Introduction

Monday, November 20, 2023 5:04 PM

Linux Structure

Unix = Ken thompson & Dennis ritchie

GNU = Richard stallman

Linux = Linus torvalds

+ usually more secure and fast updates
+ stable and fast performance

OS manages all hardware
comms between software/hardware

Parrot OS - debian-based focused on sec, privacy, development

Philosophy - 5 core principles

"Everything is a file" - all config services are stored

"Everything is a file" - configuration files for various services are stored in text files

"small, single-purpose, programs" - many tools to work w/ that can combo w/ each other

"ability to chain programs together to perform complex tasks" - carry out complex tasks like processing or filtering specific data results

"avoid captive user interfaces" - designed to work through shell which gives more control

"configuration data stored in a text file" - ex: /etc/passwd

Components

Bootloader - code that guides the booting process to start OS

ex: GRUB bootloader

OS kernel - main component of OS, manages resources for system's I/O devices at hardware level

Daemons - background services; ensure that key functions like scheduling, printing and multimedia are working

load after boot & login

OS shell - command language interpreter, Cli, interface between OS and user

bash, Tcsh/Csh, ksh, Zsh, Fish

Graphics server - graphical sub-system (server)

graphics server - graphical sub-system (server) called "X" or "X-server" to allow graphical programs to run locally or remotely on X-windowing system

Window manager - GUI; GNOME, KDE, MATE, Unity, and Cinnamon

Utilities - programs that perform particular functions

Linux Architecture

hardware - peripheral devices like ram, hard drive, CPU

kernel - core of linux OS that virtulizes and controls hardware resources like CPU, allocated mem, ...

gives each process its own dedicated

gives each process its own virtual resources and prevents conflicts

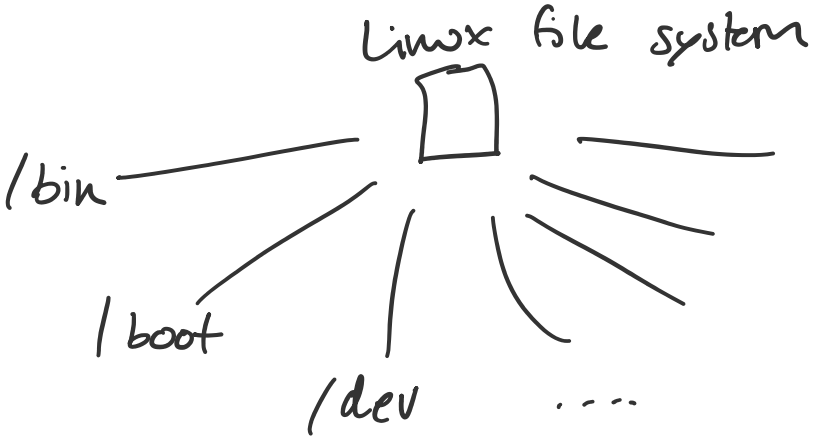
Shell - user can enter CLI commands to execute kernel functions

System utility - makes OS functionality available to user

File system Hierarchy

tree-like

Filesystem hierarchy Standard FHS



/ - root filesystem, contains all files req to boot OS before other

files req to boot OS before other filesystems are mounted and their req files

after boot, all other filesystems are mounted as sub dirs of root

/bin - essential binaries

/boot - static bootloader, kernel exec, and files req to boot Linux OS

/dev - device files for access to every hardware device attached to system

/etc - local system config files and config files for apps

/home - each user as dir here for storage

/lib - shared lib files req for system boot

/media - external removable media devices mounted here

/mnt — temp mount point for regular filesystems

/opt - optional files such as 3rd party tools can be stored

/root - home dir of root user

/sbin - exec for sys admin binary system files

/tmp - OS and apps use to store temp files
generally cleared on boot

/usr - contains exec, libraries, man

files, etc.

/var - variable data like log files, email inboxes, web app related files, cron files, etc.

man files = manual files

cron = cli job scheduler

Linux Distributions

Ubuntu, Fedora, CentOS, Debian, red hat

Usually used for servers because secure, stable, reliable, and regular updates

Cybersecurity

Cybersecurity

ParrotOS, Ubuntu, Debian, Raspberry PI,
CentOS, BackBox, Blackarch, Pentoo

Kali Linux = sec tools; pen testing

Ubuntu = desktop

Debian = servers / embedded

red hat & centOS = enterprise-level computing

Debian

uses advanced package tool apt

for patches & updates

flexible + custom

Introduction to Shell

text-based I/O interface between

users and kernel

Terminal Emulators

Software that emulates terminal

terminal = interface to shell interpreter

Shell

bourne-again shell BASH