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OpenShift OKD on IBM LinuxONE, Installation Guides

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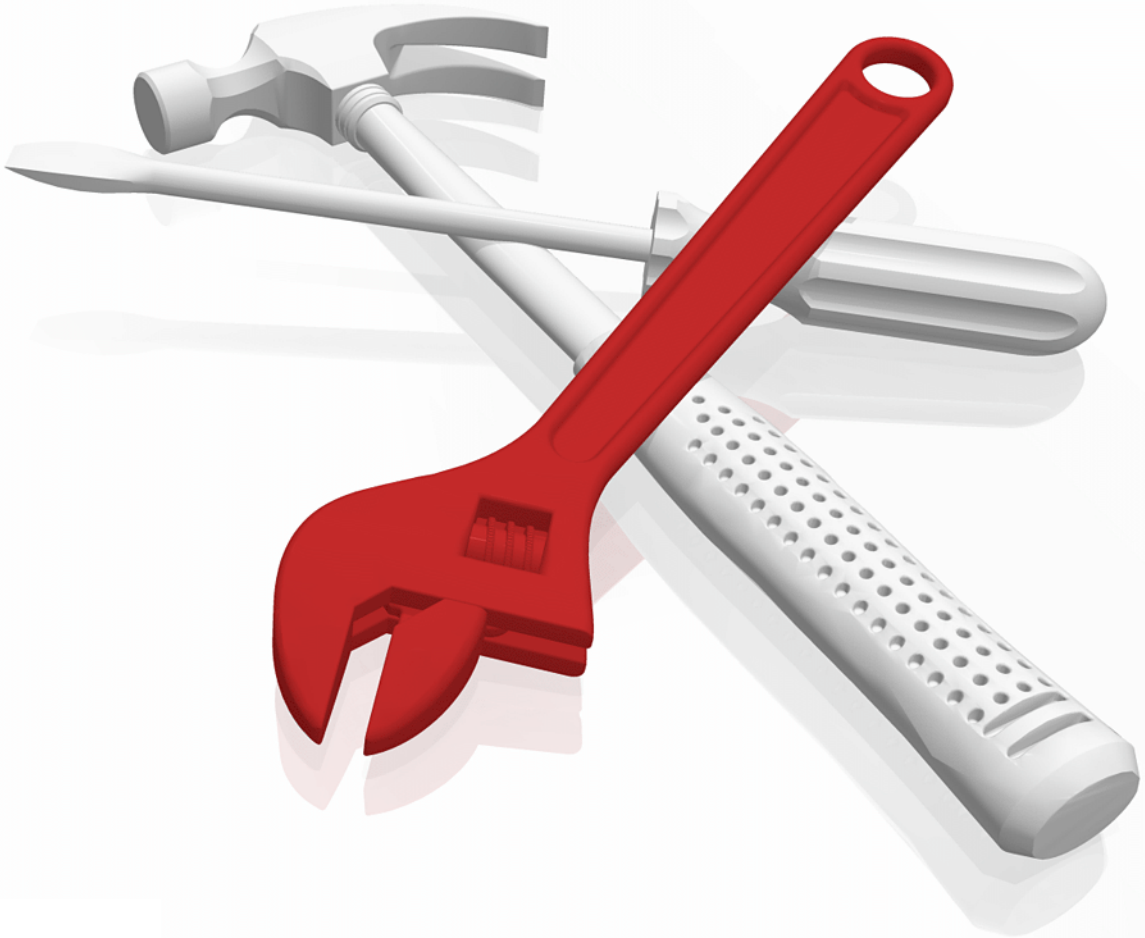

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OpenShift OKD on IBM LinuxONE, Installation Guide

This document provides the step-by-step instructions for installing OpenShift OKD 3.11 on LinuxONE. The intended audience is Systems Architects and Specialists who design, size, and implement solutions on IBM infrastructures.

Many other audiences and scenarios are covered in the OpenShift OKD official documentation, which is located here: https://docs.okd.io/3.11/welcome/index.html

Executive summary

OpenShift OKD, previously named OpenShift Origin, is a container orchestration platform that is built on Docker container packaging and Kubernetes container cluster orchestration. OpenShift OKD is the open source Origin Community distribution that powers Red Hat's OpenShift container platform.

With OpenShift OKD, you easily automate the deployment, scaling, and management of containerized applications.

This document describes installation of OpenShift OKD 3.11 on ClefOS running under LinuxONE. In this guide, we used the advanced installation method to set up the OpenShift OKD, which is based on Ansible playbooks.

Table 1 shows key architectural units of OpenShift OKD.

Table 1 Key architectural units

Architectural unit	Definition
OpenShift OKD cluster	A container for nodes.
OpenShift Node	Can be an instance of physical machines or VMs. The OpenShift nodes run pods.
OpenShift pod	A group of one or more containers that operates together and are deployed on the same host.
OpenShift cluster	A container for nodes that must contain at least one master node.

Architectural unit	Definition
OpenShift master node	A server instance that is responsible for managing the entire cluster. It contains the controller manager, API server, scheduler, and etcd.

Keywords: OpenShift, OKD, Installation, LinuxONE, Linux on Z, Containers, Open source, Orchestration.

Installation checklist

Table 2 provides an installation checklist for the system and hardware required for OpenShift OKD hosts.

Table 2 Installation checklist

Check	Task
Nodes	► Linux running in a native LPAR or under IBM z/VM or K/VM hypervisor ► Minimum of RAM: 8 GB ► Minimum of hard disk space: – 15 GB for **/var/** – 1 GB for **/user/local/bin** – 1 GB for **/tmp/** ► 15 GB of unallocated storage for Docker storage. (See the OpenShift ODK official documentation: Docker storage configuration) ► For more information, see OpenShift's *Configuring Docker Storage* topic: https://docs.openshift.com/container-platform/3.11/install/host_preparation.html#configuring-docker-storage

Linux guest	**Base OS:**
	► RHEL or ClefOS 7.4 (or later) with the latest packages from the Extra channels.
	► Check OS release with this command: **cat /etc/redhat-release**
	`[root@openshiftmaster ~]# cat /etc/redhat-release`
	`CentOS Linux release 7.5.1804 (AltArch)`

Devices	IBM ECKD, FBA, or zFCP

Architecture overview

An overview of the environment that was set up for OpenShift OKD 10.3 installation is displayed in Table 3 and Figure 1.

Table 3 Environment details

Environment details	Command-line display
Red Hat release: **cat /etc/redhat-release**	`[root@openshiftmaster ~]# cat /etc/redhat-release` `CentOS Linux release 7.5.1804 (AltArch)`

Kernel version: **uname –a**	[root@openshiftmaster ~]# uname -a Linux openshiftmaster.mop.fr.ibm.com 3.10.0-862.el7.s390x #1 SMP Sun May 20 19:2 3:01 EDT 2018 s390x s390x s390x GNU/Linux
Disk configuration: **lsdasd**	[root@openshiftmaster ~]# lsdasd Bus-ID Status Name Device Type BlkSz Size Blocks 0.0.0100 active dasda 94:0 ECKD 4096 11250MB 2880000 0.0.1000 active dasdb 94:4 ECKD 4096 46068MB 11793420

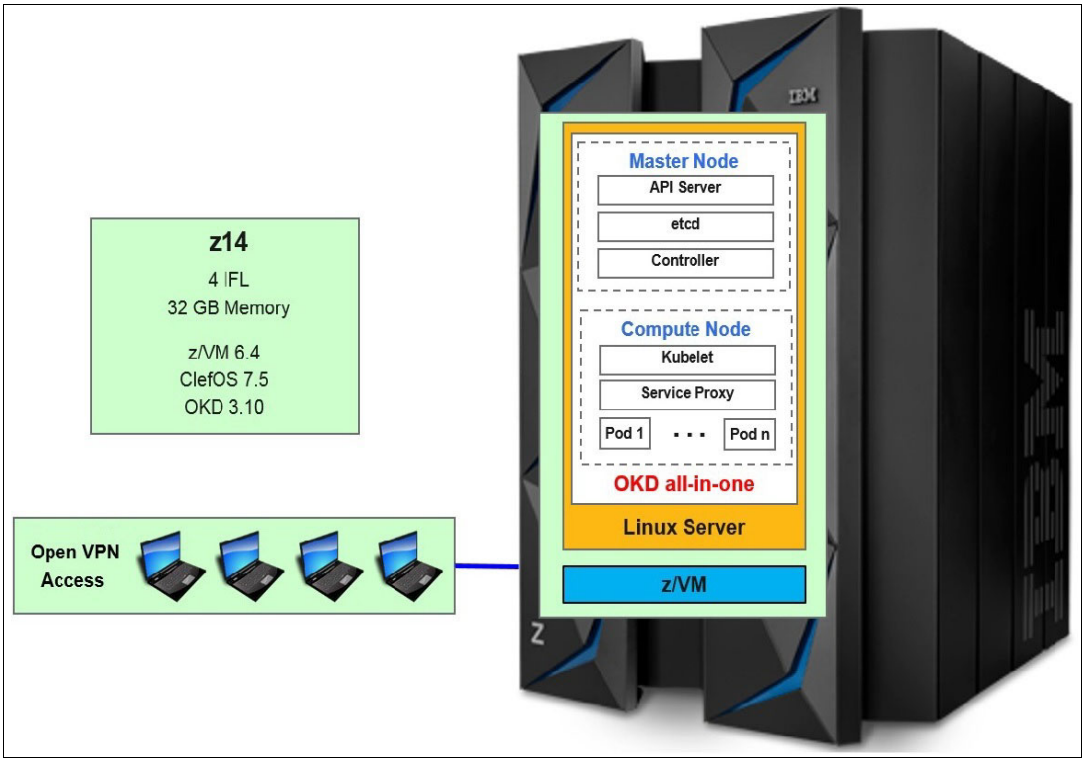

Figure 1 Environment overview

For information about the environment where you install OpenShift OKD, see the next section.

OpenShift OKD pre-installation tasks

This section describes the tasks that are required to prepare for the installation that is described in “All-in-one configuration: single-node installation” on page 17. Sometimes, the task descriptions in this section include example output for the commands that you must run.

Preinstallation task 1: Prepare the environment

Prepare your environment as follows:

1. Run the following comment to update the system to use the latest packages: **`yum update –y`**
2. Run the following command to install Extra Packages for Enterprise Linux (EPEL): **`yum install epel-release –y`**

   Figure 2 shows the results of this command in our example.

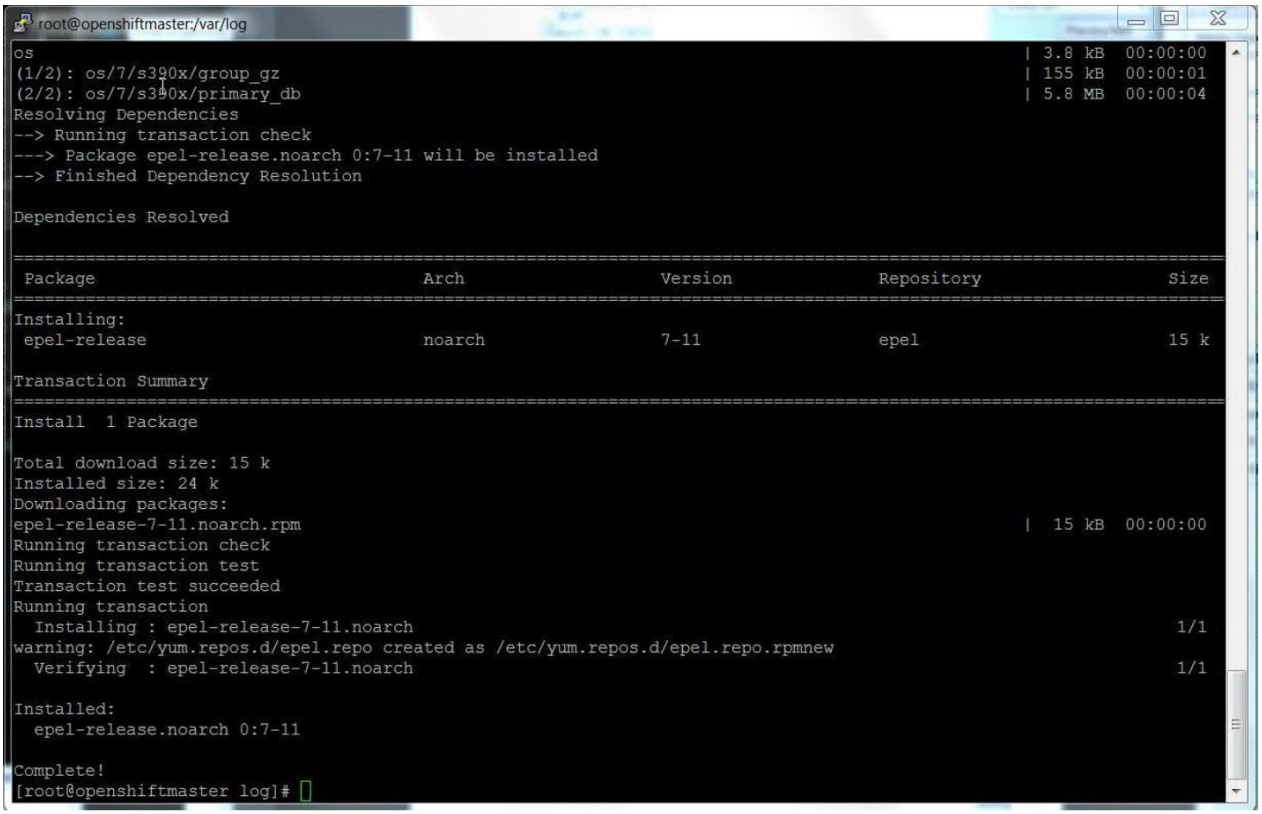

Figure 2 Epel release installation

3. Enable access to ClefOS EPEL repository as follows:
   a. Create the following file: **`vi /etc/yum.repos.d/epel.repo`**
   b. Add the following lines to the file that you created:

```
[epel] name=ClefOS Extra Packages for Enterprise Linux
baseurl=http://download.sinenomine.net/clefos/epel7 gpgcheck=1
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-SNA enabled=0
```

4. Enable password-free SSH access to nodes that compose your cluster. (In this guide, we have one node: the master node.)

   a. Generate SSH key pair on the master host, as shown in Figure 3: **`ssh-keygen -t rsa`**

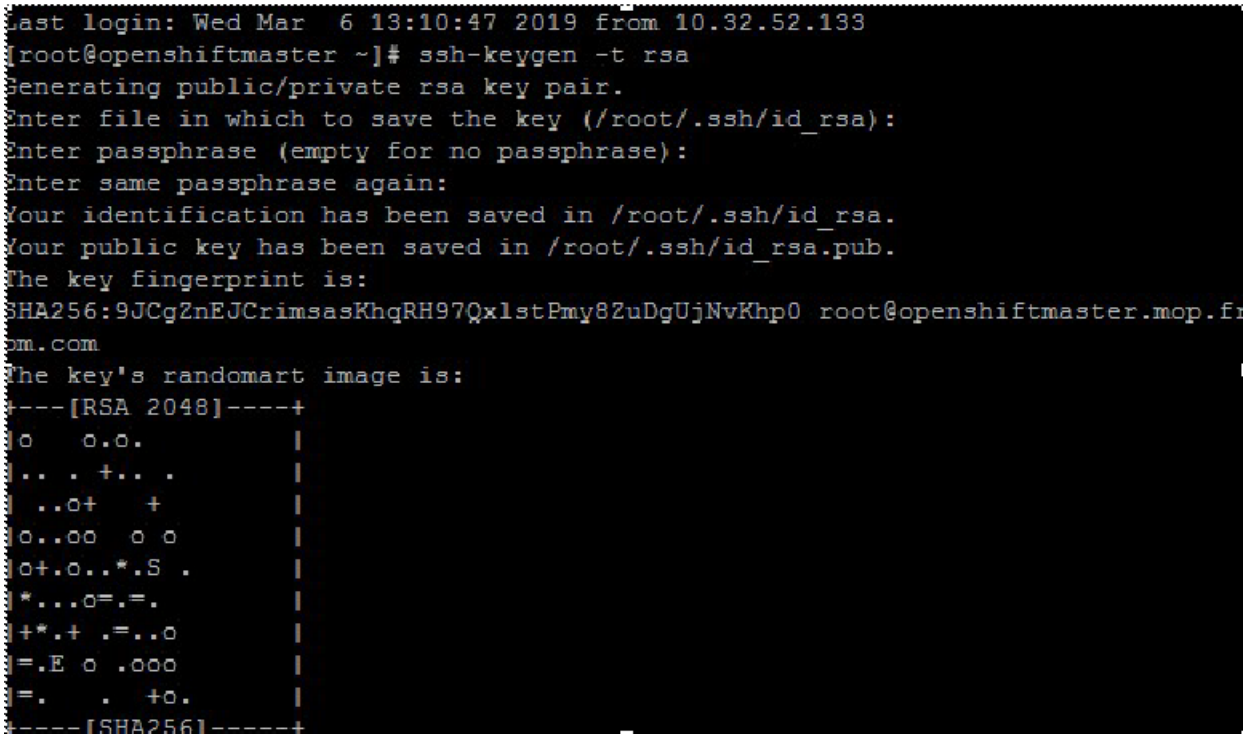

Figure 3 Using SSH-keygen to generate a new SSH key

   b. Copy the SSH key content to the following file:

```
/root/.ssh/authorized_keys
cat /root/.ssh/id_rsa.pub >> /root/.ssh/authorized_keys
sh-copy-id root@master
```

   c. Set the permissions:

```
chmod 700 ~/.ssh
chmod 600 /root/.ssh/authorized_keys
```

   d. Distribute the public key to the other cluster nodes if you are in nonAll In One node configuration. Then, log in to each host from the master node to make sure that the key was added.

```
scp /root/.ssh/id_rsa.pub root@hostname:/root/.ssh/authorized_keys
```

Security-Enhanced Linux (SELinux) must be enabled on all nodes before you run the installation of OpenShift. Otherwise, the installation fails as shown in Figure 5.

5. Run the following command to check the SELinux status: **`getenforce`**

6. To enable SELinux, change the value of SELINUX to “enforcing” in **`etc/selinux/config`** file as shown in Figure 4:

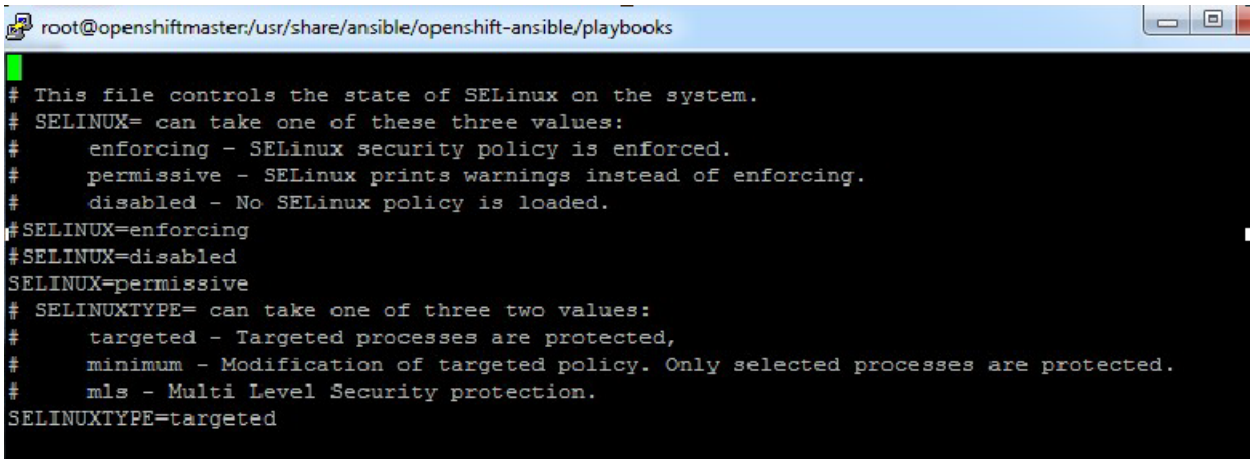

Figure 4 Enabling SELinux

If SELinux is not enabled, as shown in Figure 5, it will cause problems when the installation of OpenShift is started.

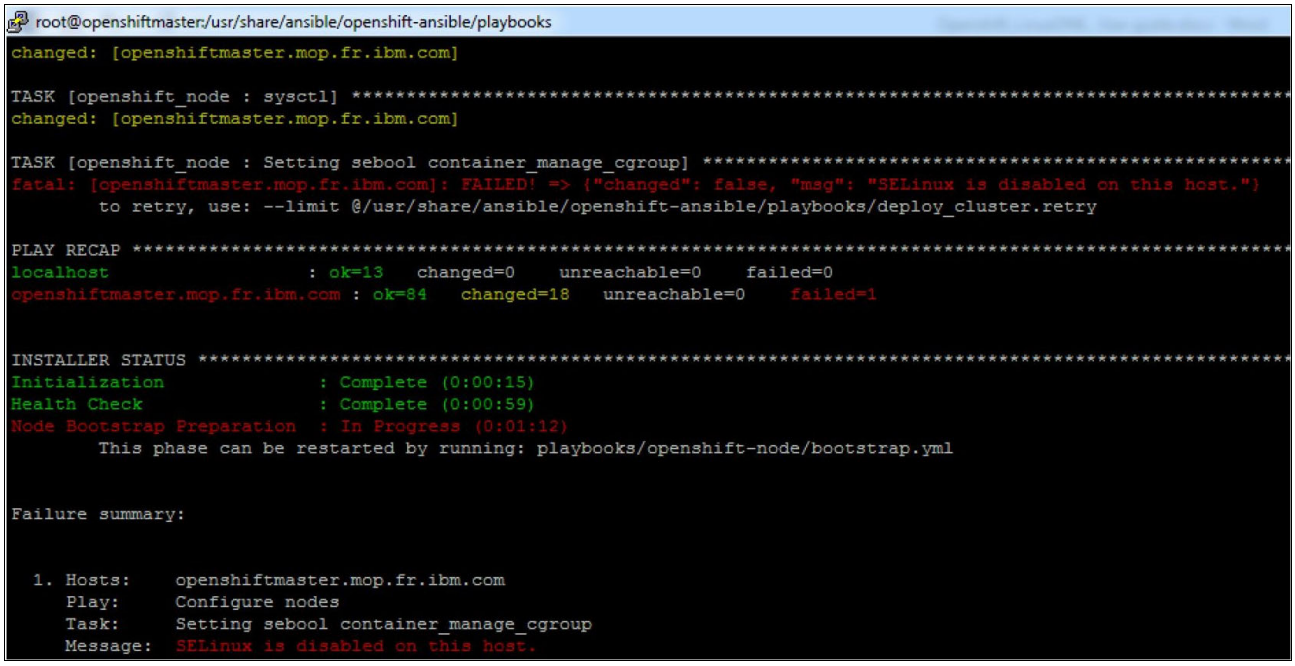

Figure 5 OpenShift installation failed due to a disabled SELinux

7. Reboot the virtual machine (z/VM or KVM) to make the change effective, and then check that the **`getenforce`** command returns the **`permissive`** value: **`reboot`**.

The OpenShift OKD installation method that is used in this user guide is based on the use of the Ansible playbooks. Use the following command to install Ansible on your host:

```
yum install ansible OpenShift-ansible -y
```

Workaround: The preceding command might fail with the error that is shown in Figure 6. In this case, you must downgrade the version of Python that is already installed in your host by using the following command. Then, rerun the failed installation after you downgrade the Python version.

```
yum downgrade python-javapackages
```

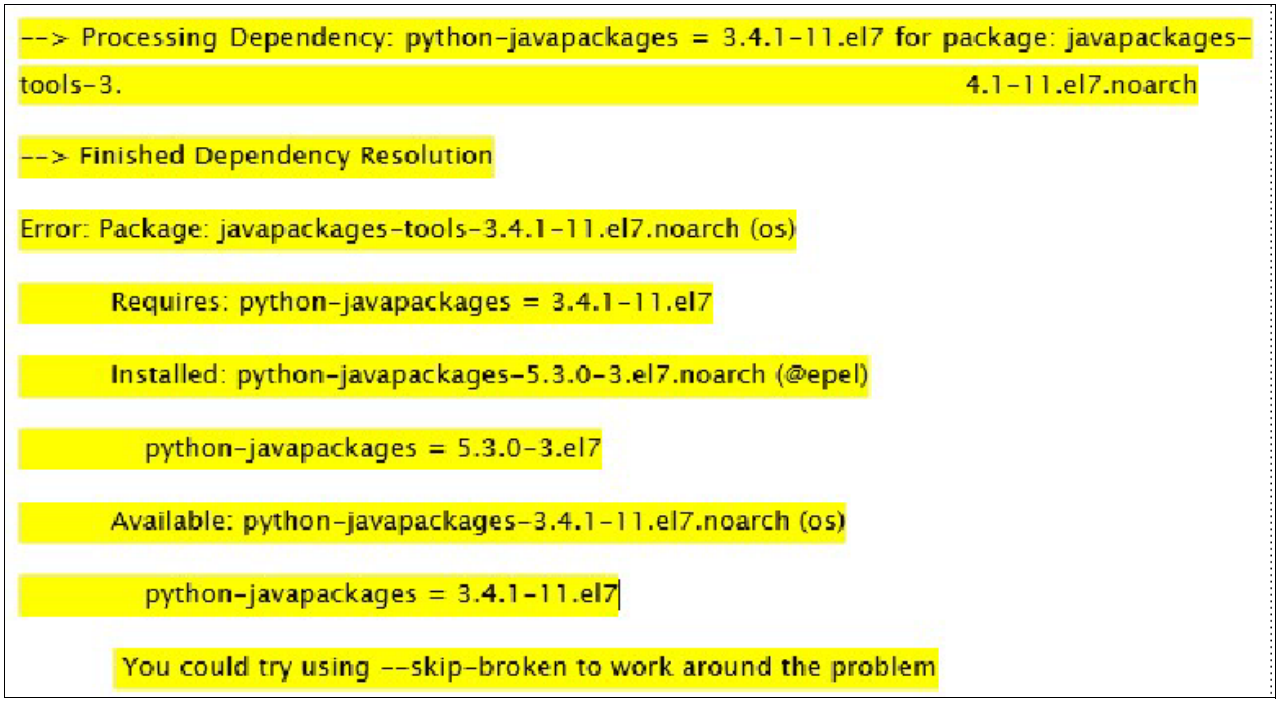

Figure 6 OpenShift-Ansible failed installation

Preinstallation task 2: Manage packages for the installation

Use the commands in the Subscription-Manager to enable and disable repositories within the repository file, as shown in these examples:

- **yum-config-manager --enable extras --save**
  See typical output for this command in Example 1.
- **yum-config-manager --disable epel –save**
  See typical output for this command in Example 2 on page 9.

Enabling extras

Example 1 shows typical results for running the following **enable** command:
yum-config-manager --enable extras --save

Example 1 Enabling a repository

```
yum-config-manager --enable extras --save
[root@OpenShiftmaster ~]# yum-config-manager --enable extras --save
Loaded plugins: fastestmirror, langpacks
================================================
repo: extras
================================================
[extras]
```

```
async = True
bandwidth = 0
base_persistdir = /var/lib/yum/repos/s390x/7
baseurl =
cache = 0
cachedir = /var/cache/yum/s390x/7/extras check_config_file_age = True
compare_providers_priority = 80 cost = 1000
deltarpm_metadata_percentage = 100
deltarpm_percentage =
enabled = 1
enablegroups = True
exclude =
failovermethod = priority
ftp_disable_epsv = False
gpgcadir = /var/lib/yum/repos/s390x/7/extras/gpgcadir
gpgcakey =
gpgcheck = True
gpgdir = /var/lib/yum/repos/s390x/7/extras/gpgdir
gpgkey = file:///etc/pki/rpm-gpg/RPM-GPG-KEY-ClefOS-7
hdrdir = /var/cache/yum/s390x/7/extras/headers
http_caching = all
includepkgs =
ip_resolve =
keepalive = True
keepcache = False
mddownloadpolicy = sqlite
mdpolicy = group:small
mediaid =
metadata_expire = 21600
metadata_expire_filter = read-only:present
metalink =
minrate = 0
mirrorlist = http://mirrors.sinenomine.net/clefos?releasever=7&arch=s390x&repo=extra s
mirrorlist_expire = 86400
name = ClefOS-7 - Extras
old_base_cache_dir =
password =
persistdir = /var/lib/yum/repos/s390x/7/extras
pkgdir = /var/cache/yum/s390x/7/extras/packages
proxy = False
proxy_dict =
proxy_password =
proxy_username =
repo_gpgcheck = False
retries = 10
skip_if_unavailable = False
ssl_check_cert_permissions = True
sslcacert =
sslclientcert =
sslclientkey =
sslverify = True
throttle = 0
timeout = 30.0
ui_id = extras/7/s390x
ui_repoid_vars = releasever,
basearch username =
```

Disabling extras

Example 2 shows typical results for running this **disable** command:
yum-config-manager --disable epel –save

Example 2 Disabling a repository

```
yum-config-manager --disable epel –save
[root@OpenShiftmaster ~]# yum-config-manager --disable epel –save
Loaded plugins: fastestmirror, langpacks
/usr/lib/python2.7/site-packages/yum/misc.py:133: UnicodeWarning: Unicode equal comparison
failed to convert both arguments to Unicode - interpreting them as being unequal return
lambda s: s.lower() == pat
================================================
repo: epel
================================================
 [epel] a
async = True
bandwidth = 0
base_persistdir = /var/lib/yum/repos/s390x/7
baseurl = http://download.sinenomine.net/clefos/epel7
cache = 0 cachedir = /var/cache/yum/s390x/7/epel
check_config_file_age = True
compare_providers_priority = 80
cost = 1000
deltarpm_metadata_percentage = 100
deltarpm_percentage =
enabled = 0
enablegroups = True
exclude =
failovermethod = priority
ftp_disable_epsv = False
gpgcadir = /var/lib/yum/repos/s390x/7/epel/gpgcadir
gpgcakey =
gpgcheck = True
gpgdir = /var/lib/yum/repos/s390x/7/epel/gpgdir
gpgkey = file:///etc/pki/rpm-gpg/RPM-GPG-KEY-SNA
hdrdir = /var/cache/yum/s390x/7/epel/headers
http_caching = all
includepkgs =
ip_resolve =
keepalive = True
keepcache = False
mddownloadpolicy = sqlite
mdpolicy = group:small
mediaid =
metadata_expire = 21600
metadata_expire_filter = read-only:present
metalink =
minrate = 0
mirrorlist =
mirrorlist_expire = 86400
name = ClefOS Extra Packages for Enterprise Linux
old_base_cache_dir =
password =
persistdir = /var/lib/yum/repos/s390x/7/epel
pkgdir = /var/cache/yum/s390x/7/epel/packages
proxy = False
proxy_dict =
proxy_password =
proxy_username =
```

```
repo_gpgcheck = False
retries = 10
skip_if_unavailable = False
ssl_check_cert_permissions = True
sslcacert =
sslclientcert =
sslclientkey =
sslverify = True
throttle = 0
timeout = 30.0
ui_id = epel
ui_repoid_vars = releasever, basearch
username =
```

Preinstallation task 3: Install required packages

In this section, we use the following commands to install the required CentOS packages:

- **yum install centos-release-ansible26**
  See typical output for this command in Example 3.
- **yum install centos-release-OpenShift-origin310**
  See typical output for this command in Example 4 on page 11.
- **yum install centos-release-OpenShift-origin**
  See typical output for this command in Example 5 on page 12.
- **yum install centos-release-ceph-luminous**
  See typical output for this command in Example 6 on page 12.

Installing centos-release-ansible26

Example 3 shows typical results for running the following package-installation command:
yum install centos-release-ansible26

Example 3 Installing ansible26

```
yum install centos-release-ansible26
[root@OpenShiftmaster ~]# yum install centos-release-ansible26
Loaded plugins: fastestmirror, langpacks
Loading     mirror    speeds       from cached       hostfile
============================================================
extras        |        3.8              kB           00:00:00
os            |        3.8              kB           00:00:00
updates       |        3.8              kB           00:00:00
(1/2): extras/7/s390x/primary_db | 166 kB     00:00:01
(2/2): extras/7/s390x/group_gz   | 155 kB     00:00:01
Resolving Dependencies
--> Running transaction check
---> Package centos-release-ansible26.noarch 0:1-3.el7.centos will be installed
--> Processing Dependency: centos-release-configmanagement for
package: centos-release-ansible26-1-3.el7.centos.noarch
--> Running transaction check
---> Package centos-release-configmanagement.noarch 0:1-1.el7.centos will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
Package                            Arch     Version         Repository    Size
================================================================================
```

```
Installing:
centos-release-ansible26           noarch   1-3.el7.centos   extras       3.9 k
Installing for dependencies:
centos-release-configmanagement    noarch   1-1.el7.centos   extras       4.3 k

Transaction Summary
================================================
Install 1 Package (+1 Dependent package)

Total download size: 8.2 k
Installed size: 1.6 k
Is this ok [y/d/N]: y Downloading packages:
(1/2): centos-release-configmanagement-1-1.el7.centos.noarch.rpm
| 4.3 kB 00:00:00
(2/2): centos-release-ansible26-1-3.el7.centos.noarch.rpm | 3.9 kB 00:00:00
------------------------------------------------------------
Total 12 kB/s | 8.2 kB 00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Installing : centos-release-configmanagement-1-1.el7.centos.noarch 1/2
Installing : centos-release-ansible26-1-3.el7.centos.noarch 2/2 Verifying :
centos-release-configmanagement-1-1.el7.centos.noarch 1/2
Verifying : centos-release-ansible26-1-3.el7.centos.noarch 2/2

Installed:
centos-release-ansible26.noarch
 0:1-3.el7.centos
Dependency Installed:
centos-release-configmanagement.noarch 0:1-1.el7.centos

Complete!
```

Installing centos-release-OpenShift-origin310

Example 4 shows typical results for running the following package-installation command:
yum install centos-release-OpenShift-origin310

Note: In the environment used for this installation, the package shown in “Installing centos-release-ansible26” on page 10 was already installed. The output of the command would be then different if you proceeded with a first-time installation of this package.

Example 4 Installing OpenShift-origin310

```
yum install centos-release-OpenShift-origin310
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
centos-OpenShift-origin                                  | 2.9 kB     00:00
clefos-ansible26                                         | 3.0 kB     00:00
clefos-ceph-luminous                                     | 3.0 kB     00:00
clefos-OpenShift-origin                                  | 3.0 kB     00:00
clefos-OpenShift-origin310                               | 3.0 kB     00:00
extras                                                   | 3.8 kB     00:00
os                                                       | 3.8 kB     00:00
updates                                                  | 3.8 kB     00:00
(1/3): extras/7/s390x/primary_db                         | 190 kB     00:01
(2/3): clefos-OpenShift-origin/7/s390x/primary_db        | 298 kB     00:02
```

```
(3/3): updates/7/s390x/primary_db                          | 5.0 MB     00:05
Package centos-release-OpenShift-origin310-1-1.el7.centos.noarch already installed and
latest version
Nothing to do
```

Installing centos-release-OpenShift-origin

Example 5 shows typical results for running the following package-installation command: **yum install centos-release-OpenShift-origin**

Example 5 Installing OpenShift-origin

```
yum install centos-release-OpenShift-origin
[root@OpenShiftmaster ~]# yum install centos-release-OpenShift-origin
Loaded plugins: fastestmirror, langpacks
Loading                                      mirror  speeds  from cached  hostfile
clefos-OpenShift-origin310                     |      3.0        kB       00:00:00
clefos-OpenShift-origin310/7/s390x/primary_db  |      3.8        kB       00:00:00
Resolving Dependencies
--> Running transaction check
---> Package centos-release-OpenShift-origin.noarch 0:1-
1.el7.centos will be installed --> Finished Dependency Resolution

Dependencies Resolved
================================================================================
Package                          Arch      Version         Repository    Size
Installing:
centos-release-OpenShift-origin  noarch  1-1.el7.centos       extras      11 k

Transaction Summary
================================================================================
Install 1 Package
Total download size: 11 k
Installed size: 18 k
Is this ok [y/d/N]: y
Downloading packages:
centos-release-OpenShift-origin-1-1.el7.centos.noarch.rpm | 11 kB  00:00:00
Running transaction check Running transaction test Transaction test succeeded
Running transaction
Installing : centos-release-OpenShift-origin-1-1.el7.centos.noarch
1/1
Verifying : centos-release-OpenShift-origin-1-1.el7.centos.noarch
1/1

Installed:
centos-release-OpenShift-origin.noarch 0:1-1.el7.centos

Complete!
```

Installing centos-release-ceph-luminous

Example 6 shows typical results for running the following package-installation command: **yum install centos-release-ceph-luminous**

Example 6 Installing centos-release-ceph-luminous

```
yum install centos-release-ceph-luminous
[root@OpenShiftmaster ~]# yum install centos-release-ceph-luminous
```

```
Loaded plugins: fastestmirror, langpacks
Loading                                      mirror   speeds   from cached   hostfile
clefos-OpenShift-origin                        |       3.0         kB        00:00:00
clefos-OpenShift-origin/7/s390x/primary_db     |       301         kB        00:00:01
Resolving Dependencies
--> Running transaction check
---> Package centos-release-ceph-luminous.noarch 0:1.0-1.el7.centos will be installed
--> Processing Dependency: centos-release-storage-common for package:
centos-release-ceph-luminous-1.0-1.el7.centos.noarch
--> Running transaction check
---> Package centos-release-storage-common.noarch 0:1-2.el7.centos will be installed
--> Finished Dependency Resolution

Dependencies Resolved
================================================================================
Package                            Arch       Version         Repository    Size
================================================================================
Installing:
centos-release-ceph-luminous     noarch  1.0-1.el7.centos     extras       4.0k
Installing for dependencies:
centos-release-storage-common    noarch  1-2.el7.centos       extras       4.5k

Transaction Summary
================================================================================
Install 1 Package (+1 Dependent package)
Total download size: 8.5 k
Installed size: 1.6 k
Is this ok [y/d/N]: y
Downloading packages:
(1/2):
centos-release-ceph-luminous-1.0-1.el7.centos.noarch.rpm       | 4.0  kB  00:00:00
(2/2): centos-release-storage-common-1-2.el7.centos.noarch.rpm | 4.5  kB  00:00:00
--------------------------------------------------------------
Total 12 kB/s | 8.5 kB 00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Installing : centos-release-storage-common-1-2.el7.centos.noarch 1/2
Installing : centos-release-ceph-luminous-1.0-1.el7.centos.noarch 2/2
Verifying : centos-release-storage-common-1-2.el7.centos.noarch 1/2
Verifying : centos-release-ceph-luminous-1.0-1.el7.centos.noarch 2/2

Installed:
centos-release-ceph-luminous.noarch 0:1.0-1.el7.centos
Dependency Installed:
centos-release-storage-common.noarch 0:1-2.el7.centos

Complete!
```

Preinstallation task 4. Prepare persistent storage for OpenShift cluster by using NFS

You can provision OpenShift clusters with persistent storage using NFS. For the basic installation that is documented here, we use persistent storage with NFS.

1. Run these commands to create the folders:

```
mkdir    -p    /exports/pv    /exports/liberty    /exports/db /exports/zeppelin
```

```
mkdir -p /exports/serverapp /exports/clientapp /exports/mongodb
```

2. Run these commands to modify file permissions so that they match Figure 7:

```
chown nobody:nobody /exports/*
chmod 0777 /exports/*
```

Figure 7 Content of export file with the associated permissions

3. Run this command to enable NFS to start at boot: **`systemctl enable nfs`**
4. Run this command to start the NFS server: **`systemctl start nfs`**
5. Run this command to check the status of the NFS server: **`systemctl status nfs`**
   Typical output from this command is shown in Example 7:

Example 7 Check the status of the NFS server

```
[root@OpenShiftmaster ~]# systemctl status nfs
nfs-server.service - NFS server and services
   Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; enabled; vendor
preset: disabled)
   Active: active (exited) since Thu 2019-03-07 11:12:18 CET; 26s ago
  Process: 28636 ExecStartPost=/bin/sh -c if systemctl -q is-active gssproxy; then
systemctl restart
  gssproxy ; fi (code=exited, status=0/SUCCESS)
  Process: 28618 ExecStart=/usr/sbin/rpc.nfsd $RPCNFSDARGS (code=exited,
status=0/SUCCESS)
  Process: 28615 ExecStartPre=/usr/sbin/exportfs -r (code=exited,
status=0/SUCCESS)
 Main PID: 28618 (code=exited, status=0/SUCCESS)
CGroup: /system.slice/nfs-server.service
Mar 07 11:12:18 OpenShiftmaster.mop.fr.ibm.com systemd[1]: Starting NFS server and
services...
Mar 07 11:12:18 OpenShiftmaster.mop.fr.ibm.com systemd[1]: Started NFS server and
services.
```

Preinstallation task 5. Configure the DNS

DNS is mandatory in an OpenShift installation. You can use an existing DNS setup outside of the cluster (this approach is not documented here). In this guide, we set up a DNS as part of the cluster itself. You must ensure that the NetworkManager is running by completing the following two operations, as described in this section:

- Check the status of the Network Manager.
- Install the Dnsmasq, which is a lightweight DNS forwarder.

Check the status of the Network Manager

Run the following command: **systemctl status NetworkManager**
Typical output for this command is shown in Example 8:

Example 8 Check the status of the network manager

```
[root@OpenShiftmaster ~]# systemctl status NetworkManager
NetworkManager.service - Network Manager
   Loaded: loaded (/usr/lib/systemd/system/NetworkManager.service; enabled;
   vendor preset: enabled)
   Active: active (running) since Tue 2019-03-05 18:43:49 CET; 1 day 19h ago
     Docs: man:NetworkManager(8)
 Main PID: 791 (NetworkManager)
   CGroup: /system.slice/NetworkManager.service
           ??791 /usr/sbin/NetworkManager --no-daemon
Mar 05 18:43:51 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551807831.0476]...
Mar 05 18:43:51 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551807831.0482]...
Mar 05 18:43:51 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551807831.0488]...
Mar 06 16:41:36 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551886896.7059]...
Mar 06 16:41:41 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551886901.0477]...
Mar 06 16:41:49 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551886909.6239]...
Mar 06 16:42:02 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551886922.1046]...
Mar 06 16:43:16 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551886996.8043]...
Mar 06 16:44:08 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551887048.8401]...
Mar 06 16:44:13 OpenShiftmaster.mop.fr.ibm.com
NetworkManager[791]: <info>  [1551887053.2771]...
Hint: Some lines were ellipsized, use -l to show in full.
```

Install the Dnsmasq

1. Run the following command to install the package: **yum install -y dnsmasq**
2. Add the IP address of your node that runs the DNS to the **/etc/resolv.conf** file. In this installation, it is the IP address of the Master node, as shown in Figure 8.

   Line to be added to the file: **nameserver Master_node_IP Address**

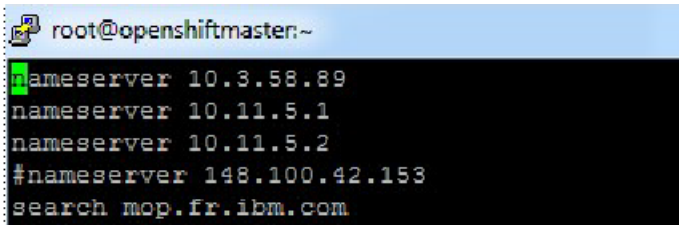

Figure 8 The /etc/resolv.conf file

Note: To ensure that **etc/resolv.con** file is not overwritten on each reboot, verify that in the **/etc/sysconfig/network-scripts/ ifcfg-enccw0.0.0d20** file, the variable PEERDNS is set to no (**PEERDNS=no**). Reboot the VM, and check that **/etc/resolv.conf** has not been overwritten.

3. Open the DNS port and enable **dnsmasq** on the host:

   a. Disable **firewalld** if it is used in your environment, and replace it with **iptables-services** by running the following commands, in the same sequence:

   ```
   systemctl stop firewalld
   systemctl disable firewalld
   systemctl mask firewalld
   yum install -y iptables-services
   systemctl enable iptables
   systemctl start iptables
   ```

   Note: In this installation, we disable the installed firewall, and we use iptables rules. Otherwise, the OpenShift ansible playbook would disable it and mask it, and the defined rules would be lost.

   b. Install the DNS iptables rules using the following commands, in the same sequence:

   ```
   iptables -I INPUT 1 -p TCP --dport 53 -j ACCEPT
   iptables -I INPUT 1 -p UDP --dport 53 -j ACCEPT
   iptables-save > /etc/sysconfig/iptables
   ```

   c. Restart the **iptables** service and make sure that the rules were validated by running this command: **`systemctl restart iptables`**

4. Enable and start **dnsmasq** by running the following commands, in the same sequence:

   ```
   systemctl enable dnsmasq
   systemctl start dnsmasq
   ```

5. Run the following command on each node (in this documentation, in the master node) to confirm that the IP address that is returned is correct:

   ```
   dig hostname
   ```

   The IP address must be the IP address of the node on which the router is running.

   Typical output for this command is shown in Figure 9:

Example 9 Confirm correct IP address

```
[root@OpenShiftmaster ~]# dig OpenShiftmaster.mop.fr.ibm.com
; <<>>  DiG 9.9.4-RedHat-9.9.4-73.el7_6 <<>>
OpenShiftmaster.mop.fr.ibm.com ;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 56932
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
; OpenShiftmaster.mop.fr.ibm.com.      IN      A
;; ANSWER SECTION:
; OpenShiftmaster.mop.fr.ibm.com. 0 IN    A       10.3.58.89
;; Query time: 0 msec
;; SERVER: 10.3.58.89#53(10.3.58.89)
;; WHEN: Thu Mar 07 15:56:38 CET 2019
;; MSG SIZE  rcvd: 75
```

All-in-one configuration: single-node installation

The topics in this section describe how to set up a single-node instance of OpenShift OKD in an all-in-one configuration:

Figure 9 shows the process for this installation.

Figure 9 Process for a single-node installation of OpenShift OKD

In this user guide, we use the advanced installation method with Ansible playbook to set up OpenShift OKD. The first step of this process is to modify the Ansible inventory file to define the configuration of the OpenShift Container Platform cluster to be consumed by OpenShift playbooks. After this file customized, we ensure that the hardware and software prerequisites that are recommended by OpenShift are met by running the **`prerequisites.yml`** playbook. This operation also installs the required packages such as Docker. Then, we download the Docker images for ClefOS from Docker repository before deployment of the OpenShift Container Platform Cluster.

Note: As mentioned before, we create the Ansible Playbook to install the all-in-one OpenShift cluster. It is recommended for a production environment to use dedicated infrastructure nodes to host the different components of OpenShift cluster.

A. Inventory file

This section describes the two steps that are necessary to set up an inventory file.

Step 1 of 2: Configure users and authentication

In this section, we configure the cluster to use HTPasswd authentication. For this purpose, we use the **htpasswd** utility that is provided by the **httpd-tools** package. This utility is used later to set the password for the user accounts, **admin** and **ntc**, which are defined in the inventory file. (Both users are created as part of this installation.)

1. Install **httpd-tools** package by running this command: **`yum install httpd-tools`**
2. Use the **`htpasswd`** command, as follows:

   To configure the OpenShift Container Platform cluster to use HTPasswd authentication, you need at least one user with a hashed password to include in the inventory file. Thus, there are two options:

   a. Generate the username and password to add directly to the inventory file. (This is the method that is used in this installation.)

   b. Create a flat file to pass the credentials to the inventory file (this method is not described in this user guide).

For this installation, we create two users: **admin** and **ntc**. To create a hashed password for a specific user, follow the steps described here:

1. Run the following command to add a user: **htpasswd -nb *<user_name>* *<password>***
2. For example, enter a clear-text password for the **ntc** user. The following example command shows the generation of a hashed password for the clear-text (**openshift**) that you enter:

   ```
   [root@OpenShiftcompute ~]# htpasswd -nb ntc openshift
   ntc:$apr1$C.FjItW2$MP2ovZg6YWZzagTTLcQuO/
   ```

   You can use the hashed password when you configure the HTPasswd authentication. The hashed password is the string after the colon (:) in the preceding example. In this case, the hashed password command was copied and pasted in the inventory file to set the password for the **ntc** user.
3. Follow the same steps to set the password for the **admin** user.

Step 2 of 2: Customize the inventory file

By default, the inventory file can be found at **/etc/ansible/hosts** location. This file is used to initiate the installation and for cluster upgrades as well.

Example 10 shows the inventory file that was used for our installation.

For each section and parameter set in this example file, there is an explanation that is preceded by a number sign (#).

Note: For this document, the *explanation* sections in Example 10 are in **bold** font. If you use this example inventory file as the basis for your own inventory file, first copy and paste the text into a raw-text editor like Notepad on Windows. This action ensures that the text is clear of extraneous formatting code.

Example 10 Sample inventory file

```
#Use of the NFS persistent storage and the host name for the system that will be the NFS host. The master
node will also act as NFS storage to provide persistent storage for the app
[nfs]
OpenShiftmaster.mop.fr.ibm.com
#Create an OSEv3 group that contains the masters, nodes, and etcd groups and add nfs to the
[OSEv3:children] section to enable the [nfs] group
[OSEv3:children] masters nodes etcd nfs
#Set variables common for all OSEv3 hosts
[OSEv3:vars]
#Set HTPasswdPasswordIdentityProvider in the identityProviders to validate user names and passwords against
a flat file generated using htpasswd.
OpenShift_master_identity_providers=[{'name': 'htpasswd_auth', 'login': 'true',
'challenge': 'true', 'kind': 'HTPasswdPasswordIdentityProvider',}]
#Define htpasswd users
#OpenShift_master_htpasswd_users={'user1': '<pre-hashed password>', 'user2':
'<pre-hashed password>'}
#or
#OpenShift_master_htpasswd_file=<path to local pre-generated htpasswd file>
#For HTPasswd authentication, you can use either the
OpenShift_master_htpasswd_users variable to create the specified user(s) and password(s)
#or the OpenShift_master_htpasswd_file variable to specify a pre-generated flat file (the htpasswd file)
with the users and passwords already created.
OpenShift_master_htpasswd_users={'ntc' :
'$apr1$C.FjItW2$MP2ovZg6YWZzagTTLcQuO/', 'admin' :
'$apr1$48dwAVeB$UBmwzmKAOp6EByxWrHMvJ1'}
```

```
#If firewall_use_firewalld=false it means use iptables os_firewall_use_firewalld=True
#Set to true to install logging. Set to false to uninstall logging.
OpenShift_logging_install_logging=false
#Define which user Ansible uses to SSH in to remote systems for gathering facts and for the installation.
By default, this is the root user, but you can set it to any user that has sudo privileges
ansible_ssh_user=root
OpenShift_deployment_type=origin
#Specify a Registry Location that stores Docker images and metadata(when using registry different from the
default one) oreg_url=docker.io/clefos/origin-${component}:${version}
OpenShift_examples_modify_imagestreams=true
#Specify the prefix for the web console images
OpenShift_web_console_prefix=docker.io/clefos/
#Specify which health checks to disable. If for example, you don't hit the minimum memory availability,
you'll need to disable memory_availability
OpenShift_disable_check=disk_availability,docker_storage,memory_availability
#Node selector used when creating router. The OpenShift router will only be deployed to nodes matching this
selector
#In this case, The default router will only be automatically deployed if a node exists that matches the
region=infra label.
OpenShift_hosted_router_selector='node-role.kubernetes.io/infra=true'
#If you do not intend to use OpenShift Container Platform to manage the registry, configure the following
Ansible setting to false
OpenShift_hosted_manage_registry=true
OpenShift_enable_unsupported_configurations=True
#Configuring Registry Storage: an NFS volume is created during an advanced install on the host within the
[nfs] group with the path: /exports/registry
OpenShift_hosted_registry_storage_kind=nfs
OpenShift_hosted_registry_storage_nfs_directory=/exports
OpenShift_hosted_registry_storage_nfs_options='*(rw,root_squash)'
OpenShift_hosted_registry_storage_volume_name=registry OpenShift_hosted_registry_storage_volume_size=5Gi
#The location of the cockpit for docker image.In this case, we use the cockpit in the Clefos repo. (Cockpit
is the entry point to an interactive server admin interface to manage containers)
OpenShift_cockpit_deployer_image=docker.io/clefos/cockpit-kubernetes:latest
#host group for masters
[masters]
OpenShiftmaster.mop.fr.ibm.com
#host group for etcd
[etcd]
OpenShiftmaster.mop.fr.ibm.com
#host group for nodes, includes region info
[nodes]
OpenShiftmaster.mop.fr.ibm.com OpenShift_node_group_name='node-configall-in-one'
```

B. Prerequisites check

The playbook **prerequisites.yml** sets up prerequisites for the OpenShift cluster including the installation of the required packages such as Docker.

Note: The **prerequisites.yml** file is already present in the following location:

```
/usr/share/ansible/OpenShiftansible/playbooks/
```

Enter the following command to run the Ansible playbook:

```
ansible-playbook --private-key=$HOME/.ssh/id_rsa
/usr/share/ansible/OpenShift-ansible/playbooks/prerequisites.yml
```

Note: If this file is not located in the **/etc/ansible/hosts** directory, use the **–i** argument followed by the path of your inventory file in the previous command.

When the execution is complete (after few minutes), the message that is shown in Figure 10 is displayed.

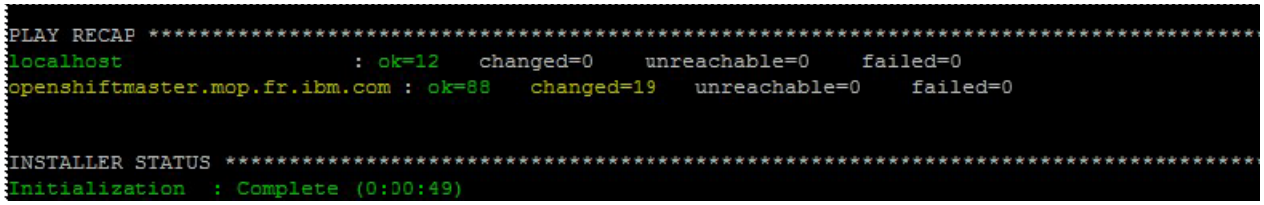

Figure 10 OpenShift prerequisites playbook results

You can find the full output of this command in *Appendix "A. Playbook execution outputs for the prerequisites.yml file" on page 25*.

C. OpenShift installation

The last step to install the OpenShift container platform is the run the **deploy_cluster.yml** playbook. By default, this playbook is found here:

```
/usr/share/ansible/OpenShift-ansible/playbooks
```

1. Navigate to the **/usr/share/ansible/OpenShift-ansible/** folder:

   ```
   cd /usr/share/ansible/OpenShift-ansible/
   ```

2. Run the **deploy_cluster.yml** playbook to install OpenShift:

   ```
   ./deploy_cluster.yml
   ```

   The installation of OpenShift takes some time to finish. You can enjoy that time for a coffee break. After the installation is complete, the message shown in Figure 11 is displayed.

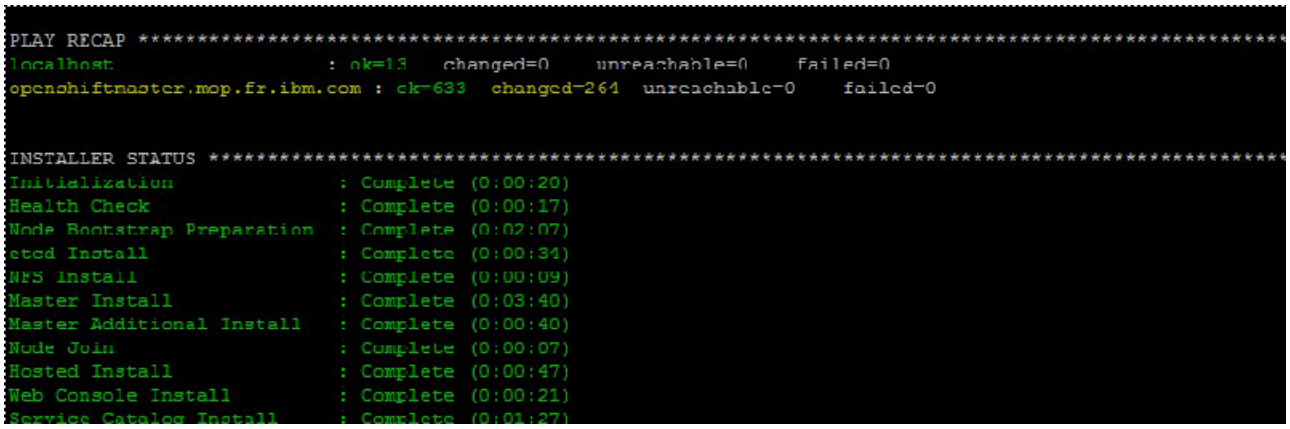

Figure 11 OpenShift successful installation recap

After the installation is complete, verify that nodes are started and reporting in Ready status by using the command **oc get node**, as shown in Figure 12.

```
root@openshiftmaster playbooks]# oc get node
AME                            STATUS    ROLES                 AGE       VERSION
penshiftmaster.mop.fr.ibm.com   Ready     compute,infra,master  8m        v1.10.0+b81c8f8
```

Figure 12 Check node status

3. From the master host, log in to OpenShift OKD from the command-line interface: **`oc login`**

```
[root@openshiftmaster ~]# oc login
Authentication required for https://openshiftmaster.mop.fr.ibm.com:8443 (openshi
ft)
Username: admin
Password:
Login successful.

You don't have any projects. You can try to create a new project, by running

    oc new-project <projectname>
```

Figure 13 Command-line authentication to OpenShift OKD

4. Run the command **`oc get node`** a second time to get the list of and status of nodes

```
root@openshiftmaster playbooks]# oc get node
AME                            STATUS    ROLES                 AGE       VERSION
penshiftmaster.mop.fr.ibm.com   Ready     compute,infra,master  8m        v1.10.0+b81c8f8
```

Figure 14 List of OpenShift nodes

As indicated in the inventory file **`/etc/hosts`**, the node act as both master and compute node.

Note: To check whether some components such as the registry and router were correctly deployed, run the following command: **`oc get po -n default`**

D. OpenShift OKD web console

After the installation of OpenShift is complete, you can reach the OpenShift web console through the public IP attached to the load balancer created by Ansible.

To access the OKD web console, open your browser and enter the IP address (In our installation, the IP address is https://OpenShiftmaster.mop.fr.ibm.com:8443).

Then, log in using the username and password created previously.

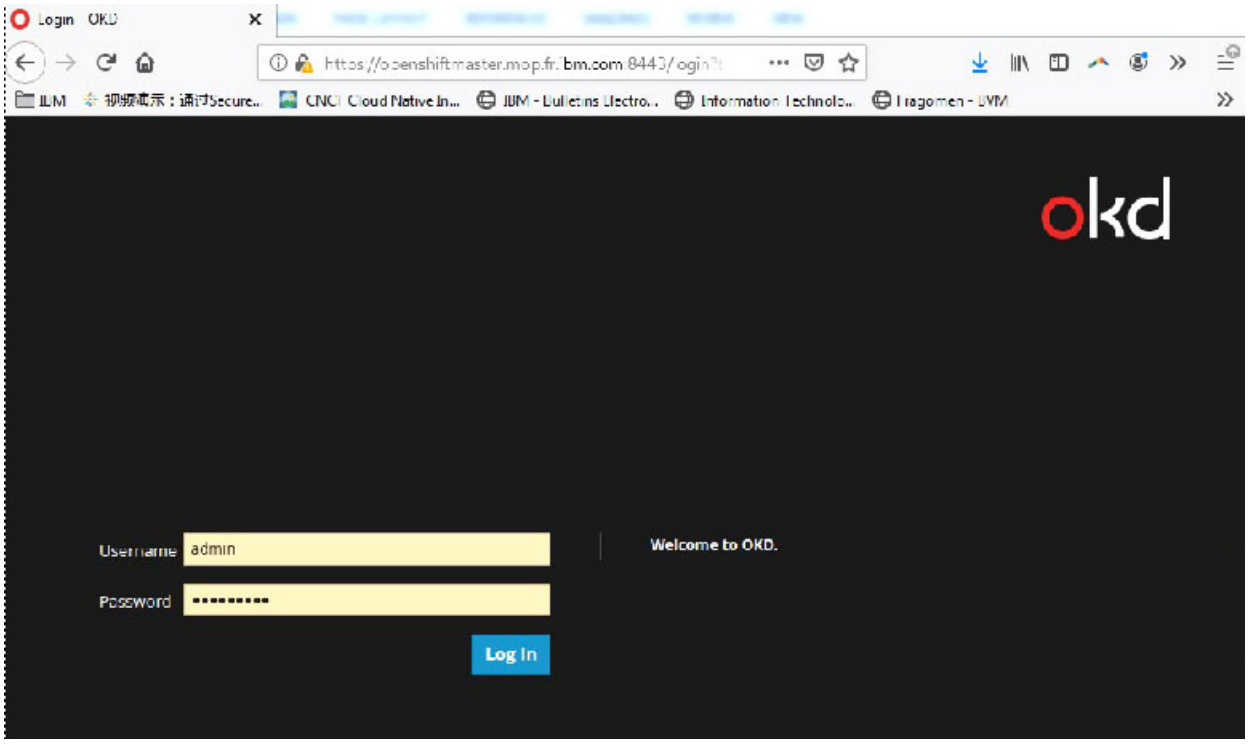

Figure 15 OpenShift OKD web console authentication

After you successfully log in to the web console, you have access to the web interface shown in Figure 16 where can create new projects and deploy your applications.

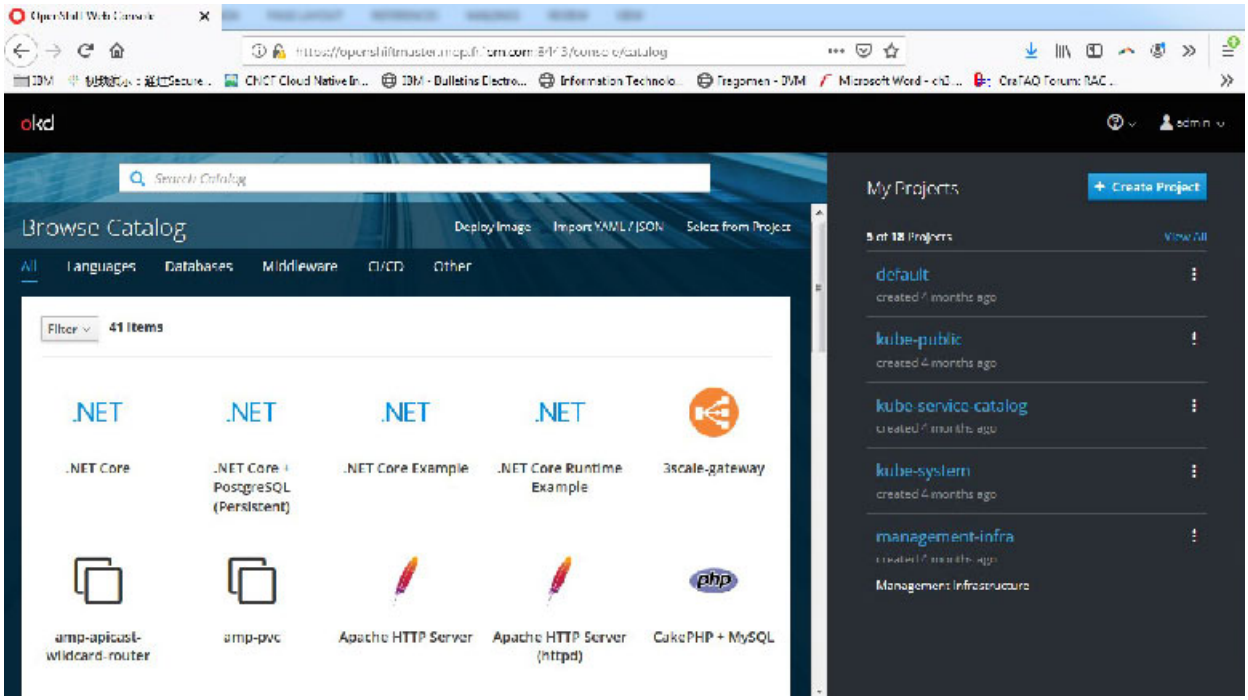

Figure 16 OpenShift OKD web console

Note: The host name (in our installation, **OpenShiftmaster.mop.fr.ibm.com**) must resolve to a name on the DNS server or in the server host file. If you try to access the OpenShift web console and the access is denied, you must add the following entry to your hosts file (**/etc/hosts** on Linux and **C:\Windows\System32\drivers\etc\hosts** on Windows):

<Master_node_IP address> <hostname>

For example, we entered the following in our **C:\Windows\System32\drivers\etc\hosts** directory:

```
10.3.58.89 OpenShiftmaster.mop.fr.ibm.com
```

A. Playbook execution outputs for the prerequisites.yml file

Example 11 shows typical results after the execution of the **prerequisites.yml** playbook.

Example 11 Typical outputs for the execution of the playbook

```
[root@OpenShiftmaster ~]#  ansible-playbook --privatekey=$HOME/.ssh/id_rsa
/usr/share/ansible/OpenShiftansible/playbooks/prerequisites.yml

PLAY [Initialization Checkpoint Start]
********************************************************************************

TASK [Set install initialization 'In Progress']
********************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Populate config host groups]
*********************************************************************************

TASK [Load group name mapping variables]
***************************************************************************
ok: [localhost]

TASK [Evaluate groups - g_etcd_hosts or g_new_etcd_hosts required]
*************************************************
skipping: [localhost]

TASK [Evaluate groups - g_master_hosts or g_new_master_hosts required]
*********************************************
skipping: [localhost]

TASK [Evaluate groups - g_node_hosts or g_new_node_hosts required]
*************************************************
skipping: [localhost]

TASK [Evaluate groups - g_lb_hosts required]
*************************************************************************
skipping: [localhost]

TASK [Evaluate groups - g_nfs_hosts required]
*************************************************************************
skipping: [localhost]

TASK [Evaluate groups - g_nfs_hosts is single host]
*****************************************************************
skipping: [localhost]

TASK [Evaluate groups - g_glusterfs_hosts required]
*****************************************************************
skipping: [localhost]

TASK [Evaluate oo_all_hosts]
***********************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)
```

```
TASK [Evaluate oo_masters]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_first_master]
*******************************************************************************
ok: [localhost]

TASK [Evaluate oo_new_etcd_to_config]
********************************************************************************

TASK [Evaluate oo_masters_to_config]
********************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_etcd_to_config]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_first_etcd]
*******************************************************************************
ok: [localhost]

TASK [Evaluate oo_etcd_hosts_to_upgrade]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_etcd_hosts_to_backup]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_nodes_to_config]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_lb_to_config]
********************************************************************************

TASK [Evaluate oo_nfs_to_config]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [Evaluate oo_glusterfs_to_config]
********************************************************************************

TASK [Evaluate oo_etcd_to_migrate]
*******************************************************************************
ok: [localhost] => (item=OpenShiftmaster.mop.fr.ibm.com)
 [WARNING]: Could not match supplied host pattern, ignoring: oo_lb_to_config

PLAY [Ensure that all non-node hosts are accessible]
****************************************************************

TASK [Gathering Facts]
*******************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Initialize basic host facts]
********************************************************************************
```

```
TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : include_tasks]
*****************************************************************
included: /usr/share/ansible/OpenShift-
ansible/roles/OpenShift_sanitize_inventory/tasks/deprecations.yml for OpenShiftmaster.mop.fr.ibm.com

TASK [OpenShift_sanitize_inventory : Check for usage of deprecated variables]
***************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : debug]
*************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : set_stats]
*************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Assign deprecated variables to correct counterparts]
***************************
included: /usr/share/ansible/OpenShift-
ansible/roles/OpenShift_sanitize_inventory/tasks/__deprecations_metrics.yml for
OpenShiftmaster.mop.fr.ibm.com =>
(item=/usr/share/ansible/OpenShiftansible/roles/OpenShift_sanitize_inventory/tasks/../tasks/__deprecations_
metr ics.yml)
included: /usr/share/ansible/OpenShift-
ansible/roles/OpenShift_sanitize_inventory/tasks/__deprecations_logging.yml for
OpenShiftmaster.mop.fr.ibm.com =>
(item=/usr/share/ansible/OpenShiftansible/roles/OpenShift_sanitize_inventory/tasks/../tasks/__deprecations_
loggi ng.yml)

TASK [OpenShift_sanitize_inventory : conditional_set_fact]
*********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : conditional_set_fact]
*********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : set_fact]
*************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Standardize on latest variable names]
*****************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Normalize OpenShift_release]
***************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Abort when OpenShift_release is invalid]
***************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : include_tasks]
```

```
*****************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Ensure clusterid is set along with the cloudprovider]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Ensure ansible_service_broker_remove and
ansible_service_broker_install are mutually exclusive]
*****************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Ensure template_service_broker_remove and
template_service_broker_install are mutually exclusive]
*****************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Ensure that all requires vsphere configuration variables are set]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : ensure provider configuration variables are defined]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Ensure removed web console extension variables are not set]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : Ensure that web console port matches API server port]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_sanitize_inventory : At least one master is schedulable]
*******************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Detecting Operating System from ostree_booted]
*****************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set OpenShift_deployment_type if unset]
*********************************************************************


skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [check for node already bootstrapped]
*********************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [initialize_facts set fact OpenShift_is_bootstrapped]
***********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [initialize_facts set fact OpenShift_is_atomic and OpenShift_is_containerized]
*******************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Determine Atomic Host Docker Version]
*********************************************************************
```

```
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [assert atomic host docker version is 1.12 or later]
**********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Retrieve existing master configs and validate]
**********************************************************

TASK [OpenShift_control_plane : stat]
*****************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_control_plane : slurp]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_control_plane : set_fact]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_control_plane : Check for file paths outside of
/etc/origin/master in master's config]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_control_plane : set_fact]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Initialize special first-master variables]
**********************************************************************

TASK [Gathering Facts]
*****************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*****************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Disable web console if required]
*****************************************************************************
```

```
TASK [set_fact]
*********************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Setup yum repositories for all hosts]
*********************************************************************

TASK [rhel_subscribe : fail]
*********************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : Install Red Hat Subscription manager]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : Is host already registered?]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : Register host]
*************************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : fail]
*********************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : Determine if OpenShift Pool Already Attached]
*********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : Attach to OpenShift Pool]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [rhel_subscribe : Satellite preparation]
*********************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_repos : OpenShift_repos detect ostree]
*************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_repos : Ensure libselinux-python is installed]
*****************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_repos : Remove OpenShift_additional.repo file]
*****************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_repos : Create any additional repos that are defined]
*********************************************

TASK [OpenShift_repos : include_tasks]
*********************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_repos : include_tasks]
*********************************************************************************
```

```
included: /usr/share/ansible/OpenShift-
ansible/roles/OpenShift_repos/tasks/centos_repos.yml for
OpenShiftmaster.mop.fr.ibm.com

TASK [OpenShift_repos : Configure origin gpg keys]
************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_repos : Configure correct origin release repository]
***********************************************
changed: [OpenShiftmaster.mop.fr.ibm.com] =>
(item=/usr/share/ansible/OpenShiftansible/roles/OpenShift_repos/templates/CentOS-OpenShift-Origin.repo.j2)

TASK [OpenShift_repos : Ensure clean repo cache in the event repos have been changed manually]
*****************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com] => {
    "msg": "First run of OpenShift_repos"
}

TASK [OpenShift_repos : Record that OpenShift_repos already ran]
***************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]
 [WARNING]: flush_handlers task does not support when conditional
RUNNING HANDLER [OpenShift_repos : refresh cache]
************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Install packages necessary for installer]
*********************************************************************

TASK [Gathering Facts]
*****************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Determine if chrony is installed]
*****************************************************************************
 [WARNING]: Consider using the yum, dnf or zypper module rather than running 'rpm'.  If you need to use
command because yum, dnf or zypper is insufficient you can add 'warn: false' to this command task or set
'command_warnings=False' in ansible.cfg to get rid of this message.
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Install ntp package]
*****************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Start and enable ntpd/chronyd]
***********************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Ensure OpenShift-ansible installer package deps are installed]
***********************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => (item=iproute)
ok: [OpenShiftmaster.mop.fr.ibm.com] => (item=dbus-python)
ok: [OpenShiftmaster.mop.fr.ibm.com] => (item=PyYAML)
ok: [OpenShiftmaster.mop.fr.ibm.com] => (item=python-ipaddress) changed: [OpenShiftmaster.mop.fr.ibm.com]
=> (item=libsemanage-python)
ok: [OpenShiftmaster.mop.fr.ibm.com] => (item=yum-utils) changed: [OpenShiftmaster.mop.fr.ibm.com] =>
(item=python-docker)

PLAY [Initialize cluster facts]
```

```
********************************************************************************* *****

TASK [Gathering Facts]
**************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [get OpenShift_current_version]
*******************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact OpenShift_portal_net if present on masters]
*********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Gather Cluster facts]
********* changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Set fact of no_proxy_internal_hostnames]
*********************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Initialize OpenShift.node.sdn_mtu]
*******************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Initialize etcd host variables]
*********************************************************************************

TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [set_fact]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Determine OpenShift_version to configure on first master]
***************************************************

TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [include_role : OpenShift_version]
*********************************************************************************

TASK [OpenShift_version : Use OpenShift_current_version fact as version to configure if already installed]
*********************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_version : Set OpenShift_version to OpenShift_release if undefined]
*********************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_version : debug]
*********************************************************
```

```
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "msg": "OpenShift_pkg_version was not defined. Falling back to -3.11"
}

TASK [OpenShift_version : set_fact]
*********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_version : debug]
*******************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "msg": "OpenShift_image_tag was not defined. Falling back to v3.11"
}

TASK [OpenShift_version : set_fact]
*******************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_version : assert OpenShift_release in OpenShift_image_tag]
*****************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "changed": false,
    "msg": "All assertions passed"
}

TASK [OpenShift_version : assert OpenShift_release in OpenShift_pkg_version]
*************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "changed": false,
    "msg": "All assertions passed"
}

TASK [OpenShift_version : debug]
***********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "OpenShift_release": "3.11"
}

TASK [OpenShift_version : debug]
***********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "OpenShift_image_tag": "v3.11"
}

TASK [OpenShift_version : debug]
***********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {     "OpenShift_pkg_version": "-3.11*"
}

TASK [OpenShift_version : debug]
***********************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] => {
    "OpenShift_version": "3.11"
}

TASK [set OpenShift_version booleans (first master)]
*****************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Set OpenShift_version for etcd, node, and master hosts]
```

```
*****************************************************
skipping: no hosts matched

PLAY [Verify Requirements]
*********************************************************************************

TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Run variable sanity checks]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Validate OpenShift_node_groups and OpenShift_node_group_name]
************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Initialization Checkpoint End]
*********************************************************************************

TASK [Set install initialization 'Complete']
**********************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Validate node hostnames]
*********************************************************************************

TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Query DNS for IP address of OpenShiftmaster.mop.fr.ibm.com]
************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Validate OpenShift_hostname when defined]
**********************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [Validate OpenShift_ip exists on node when defined]
************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

PLAY [Configure os_firewall]
*********************************************************************************

TASK [Gathering Facts]
**************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Detecting Atomic Host Operating System]
************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Set fact r_os_firewall_is_atomic]
**************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Fail - Firewalld is not supported on Atomic Host]
```

```
*********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Install firewall packages]
**********************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Ensure iptables services are not enabled]
*****************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com] => (item=iptables) changed: [OpenShiftmaster.mop.fr.ibm.com] =>
(item=ip6tables)

TASK [os_firewall : Wait 10 seconds after disabling iptables]
*****************************************************
Pausing for 10 seconds (ctrl+C then 'C' = continue early, ctrl+C then 'A' = abort)
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Start and enable firewalld service]
************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : need to pause here, otherwise the firewalld service starting can sometimes cause ssh to
fail]
*******************************************************************************
Pausing for 10 seconds
(ctrl+C then 'C' = continue early, ctrl+C then 'A' = abort)
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Restart polkitd]
*******************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Wait for polkit action to have been created]
***************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Ensure firewalld service is not enabled]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Wait 10 seconds after disabling firewalld]
***************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [os_firewall : Install iptables packages]
**********************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item=iptables)
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item=iptables-services)

TASK [os_firewall : Start and enable iptables service]
************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item=OpenShiftmaster.mop.fr.ibm.com)

TASK [os_firewall : need to pause here, otherwise the iptables service starting can sometimes cause ssh to
fail]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]
 [WARNING]: Could not match supplied host pattern, ignoring: oo_hosts_containerized_managed_true

PLAY [oo_nodes_to_config:oo_hosts_containerized_managed_true]
```

```
*****************************************************

TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Setup the docker-storage for overlay]
****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create file system on extra volume device]
***********************************************

TASK [container_runtime : Create mount entry for extra volume]
*****************************************************

PLAY [oo_nodes_to_config]
*********************************************************************************

TASK [Gathering Facts]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Install docker excluder - yum]
***********************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Install docker excluder - dnf]
***********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Install OpenShift excluder - yum]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Install OpenShift excluder - dnf]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : set_fact]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Check for docker-excluder]
************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Enable docker excluder]
************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Check for OpenShift excluder]
*************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [OpenShift_excluder : Enable OpenShift excluder]
************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Getting current systemd-udevd exec command]
```

```
*********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Assure systemd-udevd.service.d directory exists]
*****************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create systemd-udevd override file]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add enterprise registry, if necessary]
*************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add http_proxy to /etc/atomic.conf]
*******************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add https_proxy to /etc/atomic.conf]
******************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add no_proxy to /etc/atomic.conf]
********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Get current installed Docker version]
***************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Error out if Docker pre-installed but too old]
*****************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Error out if requested Docker is too old]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Install Docker]
*********************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Ensure docker.service.d directory exists]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Configure Docker service unit file]
*******************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : stat]
*********************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Set registry params]
********************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'reg_conf_var': u'ADD_REGISTRY', u'reg_flag':
u'--add-registry', u'reg_fact_val': []})
```

```
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'reg_conf_var': u'BLOCK_REGISTRY', u'reg_flag':
u'--block-registry', u'reg_fact_val': []})
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'reg_conf_var': u'INSECURE_REGISTRY', u'reg_flag':
u'--insecure-registry', u'reg_fact_val': []})

TASK [container_runtime: Place additional/blocked/insecure registries in ‘/etc/containers/registries.conf]
**********
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Set Proxy Settings]
*********************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'reg_conf_var': u'HTTP_PROXY', u'reg_fact_val': u''})
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'reg_conf_var': u'HTTPS_PROXY', u'reg_fact_val':
u''})
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'reg_conf_var': u'NO_PROXY', u'reg_fact_val': u''})

TASK [container_runtime : Set various Docker options]
************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : stat]
*****************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Configure Docker Network OPTIONS]
*****************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Detect if docker is already started]
*****************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Start the Docker service]
*****************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : set_fact]
*******************************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Check for docker_storage_path/overlay2]
*****************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Fixup SELinux permissions for docker]
*****************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Ensure /var/lib/containers exists]
*****************************************************************************
changed: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Fix SELinux Permissions on /var/lib/containers]
*******************************************
ok: [OpenShiftmaster.mop.fr.ibm.com] RUNNING HANDLER [container_runtime : restart container runtime]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Check for credentials file for registry auth]
*******************************************
```

```
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create credentials for docker cli registry auth]
****************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create credentials for docker cli registry auth (alternative)]
****************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : stat the docker data dir]
************************************************************
ok: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : stop the current running docker]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : copy "/var/lib/docker" to "/var/lib/containers/docker"]
**********************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : ensure the unmount of top level mount point]
*******************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Set the selinux context on /var/lib/containers/docker]
**********************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : restorecon the /var/lib/containers/docker]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Remove the old docker location]
************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Setup the link]
*************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : start docker]
*************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Fail if Atomic Host since this is an rpm request]
****************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Getting current systemd-udevd exec command]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Assure systemd-udevd.service.d directory exists]
****************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create systemd-udevd override file]
*********************************************************
```

```
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add enterprise registry, if necessary]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Check that overlay is in the kernel]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add overlay to modprobe.d]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Manually modprobe overlay into the kernel]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Enable and start systemd-modules-load]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Install cri-o]
***************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Remove CRI-O default configuration files]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item=/etc/cni/net.d/200loopback.conf)
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item=/etc/cni/net.d/100crio-bridge.conf)

TASK [container_runtime : Create the CRI-O configuration]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Ensure CNI configuration directory exists]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Add iptables allow rules]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'port': u'10010/tcp', u'service': u'crio'})

TASK [container_runtime : Remove iptables rules]
*************************************************************

TASK [container_runtime : Add firewalld allow rules]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com] => (item={u'port': u'10010/tcp', u'service': u'crio'})

TASK [container_runtime : Remove firewalld allow rules]
*************************************************************

TASK [container_runtime : Configure the CNI network]
*************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create /etc/sysconfig/crio-network]
*****************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]
```

```
TASK [container_runtime : Start the CRI-O service]
*****************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Ensure /var/lib/containers exists]
*********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Fix SELinux Permissions on /var/lib/containers]
*******************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Check for credentials file for registry auth]
***********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create credentials for docker cli registry auth]
*****************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Create credentials for docker cli registry auth (alternative)]
*****************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : stat the docker data dir]
*****************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : stop the current running docker]
*********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : copy "/var/lib/docker" to "/var/lib/containers/docker"]
***********************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : ensure the unmount of top level mount point]
*********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Set the selinux context on /var/lib/containers/docker]
***********************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : restorecon the /var/lib/containers/docker]
*********************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Remove the old docker location]
*********************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : Setup the link]
*************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]

TASK [container_runtime : start docker]
*******************************************************************************
skipping: [OpenShiftmaster.mop.fr.ibm.com]
```

```
PLAY RECAP
*********************************************************************
localhost : ok=12   changed=0    unreachable=0    failed=0
OpenShiftmaster.mop.fr.ibm.com : ok=88   changed=19   unreachable=0    failed=0

INSTALLER STATUS
*********************************************************************
Initialization  : Complete (0:00:49)
```

About this document

Bibliography

OpenShift OKD official documentation:
https://docs.okd.io/latest/getting_started/administrators.html

Authors

This paperpaperbook was produced by a team of specialists from around the worldtechnical specialist working at IBM Redbooks, Poughkeepsie Center.

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