MicroProfile and Jakarta EE -- What's Next?

Kevin Sutter (@kwsutter), MicroProfile and Jakarta EE Architect @ IBM
Ian Robinson (@ian__robinson), IBM Distinguished Engineer & WebSphere Chief Architect

EclipseCon Europe 2018

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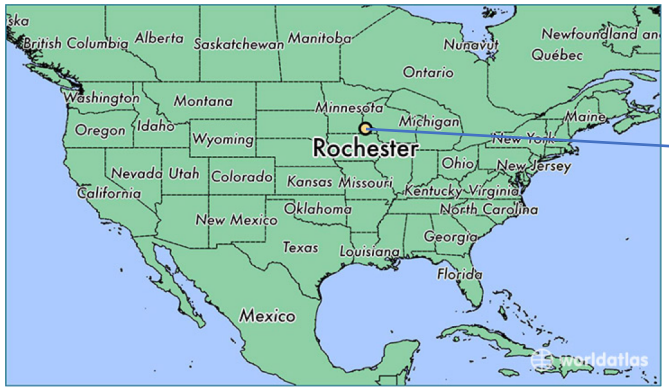
#1 Better Conference Scheduling

About Me

- IBM Senior Technical Staff Member (STSM)
- WebSphere MicroProfile and Jakarta EE Architect
- WebSphere development, open source, and enterprise Java standards
  - WebSphere, Liberty, Open Liberty, Java EE, Jakarta EE, MicroProfile, JPA, JCA, …
- Based in IBM's Rochester MN lab



MAYO CLINIC

Kevin Sutter

IBM

JavaOne 2015: Java EE – Relevant or Elephant?

http://parentrap.org/2014/09/29/easy-parenting-part-iii-the-donts-list/

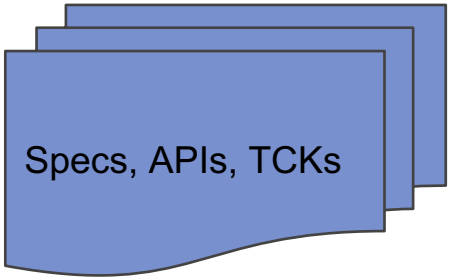
What Happened Next?

MICROPROFILE™
OPTIMIZING ENTERPRISE JAVA

Characteristics

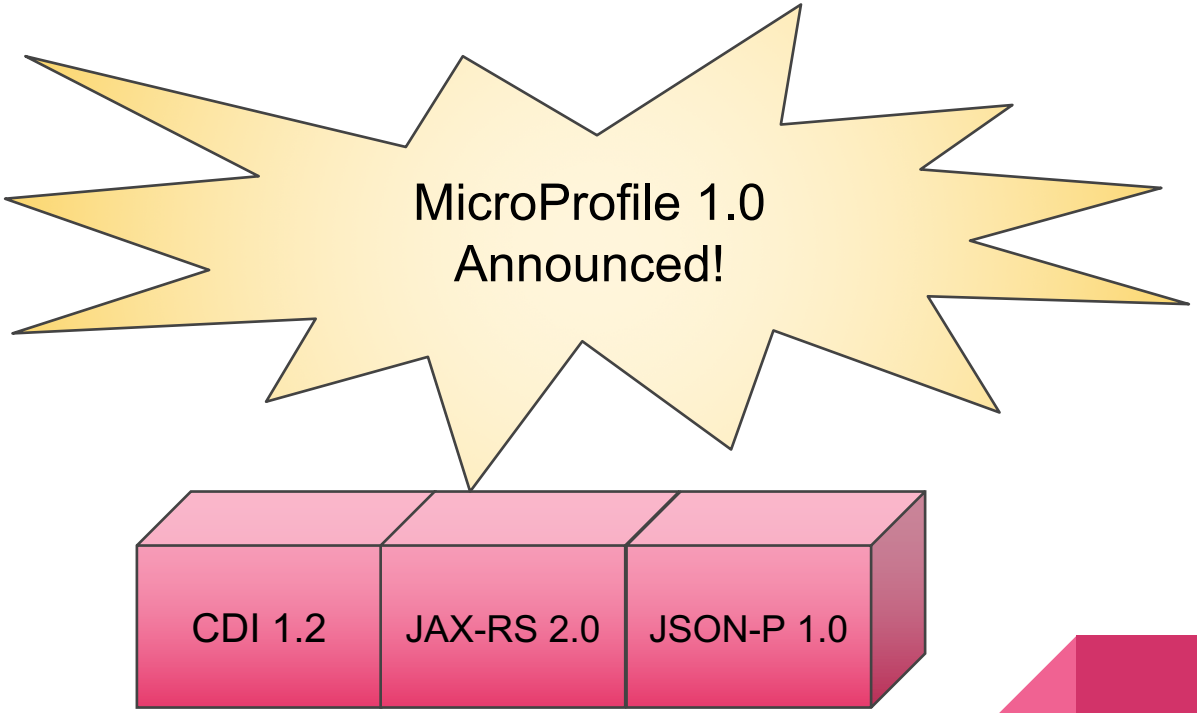
Community Driven

Lightweight, Iterative Processes



No Reference Impls!

JavaOne 2016



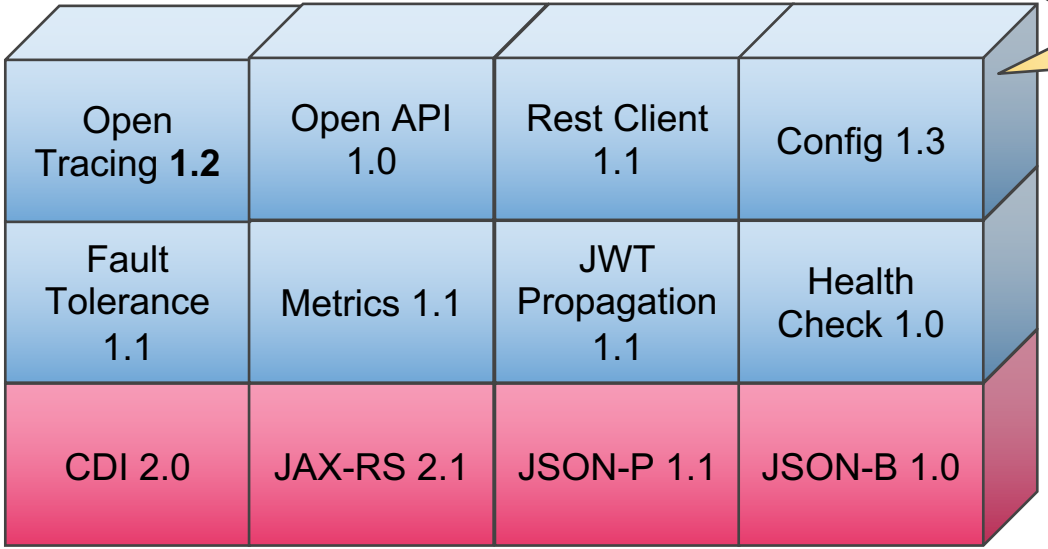
Basic Building Blocks for Microservices

Fast-forward two years...

MicroProfile 2.1

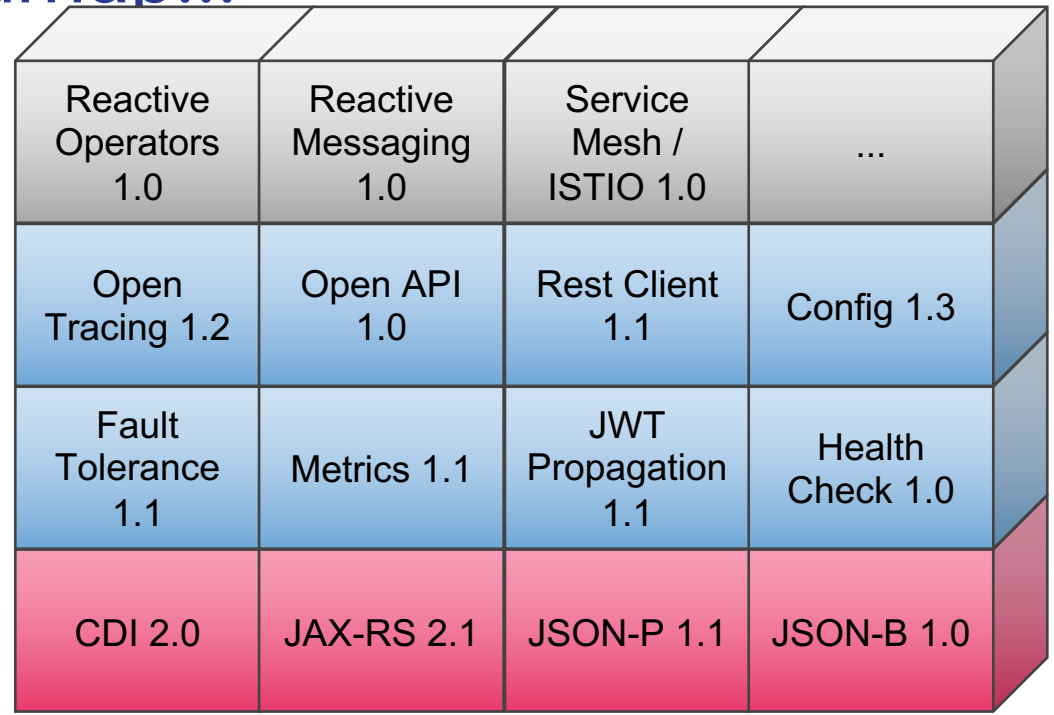
7 Platform Releases!

17 Component Releases!



MicroProfile **2.1**

Roadmap...



MicroProfile 2.x

Component Updates

- Health Check 1.1
- Rest Client 1.2
- Config 1.4
- Metrics 2.0
- Fault Tolerance 1.2
- ...

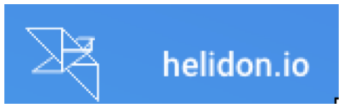
Compatible Implementations!

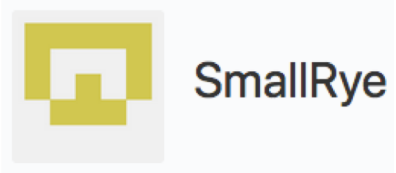
Open Liberty Project

Apache TomEE

Red Hat OpenShift

WebSphere Liberty

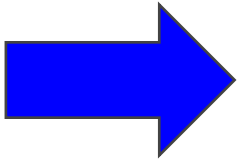




Thorntail

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

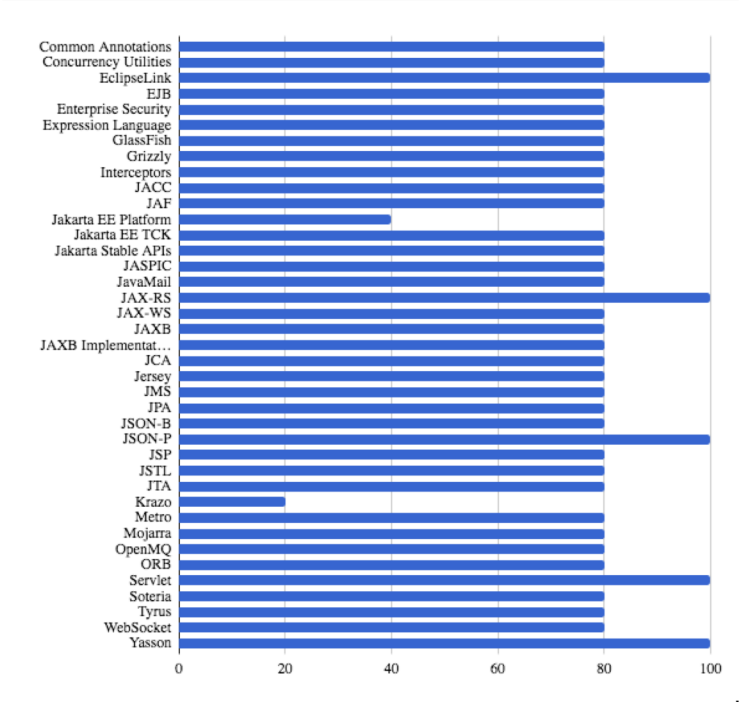
Meanwhile…



JAKARTA EE

2017 - 2018

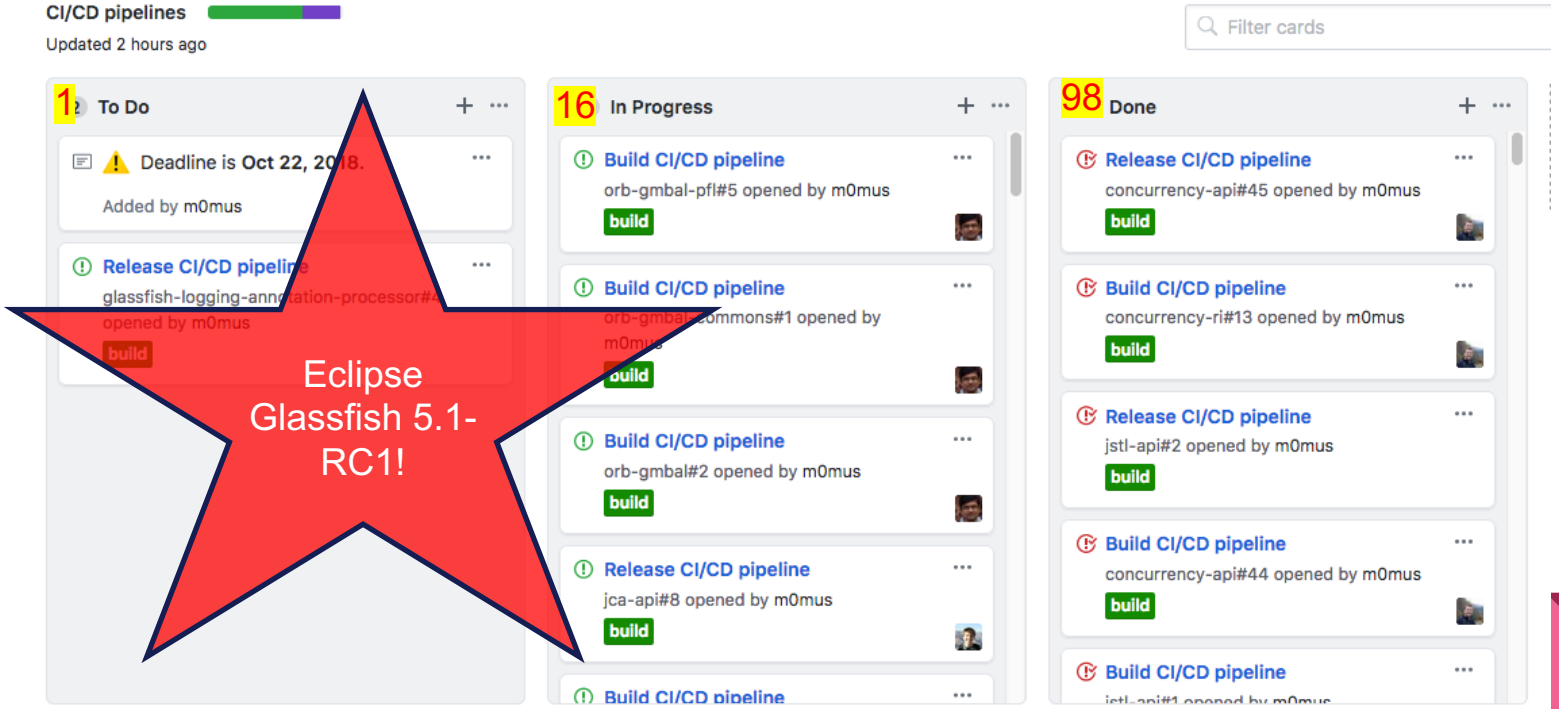
39 EE4J Projects and counting...



- 20% Project Proposal has been posted for community review
- 40% Project committers and resources have been provisioned
- 60% Initial Contribution provided to the Eclipse IP Team
- 80% Initial Contribution Pushed to Git Repository
- 100% Project has engaged in its first Release Review

https://www.eclipse.org/ee4j/status.php

EE4J CI/CD Progress



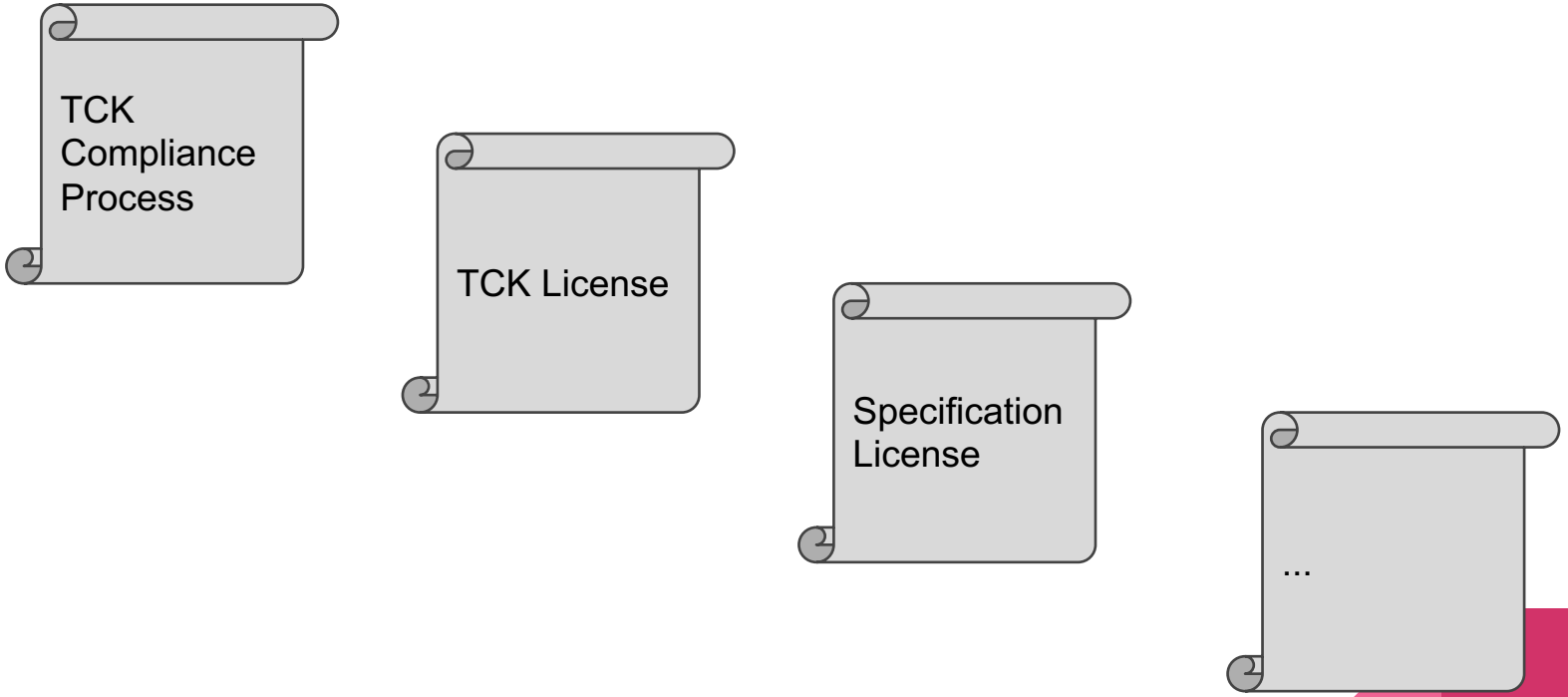
https://github.com/orgs/eclipse-ee4j/projects/1

Specification Process

Specification Process 1.0

- Replacement for JCP Standards Process
- Public Draft Available for Review (Oct 17, 2018)
  - https://docs.google.com/document/d/1ongNUyGvZPtrcuxA7RQNV2qBESFcAphQbzdk3pUIQ5s/edit#heading=h.o84um3qls283
  - Comments accepted until Oct 31, 2018
- Guinea Pig Spec Project
  - JNoSQL

Additional Work Items in progress...



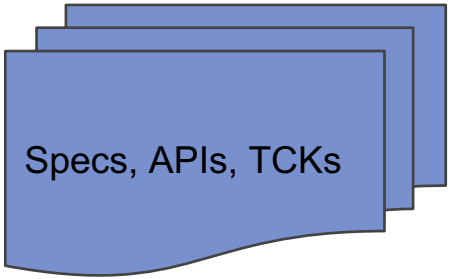
Similarities between MicroProfile and Jakarta EE

- Focused on Microservice and Cloud Native Development
- Desire Agile Development Practices
- Code First Mentality

Characteristics

Community Driven

Lightweight, Iterative Processes

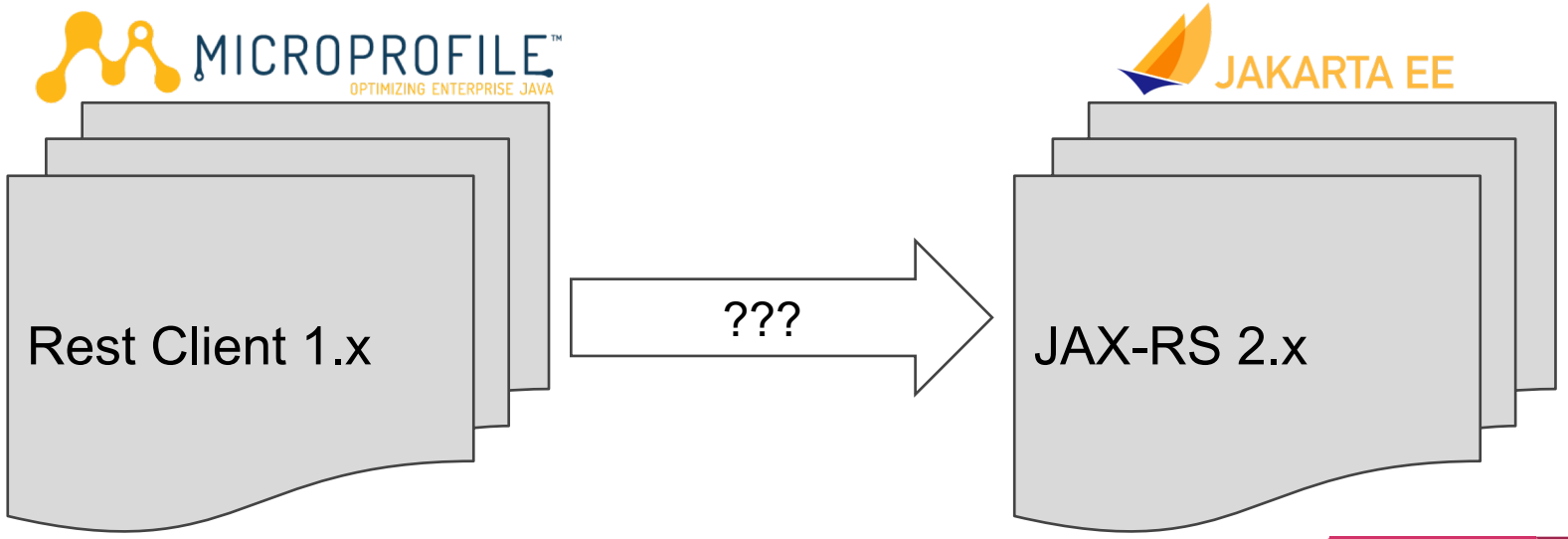


No Reference Impls!

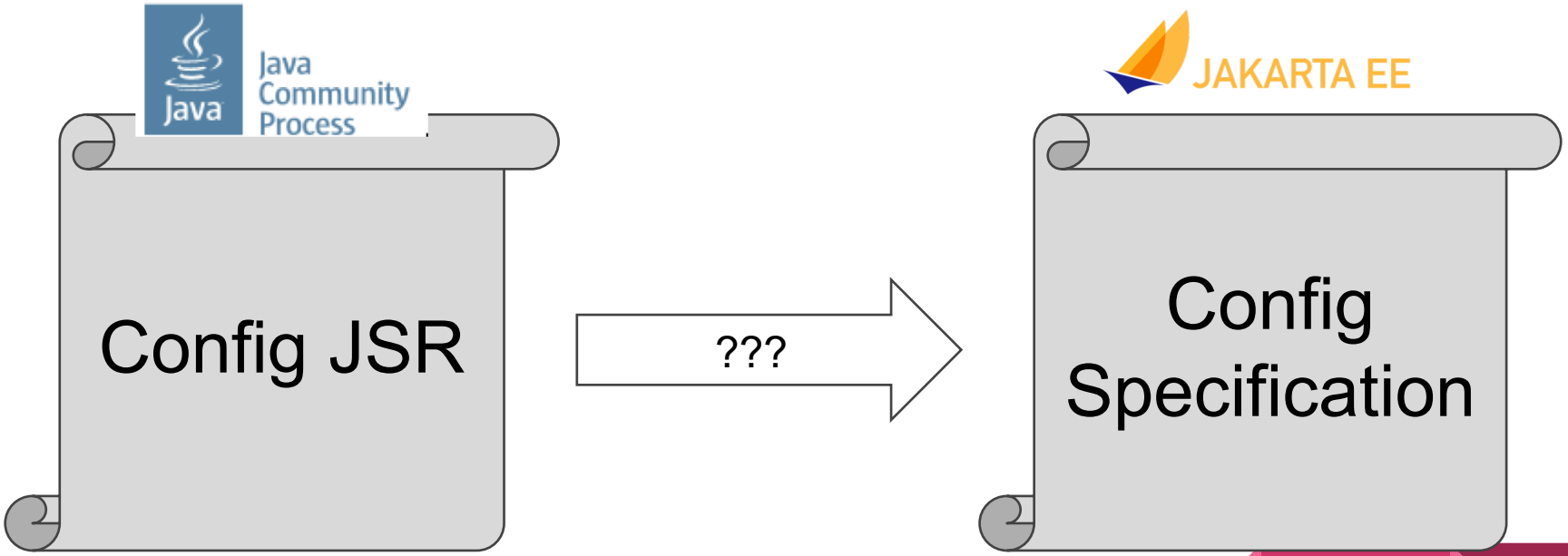
Differences between MicroProfile and Jakarta EE

- MicroProfile has an established release process and cycle
  - 7 major releases and 17 component releases in its 2 years of existence
  - Jakarta EE is planning for 1-2 major releases per year (components may have more)
- MicroProfile is not a Standards body
  - Jakarta EE needs to replace the JCP
- Jakarta EE brand is valuable and requires stringent compliance testing
  - MicroProfile's compatibility statements are strictly on the honor system

Some positive signs...



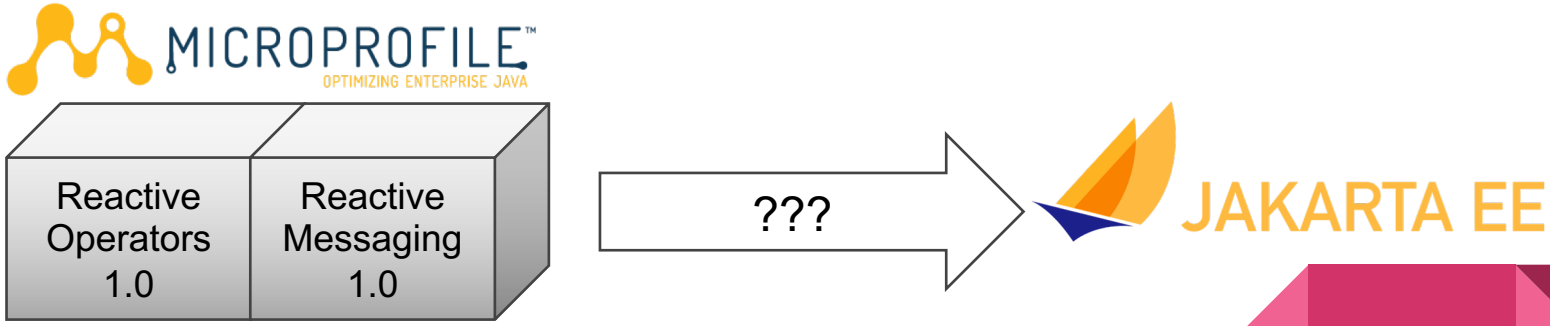
More positive signs...



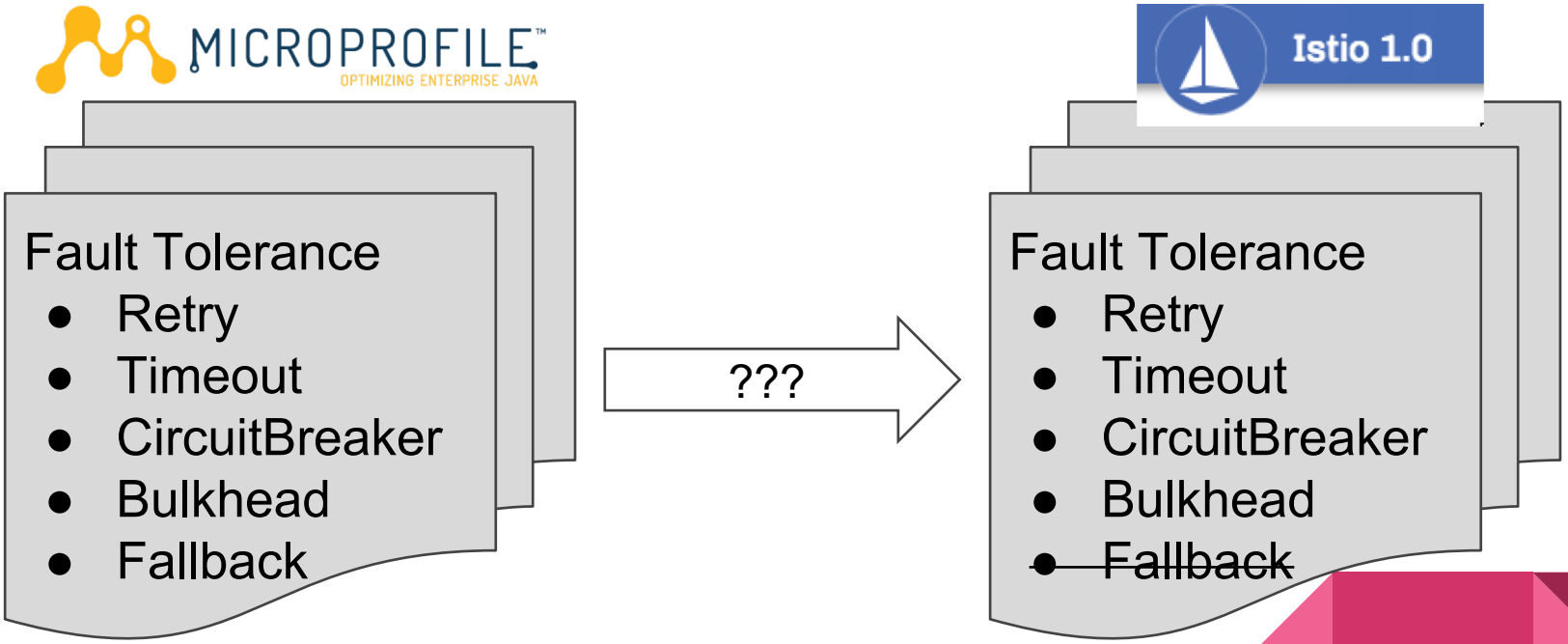
Reactive Platform...

Lightbend Reactive Platform

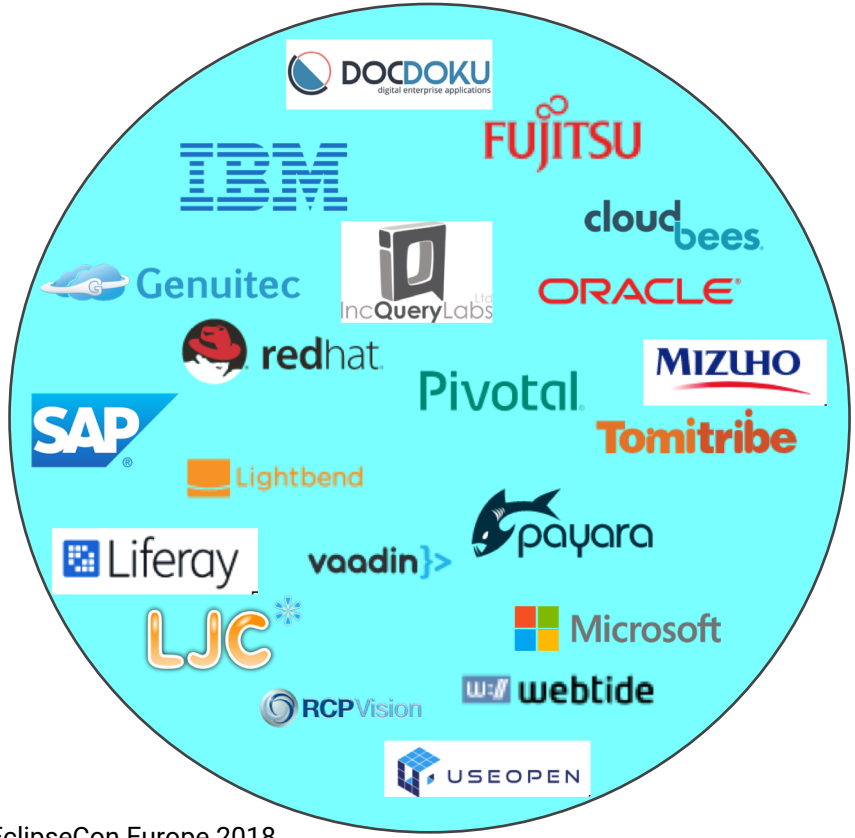
- https://www.lightbend.com/blog/how-the-microprofile-community-will-shape-jakarta-ee
- Start in MicroProfile with the end goal of becoming part of Jakarta EE



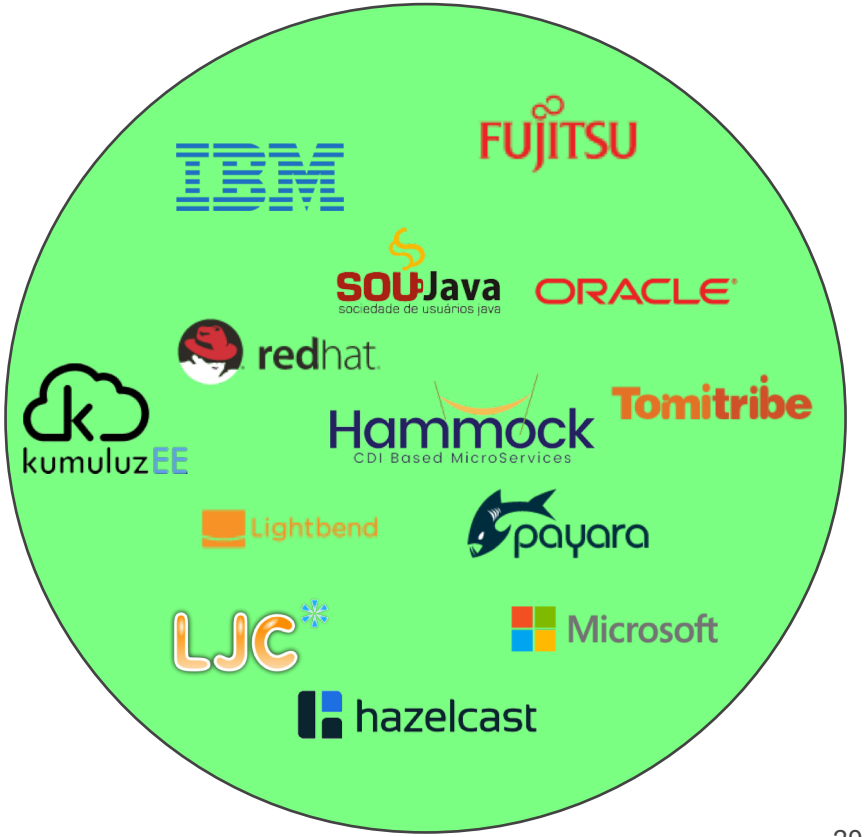
Other Integrations...



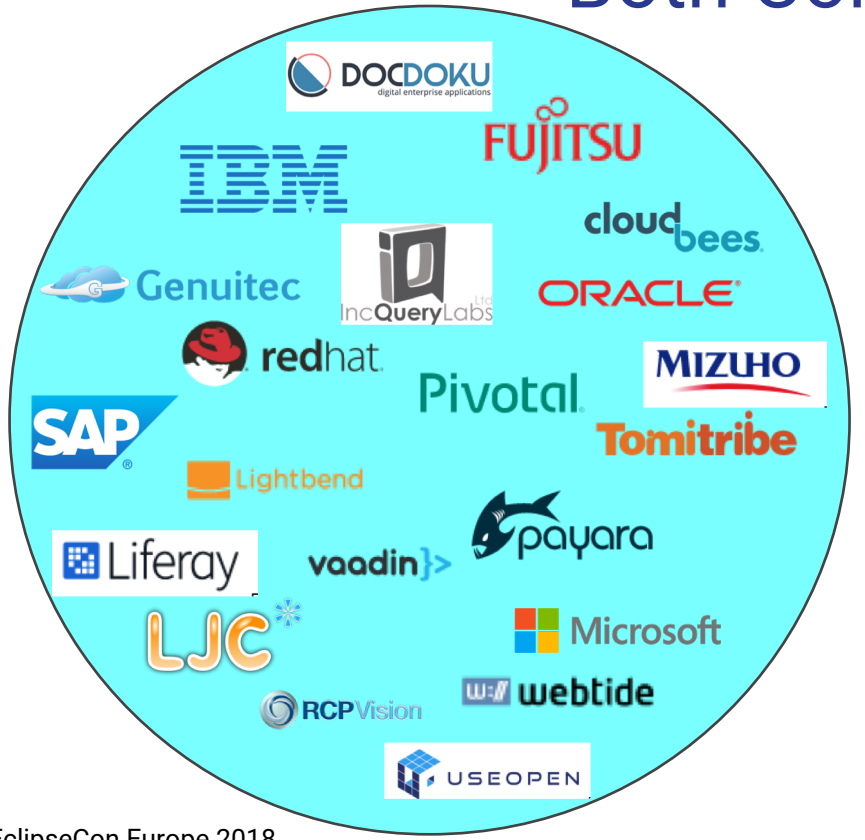
Jakarta EE Community

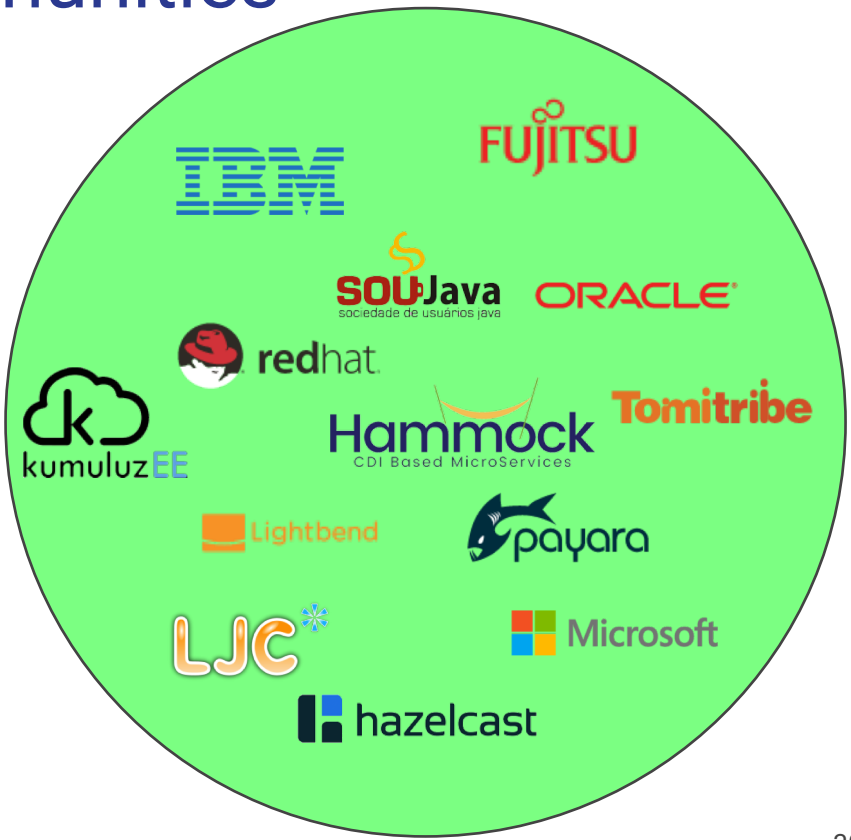


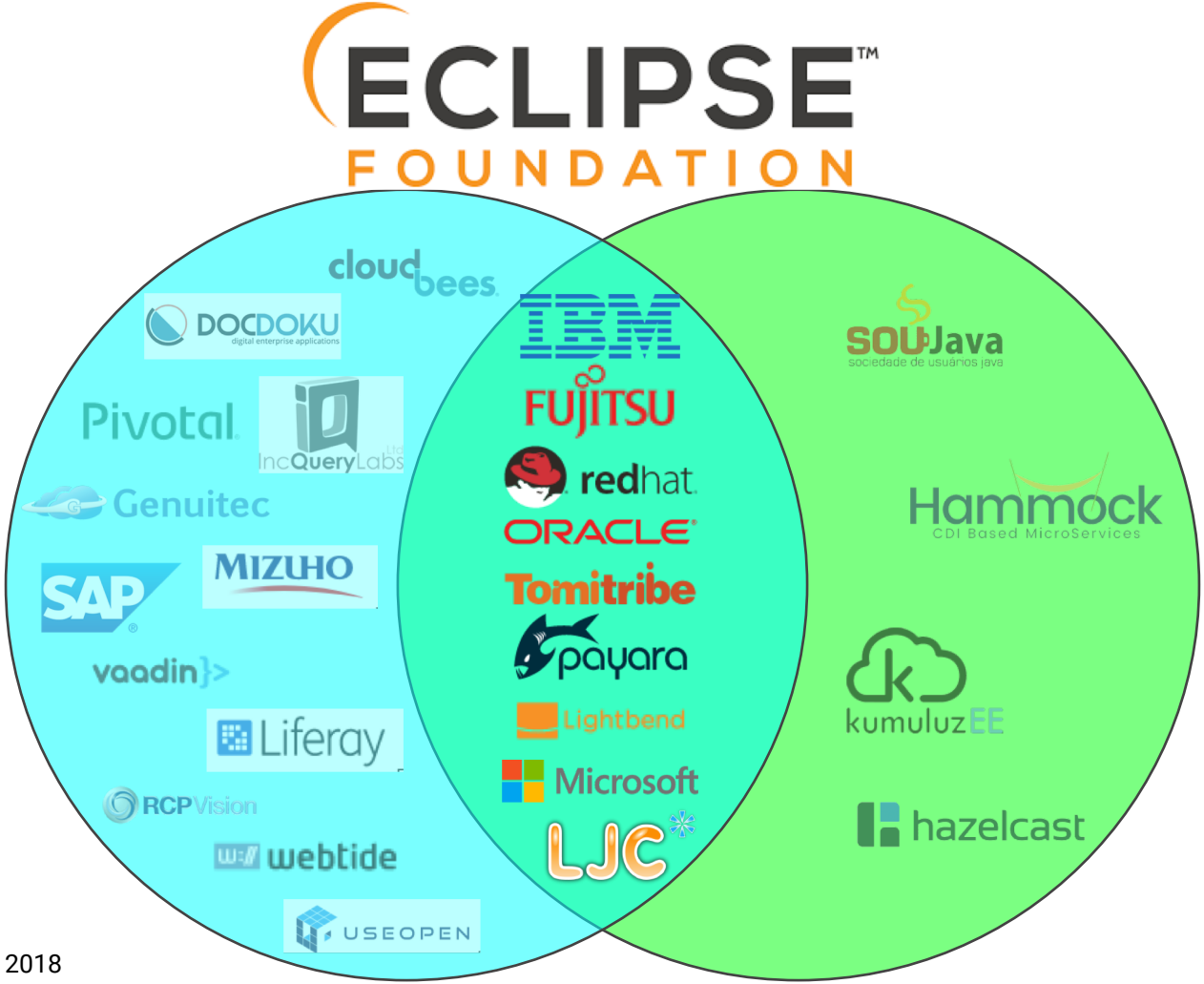
MicroProfile Community



Both Communities






ECLIPSE™
FOUNDATION
cloudbees
DOCDOKU
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Pivotal
IncQueryLabs
Genuitec
SAP
MIZUHO
vaadin}>
Liferay
RCPVision
webtide
USEOPEN
IBM
FUJITSU
redhat
ORACLE
Tomitribe
payara
Lightbend
Microsoft
LJC
SOUJava
sociedade de usuários java
Hammock
CDI Based MicroServices
kumuluzEE
hazelcast

Anticipated Relationship

- Ongoing MicroProfile innovation on top of Jakarta EE, with desired adoption of foundational technologies into JakartaEE.next

Questions?

eclipsecon Europe 2018
OSGi Community Event 2018
Evaluate the Sessions
Sign in and vote at eclipsecon.org
-1
0
+1

References

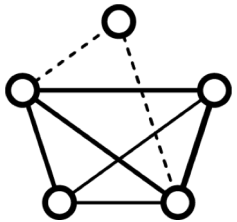
- https://openliberty.io/blog/2018/08/16/whats-next-microprofile-jakartaee.html
- https://microprofile.io
  - https://projects.eclipse.org/projects/technology.microprofile
  - https://microprofile.io/projects/
  - https://wiki.eclipse.org/MicroProfile/Implementation
  - https://openliberty.io/guides/
- https://jakarta.ee
  - https://projects.eclipse.org/projects/ee4j/
  - https://github.com/eclipse-ee4j/ee4j
  - https://www.eclipse.org/ee4j/status.php
  - https://github.com/orgs/eclipse-ee4j/projects/1

MicroProfile Backup Material

Open Tracing

URL: https://github.com/eclipse/microprofile-opentracing
Latest Release: https://github.com/eclipse/microprofile-opentracing/releases

Tracing the flow of a request in a distributed environment has always been challenging but it is even more complex in a microservices architecture, where requests traverse across not just architectural tiers but also multiple services. The MicroProfile OpenTracing API provides a standard for instrumenting microservices for distributed tracing.



Open API

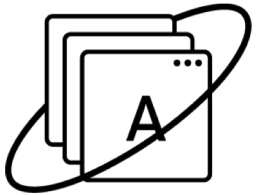
URL: https://github.com/eclipse/microprofile-open-api
Latest Release: https://github.com/eclipse/microprofile-open-api/releases

OpenAPI provides Java interfaces and programming models which allow Java developers to natively produce OpenAPI v3 documents from their JAX-RS applications.

Rest Client

URL: https://github.com/eclipse/microprofile-rest-client
Latest Release: https://github.com/eclipse/microprofile-rest-client/releases

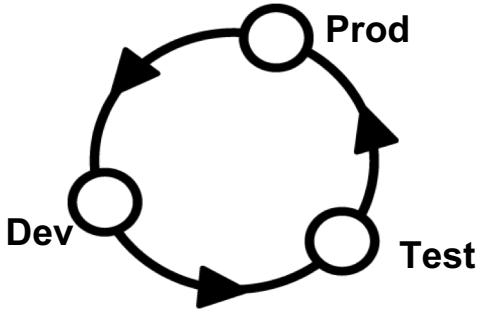
In the Microservices world, we typically talk REST to other services. While the JAX-RS specification defines a fluent API for making calls, it is difficult to make it a true type safe client. MicroProfile Rest Client makes it easy to take an interface definition and create a JAX-RS client from it.



Config

URL: https://github.com/eclipse/microprofile-config
Latest Release: https://github.com/eclipse/microprofile-config/releases

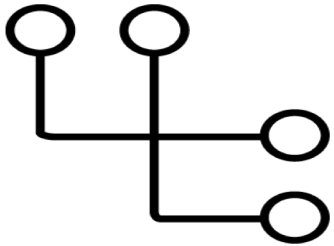
Applications need to be configured based on a running environment. Provides a standard way to define a hierarchy of config sources from which environmental config may be injected into a running application.

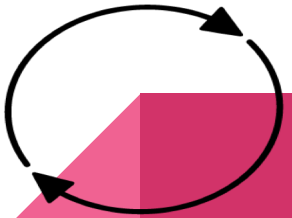


Fault Tolerance

URL: https://github.com/eclipse/microprofile-fault-tolerance
Latest Release: https://github.com/eclipse/microprofile-fault-tolerance/releases

Fault tolerance is about leveraging different strategies to guide the execution and result of some logic. Defines annotations for container-brokered timeouts, retries, fallbacks, circuit-breakers and bulkheads. Simplifies the application-handling of failure in microservice architectures.

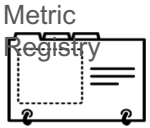


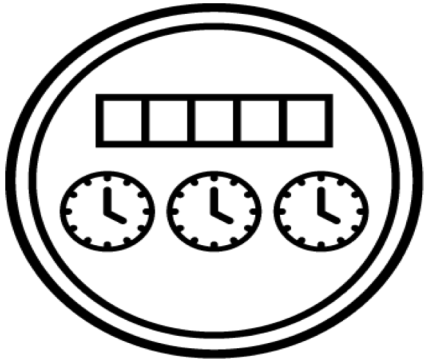


Metrics

URL: https://github.com/eclipse/microprofile-metrics
Latest Release: https://github.com/eclipse/microprofile-metrics/releases

To ensure reliable operation of software it is necessary to monitor essential system parameters. Defines annotations to define metrics and well-known monitoring endpoints to gather them from.





- Required Base metrics
- Application metrics
- Vendor-specific metrics

JWT Propagation

URL: https://github.com/eclipse/microprofile-jwt-auth
Latest Release: https://github.com/eclipse/microprofile-jwt-auth/releases

The security requirements that involve microservice architectures are strongly related with RESTful Security. Defines standard JWT claims so the content of a JWT token to be used in Java EE RBAC – identifying user principle name and group names that a container can map to deployment roles.

Health Check

URL: https://github.com/eclipse/microprofile-health
Latest Release: https://github.com/eclipse/microprofile-health/releases

Health checks are used to probe the state of a computing node from another machine (i.e. kubernetes service controller) with the primary target being cloud infrastructure environments where automated processes maintain the state of computing nodes

Reactive Streams Operators (under construction)

URL: https://github.com/eclipse/microprofile-reactive-streams
Latest Release: https://github.com/eclipse/microprofile-reactive-streams/releases

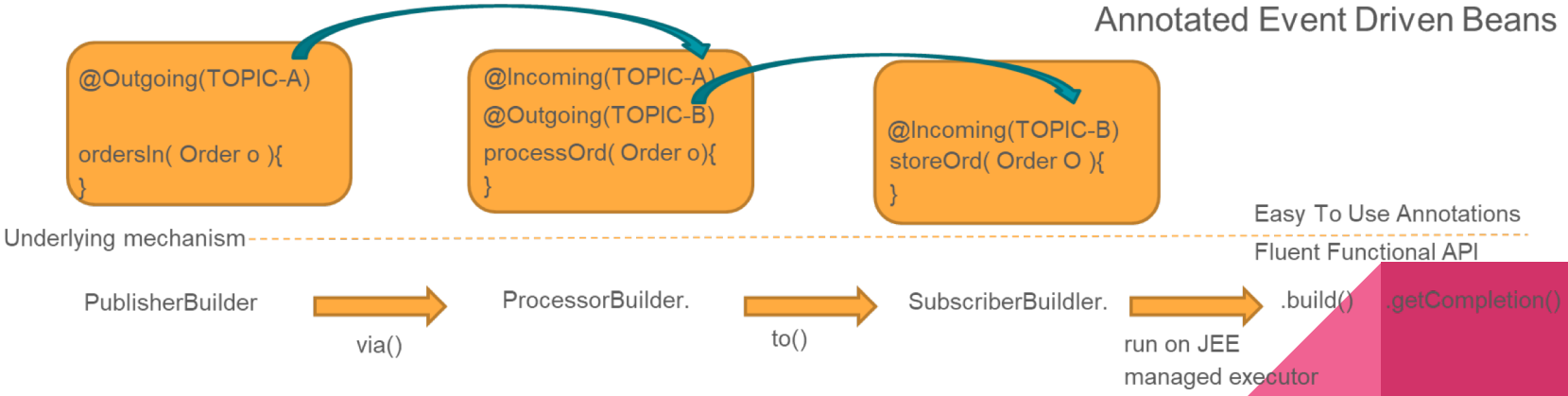
Reactive Streams is an integration SPI - it allows two different libraries that provide asynchronous streaming to be able to stream data to and from each other.

Reactive Streams is not however designed to be used directly by application developers. The semantics defined by Reactive Streams are very strict, and are non trivial, particularly in the areas of thread safety, to implement correctly. Typically, application developers are expected to use third party libraries that provide the tools necessary to manipulate and control streams. Examples include Akka Streams, RxJava and Reactor.

Reactive Messaging (under construction)

URL: https://github.com/eclipse/microprofile-reactive-messaging
Latest Release: N/A

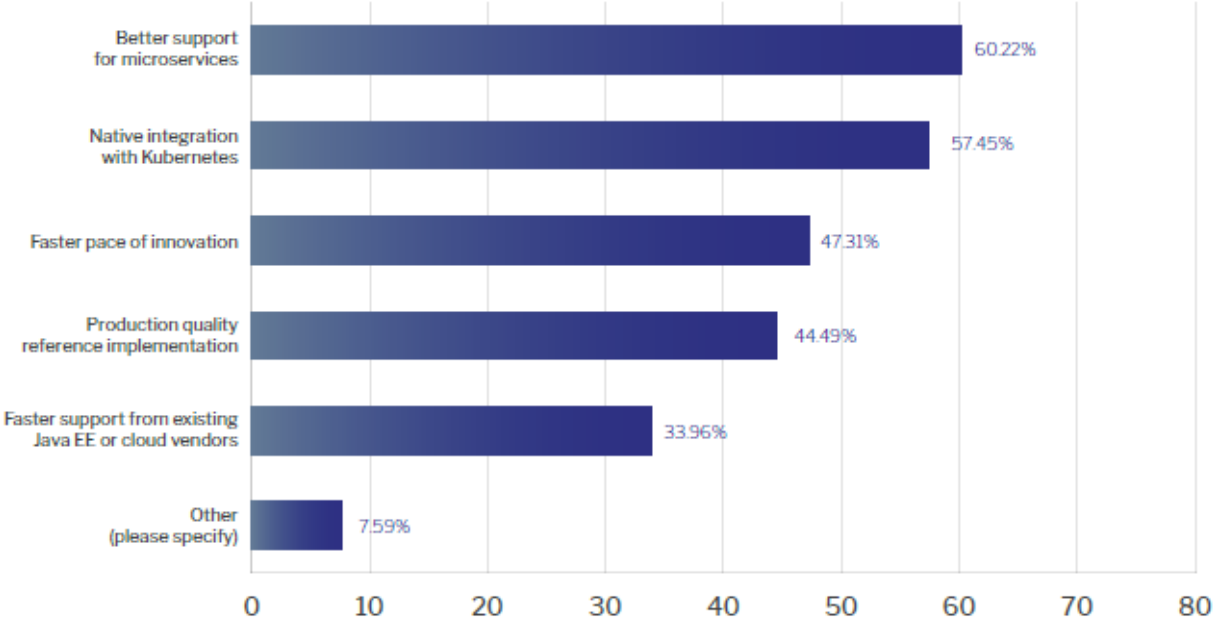
User annotates simple methods…container creates and manages Reactive Streams:



Service Mesh / ISTIO (under construction)

URL: https://github.com/eclipse/microprofile-service-mesh
Latest Release: N/A

MicroProfile defines programming model for developing cloud-native microservices. Cloud Native microservices developed with MicroProfile can take advantage of a Service Mesh by extracting many concerns away from the development of the microservice itself. It is important for MicroProfile to understand the capabilities of service mesh, so that MicroProfile can offer complimentary features for the infrastructure and avoid the conflicts.

HOW CAN THE ECLIPSE FOUNDATION BEST EVOLVE JAKARTA EE TO MEET YOUR CLOUD NEEDS? SELECT ALL THAT APPLY.

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