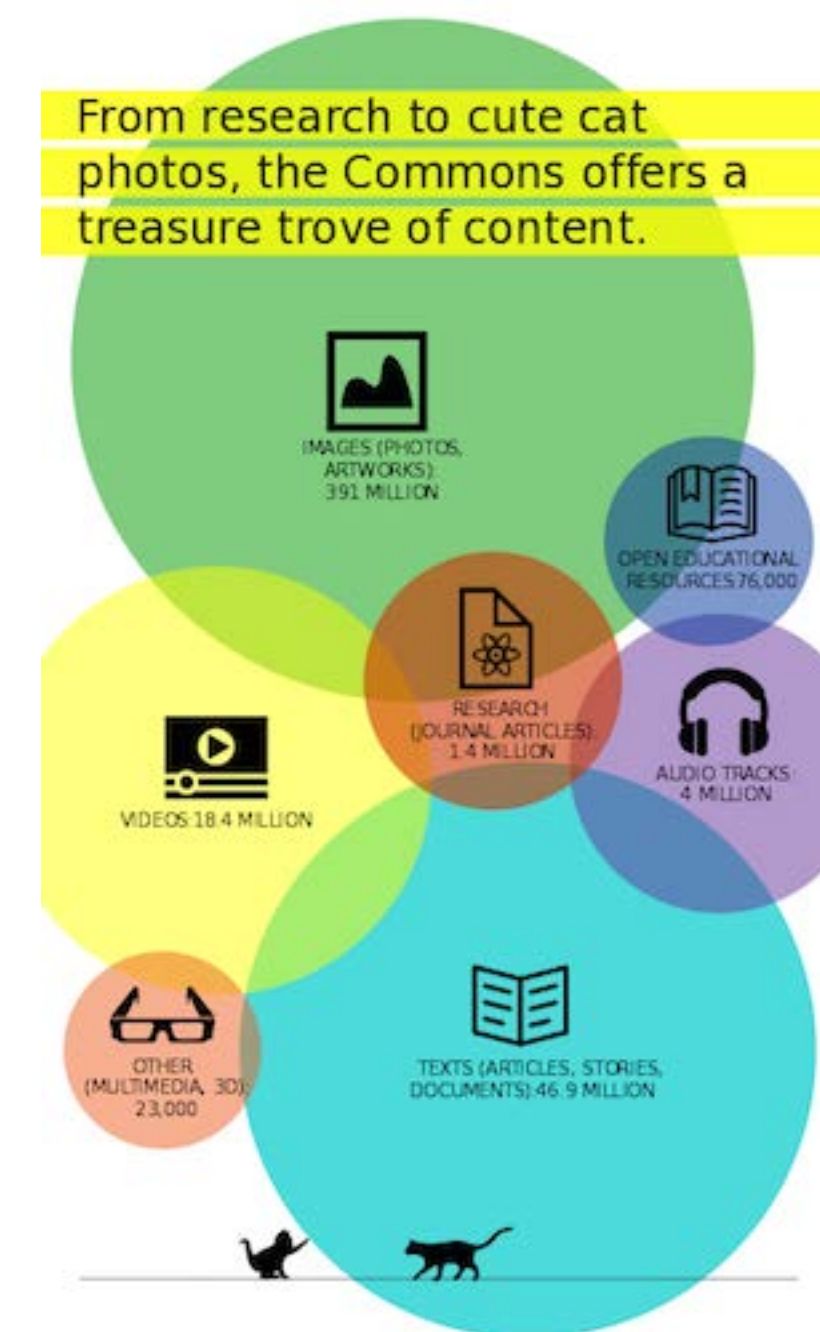
What's about the contents?

The products and information services generated by the Library

We create a digital collection of documents, and publish in the Web many of them

Creative Commons licenses

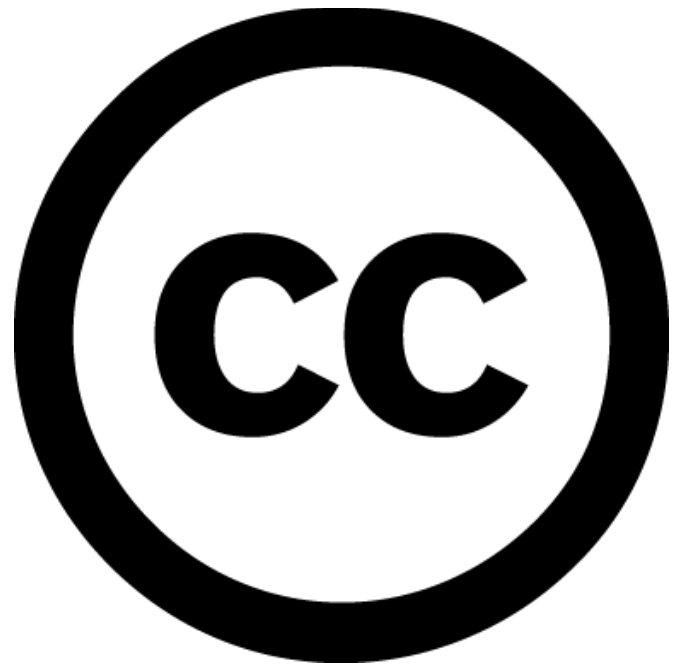
- Permits legally share the knowledge and creativity
- Is a standardized way to give the public permission to share and use the creative work with few conditions



What's about the contents?

For example The IFLA web site says:

<https://www.ifla.org/copyright>



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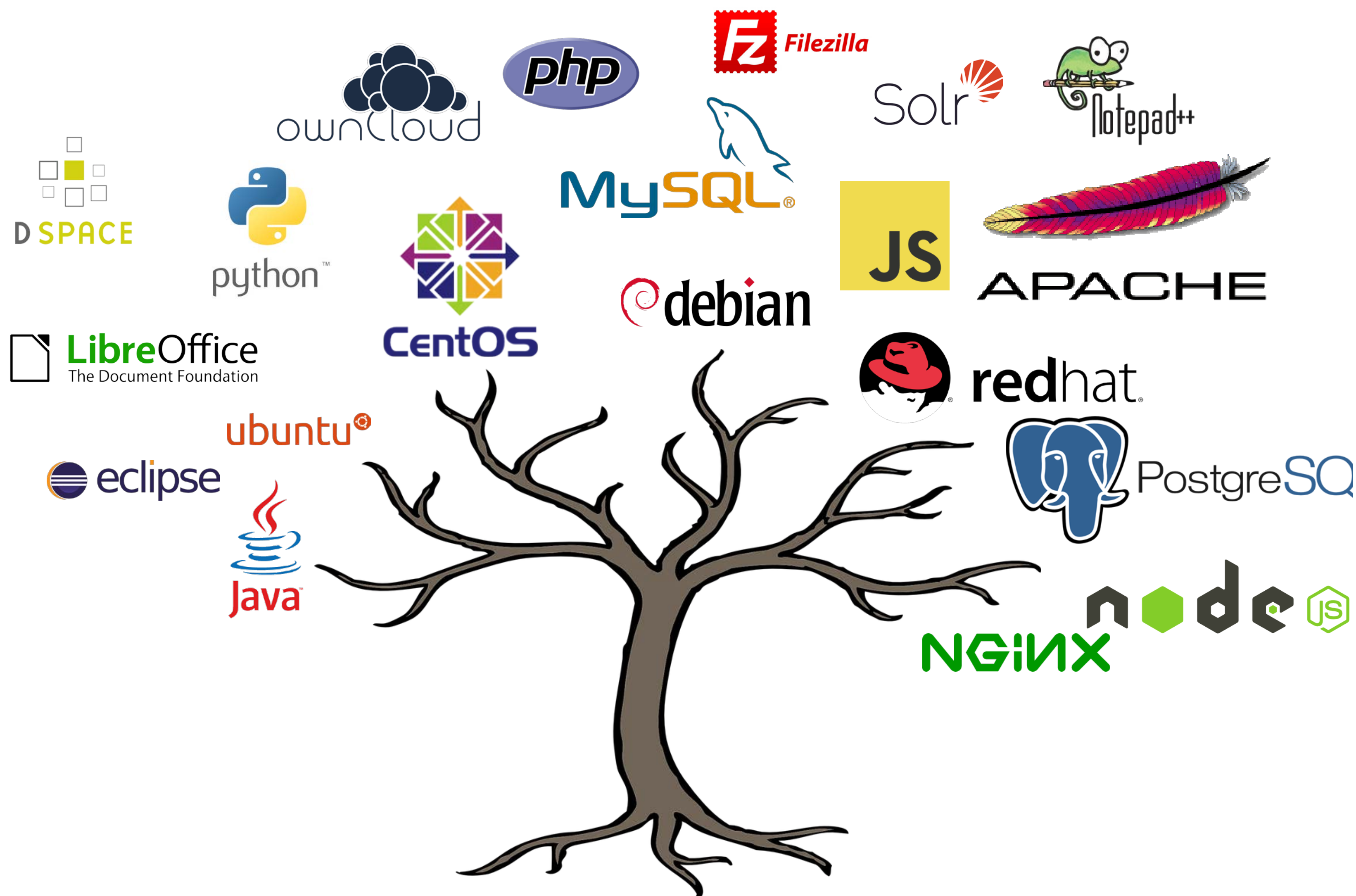
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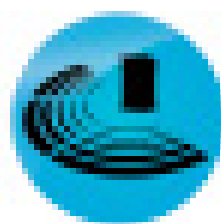
OpenSource used at RCN



- Ley Chile
- Parliamentary work
- Unified ordering system
- Portal BCN
- Wiki
- Data BCN
- History of Law
- Repositories
- News
- Databases
- Budgeted Transparency
- App Ley Fácil
- WDPL

OpenSource used at BCN

Classification	Function	Specific Software
Operating Systems	Basic component that permits computers to run	Red Hat, Centos, Debian, Ubuntu
Programming Languages	Permit build the programs and applications	Java, Python, Javascript, Php
Relational Databases	Allow storing and accessing data in a standard, structured, integrated and secure way	PostgreSQL, mysql
Repositories	Software for store digital archives(doc, xls, pdf, etc), focused on the indexation for long-term storage, access and preservation of digital collections	Dspace
IT Applications	Permit build and operate the applications according the user's requirements	Node.js, Apache, Owncloud, Filezilla, Solr, bootstrap, nginx, varnish
Finals Applications	Permit to users made their work	LibreOffice, Notepad++, Eclipse, Akoma Ntoso



OpenSource under Research at BCN

Classification	Function	Specific Software
Bigdata	Build new applications focuses in big volumes of data for extract and to make inferences about new knowledge and recommendations	Hadoop Mongodb Spark
Mobile Computing	Build applications for mobile devices. The objective is arrive to the hand of parliamentarians and their staff with information services from the library, like press clipping, prospective studies or answer to reference requests from MP	Angular React
IOT	Internet of the Things, all kind of the devices are expected to be connected	Research
Virtualization	Allow share the hardware resources in several virtual machines optimizing the IT investment	Virtualbox Docker
Code offloading and edge computing	New frontiers of the mobile computing moving the applications compute power needs from the mobile to the cloud	Firebase android-sdk

Operating Systems by applications



- Autonomy index and search
- Press and clipping service
- Administrative ERP
- Former mail server



- Development
- Test



Ley Chile
Law History
Parliamentarian Labor
Parliamentarian Portal
Parliamentarian Observatory
History of Law
Budgeted Transparency
Public Transparency
Easy Law
Civic Formation
Project Management
Unified ordering system
Portal BCN
Repositories
Databases
WDPL



- Workstations
- Datos BCN (opendata)
- New mobile apps

Relational Databases used at BCN



An open source RDBMS used by

- DSpace
- Press
- New ILS based in Koha
- Standard for new applications development



Is an open source RDBMS owned by oracle Inc. used by

- Datos BCN
- Historia de la Ley
- Systems based in wiki model



A commercial RDBMS used by its XML capacity in ley Chile system and commercial ERP



A commercial RDBMS is a legacy used in the former horizon ILS system (20+ years)

Legacy DB Not Open Source

Languages used



- New Budget system for parliamentarian
- Historia de la Ley
- Labor Parlamentaria
- Opendata
- Web services



- Ley Chile
- Formación Cívica
- Sistema de Noticias
- SUP
- Delibera
- Ley Fácil
- SIIT



- All websites



- Systems based in Wiki

Basic Apps



Is a platform for produce more efficient Web applications, based in JavaScript

- Simulador de escaños
- New redesign for ley Chile



nginx [engine x] is an HTTP and reverse proxy server

Used for optimize the access and reverse to/from external sites



A traditional Webserver for all applications



An indexer and search engine

- Ley Chile
- Transparencia Presupuestaria
- App Ley Fácil
- Labor parlamentaria
- Historia de la ley

Basic Apps



Runs a institutional cloud file storage service.

Used for store and share personal files like Dropbox.



Is an FTP utility, for transfer files between computers



Is a repository software used for the digital collections

Apps for finals users



Used in replace of MS Office suite



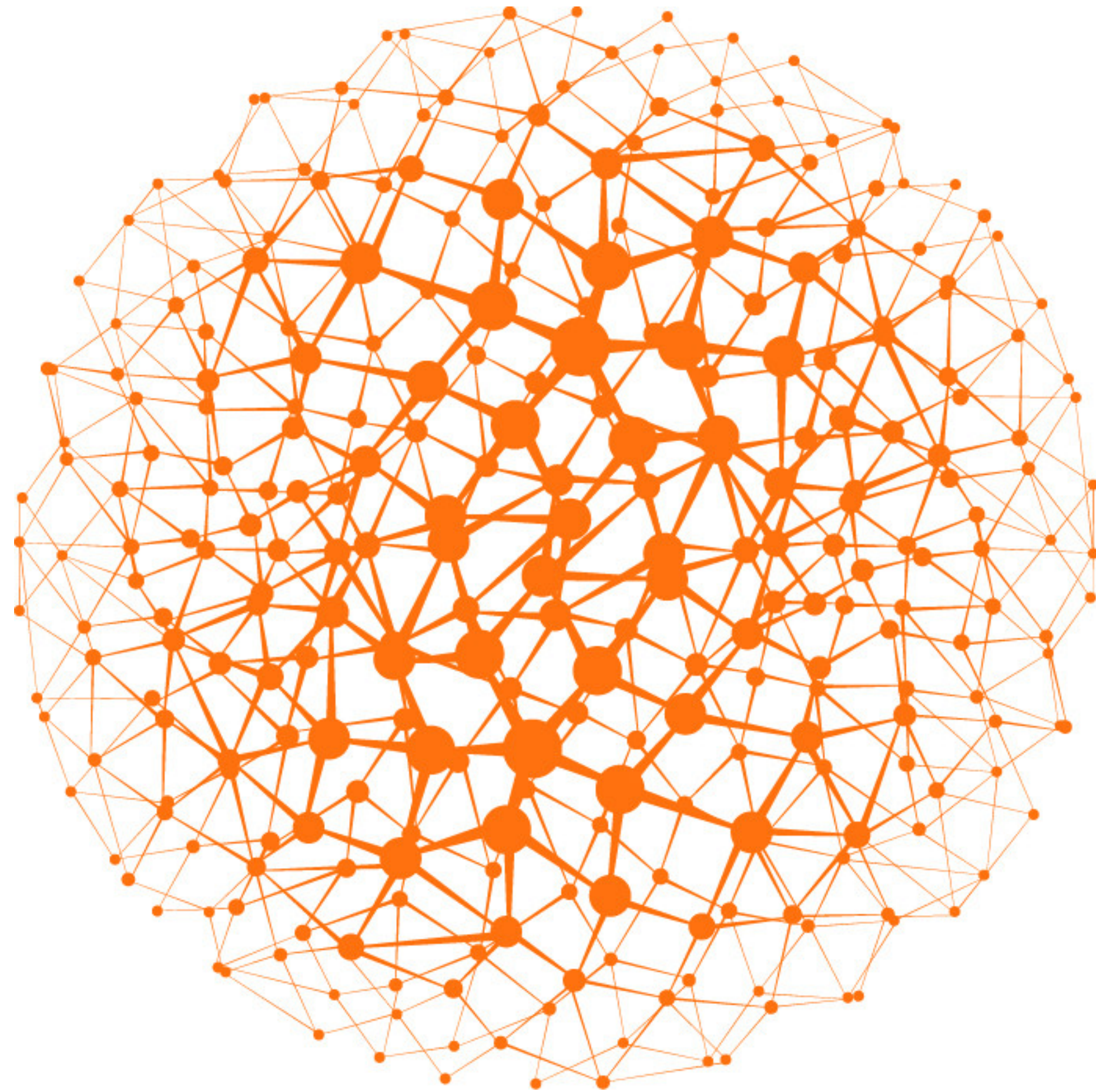
Is a text editor useful write plain text and source code programs



Tool used by programmers in the applications development process,

Topics under research

BigData



Build new applications focuses in big volumes of data for extract information and to make inferences about new knowledge and recommendations

BigData tools in research



Hadoop is a distributed processing software.

Support high-volume data service applications



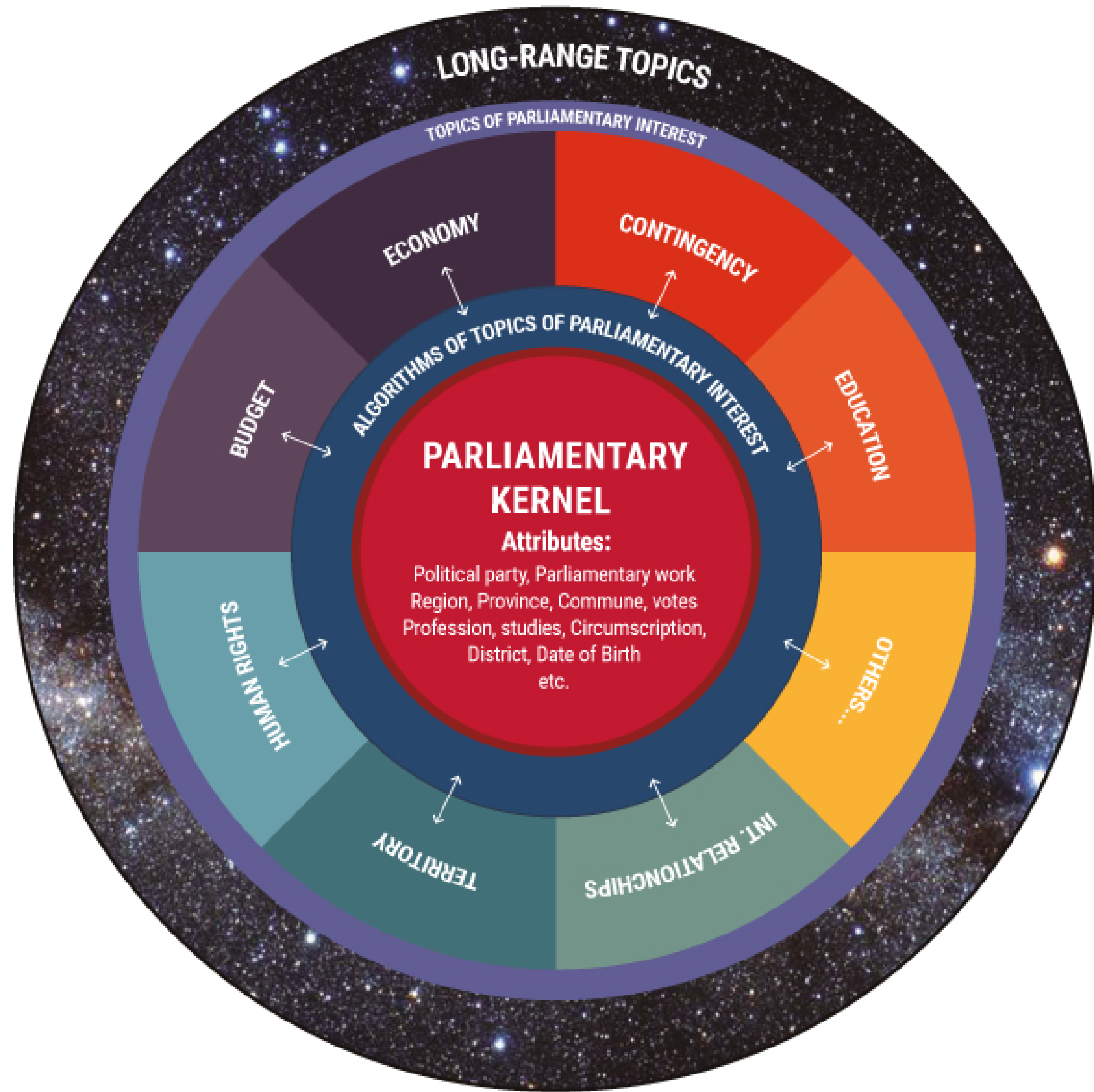
MongoDB is a NoSQL database.

Instead of using tables and rows as in relational databases, MongoDB uses an architecture of collections and documents.



Is a parallel processing framework for running large-scale data analytics applications.

Big Data Possibilities



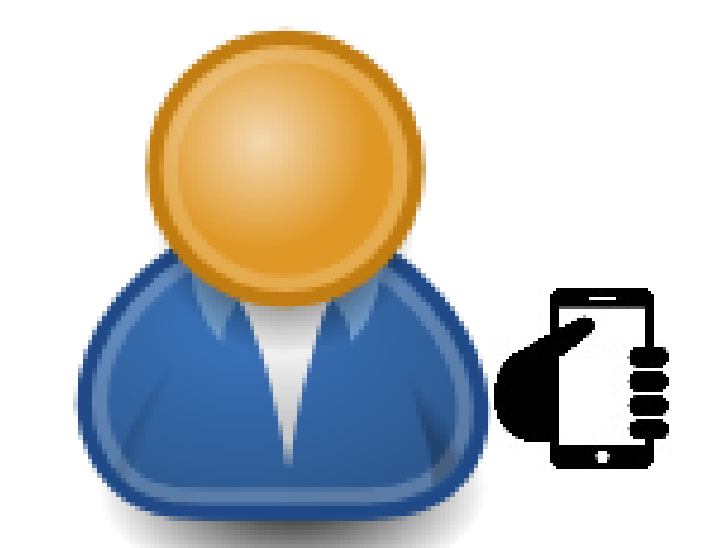
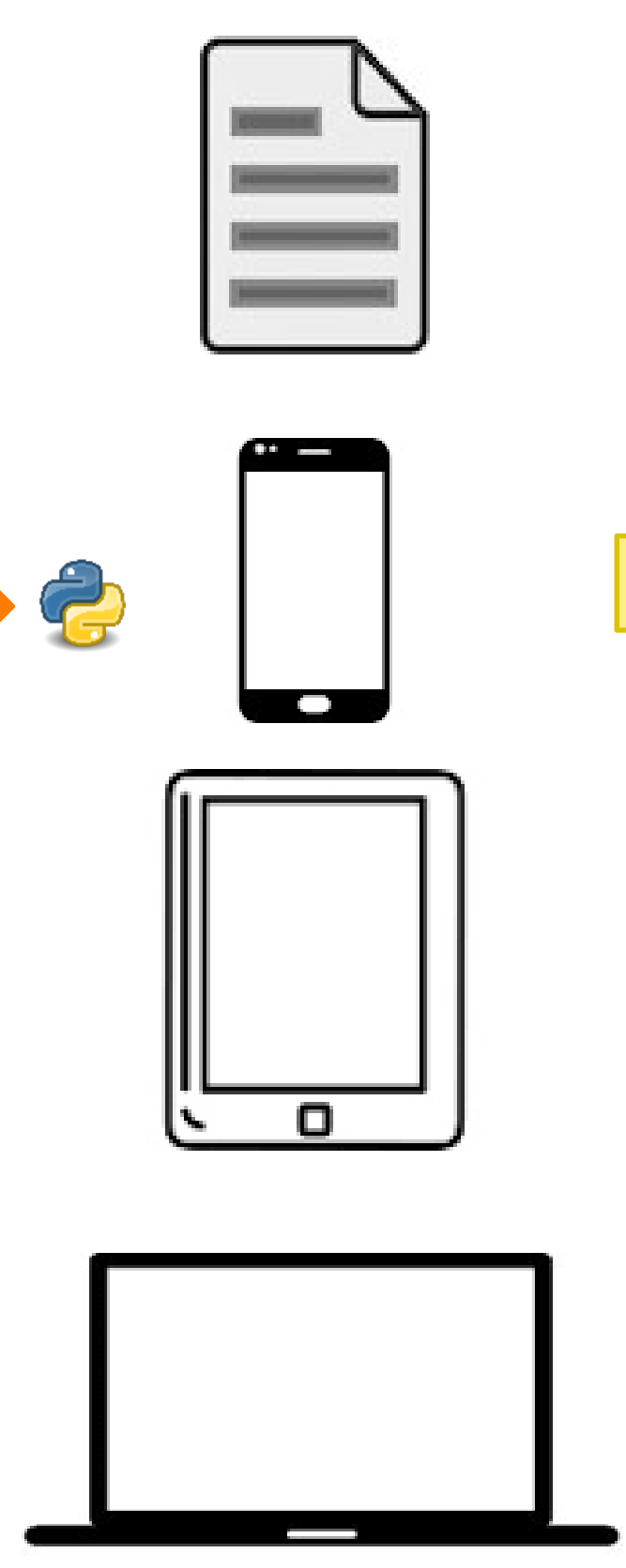
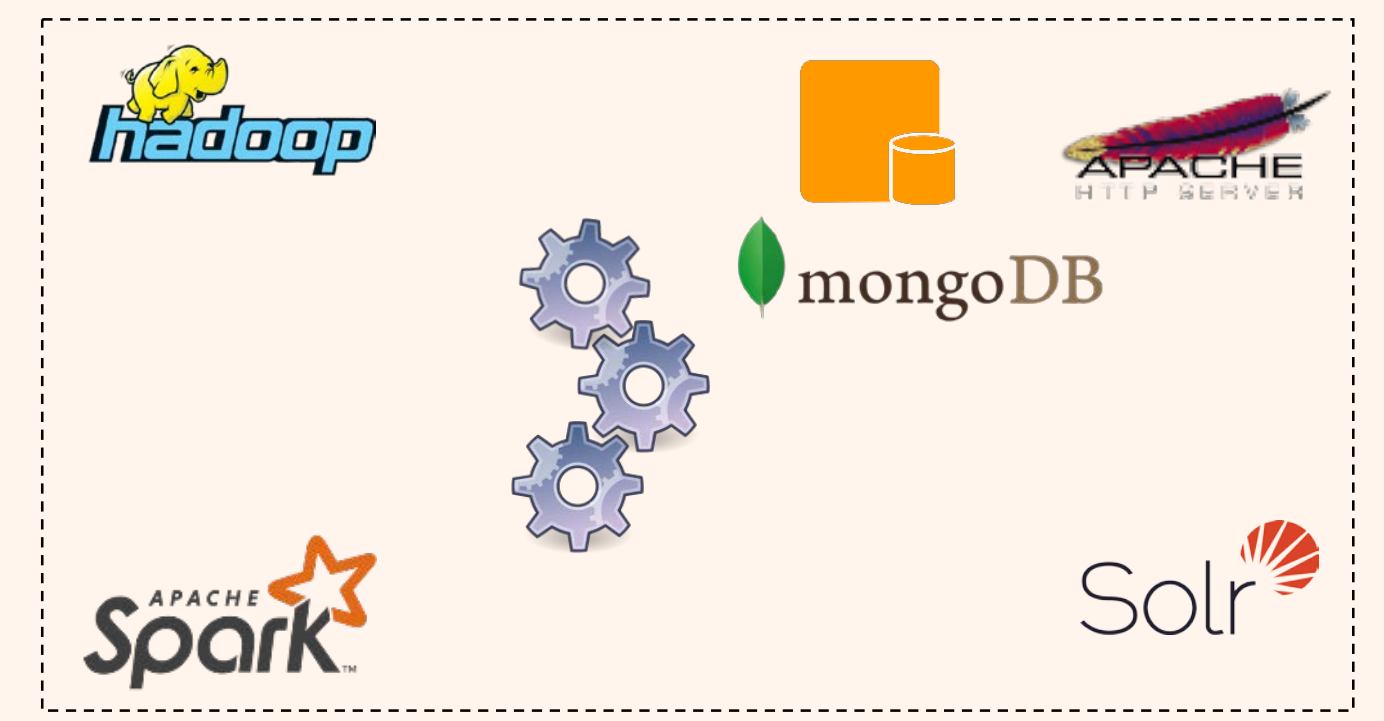
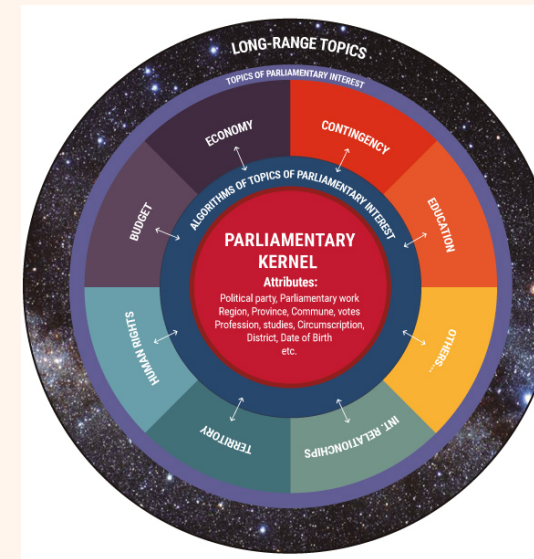
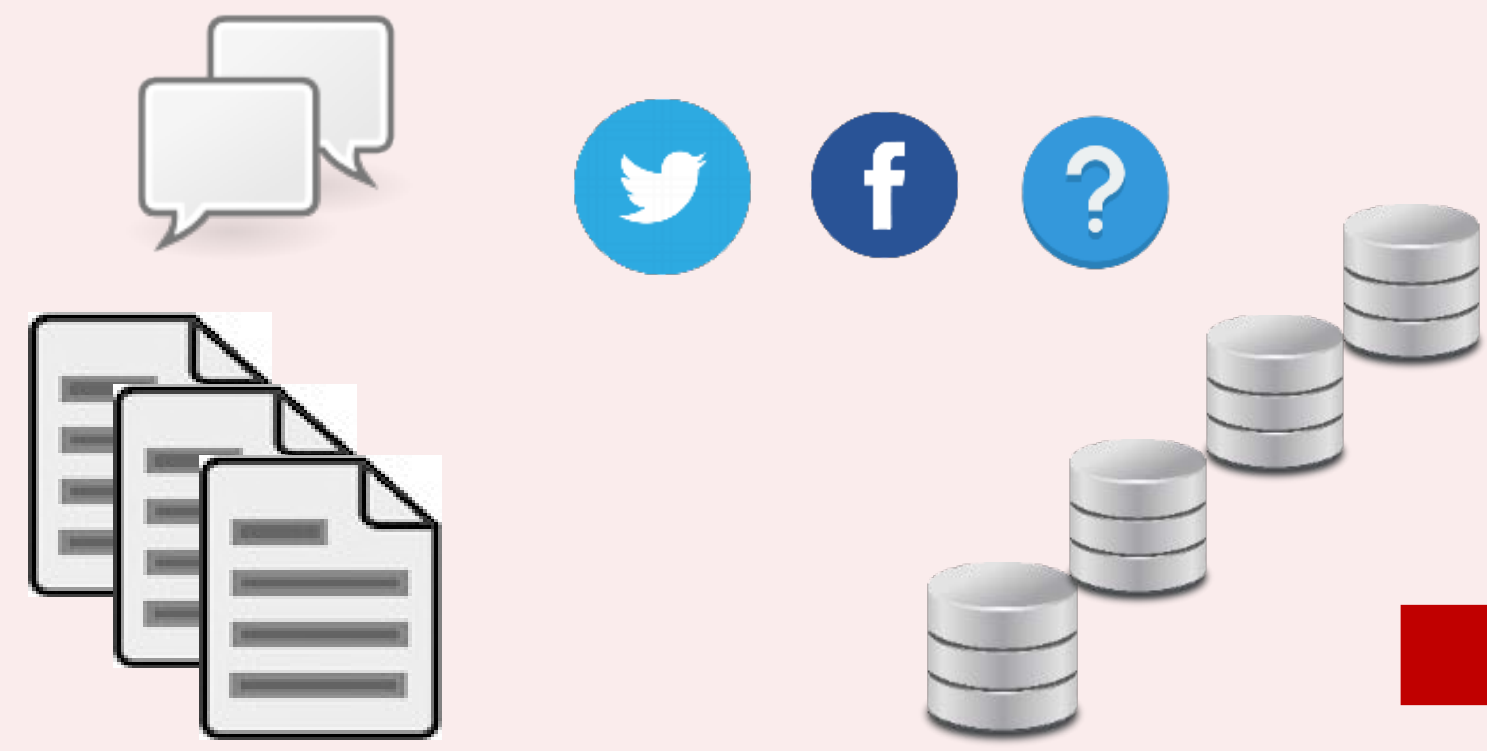
Big Data Possibilities

Data Sources

Big Data Procces

Delivery

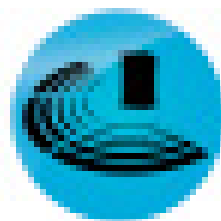
Information Services



Parliamentary



Parliamentary Staff



PARL

Mobile Computing Under research



AngularJS is a structural framework
for dynamic web apps.

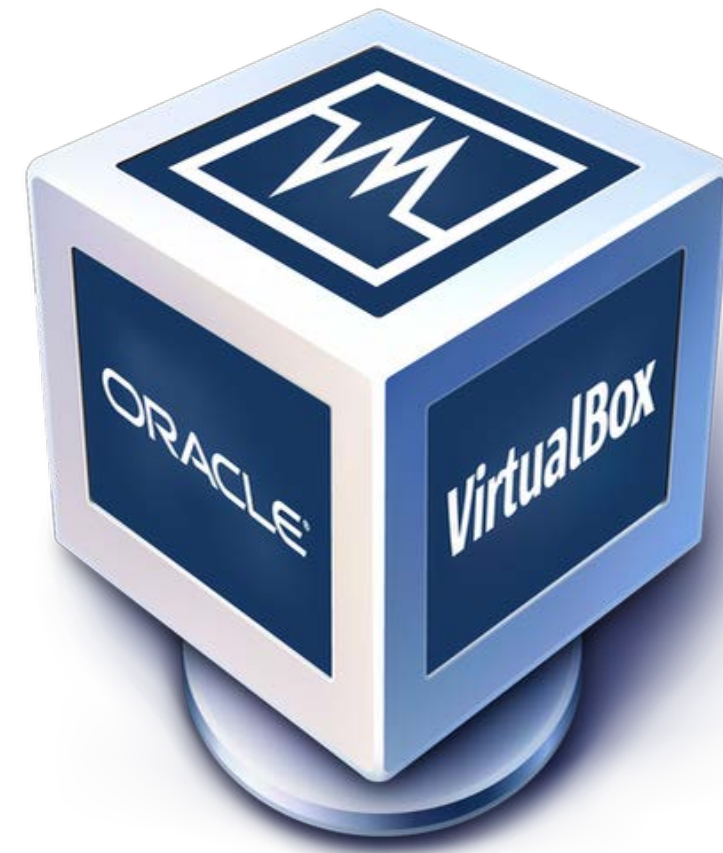


Bootstrap permits developing
responsive projects

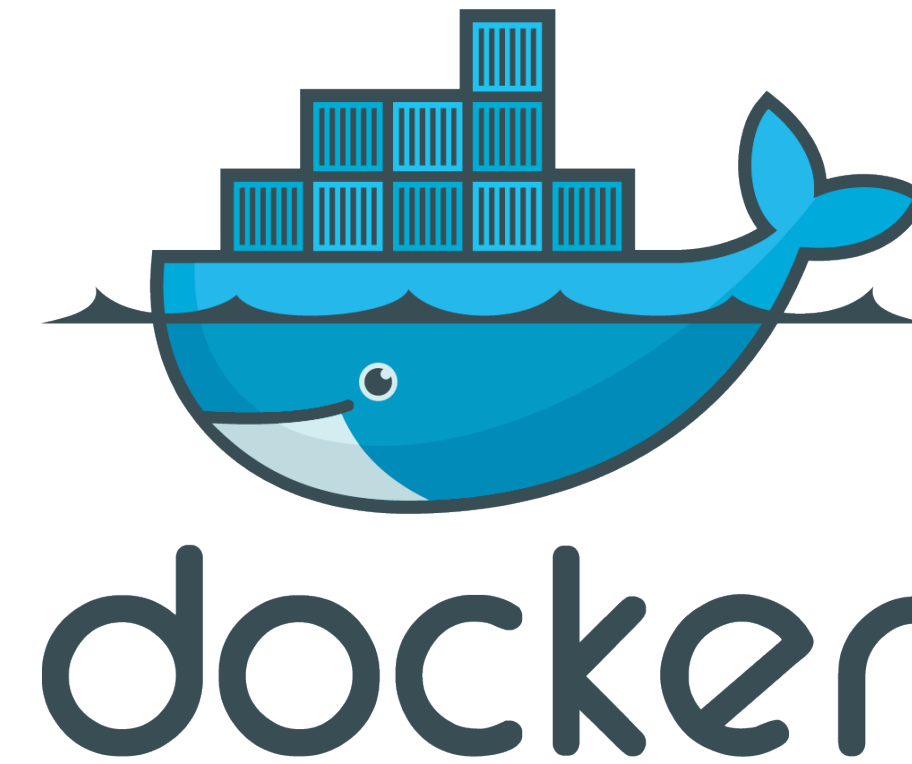


An environment for developing
software for Apple devices

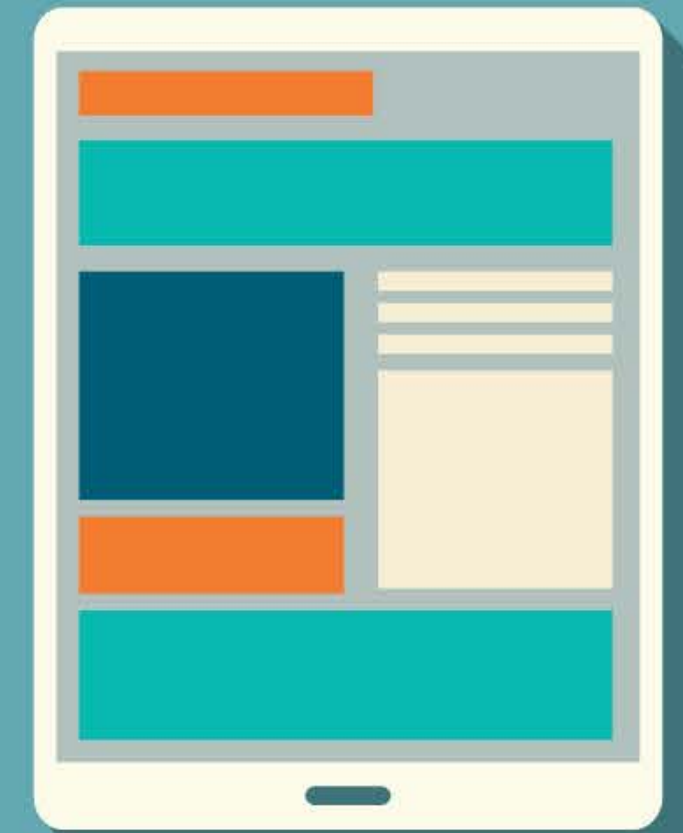
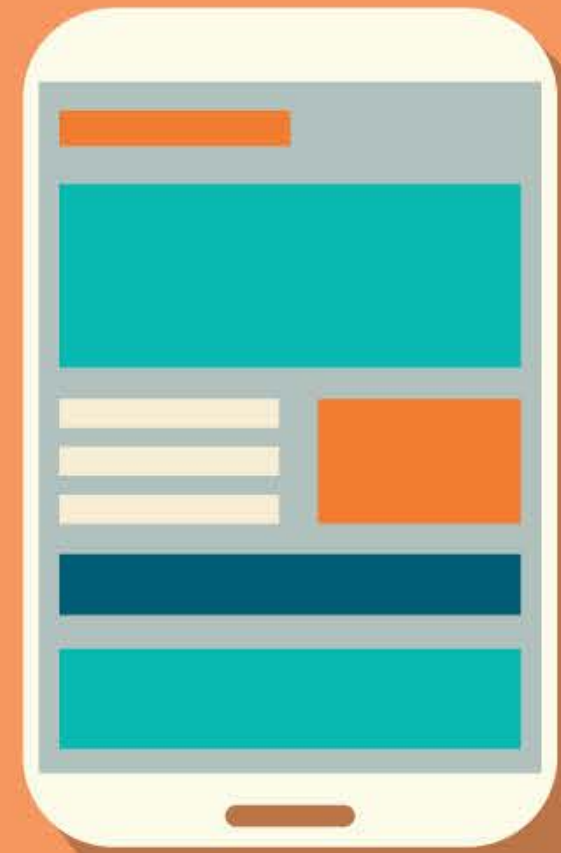
Virtualization



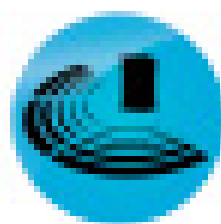
Is a software virtualization that permits install several virtual machines in a single computer



Docker is "containerization" software. It encapsulates an application, into a modular unit called a container. Each container works similar to a traditional virtualized OS.



Everything connected



The future: All kind of devices connected





Cloud Computing



The US National Institute of Standards and technology

NIST Special Publication 800-145

<https://www.nist.gov>

Cloud Computing is a model that allows:

- Convenient and on-demand availability of shared and configurable computing resources

Advantages

- In a fast way, requiring minimal management efforts
- Scale Economy

Cloud Computing



Five essential characteristics of cloud computing:

1. on-demand self-service,
2. broad network access,
3. resource pooling,
4. rapid elasticity or expansion
5. measured service.

Four "deployment models"

1. Private
2. Community
3. public
4. hybrid

Many Providers

Amazon web Service, Microsoft Azure, Google Cloud, Oracle cloud, etc.

Cloud Computing model used at BCN

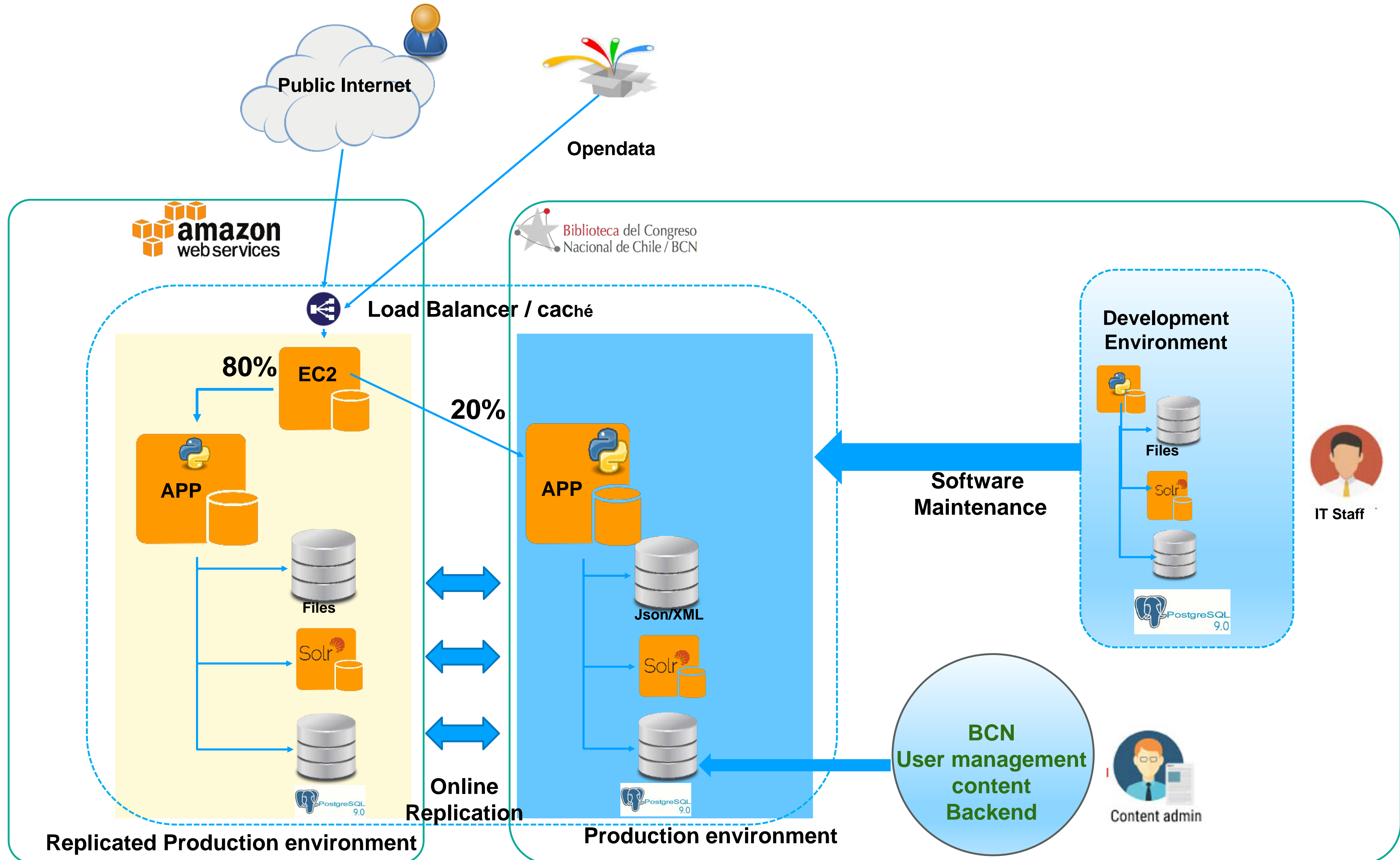
The model implements two main aspects:

- **FrontEnd:** refers to the available displayed information, the webpage that public can see.
- **BackEnd:** it is the non visible place where the contents are administrated for their publication, here is where the library staff indexes, stores, assigns metada and publishes the digital collections, depending on the application.

There are tree components

- A production environment in BCN datacenter
- A replicated production environment in AWS (updated on line)
- A development environment in BCN for produce and maintain the applications programs

Cloud Computing model used at BCN



Workshop