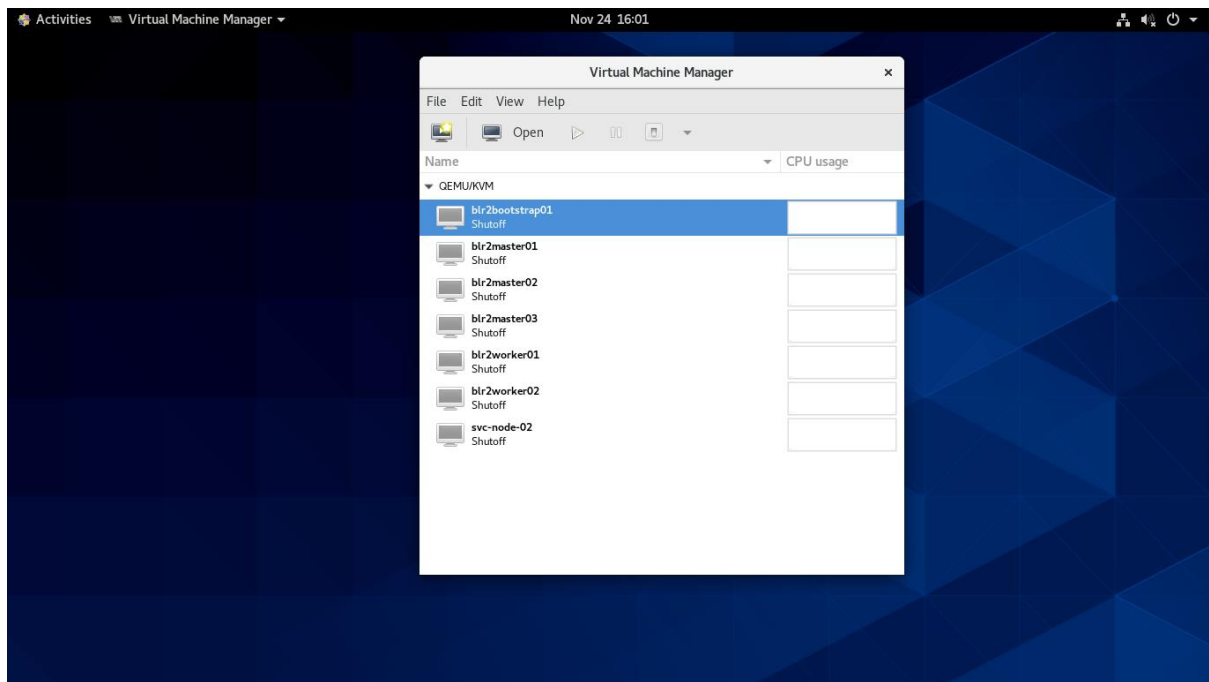


Step-01-

Design & build KVM-QEMU VMs for OpenShift installation version 4.10 (Repository/Required software/Network Setup etc).



Step-02

Here we are taking UPI method as it provide more controle and customization.

[Clusters](#) > [Cluster Type](#) > [Bare Metal](#)

Create an OpenShift Cluster: Bare Metal

Select the installation type that best fits your needs.

Interactive	Local Agent-based	Automated	Full control
★ Recommended Web-based	CLI-based	CLI-based	CLI-based
Runs Assisted Installer with standard configuration settings to create your cluster.	Runs Assisted Installer securely and locally to create your cluster.	Auto-provision your infrastructure with minimal configuration to create your cluster.	Make all of the decisions when you create your cluster.
<ul style="list-style-type: none">✓ Preflight validations✓ Smart defaults✓ For connected networks	<ul style="list-style-type: none">✓ Installable ISO✓ Preflight validations✓ For air-gapped/restricted networks	<ul style="list-style-type: none">✓ Installer Provisioned Infrastructure✓ Hosts controlled with baseboard management controller (BMC)✓ For air-gapped/restricted networks	<ul style="list-style-type: none">✓ User Provisioned Infrastructure✓ Highly customizable✓ For air-gapped/restricted networks
Learn more about interactive	Learn more about local agent-based	Learn more about automated	Learn more about full control

Start all VMs (1 bootstrap, 3 master, 2+ workers nodes) and provide required resources.

```
blr2master01 on QEMU/KVM
File Virtual Machine View Send Key
[core@blr2master01 ~]$ sudo coreos-installer install /dev/vda --insecure --image-url http://172.168.1.141:8080/ocp4/rhcos2 --ign
ition-url http://172.168.1.141:8080/ocp4/master.ign --insecure-ignition
Downloading image from http://172.168.1.141:8080/ocp4/rhcos2
Downloading signature from http://172.168.1.141:8080/ocp4/rhcos2.sig
Failed to fetch signature: fetching signature URL
Signature not found: skipping verification as requested
> Read disk 999.0 MiB/999.0 MiB (100%)

Error: couldn't find boot device for /dev/vda

Resetting partition table
Error: install failed
[core@blr2master01 ~]$ sudo coreos-installer install /dev/vda --insecure --image-url http://172.168.1.141:8080/ocp4/rhcos --igni
tion-url http://172.168.1.141:8080/ocp4/master.ign --insecure-ignition
Downloading image from http://172.168.1.141:8080/ocp4/rhcos
Downloading signature from http://172.168.1.141:8080/ocp4/rhcos.sig
Failed to fetch signature: fetching signature URL
Signature not found: skipping verification as requested
> Read disk 984.8 MiB/984.8 MiB (100%)
-
```

Creating resource manifests for Red Hat OpenShift installation.

```
Activities Terminal Jan 28 16:41
root@svc-node-03:/opt/data
File Edit View Search Terminal Tabs Help
root@svc-node-03:/opt/data labuser@ocp-base-01:~/Downloads
[root@svc-node-03 data]# ./openshift-install create manifests --dir /ocp-install/
INFO Consuming Install Config from target directory
WARNING Making control-plane schedulable by setting MastersSchedulable to true for Scheduler cluster settings
INFO Manifests created in: /ocp-install/manifests and /ocp-install/openshift
[root@svc-node-03 data]# sed -i 's/mastersSchedulable: true/mastersSchedulable: false/' /ocp-install/manifests/cluster-sch
eduler-02-config.yml
[root@svc-node-03 data]#
[root@svc-node-03 data]# ls /ocp-install/
manifests openshift
[root@svc-node-03 data]# ls /ocp-install/manifests/
cluster-config.yml cluster-network-02-config.yml kube-system-configmap-root-ca.yml
cluster-dns-02-config.yml cluster-proxy-01-config.yml machine-config-server-tls-secret.yml
cluster-infrastructure-02-config.yml cluster-scheduler-02-config.yml openshift-config-secret-pull-secret.yml
cluster-ingress-02-config.yml cvo-overrides.yml
cluster-network-01-crd.yml kube-cloud-config.yml
[root@svc-node-03 data]#
[root@svc-node-03 data]# ls /ocp-install/openshift/
99_kubeadmin-password-secret.yml 99_openshift-machineconfig_99-master-ssh.yml
99_openshift-cluster-api_master-user-data-secret.yml 99_openshift-machineconfig_99-worker-ssh.yml
99_openshift-cluster-api_worker-user-data-secret.yml openshift-install-manifests.yml
[root@svc-node-03 data]# ./openshift-install create ignition-configs --dir /ocp-install/
INFO Consuming Master Machines from target directory
INFO Consuming Worker Machines from target directory
INFO Consuming OpenShift Install (Manifests) from target directory
INFO Consuming OpenShift Manifests from target directory
INFO Consuming Common Manifests from target directory
INFO Ignition-Configs created in: /ocp-install and /ocp-install/auth
[root@svc-node-03 data]#
```

Creating ignition files and from ignition files automatically OpenShift installation further proceed.

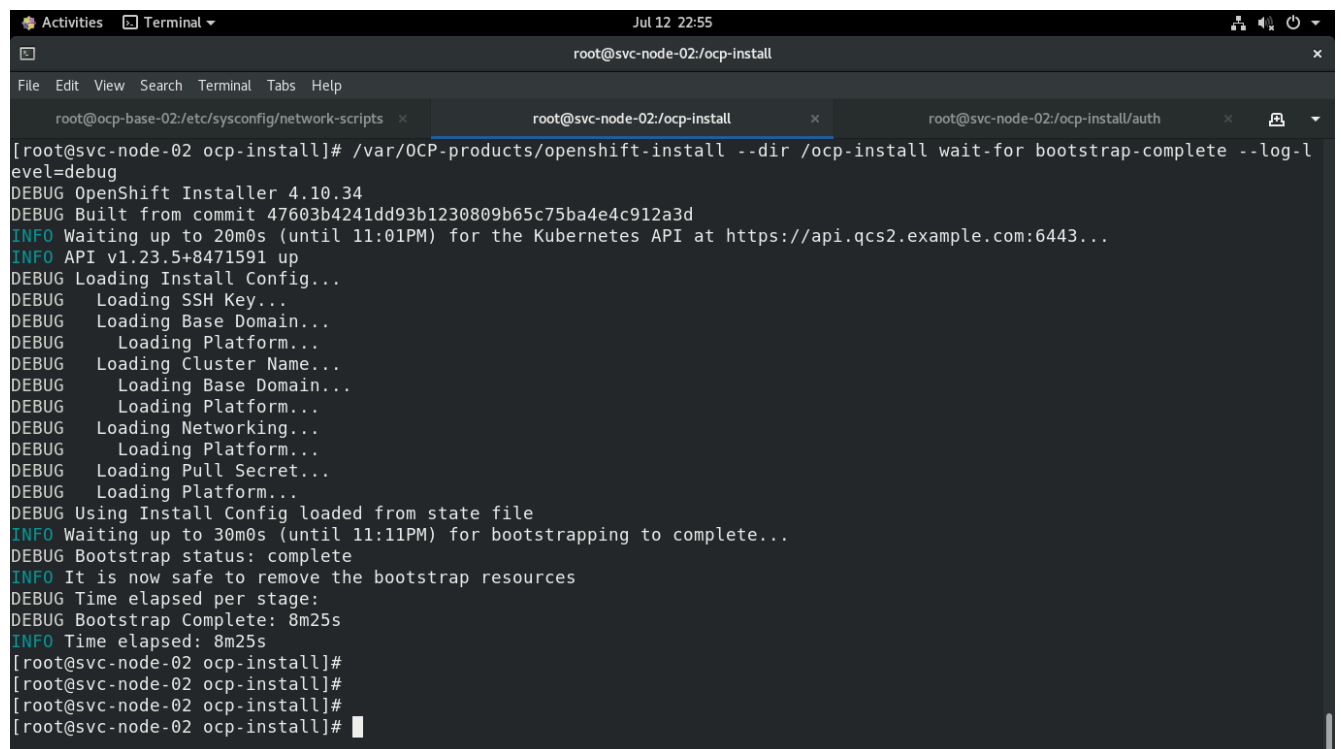
```
Activities Terminal Jan 28 16:41
root@svc-node-03:/opt/data

root@svc-node-03:/opt/data labuser@ocp-base-01:~/Downloads

[root@svc-node-03 data]# ./openshift-install create ignition-configs --dir /ocp-install/
INFO Consuming Master Machines from target directory
INFO Consuming Worker Machines from target directory
INFO Consuming OpenShift Install (Manifests) from target directory
INFO Consuming OpenShift Manifests from target directory
INFO Consuming Common Manifests from target directory
INFO Ignition-Configs created in: /ocp-install and /ocp-install/auth
[root@svc-node-03 data]# ls -l /ocp-install/
total 284
drwxr-x---. 2 root root    50 Jan 28 16:42 auth
-rw-r-----. 1 root root 277082 Jan 28 16:42 bootstrap.ign
-rw-r-----. 1 root root   1718 Jan 28 16:42 master.ign
-rw-r-----. 1 root root    96 Jan 28 16:42 metadata.json
-rw-r-----. 1 root root   1718 Jan 28 16:42 worker.ign
[root@svc-node-03 data]#
[root@svc-node-03 data]# ls -l /ocp-install/auth/
total 16
-rw-r-----. 1 root root   23 Jan 28 16:42 kubeadmin-password
-rw-r-----. 1 root root 8942 Jan 28 16:42 kubeconfig
[root@svc-node-03 data]#
[root@svc-node-03 data]#
[root@svc-node-03 data]#
[root@svc-node-03 data]#
[root@svc-node-03 data]#
[root@svc-node-03 data]#
[root@svc-node-03 data]#
[root@svc-node-03 data]#
```

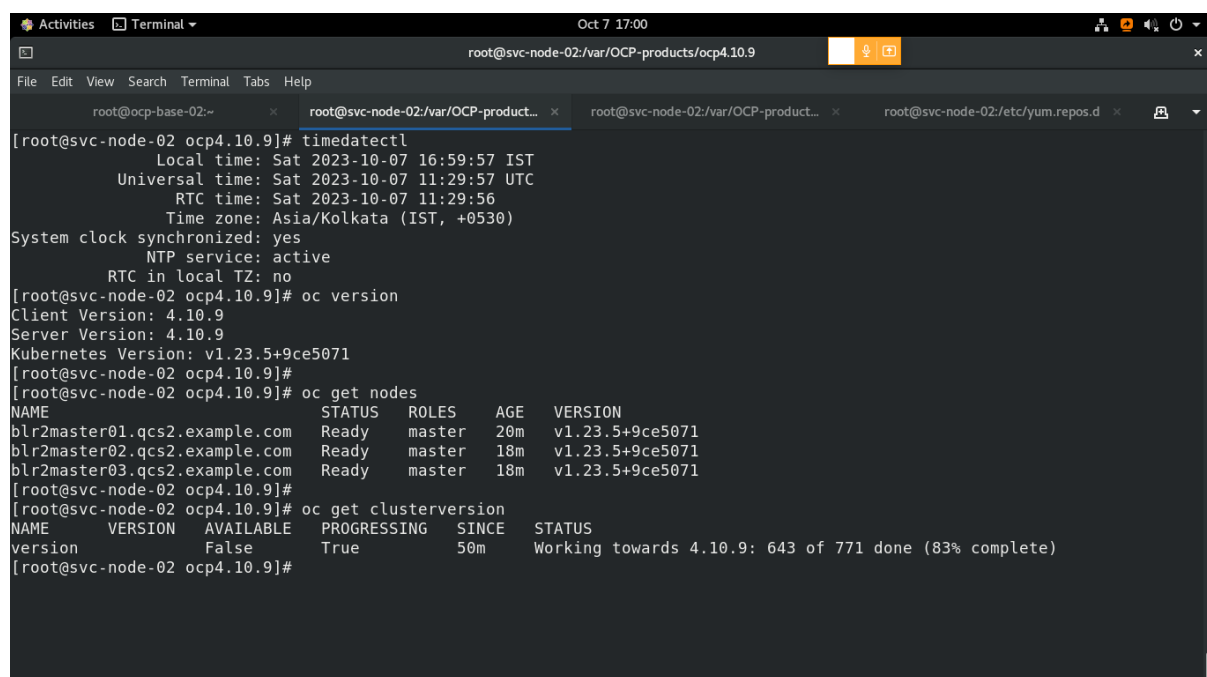


Bootstrapping-process-completed

A terminal window titled 'root@svc-node-02:/ocp-install' showing the output of the OpenShift installer. The terminal displays various debug and info messages, including the OpenShift version (4.10.34), the Kubernetes API endpoint, and the completion of the bootstrap process. The final status is 'INFO Bootstrap Complete: 8m25s'.

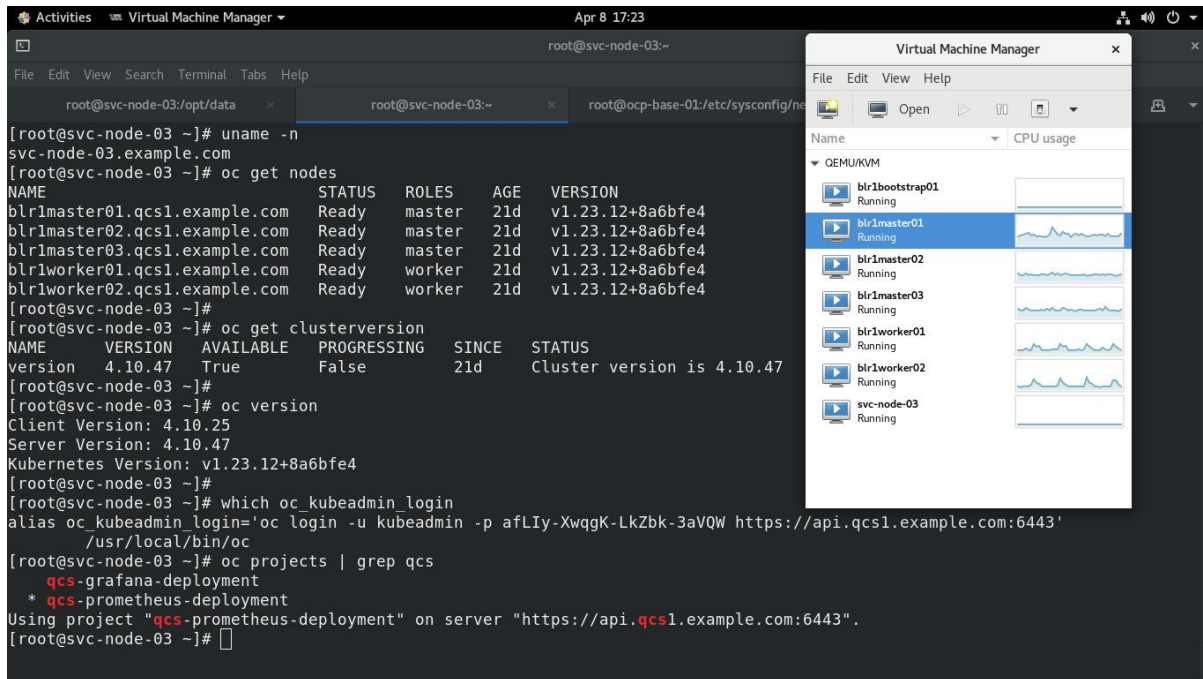
```
[root@svc-node-02 ocp-install]# /var/OCP-products/openshift-install --dir /ocp-install wait-for bootstrap-complete --log-level=debug
DEBUG OpenShift Installer 4.10.34
DEBUG Built from commit 47603b4241dd93b1230809b65c75ba4e4c912a3d
INFO Waiting up to 20m0s (until 11:01PM) for the Kubernetes API at https://api.qcs2.example.com:6443...
INFO API v1.23.5+8471591 up
DEBUG Loading Install Config...
DEBUG Loading SSH Key...
DEBUG Loading Base Domain...
DEBUG Loading Platform...
DEBUG Loading Cluster Name...
DEBUG Loading Base Domain...
DEBUG Loading Platform...
DEBUG Loading Networking...
DEBUG Loading Platform...
DEBUG Loading Pull Secret...
DEBUG Loading Platform...
DEBUG Using Install Config loaded from state file
INFO Waiting up to 30m0s (until 11:11PM) for bootstrapping to complete...
DEBUG Bootstrap status: complete
INFO It is now safe to remove the bootstrap resources
DEBUG Time elapsed per stage:
DEBUG Bootstrap Complete: 8m25s
INFO Time elapsed: 8m25s
[root@svc-node-02 ocp-install]#
[root@svc-node-02 ocp-install]#
[root@svc-node-02 ocp-install]#
[root@svc-node-02 ocp-install]#
```

Red Hat OpenShift installation (Version 4.10) process going on.

A terminal window titled 'root@svc-node-02:/var/OCP-products/ocp4.10.9' showing the progress of the OpenShift installation. The terminal displays the output of 'timedatectl', 'oc version', and 'oc get nodes'. The 'oc get nodes' command shows three master nodes in a 'Ready' state. The 'oc get clusterversion' command shows the cluster is progressing towards version 4.10.9, with 643 of 771 components done (83% complete).

```
[root@svc-node-02 ocp4.10.9]# timedatectl
Local time: Sat 2023-10-07 16:59:57 IST
Universal time: Sat 2023-10-07 11:29:57 UTC
RTC time: Sat 2023-10-07 11:29:56
Time zone: Asia/Kolkata (IST, +0530)
System clock synchronized: yes
NTP service: active
RTC in local TZ: no
[root@svc-node-02 ocp4.10.9]# oc version
Client Version: 4.10.9
Server Version: 4.10.9
Kubernetes Version: v1.23.5+9ce5071
[root@svc-node-02 ocp4.10.9]# oc get nodes
NAME                                STATUS    ROLES    AGE   VERSION
blr2master01.qcs2.example.com      Ready    master   20m   v1.23.5+9ce5071
blr2master02.qcs2.example.com      Ready    master   18m   v1.23.5+9ce5071
blr2master03.qcs2.example.com      Ready    master   18m   v1.23.5+9ce5071
[root@svc-node-02 ocp4.10.9]# oc get clusterversion
NAME      VERSION    AVAILABLE    PROGRESSING    SINCE    STATUS
version   False      True         50m            Working towards 4.10.9: 643 of 771 done (83% complete)
[root@svc-node-02 ocp4.10.9]#
```

Red Hat OpenShift Version 4.10 cluster (3 master/2 worker) successful completed.



The screenshot displays a terminal window and a Virtual Machine Manager (VMM) window. The terminal window shows the output of several OpenShift commands, confirming the cluster's status and version. The VMM window shows the status of the virtual machines used in the cluster.

Terminal Output:

```
[root@svc-node-03 ~]# uname -n
svc-node-03.example.com
[root@svc-node-03 ~]# oc get nodes
NAME                                STATUS    ROLES    AGE    VERSION
blr1master01.qcs1.example.com      Ready    master   21d    v1.23.12+8a6bfe4
blr1master02.qcs1.example.com      Ready    master   21d    v1.23.12+8a6bfe4
blr1master03.qcs1.example.com      Ready    master   21d    v1.23.12+8a6bfe4
blr1worker01.qcs1.example.com      Ready    worker   21d    v1.23.12+8a6bfe4
blr1worker02.qcs1.example.com      Ready    worker   21d    v1.23.12+8a6bfe4
[root@svc-node-03 ~]#
[root@svc-node-03 ~]# oc get clusterversion
NAME      VERSION  AVAILABLE  PROGRESSING  SINCE   STATUS
version  4.10.47  True       False        21d    Cluster version is 4.10.47
[root@svc-node-03 ~]#
[root@svc-node-03 ~]# oc version
Client Version: 4.10.25
Server Version: 4.10.47
Kubernetes Version: v1.23.12+8a6bfe4
[root@svc-node-03 ~]#
[root@svc-node-03 ~]# which oc_kubeadmin_login
alias oc_kubeadmin_login='oc login -u kubeadmin -p afLIy-XwqgK-LkZbk-3aVQW https://api.qcs1.example.com:6443'
/usr/local/bin/oc
[root@svc-node-03 ~]# oc projects | grep qcs
* qcs-grafana-deployment
* qcs-prometheus-deployment
Using project "qcs-prometheus-deployment" on server "https://api.qcs1.example.com:6443".
[root@svc-node-03 ~]#
```

Virtual Machine Manager Window:

The VMM window shows the status of the virtual machines used in the cluster. The list of VMs includes:

- blr1bootstrap01 (Running)
- blr1master01 (Running)
- blr1master02 (Running)
- blr1master03 (Running)
- blr1worker01 (Running)
- blr1worker02 (Running)
- svc-node-03 (Running)

The CPU usage for each VM is displayed as a line graph.