QUARKUS

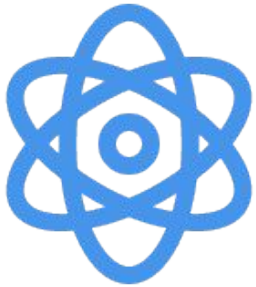
Supersonic Subatomic Java @ FOSSCOMM 2021

Dimitris Andreadis
Engineering Director
Quarkus Team, Red Hat

@dandreadis

QUARKUS

A stack to write Java apps

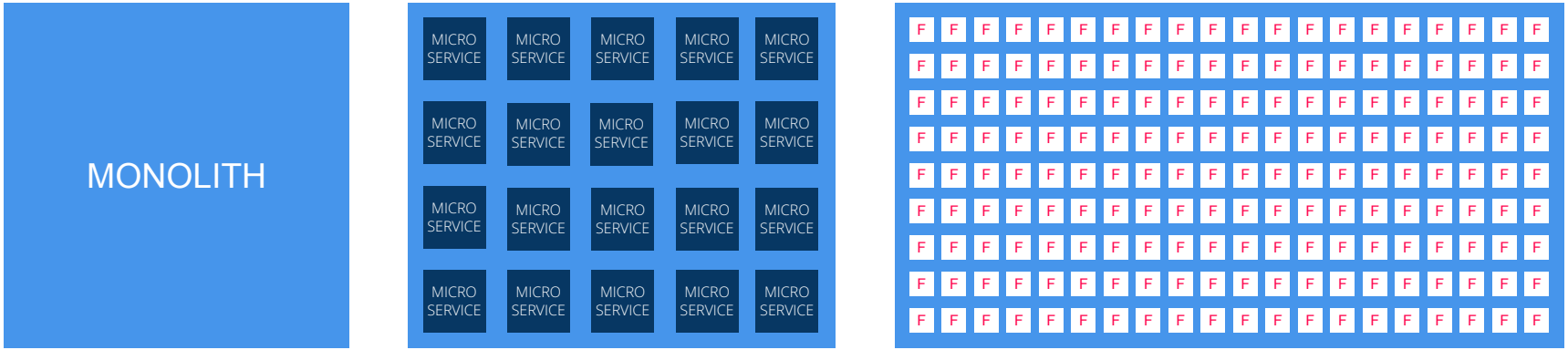


Cloud Native, Microservices, Serverless

What is the best way to write Cloud Native Applications

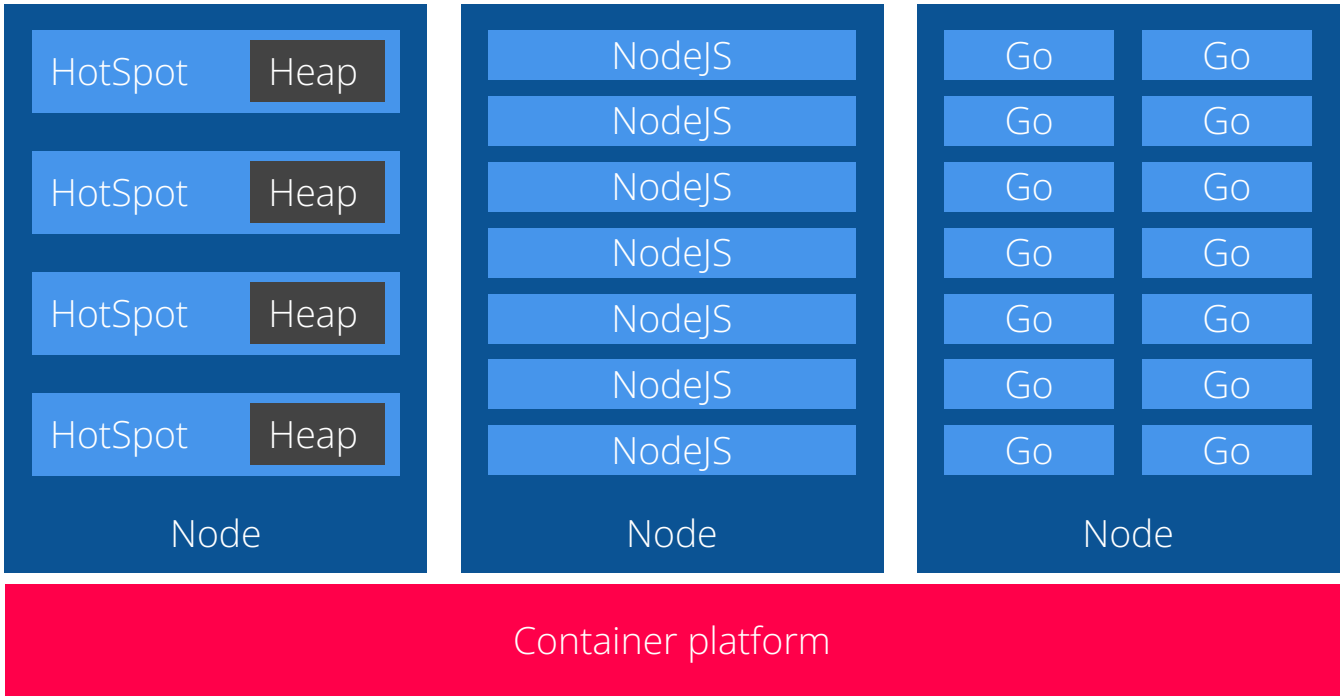
in Java

In a Kubernetes Native world, size matters



- 1 monolith ≈ 20 microservices ≈ 200 functions
- Long running process(es), vs scale up/down, vs scale infinitely and back to 0
- Start up time and density become key

Deployment density matters



Java frameworks suffer from the same problems

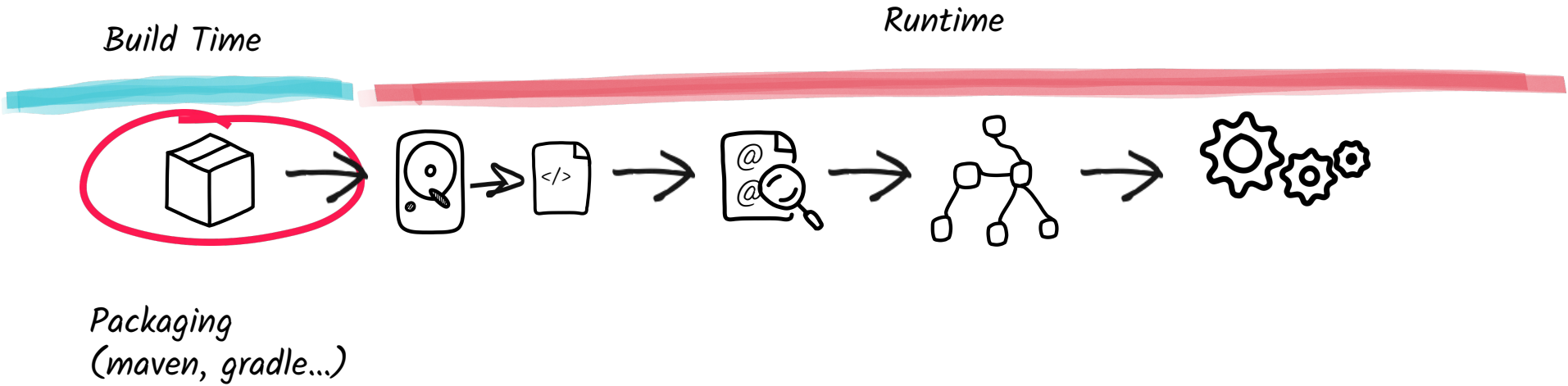
What is Wrong with Java Frameworks

They load way too many classes

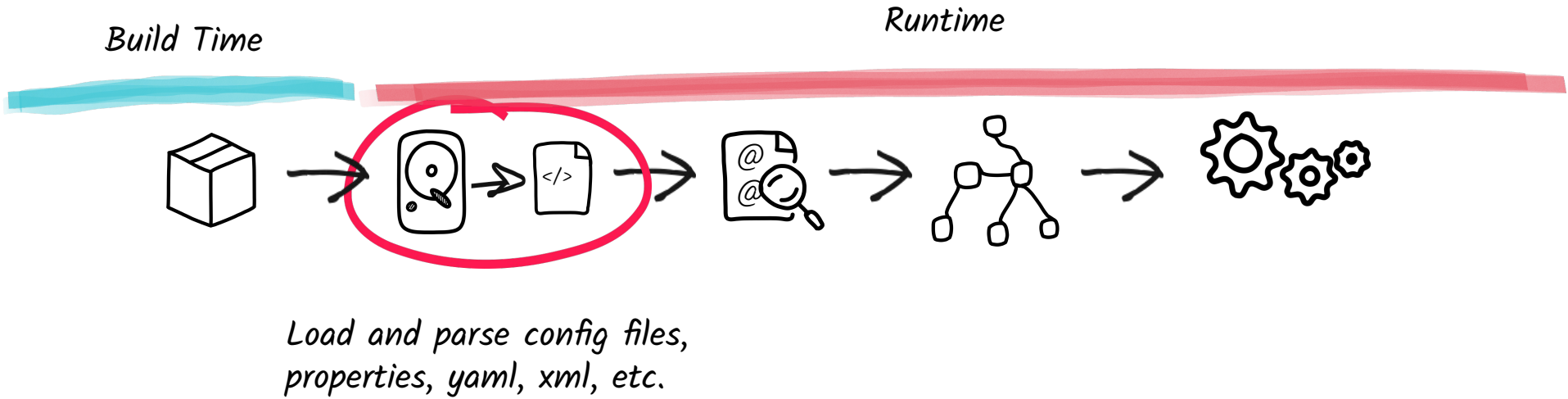
They are way too dynamic / reflective

They perform a lot of initialization at Runtime

How does a framework start?

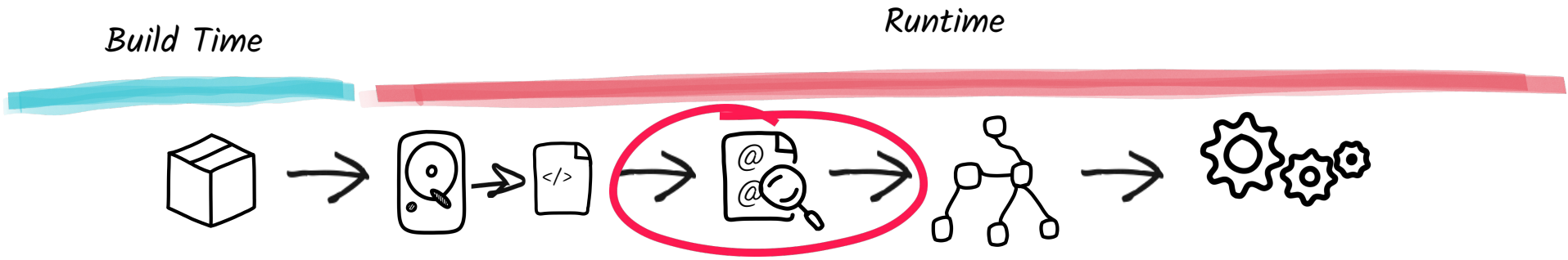


How does a framework start?



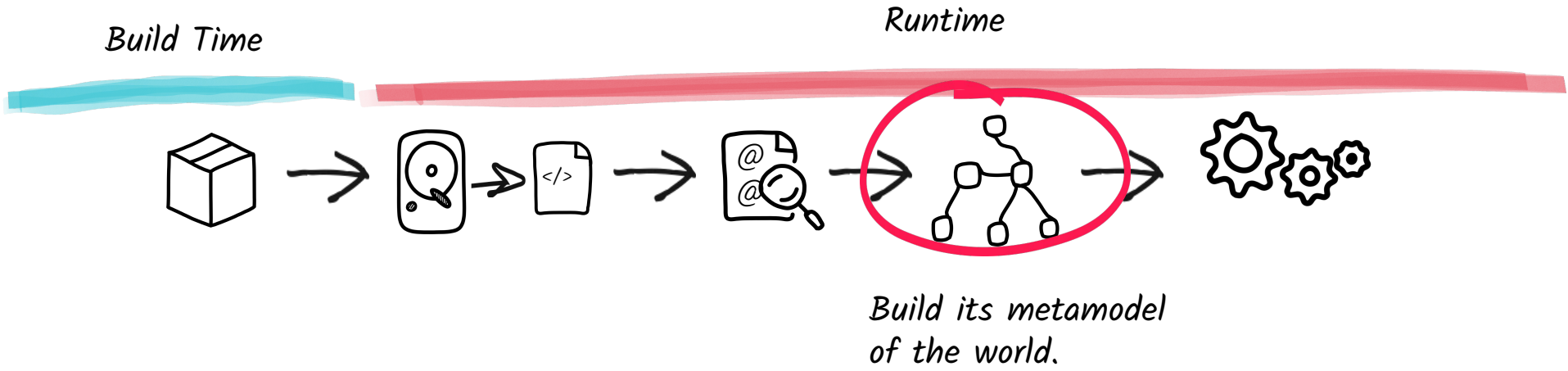
Load and parse config files,
properties, yaml, xml, etc.

How does a framework start?

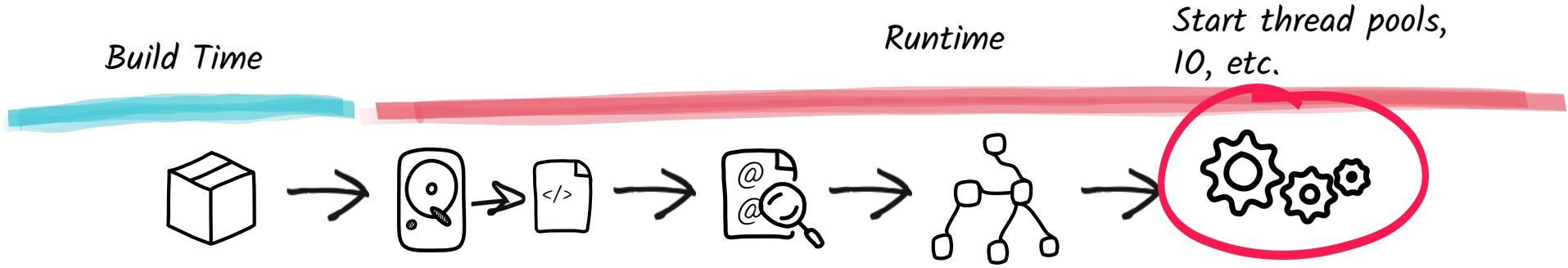


Classpath scanning and
annotation discovery
Attempt to load class to
enable/disable features

How does a framework start?

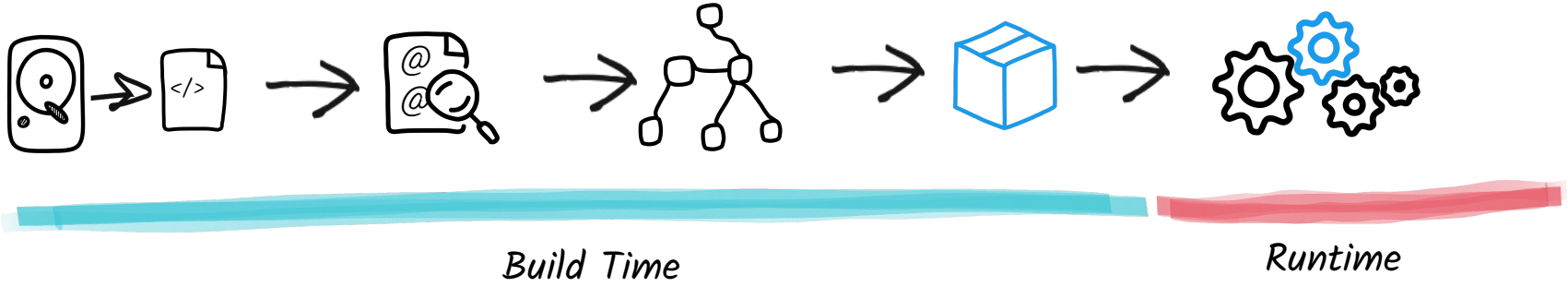


How does a framework start?



The basic idea behind Quarkus:

What if we perform Initialization at Build time?



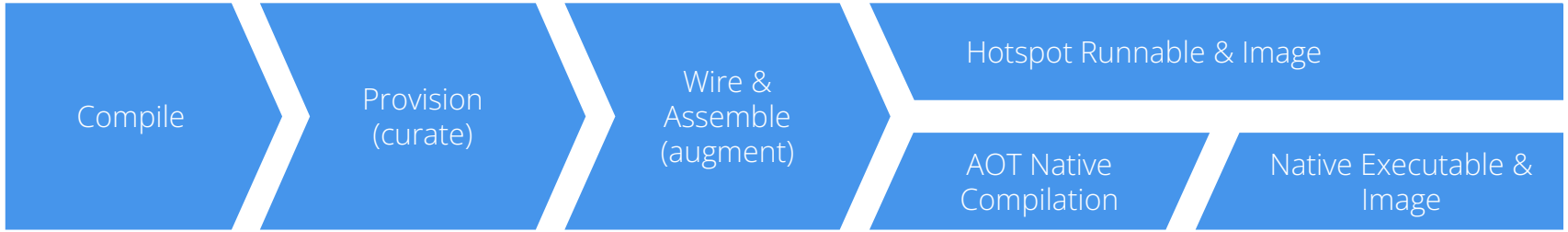
Do the work once, not at each start

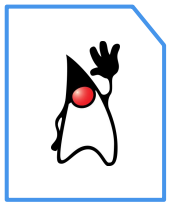
Get rid of all bootstrap classes

Less time to start, less memory needed

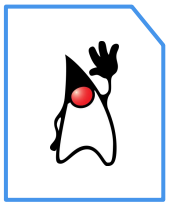
Less or no reflection nor dynamic proxies

Quarkus Build Process





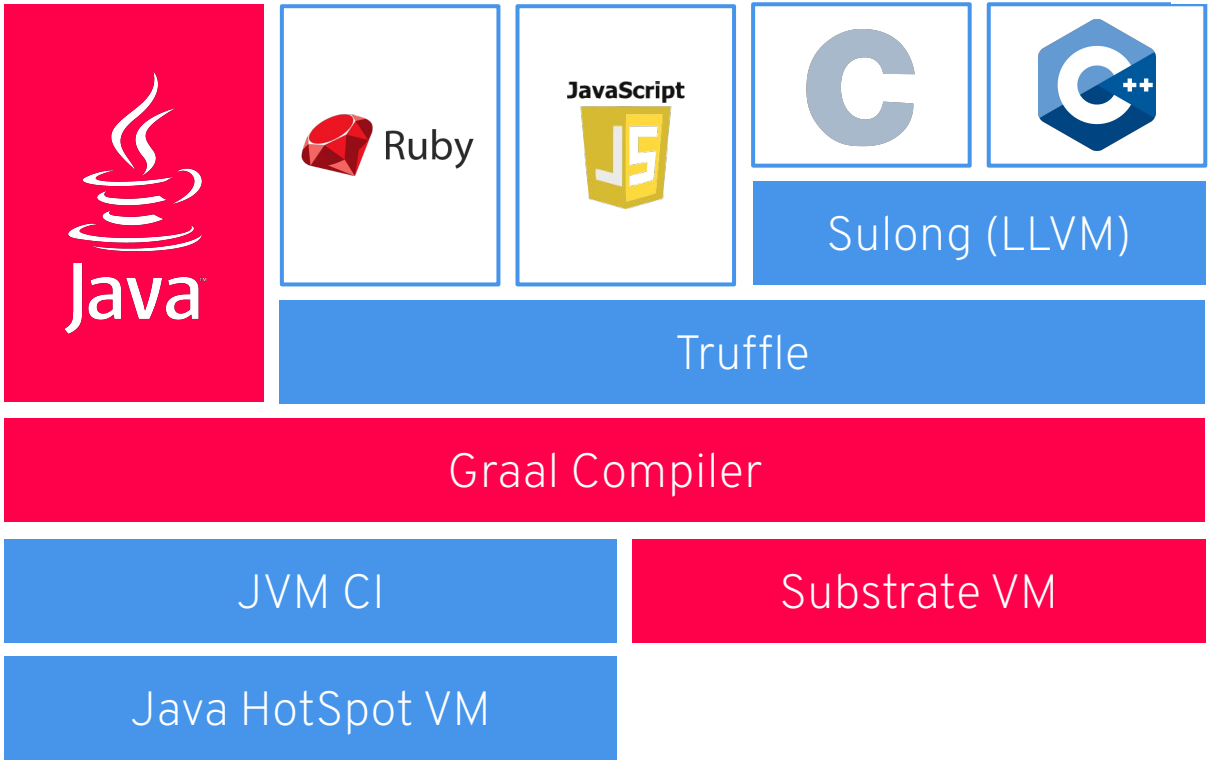
app.jar



frameworks

Runnable java app

native-app


Java
Ruby
JavaScript
C
C++
Sulong (LLVM)
Truffle
Graal Compiler
JVM CI
Substrate VM
Java HotSpot VM

The Dark Side

AOT is not That Simple

Not supported

- Dynamic classloading
- InvokeDynamic & Method handles
- Finalizers
- Security manager
- JVMTI, JMX, native VM Interfaces

OK with caveats in usage

- Reflection (requires configuration)
- Dynamic proxy (requires configuration)
- JNI (requires configuration)
- Static initializers (eager)
- Lambda, Threads (Okay)
- References (mostly supported)

https://github.com/oracle/graal/blob/master/substratevm/LIMITATIONS.md

How faster/smaller? Rule of Thumb

Hotspot optimized Quarkus App

⇒ ½ the RSS space
⇒ x5 boot speed

Native optimized Quarkus App

⇒ ⅕ the RSS space
⇒ x50 boot speed

When to use which VM with Quarkus

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

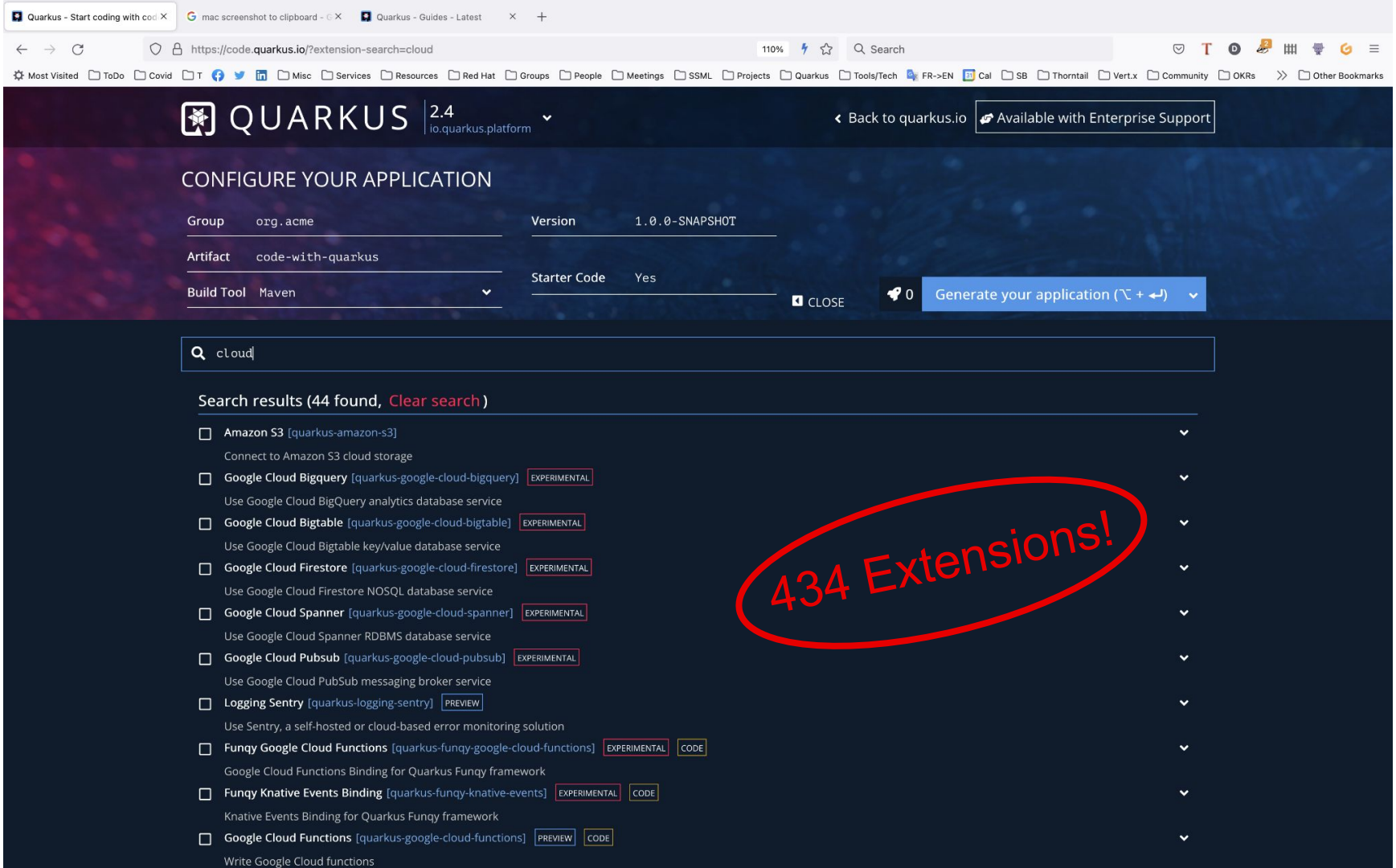
Known monitoring tools
Compile Once, Run anywhere
Libraries that only work in standard JDK

AOT - GraalVM native image

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

More consistent CPU performance
    No JIT spikes
    Simpler GC

Show me some Code!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Other Bookmarks
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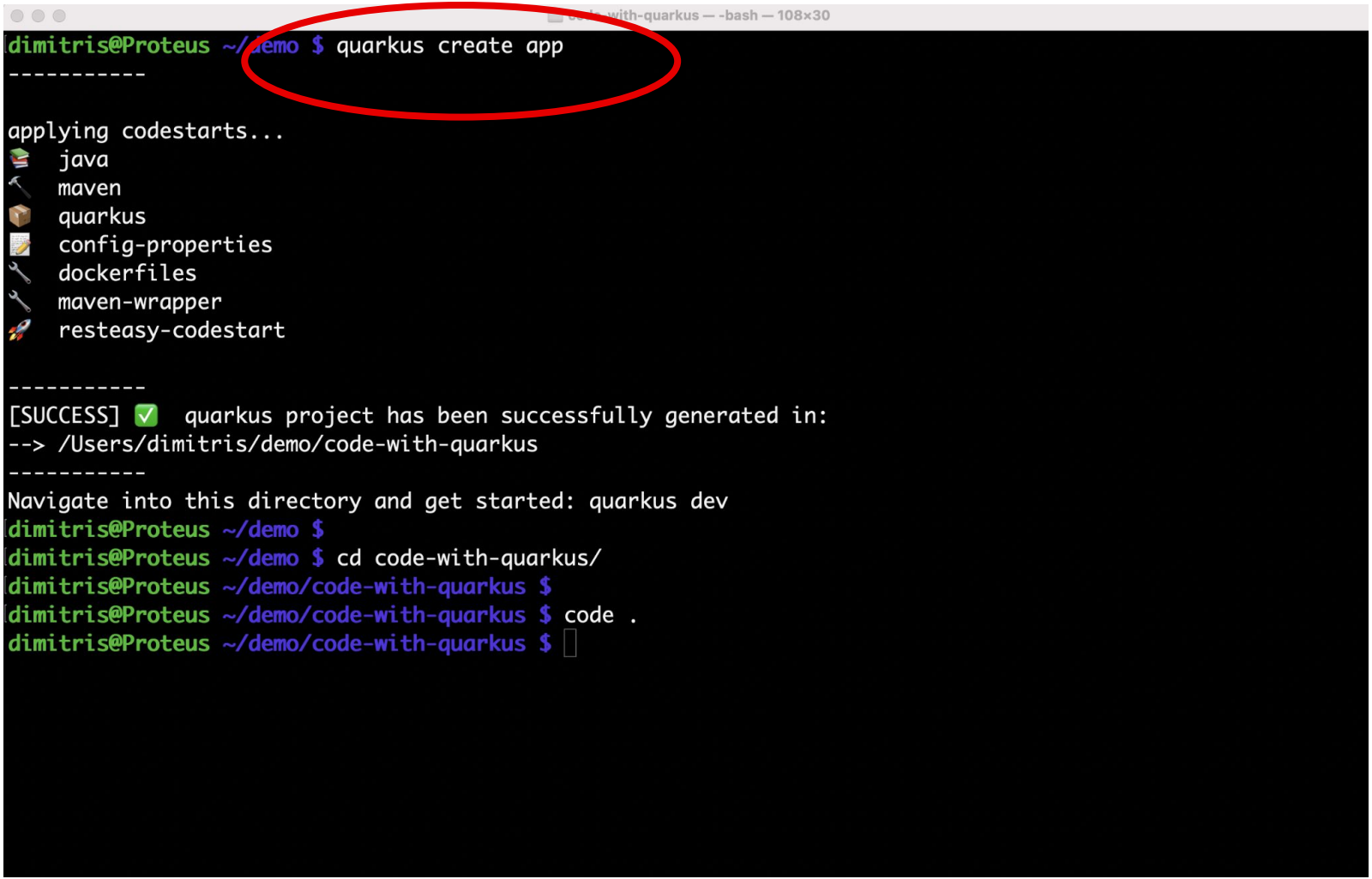
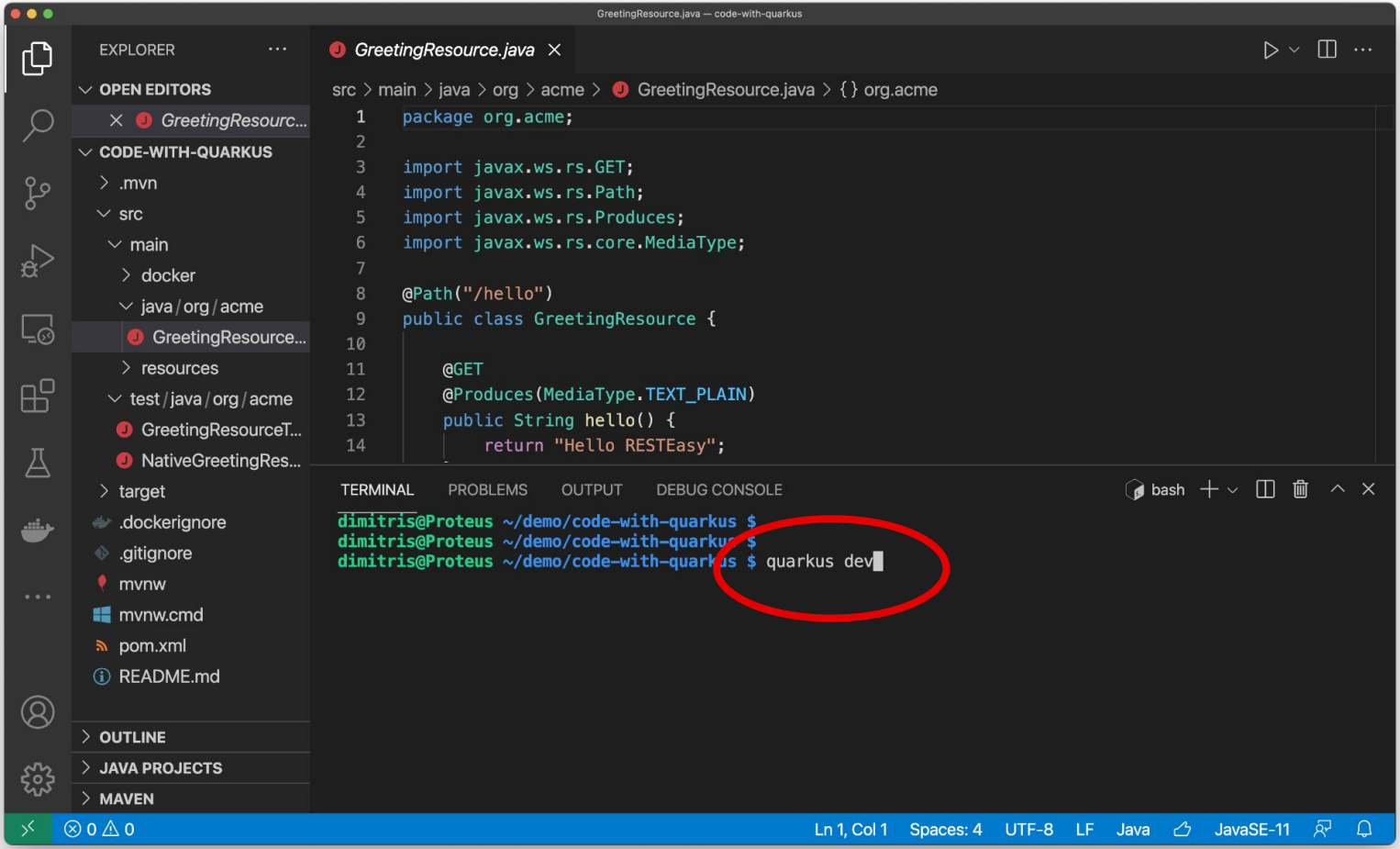
Back to quarkus.io
Available with Enterprise Support
CONFIGURE YOUR APPLICATION
Group
org.acme
Artifact
code-with-quarkus
Build Tool
Maven
Version
1.0.0-SNAPSHOT
Starter Code
Yes
CLOSE
0
Generate your application (⌥ + ↵)
cloud
Search results (44 found, Clear search)
Amazon S3 [quarkus-amazon-s3]
Connect to Amazon S3 cloud storage
Google Cloud Bigquery [quarkus-google-cloud-bigquery] EXPERIMENTAL
Use Google Cloud BigQuery analytics database service
Google Cloud Bigtable [quarkus-google-cloud-bigtable] EXPERIMENTAL
Use Google Cloud Bigtable key/value database service
Google Cloud Firestore [quarkus-google-cloud-firestore] EXPERIMENTAL
Use Google Cloud Firestore NOSQL database service
Google Cloud Spanner [quarkus-google-cloud-spanner] EXPERIMENTAL
Use Google Cloud Spanner RDBMS database service
Google Cloud Pubsub [quarkus-google-cloud-pubsub] EXPERIMENTAL
Use Google Cloud PubSub messaging broker service
Logging Sentry [quarkus-logging-sentry] PREVIEW
Use Sentry, a self-hosted or cloud-based error monitoring solution
Funqy Google Cloud Functions [quarkus-funqy-google-cloud-functions] EXPERIMENTAL CODE
Google Cloud Functions Binding for Quarkus Funqy framework
Funqy Knative Events Binding [quarkus-funqy-knative-events] EXPERIMENTAL CODE
Knative Events Binding for Quarkus Funqy framework
Google Cloud Functions [quarkus-google-cloud-functions] PREVIEW CODE
Write Google Cloud functions
434 Extensions!


code-with-quarkus — -bash — 108×30
dimitris@Proteus ~/demo $ quarkus create app
----
applying codestarts...
java
maven
quarkus
config-properties
dockerfiles
maven-wrapper
resteasy-codestart

[SUCCESS] ✅ quarkus project has been successfully generated in:
--> /Users/dimitris/demo/code-with-quarkus

Navigate into this directory and get started: quarkus dev
dimitris@Proteus ~/demo $
dimitris@Proteus ~/demo $ cd code-with-quarkus/
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ code .
dimitris@Proteus ~/demo/code-with-quarkus $


GreetingResource.java — code-with-quarkus
EXPLORER
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CODE-WITH-QUARKUS
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GreetingResource...
resources
test / java / org / acme
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NativeGreetingRes...
target
.dockerignore
.gitignore
mvnw
mvnw.cmd
pom.xml
README.md
OUTLINE
JAVA PROJECTS
MAVEN
GreetingResource.java
src > main > java > org > acme > GreetingResource.java > { } org.acme
1 package org.acme;
2
3 import javax.ws.rs.GET;
4 import javax.ws.rs.Path;
5 import javax.ws.rs.Produces;
6 import javax.ws.rs.core.MediaType;
7
8 @Path("/hello")
9 public class GreetingResource {
10
11 @GET
12 @Produces(MediaType.TEXT_PLAIN)
13 public String hello() {
14 return "Hello RESTEasy";
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
bash
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ quarkus dev
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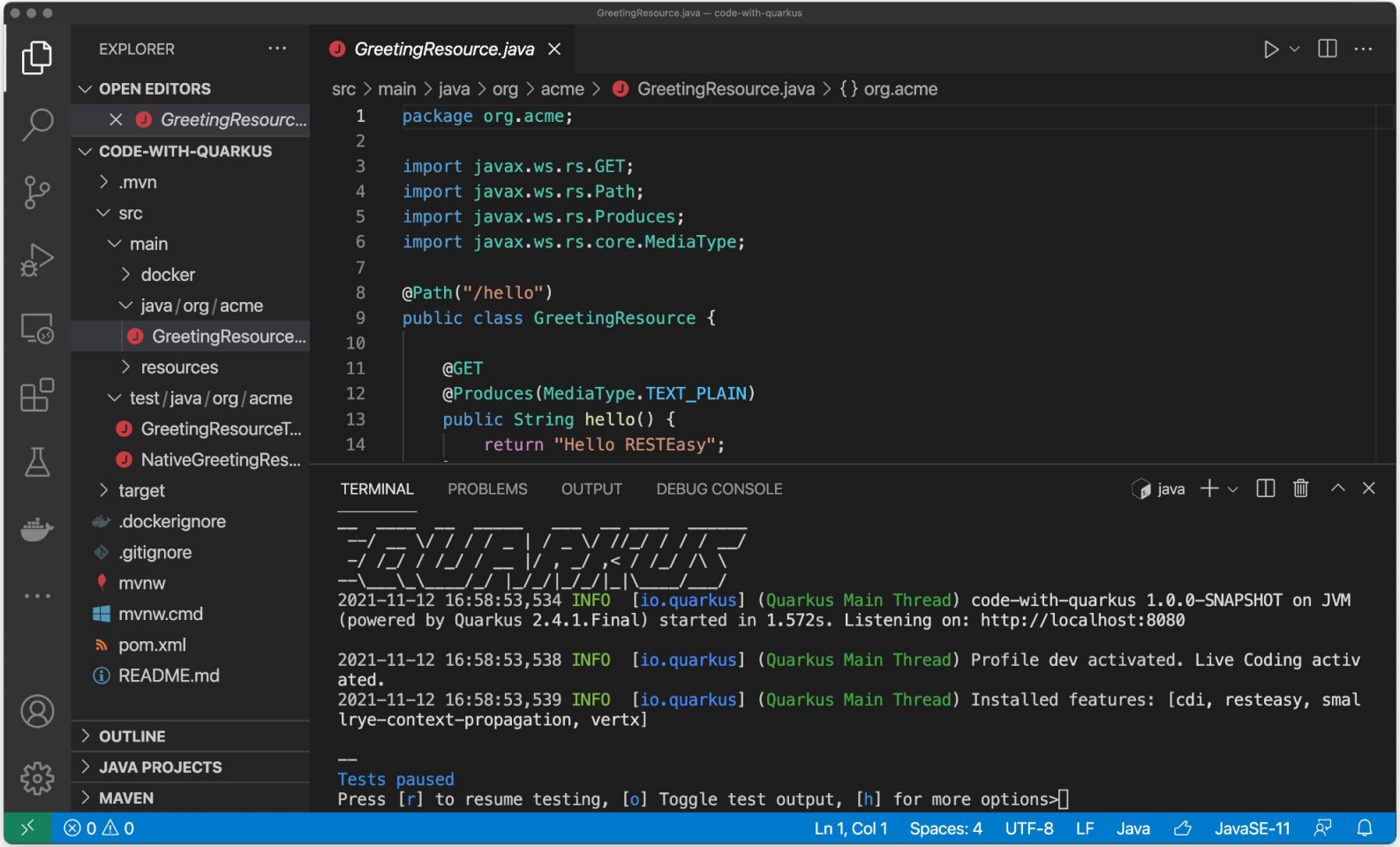
JavaSE-11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PROBLEMS
OUTPUT
DEBUG CONSOLE
java
2021-11-12 16:58:53,534 INFO [io.quarkus] (Quarkus Main Thread) code-with-quarkus 1.0.0-SNAPSHOT on JVM
(powered by Quarkus 2.4.1.Final) started in 1.572s. Listening on: http://localhost:8080
2021-11-12 16:58:53,538 INFO [io.quarkus] (Quarkus Main Thread) Profile dev activated. Live Coding activ
ated.
2021-11-12 16:58:53,539 INFO [io.quarkus] (Quarkus Main Thread) Installed features: [cdi, resteasy, smal
lrye-context-propagation, vertx]
Tests paused
Press [r] to resume testing, [o] Toggle test output, [h] for more options>
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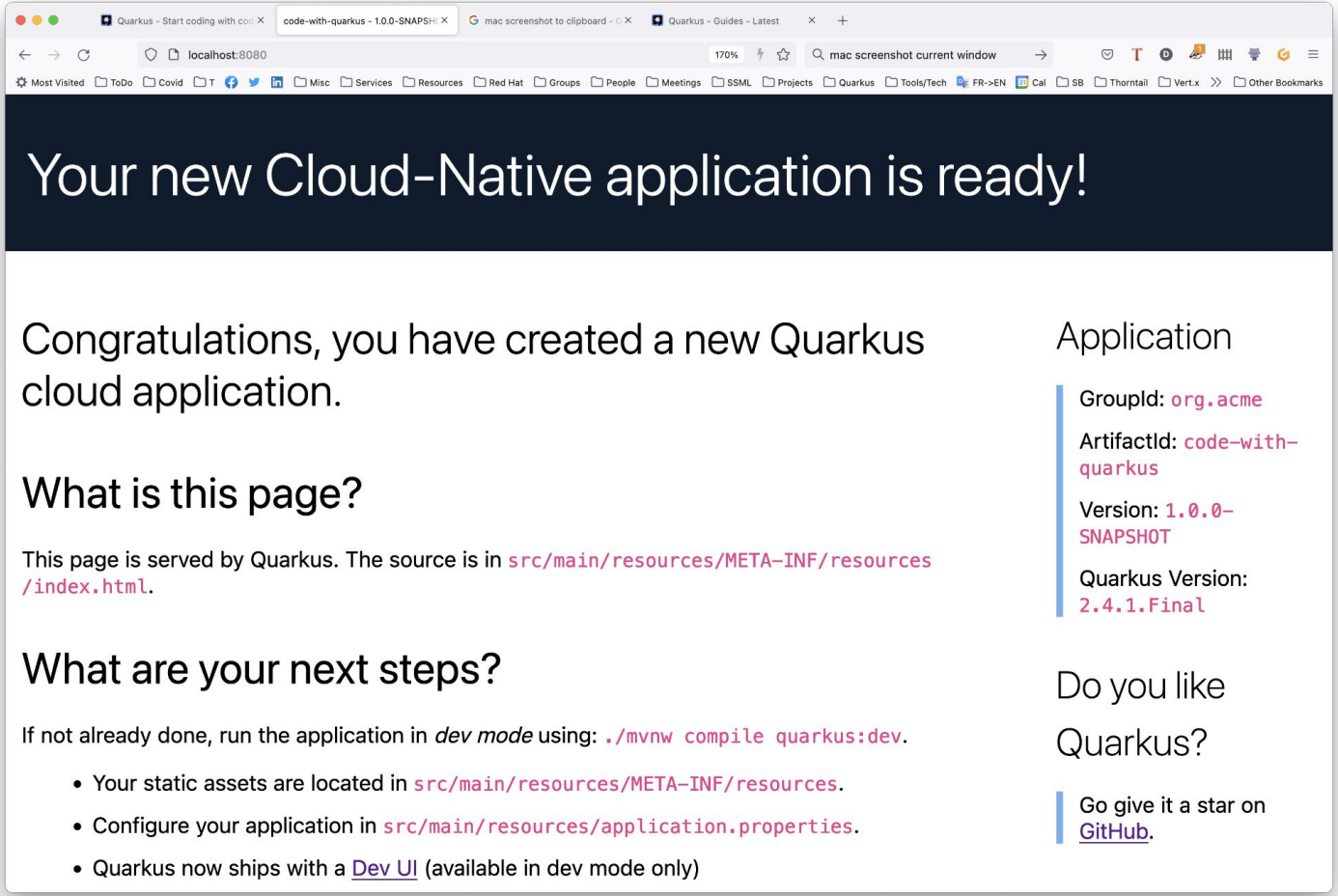
Java
JavaSE-11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Misc
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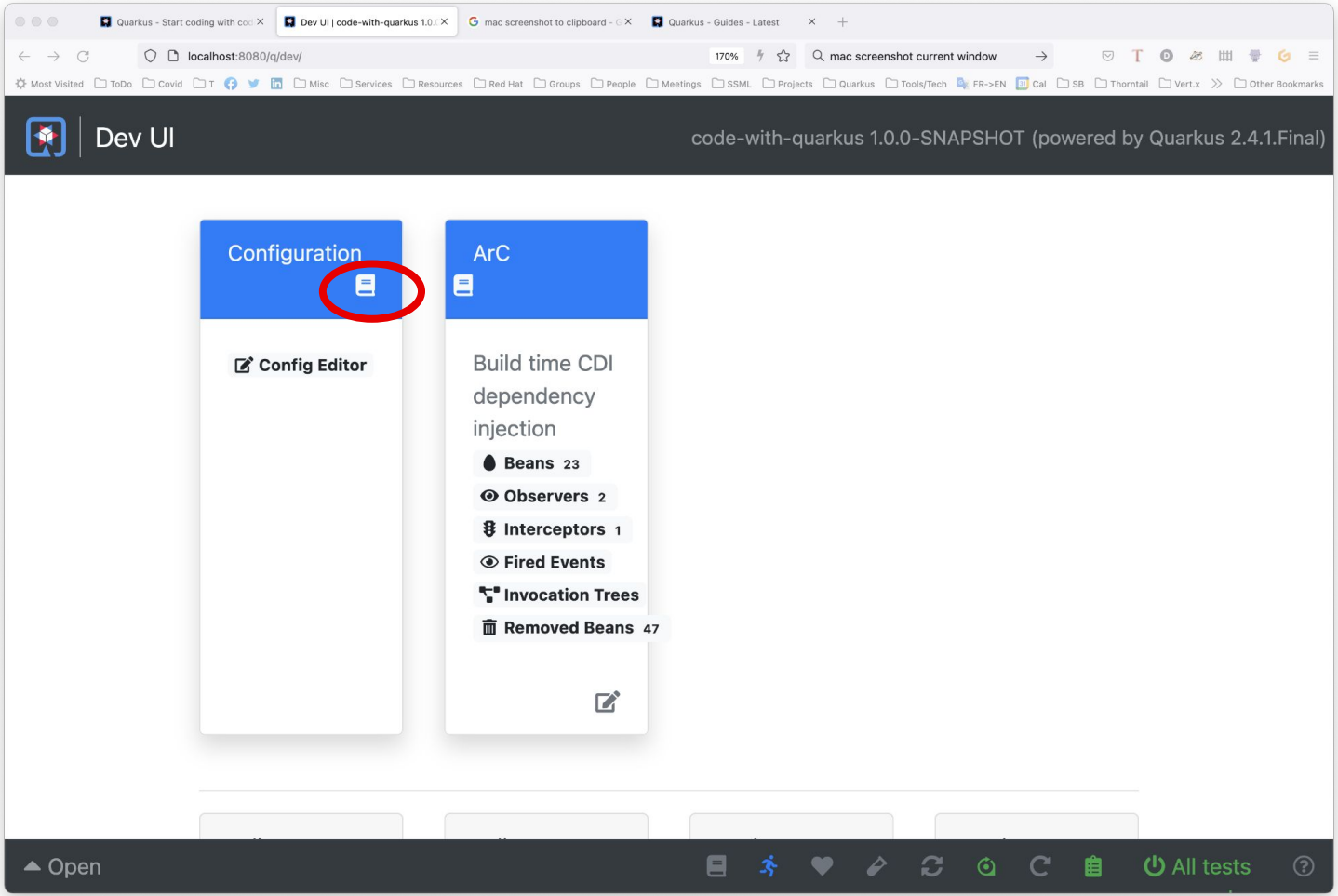
Resources
Red Hat
Groups
People
Meetings
SSML
Projects
Quarkus
Tools/Tech
FR->EN
Cal
SB
Thorntail
Vert.x
Other Bookmarks
Your new Cloud-Native application is ready!
Congratulations, you have created a new Quarkus cloud application.
What is this page?
This page is served by Quarkus. The source is in src/main/resources/META-INF/resources/index.html.
What are your next steps?
If not already done, run the application in dev mode using: ./mvnw compile quarkus:dev.
Your static assets are located in src/main/resources/META-INF/resources.
Configure your application in src/main/resources/application.properties.
Quarkus now ships with a Dev UI (available in dev mode only)
Application
GroupId: org.acme
ArtifactId: code-with-quarkus
Version: 1.0.0-SNAPSHOT
Quarkus Version: 2.4.1.Final
Do you like Quarkus?
Go give it a star on GitHub.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Configuration
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Build time CDI dependency injection
Beans 23
Observers 2
Interceptors 1
Fired Events
Invocation Trees
Removed Beans 47
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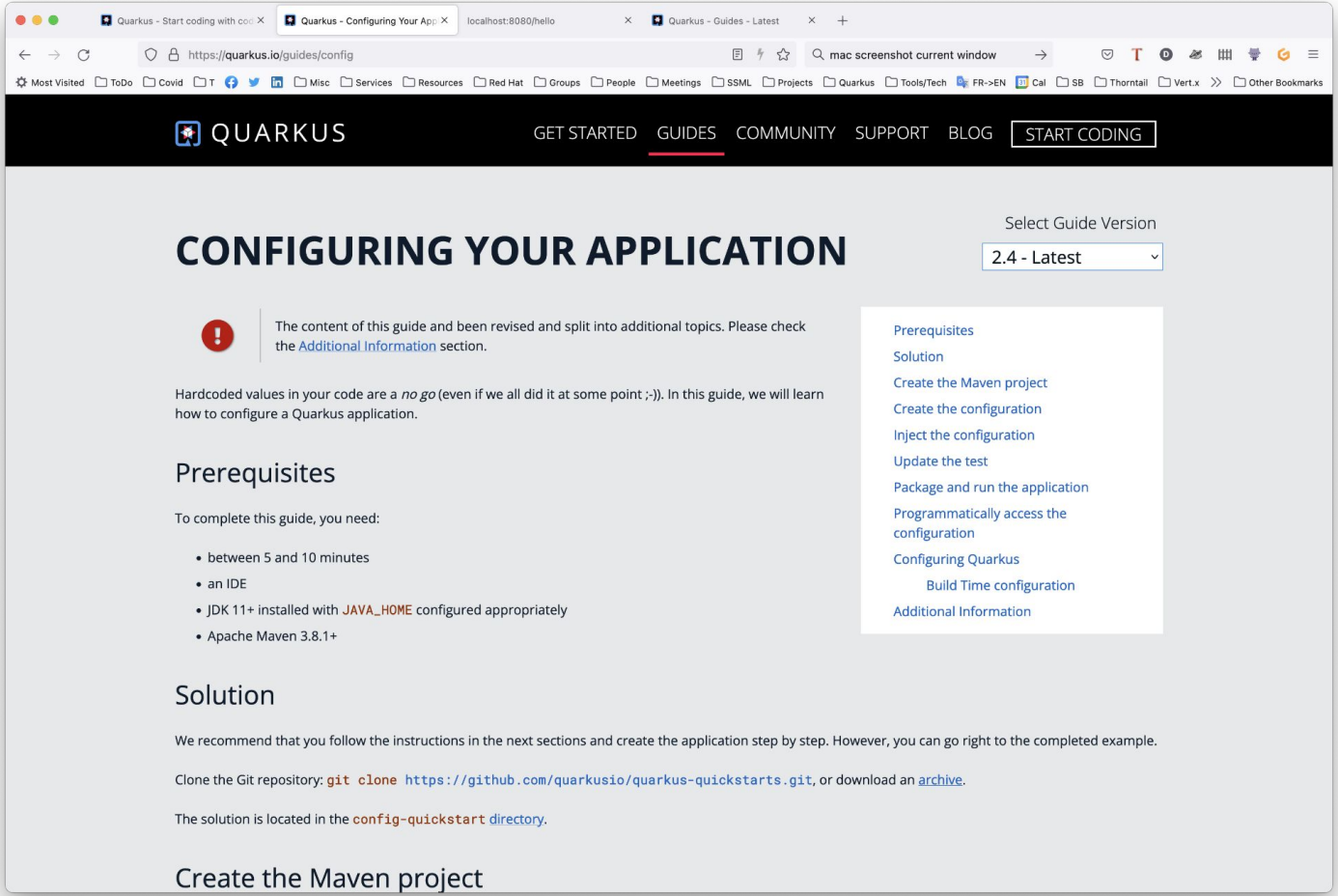
All tests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Quarkus - Configuring Your App
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QUARKUS
GET STARTED
GUIDES
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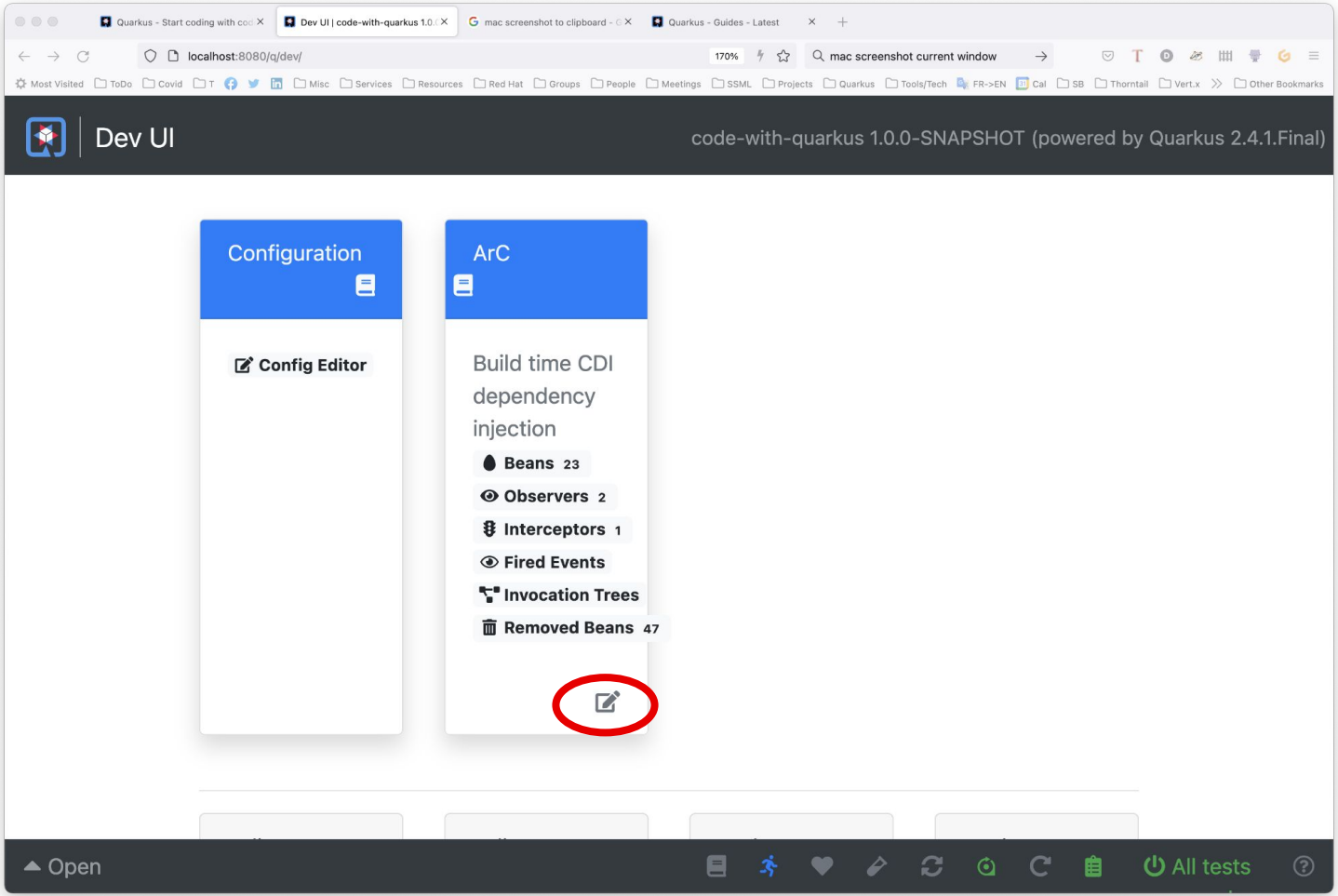
SUPPORT
BLOG
START CODING
CONFIGURING YOUR APPLICATION
Select Guide Version
2.4 - Latest
The content of this guide and been revised and split into additional topics. Please check the Additional Information section.
Hardcoded values in your code are a no go (even if we all did it at some point ;-)). In this guide, we will learn how to configure a Quarkus application.
Prerequisites
Solution
Create the Maven project
Create the configuration
Inject the configuration
Update the test
Package and run the application
Programmatically access the configuration
Configuring Quarkus
Build Time configuration
Additional Information
Prerequisites
To complete this guide, you need:
between 5 and 10 minutes
an IDE
JDK 11+ installed with JAVA_HOME configured appropriately
Apache Maven 3.8.1+
Solution
We recommend that you follow the instructions in the next sections and create the application step by step. However, you can go right to the completed example.
Clone the Git repository: git clone https://github.com/quarkusio/quarkus-quickstarts.git, or download an archive.
The solution is located in the config-quickstart directory.
Create the Maven project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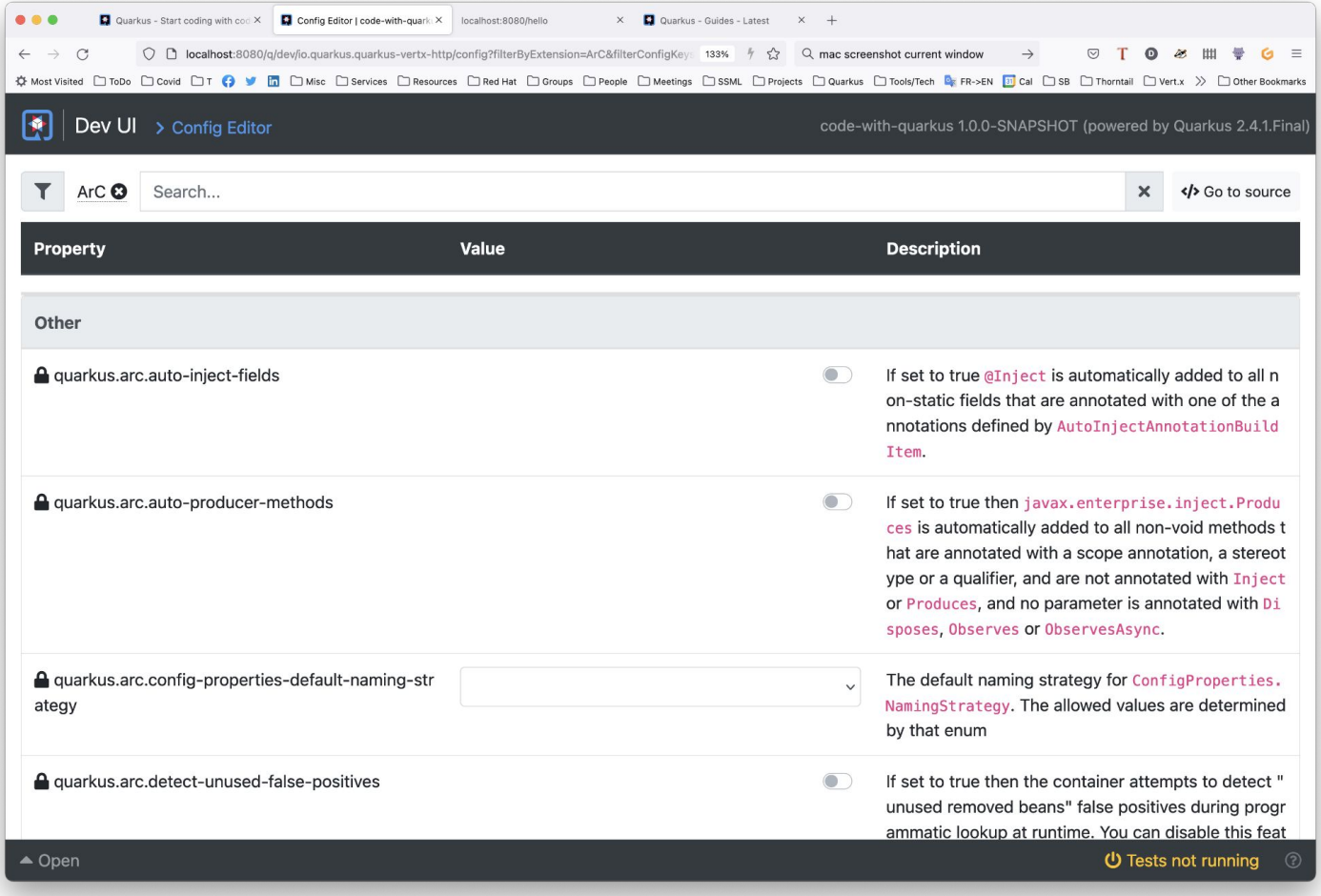
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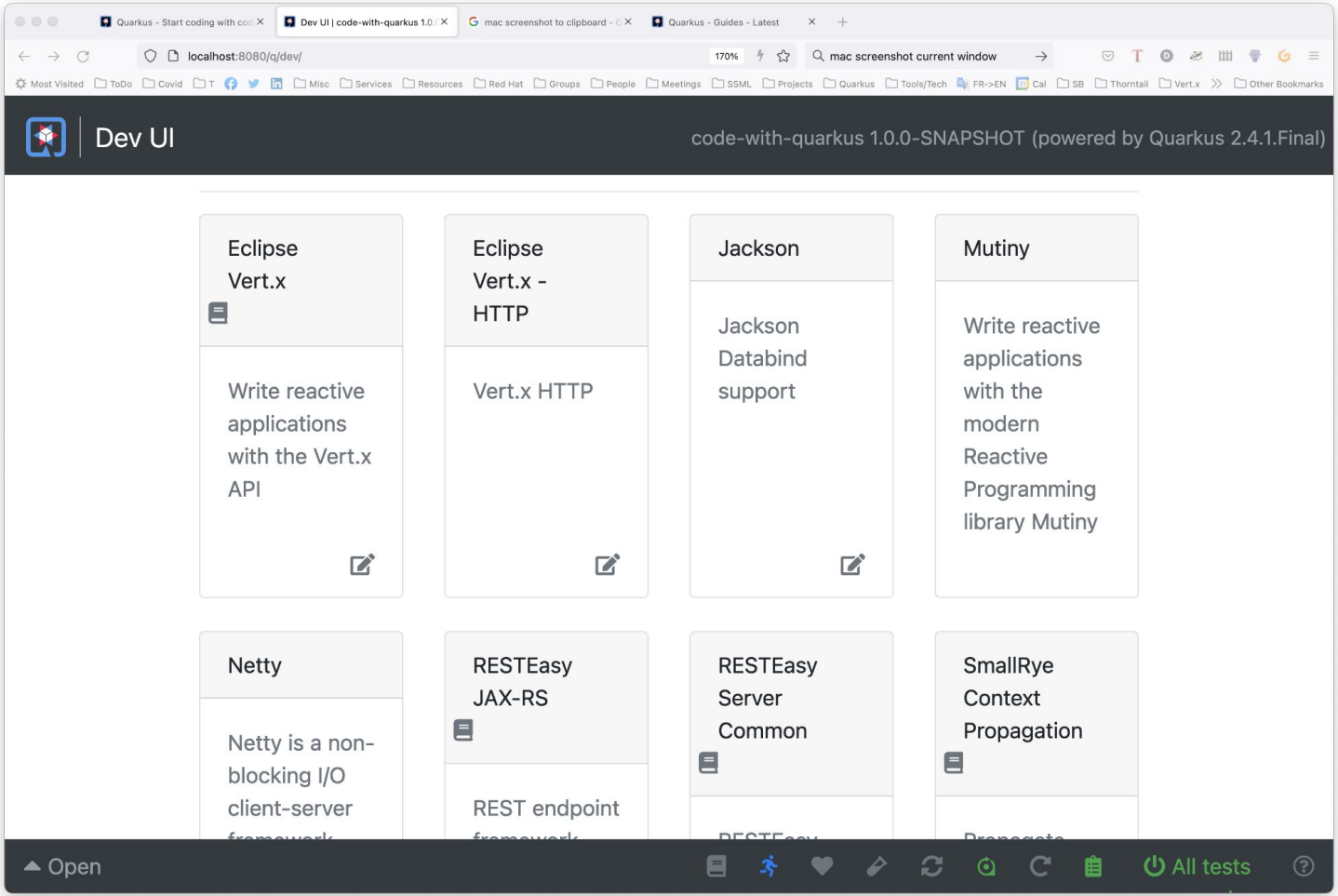
> Config Editor
code-with-quarkus 1.0.0-SNAPSHOT (powered by Quarkus 2.4.1.Final)
ArC
Search...
Go to source
Property
Value
Description
Other
quarkus.arc.auto-inject-fields
If set to true @Inject is automatically added to all n on-static fields that are annotated with one of the a nnotations defined by AutoInjectAnnotationBuild Item.
quarkus.arc.auto-producer-methods
If set to true then javax.enterprise.inject.Produ ces is automatically added to all non-void methods t hat are annotated with a scope annotation, a stereot ype or a qualifier, and are not annotated with Inject or Produces, and no parameter is annotated with Di sposes, Observes or ObservesAsync.
quarkus.arc.config-properties-default-naming-str ategy
The default naming strategy for ConfigProperties. NamingStrategy. The allowed values are determined by that enum
quarkus.arc.detect-unused-false-positives
If set to true then the container attempts to detect " unused removed beans" false positives during progr ammatic lookup at runtime. You can disable this feat
Open
Tests not running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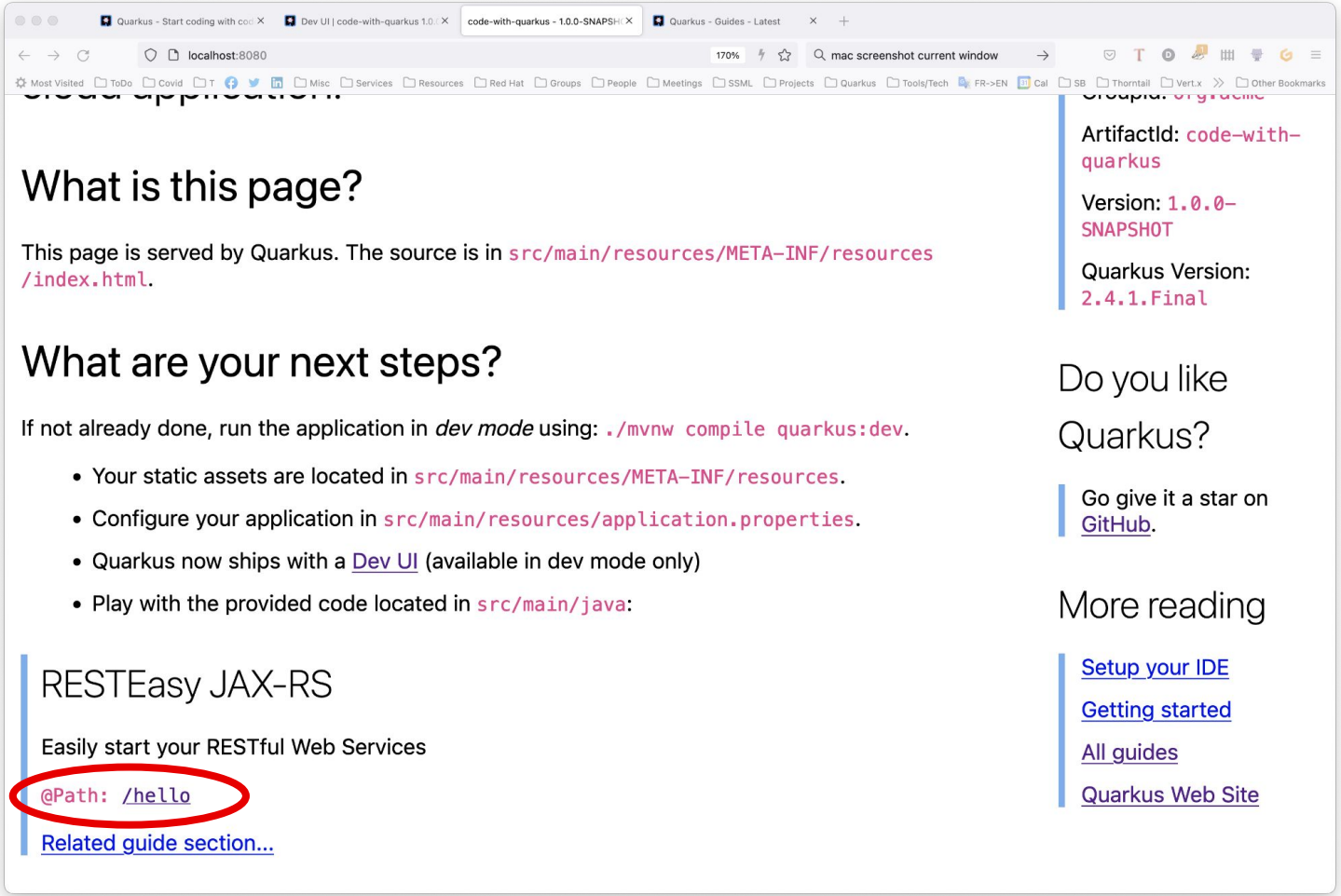
Dev UI
code-with-quarkus 1.0.0-SNAPSHOT (powered by Quarkus 2.4.1.Final)
Eclipse Vert.x
Write reactive applications with the Vert.x API
Eclipse Vert.x - HTTP
Vert.x HTTP
Jackson
Jackson Databind support
Mutiny
Write reactive applications with the modern Reactive Programming library Mutiny
Netty
Netty is a non-blocking I/O client-server
RESTEasy JAX-RS
REST endpoint
RESTEasy Server Common
SmallRye Context Propagation
Open
All tests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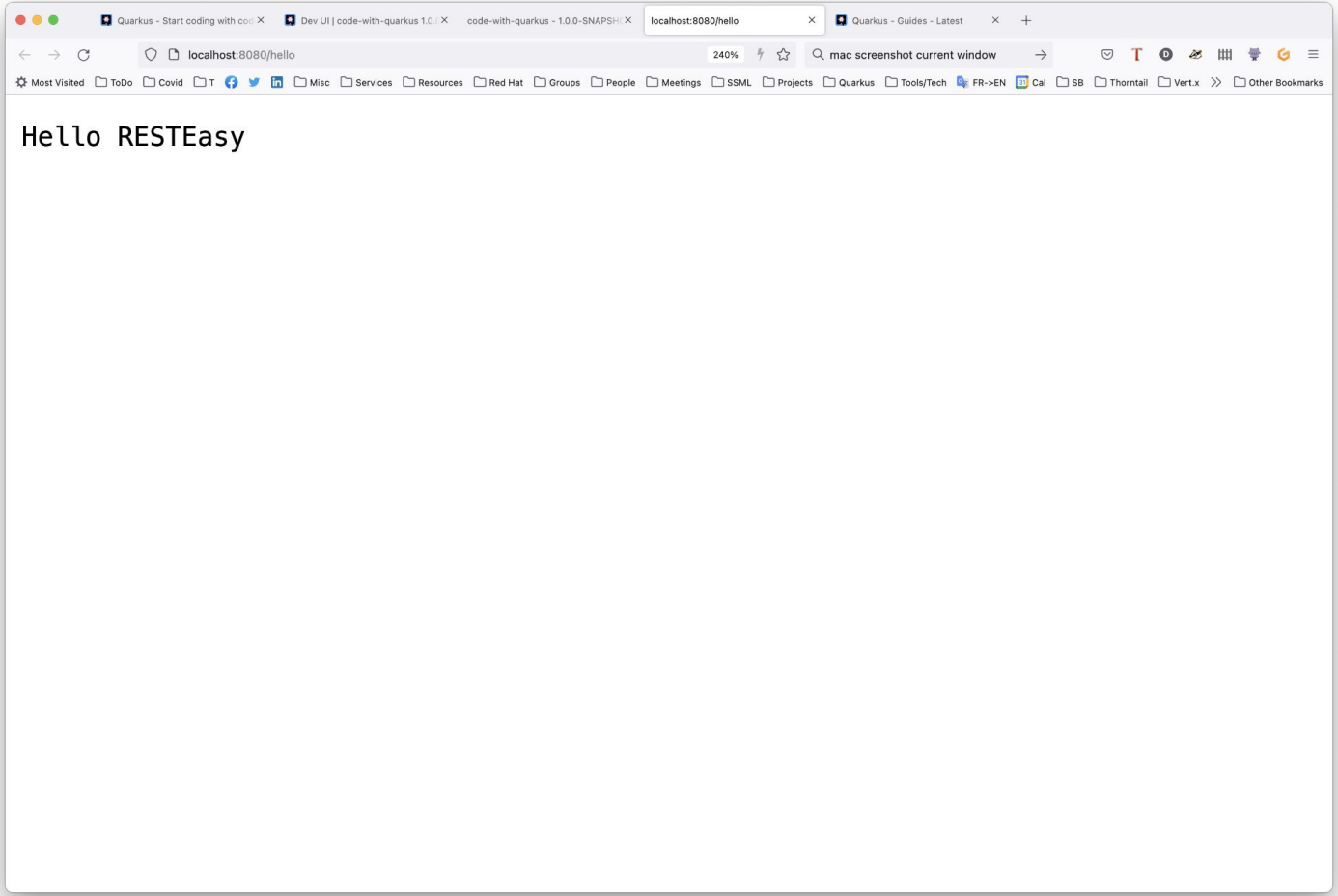
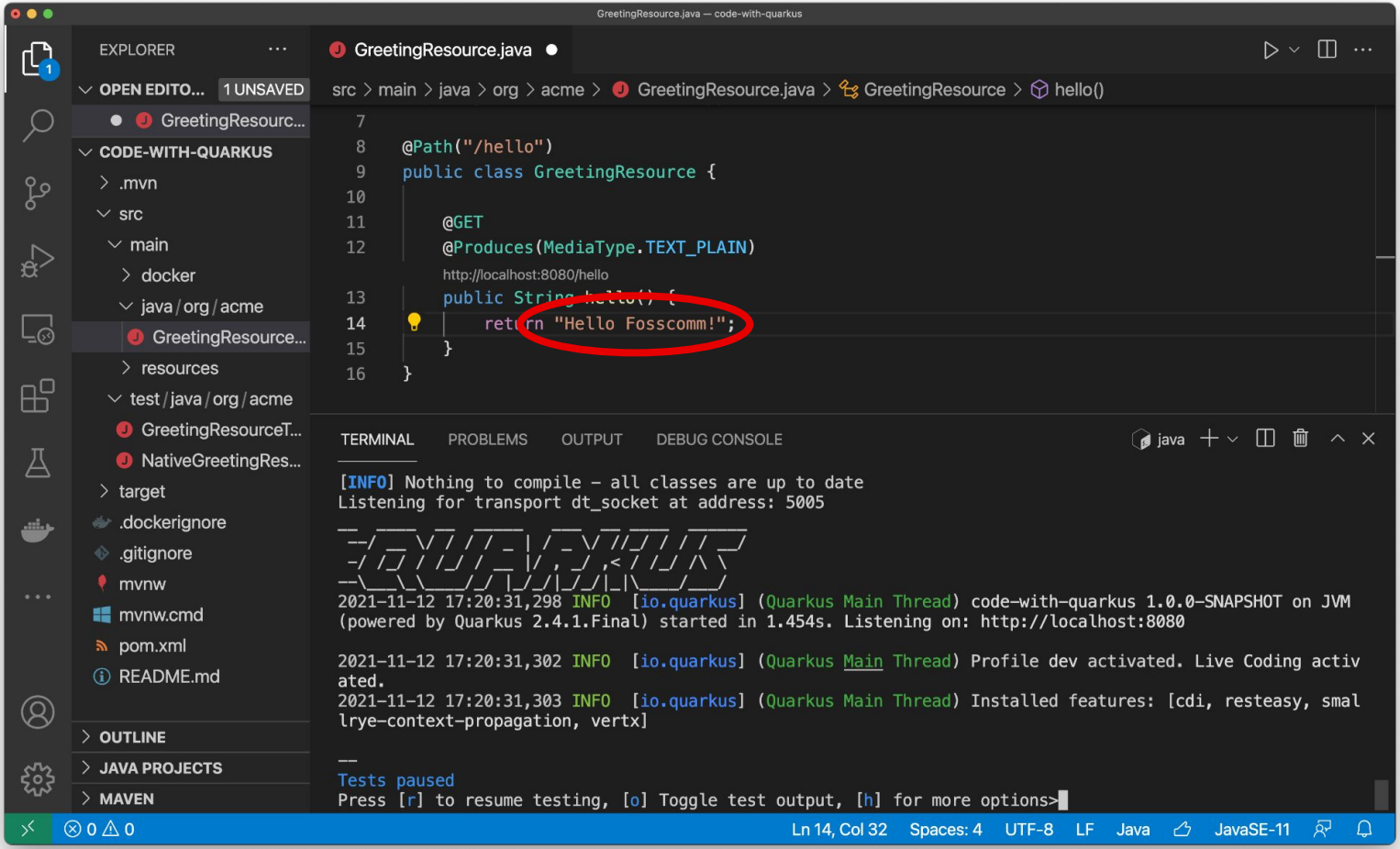
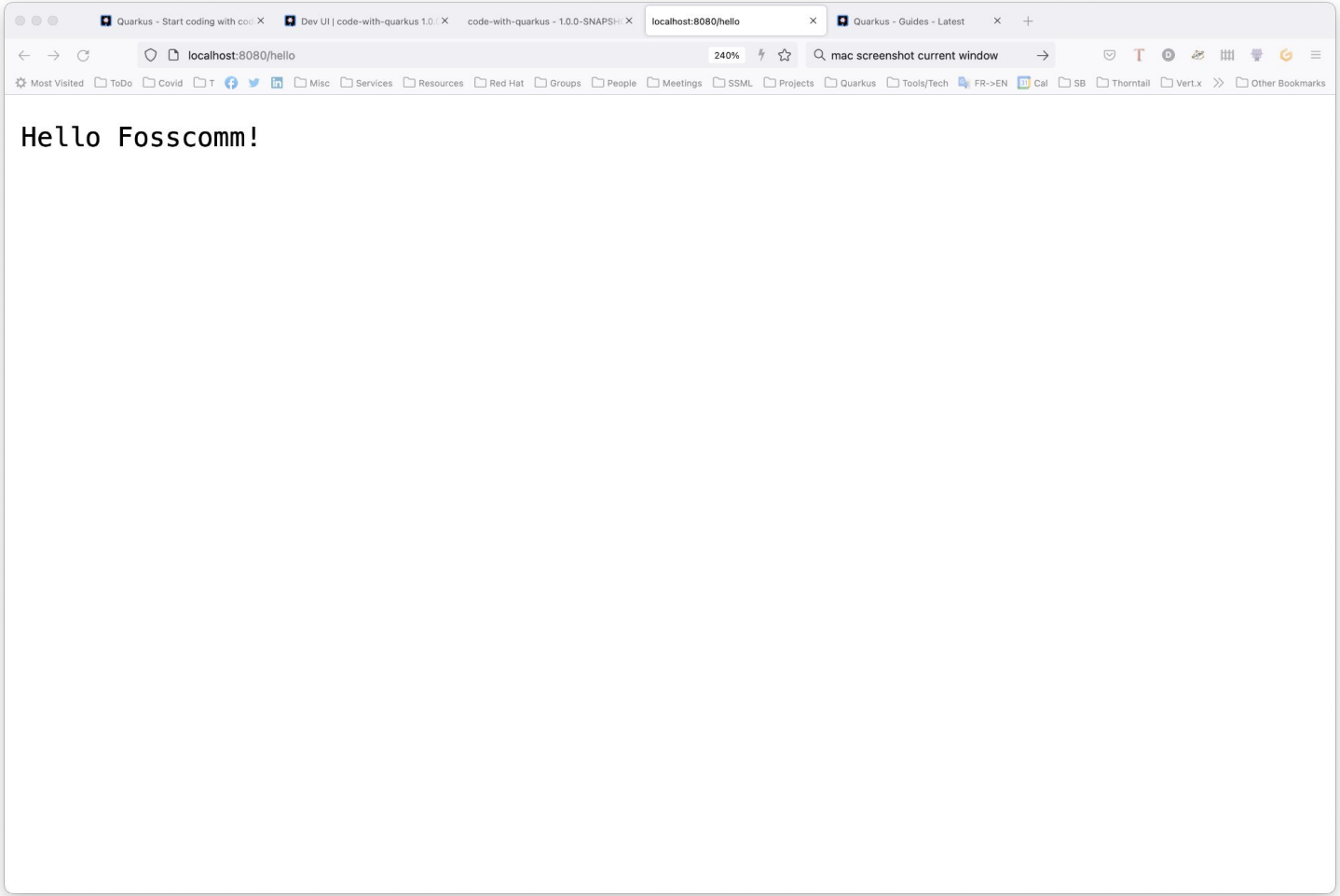
Your static assets are located in src/main/resources/META-INF/resources.
Configure your application in src/main/resources/application.properties.
Quarkus now ships with a Dev UI (available in dev mode only)
Play with the provided code located in src/main/java:
RESTEasy JAX-RS
Easily start your RESTful Web Services
@Path: /hello
Related guide section...
ArtifactId: code-with-quarkus
Version: 1.0.0-SNAPSHOT
Quarkus Version: 2.4.1.Final
Do you like Quarkus?
Go give it a star on GitHub.
More reading
Setup your IDE
Getting started
All guides
Quarkus Web Site


Quarkus - Start coding with cod
Dev UI | code-with-quarkus 1.0
code-with-quarkus - 1.0.0-SNAPSH
localhost:8080/hello
Quarkus - Guides - Latest
localhost:8080/hello
240%
mac screenshot current window
Most Visited
ToDo
Covid
T
Misc
Services
Resources
Red Hat
Groups
People
Meetings
SSML
Projects
Quarkus
Tools/Tech
FR->EN
Cal
SB
Thorntail
Vert.x
Other Bookmarks
Hello RESTEasy


GreetingResource.java — code-with-quarkus
EXPLORER
OPEN EDITO... 1 UNSAVED
GreetingResourc...
CODE-WITH-QUARKUS
.mvn
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
.dockerignore
.gitignore
mvnw
mvnw.cmd
pom.xml
README.md
OUTLINE
JAVA PROJECTS
MAVEN
GreetingResource.java
src > main > java > org > acme > GreetingResource.java > GreetingResource > hello()
@Path("/hello")
public class GreetingResource {
@GET
@Produces(MediaType.TEXT_PLAIN)
http://localhost:8080/hello
public String hello() {
return "Hello Fosscomm!";
}
}
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
[INFO] Nothing to compile - all classes are up to date
Listening for transport dt_socket at address: 5005
2021-11-12 17:20:31,298 INFO [io.quarkus] (Quarkus Main Thread) code-with-quarkus 1.0.0-SNAPSHOT on JVM
(powered by Quarkus 2.4.1.Final) started in 1.454s. Listening on: http://localhost:8080
2021-11-12 17:20:31,302 INFO [io.quarkus] (Quarkus Main Thread) Profile dev activated. Live Coding activ
ated.
2021-11-12 17:20:31,303 INFO [io.quarkus] (Quarkus Main Thread) Installed features: [cdi, resteasy, smal
lrye-context-propagation, vertx]
Tests paused
Press [r] to resume testing, [o] Toggle test output, [h] for more options>
0 0
Ln 14, Col 32
Spaces: 4
UTF-8
LF
Java
JavaSE-11


Quarkus - Start coding with cod
Dev UI | code-with-quarkus 1.0.
code-with-quarkus - 1.0.0-SNAPSH
localhost:8080/hello
Quarkus - Guides - Latest
localhost:8080/hello
240%
mac screenshot current window
Most Visited
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Cal
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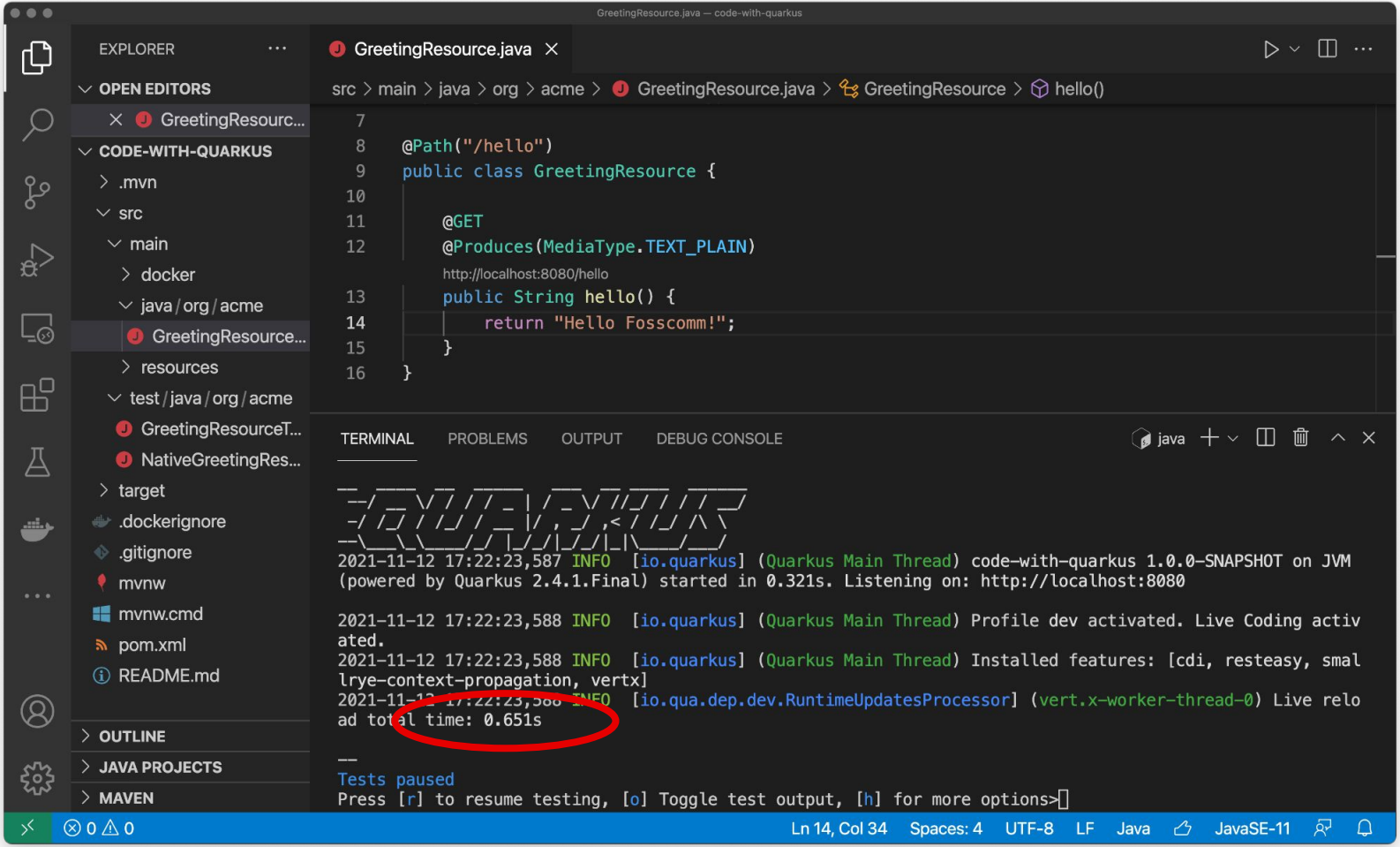
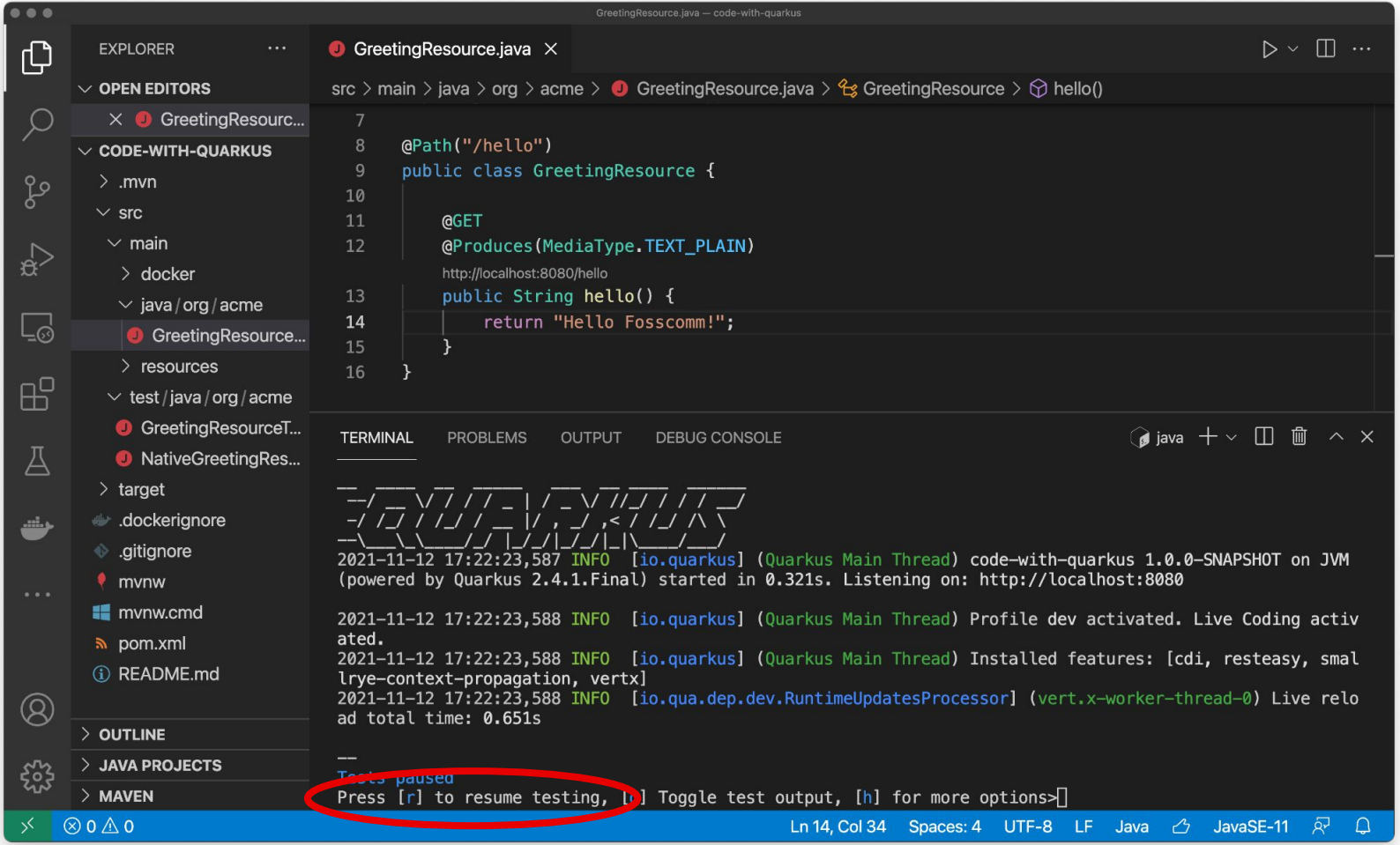
Vert.x
Other Bookmarks
Hello Fosscomm!


GreetingResource.java — code-with-quarkus
EXPLORER
OPEN EDITORS
GreetingResourc...
CODE-WITH-QUARKUS
.mvn
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
.dockerignore
.gitignore
mvnw
mvnw.cmd
pom.xml
README.md
OUTLINE
JAVA PROJECTS
MAVEN
GreetingResource.java
src > main > java > org > acme > GreetingResource.java > GreetingResource > hello()
@Path("/hello")
public class GreetingResource {
@GET
@Produces(MediaType.TEXT_PLAIN)
http://localhost:8080/hello
public String hello() {
return "Hello Fosscomm!";
}
}
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
2021-11-12 17:22:23,587 INFO [io.quarkus] (Quarkus Main Thread) code-with-quarkus 1.0.0-SNAPSHOT on JVM (powered by Quarkus 2.4.1.Final) started in 0.321s. Listening on: http://localhost:8080
2021-11-12 17:22:23,588 INFO [io.quarkus] (Quarkus Main Thread) Profile dev activated. Live Coding activated.
2021-11-12 17:22:23,588 INFO [io.quarkus] (Quarkus Main Thread) Installed features: [cdi, resteasy, smallrye-context-propagation, vertx]
2021-11-12 17:22:23,588 INFO [io.qua.dep.dev.RuntimeUpdatesProcessor] (vert.x-worker-thread-0) Live reload total time: 0.651s
Tests paused
Press [r] to resume testing, [o] Toggle test output, [h] for more options>
Ln 14, Col 34
Spaces: 4
UTF-8
LF
Java
JavaSE-11


GreetingResource.java — code-with-quarkus
EXPLORER
OPEN EDITORS
GreetingResourc...
CODE-WITH-QUARKUS
.mvn
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
.dockerignore
.gitignore
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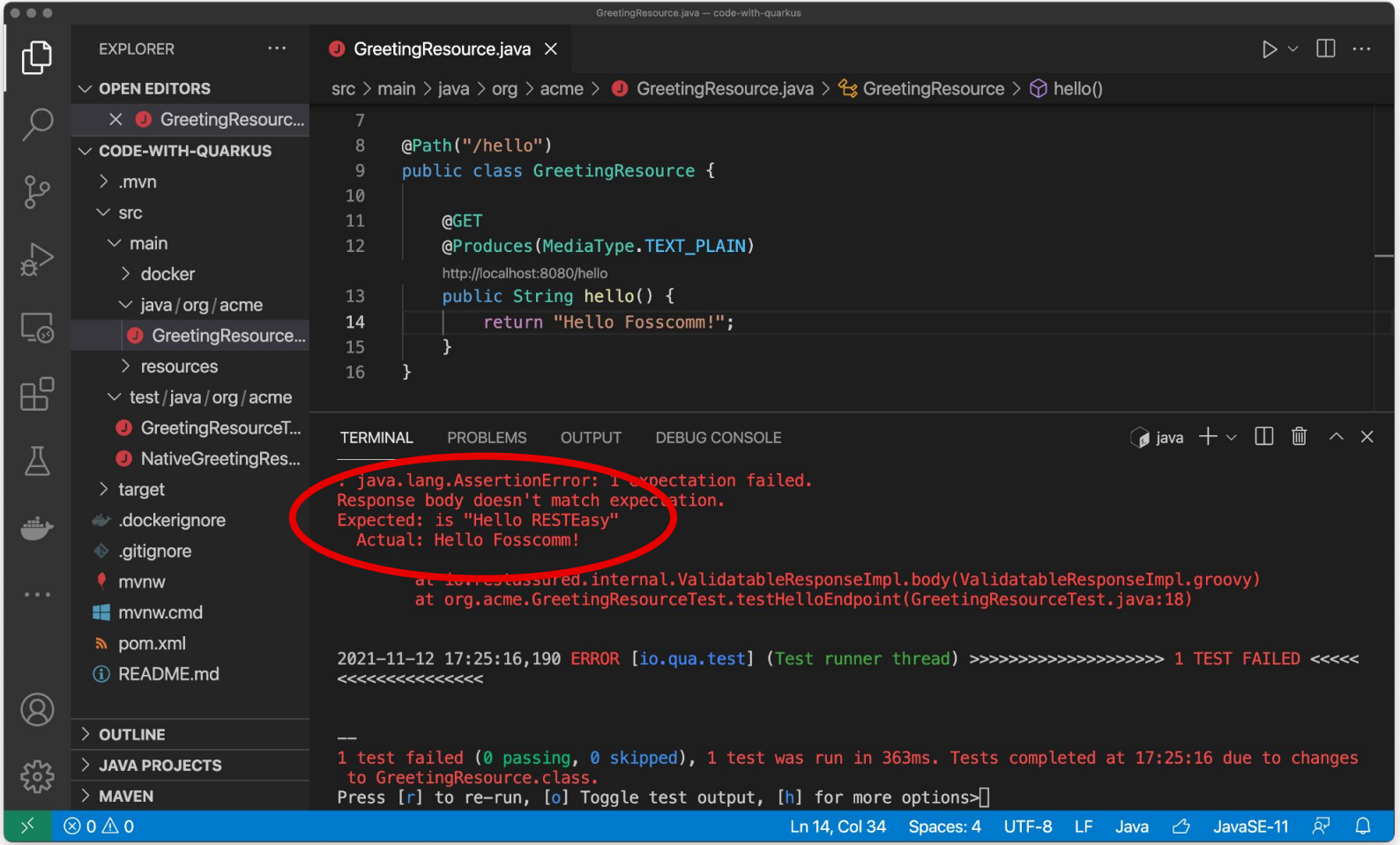
OUTLINE
JAVA PROJECTS
MAVEN
GreetingResource.java
src > main > java > org > acme > GreetingResource.java > GreetingResource > hello()
@Path("/hello")
public class GreetingResource {
@GET
@Produces(MediaType.TEXT_PLAIN)
http://localhost:8080/hello
public String hello() {
return "Hello Fosscomm!";
}
}
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
2021-11-12 17:22:23,587 INFO [io.quarkus] (Quarkus Main Thread) code-with-quarkus 1.0.0-SNAPSHOT on JVM (powered by Quarkus 2.4.1.Final) started in 0.321s. Listening on: http://localhost:8080
2021-11-12 17:22:23,588 INFO [io.quarkus] (Quarkus Main Thread) Profile dev activated. Live Coding activated.
2021-11-12 17:22:23,588 INFO [io.quarkus] (Quarkus Main Thread) Installed features: [cdi, resteasy, smallrye-context-propagation, vertx]
2021-11-12 17:22:23,588 INFO [io.qua.dep.dev.RuntimeUpdatesProcessor] (vert.x-worker-thread-0) Live reload total time: 0.651s
Tests paused
Press [r] to resume testing, [o] Toggle test output, [h] for more options>
Ln 14, Col 34
Spaces: 4
UTF-8
LF
Java
JavaSE-11


GreetingResource.java — code-with-quarkus
EXPLORER
OPEN EDITORS
GreetingResourc...
CODE-WITH-QUARKUS
.mvn
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
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JAVA PROJECTS
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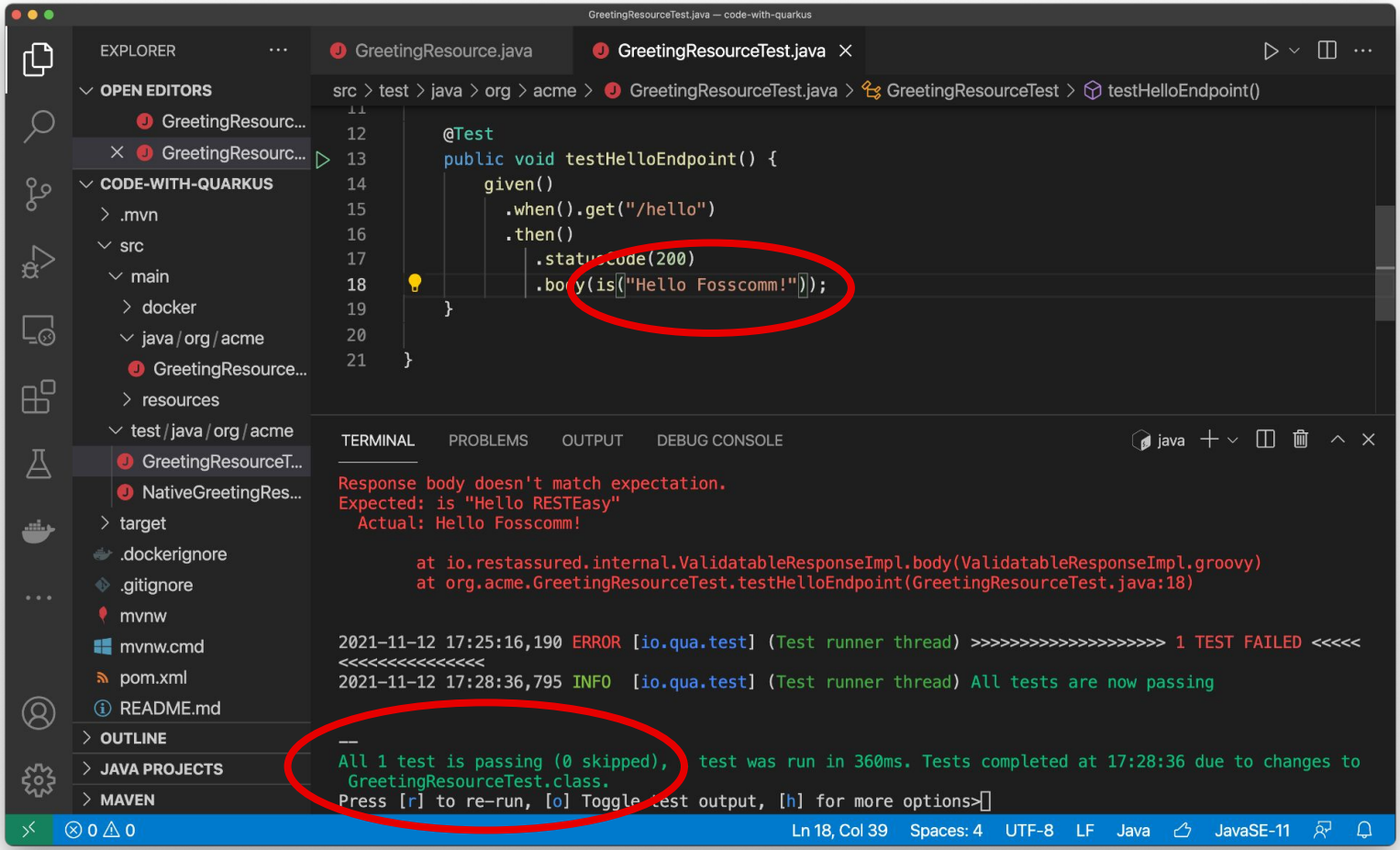
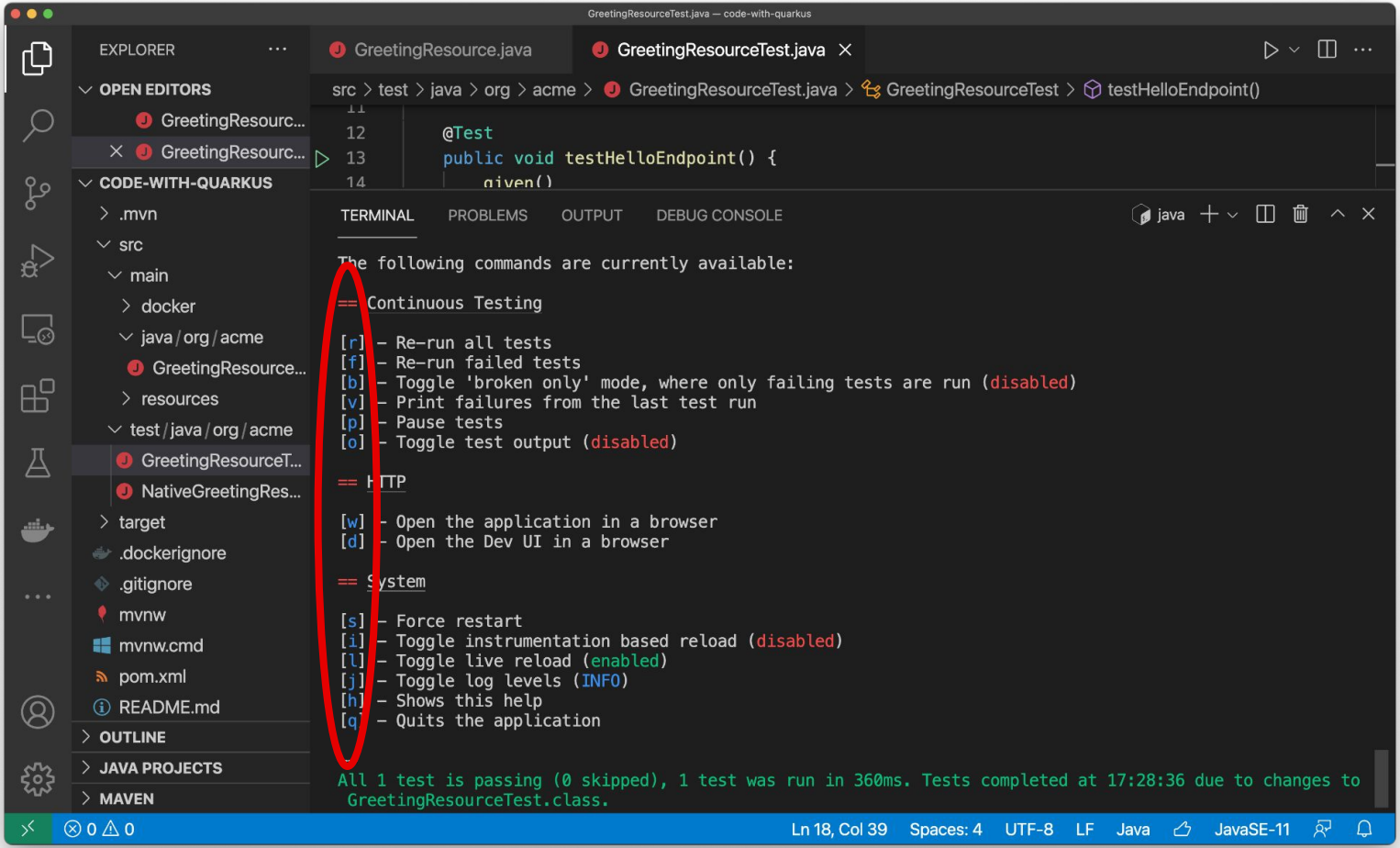
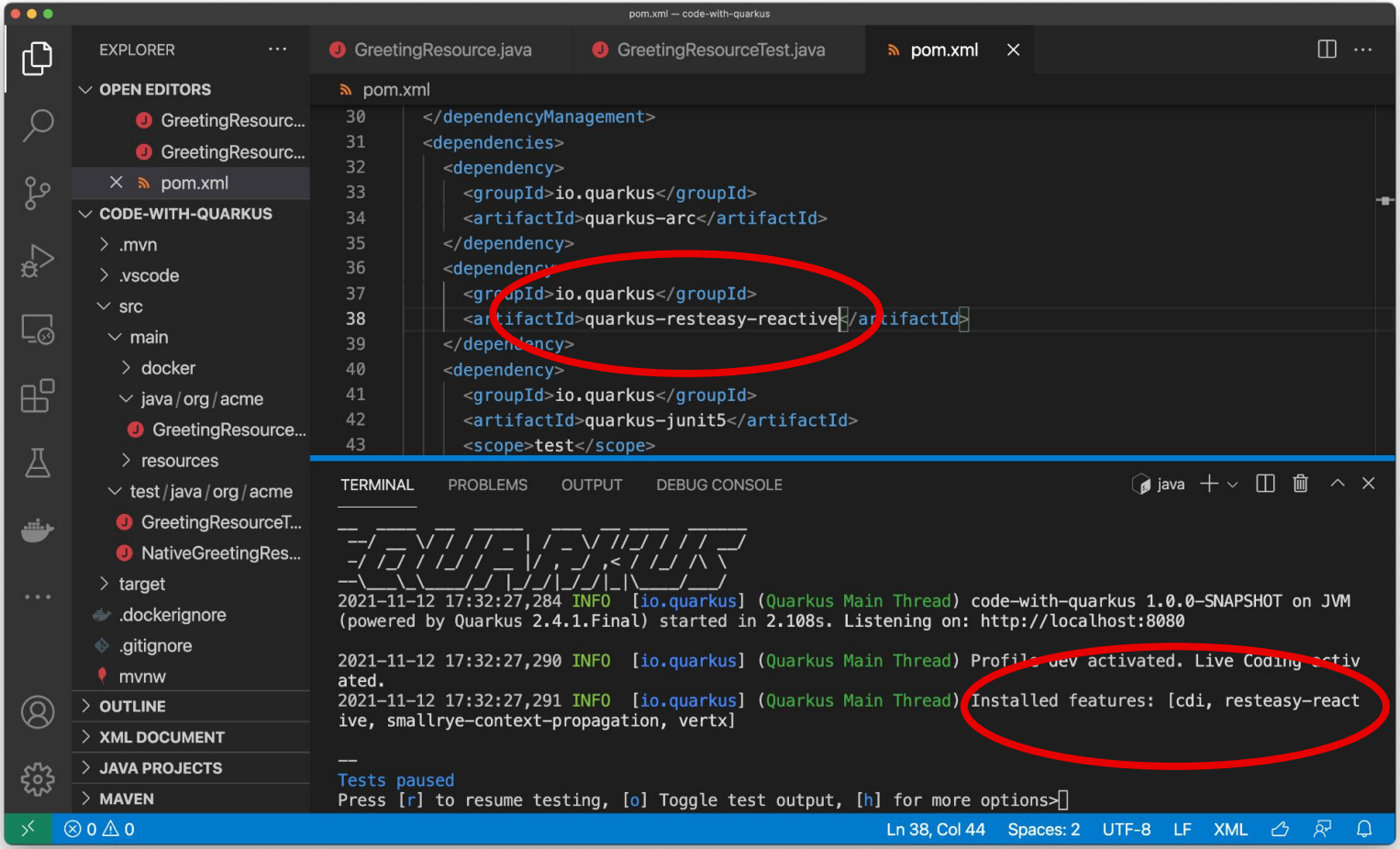
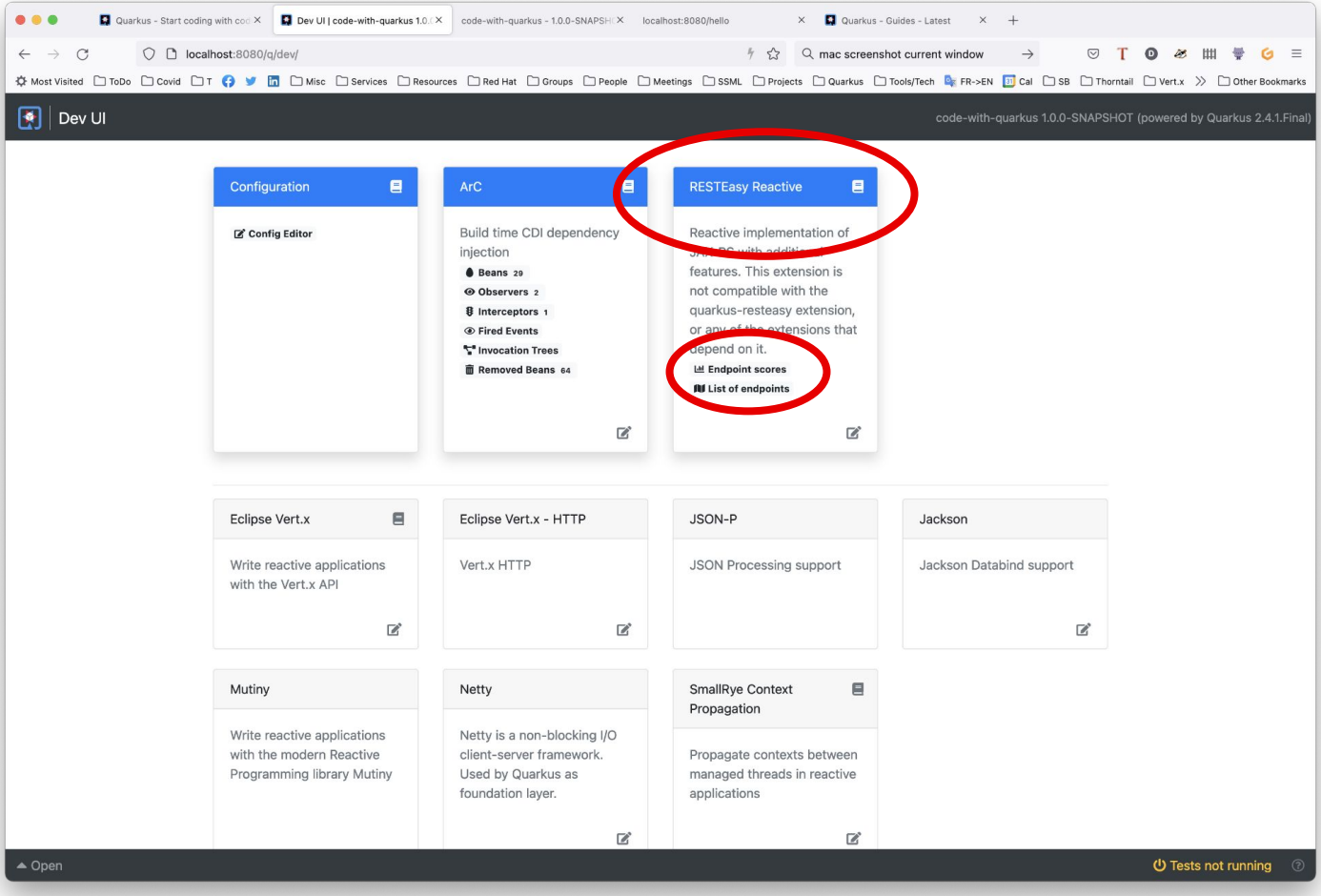
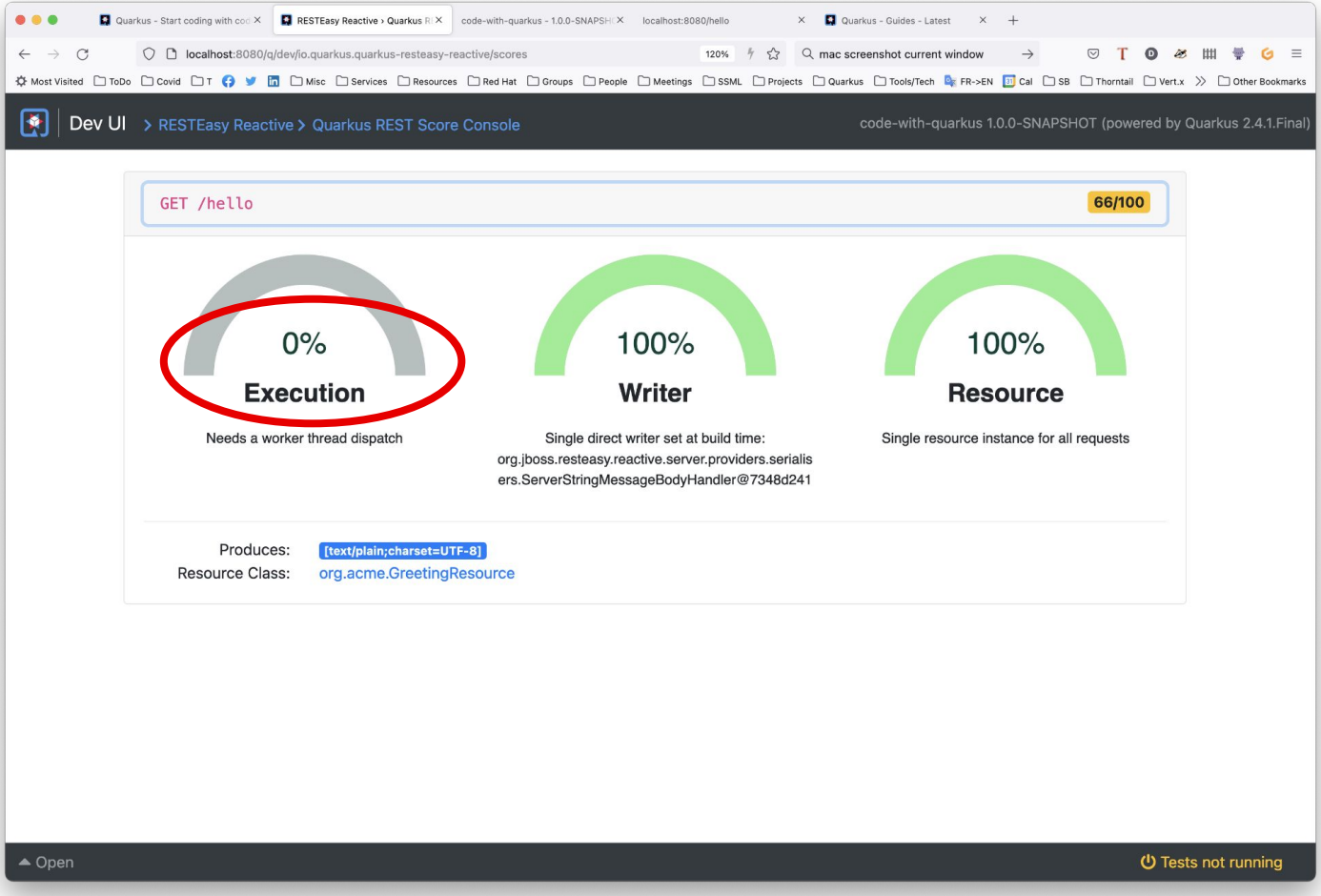
GreetingResource.java
src > main > java > org > acme > GreetingResource.java > GreetingResource > hello()
7
8 @Path("/hello")
9 public class GreetingResource {
10
11 @GET
12 @Produces(MediaType.TEXT_PLAIN)
http://localhost:8080/hello
13 public String hello() {
14 return "Hello Fosscomm!";
15 }
16 }
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
. java.lang.AssertionError: 1 expectation failed.
Response body doesn't match expectation.
Expected: is "Hello RESTEasy"
Actual: Hello Fosscomm!
at org.acme.GreetingResourceTest.testHelloEndpoint(GreetingResourceTest.java:18)
2021-11-12 17:25:16,190 ERROR [io.qua.test] (Test runner thread) >>>>>>>>>>>>>>>>>>>> 1 TEST FAILED <<<<<
<<<<<<<<<<<<<<
1 test failed (0 passing, 0 skipped), 1 test was run in 363ms. Tests completed at 17:25:16 due to changes to GreetingResource.class.
Press [r] to re-run, [o] Toggle test output, [h] for more options>
0 0
Ln 14, Col 34
Spaces: 4
UTF-8
LF
Java
JavaSE-11

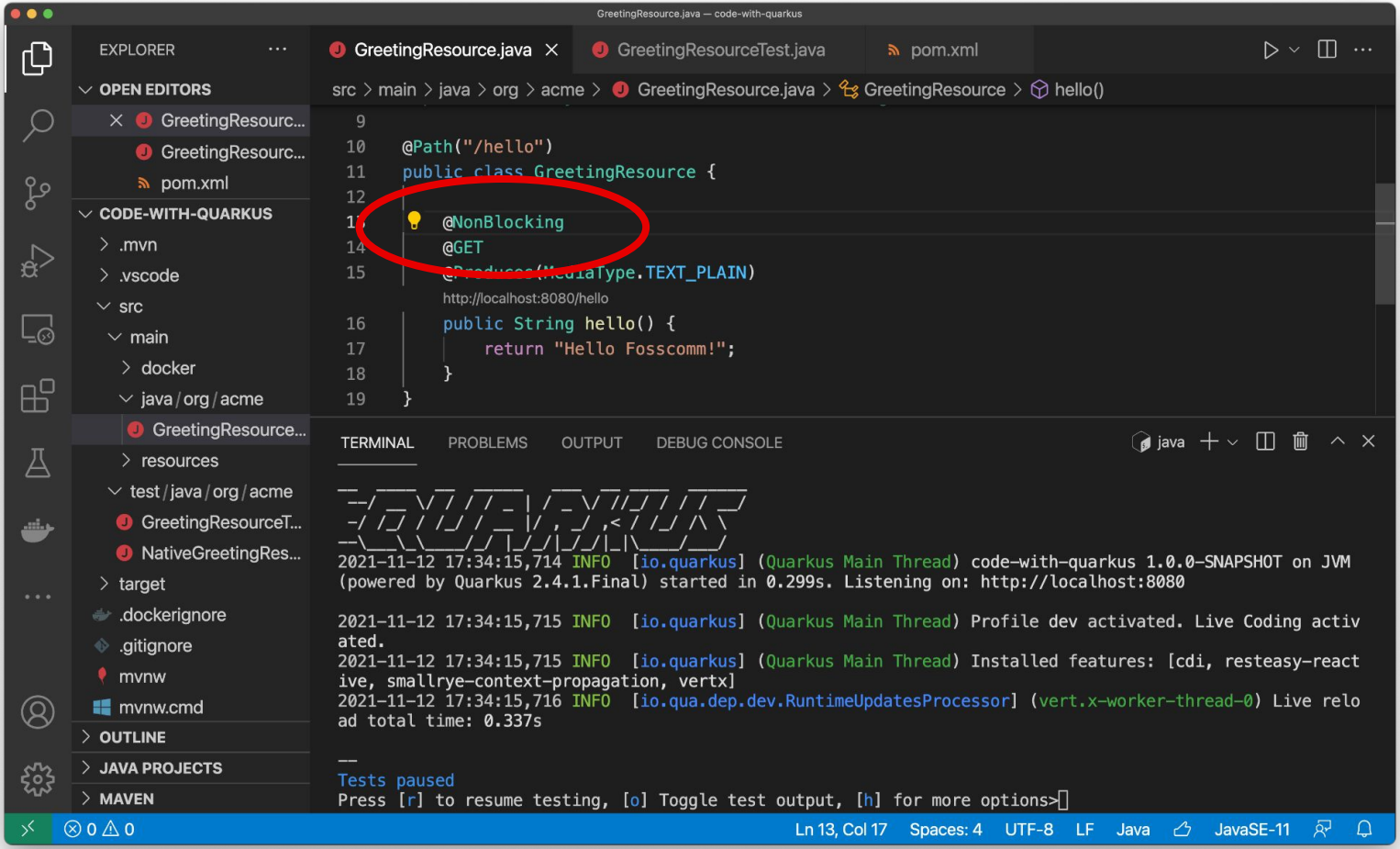

GreetingResourceTest.java — code-with-quarkus
EXPLORER
OPEN EDITORS
GreetingResourc...
GreetingResourc...
CODE-WITH-QUARKUS
.mvn
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
.dockerignore
.gitignore
mvnw
mvnw.cmd
pom.xml
README.md
OUTLINE
JAVA PROJECTS
MAVEN
GreetingResource.java
GreetingResourceTest.java
src > test > java > org > acme > GreetingResourceTest.java > GreetingResourceTest > testHelloEndpoint()
@Test
public void testHelloEndpoint() {
given()
.when().get("/hello")
.then()
.statusCode(200)
.body(is("Hello Fosscomm!"));
}
}
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
Response body doesn't match expectation.
Expected: is "Hello RESTEasy"
Actual: Hello Fosscomm!
at io.restassured.internal.ValidatableResponseImpl.body(ValidatableResponseImpl.groovy)
at org.acme.GreetingResourceTest.testHelloEndpoint(GreetingResourceTest.java:18)
2021-11-12 17:25:16,190 ERROR [io.qua.test] (Test runner thread) >>>>>>>>>>>>>>>>>>>> 1 TEST FAILED <<<<<
<<<<<<<<<<<<<<
2021-11-12 17:28:36,795 INFO [io.qua.test] (Test runner thread) All tests are now passing
--
All 1 test is passing (0 skipped), 1 test was run in 360ms. Tests completed at 17:28:36 due to changes to
GreetingResourceTest.class.
Press [r] to re-run, [o] Toggle test output, [h] for more options>
Ln 18, Col 39
Spaces: 4
UTF-8
LF
Java
JavaSE-11

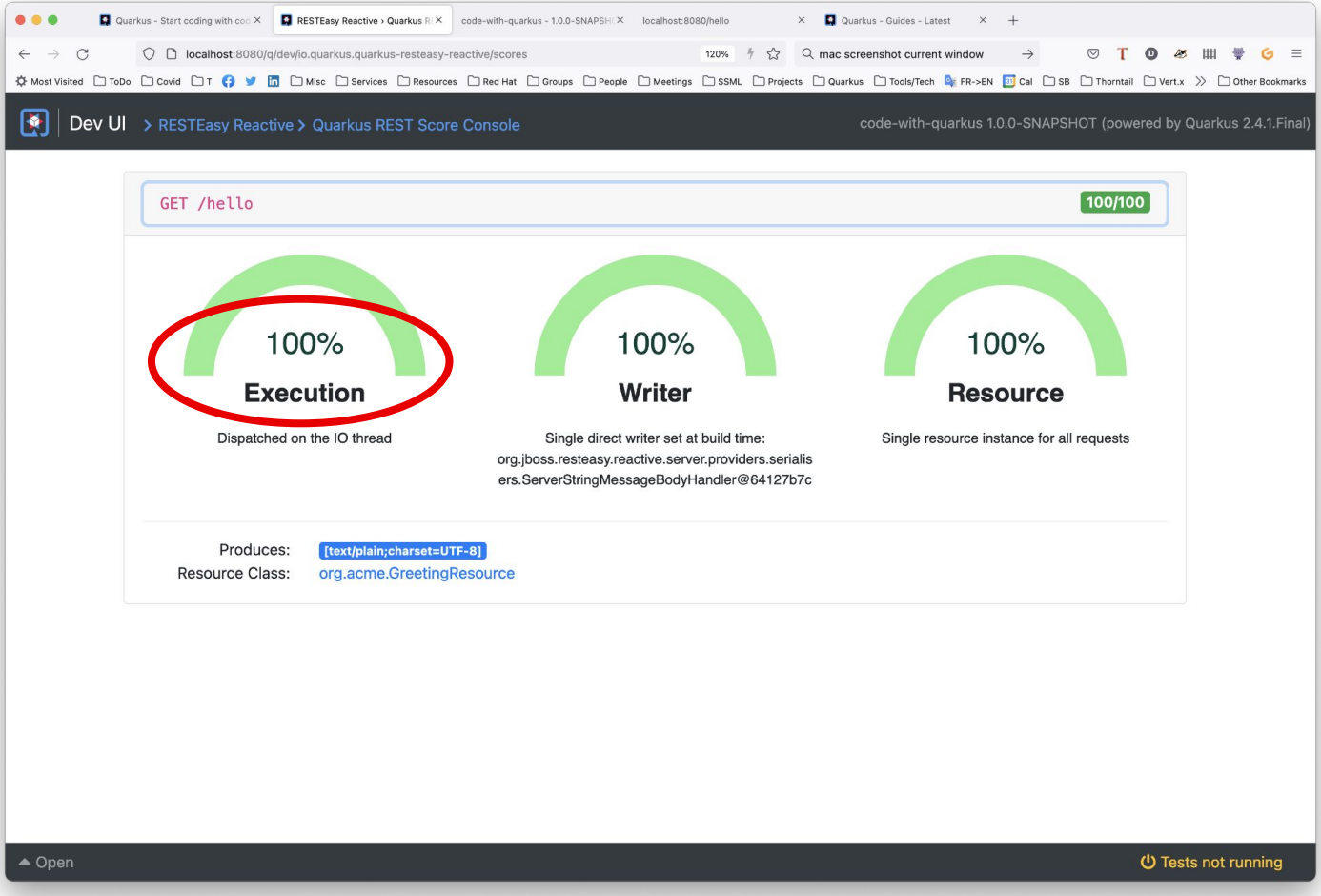

GreetingResourceTest.java — code-with-quarkus
EXPLORER
GreetingResource.java
GreetingResourceTest.java
src > test > java > org > acme > GreetingResourceTest.java > GreetingResourceTest > testHelloEndpoint()
@Test
public void testHelloEndpoint() {
given()
OPEN EDITORS
CODE-WITH-QUARKUS
.mvn
src
main
docker
java / org / acme
resources
test / java / org / acme
target
.dockerignore
.gitignore
mvnw
mvnw.cmd
pom.xml
README.md
OUTLINE
JAVA PROJECTS
MAVEN
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
The following commands are currently available:
== Continuous Testing
[r] - Re-run all tests
[f] - Re-run failed tests
[b] - Toggle 'broken only' mode, where only failing tests are run (disabled)
[v] - Print failures from the last test run
[p] - Pause tests
[o] - Toggle test output (disabled)
== HTTP
[w] - Open the application in a browser
[d] - Open the Dev UI in a browser
== System
[s] - Force restart
[i] - Toggle instrumentation based reload (disabled)
[l] - Toggle live reload (enabled)
[j] - Toggle log levels (INFO)
[h] - Shows this help
[q] - Quits the application
All 1 test is passing (0 skipped), 1 test was run in 360ms. Tests completed at 17:28:36 due to changes to GreetingResourceTest.class.
Ln 18, Col 39
Spaces: 4
UTF-8
LF
Java
JavaSE-11


pom.xml — code-with-quarkus
EXPLORER
OPEN EDITORS
GreetingResourc...
GreetingResourc...
pom.xml
CODE-WITH-QUARKUS
.mvn
.vscode
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
.dockerignore
.gitignore
mvnw
OUTLINE
XML DOCUMENT
JAVA PROJECTS
MAVEN
GreetingResource.java
GreetingResourceTest.java
pom.xml
pom.xml
30 </dependencyManagement>
31 <dependencies>
32 <dependency>
33 <groupId>io.quarkus</groupId>
34 <artifactId>quarkus-arc</artifactId>
35 </dependency>
36 <dependency>
37 <groupId>io.quarkus</groupId>
38 <artifactId>quarkus-resteasy-reactive</artifactId>
39 </dependency>
40 <dependency>
41 <groupId>io.quarkus</groupId>
42 <artifactId>quarkus-junit5</artifactId>
43 <scope>test</scope>
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
2021-11-12 17:32:27,284 INFO [io.quarkus] (Quarkus Main Thread) code-with-quarkus 1.0.0-SNAPSHOT on JVM (powered by Quarkus 2.4.1.Final) started in 2.108s. Listening on: http://localhost:8080
2021-11-12 17:32:27,290 INFO [io.quarkus] (Quarkus Main Thread) Profile dev activated. Live Coding activated.
2021-11-12 17:32:27,291 INFO [io.quarkus] (Quarkus Main Thread) Installed features: [cdi, resteasy-reactive, smallrye-context-propagation, vertx]
Tests paused
Press [r] to resume testing, [o] Toggle test output, [h] for more options>
0 0
Ln 38, Col 44
Spaces: 2
UTF-8
LF
XML


Dev UI
code-with-quarkus 1.0.0-SNAPSHOT (powered by Quarkus 2.4.1.Final)
Configuration
Config Editor
ArC
Build time CDI dependency injection
Beans 29
Observers 2
Interceptors 1
Fired Events
Invocation Trees
Removed Beans 64
RESTEasy Reactive
Reactive implementation of
features. This extension is
not compatible with the
quarkus-resteasy extension,
depend on it.
Endpoint scores
List of endpoints
Eclipse Vert.x
Write reactive applications with the Vert.x API
Eclipse Vert.x - HTTP
Vert.x HTTP
JSON-P
JSON Processing support
Jackson
Jackson Databind support
Mutiny
Write reactive applications with the modern Reactive Programming library Mutiny
Netty
Netty is a non-blocking I/O client-server framework. Used by Quarkus as foundation layer.
SmallRye Context Propagation
Propagate contexts between managed threads in reactive applications
Open
Tests not running


Quarkus - Start coding with cod
RESTEasy Reactive › Quarkus R
code-with-quarkus - 1.0.0-SNAPSHI
localhost:8080/hello
Quarkus - Guides - Latest
localhost:8080/q/dev/io.quarkus.quarkus-resteasy-reactive/scores
120%
mac screenshot current window
Most Visited
ToDo
Covid
T
Misc
Services
Resources
Red Hat
Groups
People
Meetings
SSML
Projects
Quarkus
Tools/Tech
FR->EN
Cal
SB
Thorntail
Vert.x
Other Bookmarks
Dev UI
> RESTEasy Reactive > Quarkus REST Score Console
code-with-quarkus 1.0.0-SNAPSHOT (powered by Quarkus 2.4.1.Final)
GET /hello
66/100
0%
Execution
Needs a worker thread dispatch
100%
Writer
Single direct writer set at build time:
org.jboss.resteasy.reactive.server.providers.serialis
ers.ServerStringMessageBodyHandler@7348d241
100%
Resource
Single resource instance for all requests
Produces:
[text/plain;charset=UTF-8]
Resource Class:
org.acme.GreetingResource
Open
Tests not running


GreetingResource.java — code-with-quarkus
EXPLORER
GreetingResource.java
GreetingResourceTest.java
pom.xml
src > main > java > org > acme > GreetingResource.java > GreetingResource > hello()
OPEN EDITORS
CODE-WITH-QUARKUS
.mvn
.vscode
src
main
docker
java / org / acme
GreetingResource...
resources
test / java / org / acme
GreetingResourceT...
NativeGreetingRes...
target
.dockerignore
.gitignore
mvnw
mvnw.cmd
OUTLINE
JAVA PROJECTS
MAVEN
9
10 @Path("/hello")
11 public class GreetingResource {
12
13 @NonBlocking
14 @GET
15 @Produces(MediaType.TEXT_PLAIN)
http://localhost:8080/hello
16 public String hello() {
17 return "Hello Fosscomm!";
18 }
19 }
TERMINAL
PROBLEMS
OUTPUT
DEBUG CONSOLE
java
2021-11-12 17:34:15,714 INFO [io.quarkus] (Quarkus Main Thread) code-with-quarkus 1.0.0-SNAPSHOT on JVM (powered by Quarkus 2.4.1.Final) started in 0.299s. Listening on: http://localhost:8080
2021-11-12 17:34:15,715 INFO [io.quarkus] (Quarkus Main Thread) Profile dev activated. Live Coding activated.
2021-11-12 17:34:15,715 INFO [io.quarkus] (Quarkus Main Thread) Installed features: [cdi, resteasy-reactive, smallrye-context-propagation, vertx]
2021-11-12 17:34:15,716 INFO [io.qua.dep.dev.RuntimeUpdatesProcessor] (vert.x-worker-thread-0) Live reload total time: 0.337s
Tests paused
Press [r] to resume testing, [o] Toggle test output, [h] for more options>
0 0
Ln 13, Col 17
Spaces: 4
UTF-8
LF
Java
JavaSE-11


Quarkus - Start coding with cod
RESTEasy Reactive › Quarkus R
code-with-quarkus - 1.0.0-SNAPSHI
localhost:8080/hello
Quarkus - Guides - Latest
localhost:8080/q/dev/io.quarkus.quarkus-resteasy-reactive/scores
120%
mac screenshot current window
Most Visited
ToDo
Covid
T
Misc
Services
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Tools/Tech
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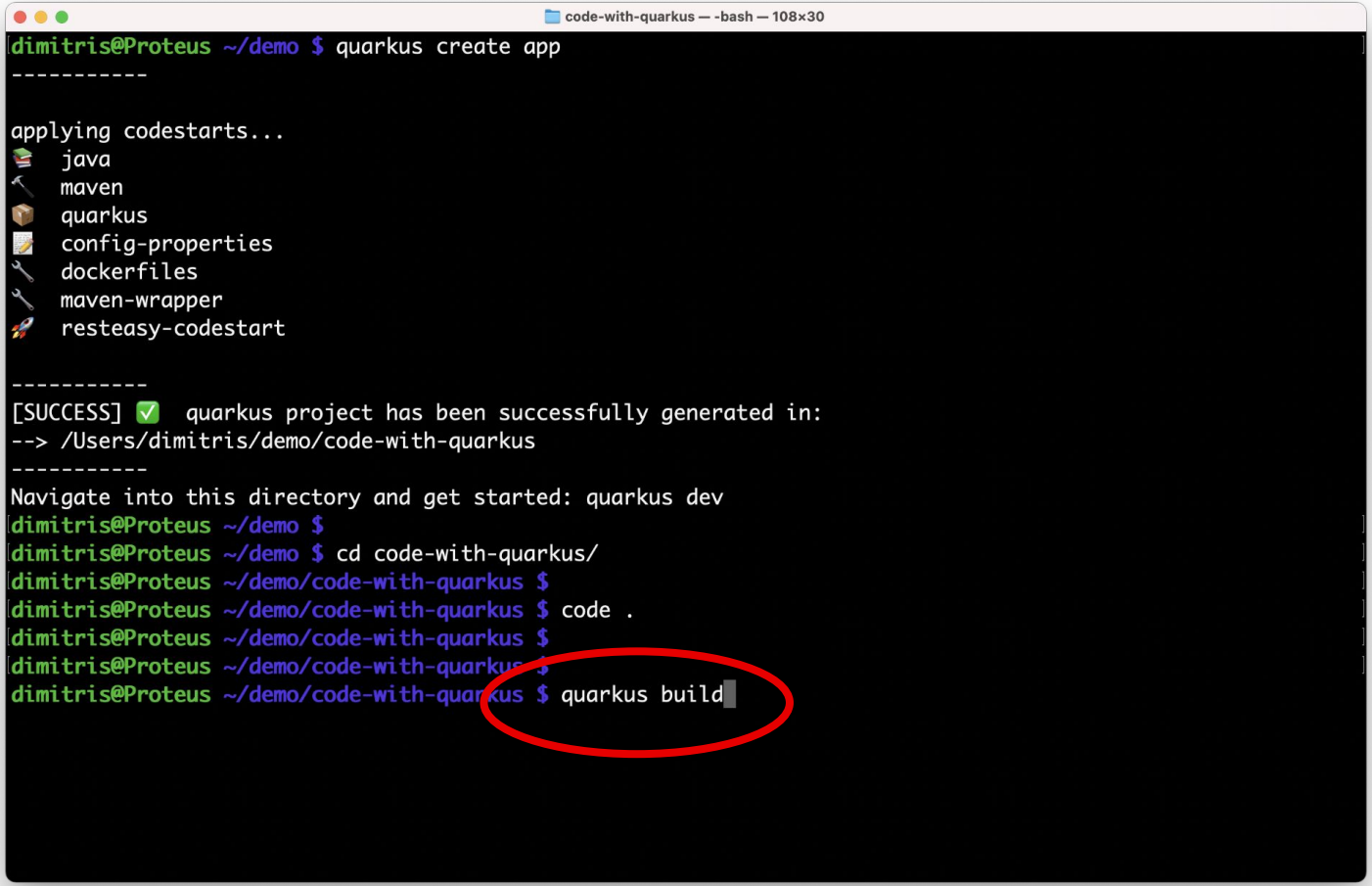
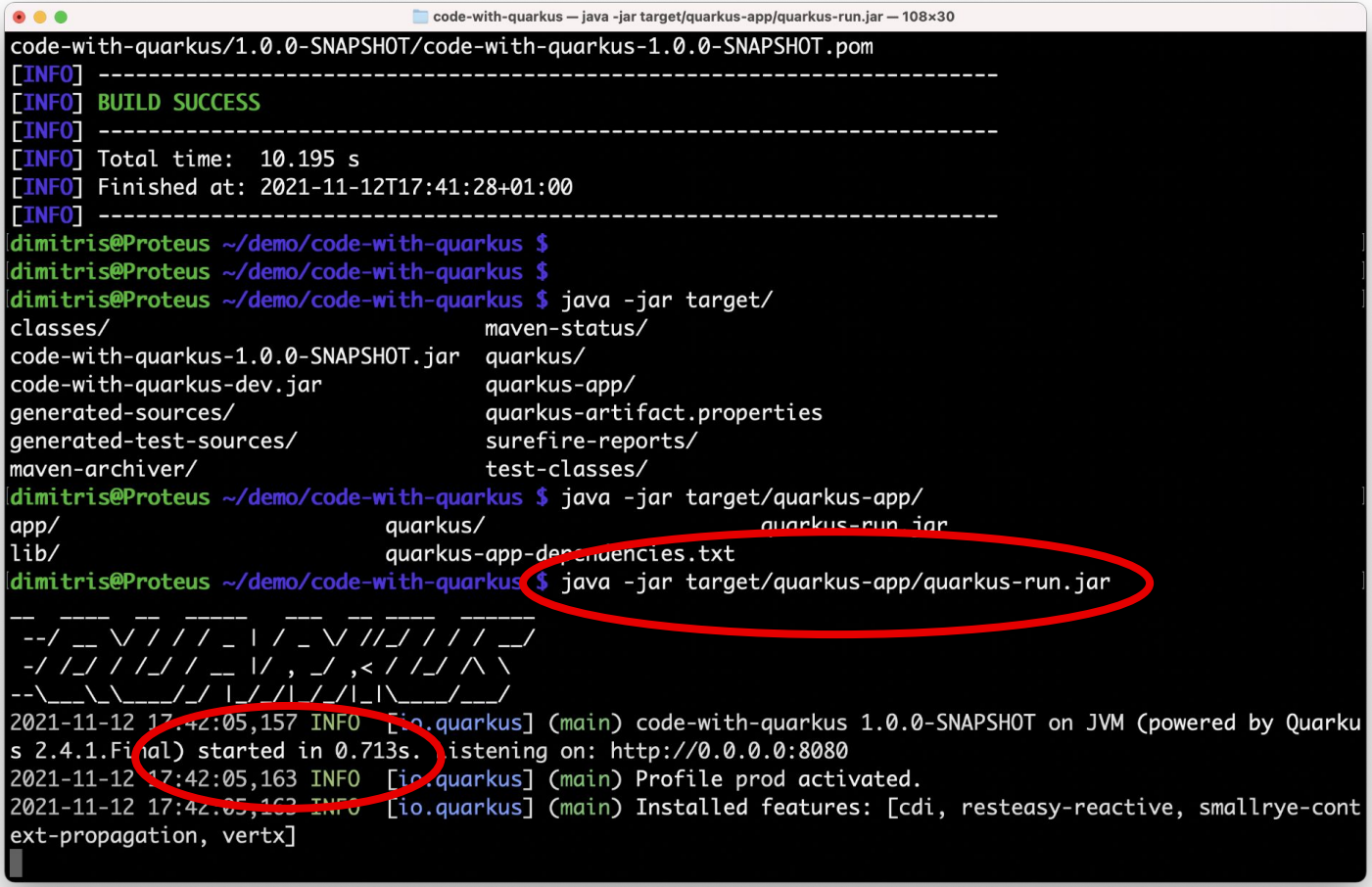
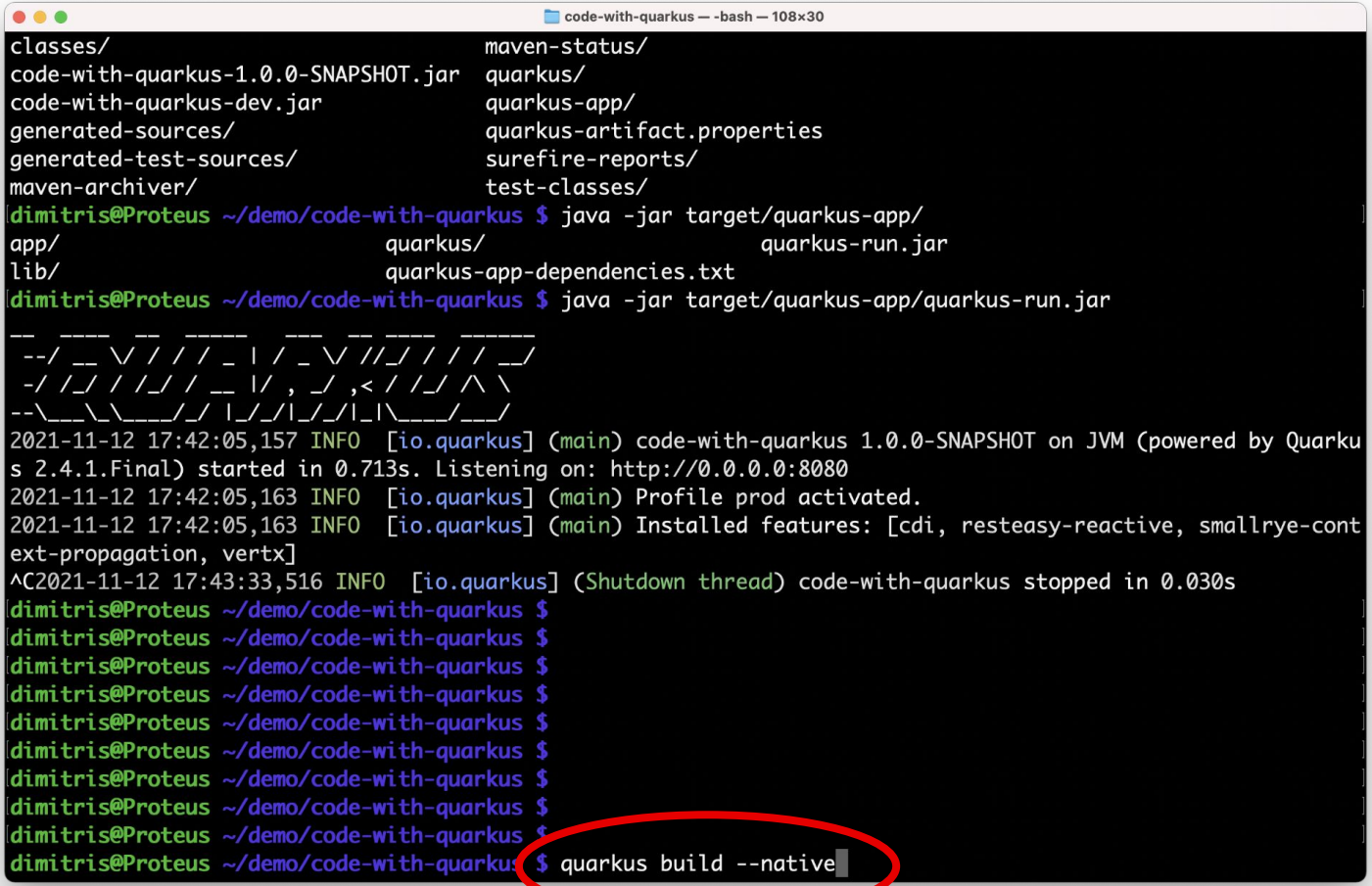
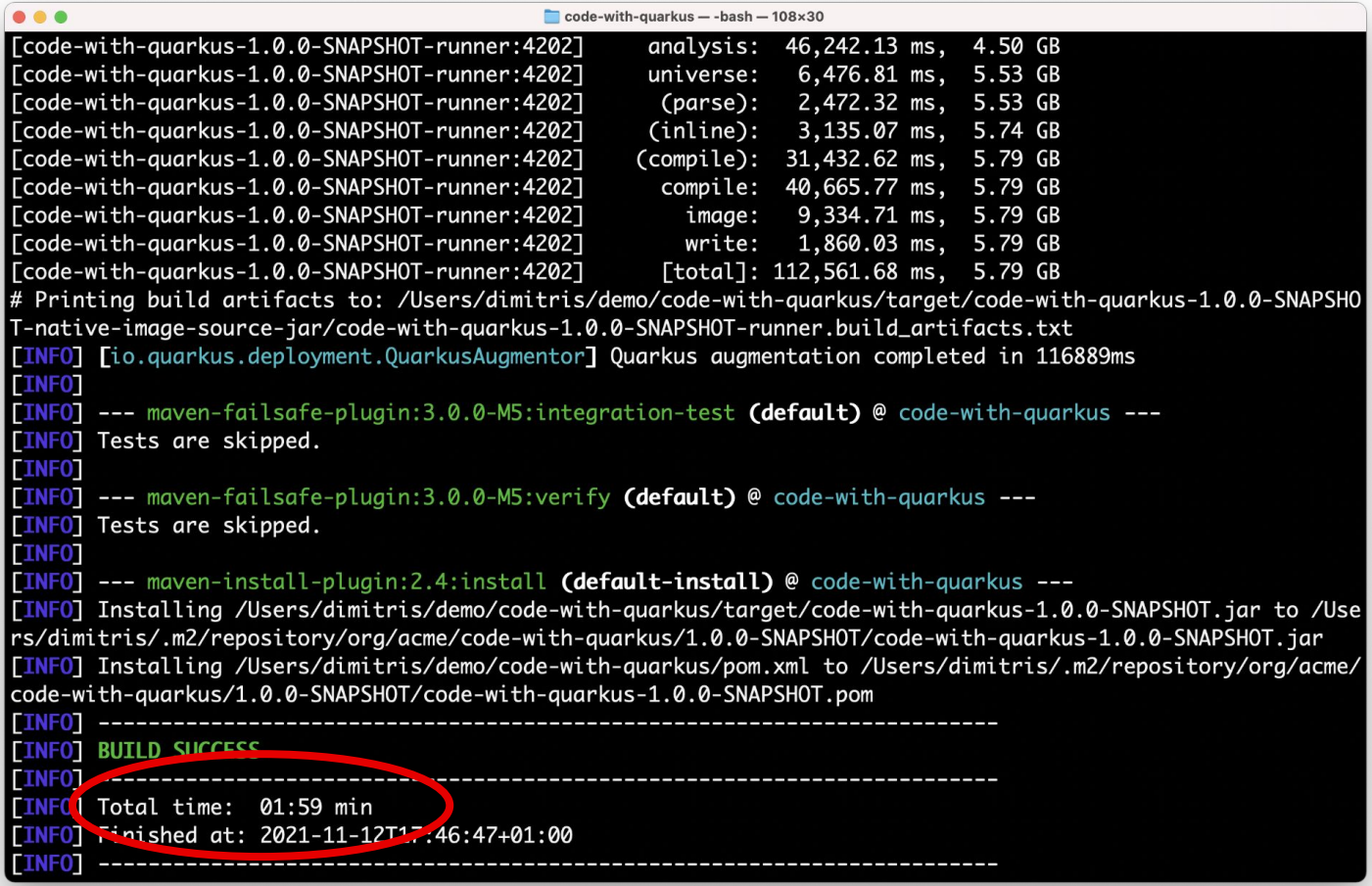
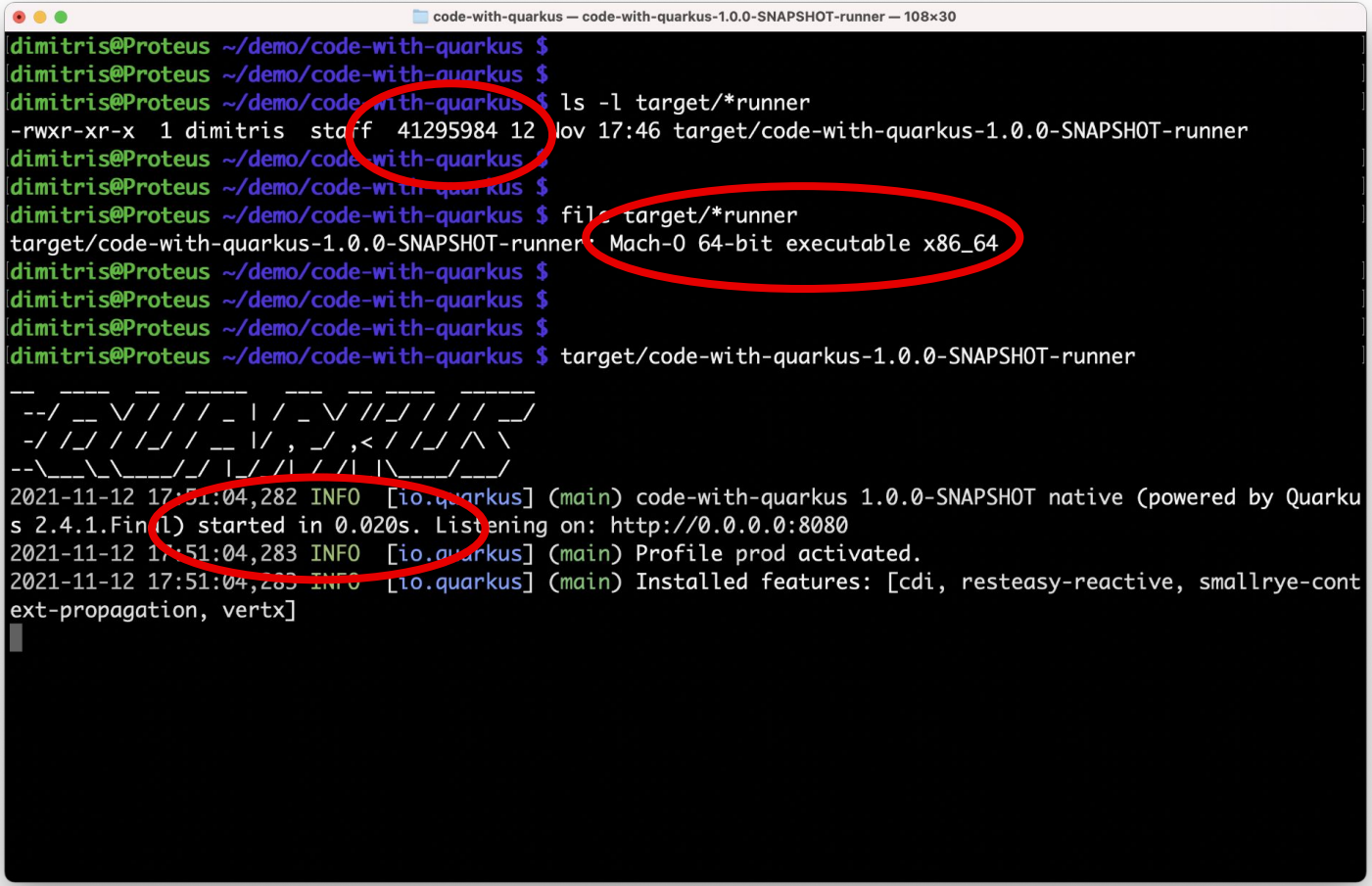
Thorntail
Vert.x
Other Bookmarks
Dev UI
> RESTEasy Reactive > Quarkus REST Score Console
code-with-quarkus 1.0.0-SNAPSHOT (powered by Quarkus 2.4.1.Final)
GET /hello
100/100
100%
Execution
Dispatched on the IO thread
100%
Writer
Single direct writer set at build time:
org.jboss.resteasy.reactive.server.providers.serialisers.ServerStringMessageBodyHandler@64127b7c
100%
Resource
Single resource instance for all requests
Produces:
[text/plain;charset=UTF-8]
Resource Class:
org.acme.GreetingResource
Open
Tests not running


code-with-quarkus — -bash — 108×30
dimitris@Proteus ~/demo $ quarkus create app
applying codestarts...
java
maven
quarkus
config-properties
dockerfiles
maven-wrapper
resteasy-codestart
[SUCCESS] ✅ quarkus project has been successfully generated in:
--> /Users/dimitris/demo/code-with-quarkus
Navigate into this directory and get started: quarkus dev
dimitris@Proteus ~/demo $
dimitris@Proteus ~/demo $ cd code-with-quarkus/
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ code .
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ quarkus build


code-with-quarkus — java -jar target/quarkus-app/quarkus-run.jar — 108×30
code-with-quarkus/1.0.0-SNAPSHOT/code-with-quarkus-1.0.0-SNAPSHOT.pom
[INFO] --
[INFO] BUILD SUCCESS
[INFO] --
[INFO] Total time: 10.195 s
[INFO] Finished at: 2021-11-12T17:41:28+01:00
[INFO] --
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ java -jar target/
classes/ maven-status/
code-with-quarkus-1.0.0-SNAPSHOT.jar quarkus/
code-with-quarkus-dev.jar quarkus-app/
generated-sources/ quarkus-artifact.properties
generated-test-sources/ surefire-reports/
maven-archiver/ test-classes/
dimitris@Proteus ~/demo/code-with-quarkus $ java -jar target/quarkus-app/
app/ quarkus/
lib/ quarkus-app-dependencies.txt
dimitris@Proteus ~/demo/code-with-quarkus $ java -jar target/quarkus-app/quarkus-run.jar
2021-11-12 17:42:05,157 INFO [io.quarkus] (main) code-with-quarkus 1.0.0-SNAPSHOT on JVM (powered by Quarkus 2.4.1.Final) started in 0.713s. Listening on: http://0.0.0.0:8080
2021-11-12 17:42:05,163 INFO [io.quarkus] (main) Profile prod activated.
2021-11-12 17:42:05,163 INFO [io.quarkus] (main) Installed features: [cdi, resteasy-reactive, smallrye-context-propagation, vertx]


code-with-quarkus — -bash — 108×30
classes/
code-with-quarkus-1.0.0-SNAPSHOT.jar
code-with-quarkus-dev.jar
generated-sources/
generated-test-sources/
maven-archiver/
maven-status/
quarkus/
quarkus-app/
quarkus-artifact.properties
surefire-reports/
test-classes/
dimitris@Proteus ~/demo/code-with-quarkus $ java -jar target/quarkus-app/
app/
lib/
quarkus/
quarkus-app-dependencies.txt
quarkus-run.jar
dimitris@Proteus ~/demo/code-with-quarkus $ java -jar target/quarkus-app/quarkus-run.jar
2021-11-12 17:42:05,157 INFO [io.quarkus] (main) code-with-quarkus 1.0.0-SNAPSHOT on JVM (powered by Quarkus 2.4.1.Final) started in 0.713s. Listening on: http://0.0.0.0:8080
2021-11-12 17:42:05,163 INFO [io.quarkus] (main) Profile prod activated.
2021-11-12 17:42:05,163 INFO [io.quarkus] (main) Installed features: [cdi, resteasy-reactive, smallrye-context-propagation, vertx]
^C2021-11-12 17:43:33,516 INFO [io.quarkus] (Shutdown thread) code-with-quarkus stopped in 0.030s
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ quarkus build --native


code-with-quarkus — -bash — 108×30
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   analysis: 46,242.13 ms, 4.50 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   universe: 6,476.81 ms, 5.53 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   (parse):   2,472.32 ms, 5.53 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   (inline):   3,135.07 ms, 5.74 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   (compile): 31,432.62 ms, 5.79 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   compile: 40,665.77 ms, 5.79 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   image: 9,334.71 ms, 5.79 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   write: 1,860.03 ms, 5.79 GB
[code-with-quarkus-1.0.0-SNAPSHOT-runner:4202]   [total]: 112,561.68 ms, 5.79 GB
Printing build artifacts to: /Users/dimitris/demo/code-with-quarkus/target/code-with-quarkus-1.0.0-SNAPSHOT-native-image-source-jar/code-with-quarkus-1.0.0-SNAPSHOT-runner.build_artifacts.txt
[INFO] [io.quarkus.deployment.QuarkusAugmentor] Quarkus augmentation completed in 116889ms
[INFO]
[INFO] --- maven-failsafe-plugin:3.0.0-M5:integration-test (default) @ code-with-quarkus ---
[INFO] Tests are skipped.
[INFO]
[INFO] --- maven-failsafe-plugin:3.0.0-M5:verify (default) @ code-with-quarkus ---
[INFO] Tests are skipped.
[INFO]
[INFO] --- maven-install-plugin:2.4:install (default-install) @ code-with-quarkus ---
[INFO] Installing /Users/dimitris/demo/code-with-quarkus/target/code-with-quarkus-1.0.0-SNAPSHOT.jar to /Users/dimitris/.m2/repository/org/acme/code-with-quarkus/1.0.0-SNAPSHOT/code-with-quarkus-1.0.0-SNAPSHOT.jar
[INFO] Installing /Users/dimitris/demo/code-with-quarkus/pom.xml to /Users/dimitris/.m2/repository/org/acme/code-with-quarkus/1.0.0-SNAPSHOT/code-with-quarkus-1.0.0-SNAPSHOT.pom
[INFO] --
[INFO] BUILD SUCCESS
[INFO] --
[INFO] Total time: 01:59 min
[INFO] Finished at: 2021-11-12T17:46:47+01:00
[INFO] --

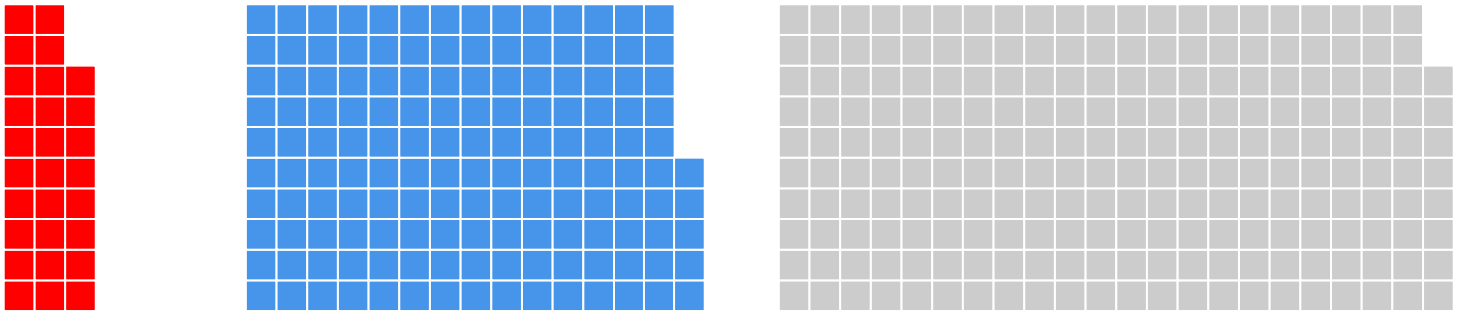

code-with-quarkus — code-with-quarkus-1.0.0-SNAPSHOT-runner — 108×30
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ ls -l target/*runner
-rwxr-xr-x 1 dimitris staff 41295984 12 Nov 17:46 target/code-with-quarkus-1.0.0-SNAPSHOT-runner
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ file target/*runner
target/code-with-quarkus-1.0.0-SNAPSHOT-runner: Mach-O 64-bit executable x86_64
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $
dimitris@Proteus ~/demo/code-with-quarkus $ target/code-with-quarkus-1.0.0-SNAPSHOT-runner
2021-11-12 17:51:04,282 INFO [io.quarkus] (main) code-with-quarkus 1.0.0-SNAPSHOT native (powered by Quarkus 2.4.1.Final) started in 0.020s. Listening on: http://0.0.0.0:8080
2021-11-12 17:51:04,283 INFO [io.quarkus] (main) Profile prod activated.
2021-11-12 17:51:04,283 INFO [io.quarkus] (main) Installed features: [cdi, resteasy-reactive, smallrye-context-propagation, vertx]

Recap:

Why QUARKUS?

Benefit No. 1: Supersonic Subatomic Java

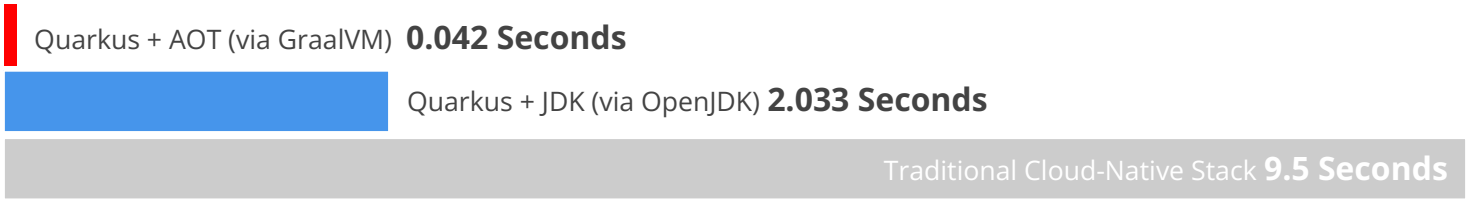
REST + CRUD



Quarkus + AOT (via GraalVM)
28 MB

Quarkus + JDK (via OpenJDK)
145 MB

Traditional Cloud-Native Stack
209 MB

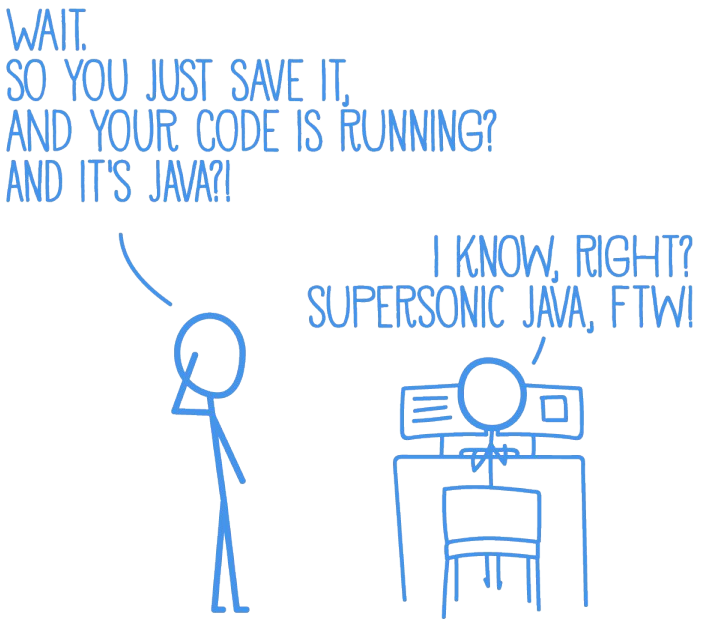


Time to first **response**

Benefit No. 2: Developer Joy

A cohesive platform for optimized 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
- Live testing!



Benefit No. 3: Unifies Imperative and Reactive

```
@Inject
SayService say;

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

```
@Channel("kafka") Multi<String> events;

@GET
@Produces(MediaType.SERVER_SENT_EVENTS)
public Multi<String> events() {
      return events;
}
```

- 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

Benefit No. 4: Best of Breed Frameworks & Standards

Quarkus provides a cohesive, fun to use, full-stack framework by leveraging a growing list of over fifty best-of-breed libraries that you love and use. All wired on a standard backbone.

Benefit No. 5: Continuous Innovation

Beyond support for popular and de-facto frameworks and standards, Quarkus is breaking ground with constant innovation in new APIs and implementations.

New Quarkus APIs & Impls

- Panache - Simplified Hibernate ORM
- Qute - New Templating Engine
- Funqy - Portable Functions API
- Mutiny - Reactive Programming Library
- RestEasy Reactive - Reactive JAX-RS variant
- Hibernate Reactive
- ...more to come

Want to learn more?

QUARKUS

https://quarkus.io

https://quarkusio.zulipchat.com

https://youtube.com/quarkusio

@quarkusio

If you like Quarkus, star it on GitHub!
https://github.com/quarkusio/quarkus