

App Services

 [linkedin.com/company/red-hat](https://www.linkedin.com/company/red-hat)

 [facebook.com/redhatinc](https://www.facebook.com/redhatinc)

 [youtube.com/user/RedHatVideos](https://www.youtube.com/user/RedHatVideos)

 twitter.com/RedHat

Self introduction

Name: Wanja Pernath

Email: wpernath@redhat.com

Base: Germany (very close to the Alps)

Role: EMEA Technical Partner Development Manager

- OpenShift and MW

Experience: Years of Consulting, Training, PreSales at

Red Hat and before

Twitter: <https://twitter.com/wpernath>

LinkedIn: <https://www.linkedin.com/in/wanjapernath/>



First book just published

Getting GitOps

A technical blueprint for developing with Kubernetes and OpenShift based on a REST microservice example written with Quarkus

Technologies discussed:

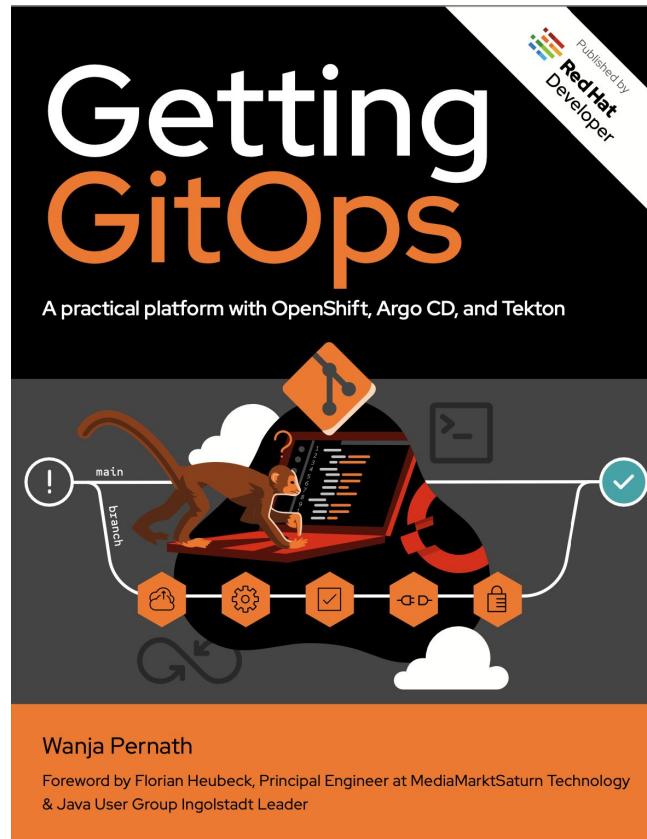
Quarkus, Helm Charts, Kustomize, Tekton Pipelines, Kubernetes Operators, OpenShift Templates, ArgoCD, CI/CD, GitOps....

Download for free at:

<https://developers.redhat.com/e-books/getting-gitops-practical-platform-on-openshift-argo-cd-and-tekton>

Interview with full GitOps Demo:

https://www.youtube.com/watch?v=znMfVgAIRzY&ab_channel=OpenShift



Red Hat Runtimes



BALANCING MODERNIZATION AND INNOVATION IS A DIFFICULT ART

“the existing needs update, the new needs innovation”

ENTERPRISES ARE INNOVATING WHILE MODERNIZING APPLICATION DEVELOPMENT

As of 2018,

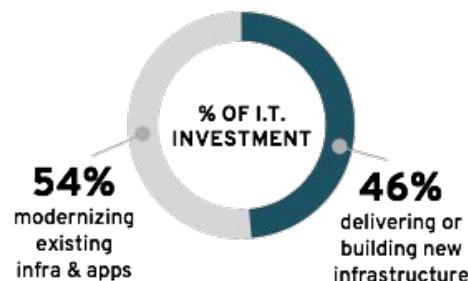


“of exec leaders believe that their companies must pick up the pace of digitalization to remain competitive”

Source: Gartner¹

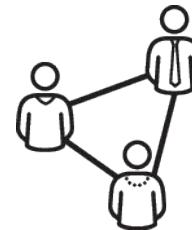
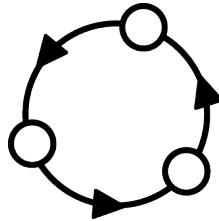
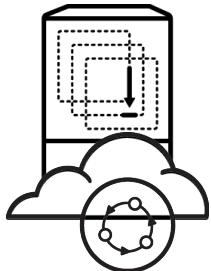
CIOs and IT organization's need to resolve their dilemma: maintaining vs innovating

Source: Red Hat and Illuminas²



TRANSFORMING INTO AN **AGILE**, **MODERN** AND **RESPONSIVE** ORGANIZATION

PICK UP THE PACE TO BECOME DIGITAL LEADERS



Next-Generation Architecture

New ways of developing,
delivering, & integrating
systems & applications

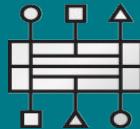
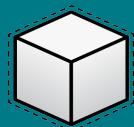
Agile Processes

New ways of doing things
across both IT &
the business

Collaborative Culture

New ways of working
together & building
organizations

ADOPTING NEW PATTERNS AND PRACTICES FOR APPLICATION DEVELOPMENT



Choosing the right set of products and technologies that will support adoption of **modern application development frameworks** while leveraging modern cloud services, infrastructure and technologies.



How do you choose a solution to
Simplify, Standardize & Optimize
Application Development?

A COMPREHENSIVE SOLUTION FOR MULTIPLE NEEDS

MODERNIZE AND INNOVATE AT YOUR OWN PACE



ADAPT EXISTING AND DEVELOP NEW APPS

Lightweight runtimes and frameworks, in-memory caching, high-performing messaging & migration tools



INTEGRATE APPS AND SYSTEMS

Easy-to-use, agile, and flexible tooling for internal and external integration of apps and systems



AUTOMATE MANUAL PROCESSES

Consistent development model to create and modify business applications and process-centric applications

SUPPORT ORGANIZATIONS TO STANDARDIZE
Hiring, Training, Partners, Ops and Dev Procedures and Governance

RED HAT MIDDLEWARE

CREATE THE APPLICATION LANDSCAPE YOU NEED WITH

RED HAT MIDDLEWARE & OPEN SOURCE PRODUCTS

RUNTIMES

BUILD & MIGRATE
APPS

INTEGRATION

COMPOSE &
INTEGRATE APPS

PROCESS
AUTOMATION

AUTOMATE & OPTIMIZE
BUSINESS PROCESSES

RED HAT® MIDDLEWARE



PHYSICAL



VIRTUAL



PRIVATE CLOUD



PUBLIC CLOUD

Create, run and maintain traditional
and cloud-native apps for
on-premise, cloud or hybrid
architectures

RUNTIMES, INTEGRATION AND PROCESS AUTOMATION

RUNTIMES

Best in class runtimes, frameworks and languages; including EAP

Modernization & optimization initiatives

In-memory data grid and standards-based enterprise messaging

SSO authentication

INTEGRATION

Pattern-based integration engine

Comprehensive set of connectors and data formats

Manage and secure access to external and internal distributed APIs

Streaming and interconnect messaging

PROCESS AUTOMATION

Consistent development model to create & modify business apps

Process automation & decision making at the microservice level

Unique platform for business users and developers to create automation

Management of rules and process-centric apps

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Architects need to **deploy** new technologies

- Ability to accommodate modernization and innovation on the same platform
- Access to a portfolio of integrated and cloud-optimized products and components
- Ability to adopt cloud-native application development frameworks
- Access to products that can facilitate formal standardization of processes
- Promote collaboration between IT and line-of-business

“Design an architecture for all apps and environments”



Developers need to deliver innovative applications

- Easy to use, portable and lightweight services
- Flexibility to choose the preferred runtime, language and framework to develop apps
- Modern and popular integration tools
- Tested and Open Source reusable capabilities
- Collaborative tools and techniques

“choose the right tool for the right task”



The choices can be overwhelming

- Clear movement away from traditional N-tier architectures and frameworks like Java EE, Spring and .NET
- Embrace of container and cloud technologies
- Reactive, Serverless, and lightweight, embeddable languages and frameworks
- Distributed architectures are the new norm

“choose the right tool for the right task”

RED HAT RUNTIMES BENEFITS

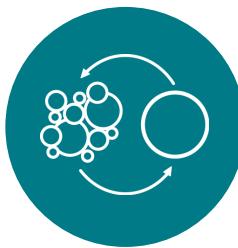
CREATE FLEXIBLE, PORTABLE, OPEN AND COST EFFECTIVE APPLICATIONS FOR
BETTER BUSINESS OUTCOMES & SUSTAINED SUCCESS



Flexibility to
choose the right
tools



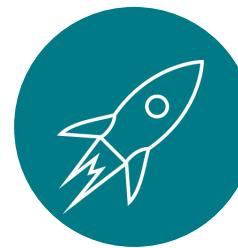
Collaboration
across teams



Simplify
application
development



Increase
efficiencies with
innovation



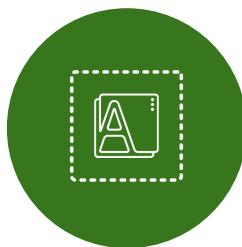
Accelerate
applications time
to market

COMPREHENSIVE PORTFOLIO WITH RED HAT MIDDLEWARE & OPENSHIFT

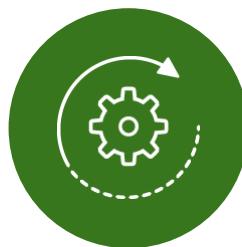
SIMPLIFIES DEVELOPMENT THROUGH NATIVE INTEGRATION WITH OPENSHIFT
AND KUBERNETES SERVICES



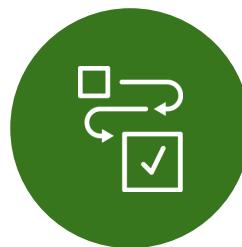
Self-service
Provisioning



Consistent
environments



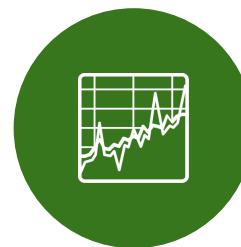
Automated
build & deploy



CI/CD
pipelines



Configuration
management



App logs &
metrics

*links to OpenShift preso

MEET OUR CUSTOMERS



Lufthansa Technik

LogistiCare



finanz informatik



Schiphol
Amsterdam Airport



FLYTOGET

Atos

ASAHI
旭鉄工株式会社



ASX



AVIVA



MIGRACIONES

tracefinancial

GENFARE ☘



RED HAT RUNTIMES

FOUNDATION FOR MODERN ENTERPRISE APPLICATION DEVELOPMENT



Red Hat Runtimes

Offering lightweight runtimes and frameworks for highly-distributed **cloud native** architectures such as microservices, with distributed in-memory caching for fast data access, single sign-on for authentication and authorization, and durable messaging for reliable data transfer between existing and new applications.

LAUNCH SERVICE	
 RED HAT® OPENSHIFT Application Runtimes	RED HAT® DATA GRID
OpenJDK™	RED HAT® AMQ BROKER
RED HAT® SSO	RED HAT® APPLICATION MIGRATION TOOLKIT

- Best-of-breed runtimes, frameworks and languages
- OpenShift & Kubernetes Services native integration
- Modernization and optimization initiatives
- Established middleware technologies (EAP)
- In-memory data grid
- Standards-based enterprise messaging
- SSO authentication

FRAMEWORKS AND RUNTIMES FOR KUBERNETES AND OPENSHIFT



Build new and modernize existing applications, using cloud computing models and DevOps practices to deliver applications and services quickly and frequently.

- Established and emerging runtimes, frameworks, and languages
- Leverage your developers' enterprise Java expertise with minimal to no learning curve to microservices
- Prescriptive/guided development via missions and boosters

GUIDED CHOICE OF RUNTIMES & LANGUAGES

ENTERPRISE JAVA

RED HAT® JBOSS®
ENTERPRISE
APPLICATION PLATFORM



JAVA MICROSERVICES



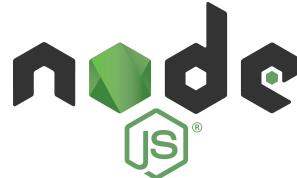
REACTIVE SYSTEMS



SPRING APPS



JAVASCRIPT FLEXIBILITY



TOMCAT SIMPLICITY

RED HAT® JBOSS®
WEB SERVER

STANDARDIZE JAVA ACROSS DESKTOP, SERVER AND CLOUD WITH OPENJDK

OpenJDK™

Free and open source implementation of
the Java Platform for Red Hat Enterprise
Linux and Windows for use across your
enterprise

- Eliminate differences between Java platform used on developer desktops, in the datacenter and on the cloud
- Fully supported for production workloads on RHEL and Windows
- Long lifecycle to match your speed of innovation
- Red Hat a leading developer and contributor to OpenJDK

BOOST APP PERFORMANCE WITH IN-MEMORY DISTRIBUTED DATA



**RED HAT®
DATA GRID**

Distributed in-memory data management system for application data, synchronizing data across multiple systems providing fast access to your data

- Container-optimized, cluster-aware, cross-datacenter
- Ideal for on-premise, web, cloud, big data and IoT applications
- Improved performance for data-driven apps with very little effort
- Familiar APIs for Java developers
- Allows legacy apps to scale

BOOST APP PERFORMANCE WITH IN-MEMORY DISTRIBUTED DATA



Flexible, standards-based messaging for
the enterprise, cloud and the Internet of
Things

- Reliable, durable messaging backbone for modern applications
- Async messaging a great solution for distributed microservices
- Multiple standard protocol support
- Fully supported alternative to RabbitMQ for Spring Apps
- Especially useful in IoT applications (compatible with Red Hat IoT Architecture)

ENHANCE SECURITY BY LEAVING CREDENTIAL MANAGEMENT TO THE EXPERTS



**RED HAT®
SSO**

Secure web applications and provide single sign-on capabilities based on popular standards such as SAML 2.0, OpenID Connect and OAuth 2.0.

- Supports modern security standards for authentication and authorization
- Adapters for Red Hat OpenShift Application Runtimes
- Optimized for OpenShift
- Integrated with existing systems of record (LDAP, AD, etc)
- Integrated with Data Grid for cross-datacenter security

BRING EXISTING APPS TO THE CLOUD WITH RED HAT

RED HAT® APPLICATION MIGRATION TOOLKIT

Move off of your proprietary or outdated middleware platforms and onto state-of-the-art lightweight, modular and cloud-ready middleware application infrastructure.

- Controlled method to migrate legacy apps to the modern world
- Predictive ROI before migration projects begin
- Supports wide range of source and target platforms: App Servers, Integration Platforms, Cloud Readiness, and more
- Extensive application landscape visualizations and migration estimates

ATTAIN VALUE WITH RED HAT MIDDLEWARE



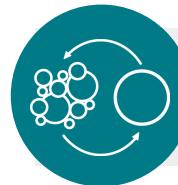
FLEXIBILITY

Innovate, Optimize and Modernize at your own pace



COLLABORATION

Collaborative tools and techniques that promote faster development



OPTIMIZED INTEGRATION

Interoperable and integrated application services providing ease-of-use



PRODUCTIVE

Spend more time innovating and staying competitive



TIME TO MARKET

Leverage full portfolio's capability and reuse capabilities to speed up

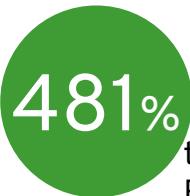
ATTAIN VALUE WITH RED HAT MIDDLEWARE

RECOGNITION & AWARDS

Leader on Gartner Magic Quadrant for Full Life Cycle API management¹ (2018)

Leader on The Forrester WaveTM for “In-Memory DataGrid”² (2015)

CODiE SIIA Award for “Best API Management Platform”³ (2017)



three-year ROI w/
Red Hat EAP⁴



three-year ROI w/
Red Hat Integration⁵



three-year ROI w/
Red Hat Process
Automation⁶

USEFUL CONTENT & RESOURCES

[Path to Cloud Native Application](#)

[Understanding Cloud-Native Apps](#)

[Application Modernization](#)

[Challenges on Integration](#)

[Red Hat Process Automation](#)

[IDC Business Value of OpenShift Whitepaper](#)

[Agile Integration - A Blueprint for enterprise architecture](#)

Quarkus Technical Value

“Historical” Enterprise Java Stack

Architecture: **Monoliths**



Deployment: **multi-app, appserver**

Dynamic Application Frameworks

App Lifecycle: **Months**

Application Server

Memory: **1GB+ RAM**

Java Virtual Machine (Hotspot)

Startup Time: **10s of sec**

Operating System + Hardware/VM

“Modern” Enterprise Java Stack

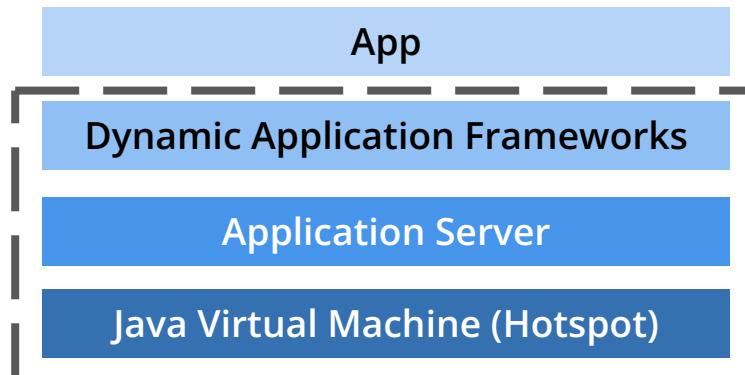
Architecture: **Microservices**

Deployment: **Single App**

App Lifecycle: **Days**

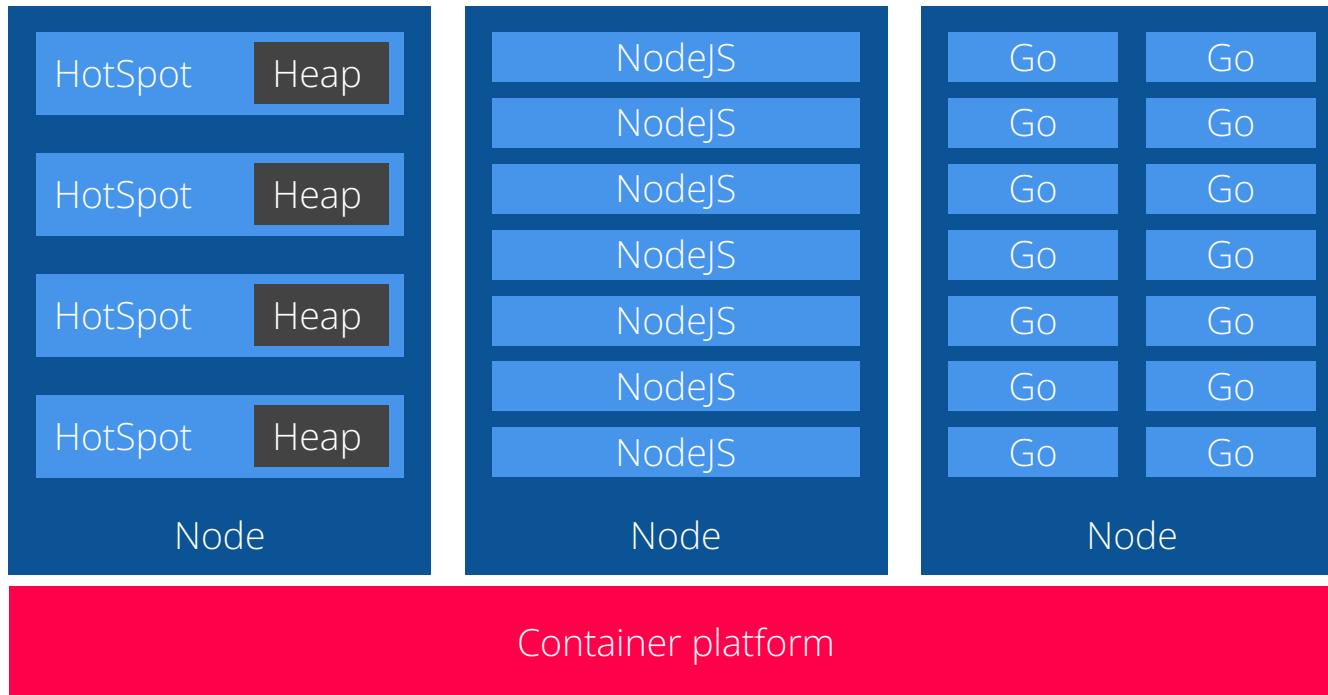
Memory: **100MBs+ RAM**

Startup Time: **Seconds**



No
Change

Hidden Truth About Java + Containers



**THERE IS A NEED FOR A
NEW JAVA STACK FOR
CLOUD-NATIVE AND
SERVERLESS**

Experts from cloud-native Java OS projects

VERT.X



Eclipse Vert.x



Hibernate



RESTEasy



Eclipse MicroProfile



Undertow

OpenJDK™



QUARKUS

Differentiators



Container First

- Tailors your app for HotSpot & GraalVM
- Fast boot time and low RSS memory
- Serverless fit



Developer Joy

- Live coding
- Unified configuration



Unifies Imperative & Reactive

- Combines blocking and non-blocking
- Built-in event bus



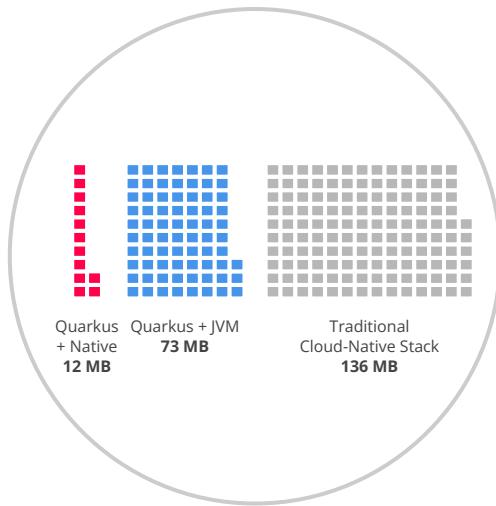
Best of Breed Libraries & Standards

- 90+ extensions
- "Powered by Quarkus" applications

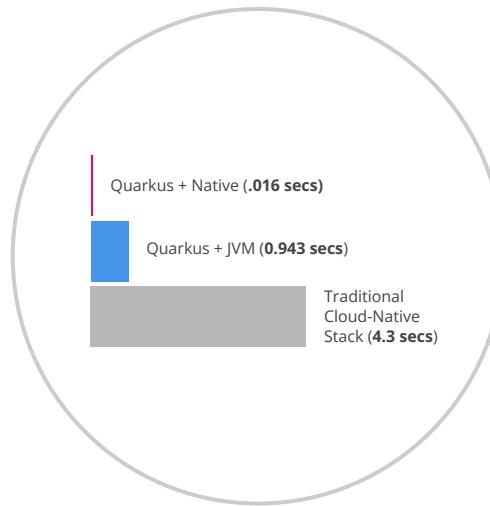
Benefit No. 1: Container First

"We went from 1-min startup times to 400 milliseconds"

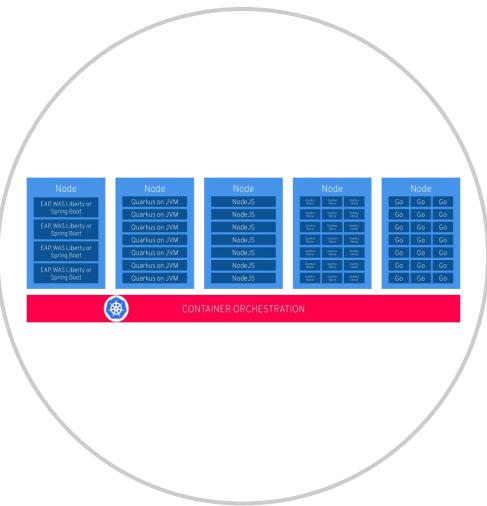
Reduced Memory Footprint



Fast Startup Time



Smaller Disk Footprint

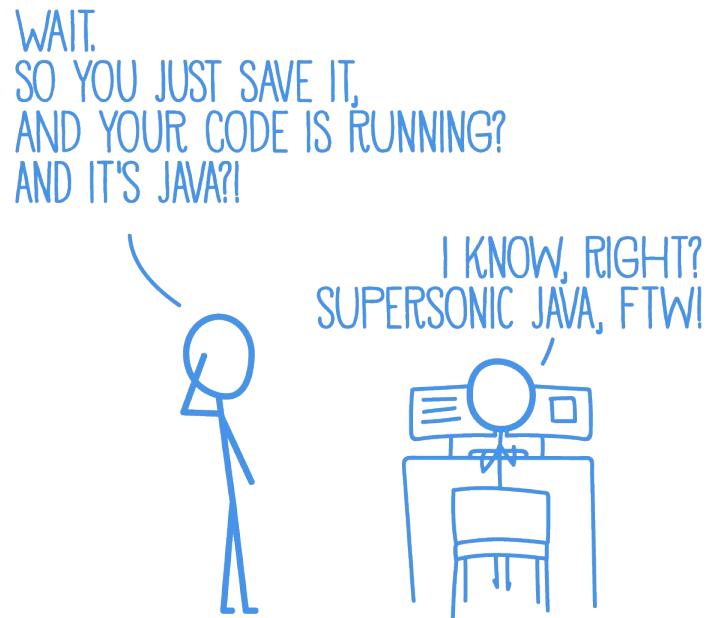


Benefit No. 2: Developer Joy

*"Our developers used to wait **2 to 3 mins** to see their changes. **Live coding** does away with this."*

A cohesive platform for optimized developer joy:

- Based on standards and more
- Unified configuration
- Live coding
- Streamlined code for the 80% common usages, flexible for the 20%
- No hassle native executable generation



Benefit No. 3: Unifies Imperative and Reactive

```
@Inject  
SayService 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;  
}
```

- Combine both Reactive and imperative development in the same application
- Inject the EventBus or the Vertx context
- Use the technology that fits your use-case
- Key for reactive systems based on event driven apps

Benefit No. 4: Best of Breed Frameworks & Standards

"When you adopt Quarkus, you will be productive from day one since you don't need to learn new technologies."



Eclipse Vert.x



Hibernate



RESTEasy



Apache Camel



Eclipse MicroProfile



Netty



Kubernetes



OpenShift



Jaeger



Prometheus



Apache Kafka



Infinispan



Flyway



Neo4j



MongoDB



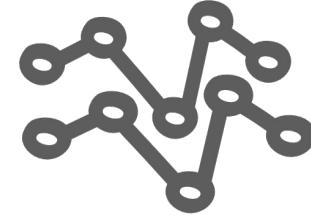
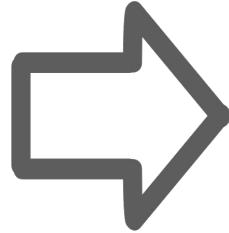
MQTT



Keycloak



Apache Tika



Supersonic, Subatomic

Fast.

Blazing fast to start.

Millisecond fast!

Supersonic, Subatomic Java

REST

Quarkus + Native (via GraalVM) **0.016 Seconds**

Quarkus + JVM (via OpenJDK) **0.943 Seconds**

Traditional Cloud-Native Stack **4.3 Seconds**

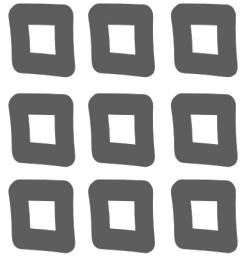
REST + CRUD

Quarkus + Native (via GraalVM) **0.042 Seconds**

Quarkus + JVM (via OpenJDK) **2.033 Seconds**

Traditional Cloud-Native Stack **9.5 Seconds**

Time to first response



Supersonic, **Subatomic**

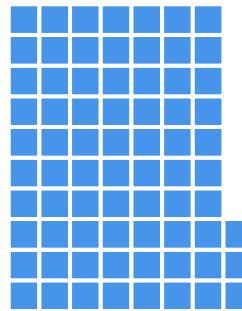
Improve memory consumption.
Increase deployment density.

Supersonic, Subatomic Java

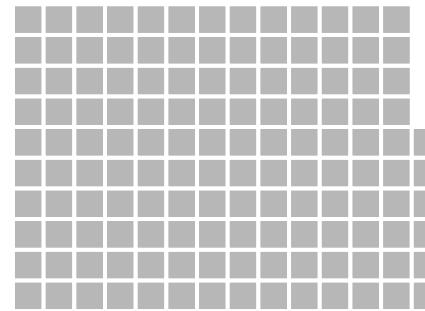
REST*



Quarkus + Native
(via GraalVM)
12 MB



Quarkus + JVM
(via OpenJDK)
73 MB



Traditional
Cloud-Native Stack
136 MB

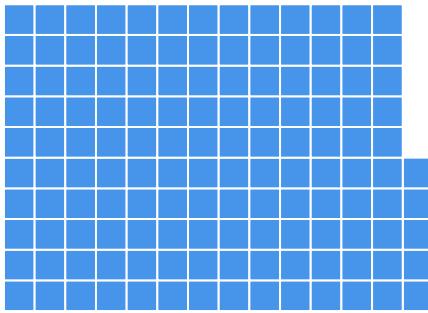
*Memory (RSS) in Megabytes, tested on a single-core machine

Supersonic, Subatomic Java

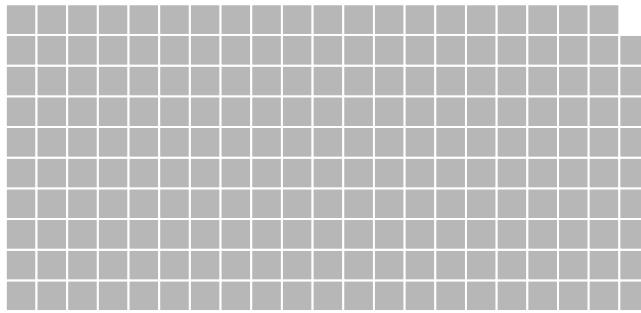
REST + CRUD*



Quarkus + Native
(via GraalVM)
28 MB



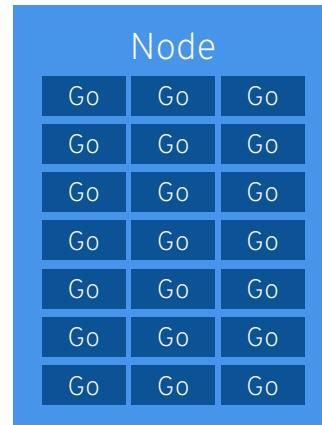
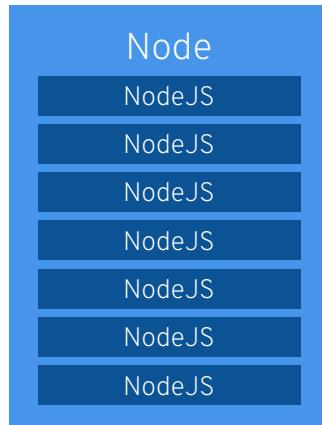
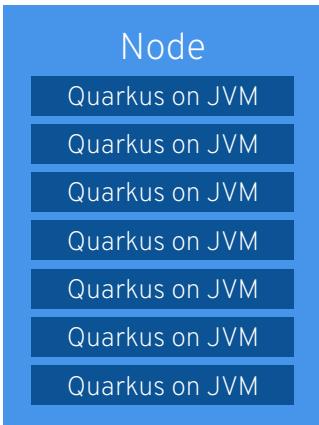
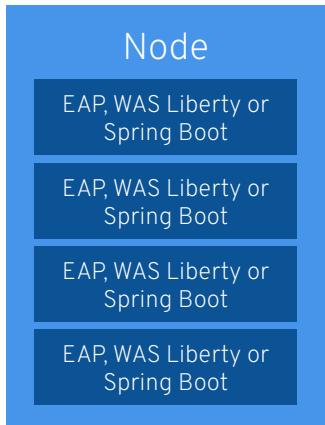
Quarkus + JVM
(via OpenJDK)
145 MB



Traditional
Cloud-Native Stack
209 MB

*Memory (RSS) in Megabytes, tested on a single-core machine

Cloud Native Java Stack + Containers



CONTAINER ORCHESTRATION

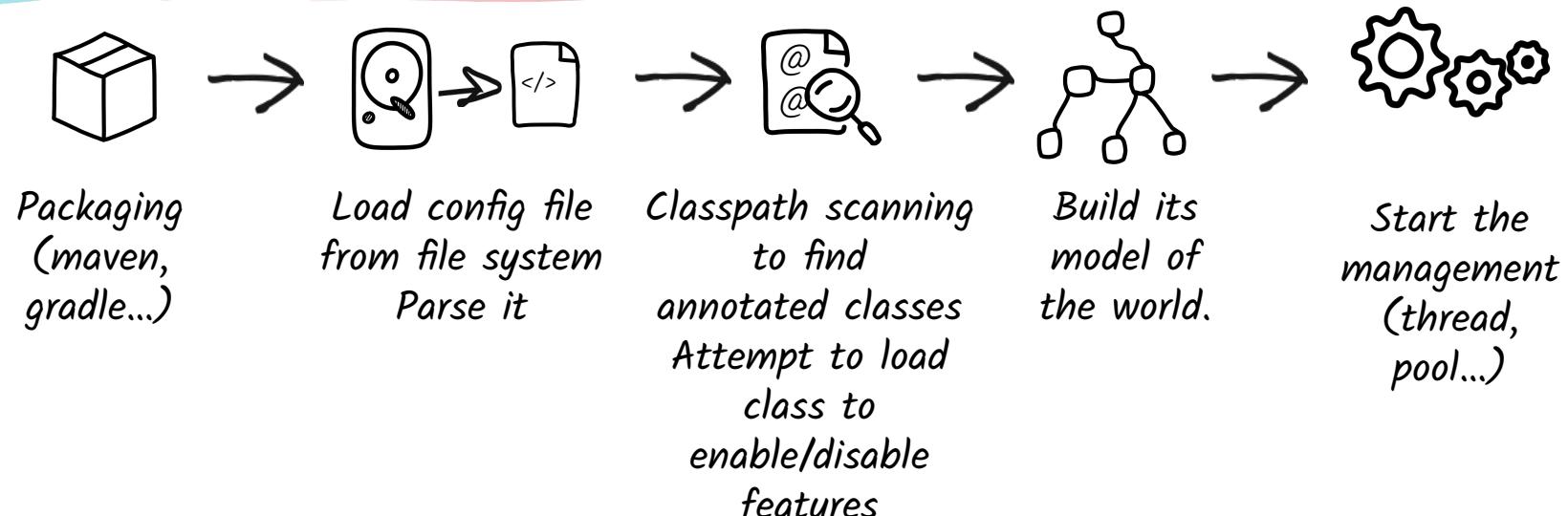
*“We could run **3 times** denser deployments without sacrificing **availability** and **response times** of services”*

HOW DOES QUARKUS WORK?

How Does a Framework Start?

Build Time

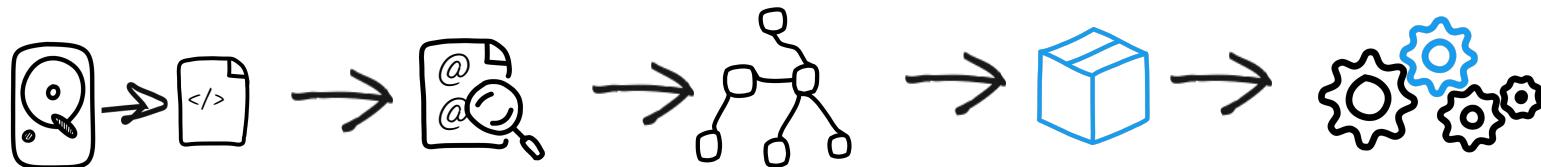
Runtime



The Quarkus Way

Build Time

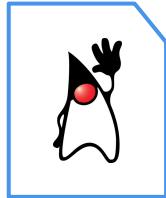
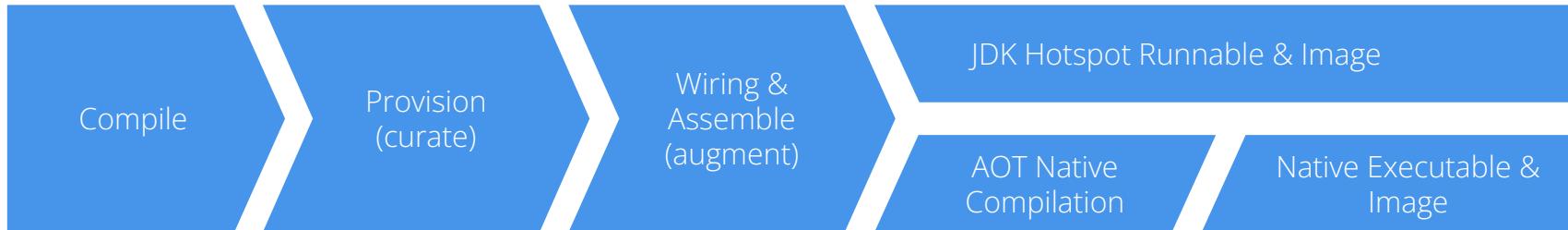
Runtime



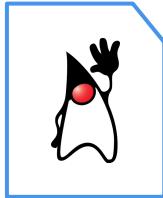
Build Time

Runtime

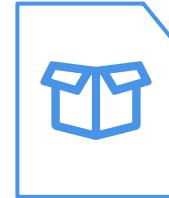
An ahead-of-time, build-time, runtime



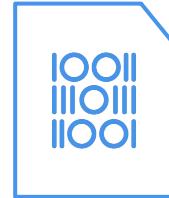
app.jar



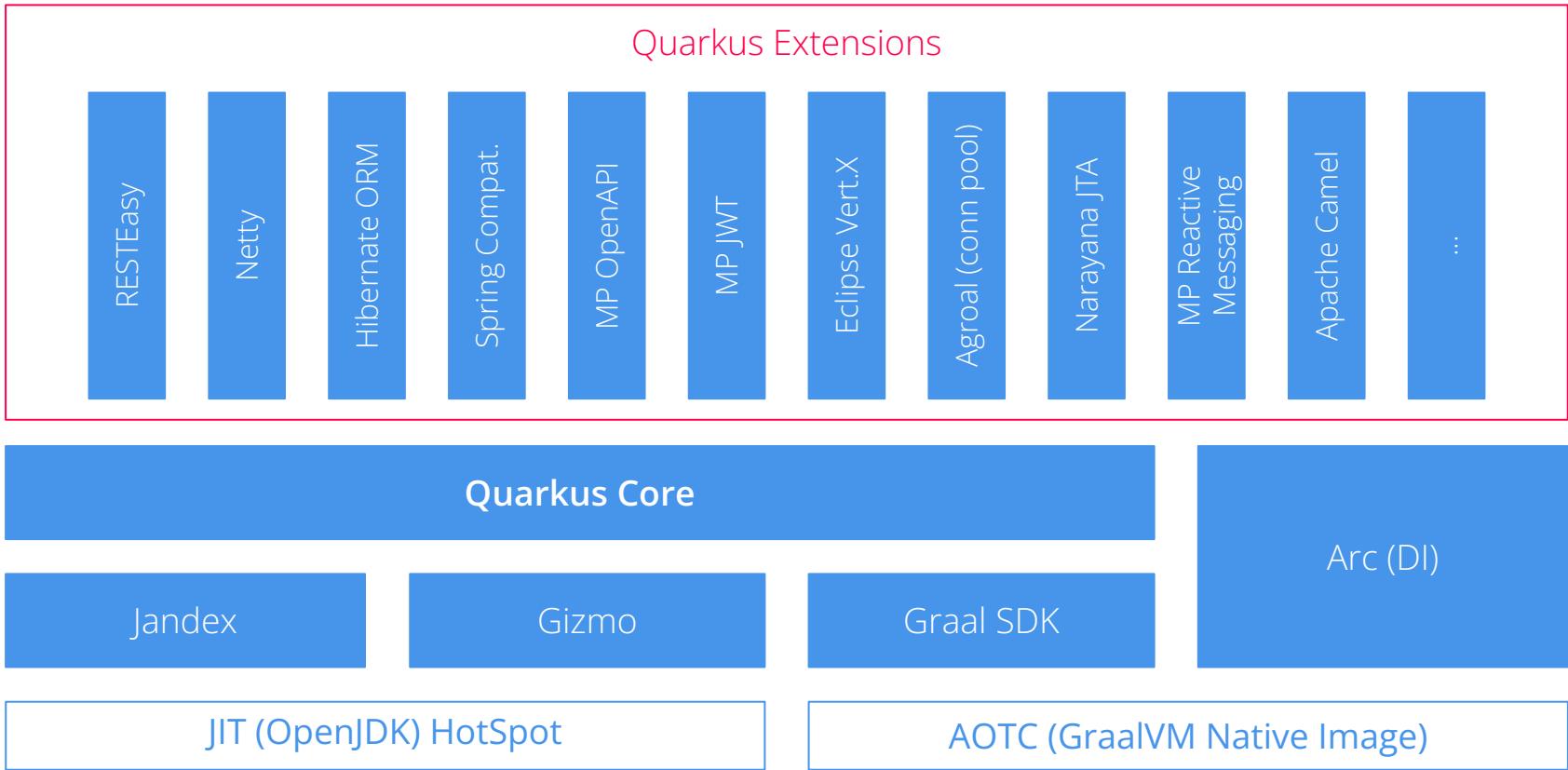
frameworks



Runnable java app



native-app



The Right VM For the Right Deployment

JIT (OpenJDK HotSpot)

- High memory density requirements
- High request/s/MB
- Fast startup time
- Best raw performance (CPU)
- Best garbage collectors
- Higher heap size usage
- Known monitoring tools
- Compile Once, Run anywhere
- Libraries that only work in standard JDK

AOT (GraalVM native image)*

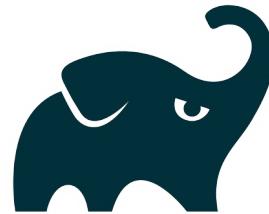
- Highest memory density requirements
- Highest request/s/MB
for low heap size usages
- Faster startup time
10s of ms for Serverless

*Currently in Tech Preview



Quarkus Tools - Build

maven



Gradle*

```
mvn io.quarkus:quarkus-maven-plugin:1.3.2.Final-redhat-00001:create \
-DprojectGroupId=org.acme \
-DprojectArtifactId=getting-started \
-DplatformGroupId=com.redhat.quarkus \
-DplatformVersion=1.3.2.Final-redhat-00001 \
-DclassName="org.acme.quickstart.GreetingResource" \
-Dpath="/hello"
cd getting-started
```

*community supported



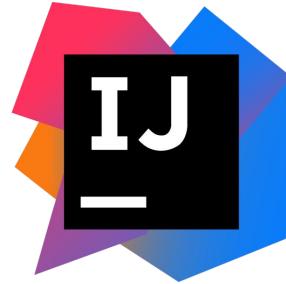
Quarkus Tools - IDE



[VSCode](#)



[Eclipse](#)



[IntelliJ](#)



[che.openshift.io](#)

DEMO

THANK YOU