

Advanced Unix System Administration

Lecture 6
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Steven Luo
<sluo+decal@OCF.Berkeley.EDU>

A Tour of Userspace

- init
- syslogd(8)
 - Programs call `openlog()`, `closelog()`, `syslog()` to write to `/dev/log`
 - Daemon picks up log messages, and writes them to logs, pipes, or over the network
 - Usually picks up kernel messages in a system-dependent manner
 - Configured in `/etc/syslog.conf`

A Tour of Userspace

- `inetd(8)`
 - Service multiplexer
 - Listens on lots of ports for incoming connections, hands them off to other programs
 - Configured via `/etc/inetd.conf` (usually)
 - Advantages: services run only when needed
 - Disadvantages: very poor performance

A Tour of Userspace

- portmap(8)/rpcbind(1M)
 - Multiplexing scheme for Sun/ONC RPC services
 - Clients connect to port 111 and get a list of running RPC services
 - Advantages: allows dynamic port assignments for running services, ports > 1024 to be used
 - Disadvantages: gives lots of information for an attacker

A Tour of Userspace

- cron(8)
 - Runs commands at intervals based on contents of crontab files
 - Crontabs installed using crontab(1)
 - For systems not up all the time, anacron(8) can be used to ensure that cron jobs get run
- atd(8)
 - Runs commands at scheduled time
 - Jobs installed using at(1)

A Tour of Userspace

- Mail transport agent
 - Programs expect `/usr/lib/sendmail` or `/usr/sbin/sendmail` to allow sending mail
 - Traditionally this is Sendmail, but could be almost anything nowadays
- X Window System
 - Provides graphical display services to X clients
 - Network transparent

A Tour of Userspace

- C library
 - Provides more comfortable/less implementation-dependent interface to the kernel
 - Provides standard/required functions
 - Provides timezone interpretation and localization features
- gettext(1)/msgformat(1)
 - Provides standard interface to localized messages

A Tour of Userspace

- Name Service Switch
 - C library grew functions `getpwnam()`, etc., to have standard ways of reading `/etc/passwd`, looking up hostnames, etc.
 - NSS mechanism allows C library to load (via `dlopen()`) different providers for this information
 - Providers include files, DNS, NIS, NIS+; can be written/installed separately from `libc`
 - Configured via `/etc/nsswitch.conf`

A Tour of Userspace

- Pluggable Authentication Modules
 - (Mostly) standardized way of checking users' passwords
 - Allows powerful access controls, multiple authentication providers via `dlopen()`
 - Available on Linux, Free/NetBSD, Solaris, most commercial Unix
- BSD Authentication
 - Like PAM, but uses program helpers instead of shared libraries; OpenBSD and BSDi