Red Hat

WILDFLY AND KUBERNETES
HOW THEY PLAY TOGETHER

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AGENDA
WILDFLY TO KUBERNETES

- s2i builds
- Galleon provisioning tool
- WildFly Operator

AGENDA
WILDFLY TO KUBERNETES

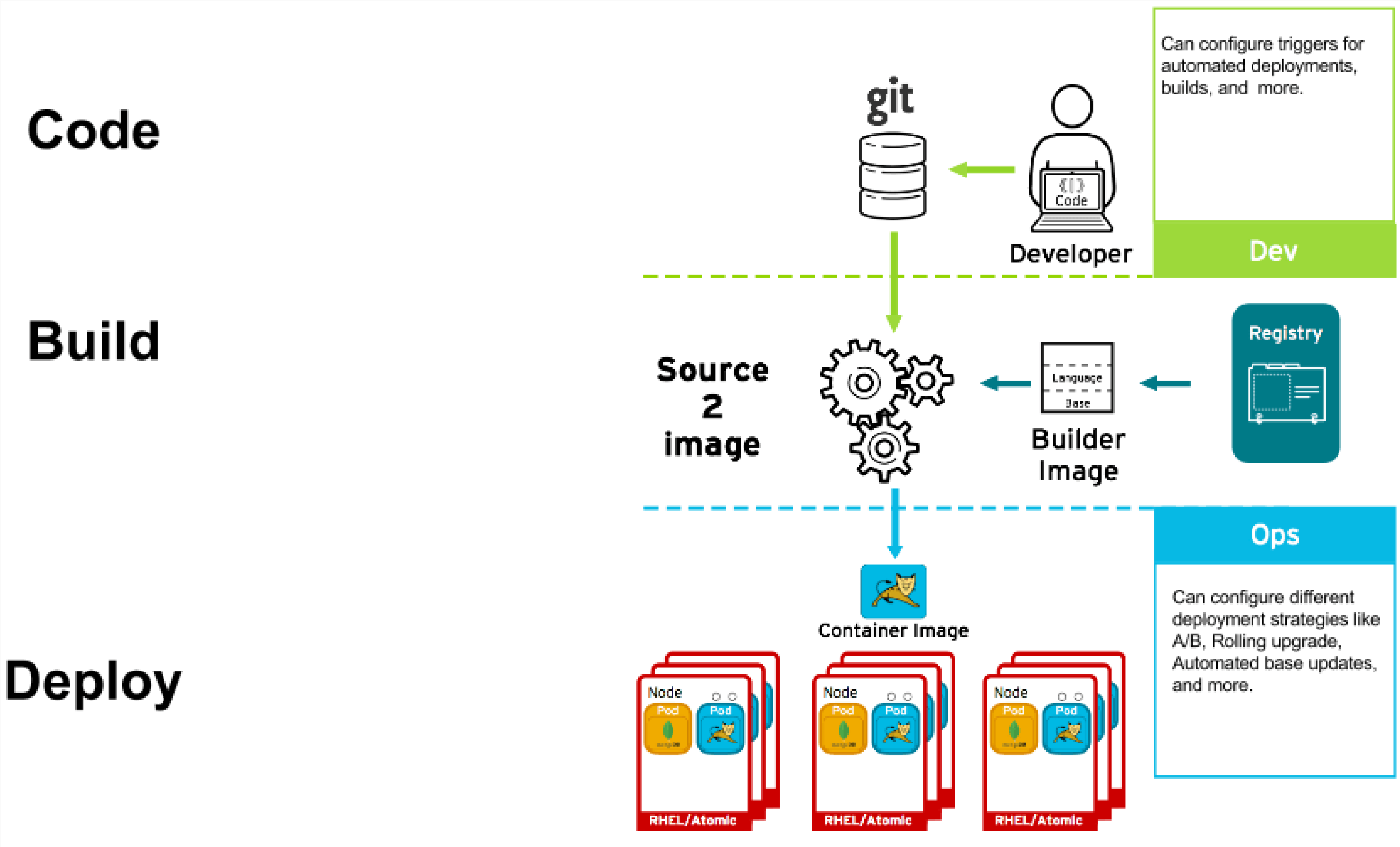
DEMO PROJECT

WildFly Quickstart / HelloWorld

- Servlet
- CDI

https://github.com/wildfly/quickstart

S2I



Code

Build

Deploy

Can configure triggers for automated deployments, builds, and more.

Can configure different deployment strategies like A/B, Rolling upgrade, Automated base updates, and more.

Source: https://blog.openshift.com/save-yourself-from-the-next-glibc/

WILDFLY CONTAINERS

https://quay.io/organization/wildfly

- quay.io/wildfly/wildfly-centos7
- quay.io/wildfly/wildfly-runtime-centos7
- quay.io/wildfly/wildfly-operator

```
s2i build
  -e GALLEON_PROVISION_DEFAULT_FAT_SERVER=true
  -e MAVEN_OPTS="-Dcom.redhat.xpaas.repo.jbossorg"

  --context-dir helloworld
  --ref 18.0.0.Final
  https://github.com/wildfly/quickstart
  quay.io/wildfly/wildfly-centos7
  helloworld-wildfly-centos7
```

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s2i build  ← s2i command to build
  -e GALLEON_PROVISION_DEFAULT_FAT_SERVER=true
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  https://github.com/wildfly/quickstart
  quay.io/wildfly/wildfly-centos7
  helloworld-wildfly-centos7
```

← **s2i command to build**

the source code

```
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  -e MAVEN_OPTS="-Dcom.redhat.xpaas.repo.jbossorg"

  --context-dir helloworld
  --ref 18.0.0.Final  ← tag/branch
                                                  the source code
  https://github.com/wildfly/quickstart ↙
  quay.io/wildfly/wildfly-centos7
  helloworld-wildfly-centos7
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  -e MAVEN_OPTS="-Dcom.redhat.xpaas.repo.jbossorg"

  --context-dir helloworld ← directory where build is started
  --ref 18.0.0.Final ← tag/branch
                                         the source code
  https://github.com/wildfly/quickstart ↙
  quay.io/wildfly/wildfly-centos7
  helloworld-wildfly-centos7
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  --context-dir helloworld  ← directory where build is started
  --ref 18.0.0.Final  ← tag/branch
                                              the source code
  https://github.com/wildfly/quickstart ↙
  quay.io/wildfly/wildfly-centos7  ← base docker image
  helloworld-wildfly-centos7
```

```
s2i build  ← s2i command to build
  -e GALLEON_PROVISION_DEFAULT_FAT_SERVER=true
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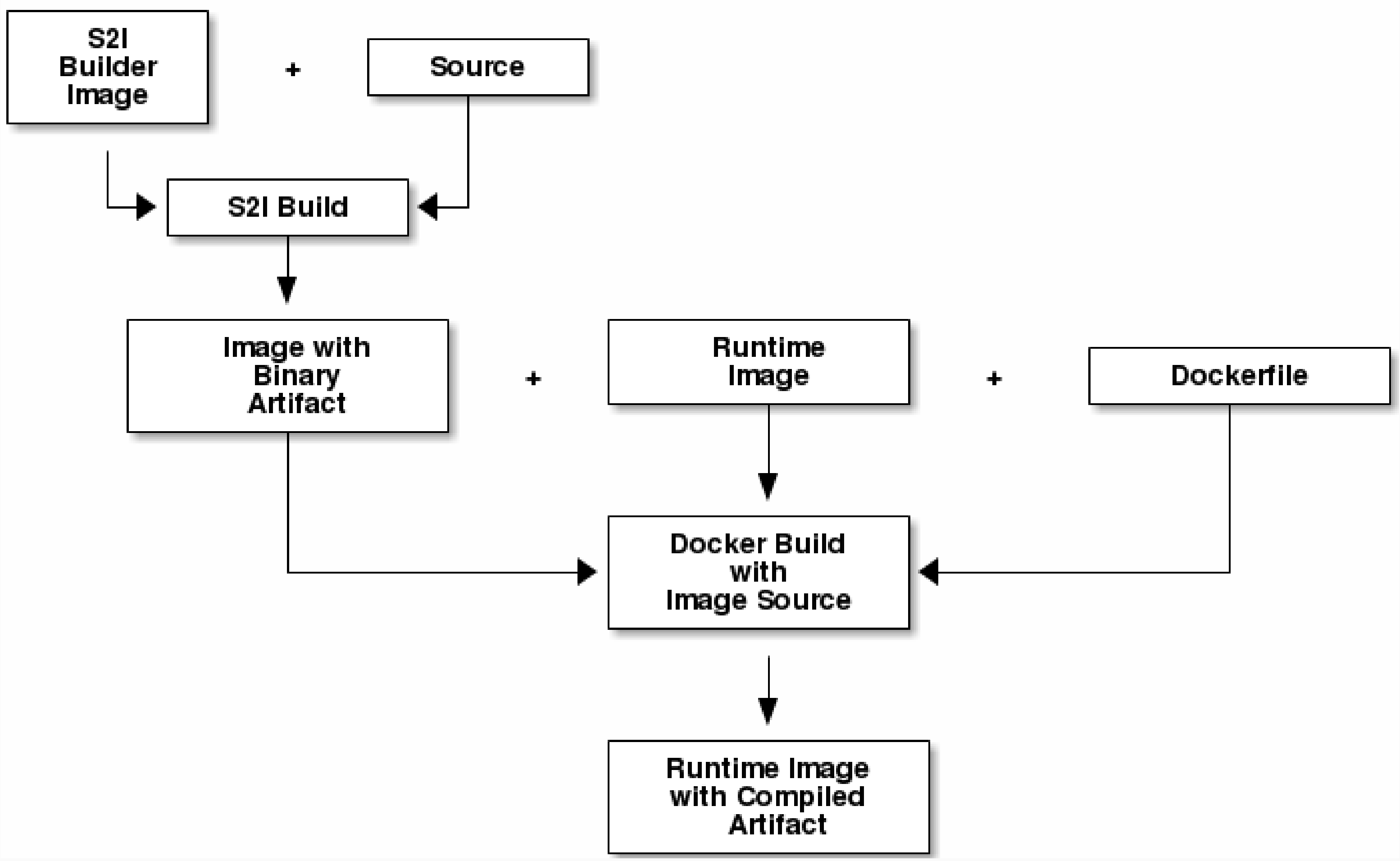
  --context-dir helloworld  ← directory where build is started
  --ref 18.0.0.Final  ← tag/branch
                                    the source code
  https://github.com/wildfly/quickstart ↙
  quay.io/wildfly/wildfly-centos7  ← base docker image
  helloworld-wildfly-centos7  ← result docker image
```

```
s2i build ← s2i command to build
  -e GALLEON_PROVISION_DEFAULT_FAT_SERVER=true
  -e MAVEN_OPTS="-Dcom.redhat.xpaas.repo.jbossorg"
                ↖ environmental variables configures how the build goes
  --context-dir helloworld ← directory where build is started
  --ref 18.0.0.Final ← tag/branch
                                        the source code
  https://github.com/wildfly/quickstart↙
  quay.io/wildfly/wildfly-centos7 ← base docker image
  helloworld-wildfly-centos7 ← result docker image
```

CHAINING BUILDS


S2I Builder Image
+
Source
S2I Build
Image with Binary Artifact
+
Runtime Image
+
Dockerfile
Docker Build with Image Source
Runtime Image with Compiled Artifact

Source: https://blog.openshift.com/chaining-builds/

WHY S2I

- Galleon features available
- OpenShift integration
    - wildfly/wildfly-s2i / wildfly-s2i-chained-build-template.yml

WILDFLY MODULES

```
java
  -jar $JBOSS_HOME/jboss-modules.jar
  -mp $JBOSS_HOME/modules
  org.jboss.as.standalone
```

WILDFLY MODULES

```
java  ← java command                          ↙jar of the module system
  -jar $JBOSS_HOME/jboss-modules.jar
  -mp $JBOSS_HOME/modules
  org.jboss.as.standalone
```

WILDFLY MODULES

```
java
  -jar $JBOSS_HOME/jboss-modules.jar
  -mp $JBOSS_HOME/modules
  org.jboss.as.standalone
```

← **java command**

↙ **jar of the module system**

← **where the modules reside**

WILDFLY MODULES

```
java  ← java command                         ↙jar of the module system
   -jar $JBOSS_HOME/jboss-modules.jar
   -mp $JBOSS_HOME/modules ← where the modules reside
   org.jboss.as.standalone ← start-up module
```

GALLEON

```
galleon.sh install
  wildfly:current
  --layers=jaxrs,cdi
  --dir=my-wildfly-server
```

Galleon layers - XML descriptors for WildFly Core build

GALLEON

```
galleon.sh install
  wildfly:current
  --layers=jaxrs,cdi
  --dir=my-wildfly-server
```

← **galleon command to install**

Galleon layers - XML descriptors for WildFly Core build

GALLEON

```
galleon.sh install ← galleon command to install
   wildfly:current ← WildFly maven repo
   --layers=jaxrs,cdi
   --dir=my-wildfly-server
```

Galleon layers - XML descriptors for WildFly Core build

GALLEON

```
galleon.sh install ← galleon command to install
  wildfly:current ← WildFly maven repo
  --layers=jaxrs,cdi ← Layers to be generated
  --dir=my-wildfly-server
```

Galleon layers - XML descriptors for WildFly Core build

GALLEON

```
galleon.sh install ← galleon command to install
  wildfly:current ← WildFly maven repo
  --layers=jaxrs,cdi ← Layers to be generated
  --dir=my-wildfly-server ← Output directory
```

Galleon layers - XML descriptors for WildFly Core build

GALLEON

```
galleon.sh install ← galleon command to install
  wildfly:current ← WildFly maven repo
  --layers=jaxrs,cdi ← Layers to be generated
  --dir=my-wildfly-server ← Output directory
```

Galleon layers - XML descriptors for WildFly Core build

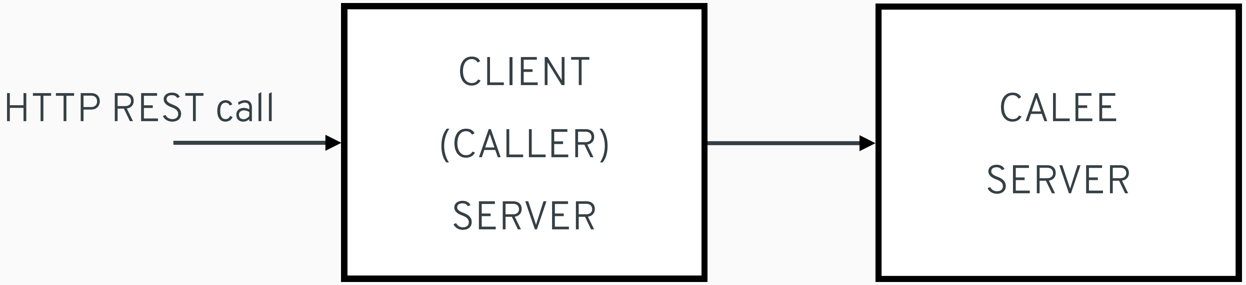
- [wildfly/wildfly-core / core-galleon-pack/src/main/resources/layers/standalone]

DEMO PROJECT

- JAX-RS (HTTP REST)
- EJB
- JPA (Hibernate ORM)
- JMS (Messaging)
- JTA (Transactions)
- Clustering

https://github.com/ochaloup/wildfly-kubernetes-presentation

DEMO PROJECT



HTTP REST call

CLIENT (CALLER) SERVER

CALEE SERVER

- EJB
- JTA
- JMS

- EJB
- JTA
- JPA
- Clustering

DEBUGGING

- environmental variable **DEBUG**

  ```
  kubectl port-forward <pod> 8787:8787
  ```

- s2i magic debugging with variable **SCRIPT_DEBUG**

SUMMARY

- WildFly uses **s2i** to build docker images
- **WildFly Operator** is the way to run on Kubernetes

ENJOY THE REST OF THE CONFERENCE