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Administrivia

- Reminder: Project proposals due today.

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Minute Essay From Last Lecture

- Some people mentioned using the `gcc-latest` module to access a non-default version of GCC compilers. Other than that, most people had not used modules.

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Overview of UNIX/Linux Filesystem Hierarchy

- In UNIX/Linux, “everything’s a file”, all part of one hierarchy starting at pathname `/`. This single hierarchy can reference multiple filesystems, local or remote, sort of like what Windows does with drive letters.

For removable media, `mount` connects device to hierarchy, `umount` removes it.

- Some variation among systems about layout of this hierarchy, but many common elements. For Linux, there’s a “Filesystem Hierarchy Standard” that apparently most distributions more or less follow.

Most systems try to organize files based in part on whether they can be read-only and whether they can be shared among systems.

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System Executables

- `/bin` and `/sbin` contain minimal subset of commands to get system up and running and possibly make repairs. `/sbin` is meant for commands mostly for administrators. (On some distributions, these may be symlinks to directories in `/usr`.)

- `/usr/bin` and `/usr/sbin` contain other (standard) commands.
- `opt` and `/usr/local` can contain non-standard commands.

Library and Include Files

- `/lib` and `/libxx` (e.g., `/lib64`) contain shared libraries for commands in `/bin` and `/sbin`, plus their static counterparts. (Here too these may be symlinks.)
- `/usr/lib` and `/usr/libxx` contain libraries for other commands.
- `/usr/include` contains C/C++ include files.

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Home Directories

- `/root` typically contains root's home directory.
- `/home` typically contains user home directories. We do something somewhat different, keeping home directories in a filesystem on our fileserver, mounted via NFS (Network File System).

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Other Files

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- `/usr/share` contains read-only files not specific to an architecture, for example man pages in `/usr/share/man`.
- `/boot` contains files used in boot process.
- `/dev` contains “special files” used to provide direct access to I/O devices .
- `/etc` contains configuration files of various types.
- `/media`, `/mnt` are where removable media typically show up, though some systems apparently instead use `/run/media`.

Other Files, Continued

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- `/proc` is sort of a fake filesystem — looks like files but actually is a way of getting access to system information (e.g., `/proc/cpuinfo`, `/proc/meminfo`).
- `/tmp` is kind of what it sounds like — a directory for temporary files. May be cleared on reboot.
- `/var` contains files that can't be read-only; e.g., `/var/log` contains system logs.

Minute Essay

- Anything today that was already familiar?

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