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Practical Cloud-native Java with Eclipse MicroProfile

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@NottyCode

Background to Cloud-native

Agile

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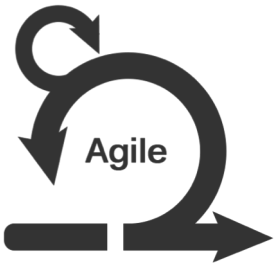

Agile & DevOps

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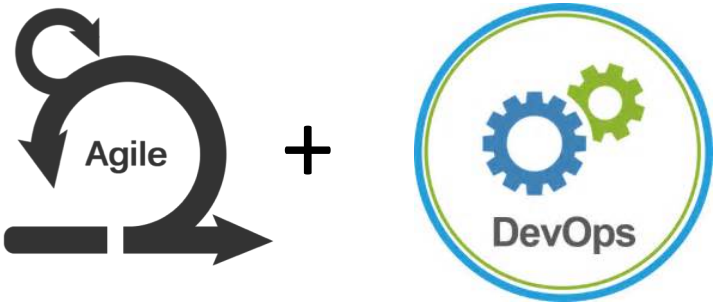
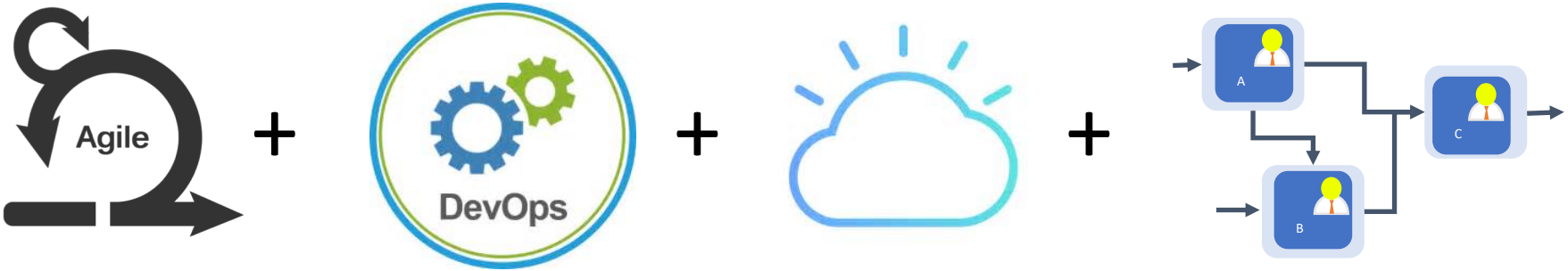


Agile & DevOps & Cloud

Agile & DevOps & Cloud & Microservices



Good characteristics of a cloud-native environment

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Provides APIs for distributed computing

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Starts fast and shuts down clean

Has a (proportionately) small footprint

Facilitates dev/prod parity, including through externalized config

Can be easily containerized

Being fast, small and open

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Middle-aged spread

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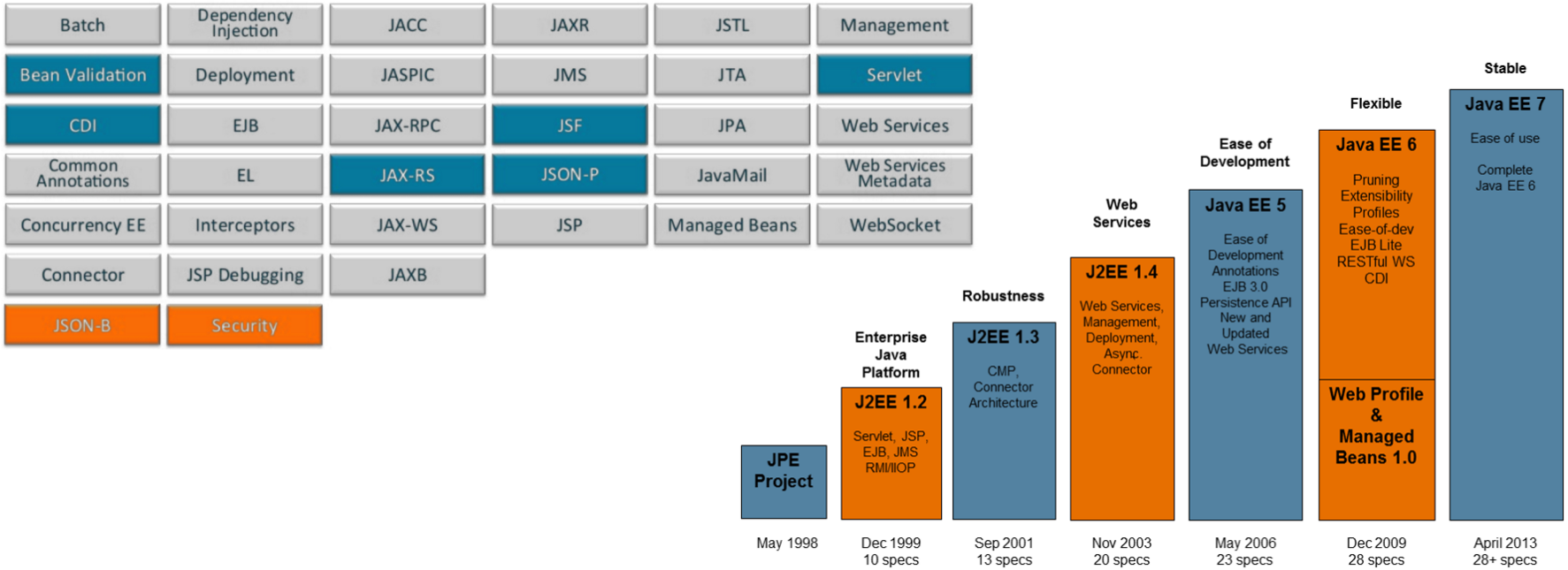

https://www.slideshare.net/delabassee/java-ee-8-february-2017-update
https://medium.com/@alextheedom/java-ee-past-present-future-8bf25df7b6a3

Liberty Features

server

```
<featureManager>
 <feature>jaxrs-2.0</feature>
 <feature>openapi-3.0</feature>
</featureManager>
```

build

```
<packaging.type>minify,runnable</packaging.type>
```

~~Wildfly Swarm~~ Thorntail Fractions

build

```
<dependency>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>jaxrs</artifactId>
</dependency>
<dependency>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>swagger</artifactId>
</dependency>
```

What does it mean to provide microservice technologies?

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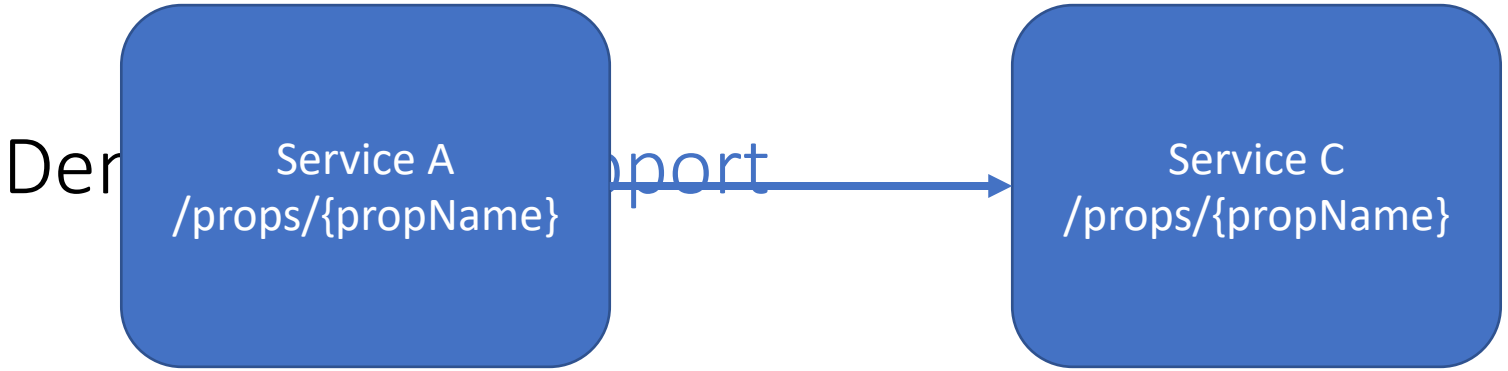
MICROPROFILE
OPTIMIZING ENTERPRISE JAVA
PROJECTS
PRESENTATIONS
FAQ
BLOG
CONTRIBUTORS
JOIN THE DISCUSSION
SEE THE CODE
Eclipse MicroProfile
Optimizing Enterprise Java for a microservices architecture
IBM
LJC
redhat
Tomitribe
payara
SOUJava
hazelcast
FUJITSU
kumuluzEE
ORACLE
Hammock
Lightbend
Microsoft

There’s a good chance you’ll use REST APIs.

Eclipse MicroProfile

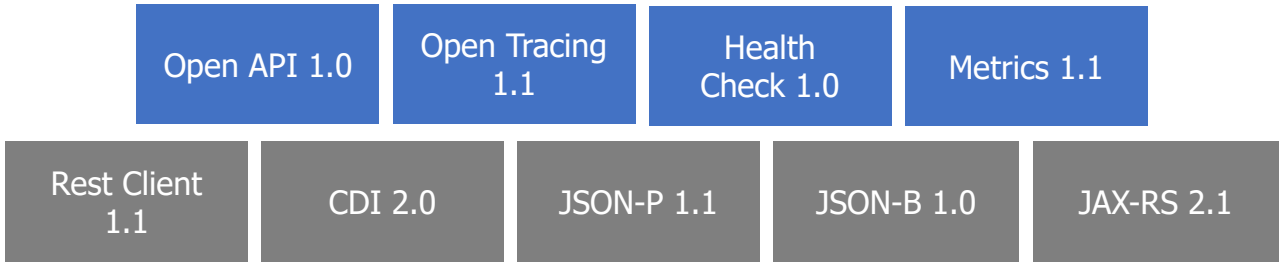
Rest Client 1.1	CDI 2.0	JSON-P 1.1	JSON-B 1.0	JAX-RS 2.1

Demo of REST support


Service A
/props/{propName}
Service C
/props/{propName}

Handling “100s” of collaborating services requires a strong operations focus

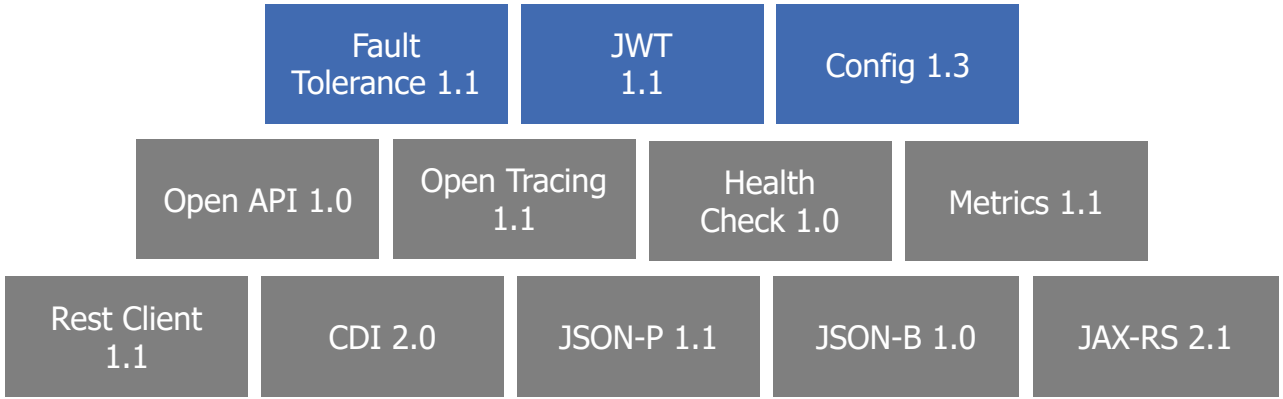
Eclipse MicroProfile



Demo openapi, health & metrics

Handling ”100s” of collaborating and frequently evolving services requires new APIs

Eclipse MicroProfile



Demo of config and Fault Tolerance

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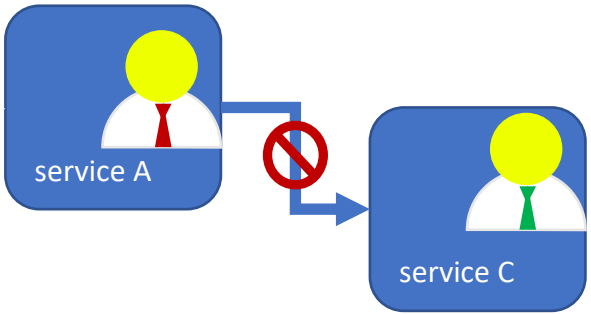
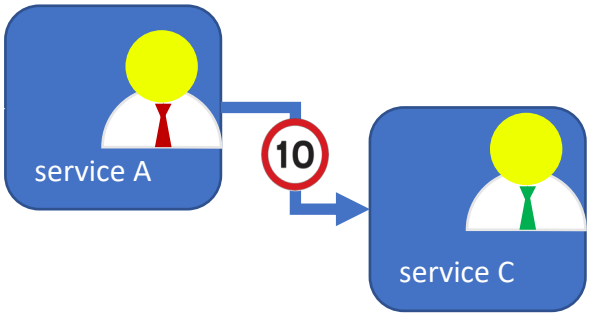
Fault Tolerance in microservices



Circuit breaker

```
@CircuitBreaker(
failOn=IOException.class,
   delay = 500)
public void callServiceC() {
    // call the service
}
```

Fault Tolerance in microservices

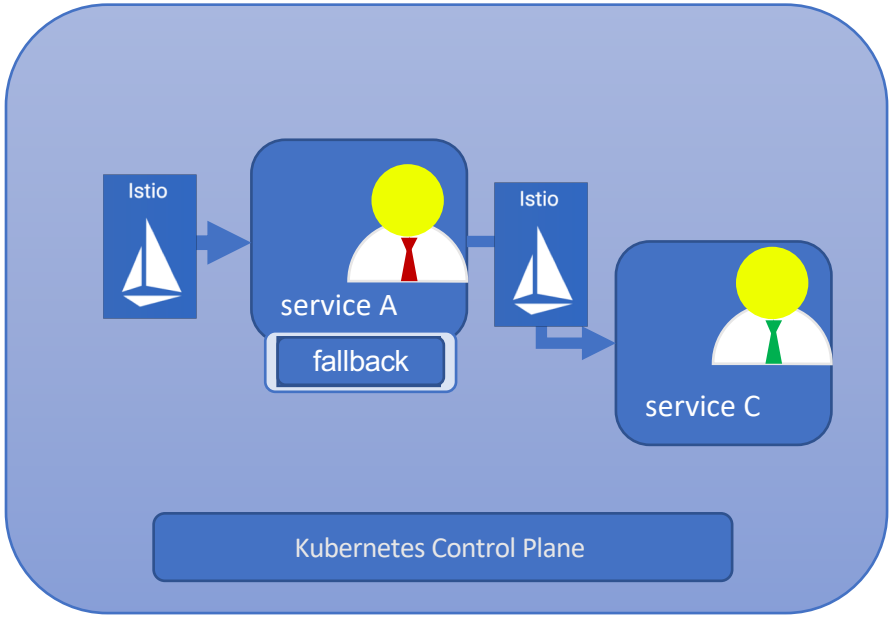


Bulkhead

```
@Asynchronous
@Bulkhead(value = 10,
   waitingTaskQueue = 15)
public void callServiceC() {
    // call the service
}
```

Can’t I do all this with a service mesh?

Fault Tolerance in microservices



App Container can defer to Cloud Platform

```
@Retry
@Timeout
@CircuitBreaker
@Bulkhead
```

Application still provides:

```
@Fallback
```

- What is next?

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- Reactive
- Data access
- Istio integration
- Updates to existing specs

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Packaging for deployment

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Making the most of Docker

Summary

- Consider both organizational and technological changes to increase likelihood of success
- Leverage MicroProfile to solve cloud-native challenges
- Choose appropriate packaging for your cloud
- Reduce overheads and cost with a right-sizeable runtime
- In Docker, strive for a thin application layer
- Learn more with Open Liberty guides https://ibm.biz/mpGuides

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Thank You