Investigation Summary

The procedure of static IP assignment does not work properly on RHEL 8.7 OS, but it seems to work on RHEL 9.1.
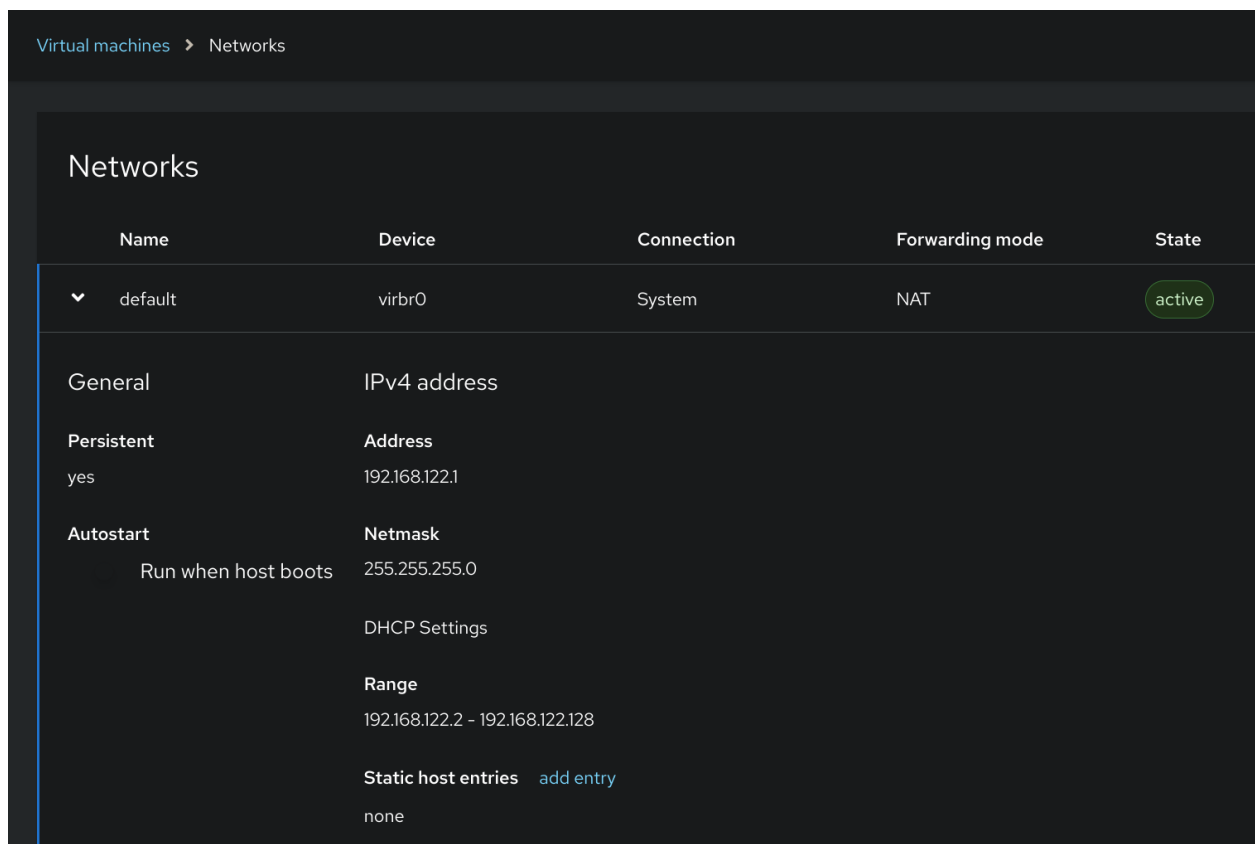
See OCPBUGS-7535 for the original problem description.

Environment

Using a RHEL 8.7 CSB image as a hypervisor to start RHEL 8.7 and RHEL 9.1 virtual machines running MicroShift.

```
$ rpm -q libvirt qemu-kvm
libvirt-8.0.0-10.2.module+el8.7.0+17753+6a6ae27a.x86_64
qemu-kvm-6.2.0-21.module+el8.7.0+17573+effbd7e8.2.x86_64
```

The `default` libvirt network was reconfigured to allocate DHCP addresses in the 192.168.122.2-192.168.122.128 range to prevent conflicts with the 192.168.122.208 and 192.168.122.209 static addresses to be used in the tests.

RHEL 9 Tests

RHEL 9 ISO was created from the `main` branch using a RHEL 9.1 development environment.

The following changes were made to the `kickstart.ks.template` file before creating the ISO.

```
$ git diff --minimal
diff --git a/scripts/image-builder/config/kickstart.ks.template
b/scripts/image-builder/config/kickstart.ks.template
index 5b1ebccb..ce2ccbb2 100644
--- a/scripts/image-builder/config/kickstart.ks.template
+++ b/scripts/image-builder/config/kickstart.ks.template
@@ -4,8 +4,11 @@ timezone UTC
 text
 reboot

-# Configure network to use DHCP and activate on boot
-network --bootproto=dhcp --device=link --activate --onboot=on
+# Configure network to use static IP and activate on boot
+#
+# network --bootproto=dhcp --device=link --activate --onboot=on
+network --activate --onboot=on --device=ens3 --bootproto=static --ip=192.168.122.209
--netmask=255.255.255.0 --gateway=192.168.122.1 --nameserver=192.168.122.1
--hostname=microshift-static9.example.com

 # Partition disk with a 1GB boot XFS partition and an LVM volume containing a 10GB+ system root
 # The remainder of the volume will be used by the CSI driver for storing data
```

Using the following command to create a virtual machine

```
VMNAME=microshift-static9
sudo -b bash -c " \
virt-install \
    --name ${VMNAME} \
    --vcpus 2 \
    --memory 3096 \
    --disk path=./${VMNAME}.qcow2,size=20 \
    --network network=default,model=virtio \
    --os-type generic \
    --events on_reboot=restart \
    --cdrom microshift-installer-4.14.0-0.nightly-2023-03-08-194110.x86_64.iso \
"
```

Test 1

After the new OS was booted, it was accessible with MicroShift running by the 192.168.122.209 IP address.

```
```

```
$ nmcli connection
NAME            UUID                                   TYPE           DEVICE
ovs-if-br-ex    b1a78361-b553-4390-a922-b76a38e86d17   ovs-interface  br-ex
br-ex           d482886e-40af-431c-9469-bb28ddeaa8e7   ovs-bridge     br-ex
ovs-if-phys0    3b0dda7c-fed0-42ad-9939-ada1a2b0c713   ethernet       ens3
ovs-port-br-ex  592ea610-52a5-4e8a-8e03-1ecebc4c648e   ovs-port       br-ex
ovs-port-phys0  ac8460ac-73ac-4daf-b36c-90f702d5793d   ovs-port       ens3
ens3            f42e7e39-47d5-41e4-b2d7-76a315199865   ethernet       --

$ ip addr show br-ex
4: br-ex: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UNKNOWN group default
qlen 1000
    link/ether 52:54:00:7a:ca:b0 brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.209/24 brd 192.168.122.255 scope global noprefixroute br-ex
       valid_lft forever preferred_lft forever
    inet 169.254.169.2/29 brd 169.254.169.7 scope global br-ex
       valid_lft forever preferred_lft forever
    inet6 fe80::5054:ff:fe7a:cab0/64 scope link noprefixroute
       valid_lft forever preferred_lft forever

$ sudo -i oc get pods -A
NAMESPACE                NAME                              READY  STATUS   RESTARTS
AGE
openshift-dns            dns-default-dn62t                 2/2    Running  0
7m18s
openshift-dns            node-resolver-gwrhl               1/1    Running  0
7m52s
openshift-ingress        router-default-6974d687-vcfcq     1/1    Running  0
7m52s
openshift-ovn-kubernetes ovnkube-master-wkxvn              4/4    Running  0
7m52s
openshift-ovn-kubernetes ovnkube-node-7zv4v                1/1    Running  1 (7m18s ago)
7m52s
openshift-service-ca     service-ca-7859cc7759-6gwvn       1/1    Running  0
7m53s
openshift-storage        topolvm-controller-f58fcd7cb-dw4l4 4/4   Running  0
7m53s
openshift-storage        topolvm-node-gn99f                4/4    Running  0
7m18s
```

Looking at the `anaconda` logs, confirms that the IP address was assigned properly.
```
$ sudo grep 192.168.122.209 /var/log/anaconda/journal.log | grep "'up'"
Mar 15 06:03:33 localhost.localdomain nm-dispatcher[1865]: req:5 'up' [ens3]: environment:
IP4_ADDRESS_0=192.168.122.209/24 192.168.122.1
```

RHEL 8 Tests

RHEL 8 ISO was created from the `release-4.12` branch using a RHEL 8.7 development environment.

The following changes were made to the `kickstart.ks.template` file before creating the ISO.
```
$ git diff --minimal
diff --git a/scripts/image-builder/config/kickstart.ks.template
b/scripts/image-builder/config/kickstart.ks.template
index d8f0b05a..18d5ca05 100644
--- a/scripts/image-builder/config/kickstart.ks.template
+++ b/scripts/image-builder/config/kickstart.ks.template
@@ -4,8 +4,11 @@ timezone UTC
 text
 reboot

-# Configure network to use DHCP and activate on boot
-network --bootproto=dhcp --device=link --activate --onboot=on
+# Configure network to use static IP and activate on boot
+#
+# network --bootproto=dhcp --device=link --activate --onboot=on
+network --activate --onboot=on --device=ens3 --bootproto=static --ip=192.168.122.208
--netmask=255.255.255.0 --gateway=192.168.122.1 --nameserver=192.168.122.1
--hostname=microshift-static8.example.com

 # Partition disk with a 1GB boot XFS partition and an LVM volume containing a 10GB+ system root
 # The remainder of the volume will be used by the CSI driver for storing data
```

Using the following command to create a virtual machine
```
VMNAME=microshift-static8
sudo -b bash -c " \
virt-install \
    --name ${VMNAME} \
    --vcpus 2 \
    --memory 3096 \
    --disk path=./${VMNAME}.qcow2,size=20 \
    --network network=default,model=virtio \
    --os-type generic \
    --events on_reboot=restart \
    --cdrom microshift-installer-4.12.0-0.nightly-2023-02-18-121434.x86_64.iso \
"
```

Test 1

After the new OS was booted, it was accessible with MicroShift running, but not by the 192.168.122.208 IP address. Instead, another address was allocated to it from the DHCP pool.

Looking at the `anaconda` logs, reveals the problem. It seems that the RHEL 8 system expects the host name to be resolved.

```
$ sudo grep -i error /var/log/anaconda/journal.log  | grep 192.168
Mar 15 05:24:31 localhost.localdomain NetworkManager[1796]: <debug> [1678857871.1233]
device[938d3d59d43c9f58] (ens3): hostname-from-dns: lookup error for 192.168.122.208: helper
process exited with status 3
```

Test 2

To work around the problem, removed the `microshift-static8.example.com` host name settings from the `kickstart.ks.template` file.

```
$ git diff --minimal
diff --git a/scripts/image-builder/config/kickstart.ks.template
b/scripts/image-builder/config/kickstart.ks.template
index d8f0b05a..30a19dfd 100644
--- a/scripts/image-builder/config/kickstart.ks.template
+++ b/scripts/image-builder/config/kickstart.ks.template
@@ -4,8 +4,9 @@ timezone UTC
 text
 reboot

-# Configure network to use DHCP and activate on boot
-network --bootproto=dhcp --device=link --activate --onboot=on
+# Configure network to use static IP and activate on boot
+# network --bootproto=dhcp --device=link --activate --onboot=on
+network --activate --onboot=on --device=ens3 --bootproto=static --ip=192.168.122.208
--netmask=255.255.255.0 --gateway=192.168.122.1 --nameserver=192.168.122.1

 # Partition disk with a 1GB boot XFS partition and an LVM volume containing a 10GB+ system root
 # The remainder of the volume will be used by the CSI driver for storing data
```

Recreated the RHEL 8 ISO image from scratch and started a new virtual machine. I can see in the `anaconda` logs that the IP is assigned correctly.

```
$ sudo grep 192.168.122.208 /var/log/anaconda/journal.log | grep "'up'"
Mar 15 12:34:15 microshift-static8 nm-dispatcher[1828]: req:6 'up' [ens3]: environment:
IP4_ADDRESS_0=192.168.122.208/24 192.168.122.1
```

However, the IP is then reassigned by the OVN configuration procedure.

```
$ nmcli connection
NAME             UUID                                   TYPE            DEVICE
ovs-if-br-ex     ef83f62f-9ca3-475b-9181-4c831f85e299   ovs-interface   br-ex
br-ex            904349d6-22fb-405b-a435-b648686ac274   ovs-bridge      br-ex
```

```
ovs-if-phys0        584f4fcc-54dd-4fe9-b354-ebfd47cc516d  ethernet        ens3
ovs-port-br-ex      6f2960f5-df62-4a9e-b55c-5cbee91bf36c  ovs-port        br-ex
ovs-port-phys0      6185bbb4-0472-4e6d-b464-17a17816d326  ovs-port        ens3
Wired connection 1  107b150b-4df8-3e79-a732-ed0c1039554e  ethernet        --

$ ip addr show br-ex
4: br-ex: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UNKNOWN group default
qlen 1000
    link/ether 52:54:00:a8:45:47 brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.102/24 brd 192.168.122.255 scope global dynamic noprefixroute br-ex
       valid_lft 3392sec preferred_lft 3392sec
    inet 169.254.169.2/29 brd 169.254.169.7 scope global br-ex
       valid_lft forever preferred_lft forever
    inet6 fe80::658b:e55:b82f:7a50/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```