

Lab 04
File management: starting from /
Hands-on Unix system administration DeCal
2012-09-24, due 2012-10-01

Your answers should only contain commands or brief responses. Please save trees, don't print out your computer's output.

If you don't know what a command does, skim the manpage, e.g. `man tee`.

1. What's the maximum length of a Unix filename? What characters cannot be used in a filename (hint: there are two)?
2. How would you find the human-readable size of `/etc`? Why does `ls -ldh /etc` not work?
3. We have a directory `/tmp/test`. How can we recursively (directory and all files contained within it including subdirectories) change its owner to be user `root` and group `root`?
4. What does the command `umask` do, and why might you use it in your `.bashrc` (assuming you use `bash`)?
5. What is a symbolic link (symlink)?
6. How can you create a symlink pointing to `/etc` named `etcfiles` in your current working directory? Hint: use `ln` with an option.
7. What happens if you delete a symlink? Is the target file affected? What about if you were to use a hard link instead of a symlink?
8. Show the octal representation of these permissions:
 - (a) `rwxr-xrw-`
 - (b) `rw-r-----`
 - (c) `--x-w-r--`
9. Why might you not want to have a file with permissions `777` in your home directory?

NFS

NFS, the Network File System, is a ubiquitous way to share data between servers. The OCF and EECS' Instructional Computing each have centralized NFS servers that store user data and often software. For this part of the lab, you will need to first SSH into the OCF using your OCF account if you haven't already:

```
ssh user@ssh.ocf.berkeley.edu
```

10. Run `df -h` at a command prompt. What does this command do? What machine is your home directory stored on?
11. How can you tell whether a particular mount is a network share or a local drive? Take a guess as to what the different network shares in `df`'s output are used for.
12. The `mount` command gives you information about locally-mounted devices. What's the difference between the output of `mount` and `df -h`, and when would you want to use one over the other? What are mount options, and how are they represented in the output of `mount`?

Extra for Experts™!

13. What is meant by `setuid`, `setgid`, and sticky bit? How are they represented in octal notation?
14. Use the `find` command with the `-perm` option to print all `setuid` binaries on the system.
15. `stat` will give you some useful attributes and permissions about a file. How is the access time impacted by the `noatime` mount option?