

8.7.1 Disk Quotas

Click one of the buttons to take you to that part of the video.

Disk Quotas 0:00-1:49

In this lesson, we're going to talk about disk quotas. Disk quotas are a very valuable management tool, when you're administering a multi-user Linux system. Here's the problem, because Linux is a true multi-user operating system, it is possible for one or two users on that system, to completely hog up all the disk space available on the file system. This is especially a problem today where it's not uncommon for a user to download very large music files from the Internet and even larger movies files. You can keep these users from consuming more than their fair share of the disk space on the system by implementing disk quotas. These quotas establish space limitations that specify how much space a particular user is allowed to use.

For example, you can specify with these quotas that a user is only allowed to use a certain amount of disk space, or you could limit the number of files that they're allowed to create by setting a quota on the number of inodes they're allowed to consume. Quotas can be configured to either temporarily allow a user to exceed limits or you may specify that they're not allowed to exceed those limits at all. In order to implement quotas on your Linux file system, you first need to install the quota package on your system. Some distributions will install this package as a part of their base installation. My experience has been, however, that most distributions do not, and you'll have to install it separately, after the system has all been installed and set up. To see if quota has already been installed on your system, you can use the appropriate package manager utility for your distribution to see if the quota package has been installed.

If it hasn't been installed, then you need to use rpm, dpkg, yum, zypper, or apt-get to go out and get it and install it. Once that package has been installed, there are several tasks you need to complete in order to establish quotas, let's take a look at what they are.

Establish Quotas 1:50-4:31

The first thing we need to do is go into our 'fstab file/etc' directory on the system where we want to establish quotas, and open it up in a text editor and add these two parameters to our mount options, usquota and grpquota. Before this will take effect, the fstab file has to be reread, probably the easiest way to do this is to simply just restart the system. After the system has been rebooted, you need to create your quota files. You do this using the command that you see here, you enter 'quotacheck', and with this command you use the '-a', '-m', '-v', '-u', and '-g' options.

Quota check utility will scan the file system and establish what the current disk usage looks like and it will also create our quota files. The -a option that you see here specifies that quota check will look at all mounted of file systems, the -m option forces quota check to check mounted file systems, the -u option tells quota check to look at users, the g option tells quota check to look at groups and then v as you might guess just tells quota check to operate in verbose mode.

When quota check command is complete, you'll see two files created at the mount point of the device in your file system, aquota.group and aquota.user. This is important because if these two files don't exist, then we can't create quotas on that file system. With those two files in place, the next thing we need to do is enable quotas on the file system. We do that using the 'quotaon' command with the '-a' and '-v' options.

Once that command has been run, you can then view the current disk space used by all the users on your system using this command right here, 'repquota -av'. When you run this command, a report is displayed on the screen showing how much space each user is consuming and you can see that right here. We have the root user, we have the ksanders user, a user named tux, the user named jsanders and a user named rtracy. Here is how much disk space that they have used. Here are how many inodes each user has used. Notice over here, we have columns named soft and hard. These are the quotas that have been set for each user. You'll notice here that all the quotas are set to zero, which means there aren't any quotas configured for each user, we need to change that.

Setting a Quota 4:32-6:11

You create a disk quota for a user using the command shown here, we enter 'edquota -u username' of the user that we want to create a quota for. In this case, I have decided to create a disk quota for the rtracy user. Essentially what this will do, is open up the vi editor and load the quota file for the user specified. What you need to do is then specify what quotas you want to set. We have our block quota and we have our inode quotas that we can set. Underneath blocks, it tells us how many have currently been consumed and inodes tells us how many inodes have been consumed on this file system for this particular user. Don't be too worried about those parameters, what we do want to be concerned with is the soft and hard parameters for inodes and for blocks. You can go ahead and replace these zeros with a number and you can set a soft and hard quota for blocks and a soft and hard quota for inodes.

Be aware that soft quotas can be temporarily exceeded for a period of time. The hard quotas on the other hand, cannot be exceeded at all. When we set a block quota, we are specifying how many blocks on the disk the user is allowed to consume. If you do the math, you can

figure out how much space equates to how many blocks. The inode quota on the other hand, specifies how many files the user can own on that file system.

Before we go on, be aware that if you have a lot of users on the system, then this process right here can be somewhat time consuming, going in and editing quotas for each and every individual user.

Copying Quotas 6:12-6:46

If the users on your system all have very similar quotas that you want to set, in other words the block and the inode quotas that you want to set are pretty much the same across multiple users, you can go through this process here using the 'edquota' command, to set up a quota for one user on the system, and then you can use the 'edquota -p' command to then say, please copy the quotas that are set for this user and copy them over to this other user. Basically, you only have to edit the file once and then copy the quotas that are set for all the other users, it's a lot faster that way.

Group Quotas 6:47-7:18

Another option for getting around this issue is to establish quotas for groups instead of individual users. You can put all the users that have a similar quota requirement into the same group, and then you can use this command 'edquota -g group name' in order to establish the quota for the group, which will then be automatically applied to all members of that group.

When you do, you see basically the same interface that you see here, you just set the quotas for a group name instead of a username.

Grace Period 7:18-8:38

Now, before we end, we need to talk about managing the grace period. The grace period is the amount of time that the end user is allowed to exceed a soft quota limit that you've set. The default is to allow users to exceed a soft quota for a maximum of seven days. This is the default grace period. If you don't like this grace period, you can change it. This is done by running the 'edquota -t' command. When you run this command, you see this interface right here. For the given file system, you can specify what the block grace period is and what the inode grace period. Again, you can see it set to seven days by default. If you want it to be shorter or longer, you can enter that value here.

Once you're done, you can then check your new quotas by running the same command again that we ran earlier, 'repquota -av'. This time you'll notice that something is different in the output of the command. Notice that from my rtracy user, I now have a soft and hard limit set for my block usage. I also have a soft and hard limit set for my inode usage. Effectively, rtracy now has quotas set on the /dev/sd3 file system. At this point, my system is now protected from disk space hogs.

Summary 8:39-8:52

That's it for this lesson. In this lesson we talked about setting up quotas, we talked about how you can set up quotas for users and for groups. We talked about how you can set soft limits and hard limits. We talked about how you can set quotas for both block usage, as well as inode usage.

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