Enseñando trucos de 20 años a Kotlin

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Kotlin

Kotlin

- Tipado estático y compilado
- Java inter-op
- OO + FP
- Null safety
- Extensions
- Operator overloading
- Data classes
- One line methods

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Kotlin - Datos interesantes

- Effective Java - Inmutabilidad, builder, singleton, override, final by default, variance by generics
- Elvis - Groovy
- Inferencia de tipos - Scala
- Inmutabilidad - Scala
- Declaración de variables - Scala
- Manejo de Null - Groovy
- Closures y funciones - Groovy
- Google

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Java - Muriendo desde 1995

- Sistemas legados (IBM)
- Retrocompatibilidad
- Release cadence (6 meses)
- Innovación constante en el ecosistema (Spring Boot, Micronaut, MicroProfile, GraalVM)
- Raw performance (Beam, Spark, Hadoop)
- Tooling - IDE, Maven, Drivers RDBMS
- JVM - (Twitter, Alibaba)
- OpenJDK

Java™

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Java - Muriendo desde 1995

Bruno Borges @brunoborges · May 27

Stop trying to fit front-end development approach to back-end development.

Great back-end systems become legacy systems as in: they keep running for years with minor changes.

Great front-end systems become legacy systems as in: they haven't changed to adapt to user's needs.

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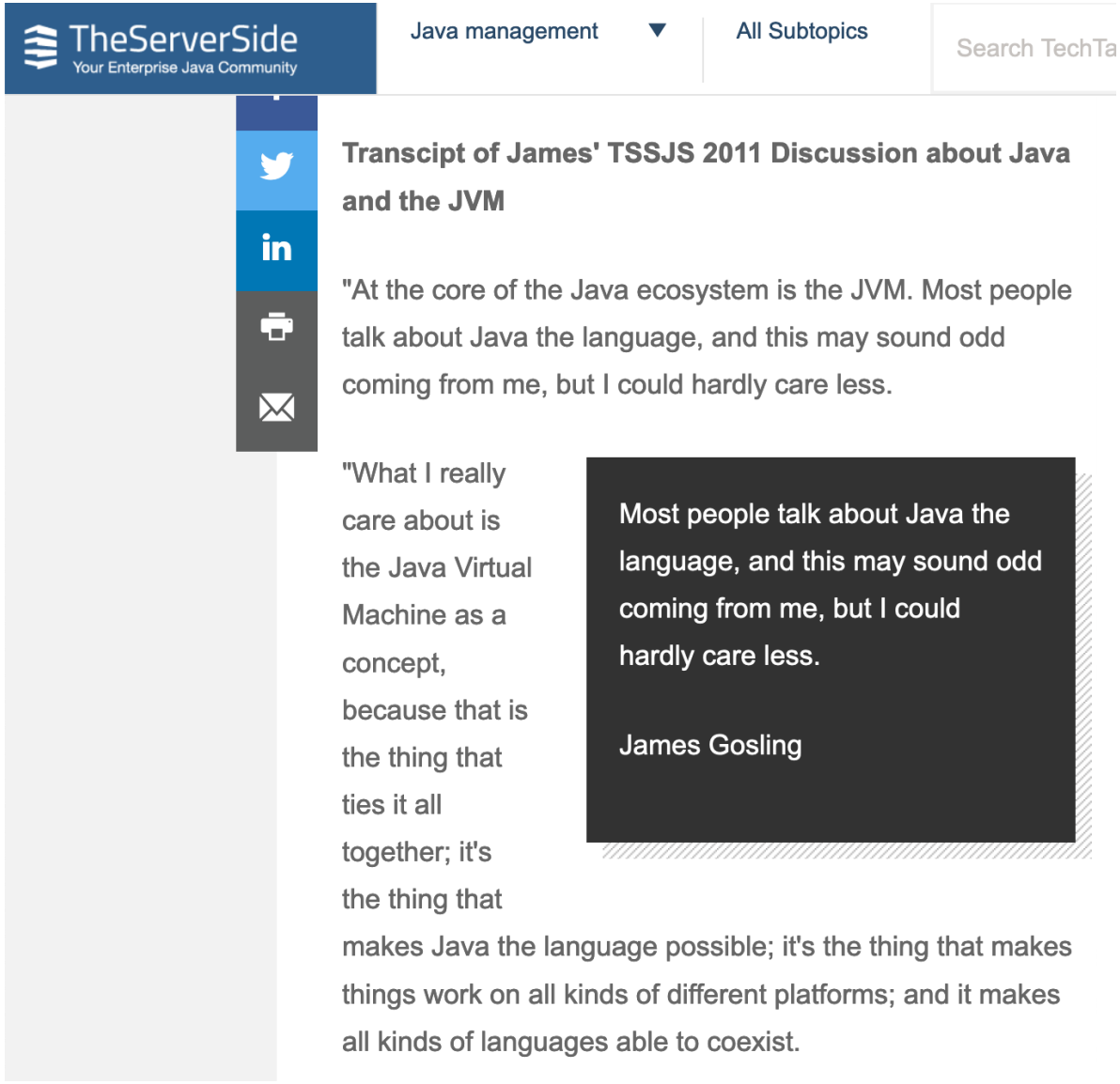
Java - Muriendo desde 1995



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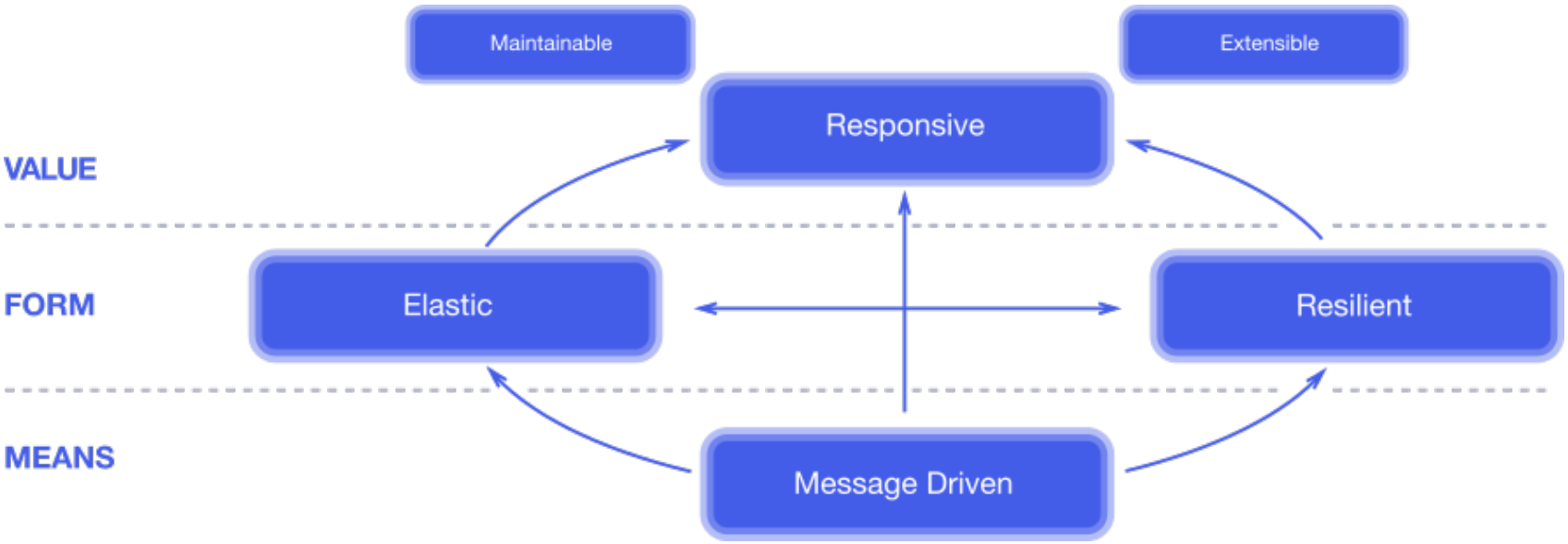
¿Microservicios?

Aplicaciones reactivas



Microservicios son una (de muchas) herramienta para creación de aplicaciones reactivas

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Microservicios

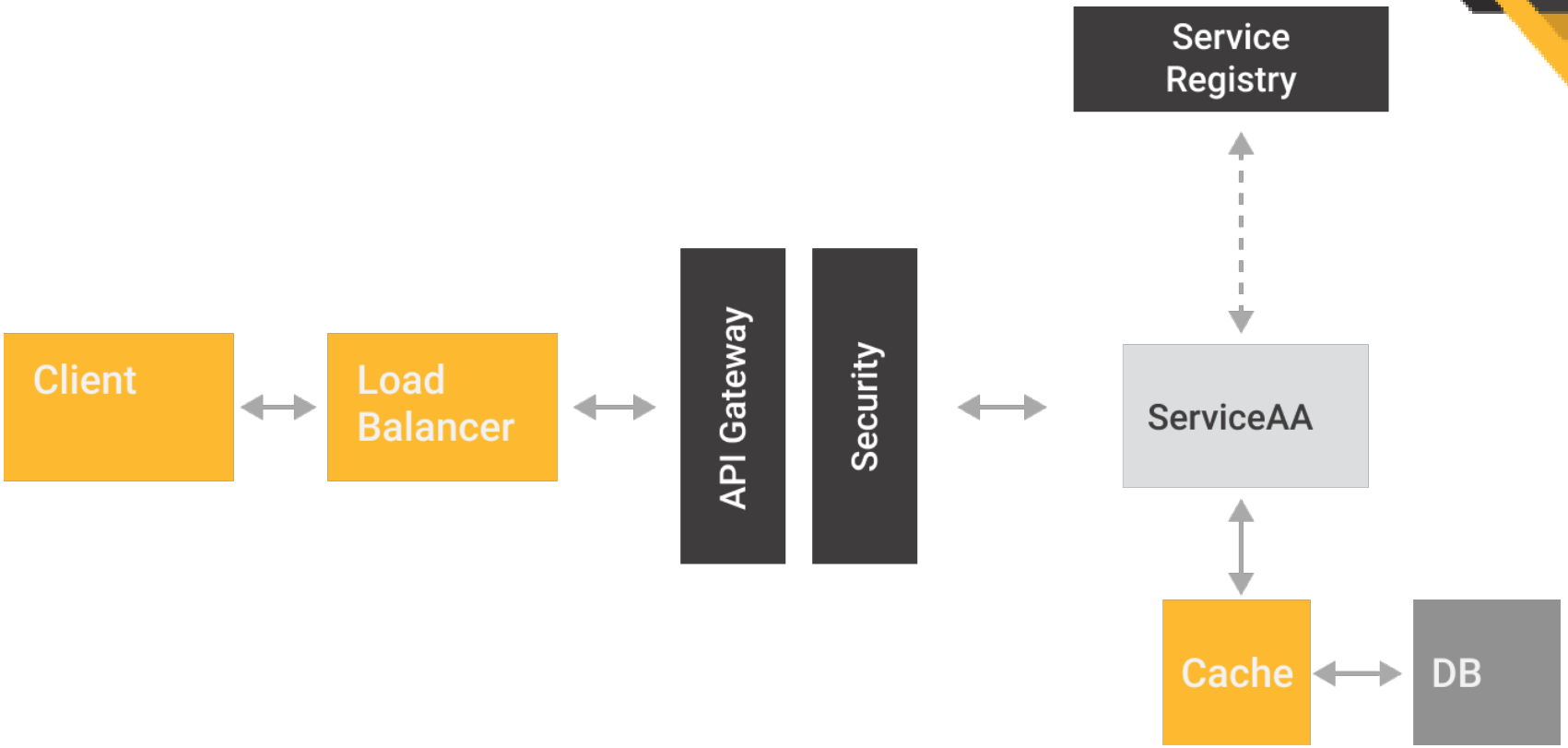

Figura 1: Microservicios

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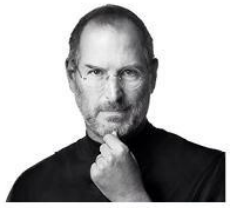
Microservicios - Java

- DIY - Jooby, Javalin, Micronaut, Spark, Vert.x, Helidon SE
- Enterprise - Spring Boot, Microprofile (implementaciones)

Microservicios - Kotlin

- DIY - Jooby, Javalin, Micronaut, Spark, Vert.x, Helidon SE, **Ktor**
- Enterprise - Spring Boot, Microprofile (implementaciones)

	DEVELOPERS	DESIGNERS	PROJECT MANAGERS	QA	SYSADMINS
SEEN BY DEVELOPERS					
SEEN BY DESIGNERS					
SEEN BY PROJECT MANAGERS					
SEEN BY QA					
SEEN BY SYSADMINS					

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Jakarta EE 8

Jakarta EE 8

Java EE 8

Batch	Dependency Injection	JACC	JAXR	JSTL	Management
Bean Validation	Deployment	JASPIC	JMS	JTA	Servlet
CDI	EJB	JAX-RPC	JSF	JPA	Web Services
Common Annotations	EL	JAX-RS	JSON-P	JavaMail	Web Services Metadata
Concurrency EE	Interceptors	JAX-WS	JSP	Managed Beans	WebSocket
Connector	JSP Debugging	JAXB			
JSON-B	Security				

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Jakarta EE 8 - Comunidad Java EE

JAKARTA EE

JAVA EE GUARDIANS

MICROPROFILE™
OPTIMIZING ENTERPRISE JAVA

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Eclipse MicroProfile

Eclipse MicroProfile

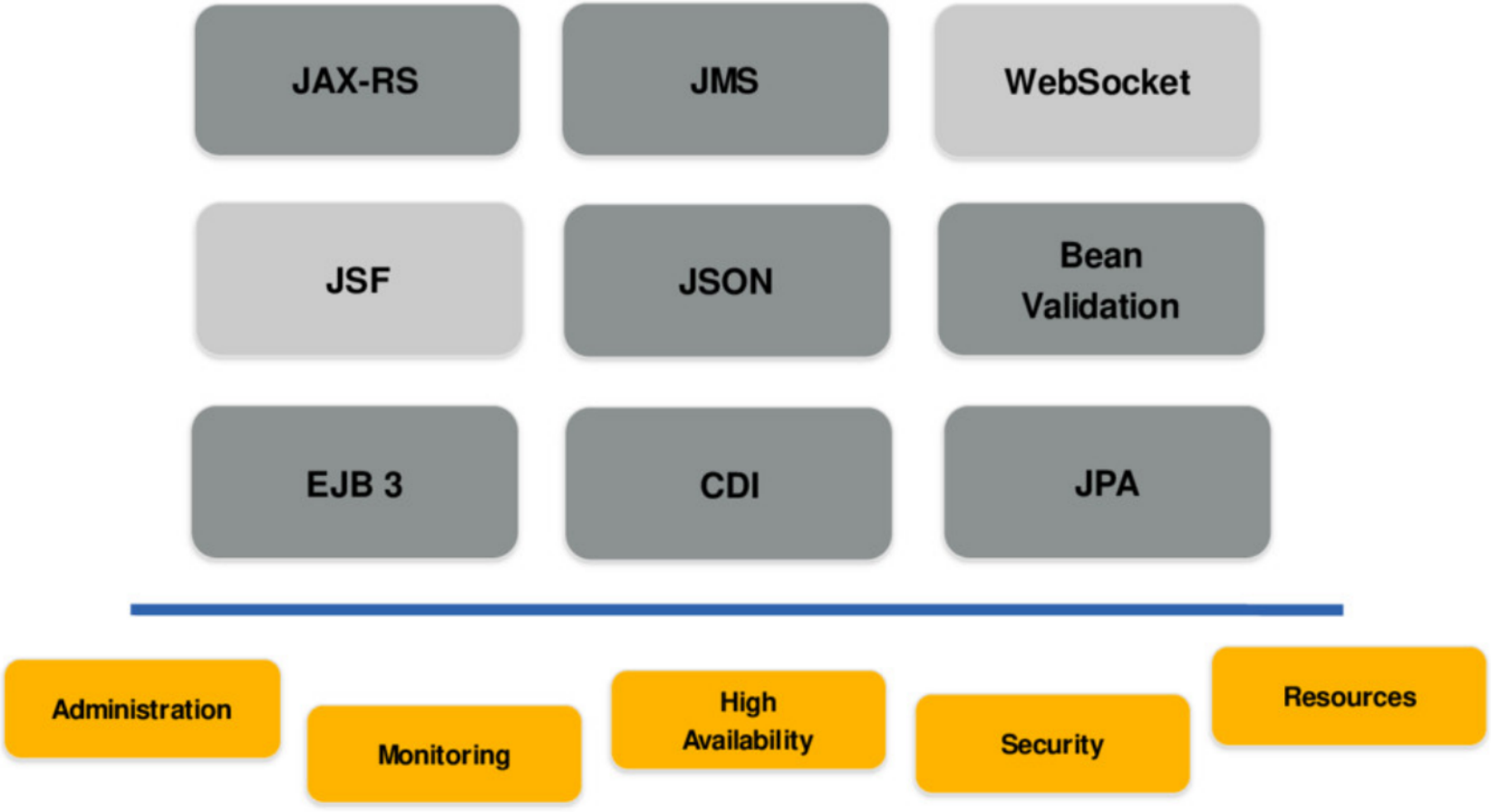

Figura 2: Credito: Reza Rahman

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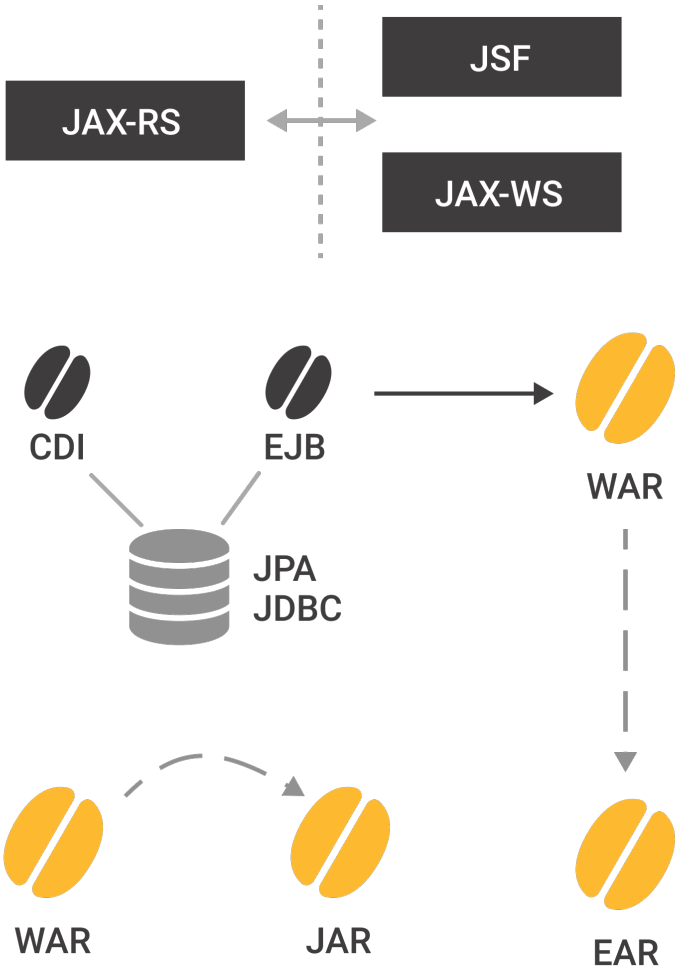
Eclipse MicroProfile



BV + JSON-P JSON-B + Security

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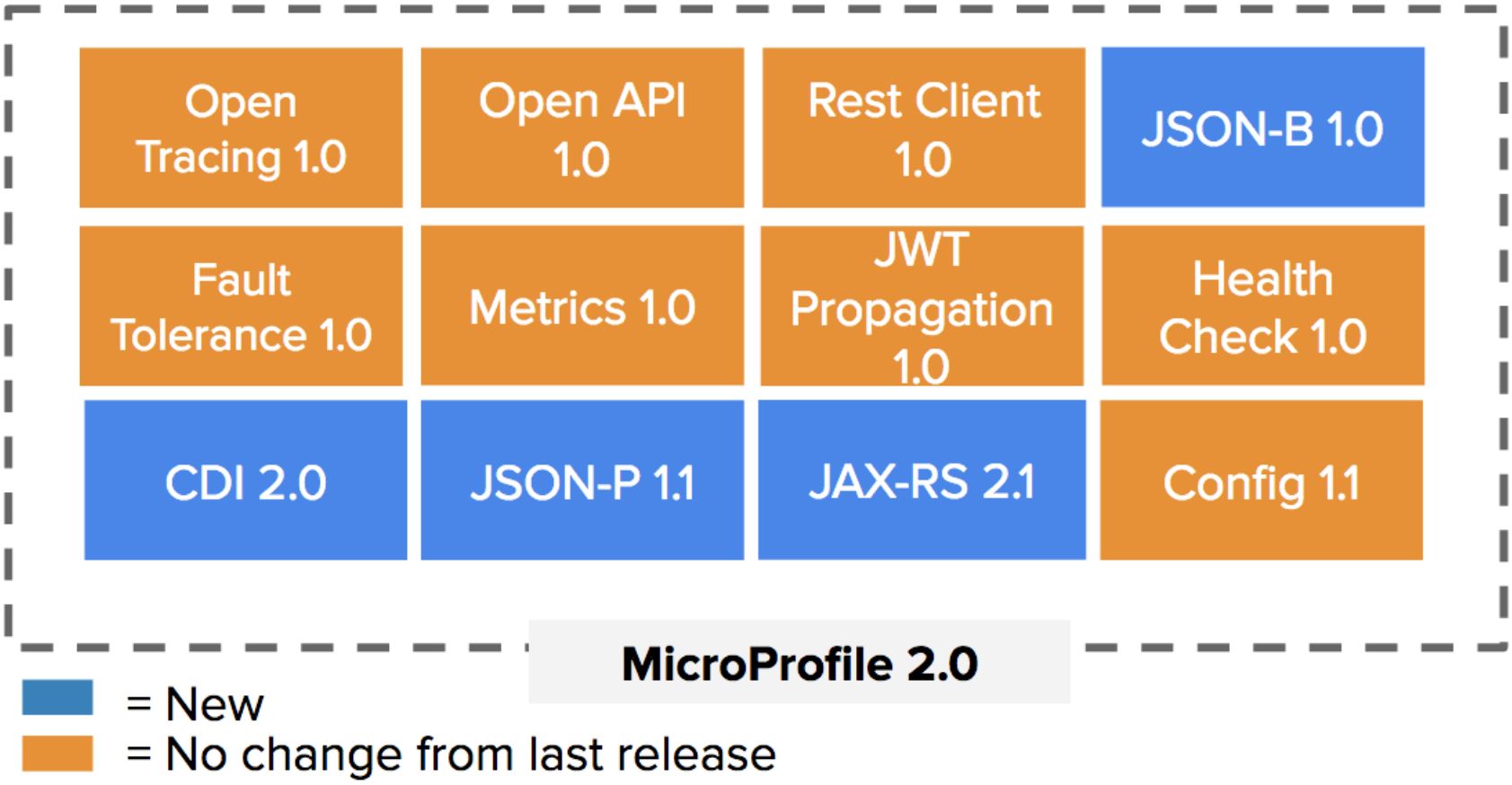
Eclipse MicroProfile



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Eclipse MicroProfile - Implementaciones

Bibliotecas

- SmallRye (Red Hat)
- Hammock
- Apache Geronimo
- Fujitsu Launcher

JEAS - Fat Jar, Uber Jar

- Dropwizard
- KumuluzEE
- Helidon (Oracle)
- Open Liberty (IBM)
- Apache Meecrowave
- Thorntail (Red Hat)
- Quarkus (Red Hat)
- Payara Micro

Eclipse MicroProfile - Implementaciones

Micro server - Thin War

- Payara Micro
- TomEE JAX-RS

Full server

- Payara Application Server
- JBoss Application Server / Wildfly Application Server
- WebSphere Liberty (IBM)

https://wiki.eclipse.org/MicroProfile/Implementation

Eclipse MicroProfile + Kotlin + Maven

Eclipse MicroProfile en Payara 5

```
<dependency>
        <groupId>org.eclipse.microprofile</groupId>
        <artifactId>microprofile</artifactId>
        <type>pom</type>
        <version>2.0.1</version>
        <scope>provided</scope>
</dependency>
```

Kotlin en Maven - Dependencias

```
<dependency>
        <groupId>org.jetbrains.kotlin</groupId>
        <artifactId>kotlin-stdlib-jdk8</artifactId>
        <version>${kotlin.version}</version>
</dependency>
```

Kotlin en Maven - maven-compiler-plugin

```
<execution>
        <id>default-compile</id>
        <phase>none</phase>
</execution>
<execution>
        <id>default-testCompile</id>
        <phase>none</phase>
</execution>
<execution>
        <id>java-compile</id>
        <phase>compile</phase>
        <goals> <goal>compile</goal> </goals>
</execution>
<execution>
        <id>java-test-compile</id>
        <phase>test-compile</phase>
        <goals> <goal>testCompile</goal> </goals>
</execution>
```

Kotlin en Maven - kotlin-maven-plugin

```
<compilerPlugins>
<plugin>all-open</plugin>
</compilerPlugins>
...
<option>all-open:annotation=javax.ws.rs.Path</option>
<option>all-open:annotation=javax.enterprise.context.RequestScoped</option>
<option>all-open:annotation=javax.enterprise.context.SessionScoped</option>
<option>all-open:annotation=javax.enterprise.context.ApplicationScoped</option>
<option>all-open:annotation=javax.enterprise.context.Dependent</option>
<option>all-open:annotation=javax.ejb.Singleton</option>
<option>all-open:annotation=javax.ejb.Stateful</option>
<option>all-open:annotation=javax.ejb.Stateless</option>
```

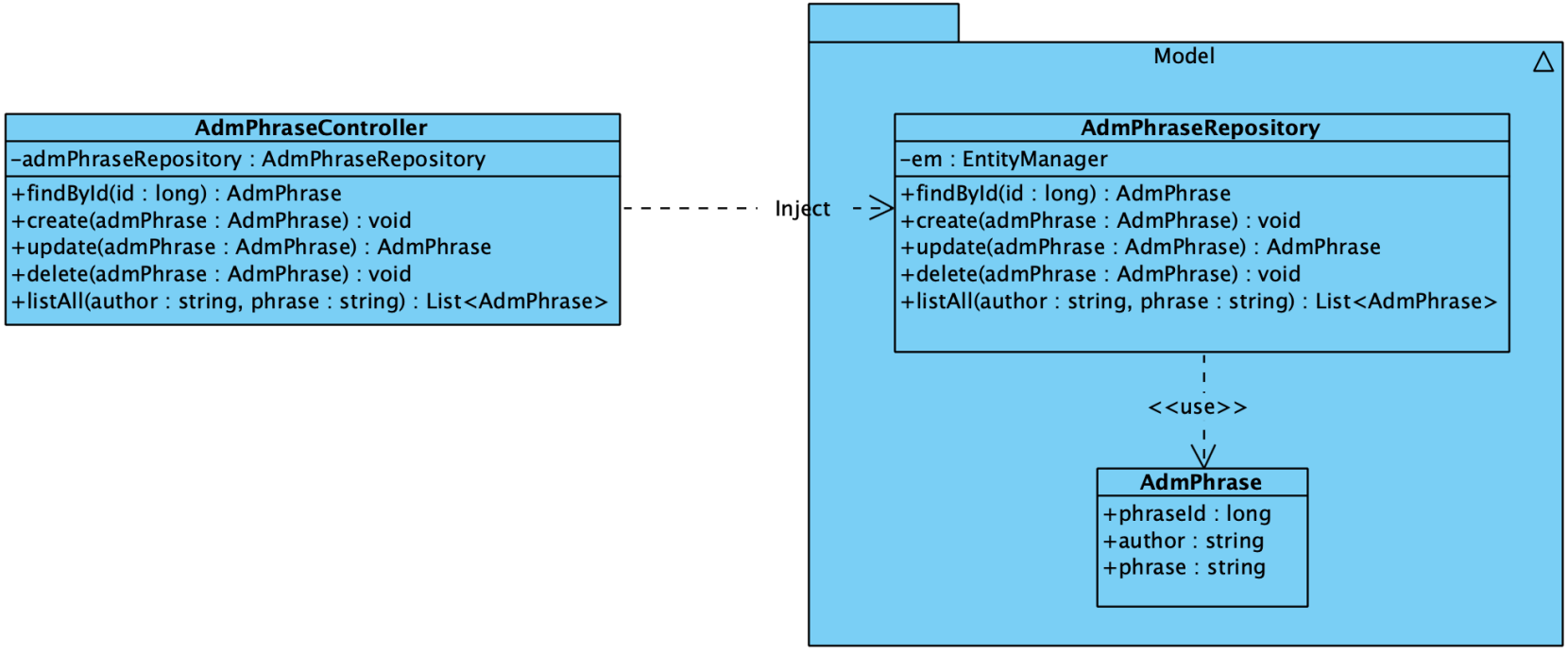
Demo

Kotlin + Jakarta EE + MicroProfile - Demo

- Kotlin 1.3
- Bibliotecas externas - SL4J, Flyway, PostgreSQL
- Jakarta EE 8 - EJB, JPA
- MicroProfile - CDI, JAX-RS, MicroProfile config
- Testing - Arquillian, JUnit, Payara Embedded

`https://dzone.com/articles/`
`the-state-of-kotlin-for-jakarta-eemicroprofile-tra`
`https://github.com/tuxtor/integrum-ee`

Kotlin + Jakarta EE + MicroProfile - Demo



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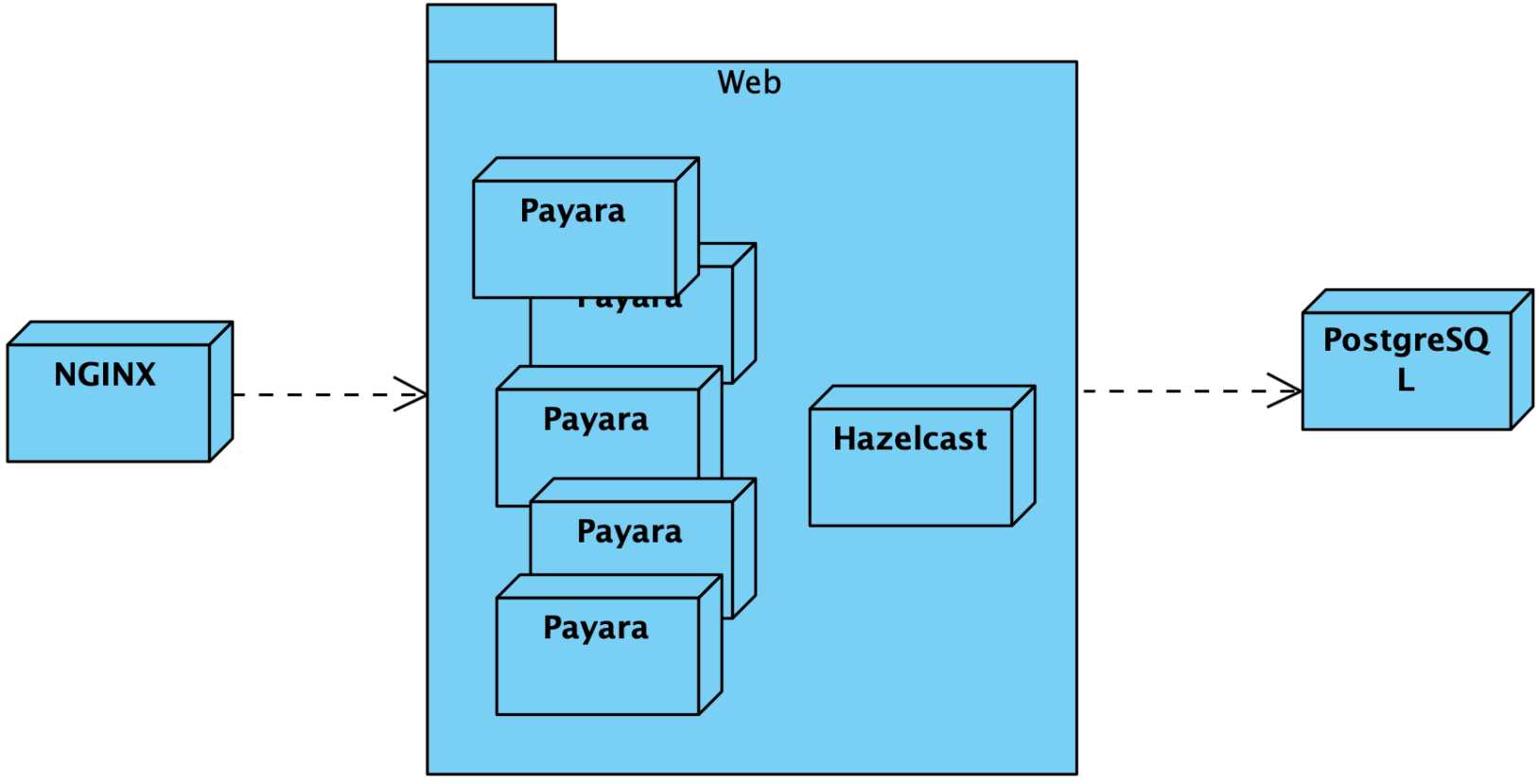
Kotlin + Jakarta EE + MicroProfile - Demo



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Kotlin - Entidad JPA

```
@Entity
@Table(name = "adm_phrase")
@TableGenerator(...)
data class AdmPhrase(
        @Id
        @GeneratedValue(strategy = GenerationType.TABLE,
                generator = "admPhraseIdGenerator")
        @Column(name = "phrase_id")
        var phraseId:Long? = null,
        var author:String = "",
        var phrase:String = ""
)
```

Data Clases, Nullable Types

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Kotlin - Repositorio CDI

```
@RequestScoped
class AdmPhraseRepository {

        @Inject
        private lateinit var em:EntityManager

        ...

}
```

Lateinit (nullable type)

Kotlin - Repositorio CDI

```
fun create(admPhrase:AdmPhrase) = em.persist(admPhrase)

fun update(admPhrase:AdmPhrase) = em.merge(admPhrase)

fun findById(phraseId: Long) =
em.find(AdmPhrase::class.java, phraseId)

fun delete(admPhrase: AdmPhrase) = em.remove(admPhrase)
. . .
```

Single expression functions (One line methods)

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Kotlin - Repositorio CDI

```
fun listAll(author: String, phrase: String):
        List<AdmPhrase> {

        val query = """SELECT␣p␣FROM␣AdmPhrase␣p
␣␣␣␣␣␣␣␣where␣p.author␣LIKE␣:author
␣␣␣␣␣␣␣␣and␣p.phrase␣LIKE␣:phrase
␣␣␣␣␣␣␣␣"""

        return em.createQuery(query, AdmPhrase::class.java)
                .setParameter("author", "%$author%")
                .setParameter("phrase", "%$phrase%")
                .resultList
}
```

Multiline String, mutable declaration

Kotlin - Controlador JAX-RS

```
@Path("/phrases")
@Produces(MediaType.APPLICATION_JSON)
@Consumes(MediaType.APPLICATION_JSON)
class AdmPhraseController{

        @Inject
        private lateinit var admPhraseRepository: AdmPhraseReposit

        @Inject
        private lateinit var logger: Logger
        ...

}
```

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Kotlin - Controlador JAX-RS

```
@GET
fun findAll(
@QueryParam("author") @DefaultValue("%") author: String,
@QueryParam("phrase") @DefaultValue("%") phrase: String) =
        admPhraseRepository.listAll(author, phrase)

@GET
@Path("/{id:[0-9][0-9]*}")
fun findById(@PathParam("id") id:Long) =
        admPhraseRepository.findById(id)

@PUT
fun create(phrase: AdmPhrase): Response {
        admPhraseRepository.create(phrase)
        return Response.ok().build()
}
```

Kotlin - Controlador JAX-RS

```
@POST
@Path("/{id:[0-9][0-9]*}")
fun update(@PathParam("id") id: Long?, phrase: AdmPhrase)
        :Response {
        if(id != phrase.phraseId)
                return Response.status(Response.Status.NOT_FOUND).

        val updatedEntity = admPhraseRepository.update(phrase)
        return Response.ok(updatedEntity).build()
}

@DELETE
@Path("/{id:[0-9][0-9]*}")
fun delete(@PathParam("id") id: Long): Response {
        val updatedEntity = admPhraseRepository.findById(id) ?:
        return Response.status(Response.Status.NOT_FOUND).build()
        admPhraseRepository.delete(updatedEntity)
        return Response.ok().build()
}
```

Elvis operator as expression

12 factores cloud native (Heroku)

Microprofile

- Config
- Backing service
- Disposability

Cloud

- Codebase (Git-Flow)
- Dependencies (Maven)
- Build, Release, Run
- Processes (Pipelines)
- Port binding
- Concurrency (Docker - k8s)
- Dev / Prod parity
- Logs
- Admin process

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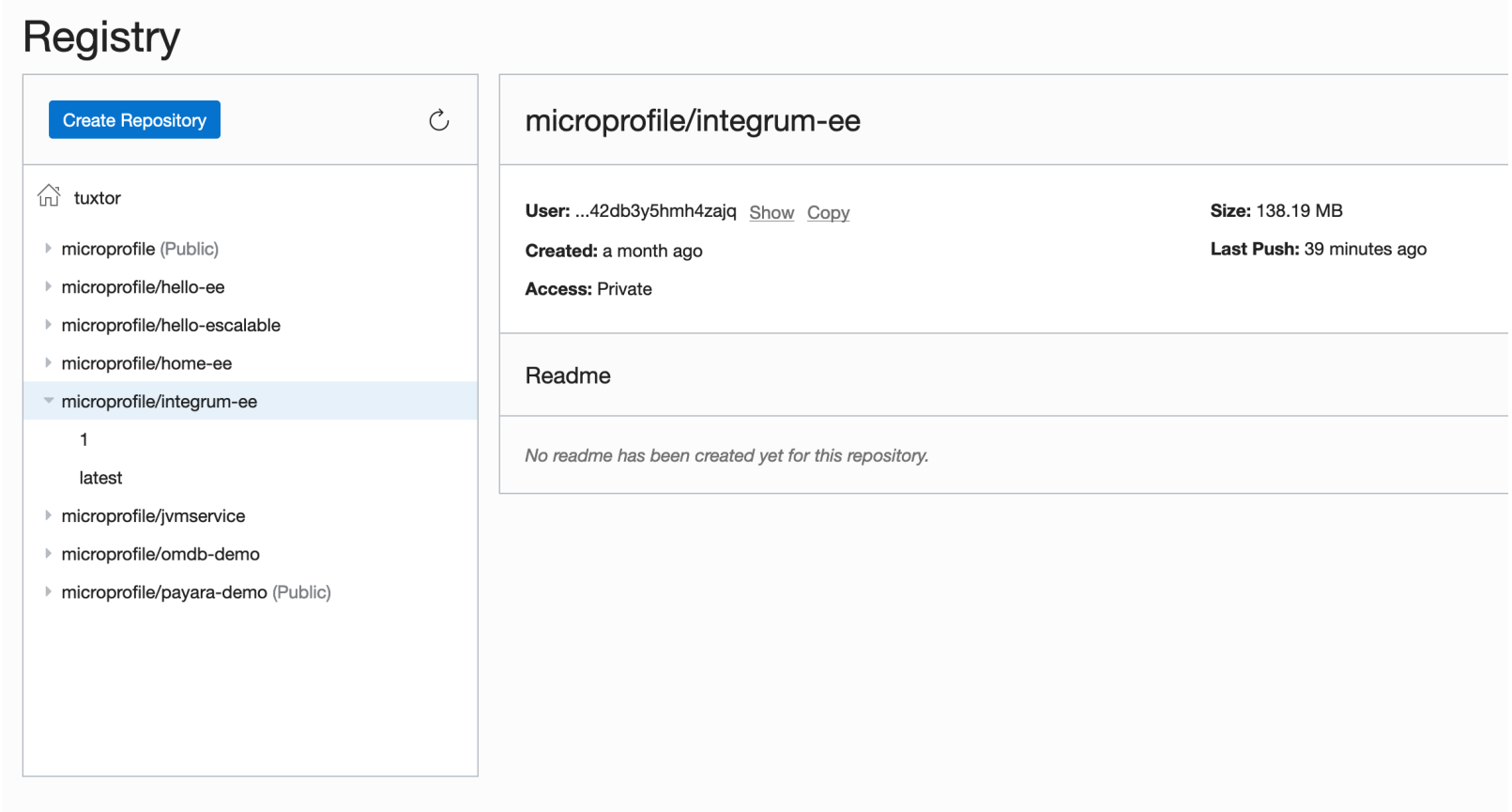
```
<groupId>io.fabric8</groupId>
<artifactId>docker-maven-plugin</artifactId>
<version>0.30.0</version>
...
<image>
        <name>iad.ocir.io/tuxtor/microprofile/integrum-ee</name>
        <build>
                <dockerFile>${project.basedir}/Dockerfile</dockerF
        </build>
</image>
```


Registry
Create Repository
tuxtor
microprofile (Public)
microprofile/hello-ee
microprofile/hello-escalable
microprofile/home-ee
microprofile/integrum-ee
1
latest
microprofile/jvmservice
microprofile/omdb-demo
microprofile/payara-demo (Public)
microprofile/integrum-ee
User: ...42db3y5hmh4zajq Show Copy
Created: a month ago
Access: Private
Size: 138.19 MB
Last Push: 39 minutes ago
Readme
No readme has been created yet for this repository.

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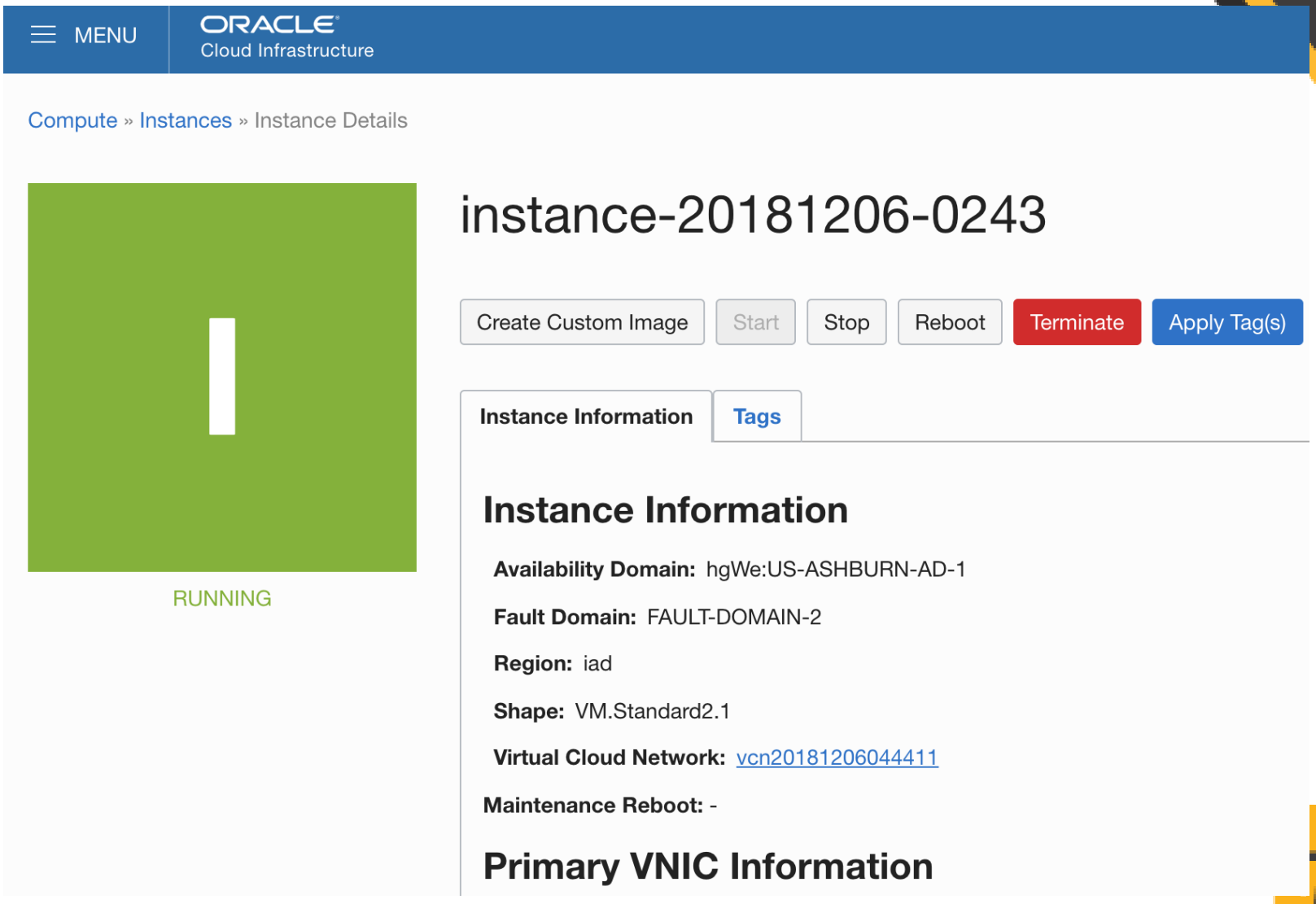
MENU
ORACLE
Cloud Infrastructure
Compute » Instances » Instance Details
instance-20181206-0243
Create Custom Image
Start
Stop
Reboot
Terminate
Apply Tag(s)
Instance Information
Tags
RUNNING
Instance Information
Availability Domain: hgWe:US-ASHBURN-AD-1
Fault Domain: FAULT-DOMAIN-2
Region: iad
Shape: VM.Standard2.1
Virtual Cloud Network: vcn20181206044411
Maintenance Reboot: -
Primary VNIC Information

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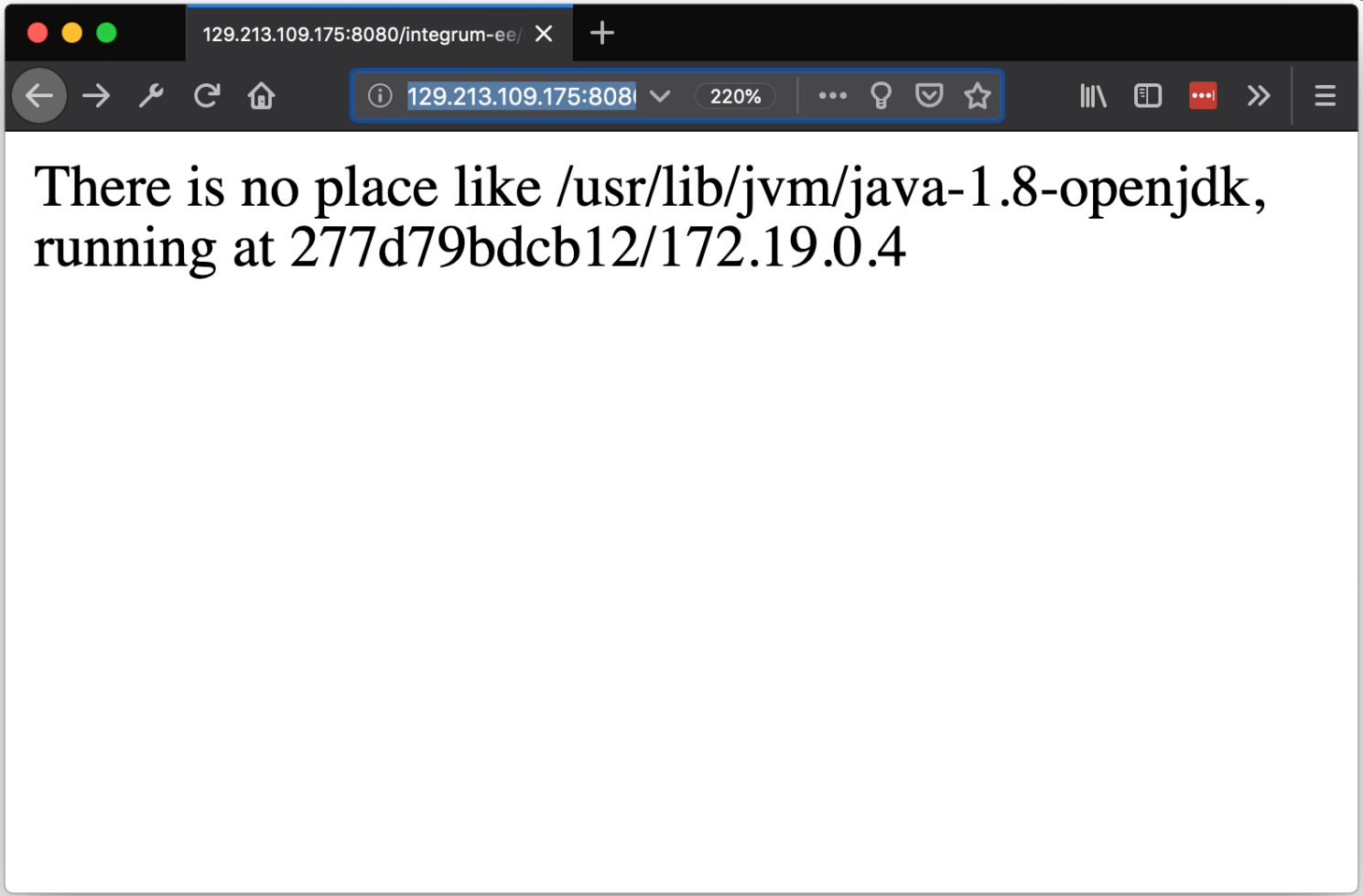
1. bash

```
tuxtor@millenium-falcon-2:~/GitHub/integrum-ee$ mvn docker:build
[INFO] Scanning for projects...
[INFO]
[INFO] ------------------------------------------------------------------------
[INFO] Building integrum-ee 2.0-SNAPSHOT
[INFO] ------------------------------------------------------------------------
[INFO]
[INFO] --- docker-maven-plugin:0.30.0:build (default-cli) @ integrum-ee ---
[INFO] Building tar: /Users/tuxtor/GitHub/integrum-ee/target/docker/iad.ocir.io/tuxtor/microprofile/integrum-ee/tmp/docker-build.tar
[INFO] DOCKER> [iad.ocir.io/tuxtor/microprofile/integrum-ee:latest]: Created docker-build.tar in 145 milliseconds
[INFO] DOCKER> [iad.ocir.io/tuxtor/microprofile/integrum-ee:latest]: Built image sha256:26156
[INFO] DOCKER> [iad.ocir.io/tuxtor/microprofile/integrum-ee:latest]: Removed old image sha256:a2361
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 2.765 s
[INFO] Finished at: 2019-05-30T16:39:15-06:00
[INFO] Final Memory: 17M/239M
[INFO] ------------------------------------------------------------------------
tuxtor@millenium-falcon-2:~/GitHub/integrum-ee$ mvn docker:push
[INFO] Scanning for projects...
[INFO]
[INFO] ------------------------------------------------------------------------
[INFO] Building integrum-ee 2.0-SNAPSHOT
[INFO] ------------------------------------------------------------------------
[INFO]
[INFO] --- docker-maven-plugin:0.30.0:push (default-cli) @ integrum-ee ---
[INFO] DOCKER> The push refers to repository [iad.ocir.io/tuxtor/microprofile/integrum-ee]
67b8beb0da59: Pushed
cfa8d5eeea6b: Layer already exists
aae73696d349: Layer already exists
714e1dd7c2e4: Layer already exists
344fb4b275b7: Layer already exists
bcf2f368fe23: Layer already exists
[INFO] DOCKER> latest: digest: sha256:066a2a86fca1ac8b2918603e22a2178e2d2eaff8c0cbb5f861f831a51984eb77 size: 1578
[INFO] DOCKER> Pushed iad.ocir.io/tuxtor/microprofile/integrum-ee in 26 seconds
```


129.213.109.175:8080/integrum-ee/
129.213.109.175:808
220%
There is no place like /usr/lib/jvm/java-1.8-openjdk, running at 277d79bdcb12/172.19.0.4

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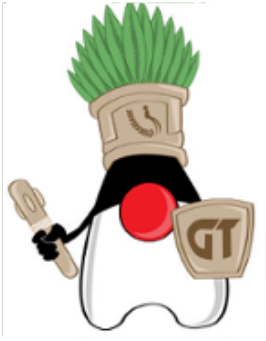

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- @tuxtor
- http://www.nabenik.com

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