

Basic UNIX

John R. Hover
RHIC/ATLAS Computing Facility
Brookhaven National Laboratory

Overview

- UNIX philosophy
- Filesystem layout and logic.
- Users, groups, privileges.
- Processes, streams, environments.
- OS functions: kernel, init, system calls, etc.
- Traditional UNIX administration: passwd, cron, packages, logging, /tmp, quotas,

UNIX Philosophy

- OS design guided by programming and engineering culture.
- Modularity vs. monolithic: small programs that work together.
- Line oriented ASCII text data.
- Command line oriented--serial vs. parallel.

Filesystem Layout and Logic I

- / -- root
- Logical divisions:

bin	user binaries
sbin	admin binaries
lib	shared libraries
include	header files
src	source
libexec	binaries for programs
etc	configuration and system-specific
tmp	temporary files (r/w)
var	variable (r/w)

Filesystem Layout and Logic II

- Roots for logical trees
 - / Main root, always available
 - /usr Vendor user root, may be mounted r/o
 - ~/ (user's home directory)
 - /usr/local Site-specific, custom root
 - /opt Vendor optional packages

Filesystem Layout and Logic III

- Directories vs. partitions. Mounts.
- Special directories
 - /dev device files
 - /proc kernel/process info (kernel made)
 - /sys kernel/system info (kernel made)
 - /boot kernel images
 - /home user home directories
 - /root root user home directory

Program execution

- Streams: stdin, stdout, stderr
- Environment
- Pipes, programs as filters.
- Fork splits currently running program image
- Execvp replaces currently running program image

OS Functions

- Discuss boot sequence:
MBR
Boot loader
Kernel loaded
init program reads /etc/inittab
/etc/rc
/etc/rc.d/rc#.d/
/etc/init.d/ (symlinks into /etc/rc.d/)
- Chkconfig -- manages symlinks in /etc/init.d