

Lecture 14 (Boot Options)

1 Components Involved during Booting

1. Input supply
2. Power regulation
3. Field effect transistors - switches
4. Power sequencing and control
5. Board clock
6. SOC device
7. Expansion IO device

2 Bootloader

1. Load kernel image into memory
2. Program system memory controllers
3. Initialize caches
4. Enable hardware devices

2.1 BIOS-Based x86 Bootloader

1. BIOS from ROM
2. 512 bytes from raw storage
3. Kernel is loaded now

2.2 GRUB - Grand Unified Bootloader

1. Very powerful, can read many fs formats to load kernel image and configuration
2. Also has a shell interface for custom options

2.3 Booting on embedded CPUs - 1

1. No BIOS
2. On powering on, CPU starts executing code at fixed address
3. H/W design must ensure that a NOR flash chip is wired

4. First stage bootloader must be programmed at the fixed address in the NOR
5. Not widely used now

2.4 Booting on embedded CPUs - 2

1. CPU has integrated boot code in ROM
2. Boot code is able to load first stage bootloader from storage device into SRAM

2.5 U-Boot

1. Can define config file to make booting configuration easier
2. Can use for a large variety of embedded systems

2.5.1 (some) Commands

These commands are available during the booting process

1. `help`
2. `fatload`
3. `ext2load`
4. `load`
5. `ls`
6. `size`
7. `ping`
8. `bootd`