

Slide 1

### Administrivia

- Homework 8 on Web; due next Wednesday.

Slide 2

### More About Files — Permissions

- We talked about most of bits settable with `chmod` — `r/w/x` for `u/g/o`. But there are three more bits, applicable to directories and executable files ...
- `setuid` “sets process’s effective user ID”. No effect on directories.
- `setgid` “sets effective group ID”. Different effects on executables and (on some systems) directories.
- `‘‘sticky’’` ... For executables, no longer used on some systems for original purpose. For directories, on some systems used for “restricted deletion”.

### More About Files — Hard Links Versus Soft Links

Slide 3

- Some background: Unix filesystems traditionally keep track of files using “inodes”. (I.e., directory entries point to inodes, which contain permissions, etc., plus info about file blocks.)
- “Hard link” points to inode.
- “Soft link” is just a file containing a path name.
- Which can point to a file on another filesystem? Which can be “broken”?

### More About Processes and Shells

Slide 4

- You write a script to change directories. When you run it, what happens? Why?  
(Does this also explain why `man cd` gives you the `man` page for a shell?)
- What’s the difference between “executing” a shell script and “sourcing” it?

### Miscellaneous Useful Tips

- Recall many things you can do to replay commands from command history.
- Recall `pushd` and `popd`.
- If you know a lot of editor tricks, but only a few shell tricks, consider using editor to build temporary scripts. (Example(s).)

Slide 5

### Minute Essay

- None — sign in.

Slide 6