

Lecture # 1 – Introduction to UNIX (Part 1)

- What is UNIX?

UNIX is an operating system available on many common hardware platforms. An operating system provides an interface between the hardware and application programs. Other common operating systems include (Windows, Mac OS/X, MVS, etc.)

- History of UNIX

1. UNIX began at AT&T Bell Laboratories in 1969 (Ken Thompson)
2. Multi-user, interactive, and easy resource sharing
3. Started making its way into major universities in 1975
4. Two major versions are BSD from UC Berkley and System V from Bell Labs
5. All current versions of UNIX are derivatives from one or both of these versions

1969	Ken Thompson creates first UNIX in PDP-7 assembler
1973	V4 – rewritten in C
1975	V6 – First version widely available outside Bell Labs
1978	2.X & 3 BSD for PDP-11
1979	V7 – For some “the last true UNIX”, full K&R C, Bourne shell (40 KB Kernel)
1980	4.0 BSD
1982	System III – First commercial version for AT&T
1983	System V & 4.2 BSD
1986	SVR3 & 4.3 BSD
1988	SVR4 – merge of System V, BSF, and SunOS
1991	OSF/1 – based on Mach 2.5 kernel, Linux 0.01
1992	4.4 BSD – last official BSD release
1994	OSF/1.3 – based on Mach 3.0 kernel, First version of Redhat Linux

- UNIX Today

Most popular versions include Linux, Solaris, HPUX, AIX.

Linux is available in many flavors (Redhat, Fedora, Suse, Mandrake, etc.) on Intel platform

Solaris, HPUX, and AIX are proprietary for particular hardware

POSIX standards

- GNU / Linux connection

In 1983, Richard Stallman announces the GNU project

From the GNU manifesto: GNU, which stands for Gnu's Not UNIX, is the name for the complete UNIX-compatible software system which I am writing so that I can give it away free to everyone who can use it.

By the early 1990's, the GNU project had completed most of the work with the exception of the kernel (trying to write one based on Mach).

In 1991, Linus Torvalds finished a kernel, and many believe he looked around for some free software to complement it (and Linux was born and married to the GNU project).

- Strengths

1. Generic, multi-purpose, multi-user operating system
2. Easy to port (consisting of mainly Machine Independent code)
 - Original UNIX was written in PDP-7 assembler
 - Ritchie and Thompson rewrote UNIX in C to promote portability of UNIX
 - Approximately 95% of all UNIX code is written in C.
3. Available on large number of hardware platforms
4. Extremely scalable
5. Wide variety of applications available (both free and commercial)

- Limitations

1. UNIX is known as “unfriendly”
2. Fairly steep learning curve (However, features are good for advanced users)
3. Assumes you know what you are doing

- UNIX Overview

Compilers, Databases, Word Processors, Mail Facilities, Formatters, etc.
Shells, Utilities, X-Windows System
Kernel
Hardware

Many utilities with specific purpose, power comes from combining.
This course will center on the “shells and utilities” layer.

A shell is a program that provides an interface between the user (application) and the kernel.
This course will offer details in several shells including Bourne, C Shell, Bash, tcsh, Perl, etc.

- Accounts / Machine Use
 1. You can use any UNIX machine that runs a relatively modern version of UNIX. These include Solaris, HPUNIX, AIX, Linux (any flavor), etc. You will get the most instructor help if you use Solaris, HPUNIX, or Linux since these are flavors that I am most familiar with, and have ready access to.
 2. UAH has Linux machines in the teaching lab, the open lab, and the Laser lab.
 3. I recommend getting a UNIX account at UAH so I can help with problems.
- Class web page at <http://www.annrich.com/cs390>