

## Disk troubleshooting

7-9 minutes : 12/7/2024

### “Out of disk space” error

If the disk is completely full, you will get an Out of disk space error that may crash your system because Dom0 does not have enough disk space to work. So it's good practice to regularly check disk space usage. Running the `df -h` command in dom0 terminal will show some information, but not include all the relevant details. The Qubes user interface provides a disk space widget. If you are unable to access the interface, the command line version is running `sudo lvs | head` and looking at top entry for LVM pool. For example:

LV	VG	Attr	LSize
Pool		Data% Meta% Move Log	
Origin			
Cpy%Sync			
Convert			
pool00	qubes_dom0	twi-aotz--	453.17g
89.95 69.78			
root	qubes_dom0	Vwi-aotz--	453.17g
pool00		5.87	
swap	qubes_dom0	-wi-ao----	7.57g

If you run `df -h`, it only shows the information in the `root` line (which is already included in the `pool00` line). As you can see, the `sudo lvs | head` command includes additional important columns `Data%` and `Meta%`, shown in the above example to have the values 89% and 69% respectively.

If your system is able to boot, but cannot load a desktop environment, it is possible to login to dom0 terminal with `Alt + Ctrl + F2`.

If this does not work, check the size of `/var/lib/qubes/qubes.xml`. If it is zero, you'll need to use one of the file backup (stored in `/var/lib/qubes/backup`), hopefully you have the current data there. Find the most recent one and place in `/var/lib/qubes/qubes.xml` instead of the empty file.

In any case you'll need some disk space to start the VM. Check `df -h` output if you have some. If not, here are some hints how to free some disk space:

1. Clean yum cache.
2. Delete `.img` files of a less important VM, which can be found in `/var/lib/qubes/appvms/`. Then, when the system is working again, clean up the rest.

With this method, you lose the data of one VM, but it'll work more reliably.

3. Decrease the filesystem safety margin (5% by default).

```
sudo tune2fs -m 4 /dev/mapper/vg_dom0-lv_root
```

4. Remove some unneeded files in dom0 home (if you have any, most likely not). Also look for unneeded files in `/var/log` in dom0, and `/var/log/qubes`.

The above steps applies to old VM disks format. These steps may work on Qubes 4.0, but are not default anymore. By default, Qubes 4.0 now uses LVM. The equivalent steps are:

1. Get a list of VM disks using `sudo lvs`.

2. Use `sudo lvremove qubes_dom0/<name>` to remove backup copies of some less important VMs – entries with `-back` in their name.
3. If that isn't enough, remove actual disks of less important VMs. NOTE: You will lose the data of that VM, but your system will resume working.

For example:

```
$ sudo lvs
  LV                               VG      Attr      LSize
Pool   Origin                     Data%   Meta%   Move Log
Cpy%Sync Convert
  pool00                          qubes_dom0 twi-aotz-- 453.17g
89.95  69.78
  root                            qubes_dom0 Vwi-aotz-- 453.17g
pool00                          5.87
  swap                            qubes_dom0 -wi-ao---- 7.57g
(...)
  vm-d10test-private              qubes_dom0 Vwi-a-tz-- 2.00g
pool00 vm-d10test-private-1600961860-back 29.27
  vm-d10test-private-1600961860-back qubes_dom0 Vwi-a-tz-- 2.00g
pool00                          4.87
  vm-d10test-standalone-private   qubes_dom0 Vwi-a-tz-- 2.00g
pool00 vm-d10test-standalone-private-1580772439-back 4.90
  vm-d10test-standalone-private-1580772439-back qubes_dom0 Vwi-a-tz-- 2.00g
pool00                          4.87
  vm-d10test-standalone-root      qubes_dom0 Vwi-a-tz-- 10.00g
pool00 vm-d10test-standalone-root-1580772439-back 43.37
  vm-d10test-standalone-root-1580772439-back qubes_dom0 Vwi-a-tz-- 10.00g
pool00                          42.05
  vm-debian-10-my-private         qubes_dom0 Vwi-a-tz-- 2.00g
pool00                          4.96
  vm-debian-10-my-root            qubes_dom0 Vwi-a-tz-- 10.00g
pool00 vm-debian-10-my-root-1565013689-back 57.99
  vm-debian-10-my-root-1565013689-back qubes_dom0 Vwi-a-tz-- 10.00g
pool00                          56.55
  vm-debian-10-private            qubes_dom0 Vwi-a-tz-- 2.00g
pool00                          4.94
  vm-debian-10-root              qubes_dom0 Vwi-a-tz-- 10.00g
pool00 vm-debian-10-root-1601126126-back 93.44
  vm-debian-10-root-1601126126-back qubes_dom0 Vwi-a-tz-- 10.00g
pool00                          88.75
(...)
$ sudo lvremove qubes_dom0/vm-d10test-standalone-root-1580772439-back
Do you really want to remove and DISCARD active logical volume qubes_dom0/vm-
d10test-standalone-root-1580772439-back? [y/n]: y
Logical volume "vm-d10test-standalone-root-1580772439-back" successfully
removed
```

After freeing some initial space, it may be possible to recover more space by deleting files in a userVM after connecting to the userVM terminal:

```
qvm-start <VMname>
qvm-console-dispvm <VMname>
```

Since `qvm-console-dispvm` requires working graphical user interface login, you must first free enough space to be able to start a VM and login to graphical UI.

# Can't resize VM storage / "resize2fs: Permission denied" error

Resizing a volume in the Qubes interface should be a straightforward process. But sometimes, an attempt to resize will look like it worked, when it in fact fails silently. If you then try the same operation in the dom0 console using the `qvm-volume extend` command, it fails with the error message: `resize2fs: Permission denied to resize filesystem`. This error indicates that a `resize2fs` will not work, unless `fsck` is run first. Qubes OS utilities cannot yet handle this case.

To fix this issue:

1. In the dom0 terminal get a root console on the vm (eg. sys-usb) with:

```
qvm-console-dispvm sys-usb
```

2. Unmount everything mounted on the private volume `/dev/xvdb` partition. There are typically several mounts listed in `/etc/mtab`.
3. When you attempt to unmount the `/home` directory using the `umount /home` command, you will encounter an error because there are processes using the `/home` directory. You can view a list of these processes with the `fuser` command:

Kill these process until they are all gone using `kill <process ID>`.

1. Finally, run:

```
umount /home  
fsck /dev/xvdb  
resize2fs /dev/xvdb
```

After restarting your VM, everything should now work as expected. The private volume size shown externally in the VM's settings interface is the same as that seen within the VM.