

UNIX and C

(Thedsadude)

(Jake vonSlatt, Steamtop, 2007)

Steven Bradley

1958

Antitrust case settlement

forbids AT&T from them

selling computer products

1964

MULTICS

(Multiplexed

Information and

Computing

Service) project

started

MIT + GE + Bell

Labs

1969

UNICS (Uniplexed

Information and

Computing

Service)

AT&T Bell Labs

- Ken Thompson

- Dennis Ritchie

- Brian Kernighan

- Douglas McIlroy

- Michael Lesk

- Joe Ossanna

1972

- UNICS becomes UNIX

- Originally written in

assembly

- Rewritten in C by 1973

1974

- UCB (Berkeley, California) start their own development

- This eventually becomes BSD

(1978)

- BSD Licence allows for any use

1981

- MSDOS launched

1982

- Bill Joy of BSD

co-founds Sun

(eventually

makes Java)

- Solaris

becomes

widely adopted

by late 90s but

declines.

1983

- AT&T disband

Bell labs after

new anti-trust

case

- Now free to

commercialise

UNIX V

- GNU launched

by Richard

Stallman under

GPL - not yet a

stable system

1991

Linus Torvalds

starts writing

Linux for x86

1997

Apple choose

NEXTSTEP,

based on BSD

for Macintosh

(highly simplified!)

14

An example UNIX command

- sort
- What does it sort?
 - A file (if specified)
 - stdin: standard input, by default from terminal
- Where does it put the results?
 - stdout: standard output, by default the terminal
 - A file? Not available as a parameter
- Can redirect output to file with >
 - E.g. `sort infile.txt > outfile.txt`
 - Use >> to append rather than overwrite existing file
- Can redirect input from file with <
 - `sort <infile.txt > outfile.txt`
 - Or ... `<infile.txt sort > outfile.txt`

stdin, stdout and stderr

- Remove the need to worry about I/O

devices

- Two types of output, each can be

redirected

- These are stream variables, can

redirect e.g.

– 2>&1

- Can redirect input from another program with
pipe —
 - `wc * | sort`
 - `wc` (word count) counts lines, words and chars in
file
- Can sort by number (instead of
lexicographically) with `sort -n`
 - `wc * | sort -n`
- Can use command line as simple editor with
`cat`
 - `cat > outfile.txt`
 - `cat` concatenates all its input files (or `stdin`) to
`stdout`
 - Use `Ctrl-D` for EOF

More unix commands

- tr
 - translates or deletes characters from SET1 to SET2
 - e.g. tr 'A-Z' 'a-z' makes a lower case version of stdin
 - option -c takes complement of SET1
 - option -s squeezes repeats to a single char

uniq

- Remove or report repeated lines
- Use with sort to find lines repeated

throughout document

- E.g. sort — uniq
- Use -c option to count number of repetitions

- Tie these all together: what does this do?

```
tr 'A-Z' 'a-z' < infile — tr -cs 'a-z' '\n' — sort —  
uniq -c — sort -n
```

Summary

- UNIX is written in C
- stdin/ stdout/ stderr provide

hardware independent IO

- Can redirect input and output
- Use C to write new programs for

UNIX

- For interpreted equivalent try shell
script or perl

UNIX at Durham

Logging in via Windows DUDE

- x2go app
- putty/ssh to mira
- J drive as home directory

UNIX on your machine

-
-
-
-
-
-

dual boot

OSX

Cygwin

virtualbox

most web hosts

automate tasks done by hand

What now

- UNIX tutorial : open of course
- Try python on the command line

(python3) Redirect output of python
program to a file