

# Linux File System Quotas

## Configuration:

Configuration of disk usage quotas on Linux - Perform the following as root:

1. Edit file `/etc/fstab` to add qualifier "usrquota" or "grpquota" to the partition. The following file system mounting options can be specified in `/etc/fstab`: `grpquota`, `noquota`, `quota` and `usrquota`. (These options are also accepted by the `mount` command but ignored.) The filesystem when mounted will show up in the file `/etc/mtab`, the list of all currently mounted filesystems.)
  - To enable user quota support on a file system, add "usrquota" to the fourth field containing the word "defaults".

```
...  
/dev/hda2  /home  ext3  defaults,usrquota      1  1  
...
```

- Replace "usrquota" with "grpquota", should you need group quota support on a file system.

```
...  
/dev/hda2  /home  ext3  defaults,grpquota      1  1  
...
```

- Need both user quota and group quota support on a file system?

```
...  
/dev/hda2  /home  ext3  defaults,usrquota,grpquota  1  1  
...
```

This enables user and group quotas support on the `/home` file system.

2. `touch /partition/aquota.user`  
where the partition might be `/home` or some partition defined in `/etc/fstab`.  
then  
`chmod 600 /partition/aquota.user`

The file should be owned by root. Quotas may also be set for groups by using the file `aquota.group`

Quota file names:

- Quota Version 2 (Linux 2.4/2.6 kernel: Red Hat 7.1+/8/9, FC 1-3): `aquota.user`, `aquota.group`
- Quota Version 1 (Linux 2.2 kernel: Red Hat 6, 7.0): `quota.user`, `quota.group`

The files can be converted/upgraded using the [convertquota](#) command.

3. Re-boot or re-mount file partition with quotas.

- Re-boot: shutdown -r now
- Re-mount partition: mount -o remount */partition*

After re-booting or re-mounting the file system, the partition will show up in the list of mounted filesystems as having quotas. Check */etc/mtab*:

```
...  
/dev/hda5 / ext3 rw,usrquota 0 0  
...
```

4. quotacheck -vgum */partition*

or

quotacheck -vguma

- For example (Linux kernel 2.4+: Red Hat 7.1+, Fedora): quotacheck -vguma  
quotacheck: WARNING - Quotafile //aquota.user was probably truncated. ...  
quotacheck: Scanning /dev/hda5 [/] done  
quotacheck: Checked 9998 directories and 179487 files
- For example (Linux kernel 2.2: Red Hat 6/7.0): quotacheck -v /dev/hda6  
System response:  
Scanning /dev/hda6 [/home] done  
Checked 444 directories and 3136 files  
Using quotafile /home/quota.user

Quotacheck is used to scan a file system for disk usages, and updates the quota record file "quota.user/aquota.user" to the most recent state. It is recommended that quotacheck be run at bootup (part of Redhat default installation)

Man page: [quotacheck](#) - scan a filesystem for disk usage, create, check and repair quota files

5. quotaon -av

System Response: /dev/hda6: user quotas turned on

quotaon - enable disk quotas on a file system.

quotaoff - turn off disk quotas for a file system.

Man page: [quotaon](#) - turn filesystem quotas on and off

6. edquota -u *user\_id*

Edit directly using vi editor commands. (See below for more info.)

For example: edquota -u user1

- System Response (RH 7+):

Disk quotas for user *user1* (uid 501):

Filesystem	blocks	soft	hard	inodes	soft	hard
/dev/hda5	1944	0	0	120	0	0

- blocks: 1k blocks
- inodes: Number of entries in directory file
- soft: Max number of blocks/inodes user may have on partition before warning is issued and grace period countdown begins.  
If set to "0" (zero) then no limit is enforced.
- hard: Max number of blocks/inodes user may have on partition.  
If set to "0" (zero) then no limit is enforced.

- System Response (RH 6):

Quotas for user user1:

/dev/sdb6: blocks in use: 56, limits (soft = 0, hard = 0)  
inodes in use: 50, limits (soft = 0, hard = 0)

Something failed if you get the response:

/dev/sdb6: blocks in use: 0, limits (soft = 0, hard = 0)  
inodes in use: 0, limits (soft = 0, hard = 0)

Edit limits:

Quotas for user user1:

/dev/hda6: blocks in use: 992, limits (soft = 50000, hard = 55000)  
inodes in use: 71, limits (soft = 10000, hard = 11000)

If editing group quotas: `edquota -g group_name`

Man page: [edquota](#) - edit user quotas

## 7. List quotas:

`quota -u user_id`

For example: `quota -u user1`

System response:

Disk quotas for user user1 (uid 501):

Filesystem	blocks	quota	limit	grace	files	quota	limit	grace
/dev/hda6	992	50000	55000		71	10000	11000	

If this does not respond similar to the above, then restart the computer: `shutdown -r now`

Man page: [quota](#) - display disk usage and limits

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## Quota Reports:

- Report on all users over quota limits: `quota -q`
- Quota summary report: `repquota -a`

\*\*\* Report for user quotas on device `/dev/hda5`

Block grace time: 7days; Inode grace time: 7days

User		Block limits			grace	File limits		
		used	soft	hard		used	soft	hard
root	--	4335200	0	0	181502	0	0	
bin	--	15644	0	0	101	0	0	
...								
user1	--	1944	0	0	120	0	0	

No limits shown with this user as limits are set to 0.

Man page: [repquota](#) - summarize quotas for a filesystem.

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## Cron:

Quotacheck should scan the file system via cronjob periodically (say, every week?). Add a script to the `/etc/cron.weekly/` directory.

File: `/etc/cron.weekly/runQuotacheck`

- Linux Kernel 2.4: Red Hat 7.1 - Fedora Core 3:

```
#!/bin/bash
/sbin/quotacheck -vguma
```

- Linux Kernel 2.2: Red Hat 6/7.0:

```
#!/bin/bash
/sbin/quotacheck -v -a
```

(Remember to `chmod +x /etc/cron.weekly/runQuotacheck`)

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## Edquota Note:

The "edquota" command puts you into a "vi" editing mode so knowledge of the "vi" editor is necessary. Another editor may be specified with the **EDITOR** environment variable. You are **NOT** editing the `quota.user` file directly. The `/partition/quota.user` or `quota.group` file is a binary file which you do not edit directly. The command `edquota` gives you an ascii interface with the text prepared for you. When you `":wq"` to save the file from the vi session, it is converted to binary by the `edquota` command and stored in the `quota.user` file.

Assigning quota for a bunch of users with the same value. To rapidly set quotas for all users, on my system to the same value as user user1, I would first edit user user1's quota information by hand, then execute:

```
edquota -p user1 `awk -F: ' $3 > 499 {print $1}' /etc/passwd`
```

This assumes that the user uid's start from 500 and increment upwards. "blocks in use" is the total number of blocks (in kilobytes) a user has consumed on a partition. "inodes in use" is the total number of files a user has on a partition.

edquota options:

Option	Description
-r -m	Edit quotas on remote server using RPC. Remote server must be configured with the daemonrpc.rquotad
-u	Edit user quota
-g	Edit group quota
-p <i>user-id</i>	Duplicate the quotas based on existing prototype user
-F <i>format</i> -F vfsold -F vfstv0 -F rpc -F xfs	Format: vfstv0 - version 1 vfstv0 - version 2 rpc - quotas over NFS xfs - quotas for XFS filesystem
-f <i>/file-system</i>	Perform on specified filesystem. Default is to apply on all filesystems with quotas
-t	Edit the soft time limits for each filesystem.
-T	Edit time for user/group when softlimit is enforced. Specify number and unit or "unset"

### Soft Limit and Hard Limits:

Soft limit indicates the maximum amount of disk usage a quota user has on a partition. When combined with "grace period", it acts as the border line, which a quota user is issued warnings about his impending quota violation when passed. Hard limit works only when "grace period" is set. It specifies the absolute limit on the disk usage, which a quota user can't go beyond his "hard limit".

### Grace Period:

"Grace Period" is configured with the command "edquota -t", "grace period" is a time limit before the "soft limit" is enforced for a file system with quota enabled. Time units of sec(onds), min(utes), hour(s), day(s), week(s), and month(s) can be used. This is what you'll see with the command "edquota -t":

System response:

- Linux Kernel 2.4+: Red Hat 7.1+/Fedora:

Grace period before enforcing soft limits for users:

Time units may be: days, hours, minutes, or seconds

Filesystem	Block grace period	Inode grace period
/dev/hda5	7days	7days

- Linux Kernel 2.2: Red Hat 6/7.0:

Time units may be: days, hours, minutes, or seconds

Grace period before enforcing soft limits for users:

/dev/hda2: block grace period: 0 days, file grace period: 0 days

Change the 0 days part to any length of time you feel reasonable. A good choice might be 7 days (or 1 week).

### **Quota files:** (non-XFS file systems)

The edquota command will create/edit the quota file at the root of the file system. (See /etc/mtab for the list of the currently mounted filesystems.)

- Version 2: aquota.user, aquota.group
- Version 1: quota.user, quota.group

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### **The Linux Kernel:**

The default Red Hat/Fedora Core Linux kernel is shipped quota ready. If you have streamlined your kernel by rebuilding it with fewer options, make sure it has been configured with quotas support. When using the tools xconfig or menuconfig be sure to reply y to:

Quota support (CONFIG\_QUOTA) [n] y

Fedora Core 3: grep CONFIG\_QUOTA /usr/src/redhat/SOURCES/kernel-2.6.9-x86\_64.config

Response:

```
CONFIG_QUOTA=y
CONFIG_QUOTACTL=y
```

The Redhat default init script /etc/rc.d/rc.sysinit will also contain a point in the script to run quotacheck:

- Red Hat 6, 7.0:

```
if [ -x /sbin/quotacheck ]; then
    echo "Checking root filesystem quotas"
    /sbin/quotacheck -v -a
fi
```

And turn quota checking on:

```
if [ -x /usr/sbin/quotaon ] then
  echo "Turning on quota."
  /usr/sbin/quotaon -v -a
fi
```