Oracle Linux Virtualization Manager

Getting Started

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1 Preface

Oracle Linux Virtualization Manager Release 4.4 is based on oVirt, which is a free, open-source virtualization solution. The product documentation comprises:

- **Release Notes** - A summary of the new features, changes, fixed bugs, and known issues in the Oracle Linux Virtualization Manager. It contains last-minute information, which might not be included in the main body of documentation.
- **Architecture and Planning Guide** - An architectural overview of Oracle Linux Virtualization Manager, prerequisites, and planning information for your environment.
- **Getting Started Guide** - How to install, configure, and get started with the Oracle Linux Virtualization Manager. The document includes an example scenario covering basic procedures for setting up the environment, such as adding hosts and storage, creating virtual machines, configuring networks, working with templates, and backup and restore tasks. In addition, there is information on upgrading your engine and hosts as well as deploying a self-hosted configuration.
- **Administration Guide** - Provides common administrative tasks for Oracle Linux Virtualization Manager and information on setting up users and groups, configuring high-availability, memory and CPUs, configuring and using event notifications, configuring vCPUs and virtual memory.

You can also refer to:

- REST API Guide, which you can access from the Welcome Dashboard or directly through its URL `https://`***manager-fqdn***`/ovirt-engine/apidoc`.
- Upstream oVirt Documentation.

To access the Release 4.3.10 documentation, PDFs are available at:

- https://www.oracle.com/a/ocom/docs/olvm43/olvm-43-releasenotes.pdf
- https://www.oracle.com/a/ocom/docs/olvm43/olvm-43-gettingstarted.pdf
- https://www.oracle.com/a/ocom/docs/olvm43/olvm-43-architecture-planning.pdf
- https://www.oracle.com/a/ocom/docs/olvm43/olvm-43-administration.pdf

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

For information about the accessibility of the Oracle Help Center, see the Oracle Accessibility Conformance Report at https://www.oracle.com/corporate/accessibility/templates/t2-11535.html.

Access to Oracle Support for Accessibility

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit https://www.oracle.com/corporate/accessibility/learning-support.html#support-tab.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

2 Requirements and Scalability Limits

Before you begin the tasks in this guide, you should review Oracle Linux Virtualization Manager Release 4.4 concepts, environment requirements, and scalability limitations in the Oracle Linux Virtualization Manager: Architecture and Planning Guide.

3 Installation and Configuration

To deploy Oracle Linux Virtualization Manager, you install and configure the engine on a host with Oracle Linux 8.5 (or later), configure KVM hosts, storage, and networks, and create virtual machines. Thoroughly review the Requirements and Scalability Limits as the requirements for the engine host are different than the KVM hosts.

To review conceptual information and help to plan your installation, see the Oracle Linux Virtualization Manager: Architecture and Planning Guide.

Installing the Engine

To install Oracle Linux Virtualization Manager, you perform a fresh installation of Oracle Linux 8.5 (or later) on the host, install the `ovirt-engine` package, and then run the engine-setup command to configure the Manager.

> **Note:**
>
> You can install the Manager in a virtual machine as long as it is not managing that virtual machine, or in a self-hosted engine configuration. For more information, see Self-Hosted Engine Deployment. **Do not configure the same host as a standalone engine and a KVM host.**

You can download the installation ISO for Oracle Linux 8.5 (or later) from the Oracle Software Delivery Cloud at https://edelivery.oracle.com.

1. Install Oracle Linux 8.5 (or later) on the host using the **Minimal Install** base environment.

   Follow the instructions in the Oracle® Linux 8: Installing Oracle Linux.

   > **Important:**
   >
   > Do not install any additional packages until after you have installed the Manager packages, because they may cause dependency issues.

2. **(Optional)** If you use a proxy server for Internet access, configure Yum with the proxy server settings. For more information, see the Oracle® Linux: Managing Software on Oracle Linux.
3. Complete one of the following sets of steps:
   - **For ULN registered hosts or using Oracle Linux Manager**

     Subscribe the system to the required channels.

a. For ULN registered hosts, log in to https://linux.oracle.com with your ULN user name and password. For Oracle Linux Manager registered hosts, access your internal server URL.

b. On the Systems tab, click the link named for the host in the list of registered machines.

c. On the System Details page, click **Manage Subscriptions**.

d. On the System Summary page, select each required channel from the list of available channels and click the right arrow to move the channel to the list of subscribed channels. Subscribe the system to the following channels:

   - `ol8_x86_64_baseos_latest`
   - `ol8_x86_64_appstream`
   - `ol8_x86_64_kvm_appstream`
   - `ol8_x86_64_ovirt44`
   - `ol8_x86_64_ovirt44_extras`
   - `ol8_x86_64_gluster_appstream`
   - **(For VDSM)** `ol8_x86_64_UEKR7`

e. Click **Save Subscriptions**.

f. Enable the pki-deps and PostgreSQL:13 appstream modules.

```
# dnf -y module enable pki-deps
```

```
# dnf -y module enable postgresql:13
```

g. Disable the virt:ol module and enable the virt:kvm_utils2 module.

```
# dnf -y module disable virt:ol
```

```
# dnf -y module enable virt:kvm_utils2
```

- **For Oracle Linux yum server hosts**

  Install the Oracle Linux Virtualization Manager Release 4.4 package and enable the required repositories.

  a. **(Optional)** Make sure the host is using the modular yum repository configuration. For more information, see Oracle® Linux: Yum Modularization Update Notice.

  b. Enable the `ol8_baseos_latest` repository.

  ```
  # dnf config-manager --enable ol8_baseos_latest
  ```

  > **Important:**
  >
  > Before you execute **dnf config-manager** ensure the **dnf-utils** package is installed on your system. For more information, see Yum DNF in Oracle® Linux: Managing Software on Oracle Linux .

  c. Install the Oracle Linux Virtualization Manager Release 4.4 package.

```
# dnf install oracle-ovirt-release-el8
```

d. Use the dnf command to verify that the required repositories are enabled.

   i. Clear the dnf cache.

      ```
      # dnf clean all
      ```

   ii. List the configured repositories and verify that the required repositories are enabled.

      ```
      # dnf repolist
      ```

      The following repositories must be enabled:

      - `ol8_baseos_latest`
      - `ol8_appstream`
      - `ol8_kvm_appstream`
      - `ol8_ovirt44`
      - `ol8_ovirt44_extras`
      - `ol8_64_gluster_appstream`
      - **(For VDSM)** `ol8_64_UEKR7`

   iii. If a required repository is not enabled, use the dnf config-manager to enable it.

      ```
      # dnf config-manager --enable repository
      ```

4. Install the Manager using the `ovirt-engine` command.

   ```
   # dnf install ovirt-engine
   ```

   Proceed to Configuring the Engine.

Configuring the Engine

After you install the Oracle Linux Virtualization Manager, you run the engine-setup command (the Setup program) to configure the Manager. You are prompted to answer a series of questions whose values are used to configure the Manager. Some of these questions relate to features that are in technology preview; Oracle recommends that you accept the default values for these features. For more information, see Technology Preview in the Oracle Linux Virtualization Manager: Release Notes.

The Manager uses two PostgreSQL databases: one for the engine and one for the data warehouse. By default, Setup creates and configures the engine database locally on the engine host. Alternatively, you can configure the engine host to use a manually-configured local or remote database. If you choose to use a manually-configured local or remote database, you must set it up **before** running `engine-setup`. Currently, running the engine or data warehouse database on a remote host is a technology preview feature.

To configure the Manager:

1. Run the `engine-setup` command on the host where you installed the Manager.

   ```
   [ INFO ] Stage: Initializing
   [ INFO ] Stage: Environment setup
   Configuration files: /etc/ovirt-engine-setup.conf.d/10-packaging-jboss.conf, /etc/
   ovirt-engine-setup.conf.d/10-packaging.conf
   ```

```
Log file: /var/log/ovirt-engine/setup/ovirt-engine-setup-YYYYMMDDHHMMSS-
snz1rn.log
[ INFO ] Stage: Environment packages setup
[ INFO ] Stage: Programs detection
[ INFO ] Stage: Environment setup (late)
[ INFO ] Stage: Environment customization
```

> **Note:**
>
> Run `engine-setup --accept-defaults` to automatically accept all questions that have default answers.

The Setup program prompts you to configure the Manager.

2. Enter Yes if you want to configure Cinderlib integration, which is currently a Tech Preview feature. The default is *No*.

   ```
   Configure Cinderlib integration (Currently in tech preview) (Yes, No) [No]:
   ```

3. Enter Yes to configure the Manager.

   ```
   Configure Engine on this host (Yes, No) [Yes]:
   ```

   If you enter No, the configuration stops. To restart, rerun the engine-setup command.

4. For the remaining configuration questions, provide input or accept default values, which are in square brackets after each question. To accept the default value for a given question, press Enter.

   > **Note:**
   >
   > Setup asks you for the fully qualified DNS name (FQDN) of the Manager host. Although Setup tries to automatically detect the name, you must ensure the FQDN is correct.
   >
   > For detailed information on the configuration options, see Engine Configuration Options.

5. Once you have answered all the questions, Setup displays a list of the values you entered. Review the list carefully and then press Enter to configure the Manager.

   Your answers are saved to a file that can be used to reconfigure the Manager using the same values. Setup also displays the location of the log file for the configuration process.

6. When the configuration is complete, details about how to log in to the Administration Portal are displayed. To verify that the configuration was successful, log into the Administration Portal, as described in Logging in to the Administration Portal.

Engine Configuration Options

The information in thie section describes the options for configuring Oracle Linux Virtualization Manager when you run the engine-setup command.

Note:

Some of the configuration option are in technology preview; Oracle recommends that you accept the default values for these features. For more information, see Technology Preview in the Oracle Linux Virtualization Manager: Release Notes.

OVN Provider

```
Configuring ovirt-provider-ovn also sets the Default cluster's default network
provider to ovirt-provider-ovn.
Non-Default clusters may be configured with an OVN after installation.
Configure ovirt-provider-ovn (Yes, No) [Yes]:
```

Install the Open Virtual Network (OVN) provider on the Manager host and add it as an external network provider. The default cluster is automatically configured to use OVN as its network provider.

OVN is an OVS (Open vSwitch) extension which enables you to configure virtual networks.

Using external providers, including the OVN provider, is a technology preview feature.

WebSocket Proxy

```
Configure WebSocket Proxy on this machine? (Yes, No) [Yes]:
```

The WebSocket Proxy enables you to connect to virtual machines using the noVNC or HTML 5 consoles.

For security and performance reasons, you can configure the WebSocket Proxy on a remote host.

Data Warehouse

```
Please note: Data Warehouse is required for the engine.
If you choose to not configure it on this host, you have to configure
it on a remote host, and then configure the engine on this host so that it can
access the database of the remote Data Warehouse host.
Configure Data Warehouse on this host (Yes, No) [Yes]:
```

The Data Warehouse feature can run on the Manager host or on a remote host. Running Data Warehouse on a remote host reduces the load on the Manager host.

Running the Data Warehouse on a remote host is a technology preview feature.

VM Console Proxy

```
Configure VM Console Proxy on this host (Yes, No) [Yes]:
```

The VM Console Proxy enables you to access virtual machine serial consoles from a command line. To use this feature, serial consoles must be enabled in the virtual machines.

Grafana

```
Use Engine admin password as initial Grafana admin password (Yes, No) [Yes]:
```

Grafana can be configured to to use the Engine password to make signing in easier.

Manager DNS Name

```
Host fully qualified DNS name of this server [<autodetected-host-name>]:
```

The fully qualified DNS name of the Manager host. Check that the automatically detected DNS name is correct.

Automatic Firewall Configuration

```
Setup can automatically configure the firewall on this system.
Note: automatic configuration of the firewall may overwrite current settings.
Do you want Setup to configure the firewall? (Yes, No) [Yes]:

The following firewall managers were detected on this system: firewalld
Firewall manager to configure (firewalld): firewalld
```

Configure the firewall on the host to open the ports used for external communication between Oracle Linux Virtualization Manager and the components it manages.

If Setup configures the firewall, and no firewall managers are active, you are prompted to select a firewall manager from a list.

If you enter No, you must manually configure the firewall. When the Manager configuration is complete, Setup displays a list of ports that need to be opened, see for details.

Data Warehouse Database

```
Where is the DWH database located? (Local, Remote) [Local]:
```

The Data Warehouse database (the history database) can run on the Manager host or on a remote host. Running the database on a remote host reduces the load on the Manager host.

Running the database on a remote host is a technology preview feature.

> **Caution:**
>
> In this step you configure the name of the database, and the user name and password for connecting to it. Make a note of these details.

Enter Local to connect to a local PostgreSQL server, or Remote to connect to an existing PostgreSQL server running on a remote host.

If you enter Local, you can choose whether to set up a local PostgreSQL server automatically, or to connect to an existing local PostgreSQL server.

```
Setup can configure the local postgresql server automatically for the DWH to
run.
This may conflict with existing applications.
Would you like Setup to automatically configure postgresql and create DWH
database,
or prefer to perform that manually? (Automatic, Manual) [Automatic]:
```

Enter Automatic to have Setup configure a local database server, or Manual to connect to an existing local database server. If you enter Manual, you are prompted for the details for connecting to the database:

```
DWH database secured connection (Yes, No) [No]:
DWH database name [ovirt_engine_history]:
DWH database user [ovirt_engine_history]:
DWH database password:
```

If you enter Remote to connect to an existing PostgreSQL server running on a remote host, you are prompted for the details for connecting to the database:

```
DWH database host [localhost]:
DWH database port [5432]:
DWH database secured connection (Yes, No) [No]:
DWH database name [ovirt_engine_history]:
DWH database user [ovirt_engine_history]:
DWH database password:
```

Engine Database

```
Where is the Engine database located? (Local, Remote) [Local]:
```

The Oracle Linux Virtualization Manager database (the engine database) can run on the Manager host or on a remote host. Running the database on a remote host reduces the load on the Manager host.

Running the database on a remote host is a technology preview feature.

> **Caution:**
>
> In this step you configure the name of the database, and the user name and password for connecting to it. Make a note of these details.

Enter Local to connect to a local PostgreSQL server, or Remote to connect to an existing PostgreSQL server running on a remote host.

If you enter Local, you can choose whether to set up a local PostgreSQL server automatically, or to connect to an existing local PostgreSQL server.

```
Setup can configure the local postgresql server automatically for the engine to run.
This may conflict with existing applications.
Would you like Setup to automatically configure postgresql and create Engine database,
or prefer to perform that manually? (Automatic, Manual) [Automatic]:
```

Enter Automatic to have Setup configure a local database server, or Manual to connect to an existing local database server. If you enter Manual, you are prompted for the details for connecting to the database:

```
Engine database secured connection (Yes, No) [No]:
Engine database name [engine]:
Engine database user [engine]:
Engine database password:
```

If you enter Remote to connect to an existing PostgreSQL server running on a remote host, you are prompted for the details for connecting to the database:

```
Engine database host [localhost]:
Engine database port [5432]:
Engine database secured connection (Yes, No) [No]:
Engine database name [engine]:
Engine database user [engine]:
Engine database password:
```

Admin User Password

```
Engine admin password:
Confirm engine admin password:
```

Enter a password for the default administrative user (admin@internal). Make a note of the password. If you use a simple password, you might get the following warning:

```
[WARNING] Password is weak: The password fails the dictionary check - it is
based on a dictionary word
Use weak password? (Yes, No) [No]: Yes
```

Application Mode

```
Application mode (Both, Virt, Gluster) [Both]:
```

The Manager can be configured to manage virtual machines (**Virt**) or manage Gluster clusters (**Gluster**), or **Both**.

OVN Provider Credentials

```
Use default credentials (admin@internal) for ovirt-provider-ovn (Yes, No) [Yes]:
oVirt OVN provider user[admin@internal]:
oVirt OVN provider password:
```

If you installed the OVN provider, configure the credentials for connecting to the OVN (Open vSwitch) databases.

Using external providers, including the OVN provider, is a technology preview feature.

SAN Wipe After Delete

```
Default SAN wipe after delete (Yes, No) [No]:
```

Enter Yes to set the default value for the `wipe_after_delete` flag to `true`, which wipes the blocks of a virtual disk when it is deleted.

Using the wipe after delete functionality is a technology preview feature.

Web Server Configuration

```
Organization name for certificate [<autodetected-domain-based-name>]:
```

Provide the organization name to use for the automatically generated self-signed SSL certificate used by the Manager web server.

```
Setup can configure the default page of the web server to
present the application home page. This may conflict with existing applications.
Do you wish to set the application as the default web page of the server? (Yes,
No) [Yes]:
```

Enter Yes to make the Oracle Linux Virtualization Manager landing page the default page presented by the web server.

```
Setup can configure apache to use SSL using a certificate issued
from the internal CA. Do you wish Setup to configure that, or prefer to
perform that manually? (Automatic, Manual) [Automatic]:
```

Enter Automatic to generate a self-signed SSL certificate for the web server. Only use self-signed certificates for testing purposes.

Enter Manual to provide the location of the SSL certificate and private key to use the web server.

Data Warehouse Sampling Scale

```
Please choose Data Warehouse sampling scale:
(1) Basic
(2) Full
(1, 2)[1]:
```

Set the Data Warehouse sampling scale, either Basic or Full. This step is skipped the Data Warehouse is not configured to run on the Manager host.

Enter 1 for Basic, which reduces the values of `DWH_TABLES_KEEP_HOURLY` to `720` and `DWH_TABLES_KEEP_DAILY` to `0`. Enter 2 for Full.

If the Manager and the Data Warehouse run on the same host, Basic is the recommended sample scale because this reduces the load on the Manager host. Full is recommended only if the Data Warehouse runs on a remote host.

The Full sampling scale is a technology preview feature.

Grafana

```
Use Engine admin password as initial Grafana admin password (Yes, No) [Yes]:
```

Grafana can be configured to to use the Engine password to make signing in easier.

Logging in to the Administration Portal

After you run the engine-setup command to configure Oracle Linux Virtualization Manager, you should log into the Administration Portal to verify that the configuration was successful.

Preparing to Log in

It is recommended that you use the latest version one of the following browsers to access the Administration Portal

- Mozilla Firefox
- Google Chrome
- Apple Safari
- Microsoft Internet Explorer 11
- Microsoft Edge

If Oracle Linux Virtualization Manager was configured to use a self-signed SSL certificate, or an SSL certificate that is signed by a Certificate Authority (CA) that is not trusted by the browser (for example an Intermediate CA), you should install the CA certificate in the browser. Consult your browser's instructions for how to import a CA certificate.

You can download the CA certificate by clicking *Engine CA Certificate* on the Welcome dashboard or by navigating directly to `http://`***manager-fqdn***`/ovirt-engine/services/pki-resource?resource=ca-certificate&format=X509-PEM-CA`.

Usually you access the Administration Portal using the fully qualified domain name of the Manager host that you provided during installation. However, you can access the Administration Portal using an alternate host name(s). To do this, you need to add a configuration file to the Manager as follows:

1. Log in to the Manager host as root.
2. Create the file `/etc/ovirt-engine/engine.conf.d/99-custom-sso-setup.conf` with the following content:

   ```
   SSO_ALTERNATE_ENGINE_FQDNS="alias1.example.com alias2.example.com"
   ```

   The list of alternate host names must be separated by spaces.
3. Restart Oracle Linux Virtualization Manager.

   ```
   # systemctl restart ovirt-engine
   ```

Logging in

You log in to the Administration Portal using a web browser and the default admin@internal user.

1. Go to `https://`***manager-fqdn***`/ovirt-engine`. The **Welcome** page displays.
2. **(Optional)** Change the preferred language from the drop-down list on the **Welcome** page.

   You can view the **Administration Portal** in multiple languages. The default language is based on the locale of your web browser.
3. Click **Administration Portal**. The **Login** page displays.
4. Enter `admin` for the **Username** and the password you specified when you configured the Manager.
5. From the **Profile** list, select `internal` and click **Log In**.

> **Important:**
>
> From the Welcome dashboard, you also have the option of logging into two additional portals:
>
> - The VM Portal
> - The Monitoring Portal
>
> For more information, see Access Portals in the Oracle Linux Virtualization Manager: Architecture and Planning Guide

Next Steps

Now that you have configured and logged into the Manager, the next step is to add Oracle Linux KVM hosts, as described in Configuring a KVM Host.

You also need to add storage and configure logical networks. See Adding Storage and Creating a Logical Network.

Logging Out

To log out of the **Administration Portal**, click the person icon in the header bar and click **Sign Out**. You are returned to the **Login** page.

Configuring a KVM Host

Prepare and add a KVM host installed with Oracle Linux 8.5 (or later). For detailed information on the supported guest operating systems, see the Oracle® Linux: KVM User's Guide.

To manage an Oracle Linux KVM host using Oracle Linux Virtualization Manager, prepare the KVM host by performing a fresh installation of Oracle Linux 8.5 (or later) and enabling the required repositories, and then you add the host to a data center using the Administration Portal.

Preparing a KVM Host

Before you can add an Oracle Linux KVM host, prepare it by performing a fresh installation of Oracle Linux 8.5 (or later) and enabling the required repositories. You can download the installation ISO for Oracle Linux 8.5 (or later) from the Oracle Software Delivery Cloud at https://edelivery.oracle.com.

1. Install Oracle Linux 8.5 (or later) on the host.
   - Follow the instructions in the Oracle® Linux 8: Installing Oracle Linux.
   - Select **Minimal Install** as the base environment for the installation.

     > **Caution:**
     >
     > Do **NOT** select any other base environment than **Minimal Install** for the installation or your hosts will have incorrect qemu and libvirt versions, incorrect repositories configured, and no access to virtual machine consoles.

   - Do not install any additional packages until after you have added the host to the Manager, because they may cause dependency issues.
2. **(Optional)** If you use a proxy server for Internet access, configure Yum with the proxy server settings. For more information, see the Oracle® Linux: Managing Software on Oracle Linux.
3. Complete one of the following sets of steps:
   - **For ULN registered hosts or using Oracle Linux Manager**

Subscribe the system to the required channels.

a. For ULN registered hosts, log in to https://linux.oracle.com with your ULN user name and password. For Oracle Linux Manager registered hosts, access your internal server URL.

b. On the Systems tab, click the link named for the host in the list of registered machines.

c. On the System Details page, click **Manage Subscriptions**.

d. On the System Summary page, select each required channel from the list of available channels and click the right arrow to move the channel to the list of subscribed channels. Subscribe the system to the following channels:

   - `ol8_x86_64_baseos_latest`
   - `ol8_x86_64_appstream`
   - `ol8_x86_64_kvm_appstream`
   - `ol8_x86_64_ovirt44`
   - `ol8_x86_64_ovirt44_extras`
   - `ol8_x86_64_gluster_appstream`
   - **(For VDSM)** `ol8_x86_64_UEKR7`

e. Click **Save Subscriptions**.

f. Disable the virt:ol module and enable the virt:kvm_utils2 module.

```
# dnf -y module disable virt:ol

# dnf -y module enable
virt:kvm_utils2
```

- **For Oracle Linux yum server configured KVM hosts**

  Install the Oracle Linux Virtualization Manager Release 4.4 package and enable the required repositories.

  > **Note:**
  >
  > Installing the Oracle Linux Virtualization Manager Release 4.4 package configures an Oracle Linux KVM host; it does not install the Manager.

  a. **(Optional)** Make sure the host is using the modular yum repository configuration. For more information, see Getting Started with Oracle Linux Yum Server.

  b. Enable the ol8_baseos_latest repository.

```
# dnf config-manager --enable ol8_baseos_latest
```

> **Important:**
>
> Before you execute **dnf config-manager** ensure the **dnf-utils** package is installed on your system. For more information, see Yum DNF in Oracle® Linux: Managing Software on Oracle Linux.

c. Install the Oracle Linux Virtualization Manager Release 4.4 package.

```
# dnf install oracle-ovirt-release-el8
```

d. Use the dnf command to verify that the required repositories are enabled.

   i. Clear the dnf cache.

   ```
   # dnf clean all
   ```

   ii. List the configured repositories and verify that the required repositories are enabled.

   ```
   # dnf repolist
   ```

   The following repositories must be enabled:

   – `ol8_64_baseos_latest`

   – `ol8_appstream`

   – `ol8_kvm_appstream`

   – `ol8_ovirt44`

   – `ol8_ovirt44_extras`

   – `ol8_gluster_appstream`

   – **(For VDSM)** `ol8_UEKR7`

   iii. If a required repository is not enabled, use the dnf config-manager to enable it.

   ```
   # dnf config-manager --enable repository
   ```

4. **(Optional)** Open the Cockpit port.

   ```
   # firewall-cmd --zone=public --add-port=9090/tcp
   ```

   The Cockpit web interface can be used to monitor the host’s resources and to perform administrative tasks. You can access the host's Cockpit web interface from the Administration Portal or by connecting directly to the host.

   For more information about configuring `firewalld`, see Configuring a Packet Filtering Firewall in the Oracle® Linux 8: Configuring the Firewall.

5. **(Optional)** Complete the previous steps to prepare additional KVM hosts.

The Oracle Linux KVM host is now ready to be added to the Manager using the Administration Portal.

Adding a KVM Host

Once you have configured an Oracle Linux KVM host, you use the Administration Portal to add the host to a data center so that it can be used to run virtual machines. You can follow the steps below to add KVM hosts installed with other supported guest operating systems.

> **Note:**
>
> When you install Oracle Linux Virtualization Manager, a data center and cluster named Default is created. You can rename and configure this data center and cluster, or you can add new data centers and clusters, to meet your needs. See the Data Centers and Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide for details of how to do this.

To add an Oracle Linux KVM host:

1. Log in to the Administration Portal.

   See Logging in to the Administration Portal for details.

2. Go to **Compute** and then click **Hosts**.

3. On the **Hosts** pane, click **New**.

   The **New Host** dialog box opens with the **General** tab selected on the sidebar.

4. From the **Host Cluster** drop-down list, select the data center and host cluster for the host.

   The **Default** data center is auto-selected.

   For the example scenario in Quick Start, you use the default data center and cluster. If you want to create a new data center or a new cluster, refer to the Data Centers or Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide.

5. In the **Name** field, enter a name for the host.

6. In the **Hostname** field, enter the fully-qualified domain name or IP address of the host.

7. In the **SSH Port** field, change the standard SSH port 22 if the SSH server on the host uses a different port.

8. Under **Authentication**, select the authentication method to use.

   Oracle recommends that you select **SSH PublicKey** authentication. If you select this option, copy the key displayed in the **SSH PublicKey** field to the `/root/.ssh/authorized_keys` file on the host.

   Otherwise, enter the root user's password to use password authentication.

9. **(Optional)** Configure other settings for the host from the other tabs on the **New Host** sidebar.

   > **Note:**
   >
   > If you do not want to set any other configuration options now, you can always make changes later by selecting a host from the **Hosts** pane and clicking **Edit**.

10. Click **OK**.

    The **Power Management Configuration** screen is displayed.

11. If you do not want to configure power management, click **OK**. Otherwise, click **Configure Power Management**. See Configuring Power Management and Fencing on a Host for more information.

    The host is added to the list of hosts in the Manager. While the Manager is installing the host agent (VDSM) and other required packages on the host, the status of the host is shown as **Installing**. You can view the progress of the installation in the Hosts details pane. When the installation is complete, the host status changes to **Up**.

12. **(Optional)** Complete the previous steps to add more KVM hosts to the Manager.

> **Important:**
>
> Oracle Linux Virtualization Manager allows you to overallocate a KVM host's memory and CPU resources. As the KVM host itself also needs memory and CPU in order to run, Oracle recommends that you reserve some memory and CPU for the KVM host. To do this, go to **Administration** and set a memory quota and a vCPU quota.

Now that you have your engine and host(s) configured, you can complete other configuration and administrative tasks. See Quick Start for information on configuring your environment with storage, networks, virtual machines and learn how to create templates and back up your environment. See the Oracle Linux Virtualization Manager: Administration Guide for more detailed configuration and administrative tasks.

4 Quick Start

To get you started with Oracle Linux Virtualization Manager, the following example scenario walks you through the procedures for adding hosts, adding storage, setting up a network, creating virtual machines, and backing up and restoring the Manager.

Before You Begin

Before you begin the quick start tasks, you should be familiar with the concepts that are presented in the Oracle Linux Virtualization Manager: Architecture and Planning Guide and ensure the following prerequisites are met.

- The procedures in this section assume that you have installed and configured Oracle Linux Virtualization Manager in your environment. For more information, refer to Installation and Configuration.
- For tasks that must be completed in the Manager, the procedures in this emphasisde assume that you are logged in to the Administration Portal.
- Oracle Linux Virtualization Manager creates a default data center and cluster during installation. For the purpose of this example scenario, the default data center and cluster are used. For the procedures to create new data centers or a new clusters, refer to Clusters in the Oracle Linux Virtualization Manager: Administration Guide.
- For Adding a KVM Host to the Manager, you must have access to a host that you can add to your virtualization environment and it must be appropriately prepared. See Preparing a KVM Host.
- For Adding Storage, an Internet Small Computer System Interface (iSCSI) storage device is used for the example scenario. If you do not have access to an iSCSI device, refer to Storage in the Oracle Linux Virtualization Manager: Administration Guide for the procedures for adding other storage types to your virtualization environment.
- For Uploading Images to the Data Domain, the `ovirt-engine` certificate must be registered as a valid CA in the browser to connect to the `ovirt-imageio-service`.
- In Creating a New Virtual Machine:
  - The procedures for creating an Oracle Linux virtual machine assume you are using an Oracle Linux 7 guest operating system.

    > **Note:**
    >
    > For detailed information on the supported guest operating systems, see the Oracle® Linux: KVM User's Guide.

  - The procedures for creating Oracle Linux and Microsoft Windows virtual machines assume that you have added the ISO images to the data domain on the storage device used in Adding Storage.

> **Important:**
>
> See See *Windows Virtual Machines Lose Functionality Due To Deprecated Guest Agent* in the *Known Issues* section of the Oracle Linux Virtualization Manager: Release Notes.

– To use the console to access a virtual machine, you must install the Remote Viewer application on the client from which you want to access. This application provides users with a graphical console for connecting to virtual machines.

1. Install the `virt-viewer` package.

```
# dnf install virt-viewer
```

2. Restart your browser for the changes to effect in the Oracle Linux Virtualization Manager.

Adding a KVM Host to the Manager

To add a KVM host to the Manager, follow the procedure for Adding a KVM Host.

Adding Storage

For this example scenario, you attach an iSCSI storage to your virtualization environment and then upload an ISO image to the data domain. If you do not have access to an iSCSI device, refer to Storage in the Oracle Linux Virtualization Manager: Administration Guide for the procedures for adding other storage types to your virtualization environment.

Attaching an iSCSI Data Domain

For iSCSI storage, a storage domain is created from a volume group that is composed of pre-existing LUNs.

To attach an iSCSI data domain to your virtualization environment:

1. Go to **Storage** and then click **Domains**.

   The **Storage Domains** pane opens.

2. Click **New Domain**.

   The **New Domain** dialog box opens.

3. From the **Data Center** drop-down list, select the data center for which to attach the data domain.

   The **Default** data center is pre-selected in the drop-down list. Leave **Default** selected from the drop-down list because the default data center and cluster are used for the example scenario.

   For the procedures to create new data centers or a new clusters, refer to Data Centers or Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide.

4. For the **Name** field, enter a name for the data domain.

5. From the **Domain Function** drop-down list, select the domain function. By default, the **Data** option is selected in the drop-down list.

   For this step, leave **Data** as the domain function because you are creating a data domain in this example.

6. From the **Storage Type** drop-down list, select **iSCSI**.

7. From the **Host** drop-down list, select the host for which to attach the data domain.

   For this example scenario, select the host added in Adding a KVM Host to the Manager.

8. When **iSCSI** is selected for the **Storage Type**, the **Discover Targets** dialog box opens and the **New Domain** dialog box automatically displays the known targets with unused LUNs under the **Target Name** column.

   If the target from which you are adding storage is not listed, complete the following fields in the **Discover Targets** dialog box:

   a. For the **Address** field, enter fully qualified domain name or IP address of the iSCSI host on the storage array.

   b. For the **Port** field, enter the port to connect to on the host when browsing for targets. By default, this field is automatically populated with the default iSCSI Port, **3260**.

   After completing these fields, click **Discover**.

   The **Target Name** column updates to list all the available targets discovered on the storage array.

9. Under the **Target Name** column, select the desired target and select the black right-directional arrow to log in to the target.

   The **Storage Domains** pane refreshes to list only the targets for which you logged in.

10. Click **+** to expand the desired target.

    The target expands to display all the unused LUNS.

11. Click **Add** for each LUN ID that is to connect to the target.

12. **(Optional**) Configure the advanced parameters.

    If you are using ZFS storage, you must uncheck the **Discard after Delete** option.

13. Click **OK**.

    You can click **Tasks** to monitor the various processing steps that are completed to attach the iSCSI data domain to the data center.

    After the iSCSI data domain has been added to your virtualization environment, you can then upload the ISO images that are used for creating virtual machines in Creating a New Virtual Machine.

Uploading Images to the Data Domain

Before using the Manager to upload images to the data domain, you must perform the following steps to ensure that the prerequisites for uploading images have been met on the Manager and KVM hosts.

Before You Begin

To ensure that the prerequisites for uploading images to the data domain have been met:

1. On the engine host, verify that the `ovirt-imageio` service has been configured and is running.

   ```
   # systemctl status ovirt-imageio.service
   ```

   When the service is running, the output displays as follows.

   ```
   # systemctl status ovirt-imageio.service
     ovirt-imageio.service - oVirt ImageIO
      Loaded: loaded (/usr/lib/systemd/system/ovirt-imageio.service; enabled;
      vendor preset: disabled)
      Active: active (running) since Mon 2019-03-25 13:12:29 PDT; 2 weeks 0
   days ago
    Main PID: 28708 (ovirt-imageio-p)
      CGroup: /system.slice/ovirt-imageio.service
              └─28708 /usr/bin/python2 /usr/bin/ovirt-imageio
   ...
   ```

   This service is automatically configured and is started when you run the engine-setup command during the installation of the Manager.

2. On the KVM host, verify that the `ovirt-imageio` service has been configured and is running. For example:

   ```
   # systemctl status ovirt-imageio-daemon
     ovirt-imageio-daemon.service - oVirt ImageIO Daemon
      Loaded: loaded (/usr/lib/systemd/system/ovirt-imageio-daemon.service;
   disabled;
      vendor preset: disabled)
      Active: active (running) since Wed 2019-03-27 18:38:36 EDT; 3 weeks 4
   days ago
    Main PID: 366 (ovirt-imageio-d)
       Tasks: 4
      CGroup: /system.slice/ovirt-imageio-daemon.service
              └─366 /usr/bin/python /usr/bin/ovirt-imageio-daemon

   Mar 27 18:38:36 myserver systemd[1]: Starting oVirt ImageIO Daemon...
   Mar 27 18:38:36 myserver systemd[1]: Started oVirt ImageIO Daemon.
   ```

3. Verify that the certificate authority has been imported into the web browser used to access the Manager by browsing to the following URL and enabling the trust settings: https://***engine_address***/ovirt-engine/services/pki-resource?resource=ca-certificate&format=X509-PEM-CA

4. Verify that you are using a browser that meets the browser requirement to access the Administration Portal.

   For more information, refer to the Logging in to the Administration Portal.

5. Proceed to Uploading an ISO Image to the Data Domain.

Uploading an ISO Image to the Data Domain

To upload an ISO image to data domain using the Manager:

1. Download or copy an ISO image file that you want to upload into your environment to a location on your desktop, laptop, or a system where the Manager is accessible from a Web browser.

2. Go to **Storage** and then click **Disks**.

   The **Disks** pane opens.

3. Click **Upload** and then select **Start** from the drop-down list.

   The **Upload Image** dialog box opens.

4. Click **Choose File** and navigate to the location where you saved the ISO image.
5. Complete the **Disk Options** section of the dialog box.
6. Ensure that the prerequisites have been met by clicking **Test Connection**.

   If the test returns a warning or error message, refer to Before You Begin to review the prerequisites.

7. Click **OK** to start uploading the ISO image.

   The status field on the **Disks** pane tracks the progress of the upload.

   After the ISO image upload is completed successfully, you can attach the image to virtual machines as CDROMs or use the image to boot virtual machines.

Creating a Logical Network

For this example scenario, you create a virtual machine network that you then assign to the KVM host added in Adding a KVM Host to the Manager. This network is used as the virtual machine network for the virtual machines created in Creating a New Virtual Machine.

> **Note:**
>
> If you plan to use VLANs on top of bonded interfaces, refer to the My Oracle Support (MOS) article *How to Configure 802.1q VLAN on NIC (Doc ID 1642456.1)* for instructions.

Creating a Virtual Machine Network

To create a virtual machine network:

1. Go to **Network** and then click **Networks**.
2. On the **Networks** pane, click **New**.

   The **New Logical Network** dialog box opens with the **General** tab selected on the sidebar.

3. From the **Data Center** drop-down list, select the Data Center for the network.

   By default, the **Default** option is selected in the drop-down list.

   For this step, leave **Default** selected from the drop-down list because the default data center and cluster are used in this example scenario.

   For the procedures to create new data centers or a new clusters, refer to Data Centers or Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide.

4. For the **Name** field, enter a name for the new network.
5. Leave the **VM Network** check box selected.

   Under the **Network Parameters** section, the **VM Network** check box is selected by default, which is left selected because a virtual machine network is being created in this example.

6. **(Optional)** Configure other settings for the new logical network from the other tabs on the **New Logical Network** sidebar.

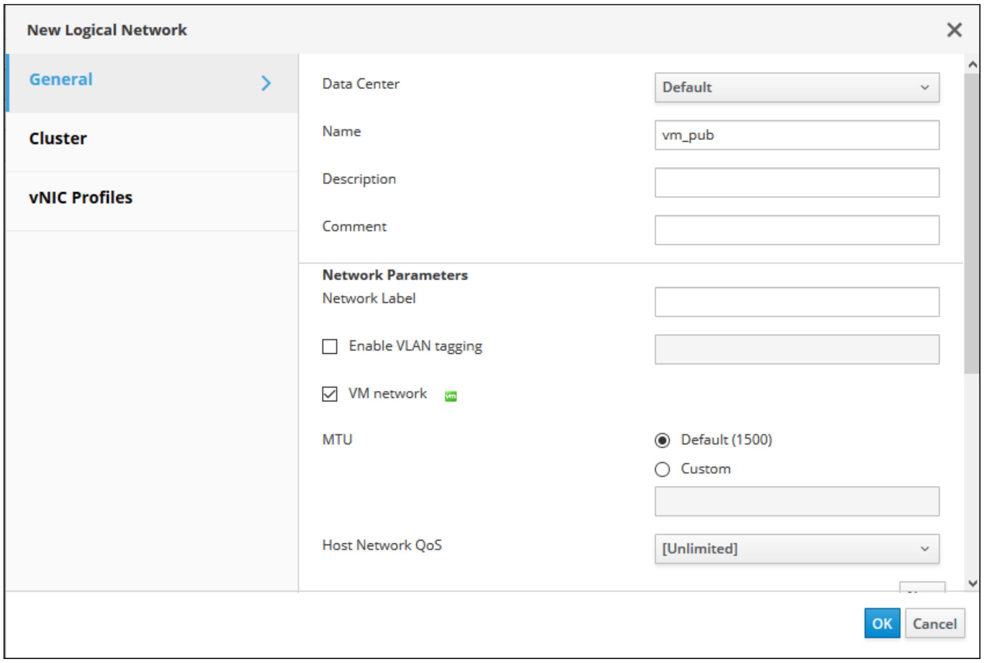
   The default settings are used for this example scenario.

7. Click **OK** to create the network.

   The following screenshot shows the **General** tab of the **New Logical Network** dialog box completed for the new logical network that is being created in this example:

   - From the **Data Center** drop-down list, the **Default** option is selected.
   - For the **Name** field, `vm_pub` is entered.
   - Under the **Network Parameters** section, the **VM Network** check box is selected.

Figure 4-1 New Logical Network Dialog Box: General Tab



New Logical Network

Data Center: Default

Name: vm_pub

Description:

Comment:

Network Parameters

Network Label:

☐ Enable VLAN tagging

☑ VM network

MTU: ● Default (1500) ○ Custom

Host Network QoS: [Unlimited]

Assigning the Virtual Machine Network to a KVM Host

To assign the virtual machine network to a KVM host:

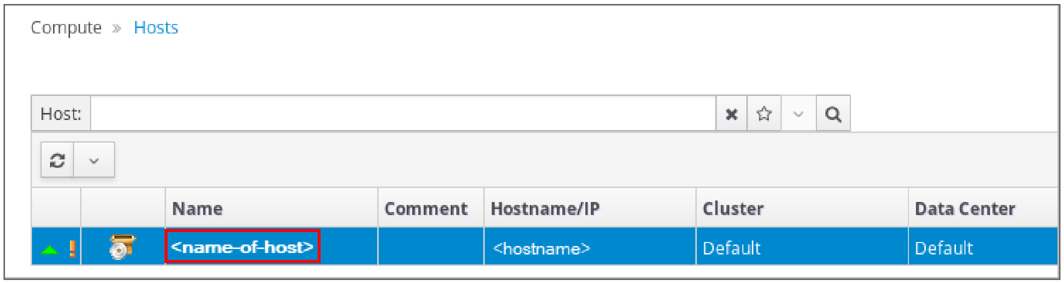
1. Go to **Compute** and then click **Hosts**.

   The **Hosts** pane opens.

2. Under the **Name** column, click the name of the host for which to add the network.

   The following screenshot shows the **Hosts** pane with the name of the host highlighted in a red rectangular box to emphasize where you need to click to set up a network on a host.

Figure 4-2 Hosts Pane



		Name	Comment	Hostname/IP	Cluster	Data Center
▲ !		<name-of-host>		<hostname>	Default	Default

After clicking the name of the host, the **General** tab opens with details about the host.

3. Click the **Network Interfaces** tab on the horizontal menu.

   The **Network Interfaces** tab opens with details about the network interfaces on the available host.

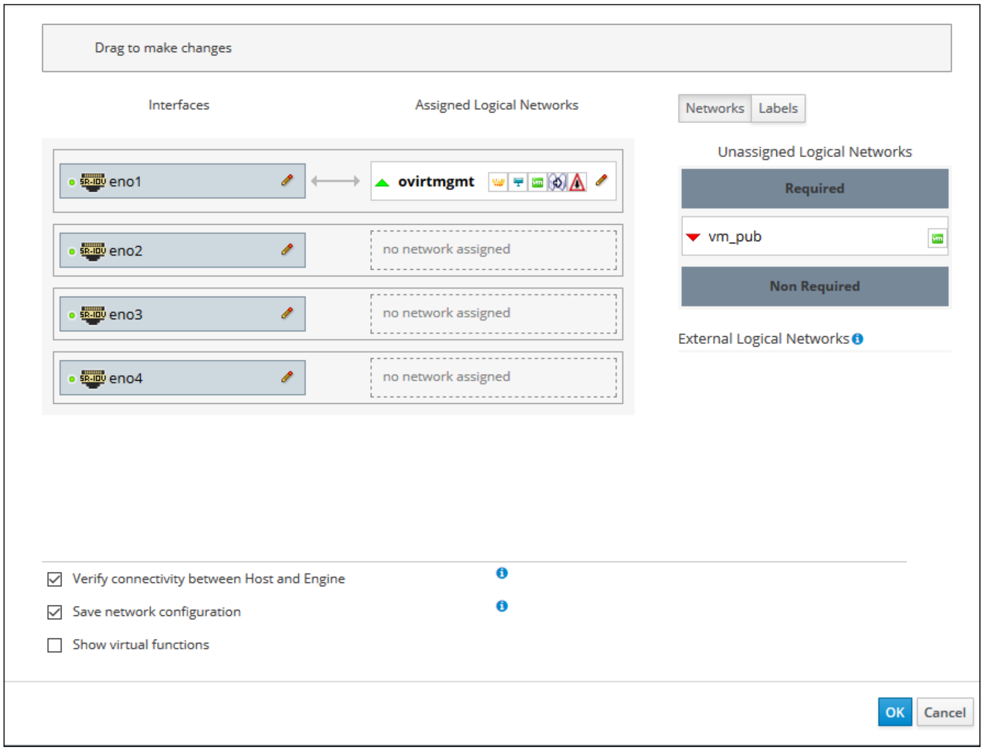
4. Highlight the network interface that you want to use for the network being added by clicking the row for the respective interface.

5. Click **Setup Host Networks**.

   The **Setup Host Networks** dialog box opens for the host. The physical interfaces on the host are listed under the **Interfaces** column and any logical networks assigned to the interface are displayed under the **Assigned Logical Networks** column. Unassigned logical networks are displayed under the **Unassigned Logical Networks** column.

   As shown in the following screenshot, the logical network created in Creating a Logical Network named `vm_pub` is displayed under the **Unassigned Logical Networks** column. In the next step, you assign this network to the network interface named `eno2`, which currently has no network assigned to it.

Figure 4-3 Setup Host Dialog Box: Unassigned Logical Networks



☑ Verify connectivity between Host and Engine

☑ Save network configuration

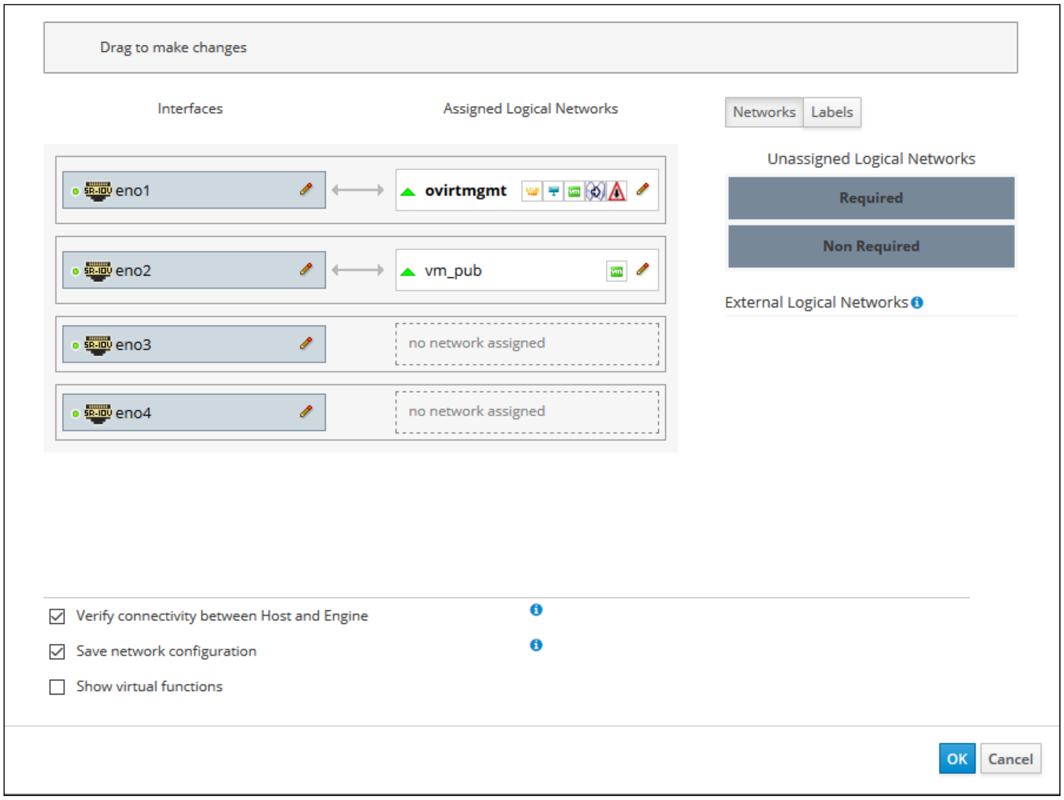
☐ Show virtual functions

6. Select the network you want to add from the **Unassigned Logical Networks** column by left-clicking the network and, while holding down the mouse, drag the network over to the box to the right of the available network interface where you want to add the network.

   Alternatively, you can right-click the network and select the available interface from a drop-down list.

   For this example, the logical network named `vm_pub` is assigned to the available network interface named `eno2`. As shown in the following screenshot, after dragging the network from **Unassigned Logical Networks** over to this interface, the network named `vm_pub` appears under the **Assigned Logical Networks** column as assigned to the network interface named `eno2`.

Figure 4-4 Setup Host Dialog Box: Assigned Logical Networks



☑ Verify connectivity between Host and Engine

☑ Save network configuration

☐ Show virtual functions

7. After editing the network settings, click **OK** to save the settings.
8. Click **OK** to add the network.

Creating a New Virtual Machine

Before creating new virtual machines for use in your virtualization environment, refer to Before You Begin for more information about the prerequisites for this example scenario.

> **Note:**
>
> In addition to creating virtual machines, you can import an Open Virtual Appliance (OVA) file into your environment from any host in the data center. For more information, see oVirt Virtual Machine Management in oVirt Documentation.

Installing Remote Viewer on Client Machine

A console is a UI that allows you to view and interact with a virtual machine similar to a physical machine. The default console is Remove Viewer application that provides users with a UI for connecting to virtual machines.

Before you begin a Linux or Windows installation, download the appropriate install package from the Virtual Machine Manager web site.

> **Note:**
>
> See See *Windows Virtual Machines Lose Functionality Due To Deprecated Guest Agent* in the *Known Issues* section of the Oracle Linux Virtualization Manager: Release Notes.

For more information, see Consoles in the Oracle Linux Virtualization Manager: Architecture and Planning Guide.

To install Remote Viewer on Linux:

1. Ensure you have downloaded the `virt-viewer` installation package.
2. Install the `virt-viewer` package using one of the following commands depending on your system.

   ```
   # yum install virt-viewer
   ```

   ```
   # dnf install virt-viewer
   ```

3. Restart your browser for the changes to take effect in the Oracle Linux Virtualization Manager.

You can now connect to your virtual machines using the VNC protocol.

To install Remote Viewer on Windows:

1. Ensure you have downloaded either the 32-bit or 64-bit `virt-viewer` installer depending on the architecture of your system.
2. Go to the folder where you saved the file and double-click the file.
3. If prompted with a security warning, click **Run**.
4. If prompted by User Account Control, click **Yes**.

Once installed, you can access Remote Viewer in the **VirtViewer** folder of **All Programs** from the **Start** menu.

Creating a New Oracle Linux Virtual Machine

For the example scenario, you create a new Oracle Linux virtual machine, install the Oracle Linux guest OS, and install the Linux guest agent for this Oracle Linux virtual machine.

> **Note:**
>
> For detailed information on the supported guest operating systems, see the Oracle® Linux: KVM User's Guide.

To create a new Oracle Linux virtual machine:

1. Go to **Compute** and then click **Virtual Machines**.

   The **Virtual Machines** pane opens with the list of virtual machines that have been created.

2. Click **New**.

   The **New Virtual Machine** dialog box opens with the **General** tab selected on the sidebar.

3. From the **Cluster** drop-down list, select the data center and host cluster for the new host.

   By default, the **Default** option is selected in the drop-down list.

   For this step, leave **Default** selected from the drop-down list because the default data center and cluster are used in this example scenario. For the procedures to create new data centers or a new clusters, refer to Data Centers or Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide.

4. From the **Operating System** drop-down list, select the operating system for the virtual machine.

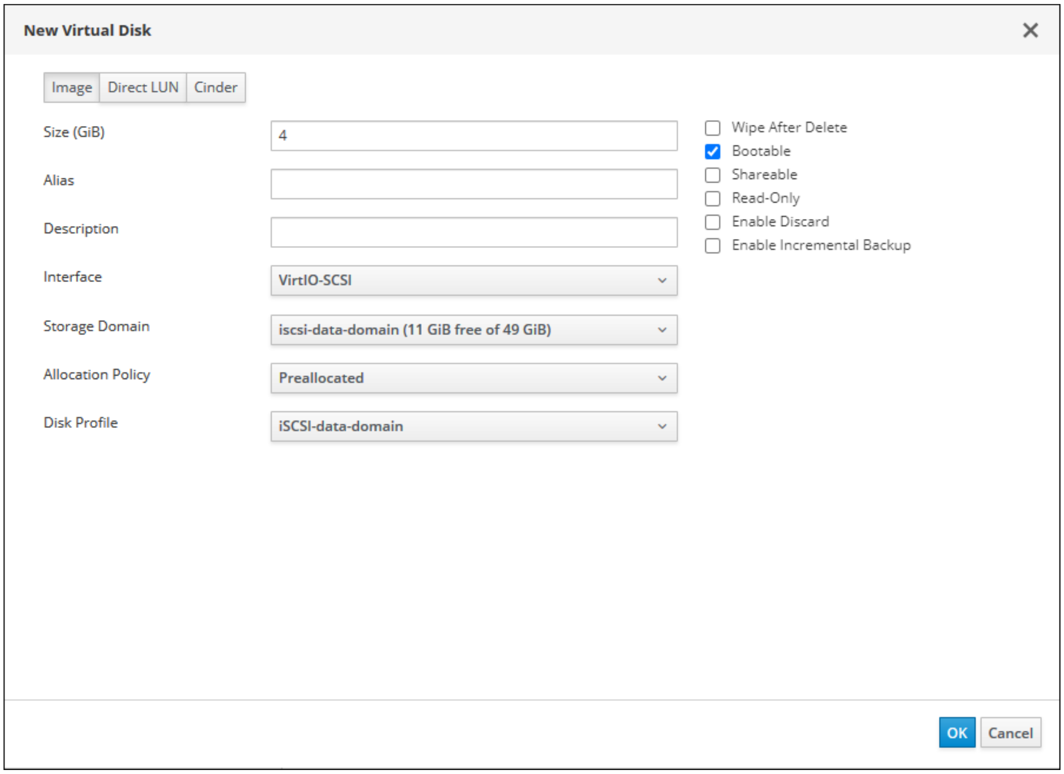
5. For the **Name** field, enter a name for the new virtual machine.

6. Under **Instance Images**, add storage to the virtual machine by either using an existing virtual disk or creating a new virtual desk.

   - To use an existing virtual disk, click **Attach** and select the virtual disk to use for the virtual machine storage. Then click **OK**.
   - To create a new virtual disk, click **Create** and update the fields for the virtual machine storage or accept the default settings. Then click **OK**.

   For the example scenario, all of the default settings are accepted for the new virtual disk that is being created, except the **Size (GiB)** field, which is set to `4`. The following screenshot shows the **New Virtual Disk** dialog box for the Oracle Linux virtual machine being created in this example scenario.

Figure 4-5   New Virtual Disk Dialog Box



New Virtual Disk

Size (GiB): 4

Alias:

Description:

Interface: VirtIO-SCSI

Storage Domain: iscsi-data-domain (11 GiB free of 49 GiB)

Allocation Policy: Preallocated

Disk Profile: iSCSI-data-domain

☐ Wipe After Delete
☑ Bootable
☐ Shareable
☐ Read-Only
☐ Enable Discard
☐ Enable Incremental Backup

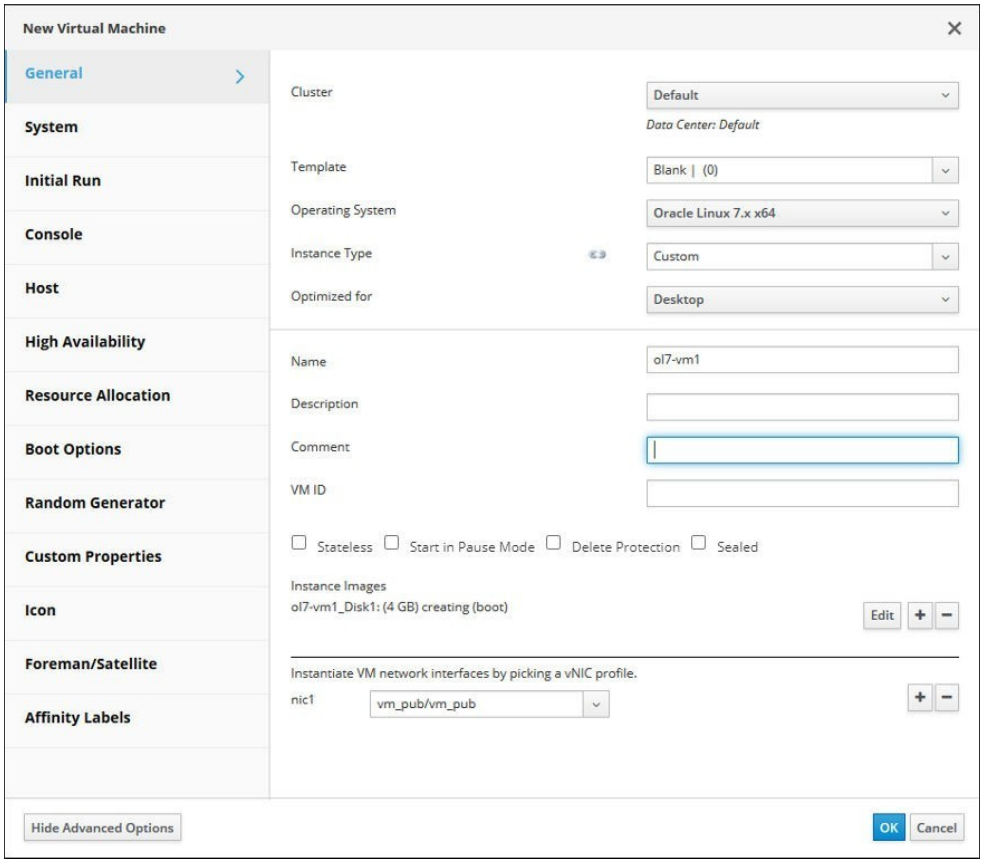
7. Connect the virtual machine to a network by adding a network interface. To do that, select the vNIC profile created in Creating a Logical Network from the **nic1** drop-down list.

   For information about customizing vNICs, refer to Customizing vNIC Profiles for Virtual Machines in the Oracle Linux Virtualization Manager: Administration Guide.

   The following screenshot shows the **General** tab open on the **New Virtual Machine** dialog box for the new Oracle Linux virtual machine being created in this example scenario. In the dialog box, the following key fields are completed:

   - From the **Cluster** drop-down list, the **Default** option is selected.
   - For the **Operating System** drop-down list, **Oracle Linux 7.x x64** is selected.
   - For the **Name** field, `ol7-vm1` is entered.
   - Under **Instance Images**, a virtual disk named `ol7-vm1_Disk1` is being created, which has been set to a size of `4GB`.
   - From the **nic1** drop-down list, the logical network named `vm_pub` is selected.

Figure 4-6   New Virtual Machine Dialog Box



Cluster: Default
Data Center: Default
Template: Blank | (0)
Operating System: Oracle Linux 7.x x64
Instance Type: Custom
Optimized for: Desktop
Name: ol7-vm1
Description:
Comment:
VM ID:
☐ Stateless ☐ Start in Pause Mode ☐ Delete Protection ☐ Sealed
Instance Images
ol7-vm1_Disk1: (4 GB) creating (boot)
Instantiate VM network interfaces by picking a vNIC profile.
nic1: vm_pub/vm_pub

8. Click **Show Advanced Options** to display additional configuration options available for the new virtual machine.
9. **(Optional)** Click the **System** tab on the sidebar to adjust the CPU and memory size for the virtual machine from the defaults.

   For this example scenario the default values are used:

- For **Memory Size** field, the default value of `1024 MB` is used.
- For the **Maximum memory** field, the default value of `4096 MB` is used.
- For the **Total Virtual CPUs** field, the default value of `1` is used.

10. Click **OK** to create the virtual machine.
11. Proceed to Installing the Oracle Linux Guest OS.

Installing the Oracle Linux Guest OS

To install the Oracle Linux 7 guest OS for this example scenario:

1. From the **Virtual Machines** pane, select the virtual machine created in Creating a New Oracle Linux Virtual Machine.
2. Using the down arrow next to **Run**, select **Run Once**.
3. Attach your ISO file, for example **OracleLinux-R7-U6-Server-x86_64-dvd.iso**, and click **OK**.
4. Click **Console** to open a console to the virtual machine.

   If you have not installed the Remote Viewer application, refer to Before You Begin.
5. Install the Oracle Linux guest OS.

   Refer to the Oracle® Linux 7: Installation Guide for more information on how to install Oracle Linux.
6. When the installation completes, reboot the virtual machine.
7. **(Optional)** If you use a proxy server for Internet access, configure Yum with the proxy server settings. For more information about configuring `firewalld`, see Configuring a Packet Filtering Firewall in the Oracle® Linux 8: Configuring the Firewall.
8. **(Optional)** If you are using yum to update the host, make sure the host is using the modular yum repository configuration. For more information, see Getting Started with Oracle Linux Yum Server.
9. Proceed to Installing the Oracle Linux Guest Agent.

Installing the Oracle Linux Guest Agent

To install the Oracle Linux guest agent for this example scenario, follow the Oracle Linux 7 parts of the steps below.

1. Open a console session for the Oracle Linux guest and log in to the terminal.
2. Install the latest guest agent package.

   (**Example scenario**) For Oracle Linux 8 guests:

   ```
   # dnf config-manager --enable ol8_appstream
   # dnf install qemu-guest-agent
   ```

   For Oracle Linux 7 guests:

   ```
   # yum install yum-utils -y
   # yum-config-manager --enable ol7_latest
   # yum install qemu-guest-agent
   ```

   For Oracle Linux 6 guests:

```
# yum install yum-utils -y
# yum-config-manager --enable ol6_latest
# yum install qemu-guest-agent
```

For Oracle Linux 5 guests:

```
# yum install yum-utils -y
# yum install http://yum.oracle.com/repo/OracleLinux/OL7/ovirt42/x86_64/
getPackage/ \
  ovirt-guest-agent-1.0.13-2.el5.noarch.rpm
```

3. Start the guest agent service for the Oracle Linux guest.

   (**Example scenario**) For Oracle Linux 8 and Oracle Linux 7 guests:

   ```
   # systemctl start qemu-guest-agent.service
   ```

   For Oracle Linux 6 guests:

   ```
   # service qemu-ga enable
   # service qemu-ga start
   ```

   For Oracle Linux 5 guests:

   ```
   # service ovirt-guest-agent enable
   # service ovirt-guest-agent start
   ```

4. **(Optional)** Enable an automatic restart of the guest agent service when the virtual machine is rebooted.

   (**Example scenario**) For Oracle Linux 8 and Oracle Linux 7 guests:

   ```
   # systemctl enable qemu-guest-agent.service
   ```

   For Oracle Linux 6 guests:

   ```
   # chkconfig qemu-ga on
   ```

   For Oracle Linux 5 guests:

   ```
   # chkconfig ovirt-guest-agent on
   ```

Creating a New Microsoft Windows Virtual Machine

For the example scenario, you create a new Microsoft Windows virtual machine, install the Microsoft Windows guest OS, install the VirtIO drivers and install the QEMU guest agent.

Before You Begin

Before creating Microsoft Windows virtual machines, ensure the following prerequisites are met.

Obtain the Oracle VirtIO Drivers for Microsoft Windows.

1. Download Oracle VirtIO Drivers for Microsoft Windows to the Manager host from Oracle Software Delivery Cloud or My Oracle Support (MOS). Refer to Oracle VirtIO Drivers for Microsoft Windows for Use With KVM for more information.
2. Upload the Oracle VirtIO Drivers for Microsoft Windows ISO image to an Oracle Linux Virtualization Manager storage domain. Refer to Uploading an ISO Image to the Data Domain for more information.

Download the QEMU guest agent to the Manager host.

- **For ULN registered hosts or using Oracle Linux Manager**, download `qemu-ga-win` from the *oVirt Release 4.4 on Oracle Linux 8 (x86_64) - Extra* channel.
- **For Oracle Linux yum server configured KVM hosts**, download `qemu-ga-win` from the Oracle Linux 8 (x86_64) oVirt 4.4 Extra repository.

Creating a New Microsoft Windows Virtual Machine

To create a new Microsoft Windows virtual machine:

1. Go to **Compute** and then click **Virtual Machines**.

   The **Virtual Machines** pane opens with the list of virtual machines that have been created.

2. Click **New**.

   The **New Virtual Machine** dialog box opens with the **General** tab selected on the sidebar.

3. From the **Cluster** drop-down list, select the data center and host cluster for the new host.

   By default, the **Default** option is selected in the drop-down list.

   For this step, leave **Default** selected from the drop-down list because the default data center and cluster are used in this example scenario. For the procedures to create new data centers or a new clusters, refer to Data Centers or Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide.

4. From the **Operating System** drop-down list, select the appropriate Microsoft Windows operating system for the virtual machine.

5. For the **Name** field, enter a name for the new virtual machine.

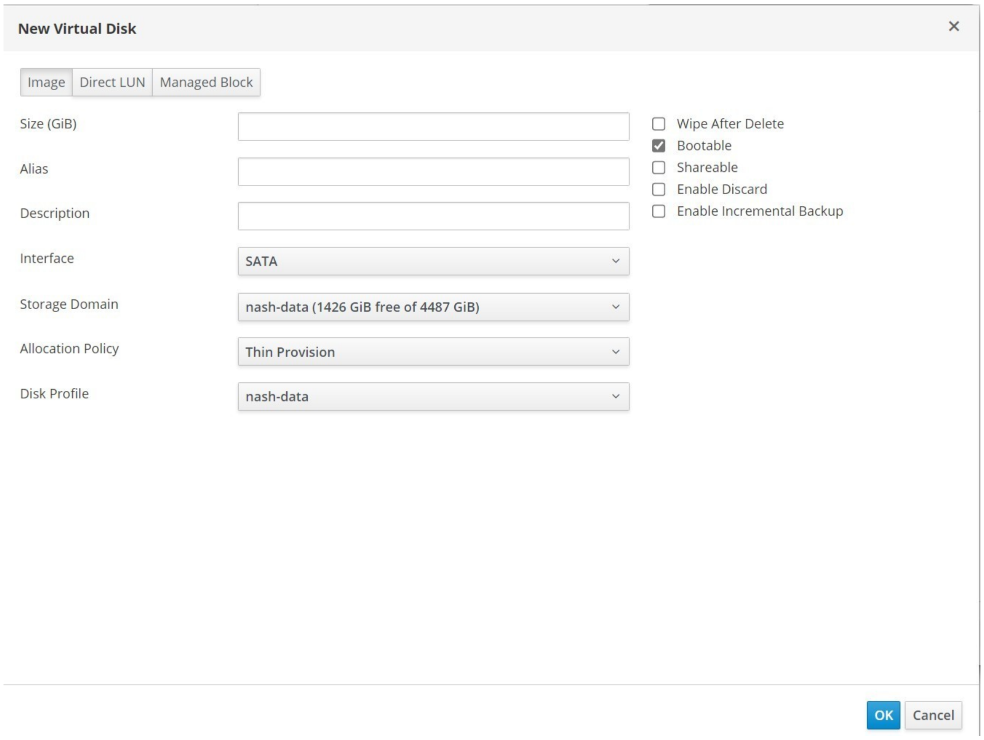
6. Under **Instance Images**, add storage to the virtual machine by either using an existing virtual disk or creating a new virtual desk.

   - To use an existing virtual disk, click **Attach** and select the virtual disk to use for the virtual machine storage. Then click **OK**.
   - To create a new virtual disk, click **Create** and update the fields for the virtual machine storage or accept the default settings. Then click **OK**.

   The following screenshot shows the **New Virtual Disk** dialog box for the Oracle Linux virtual machine being created in this example scenario. In the dialog box, the following key fields are completed:

   - For the **Size (GiB)** field, a value of `12` is entered.
   - From the **Interface** drop-down list, **SATA** is selected.
   - From the **Allocation Policy** drop-down list, **Thin Provision** is selected.

Figure 4-7 New Virtual Disk Dialog Box


New Virtual Disk ×

Size (GiB)

Alias

Description

Interface: SATA

Storage Domain: nash-data (1426 GiB free of 4487 GiB)

Allocation Policy: Thin Provision

Disk Profile: nash-data

□ Wipe After Delete
☑ Bootable
□ Shareable
□ Enable Discard
□ Enable Incremental Backup

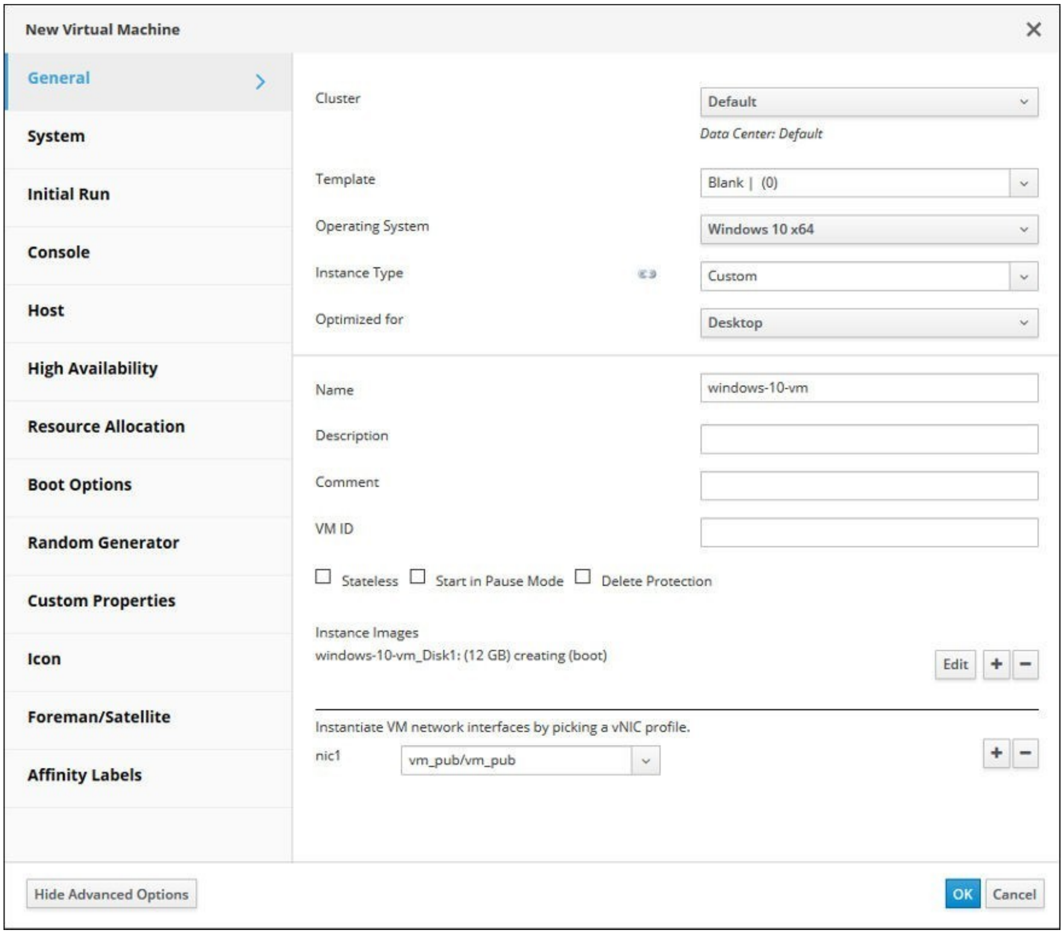
7. Connect the virtual machine to a network by selecting the vNIC profile created in Creating a Logical Network from the **nic1** drop-down list.

   For information about customizing vNICs, refer to Customizing vNIC Profiles for Virtual Machines in the Oracle Linux Virtualization Manager: Administration Guide.

   The following screenshot shows the **General** tab on **New Virtual Machine** dialog box for the new Microsoft Windows virtual machine that is being created in this example scenario. In the dialog box, the following key fields are completed:

   - From the **Cluster** drop-down list, the **Default** option is selected.
   - For the **Operating System** drop-down list, `Windows 10 x64` is selected.
   - For the **Name** field, `windows-10-vm` is entered.
   - Under **Instance Images**, a virtual disk named `windows-10-vm_Disk1` is being created, which has been set to a size of `12GB`.
   - From the **nic1** drop-down list, the logical network named `vm_pub` is selected.

Figure 4-8 New Virtual Machine Dialog Box - General Tab



Cluster: Default
Data Center: Default

Template: Blank | (0)

Operating System: Windows 10 x64

Instance Type: Custom

Optimized for: Desktop

Name: windows-10-vm

Description:

Comment:

VM ID:

□ Stateless □ Start in Pause Mode □ Delete Protection

Instance Images
windows-10-vm_Disk1: (12 GB) creating (boot)

Instantiate VM network interfaces by picking a vNIC profile.

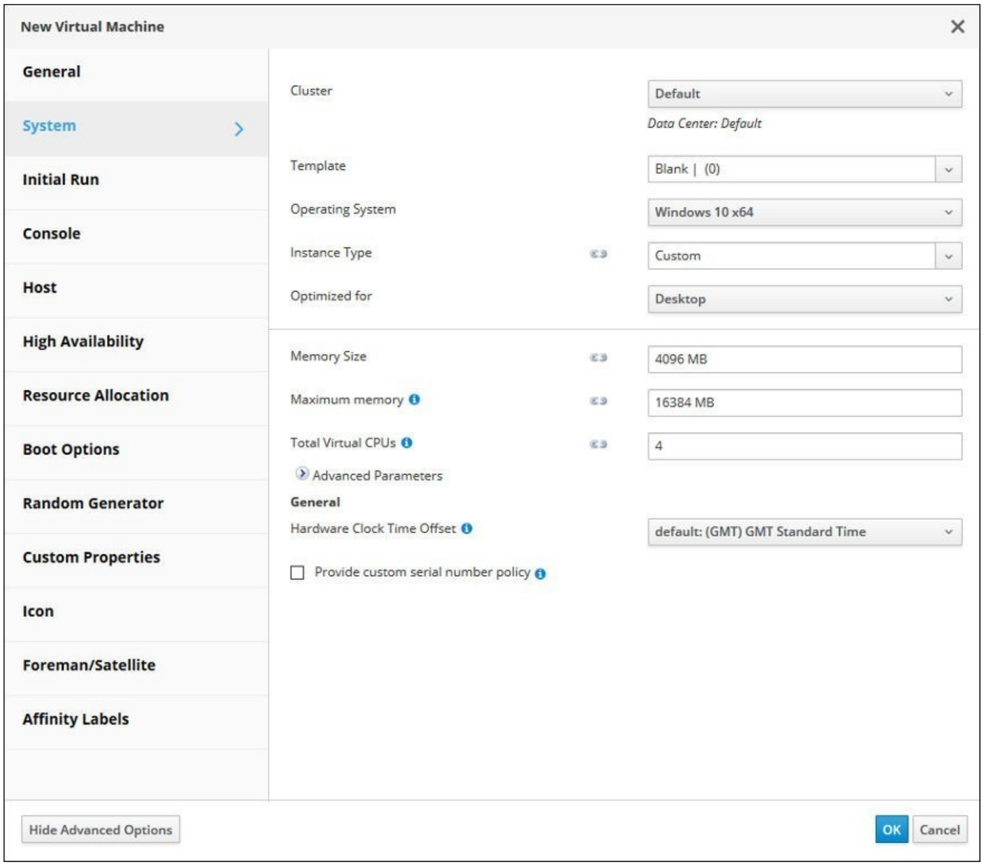
nic1: vm_pub/vm_pub

8. Click the **System** tab on the sidebar to adjust the memory size for the virtual machine from the defaults.

   In this example, change the **Memory Size** field to `4096 MB` and the **Total Virtual CPUs** field to `4`.

   The following screenshot shows the **System** tab on **New Virtual Machine** dialog box for the new Microsoft Windows virtual machine that is being created in this example scenario. In the dialog box, the following key fields are completed:

Figure 4-9   New Virtual Machine Dialog Box - System Tab



Cluster: Default
Data Center: Default
Template: Blank | (0)
Operating System: Windows 10 x64
Instance Type: Custom
Optimized for: Desktop
Memory Size: 4096 MB
Maximum memory: 16384 MB
Total Virtual CPUs: 4
Advanced Parameters
General
Hardware Clock Time Offset: default: (GMT) GMT Standard Time
□ Provide custom serial number policy

- The **Memory Size** field is changed to `4096 MB`.
- The **Maximum memory** field automatically updates to `16384 MB` when the **Memory Size** field is changed to `4096 MB`.
- The **Total Virtual CPUs** field is changed to `4`.

9. Click **OK** to create the virtual machine.
10. Proceed to Installing the Microsoft Windows Guest OS.

Installing the Microsoft Windows Guest OS

To install the Microsoft Windows guest OS:

1. From the **Virtual Machines** pane, select the virtual machine created in Creating a New Microsoft Windows Virtual Machine.
2. Using the down arrow next to **Run**, select **Run Once**.
3. Attach your ISO file and click **OK**.
4. Click **Console** to open a console to the virtual machine.

   If you have not installed the Remote Viewer application, refer to Before You Begin.
5. Install the Microsoft Windows guest OS.

Refer to the applicable Microsoft Windows documentation for instructions on how to install the operating system.

6. When the installation completes, reboot the virtual machine.
7. Proceed to installing the VirtIO drivers and QEMU guest agent.

Installing the VirtIO Drivers

Before attempting to install the Oracle VirtIO Drivers for Microsoft Windows on a new Microsoft Windows virtual machine, ensure that you have downloaded the drivers onto the Manager host and uploaded the ISO image to an Oracle Linux Virtualization Manager storage domain. For more information, see the prerequisites.

To install the Oracle VirtIO Drivers for Microsoft Windows:

1. After you finish installing the Microsoft Windows guest OS, return to the **Virtual Machines** pane, highlight the row for this virtual machine, and click **Edit**.

   The **Edit Virtual Machines** dialog box opens.
2. Click the **Boot Options** tab on the sidebar of the dialog box to specify the boot sequence for the virtual device.
   a. From the **First Device** drop-down list, change **CD-ROM** to **Hard Disk**.
   b. From the **Second Device** drop-down list, select **CD-ROM**.
   c. Select the **Attach CD** checkbox and choose **virtio** from the drop-down list.
3. Click **OK** to save the changes to the virtual machine configuration.
4. Click **OK** when the **Pending Virtual Machine changes** dialog box appears.
5. From the **Virtual Machines** pane, reboot the virtual machine.
6. Click **Console** to open a console to the virtual machine and navigate to the CDROM.
7. Double-click the **virtio** folder and then click **Setup** to start the Oracle VirtIO Drivers for Microsoft Windows installer.

   The installer window is displayed.
8. Click **Install** to start the Oracle VirtIO Drivers for Microsoft Windows installer.

   The installer copies the Oracle VirtIO Drivers for Microsoft Windows installer files and then installs the drivers on the Microsoft Microsoft Windows guest operating system.
9. Click **Yes, I want to restart my computer now** and click **Finish**.

   The virtual machine is restarted.
10. Stop the virtual machine.
11. Go to **Compute** and then click **Virtual Machines**.

    The **Virtual Machines** pane opens with the list of virtual machines that have been created.
12. Select the Microsoft Windows virtual machine created in Creating a New Microsoft Windows Virtual Machine and click **Edit**.
13. Edit the virtual disk. From the **Interface** drop-down list, change **SATA** to **VirtIO-SCSI** .
14. Click the **Boot Options** tab on the sidebar.

   a. Do not make any changes to the **First Device** drop-down list. The **Hard Disk** option is selected from a previous step.
   b. From the **Second Device** drop-down list, select **None**.
   c. Deselect the **Attach CD** checkbox.
15. Click **OK** to save the changes to the virtual machine configuration.
16. Restart the virtual machine.
17. Proceed to Installing the QEMU Guest Agent.

Installing the QEMU Guest Agent

Before attempting to install the QEMU guest agent on a new Microsoft Windows virtual machine, ensure that you have downloaded the drivers onto the Manager host. For more information, see the prerequisities.

1. On the Manager host, install the QEMU guest agent.

   ```
   # dnf install qemu-ga-win
   ```

2. Verify the installation.

   ```
   # ls -alt /usr/i686-w64-dir /sys-root/username/bin
   total 9280
   drwxr-xr-x. 2 root root      30 Nov  3 13:56 .
   -rw-r--r--. 1 root root 9499648 Nov  2 09:45 qemu-ga-i386.msi
   drwxr-xr-x. 3 root root      17 Sep 23 19:02 ..

   # ls -alt /usr/x86_64-w64-dir /sys-root/username/bin/
   total 9472
   drwxr-xr-x. 2 root root      32 Nov  3 13:56 .
   -rw-r--r--. 1 root root 9697280 Nov  2 09:45 qemu-ga-x86_64.msi
   ```

Important:

- If you have access to the virtual machine, you can copy the appropriate MSI (32-bit or 64-bit) to the virtual machine and then run the installer to install the QEMU guest agent.
- If you do not have access to the virtual machine, use the following steps to build and upload an ISO and then install the QEMU guest agent.

Build the ISO and install the QEMU guest agent on the virtual machine.

1. Build the QEMU guest agent ISO.

   ```
   # dnf install genisoimage -y
   # pwd
   /root
   # mkdir build-iso
   # cp  /usr/x86_64-w64-dir /sys-root/username/bin/qemu-ga-x86_64.msi
   ```

```
build-iso/
# cp  /usr/i686-w64-dir /sys-root/username/bin/qemu-ga-i386.msi build-iso/
# mkisofs -R -J -o qemu-ga-windows.iso build-iso/*
I: -input-charset not specified, using utf-8 (detected in locale settings)
Using QEMU_000.MSI;1 for  /qemu-ga-x86_64.msi (qemu-ga-i386.msi)
 52.36% done, estimate finish Thu Nov  3 14:20:49 2022
Total translation table size: 0
Total rockridge attributes bytes: 347
Total directory bytes: 0
Path table size(bytes): 10
Max brk space used 0
9549 extents written (18 MB)

# ll qemu-ga-windows.iso
-rw-r--r--. 1 root root 19556352 Nov  3 14:20 qemu-ga-windows.iso
```

2. Upload the QEMU guest agent ISO image to an Oracle Linux Virtualization Manager storage domain. Refer to Uploading an ISO Image to the Data Domain for more information.
3. From the **Virtual Machines** pane, select the virtual machine created in Creating a New Microsoft Windows Virtual Machine.
4. Highlight the row for this virtual machine, and click **Edit**.

   The **Edit Virtual Machines** dialog box opens.
5. Click the **Boot Options** tab on the sidebar of the dialog box to specify the boot sequence for the virtual device.

   a. From the **First Device** drop-down list, change **CD-ROM** to **Hard Disk**.

   b. From the **Second Device** drop-down list, select **CD-ROM**.

   c. Select the **Attach CD** checkbox and choose the **qemu** executable from the drop-down list.
6. Click **OK** to save the changes to the virtual machine configuration.
7. Click **OK** when the **Pending Virtual Machine changes** dialog box appears.
8. From the **Virtual Machines** pane, reboot the virtual machine.
9. Click **Console** to open a console to the virtual machine and navigate to the CDROM.
10. Double-click the the **qemu** executable to launch the installation program.
11. When installation completes, click **Yes, I want to restart my computer now** and click **Finish**.

    The virtual machine is restarted.
12. Stop the virtual machine.
13. Go to **Compute** and then click **Virtual Machines**.

    The **Virtual Machines** pane opens with the list of virtual machines that have been created.
14. Select the Microsoft Windows virtual machine created in Creating a New Microsoft Windows Virtual Machine and click **Edit**.
15. Click the **Boot Options** tab on the sidebar.

   a. Do not make any changes to the **First Device** drop-down list. The **Hard Disk** option is selected from a previous step.
   b. From the **Second Device** drop-down list, select **None**.
   c. Deselect the **Attach CD** checkbox.
16. Click **OK** to save the changes to the virtual machine configuration.
17. From the **Virtual Machines** pane, reboot the virtual machine.
18. Run the Microsoft Windows virtual machine.

For more information, see the Oracle® Linux: KVM User's Guide

Creating a Template

For this example scenario, you seal the Oracle Linux virtual machine created in Creating a New Virtual Machine and then you create an Oracle Linux template based on that virtual machine. You then use that template as the basis for a Cloud-Init enabled template to automate the initial setup of a virtual machine.

A template is a copy of a virtual machine that you can use to simplify the subsequent, repeated creation of similar virtual machines. Templates capture the configuration of software, the configuration of hardware, and the software installed on the virtual machine on which the template is based, which is known as the source virtual machine.

Virtual machines that are created based on a template use the same NIC type and driver as the original virtual machine but are assigned separate, unique MAC addresses.

> **Important:**
>
> Oracle provides pre-installed and pre-configured templates that allow you to deploy a fully configured software stack. Use of Oracle Linux templates eliminates the installation and configuration costs and reduces the ongoing maintenance costs. For more information, see Importing an Oracle Linux Template in the Oracle Linux Virtualization Manager: Administration Guide.

Sealing an Oracle Linux Virtual Machine for Use as a Template

Sealing is the process of removing all system-specific details from a virtual machine before creating a template based on that virtual machine. Sealing is necessary to prevent the same details from appearing on multiple virtual machines that are created based on the same template. It is also necessary to ensure the functionality of other features, such as predictable vNIC order.

To seal an Oracle Linux virtual machine for use as a template:

1. Log in to the Oracle Linux virtual machine as the `root` user.
2. Flag the system for reconfiguration.

   ```
   # touch /.unconfigured
   ```
3. Remove the SSH host keys.

```
# rm -rf /etc/ssh/ssh_host_*
```

4. Set the host name value of the `HOSTNAME=localhost.localdomain` in the `/etc/sysconfig/network` file for Oracle Linux 6 or the `/etc/hostname` file for Oracle Linux 7.
5. Remove `/etc/udev/rules.d/70-*`.

   ```
   # rm -rf /etc/udev/rules.d/70-*
   ```

6. Remove the `HWADDR` and `UUID` lines in the `/etc/sysconfig/network-scripts/ifcfg-eth*` file.
7. **(Optional)** Delete all the logs from `/var/log` and build logs from `/root`.
8. Cleanup the command history.

   ```
   # history -c
   ```

9. Shutdown the virtual machine.

   ```
   # poweroff
   ```

   The Oracle Linux virtual machine is now sealed and ready to be made into a template.

Creating an Oracle Linux Template

When you create a template based on a virtual machine, a read-only copy of the virtual machine's disk is created. This read-only disk becomes the base disk image of the new template, and of any virtual machines that are created based on the template.

To create an Oracle Linux template:

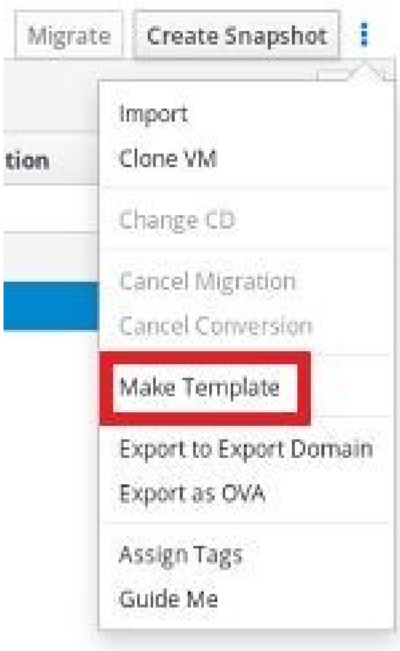
1. Go to **Compute**, and then click **Virtual Machines**.

   The **Virtual Machines** pane opens with the list of virtual machines that have been created.

2. Click **More Actions** to expand the drop-down list and select **Make Template** from the drop-down list.

   The following screenshot shows the **More Actions** drop-down list expanded to display the **Make Template** option. The **Make Template** option is highlighted with a red rectangular box for emphasis.

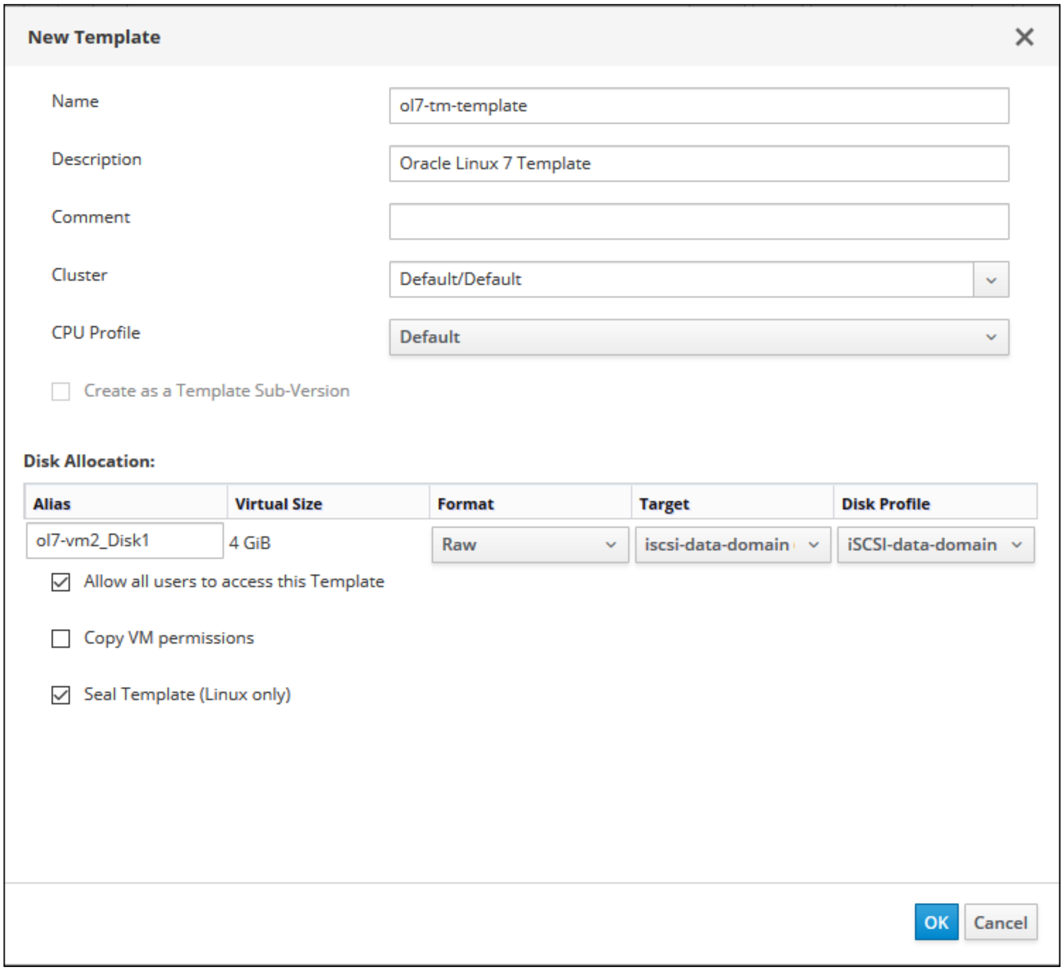
Figure 4-10 Make Template Option



3. For the **Name** field, enter a name for the new virtual machine template.
4. In the **Disc Allocation:** section under the **Alias** column, rename the disk alias to be the same as the template name entered for the **Name** field.
5. Click the **Seal Template (Linux only)** checkbox.

   The following screenshot shows the **New Template** dialog box completed for the new template named `ol7-vm-template`, which is being created in this example scenario. In the dialog box, the disk alias has been renamed to `ol7-vm-template` and the **Seal Template (Linux only)** checkbox is selected.

Figure 4-11   New Template Dialog Box



New Template

Name	ol7-tm-template
Description	Oracle Linux 7 Template
Comment	
Cluster	Default/Default
CPU Profile	Default

□ Create as a Template Sub-Version

Disk Allocation:

Alias	Virtual Size	Format	Target	Disk Profile
ol7-vm2_Disk1	4 GiB	Raw	iscsi-data-domain	iSCSI-data-domain

☑ Allow all users to access this Template

□ Copy VM permissions

☑ Seal Template (Linux only)

6. Click the **OK** button to create the template.

   The virtual machine displays a status of image `Locked` while the template is being created. The time it takes for the template to be created depends on the size of the virtual disk and the capabilities of your storage hardware. When the template creation process completes, the template is added to the list of templates displayed on the **Templates** pane.

   You can now create new Oracle Linux virtual machines that are based on this template.

Creating a Cloud-Init Enabled Template

For Oracle Linux 7 (and later) virtual machines, you can use the Cloud-Init tool to automate the initial setup of virtual machines. Common tasks, such as configuring host names, network interfaces, and authorized keys, can be automated by using this tool. When provisioning virtual machines that have been deployed based on a template, the Cloud-Init tool can be used to prevent conflicts on the network.

Before You Begin

Before you create Cloud-Init enabled templates, ensure the following prerequisites are met:

- To use Cloud-Init, the `cloud-init` package must first be installed on the virtual machine. Once installed, the Cloud-Init service starts during the boot process and searches for instructions on what to configure. Use the **Run Once** window to provide these instructions on a one-time only basis.
- You must have sealed an Oracle Linux for use as a template. For more information, refer to Sealing an Oracle Linux Virtual Machine for Use as a Template.
- You must create a template. For more information, refer to Creating an Oracle Linux Template.

1. Log in to a Oracle Linux virtual machine.
2. List the `cloud-init` package.

   ```
   # dnf list cloud-init
   ```

3. Install the `cloud-init` package.

   ```
   # dnf install cloud-init
   ```

4. Run the following command to enable the `cloud-init` service.

   ```
   # systemctl enable cloud-init
   ```

5. Run the following command to start the cloud-init service.

   ```
   # systemctl start cloud-init
   ```

Using Cloud-Init to Automate the Initial Setup of a Virtual Machine

To use Cloud-Init to automate the initial setup of a virtual machine:

1. Go to **Compute** and then click **Templates**.

   The **Templates** pane opens with the list of templates that have been created.
2. Select a template and click the **Edit** button.
3. Click **Show Advanced Options**.
4. Click the **Initial Run** tab and select the **Use Cloud-Init/Sysprep** check box.
5. Enter a host name in the **VM Hostname** text field.
6. Select the **Configure Time Zone** check box and select a time zone from the **Time Zone** drop-down list.
7. Expand the **Authentication** section.
   - Select the **Use already configured password** check box to use the existing credentials, or clear that check box and enter a `root` password in the **Password** and **Verify Password** text fields to specify a new `root` password.
   - Enter any SSH keys to be added to the authorized hosts file on the virtual machine in the **SSH Authorized Keys** text area.
   - Select the **Regenerate SSH Keys** check box to regenerate SSH keys for the virtual machine.
8. Expand the **Networks** section.
   - Enter any DNS servers in the **DNS Servers** text field.
   - Enter any DNS search domains in the **DNS Search Domains** text field.

- Select the **In-guest Network Interface** check box and use the **+ Add new** and **- Remove selected** buttons to add or remove network interfaces to or from the virtual machine.

> **Important:**
>
> You must specify the correct network interface name and number (for example, `eth0`, `eno3`, `enp0s`); otherwise, the virtual machine's interface connection will be up but will not have the Cloud-Init network configuration.

9. Expand the **Custom Script** section and enter any custom scripts in the **Custom Script** text area.

Creating a Virtual Machine from a Template

For this example scenario, you create an Oracle Linux virtual machine from the template created in Creating a Template.

Creating an Oracle Linux Virtual Machine from a Template

To create an Oracle Linux virtual machine from a template:

1. Go to **Compute** and then click **Virtual Machines**.
2. Click **New VM**.
3. From the **Template** drop-down list, select the desired template from the drop-down list.

   For this example scenario, select the template created in Creating an Oracle Linux Template.
4. On the **Cluster** drop-down list, select the data center and host cluster for the new host.

   By default, the **Default** option is selected in the drop-down list.

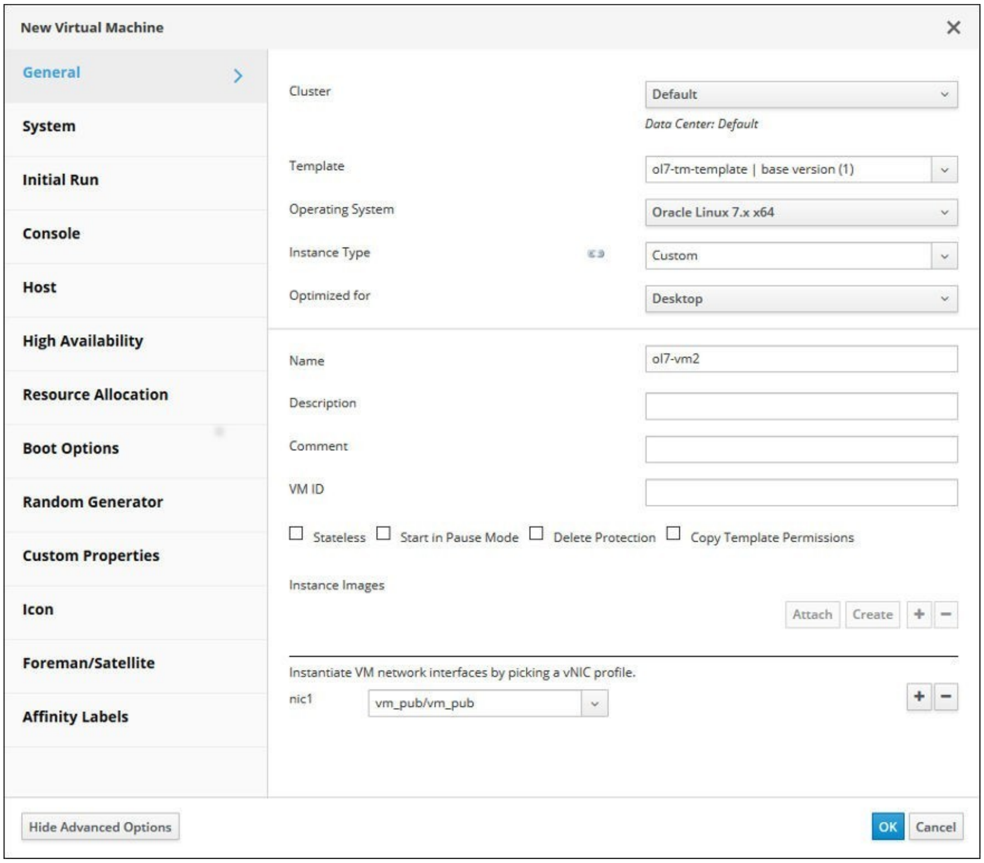
   For this step, leave **Default** selected from the drop-down list because the default data center and cluster are used in this example scenario.

   For the procedures to create new data centers or a new clusters, refer to Data Centers or Clusters tasks in the Oracle Linux Virtualization Manager: Administration Guide.
5. For the **Name** field, enter a name for the virtual machine.

   The following screenshot shows the **New Virtual Machine** dialog box for the new Oracle Linux virtual machine that is being created based on the template that was created in Creating an Oracle Linux Template. In the dialog box, the following key fields are completed:

   - From the **Cluster** drop-down list, the **Default** option is selected.
   - From the **Template** drop-down list, the template named `ol7-vm-template` is selected.
   - For the **Operating System** drop-down list, `Oracle Linux 7.x x64` is selected.
   - For the **Name** field, `ol7-vm2` is entered.
   - From the **nic1** drop-down list, the logical network named `vm_pub` is selected.

Figure 4-12 New Virtual Machine Dialog Box for a Template - General Tab



Cluster: Default
Data Center: Default
Template: ol7-tm-template | base version (1)
Operating System: Oracle Linux 7.x x64
Instance Type: Custom
Optimized for: Desktop
Name: ol7-vm2
Description:
Comment:
VM ID:
□ Stateless □ Start in Pause Mode □ Delete Protection □ Copy Template Permissions
Instance Images
Instantiate VM network interfaces by picking a vNIC profile.
nic1: vm_pub/vm_pub

6. Click **OK** to create the virtual machine from the template.

   The new virtual machine appears on the **Virtual Machines** pane.

7. Highlight the virtual machine that you created from the template and then click **Run** to boot the virtual machine.

   The red down arrow icon to the left of the virtual machine turns green and the **Status** column displays `Up` when the virtual machine is up and running on the network.

   Depending on your template, you might need to configure the cloud-init option when you run the virtual machine for the first time

   a. From the drop-down arrow next to **Run**, select **Run Once**

   b. Expand **Initial Run** and check **Use Cloud-init**,

   c. The hostname is pre-filled. Fill in other options such as a new user and password, network configuration, timezone.

   d. Add a cloud-init script.

Backing Up and Restoring the Manager

For this example scenario, you backup and restore the Oracle Linux Virtualization Manager by using the engine-backup command utility.

Backing Up the Manager

To backup the Manager:

1. Log into the host that is running the Manager.

   > **Note:**
   >
   > When running the Manager within a virtual machine (standalone or self-hosted engine) log into the virtual machine that is running the engine.

2. Create a full backup of the Manager. You do *not* need to stop the ovirt-engine service before creating your backup.

   ```
   # engine-backup --mode=backup --scope=all --file=path --log=path
   ```

   The following example shows how to use the engine-backup command to create a full backup of the Manager. A backup file and log file for the Manager backup is created in the path specified.

   ```
   # engine-backup --mode=backup --scope=all --file=backup/file/ovirt-engine-backup --
   log=backup/log/ovirt-engine-backup.log
   Backing up:
   Notifying engine
   - Files
   - Engine database 'engine'
   - DWH database 'ovirt_engine_history'
   Packing into file 'backup/file/ovirt-engine-backup'
   Notifying engine
   Done.
   ```

3. **(Optional)** Set up a `cron` job to take regular backups.

   By default, the Manager does not take automatic backups. Oracle recommends that you take you regular backups of the Manager.

   The following example shows a sample `cron` job defined in a `crontab`-format file.

   ```
   today=`date +'%Y%m%d-%H%M'`
   engine-backup --mode=backup --scope=all --file=/backup/file/ovirt-engine-backup-$
   {today}
   --log=/backup/log/ovirt-engine-backup-${today}.log
   ```

Restoring a Full Backup of the Manager

To restore a full backup of the Manager:

1. Login to the host that is running the Manager.

   > **Note:**
   >
   > When running the Manager within a virtual machine (standalone or self-hosted engine) log into the virtual machine that is running the engine.

2. Clean up the objects associated with the Manager.

   ```
   # engine-cleanup
   ```

   This engine-cleanup command removes the configuration files and cleans the database associated with the Manager.

   The following example shows output from the engine-cleanup command.

   ```
   # engine-cleanup
   [ INFO  ] Stage: Initializing
   [ INFO  ] Stage: Environment setup
             Configuration files: ...
             Log file: ...
             Version: otopi-1.7.8 (otopi-1.7.8-1.el7)
   [ INFO  ] Stage: Environment packages setup
   [ INFO  ] Stage: Programs detection
   [ INFO  ] Stage: Environment customization
             Do you want to remove all components? (Yes, No) [Yes]: Yes
             The following files were changed since setup:
             /etc/ovirt-engine/engine.conf.d/11-setup-sso.conf
             Remove them anyway? (Yes, No) [Yes]: Yes

             --== PRODUCT OPTIONS ==--

   [ INFO  ] Stage: Setup validation
             During execution engine service will be stopped (OK, Cancel) [OK]:
   OK
             All the installed ovirt components are about to be removed ...(OK,
   Cancel)
             [Cancel]: OK
   [ INFO  ] Stage: Transaction setup
   [ INFO  ] Stopping engine service
   [ INFO  ] Stopping ovirt-fence-kdump-listener service
   [ INFO  ] Stopping dwh service
   [ INFO  ] Stopping Image I/O Proxy service
   [ INFO  ] Stopping vmconsole-proxy service
   [ INFO  ] Stopping websocket-proxy service
   [ INFO  ] Stage: Misc configuration
   [ INFO  ] Stage: Package installation
   [ INFO  ] Stage: Misc configuration
   [ INFO  ] Backing up PKI configuration and keys
   ...
   [ INFO  ] Clearing Engine database engine
   ...
   [ INFO  ] Clearing DWH database ovirt_engine_history
   [ INFO  ] Removing files
   [ INFO  ] Reverting changes to files
   ...
   [ INFO  ] Stage: Transaction commit
   [ INFO  ] Stage: Closing up

             --== SUMMARY ==--

             Engine setup successfully cleaned up
             A backup of PKI configuration and keys is available at ...
             ovirt-engine has been removed
             A backup of the Engine database is available at ...
             A backup of the DWH database is available at ...

             --== END OF SUMMARY ==--
   ```

```
[ INFO  ] Stage: Clean up
          Log file is located at ...
[ INFO  ] Generating answer file ...
[ INFO  ] Stage: Pre-termination
[ INFO  ] Stage: Termination
[ INFO  ] Execution of cleanup completed successfully
```

3. Restore a full backup of the Manager.

   The following form of the engine-backup command is used to a restore a full backup of the Manager.

   ```
   engine-backup --mode=restore --scope=all --file=path --log=path --restore-
   permissions
   ```

   The following example shows how to use the engine-backup command to restore a full backup of the Manager.

   ```
   # engine-backup --mode=restore --scope=all --file=backup/file/ovirt-engine-backup \
     --log=backup/log/ovirt-engine-backup.log --restore-permissions
   Preparing to restore:
   - Unpacking file 'backup/file/ovirt-engine-backup'
   Restoring:
   - Files
   - Engine database 'engine'
     - Cleaning up temporary tables in engine database 'engine'
     - Updating DbJustRestored VdcOption in engine database
     - Resetting DwhCurrentlyRunning in dwh_history_timekeeping in engine database
     - Resetting HA VM status
   ------------------------------------------------------------------------------
   Please note:

   The engine database was backed up at 2019-03-25 12:48:02.000000000 -0700 .

   Objects that were added, removed or changed after this date, such as virtual
   machines, disks, etc., are missing in the engine, and will probably require
   recovery or recreation.
   ------------------------------------------------------------------------------
   - DWH database 'ovirt_engine_history'
   You should now run engine-setup.
   Done.
   ```

4. Run the engine-setup command to complete the setup of the restored Manager.

   ```
   # engine-setup
   ```

   This command reconfigures the firewall and ensures that the Manager service is correctly configured.

5. Log in to the Manager and verify that the Manager has been restored to the backup.

5
Self-Hosted Engine Deployment

In Oracle Linux Virtualization Manager, a self-hosted engine is a virtualized environment where the engine runs inside a virtual machine on the hosts in the environment. The virtual machine for the engine is created as part of the host configuration process. And, the engine is installed and configured in parallel to the host configuration.

Since the engine runs as a virtual machine and not on physical hardware, a self-hosted engine requires less physical resources. Additionally, since the engine is configured to be highly available, if the host running the Engine virtual machine goes into maintenance mode or fails unexpectedly the virtual machine is migrated automatically to another host in the environment. A minimum of two KVM hosts are required.

To review conceptual information, troubleshooting, and administration tasks, see the oVirt Self-Hosted Engine Guide in oVirt Documentation.

To deploy a self-hosted engine, you perform a fresh installation of Oracle Linux 8.5 (or later) on the host, install the Oracle Linux Virtualization Manager Release 4.4 package, and then run the hosted engine deployment tool to complete configuration.

> **Note:**
>
> If you are deploying a self-hosted engine as a hyperconverged infrastructure with GlusterFS storage, you must deploy GlusterFS *BEFORE* you deploy the self-hosted engine. See Deploying GlusterFS Storage.

Self-Hosted Engine Prerequisites

In addition to the Requirements and Scalability Limits, you must satisfy the following prerequisites before deploying a self-hosted engine.

- A minimum of two KVM hosts.
- A fully qualified domain name for your engine and host with forward and reverse lookup records set in the DNS.
- A directory of at least 5 GB on the host for the oVirt Engine Appliance. During the deployment process the `/var/tmp` directory is checked to see if it has enough space to extract the appliance files. If the `/var/tmp` directory does not have enough space, you can specify a different directory or mount external storage.

  > **Note:**
  >
  > The VDSM user and KVM group must have read, write, and execute permissions on the directory.

- Prepared storage of at least 74 GB to be used as a data storage domain dedicated to the engine virtual machine. The data storage domain is created during the self-hosted engine deployment.

  If you are using iSCSI storage, do not use the same iSCSI target for the self-hosted engine storage domain and any additional storage domains.

  > **NOT_SUPPORTED:**
  >
  > When you have a data center with only one active data storage domain and that domain gets corrupted, you are unable to add new data storage domains or remove the corrupted data storage domain. If you have deployed your self-hosted engine in such a data center and its data storage domain gets corrupted, you must redeploy your self-hosted engine.

- The host you are using to deploy a self-hosted engine, must be able to access yum.oracle.com.

Deploying the Self-Hosted Engine

You must perform a fresh installation of Oracle Linux 8.5 (or later) on an Oracle Linux Virtualization Manager host before deploying a self-hosted engine. You can download the installation ISO for from the Oracle Software Delivery Cloud at https://edelivery.oracle.com.

1. Install Oracle Linux 8.5 (or later) on the host using the **Minimal Install** base environment.

   > **Caution:**
   >
   > Do **NOT** select any other base environment than **Minimal Install** for the installation or your hosts will have incorrect qemu and libvirt versions, incorrect repositories configured, and no access to virtual machine consoles.
   >
   > Do not install any additional packages until after you have installed the Manager packages, because they may cause dependency issues.

   Follow the instructions in the Oracle® Linux 8: Installing Oracle Linux.

2. Ensure that the firewalld service is enabled and started.

   For more information about configuring `firewalld`, see Configuring a Packet Filtering Firewall in the Oracle® Linux 8: Configuring the Firewall.

3. Complete one of the following sets of steps:

   - **For ULN registered hosts or using Oracle Linux Manager**

     Subscribe the system to the required channels.

a. For ULN registered hosts, log in to https://linux.oracle.com with your ULN user name and password. For Oracle Linux Manager registered hosts, access your internal server URL.

b. On the Systems tab, click the link named for the host in the list of registered machines.

c. On the System Details page, click **Manage Subscriptions**.

d. On the System Summary page, select each required channel from the list of available channels and click the right arrow to move the channel to the list of subscribed channels. Subscribe the system to the following channels:

   - `ol8_x86_64_baseos_latest`
   - `ol8_x86_64_appstream`
   - `ol8_x86_64_kvm_appstream`
   - `ol8_x86_64_ovirt44`
   - `ol8_x86_64_ovirt44_extras`
   - `ol8_x86_64_gluster_appstream`
   - **(For VDSM)** `ol8_x86_64_UEKR7`

e. Click **Save Subscriptions**.

f. Disable the virt:ol module and enable the virt:kvm_utils2 module.

```
# dnf -y module disable virt:ol
```

```
# dnf -y module enable virt:kvm_utils2
```

- **For Oracle Linux yum server hosts**

  Install the Oracle Linux Virtualization Manager Release 4.4 package and enable the required repositories.

  a. **(Optional)** Make sure the host is using the modular yum repository configuration. For more information, see Getting Started with Oracle Linux Yum Server.

  b. Enable the `ol8_baseos_latest` yum repository.

```
# dnf config-manager --enable ol8_baseos_latest
```

> **Important:**
>
> Before you execute **config-manager** ensure the **dnf-utils** package is installed on your system. For more information, see Yum DNF in Oracle® Linux: Managing Software on Oracle Linux.

  c. Install the Oracle Linux Virtualization Manager Release 4.4 package.

```
# dnf install oracle-ovirt-release-el8
```

  d. Use the dnf command to verify that the required repositories are enabled.

   i. Clear the yum cache.

```
# dnf clean all
```

ii. List the configured repositories and verify that the required repositories are enabled.

```
# dnf repolist
```

The following repositories must be enabled:

- `ol8_baseos_latest`
- `ol8_appstream`
- `ol8_kvm_appstream`
- `ol8_ovirt44`
- `ol8_ovirt44_extras`
- `ol8_gluster_appstream`
- **(For VDSM)** `ol8_UEKR7`

iii. If a required repository is not enabled, use the config-manager to enable it.

```
# dnf config-manager --enable
repository
```

4. Install the hosted engine deployment tool and engine appliance.

```
# dnf install ovirt-hosted-engine-setup -y
# dnf install ovirt-engine-appliance -y
```

You can deploy a self-hosted engine using the command line or Cockpit portal. If you want to use the command line, proceed to Using the Command Line to Deploy. If you want to use the Cockpit portal, proceed to Using the Cockpit Portal to Deploy.

> **Note:**
>
> If you are behind a proxy, you must use the command line option to deploy.

Using the Command Line to Deploy

You can deploy the self-hosted engine from the command line. A script collects the details of your environment and uses them to configure the host and the engine.

1. Start the deployment.

```
# hosted-engine --deploy
```

> **Note:**
>
> You can deploy the hosted engine using all the default settings. Make sure the auto-detected fully qualified DNS name of the host is correct. The fully qualified DNS name should resolve to the IP address that is accessible through the host's main interface. For more information on the default settings, see Engine Configuration Options.

Optionally, use the `--ansible-extra-vars` option to define variables for the deployment. For example:

```
# hosted-engine --deploy --ansible-extra-vars="@/root/extra-vars.yml"

cat /root/extra-vars.yml
---
he_pause_host: true
he_proxy: "http://<host>:<port>"
```

See the oVirt documentation for more information, Deploying the self-hosted engine using the command line.

2. Enter Yes to begin deployment.

   ```
   Continuing will configure this host for serving as hypervisor and will create a
   local VM
   with a running engine. The locally running engine will be used to configure a new
   storage
   domain and create a VM there. At the end the disk of the local VM will be moved to
   the
   shared storage.
   Are you sure you want to continue? (Yes, No)[Yes]:
   ```

   > **Note:**
   >
   > The hosted-engine script creates a virtual machine and uses cloud-init to configure it. The script also runs engine-setup and reboots the system so that the virtual machine can be managed by the high availability agent.

3. Configure the network.

   a. If the gateway that displays is correct, press Enter to configure the network.

   b. Enter a pingable address on the same subnet so the script can check the host's connectivity.

      ```
      Please indicate a pingable gateway IP address [X.X.X.X]:
      ```

   c. The script detects possible NICs to use as a management bridge for the environment. Select the default.

      ```
      Please indicate a nic to set ovirtmgmt bridge on: (eth1, eth0) [eth1]:
      ```

4. Enter the path to an OVA archive if you want to use a custom appliance for the virtual machine installation. Otherwise, leave this field empty to use the oVirt Engine Appliance.

   ```
   If you want to deploy with a custom engine appliance image,
   please specify the path to the OVA archive you would like to use
   (leave it empty to skip, the setup will use ovirt-engine-appliance rpm
   installing it if missing):
   ```

5. Specify the fully-qualified domain name for the engine virtual machine.

   ```
   Please provide the FQDN you would like to use for the engine appliance.
    Note: This will be the FQDN of the engine VM you are now going to launch,
    it should not point to the base host or to any other existing machine.
    Engine VM FQDN:  manager.example.com
    Please provide the domain name you would like to use for the engine appliance.
    Engine VM domain: [example.com]
   ```

6. Enter and confirm a root password for the engine.

```
Enter root password that will be used for the engine appliance:
Confirm appliance root password:
```

7. Optionally, enter an SSH public key to enable you to log in to the engine as the root user and specify whether to enable SSH access for the root user.

   ```
   Enter ssh public key for the root user that will be used for the engine
   appliance (leave it empty to skip):
   Do you want to enable ssh access for the root user (yes, no, without-
   password)
   [yes]:
   ```

8. Enter the virtual machine's CPU and memory configuration.

   ```
   Please specify the number of virtual CPUs for the VM (Defaults to appliance
   OVF value): [4]:
   Please specify the memory size of the VM in MB (Defaults to maximum
   available): [7267]:
   ```

9. Enter a MAC address for the engine virtual machine or accept a randomly generated MAC address.

   ```
   You may specify a unicast MAC address for the VM or accept a randomly
   generated default [00:16:3e:3d:34:47]:
   ```

   > **Note:**
   >
   > If you want to provide the engine virtual machine with an IP address using DHCP, ensure that you have a valid DHCP reservation for this MAC address. The deployment script does not configure the DHCP server for you.

10. Enter the virtual machine's networking details.

    ```
    How should the engine VM network be configured (DHCP, Static)[DHCP]?
    ```

    > **Note:**
    >
    > If you specified Static, enter the IP address of the Engine. The static IP address must belong to the same subnet as the host. For example, if the host is in 10.1.1.0/24, the Engine virtual machine's IP must be in the same subnet range (10.1.1.1-254/24).
    >
    > ```
    > Please enter the IP address to be used for the engine VM [x.x.x.x]:
    > Please provide a comma-separated list (max 3) of IP addresses of
    > domain
    > name servers for the engine VM
    > Engine VM DNS (leave it empty to skip):
    > ```

11. Specify whether to add entries in the virtual machine's `/etc/hosts` file for the engine virtual machine and the base host. Ensure that the host names are resolvable.

    ```
    Add lines for the appliance itself and for this host to /etc/hosts on the
    engine VM?
    Note: ensuring that this host could resolve the engine VM hostname is still
    ```

```
up
to you (Yes, No)[No]
```

12. Provide the name and TCP port number of the SMTP server, the email address used to send email notifications, and a comma-separated list of email addresses to receive these notifications. Or, press Enter to accept the defaults.

    ```
    Please provide the name of the SMTP server through which we will send
    notifications [localhost]:
    Please provide the TCP port number of the SMTP server [25]:
    Please provide the email address from which notifications will be sent
    [root@localhost]:
    Please provide a comma-separated list of email addresses which will get
    notifications [root@localhost]:
    ```

13. Enter and confirm a password for the `admin@internal` user to access the Administration Portal.

    ```
    Enter engine admin password:
    Confirm engine admin password:
    ```

    The script creates the virtual machine which can take time if it needs to install the oVirt Engine Appliance. After creating the virtual machine, the script continues gathering information.

14. Select the type of storage to use.

    ```
    Please specify the storage you would like to use (glusterfs, iscsi, fc,
    nfs)[nfs]:
    ```

    - If you selected NFS, enter the version, full address and path to the storage, and any mount options.

      ```
      Please specify the nfs version you would like to use (auto, v3, v4,
      v4_1)[auto]:
      Please specify the full shared storage connection path to use (example:
      host:/path):
      storage.example.com:/hosted_engine/nfs
      If needed, specify additional mount options for the connection to the
      hosted-engine storage domain []:
      ```

    - If you selected iSCSI, enter the portal details and select a target and LUN from the auto-detected lists. You can only select one iSCSI target during the deployment, but multipathing is supported to connect all portals of the same portal group.

      > **Note:**
      >
      > To specify more than one iSCSI target, you must enable multipathing before deploying the self-hosted engine. There is also a Multipath Helper tool that generates a script to install and configure multipath with different options.

      ```
      Please specify the iSCSI portal IP address:
        Please specify the iSCSI portal port [3260]:
        Please specify the iSCSI discover user:
        Please specify the iSCSI discover password:
        Please specify the iSCSI portal login user:
        Please specify the iSCSI portal login password:

        The following targets have been found:
      ```

```
        [1]    iqn.2017-10.com.redhat.example:he
            TPGT: 1, portals:
                192.168.1.xxx:3260
                192.168.2.xxx:3260
                192.168.3.xxx:3260

    Please select a target (1) [1]: 1

    The following luns have been found on the requested target:
      [1] 360003ff44dc75adcb5046390a16b4beb   199GiB  MSFT   Virtual HD
          status: free, paths: 1 active

    Please select the destination LUN (1) [1]:
```

- If you selected GlusterFS, enter the full address and path to the storage, and any mount options. Only replica 3 Gluster storage is supported.

  ```
  * Configure the volume as follows as per [Gluster Volume Options for
  Virtual
    Machine Image Store]
    (documentation/admin-guide/chap-Working_with_Gluster_Storage#Options
    set on Gluster Storage Volumes to Store Virtual Machine Images)

    Please specify the full shared storage connection path to use
  (example: host:/path):
    storage.example.com:/hosted_engine/gluster_volume
    If needed, specify additional mount options for the connection to the
  hosted-engine storage domain []:
  ```

- If you selected Fibre Channel, select a LUN from the auto-detected list. The host bus adapters must be configured and connected. The deployment script auto-detects the available LUNs, and the LUN must not contain any existing data.

  ```
  The following luns have been found on the requested target:
    [1] 3514f0c5447600351   30GiB   XtremIO XtremApp
            status: used, paths: 2 active

    [2] 3514f0c5447600352   30GiB   XtremIO XtremApp
            status: used, paths: 2 active

    Please select the destination LUN (1, 2) [1]:
  ```

15. Enter the engine disk size:

    ```
    Please specify the size of the VM disk in GB: [50]:
    ```

    If successful, one data center, cluster, host, storage domain, and the engine virtual machine are already running.

16. Optionally, log into the Oracle Linux Virtualization Manager Administration Portal to add any other resources.

    In the Administration Portal, the engine virtual machine, the host running it, and the self-hosted engine storage domain are flagged with a gold crown.

17. Enable the required repositories on the Engine virtual machine.

18. Optionally, add a directory server using the `ovirt-engine-extension-aaa-ldap-setup` interactive setup script so you can add additional users to the environment.

Using the Cockpit Portal to Deploy

> **Note:**
>
> If you are behind a proxy, you must use the command line option to deploy your self-hosted engine.

To deploy the self-hosted engine using the Cockpit portal, complete the following steps.

1. Install the Cockpit dashboard.

   ```
   # dnf install cockpit-ovirt-dashboard -y
   ```

2. Open the Cockpit port 9090 on firewalld.

   ```
   # firewall-cmd --permanent --zone=public --add-port=9090/tcp
   ```

   ```
   # systemctl restart firewalld
   ```

3. Start the Cockpit service

   ```
   # systemctl start cockpit
   ```

   ```
   # systemctl enable cockpit
   ```

4. Log into the Cockpit portal from the following URL:

   `https://`***host_IP_or_FQDN***`:9090`

5. To start the self-hosted engine deployment, click **Virtualization** and select **Hosted Manager**.

6. Click **Start** under **Hosted Manager**.

7. Provide the following details for the Engine virtual machine.

   a. In the **Engine VM FQDN** field, enter the Engine virtual machine FQDN. Do not use the FQDN of the host.

   b. In the **MAC Address** field, enter a MAC address for the Engine virtual machine or leave blank and the system provides a randomy-generated address.

   c. From the **Network Configuration** drop-down list, select **DHCP** or **Static**.

      - To use **DHCP**, you must have a DHCP reservation (a pre-set IP address on the DHCP server) for the Engine virtual machine. In the **MAC Address** field, enter the MAC address.

      - To use **Static**, enter the virtual machine IP, the gateway address, and the DNS servers. The IP address must belong to the same subnet as the host.

   d. Select the **Bridge Interface** from the drop-down list.

   e. Enter and confirm the virtual machine's **Root Password**.

   f. Specify whether to allow **Root SSH Access**.

   g. Enter the **Number of Virtual CPUs** for the virtual machine.

   h. Enter the **Memory Size (MiB)**. The available memory is displayed next to the field.

8. Optionally, click **Advanced** to provide any of the following information.

- Enter a **Root SSH Public Key** to use for root access to the Engine virtual machine.
- Select the **Edit Hosts File** check box if you want to add entries for the Engine virtual machine and the base host to the virtual machine's `/etc/hosts` file. You must ensure that the host names are resolvable.
- Change the management **Bridge Name**, or accept the default of `ovirtmgmt`.
- Enter the **Gateway Address** for the management bridge.
- Enter the **Host FQDN** of the first host to add to the Engine. This is the FQDN of the host you are using for the deployment.

9. Click **Next**.
10. Enter and confirm the **Admin Portal Password** for the `admin@internal` user.
11. Optionally, configure event notifications.
    - Enter the **Server Name** and **Server Port Number** of the SMTP server.
    - Enter a **Sender E-Mail Address**.
    - Enter **Recipient E-Mail Addresses**.
12. Click **Next**.
13. Review the configuration of the Engine and its virtual machine. If the details are correct, click **Prepare VM**.
14. When the virtual machine installation is complete, click **Next**.
15. Select the **Storage Type** from the drop-down list and enter the details for the self-hosted engine storage domain.
    - For NFS:
      a. In the **Storage Connection** field, enter the full address and path to the storage.
      b. If required, enter any **Mount Options**.
      c. Enter the **Disk Size (GiB)**.
      d. Select the **NFS Version** from the drop-down list.
      e. Enter the **Storage Domain Name**.
    - For iSCSI:
      a. Enter the **Portal IP Address**, **Portal Port**, **Portal Username**, and **Portal Password**.
      b. Click **Retrieve Target List** and select a target. You can only select one iSCSI target during the deployment, but multipathing is supported to connect all portals of the same portal group.

> **Note:**
>
> To specify more than one iSCSI target, you must enable multipathing before deploying the self-hosted engine. There is also a Multipath Helper tool that generates a script to install and configure multipath with different options.

   c. Enter the **Disk Size (GiB)**.

   d. Enter the **Discovery Username** and **Discovery Password**.

- For FibreChannel:

   a. Enter the **LUN ID**. The host bus adapters must be configured and connected and the LUN must not contain any existing data.

   b. Enter the **Disk Size (GiB)**.

- For Gluster Storage:

   a. In the **Storage Connection** field, enter the full address and path to the storage.

   b. If required, enter any **Mount Options**.

   c. Enter the **Disk Size (GiB)**.

16. Click **Next**.

17. Review the storage configuration. If the details are correct, click **Finish Deployment**.

18. When the deployment is complete, click **Close**.

    If successful, one data center, cluster, host, storage domain, and the engine virtual machine are already running.

19. Optionally, log into the Oracle Linux Virtualization Manager Administration Portal to add any other resources.

    In the Administration Portal, the engine virtual machine, the host running it, and the self-hosted engine storage domain are flagged with a gold crown.

20. Enable the required repositories on the Engine virtual machine.

21. Optionally, add a directory server using the `ovirt-engine-extension-aaa-ldap-setup` interactive setup script so you can add additional users to the environment.

22. To view the self-hosted engine's status in Cockpit, under **Virtualization** click **Hosted Engine**.

Enabling High-Availability

The host that houses the self-hosted engine is not highly available by default. Since the self-hosted engine runs inside a virtual machine on a host, if you do not configure high-availability for the host, then live VM migration is not possible.

Configuring a Highly Available Host

If you want the hosts in a cluster to be responsive and available when unexpected failures happen, you should use fencing. Fencing allows a cluster to react to unexpected host failures and enforce power saving, load balancing, and virtual machine availability policies. You should configure the fencing parameters for your host's power management device and test their correctness from time to time.

A *Non Operational* host is different from a *Non Responsive* host. A *Non Operational* host can communicate with the Manager, but has incorrect configuration, for example a missing logical network. A *Non Responsive* host cannot communicate with the Manager.

In a fencing operation, a non-responsive host is rebooted, and if the host does not return to an active status within a prescribed time, it remains non-responsive pending manual intervention and troubleshooting.

The Manager can perform management operations after it reboots, by a proxy host, or manually in the **Administration Portal**. All the virtual machines running on the non-responsive host are stopped, and highly available virtual machines are restarted on a different host. At least two hosts are required for power management operations.

> ❗ **Important:**
>
> If a host runs virtual machines that are highly available, power management must be enabled and configured.

Configuring Power Management and Fencing on a Host

The Manager uses a proxy to send power management commands to a host power management device because the engine does not communicate directly with fence agents. The host agent (VDSM) executes power management device actions and another host in the environment is used as a fencing proxy. This means that you must have at least two hosts for power management operations.

When you configure a fencing proxy host, make sure the host is in:

- the same cluster as the host requiring fencing.
- the same data center as the host requiring fencing.
- `UP` or `Maintenance` status to remain viable.

Power management operations can be performed in three ways:

- by the Manager after it reboots
- by a proxy host
- manually in the **Administration Portal**

To configure power management and fencing on a host:

1. Click **Compute** and select **Hosts**.
2. Select a host and click **Edit**.
3. Click the **Power Management** tab.
4. Check **Enable Power Management** to enable the rest of the fields.
5. Check **Kdump integration** to prevent the host from fencing while performing a kernel crash dump. Kdump integration is enabled by default.

   > ❗ **Important:**
   >
   > If you enable or disable Kdump integration on an existing host, you must reinstall the host.

6. **(Optional)** Check **Disable policy control of power management** if you do not want your host’s power management to be controlled by the scheduling policy of the host's cluster.
7. To configure a fence agent, click the plus sign (+) next to **Add Fence Agent**.

The **Edit fence agent** pane opens.

8. Enter the **Address** (IP Address or FQDN) to access the host's power management device.
9. Enter the **User Name** and **Password** of the of the account used to access the power management device.
10. Select the power management device **Type** from the drop-down list.
11. Enter the **Port** (SSH) number used by the power management device to communicate with the host.
12. Enter the **Slot** number used to identify the blade of the power management device.
13. Enter the **Options** for the power management device. Use a comma-separated list of key-value pairs.
    - If you leave the **Options** field blank, you are able to use both IPv4 and IPv6 addresses
    - To use only IPv4 addresses, enter `inet4_only=1`
    - To use only IPv6 addresses, enter `inet6_only=1`
14. Check **Secure** to enable the power management device to connect securely to the host.

    You can use ssh, ssl, or any other authentication protocol your power management device supports.
15. Click **Test** to ensure the settings are correct and then click **OK**.

    Test Succeeded, Host Status is: on displays if successful.

    > **NOT_SUPPORTED:**
    >
    > Power management parameters (userid, password, options, etc.) are tested by the Manager only during setup and manually after that. If you choose to ignore alerts about incorrect parameters, or if the parameters are changed on the power management hardware without changing in the Manager as well, fencing is likely to fail when most needed.
16. Fence agents are sequential by default. To change the sequence in which the fence agents are used:
    a. Review your fence agent order in the **Agents by Sequential Order** field.
    b. To make two fence agents concurrent, next to one fence agent click the **Concurrent with** drop-down list and select the other fence agent.

       You can add additional fence agents to this concurrent fence agent group.
17. Expand the **Advanced Parameters** and use the up and down buttons to specify the order in which the Manager searches the host's **cluster** and **dc** (data center) for a power management proxy.
18. To add an additional power management proxy:
    a. Click the plus sign (+) next to **Add Power Management Proxy**.

       The **Select fence proxy preference type to add** pane opens.
    b. Select a power management proxy from the drop-down list and then click **OK**.

Your new proxy displays in the **Power Management Proxy Preference** list.

> **Note:**
>
> By default, the Manager searches for a fencing proxy within the same cluster as the host. If The Manager cannot find a fencing proxy within the cluster, it searches the data center.

19. Click **OK**.

From the list of hosts, the exclamation mark next to the host's name disappeared, signifying that you have successfully configured power management and fencing.

Preventing Host Fencing During Boot

After you configure power management and fencing, when you start the Manager it automatically attempts to fence non-responsive hosts that have power management enabled *after* the quiet time (5 minutes by default) has elapsed. You can opt to extend the quiet time to prevent, for example, a scenario where the Manager attempts to fence hosts while they boot up. This can happen after a data center outage because a host's boot process is normally longer than the Manager boot process.

You can configure quiet time using the `engine-config` command option `DisableFenceAtStartupInSec`:

```
# engine-config -s DisableFenceAtStartupInSec=number
```

Checking Fencing Parameters

To automatically check the fencing parameters, you can configure the `PMHealthCheckEnabled` (false by default) and `PMHealthCheckIntervalInSec` (3600 sec by default) engine-config options.

```
# engine-config -s PMHealthCheckEnabled=True
```

```
# engine-config -s PMHealthCheckIntervalInSec=number
```

When set to true, `PMHealthCheckEnabled` checks all host agents at the interval specified by `PMHealthCheckIntervalInSec` and raises warnings if it detects issues.

Installing Additional Self-Hosted Engine Hosts

You add self-hosted engine hosts the same way as a regular host, with an additional step to deploy the host as a self-hosted engine host. The shared storage domain is automatically detected and the host can be used as a failover host to host the Engine virtual machine when required. You can also add regular hosts to a self-hosted engine environment, but they cannot be used to host the Engine virtual machine.

> **Important:**
>
> Before you begin, refer to Preparing a KVM Host.

To install an additional self-hosted engine host, complete the following steps.

1. In the **Administration Portal**, go to **Compute** and click **Hosts**.
2. Click **New**.

   For information on additional host settings, see the Admin Guide in the latest upstream oVirt Documentation.
3. Use the drop-down list to select the **Data Center** and **Host Cluster** for the new host.
4. Enter the **Name** and the **Address** of the new host. The standard SSH port, port 22, is auto-filled in the **SSH Port** field.
5. Select an authentication method to use for the engine to access the host.
   - Enter the root user's password to use password authentication.
   - Alternatively, copy the key displayed in the **SSH PublicKey** field to `/root/.ssh/authorized_keys` on the host to use public key authentication.
6. Optionally, configure power management, where the host has a supported power management card. For information, see Configuring Power Management and Fencing on a Host.
7. Click the **Hosted Engine** sub-tab.
8. Select the **Deploy** radio button.
9. Click **OK**.

Cleaning up the Deployment

If your self-hosted engine deployment fails, you must perform a few cleanup tasks before retrying.

1. Run the hosted engine cleanup command:

   ```
   # /usr/sbin/ovirt-hosted-engine-cleanup
   ```
2. Remove the storage:

   ```
   # rm -rf <storage_repo>/*
   ```
3. If the deployment failed after the local, temporary hosted engine virtual machine is created, you might need to clean up the local virtual machine repository:

   ```
   # rm -rf /var/tmp/localvm*
   ```

Upgrading Or Updating the Self-Hosted Engine

See Upgrading Your Environment to 4.4 or Updating the Self-Hosted Engine in the Oracle Linux Virtualization Manager: Administration Guide.

6
Deploying GlusterFS Storage

Oracle Linux Virtualization Manager has been integrated with GlusterFS, an open source scale-out distributed filesystem, to provide a hyperconverged solution where both compute and storage are provided from the same hosts. Gluster volumes residing on the hosts are used as storage domains in the Manager to store the virtual machine images. In this scenario, the Manager is run as a self-hosted engine within a virtual machine on these hosts; although, you can deploy GlusterFS within a standalone environment.

For instructions on creating a GlusterFS storage domain, refer to the My Oracle Support (MOS) article *How to Create Glusterfs Storage Domain (Doc ID 2679824.1)*.

> **Note:**
>
> If you are deploying a self-hosted engine as hyperconverged infrastructure with GlusterFS storage, you must deploy GlusterFS *BEFORE* you deploy the self-hosted engine. For more information about using GlusterFS, including prerequisites, see the Oracle Linux GlusterFS documentation.

Deploying GlusterFS Storage Using Cockpit

To deploy GlusterFS storage using the Cockpit web interface, complete the following steps.

> **Important:**
>
> To deploy GlusterFS, you must have at least three (3) KVM hosts. If you want more than three KVM hosts, they must be added in factors of three.

1. Ensure that on all KVM hosts you have installed the following packages:
   - `cockpit-ovirt-dashboard` to provide a UI for installation
   - `vdsm-gluster` to manage gluster services
   - `ovirt-host` on the KVM host used for cockpit deployment
2. Go to **Compute**, and then click **Hosts**.
3. Under the **Name** column, click the host to be used as the designated server.
4. Click **Host Console**.
5. Enter your login credentials (the user name and password of the root account.).
6. Go to **Virtualization** and then click **Hosted Engine**.
7. Click **Redeploy** under **Hosted Engine Setup**.
8. Click **Start** under **Hyperconverged**.

9. On the **Hosts** screen, enter 3 (or more) KVM hosts that are in the data center to be used for GlusterFS, with the main designated KVM host entered first and click **Next** when finished.
10. On the **FQDNs** screen, enter the FQDN (or IP address) for the hosts to be managed by the Hosted Engine and click **Next** when finished.

    > **Note:**
    >
    > The FQDN of the designated server is input during the Hosted Engine deployment process and is not asked for here.

11. Click **Next** on the **Packages** screen.
12. On the **Volumes** screen, create the minimum storage domains that are required: `engine`, `data`, `export`, and `iso`. Click **Next** when finished.

    For example:

    engine

    - **Name**: `engine`
    - **Volume Type**:`Replicate` (default)
    - **Arbiter**: Ensure the check box is selected.
    - **Brick Dirs**: **/gluster_bricks/engine/engine** (default)

    data

    - **Name**: `data`
    - **Volume Type**:`Replicate` (default)
    - **Arbiter**: Ensure the check box is selected.
    - **Brick Dirs**: `/gluster_bricks/data/data` (default)

    export

    - **Name**: `export`
    - **Volume Type**:`Replicate` (default)
    - **Arbiter**: Ensure the check box is selected.
    - **Brick Dirs**: `/gluster_bricks/export/export` (default)

    iso

    - **Name**: `iso`
    - **Volume Type**:`Replicate` (default)
    - **Arbiter**: Ensure the check box is selected.
    - **Brick Dirs**: `/gluster_bricks/iso/iso` (default)

13. On the **Brick Locations** screen, specify the brick locations for your volumes and click **Next** when finished.

    For this step, you specify the brick locations for your volumes (`engine`, `data`, `export`, and `iso`).

14. Review the screen and click **Deploy**.

    - If you are using an internal disk as the Gluster disk, no edits are required and you can simply click **Deploy** to continue with the deployment.
    - If you are using an external iSCSI ZFS external drive as the Gluster disk, click **Edit** to edit the `gdeployConfig.conf` file and specify the block device on each server that is being used for storage. Click **Save** and then click **Deploy** to continue with the deployment.

    This process takes some time to complete, as the gdeploy tool installs required packages and configures Gluster volumes and their underlying storage.

    A message display on the screen when the deployment completes successfully.

Creating a GlusterFS Storage Domain Using the Manager

To add a GlusterFS storage volume as a storage domain:

1. Go to **Storage** and then click **Domains**.
2. On the **Storage Domains** pane, click the **New Domain** button.
3. For the **Name** field, enter a name for the data domain.
4. From the **Data Center** drop-down list, select the data center where the GlusterFS volume is deployed. By default, the **Default** option is selected in the drop-down list.
5. From the **Domain Function** drop-down list, select the domain function. By default, the **Data** option is selected in the drop-down list.

    For this step, leave **Data** as the domain function because a data domain is being created in this example.
6. From the **Storage Type** drop-down list, select **GlusterFS**.
7. For the **Host to Use** drop-down list, select the host for which to attach the data domain.
8. When **GlusterFS** is selected for the **Storage Type**, the **New Domain** dialog box updates to display additional configuration fields associated with GlusterFS storage domains.
9. Ensure the **Use managed gluster volume** check box is not selected.
10. From the **Gluster** drop-down list, select the path to which domain function you are creating.
11. For the **Mount Options** option, specify additional mount options in a comma-separated list, as you would using the mount -o command.
12. **(Optional)** Configure the advanced parameters.
13. Click **OK** to mount the volume as a storage domain.

    You can click **Tasks** to monitor the various processing steps that are completed to add the GlusterFS storage domain to the data center.