

# CONTAINER JAVA

How fit is Java for the Cloud ?

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JAX Mainz - 2019-05-08

**NO on Prop. 211**



No baseless lawsuits



OCTOBER 1996

Sun on the Net SunSITE

Back Issues

# 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

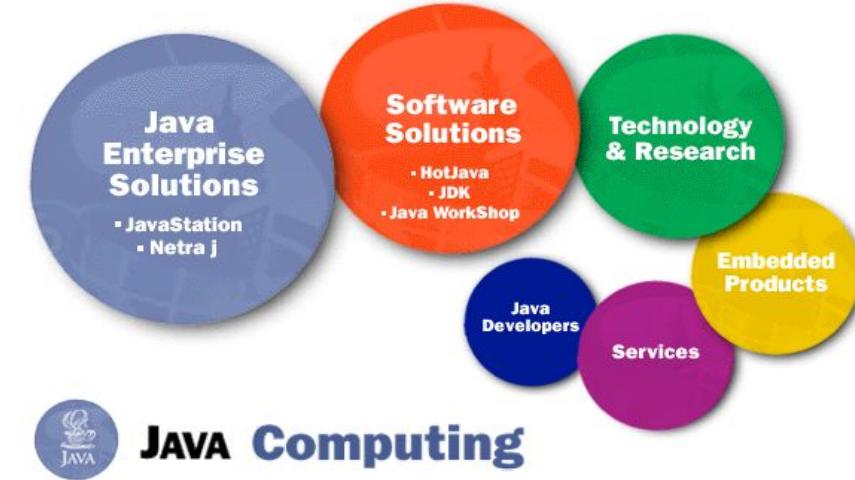
► Technology & Developers

► Info & Jobs

• SunWorld OnLine

• What's new!

• Contacts at Sun



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

# 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%

# Slow Startup

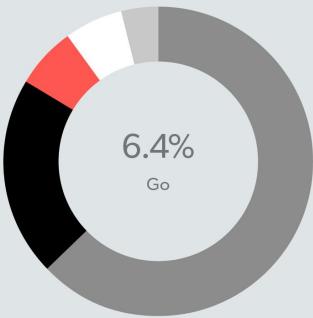


# Memory Hog



# Serverless Adoption

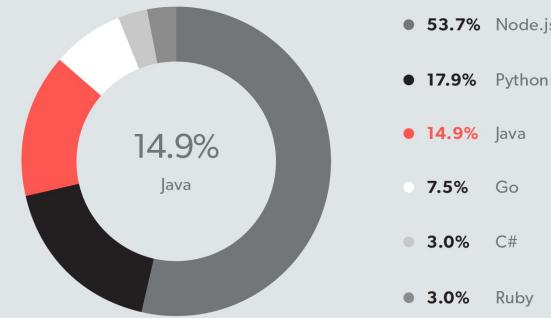
Languages used for serverless development



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

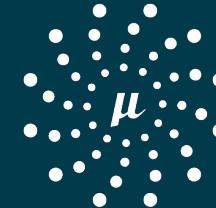
# Build

# Deploy

# Spring Boot



# Spring Boot + Micronaut



M I C R O N A U T<sup>TM</sup>

# 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

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**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 🚀

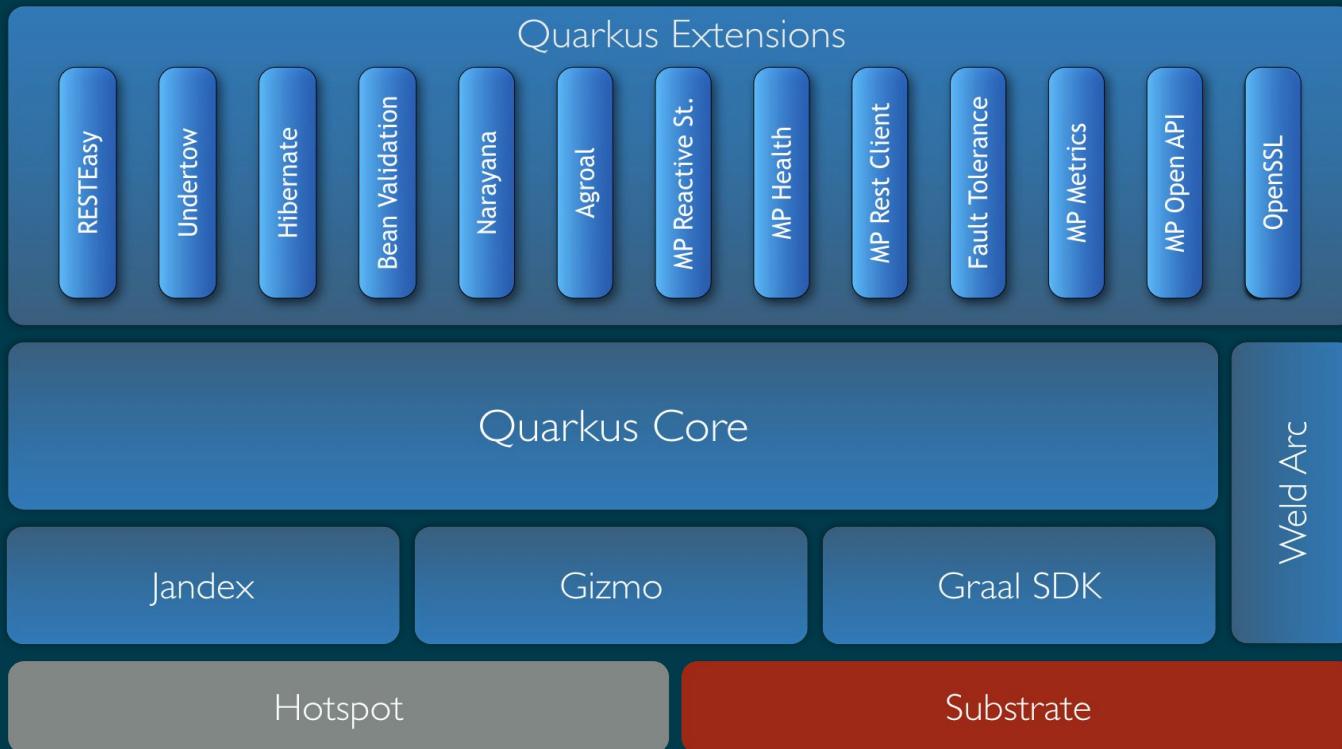


- Lower memory usage
- Faster startup
- Optimized for short-lived processes
- Kubernetes Native

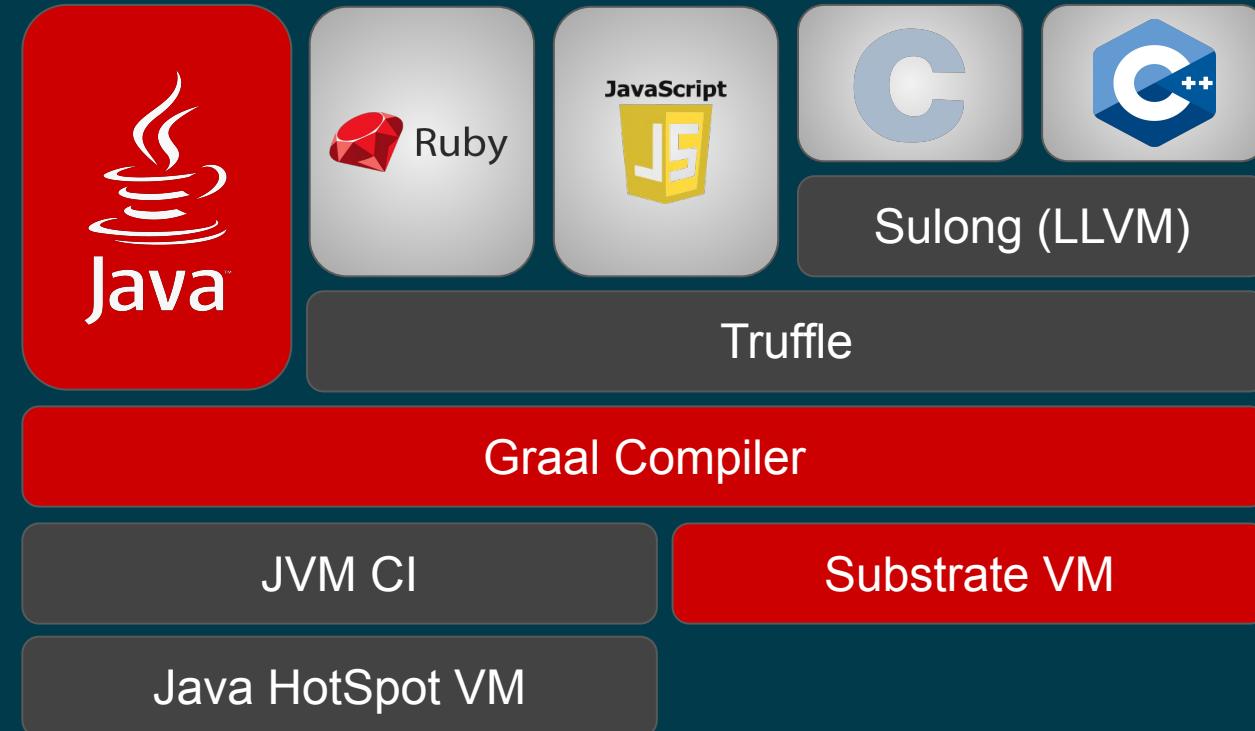
# Supported Libraries and Standards



# Quarkus Architecture



# GraalVM™



# Closed World



# AOT





# DEMO TIME





# Develop

# Build

# Deploy

# Building Container Images

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

# 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
- <https://github.com/fabric8io/docker-maven-plugin>

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



# Develop

# Build

# Deploy

# Deploying to Kubernetes

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

# ap4k

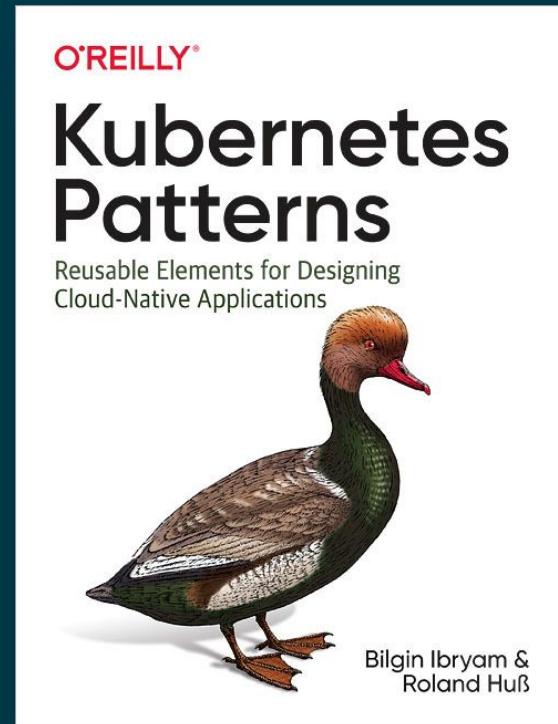
- <https://github.com/ap4k/ap4k>
- Collection of annotations and APT processors for generating Kubernetes resources
- Support for Istio, Prometheus, Service Catalog, Application CRD, ....
- Evaluates Framework annotations for Spring Boot, MicroProfile (Quarkus), Micronaut
- Foundation of quarkus-kubernetes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



# DEMO TIME



# KUBERNETES PATTERNS



<https://k8spatterns.io>



# THANK YOU

@ro14nd // k8spatterns.io