Red Hat

WILDFLY AND KUBERNETES HOW THEY PLAY TOGETHER

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Speaker notes

Demo is simple but shows the multiple Java EE technologies. We will touch them with concern of the journey to run them in Kubernetes.

AGENDA
WILDFLY TO KUBERNETES

- s2i builds
- Galleon provisioning tool
- WildFly Operator

Speaker notes

Expectation to audience:
- a basic knowledge of WildFly and basic knowledge of Kubernetes

WildFly and particularly JBoss EAP - as a Red Hat's product based on the WildFly project - focuses on smooth integration to OpenShift. Some of the design decisions is based on that fact.

AGENDA
WILDFLY TO KUBERNETES

DEMO PROJECT

WildFly Quickstart / HelloWorld

- Servlet
- CDI

https://github.com/wildfly/quickstart

WILDFLY CONTAINERS

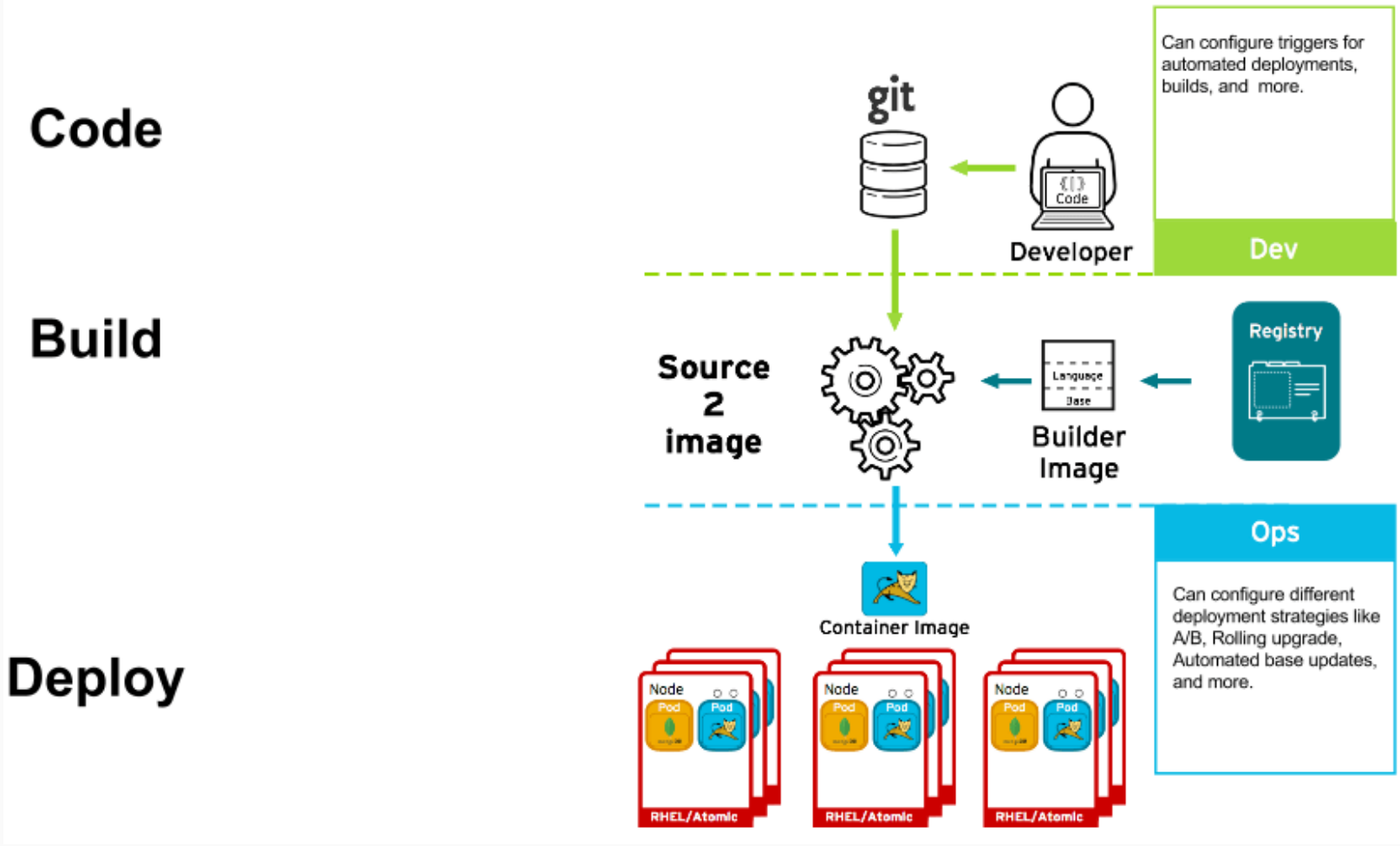
https://quay.io/organization/wildfly

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

Speaker notes

- wildfly-centos7: s2i image with environment prepared for galleon to work
- wildfly-runtime-centos7: no WFLY included. a bare container with set-up environmental variables that is to be shipped with a container in a chain build
- wildfly-operator: Kubernetes Operator for managing WFLY

S2I



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

Speaker notes

- abbreviation for source to image
- goal : building artifacts from sources and injecting them to container
- executing scripts and using plugins to adjust the behaviour

* https://github.com/openshift/source-to-image
* https://docs.openshift.com/aro/creating_images/s2i.html

```
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
```

s2i command to build

environmental variables configures how the build goes

directory where build is started

tag/branch

the source code

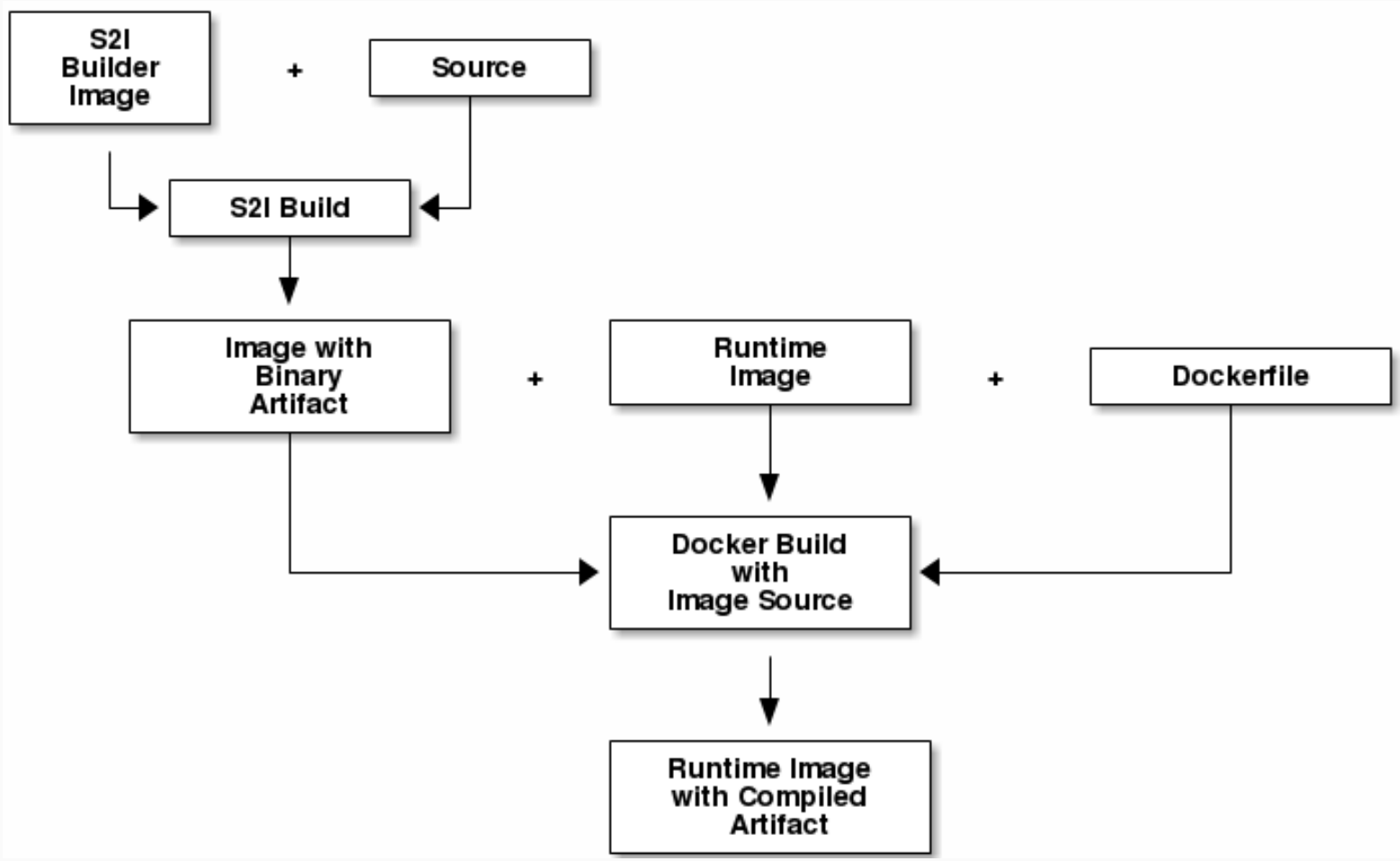
base docker image

result docker image

Speaker notes

* https://github.com/wildfly/wildfly-s2i
* https://github.com/cekit/cekit (CEKit helps to build container images from image definition files with strong focus on modularity and code reuse)
* https://github.com/wildfly/quickstart
* https://github.com/wildfly/quickstart/blob/master/helloworld/src/main/java/org/jboss/as/quickstarts/helloworld/HelloWorld

CHAINING BUILDS



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

WHY S2I

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

Speaker notes

- OpenShift upstream project is Okd.io

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

← start-up module

Speaker notes

- JBoss Modules is a standalone implementation of a modular (non-hierarchical) class loading and execution environment for Java

* http://jboss-modules.github.io/jboss-modules/manual/
* https://wildfly.org/news/2016/12/12/Jigsaws-Missing-Pieces (Jason Green's critique on Jigsaw project)

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

Speaker notes

- provisioning tool used for WildFly builds

* https://docs.wildfly.org/galleon/ (documetation)
* https://wildfly.org/news/2019/12/17/Ship-your-WildFly-additions-via-Galleon-feature-packs/ (WildFly blogpost)
* https://wildfly.org/news/2019/03/01/Galleon_Openshift/ (Galleon on OpenShift)

DEMO PROJECT

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

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

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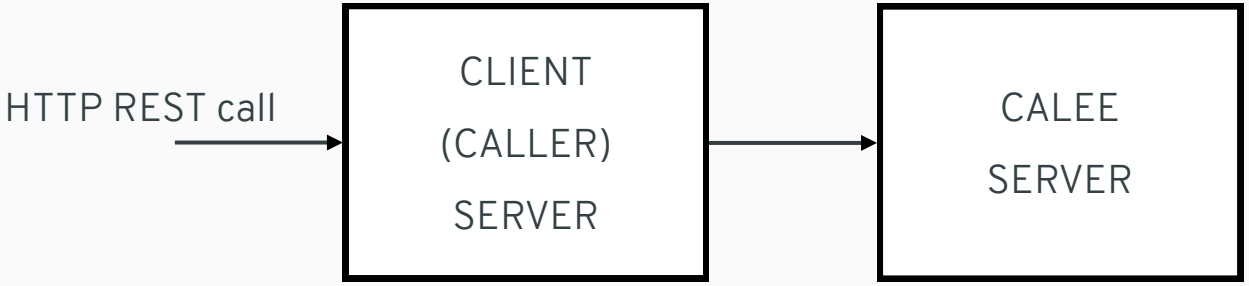
DEMO PROJECT



- EJB
- JTA
- JMS

- EJB
- JTA
- JPA
- Clustering

DEBUGGING

- environmental variable **DEBUG**

  kubectl port-forward <pod> 8787:8787

- s2i magic debugging with variable **SCRIPT_DEBUG**

Speaker notes

* https://blog.openshift.com/debugging-java-applications-on-openshift-kubernetes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