Quarkus

Java weather forecast: cheerful to cloudy

Harald Pehl
@haraldpehl

Red Hat

Harald Pehl

Senior Software Engineer at Red Hat

WildFly Management / HAL Console

Quarkus gRPC Extensions

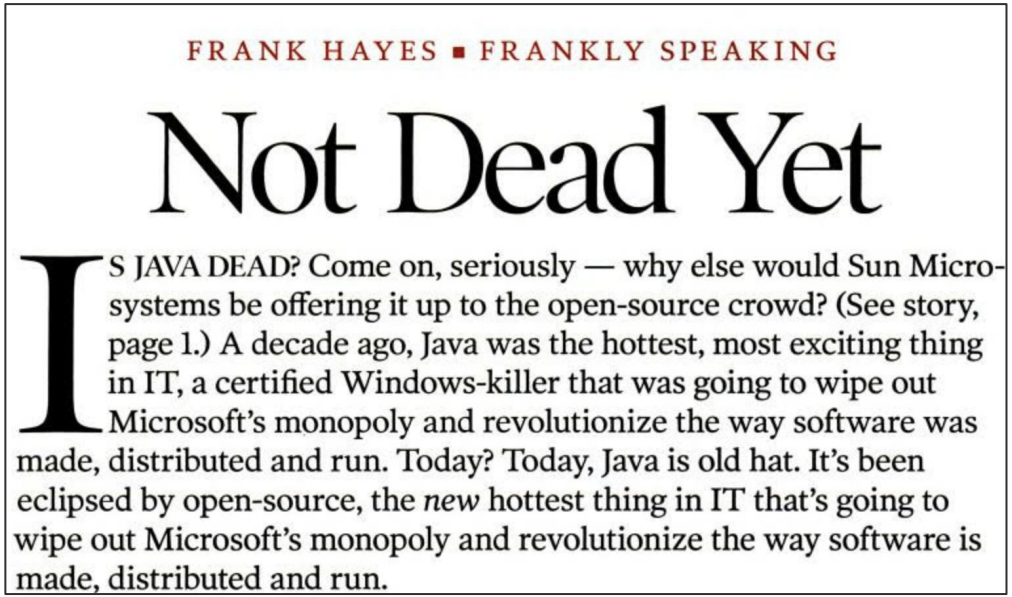
Red Hat

Why Quarkus?

Another framework?

No thanks - I can't take any more!

Red Hat



FRANK HAYES ▪ FRANKLY SPEAKING

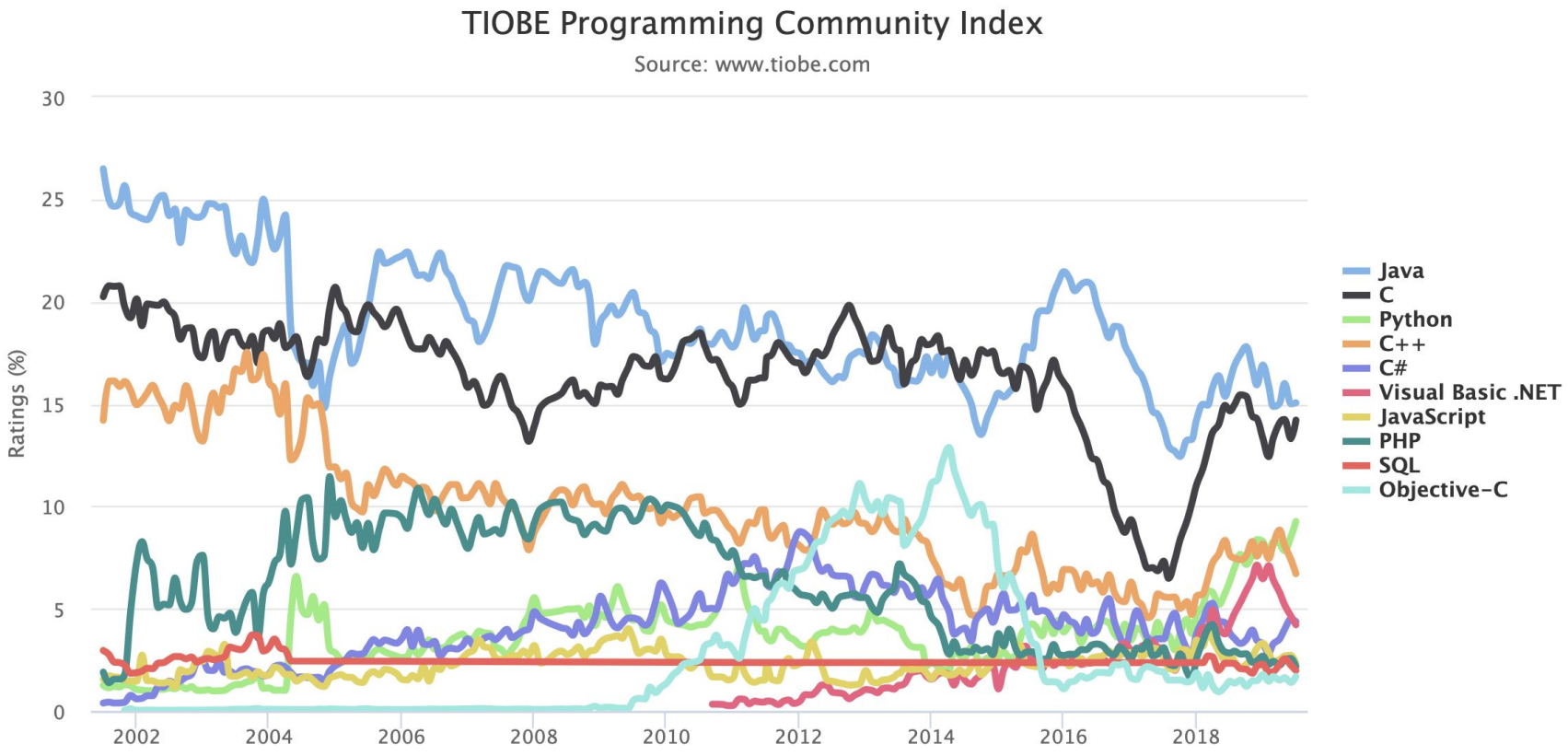
Not Dead Yet

IS JAVA DEAD? Come on, seriously — why else would Sun Microsystems be offering it up to the open-source crowd? (See story, page 1.) A decade ago, Java was the hottest, most exciting thing in IT, a certified Windows-killer that was going to wipe out Microsoft's monopoly and revolutionize the way software was made, distributed and run. Today? Today, Java is old hat. It's been eclipsed by open-source, the *new* hottest thing in IT that's going to wipe out Microsoft's monopoly and revolutionize the way software is made, distributed and run.

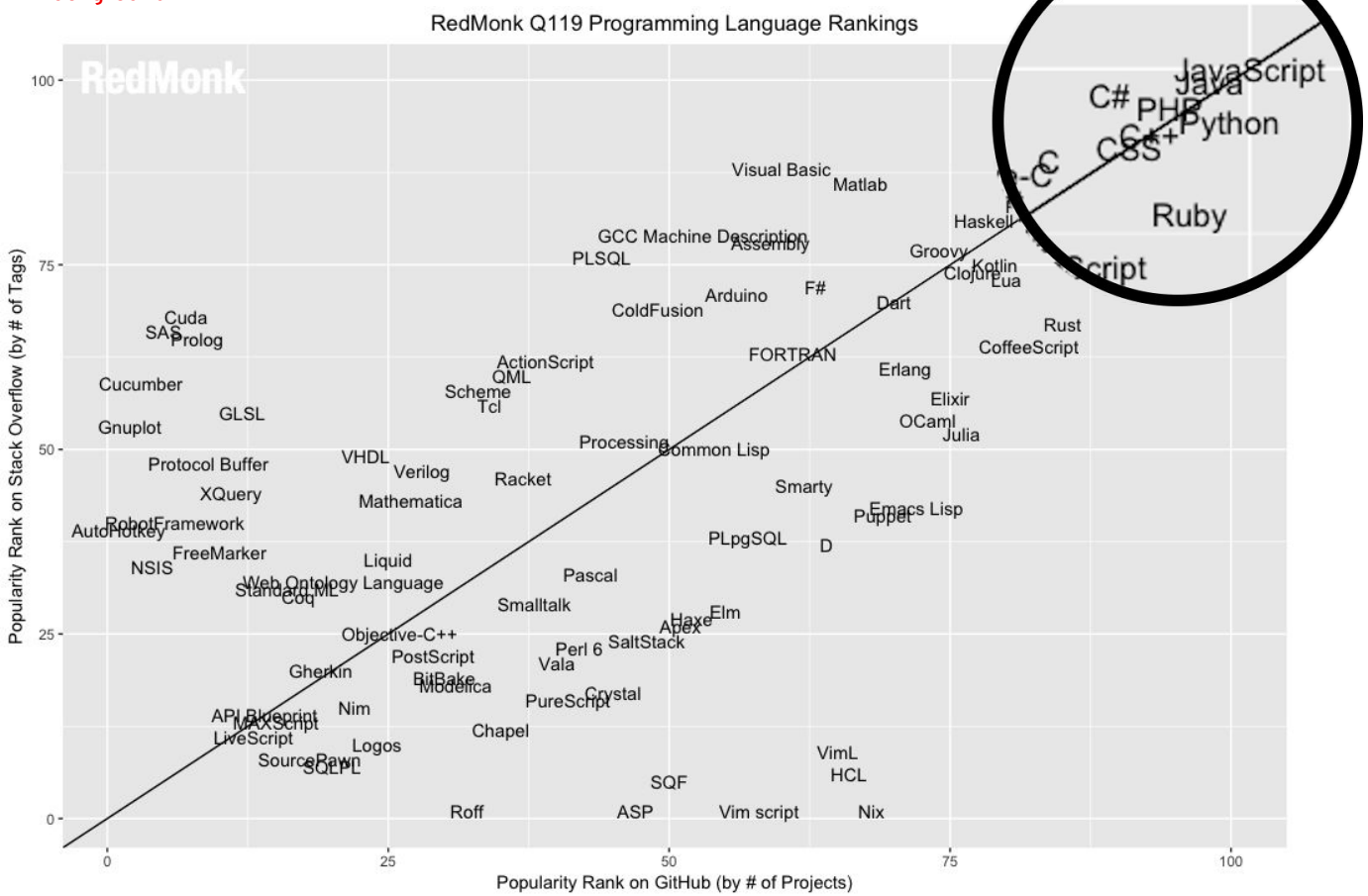
Computer World

May 22, 2006

Red Hat

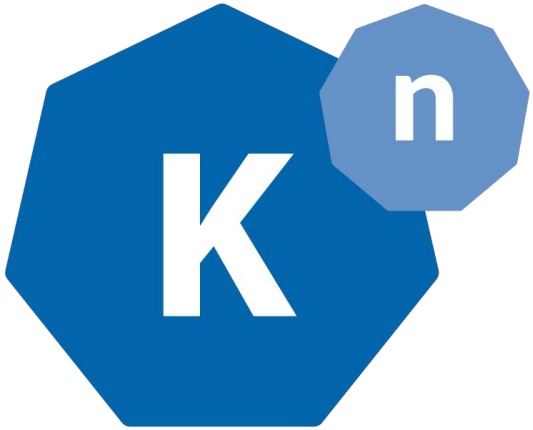

TIOBE Programming Community Index
Source: www.tiobe.com
Ratings (%)
30
25
20
15
10
5
0
2002
2004
2006
2008
2010
2012
2014
2016
2018
Java
C
Python
C++
C#
Visual Basic .NET
JavaScript
PHP
SQL
Objective-C

Red Hat

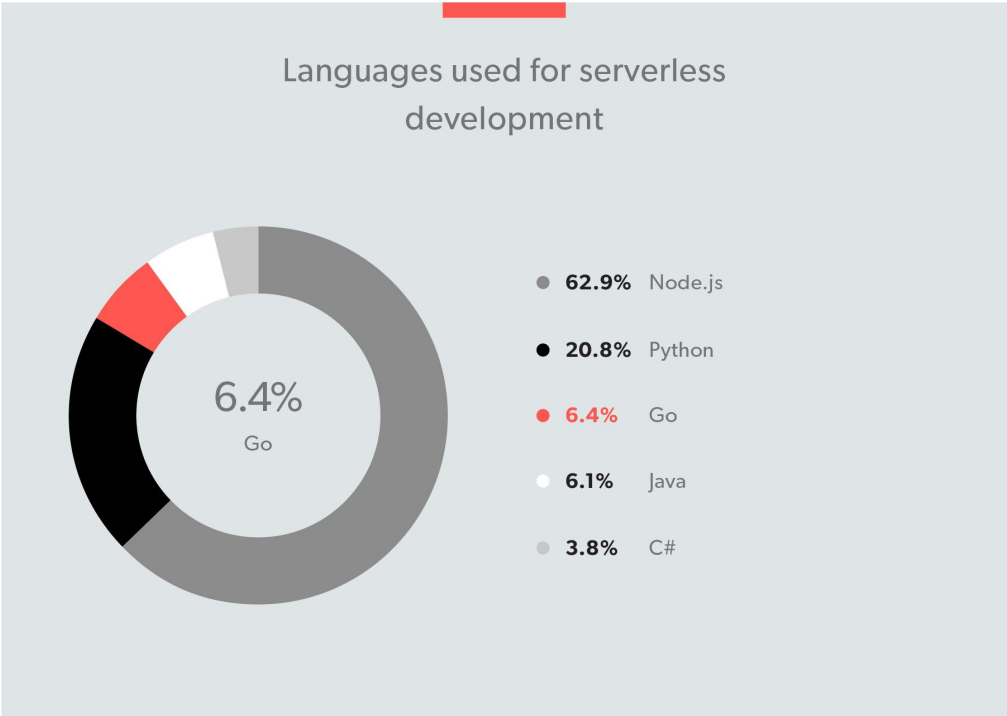


1. JavaScript
2. Java
3. Python
4. PHP
5. C#
6. C++
7. CSS
8. Ruby
9. C
10. Objective-C

Red Hat



Red Hat



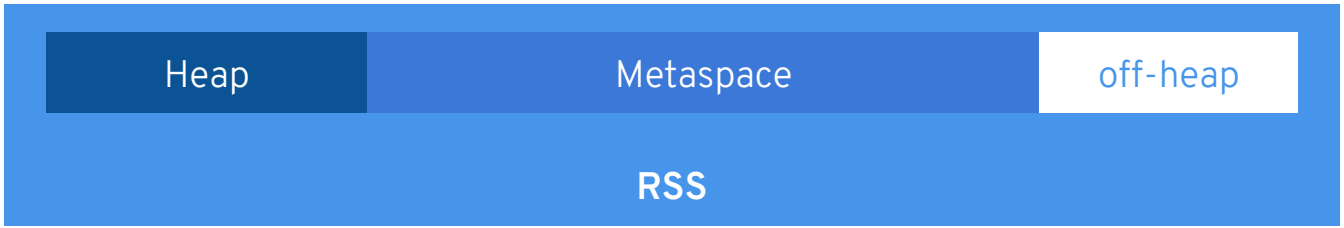
https://serverless.com/blog/2018-serverless-community-survey-huge-growth-usage/

Red Hat

The hidden truth

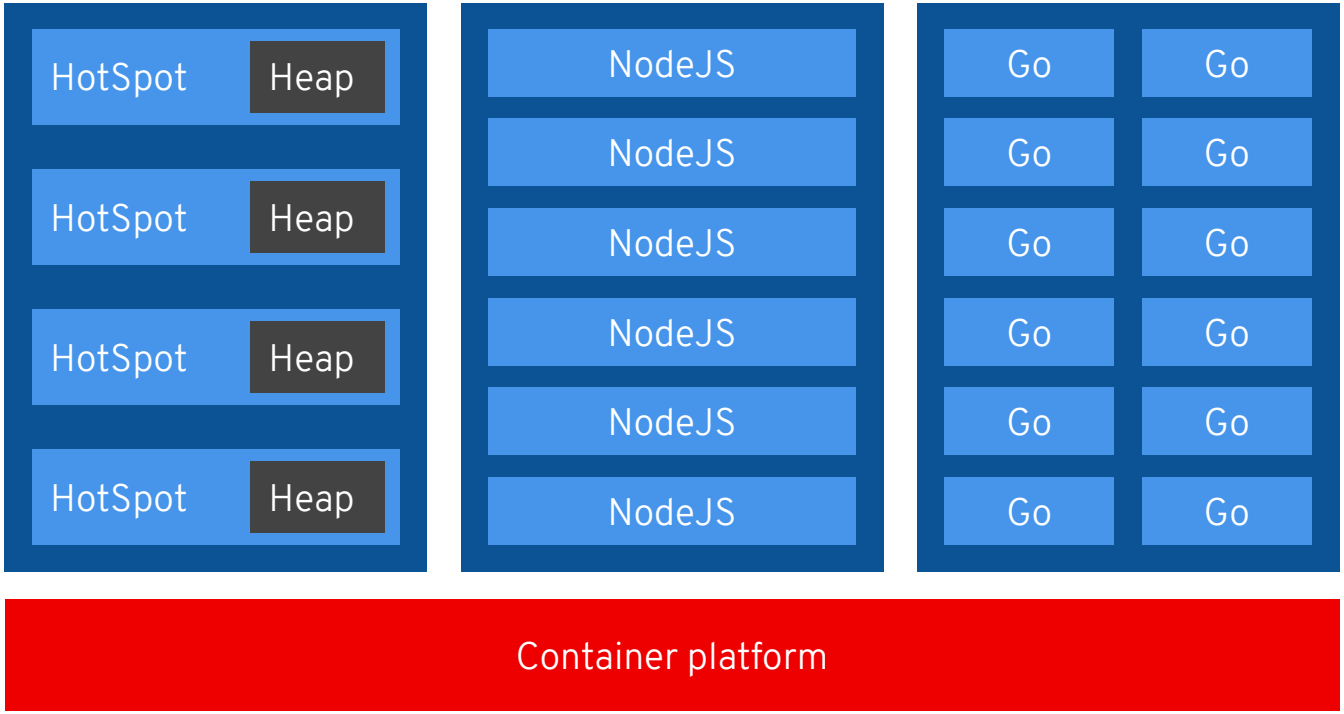
Startup Overhead: # of classes, bytecode, JIT

Memory Overhead: # of classes, metadata, compilation

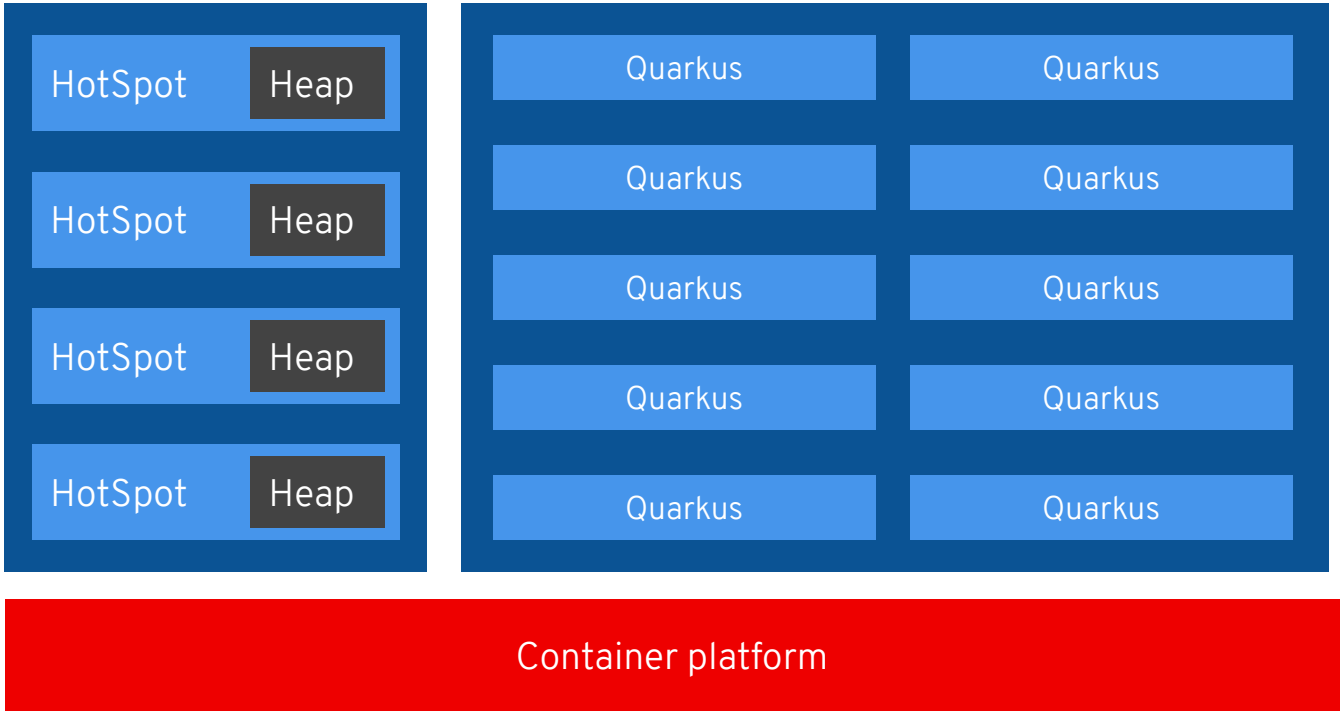


https://developers.redhat.com/blog/2017/03/14/java-inside-docker/

Red Hat


HotSpot
Heap
HotSpot
Heap
HotSpot
Heap
HotSpot
Heap
NodeJS
NodeJS
NodeJS
NodeJS
NodeJS
NodeJS
Go
Go
Go
Go
Go
Go
Go
Go
Go
Go
Go
Go
Container platform

Red Hat


HotSpot
Heap
HotSpot
Heap
HotSpot
Heap
HotSpot
Heap
Quarkus
Quarkus
Quarkus
Quarkus
Quarkus
Quarkus
Quarkus
Quarkus
Quarkus
Quarkus
Container platform

Red Hat

What is Quarkus?

A look into the box

Red Hat

WTF

is a

Quarkus?

Quark - type of elementary particle and a fundamental constituent of matter

us - the hardest problem in software

Red Hat

Supersonic. Subatomic. Java.

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

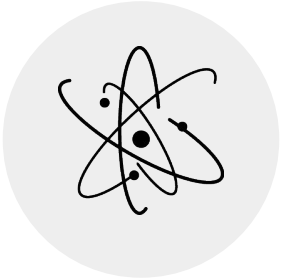
Red Hat

Supersonic

Fast.

Blazing fast to start.

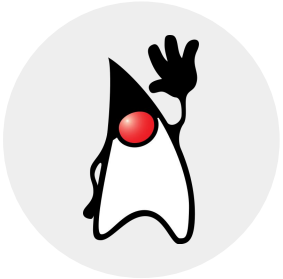
Millisecond fast!



Subatomic

Improve memory consumption

Increase deployment density



Java

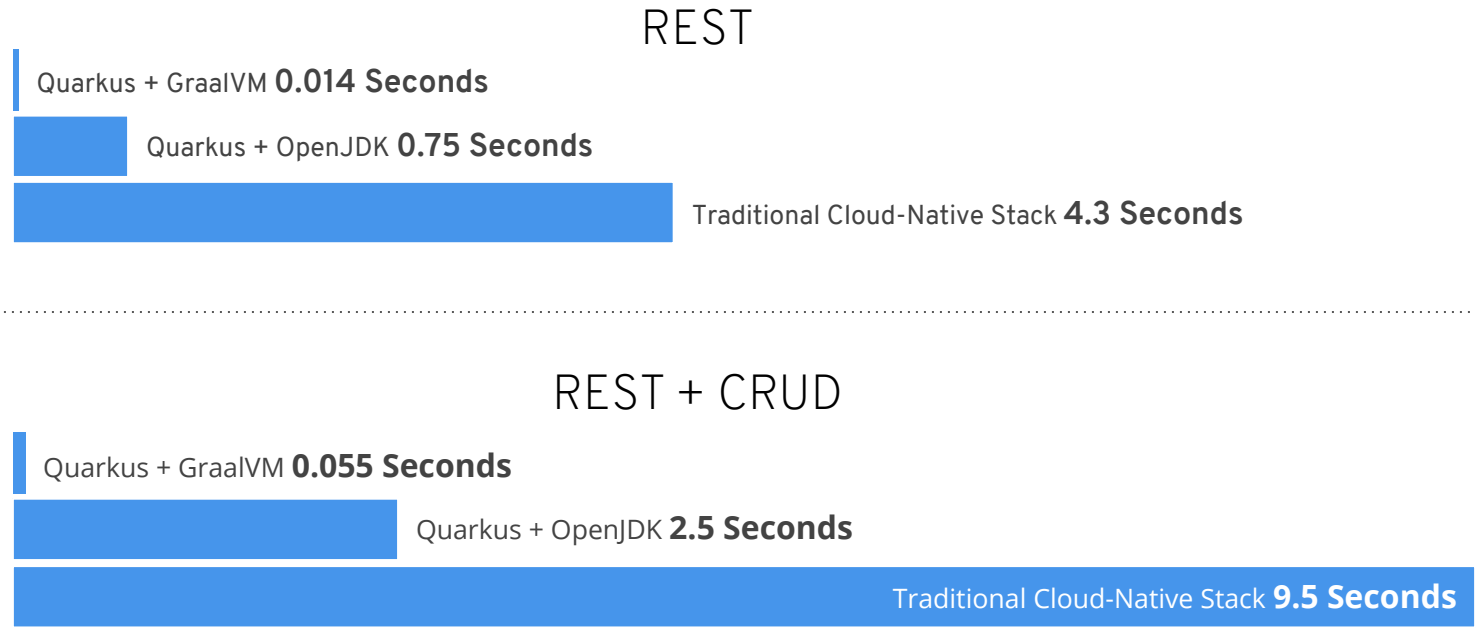
Based on a framework &

specs you love

Blazing fast-hot-reload

Red Hat

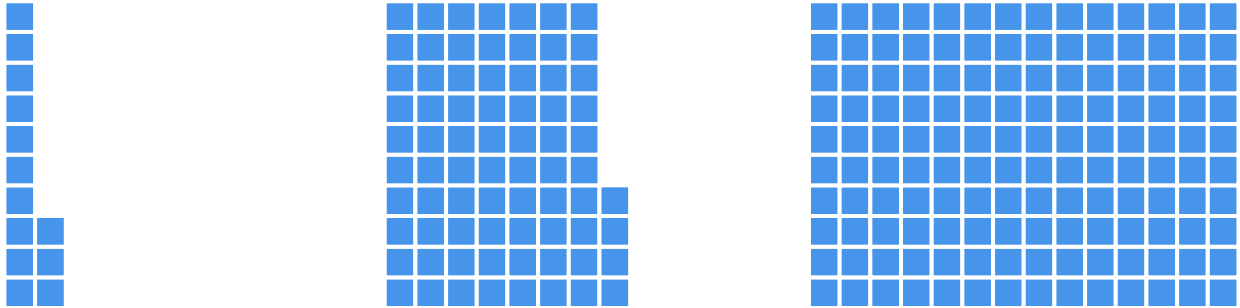
Time to first response



Red Hat

Memory (RSS)

REST



Quarkus + GraalVM
13 MB

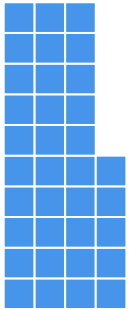
Quarkus + OpenJDK
74 MB

Traditional Cloud-Native Stack
140 MB

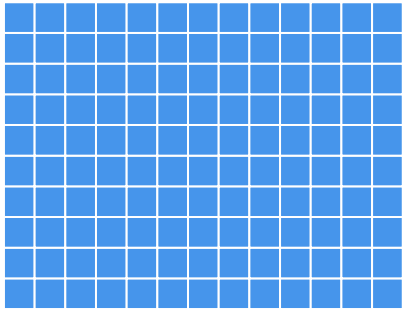
Red Hat

Memory (RSS)

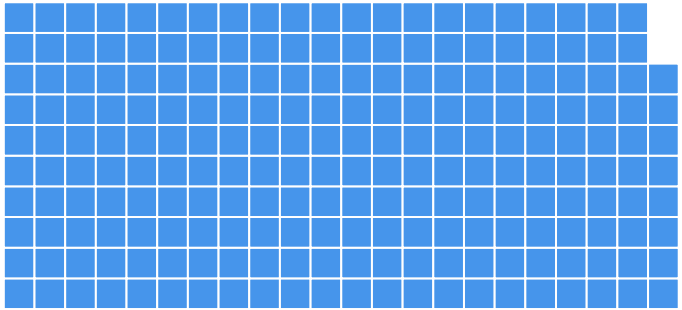
REST + CRUD



Quarkus + GraalVM
35 MB



Quarkus + OpenJDK
130 MB



Traditional Cloud-Native Stack
218 MB

https://quarkus.io/guides/performance-measure

Red Hat

Standards

Servlet
JAX-RS
JPA, JDBC
CDI
Bean Validation
Transactions
Logging

Fault Tolerance
Health
JWT
Metrics

OpenAPI
OpenTracing
Reactive
Messaging
Rest Client

Red Hat

Best of Breed

Eclipse Vert.x

Hibernate

RESTEasy

Apache Camel

Eclipse MicroProfile

Netty

Kubernetes

OpenShift

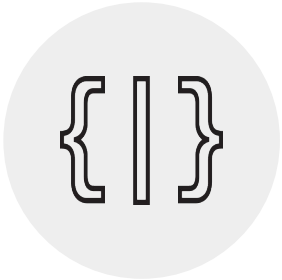
Jaeger

Prometheus

Apache Kafka

Infinispan

Red Hat



Developer Joy

Live reload

Java or Kotlin

Maven or Gradle

No Compromises

Serverless and Microservices

JVM Mode and Native Executables

Imperative and Reactive

Blazing Fast

Lower memory usage

Faster startup

Optimized for short-lived processes

Red Hat

A cohesive platform for developer joy

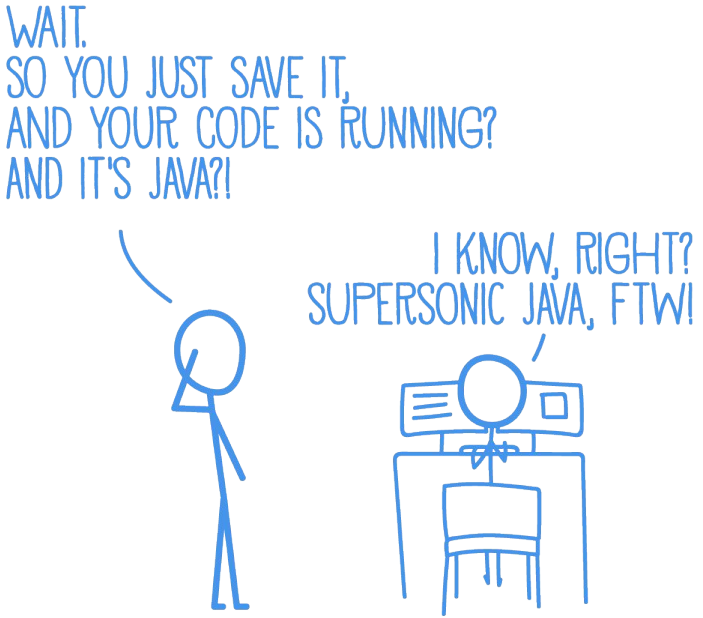
Based on standards, but not limited

Unified configuration

Zero config, live reload in the blink of an eye

Streamlined code for the 80% common usages, flexible for the 20%

No hassle native executable generation



Red Hat

Unifies

Imperative

```
@Inject
SayService say;

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

Reactive

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

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


Red Hat

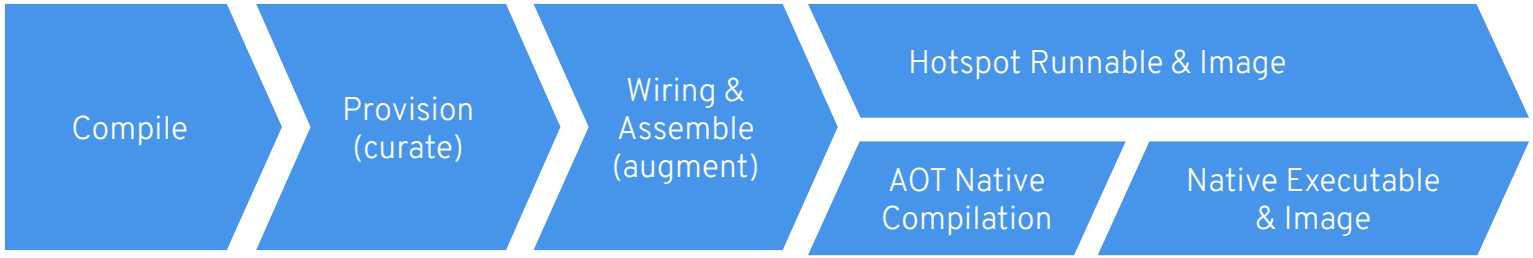
Demo

“Truth can only be found in one place: the code.”

Robert C. Martin, Clean Code

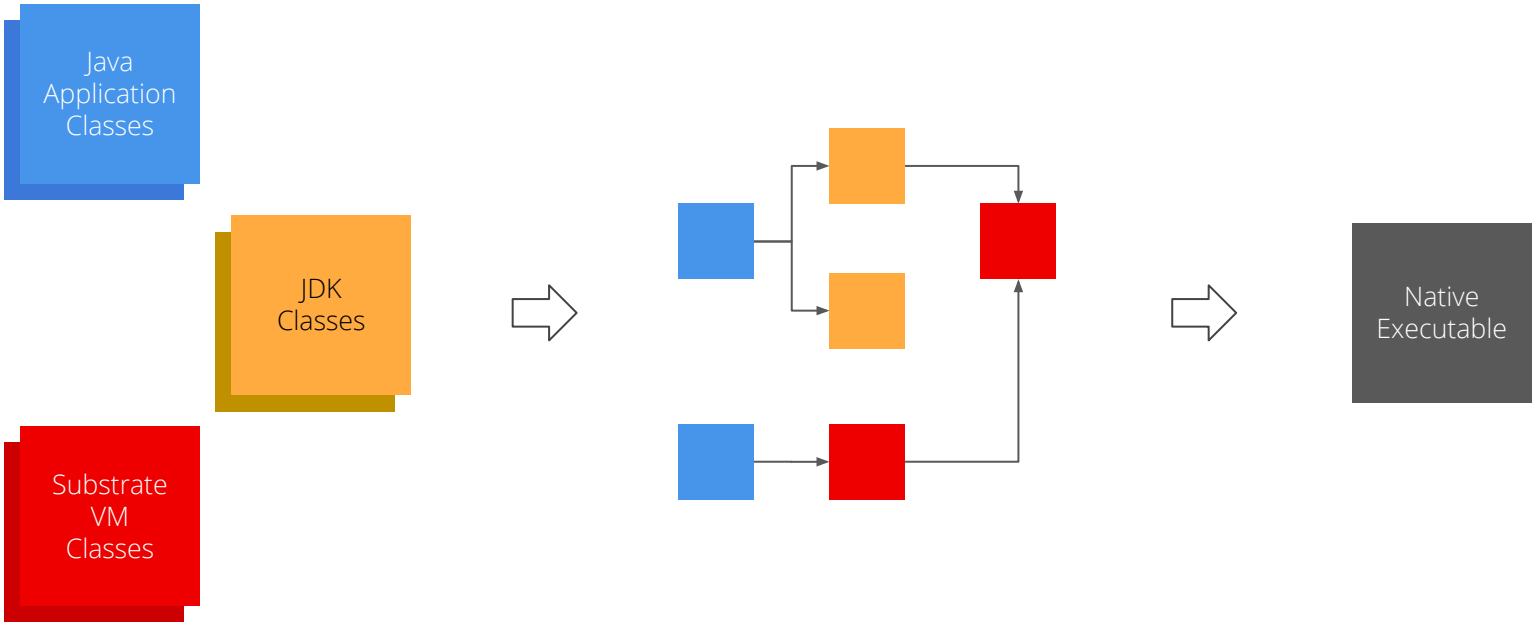
Red Hat

Build Process

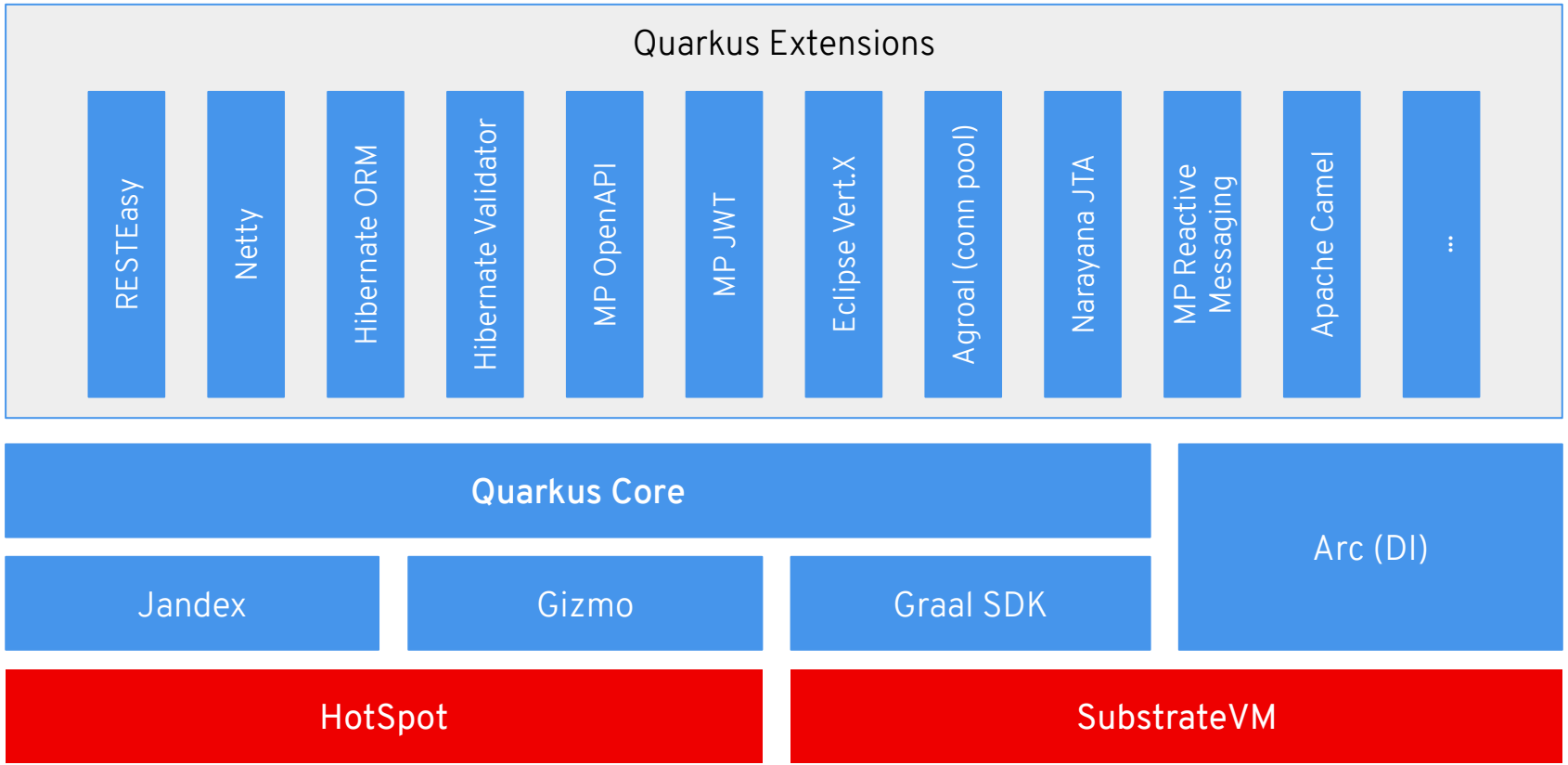


Red Hat

Dead code elimination



Red Hat


Quarkus Extensions
RESTEasy
Netty
Hibernate ORM
Hibernate Validator
MP OpenAPI
MP JWT
Eclipse Vert.X
Agroal (conn pool)
Narayana JTA
MP Reactive Messaging
Apache Camel
...
Quarkus Core
Arc (DI)
Jandex
Gizmo
Graal SDK
HotSpot
SubstrateVM

Red Hat

Links

Memory settings for the JVM in containers:	https://serverless.com/blog/2018-serverless-community-survey-huge-growth-usage/
Performance measurement in Quarkus	https://quarkus.io/guides/performance-measure
Quarkus Todo sample	https://github.com/burrsutter/quarkus-todo-app
Quarkus gRPC extensions	https://github.com/hpehl/quarkus-grpc-extension https://github.com/hpehl/quarkus-grpc-client-extension https://github.com/hpehl/quarkus-grpc-quickstart

Red Hat

Thank you!
Questions?

https://quarkus.io

https://quarkusio.zulipchat.com

@quarkusio

https://github.com/quarkusio/quarkus

Red Hat