Introduction to Unix*

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*This document contains lecture notes for informal Unix seminar for ITT AES employees (Reston, VA). No information in this document is either endorsed by or attributable to ITT. This document contains no ITT Privileged/Proprietary Information.

A Brief History

A morsel of genuine history is a thing so rare as to be always valuable. *Thomas Jefferson*
Unix is a Registered Bell of AT&T Trademark Laboratories. *Donn Seeley*

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1969 Thompson & Ritchie start to work on an old obsolete PDP-7 [1]. Unix start to emerge. Unix as a toolbox. Synergy between C and Unix. Early principles of Unix:

1. Make each program do one thing well
2. Expect the output of every program to become the input to another, as yet unknown, program
3. Design and build software to be tried early, ideally within weeks
4. Use tools in preference to unskilled help to lighten a programming task, even if you have to detour to build the tools and expect to throw some of them out after you've finished using them

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[1]AT&T management did not want to buy them a PDP-11

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1970s Unix dissipates into At&T operations.

> When UNIX evolved within Bell Laboratories, it was not a result of some deliberate management initiative. It spread through channels of technical need and technical contact. . . This was typical of the way UNIX spread around Bell Laboratories. You had MTSS Supervisors and Department Heads saying we had to go in this direction while Executive Directors were saying, "Well, I'm awful nervous about it. But if you guys say that is what we've got to do, I'll back your play." *Viktor Vyssotsky, 1985*

mid 1970s AT&T sells Unix tapes to universities. Popularity among academic community. Many enhancements. Networking.

1980s AT&T decides to commercialize UNIX. Berkeley starts its own distribution (BSD). The great schism between SysV & BSD

mid 1980s Independent vendors offer their Unices. (SunOS, HP-UX, etc)

end 1980s OSF vs UNIX International. POSIX standard appears.

begining 1990s Lawsuits and wars. Linux appears.

mid 1990s Settlements. New ideas.

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What is Good About Unix?

Unix: Some say the learning curve is steep, but you only have to climb it once. *Karl Lehenbauer*

Those who do not understand Unix are condemned to reinvent it, poorly. *Henry Spencer*

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1. A system built by the people working with the system

2. Toolbox idea: all programs a building block, universal way to connect them. A Lego-like system

3. Expandability: create your own solutions

Example: a scheduler

- ```
  at 7:30am tomorrow
  mpg123 music/Beatles/Yesterday.mp3
  ```

- ```
  at 7:00am December 20
  echo "Happy birthday" | mail -s "Congrats" boris.veytsman@itt.com
  ```

- ```
  at 3:00am
  if long_calculation.sh 2>calc.log
      then mail -s "Success" boris.veytsman@itt.com
      else cat calc.log | mail -s "Bad news" boris.veytsman@itt.com
  fi
  ```

4. Multi-user and multitasking system

5. A real networking system. Example: X-windows. Screen from computer A, files from computer B and CPU from computer C, fonts from computer D.

   Some additional food for thought: `http://www.performancecomputing.com/archives/articles/1998/september/9809of1.shtml`

What is Bad About Unix?

Unix gives you just enough rope to hang yourself—and then a couple of more feet, just to be sure. *Eric Allman*

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1. Learning curve
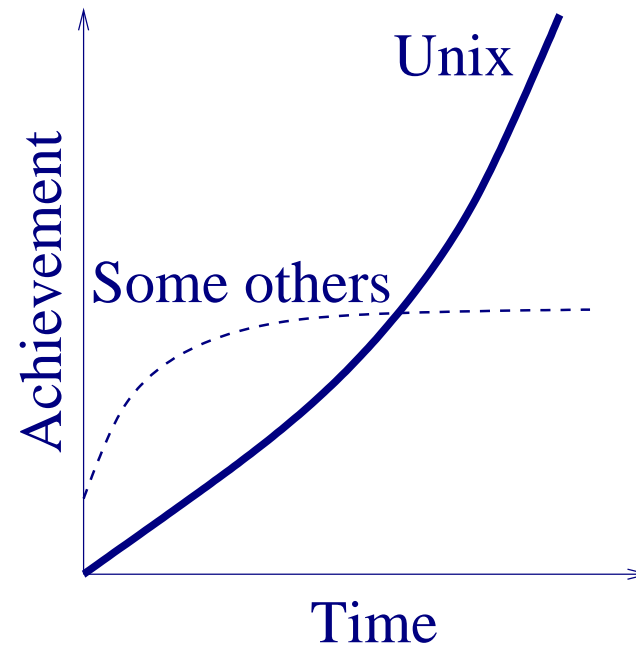
- You cannot accomplish much unless you are a guru
- If you are a guru, you can accomplish almost anything

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2. Security features were a later add-on. Default system is rather primitive (but we *do* have ACL!)

3. Lot of legacy stuff

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Uses of Unix

I have ways of making money that you know nothing of. *John D. Rockefeller*

1. A server

2. A workbench (calculation, development, etc.)

3. A workhorse in a predictable environment (most of Point of Sale Systems are unices!). Embedded systems.

4. A desktop for a tinkerer

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Unix Flavors

Unix Express:

All passengers bring a piece of the aeroplane and a box of tools with them to the airport. They gather on the tarmac, arguing constantly about what kind of plane they want to build and how to put it together. Eventually, the passengers split into groups and build several different aircraft, but give them all the same name. Some passengers actually reach their destinations. All passengers believe they got there.

xSysV: AIX, SCO Unix, Solaris, HP-UX (many BSD features), IRIX (many BSD features)

xBSD: BSDi, FreeBSD, NetBSD, SunOS, Ultrix

Intermediate: Linux

- The most important difference for a user: groups permissions mechanism

- The most important difference for an admin: startup files

See `http://www.faqs.org/faqs/unix-faq/faq/part6/` and the diagram at `http://perso.wanadoo.fr/levenez/unix/`

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Aims of the Seminar

I took a course in speed reading and was able to read "War and Peace" in twenty minutes. It's about Russia.
Woody Allen

1. A road map for learning

2. Tips and tricks

3. General discussions