Ceph ICE Virtual Machine Deployment Guide

1. Ceph Ice Virtual Machine Deployment

The deployment of the Ceph virtual machine is performed using the *deploy-ceph-vm.sh* script. This script creates a kickstart file and then executes the **`virt-install`** command to install the system.

The generated kickstart script performs the following steps.

- Partitions the system
- Sets SELinux to permissive mode
- Configures iptables to run on the system and disables firewalld.
- Configures networking including the following:
  - static IP addresses
  - The gateway
  - Name resolution
  - NTP time service
- Registers the system using the Red Hat Subscription Manager

1.1. Setup

Make sure a copy of the ISO for the **`Red Hat Enterprise Server 7 Installation DVD`** is in the */store/data/iso* directory

Copy the *deploy-ceph-vm.sh* script into the */root* directory.

Copy the *vlock_files/ceph_vm.vlock* file into the */root* directory.

1.2. Configuration

Create a configuration file in the */root* directory called *ceph.cfg*.

The file should look similar to the following file:

```
hostname ceph.example.org
rootpassword changeme
timezone America/Chicago
smuser CHANGEME
smpassword 'CHANGEME'
smpool 5438fdsdgf09gig8er80gfgeg8eg8gff

gateway 10.19.143.254
nameserver 10.19.143.247,10.19.143.248
ntpserver 0.fedora.pool.ntp.org


# Iface     IP               NETMASK
eth0        10.19.139.65     255.255.248.0
eth1        172.44.139.65    255.255.255.0
```

The file contains the following configuration parameters: Set the following variables:

hostname	The FQDN of the server.
rootpassword	The root user password for the system.
timezone	The timezone the system is in.
smuser	The user credential when registering with Subscription Manager.
smpassword	The user password when registering with Subscription Manager. The password must be enclosed in single quotes if it contains certain special characters.
smpool	The pool ID used when attaching the system to an entitlement.
gateway	The default gateway for the system.
nameserver	A comma separated list of nameserver IP addresses.
ntpserver	A comma separated list of time servers. This can be IP addresses or FQDNs.

The following parameters must be specified after all the other parameters.

eth0 This line specifies the IP address and network mask for the eth0 interface. The line begins with eth0 followed by at least one space and then the IP address, followed by another set of spaces and then the network mask.

eth1 This line specifies the IP address and network mask for the eth1 interface. The line begins with eth1 followed by at least one space and then the IP address, followed by another set of spaces and then the network mask.

1.3. Installing the Ceph Virtual Machine

To install the Ceph virtual machine, invoke the *deploy-Ceph-vm.sh* script. Pass *ceph.cfg* as the first parameter and the full path to the Red Hat Enterprise Server 6 Installation media as the second option.

```
# ./deploy-ceph-vm.sh ceph.cfg /store/data/iso/rhel-server-7.0-x86_64-
dvd.iso

Starting install...
Retrieving file .treeinfo...
| 3.2 kB  00:00:00
Retrieving file vmlinuz...
| 7.9 MB  00:00:00
Retrieving file initrd.img...
|  64 MB  00:00:00
Creating storage file ceph.img
|  16 GB  00:00:00
Creating domain...
|    0 B  00:00:00
Domain installation still in progress. You can reconnect to
the console to complete the installation process.
```

The installation will begin, but no console will be displayed. To display the console, make sure you are logged into a GUI environment, open a terminal and type **`virt-viewer ceph`**.

Note that if you are connected to the Foreman server using a Windows system, you need to install **`Xwin Server`** before executing **`virt-viewer ceph`**.

A console for the Ceph virtual machine will open.

After the virtual machine completes the installation, it will power itself off.

The power state of the virtual machine can be viewed using the **`virsh list --all`** command.

```
# virsh list --all
 Id    Name                           State
 ----------------------------------------------------
 2     ceph                         running
```

The virtual machine can be started using the following command:

```
# virsh start ceph
```

1.4. Next Steps

After the Ceph virtual machine is installed and the Ceph installer is executed, the Ceph instance must be configured for the environment.

Follow the applicable Ceph Configuration Guide.

2. deploy-ceph-vm.sh

```
#! /bin/bash

[[ ${#@} != 2 ]] && echo "This script requires two parameters, a
configuration file as the first parameter and the location of the
installation ISO as the second parameter." && exit

cfg_file=$1
location=$2

cat <<'EOFKS' > /tmp/ceph.ks

install
cdrom
reboot

# Partitioning
ignoredisk --only-use=vda
zerombr
bootloader --boot-drive=vda

clearpart --all

part /boot --fstype=ext4 --size=500
part pv.01 --size=8192 --grow

volgroup VolGroup --pesize=4096 pv.01

logvol / --fstype=ext4 --name=lv_root --vgname=VolGroup --grow --size=1024
logvol swap --name=lv_swap --vgname=VolGroup --size=1024

keyboard --vckeymap=us --xlayouts='us'
lang en_US.UTF-8

auth --enableshadow --passalgo=sha512

%include /tmp/ks_include.txt

skipx
firstboot --disable
eula --agreed

%packages
@core
ntp
ntpdate
-chrony
-firewalld
system-config-firewall-base
iptables
iptables-services
yum-plugin-versionlock
```

```
yum-utils
%end

%pre --log /tmp/ceph-pre.log
EOFKS


{
ntp=""

while read iface ip mask bridge
do
  flag=""

  [[ ${iface} == rootpassword ]] && echo "echo rootpw ${ip} >>
/tmp/ks_include.txt"
  [[ ${iface} == timezone ]] && echo "echo timezone ${ip} --utc >>
/tmp/ks_include.txt"

  [[ ${iface} == hostname ]] && {
    HostName=${ip}
    echo "echo HostName=${ip} >> /tmp/ks_post_include.txt"
    }

  [[ ${iface} == nameserver ]] && {
    NameServers=${ip}
    echo "echo NameServers=${ip} >> /tmp/ks_post_include.txt"
    }

  [[ ${iface} == gateway ]] && {
    Gateway=${ip}
    echo "echo Gateway=${ip} >> /tmp/ks_post_include.txt"
    }

  [[ ${iface} == ntpserver ]] && echo "echo NTPServer=${ip} >>
/tmp/ks_post_include.txt"
  [[ ${iface} == smuser ]] && echo "echo SMUser=${ip} >>
/tmp/ks_post_include.txt"
  [[ ${iface} == smpassword ]] && echo "echo SMPassword=\'${ip}\' >>
/tmp/ks_post_include.txt"
  [[ ${iface} == smpool ]] && echo "echo SMPool=${ip} >>
/tmp/ks_post_include.txt"

  [[ ${iface} == smproxy ]] && echo "echo SMProxy=${ip} >>
/tmp/ks_post_include.txt"
  [[ ${iface} == smproxyuser ]] && echo "echo SMProxyUser=${ip} >>
/tmp/ks_post_include.txt"
  [[ ${iface} == smproxypassword ]] && echo "echo SMProxyPassword=${ip}
>> /tmp/ks_post_include.txt"

  [[ ${iface} == eth0 ]] && {
    echo "echo network --activate --onboot=true --noipv6 --device=${iface}
--bootproto=static --ip=${ip} --netmask=${mask} --hostname=${HostName}
--gateway=${Gateway} --nameserver=${NameServers} >> /tmp/ks_include.txt"
    }
```

```
  [[ ${iface} == eth1 ]] && {
    echo "echo network --activate --onboot=true --noipv6 --device=${iface}
--bootproto=static --ip=${ip} --netmask=${mask} --gateway=${Gateway}
--nodefroute >> /tmp/ks_include.txt"
    }

done <<< "$( grep -Ev "^#|^;|^\s*$" ${cfg_file} )"
} >> /tmp/ceph.ks

cat <<'EOFKS' >> /tmp/ceph.ks
%end

%post --nochroot --logfile /root/ceph-post.log
# Copy the files created during the %pre section to /root of the installed
system for later use.
  cp -v /tmp/ceph-pre.log /mnt/sysimage/root
  cp -v /tmp/ks_include.txt /mnt/sysimage/root
  cp -v /tmp/ks_post_include.txt /mnt/sysimage/root
%end


%post

exec < /dev/tty8 > /dev/tty8
chvt 8

(
  # Source the variables from the %pre section
  . /root/ks_post_include.txt

  # Configure name resolution
  for ns in ${NameServers//,/ }
  do
    echo "nameserver ${ns}" >> /etc/resolv.conf
  done

  echo "GATEWAY=${Gateway}" >> /etc/sysconfig/network

  sed -i -e '/^DNS/d' -e '/^GATEWAY/d' /etc/sysconfig/network-scripts/ifcfg-
eth0
  sed -i -e '/^DNS/d' -e '/^GATEWAY/d' /etc/sysconfig/network-scripts/ifcfg-
eth1

  echo "$( ip addr show dev eth0 | awk '/inet / { print $2 }' | sed
's/\/.*//' )  ${HostName}" >> /etc/hosts

  echo "----------------------"
  ip addr
  echo "subscription-manager register --username ${SMUser} --password
*********"
  echo "----------------------"

# Register the system using Subscription Manager
  [[ ${SMProxy} ]] && {
```

```
    ProxyInfo="--proxy ${SMProxy}"

    [[ ${SMProxyUser} ]] && ProxyInfo+=" --proxyuser ${SMProxyUser}"
    [[ ${SMProxyPassword} ]] && ProxyInfo+=" --proxypassword $
{SMProxyPassword}"
    }

  subscription-manager register --username ${SMUser} --password $
{SMPassword} ${ProxyInfo}


  SMPool=""

  [[ x${SMPool} = x ]] \
    && SMPool=$( subscription-manager list --available | awk '/Red Hat
Enterprise Linux Server/,/Pool/ {pool = $3} END {print pool}' )

  [[ -n ${SMPool} ]] \
    && subscription-manager attach --pool ${SMPool} \
    || ( echo "Could not find a Red Hat Enterprise Linux Server pool to
attach to. - Auto-attaching to any pool." \
         subscription-manager attach --auto
         )

  # Disable all enabled repositories
  for repo in $( yum repolist all | awk '/enabled:/ { print $1}' )
  do
    yum-config-manager --disable ${repo} | grep -E "^\[|^enabled"
  done

  yum-config-manager --enable rhel-7-server-rpms

  cat <<EOIP > /etc/sysconfig/iptables
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 22 -j ACCEPT
-A INPUT -m state --state NEW -m tcp -p tcp --dport 80 -j ACCEPT
-A INPUT -m state --state NEW -m tcp -p tcp --dport 4505 -j ACCEPT
-A INPUT -m state --state NEW -m tcp -p tcp --dport 4506 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
-A FORWARD -j REJECT --reject-with icmp-host-prohibited
COMMIT
EOIP

  systemctl enable iptables


  sed -i -e "s/^SELINUX=.*/SELINUX=permissive/" /etc/selinux/config

  # Configure the ntp daemon
```

```
  chkconfig ntpd on
  sed -i -e "/^server /d" /etc/ntp.conf

  for ntps in ${NTPServers//,/ }
  do
    echo "server ${ntps}" >> /etc/ntp.conf
  done

  mkdir /tmp/mnt
  mount /dev/fd0 /tmp/mnt
  [[ -e /tmp/mnt/versionlock.list ]] && {
    cp /tmp/mnt/versionlock.list /etc/yum/pluginconf.d
    chmod 644 /etc/yum/pluginconf.d/versionlock.list
    }


  yum -y update

  systemctl disable NetworkManager
  systemctl disable firewalld



) 2>&1 | /usr/bin/tee -a /root/ceph-post.log

chvt 6

%end

EOFKS


[[ ! -e /store/data/images ]] && mkdir -p /store/data/images

[[ -e ceph.vlock ]] && {

  [[ -e /tmp/floppy-ceph.img ]] && rm -rf /tmp/floppy-ceph.img
  mkfs.vfat -C /tmp/floppy-ceph.img 1440
  mkdir /tmp/mnt-ceph
  mount -o loop /tmp/floppy-ceph.img /tmp/mnt-ceph
  cp ceph.vlock /tmp/mnt-ceph/versionlock.list
  sync
  umount /tmp/mnt-ceph
  rmdir /tmp/mnt-ceph

  virt-install --name ceph \
    --ram 4096 \
    --vcpus 2 \
    --hvm \
    --os-type linux \
    --os-variant rhel6 \
    --disk /store/data/images/ceph.img,bus=virtio,size=16 \
    --disk /tmp/floppy-ceph.img,device=floppy \
    --network bridge=public \
    --network bridge=provision \
```

```
    --initrd-inject /tmp/ceph.ks \
    --extra-args "ks=file:/ceph.ks" \
    --noautoconsole \
    --graphics spice \
    --autostart \
    --location ${location}
  } || {

virt-install --name ceph \
  --ram 4096 \
  --vcpus 2 \
  --hvm \
  --os-type linux \
  --os-variant rhel6 \
  --disk /store/data/images/ceph.img,bus=virtio,size=16 \
  --network bridge=public \
  --network bridge=provision \
  --initrd-inject /tmp/ceph.ks \
  --extra-args "ks=file:/ceph.ks" \
  --noautoconsole \
  --graphics spice \
  --autostart \
  --location ${location}
  }
```