



# Descubriendo Quarkus

Java Subatómico en acción

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# ¿Quién soy?



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Red Hat - Snowdrop team

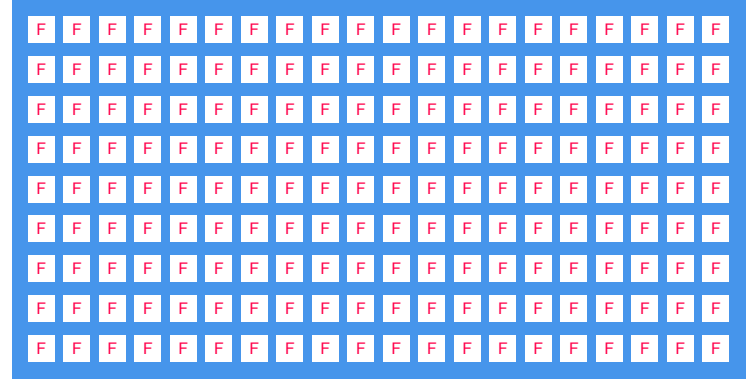
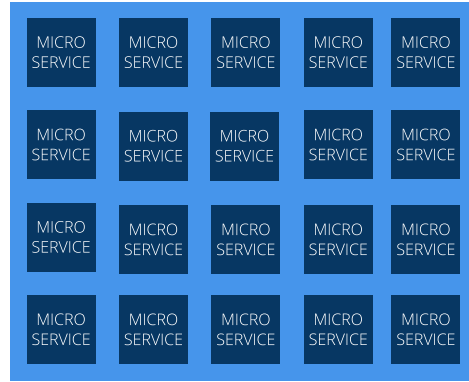


# La nueva era de las aplicaciones

## Cloud native & Container platforms



# Monolitos->Microservicios->serverless



- 1 monolith  $\approx$  20 microservices  $\approx$  200 functions
- Scale to 1 vs scale to 0
- Start up time

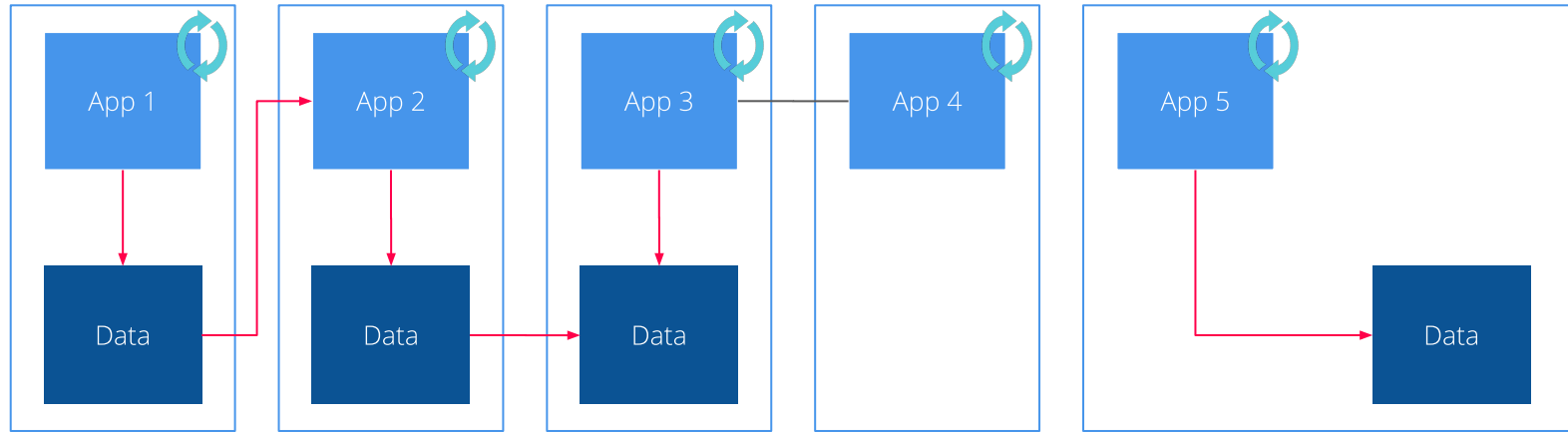


# ¿Por qué complicarnos la vida?





# Agilidad, escalabilidad, mayor reactividad



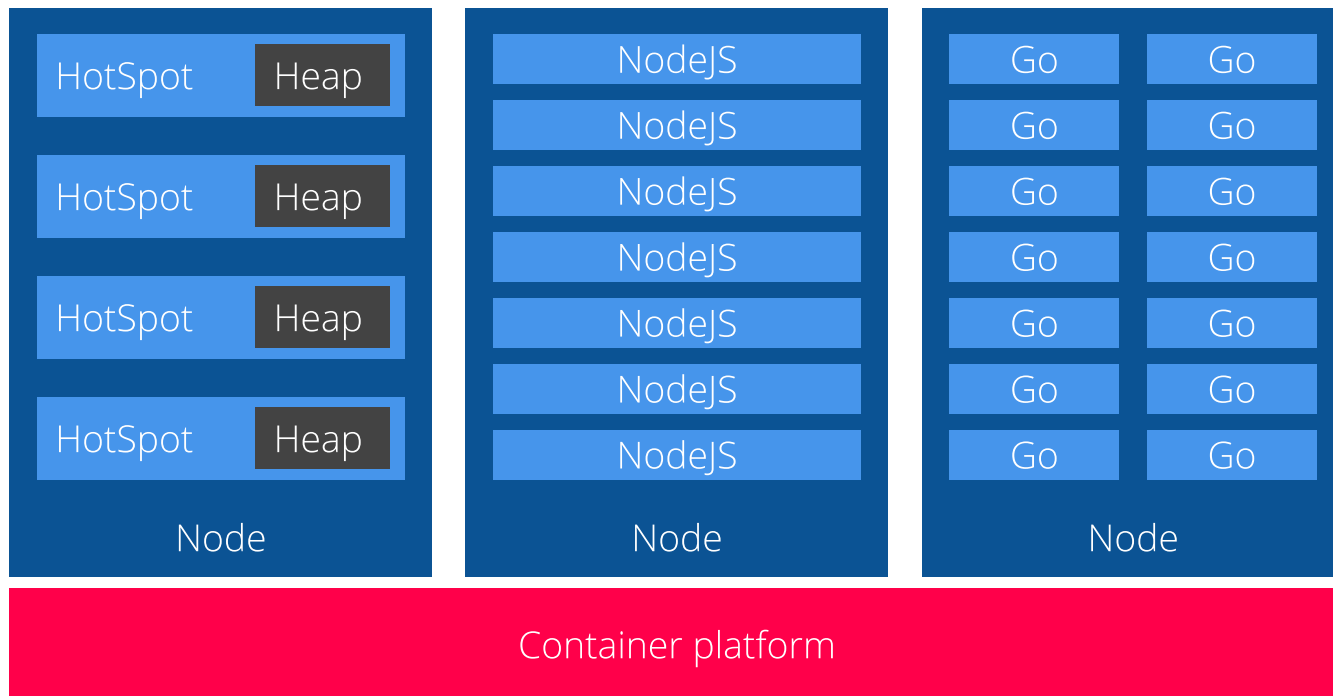
Container platform





**When containers meet java**

# La verdad tras la JVM





# Java on cloud native: a Red Hat journey

## Standards

- Java EE streamlining
- Eclipse MicroProfile

## Runtimes

- WildFly on OpenShift

## Hardware architectures

- Raspberry Pi and Plug Computer
- Android

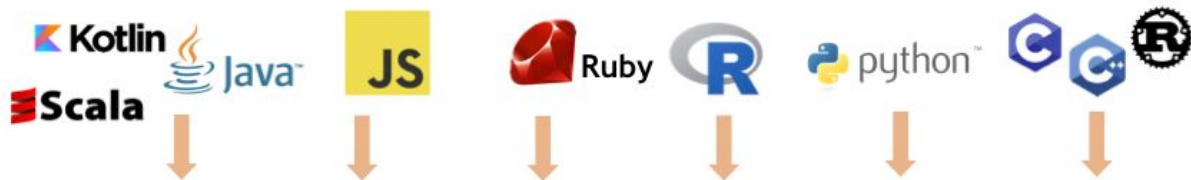
## Ahead of time compilation

- Lead gcj
- Looked at Dalvik, Avian, Excelsior JET

## OpenJDK

- Container ergonomics
- JVM metadata reduction

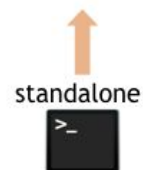


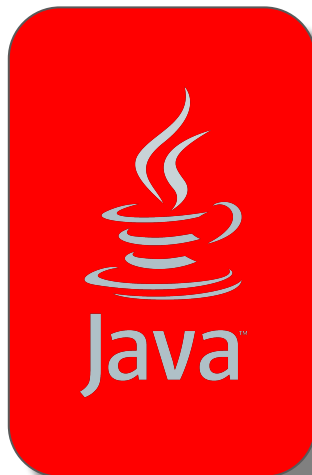


Automatic transformation of interpreters to compiler

**GraalVM**<sup>TM</sup>

Embeddable in native or managed applications





Sulong (LLVM)

Truffle

Graal Compiler

JVM CI

Substrate VM

Java HotSpot VM



# El problema de Graal

## No soporta

- **Dynamic classloading**
- `InvokeDynamic` & `Method handles`
- `Finalizer`
- `Security manager`
- `JVMTI`, `JMX`, native VM Interfaces

## Con limitaciones

- **Reflection (manual list)**
- **Dynamic proxy (manual list)**
- `JNI (manual list)`
- **Static initializers (eager)**
- **Lambda, Threads (OK, pfff!)**
- `References (similar)`



# ¿Qué significa Quarkus?

QUARK: elementary particle

US: hardest thing in computer science







# QUARKUS

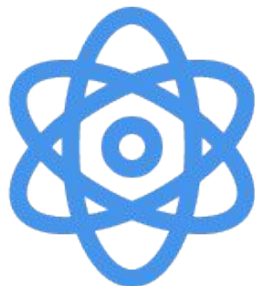
## Supersonic Subatomic Java

A Kubernetes Native Java stack tailored for GraalVM & OpenJDK HotSpot,  
crafted from the best of breed Java libraries and standards

# An Open Source stack to write Java apps



Cloud Native,



Microservices,



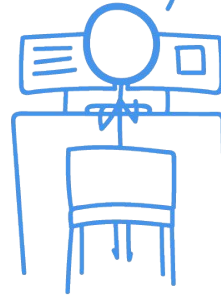
Serverless

# Beneficio 1: Felicidad del programador

WAIT.  
SO YOU JUST SAVE IT,  
AND YOUR CODE IS RUNNING?  
AND IT'S JAVA?!



I KNOW, RIGHT?  
SUPERSONIC JAVA, FTW!



## Beneficio 2: Supersonic Subatomic Java

REST + CRUD

Quarkus + GraalVM **0.055 Seconds**

Quarkus + OpenJDK **2.5 Seconds**

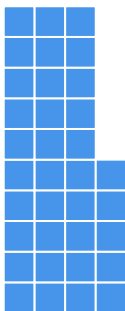
Traditional Cloud-Native Stack **9.5 Seconds**

Time to first response

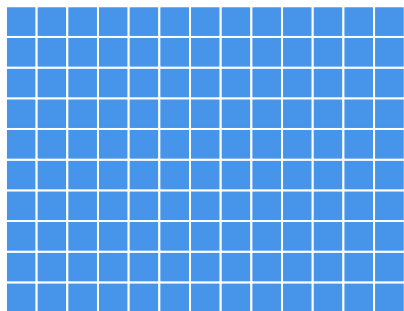


## Beneficio 2: Supersonic Subatomic Java

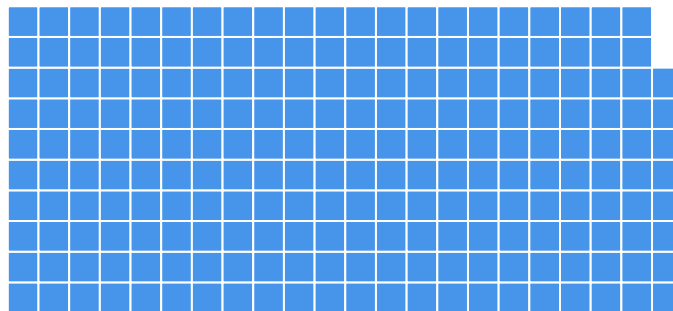
REST + CRUD



Quarkus + GraalVM  
**35 MB**



Quarkus + OpenJDK  
**130 MB**



Traditional Cloud-Native Stack  
**218 MB**





## Beneficio 3: Unifica Imperativo + Reactivo

```
@Inject
Servicio say;

@GET
@Produces(MediaType.TEXT_PLAIN)
public String hello() {
    return say.hello();
}
```

```
@Inject @Stream("kafka")
Publisher<String> reactiveSay;

@GET
@Produces(MediaType.SERVER_SENT_EVENTS)
public Publisher<String> stream() {
    return reactiveSay;
}
```



## Beneficio 4: Los mejores Frameworks y Standards

The logo for Eclipse Vert.x, featuring the word "VERT.x" in a bold, sans-serif font. "VERT" is in dark blue and ".x" is in purple.

Eclipse Vert.x



Eclipse MicroProfile



Spring Compas



Hibernate



RESTEasy



Apache Camel



Kubernetes



OpenShift



Jaeger



Prometheus



Apache Kafka



Netty



# Quarkus: nucleo + extensiones

## Extensiones de Quarkus

RESTEasy

Netty

Hibernate ORM

Hibernate Validator

MP OpenAPI

MP JWT

Eclipse Vert.X

Agroal (conn pool)

Narayana JTA

MP Reactive  
Messaging

Apache Camel

...

## Nucleo de Quarkus

Jandex

Gizmo

Graal SDK

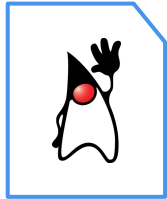
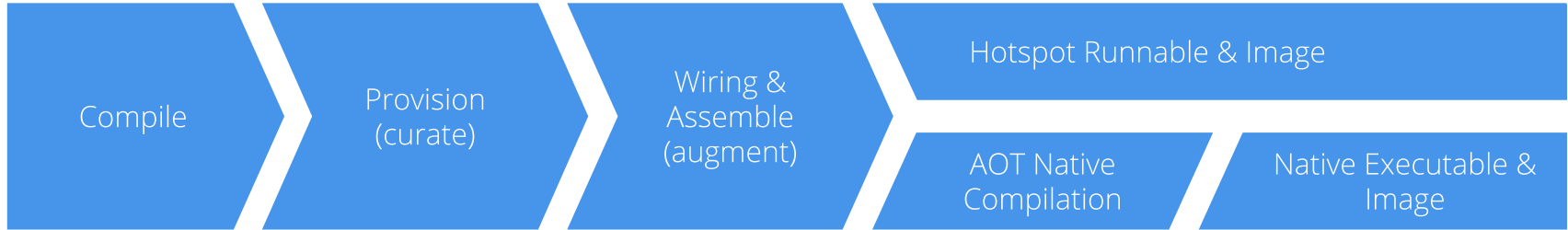
Arc (DI)

HotSpot

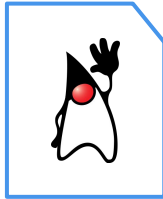
SubstrateVM



# Proceso de build



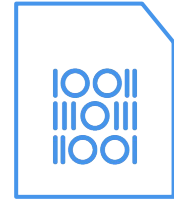
app.jar



frameworks



Runnable java app



native-app



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# Simple REST endpoint, returning "hello" to requests on "/hello"

```
mvn io.quarkus:quarkus-maven-plugin:1.4.1.Final:create \
  -DprojectId=org.acme \
  -DprojectArtifactId=getting-started \
  -DclassName="org.acme.getting.started.GreetingResource" \
  -Dpath="/hello"
cd getting-started
```

<https://quarkus.io/guides/getting-started#bootstrapping-the-project>



## Beneficio 4: Los mejores Frameworks y Standards

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Eclipse MicroProfile



Spring Compatri



Hibernate



RESTEasy



Apache Camel



Kubernetes



OpenShift



Jaeger



Prometheus



Apache Kafka



Netty



# Spring Apps con Quarkus

## Por qué Spring en Quarkus?

- Capitalizar el conocimiento Spring
- Familiaridad
- Acelerar el aprendizaje y onboarding.



# Spring DI - Spring Web

## Dependency injection model

- @Component, @Autowired, etc

## Spring Web - Developing REST APIs

- @RestController, @RequestMapping etc



# Spring REST APIs

*pom.xml*

```
<dependency>  
  <groupId>io.quarkus</groupId>  
  <artifactId>quarkus-spring-web</artifactId>  
</dependency>
```

*GreetingController.java*

```
import org.springframework.web.bind.annotation.GetMapping;  
import org.springframework.web.bind.annotation.RequestParam;  
import org.springframework.web.bind.annotation.RestController;
```

@RestController

```
public class GreetingController {
```

```
    @GetMapping("/hello")
```

```
    public String hello(@RequestParam(defaultValue = "world") String name) {
```

```
        return "hello " + name;
```

```
    }
```

```
}
```







# Spring Data JPA

## Spring Data JPA

- Derived methods
- Custom query methods
- Fragments
- Transactional support



# Spring Data JPA

*pom.xml*

```
<dependency>
  <groupId>io.quarkus</groupId>
  <artifactId>quarkus-spring-data-jpa</artifactId>
</dependency>
```

*BookRepository.java*

```
import java.util.List;
import org.springframework.data.jpa.repository.Modifying;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.repository.CrudRepository;
import org.springframework.data.repository.query.Param;

public interface BookRepository extends CrudRepository<Book, Integer> {

    List<Book> findByPublicationYearBetween(Integer lower, Integer higher);

}
```

*Book.java*

```
import javax.persistence.Entity;
import javax.persistence.Id;

@Entity
public class Book {
    @Id
    private Integer bid;
    private Integer publicationYear;
    private String name;
}
```





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**QUARKUS CONSIGUE UN MEJOR  
JAVA EN ENTORNOS DE  
CONTENEDORES Y SERVERLESS**





# QUARKUS



<https://quarkus.io>



<https://quarkusio.zulipchat.com>



@quarkusio



## Docs:

<https://github.com/quarkusio/quarkus-quickstarts.git>

<https://quarkus.io/guides/spring-di-guide>

<https://quarkus.io/guides/spring-web>

<https://quarkus.io/guides/spring-data-jpa>

<https://quarkus.io/guides/hibernate-orm>

<https://learn.openshift.com/middleware/courses/middleware-quarkus/getting-started>

## Demos:

<https://github.com/aureamunoz/spring-quarkus-jug>

<https://github.com/aureamunoz/quarkus-getting-started>

<https://github.com/snowdrop/spring-quarkus-fruits>

<https://github.com/snowdrop/crud-example>





# Gracias!



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