



Open Liberty

Liberty Quarterly Update

20.0.0.1-20.0.0.3

Alasdair Nottingham – Liberty Lead Architect

 @nottycode

Agenda

Open Liberty



Part 1: 10 Minute Liberty overview

Part 2: Liberty and OpenShift – Arthur De Magalhaes

Part 3: What is new this quarter

Part 4: Q&A

10 minute overview

Why Choose Liberty

Open Liberty



- Cloud Ready
 - Container optimized
 - Designed for dev/ops
 - Small disk footprint
 - Efficient memory usage
 - Fast startup
 - High throughput
 - Self-Tuned Thread Pool
- Developer friendly
 - Just enough application server
 - Fast inner loop with dev mode
 - Support for industry standard dev tools
 - Jakarta EE, Java EE, MicroProfile APIs
 - Zero Migration

What people are saying

- "Light operation and efficient operation (restart time can be reduced compared to ND)"
- "Ease of use small footprint ability to be built into a container"
- "It's the best tool for the job."
- "Easy to manage, Cloud Ready a Smart Product with cool feature. Modular flexible and fast."
- "Simple, well supported, cloud and container friendly."
- "Liberty is a fast-to-configure application server with some advantages over other similar products."
- "Simplicity of use."
- "Now that we have experienced Liberty, we are spoiled and want to stick to those easy, non-impacting migrations."

Open Liberty



Alex Lewis
@seekingbinary

Follow

Starting to use this in my own projects. Thoroughly recommended. Keep up the great work @OpenLibertyIO team.

openlibertyio @OpenLibertyIO

Dev mode support and more developer experience enhancements to the Liberty Maven plug-in: openliberty.io/blog/2019/11/2...

11:36 PM - 28 Nov 2019

5 Retweets 13 Likes



Tim Zöller
@javahippie

Follow

The @OpenLibertyIO dev mode is one of the best hot-reload features I have ever worked with, I am seriously impressed!

11:56 PM - 25 Oct 2019

9 Retweets 25 Likes



Philip Riecks
@riECKpil

Follow

This Maven plugin is really a gamechanger for the development experience when it comes to developing @JakartaEE and @MicroProfileIO applications on @OpenLibertyIO. Read my review here: [riECKpil.de/joyful-open-li ...](https://riECKpil.de/joyful-open-li...)

Just Enough Application Server

Open Liberty



You control which features are loaded into each server instance

Java EE



```
<feature>jsf-2.3</feature>
```

jsp-2.3

jsf-2.3

servlet-4.0

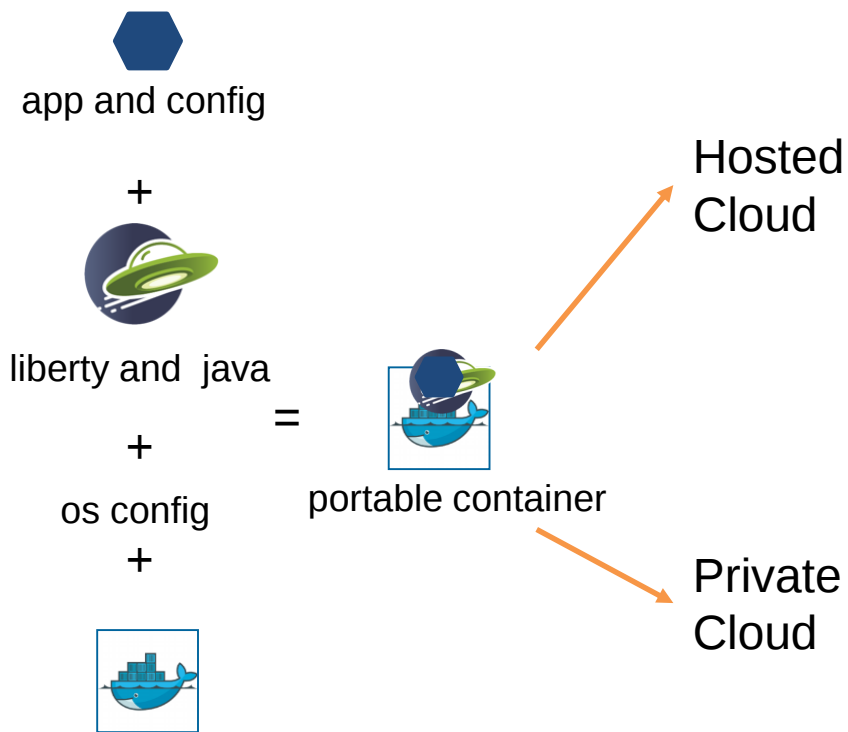
http-2.0

appmgr

Kernel



Liberty in Containers



IBM Cloud Kubernetes Service

Azure Kubernetes Service

Google Kubernetes Engine

Amazon Elastic Kubernetes Service

Jelastic

Red Hat Open Shift Container Platform

Pivotal Kubernetes Service

Pivotal Cloud Foundry

FROM open-liberty
ADD myapp.war /config/dropins/myapp.war

Liberty Zero Migration

Open Liberty

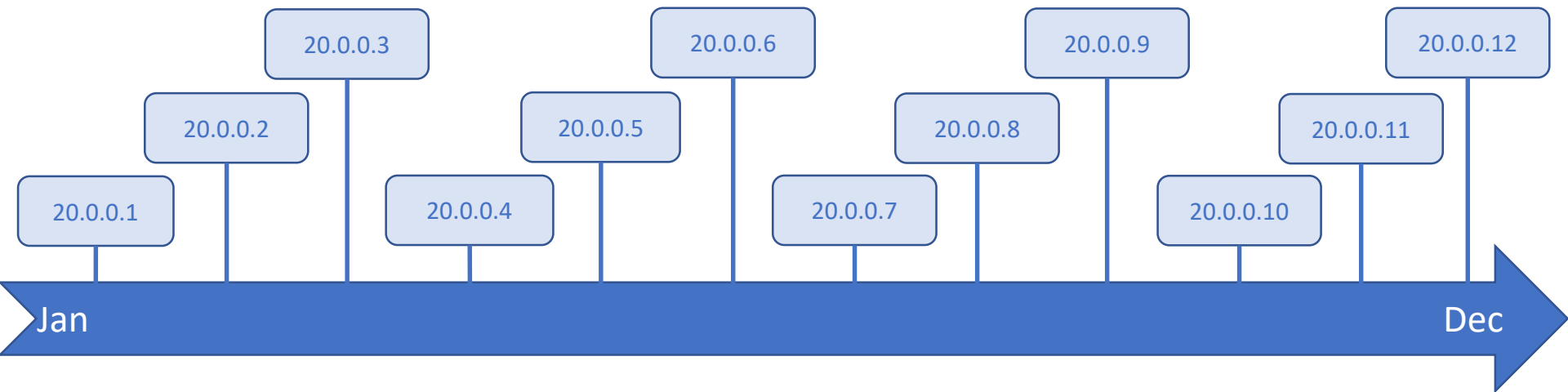


- Zero config migration
 - Write once, run forever
- Zero app migration
 - No behavior changes in existing features
 - New behaviors in new features
- Choose your Java
 - Java 13, 11, 8
 - AdoptOpenJDK
 - IBM
 - OpenJDK
 - Oracle



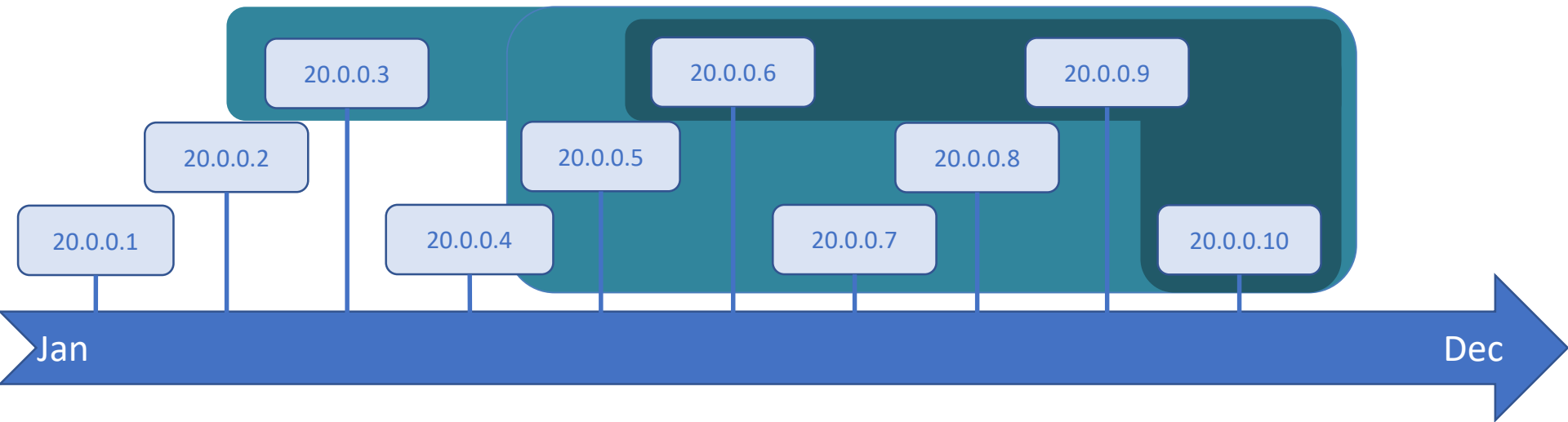
Liberty Release Cadence

Open Liberty



	All CD releases	CD releases ending .3 .6 .9 .12
Support Provided	5 years	5 years
iFixes	24 weeks	2 years
Proactive Security iFixes	Most recent	Most recent 2

Liberty Release Cadence Example



	All CD releases	CD releases ending .3 .6 .9 .12
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How to get Support

Open Liberty



WebSphere



z/OS
ND
Base
Core



IBM Cloud Pack for Apps

IBM Integrated Application Runtimes

Java:

- WebSphere
- Liberty
- MicroProfile
- Jakarta EE
- OpenJ9
- HotSpot

Node.js:

- Loopback
- Express



Red Hat Runtimes

Integrated DevOps



Red Hat OpenShift

Red Hat Runtimes



Open Liberty

JBoss EAP

OpenJDK

Spring

Thorntail

Node.js

Red Hat AMQ

Red Hat Data Grid



Liberty and OpenShift

Arthur De Magalhaes – Runtimes Containers Architect





Certified Liberty images

Certified by Red Hat: <https://access.redhat.com/containers/#/search/liberty>

Available from Docker Hub and IBM Cloud Container Registry

- 3 versions (latest and last 2 quarter drivers)
- 2 tags: kernel & full



IBM Java JRE 8

ubi8 standard



AdoptOpenJDK OpenJ9 JRE 8

ubi8 standard



AdoptOpenJDK OpenJ9 JRE 11

ubi8 standard



IBM Java JRE 8

Ubuntu

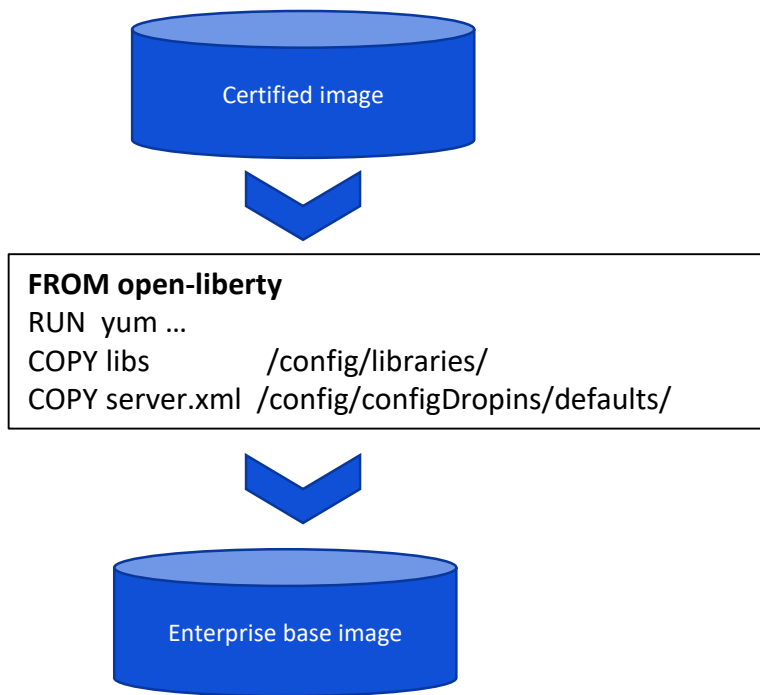


AdoptOpenJDK OpenJ9 JRE 8

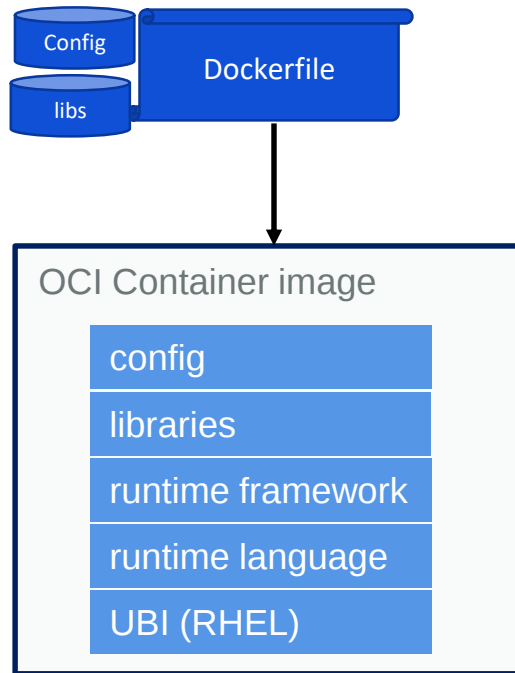
Ubuntu



Consistent enterprise images



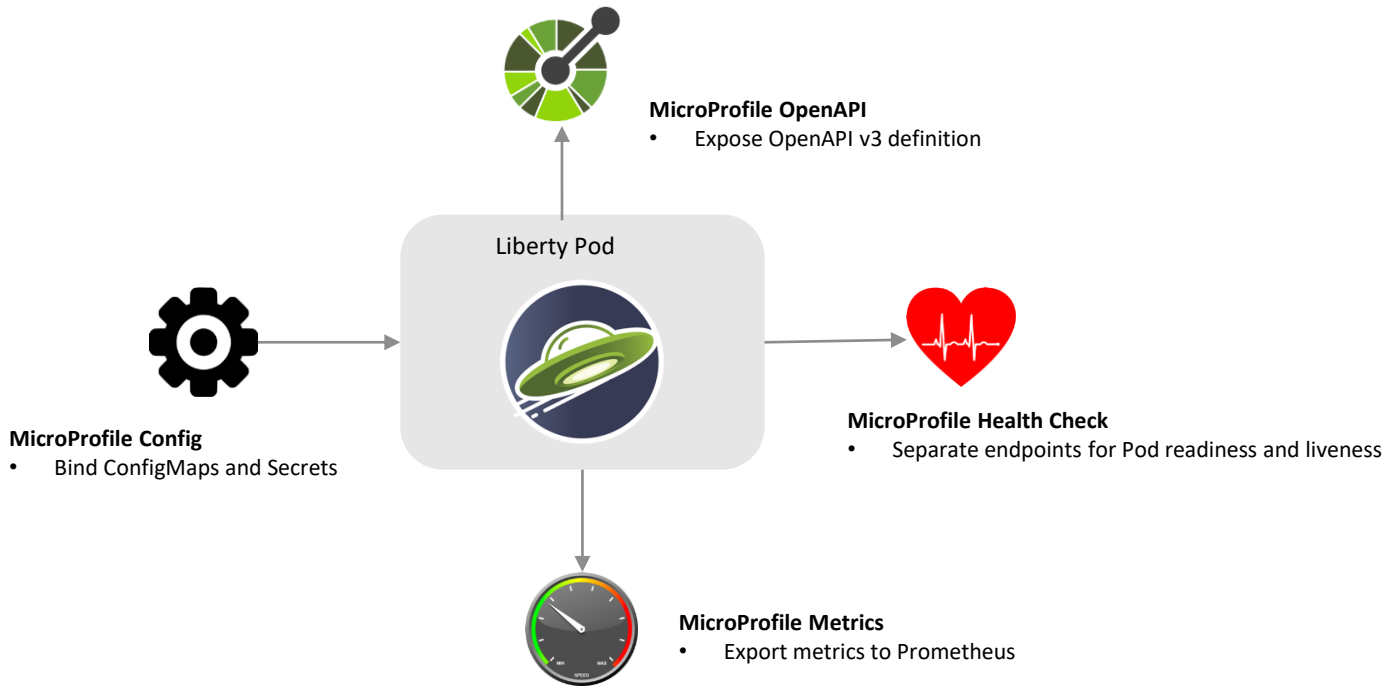
Consistency across the enterprise



Improves performance w/ layer caching



Cloud best practices via MicroProfile



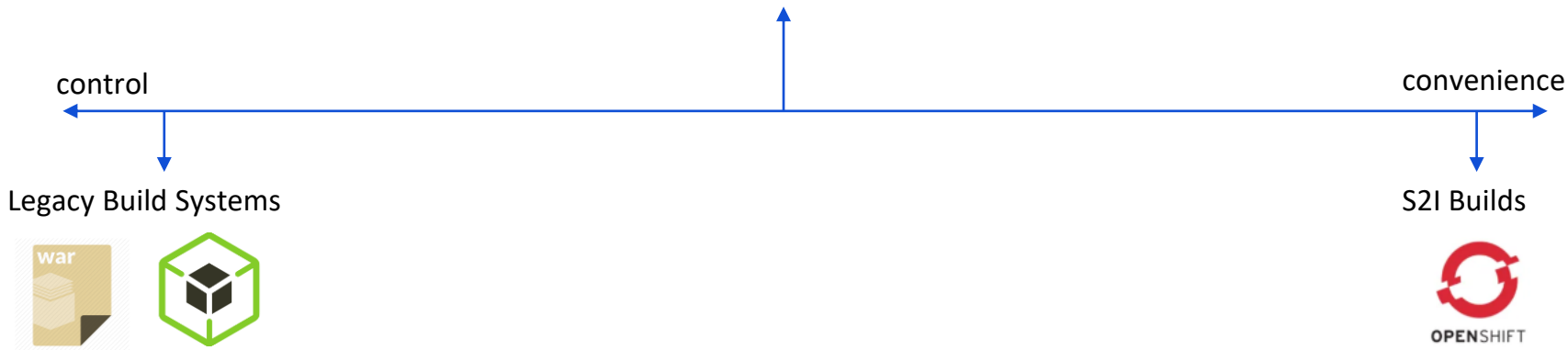


Building application images with convenience

Multi-stage Dockerfile

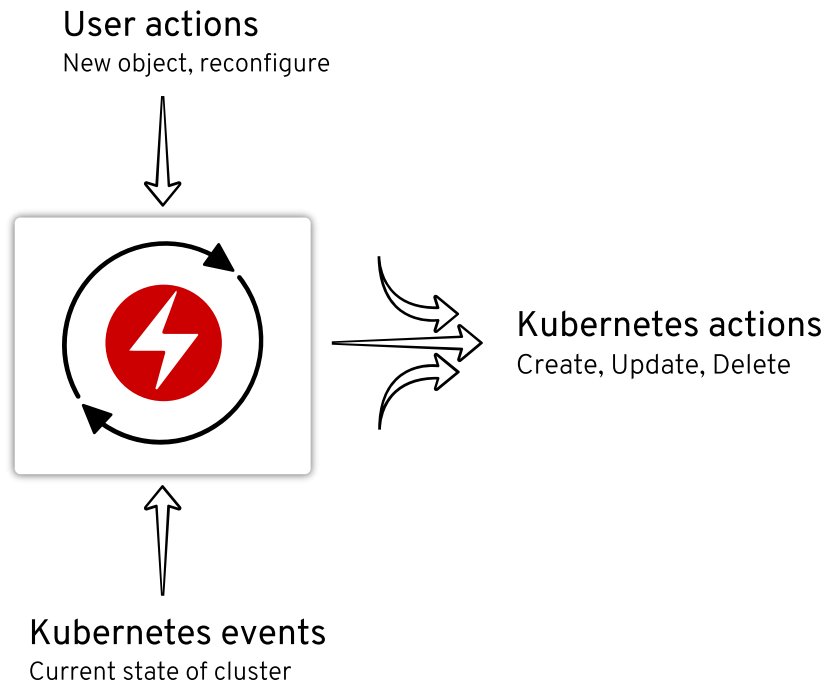
```
FROM maven:latest AS builder
COPY mySourceCode/ /source/MyApp
RUN cd /source/myApp && mvn clean package

FROM enterprise-base:backend
COPY --from=builder --chown=1001:0 /source/myApp/target/myApp.war /config/dropins/
COPY --from=builder --chown=1001:0 /source/myApp/target/server.xml /config
```



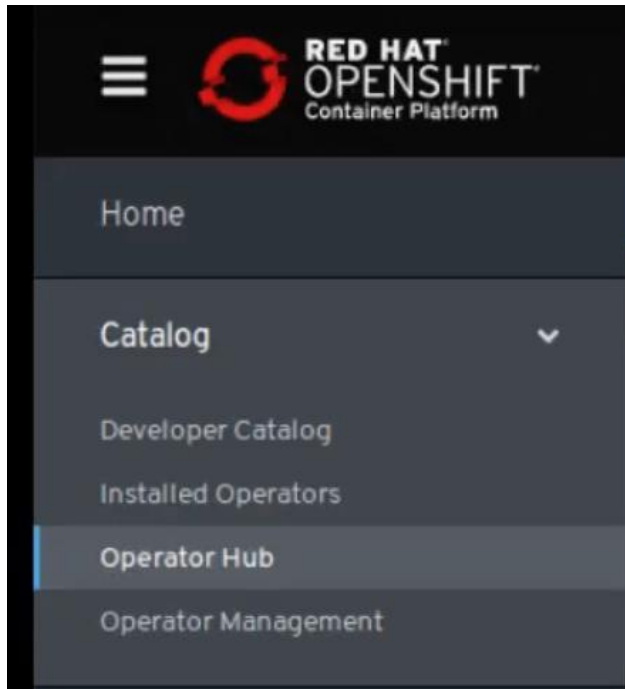


Embracing Operators





Open Liberty Operator



Operator Hub:

<https://operatorhub.io/operator/open-liberty>

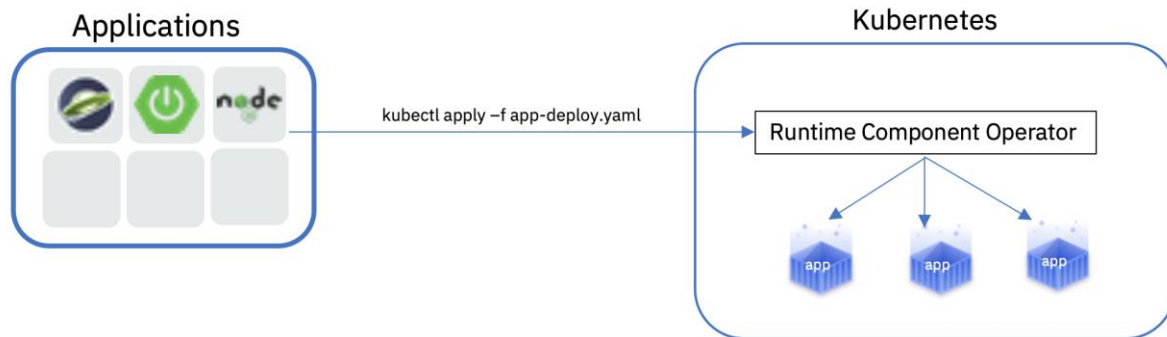
Open Source Community:

<https://github.com/OpenLiberty/open-liberty-operator>

Certified on 01/11/2020



Runtime Component Operator



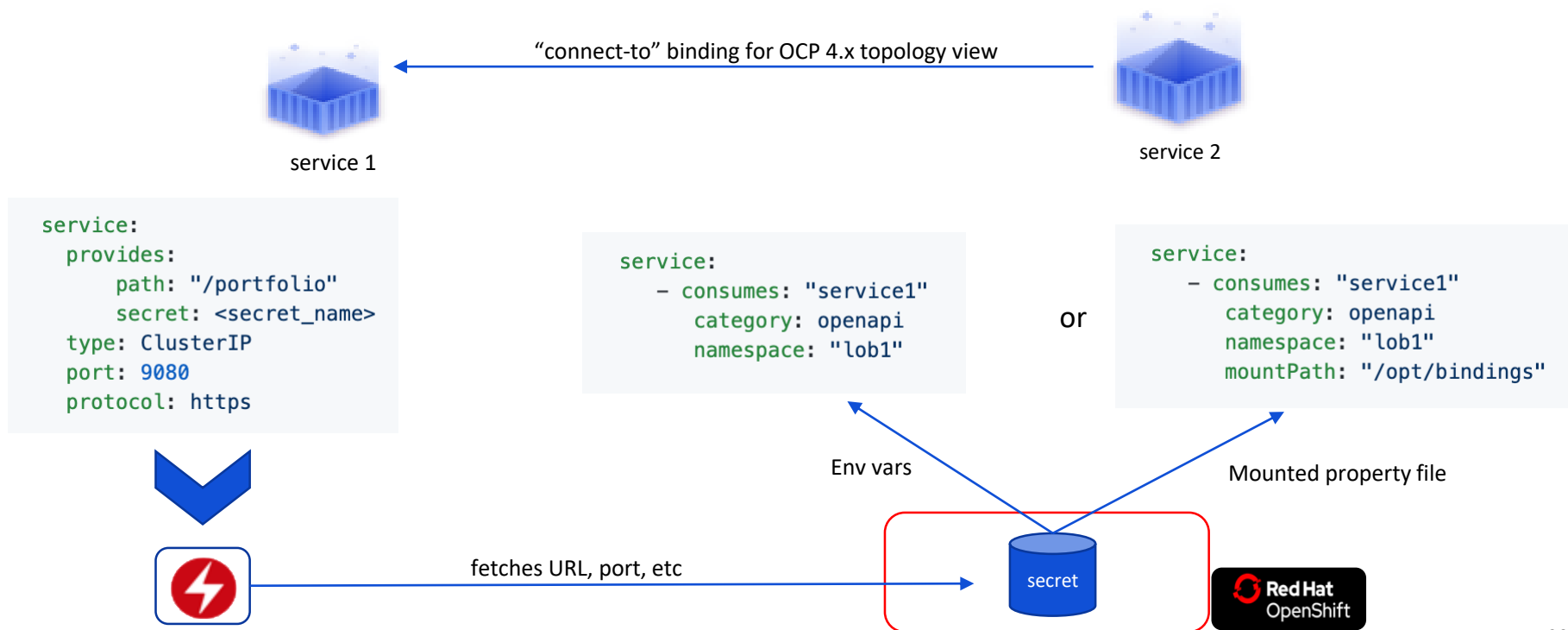
- Creation / deployment of k8s or **Knative** resources
- Horizontal auto-scaling
- Resource constraints
- Built-in logging and monitoring (Prometheus) integration
- Auto-creation of Routes
- Readiness / liveness probes
- Environment variables setup
- Easy volume persistence setup
- Integration with kAppNav
- App-app service binding
- Image stream support
- Day 2 operations
- Integration with Certificate Manager
- Automatic setup of OpenID Connect Client
- Automatic binding to databases



Connecting microservices with ease



- Red Hat's Service Binding Operator: <https://github.com/redhat-developer/service-binding-operator>
- Service Binding Specification: <https://github.com/application-stacks/service-binding-specification>





Day 2 Operations



> oc client

```
arthur ~ --bash -- 85x6
Last login: Thu Dec 12 15:12:22 on ttys001
arthur@mbp-2:~$ arthur$ oc apply -f day2operation.yaml
```

kAppNav

Components

Status	Name	Kind	Namespace	Platform	Actions
Normal	stock-trader	Deployment	kappnav	Kube	
Normal	stock-trader-service	Service	kappnav	Kube	
Normal	stock-trader-service	Service	kappnav	Kube	
Normal	stock-trader-service	Deployment	kappnav	Kube	
Normal	stock-trader	Deployment	kappnav	Kube	

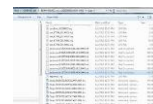


Open Liberty Operator

Actions



Trace Gathering



JVM Dump



Persisted Volume

<https://github.com/OpenLiberty/open-liberty-operator/issues>



Enterprise-Ready Application Stacks

Add governance and ensure enterprise consistency
100% Open Source

Sharable pre-built, cloud-optimized
technology stacks

Production deploy to Kubernetes
Server or Serverless Scaling

Open Liberty

Open Liberty & OpenJ9
using Maven

Select

Spring Boot®

Spring Boot using OpenJ9
and Maven

Select

Eclipse Vert.x

Eclipse Vert.x runtime for
running Java applications

Select

[+ 15 stacks]

Appsody.dev - Open Source Project

Recent Updates

Periodic Table of Liberty (20.0.0.3) Open Liberty

zOS

ND

Base

Core

Open
Liberty

New in
4Q19

New in
3Q19

New in
2Q19

New in
1Q20

batchSMFLogging-1.0		zosLocalAdapters-1.0		zosTransaction-1.0		zosSecurity-1.0	
collectiveController-1.0		dynamicRouting-1.0		healthManager-1.0		scalingController-1.0	
clusterMember-1.0		healthAnalyzer-1.0		scalingMember-1.0		Security	
cloudant-1.0		sipServlet-1.0		batchManagement-1.0		Operations	
javaee-7.0				wsAtomicTransaction-1.2			
javaee-8.0							
jakartaee-8.0							passwordUtilities-1.0 
							wsSecurity-1.1 
							wsSecuritySaml-1.0 
bells-1.0		mpContextPropagation-1.0		adminCenter-1.0		constrainedDelegation-1.0	
concurrent-1.0		mpReactiveMessaging-1.0		collectiveMember-1.0		federatedRepository-1.0	
javaMail-1.6		mpReactiveStreams-1.0		distributedMap-1.0		jwt-1.0	
jaxb-2.2		opentracing-1.3		eventLogging-1.0		jwtSso-1.0	
jdbc-4.3		osgiConsole-1.0		logstashCollector-1.0		sessionDatabase-1.0	
jpaContainer-2.2		springBoot-2.0		monitor-1.0		webCache-1.0	
jsfContainer-2.3		webProfile-7.0		openapi-3.1			samlWeb-2.0 
json-1.0		webProfile-8.0		requestTiming-1.0			scim-1.0
jsonbContainer-1.0				usageMetering-1.0			socialLogin-1.0 
jsonpContainer-1.1				restConnector-2.0			spnego-1.0 
microProfile-3.2		APIs		sessionCache-1.0			transportSecurity-1.0 

Focus areas

Open Liberty



Developer Experience

APIs

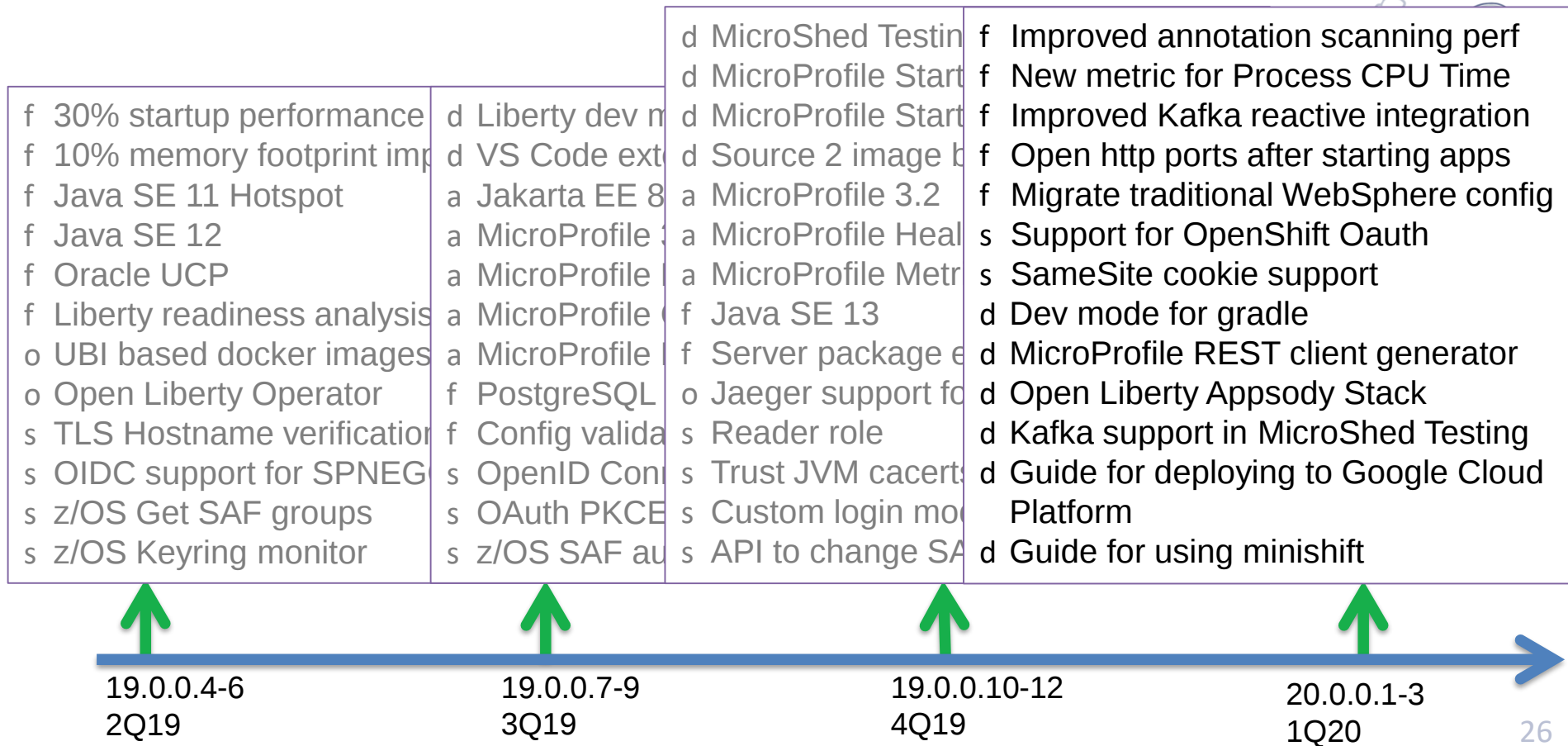
Foundation

Orchestration

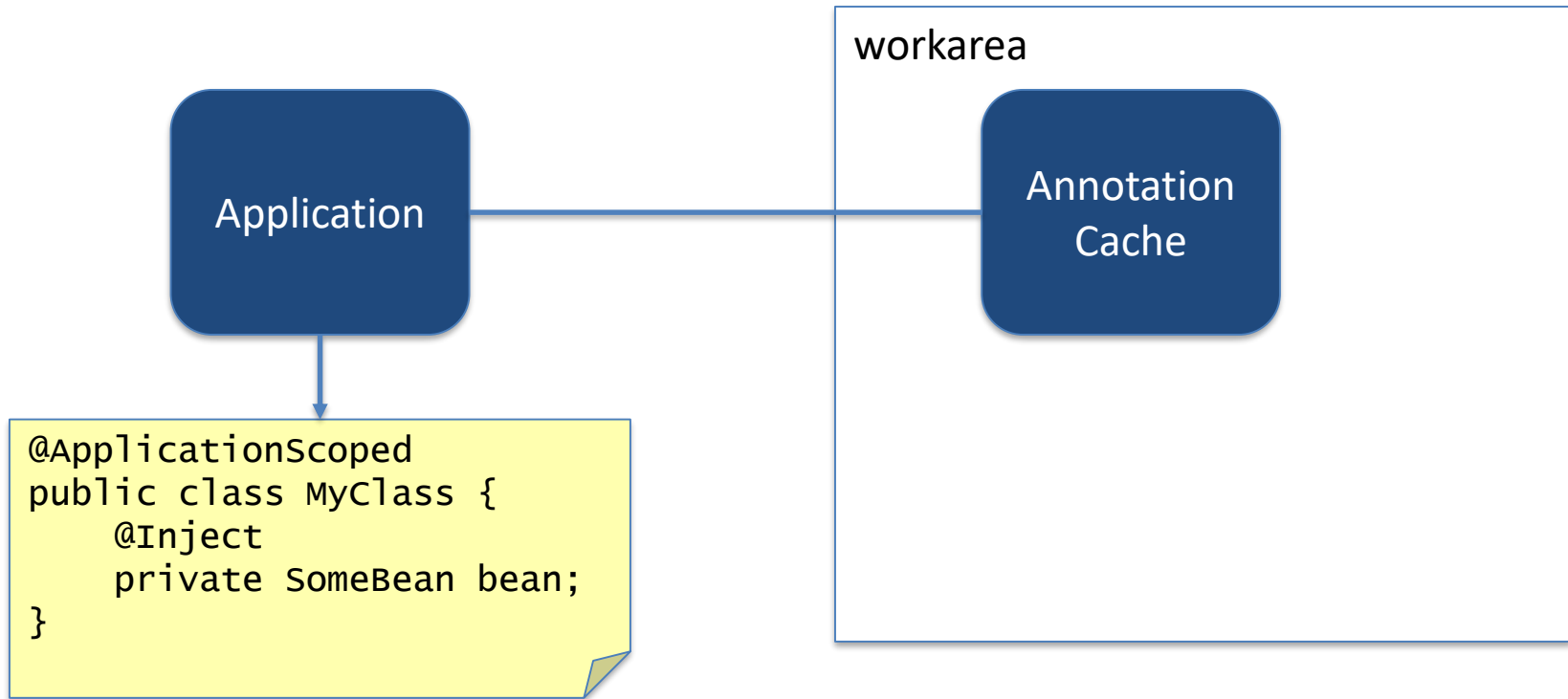
Security

Last 12 month highlights

Open Liberty



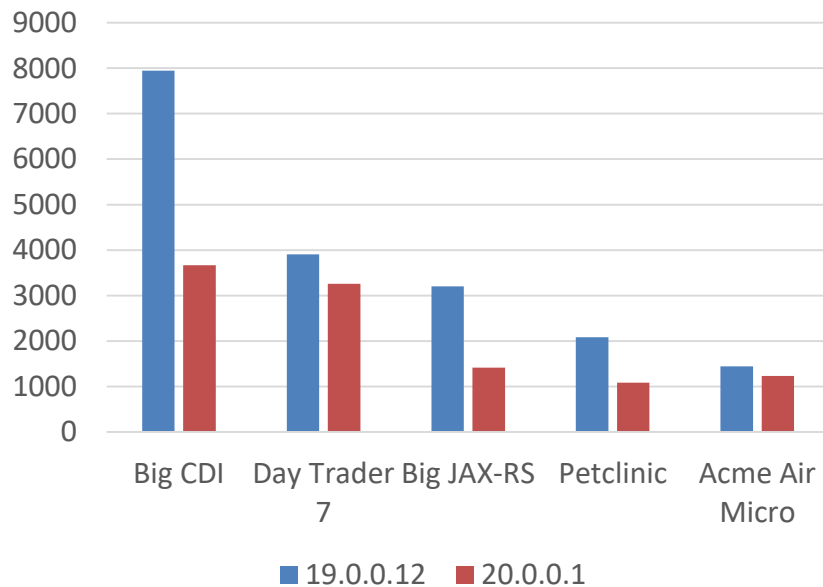
Annotation Scan Caching



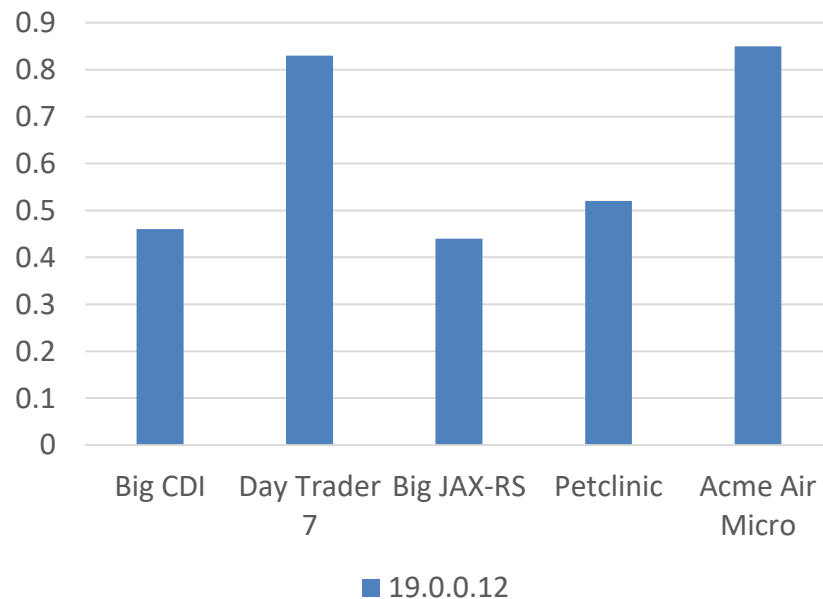
Annotation Scanning Performance



Startup Time (ms)



Startup Improvement %

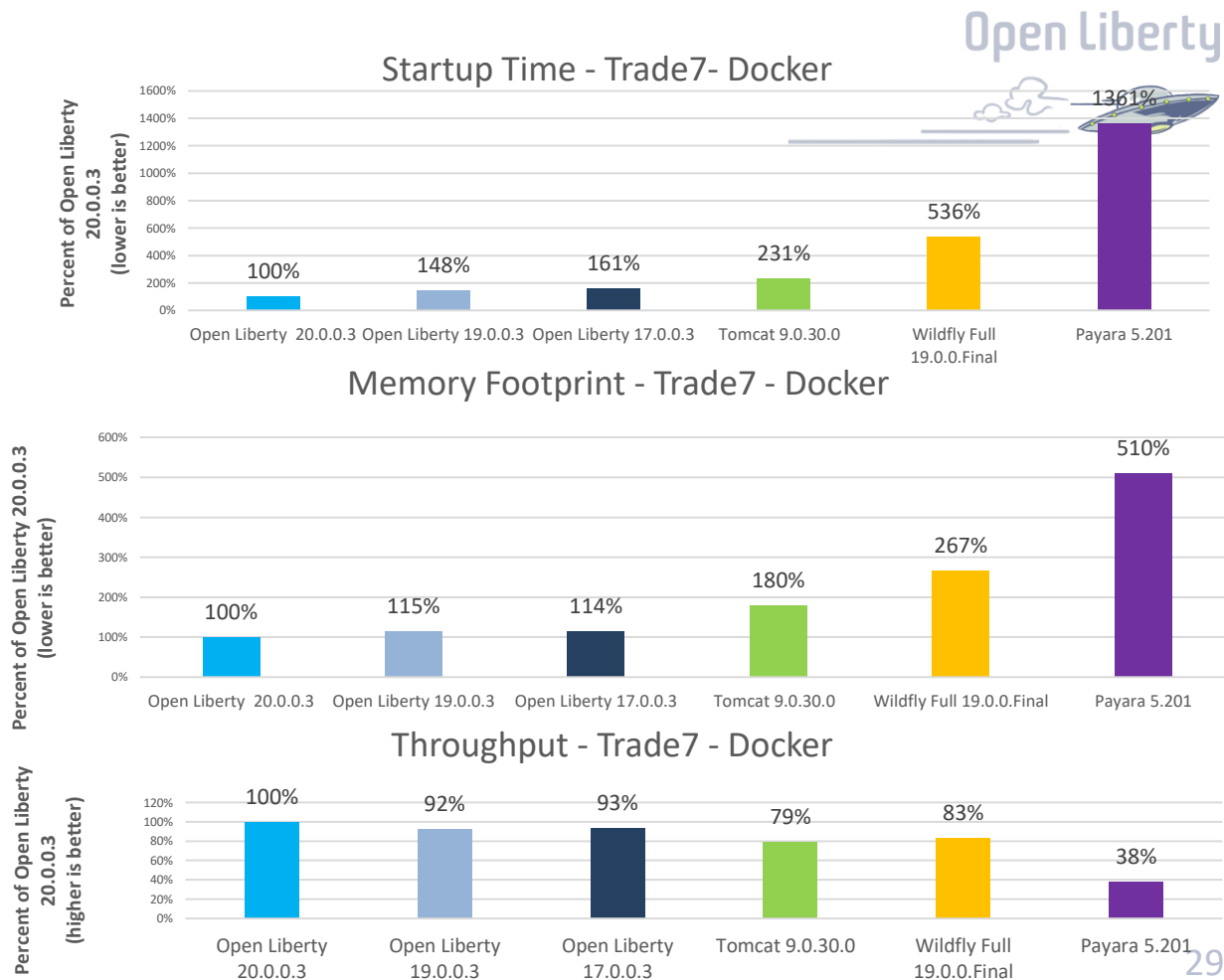


EE7 Performance (Trade7)

- Competitive comparisons used docker images for the different frameworks
- Open Liberty shows good improvements in last year on all metrics and is better than competition on all metrics

System Configuration:

SUT: LinTel – SLES 12.3, Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz, 4 physical cores, 64GB RAM.
JDK version distributed with the docker images used for each server instance.



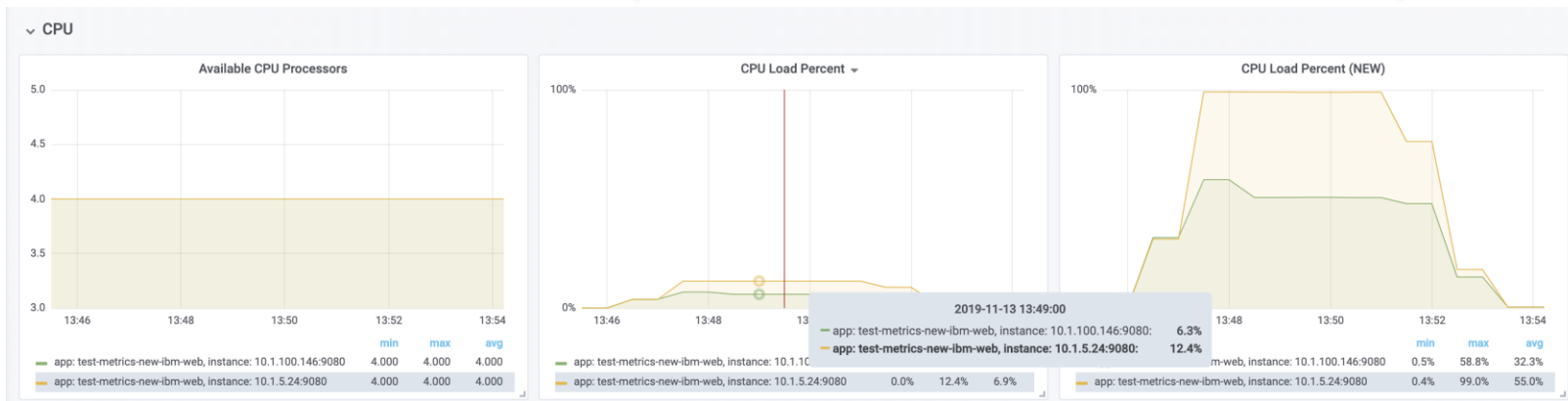
Process CPU Time Metric

Open Liberty



Old CPU Load % maxes out based on usage of total physical CPUs

New CPU Load % maxes out based on container CPU limits



Delayed HTTP Port opening

Open Liberty



Before



Request to app
fails with 404

Request to app
not possible

Request to app
succeeds 200

After



SameSite Cookies



- Configure for JSESSION cookie

```
<httpSession cookieSameSite="Lax|Strict|None|Disabled"/>
```

- Configure for SSO cookies

```
<webAppSecurity sameSiteCookie="Lax|Strict|None|Disabled"/>
```

- Configure for your cookies

```
<httpEndpoint id="defaultHttpEndpoint">  
  <samesite lax="myLaxCookies" strict="myStrictCookies"  
    none="myNoneCookies"/>  
</httpEndpoint>
```

Config Migration

Open Liberty



- Point binary scanner at app deployed to tWAS and get Liberty config
- JDBC
- JMS
- Service Integration Bus
- Authentication Alias

<http://ibm.biz/WAMT4AppBinaries>

```
<enterpriseApplication location="DayTrader7.ear"/>

  <dataSource containerAuthDataRef="TradeDataSourceAuthData" id="Traded
jdbcDriverRef="Derby_JDBC_Provider" jndiName="jdbc/TradeDataSource">
    <properties.derby.embedded createDatabase="create" databaseName="tr
    <connectionManager agedTimeout="-1" connectionTimeout="180" maxIdle
maxPoolSize="50" minPoolSize="10" purgePolicy="EntirePool" reapTime="18
  </dataSource>

  <jmsQueueConnectionFactory id="TradeBrokerQCF" jndiName="jms/TradeBro
    <properties.wasJms/>
  </jmsQueueConnectionFactory>
  <jmsQueue id="TradeBrokerQueue" jndiName="jms/TradeBrokerQueue">
    <properties.wasJms deliveryMode="NonPersistent" queueName="TradeBro
  </jmsQueue>
  <jmsActivationSpec id="eis/TradeBrokerMDB">
    <properties.wasJms destinationRef="TradeBrokerQueue" destinationTyp
  </jmsActivationSpec>
```

dev mode

Open Liberty



Boosts developer productivity

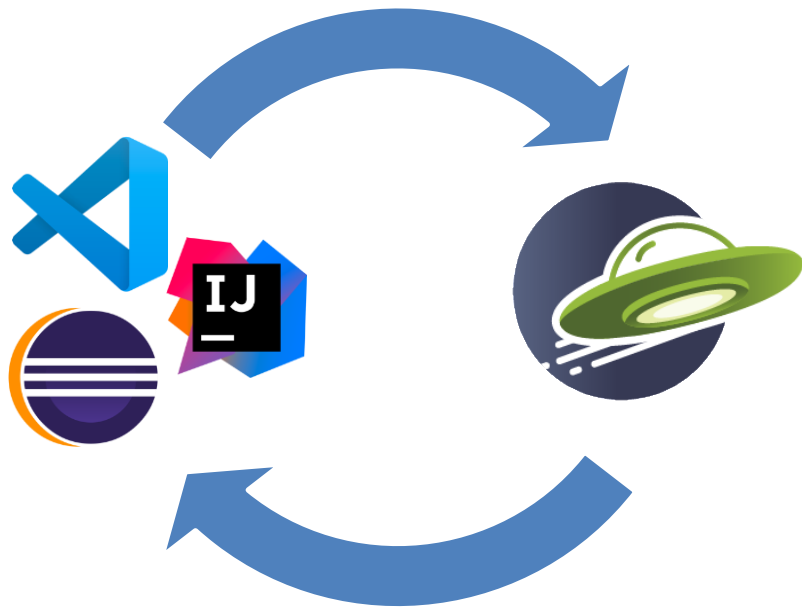
Immediate feedback for code and config changes

No re-build necessary

Hot deployment, testing and debugging

mvn liberty:dev

gradle libertyDev 🍰



Liberty Gradle Plugin v3

Open Liberty



New io.openliberty.tools group

dev mode support

Install latest Liberty from Maven
Central by default

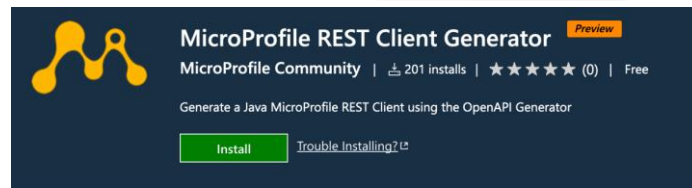
Configure Liberty server using
Gradle project properties

```
buildscript {  
    repositories {  
        mavenCentral()  
    }  
    dependencies {  
        classpath 'io.openliberty.tools:liberty-gradle-plugin:3.0'  
    }  
}
```

MicroProfile REST Client Generator

Generate template interface for MP REST Client from OpenAPI document

- Command line using OpenAPI Generator in OpenAPI Tools
- VS Code using MP REST Client Generator extension



VS Code MicroProfile Rest Client Generator Extension

Visual Studio Marketplace v0.1.1 build passing

The MicroProfile REST Client Generator Extension provides support for generating a [MicroProfile REST Client](#) interface template from an [OpenAPI](#) document. This extension calls the [openapi-generator](#) to generate models and apis folders. The code for this extension is hosted under the MicroShed organization on [GitHub](#). Learn more about MicroProfile REST Client on [GitHub](#).

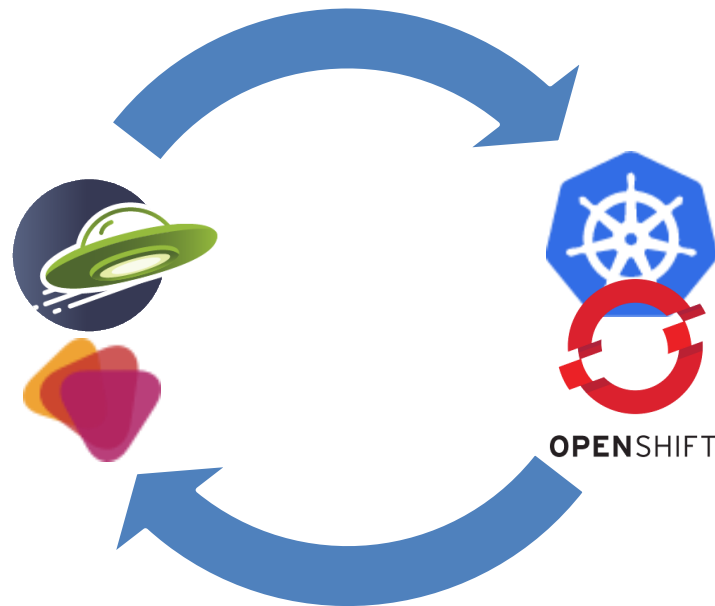
```
java -jar openapi-generator-cli-4.2.3.jar \
generate \
--generator-name java \
--library microprofile \
--input-spec my.api.yaml \
--api-package my.example.api \
--model-package my.example.model \
--output project-dir
```

Open Liberty Application Stack

Open Liberty



- Develop new applications easily with a stack that is ready for Kubernetes
 - Open Liberty as the runtime
 - Best practices and latest technologies (e.g. dev mode) built in
- Easy deployment onto Kubernetes platform
- Reusable and customizable



Labs, Questions

WebSphere Liberty Virtual POT

Open Liberty



Download the operating system specific content zip file from either

<https://ibm.box.com/WASLibertyVPoT> (fast - about 10 minute download)

<https://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/wasdev/pot/> (slower but firewall friendly – about 1 hour download)



Liberty Quarterly Update_20.0.0.1-3.final.pdf



LibertyPoT_20.0.0.3_LINUX.zip



LibertyPoT_20.0.0.3_MAC.zip



LibertyPoT_20.0.0.3_WIN.zip



labs_n_presentations_only.zip V13



LibertyResourceList.pdf V2

charts only

charts & lab instructions
only

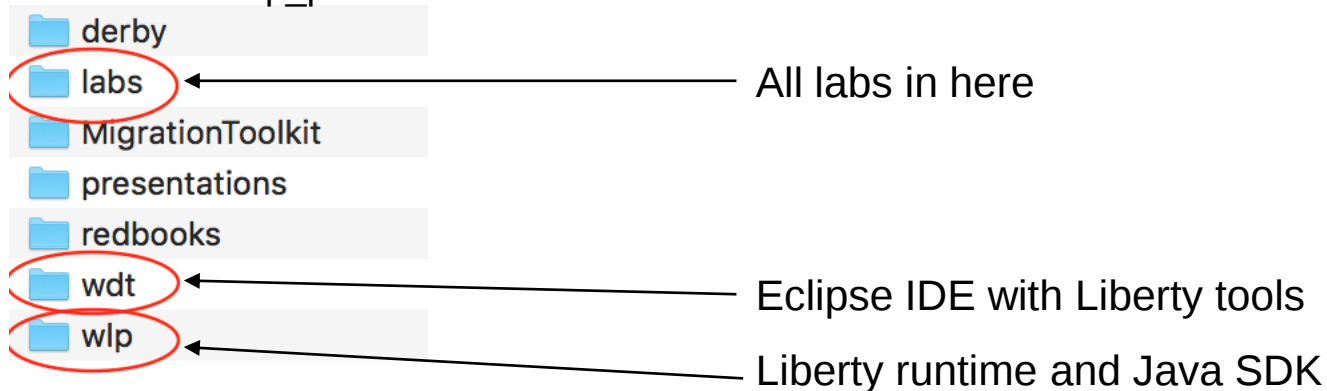
WebSphere Liberty Virtual POT

Open Liberty



Unzip to C:\wlp_pot

- Note: You can unzip to anywhere you wish but the lab instructions assume the unzip location is C:\wlp_pot



Follow [labs\gettingStarted\0_setup_20180105\setup.pdf](#)

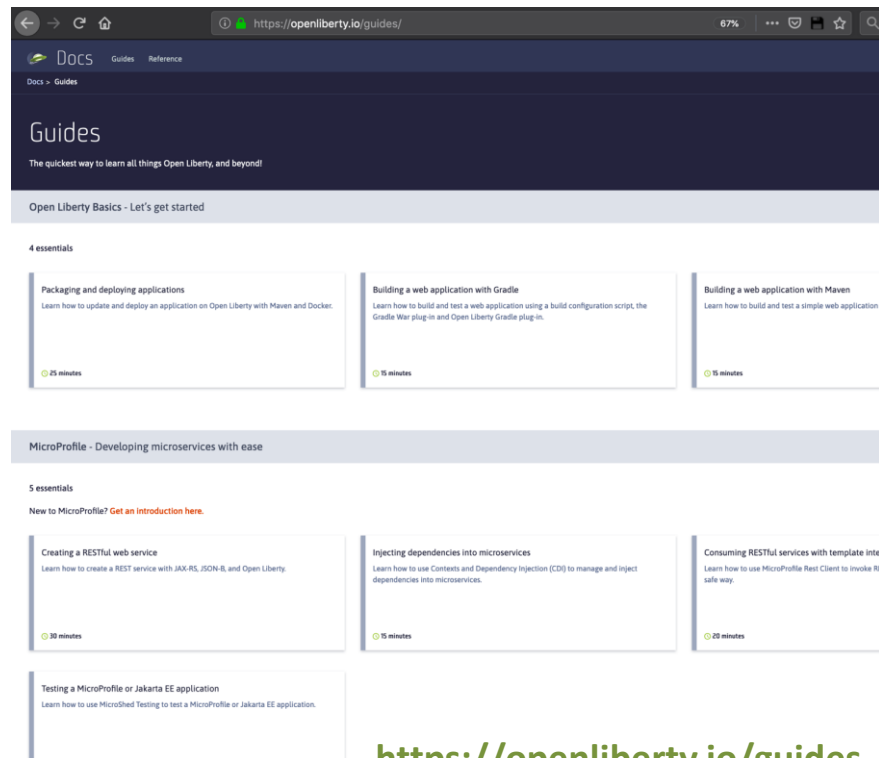
Then choose any labs you want to do

Open Liberty Guides

Open Liberty



- Hands-on learning in ~20 minutes
- 44 guides
 - MicroProfile & Jakarta EE
 - Open Shift, Docker, Kubernetes Istio
- Latest Guides
 - *Deploying microservices to an OKD cluster using Minishift*
 - *Deploying microservices to Google Cloud Platform*



<https://openliberty.io/guides>

Resources

Open Liberty



- Open Liberty: <https://www.openliberty.io/>
- Eclipse MicroProfile: <https://microprofile.io/>
- Jakarta EE: <https://jakarta.ee/>
- Liberty advantage: <https://www.ibm.com/downloads/cas/NVY3KY4E>
- Open Liberty Guides: <https://openliberty.io/guides>
- Why Liberty is the best Java runtime for the Cloud <https://developer.ibm.com/wasdev/docs/liberty-profile-best-java-runtime-cloud/>
- WebSphere Application Server V8.5 Administration and Configuration Guide for Liberty Profile (Redbook)
<http://www.redbooks.ibm.com/abstracts/sg248170.html?Open>
- Liberty videos: https://www.ibm.com/support/knowledgecenter/SSAW57_liberty/com.ibm.websphere.wlp.nd.multiplatform.doc/ae/covr_media.html
- Java support dates <http://www.ibm.com/developerworks/java/jdk/lifecycle>
- Single Stream Continuous Delivery <https://www-01.ibm.com/support/docview.wss?uid=ibm10869798>
- WebSphere Migration Knowledge Collection: Planning and Resources <https://www-01.ibm.com/support/docview.wss?uid=swg27008724>
- IBM Transformation Advisor <http://ibm.biz/cloudta>
- WebSphere Binary Migration Toolkit: <http://ibm.biz/WAMT4AppBinaries>

Next Quarterly Update

Open Liberty



Liberty 20.0.0.1-3 Update

Session#1: April 8, 2020 from 1-3pm ET - <http://ibm.biz/Liberty-Apr08>

Session#2: April 22, 2020 from 9-11am ET - <http://ibm.biz/Liberty-Apr22>

Liberty 20.0.0.4-6 Update

Session#1: June 24, 2020 from 1-3pm ET - <http://ibm.biz/Liberty-Jun24>

Session#2: July 8, 2020 from 9-11am ET - <http://ibm.biz/Liberty-Jul08>

WebSphere & Cloud Pak for Apps Customer Advisory Board

All Customers and Business Partners
welcome

<http://ibm.biz/WebSphereAdvisoryBoard>

email: claudiab@us.ibm.com

OPEN invitation

Join 230+ other members

Recordings/charts:

ibm.biz/WASCABCommunityResources

NEW

Monthly sessions
for Business
Partners and in
the IST timezone

Possible engagement levels – no commitment needed:

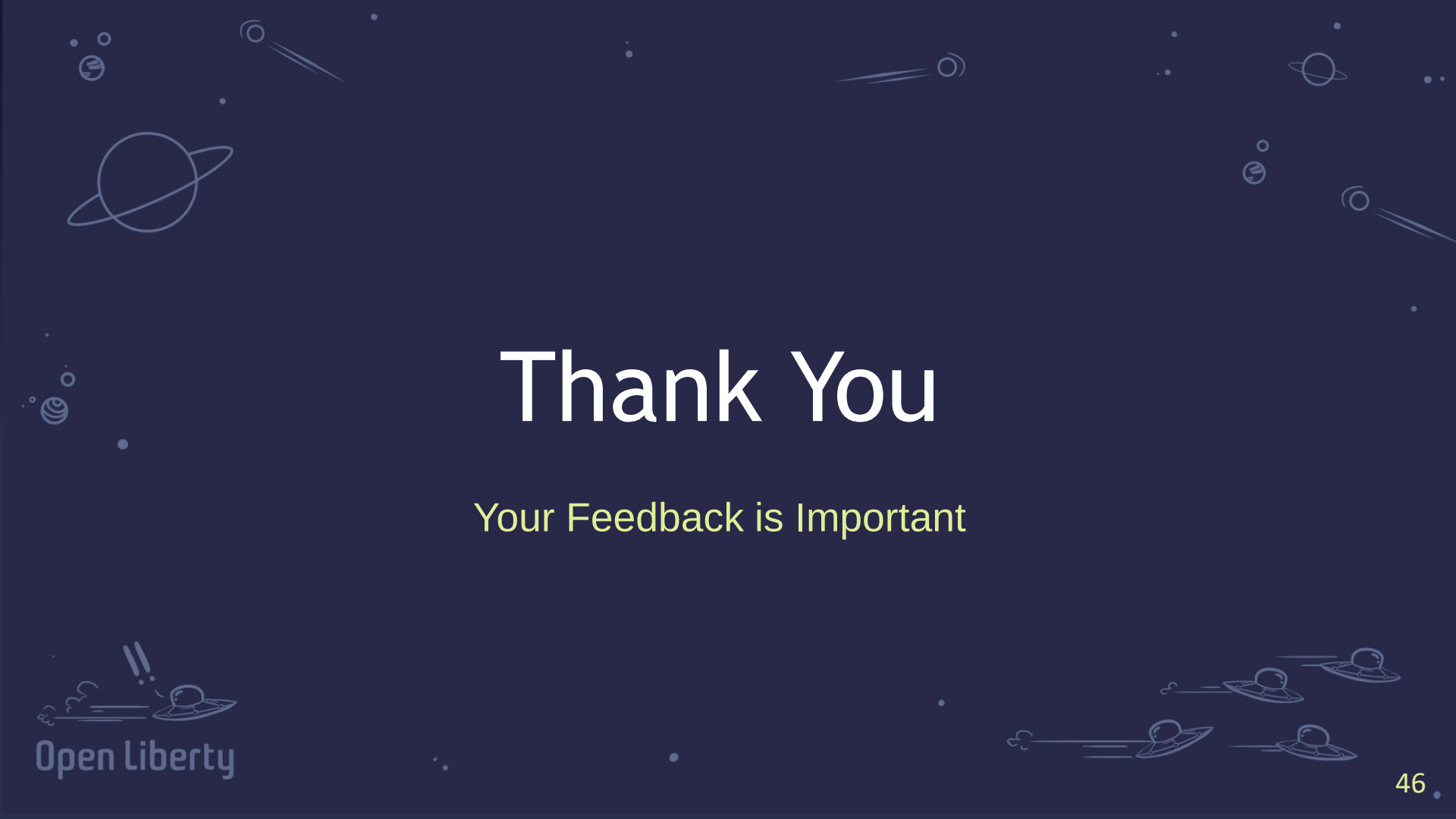
1. Fly on the wall – NEW**
2. Stay ahead of the curve: more time commitment
3. Close the gap: quarterly involvement
4. At your own pace: impact longer term goals

What you get out of it:

- ✓ **Direct access** to architects, developers, team leads during sessions
- ✓ **Insight** into roadmaps, pre-announce insider tips (under Feedback agreement)
- ✓ Directly **influence** deliverables
- ✓ **Gain** insights from other customers
- ✓ **Bonus:** special sessions at conferences
- ✓ **Bonus:** Free Cloud assessment

Questions?

<http://stackoverflow.com/questions/tagged/websphere-liberty>
alasdair@us.ibm.com



Thank You

Your Feedback is Important