CSGE602055 Operating Systems
CSF2600505 Sistem Operasi
Minggu 03

Rahmat M. Samik-Ibrahim

Universitas Indonesia

`http://rms46.vlsm.org/2/207.html`

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Agenda

- Reference: (Any Related Tutorial) (ETC 300-323)
  - Upstart Intro, Cookbook and Best Practices
    `upstart.ubuntu.com/cookbook/upstart_cookbook.pdf`
- BIOS & UEFI
- Loader: grub, lilo
- Init, UpStart & Systemd
- Lab
  - Scripting
  - Simple Programs

Legacy BIOS

- Check Settings
- Initialize CPU & RAM
- POST: Power-On Self-Test
- Initialize ports, LANS, etc.
- Load a Boot Loader
- Handover to the Boot Loader
- Provides "Native" (obsolete) Drivers only
- Provides "INT" services
- Limitation: Technology of 1970-80s (size).

UEFI

- A Firmware Specification, not an Implementation!
- No service after boot.
- HII: Human Interface Infrastructure
- Protected Mode
- Flexible
  - Technology of 2000s
  - writen in C
  - loadable drivers
  - Emulate Legacy BIOS (MBR block, INT service)
  - UEFI Shell: environment shell for diagnostic (no need for an OS)
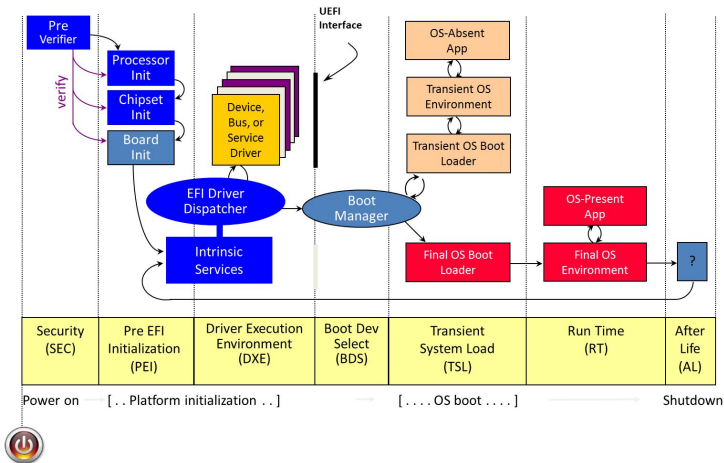
Platform Initialization (PI) Boot Phases

Figure: UEFI Boot Process[1].

Bootloader

- General
    - How/Where to start the operating system?
    - What to do?
    - How many ways to boot?
    - How many types of OS?
- GRUB/GRUB2: GRand Unified Boot system
    - Stage 1 (boot.img): MBR (Master Boot Record) – Where is everything
    - Stage 1.5 (image.img): generated from diskboot.img
    - Stage 2: Kernel Selection: Windows, Linux, BSD, etc.
- GRUB2
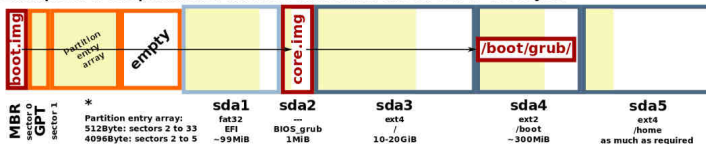   - More flexible than GRUB legacy
    - More automated than GRUB legacy
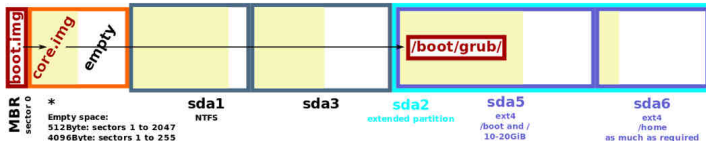
Figure: GRUB[1].

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[1]Source Shmuel Csaba Otto Traian 2013

init (legacy)

- File: `/etc/inittab`
- Folders: `/etc/rcX.d` — X = runlevel
- runlevels: 0 (shutdown), 1 (single-user/admin), 2 (multi-user non net) 3 (standard), 4 (N/A), 5 (3+GUI), 6 (reboot)
- dependency is set manually

UpStart

- Developer: Ubuntu
- Folder: /etc/init/
- Control: initctl
- better support for hotplug devices
- cleaner service management
- faster service management
- asynchronous

systemd

- dependencies handling
- concurency handling
- overhead reducing

The End

- This is the end of the presentation.