CodeReady Containers

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

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Who am I

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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
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
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
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
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

```bash
$ 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
```

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