

## Intro. To Unix commands

- For those who've never used Unix before
- Quick tutorial to let you move around your Unix Accounts
- No discussion of inner workings of Unix
  - Take Operating Systems – CSCI-4210
- Comparisons to Windows/DOS commands

---

---

---

---

---

---

---

---

## What are the machines?

- rcs.rpi.edu – takes you to a random OS
- rcs-sun4.rpi.edu – takes you to a Sun machine
  - This is the machine to use for HW and ICA submissions, until we get CS accounts set up.
- rcs-ibm1.rpi.edu – takes you to an IBM machine

You should have SecureCRT installed on your RPI laptop by default. If you don't, see the Helpdesk, or download puTTY (Google for it).

---

---

---

---

---

---

---

---

## Very basics

- 'ls' - get directory listing
  - DOS: 'dir'
- 'ls -l' – get long file listing
- 'cd <dir>' – change directory
- 'mkdir <dir>' – make directory
  - DOS: md
- 'rm <file>' – remove a file
  - DOS: 'del'
- 'rmdir <dir>' – remove directory

---

---

---

---

---

---

---

---

## More basics

- 'more <file>' – contents of a file
  - DOS: 'type'
- 'cp <from\_path> <to\_path>' – copy a file
  - DOS: 'copy'
- 'mv <from\_path> <to\_path>' – move a file
  - DOS: 'move'

---

---

---

---

---

---

---

---

## chmod

- Change mode (permissions) of file/directory
- using 'ls -l', 10 fields of information are shown
- ex: drwxrw-r—
- first position: 'd' (directory) or '-' (file)
- next three: user permissions:
  - 'r' – Read permissions
  - 'w' – Write permissions
  - 'x' – eXecute permissions
- next three: group permissions
- last three: world permissions

---

---

---

---

---

---

---

---

## chmod continued

- permissions are represented as octal numbers
- `rwXrwxrwx` = 111 111 111 = 777
- `rwXrw-r--` = 111 110 100 = 764
- `rw-----` = 110 000 000 = 600
- etc.
- `chmod <mode> <file>`
- ex: `chmod 755 script.plx`
  - Give yourself all permissions, group and world read and execute permissions

---

---

---

---

---

---

---

---

## User Friendly chmod

- Can specify modes without using octal representations.
- Still a 3 character code.
  - First char: u (user), g (group), o (other)
  - Second: + (add permissions) or - (remove permissions)
  - Third: r (read), w (write), x (execute)
- `chmod u+x file.pl`
  - give yourself execute permissions on file.pl
- `chmod o+r file.pl`
  - give others (ie, world) read permissions on file.pl

---

---

---

---

---

---

---

---

## Windows vs Unix

- They don't like each other.
- Many problems can (and will) arise due to difference in end-of-line character.
  - Unix: `\n`
  - Windows: `\r\n`
  - In Unix, a Windows `\r` can show up as `^M`
  - In Windows, a Unix `\n` (missing the `\r`) can show up as a  and no newline (at least in Notepad – Wordpad is mildly smarter)
- To change a file from Windows to Unix, use the command:
  - `dos2unix`
  - Ex: `dos2unix oldfile > newfile`
  - `unix2dos` also exists
- If you \*ever\* save a file in Windows and then transfer it to Unix, you should run `dos2unix`

---

---

---

---

---

---

---

---

## Transferring files

- To get a file from your Windows PC to your Unix RCS account:
- Use an ftp client (ex: CuteFTP) or the default Windows ftp program
  - Ask Paul for help with this if you don't know ftp
  - ftp address of RCS is [ftp.rpi.edu](http://ftp.rpi.edu)
  - Make sure you transfer in ASCII mode, not Binary!!
- Or use an SCP client (ex: WinSCP)
  - Download from <http://winscp.sourceforge.net/>
  - Connect to `rps.rpi.edu`
- Avoid simply connecting to your network drive via Samba – this automatically transfers in binary mode, and you will need to run `dos2unix`

---

---

---

---

---

---

---

---

## Creating a file in Unix

- Many options. Two most common: **emacs** and **vi** ("vee-eye", not "vye" or "six")
  - Which is 'better' is a cause of online holy wars
- Many **many** tutorials online to help you with either program
- There is an emacs reference card on the Definitions & Links page
- A third possibility is **pico**. This may be significantly easier for you if you've never edited a file on unix before.
  - All commands are shown on bottom of pico window
- To start a new file or edit an existing file, type name of editor followed by filename:
  - **emacs file.pl**
  - **vi file.pl**
  - **pico file.pl**

---

---

---

---

---

---

---

---

---

---

## Beginning emacs shortcuts

- CTRL-X CTRL-F – open new or existing file
- CTRL-X S – prompt to save file
- CTRL-X CTRL-S – save file without prompt
- CTRL-X W – save file as
- CTRL-A – beginning of line
- CTRL-E – end of line
- CTRL-X CTRL-J – jump to line #....
- CTRL-K – Cut to end of line
- CTRL-Y – Paste most recent cut
- ESC-X – many mini-buffer commands (replace, undo, search, etc (tab-complete for list) )
- ESC-> – end of file
- ESC-< – beginning of file
- CTRL-G – quit mini-buffer (if you typo when typing a command)
- CTRL-X CTRL-C – Exit emacs

---

---

---

---

---

---

---

---

---

---

## vi Commands

- ESC - leave insert/append/replace mode
- i - enter Insert mode at current position
- I - enter Insert mode line start
- a - enter Append mode at current position
- A - enter Append mode at line end
- r - replace single character at current position
- R - enter Replace mode at current position
- /foo<enter> - search forwards for "foo"
- ?foo<enter> - search backwards for "foo"
- w - move cursor to next word
- \$ - move cursor to end of line
- ^ - move cursor to start of line
- x - delete current character
- dw - delete to end of word
- d\$ - delete to end of line
- :w<enter> - write (save) file
- :wq<enter> - save file and quit
- :q<enter> - quit
- :q!<enter> - quit without saving changes

---

---

---

---

---

---

---

---

---

---

## backspace

- If as you are editing your files, you find that your backspace key doesn't seem to work
  - either prints `^H` or `^?`, or `emacs` reacts as though you'd pressed CTRL-H
- edit your `.bashrc` file in your home directory to include this line:
  - `stty erase ^H`

---

---

---

---

---

---

---

---

## For more help...

- If you find yourself unable to do something in this class because of a lack of familiarity with Unix, ask Paul. He'll be happy to help.

---

---

---

---

---

---

---

---