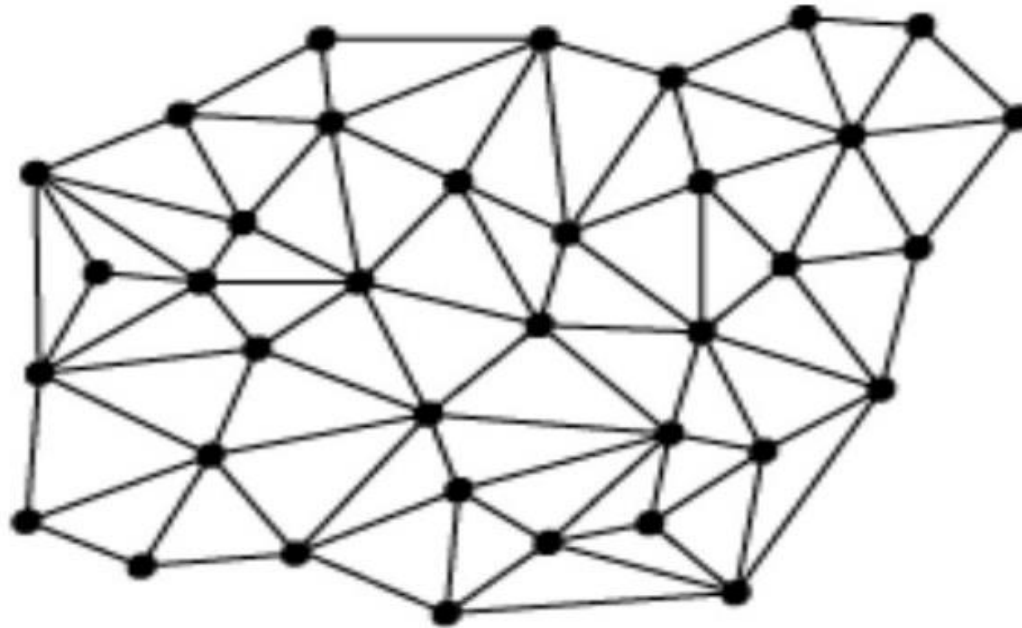


Distributed System Course

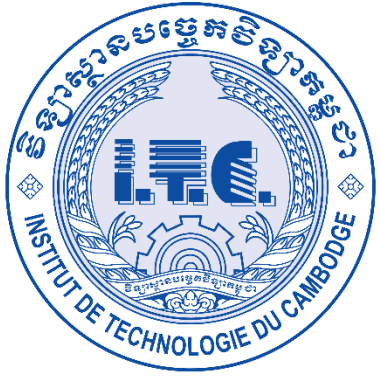
2021-22-GICI41SSD-Distributed System



Academic Year: 2021-2022 Lecturer: SOK Kimheng

Information

Course	Distributed System	48h, 12 Weeks, 4h/week (3 Groups = 96h)
General Distributed System	Week 1	Information, Self-Study Skill, Introduction
	Week 2	Distributed Communication (TCP/IP, Socket, RPC, REST, gRPC, OMQ)
	Week 3	Clock, Timestamp
	Week 4	Fault Tolerance (Two general problem, Byzantine General Problem)
	Week 5	Consensus Algorithm (Paxos, ZooKeeper, Raft)
	Week 6	Quiz
Blockchain	Week 7	Basic Cryptography
	Week 8	Blockchain and Bitcoin (Proof of Work)
	Week 9	Ethereum and Smart Contract (Proof of Stake)
	Week 10	Hyperledger and Self-Sovereign Identity
	Week 11	Security
	Week 12	Final Exam



Distributed System Course

2021-22-GICI41SSD-Distributed System

Week1:

Introduction

Academic Year: 2021-2022 Lecturer: SOK Kimheng

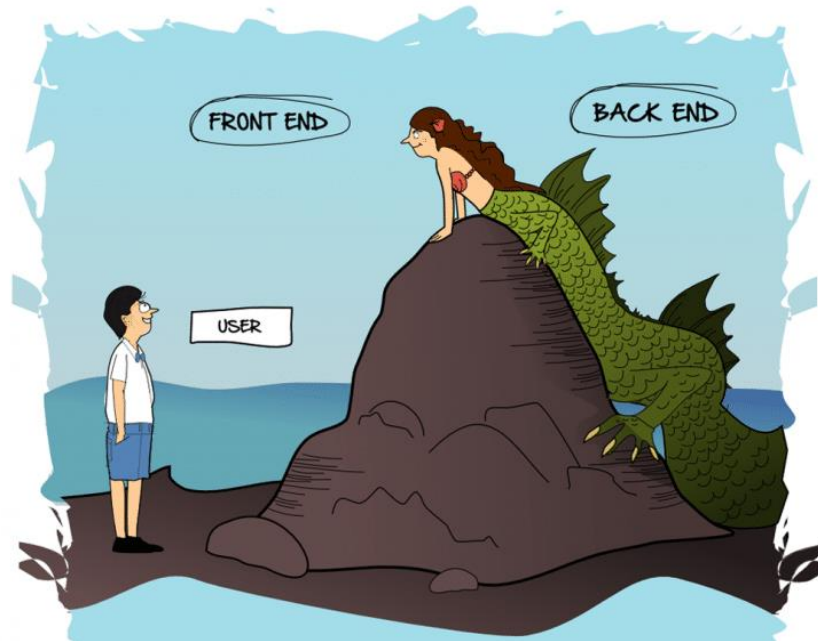
Agenda

- 1 What is distributed system?
- 2 Centralized system
- 3 Distributed system
- 4 CAP Theorem
- 5 Should I go distributed?

Introduction

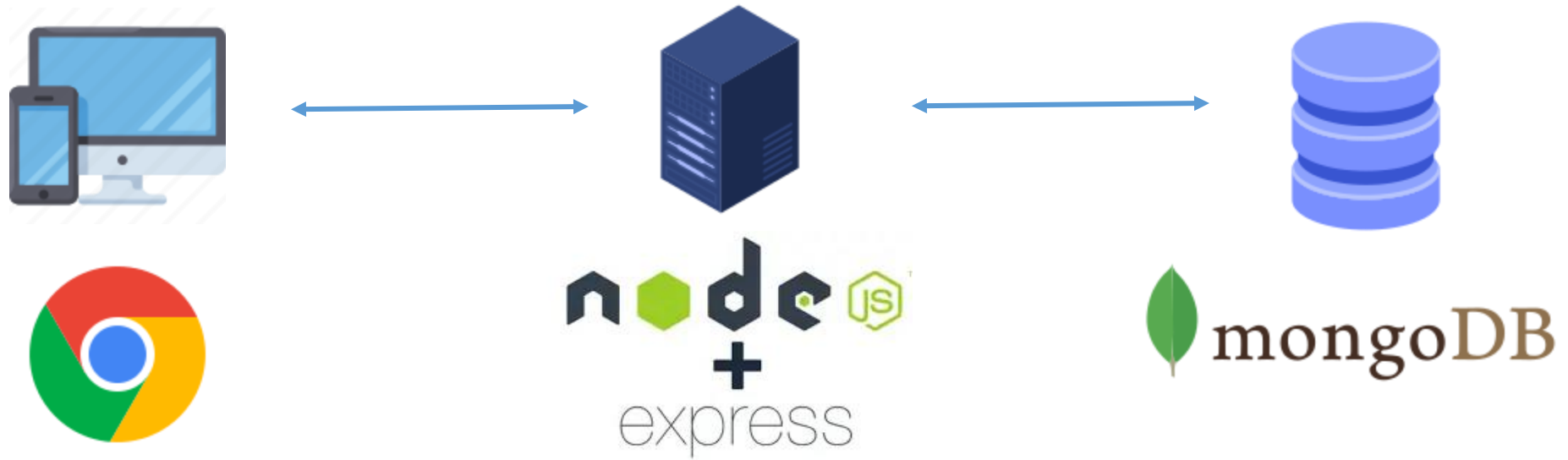
Definition

Distributed System is a collection of independent computers that appears to its users as a single coherent system.



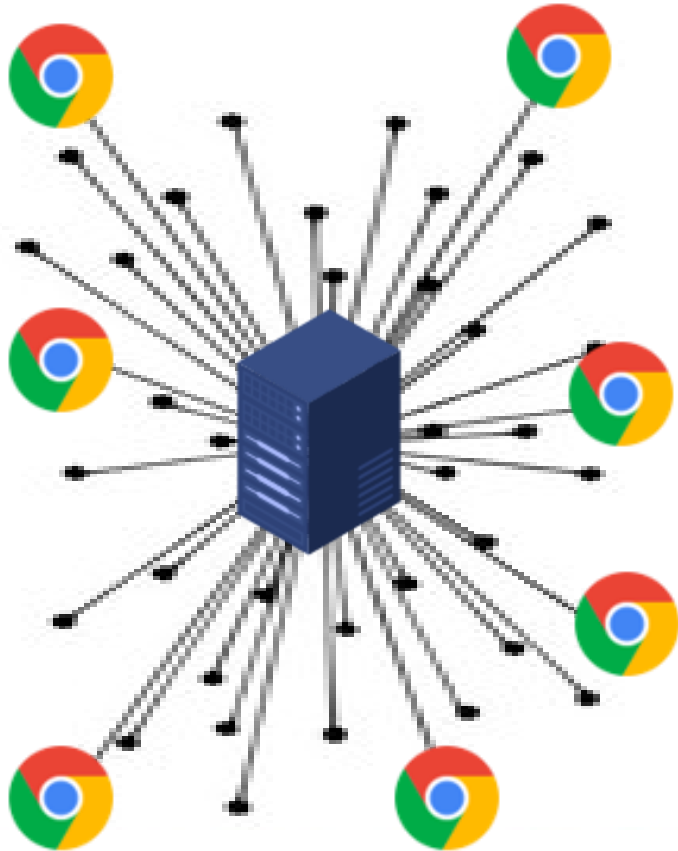
Introduction

Centralized System



Introduction

Centralized System



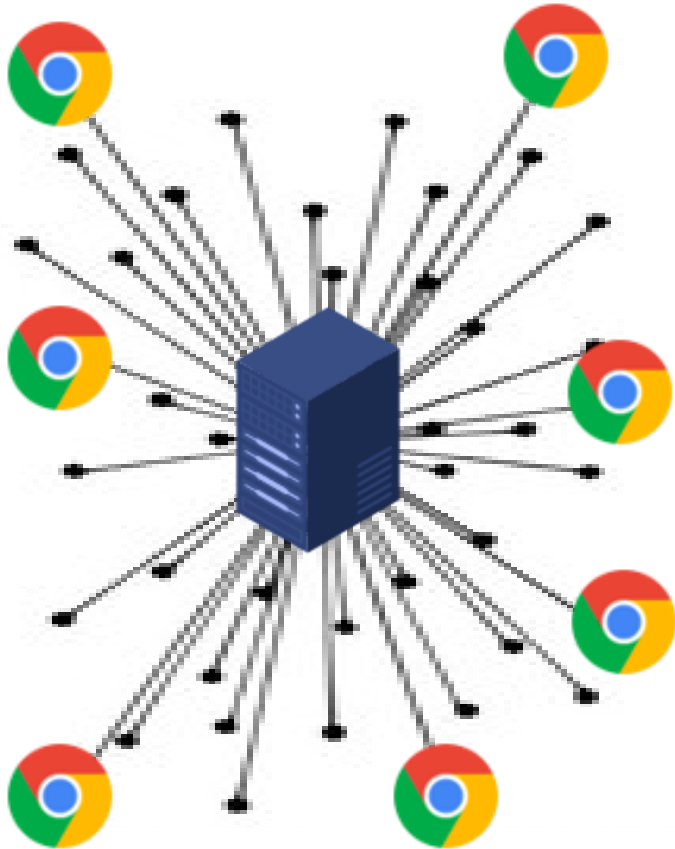
Pros

- Easy to control
- Easy to update
- Easy to implement

Cons

- Single point of failure
- Management overhead
- Not flexible
- Can't scale

Introduction

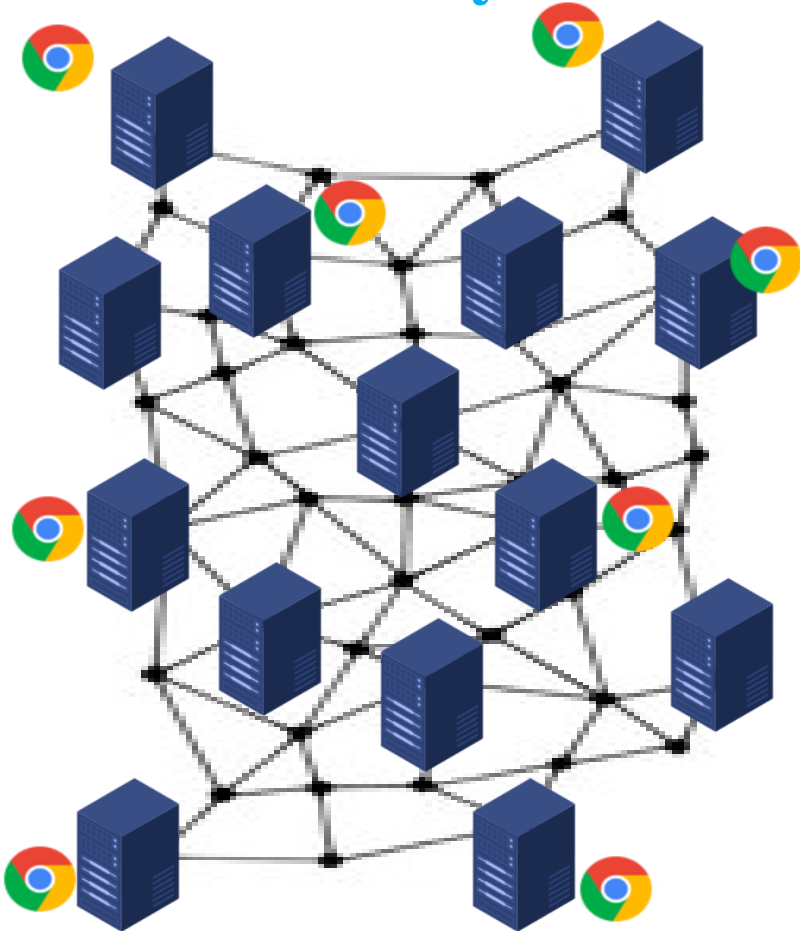


Motivation to change

- Scale up
- Availability, Reliability
 - Minimize downtime
- Multiparty
 - Interoperability
- Trust
 - Transparency
 - Auditability

Introduction

Distributed System

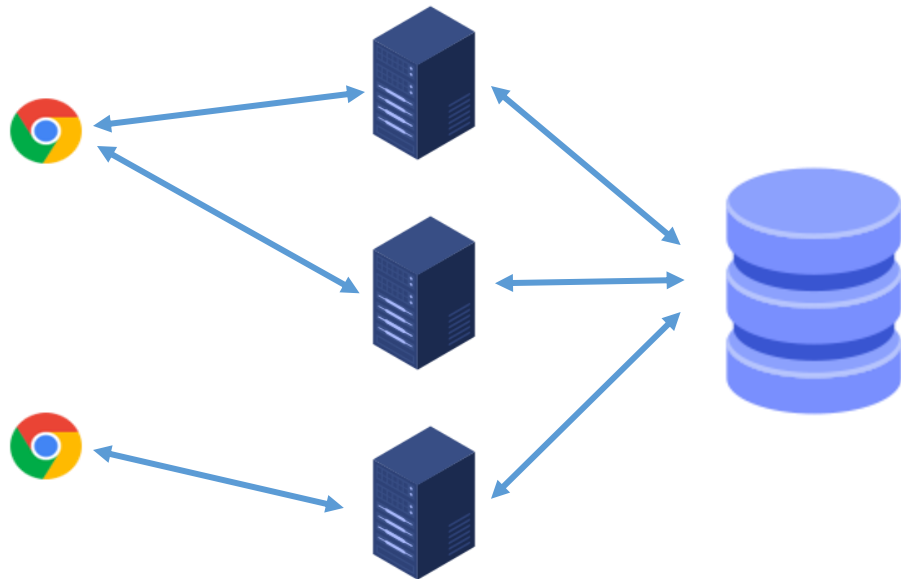


Myths

- High performance
- Fast speed
- More secure
- Scale

Introduction

Distributed System

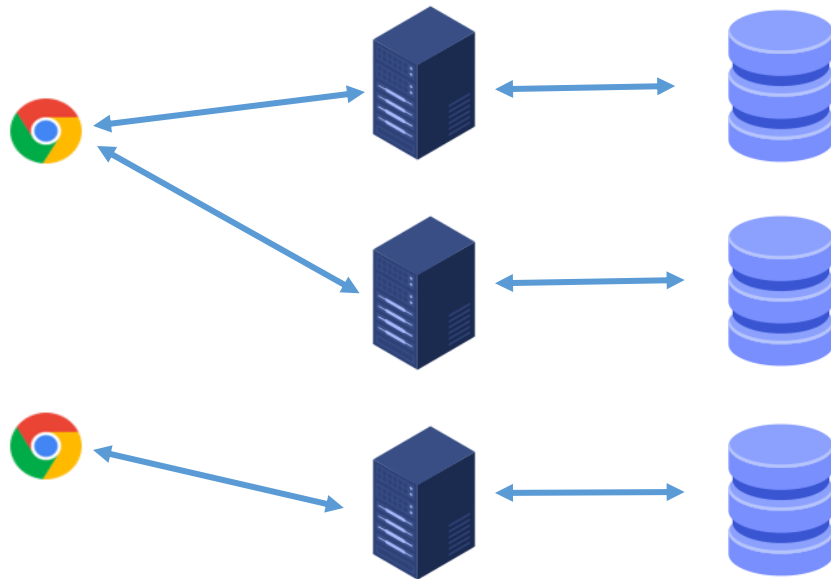


Centralized storage

➤ Inherit all the pros and cons of
The centralized system

Introduction

Distributed System



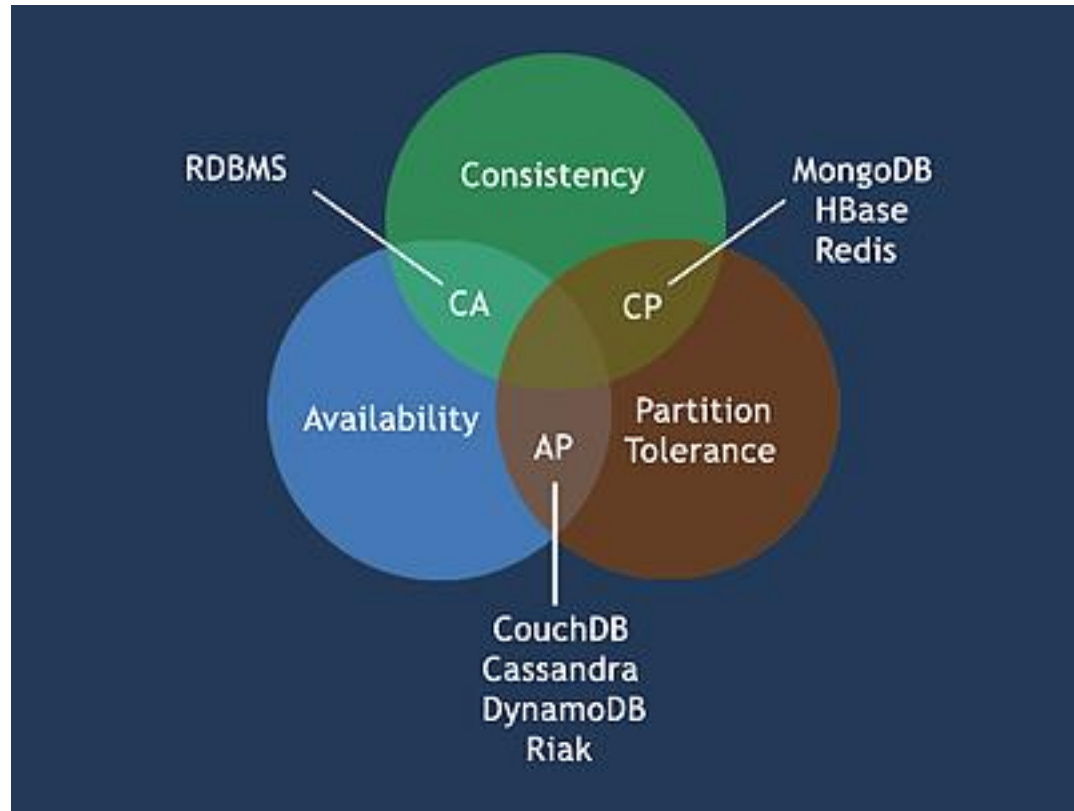
Characteristics

- Independent, Concurrency
 - Independent failure
- Partition
 - Network partition
- Replication (Log replication)
- No global clock

Introduction

CAP Theorem

- Consistency
- Availability
- Partition
 - Network Partition



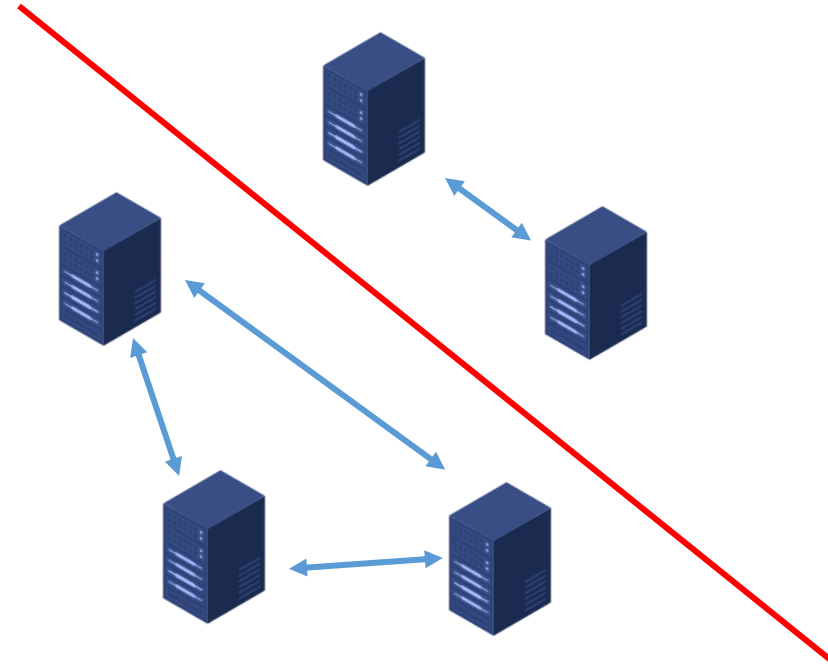
Introduction

CAP Theorem

When network partition happens

Choose:

1. Consistency
2. Availability



Introduction

Should I go distributed?



Nordic.js 2019 • James Simpson - Building Distributed Systems with Node.js

6K views • 2 years ago



Nordic.js

0:10 And sorry the the wrong title was up there but today we'll be talking about building **distributed systems** so just a quick show of ...



Distributed Systems in One Lesson by Tim Berglund

345K views • 4 years ago



Devovx Poland

Normally simple tasks like running a program or storing and retrieving data become much more complicated when we start to do ...

Practice

Build simple distributed system with nodejs

github.com/goldfire/Building-Distributed-Systems-Node.js

Why GitHub? Team Enterprise Explore Marketplace Pricing

goldfire / Building-Distributed-Systems-Node.js Public

<> Code Issues Pull requests 16 Actions Projects Wiki Security Insights

master 17 branches 0 tags

Go to file Code

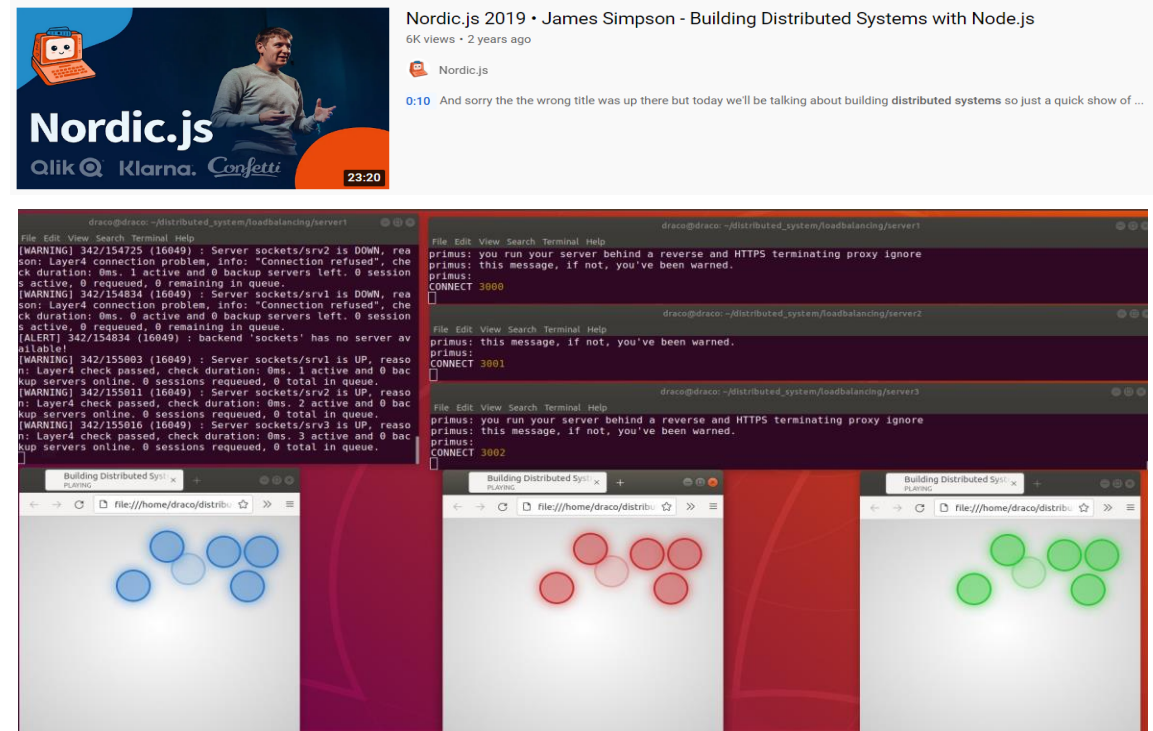
goldfire Initial commit	99a4b6f on Oct 11, 2019 1 commit
assets	Initial commit 2 years ago
src	Initial commit 2 years ago
talk	Initial commit 2 years ago
.gitignore	Initial commit 2 years ago
README.md	Initial commit 2 years ago
haproxy.cfg	Initial commit 2 years ago
index.html	Initial commit 2 years ago
package.json	Initial commit 2 years ago
server.js	Initial commit 2 years ago

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Nordic.js

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<https://github.com/goldfire/Building-Distributed-Systems-Node.js>