Setting Disk Quotas

Concept:
Limit the amount of disk a user is allowed.

Soft quota — Root and/or the user get warning messages
Hard quota — Actions that put you over this limit abort.

Quotas are optional.
They may be set for users, groups, both or not set at all.
By default, they are not set.

Must build a kernel with quota support.

Quota's are applied to a partition/file system.

For each partition/file system that implements quotas there are files in the base directory containing the quota information

Quotas for a partition, like mounts and swapping,
can be turned on and off by hand or
can be turned on at boot, off at reboot using `fstab`.

Quota Entries For fstab

The allowable entries are: `grpquota`, `usrquota`, `quota`, `noquota`

Sample `fstab`:

```
/dev/sdb1 /u1 ext2 rw,quota 1 1
/dev/sdc1 /u2 ext2 usrquota 1 1
/dev/sdd1 /u3 ext2 grpquota 1 1
/dev/sde1 /u4 ext2 ro,noquota 1 1
```

`u1`: quotas are set for both users and groups
The `rw` is redundant since it is the default.

`u2`: quotas are set for users
There are no quotas on groups

`u3`: quotas are set for groups
There are no quotas on individual users

`u4`: no quotas are set
Since this the default it could be omitted
Read only is set

The Quota Files

The quota files are in the base directory of the file system.

Example: for the `/u3` file system,
the quota files must be in `/u3`.
Note: the base directory also always has a `lost+found` subdirectory that is used by `fsck`.

Files: `quota.user`, `quota.group`:
the quota files for version 1 of quota.

Files: `aquota.user`, `aquota.group`:
the quota files for version 2 of quota.

The files are binary (not text).
The files are owned by `root`.
They track quota and disk usage.
The files are often mode 600 (readable only by root).
If you want the user to look at their own quota,
change them to mode 644.

Creating these files: run `quotacheck`
It will create one or both files depending on what it finds in the `fstab`.

Modifying these files: use `edquota`

The quota Command

Display disk usage and limits
for user or group(s).

You may only display your quota and quotas of groups to
which you belong.

Example: `qouta -g`
Display the usage for all groups the user belongs to.

Root may display any quota.
Example: `quota -u bob`
Display the usage for the user `bob`.

The quota display format is similar to that of `edquota`.
Sizes of the hard and soft quotas and disk usage for the
user are give in blocks.

The quotacheck Command

Normally this command is run at boot.
It will check, update and repair; or create the quota files.

You should not update/repair quota files while the file
system can modified because the disk usage could be
miscalculated.
At boot the file system is mounted read-only so that `fsck`
and `quotacheck` may run correctly.

When creating the quota files (empty) this command
may be run as:
`qoutacheck -a -m`
Since there are no files to check, it will create the empty
files required by the `fstab` entries.
`-a` option: use `fstab`
`-m` option: ignore the read-only requirement
`-c` option: force creation of the quota files,
i.e., ignore any existing quota files.

The edqouta Command

Edit the quota for a user or group.
You must be `root` to edit a quota.

`edquota -u joe sam`
Edit the quotas of the specified users.
The `-u` is optional.
Use `-g` (instead of `-u`) to edit groups.
Extracts the quota information into a text file. Invokes an editor on that text file. When done editing, inserts the new information into the quota files.

`edquota -p john -u joe sam`
Use a prototype.
The specified users (groups) get the same quota as the prototype.
`joe` and `sam` get the same quota as `john`
This format does not invoke an editor.

You may set soft and/or hard quotas in units of blocks.
Hence what the number means depends on the block size.

The quotaon and quotaoff Commands

Quotas on a file system are not in effect until they are turned on.

Example: `quotaon /u3`
Turn on quotas for the file system `u3`
Precondition: the quota file(s) must exist in `/u3`.

`fstab` may be used
Command: `quotaon -a`
Turn on quotas for every file system listed in `fstab` as having quotas.
In effective if the quota file(s) do not exist in those file systems.

Note: `qoutaon -a` is run as part of the boot scripts.

`quotaoff` turns off quotas.
You may name a files system or use the `-a` option.

Note: `qoutaoff -a` is run as part of shutdown.

Disk Usage Report

`root` may get a summary of quota information for a filesystem.

Either the mount point or `-a` may be specified.

Example: `repquota /u2`
Report the quota summary for the `/u2` file system.

Network (NFS) Support

Quotas are not directly part of NFS.
Quotas are implemented only on local drives.

An NFS server may implement quotas on the drives it
exports.

However, an NFS client may not implement quotas on
the drives it mounts (imports).

You can have quotas even with NFS, but you must do it
on the server side.

`rpc.rquota` (aka `rquotad`)
An NFS server daemon that will read and report quotas
to NFS clients.

`quota:`
Checks to see if the file system is local or NFS
Local: reads the quota file
NFS: calls `rpc.quota` on the NFS server