CodeReady Containers

Simplified deployment of OpenShift 4.x on desktops and the Cluster API

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Who am I

Gerard Braad - @gbraad, gbraad@redhat.com

Principal Software Engineer (DevTools)

Worked on large scale OpenStack deployments

Developed code and managed projects using Agile practices

Working on …

Container technology
        targeting Docker, Kubernetes, Podman, OpenShift

Developer tools
        utilizing virtualization to simplify deployment
        Libvirt+KVM, Hyper-V, Hyperkit, machine-drivers

        Minikube, Minishift

        CodeReady Containers

Minishift

Deploys a local OpenShift 3.x cluster
　　　All-in-one (Single node cluster)
　　　`oc cluster up`

Forked from Minikube
　　　uses libmachine and Docker

Lessons learned

Networking complicates deployment
       Company VPN
       Firewalls and proxies
       especially when images are pulled from the Internet, gcr.io, etc

Libmachine
       machine-drivers

Forked from Minikube

Non-standard installation → not like production

What is ...

OpenShift 4.x

CodeReady Containers

Cluster API

OpenShift 4

Trusted Enterprise Kubernetes solution

highly available

installer provisioned infrastructure

auto-update

Operators (K8s native applications)

Deployed on Red Hat CoreOS nodes

The new installer

Itself a product from lessons learned related to the installers that existed

Targets cloud providers, like AWS, Azure, etc

Creates initial bootstrap and master nodes to form the control plane

After which worker nodes are created using the Cluster API

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Cluster API

Allows you to perform operations on your cluster for

Day 1   installation

Day 2   management

CodeReady Containers

Development tool which provides a local OpenShift 4 cluster

configured as a Single Node Cluster

targeting Linux, Windows and macOS

optimized for use with native hypervisors

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Libvirt Cluster API

Development purposes to test the OpenShift cluster and test scaling

https://github.com/openshift/cluster-api-provider-libvirt

Scaling a MachineSet

```
$ oc get machinesets -n openshift-machine-api
```

```
$ oc scale --replicas=2 machineset <machineset> -n openshift-machine-api
```

```
$ oc edit machineset <machineset> -n openshift-machine-api
```

Demo

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Single-Node Cluster

Not preferred to deploy both a master and worker on a development machine

'Disabled' operators (replicaset=0)

Cluster Version Operator

Monitoring

Machine API

Machine Config Operator

https://github.com/code-ready/snc

Current state …

Currently able to bring-up the cluster on:

Libvirt+KVM
VirtualBox

Future ...

Allow use on:

Hyper-V
Hyperkit

Both need additional infrastructure, like DNS

and ...

Demo

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Multi-Node Cluster

Allow CodeReady Containers to communicate with the local libvirt instance

```
$ vi /etc/libvirt/libvirtd.conf
```

```
listen_tls = 0
listen_tcp = 1
auth_tcp="none"
tcp_port = "16509"
```

```
/usr/sbin/libvirtd -l
```

```
qemu+tcp://192.168.130.1/system
```

Multi-Node Cluster

After this enable the operators and scale out

```
$ oc scale --replicas=0 deployment --all -n openshift-machine-api
$ oc scale --replicas=0 replicaset --all -n openshift-machine-api
$ oc scale --replicas=0 deployment --all -n openshift-machine-config-operator
$ oc scale --replicas=0 replicaset --all -n openshift-machine-config-operator
```

```
$ oc get machinesets -n openshift-machine-api
$ oc scale --replicas=2 machineset <machineset> -n openshift-machine-api
```

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How about …

Allowing Multi-Node Cluster on Hyper-V

    Libvirt not running as a server/daemon on Windows

    Communication necessary with the local hypervisor

    Win-RM

Hyperkit has no management API endpoint

    how about a generic endpoint from the Cluster API to a pluggable

    desktop virtualization interface?

Minikube

Thank you ...

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Thank you

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