Lab 13.2: Filesystem Quotas

1. Change the entry in /etc/fstab for your new filesystem to use user quotas (change `noexec` to `usrquota` in the entry for /mnt/tempdir). Then remount the filesystem.

2. Initialize quotas on the new filesystem, and then turn the quota checking system on.

3. Now set some quota limits for the normal user account: a soft limit of 500 blocks and a hard limit of 1000 blocks.

4. As the normal user, attempt to use **dd** to create some files to exceed the quota limits. Create bigfile1 (200 blocks) and bigfile2 (400 blocks).

   You should get a warning. Why?

5. Create bigfile3 (600 blocks).

   You should get an error message. Why? Look closely at the file sizes.

6. Eliminate the persistent mount line you inserted in /etc/fstab.

Solution 13.2

1. Change /etc/fstab to have one of the following two lines according to whether you are using a real partition or a loopback file:

   ```
   /dev/sda11      /mnt/tempdir ext4 usrquota      1 2
   /imagefile      /mnt/tempdir ext4 loop,usrquota 1 2
   ```

   Then remount:

   ```
   $ sudo mount -o remount /mnt/tempdir
   ```

2. ```
   $ sudo quotacheck -u /mnt/tempdir
   $ sudo quotaon -u /mnt/tempdir
   $ sudo chown student.student /mnt/tempdir
   ```

   (You won't normally do the line above, but we are doing it to make the next part easier).

3. Substitute your user name for the `student` user account.

4. ```
   $ sudo edquota -u student
   ```

5. ```
   $ cd /mnt/tempdir
   $ dd if=/dev/zero of=bigfile1 bs=1024 count=200
   200+0 records in
   200+0 records out
   204800 bytes (205 kB) copied, 0.000349604 s, 586 MB/s
   $ quota
   Disk quotas for user student (uid 500):
   Filesystem blocks quota lim grace files qu lim gr
   /dev/sda11    200   500  1000   1   0   0
   $ dd if=/dev/zero of=bigfile2 bs=1024 count=400
   sda11: warning, user block quota exceeded.
   400+0 records in
   400+0 records out
   4096600 bytes (410 kB) copied, 0.000654847 s, 625 MB/s
   ```

   Create bigfile3 (600 blocks).

6. ```
   $ quota
   Disk quotas for user student (uid 500):
   Filesystem blocks quota limit grace files qu lim gr
   /dev/sda11    600*   500  1000 6days   2  0  0
   $ dd if=/dev/zero of=bigfile3 bs=1024 count=600
   sda11: write failed, user block limit reached.
   dd: writing 'bigfile3': Disk quota exceeded
   401+0 records in
   400+0 records out
   409600 bytes (410 kB) copied, 0.00177744 s, 230 MB/s
   $ quota
   Disk quotas for user student (uid 500):
   Filesystem blocks  quota limit grace files quota limit grace
   /dev/sda11   1000*   500  1000 6days     3     0     0
   $ ls -l
   total 1068
   -rw------- 1 root    root      7168 Dec 10 18:56 aquota.user
   -rw-rw-r-- 1 student student 204800 Dec 10 18:58 bigfile1
   -rw-rw-r-- 1 student student 409600 Dec 10 18:58 bigfile2
   -rw-rw-r-- 1 student student 409600 Dec 10 19:01 bigfile3
   drwx------ 2 root    root     16384 Dec 10 18:47 lost+found
   -rwxr-xr-x 1 root    root     41216 Dec 10 18:52 more
   ```

   Look closely at the file sizes.

7. Get rid of the line in /etc/fstab.