



Red Hat OpenStack Platform 16.1

Migrating the Networking Service to the ML2/OVN Mechanism Driver

Migrate the Networking service (neutron) from the ML2/OVS mechanism driver to the ML2/OVN mechanism driver

Red Hat OpenStack Platform 16.1 Migrating the Networking Service to the ML2/OVN Mechanism Driver

Migrate the Networking service (neutron) from the ML2/OVS mechanism driver to the ML2/OVN mechanism driver

OpenStack Team
rhos-docs@redhat.com

Legal Notice

Copyright © 2022 Red Hat, Inc.

The text of and illustrations in this document are licensed by Red Hat under a Creative Commons Attribution–Share Alike 3.0 Unported license ("CC-BY-SA"). An explanation of CC-BY-SA is available at

<http://creativecommons.org/licenses/by-sa/3.0/>

. In accordance with CC-BY-SA, if you distribute this document or an adaptation of it, you must provide the URL for the original version.

Red Hat, as the licensor of this document, waives the right to enforce, and agrees not to assert, Section 4d of CC-BY-SA to the fullest extent permitted by applicable law.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo, the Red Hat logo, JBoss, OpenShift, Fedora, the Infinity logo, and RHCE are trademarks of Red Hat, Inc., registered in the United States and other countries.

Linux[®] is the registered trademark of Linus Torvalds in the United States and other countries.

Java[®] is a registered trademark of Oracle and/or its affiliates.

XFS[®] is a trademark of Silicon Graphics International Corp. or its subsidiaries in the United States and/or other countries.

MySQL[®] is a registered trademark of MySQL AB in the United States, the European Union and other countries.

Node.js[®] is an official trademark of Joyent. Red Hat is not formally related to or endorsed by the official Joyent Node.js open source or commercial project.

The OpenStack[®] Word Mark and OpenStack logo are either registered trademarks/service marks or trademarks/service marks of the OpenStack Foundation, in the United States and other countries and are used with the OpenStack Foundation's permission. We are not affiliated with, endorsed or sponsored by the OpenStack Foundation, or the OpenStack community.

All other trademarks are the property of their respective owners.

Abstract

This is an instructional guide for migrating the Red Hat OpenStack Platform Networking service (neutron) from the Modular Layer 2 plug-in with Open vSwitch mechanism driver to Modular Layer 2 plug-in with Open Virtual Networking.

Table of Contents

MAKING OPEN SOURCE MORE INCLUSIVE	3
PROVIDING FEEDBACK ON RED HAT DOCUMENTATION	4
CHAPTER 1. MIGRATING FROM ML2/OVS TO ML2/OVN	5
1.1. LIMITATIONS OF THE ML2/OVN MECHANISM DRIVER	6
1.1.1. ML2/OVS features not yet supported by ML2/OVN	6
1.1.2. Core OVN limitations	6
1.2. ML2/OVS TO ML2/OVN IN-PLACE MIGRATION: VALIDATED AND PROHIBITED SCENARIOS	7
1.2.1. Validated ML2/OVS to ML2/OVN migration scenarios	7
1.2.2. ML2/OVS to ML2/OVN in-place migration scenarios that have not been verified	7
1.2.3. ML2/OVS to ML2/OVN in-place migration and security group rules	8
1.3. PREPARING TO MIGRATE FROM ML2/OVS TO ML2/OVN	8
1.4. MIGRATING FROM ML2/OVS TO ML2/OVN	14

MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see [our CTO Chris Wright's message](#).

PROVIDING FEEDBACK ON RED HAT DOCUMENTATION

We appreciate your input on our documentation. Tell us how we can make it better.

Using the Direct Documentation Feedback (DDF) function

Use the **Add Feedback** DDF function for direct comments on specific sentences, paragraphs, or code blocks.

1. View the documentation in the *Multi-page HTML* format.
2. Ensure that you see the **Feedback** button in the upper right corner of the document.
3. Highlight the part of text that you want to comment on.
4. Click **Add Feedback**.
5. Complete the **Add Feedback** field with your comments.
6. Optional: Add your email address so that the documentation team can contact you for clarification on your issue.
7. Click **Submit**.

CHAPTER 1. MIGRATING FROM ML2/OVS TO ML2/OVN

Red Hat chose ML2/OVN as the default mechanism driver for all new deployments starting with RHOSP 16.0 because it offers immediate advantages over the ML2/OVS mechanism driver for most customers today. Those advantages multiply with each release while we continue to enhance and improve the ML2/OVN feature set.

If your existing Red Hat OpenStack Platform (RHOSP) deployment uses the ML2/OVS mechanism driver, start now to evaluate the benefits and feasibility of replacing the ML2/OVS mechanism driver with the ML2/OVN mechanism driver.



NOTE

Red Hat requires that you file a proactive support case before attempting a migration from ML2/OVS to ML2/OVN. Red Hat does not support migrations without the proactive support case. See [How to submit a Proactive Case](#) .

Engage your Red Hat Technical Account Manager or Red Hat Global Professional Services early in this evaluation. In addition to helping you file the required proactive support case if you decide to migrate, Red Hat can help you plan and prepare, starting with the following basic questions.

Should you migrate?

Red Hat believes that ML2/OVN is the right choice for most deployments. For various reasons, some deployments are better served by ML2/OVS. See [Limitations of the ML2/OVN mechanism driver](#) and [ML2/OVS to ML2/OVN in-place migration: validated and prohibited scenarios](#) .

When should you migrate?

Timing depends on many factors, including your business needs and the status of our continuing improvements to the ML2/OVN offering. For instance, security groups logging is planned for a future RHOSP release. If you need that feature, you might plan for a migration after the feature is available. See [Limitations of the ML2/OVN mechanism driver](#) .

In-place migration or parallel migration?

Depending on a variety of factors, you can choose between the following basic approaches to migration.

- Parallel migration. Create a new, parallel deployment that uses ML2/OVN and then move your operations to that deployment.
- In-place migration. Use the `ovn_migration.sh` script as described in this document. Note that Red Hat supports the `ovn_migration.sh` script only in deployments that are managed by RHOSP director.

You can migrate from the ML2/OVS to the ML2/OVN mechanism driver with the `ovs-firewall` firewall driver. Migration with the `iptables_hybrid` firewall driver is not supported. The intermediate `linux_bridge` interface used in `iptables_hybrid` deployments is not compatible with the migration tool.



WARNING

An ML2/OVS to ML2/OVN migration alters the environment in ways that might not be completely reversible. A failed or interrupted migration can leave the OpenStack environment inoperable. Before migrating in a production environment, file a proactive support case. Then work with your Red Hat Technical Account Manager or Red Hat Global Professional Services to create a backup and migration plan and test the migration in a stage environment that closely resembles your production environment.

1.1. LIMITATIONS OF THE ML2/OVN MECHANISM DRIVER

Some features available with the ML2/OVS mechanism driver are not yet supported with the ML2/OVN mechanism driver.

1.1.1. ML2/OVS features not yet supported by ML2/OVN

Feature	Notes	Track this Feature
Distributed virtual routing (DVR) with OVN on VLAN project (tenant) networks.	<p>FIP traffic does not pass to a VLAN tenant network with ML2/OVN and DVR.</p> <p>DVR is enabled by default in new ML2/OVN deployments and in ML2/OVN deployments that were migrated from ML2/OVS deployments that had DVR enabled. If you need VLAN tenant networks with OVN, you can disable DVR. To disable DVR, include the following lines in an environment file:</p> <pre>parameter_defaults: NeutronEnableDVR: false</pre>	<p>https://bugzilla.redhat.com/show_bug.cgi?id=1704596 https://bugzilla.redhat.com/show_bug.cgi?id=1766930</p>
Provisioning Baremetal Machines with OVN DHCP	<p>The built-in DHCP server on OVN presently can not provision baremetal nodes. It cannot serve DHCP for the provisioning networks. Chainbooting iPXE requires tagging (--dhcp-match in dnsmasq), which is not supported in the OVN DHCP server.</p>	<p>https://bugzilla.redhat.com/show_bug.cgi?id=1622154</p>

1.1.2. Core OVN limitations

North/south routing on VF(direct) ports on VLAN tenant networks does not work with SR-IOV because the external ports are not colocated with the logical router's gateway ports. See <https://bugs.launchpad.net/neutron/+bug/1875852>.

1.2. ML2/OVS TO ML2/OVN IN-PLACE MIGRATION: VALIDATED AND PROHIBITED SCENARIOS

Red Hat continues to test and refine in-place migration scenarios. Work with your Red Hat Technical Account Manager or Global Professional Services to determine whether your OVS deployment meets the criteria for a valid in-place migration scenario.

1.2.1. Validated ML2/OVS to ML2/OVN migration scenarios

DVR to DVR

Start: RHOSP 16.1.1 or later with OVS with DVR.

End: Same RHOSP version and release with OVN with DVR.

SR-IOV was not present in the starting environment or added during or after the migration.

Centralized routing + SR-IOV with virtual function (VF) ports only

Start: RHOSP 16.1.1 or later with OVS (no DVR) and SR-IOV.

End: RHOSP 16.1.1 with OVN (no DVR) and SR-IOV.

Workloads used only SR-IOV virtual function (VF) ports. SR-IOV physical function (PF) ports caused migration failure.

1.2.2. ML2/OVS to ML2/OVN in-place migration scenarios that have not been verified

You cannot perform an in-place ML2/OVS to ML2/OVN migration in the following scenarios until Red Hat announces that the underlying issues are resolved.

OVS deployment uses iptables_hybrid firewall driver

You can migrate from the ML2/OVS to the ML2/OVN mechanism driver with the openvswitch firewall driver, but not with the iptables_hybrid firewall driver. Migration with the iptables_hybrid firewall driver is not supported. For more information, see https://bugzilla.redhat.com/show_bug.cgi?id=2011450.

OVS deployment uses network functions virtualization (NFV)

Red Hat supports new deployments with ML2/OVN and NFV, but has not successfully tested migration of an ML2/OVS and NFV deployment to ML2/OVN. To track progress on this issue, see https://bugzilla.redhat.com/show_bug.cgi?id=1925290.

SR-IOV with physical function (PF) ports

Migration tests failed when any workload uses an SR-IOV PF port. To track progress on this issue, see https://bugzilla.redhat.com/show_bug.cgi?id=1879546.

OVS uses trunk ports

If your ML2/OVS deployment uses trunk ports, do not perform an ML2/OVS to ML2/OVN migration. The migration does not properly set up the trunked ports in the OVN environment. To track progress on this issue, see https://bugzilla.redhat.com/show_bug.cgi?id=1857652.

DVR with VLAN project (tenant) networks

Do not migrate to ML2/OVN with DVR and VLAN project networks. You can migrate to ML2/OVN with centralized routing. To track progress on this issue, see https://bugzilla.redhat.com/show_bug.cgi?id=1766930.

1.2.3. ML2/OVS to ML2/OVN in-place migration and security group rules

Ensure that any custom security group rules in your originating ML2/OVS deployment are compatible with the target ML2/OVN deployment.

For example, the default security group includes rules that allow egress to the DHCP server. If you deleted those rules in your ML2/OVS deployment, ML2/OVS automatically adds implicit rules that allow egress to the DHCP server. Those implicit rules are not supported by ML2/OVN, so in your target ML2/OVN environment, DHCP and metadata traffic would not reach the DHCP server and the instance would not boot. In this case, to restore DHCP access, you could add the following rules:

```
# Allow VM to contact dhcp server (ipv4)
openstack security group rule create --egress --ethertype IPv4 --protocol udp --dst-port 67
${SEC_GROUP_ID}
# Allow VM to contact metadata server (ipv4)
openstack security group rule create --egress --ethertype IPv4 --protocol tcp --remote-ip
169.254.169.254 ${SEC_GROUP_ID}

# Allow VM to contact dhcp server (ipv6, non-slaac). Be aware that the remote-ip may vary
depending on your use case!
openstack security group rule create --egress --ethertype IPv6 --protocol udp --dst-port 547 --
remote-ip ff02::1:2 ${SEC_GROUP_ID}
# Allow VM to contact metadata server (ipv6)
openstack security group rule create --egress --ethertype IPv6 --protocol tcp --remote-ip
fe80::a9fe:a9fe ${SEC_GROUP_ID}
```

1.3. PREPARING TO MIGRATE FROM ML2/OVS TO ML2/OVN

Environment assessment and preparation is critical to a successful migration. Your Red Hat Technical Account Manager or Global Professional Services will guide you through these steps.

Prerequisites

- Your pre-migration deployment is Red Hat OpenStack Platform (RHOSP) 16.1 or later.
- Your pre-migration deployment does not use the **iptables_hybrid** firewall driver. The intermediate **linux_bridge** interface used in **iptables_hybrid** deployments is not compatible with the migration tool.
- Your RHOSP deployment is up to date. In other words, if you need to upgrade or update your OpenStack version, perform the upgrade or update first, and then perform the ML2/OVS to ML2/OVN migration.
- You have worked with your Red Hat Technical Account Manager or Global Professional Services to plan the migration and have filed a proactive support case. See [How to submit a Proactive Case](#).

Procedure

1. Create an ML2/OVN stage deployment to obtain the baseline configuration of your target ML2/OVN deployment and test the feasibility of the target deployment. Design the stage deployment with the same basic roles, routing, and topology as the planned post-migration production deployment. Save the **overcloud-deploy.sh** file and any files referenced by the deployment, such as environment files. You need these files later in this

procedure to configure the migration target environment.



NOTE

Use these files only for creation of the stage deployment and in the migration. Do not re-use them after the migration.

2. If your ML2/OVS deployment uses VXLAN or GRE project networks, schedule for a waiting period of up to 24 hours after the `setup-mtu-t1` step.
 - This waiting period allows the VM instances to renew their DHCP leases and receive the new MTU value. During this time you might need to manually set MTUs on some instances and reboot some instances.
 - 24 hours is the time based on default configuration of 86400 seconds. The actual time depends on `/var/lib/config-data/puppet-generated/neutron/etc/neutron/dhcp_agent.ini` `dhcp_renewal_time` and `/var/lib/config-data/puppet-generated/neutron/etc/neutron/neutron.conf` `dhcp_lease_duration` parameters.
3. Install `python3-networking-ovn-migration-tool`.

```
sudo dnf install python3-networking-ovn-migration-tool @container-tools
```

The `@container-tools` argument also installs the container tools if they are not already present.

4. Create a directory on the undercloud, and copy the Ansible playbooks:

```
mkdir ~/ovn_migration
cd ~/ovn_migration
cp -rfp /usr/share/ansible/networking-ovn-migration/playbooks .
```

5. Copy your ML2/OVN stage deployment files to the migration home directory, such as `~/ovn_migration`.
The stage migration deployment files include `overcloud-deploy.sh` and any files referenced by the deployment, such as environment files. Rename the copy of `overcloud-deploy.sh` to `overcloud-deploy-ovn.sh`. Use this script for migration only. Do not use it for other purposes.
6. Find your migration scenario in the following list and perform the appropriate steps to customize the `openstack deploy` command in `overcloud-deploy-ovn.sh`.

Scenario 1: DVR to DVR, compute nodes have connectivity to the external network

- Add the following environment files to the `openstack deploy` command in `overcloud-deploy-ovn.sh`. Add them in the order shown. This command example uses the default `neutron-ovn-dvr-ha.yaml` file. If you use a different file, replace the file name in the command.

```
-e /usr/share/openstack-tripleo-heat-templates/environments/services/neutron-ovn-dvr-ha.yaml \
-e $HOME/ovn-extras.yaml
```

Scenario 2: Centralized routing to centralized routing (no DVR)

- If your deployment uses SR-IOV, add the service definition **OS::TripleO::Services::OVNMetadataAgent** to the Controller role in the file **roles_data.yaml**.
- Preserve the pre-migration custom bridge mappings.
 - Run this command on a controller node to get the current bridge mappings:

```
sudo podman exec -it neutron_api crudini --get
/etc/neutron/plugins/ml2/openvswitch_agent.ini ovs bridge_mappings
```

Example output

```
datacentre:br-ex,tenant:br-isolated
```

- On the undercloud, create an environment file for the bridge mappings: **/home/stack/neutron_bridge_mappings.yaml**.
 - Set the defaults in the environment file. For example:
- Add the following environment files to the **openstack deploy** command in `overcloud-deploy-ovn.sh`. Add them in the order shown. If your environment does not use SR-IOV, omit the `neutron-ovn-sriov.yaml` file. The file `ovn-extras.yaml` does not exist yet but it is created by the script `ovn_migration.sh` before the **openstack deploy** command is run.

```
-e /usr/share/openstack-tripleo-heat-templates/environments/services/neutron-ovn-
ha.yaml \
-e /usr/share/openstack-tripleo-heat-templates/environments/services/neutron-ovn-
sriov.yaml \
-e /home/stack/ovn-extras.yaml \
-e /home/stack/neutron_bridge_mappings.yaml
```

- Leave any custom network modifications the same as they were before migration.

Scenario 3: Centralized routing to DVR, with Geneve type driver, and compute nodes connected to external networks through **br-ex**



WARNING

If your ML2/OVS deployment uses centralized routing and VLAN project (tenant) networks, do not migrate to ML2/OVN with DVR. You can migrate to ML2/OVN with centralized routing. To track progress on this limitation, see https://bugzilla.redhat.com/show_bug.cgi?id=1766930.

- Ensure that compute nodes are connected to the external network through the **br-ex** bridge. For example, in an environment file such as `compute-dvr.yaml`, set the following:

```

type: ovs_bridge
  # Defaults to br-ex, anything else requires specific # bridge mapping entries for it to
  be used.
  name: bridge_name
  use_dhcp: false
  members:
    -
      type: interface
      name: nic3
      # force the MAC address of the bridge to this interface
      primary: true

```

7. Ensure that all users have execution privileges on the file **overcloud-deploy-ovn.sh**. The script requires execution privileges during the migration process.

```
$ chmod a+x ~/overcloud-deploy-ovn.sh
```

8. Use **export** commands to set the following migration-related environment variables. For example:

```
$ export PUBLIC_NETWORK_NAME=my-public-network
```

- `STACKRC_FILE` - the `stackrc` file in your undercloud.
Default: `~/stackrc`
- `OVERCLOUDRC_FILE` - the `overcloudrc` file in your undercloud.
Default: `~/overcloudrc`
- `OVERCLOUD_OVN_DEPLOY_SCRIPT` - the deployment script.
Default: `~/overcloud-deploy-ovn.sh`
- `PUBLIC_NETWORK_NAME` - the name of your public network.
Default: `public`.
- `IMAGE_NAME` - the name or ID of the glance image to use to boot a test server.
Default: `cirros`.

The image is automatically downloaded during the pre-validation / post-validation process.

- `VALIDATE_MIGRATION` - Create migration resources to validate the migration. Before starting the migration, the migration script boots a server and validates that the server is reachable after the migration.
Default: `True`.

**WARNING**

Migration validation requires at least two available floating IP addresses, two networks, two subnets, two instances, and two routers as admin.

Also, the network specified by `PUBLIC_NETWORK_NAME` must have available floating IP addresses, and you must be able to ping them from the undercloud.

If your environment does not meet these requirements, set `VALIDATE_MIGRATION` to `False`.

- `SERVER_USER_NAME` - User name to use for logging to the migration instances.
Default: `cirros`.
 - `DHCP_RENEWAL_TIME` - DHCP renewal time in seconds to configure in DHCP agent configuration file.
Default: 30
9. Ensure you are in the `ovn-migration` directory and run the command **`ovn_migration.sh generate-inventory`** to generate the inventory file **`hosts_for_migration`** and the **`ansible.cfg`** file.


```
$ ovn_migration.sh generate-inventory | sudo tee -a /var/log/ovn_migration_output.txt
```
 10. Review the **`hosts_for_migration`** file for accuracy.
 - a. Ensure the lists match your environment.
 - b. Ensure there are `ovn` controllers on each node.
 - c. Ensure there are no list headings (such as `[ovn-controllers]`) that do not have list items under them.
 - d. From the `ovn migration` directory, run the command `ansible -i hosts_for_migration -m ping all`
 11. If your original ML2/OVS deployment uses VLAN project networks, skip to step 18.
 12. Run **`ovn_migration.sh setup-mtu-t1`**. This lowers the T1 parameter of the internal neutron DHCP servers that configure the **`dhcp_renewal_time`** in `/var/lib/config-data/puppet-generated/neutron/etc/neutron/dhcp_agent.ini` in all the nodes where DHCP agent is running.


```
$ ovn_migration.sh setup-mtu-t1 | sudo tee -a /var/log/ovn_migration_output.txt
```
 13. If your original OVS deployment uses VXLAN or GRE project networking, wait until the DHCP leases have been renewed on all VM instances. This can take up to 24 hours depending on lease renewal settings and the number of instances.
 14. If you have any instances with static IP assignment on VXLAN or GRE project networks, you must manually modify the configuration of those instances to configure the new Geneve MTU,

which is the current VXLAN MTU minus 8 bytes. For example, if the VXLAN-based MTU was 1450, change it to 1442.



NOTE

Perform this step only if you have manually provided static IP assignments and MTU settings on VXLAN or GRE project networks. By default, DHCP provides the IP assignment and MTU settings.

15. Verify that the T1 parameter has propagated to existing VMs.

- Connect to one of the compute nodes.
- Run `tcpdump` over one of the VM taps attached to a project network. If T1 propagation is successful, expect to see that requests happen on an interval of approximately 30 seconds:

```
[heat-admin@overcloud-novacompute-0 ~]$ sudo tcpdump -i tap52e872c2-e6 port 67 or
port 68 -n
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on tap52e872c2-e6, link-type EN10MB (Ethernet), capture size 262144 bytes
13:17:28.954675 IP 192.168.99.5.bootpc > 192.168.99.3.bootps: BOOTP/DHCP,
Request from fa:16:3e:6b:41:3d, length 300
13:17:28.961321 IP 192.168.99.3.bootps > 192.168.99.5.bootpc: BOOTP/DHCP, Reply,
length 355
13:17:56.241156 IP 192.168.99.5.bootpc > 192.168.99.3.bootps: BOOTP/DHCP,
Request from fa:16:3e:6b:41:3d, length 30013:17:56.249899 IP 192.168.99.3.bootps >
192.168.99.5.bootpc: BOOTP/DHCP, Reply, length 355
```



NOTE

This verification is not possible with cirros VMs. The cirros `udhcpd` implementation does not respond to DHCP option 58 (T1). Try this verification on a port that belongs to a full Linux VM. Red Hat recommends that you check all the different types of workloads that your system runs (Windows, different flavors of Linux, etc..).

16. If any VM instances were not updated to reflect the change to the T1 parameter of DHCP, reboot them.
17. Lower the MTU of the pre-migration VXLAN and GRE networks:

```
$ ovn_migration.sh reduce-mtu | sudo tee -a /var/log/ovn_migration_output.txt
```

This step reduces the MTU network by network and tags the completed network with `adapted_mtu`. The tool ignores non-VXLAN/GRE networks, so if you use VLAN for project networks, this step is not expected to change any values.

18. Prepare the new container images for use after the migration to ML2/OVN.

- a. Create **containers-prepare-parameter.yaml** file in the home directory if it is not present.

```
$ test -f $HOME/containers-prepare-parameter.yaml || sudo openstack tripleo container
image prepare default \
--output-env-file $HOME/containers-prepare-parameter.yaml
```

- b. Verify that **containers-prepare-parameter.yaml** is present at the end of your `$HOME/overcloud-deploy-ovn.sh` and `$HOME/overcloud-deploy.sh` files.
- c. Change the `neutron_driver` in the **containers-prepare-parameter.yaml** file to `ovn`:

```
$ sed -i -E 's/neutron_driver:([ ]w+)/neutron_driver: ovn/' $HOME/containers-prepare-
parameter.yaml
```

- d. Verify the changes to the `neutron_driver`:

```
$ grep neutron_driver $HOME/containers-prepare-parameter.yaml
neutron_driver: ovn
```

- e. Update the images:

```
$ sudo openstack tripleo container image prepare \
--environment-file /home/stack/containers-prepare-parameter.yaml
```



NOTE

Provide the full path to your **containers-prepare-parameter.yaml** file. Otherwise, the command completes very quickly without updating the image list or providing an error message.

19. On the undercloud, validate the updated images.

```
. Log in to the undercloud as the user `stack` and source the stackrc file.
$ source ~/stackrc
$ openstack tripleo container image list | grep "\-ovn"
```

Your list should resemble the following example. It includes containers for the OVN databases, OVN controller, the metadata agent, and the neutron server agent.

```
docker://undercloud-0.ctlplane.redhat.local:8787/rh-osbs/rhosp16-openstack-ovn-
northd:16.2_20211110.2
docker://undercloud-0.ctlplane.redhat.local:8787/rh-osbs/rhosp16-openstack-ovn-sb-db-
server:16.2_20211110.2
docker://undercloud-0.ctlplane.redhat.local:8787/rh-osbs/rhosp16-openstack-ovn-
controller:16.2_20211110.2
docker://undercloud-0.ctlplane.redhat.local:8787/rh-osbs/rhosp16-openstack-neutron-server-
ovn:16.2_20211110.2
docker://undercloud-0.ctlplane.redhat.local:8787/rh-osbs/rhosp16-openstack-ovn-nb-db-
server:16.2_20211110.2
docker://undercloud-0.ctlplane.redhat.local:8787/rh-osbs/rhosp16-openstack-neutron-
metadata-agent-ovn:16.2_20211110.2
```

1.4. MIGRATING FROM ML2/OVS TO ML2/OVN

The `ovn-migration` script performs environmental setup, migration, and cleanup tasks related to the in-place migration from ML2/OVN to ML2/OVS.

Prerequisites

- You have completed the steps in [Preparing to migrate from ML2/OVS to ML2/OVN](#)

Procedure

- Run `ovn_migration.sh start-migration` to begin the migration process. The `tee` command creates a copy of the script output for troubleshooting purposes.

```
$ ovn_migration.sh start-migration | sudo tee -a /var/log/ovn_migration_output.txt
```

Result

The script performs the following actions.

- Creates pre-migration resources (network and VM) to validate existing deployment and final migration.
- Updates the overcloud stack to deploy OVN alongside reference implementation services using the temporary bridge `br-migration` instead of `br-int`. The temporary bridge helps to limit downtime during migration.
- Generates the OVN northbound database by running `neutron-ovn-db-sync-util`. The utility examines the Neutron database to create equivalent resources in the OVN northbound database.
- Clones the existing resources from `br-int` to `br-migration`, to allow `ovn` to find the same resource UUIDS over `br-migration`.
- Re-assigns `ovn-controller` to `br-int` instead of `br-migration`.
- Removes node resources that are not used by ML2/OVN, including the following.
 - Cleans up network namespaces (`fip`, `snat`, `qrouter`, `qdhcp`).
 - Removes any unnecessary patch ports on **`br-int`**.
 - Removes **`br-tun`** and **`br-migration`** ovs bridges.
 - Deletes ports from **`br-int`** that begin with **`qr-`**, **`ha-`**, and **`qg-`** (using `neutron-netns-cleanup`).
- Deletes Networking Service (`neutron`) agents and Networking Service HA internal networks from the database through the Networking Service API.
- Validates connectivity on pre-migration resources.
- Deletes pre-migration resources.
- Creates post-migration resources.
- Validates connectivity on post-migration resources.
- Cleans up post-migration resources.

- Re-runs the deployment tool to update OVN on **br-int**.