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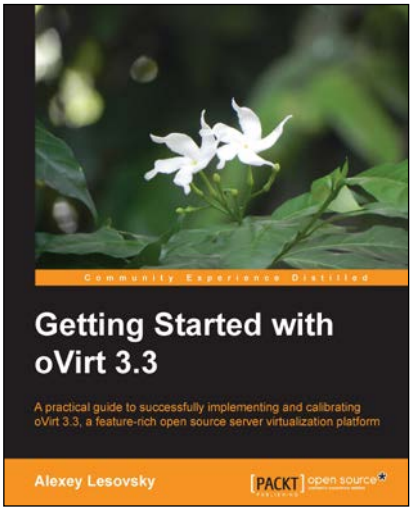
Getting Started with oVirt 3.3

Alexey Lesovsky



Chapter No. 3
"Configuring oVirt"

In this package, you will find:

A Biography of the author of the book

A preview chapter from the book, Chapter NO.3 "Configuring oVirt"

A synopsis of the book's content

Information on where to buy this book

About the Author

Alexey Lesovsky is a system administrator at a software development company that works with federal mobile operators. He has eight years of IT experience, which includes over three years on KVM virtualization technologies and products. His primary areas of interest are Linux, KVM virtualization products, system monitoring, and web infrastructure solutions oriented on a high load. This is his first book.

I want to thank my wife and son for their patience and understanding. Thank you! I love you very much.

Getting Started with oVirt 3.3

oVirt is one of the most dynamically developed tools for creating your own virtualization infrastructure. With great potential, oVirt combines modern and advanced virtualization technology. Based on KVM, it allows you to create very flexible configurations that are able to solve a variety of issues. If you are interested in virtualization, oVirt is a good choice.

This book will guide you through the process of creating and customizing your own virtualization infrastructure. Step-by-step, you will learn what you need to do to create a complete infrastructure. In addition, you will learn about more advanced features and how to use them.

What This Book Covers

Chapter 1, Before you Begin, introduces the overall architecture and the internal structure of oVirt. It also provides an overview of the system requirements that must be met.

Chapter 2, Installing oVirt, will guide you through the installation and initial configuration of oVirt Engine and virtualization hosts. We also look at the Administrator Portal, which is the main control center.

Chapter 3, Configuring oVirt, describes the process of setting up the environment, including the creation and configuration of data centers, clusters, and virtualization hosts. Particular attention is paid to the connection of storage to oVirt and the creation of logical networks.

Chapter 4, Managing Virtual Machines, talks about how to create virtual machines. oVirt allows you to create virtual machines in a variety of configurations. Here we look at templates—convenient tools for the rapid deployment of virtual machines.

Chapter 5, Advanced Features, talks about the additional features offered by oVirt, such as user management and resource quotas, pools with prestarted virtual machines and snapshots, live migration and high availability, and more.

Chapter 6, oVirt Troubleshooting, helps us understand what to do when problems occur, and the steps that need to be taken to solve them.

Appendix A, NFS Storage Setup on CentOS, covers how to set up the NFS server with CentOS Linux

Appendix B, iSCSI Storage Setup on CentOS, covers how to set up an iSCSI server with CentOS Linux.

3
Configuring oVirt

After the installation of oVirt Engine through the engine setup utility, the next step is to configure the oVirt virtual environment. Further configuration is done using the already familiar administrator portal. The administrator portal performs the integration of existing resources in a virtual infrastructure. The oVirt environment is formed from a set of logical components. However, these components are very real physical devices, given as follows:

- **Data centers**: They are the top-level containers and may incorporate several clusters
- **Clusters**: These are a group of hosts with some properties
- **Hosts**: They are the physical servers on which the virtual environments will work

In addition to these components, there are some more components too: **Logical networks**, **Volumes**, and **Storage**. An important element is **Storage** that connects to the data center. The type of data center and Storage is determined during configuration of oVirt Engine or in the process of creating the data center. Dedicated storage is used to store virtual disks that belong to virtual machines. oVirt's significant advantage is that it supports different types of storage facilities, and it can create additional data centers using various types of storages. Note that the data center can only work with one type of storage. Supported types of storages are NFS, iSCSI, Fibre Channel, and GlusterFS.

Networks are an essential component of any data center, both physical and virtual. Logical networks can be used for separation of traffic and building complex network environments. Volumes in oVirt are preconfigured and ready-to-use GlusterFS storage, which are distributed across virtualization hosts.

Data centers

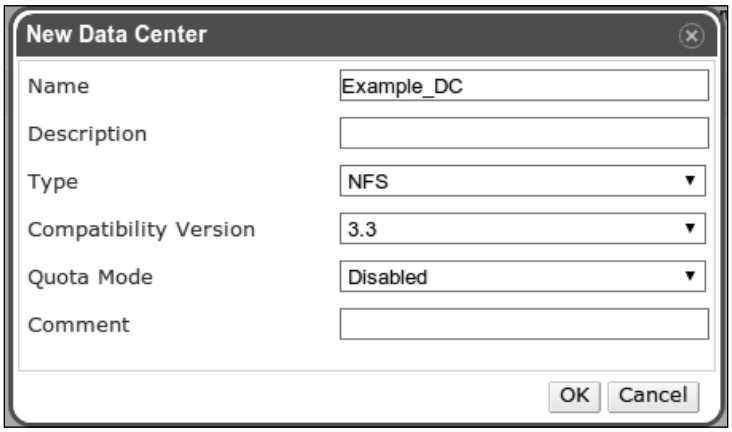
Data centers are top-level containers for any resource available in the oVirt environment. Data center consists of a set of clusters, which are composed of sets of hosts. The data centers contain logical networks and various types of storage. After the completion of the engine setup in our infrastructure, we create a data center named `Default` and a preconfigured cluster, also named `Default`. This predefined data center and cluster are a good starting point for getting started. We can even use the predefined data center. We will show how to build the infrastructure from scratch and create our own data centers. It is recommended not to remove the predefined data center. We will create a single data center with the NFS storage and this example will describe the setting up of oVirt. There will also be examples to connections of other storage types.

Creating a new data center

The first step in the oVirt virtual environment is the process of creating the data center. Log in to the administrator portal and go to the **Data Centers** section in the resource pane. Click on **New**. The dialog box named **New Data Center** should be filled with the settings for the new data center. The components of the dialog box are given as follows:

- **Name**: Here we need to specify a unique data center name.
- **Type**: Select the type of storage, choose **NFS**, or any other type, depending on the type of your available storage.
- **Compatibility Version**: It must be the latest version. This field is used to upgrade data center version in case of oVirt Engine upgrade. For example, from 3.2 to 3.3.
- **Quota Mode**: Here we can enable quotas that are used to limit resources of oVirt users. Quota is an extended feature and will be covered in *Chapter 5*, *Advanced Features*.

The following screenshot shows the **New Data Center** dialog box:



Click on the **OK** button and open the data center wizard named **Guide Me**. This is a very useful wizard for those who have never seen the settings of oVirt.

The next step is to create a cluster; click on the **Configure Cluster** button in the **Guide Me** wizard. Note that there is a way to create a cluster without a master. To do this, select the **Clusters** tab in the resource pane and click on the **New** button in the toolbar.

Clusters

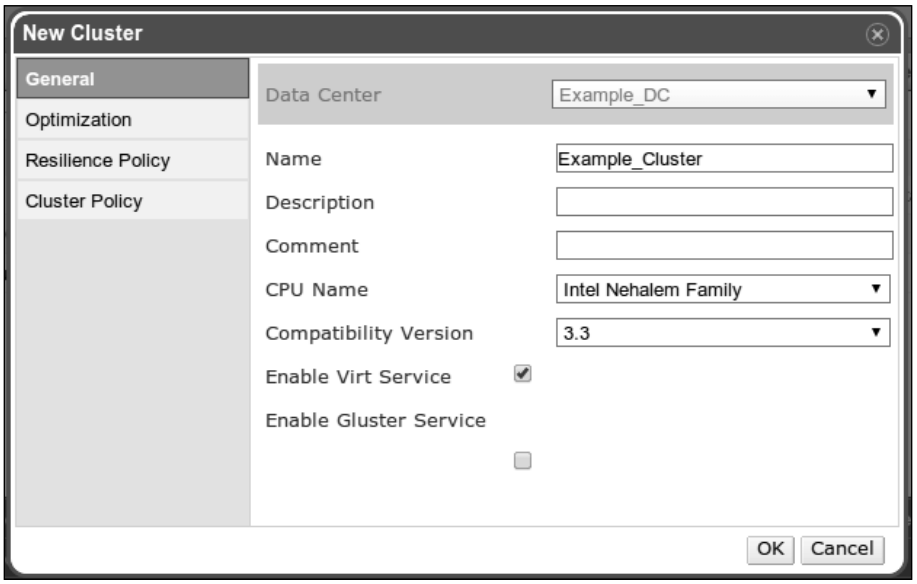
Clusters are groups of physical servers that use a shared storage and have one type of CPU. VMs in a cluster may move from one physical host to another. In this case, the VM does not stop. This process is called **Live Migration**. There is one limitation, the virtual machines cannot migrate between clusters. Any virtualization host is a member of the cluster. Any cluster in the oVirt environment necessarily belongs to data centers. Using this hierarchy along with the cluster policies, we will have the ability to dynamically allocate the available resources and to determine which of the hosts will run the VM. When the VM is started, it can be migrated between hosts within their cluster. This is done either at the request of the Administrator or automatically to comply with the cluster policy. VM migration is also very useful when we need to perform virtualization host maintenance. The migration process is transparent to the end user, and the user can continue working as usual at this time.

Creating a cluster

After clicking on **Configure Cluster**, a dialog box is displayed in which you must fill in the parameters for the future cluster. These parameters are grouped into several sections, which are given as follows:

- **General**: It describes the basic parameters and the appointment of a cluster. Particular attention should be paid to the CPU type in the **CPU Name** list. Choose the type of processor from the available list. Virtualization hosts that are members of the same cluster must have the same type of CPU; this is a very important condition when we have to perform VMs live migration within a cluster. If we use servers with a different CPU, the lowest family needs to be chosen, or it will be better if you create multiple clusters. When you try to join the host with an older CPU family to a cluster with a newer family configured, you can see the following message in the event pane: `Host moved to Non-Operational state as host does not meet the cluster's minimum CPU level`. CPU family can be determined through the `/proc/cpuinfo` interface.
- **Compatibility Version**: The version of the cluster must be the same as the version of oVirt Engine. This option used when oVirt Engine is upgraded.
- In fact, cluster may be used in two ways: as a virtualization host and as a Gluster storage. The previous points define the role of the cluster; the cluster can be used in virtualization purposes to run VMs for storage purposes, which will allow us to create GlusterFS volumes or a combination of both. Click on the **Enable Virt Service** checkbox, which enables the ability to run VMs in a cluster. We can also click on the **Enable Gluster Service** checkbox to enable Gluster storage service. Alternatively, click on both the checkboxes to enable both the services.

The following screenshot shows the **New Cluster** dialog box:



The components of the **New Cluster** dialog box are as follows:

- **Optimization**: It allows us to set the parameters for the optimization of memory and processors:
    - **Memory Optimization**: It specifies the use of technology **KSM** (**Kernel Samepage Merging**) which allows you to combine identical memory pages into one page. With the use of KSM memory utilization, efficiency increases. It has the following options:

      None: It allows you to disable the use of KSM.

      For Server Load: It allows us to use moderate settings KSM.

      For Desktop Load: It allows the use of aggressive parameters in KSM.

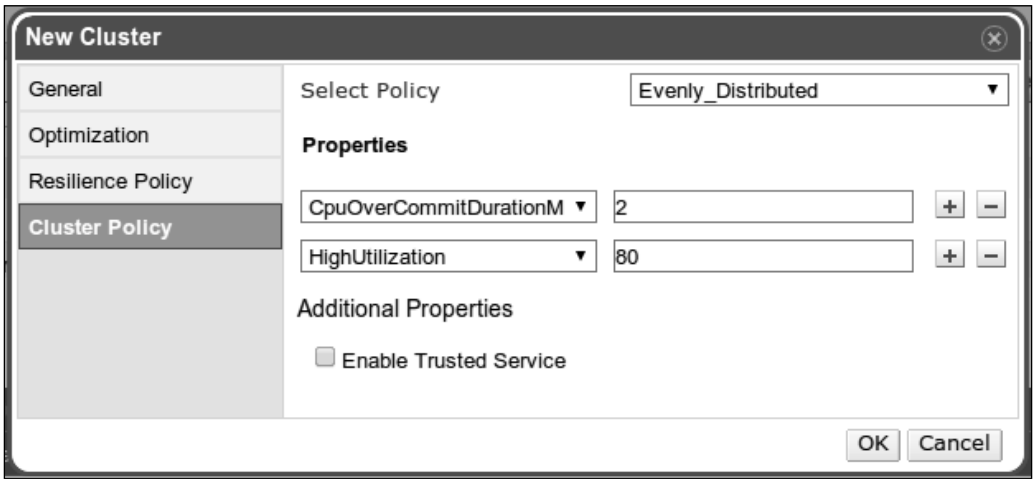
It should be noted that the use of KSM implies an additional load on the CPU, because to find the same pages requires additional computing power. And the more aggressive options, the more CPU processing power required. Note that heavy-loaded relational databases such as Oracle, PostgreSQL, MySQL/MariaDB, will cause a high load due the fact that their memory changes a lot. More info about KSM can be found on Fedora KSM page at `https://fedoraproject.org/wiki/Features/KSM`.

  - **CPU Threads**: It allows the hypervisor to use separate threads for each core as a separate virtual processor. This requires that the physical processor supports **AMD Clustered MultiThreading** or **Intel Hyper-Threading**. Enabling this option may be useful when it is planned that the cluster will not have a high load.
  - **Memory Balloon**: It allows shrinking the memory used by the hypervisors and increases VMs memory. Ballooning allows the VMs to dynamically change their memory usage by evicting unused memory.

- **Resilience Policy**: This policy is here to define the management policies that are associated with the configuration of VM's high availability. Depending on the need and the importance of running machines in a cluster, you can choose one of the following three policies:
  - **Migrate Virtual Machines**: This is used if it is necessary to use an automated migration for any VMs in cluster
  - **Migrate only Highly Available Virtual Machines**: This option is used in case there is a need to migrate only high availability VMs
  - **Do not Migrate Virtual Machines**: This option is used if we do not need to perform automatic migration of VMs

- **Cluster Policy**: It is a policy which determines the VM's allocation strategy within the cluster. In this case, it is determined by the load limits for virtualization hosts. When the limits are reached, the VM will be permanently migrated to other nodes in the cluster to return to a state policy of satisfying the cluster. By default, there are two policy clusters, **Even Distribution** and **Power Saving**. Even Distribution allows you to evenly distribute the load on the cluster nodes. Power Saving allows you to collect the load on multiple cluster nodes to permit further opportunities for the newly independent nodes. oVirt 3.3 allows you to create your own cluster policies; this feature will be covered in *Chapter 5*, *Advanced Features*.

This figure shows the **Cluster Policy** section:



After defining the cluster parameters, click on **OK** and return to the data center configuration menu named **Guide Me**. It should be noted that the data center may have several clusters and more clusters can be created in many ways.

The next step is to add virtualization hosts. To do this, in the wizard **Guide Me**, we need to click on **Configure Hosts**. Or go to the **Hosts** tab in the resource pane.

Hosts

The main components of the infrastructure are the virtualization hosts called *Hosts*.

Start and run the VMs on the hosts. All hosts are members of the cluster. Joining Hosts into clusters accomplishes many goals, for example, creating a logical structure in the virtualization environment or creating a separated group of servers for special purposes. Also, hosts can be joined into clusters by CPU type.

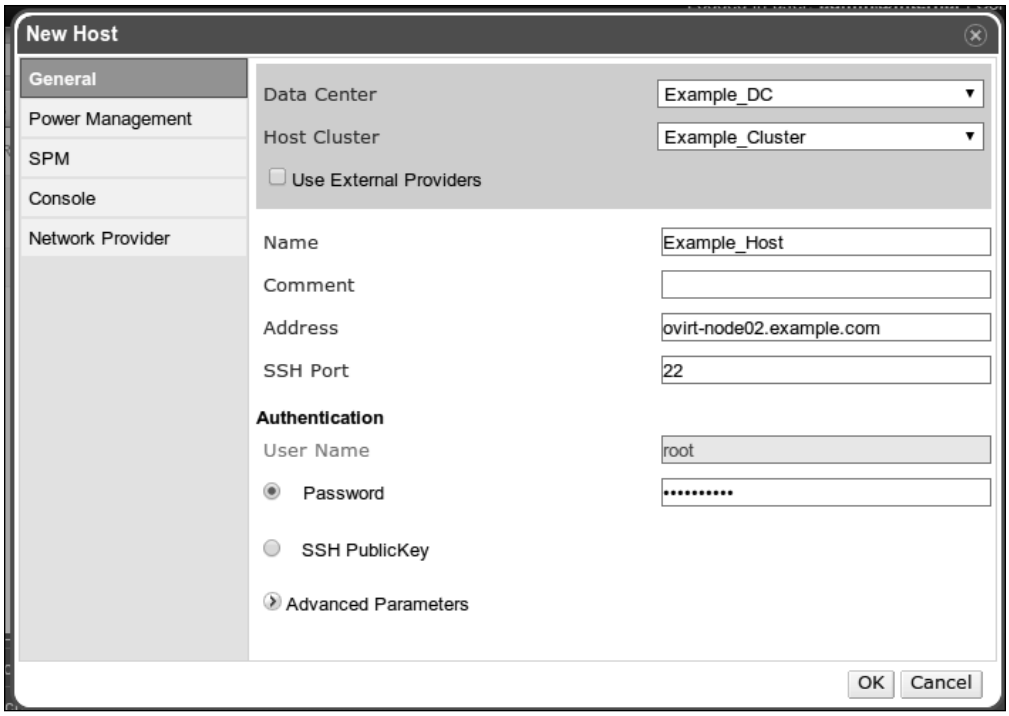
Configuring hosts

The configuration of virtualization hosts in oVirt is simple and requires only a physical server that meets the hardware requirements with CentOS/RHEL preinstalled and accessible via SSH. This host must have a preconfigured VDSM repository. This issue is described in *Chapter 2*, *Installing oVirt*, in the *oVirt Engine setup* section.

After clicking on **Configure Hosts** in the **Guide Me** wizard, a dialog box for adding virtualization host is displayed, which has the following three sections:

- **General**: Here you should enter the basic settings for the new host. These settings are given as follows:
    - **Name**: It allows us to specify the unique name for the new host.
    - **Address**: It allows us to specify the **FQDN** (**fully qualified domain name**) or IP address of the host.
    - **SSH Port**: It specifies a port number to connect to the host. Be sure that the sshd service is running on the target host.
    - **Root Password**: It allows us to define the password to connect to the root account on the server.

    The following screenshot shows the **New Host** dialog box with the **General** section:

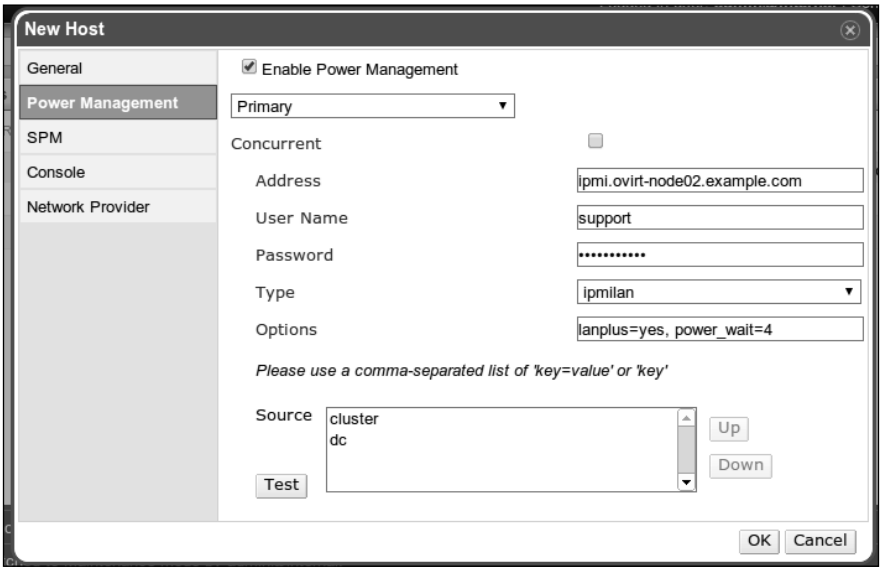


Here we define the parameters for the virtualization host. Using these parameters, oVirt Engine will connect to the host and run a fully automated installation process VDSM agent. There is also a clause to automatically configure the remote host firewall.

- **Power Management**: Power management is a mechanism that allows the cluster to shutdown the host on which the failure occurs. oVirt Engine works directly with the hardware through special fence agents. When a failure is detected, oVirt sends a signal to the control module that powers off the server. Power management can be configured if the integrated management module is present in server. Click on the section named **Power Management** and enable the **Enable Power Management** option and specify the following required parameters:
    - **Address**: Here we need to specify the remote management module IP address or FQDN.
    - **User Name** and **Password**: Here you can specify the user and password under which oVirt will connect.
    - **Type**: It determines the type of device that will control the power. oVirt supports different types of remote management device. Additional info about the specific modules can be found in the vendor hardware documentation.
    - **Options**: It consists of optional parameters that are passed to fence agent. Detailed information about the available options can be found in the man pages of the respective fence agents.

  To check the power management agent, click on the **Test** button. Note that at least two nodes need to be in a cluster, otherwise power management won't work.

  The following figure shows the **Power Management** window:



For high availability, it is required to set up power management. Without power management, high availability won't work. But if you don't have hardware allowing you to perform power management, this step can be skipped and keep the **Enable Power Management** option disabled.

- **SPM**: **SPM** (**Storage Pool Manager**) priority feature allows the admin to define priorities between hosts regarding the **SPM** election process. SPM is a role assigned to one host in a data center which has the power to allocate, create, delete, and manipulate virtual disk images, snapshots, and templates in storage. This role can be migrated to any host in data center. SPM role is assigned to a host with high priority. A host can be given **Low**, **Normal**, or **High** priority. There should be only one SPM in a data center.
- **Console**: This section allows us to override IP address on which VMs consoles will be run.
- **Network Provider**: It allows us to specify OpenStack Neutron as an external network provider and use Neutron capabilities such as network discovery, provisioning, security groups, and others. More information about Neutron integration can be found at `http://www.youtube.com/watch?v=S16AfFylcHk`.

By clicking on **OK**, we'll be back in the configuration dialog of the data center and a background process setting up the virtualization host is run. During the installation process, oVirt Engine will connect to the specified host and run the software installation process. After this, it will restart a new host. The new host will automatically be added to the specified cluster. The next step is to configure the storage.

Configuring storage

Storage is independent of an oVirt component unless you use local storage or GlusterFS on virtualization hosts. Storage should be preconfigured, so in order to proceed further, you must have ready-to-use storage.

For configuring the storage in the **Guide Me** dialog box, you must click on **Configure Storage**. Or you can do it in the **Storage** tab is in the resource pane. In both cases, it will open the same dialog box allowing you to add and connect storage to the data centers. The attached storage must match the type that was specified when creating a data center. Note that multiple storage of the same type can be connected to the data center. All types of storage listed in the following section allow the administrator to be flexible in the oVirt environment. The storage can be connected, depending on the availability of resources.

In oVirt, there are two additional storage required to perform regular functions. These are the ISO and the export storage domains which will be covered after data storage types.

Configuring the NFS storage

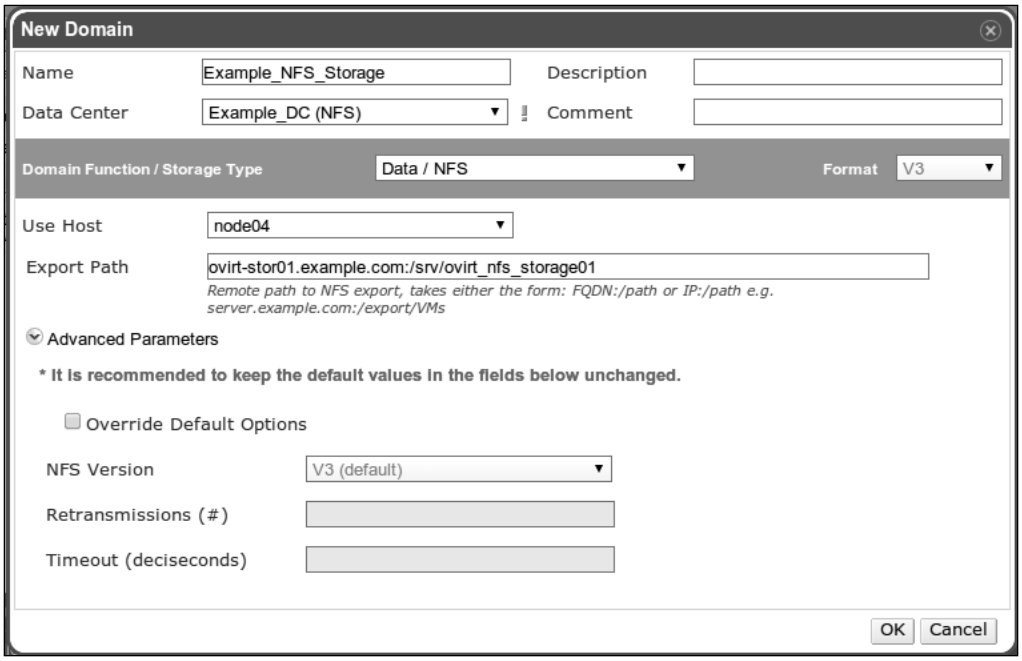
NFS storage is a fairly common type of storage that is quite easy to set up and run even without special equipment. You can take the server with large disks and create NFS directory. This process is covered in *Appendix A*, *NFS Storage Setup on CentOS*. But despite the apparent simplicity of NFS, setting s should be done with attention to details, which covered in *Appendix A*, *NFS storage setup on CentOS*.

Make sure that the NFS directory is suitable for use; go to the procedure of connecting storage to the data center. The following options are displayed after you click on the **Configure Storage** dialog box in which we specify the basic storage configuration:

- **Name and Data Center**: It is used to specify a name and target of the data center for storage
- **Domain Function/Storage Type**: It is used to choose a data function and NFS type
- **Use Host**: It is used to enter the host that will make the initial connection to the storage and a host who will be in the role of SPM
- **Export Path**: It is used to enter the storage server name and path of the exported directory
- **Advanced Parameters**: It provides additional connection options, such as NFS version, number of retransmissions and timeout, that are recommended to be changed only in exceptional cases

Fill in the required storage settings and click on the **OK** button; this will start the process of connecting storage.

The following image shows the **New Storage** dialog box with the connecting NFS storage:



Configuring the iSCSI storage

This section will explain how to connect the **iSCSI** storage to the data center with the type of storage as iSCSI. You can skip this section if you do not use iSCSI storage.

iSCSI is a technology for building **SAN** (**Storage Area Network**). A key feature of this technology is the transmission of SCSI commands over the IP networks. Thus, there is a transfer of block data via IP. By using the IP networks, data transfer can take place over long distances and through network equipment such as routers and switches. These features make the iSCSI technology good for construction of low-cost SAN. oVirt supports iSCSI and iSCSI storages that can be connected to oVirt data centers.

Then begin the process of connecting the storage to the data center. After you click on the **Configure Storage** dialog box in which you specify the basic storage configuration, the following options are displayed:

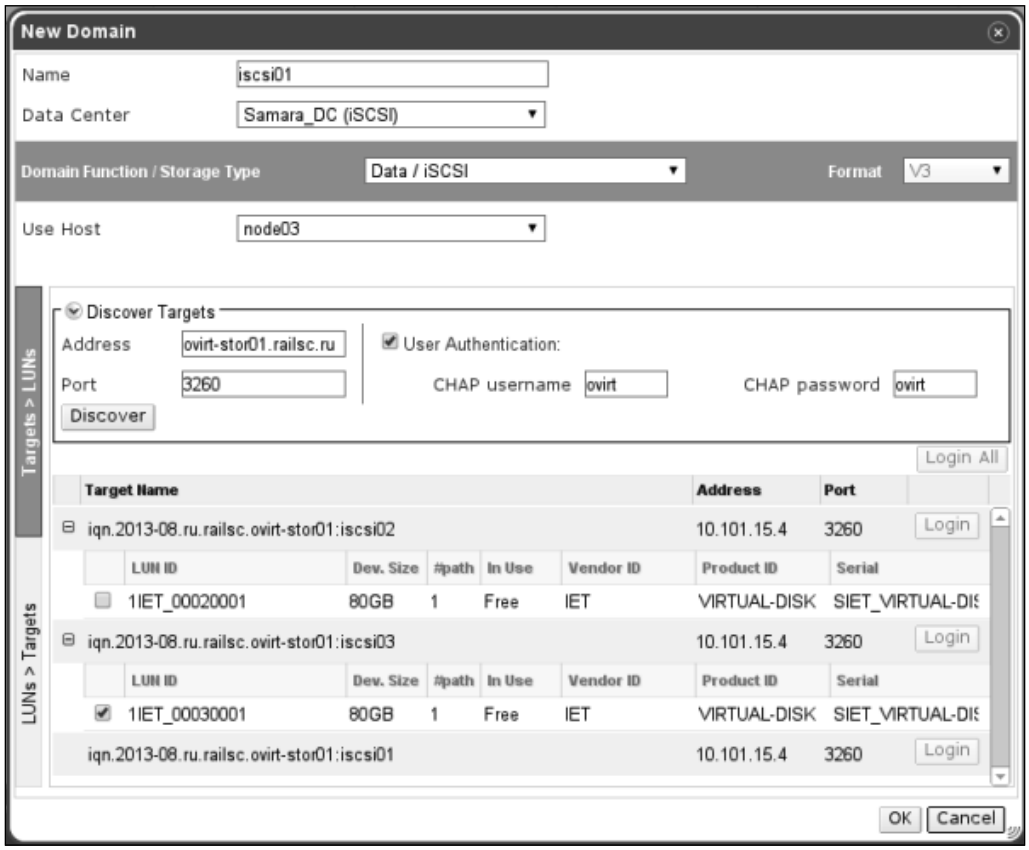
- **Name and Data Center**: It is used to specify the name and target of the data center.
- **Domain Function/Storage Type**: It is used to specify the domain function and storage type. In this case, the data function and iSCSI type.
- **Use Host**: It is used to specify the host to which the storage (SPM) will be attached.

The following options are present in the search box for iSCSI targets:

- **Address and Port**: It is used to specify the address and port of the storage server that contains the iSCSI target
- **User Authentication**: Enable this checkbox if authentication is to be used on the iSCSI target
- **CHAP username and password**: It is used to specify the username and password for authentication

Click on the **Discover** button and oVirt Engine connects to the specified server for the searching of iSCSI targets. In the resulting list, click on the designated targets, we click on the **Login** button to authenticate. Upon successful completion of the authentication, the display target LUN will be displayed; check it and click on **OK** to start connection to the data center. New storage will automatically connect to the data center. If it does not, select the location from the list and click on the **Attach** button in the detail pane where we choose a target data center.

The following screenshot shows the **New Storage** dialog box with iSCSI storage type:



Configuring the Fibre Channel storage

If you have selected **Fibre Channel** when creating the data center, we should create a Fibre Channel storage domain. oVirt supports Fibre Channel storage based on multiple preconfigured **Logical Unit Numbers** (**LUN**). Skip this section if you do not use Fibre Channel equipment.

Begin the process of connecting the storage to the data center. Open the **Guide Me** wizard and click on the **Configure Storage** dialog box where you specify the basic storage configuration:

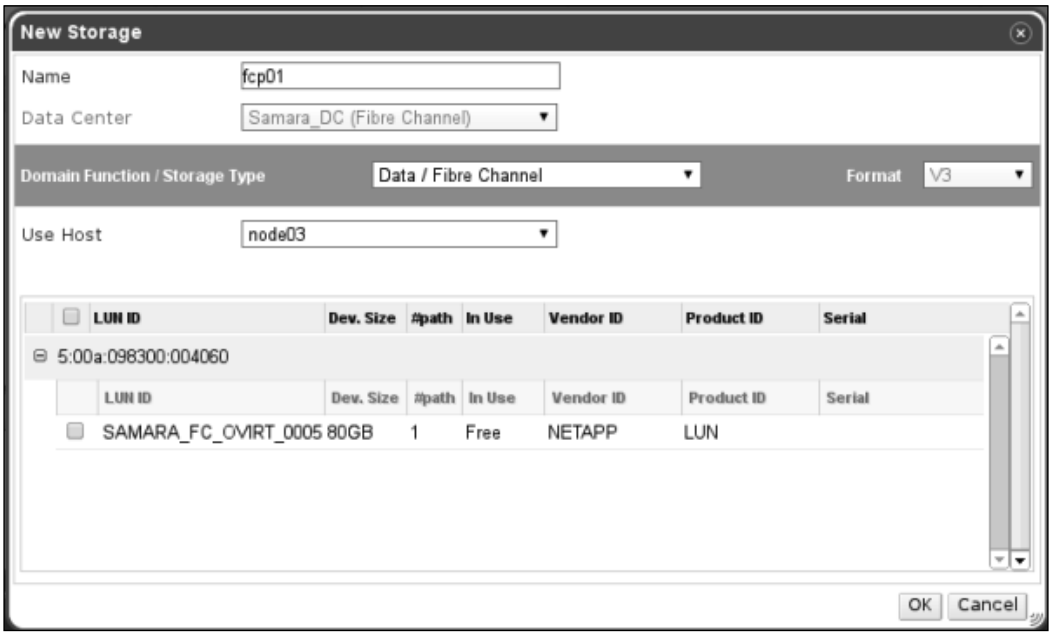
- **Name and Data Center**: It is used to specify the name and data center
- **Domain Function/Storage Type:** Here we need to specify the data function and Fibre Channel type

- **Use Host**: It specifies the address of the virtualization host that will act as the SPM

In the area below, the list of LUNs are displayed, enable the **Add LUN** checkbox on the selected LUN to use it as Fibre Channel data storage.

Click on the **OK** button and this will start the process of connecting storage to the data centers. In the **Storage** tab and in the list of storages, we can see created Fibre Channel storage. In the process of connecting, its status will change and at the end new storage will be activated and connected to the data center. The connection process can also be seen in the event pane.

The following screenshot shows the **New Storage** dialog box with Fibre Channel storage type:



Configuring local on host storage

It is possible to create a local on host type of storage for the cases when the virtualization host, cluster, and data center is located on the single physical server. When using this type of storage storage type is a significant limitation. For VMs that are created on a cluster of the local type, we cannot perform migrations, fencing, or scheduling. Skip this section if you do not plan to use local on host data centers.

Preparing the local storage

Before connecting the storage data center, we need to create a storage directory on a virtualization host:

1. Create a separate partition that will have enough space to contain all VM images. Make a directory that will serve as the local store.
2. Directory must have permissions to read and write for the user's VSDM and group for KVM.

As an example, we may use the directory `/srv/vmdata`. This is done as shown in the following commands:

```
# chown vdsm:kvm /srv/vmdata
# chmod 0755 /srv/vmdata
```

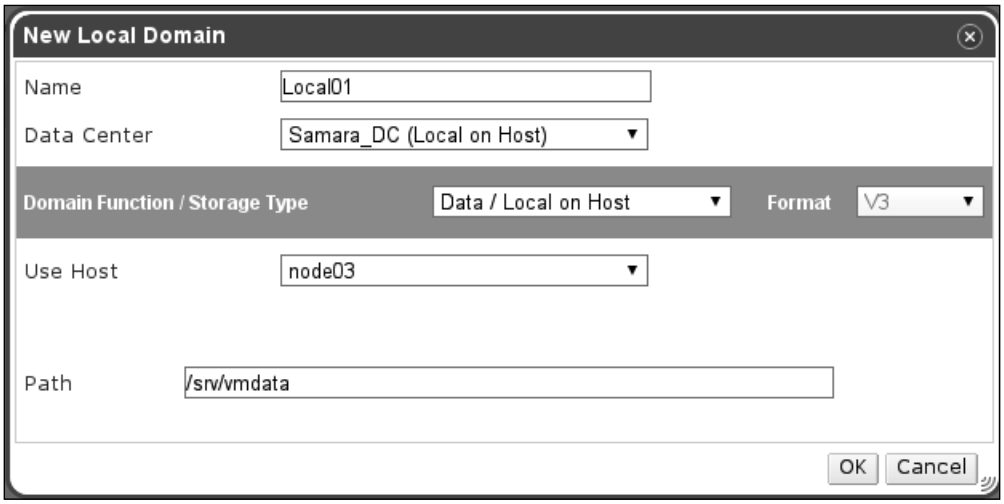
Connecting the local storage into data center

Go to the **Storage tab** in the resource pane. Click on the **New Domain** button. A dialog box opens, set up the storage options:

- **Name and Data Center**: It is used to specify a name and data center for the new storage
- **Domain Function/Storage Type**: It specifies the data function and the local on host type
- **Use Host**: It allows to only select a single host that is available in a data center
- **Path**: It specifies our catalog that will be used as storage `/srv/vmdata`

Click on **OK** and then start the process of connecting to a storage data center. When it is ready, our local storage will automatically attach to the data center.

The following figure shows the **New Storage** dialog box with the **Local on Host** storage type:



Configuring the GlusterFS storage

GlusterFS is a distributed, parallel, and linearly scalable filesystem. GlusterFS can combine the data storage that are located on different servers into a parallel network filesystem. GlusterFS's potential is very large, so developers directed their efforts towards the implementation and support of GlusterFS in oVirt (GlusterFS documentation is available at `http://www.gluster.org/community/documentation/index.php/Main_Page`). oVirt 3.3 has a complete data center with the GlusterFS type of storage.

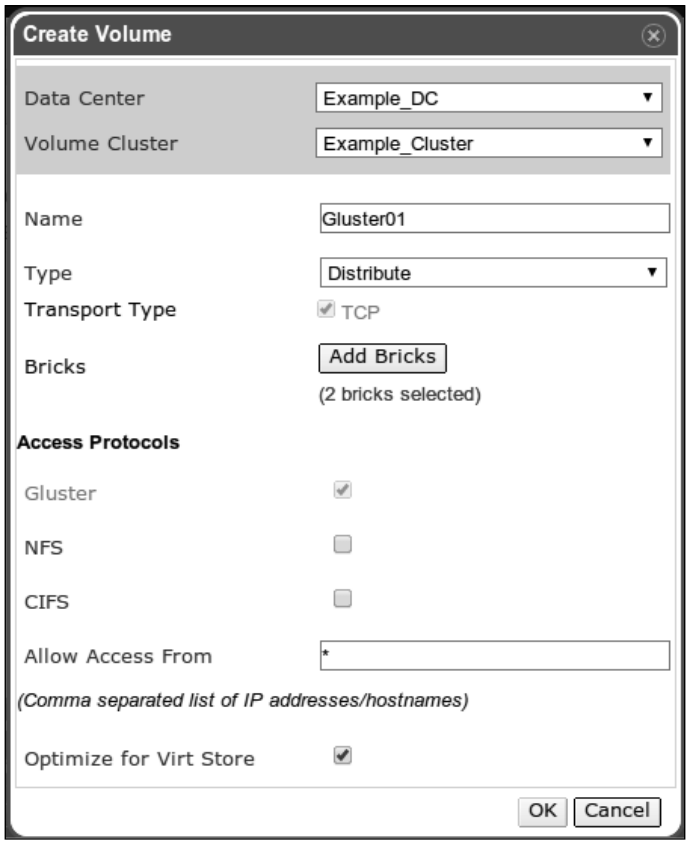
Configuring the GlusterFS volume

Before attempting to connect GlusterFS storage into the data center, we need to create the volume. The procedure of creating GlusterFS volume is common in all versions.

1. Select the **Volumes** tab in the resource pane and click on **Create Volume**.
2. In the open window, fill the volume settings:
    - **Data Center**: It is used to specify the data center that will be attached to the GlusterFS storage.
    - **Volume Cluster**: It is used to specify the name of the cluster that will be created.

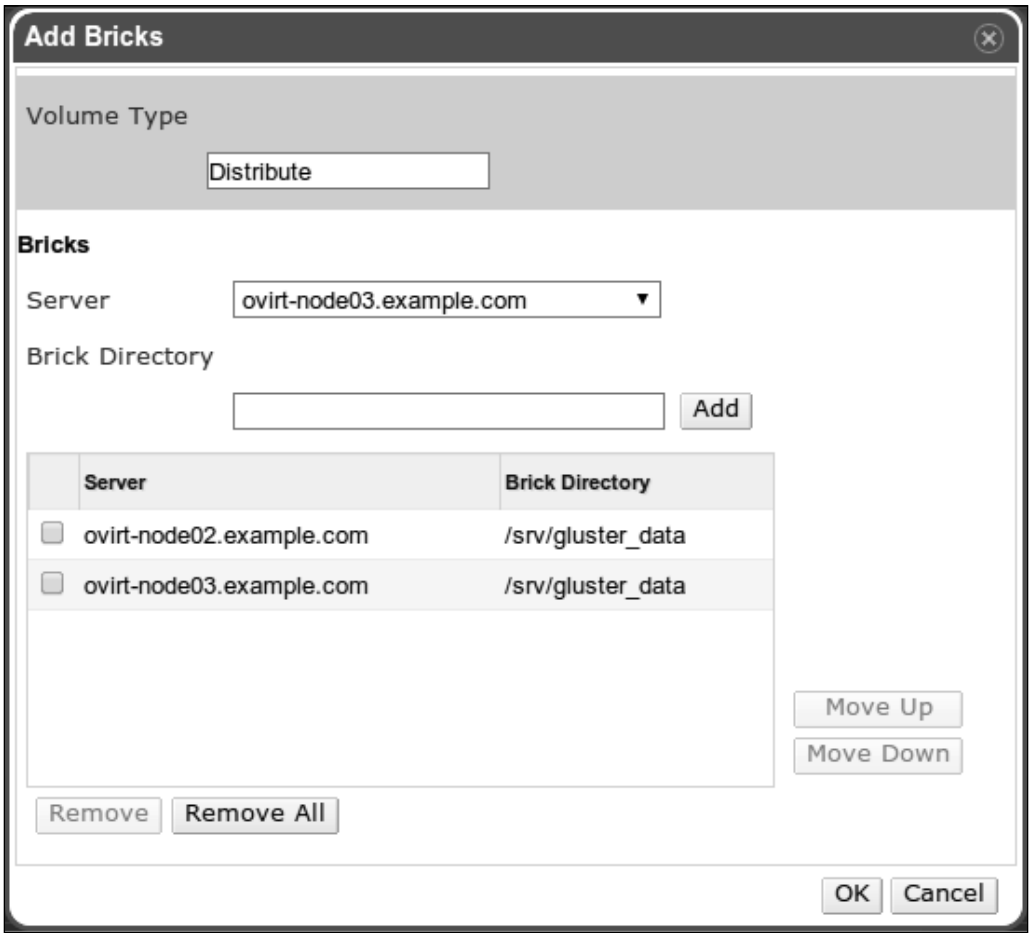
- **Name**: It is used to specify a name for the new volume.
- **Type**: It is used to specify the type of GlusterFS volume available to choose from, there are seven types of volume that implement various strategic placements of data on the filesystem. Base types are Distribute, Replicate, and Stripe and other combination of these types: Distributed Replicate, Distributed Stripe, Striped Replicate, and Distributed Striped Replicate (additional info can be found at the link: `http://gluster.org/community/documentation/index.php/GlusterFS_Concepts`).
- **Bricks**: With this button, a list of bricks will be collected from the filesystem. Brick is a separate piece with which volume will be built. These bricks are distributed across the hosts. As bricks use a separate directory, it should be placed on a separate partition.
- **Access Protocols**: It defines basic access protocols that can be used to gain access to the following:
    i. **Gluster**: It is a native protocol access to volumes GlusterFS, enabled by default.
    ii. **NFS**: It is an access protocol based on NFS.
    iii. **CIFS**: It is an access protocol based on CIFS.
- **Allow Access From**: It allows us to enter a comma-separated IP address, hostnames, or * for all hosts that are allowed to access GlusterFS volume.
- **Optimize for oVirt Store**: Enabling this checkbox will enable extended options for created volume.

The following screenshot shows the dialog box of **Create Volume**:



3. Fill in the parameters, click on the **Bricks** button, and go to the new window to add new bricks with the following properties:
    - **Volume Type**: This is used to change the previously marked type of the GlusterFS volume
    - **Server**: It is used to specify a separate server that will export GlusterFS brick
    - **Brick Directory**: It is used to specify the directory to use
4. Specify the server and directory and click on **Add**. Depending on the type of volume, specify multiple bricks. After completing the list with bricks, click on the **OK** button to add volume and return to the menu.
5. Click on the **OK** button to create GlusterFS volumes with the specified parameters.

The following figure shows the **Add Bricks** dialog box:



Now that we have GlusterFS volume, we select it from the list and click on **Start**.

Configuring the GlusterFS storage

oVirt 3.3 has support for creating data centers with the GlusterFS storage type:

1. The GlusterFS storage type requires a preconfigured data center.
2. A pre-created cluster should be present inside the data center. The enabled Gluster service is required.
3. Go to the **Storage** section in resource pane and click on **New Domain**.

4. In the dialog box that opens, fill in the details of our storage. The details are given as follows:
    - **Name and Data Center**: It is used to specify the name and data center
    - **Domain Function/Storage Type**: It is used to specify the data function and GlusterFS type
    - **Use Host**: It is used to specify the host that will connect to the SPM
    - **Path**: It is used to specify the path to the location in the format `hostname:volume_name`
    - **VFS Type**: Leave it as **glusterfs** and leave **Mount Option** blank
5. Click on the **OK** button; this will start the process of creating the repository.

The created storage automatically connects to the specified data centers. If not, select the repository created in the list, and in the subtab named **Data Center** in the detail pane, click on the **Attach** button and choose our data center. After you click on **OK**, the process of connecting storage to the data center starts.

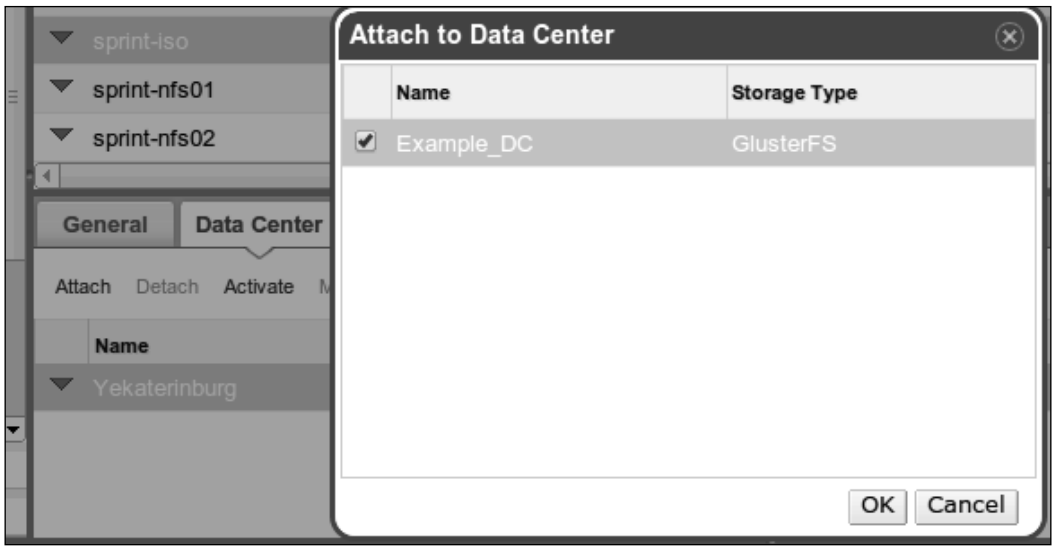
The following figure shows the **New Storage** dialog box with the GlusterFS storage type.

Configuring the ISO domain

Most general installation methods for installing VMs are the installing it with ISO images. For storing ISO images, use the ISO domain, which is the NFS directory. In most cases, ISOs connecting the ISO domain is a required step in configuring the data center. These steps are given as follows:

1. To connect to the ISO domain, we need to open the **Storage** tab in the resources pane. Here, the ISO domain that was created during the configuration engine setup is already present.
2. Select the predefined ISO domain from the list, and the details pane opens; click on the **Attach** button.
3. In the dialog box that opens, click on the checkbox for our data center and click on **OK**.
4. Now we need to go to the **Data Centers** section in the resource pane. Select the data center to which ISO domain was attached. In the detail pane, select the ISO domain and click on on the **Activate** button.

The following image shows the **Attach to Data Center** dialog box:



After a while, the ISO domain icon turns green, which means that the ISO domain is connected and ready for use.

We can now upload the installation image to the ISO domain storage, this step is performed in the Linux console. These steps are given as follows:

1. Copy the ISO image to the directory of the system, which is running oVirt Engine.
2. Log in with the root account to the system running oVirt Engine.
3. To download the ISO image, use a command line utility `ovirt-iso-uploader`. The process of uploading the image takes some time depending on the size of the ISO image, and the network bandwidth between oVirt Engine and the ISO domain.

After the ISO image is uploaded, we can install a VM in the oVirt environment.

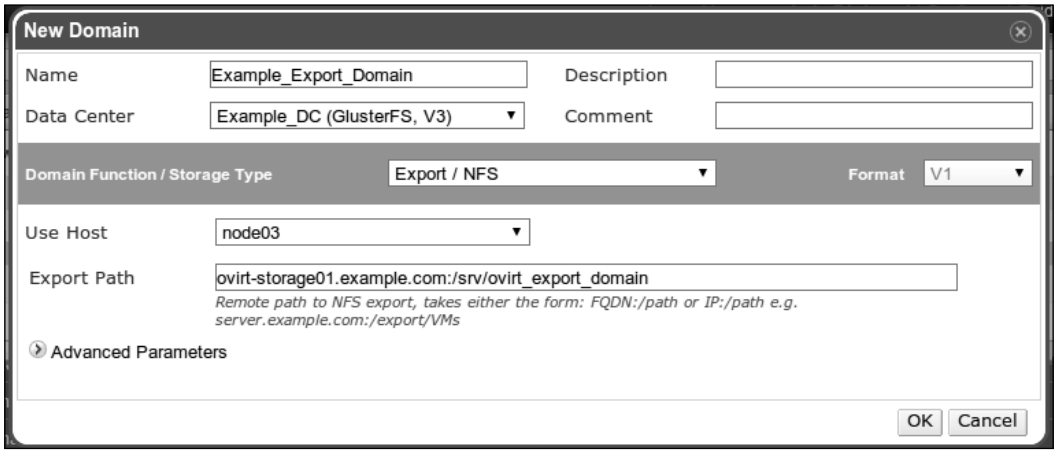
Configuring the export domain

The export domain is needed to store the exported VMs during oVirt software upgrades, moving VMs across data centers, import VMs with *virt-v2v/virt-p2v* or *Acronis* utilities. Export domain is also an NFS storage, but it is not created by default. So, we can create the export domain manually. Export domain is not required for the operation of the data center so it is always possible to create it later when it is necessary. Export domain creation procedure is given in the following steps:

1. Click on the **New Domain** button in the **Storage** tab.
2. In the dialog box that opens, fill in the following parameters of the new domain:
    - **Name and Data Center**: It is used to specify the storage name and data center
    - **Domain Function/Storage Type**: It is used to provide a domain function and the type of storage selected as an export function, and the type is NFS
    - **Use Host**: It is used to specify the host that will be connected to the storage or a host that will be in the role of SPM
    - **Export Path**: It is used to provide a storage server name and path for the exported directory
    - **Advanced Parameters**: It is used to specify additional connection options that are recommended to be changed only in exceptional cases

3. Fill in the required storage options and click on on the **OK** button; this will start the process of connecting the storage.

   The following figure shows the **New Domain** dialog box

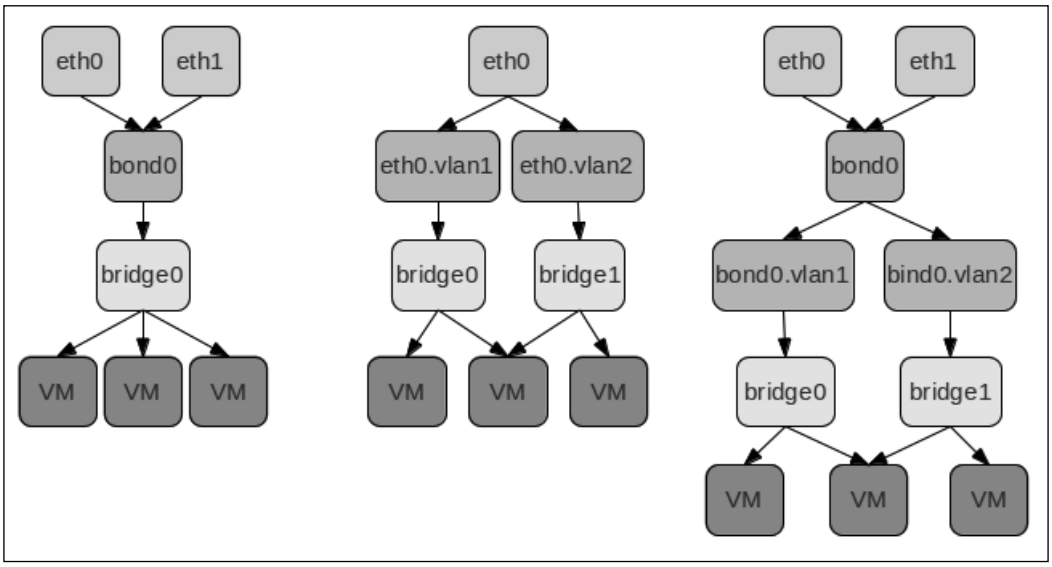


oVirt networking

To start using oVirt, each physical machine should have a network card connected to a network and an IP address manually assigned or received by DHCP. This approach is already providing a functional environment. By default, oVirt Engine creates a single *logical network* and uses this network for all types of traffic. oVirt's default network is created and labeled as `Management logical network`. The oVirt logical network is designed for the management of traffic between the oVirt Engine and the virtualization hosts.

Practice shows that for efficient operation of the network environment, the different types of traffic should be separated. oVirt can assign different types of network traffic into dedicated logical networks, and each logical network has to be associated with the network interface of the virtualization host. Such a network interface can act as a physical device or logical, such as bond or virtual NIC.

The following diagram shows network usage scenarios:



Logical networks

By default, the logical network named `ovirtmgmt` is attached to the precreated data center named `Default`. At the same time, we can create new logical networks for some purposes, for example, data, storage, or display. In most cases, logical networks are used for network separation or for a virtualization physical topology. In addition, other logical networks can be used to separate VMs traffic from the management networks. Another purpose may be traffic isolation between VMs groups in the same cluster. In oVirt Engine, network definition, type, and function are integrated in a logical entity called a logical network.

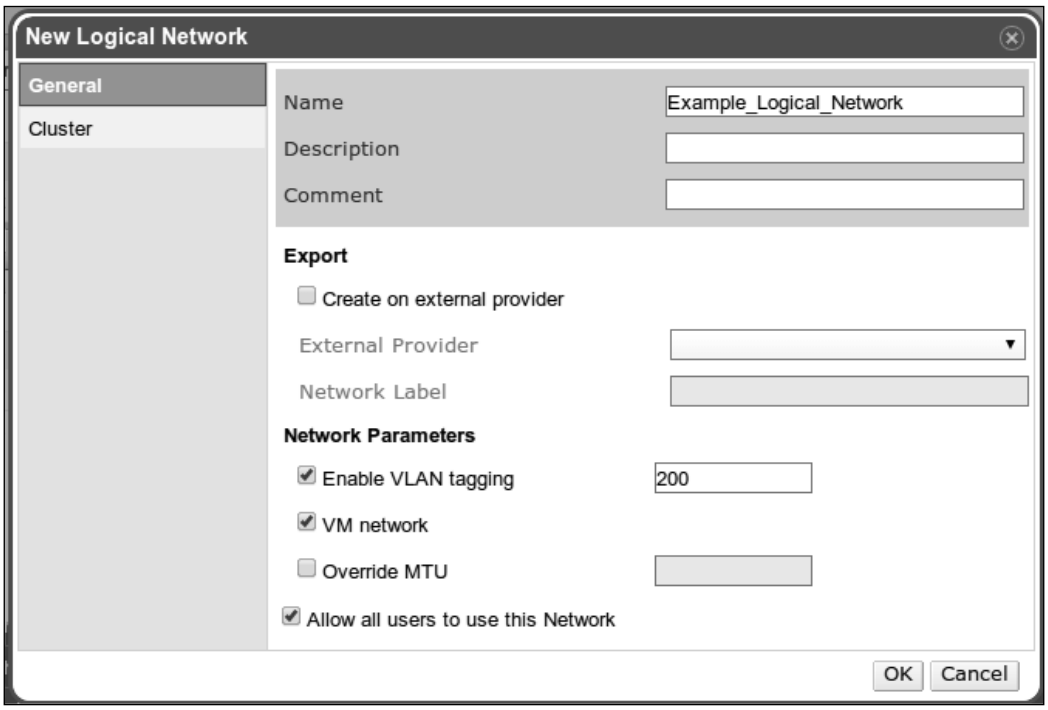
Creating a new logical network

Creating a logical network is process independent and can be executed at any time, regardless of the current situation in the oVirt environment. The steps for creating a logical network are as follows:

1. Go to the **Data Centers** section in the resource pane and select data center in which a logical network will be created.
2. In the **details pane**, select the **Logical Networks** section and click on **New**.

3. In the dialog box that opens, fill in the network parameters in the **General** section:
    - **Name**: It is used to specify the name for the new logical network
    - **Enable VLAN tagging**: It is used to specify the VLAN tag
    - **VM network**: Tick this checkbox if network should be used by VMs
    - **Override MTU**: It is used to change the maximum transmission unit if required
4. Select the **Cluster** section, mark the target data center, and click on **Attach**.
5. Click on **OK** and it will start creating the new logical network and will automatically attach it to the data center.

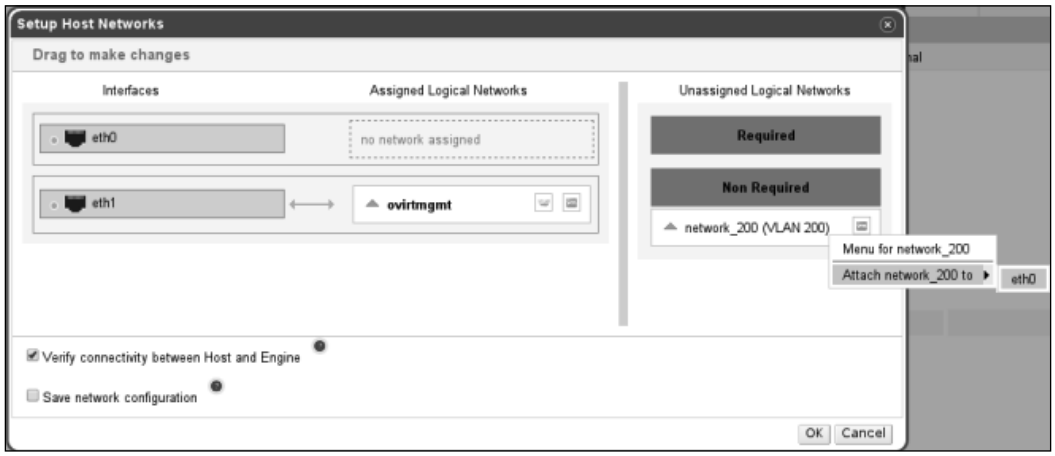
The following screenshot shows the **New Logical Network** dialog box:



The final step is assigning the logical network to the virtualization hosts; this is given in the following steps:

1. Go to the **Hosts** tab in the resource pane and choose the target host.
2. In the details pane, select the **Logical Networks** section and click on **Setup Host Network**.
3. The current network configuration of the host, which was selected previously, is determined on the left side of the window. On the right-hand side of the dialogue box, there is a list of available logical networks. Click on the desired network and select the **Attach network to** item from the drop-down list. Then select the interface to which it must be connected to a logical network.

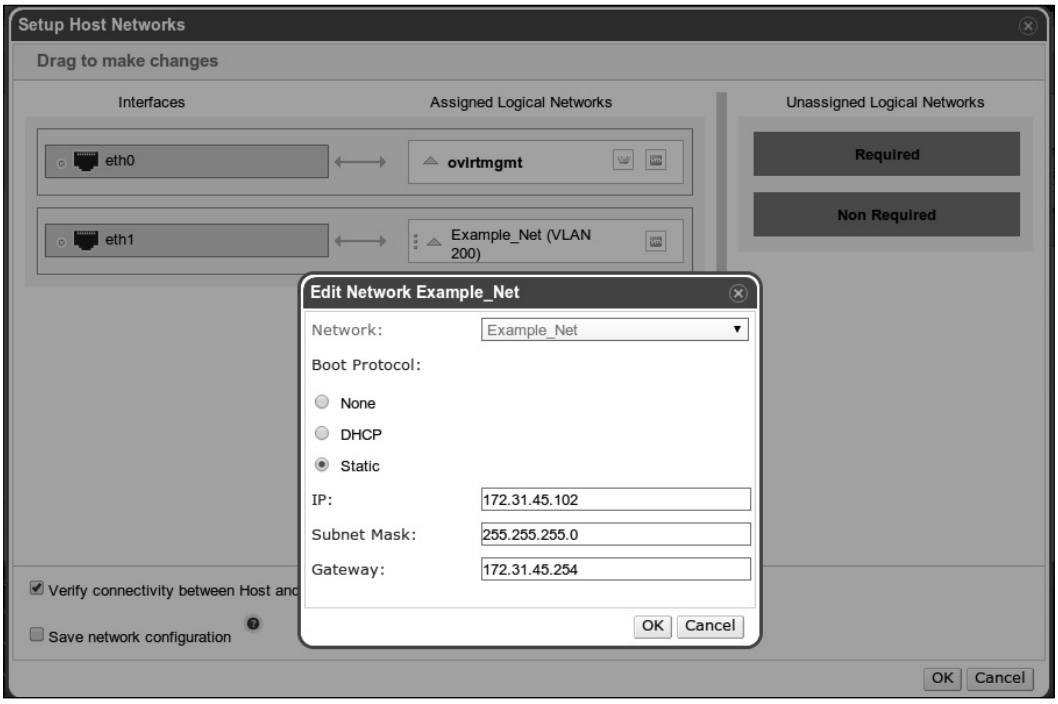
   The following screenshot shows the **Setup Host Networks** dialog box:



After connecting to the logical network interface, you must configure a network connection; the steps for this are given as follows:

1. Select the logical network from the left-hand side of the screen and click on the pencil icon.
2. In the **Edit network** dialog box, specify the network connection type. Here, **DHCP** is available, which allows you to use DHCP for automatic TCP/IP configuration and **Static**. When static configuration is selected, we can set the IP address manually with the required **IP**, **Subnet mask**, and **Gateway**.

3. The following figure shows the **Edit Network** dialog box and the attached logical network from the previous **Setup Host Networks** dialog box.



4. After completing the settings, click on the **OK** button and return to the **Host Networks** setup menu**.** The following two checkboxes are present:
    - **Verify connectivity between Host and Engine**: This ensures we won't lose connectivity to the engine. If connectivity from the Host to the engine is lost after changing the network configuration, the changes are rolled back.
    - **Save network configuration**: Here, all changes done to the networking configuration are saved temporarily until they are explicitly saved. Enable the checkbox to make the changes persistent.
5. Click on **OK** and repeat this procedure for all hosts that you want to connect the logical network to.

In this step, the logical network is finished. We created a logical network and connected virtualization hosts to it.

Summary

In this chapter, we have done the step-by-step setup and configuration of the oVirt environment. We started with setting up data centers and clusters. Next, we placed our virtualization hosts in clusters. Afterwards, we attached storage. oVirt supports multiple storage types, it allows a very flexible design environment, oVirt and depending on your needs to choose the right type of storage. Finally, we met with the mechanism for creating logical networks, which is an important part of the virtualization infrastructure. In *Chapter 4*, *Managing Virtual Machines*, we proceed with the creation of VMs. This is the final step; after this, the oVirt environment is ready for use.

Where to buy this book

You can buy Getting Started with oVirt 3.3 from the Packt Publishing website: `http://www.packtpub.com/getting-started-with-ovirt-3-3/book`.

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