
VIDA
MEDICINA DIAGNÓSTICA

Arquitetura

Sistema Vida


kafka


TensorFlow


redis

Programação Reativa

Streams Streams Streams Streams Streams Streams Streams Streams Streams

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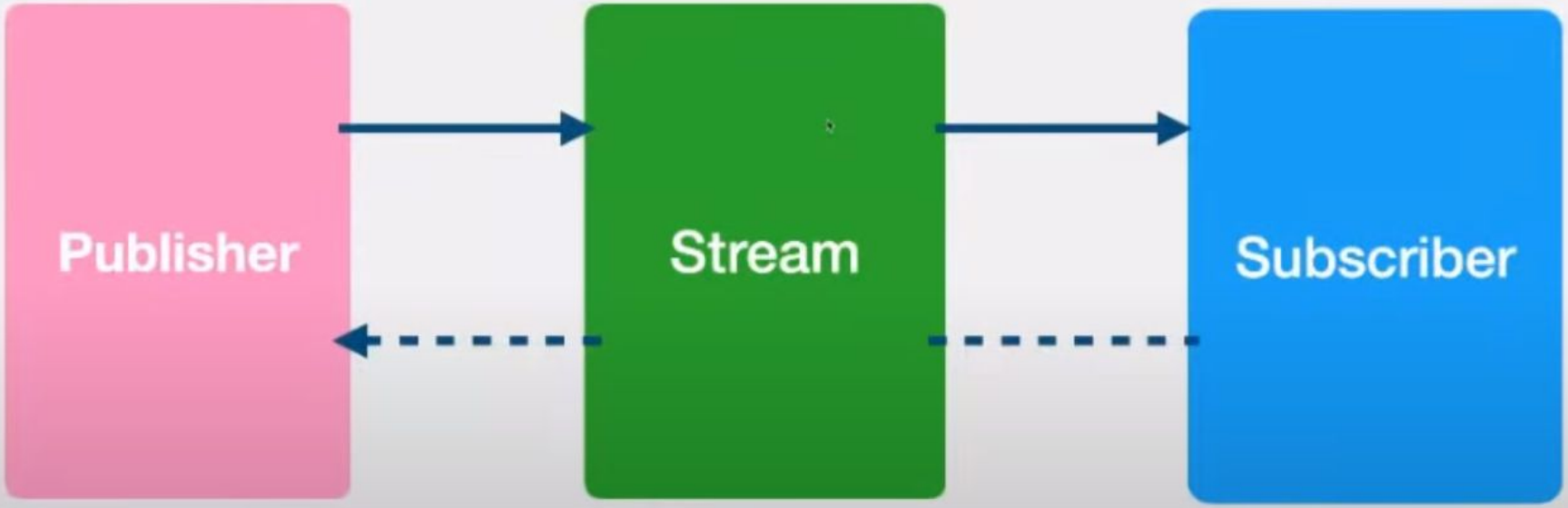
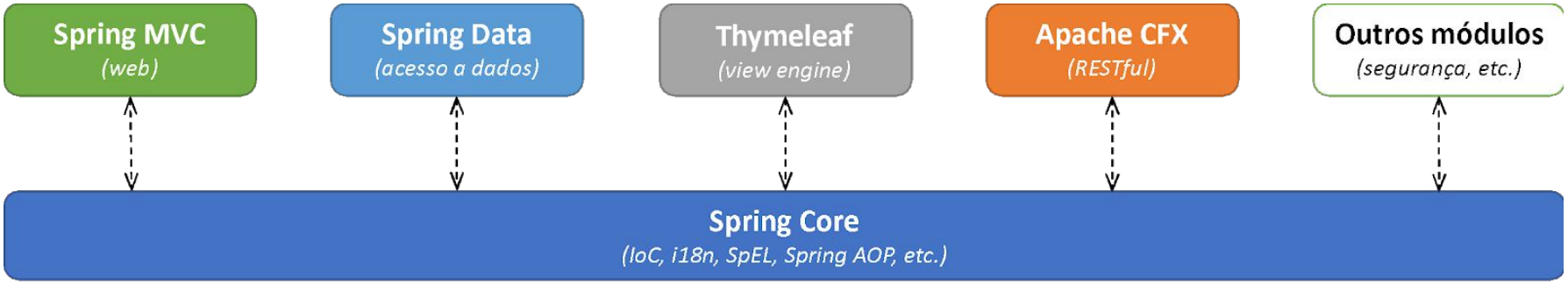
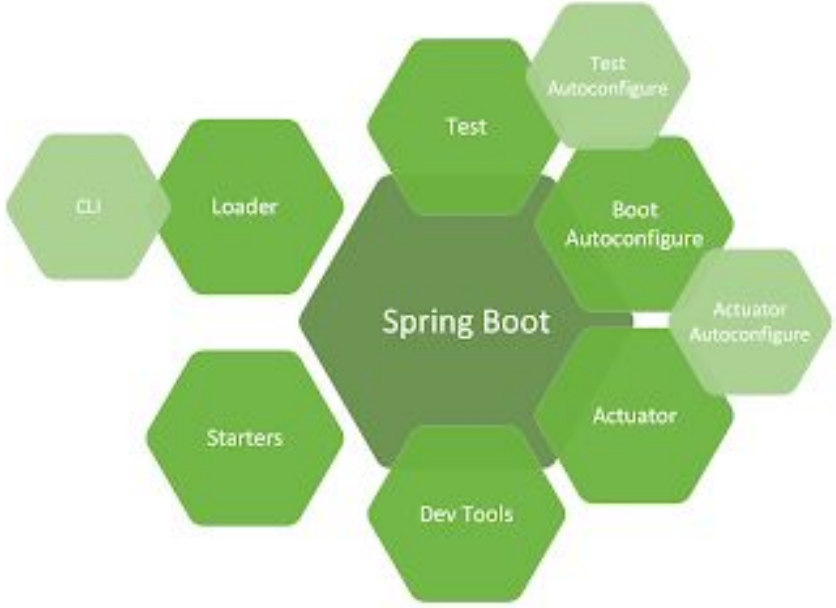
Aplicações Reativas

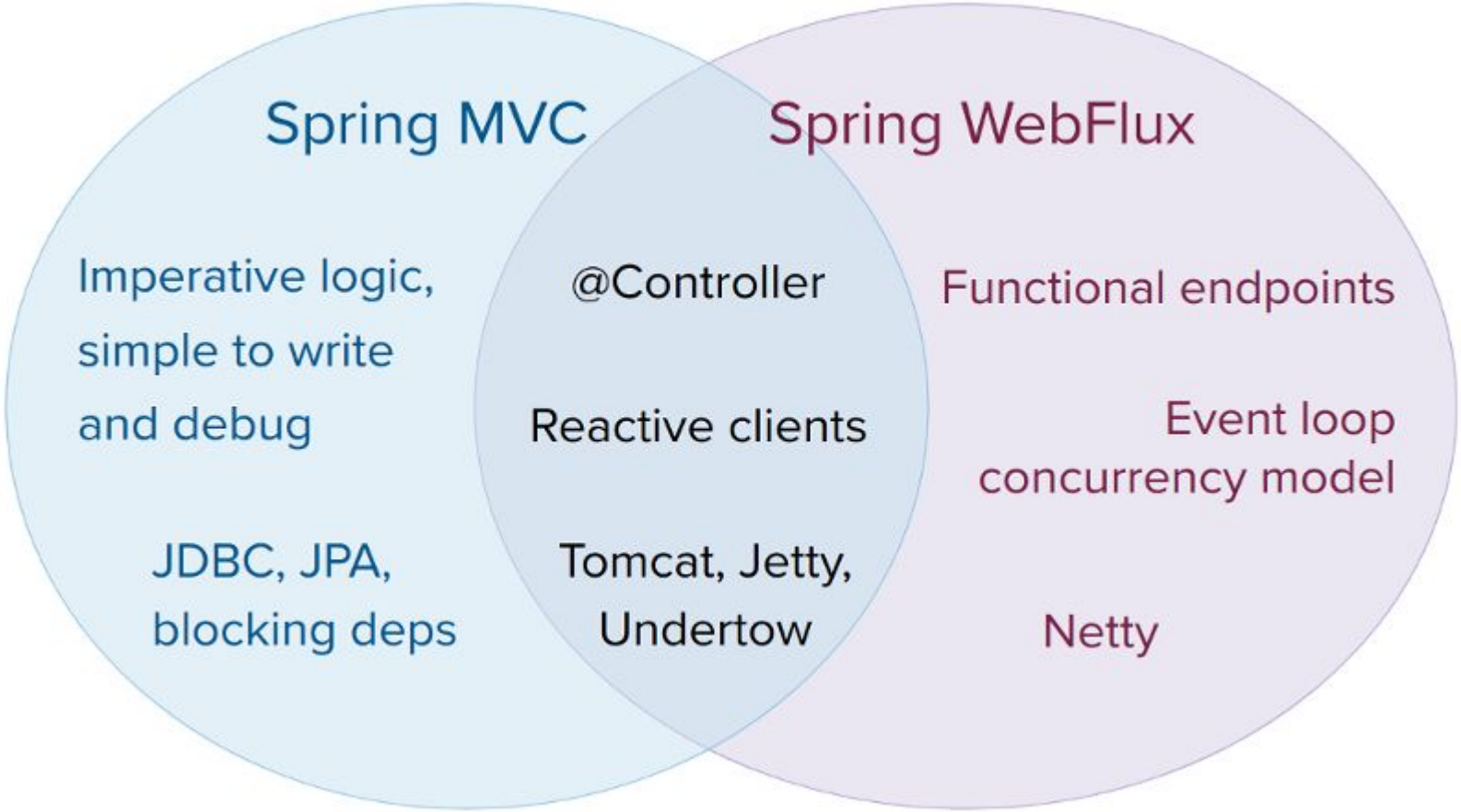


Por Que Angular ?



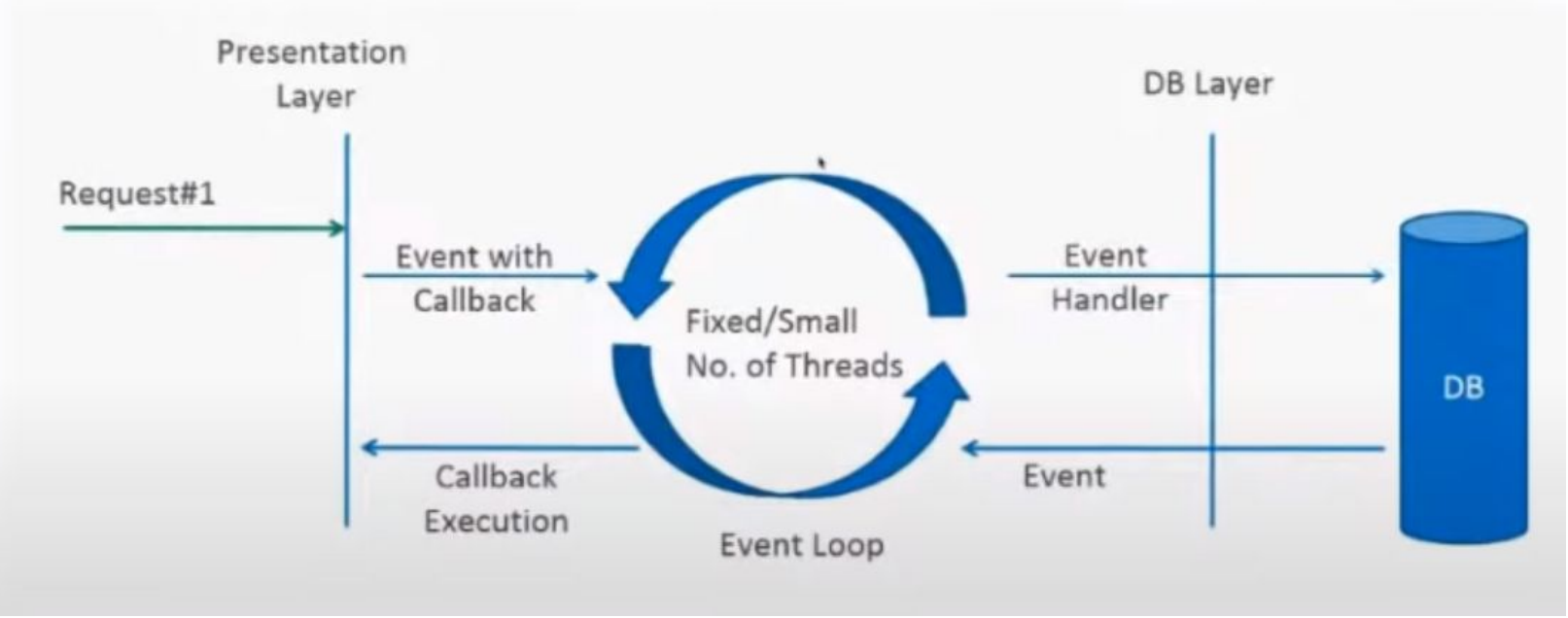
Por Que Spring Boot ?

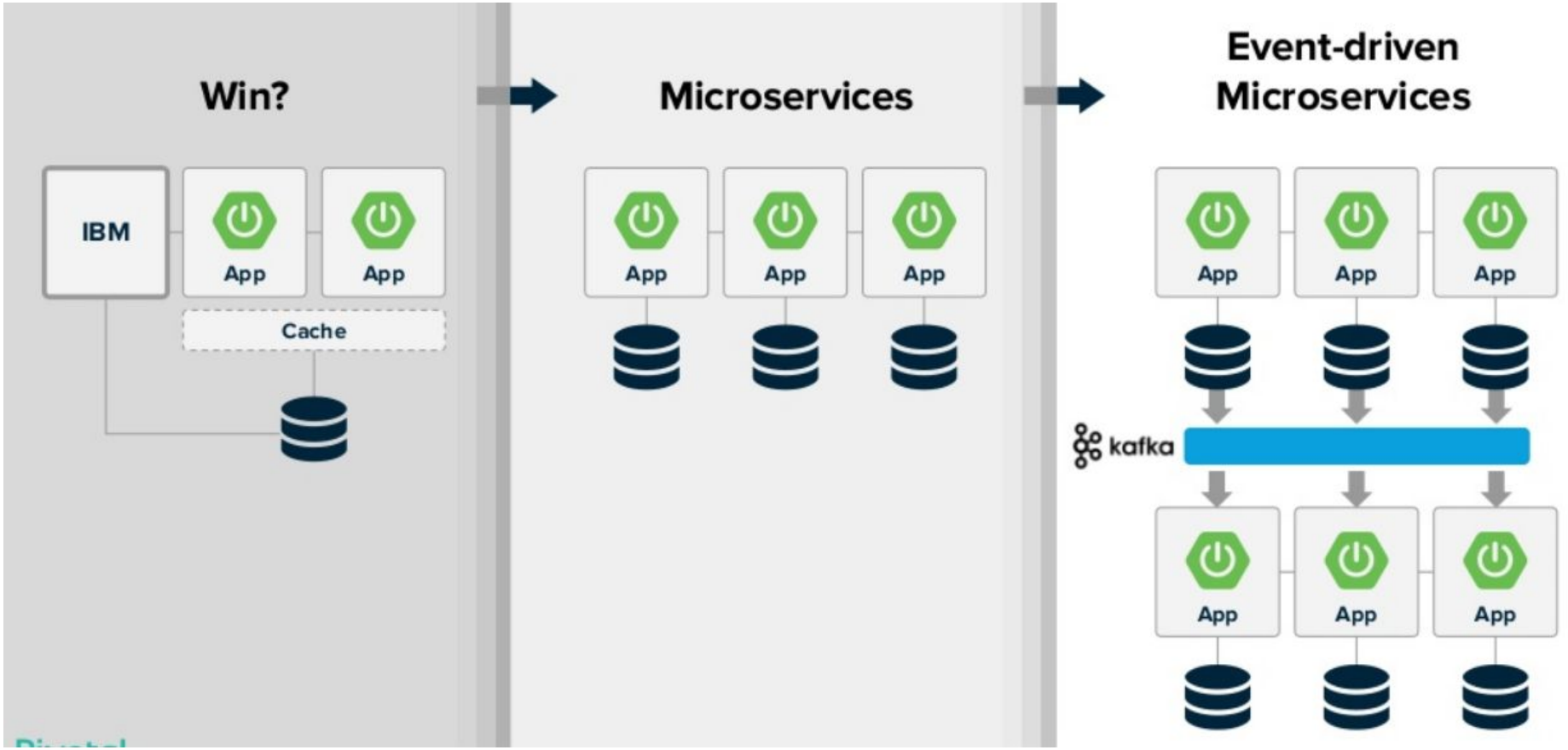


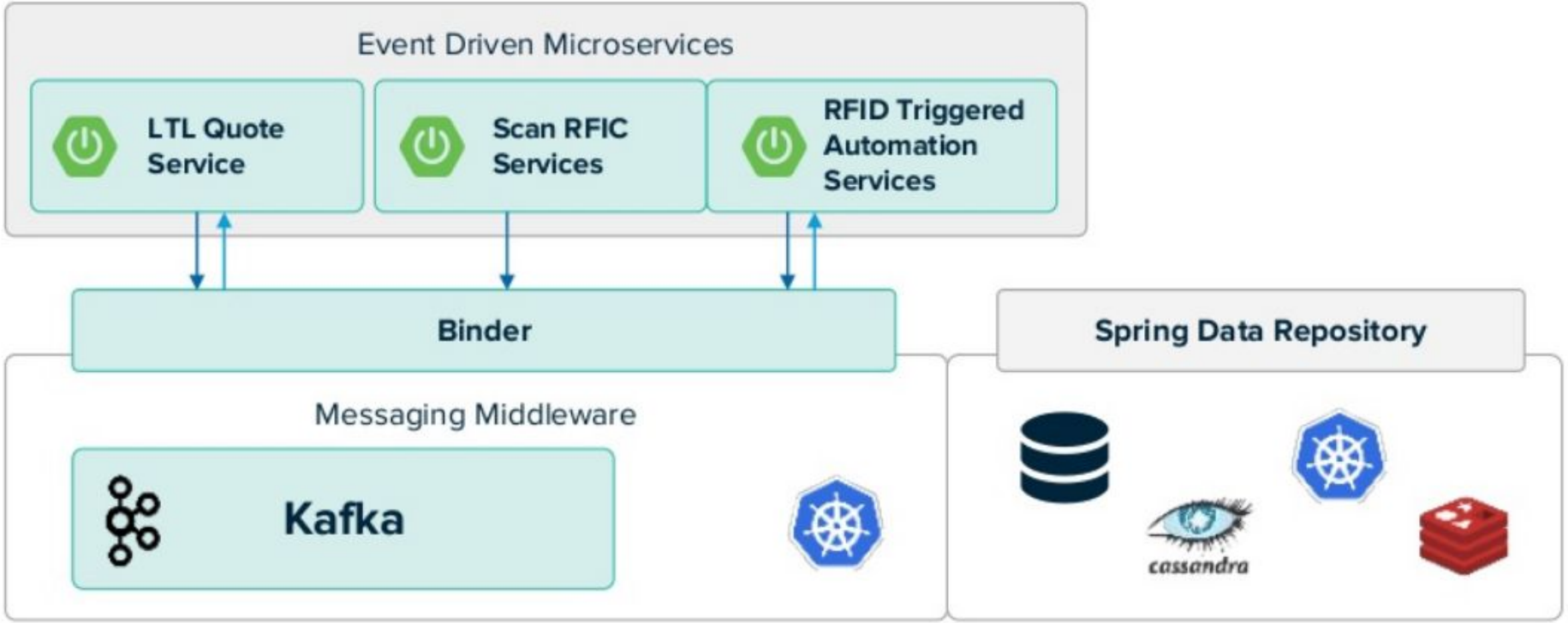

Spring MVC
Spring WebFlux
Imperative logic, simple to write and debug
@Controller
Functional endpoints
Reactive clients
Event loop concurrency model
JDBC, JPA, blocking deps
Tomcat, Jetty, Undertow
Netty

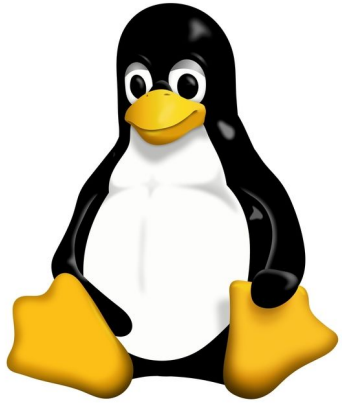
https://docs.spring.io/spring/docs/current/spring-framework-reference/web-reactive.html#spring-webflux

Spring WebFlux




Win?
IBM
App
App
Cache
Microservices
App
App
App
Event-driven
Microservices
App
App
App
kafka
App
App
App


Event Driven Microservices
LTL Quote Service
Scan RFIC Services
RFID Triggered Automation Services
Binder
Spring Data Repository
Messaging Middleware
Kafka
cassandra



debian

Spring Data

```
public interface ReactiveMongoRepository<T, ID> {

    <S extends T> Mono<S> insert(S var1);

    <S extends T> Flux<S> insert(Iterable<S> var1);

    <S extends T> Flux<S> insert(Publisher<S> var1);

    <S extends T> Flux<S> findAll(Example<S> var1);

    <S extends T> Flux<S> findAll(Example<S> var1, Sort var2);
}
```

Repository

```
public interface ProductRepository
    extends ReactiveMongoRepository<Product, String> {
}
```

Controller

```
@RestController
@RequestMapping("/api/products")
public class ProductController {

    private ProductRepository repository;

    public ProductController(ProductRepository repository) {
        this.repository = repository;
    }
}
```

Controller: WebFlux x MVC

```
@GetMapping
 public Flux<Product> getAll() {
     return repository.findAll();
 }
```

WebFlux

```
@GetMapping
public List findAll(){
    return repository.findAll();
}
```

MVC

Controller: WebFlux x MVC

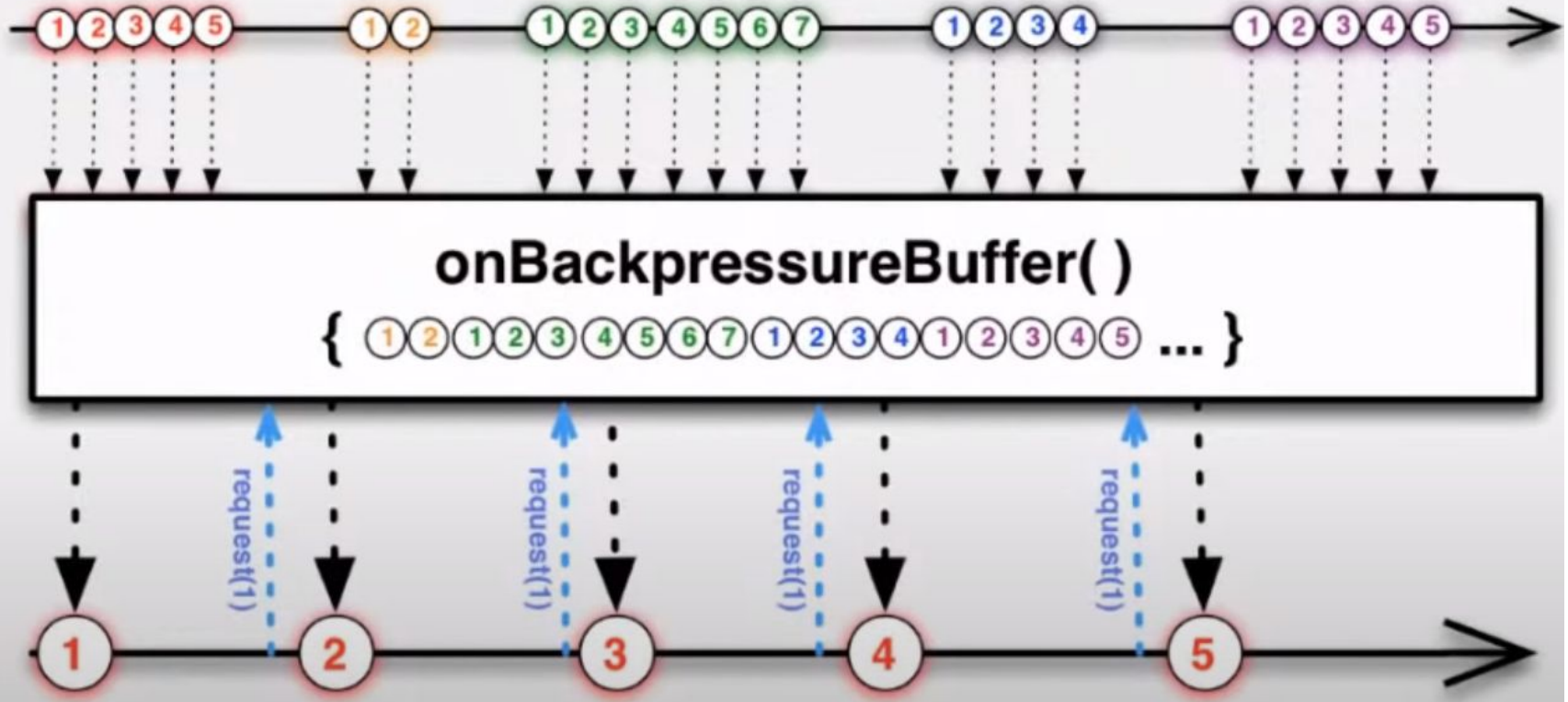
```
@GetMapping("{id}")
public Mono<ResponseEntity<Product>> getById(@PathVariable String id) {
    return repository.findById(id)
            .map(product → ResponseEntity.ok(product))
            .defaultIfEmpty(ResponseEntity.notFound().build());
}
```

WebFlux

```
@GetMapping(path = {"{id}"})
public ResponseEntity<Contact> findById(@PathVariable("id") long id){
    return repository.findById(id)
            .map(record → ResponseEntity.ok().body(record))
            .orElse(ResponseEntity.notFound().build());
}
```

MVC

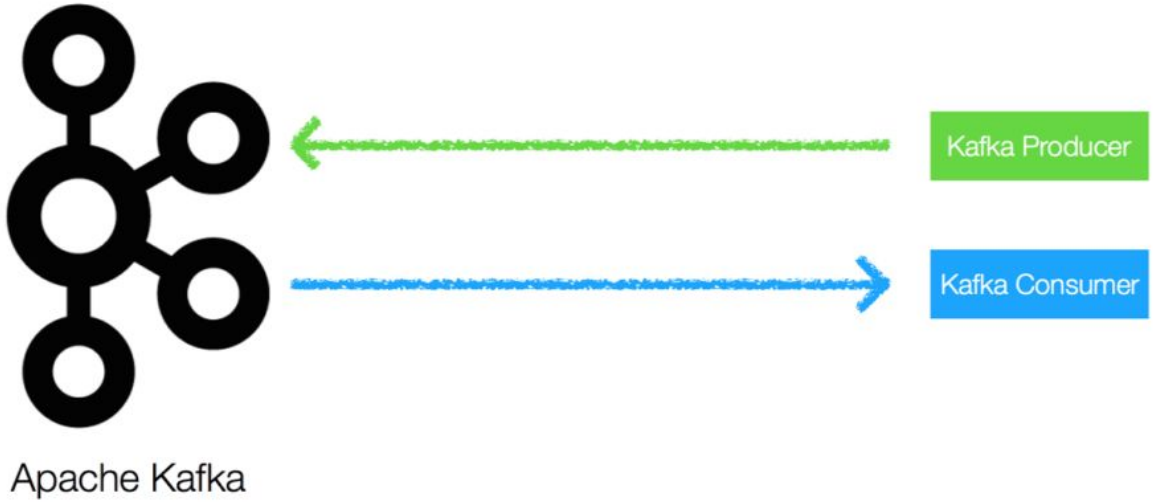
Backpressure



Backpressure

```
@GetMapping(value = "/stream", produces = MediaType.TEXT_EVENT_STREAM_VALUE)
public Flux<Order> streamOrderStatus() {
    return repository.findAll().delayElements(Duration.ofSeconds(7));
}
```

2 Trilhões de Mensagens Linkedin
500 Trilhões de Eventos Netflix - 1.3 PB



Por Que Kafka + Mongo ?

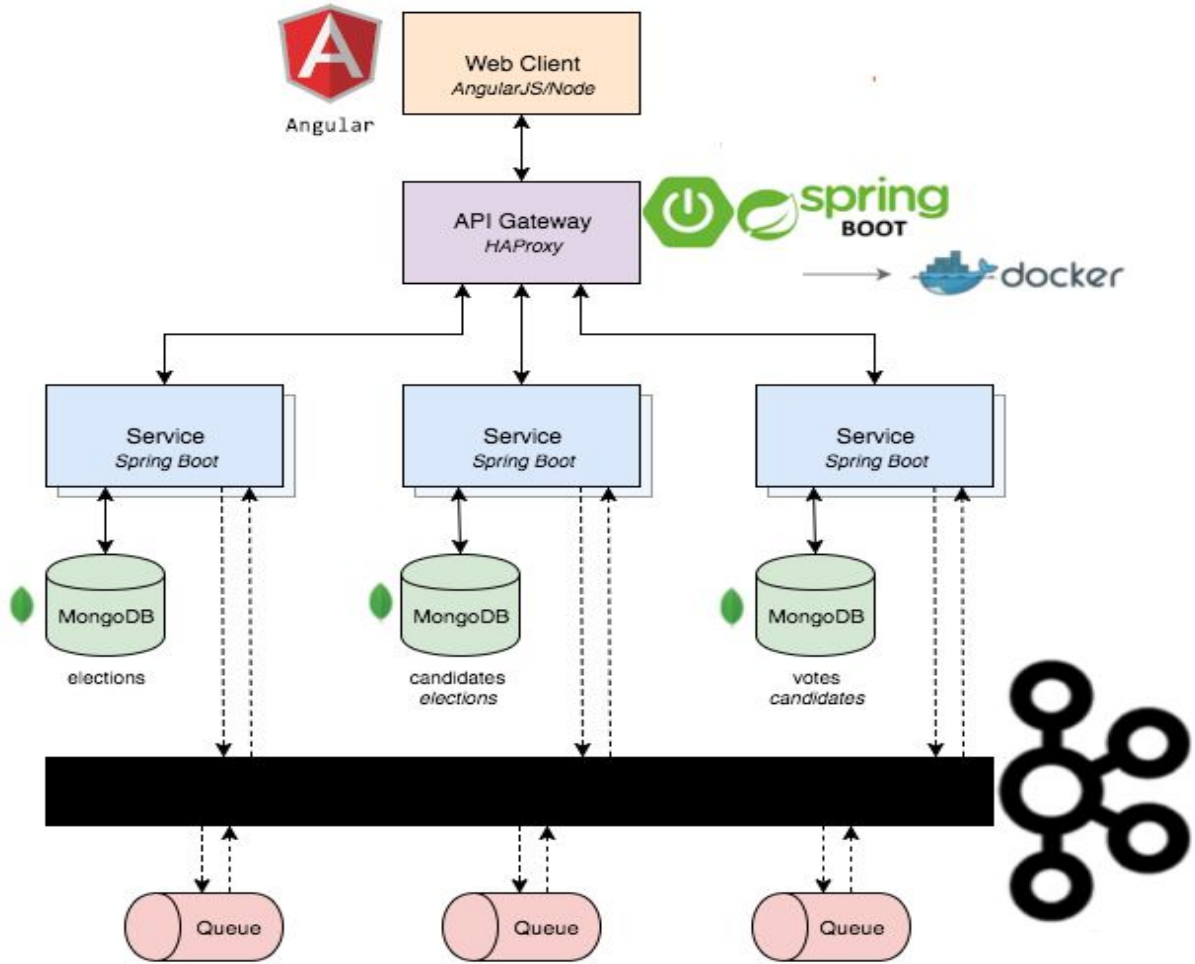
Redis

A single IOPS ~0.5msec

Disk-Based

Multiple IOPS >50 msec

~x100 Faster


Angular
Web Client
AngularJS/Node
API Gateway
HAProxy
spring
BOOT
docker
Service
Spring Boot
Service
Spring Boot
Service
Spring Boot
MongoDB
elections
MongoDB
candidates
elections
MongoDB
votes
candidates
Queue
Queue
Queue


10

Angular Reativo

- Http
- Router
- Guards
- Forms

Observable

Observable emite valores assíncronos e notifica observers

Angular Http + Spring

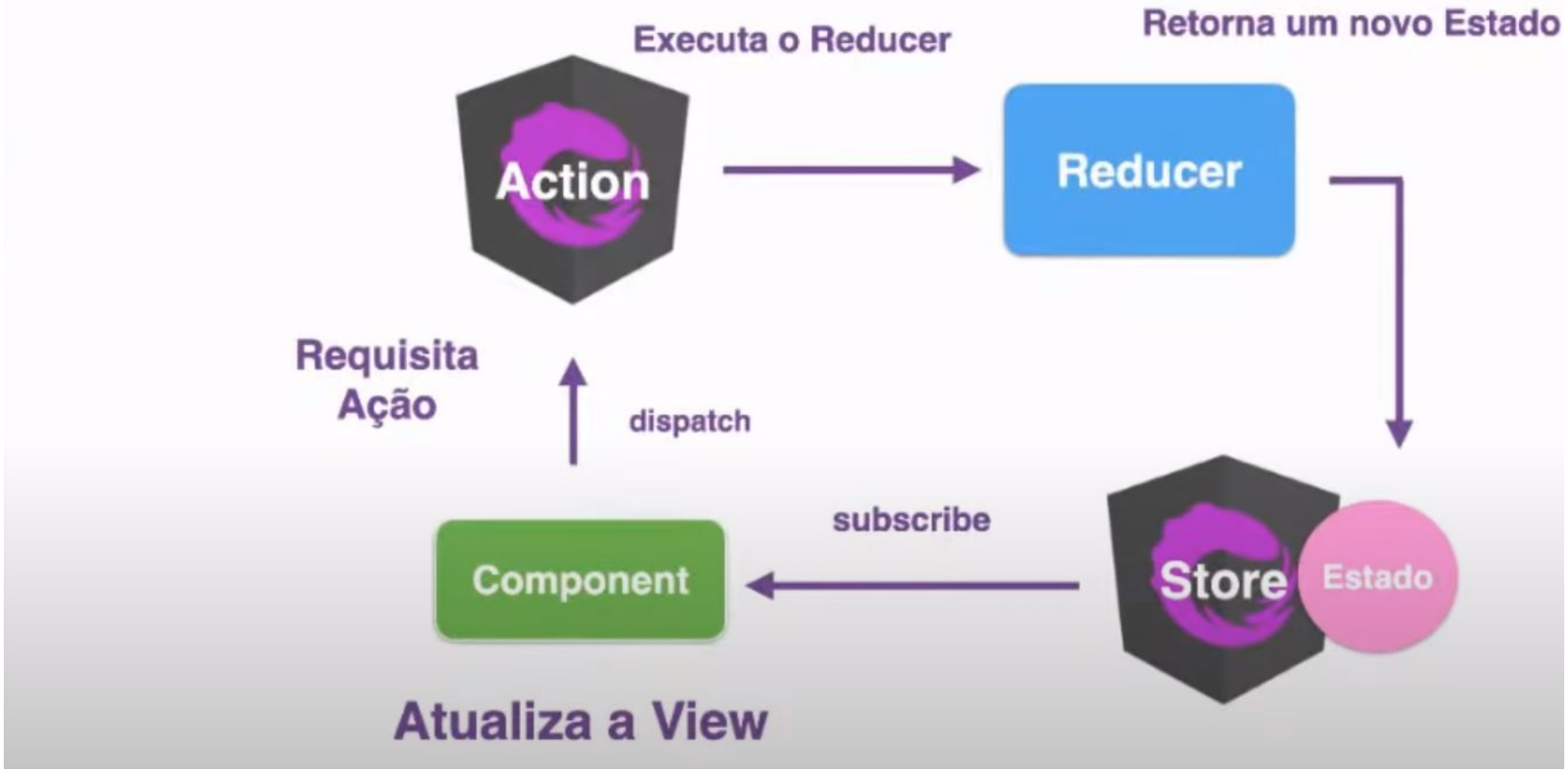
```
load() {
  return this.http.get<Contact[]>(this.API)
    .pipe(
      take(1),
      tap(data => this.contactsCache = data)
    );
}

create(record: Contact) {
  return this.http.post<Contact>(this.API, record).pipe(take(1));
}

update(record: Contact) {
  return this.http.put<Contact>(`${this.API}/${record.id}`, record).pipe(take(1));
}

remove(id: number) {
  return this.http.delete<Contact>(`${this.API}/${id}`).pipe(take(1));
}
```

Backpressure with RxJS

```
observeMessages(url: string): Observable<any> {
  return new Observable<any>(obs => {
    const es = new EventSource(url);
    es.addEventListener('message', (evt: any) => {
      console.log(evt.data);
      obs.next(evt.data != null ? JSON.parse(evt.data) : evt.data);
    });
    return () => es.close();
  });
}
```

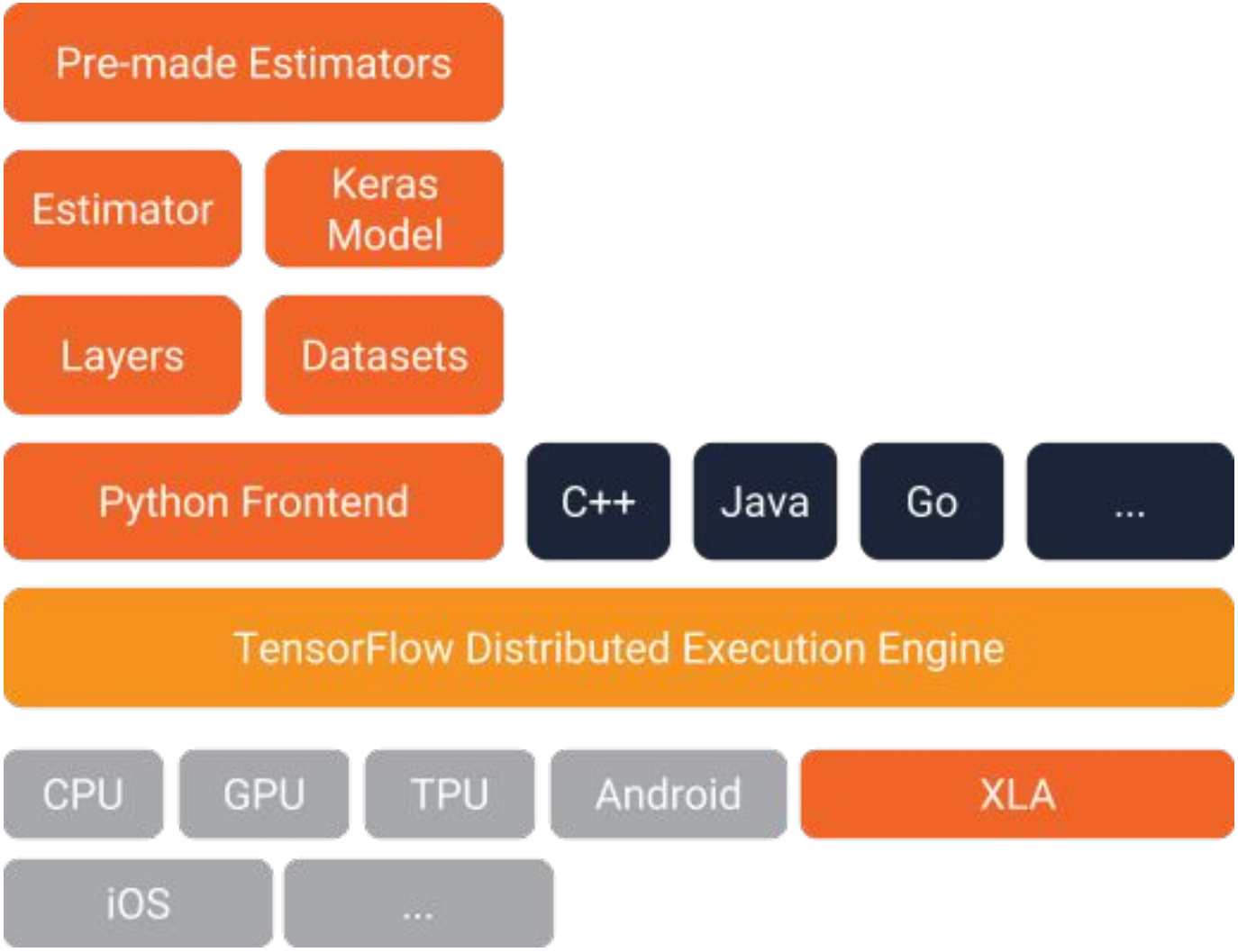
O Ideal ?

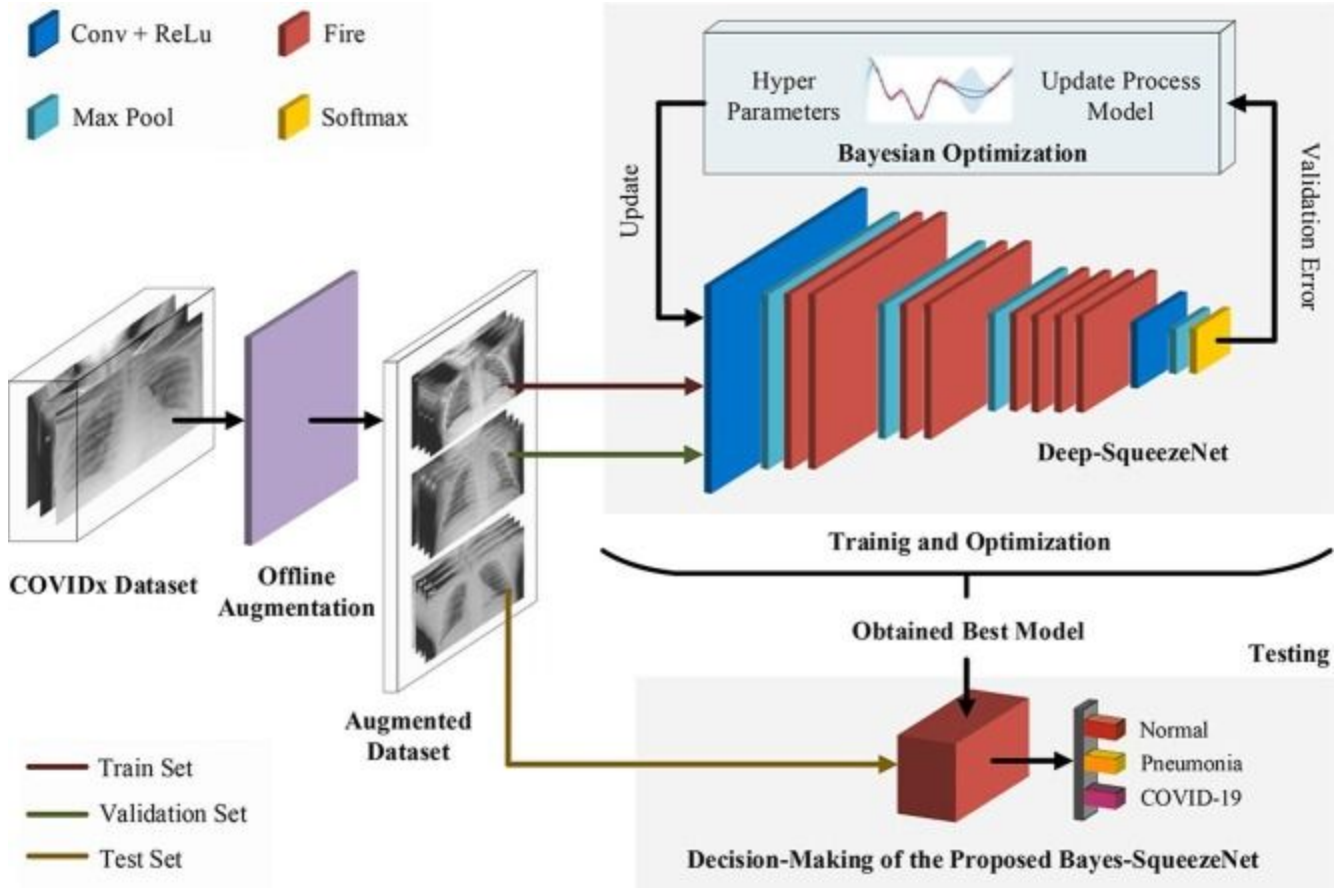
Fluxo de Dados Assíncrono



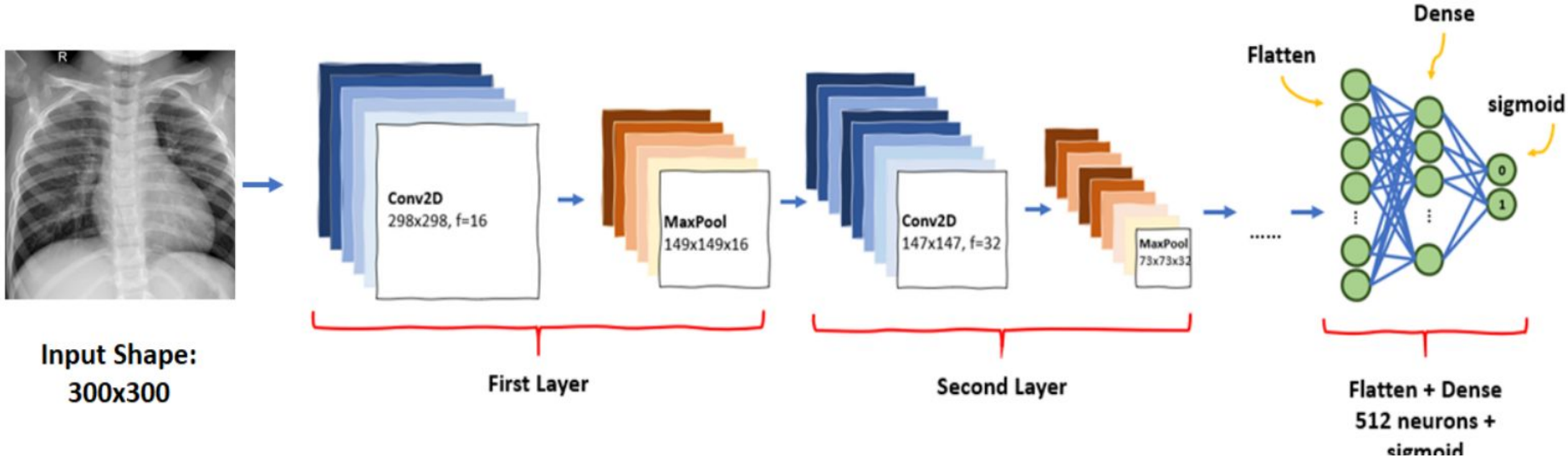
TensorFlow

2.0

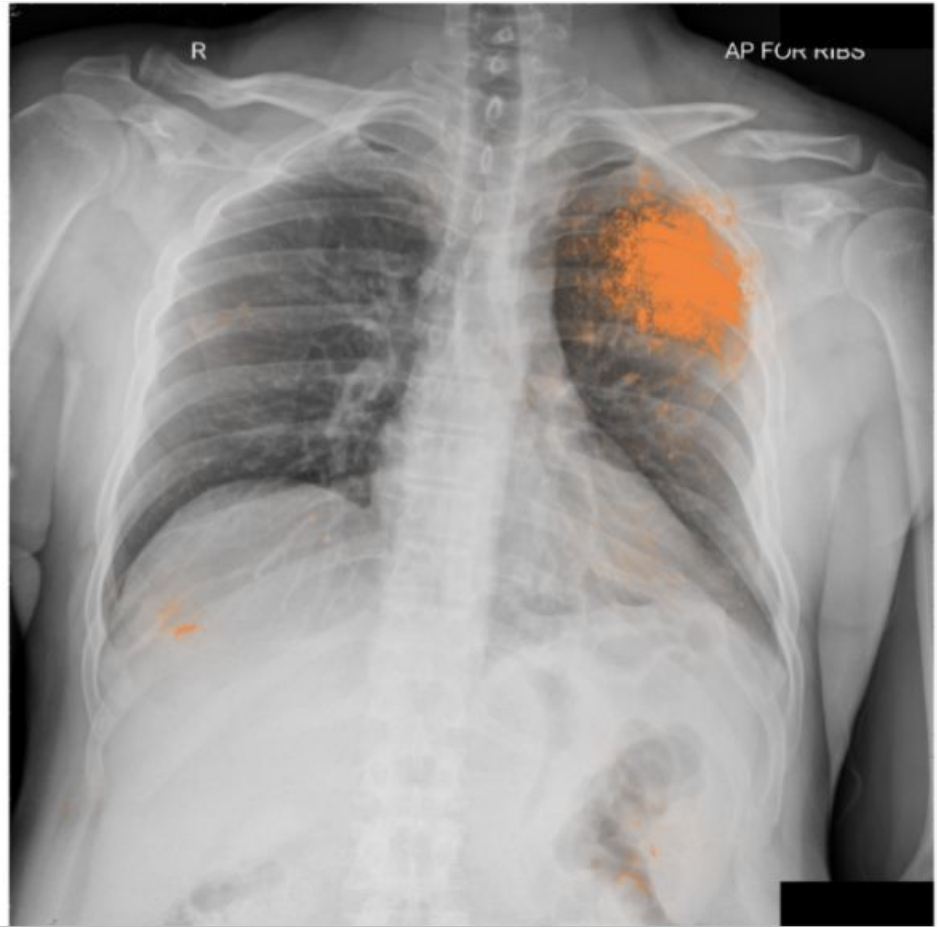

Pre-made Estimators
Estimator
Keras Model
Layers
Datasets
Python Frontend
C++
Java
Go
...
TensorFlow Distributed Execution Engine
CPU
GPU
TPU
Android
XLA
iOS
...


Conv + ReLu
Fire
Max Pool
Softmax
Hyper Parameters
Update Process Model
Bayesian Optimization
Update
Validation Error
Deep-SqueezeNet
COVIDx Dataset
Offline Augmentation
Augmented Dataset
Trainig and Optimization
Obtained Best Model
Testing
Normal
Pneumonia
COVID-19
Train Set
Validation Set
Test Set
Decision-Making of the Proposed Bayes-SqueezeNet

Pneumonia Detection using Convolutional Neural Network (CNN)



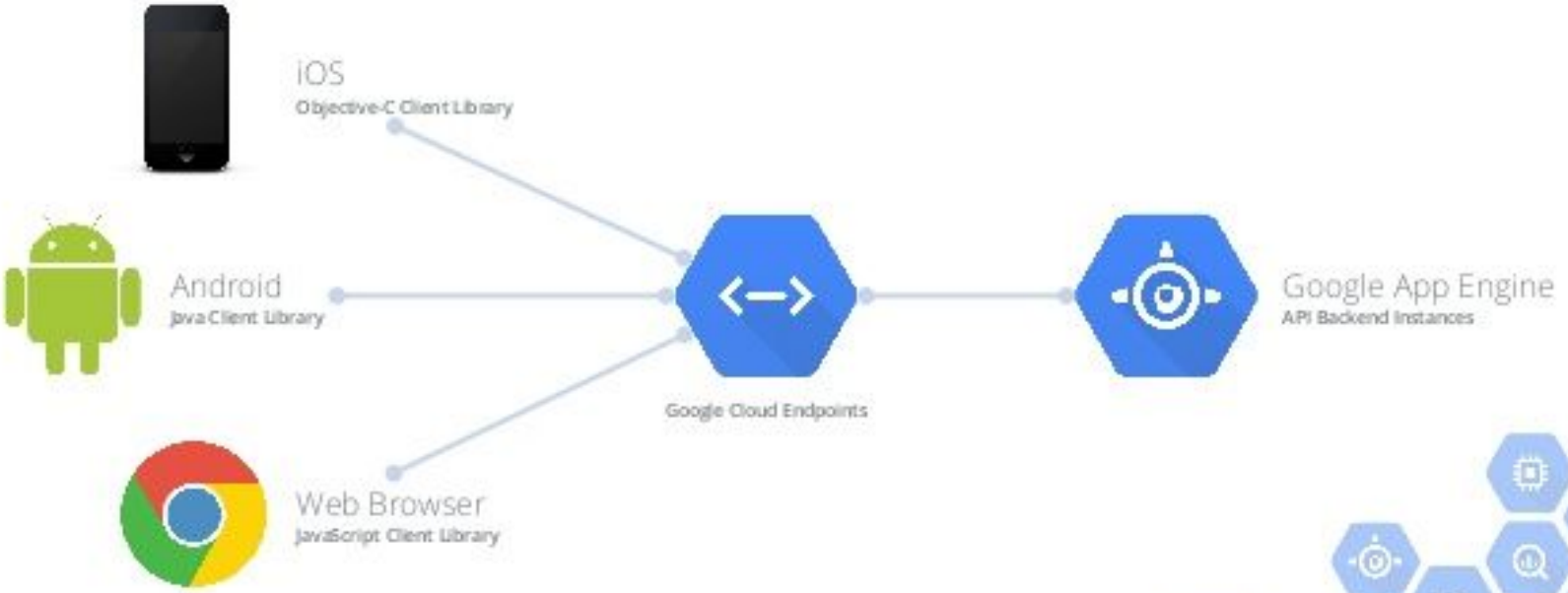

R
AP FOR RIBS


R
AP FOR RIBS

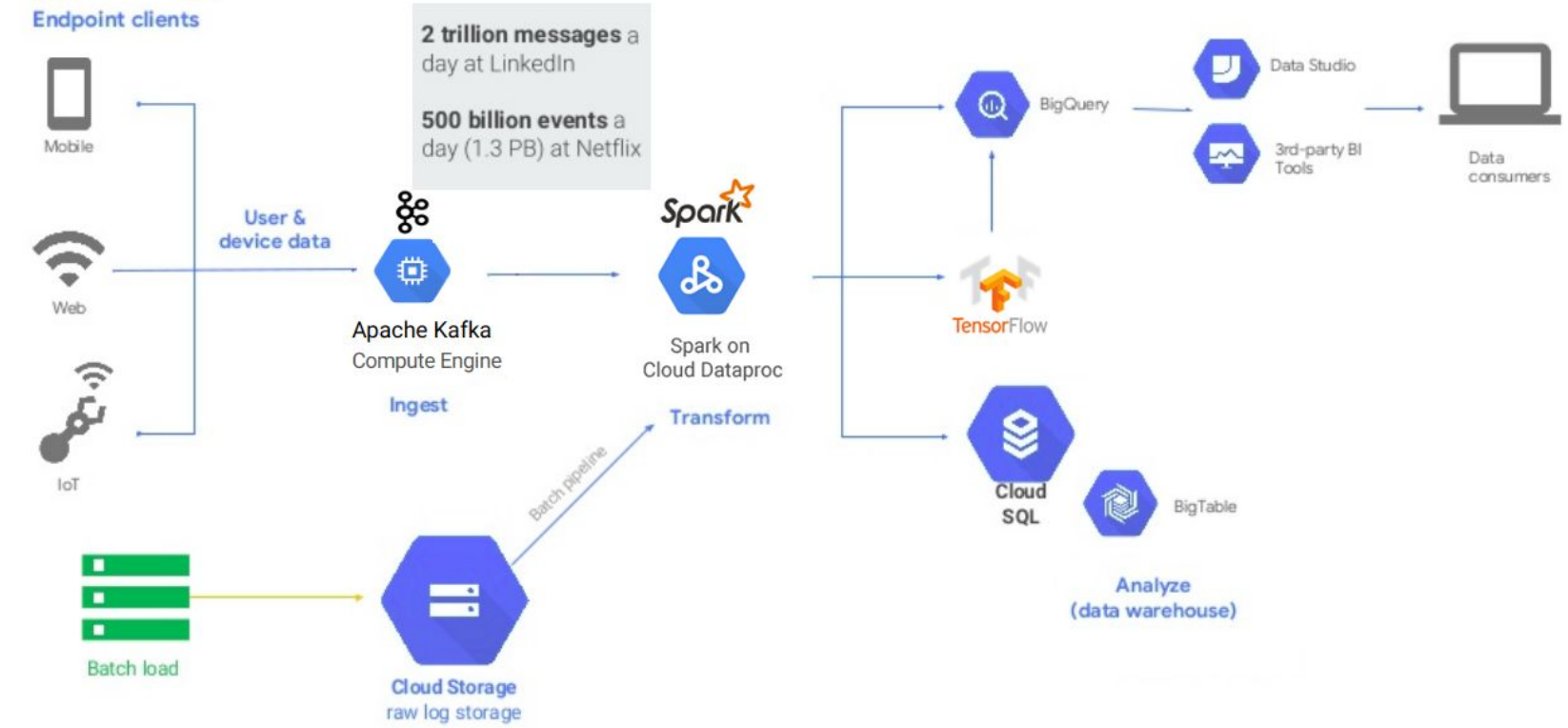
Deploy GCP

Deploy to Google Kubernetes Engine - Deploy to GKE | CircleCI

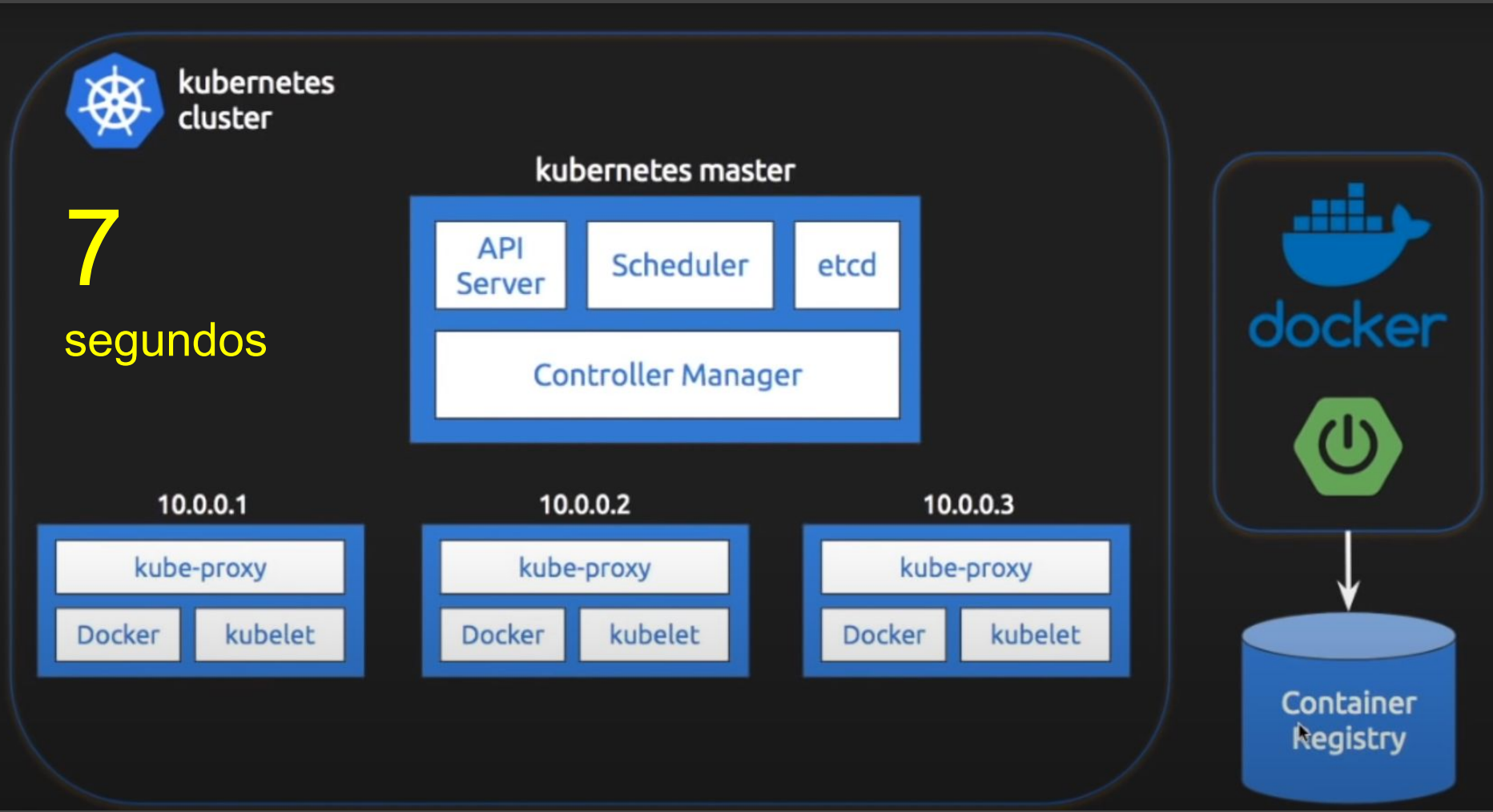
Cloud Endpoints Architecture

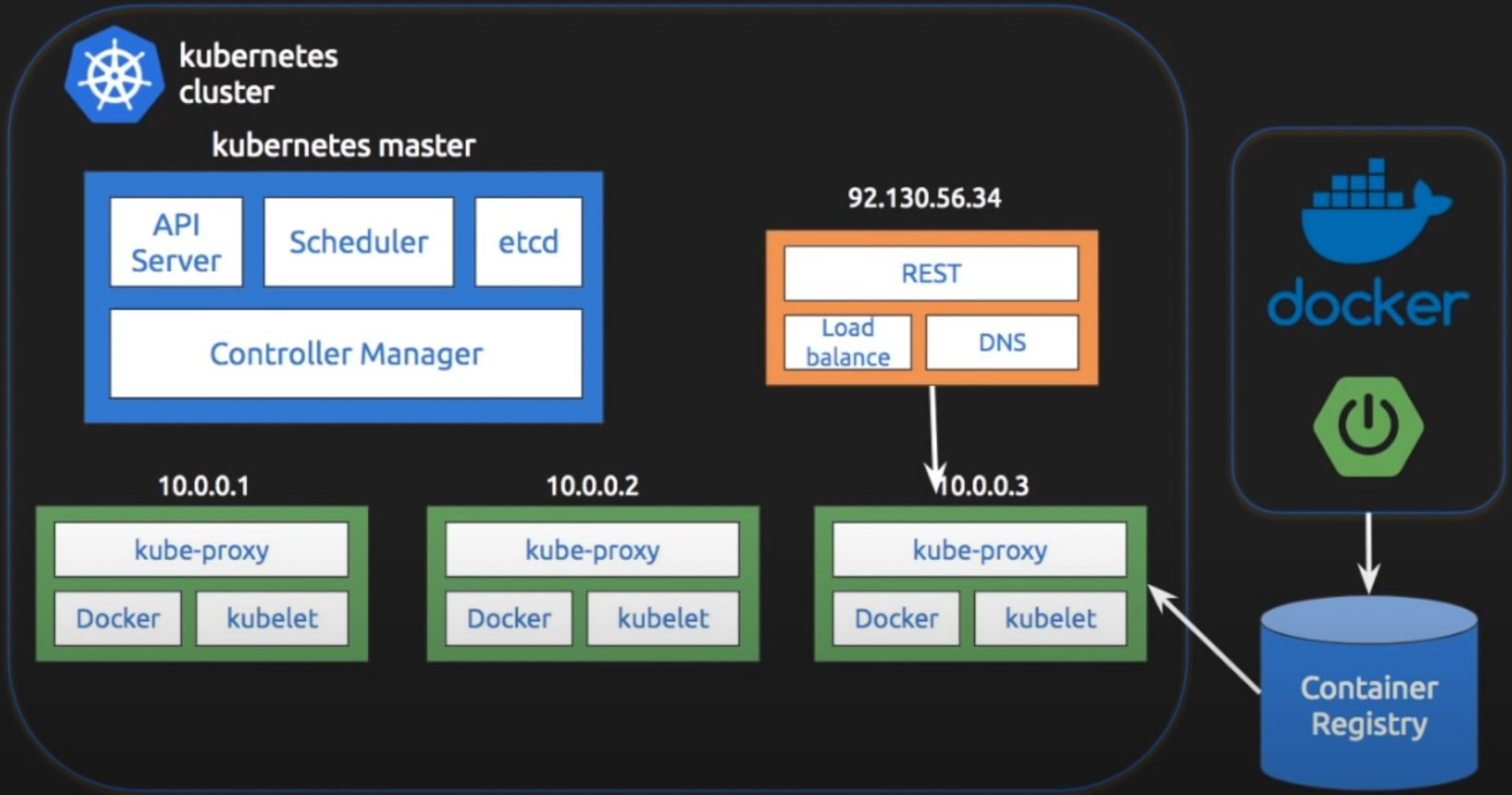


Software como Serviço (SaaS),
Plataforma como Serviço (PaaS),
Infraestrutura como Serviço (IaaS).




docker
kubernetes


kubernetes cluster
7
segundos
kubernetes master
API Server
Scheduler
etcd
Controller Manager
10.0.0.1
kube-proxy
Docker
kubelet
10.0.0.2
kube-proxy
Docker
kubelet
10.0.0.3
kube-proxy
Docker
kubelet
docker
Container Registry


kubernetes
cluster
kubernetes master
API
Server
Scheduler
etcd
Controller Manager
92.130.56.34
REST
Load
balance
DNS
docker
10.0.0.1
kube-proxy
Docker
kubelet
10.0.0.2
kube-proxy
Docker
kubelet
10.0.0.3
kube-proxy
Docker
kubelet
Container
Registry

PACIENTE

SISVIDA

- DASHBOARD
- USUÁRIO
- FUNCIONÁRIO
- PACIENTE
- EXAMES
- PRONTUÁRIO ELETRÔNICO
- LAUDO
- INTELIGÊNCIA ARTIFICIAL
- RELATORIOS
- ATENDIMENTO ONLINE
- CENTRAL AJUSTES

Listagem

Ordenadas Por Data De Cadastro

Cadastrar Pacientes

STATUS	QRCODE	NOME	CPF	TELEFONE	E-MAIL
Ativo	+1 +2 +3 +4	ALEXANDRE NORMANDIA DA ROCHA	6452545225888	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	ALEXANDRE NORMANDIA DA ROCHA	| ALEXANDRE NORMANDIA DA ROCHA | 6452545225888 | +56 699125465465 | email@gmail.com | RUA DOS JAVA	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	RODRIGO MINOTAURO	Ativo | 5f2824b078d26760674e9d0f	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	RODRIGO MINOTAURO		+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	RODRIGO MINOTAURO	0005548888605	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	ESMUYKE ALVES TLLES	00055436605	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	MARIA AVILAR	34525436605	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	LOURRANIO SIMOES	64525430005	+56 699125465465	email@gmail.com
Ativo	+1 +2 +3 +4	FRED R F JUNIOR	64525430265	+56 859125465465	email@gmail.com

Data Scientist José R F Junior
web2ajax@gmail.com