

Intro to Unix

Adriane Boyd & Jon Dehdari

The Ohio State University

Department of Linguistics

Columbus, OH, USA

{adriane, jonsafari}@ling.ohio-state.edu

- `whatis` Unix
- System commands
- Text processing commands
- Useful graphical software

1. Operating system based on original AT&T Unix codebase
2. Operating system conforming to the Single UNIX Specification
3. Any operating system with a Unixy feel
4. `unix (7)` - Sockets for local interprocess communication

The Freedom to . . .

- Run the program, for any purpose
- Study how the program works, and adapt it to your needs
- Redistribute copies
- Improve the program and release it to the public¹

¹<http://www.fsf.org/licensing/essays/free-sw.html>

- Solaris



- Linux



- *BSD



- Many others



XENIX



Tru64
UNIX

HP-ux

- (1) a. *command options file* | ...
verb adverb noun complementizer ...
- b. *sudo command* < *file1* > *file2*
honorific verb NOM noun ACC noun

Very Common Commands

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- `ls` - list directory contents
 - `ls -l` - use a long listing format
 - `ls *.pdf` - list all files ending with `.pdf`
- `cd` - change directory
 - `cd ..` - go up one directory
 - `cd ../../..` - go up three directories
 - `cd ~` - go to your home directory
 - `cd -` - go to your previous working directory
- `rm` - remove files or directories
 - `rm *.js` - remove all files in current directory ending with `.js`
 - `rm -r` - recursively remove all files a given directory

- `mv` - move / rename files or directories
- `clear` - clear the terminal screen
- `pwd` - prints your current working directory
- `man` - reference manual for a given command
- `mkdir` - create a directory
- `rmdir` - delete an empty directory
- `more` , `less` , `cat` - show contents of a file
- `head` - show the first few lines of a file
- `tail` - show the last few lines of a file

- `bash` and `tcsh` are most common these days
- `chsh` will change your default shell
- `>` - redirects shell output to a file
- `>>` - redirects shell output to a file, appending to it if already present
- `&` - run a command in the background. Use this after running graphical programs
- `|` - use the output of first command as the input of second command. Allows chaining of commands

- Most configurations files stored as `~/.myprogram.conf` or `~/.myprogramrc`
- `env` shows all your environment variables
- `export TEXINPUTS=~/.latex:..`: In Bash, sets your TEXINPUTS environment variable to include `~/latex/`
- `setenv BIBINPUTS ~/.latex:..`: In tcsh, sets your BIBINPUTS environment variable to include `~/latex/`

- Vi - Lightweight, very powerful, steep learning curve
- Emacs - Everything but the kitchen sink
- Nano/Pico - Small and simple
- Gedit - Like Notepad, but with more features

- To insert text, type `i`, then your text
- To save, type `[ESC] :w`
- To exit, type `[ESC] :q`

eMacs: Discontinued educational variants of iMacs



- To insert text, patiently wait until Emacs starts, then just start typing
- To save, type `[CTRL] x [CTRL] s`
- To exit, type `[CTRL] x [CTRL] c`

- To insert text, just start typing
- To save, type `[CTRL] o`
- To exit, type `[CTRL] x`

- `cat` - concatenate files, and more
- `split` - split a big file into lots of smaller ones
- `tac`, `rev` - reverse text (in different ways)
- `nl` - number lines of files
- `wc` - print the number of newlines, words, and bytes in files
- `diff` - compare files line by line
- `cut` - display selected columns from a `.csv/.tsv` file
- `paste` - merge multiple `.csv/.tsv` files into a single `.csv/.tsv` file

Grep is a very useful command for linguists

- `grep 'hello' file.txt` - displays all lines containing 'hello'
- `grep -v` - inverse match
- `grep -o` - show only the part of a line matching your pattern
- `grep -n` - show line numbers with output
- `grep -r` - search all files within a given directory
- `grep --color` - highlight your pattern within the line
- `egrep` - extended grep, with more powerful pattern-matching
- `pcregrep` - Perl regular expression-compatible grep, for really advanced pattern-matching

- `egrep -rn '[3-7] days' papers/` - find all instances of '3' through '7', followed by 'days' within the papers directory, and show the line numbers
- `egrep -o '.{0,20}tables?.{0,20}' text.txt` - find 'table' or 'tables', with some context, if present, on both sides
- `egrep '\w*able\W' text.txt` - find all words ending with 'able' (eg. able, table, vegetable, (un)comfortable)
- `egrep -o '(\w+)\W\1' text.txt | sort | uniq -c | sort -rn` - find all reduplications of words, and ranks them by frequency
- Type `man grep` for more details

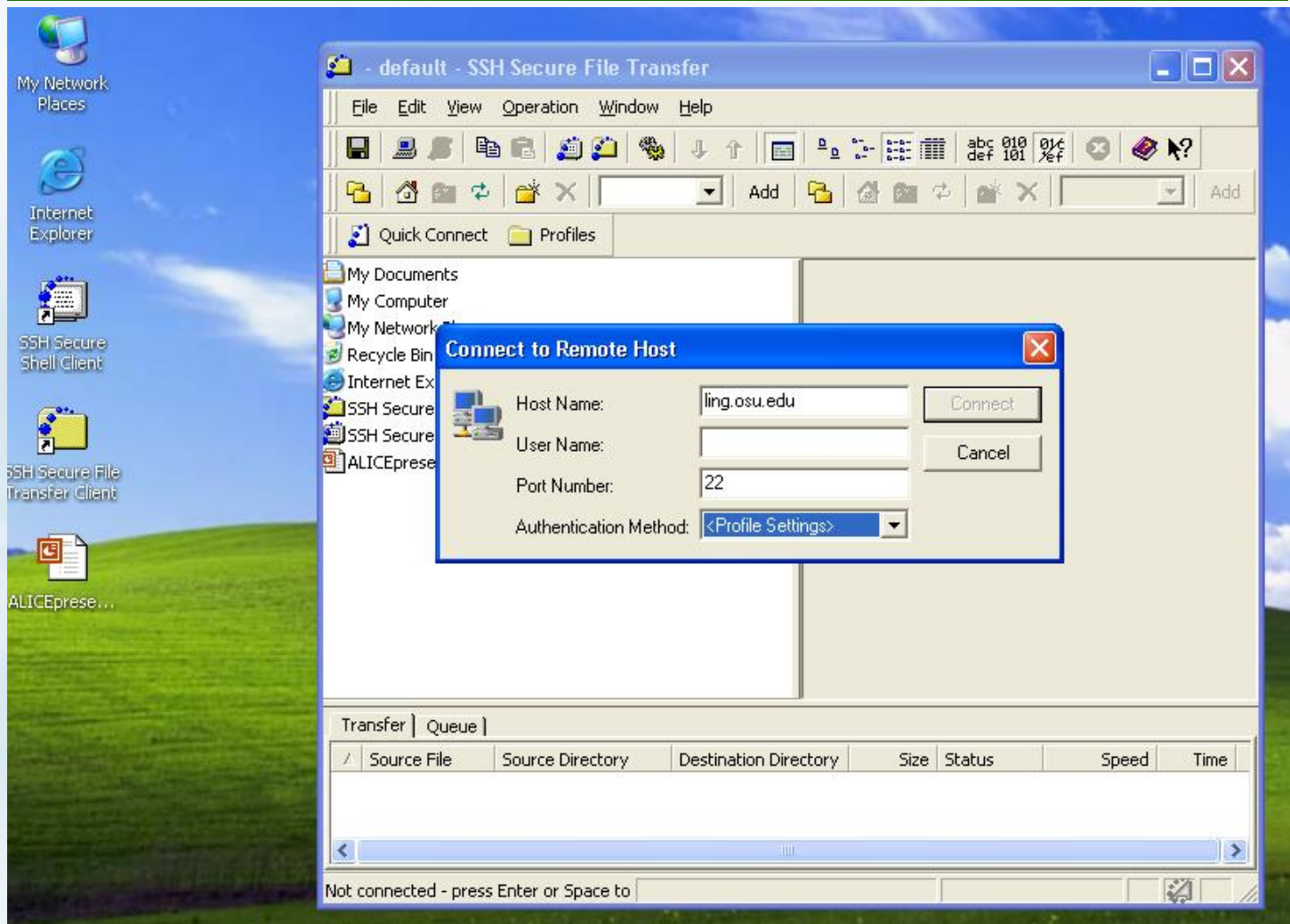
- `gunzip file.tar.gz` - Uncompresses a `.tar.gz` file
- `bunzip2 file.tar.bz2` - Uncompresses a `.tar.bz2` file
- `tar -xvf file.tar` - Untars a `.tar` file
- `tar -zxvf file.tar.gz` - Uncompresses and untars a `.tar.gz` file (not available on most Solaris boxes)
- `unzip file.zip` - Uncompresses a `.zip` file
- `unzip -l file.zip` - Lists contents of a `.zip` file

- `mycommand --help` - Usually lists quick overview of command usage
- `man mycommand` - Comprehensive synopsis of command usage
- Google & Google groups - Very helpful
- `support@...` - If you're stuck, send us an email

- `ssh bob@julius` - Remotely login user bob onto julius
- `ssh -X` - Allows graphical programs to run over ssh
- `scp myfile.txt sue@julius:papers/` - Copy local file `myfile.txt` to sue's remote directory `papers`
- `scp -r me@julius:papers/2006/ .` - Copy all files under remote directory `~/papers/2006` to local machine's current working directory

SSH on Windows

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- `mutt`, `pine` - console mail readers to run on julius or other department unix machine
- webmail - <http://www.ling.ohio-state.edu/webmail>
- configuring another mail program
 - IMAP server: mail.ling.ohio-state.edu
 - SMTP: your local internet provider's SMTP server at home; mail.ling.ohio-state.edu at school
- mail forwarding and spam filtering settings
 - go to <https://www.ling.ohio-state.edu/local/mail/>

- Department printers: printer221, copier200 (hallway), printer021 (in 024)
- `lpr` - print a file
 - `lpr -Pprintername file.ps`
 - `lpr -Pprintername/d file.ps` (double-sided)
 - `lpr -Pprintername/2d file.ps` (2-up and double-sided)
- `lpq` - see printer status
 - `lpq -Pprintername`
- `lprm` - remove a job from the printer queue
 - `lprm -Pprintername job-number` (job numbers are shown by `lpq`)

L^AT_EX is a “document-preparation system”

- a L^AT_EX file can be created with any text editor
- `latex file.tex` will process it and create `file.dvi`
- `pdflatex file.tex` will create `file.pdf`

Un*x L^AT_EX editors

- `kile` is a user-friendly KDE-based L^AT_EX editor
- `lyx` is a WYSIWYG L^AT_EX editor

L^AT_EX for Windows: MiK_TE_X (<http://www.miktex.org>)

- `latex` produces DVI files
 - view DVI with `xdvi file.dvi`
 - print DVI with `dvips -Pprintername`
 - convert to PS with `dvips -o outfile.ps file.dvi`
 - convert to PDF with `dvipdf file.dvi (outfile.pdf)`
- PS files
 - view PS with `gv file.ps`
 - print PS with `lpr file.ps`
 - convert to PDF with `ps2pdf file.ps (outfile.pdf)`

- `pdflatex` produces PDF files
 - view PDF with `xpdf file.pdf` or `acroread file.pdf`
 - print PDF from within `xpdf` or `acroread`
 - print PDF with `lpr file.pdf` (will be automatically converted to PS)
- modifying PS and PDF files
 - `mpage`, `psnup`, and `pdfnup` produce N-up output
 - `mpage -2 -Pprintername file.ps`
 - `psnup -2 file.ps > outfile.ps`
 - `pdfnup --nup 2x2 --paper letter --orient landscape --frame true file.pdf (outfile.pdf)`

Synchronizing Files with rsync

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`rsync` copies files from one machine to another, only transferring data for files that have been modified

- `rsync -e ssh -av`
`user@ling.ohio-state.edu:/home/user/dir /local/dir`

`unison` allows interactive synchronization between two computers
(<http://www.cis.upenn.edu/~bcpierce/unison/>)

- install the same version of unison on your home computer as on julius (currently 2.7.7, but this needs to be upgraded)
- set up a profile
 - select a directory on your home computer to synchronize
 - select a directory in your home directory on julius, specify SSH, and use `ling.ohio-state.edu` as the host

- create a directory in the top level of your home directory called `public_html`
 - `mkdir ~/public_html`
- set the permissions to make sure anyone can read it
 - `chmod a+rx ~/public_html`
- go to <http://www.ling.ohio-state.edu/~user/> to see your empty directory

- Add HTML pages and subdirectories as you like
 - in each directory, `index.html` is the page displayed by default
 - if you'd prefer not to let people see the directory listing, you can just create an empty file called `index.html` using the command `touch index.html`
 - if you get a “permission denied” error, make sure the directory or file is world-readable with `chmod a+r file` for a file or `chmod a+rx directory` for a directory

