

[Prev](#)[Next](#)

## 10.2. Adding storage devices to guests

This section covers adding storage devices to virtualized guest. Additional storage can only be added after guests are created. The might work storage devices and protocol include:

- ▶ local hard drive partitions,
- ▶ logical volumes,
- ▶ Fibre Channel or iSCSI directly connected to the host.
- ▶ File containers residing in a file system on the host.
- ▶ **NFS** file systems mounted directly by the virtual machine.
- ▶ iSCSI storage directly accessed by the guest.
- ▶ Cluster File Systems (**GFS**).

### Adding file-based storage to a guest

File-based storage or file-based containers are files on the hosts file system which act as virtualized hard drives for virtualized guests. To add a file-based container perform the following steps:

1. Create an empty container file or using an existing file container (such as an ISO file).
  - a. Create a sparse file using the **dd** command. Sparse files are not recommended due to data integrity and performance issues. Sparse files are created much faster and can used for testing but should not be used in production environments.

```
# dd if=/dev/zero of=/var/lib/libvirt/images/FileName.img bs=1M seek=4096 count=0
```

- b. Non-sparse, pre-allocated files are recommended for file-based storage images. Create a non-sparse file, execute:

```
# dd if=/dev/zero of=/var/lib/libvirt/images/FileName.img bs=1M count=4096
```

Both commands create a 400MB file which can be used as additional storage for a virtualized guest.

2. Dump the configuration for the guest. In this example the guest is called **Guest1** and the file is saved in the users home directory.

```
# virsh dumpxml Guest1 > ~/Guest1.xml
```

3. Open the configuration file (**Guest1.xml** in this example) in a text editor. Find the **<disk>** elements, these elements describe storage devices. The following is an example disk element:

```
<disk type='file' device='disk'>
  <driver name='tap' type='aio' />
  <source file='/var/lib/libvirt/images/Guest1.img' />
  <target dev='xvda' />
</disk>
```

4. Add the additional storage by duplicating or writing a new `<disk>` element. Ensure you specify a device name for the virtual block device attributes. These attributes must be unique for each guest configuration file. The following example is a configuration file section which contains an additional file-based storage container named `FileName.img`.

```
<disk type='file' device='disk'>
  <driver name='tap' type='aio' />
  <source file='/var/lib/libvirt/images/Guest1.img' />
  <target dev='xvda' />
</disk>
<disk type='file' device='disk'>
  <driver name='tap' type='aio' />
  <source file='/var/lib/libvirt/images/FileName.img' />
  <target dev='hda' />
</disk>
```

5. Restart the guest from the updated configuration file.

```
# virsh create Guest1.xml
```

6. The following steps are Linux guest specific. Other operating systems handle new storage devices in different ways. For other systems, refer to that operating system's documentation. The guest now uses the file `FileName.img` as the device called `/dev/hdb`. This device requires formatting from the guest. On the guest, partition the device into one primary partition for the entire device then format the device.

- a. Press **n** for a new partition.

```
# fdisk /dev/hdb
Command (m for help):
```

- b. Press **p** for a primary partition.

```
Command action
 e   extended
 p   primary partition (1-4)
```

- c. Choose an available partition number. In this example the first partition is chosen by entering **1**.

```
Partition number (1-4): 1
```

- d. Enter the default first cylinder by pressing **Enter**.

```
First cylinder (1-400, default 1):
```

- e. Select the size of the partition. In this example the entire disk is allocated by pressing **Enter**.

```
Last cylinder or +size or +sizeM or +sizeK (2-400, default 400):
```

- f. Set the type of partition by pressing **t**.

```
Command (m for help): t
```

- g. Choose the partition you created in the previous steps. In this example, the partition number is **1**.

```
Partition number (1-4): 1
```

h. Enter **83** for a linux partition.

```
Hex code (type L to list codes): 83
```

i. write changes to disk and quit.

```
Command (m for help): w
Command (m for help): q
```

j. Format the new partition with the **ext3** file system.

```
# mke2fs -j /dev/hdb
```

7. Mount the disk on the guest.

```
# mount /dev/hdb1 /myfiles
```

The guest now has an additional virtualized file-based storage device.

### Adding hard drives and other block devices to a guest

System administrators use additional hard drives for to provide more storage space or to separate system data from user data. This procedure, [Procedure 10.1, “Adding physical block devices to virtualized guests”](#), describes how to add a hard drive on the host to a virtualized guest.

The procedure works for all physical block devices, this includes CD-ROM, DVD and floppy devices.

## Block device security

The host should not use disk labels to identify file systems in the `fstab` file, the `initrd` file or used by the kernel command line. If less privileged users, especially virtualized guests, have write access to whole partitions or LVM volumes the host system could be compromised. Guest should not be given write access to whole disks or block devices (for example, `/dev/sdb`). Virtualized guests with access to block devices may be able to access other block devices on the system or modify volume labels which can be used to compromise the host system. Use partitions (for example, `/dev/sdb1`) or LVM volumes to prevent this issue.

### Procedure 10.1. Adding physical block devices to virtualized guests

1. Physically attach the hard disk device to the host. Configure the host if the drive is not accessible by default.
2. Configure the device with `multipath` and persistence on the host if required.
3. Use the `virsh attach` command. Replace: `myguest` with your guest's name, `/dev/hdb1` with the device to add, and `hdc` with the location for the device on the guest. The `hdc` must be an unused device name. Use the `hd*` notation for Windows guests as well, the guest will recognize the device correctly. Append the `--type hdd` parameter to the command for CD-ROM or DVD devices. Append the `--type floppy` parameter to the command for floppy devices.

```
# virsh attach-disk myguest
                                /dev/hdb1
                                hdc --driver tap --mode readonly
```

4. The guest now has a new hard disk device called `/dev/hdb` on Linux or `D: drive`, or similar, on Windows. This device may require formatting.

---

Prev

Up

Home

Next

Chapter 10. Virtualized storage devices

10.3. Configuring persistent storage in Fedora