This lecture overview

- General information.
- What is an operating system.
- Short history of computers and operating systems.
- Short history of UNIX.
- Editors `ed` and `vi`.

Course organization

Lecturer	room	e-mail
Jerzy Sobczyk	519	J.Sobczyk@ia.pw.edu.pl

Date	Time	room
Wednesday	16 – 18	GG ???
Wednesday	18 – 20	GE 518

First lab. 10 III 1999

Bibliography

- A.S.Tanenbaum, "Modern Operating Systems", Prentice-Hall 93
- A.Tanenbaum, "Operating Systems, Design and Implementation", Prentice-Hall 97
- W.R.Stevens, "UNIX Network Programming", Prentice-Hall 90
- John Valley, "UNIX Programmers Reference", Que Corporation 91

Course overview

1. Brief history of computers and operating systems.
2. Command interpreters.
3. Users and accounts.
4. File systems.
5. Security.
6. **Test**
7. Programmers interface.
8. Memory management.
9. Processes and synchronization.
10. Inter process communication.
11. System processes.
12. Basic network services.
13. Internet protocol suite.
14. **Test**
15. Distributed systems.

Laboratory overview

1. Introduction
2. Basic commands.
3. Shell programming (2).
4. File manipulation.
5. Experimenting with file system security.
6. System calls.
7. Experimenting with memory allocation.
8. Creating simple processes.
9. Shared memory.
10. Inter proces communication (2).
11. Creating network daemons (3).

Short history of UNIX

1969 Ken Thompson leaves the team working on MULTICS and starts new project. Brian Kernighan invents the name: Uniplexed Information and Computing System - UNICS shortened to UNIX.

1971 Work on C language starts.

1973 Kernel is rewritten in C, system ported into other platforms and given to some universities. AT&T does not charge universities.

1974 University of California in Berkeley (UCB) receives its copy of UNIX.

1975 UNIX edition 5 is created (also known as) PWB/UNIX 1.0.

1977 Bell Labs releases UNIX edition 6. UCB sends abt. 30 copies of its additions as 1 BSD. Interactive Systems Co. starts selling office applications.

1978 Version BSD has virtual memory, vi editor, curses and termcap libraries.

Short history of UNIX, cont.

1979 UNIX edition 7 released. Stanford University Network board commecializes SUN Microsystems, Inc. is created.

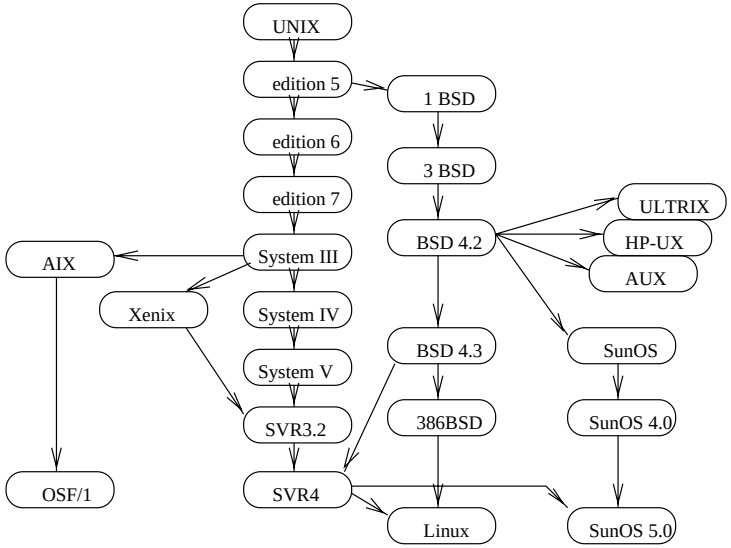
1982 Programmers Workbench (PWB) together with Unix System Group (USG) from Bell Labs create Unix Sytem Developement Laboratory (USLD). UNIX System III is released.

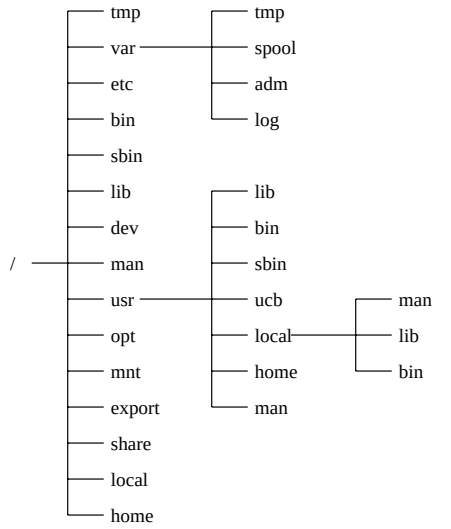
1983 UNIX System V is released by AT&T.

1984 Based on "edition 7" and "System III" Microsoft creates XENIX. IBM creates AIX based on "Systemu III". SUN starts using SPARC processors.

1987 AT&T buys control package of SUN actions. UNIX war starts.

1988 Open Systems Foundation is created.





vi - Searching

- `/pattern` forward search
- `?pattern` backward search
- `//` repeating last search forward
- `??` repeating last search backward
- `/pattern/-n` search and move n lines back
- `/pattern/+n` search and move n lines forward
- `?pattern?-n` search back and move n lines back
- `?pattern?+n` search back and move n lines forward

vi - Cursor movements

- `h` one character left
- `j` next line
- `k` previous line
- `l` one character right
- `^D` half page down
- `^U` half page up
- `^F` one page down
- `^B` one page up
- `^E` scroll one line up
- `^Y` scroll one line down
- `^L` refresh the screen

vi - Line mode - addressing

:*beg,end cmd*

- `.` current lin
- `.-1` previous line
- `.+1` next line
- `/pattern/` line containing pattern (forward search)
- `?pattern?` line containing pattern (backward search)
- `'m` line marked with m
- `1` first line of the file
- `5` fifth line of the file
- `$` last line of the file

`%` is equivalent to `1,$`

vi - Line mode

- `:a` append after current line
- `:a!` append after current line (ignore autoindent mode)
- `:i` insert before current line
- `:i!` insert before current line (ignore autoindent mode)
- `:l` list lines
- `:d` delete lines
- `:w file` write to the file
- `:r file` read from the file

vi - Line mode (cont.)

- `:s/patt/repl/gc` substitute
- `:g/patt/cmd` repeat command for all matched lines
- `:g!/patt/cmd` repeat command for all not matched lines
- `:n` get next file from the list
- `:n list` get first file from the list
- `:rew` rewind to the first file on the list

vi - Regular expressions

- `*` repeat last expression
- `.` any character
- `[...]` any character from the class
- `[A-Z]` any capital letter
- `[^...]` any character not belonging to the class
- `\(...\)` subexpression
- `^` beginning of the line
- `$` end of the line

vi - Replacements

- `&` anything matching the pattern
- `\1` first subexpression
- `\2` second subexpression
- `\L` start changing to lower case
- `\l` change next character to lower case
- `\U` start changing to upper case
- `\u` change next character to upper case
- `\E` stop changing the case
- `\e` stop changing the case

vi - Line mode - examples

- `:%s/\([^ ]*\) \(.*\)/\2 \1/` move first word of every line to the end of the line
- `:%g/bob/s/^\([a-zA-Z]*\)/\[\1\]/` put brackets around first word of every line containing string *bob*
- `:1,'mg/==/d` delete all lines containing == starting form the beginning of the file to the line marked with *m*
- `:1,.g!/==/d` delete all lines not containing == starting from the beginning of the file to the current line
- `:%s/\([^ ]*\) \(.*\)/\2 \U\1\E/` move first word in every line to the end of the line changing it into upper case