

*nix 1010

An Introduction to the Linux / Unix / BSD
operating systems.



Think **correctly**.



SOLARIS

Outline

- Distributions and Platforms
- Live Booting
- Installation
- The Pieces of *nix
- Linux File System Layout
- Window Manager
- Security and Permissions
- The Command Line
- Editing Configurations
- Programs: Package Management
- Process Control
- Scripting
- Remote Access (SSH)
- Demo?

Distributions and Platforms

- What is Unix?
- What is Linux?
- What is BSD?
- Distribution vs Platform

What is UNIX

Unix is an Operating system from Bell Systems at AT&T, development was started in 1969 on a DEC PDP-7 and then on a DEC PDP-11/20. It was not sold on the market, instead you could buy a license and get access to the source code.

What is Linux

Linux is an open source Unix clone, it is just a Kernel, nothing more nothing less. The Linux kernel is used in what's called a GNU/Linux distribution. The Linux ecosystem is often described as chaotic.

What is BSD

BSD (Berkeley Software Distribution) originally started out as a series of patches to the original UNIX code from Bell Systems however by the early 1990s there was enough BSD code written to where you could replace almost all of AT&T's code in UNIX and that is how we now have all of those *BSD platforms.

Distribution vs Platform

In the world of Linux we have Distributions, groups take the Linux kernel and then slap all the remaining software needed to create a functional OS.

In the world of *BSD we have something more akin to a platform, the *BSD kernel is developed alongside the entire base system resulting in a much more controlled and organized ecosystem unlike Linux.

Examples: Linux

- Ubuntu
- Debian
- Arch Linux
- RHEL (Red Hat Enterprise Linux)
- Fedora
- Suse/SLES
- CentOS
- Slackware
- Gentoo

Examples: Unix

- Solaris
- OpenSolaris
- HP/UX
- OpenServer
- AIX

Examples: Unix-Based

- FreeBSD
- NetBSD
- OpenBSD (fork of NetBSD)
- Mac OS X* (has received UNIX 03 cert.)
- DragonFly BSD
- PCBSD
- NanoBSD

Examples: Embedded Linux

- KaeilOS
- TimeSys
- Ubuntu Mobile
- Android Platform
- OpenMoko Platform
- Open Wrt
- GeeXboX
- Embedded Gentoo
- Flash Linux

Live Booting

What is Live Booting?

Live booting is exactly what it sounds like, it's booting into a fully functioning OS environment.

Participation Time!!! WOOO!!

- See US for a FREE LinuxMint Live Boot CD

Installation

Installing *nix

- Partitioning your HDD / SSD
- File System Formats
- Packages

Partitioning HDD/SSD

The main partitions in Linux (and most *NIX systems) are / (root) /home /tmp and swap. The / (root) directory holds everything that makes the OS work. /home is where all of the user's home directories are, /tmp is for temporary files, and swap is like the paging file in Windows systems.

File System Types

- EXT3/EXT4
- JFS (IBM file system)
- XFS (SGI file system)
- BtrFS (Developed by Oracle, similar to ZFS)
- ReiserFS/Reiser4
- UFS (BSD specific)
- ZFS (A FS originally developed by Sun M/S)

Packages

Programs in the world of Linux are installed via packages, a package system is how a given Linux distribution tracks package versions, dependencies, and which packages are installed. The most common package types are currently RPMs and DEBs. The RPM package was developed by the Red Hat Linux team, and the DEB package was developed by the Debian team.

Linux Parts

Pieces of Linux

- What is a Linux?
- What the ^5\$D\$\$% is the Kernel?
- Userland VS Kernel Space
- Everything is a file
- Everything is made up of small tiny parts that work together.

Userland vs Kernel space

Userland is where all of the "non-privileged" code gets run, basically all the code that doesn't run the system is executed here.

Kernel space is where all of the code that manages the system hardware, schedules threads/programs, and usually where the device drivers reside.

In Linux (and other *NIX systems) everything is a file, even devices, this makes interfacing with devices a simple task.

The entire Linux/*NIX system is also a collection of simple programs that do one or two things very well.

File System

FileSystem

- Where are the files? (In the computer)
 - Configuration Files
 - Program Files
 - Log Files are \$#%#\$% friends
 - Devices. Where are the thingies?
 - Home Directories. Where are MY files?
- Links
- Mount Points (Rawr)

The Windowing System

There are tons of windows managers, the main ones are Gnome, KDE, and XFCE4. Today we'll be using the XFCE flavor, it's simple, lean and small so it provides a very responsive and enjoyable experience even on aged hardware.

Security and Permissions

Permissions. Let's lock this down!

- Users and Groups
- If I can't SU, FU.
- File Permissions
- Advanced Permissions: SELinux / AppArmor / etc

The Command Line

What is the Shell?

The shell is a program that resides as a layer between the user and the operating system, it's what converts stupid human language into machine code, the stuff that computer hardware understands.

Basic Commands

- MAN / APROPOS / INFO
- File System Commands
- File Creation

Bad Stuff

- Things you should never do.
 - `rm -rf /`

Programs.

(Package Management)

Editing Configuration Files

Editors

- Vi or Vim (Vi Improved) (Powerfullers)
- Nano / Pico (Simple!)
- EMacs (Beards and Beer)

Process Control

Process Control



Process Control

Scripting

SSH

DEMO