

CMPSCI 105: Lecture #7 Introduction to UNIX

©2014 Dr. William T. Verts

Styles of Operating Systems

- Operating Systems come in two styles:
 - Command-Line Interfaces (CLI)
 - Graphical User Interfaces (GUI)
- CLIs
 - Earliest form of computer command interface
 - Commands (verbs) are typed in first, then options (nouns)
 - Difficult to learn: Users have to remember what to type
- GUIs
 - Items (nouns) are selected, then actions (verbs) applied
 - Easy to learn: Users select options from a menu

©2014 Dr. William T. Verts

Operating Systems

- CLI
 - UNIX
 - MS-DOS (original IBM-PC and later clones)
- GUI
 - Microsoft Windows
 - Apple Mac interface (but under-layer is UNIX)

©2014 Dr. William T. Verts

UNIX

- Dates from early 1970s
- Used in academia ever since
- Used today in many servers on the Internet
- Variations include Linux
- The Web server for our class runs it, and is:
 - Physically located in the CMPSCI Building
 - Accessible only through the Internet
 - Through Host Address: `elsrv3.cs.umass.edu`

©2014 Dr. William T. Verts

Internet Tools

- Telnet
 - Connect over the Internet to remote server for the purpose of giving it commands
 - Original version was unencrypted
 - Modern versions are encrypted
- FTP (File-Transfer-Protocol)
 - Connect over the Internet to copy files between remote machines
 - Original version was unencrypted
 - Modern versions are encrypted

©2014 Dr. William T. Verts

Modern Tools

- Encrypted Telnets:
 - Microsoft Windows: PuTTY (download from UK)
 - Apple Mac: ssh from Terminal (built-in standard)
- Encrypted FTP:
 - Microsoft Windows: WinSCP (download)
 - Apple Mac: Fugu (download 1.2.1pre1 for Lion)

©2014 Dr. William T. Verts

Student Accounts

- Usernames are the same as UMail usernames.
- Passwords are initially ELxxxaaa, where xxx is the last three digits of the SPIRE ID number, and aaa is the first three letters of the username (lower case).
- Example: Fred Smith with username fsmith and ID number 12345678 would have initial password EL678fsm.
- First successful telnet connection demands that the password be changed.

©2014 Dr. William T. Verts

UNIX Commands (Telnet)

- `logout` Terminate connection
- `ls -al` List all files with all options
- `pwd` Where am I? (Pr. Work. Dir.)
- `cd name` Change dir to named folder
- `cd ..` Change to enclosing folder
- `mkdir name` Make a new directory folder
- `chmod permissions name`
Change permissions on named file

©2014 Dr. William T. Verts

File Permissions

- Permissions are three triplets: `rxwxrxwx`
 - r = read (ability to examine file's contents)
 - w = write (ability to modify/delete file)
 - x = execute (execute programs or open folders)
- Triplets, in order:
 - u = User (owner of file)
 - g = Group (collaborative group)
 - o = Others (everybody else)
- Presence of a letter: permission granted
- Presence of a dash (not letter): permission denied.

©2014 Dr. William T. Verts

chmod

- Symbolic Form:
 - `chmod ugo+rwx,ugo+rwx filename`
 - a is a shortcut for ugo
- Absolute Form:
 - `chmod nnn filename`
 - nnn is an octal (base 8) number
 - each n encodes `rxwx` in binary number, letters = 1, dashes = 0.

©2014 Dr. William T. Verts

chmod Examples

- Add read permission to user, group, and others, but deny write permission from group and others on file `Frog.gif`

```
chmod a+r,go-w Frog.gif
```
- Set permissions `rw-r--r--` on `Frog.gif`

```
chmod 644 Frog.gif
```
- Set permissions `rxwx-r-x` on `public_html`

```
chmod 755 public_html
```

©2014 Dr. William T. Verts

Setting up the Web nest on UNIX

- Create special folder for Web files


```
mkdir public_html
```
- Set permissions so outsiders can see in:


```
chmod 755 .
```
- Set permissions so outsiders can get Web files:


```
chmod 755 public_html
```
- Now, any files in `public_html` may be visible on the Web (if they have the right permissions).

©2014 Dr. William T. Verts