Welcome to the OpenShift Container Platform Workshop

Bob Kozdemba
koz@redhat.com
Principal Domain Architect

April 2017
TODAY’S AGENDA

● Why containers?
● Enterprise deployment of containers
● OpenShift Overview
● Hands-On Workshop
Applications ...

- can have different requirements (run-times, databases, etc).
- require testing, installation and integration every time they are changed and deployed.
WHAT ARE CONTAINERS?
It Depends Who You Ask

- A sandboxed application sharing a Linux kernel
- Simpler and lighter than virtual machines
- Extremely Portable
- Near-zero configuration

INFRASTRUCTURE

APPLICATIONS

- Package my application and all of its dependencies
- Deploys in seconds and enables CI/CD
- Makes my dev look like production
CLEAR BOUNDARIES

- Container
  - App
    - Operating System
      - Virtual Machine
        - Hardware

Controlled by IT Operations

Controlled by Developers
WE NEED MORE THAN JUST CONTAINERS

Scheduling
Decide where to deploy containers

Lifecycle and health
Keep containers running despite failures

Discovery
Find other containers on the network

Monitoring
Visibility into running containers

Security
Control who can do what

Scaling
Scale containers up and down

Persistence
Survive data beyond container lifecycle

Aggregation
Compose apps from multiple containers
Introducing

The industry’s most secure and comprehensive enterprise-grade container platform based on open source technologies including Linux, Docker and Kubernetes.
Kubernetes is an open-source system for automating deployment, operations, and scaling of containerized applications across multiple hosts
OPENSHIFT = KUBERNETES + BUILD/DEPLOYMENT AUTOMATION
Begin with a trusted container Operating System

Trusted by Fortune Global 500 companies
Add a clustered container infrastructure

**kubernetes**

Cloudforms

Red Hat Storage

**Red Hat Enterprise Linux**

Container Runtime & Packaging (Docker)

Atomic Host

**Networking** | **Storage** | **Registry** | **Logs & Metrics** | **Security**
--- | --- | --- | --- | ---

**Infrastructure Automation & Mg**

**Red Hat Enterprise Linux**

Container Orchestration & Cluster Management (kubernetes)
Add an Enterprise Container Platform

Source-2-Image
Application Pipelines
Dev Tools
Applications go on top

JBoss EAP
JBoss Data Grid
JBoss Data Virtualization
JBoss AM-Q
JBoss BRMS
JBoss BPM
JBoss FUSE
Red Hat Mobile
Red Hat SSO
3Scale
OpenShift
Architecture Overview
Masters and Nodes

- Developers
  - SCM (GIT)
  - CI/CD

- Operations
  - Existing Automation Toolsets

- Service Layer
  - Physical
  - Virtual
  - Private
  - Public
  - Hybrid

- Routing Layer
- Persistent Storage

- External User
OpenShift runs on your choice of infrastructure
Nodes run Red Hat Enterprise Linux (RHEL)
Images run as containers within pods
Pods are the orchestrated unit in OpenShift
Masters are the Control Plane
API and Authentication
Desired and Current State

- MASTER
  - API/AUTHENTICATION
  - DATA STORE

- NODE
  - RHEL

RED HAT ENTERPRISE LINUX

- NODE
  - RHEL

- NODE
  - RHEL

- NODE
  - RHEL

- NODE
  - RHEL

PHYSICAL | VIRTUAL | PRIVATE | PUBLIC | HYBRID
Scheduler Pulls From The Registry
Orchestration and Scheduling
Placement by Policy
Services connect application components
Health and Scaling
What about unhealthy Pods?
The Master remediates Pod failures
What about app data?
Routing layer for external accessibility

- **Master**
  - API/Authentication
  - Data Store
  - Scheduler
  - Health/Scaling

- **Node**
  - RHEL

- **Persistent Storage**
- **Registry**

**Service Layer**

- Physical
- Virtual
- Private
- Public
- Hybrid
Developer access via Web UI, CLI, IDE or API
OpenShift
Source-to-Image
Developers can leverage existing development tools and then access the OpenShift Web, CLI or IDE interfaces to create new application services and push source code via GIT. OpenShift can also accept binary deployments or be fully integrated with a customer’s existing CI/CD environment.
OpenShift automates the Docker image build process with Source-to-Image (S2I). S2I combines source code with a corresponding Builder image from the integrated Docker registry. Builds can also be triggered manually or automatically by setting a Git webhook. Add in Build pipelines.
OpenShift automates the deployment of application containers across multiple Node hosts via the Kubernetes scheduler. Users can automatically trigger deployments on application changes and do rollbacks, configure A/B deployments & other custom deployment types.
Workshop
Workshop

Open your browsers at:

http://tinyurl.com/mynb877
OpenShift Terminology - DC-Metro Application

Routing Layer (dcmetro-user1.apps.rhsademo.net)

Service Layer (172.30.0.0/16)

SDN Layer (10.1.0.0/16)

GET

DC Metro API
Deploying a Docker container

$ oc new-app <my-container>
Building and deploying a Docker container

$ oc new-app ~builder-image:<source-code>
DC-Metro CI/CD Pipeline Lab

dev stage

Jenkins

deploy-to-test stage

OpenShift

build “dev”

“dev” Image Stream

dev:latest

dev:readyToTest

pull

deploy then scale

“dev” deployment uses “latest” image

pod

“test” deployment uses “readyToTest” image

pod

pod
Wrapup
Minishift is a tool that helps you run OpenShift locally by launching a single-node OpenShift cluster inside a virtual machine. With Minishift you can try out OpenShift or develop with it, day-to-day, on your local machine.

You can run Minishift on Windows, Mac OS, and GNU/Linux operating systems. Minishift uses libmachine for provisioning virtual machines, and OpenShift Origin for running the cluster.
Register for the OpenShift Online (Next Gen) Developer Preview
Access to the OpenShift Online (Next Gen) Developer Preview is limited. Apply for access today.

SIGN UP FOR FREE
https://install.openshift.com/

Pick the installation that's right for you.

**Latest development release**

*oc cluster up*

- Cross platform; Runs anywhere you can run Docker

**Container Development Kit**

*vagrant up (On Mac/Linux)*

- Most full featured all-in-one host environment
- Cross platform; Runs in a virtual machine
- Ideal for all levels of container experience

(Run the *devsuite installer* exe on Windows)

**OpenShift Container Platform**

*atomic-openshift-installer install*

- Enterprise grade, fully supported for production workloads in your datacenter or the cloud
- Highly configurable

Don't have access? Start a free trial today!

Need more help? We're here for you.

- The OpenShift Enterprise Installation and Configuration Guide is available at the OpenShift Enterprise documentation site.
- Customers can open support cases as well as browse a wealth of subscribers only solutions, articles and much more.
- Familiar with IRC? OpenShift superstars can be found on the #openshift and #openshift-dev channels on FreeNode.
- You can also join the Users or Developers mailing list.
THANK YOU

plus.google.com/+RedHat
linkedin.com/company/red-hat
youtube.com/user/RedHatVideos
facebook.com/redhatinc
twitter.com/RedHatNews