

Introduction to Linux 2

Week 1 - Wednesday

Link: A special type of file

- Symbolic link (soft link)
 - A file that contains a reference to another file
 - Create a symbolic link with `ln`
 - `ln -s TARGET LINK_NAME`
 - Get the file that a symbolic link points to with `readlink`
- Non-symbolic link (hard link)
 - A directory entry that associates a name a file on a file system
 - Also created with `ln`

Difference between soft link & hard link ?

- A long story related with the design of the file system
- Some helpful tests
 - Create a soft/hard link to a regular file
 - Create a soft/hard link to a directory
 - Create a soft/hard link to a non-existent file
 - What happen to a soft/hard link if the target file is removed

Environment Variables

- A set of dynamic named values maintained by the system
 - Used by many programs, as a solution of dynamic configuration
 - A typical usage: specify locations for programs to search for resources
 - PATH
- Read/write a environment variables
 - echo \$VARIABLE_NAME
 - How to write?

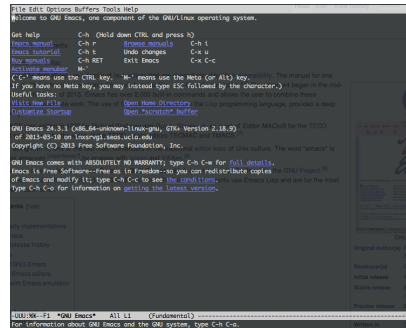
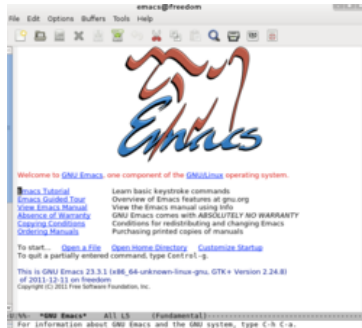
LEARNING EMACS

Introduction to Emacs

- An extensible, customizable, self-documenting, real-time display editor
- Has over 2,000 built-in commands
- Allows user to combine there commands into macros to automate work
- Using Emacs Lisp, provides a deep extension capability
- “Dr. Eggert contributes to many GNU projects, including ..., GNU Emacs, ...”

Preparation

- Installing Emacs in your ubuntu
 - `sudo apt-get install emacs`
- Emacs has both GUI and CLI



- Executing an Emacs command
 - Shortcut key
 - Exit Emacs: `C-x C-c`
 - Directly type the name of the command
 - `M-x cmd <RET>`
 - “C” = ctrl; “M” = alt (Windows)/option (Mac)

Moving around

- Left/right/up/down
- How to move faster?
 - Move by word
 - Move to the start/end of the line
 - Scrolling
 - Moving to a certain line
- Why bother to use these keys instead of the arrows, page up/down, home/end?

Emacs's keyboard



- Typewriter keys
- Function keys
- Enter keys
- System keys
- Numeric keypad
- Other
- Application key
- Cursor control keys



Editing

- Insert & delete
- Mark
 - Select a region to work on
- (Copy/cut/paste) **kill** & **yank**
 - NOT “Ctrl+c -> Ctrl+v” (not using OS’s clipboard)!
Emacs has its own **kill ring**
 - Kill: put something (a word/line/region/...) into the kill ring (=cut)
 - Copy region to kill ring (=copy)
 - Yank: pull something out of the kill ring (=paste)
 - Kill “Ring”?

Search & Replace

- Incremental search
 - Search forward/backward
 - Search with a pattern (regular expression)
- Interactively replace a text string

Emacs as directory editor (Dired)

- Entering Dired: C - x d (dired)
- Navigation
- Flagging many files
- File operations (copy/paste/delete/rename /...)
- mkdir
- http://www.gnu.org/software/emacs/manual/html_node/emacs/Dired.html#Dired

Emacs as shell

- Execute any shell command that you run in a terminal in Emacs
 - M- ! cmd <RET>
 - You don't need to exit Emacs to run your program
- http://www.gnu.org/software/emacs/manual/html_node/emacs/Shell.html

Emacs as IDE

- Edit the source code
- Compile the program (build a executable from the source code)
 - M-x compile
 - Then specify the command to compile the code
 - Tips for homework: `gcc hello.c -o hello`
- Run the executable
 - Run the shell command: `./hello`
- Debug with gdb
 - http://www.gnu.org/software/emacs/manual/html_node/emacs/GDB-Graphical-Interface.html

Reference

- Built-in manual (C-h r) & **tutorial** (C-h t)
- Online manual:
[http://www.gnu.org/software/emacs/
manual/emacs.html](http://www.gnu.org/software/emacs/manual/emacs.html)
- **GUN Emacs Reference Card**