

Kubernetes 14-18 Oct 2024

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My YouTube Channel

<https://www.youtube.com/@JeganathanSwaminathan/videos>

My Blogs

https://medium.com/@jegan_50867/docker-overview-be840f727b3

<https://medium.com/tektutor/container-engine-vs-container-runtime-667a99042f3>

https://medium.com/@jegan_50867/docker-commands-ba19387383b4

<https://medium.com/tektutor/kubernetes-3-node-cluster-setup-50943378be41>

https://medium.com/@jegan_50867/kubernetes-lightweight-developer-setup-using-rancher-k3d-a3a94e9b5eb4

<https://medium.com/tektutor/kubernetes-3-node-cluster-using-k3s-with-docker-e325cc82fd50>

https://medium.com/@jegan_50867/kubernetes-3-node-cluster-using-k3s-d28b2c09e2f7

References

<https://blog.networktocode.com/post/kubernetes-collection-ansible/>

<https://network-insight.net/2022/05/11/openshift-security-best-practices/>

<https://www.densify.com/openshift-tutorial/openshift-route/>

Installing Code Ready Containers(OpenShift on Laptop/Desktop)

<https://developers.redhat.com/products/openshift-local/overview>

Using Free RedHat Developer Sandbox on cloud - Openshift

<https://console.redhat.com/openshift/sandbox>

Installing a single node Red Hat Openshift

https://docs.openshift.com/container-platform/4.14/installing/installing_sno/install-sno-installing-sno.html

Demo - 🚧 Installing Code Ready Containers - OpenShift Local in your Laptop/Desktop for learning purpose

Please do not attempt this exercise in our lab. This will corrupt our existing OpenShift cluster.

The instructions are for your future reference purpose. Feel free to try this in your home lab.

```
cd ~/Downloads

wget https://developers.redhat.com/content-
gateway/rest/mirror/pub/openshift-v4/clients/crc/latest/crc-linux-
amd64.tar.xz

tar xvf crc-linux-amd64.tar.xz

cd crc-linux-2.8.0-amd64/
sudo mv crc /usr/local/bin
```

Starting the CRC setup

```
crc setup
```

Expected output

```
[jegan@localhost ~]$ crc setup
INFO Using bundle path
/home/jegan/.crc/cache/crc_libvirt_4.11.1_amd64.crcbundle
INFO Checking if running as non-root
INFO Checking if running inside WSL2
INFO Checking if crc-admin-helper executable is cached
INFO Checking for obsolete admin-helper executable
INFO Checking if running on a supported CPU architecture
INFO Checking minimum RAM requirements
INFO Checking if crc executable symlink exists
INFO Checking if Virtualization is enabled
INFO Checking if KVM is enabled
INFO Checking if libvirt is installed
INFO Installing libvirt service and dependencies
INFO Using root access: Installing virtualization packages
[sudo] password for jegan:
```

```

INFO Checking if user is part of libvirt group
INFO Adding user to libvirt group
INFO Using root access: Adding user to the libvirt group
INFO Checking if active user/process is currently part of the libvirt group
INFO Checking if libvirt daemon is running
INFO Checking if a supported libvirt version is installed
INFO Checking if crc-driver-libvirt is installed
INFO Installing crc-driver-libvirt
INFO Checking if systemd-networkd is running
INFO Checking if NetworkManager is installed
INFO Checking if NetworkManager service is running
INFO Checking if /etc/NetworkManager/conf.d/crc-nm-dnsmasq.conf exists
INFO Writing Network Manager config for crc
INFO Using root access: Writing NetworkManager configuration to
/etc/NetworkManager/conf.d/crc-nm-dnsmasq.conf
INFO Using root access: Changing permissions for
/etc/NetworkManager/conf.d/crc-nm-dnsmasq.conf to 644
INFO Using root access: Executing systemctl daemon-reload command
INFO Using root access: Executing systemctl reload NetworkManager
INFO Checking if /etc/NetworkManager/dnsmasq.d/crc.conf exists
INFO Writing dnsmasq config for crc
INFO Using root access: Writing NetworkManager configuration to
/etc/NetworkManager/dnsmasq.d/crc.conf
INFO Using root access: Changing permissions for
/etc/NetworkManager/dnsmasq.d/crc.conf to 644
INFO Using root access: Executing systemctl daemon-reload command
INFO Using root access: Executing systemctl reload NetworkManager
INFO Checking if libvirt 'crc' network is available
INFO Setting up libvirt 'crc' network
INFO Checking if libvirt 'crc' network is active
INFO Starting libvirt 'crc' network
INFO Checking if CRC bundle is extracted in '$HOME/.crc'
INFO Checking if /home/jegan/.crc/cache/crc_libvirt_4.11.1_amd64.crcbundle
exists
INFO Getting bundle for the CRC executable
INFO Downloading crc_libvirt_4.11.1_amd64.crcbundle
3.23 GiB / 3.23 GiB [-----] 100.00% 9.16 MiB p/s
INFO Uncompressing
/home/jegan/.crc/cache/crc_libvirt_4.11.1_amd64.crcbundle
crc.qcow2: 12.49 GiB / 12.49 GiB [-----] 100.00%
oc: 118.13 MiB / 118.13 MiB [-----] 100.00%
Your system is correctly setup for using CRC. Use 'crc start' to start the
instance

```

Starting the Local Openshift CRC single node cluster

```

crc start

```

Expected output

```
[jegan@localhost ~]$ crc start
INFO Checking if running as non-root
INFO Checking if running inside WSL2
INFO Checking if crc-admin-helper executable is cached
INFO Checking for obsolete admin-helper executable
INFO Checking if running on a supported CPU architecture
INFO Checking minimum RAM requirements
INFO Checking if crc executable symlink exists
INFO Checking if Virtualization is enabled
INFO Checking if KVM is enabled
INFO Checking if libvirt is installed
INFO Checking if user is part of libvirt group
INFO Checking if active user/process is currently part of the libvirt group
INFO Checking if libvirt daemon is running
INFO Checking if a supported libvirt version is installed
INFO Checking if crc-driver-libvirt is installed
INFO Checking if systemd-networkd is running
INFO Checking if NetworkManager is installed
INFO Checking if NetworkManager service is running
INFO Checking if /etc/NetworkManager/conf.d/crc-nm-dnsmasq.conf exists
INFO Checking if /etc/NetworkManager/dnsmasq.d/crc.conf exists
INFO Checking if libvirt 'crc' network is available
INFO Checking if libvirt 'crc' network is active
INFO Loading bundle: crc_libvirt_4.11.1_amd64...
CRC requires a pull secret to download content from Red Hat.
You can copy it from the Pull Secret section of
https://console.redhat.com/openshift/create/local.
? Please enter the pull secret
*****
*****
INFO Creating CRC VM for openshift 4.11.1...
INFO Generating new SSH key pair...
INFO Generating new password for the kubeadmin user
INFO Starting CRC VM for openshift 4.11.1...
INFO CRC instance is running with IP 192.168.130.11
INFO CRC VM is running
INFO Updating authorized keys...
INFO Check internal and public DNS query...
INFO Check DNS query from host...
INFO Verifying validity of the kubelet certificates...
INFO Starting kubelet service
INFO Waiting for kube-apiserver availability... [takes around 2min]
INFO Adding user's pull secret to the cluster...
INFO Updating SSH key to machine config resource...
INFO Waiting for user's pull secret part of instance disk...
INFO Changing the password for the kubeadmin user
INFO Updating cluster ID...
INFO Updating root CA cert to admin-kubeconfig-client-ca configmap...
INFO Starting openshift instance... [waiting for the cluster to stabilize]
INFO 3 operators are progressing: image-registry, network, openshift-
controller-manager
```

```

INFO 3 operators are progressing: image-registry, network, openshift-
controller-manager
INFO 3 operators are progressing: image-registry, network, openshift-
controller-manager
INFO 3 operators are progressing: image-registry, network, openshift-
controller-manager
INFO 2 operators are progressing: image-registry, openshift-controller-
manager
INFO 3 operators are progressing: image-registry, node-tuning, openshift-
controller-manager
INFO Operator openshift-controller-manager is progressing
INFO Operator openshift-controller-manager is progressing
INFO Operator openshift-controller-manager is progressing
INFO Operator openshift-controller-manager is progressing
INFO 2 operators are progressing: authentication, openshift-controller-
manager
INFO Operator authentication is progressing
INFO Operator authentication is progressing
INFO Operator authentication is progressing
INFO Operator authentication is progressing
ERRO Cluster is not ready: cluster operators are still not stable after
10m10.227355941s
INFO Adding crc-admin and crc-developer contexts to kubeconfig...
Started the OpenShift cluster.

```

The server is accessible via web console at:
<https://console-openshift-console.apps-crc.testing>

Log in as administrator:
 Username: kubeadmin
 Password: gwifD-9W6K9-Hn3ey-h2Wwe

Log in as user:
 Username: developer
 Password: developer

Use the 'oc' command line interface:
 \$ eval \$(crc oc-env)
 \$ oc login -u developer https://api.crc.testing:6443

Testing the lab environment

- From the RPS cloud machine, you need to RDP to the Linux server assigned to you
- The Linux user will be user[xy], where xy is the last two digits of your RPS Cloud user
- We have total 3 Linux servers with the below details
 - Server 1 - 10.10.15.27 (user01 thru user08) and password is rps@12345
 - Server 2 - 10.10.15.34 (user09 thru user15) and password is rps@12345
 - Server 3 - 10.10.15.35 (user16 thru user23) and password is rps@12345
- The Linux Server details

- OS - Oracle Linux v9.4 64-bit
- Hypervisor - KVM
- Processor with 48 CPU Cores
- 755 GB RAM
- 17.3 TB HDD Storage

Check if docker installed from the linux terminal

```
docker --version
```

Check if you are able to list docker images

```
docker images
```

Check if you are able to access the kubectl - kubernetes client tool

```
kubectl version
```

Check if you are able to access the oc - openshift client tool

```
oc version
```

check if you are able to login to Red Hat Openshift cluster from terminal

```
cat ~/openshift.txt  
oc login
```

Check if you are able to list the openshift nodes

```
oc get nodes
```