Slide 1

Administrivia

- Homeworks:
  - Homework 1 on Web now. Due next Monday. Individual assignment, topics from chapters 1, 4, and 5.
  - Homework 2 on Web soon. Also due next Monday. Group assignment.

Slide 2

Ownership of Files and Processes

- Files and processes both have notions of "owner" and "group owner".
- Internally, users and groups represented by numeric UID and GID. Map from numeric IDs to text names is in `/etc/passwd`, `/etc/group`.
- Processes have "real" and "effective" UIDs and GIDs; effective IDs can change with system call or because executable has appropriate bits set.
- Example — consider permissions/IDs on `passwd`, `/etc/passwd`.

Slide 3

File Modes, Revisited

- You know about read/write/execute bits for files. But there's one more set of bits . . .
- "Sticky bit" (formally, "save text mode"). For files, no meaning on most current systems. For directories, means users can only delete files they own. (What's the "normal" situation?)
- "setuid" bit: For executable files, set effective UID to file owner. For other files/directories, no meaning.
- "setgid" bit: For executable files, set effective GID to file owner. For directories (on some systems), use "BSD semantics" for creating files. For other files, no meaning.

Slide 4

The Superuser

- Regular users are mostly not allowed to mess with other users' files or processes or issue some commands with system-wide effects. No such restrictions on "superuser" (root).
- Can "become root" by logging in as root, or via `su` command. The latter provides some tracking, if multiple people have the root password. (The paranoid type `/bin/su`. Why?)
- Alternative to giving many people root access — `sudo`.

  Caution: Notice that some commands allow "shell escape". What happens if you give a non-root user the ability to run such a command as root?

Slide 5

What's in `/etc/passwd`

- For each user:
  - Login name (probably best to limit to 8 characters).
  - Encrypted password.
  - UID number, default GID number.
  - "GECOS field".
  - Home directory.
  - Login shell.
- Some of these can be changed by user — `passwd`, etc., commands.
- Can be superseded by `/etc/shadow`.

Slide 6

Groups

- Some commands:
  - To change group ownership of file? `chown`
  - To change default group for new files? `newgrp`
    (Ignored if "BSD semantics" in effect. How to make this true for a directory? `setgid` bit.)
- Info kept in `/etc/groups`.

Slide 7

Adding and Deleting Users

- Things to do to add a user:
  - Define user in `/etc/passwd`, set initial password, create home directory.
  - Copy default startup files, set up for mail (defer for now).
  - Add user to `/etc/group`, set up quota.
- Can do all of these individually (as described in text), or with `useradd`.
- Deleting users — reverse all of the above, or use `userdel`.

Slide 8

Adding, Deleting, and Modifying Groups

- Could change `/etc/groups` directly.
- Or use commands `groupadd`, `groupdel`, `groupmod`.

Slide 9

Minute Essay

- How familiar are you with networking (concepts and details)?