

CS114: Lecture 10

Software development, packages, networking tools

HW3 due tonight!

HW4 out this afternoon
due in two weeks

Software development

- Windows model: all-in-one GUI
 - Microsoft Visual Studio, Metrowerks CodeWarrior ...
 - MATLAB, DrJava
- UNIX model: editor + tools
 - Emacs or vim
 - Compiler (`cc`, `javac`, ...)
 - Every unix system has at least `cc`
 - Many (including Apple) use `gcc`
 - Build manager
 - `make` (other tools exist: `cons`, ...)

Make

- Complex combinations of commands
 - Compile, link, install, javadoc, ...
- Only recompile what's actually changed
 - Manage dependencies among files
- [demo]

Other useful development tools

- **Debugger**
 - `gdb` (has nice Emacs integration)
- **Profiler**
 - `gprof`
- **Version control**
 - `cvcs`, `svn`, `rCS`
- **Linker, assembler**
 - `ld`, `as` – usually called by compiler

Options for a development environment

- All-in-one GUI: eclipse, etc.
- Everything through your editor: Emacs ...
 - Good integration with debugger, interpreters, shell...
- Multiple windows: editor(s), build window, test window, ...

Packages

- Windows: ZIP! (PKZIP, WinZip, ...)
- UNIX: two pieces
 - `tar`: collect many files into one file
 - compression: make a file take less space
 - “tarball” - `.tar.gz` (sometimes `.tgz`, `.tar.bz2`)

Collecting files: tar

- `tar cf archive.tar file1 dir2 dir3`
 - Create new archive named `archive.tar` (`archive.tar` didn't exist before; `file1`, `dir2`, `dir3` exist)
 - Best practice: always `tar` up ONE directory
- `tar xf archive.tar`
 - eXtract contents of archive into current directory
- `tar tf archive.tar`
 - Peek into archive (doesn't change anything) – table of contents.

Compressing files

- `gzip` (GNU zip)
 - `gzip myfile`
 - **removes** `myfile`, **replaces** with `myfile.gz`
 - **stdin/stdout**
 - `gunzip` **is opposite**
- `bzip2` / `bunzip2`
- `compress` / `uncompress`

Packaging idioms

- Creating archives

- `tar cv mydir/ | gzip > mydir.tar.gz`

- `tar czvf mydir.tgz mydir/ (GNU tar)`

- Note name of directory matches name of archive

- Unpacking archives

- `gunzip < mydir.tar.gz | tar xv`

- `tar zxvf mydir.tar.gz (requires GNU tar)`

- Listing archives

- Just like unpacking, replace `x` with `t`

- `zip / unzip` are often available, but rarely used.

Package management

- I want to install this but it depends on that
- Linux: .rpm, .deb
- Source vs binary
- Many packages require root privileges to install
 - Can install in your home directory instead

Internet programs

- ftp (Anonymous login; ls, cd, get, put, help, !)
- ssh
 - scp (just like cp, but remote and secure)
 - sftp (just like ftp but secure)
- wget (powerful scriptable http agent)
- finger (directory lookup)
- telnet (old-style remote shell connection)
- ping (are you there?)

Terminal “GUIs”

- Editors (`emacs`, `vim`, `nano/pico`, ...)
- Web browser (`lynx`, `elinks`)
- E-mail (`pine`, `mutt`, `elm`)