59 - Quotas

Description: Candidates should be able to manage disk quotas for users. This objective includes setting up a disk quota for a filesystem, editing, checking, and generating user quota reports.

- **Key files, terms, and utilities:**
  `quota`
  `edquota`
  `repquota`
  `quotaon`

- **Terms of quota editing and reports:**
  1. The user is allowed to cross the *soft limit* for the length of time limited by the *grace period,* after which he's not any more allowed to write anything on the partition.
  2. The *hard limit* may never be exceeded by the user.
  3. The quota limits may be expressed in number of 1k blocks or in number of i-nodes (files) or both.

- **Procedure for installing quota for users and groups:**(short form)
  - Edit `/etc/fstab` and enter `usrquota,grpquota` in options field for filesystem
    `/dev/hda3 /home ext2 defaults,usrquota,grpquota 1 1`
  - Remount the filesystem:
    `mount -o remount /dev/hda3`
  - Initialize the quota databases files(`aquota.user,aquota.group`)
    `quotacheck -avugm`
  - Set quota for each user:
    `edquota -u paul` or
    `edquota paul`
  - Edits grace period for all the users:
    `edquota -tu`
  - Turn quota ON:
    `quotaon -u /dev/hda3`
  - Check quota for user:
    `quota paul`
  - Create a quota report for all users:
    `repquota -u /dev/hda3`
  - Create a quota report for all groups:
    `repquota -g /dev/hda3`
  - Turn quota OFF(when needed)
    `quotaoff -u /dev/hda3`

- **Detailed preparation of quotas.**

- Enter the following options in /etc/fstab for the partitions where we want to use quotas.
  eg.
  ```
  /dev/hda2 /srv/www  ext2 defaults,usrquota,grpquota    1  1
  /dev/hda3 /home     ext2 defaults,usrquota,grpquota    1  1
  ```

- Remount the filesystems:
  ```
  mount -o remount /srv/www
  mount -o remount /home
  ```

- Enter the following command to verify the already used space by each user and group:
  `quotacheck -avugm`
  This command will also update 2 files in the `/home` directory:
  `quota.group`, and `quota.user`
  if version 2 of quotas is used then the 2 files will be:
  `aquota.group`, and `aquota.user`

- Start editing the quota for each user:
  eg. `edquota -u john` or `edquota john`
  Edits the filesystem quota for the user john
  The quota editor(`vi`) will appear and will allow to change the soft and hard quota for user `john`. Note: The value 0 for `soft` or `hard` quota means N O L I M I T.

Filesystem	blocks	soft	hard	inodes	soft	hard
/dev/hda7	3288	**4000**	**6000**	649	**2000**	**3000**

  This above example means that john:
  Uses already 3288 blocks(kb) of data on `/dev/hda7` in 649 inodes (files)
  The soft quota is set to 4000 kB and hard to 6000 kB
  The soft limit is set to 2000 inodes and hard limit to 3000 inodes
  To get the Number of Inodes contained in a partition:
  `tune2fs -l | grep “Inode count”`

- `edquota -tu` Edits grace period for all the users.
  Not possible to set grace period for individual users
  (`month(s),day(s),hour(s),min(utes),sec(onds)`)

eg.

Filesystem	Block grace period	Inode grace period
/dev/hda7	7days	5days

- To copy the quota for other users with the same limit values, the easy way is:
  `edquota -p john patrick`
  This command will give the same quota limits of `john` to `patrick.`

- To verify the status of the quota for the user `john` use the commands:
  ```
  su -
  quota john
  ```

The result:

```
+-------------------------------------------------------------------+
| Disk quotas for user john (uid 5001):                             |
| Filesytem blocks  quota  limit grace  files  quota  limit  grace |
| /dev/hda7 3288     4000   6000          649   2000   3000        |
+-------------------------------------------------------------------+
```

This means that the user `john` is having `649` files using `3288` Kb of hard disk space.
His soft limit is `4000` Kb or `2000` Files and hard limit is `6000` kb or `3000` Files(inodes).

Repquota

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

```
# repquota -a
     *** Report for user quotas on device /dev/hda7
     Block grace time: 7days; Inode grace time: 5days
                  Block limits                  File limits
     User         used    soft    hard  grace    used  soft  hard  grace
     root    -- 175419       0       0          14679    0     0
     john    +-   6000    4000    6000            650 2000  3000
     uucp    --    729       0       0             23    0     0
     user1   --  13046   15360   19200            806 1500  2250
```

`repquota -g /home` Report of groups quota
`repquota -u /home` same as `repquota /home` Report of users quota

- **Quotaon and Quotaoff**

`quotaon -u /dev/hda2` turns ON quota accouting in kernel for users(`-u`)
`quotaoff -u /dev/hda2` turns it OFF.

Actually both files are similar. They are executed at system startup and shutdown.

Files involved in Quota

quota (1) Display disk usage and limits `quota` reports the quotas of all the filesystems listed in `/etc/mtab`. For filesystems that are NFS-mounted to a server, a call to the `rpc.rquotad` on the server machine is performed to get the information.
setquota (8) Set disk quotas on one commmand wihtout editing like with edquota
edquota (8) Edit user quotas
quotaoff (8) Turn filesystem quotas off and on [**quotaon**]
quotacheck (8) Scan a file system for disk usages, create and check the files `aquota.user` and `aquota.group`
repquota (8) Summarize quotas for a filesystem
quota (8) Summarize filesystem ownership
quotastats Summarizes quota activity statistics
warnquota (8) Send mail to users over quota
convertquota (8) Convert quota from old file(1) format to new one(2) repair quota files
/etc/init.d/quota Script to turn quota ON or off
Warning: the SuSE 7.3 has a fault in the `stop)` section of this script .
To fix it: add `-f` option in the command
`$QUOTAOFF_BIN -avug`
result: `$QUOTAOFF_BIN -avugf`

	Reason: The `quotaon` program is used for both ON and OFF . For OFF we need to add `-f` option.
`/usr/sbin/rcquota`	Symlink to `/etc/init.d/quota {start|stop})`
`/etc/init.d/quotad`	Script to start the quota demon (`rpc.quotad`)
`/usr/sbin/rcquotad`	Symlink to `/etc/init.d/quotad`
`/var/adm/fillup-templates/rc.config.quota`	
`maildirquota` (8)	Experimental implementation of Maildir quotas
`deliverquota` (8)	Deliver to a maildir with a quota
`rquotad`	Remote quota server
`rpc.rquotad`	Remote quota server (same as **`rquotad`**)
`mfsm` (1x)	File system and disk quota monitor for X-Motif
`/usr/sbin/xqmstats`	Statistic of XFS Quota system

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.

Man page of `convertquota` command

NAME

`convertquota -` convert quota from old file format to new one

SYNOPSIS

`convertquota [ -ug ] filesystem`

DESCRIPTION

`convertquota` converts old quota files `quota.user` and `quota.group` to files `aquota.user` and `aquota.group` in new format currently used by 2.4.0-ac? and newer or by Red Hat Linux 2.4 kernels on filesystem.

New file format allows using quotas for 32-bit uids/gids, setting quotas for root, accounting used space in bytes (and so allowing use of quotas in ReiserFS) and it is also architecture independent. This format introduces Radix Tree (a simple form of tree structure) to quota file.

OPTIONS

`-u`	convert user quota file. This is the default.
`-g`	convert group quota file.
`-V`	print version information.

FILES

`aquota.user`	new user quota file
`aquota.group`	new group quota file

SEE ALSO

`quota`(1), `setquota`(8), `edquota`(8), `quotacheck`(8), `quotaon`(8), `repquota`(8)

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