QUARKUS

HAVING FUN WITH QUARKUS

ON KUBERNETES AND OPENSHIFT

ABOUT ME

- Sr. Principal Software Engineer @ Red Hat

- Member of Apache Software Foundation

- Fabric8 Kubernetes client

- Spring Cloud Kubernetes

- Dekorate

- Quarkus Kubernetes ecosystem

AGENDA

- Create a small application
- Move it to the cloud
  - Kubernetes
  - OpenShift

DEMO

CREATING A QUARKUS APP

- https://code.quarkus.io
- Quarkus CLI

CREATING A QUARKUS APP USING THE CLI

```
quarkus create app hello-zurich
cd hello-zurich
quarkus dev
```

HELLO ZURICH

- http://localhost:8080/hello

STEPS TO THE CLOUD

- create container image
- create deployment manifests

CONTAINER IMAGES

- Quarkus extensions
  - quarkus-container-image-docker
  - quarkus-container-image-buildpacks
  - quarkus-container-image-jib
  - quarkus-container-image-openshift

MANIFEST GENERATION

- Quarkus extensions
  - quarkus-kubernetes
    - quarkus-minikube
    - quarkus-kind
  - quarkus-openshift

BUILD A CONTAINER IMAGE

```
quarkus ext add quarkus-container-image-docker
quarkus build -Dquarkus.container-image.build=true
```

or

```
quarkus image build docker
```

DEPLOYING TO KUBERNETES

```
quarkus ext add quarkus-kubernetes
quarkus build -Dquarkus.kubernetes.deploy=true
```

or

```
quarkus deploy kubernetes
```

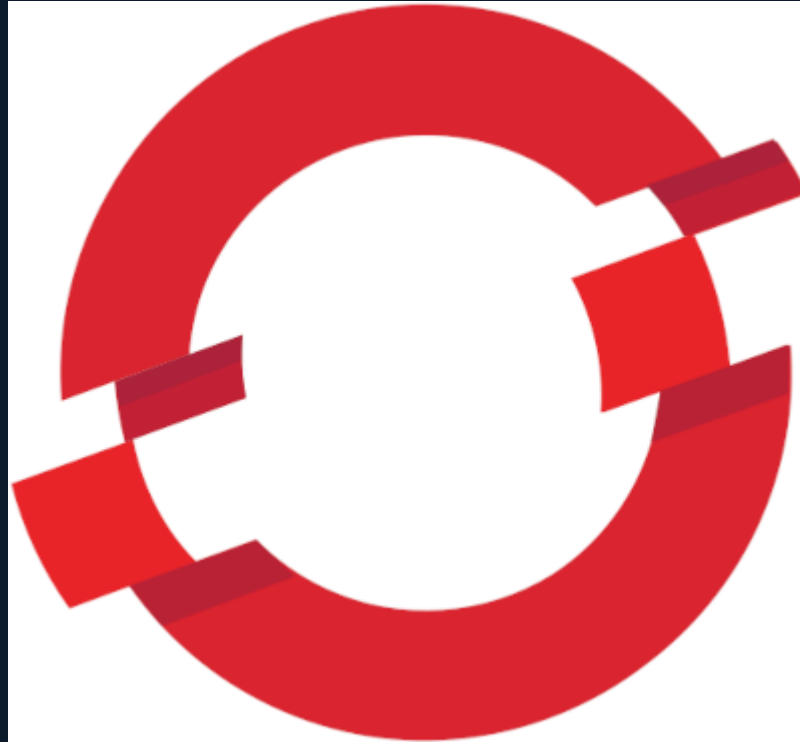# MY KIND CLUSTER DOESN'T SEE THE IMAGE

- Solutions
    - push to public registry
    - push to kind registry
    - use the kind binary
    - use the quarkus-kind extension

```
quarkus ext add quarkus-kind
quarkus build -Dquarkus.kubernetes.deploy=true
```
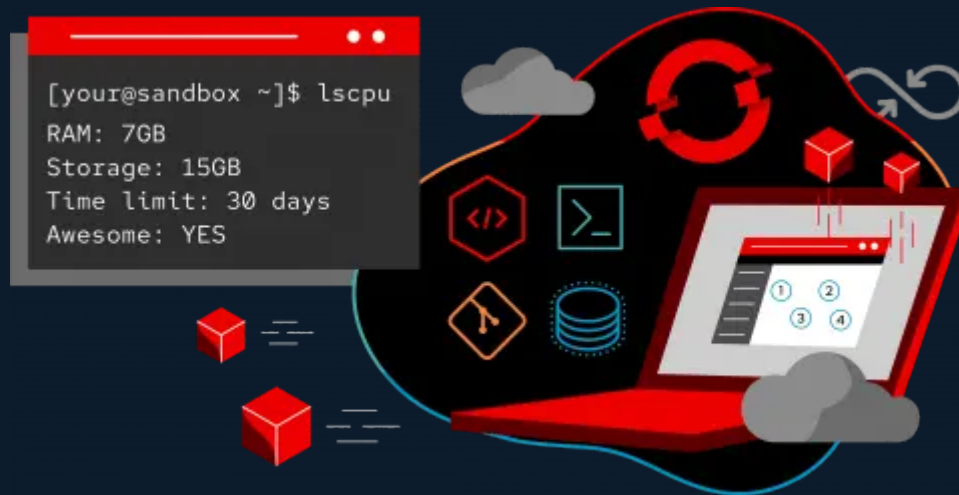
or

```
quarkus deploy kind --image-build
```

MOVING THE APP TO OPENSHIFT

- Red Hat distribution of Kubernetes

OPENSHIFT SANDBOX

DEPLOYING TO OPENSHIFT

```
quarkus ext add openshift
quarkus build -Dquarkus.openshift.deploy=true
```

or

```
quarkus deploy openshift --image-build
```

EXPOSING THE APP

```
quarkus deploy openshift --image-build -Dquarkus.openshift.rou
```

CUSTOMIZING THE MANIFESTS

- Add to the application.properties

```
quarkus.openshift.lables=FOO=BAR
quarkus.openshift.annotaitons=BAR=BAZ
quarkus.openshift.env.vars.MY_KEY=MY_VALUE
```

OTHER OPTIONS

- See https://quarkus.io/guides/all-config

INTEGRATION WITH OTHER EXTENSIONS

- Manifests are not just rendered templates
- Tight integration with:
  - kubernetes-config
  - kubernetes-client
  - flyway, liquibase
  - grpc

KUBERNETES CLIENT

- Client needs to talk to API server
  - Requires RBC
    - automatically generated
    - grant the view role

KUBERNETES CONFIG

- Client neds to read ConfigMap and Secret
  - Requires RBC
    - automatically generated
    - grant the view role

INITIALIZATION TASKS

- Some tasks have different scaling requirements

  - Examples:
    - Database initialization
    - Database migration

- Liquibase, Flyway, etc

INITIALIZATION TASKS PT 2

- Externalize init tasks as Jobs

FLYWAY EXAMPLE

```
quarkus ext add quarkus-flyway
```

FLYWAY JOB

```yaml
apiVersion: batch/v1
kind: Job
metadata:
  name: hello-zurich
spec:
  completionMode: NonIndexed
  template:
    metadata: {}
    spec:
      containers:
        - env:
            - name: QUARKUS_INIT_AND_EXIT
              value: "true"
            - name: QUARKUS_FLYWAY_ENABLED
              value: "true"
```

QUESTIONS?

THANK YOU