Foreman Virtual Machine Deployment Guide

1. Foreman Virtual Machine Deployment

The deployment of the Foreman virtual machine is performed using the *deploy-foreman-vm.sh* script. This script creates a kickstart file and then excutes 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 ensure the following services can pass traffic: http, https, dns, tftp, and port 8140:tcp.
- Configures the Foreman server to act as a NAT'd gateway between the provisioning network and the public network.
- Configures networking including the following:
  - static IP addresses
  - The gateway
  - Name resolution
  - NTP time service
- Registers the system using the Red Hat Subscription Manager
- Installs the Foreman installer.
  - Configures the Foreman installer to not install the EPEL repository.

1.1. Setup

Make sure a copy of the ISO for the **`Red Hat Enterprise Server 6 Installation DVD`** is in the */store/data/iso* directory

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

1.2. Configuration

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

The file should look similar to the following file:

```
hostname foreman.example.org
rootpassword changeme
timezone America/Chicago
smuser CHANGEME
smpassword 'CHANGEME'
smpool 6598fg09gdf980fgdfgdfg90fdgd80f9

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 Foreman Virtual Machine

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

```
# ./deploy-foreman-vm.sh foreman.cfg /store/data/iso/rhel-server-6.5-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 foreman.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 foreman`**.

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

A console for the Foreman 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     foreman                        running
```

The virtual machine can be started using the following command:

```
# virsh start foreman
```

1.4. Installing Foreman

To install Foreman, log into the Foreman virtual machine and execute the *foreman_server.sh* script that is located in the */usr/share/openstack-foreman-installer/bin* directory.

You must execute the script from the */usr/share/openstack-foreman-installer/bin* directory. The ***`FOREMAN_PROVISIONING`***, ***`FOREMAN_GATEWAY`***, and ***`PROVISIONING_INTERFACE`*** variables should also be set.

FOREMAN_PROVISIONING	Provisioning is enabled if set to true.
FOREMAN_GATEWAY	This defines the gateway of the provisioned hosts. Set it to the ip address of the Foreman servers provisioning interface if the Foreman server will act as a gateway.
PROVISIONING_INTERFACE	The interface used for provisioning.

```
# cd /usr/share/openstack-foreman-installer/bin
# FOREMAN_PROVISIONING=true FOREMAN_GATEWAY=172.44.139.65
PROVISIONING_INTERFACE=eth1 ./foreman_server.sh 2>&1 | tee
/root/foreman_server.out
```

The Foreman installation can take a while.

After Foreman is installed, the Foreman interface can be accessed using a web browser.

The information within the Foreman interface may not be complete until the puppet agent on the Foreman server runs.

Waiting for the puppet agent to run can take up to 30 minutes. The agent can be manually run to speed up the process.

```
# puppet agent -t
```

1.5. Foreman Password

The Foreman installer creates a random password for the admin user. This password may no be displayed during installation, but can be reset using the **`foreman-rake permission:reset`** command.

```
# foreman-rake permissions:reset
Reset to user: admin, password: 9FjczR82BtrNUX8y
```

Once known, the password can be set to a password of your choosing by logging into the Foreman interface using the admin account and generated password.

- Select the **Admin User** dropdown on the top right of the window.
- Enter a new password of your choosing in the **Password** and **Verify** fields.
- Select **Submit**

After resetting the Foreman password, make sure the **options.password** entry in the */usr/share/openstack-foreman-installer/bin/quickstack_defaults.rb* file is set correctly.

```
    options.password = '9FjczR82BtrNUX8y'
    options.username = 'admin'
```

1.6. Next Steps

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

Follow the applicable Foreman Configuration Guide.

2. deploy-foreman-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/foreman.ks

install
text
cdrom
reboot

# Partitioning
zerombr
clearpart --all
bootloader --location=mbr

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

%include /tmp/ks_include.txt

keyboard us
lang en_US.UTF-8

auth --enableshadow --passalgo=sha512

skipx
firstboot --disable

%packages
@base
@core
@fonts
@input-methods
@internet-browser
@remote-desktop-clients
ntp
ntpdate
yum-plugin-versionlock
%end

%pre --log /tmp/foreman-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}

  [[ ${iface} == ntpserver ]] && echo "echo NTPServer=${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} >> /tmp/ks_include.txt"
    }
done <<< "$( grep -Ev "^#|^;|^\s*$" ${cfg_file} )"
} >> /tmp/foreman.ks
```

```
cat <<'EOFKS' >> /tmp/foreman.ks
%end

%post --nochroot --logfile /root/foreman-post.log
# Copy the files created during the %pre section to /root of the installed
system for later use.
  cp -v /tmp/foreman-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 "$( 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
'/OpenStack/,/Pool/ {pool = $3} END {print pool}' )
```

```
  [[ -n ${SMPool} ]] \
    && subscription-manager attach --pool ${SMPool} \
    || ( echo "Could not find an OpenStack 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

  # Enable only the repositories we need
  yum-config-manager --enable rhel-6-server-rpms \
    rhel-6-server-openstack-foreman-rpms \
    rhel-server-rhscl-6-rpms

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

  yum -y install openstack-foreman-installer

  yum -y update

  # Firewall rules to allow traffic for the http, https, dns, and tftp
services and tcp port 8140.
  # Also accept all traffic from eth1 to pass through to eth0 and become
NAT'd on the way out of eth0.

  cat <<EOIP > /etc/sysconfig/iptables
*nat
:PREROUTING ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
:POSTROUTING ACCEPT [0:0]
-A POSTROUTING -o eth0 -j MASQUERADE
COMMIT
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -i eth1 -j ACCEPT
-A INPUT -m state --state NEW -m tcp -p 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 443 -j ACCEPT
-A INPUT -m state --state NEW -m tcp -p tcp --dport 53 -j ACCEPT
```

```
-A INPUT -m state --state NEW -m udp -p udp --dport 53 -j ACCEPT
-A INPUT -m state --state NEW -m udp -p udp --dport 69 -j ACCEPT
-A INPUT -m state --state NEW -m tcp -p tcp --dport 8140 -j ACCEPT
-A FORWARD -m state --state ESTABLISHED,RELATED -j ACCEPT
-A FORWARD -p icmp -j ACCEPT
-A FORWARD -i lo -j ACCEPT
-A FORWARD -i eth1 -j ACCEPT
-A FORWARD -o eth0 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
-A FORWARD -j REJECT --reject-with icmp-host-prohibited
COMMIT
EOIP


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

  sed -i -e "/^net.ipv4.ip_forward/d" /etc/sysctl.conf
  echo "net.ipv4.ip_forward = 1" >> /etc/sysctl.conf
  sysctl -p


  # 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


  sed -i "/^class.*'foreman'.*/aconfigure_epel_repo => false,"
/usr/share/openstack-foreman-installer/bin/foreman_server.sh
  sed -i '/read -p/d' /usr/share/openstack-foreman-
installer/bin/foreman_server.sh

) 2>&1 | /usr/bin/tee -a /root/foreman-posts.log

chvt 1

%end

EOFKS


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


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

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

```
  sync
  umount /tmp/mnt-foreman
  rmdir /tmp/mnt-foreman

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

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