Quota mini–HOWTO

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Quota mini–HOWTO

Ralf van Dooren `r.vdooren@snow.nl`

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This document describes how to enable file system quota on a Linux host, assigning quota for users and groups, as well as the usage of miscellaneous quota commands. It is intended for users running kernel 2.x (recently tested on kernel 2.4.21).

Feel free to send feedbacks or comments to r.vdooren@snow.nl if you find an error, or if any information is missing. I appreciate it.

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1. What is quota?

1.1 What is quota for?

Quota allows you to specify limits on two aspects of disk storage: the number of inodes a user or a group of users may possess; and the number of disk blocks that may be allocated to a user or a group of users.

The idea behind quota is that users are forced to stay under their disk consumption limit, taking away their ability to consume unlimited disk space on a system. Quota is handled on a per user, per file system basis. If there is more than one file system which a user is expected to create files, then quota must be set for each file system separately. Various tools are available for you to administer and automate quota policies on your system.

1.2 Current Status of Quota on Linux

Currently, there are some major changes in the way quota works. There are two different setups. The tools works the same, but there's a difference in used files. This document describes the setup and operation of the _new_ quota setup. As the new setup of quota is not in the regular kernel source, this setup needs some patching. We will describe this patching and installation of the linuxquota package. If you already have the quota software installed on your system, you may or may not have to install this patch and package. You can email me if you have any questions about this. I'll try to include a overview of Linux distro's and it's implications in a later version of this document.

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2. Requirements for quota

2.1 Kernel

The 2.x kernel source is available from http://www.kernel.org Please use an available mirror close to your location to save bandwidth. If you have a recent version of tar, you can download the .bz2 compressed file.

Untar the kernel:

```
cd /usr/src
tar jxvf /path/to/linux-2.4.21-tar.bz2      - for bzip2 kernel -
tar zxvf /path/to/linux-2.4.21-tar.gz       - for gzip kernel -
ln -s /usr/src/linux-2.4.21 /usr/src/linux
```

2.2 Quota software

Depending on the Linux distribution you have, you may, or may not have the quota softwares installed on your system. The most recent version of quota is available through SourceForge and is in active development. You can reach the homepage of the quota−development at http://www.sourceforge.net/projects/linuxquota.

3. Quota setup: installation and configuration

3.1 Patch the kernel

Download the patch for your kernel at:

ftp::/atrey.karlin.mff.cuni.cz/pub/local/jack/quota/.

Choose your kernel version and download the patch(es). Patch your kernel with the 'patch' command. If there is more than 1 patch for your kernel version, be sure to apply the patches in the correct order.

You can use this script (I assume the downloaded patches are in /tmp/quota/ and the kernel has been untarred to /usr/src/linux) :

```
#!/bin/sh

gunzip /tmp/quota/*.gz
cd /usr/src/linux
COUNT=`ls -1 /tmp/quota/*.diff | wc -l`
for I in `seq 1 $COUNT`
do
   patch -p1 < /tmp/quota/quota-2.4.21-$I-*.diff
done
```

3.2 Reconfigure your kernel

Reconfigure your kernel and add quota support.

Via `make menuconfig` or `make xconfig` you can find the option to support quota under the Filesystems−menu. You can specify extra options if you need them, like 32−bit UID support.

Save the configuration and compile the kernel. Make sure the new kernel will be used when rebooting the system.

3.3 Compile and install the quota softwares

To be able to use all the features of the new quota system, you'll probably need to download the new quota−package. Download the new quota software via the URL provided above.

When downloaded do:

```
$ gzip -dc <downloaded file> | tar xvf
$ cd quota-tools  (or whatever directory the software is put in)
```

```
$ ./configure
$ make
$ su
# make install
```

3.4 Modify your system init script to check quota and turn quota on at boot time

Here's an example:

```
# Check quota and then turn quota on.
if [ -x /usr/sbin/quotacheck ]
        then
               echo "Checking quotas. This may take some time."
               /usr/sbin/quotacheck -avug
               echo " Done."
        fi
         if [ -x /usr/sbin/quotaon ]
        then
                echo "Turning on quota."
                /usr/sbin/quotaon -avug
        fi
```

The golden rule is that always turn quota on after your file systems in /etc/fstab have been mounted, otherwise quota will fail to work. I recommend turning quota on right after the part where file systems are mounted in your system init script.

3.5 Modify /etc/fstab

Partitions that you have not yet enabled quota normally look something like:

```
/dev/hda1       /       ext2    defaults        1       1
/dev/hda2       /usr    ext2    defaults        1       1
```

To enable user quota support on a file system, add "usrquota" to the fourth field containing the word "defaults" (man fstab for details).

```
/dev/hda1       /       ext2    defaults        1       1
/dev/hda2       /usr    ext2    defaults,usrquota       1       1
```

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

```
/dev/hda1       /       ext2    defaults        1       1
/dev/hda2       /usr    ext2    defaults,grpquota       1       1
```

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

```
/dev/hda1       /       ext2    defaults        1       1
/dev/hda2       /usr    ext2    defaults,usrquota,grpquota       1   1
```

3.6 Activate the quota system

To activate the quota software you have to reboot the system for the changes you have made to take effect. The new kernel with quota support will be loaded and the startup scripts you've just created will be executed. At first run, quotacheck will generate the appropiate files to maintain the quota databases.

3.7 Add quotacheck to crontab

Although quota should work with periodical checks, it sometimes helps to run quotacheck periodically, e.g. weekly. Add the following line to your root's crontab:

```
0 3 * * 0 /sbin/quotacheck -avug
```

4. Quota setup: tools

This operation is performed with the edquota command (`man edquota` for details).

4.1 Assigning quota for a particular user

Here's an example. I have a user with the login id bob on my system. The command "edquota −u bob" takes me into vi (or editor specified in my $EDITOR environment variable) to edit quota for user bob on each partition that has quota enabled:

```
Quotas for user bob:
/dev/hda3: blocks in use: 2594, limits (soft = 5000, hard = 6500)
         inodes in use: 356, limits (soft = 1000, hard = 1500)
```

"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 inodes a user has consumed on a partition.

4.2 Assigning quota for a particular group

Now I have a group games on my system. "edquota −g games" takes me into the vi editor again to edit quota for the group games:

```
        Quotas for group games:
        /dev/hda4: blocks in use: 5799, limits (soft = 8000, hard = 10000)
                inodes in use: 1454, limits (soft = 3000, hard = 4000)
```

4.3 Assigning quota for a bunch of users with the same value

To rapidly set quotas for, say 100 users, on my system to the same value as my user bob, I would first edit bob's quota information by hand, then execute:

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

assuming that you are using csh, and that you assign your user UID's starting with 500.

In addition to edquota, there are 3 terms which you should familiarize yourself with: Soft Limit, Hard Limit, and Grace Period.

4.4 Soft Limit

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.

4.5 Hard Limit

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.

4.6 Grace Period

Executed 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":

```
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. I personally would choose 7 days (or 1 week).

5. Miscellaneous Quota Commands

5.1 Quotacheck

Quotacheck is used to scan a file system for disk usages, and updates the quota record file "aquota.user" to the most recent state. I recommend running quotacheck at system bootup, and via cronjob periodically (say, every week?).

5.2 Repquota

Repquota produces a summarized quota information for a file system. Here is a sample output repquota gives:

```
# repquota −a
                        Block limits               File limits
        User            used    soft    hard  grace    used  soft  hard  grace
        root      --  175419       0       0          14679     0     0
        bin       --   18000       0       0            735     0     0
        uucp      --     729       0       0             23     0     0
```

```
man       --      57       0       0              10     0     0
user1     --   13046   15360   19200             806  1500  2250
user2     --    2838    5120    6400             377  1000  1500
```

5.3 Quotaon and Quotaoff

Quotaon is used to turn on quota accounting; quotaoff to turn it off. Actually both files are similar. They are executed at system startup and shutdown.