

CONTAINER JAVA

How fit is Java for the Cloud ?

Roland Huß, Red Hat, @ro14nd

Javaland - Brühl - 2019-03-20

NO on Prop. 211



No baseless lawsuits



OCTOBER 1996



Sun on the Net SunSITE

max*imum* up*time*



Sun introduces comprehensive,
turnkey cluster solutions for
high availability and performance.



• *Java Computing
in the Enterprise*
The White Paper



October 29
Java jolts the enterprise

► Products & Solutions

► Sales & Service

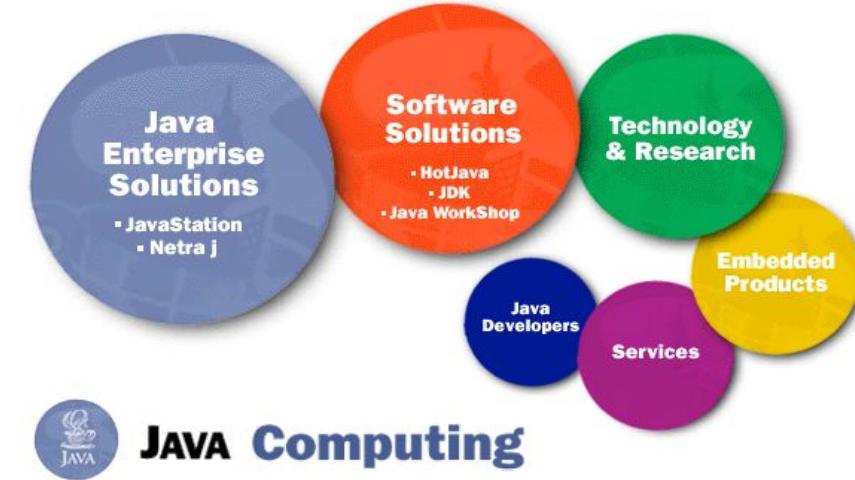
► Technology & Developers

► Info & Jobs

► SunWorld OnLine

► What's new!

► Contacts at Sun



JAVA Computing

It's the most exciting technology of our time.

Endorsed by major hardware and software vendors in the world. And hailed as the future of network computing. From hand-held PDA's to network thin clients and enterprise servers, from platform-independent software to service and support, Java Computing is revolutionizing the computer industry.

1996



1999



2009

2019

Slow Startup



Memory Hog

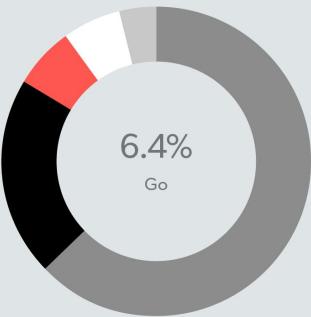


Tiobe Index

Mar 2019	Mar 2018	Change	Programming Language	Ratings	Change
1	1		Java	14.880%	-0.06%
2	2		C	13.305%	+0.55%
3	4	▲	Python	8.262%	+2.39%
4	3	▼	C++	8.126%	+1.67%
5	6	▲	Visual Basic .NET	6.429%	+2.34%
6	5	▼	C#	3.267%	-1.80%
7	8	▲	JavaScript	2.426%	-1.49%
8	7	▼	PHP	2.420%	-1.59%
9	10	▲	SQL	1.926%	-0.76%
10	14	▲	Objective-C	1.681%	-0.09%
11	18	▲	MATLAB	1.469%	+0.06%
12	16	▲	Assembly language	1.413%	-0.29%
13	11	▼	Perl	1.302%	-0.93%
14	20	▲	R	1.278%	+0.15%
15	9	▼	Ruby	1.202%	-1.54%
16	60	▲	Groovy	1.178%	+1.04%
17	12	▼	Swift	1.158%	-0.99%
18	17	▼	Go	1.016%	-0.43%

Serverless Adoption

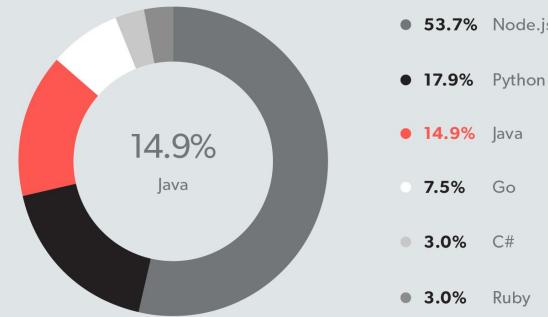
Languages used for serverless development



serverless

serverless.com

Languages used for serverless development in companies with >1000 employees



serverless

serverless.com

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



Develop

Build

Deploy



Develop

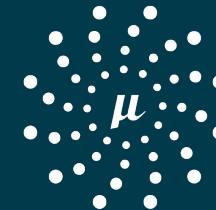
Build

Deploy

Spring Boot



Spring Boot + Micronaut



M I C R O N A U TTM

Micronaut

- Dependency Injection
- Fast startup time
- Reduced memory footprint
- Minimal use of reflection
- Minimal use of proxies
- Easy unit testing

Spring Boot + Micronaut + Quarkus



MICRONAUT™

QUARKUS

QUARKUS

Supersonic Subatomic Java

Quarkus Features

Developer Joy ☕

- 🔥 Live Reload
- 💻 Imperative and Reactive
- ☸️ Serverless and Microservices

No compromises ✨

- 🎁 Fat Jars and Native Executables
- ⌚ Optimized for JAX-RS & JPA

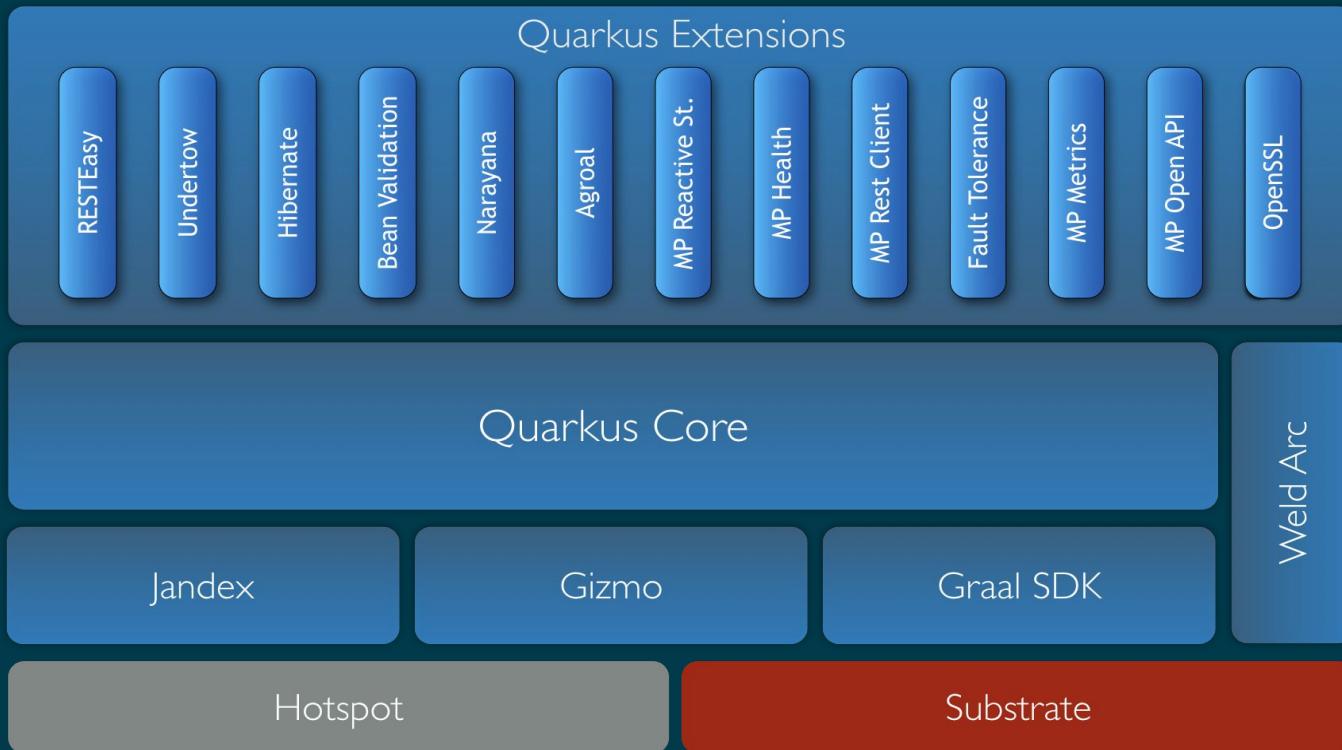
Optimized for the Cloud ✈️

- 💾 Lower memory usage
- 🚀 Faster startup
- ⌚ Optimized for short-lived processes
- ✳️ Kubernetes Native

Supported Libraries and Standards



Quarkus Architecture



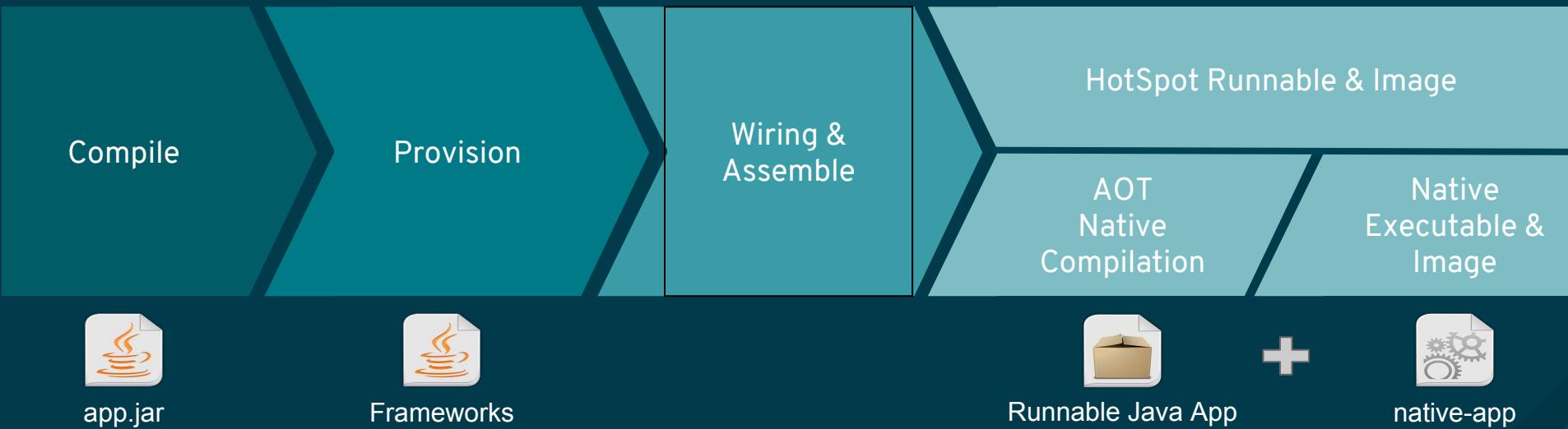
Closed World



AOT



Quarkus Build Process

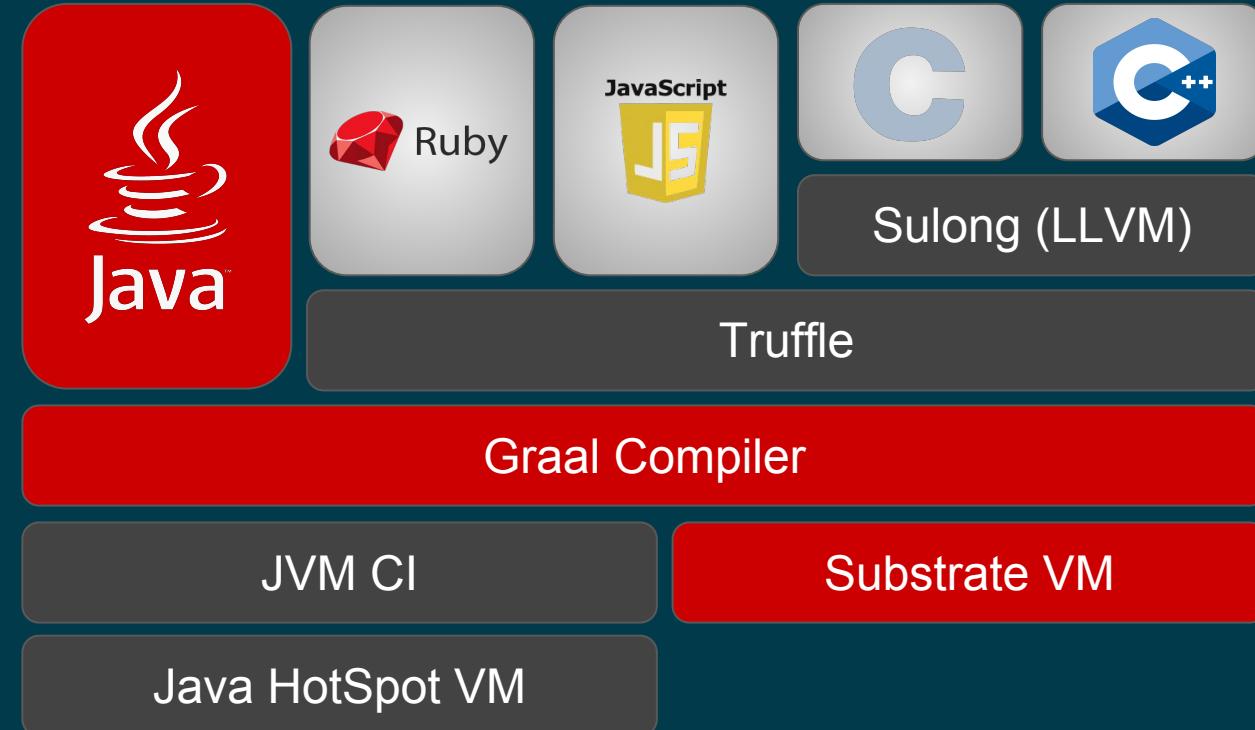




DEMO TIME



GraalVM™



GraalVM / Substrate VM Limitations

- Closed World analysis
- Maximizing dead code elimination
-

QUARKUS

Supersonic Subatomic Java

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

GET STARTED



Develop

Build

Deploy

Building Container Images

- Jib
- docker-maven-plugin
- Skaffold
- Docker, Buildah, Kaniko, img, ...

Jib

- Docker-less OCI image build
- Maven & Gradle plugins
- Image Layering:
 - Dependencies
 - Resources
 - Classes
- Push to registries
- Support for Spring Boot & Micronaut
- Fast

docker-maven-plugin

- No Docker CLI required
- Dockerfile support
- XML configuration
- Running containers*
- Hot rebuild
- Image Push to registries
- Flexible
- <https://github.com/fabric8io/docker-maven-plugin>

*deprecated, use <https://www.testcontainers.org/> instead for new projects



DEMO TIME





Develop

Build

Deploy

Deploying to Kubernetes

- fabric8-maven-plugin
- Metaparticle
- ap4k
- Draft
- Plain Kubernetes
 - Helm
 - OpenShift Templates
 - Application CRD

ap4k

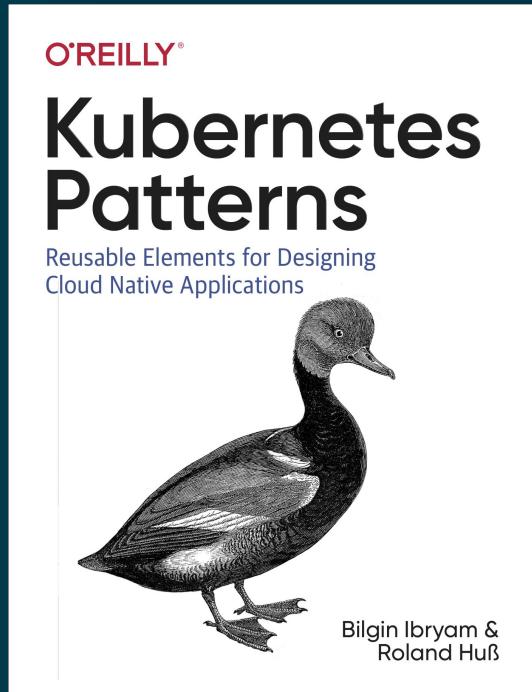
- <https://github.com/ap4k/ap4k>
- Collection of annotations and APT processors for generating Kubernetes resources
- Support for Istio, Prometheus, Service Catalog, Application CRD,
- Evaluates Framework annotations for Spring Boot, MicroProfile (Quarkus), Micronaut



DEMO TIME



KUBERNETES PATTERNS



<https://k8spatterns.io>



THANK YOU

@ro14nd // k8spatterns.io