

COMP421

Unix Environment for Programmers

Lecture 01: History

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“...the number of UNIX installations has grown to 10, with more expected...”

–Dennis Ritchie and Ken Thompson, June 1972

The beginning

- Written at Bell labs (Now AT&T Bell Labs) in 1969.
 - by Ken Thompson and Dennis Ritchie.
- Not designed as a commercial operating system.
- Designed as a “hacker’s toolset” for programmers.
 - An early release was called PWB (Programmer’s work bench).
- Written for their own use and for friends and coworkers.

Early capabilities:

- First version ran on a PDP 11/20
- Had simple versions of `fork()`, `ed` and `roff`
- Used for document processing.

Growth by extension:

- Utility programs written by various people.
- As individual needs arose, solutions to the problem were created and contributed.
- Source code donated to Universities for free.
- Researchers also wrote and donated their software for it.

Commercialization:

- Commercial operating systems already existed for larger mainframes.
- VAX VMS and IBM CMS operating systems were introduced in 1977 to replace PDP-11 machines.
 - Incredibly costly application software. Compilers, editors and applications were value add-ons and priced accordingly.
- Sold commercially by AT&T and Sun microsystems (jointly) in 1984.
 - Cost is prohibitive but competitive.
- Open Software Foundation (OSF) founded in 1987 by Richard Stallman to combat increase in cost and prevent monopolistic commercialization.
 - most of what we recognize today as “Unix” is actually the applications written by the OSF (`emacs`, `sed`, `awk`, `find`, `grep`, `bash`, `etc.`)
- Sold to Novell in 1993
- Sold to SCO in 1995

Flavours:

Many different brands of “Unix” were created to address particular needs or support specific hardware.

- HP-UX for Hewlett-packard servers
- Solaris (SunOS) for AT&T/Sun microsystems.
- minix (an early free implementation)
- Linux (when Linus got fed up with minix and need a grad. project.)
 - Tons of “Sub-distributions”: Slackware, debian, gentoo, Ubuntu, RedHat, Suse.
- FreeBSD
- OpenBSD
- Hurd

Hardware issues aside, Dissagreement on politics motivated the branching of Unix into various flavors.

Comparison with Windows:

<i>Unix</i>	<i>Windows/DOS</i>
Good	Bad
Multi-user	originally single user
Multiprocess	DOS not multiprocess cable
Security features present at conception	security features tacked on
Windowing environment seperate	Windowing (now) integrated
Shared Libraries (.so)	dynamic link libraries (DLLs)
Networking features added early	networking features tacked on late
Historically better design decisions	640K/2GB limits poorly chosen
Complex configuration	streamlined configuration
Flexible/extensible	Heavily proprietary
Poor desktop market penetration	Deep, Wide spread penetration
multiarchitecture	x86 specific (recently changing)
Course filesystem security granularity	Fine filesystem security granularity
FREE (as in “beer” and “rights”)	Costly and resistance is futile