QUARKUS
QUARKUS WORLD TOUR 2022
Introduction to Quarkus

Who's on stage today?

Yoann Rodiere

QUARKUS

HIBERNATE

- Hibernate team at Red Hat
- Hibernate Search lead developer
- Contributor to
  - Hibernate (Search, ORM, Validator)
  - Quarkus (Search, ORM, Validator, Core)
  - Whatever gets in the way...

QUARKUS
Supersonic Subatomic Java
Quarkus World Tour 2022

Demo

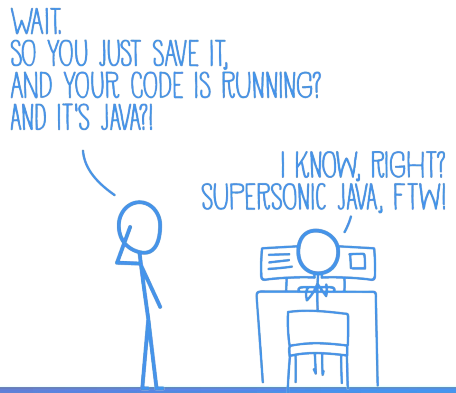
https://code.quarkus.io/?e=resteasy-reactive&e=hibernate-orm-panache&e=jdbc-postgresql&e=smallrye-openapi

(Use a desktop browser to download the project...)

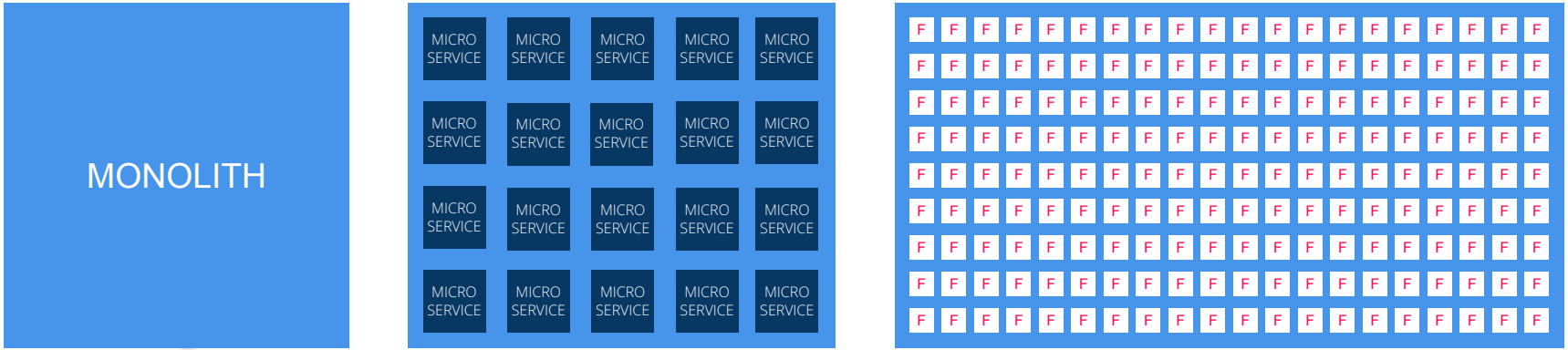
Developer Joy

A cohesive platform for optimized developer joy:

- Zero config, live reload in the blink of an eye
- Seamless Development and testing setup with dev services starting databases, SSO, Kafka etc.
- Unified configuration
- Based on standards, but not limited
- Streamlined code for the 80% common usages, flexible for the 20%
- No hassle native executable generation

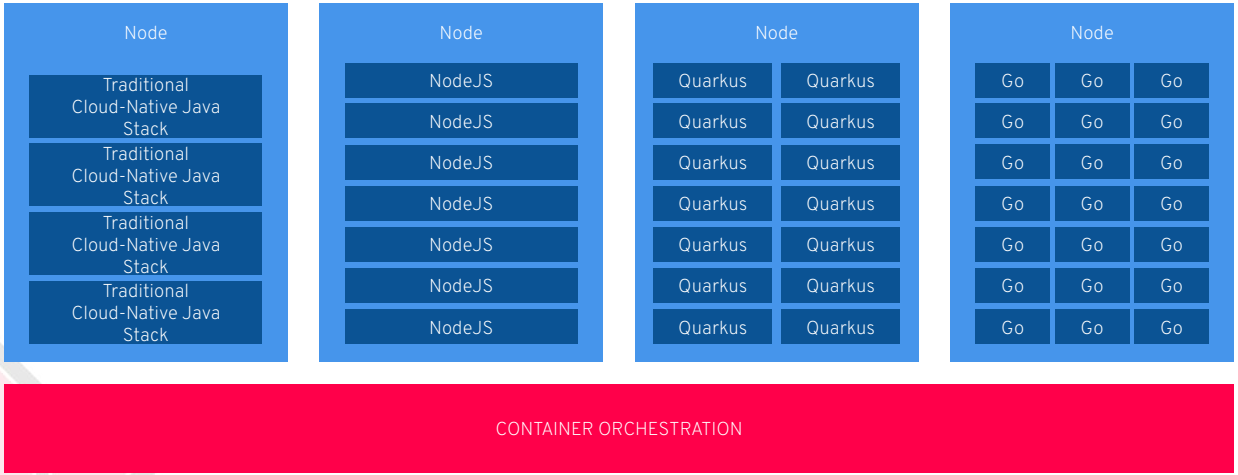


From monolith to...

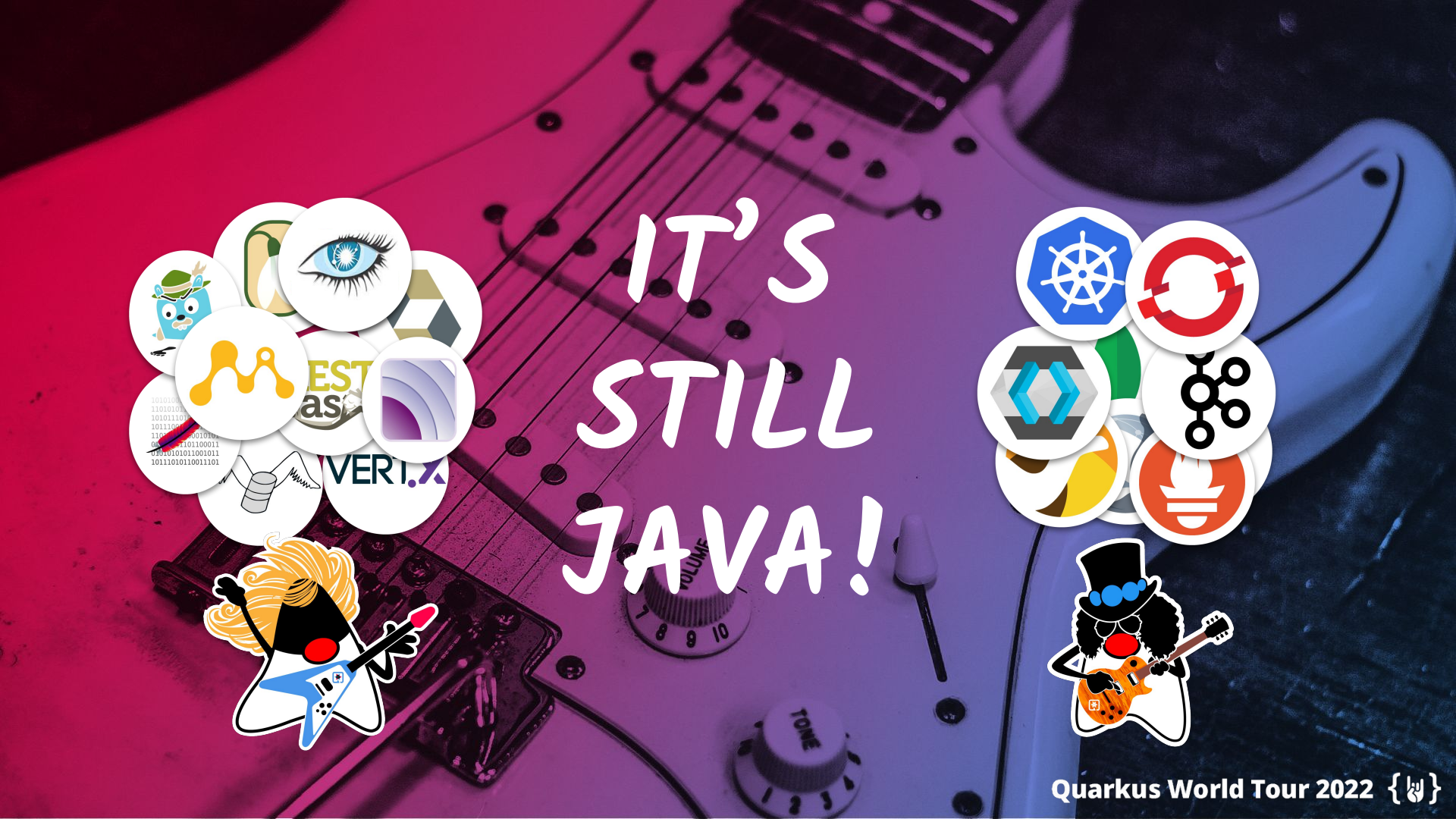


- 1 monolith ≈ 20 microservices ≈ 200 functions
- Scale to 1 vs scale to 0
- Start up time

Supersonic Subatomic Java



Demo


IT'S
STILL
JAVA!
VERT.X
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Best of Breed libraries & Standards

Eclipse Vert.x

Eclipse MicroProfile

Apache Kafka

Prometheus

Netty

Hibernate

OpenShift

Jaeger

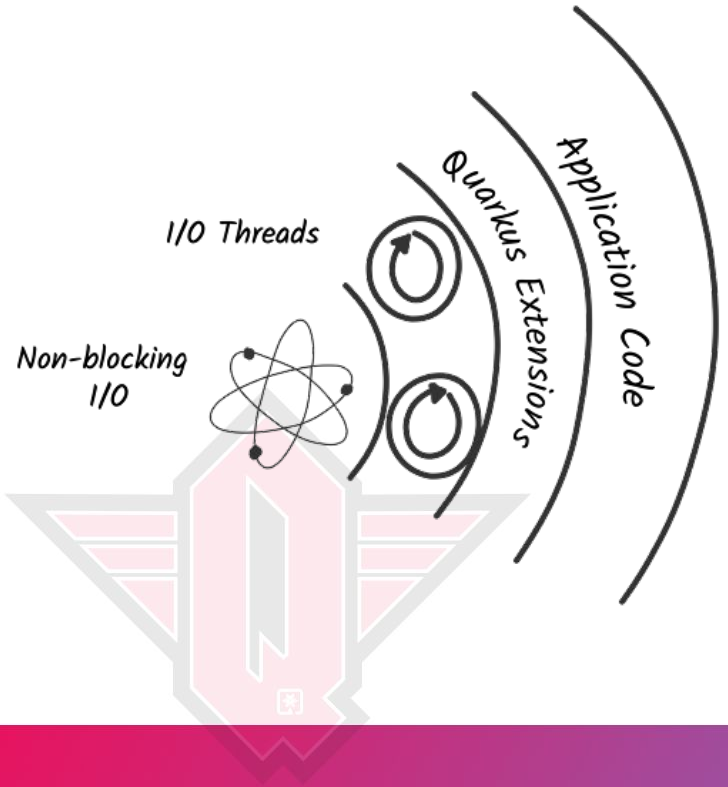
RESTEasy

Apache Camel

Kubernetes

Spring Compat

Unification of Imperative and Reactive




```
@Inject
SayService say;

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

```
@Inject @Channel("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
- Use the technology that fits your use-case
- Key for reactive systems based on event driven apps

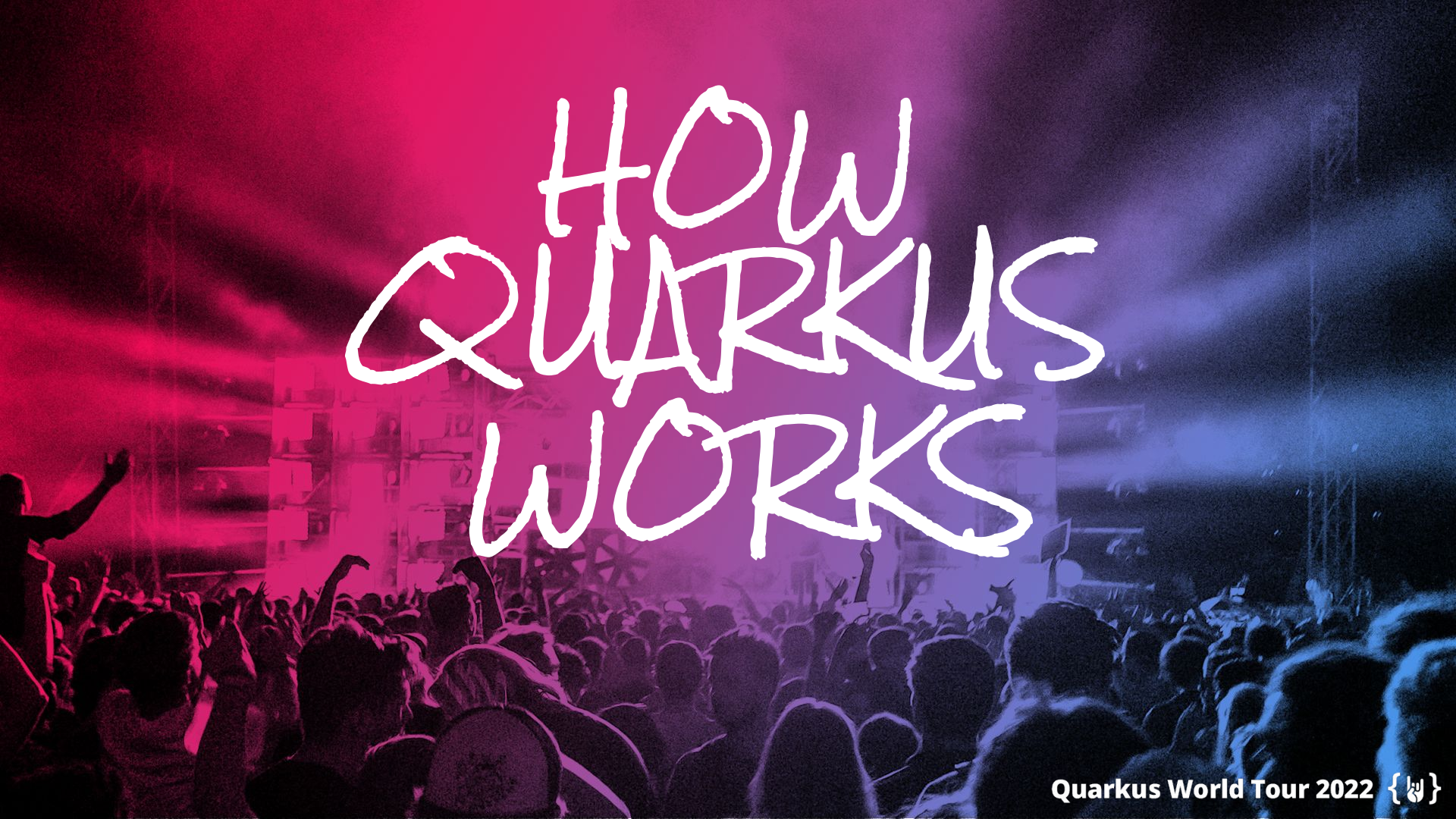
Quarkus Benefits

Developer Joy

Supersonic Subatomic Java

Best of Breed Libraries and Standards

Unifies Imperative and Reactive


HOW
QUARKUS
WORKS
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How Does a Framework Start?

Build Time

Runtime

Packaging (maven, etc)

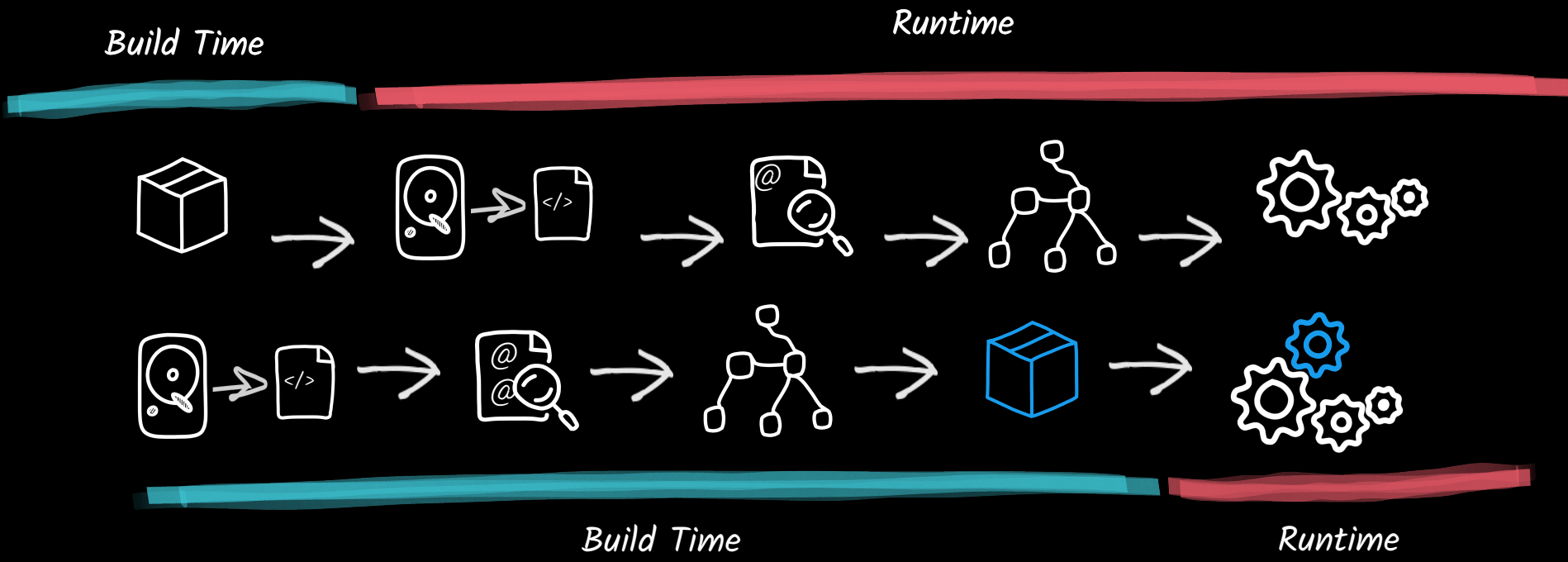
Load config file from file system Parse it

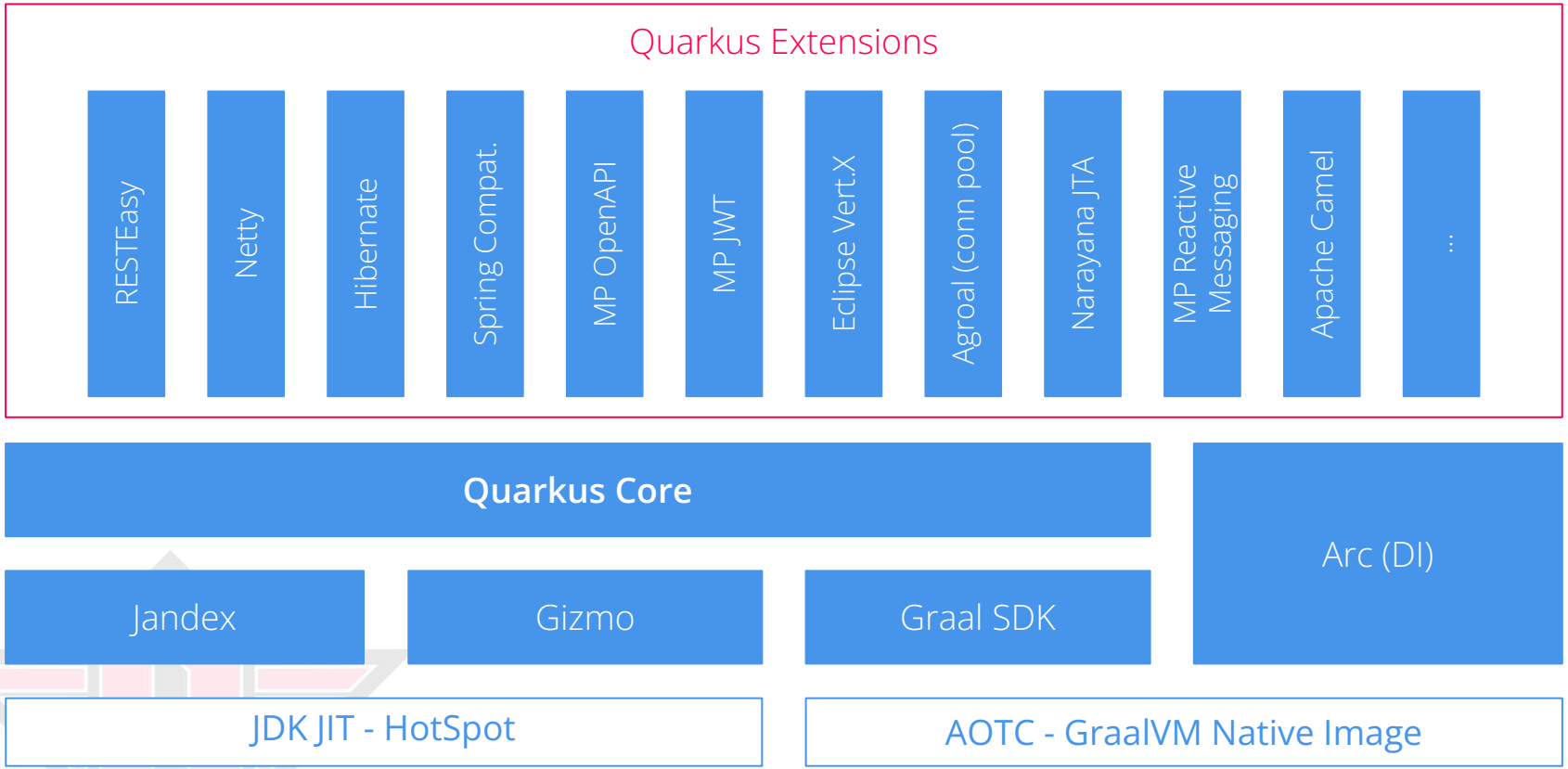
Classpath scanning to find annotated classes Attempt to load class to enable/disable features

Build its model of the world.

Start the management (thread, pool...)

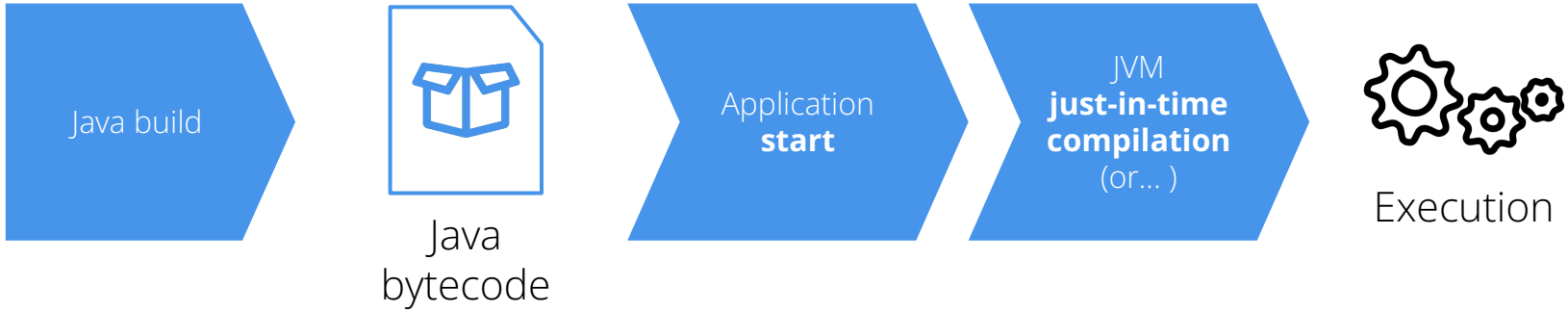
The Quarkus Way

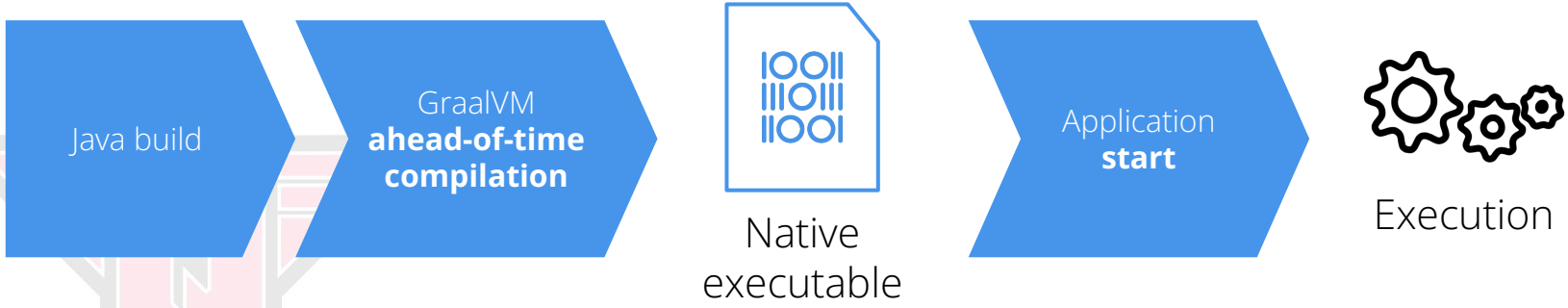



Quarkus Extensions
RESTEasy
Netty
Hibernate
Spring Compat.
MP OpenAPI
MP JWT
Eclipse Vert.X
Agroal (conn pool)
Narayana JTA
MP Reactive Messaging
Apache Camel
...
Quarkus Core
Arc (DI)
Jandex
Gizmo
Graal SDK
JDK JIT - HotSpot
AOTC - GraalVM Native Image

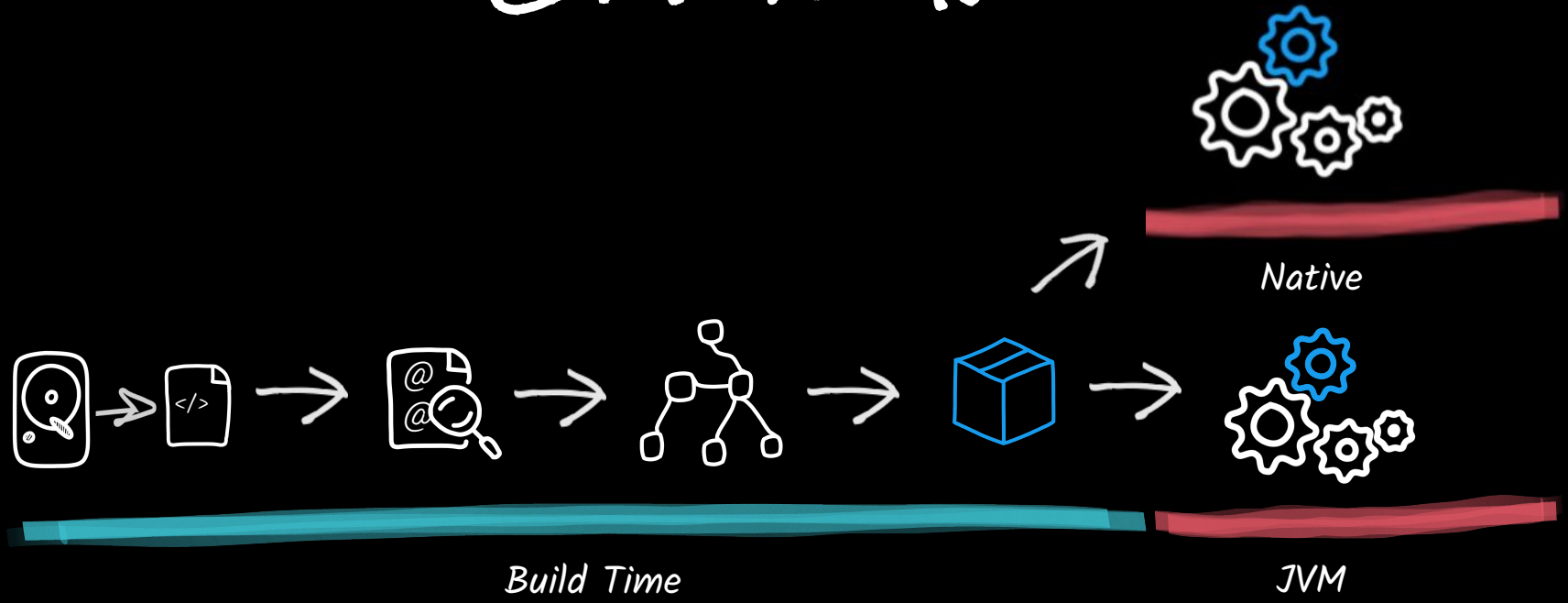
Native
compilation

Native = Ahead-of-time





The Quarkus Way enables Native Compilation



Demo

The Dark Side of GraalVM

Not supported

- Dynamic classloading
- InvokeDynamic
- Finalizer
- Security manager
- JVMTI, JMX, native VM Interfaces

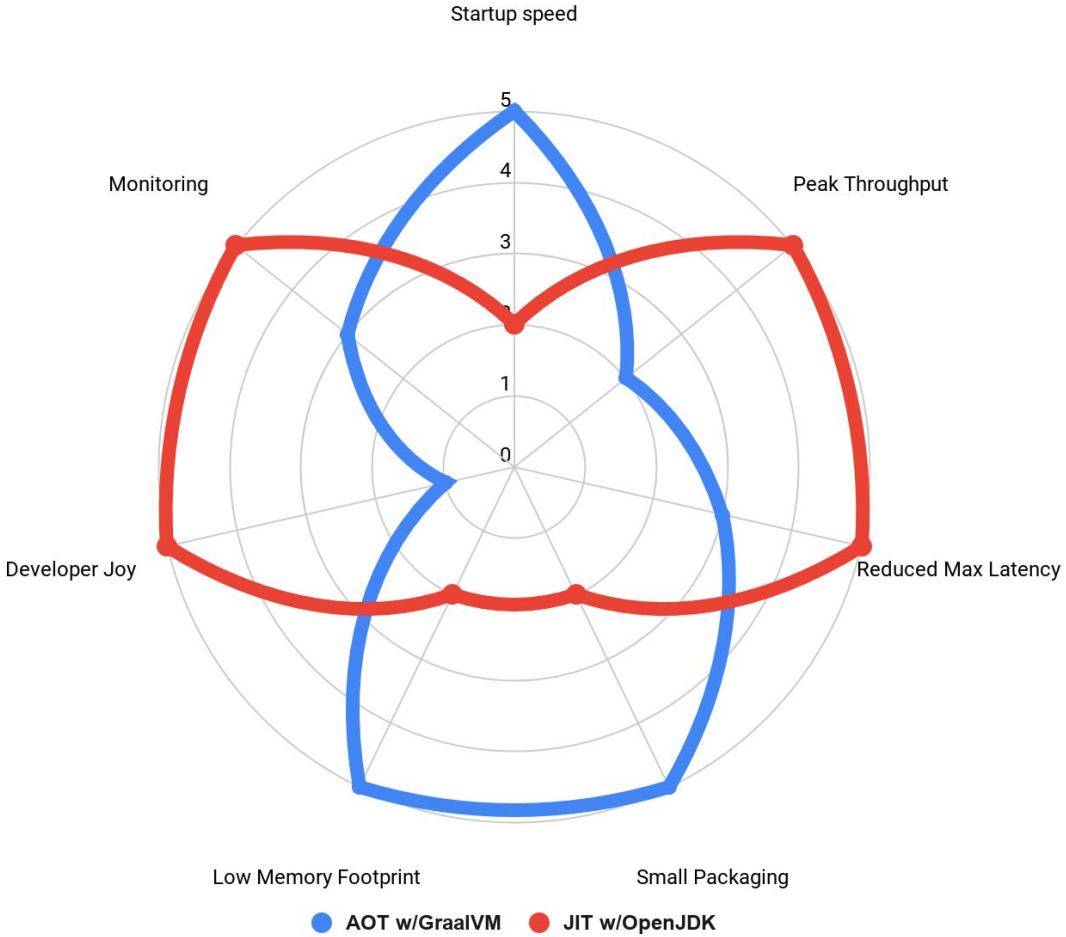
OK with caveats in usage

- Reflection (manual list)
- Method handles
- Dynamic proxy (manual list)
- JNI (manual list)
- Static initializers (eager)
- References (similar)

Red: The "actually good" Parts

Grey: The "Not so bad" Parts

JVM vs. Native



Native Compilation with Mandrel

- Direct downstream distribution of GraalVM
- Near drop-in replacement for GraalVM
- Uses standard OpenJDK instead of GraalVM's custom version
- Focused on native compilation for Java only
- Red Hat contributes upstream!
  - Debugging support
  - ARM support
  - Java Flight Recorder
  - Quarkus part of the upstream GraalVM test suite

Users Own Stories

https://quarkus.io/blog/tag/user-story/

Don't Take Our Word For It!

asiakastieto	"We went from 1 min startup times to 400 ms."	RH Press Release Community
vodafone	"We became increasingly worried about resource consumption that Spring Boot was having while being deployed on the Kubernetes cluster… It became increasingly cumbersome to find ways to circumvent the methodology we were using just to squeeze every little bit of performance out of Spring Boot" - Christos Sotiriou DXL Backend Chapter Lead, Vodafone Greece	Information Week Community
Lufthansa	"We could run 3x denser deployments without sacrificing availability and response times of service." "Quarkus is close to what our developers are already doing with Spring and it's familiar to them. This is a big benefit"	Community
wipro	"Before we introduced Quarkus, many of our customers had started to look at alternative stacks like Go and node.js to improve performance and efficiency. These customers were weary of selecting a new language and having to hire new developers or retrain their existing Java developers." - Arijit Mazumdar "There was a low learning curve with Quarkus. It took one of our developers one week to get up to speed on Quarkus and another week to migrate a Spring application to Quarkus." - Arijit Mazumdar "Quarkus and the Spring API compatibility reduced the migration time and complexity which is critically important for our customers." - Arijit Mazumdar	Community

Don't Take Our Word For It!

ENNOVATIVE SOLUTIONS	"using Spring with AWS Lambda would have been prohibitive because the startup time of Spring in AWS Lambda is too big from my research" - Dennis Baerten "As costs increase, this is when the benefit of using Quarkus will be experienced due to its more efficient use of cloud resources and fast startup time compared to plain Java and Spring Boot" - Dennis Baerten "It took me about 3 days to get familiar with the Quarkus stack" - Dennis Berten, Spring Developer	Blog
Payair	"Some of Payair's developers had mainly Spring experience, we were concerned that it would be difficult for them to "switch sides". It turned out that our fear of the unknown was completely unfounded. Quarkus leverages some good old Jakarta EE standards that all Java developers are familiar with. We did not have to learn a bunch of new APIs." - Hubert Lewandowski "As a long term Spring developer I realized that Spring is slowly becoming the very thing it swore to destroy. The initial premises of Spring (which basically can be summed up as a lightweight alternative to Jakarta EE) are way past the expiry date now. Spring is the undisputed heavyweight champion that can handle everything you imagine but is not your best option for fast and light services. And that applies to Spring Boot as well. - Hubert Lewandowski	Blog
talkdesk	"When you adopt Quarkus, you will be productive from day one since you don't really need to learn new technologies." -TalkDesk	Blog
Logic Monitor	"After deploying, we found that Quarkus used about 15% of the CPU, 12% of the memory compared to Spring Boot. So far, we are sticking with Quarkus!" - Sam Dacanay, Lead Software Engineer	Blog

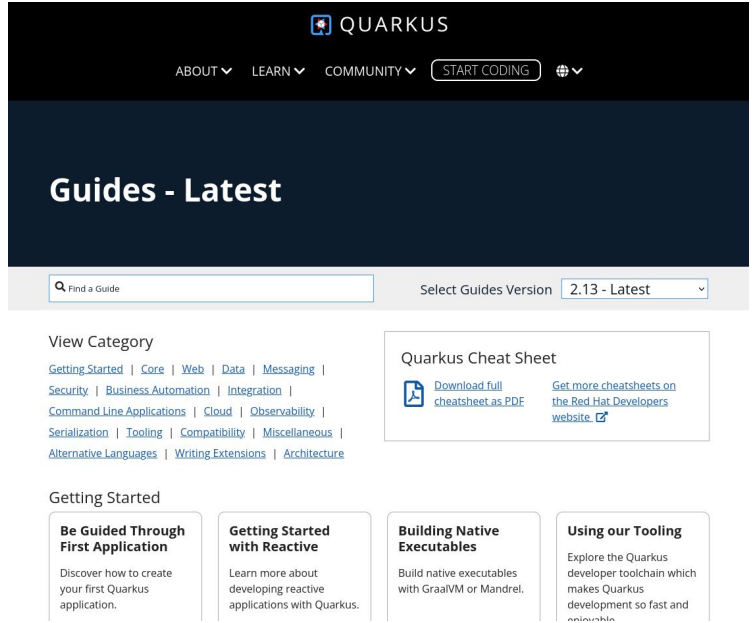
But I already know Spring...

Why migrate?

Developer Joy	Supersonic Subatomic Java
Best of Breed Libraries and Standards	Unifies Imperative and Reactive

- What if there isn't an extension for my library?
- GraalVM compilation time / is memory intensive...
- How stable is it? There are lots of issues on GitHub...

Starting from scratch



https://quarkus.io/guides/

Starting the migration with Spring compatibility extensions

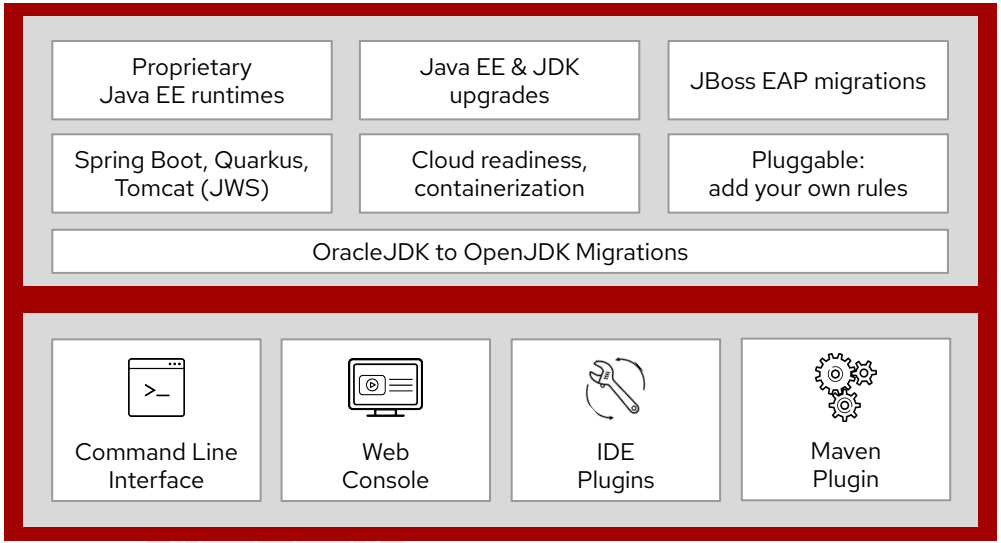
```
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;

import com.acme.todo.domain.TodoEntity;

@Repository
public interface TodoRepository
        extends JpaRepository<TodoEntity, Long> {
}
```

- Dependency injection
- Spring Web/MVC
- Spring Data JPA
- Spring Data REST
- Spring Security
- Spring Cache
- Spring Boot Configuration Properties
- Spring Scheduled
- Spring Cloud Config Client

This is intended to help with migration, not for long-term production use.

Migration Toolkit for Applications

"Simplifies the Migration of Spring Apps to Quarkus"

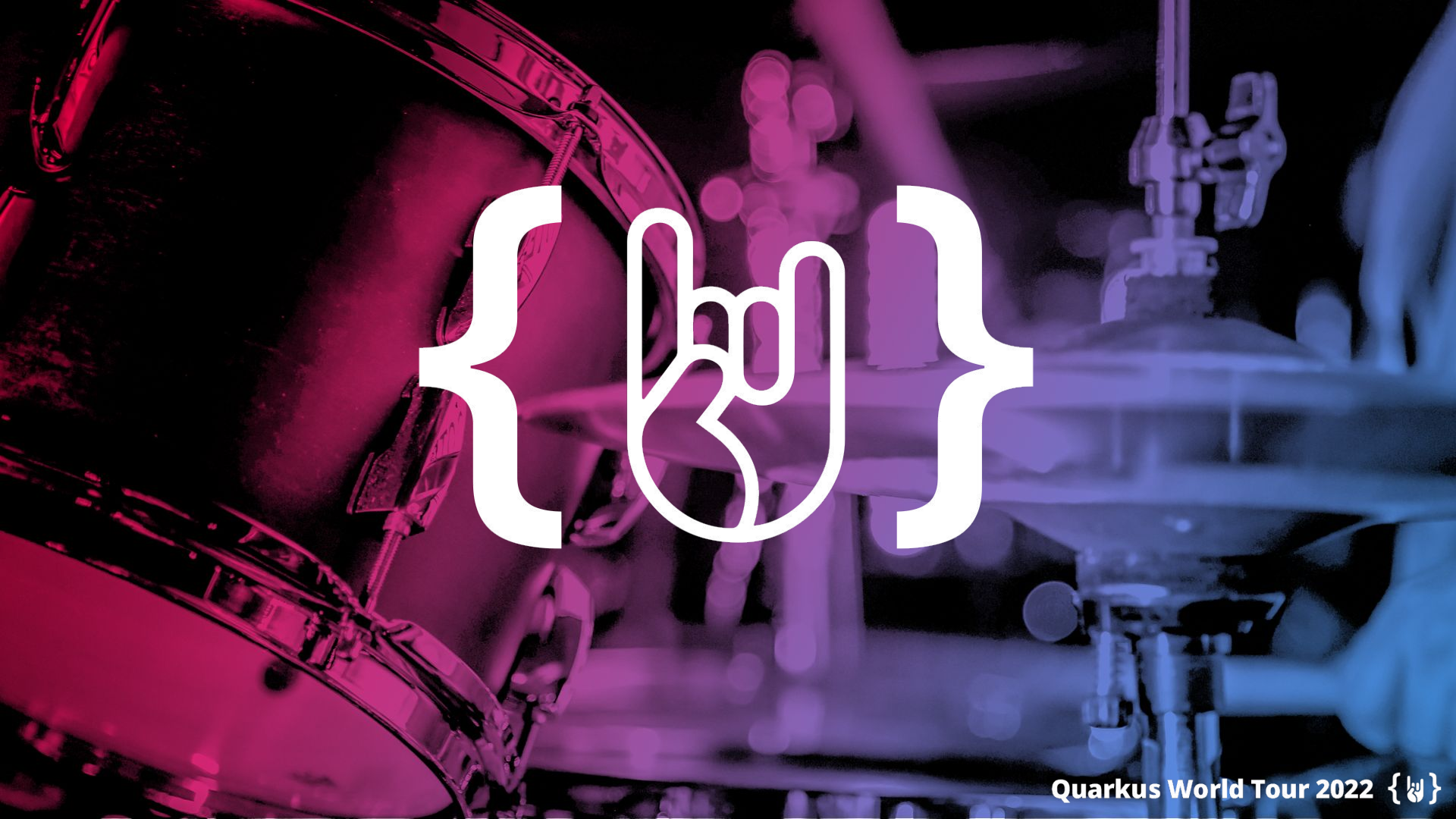


https://developers.redhat.com/products/mta

- Automate application analysis
- Estimate level of effort
- Accelerate code transformation & migration
- Includes rules for DI, metrics, security, web, shell, & more

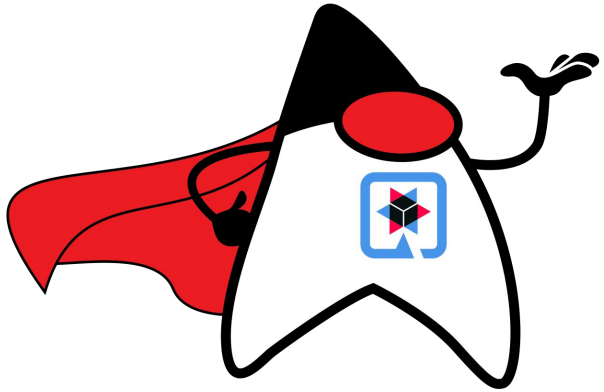
Demo

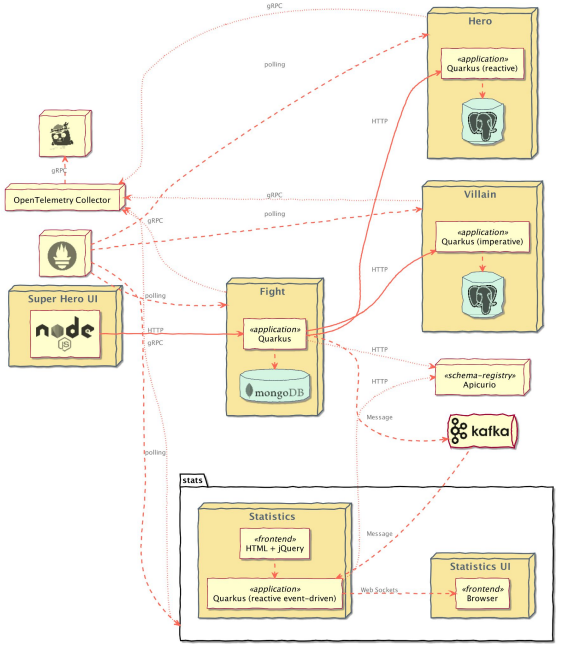
https://red.ht/spring-to-quarkus-todo



https://red.ht/quarkus-spring-devs

Quarkus Superheroes



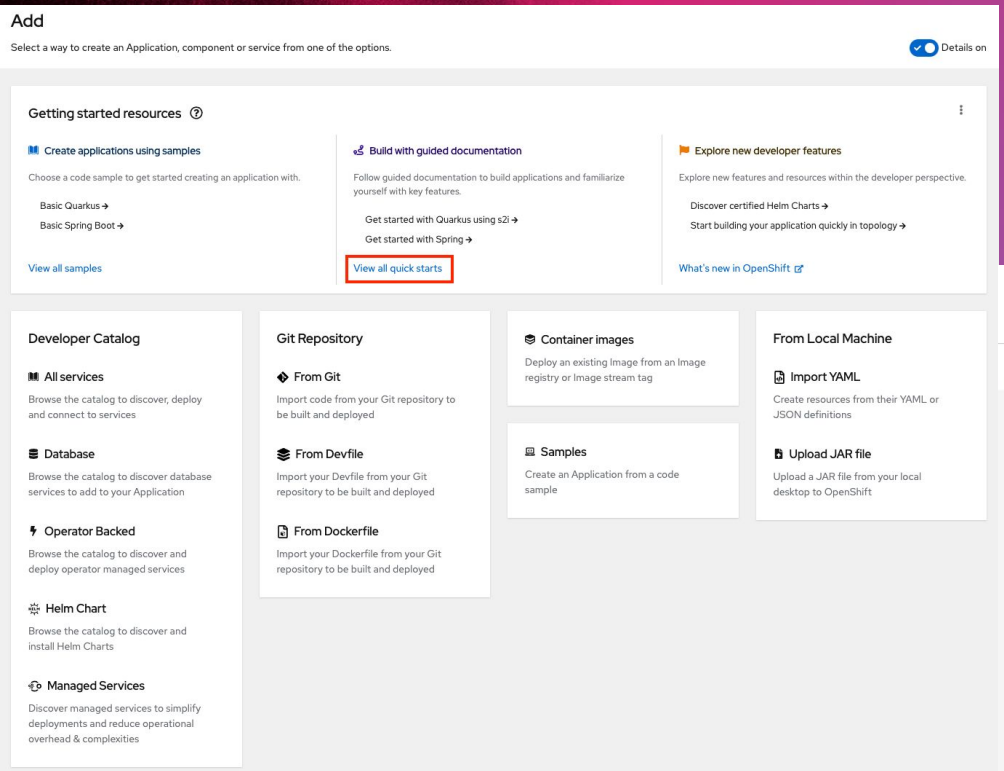


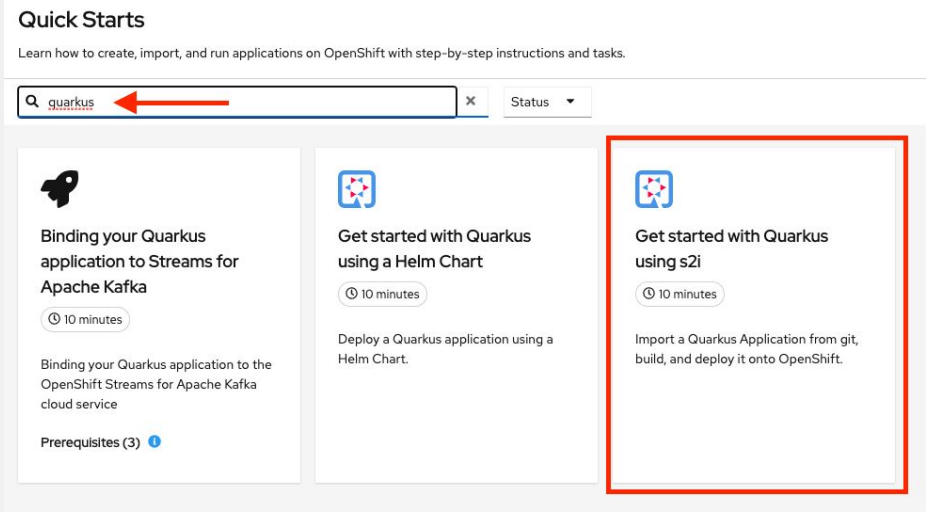
https://github.com/quarkusio/quarkus-super-heroes

Developer Sandbox

- 30 days
- Limited access
- 4 vCPU, 8 GB RAM
- 3 projects
- Cloud IDE, Pipelines

red.ht/dev-sandbox





Thank You!

https://quarkus.io

https://quarkusio.zulipchat.com

@quarkusio

https://youtube.com/c/quarkusio

@yoannrodiere

https://yrodiere.github.io/presentation/2022-10-06-lorraine-jug-intro-to-quarkus/