

Linux Grundlagen / Workshop

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UnFUG

8. Oktober 2009

Outline

- 1 Linux history
- 2 Linux insight
- 3 Linux Distributions
- 4 Workshop

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UNIX / GNU

- 1960s-1970: UNIX
- 1983: Richard Stallman started GNU (Free UNIX-like OS)
- 1987: MINIX by Andrew S. Tanenbaum
- 1991: GNU nearly complete // Kernel missing



Linux

- MINIX only for 16Bit-Systems
- Linus Torvalds programmed a terminal emulator to access the UNIX-Server of his university
- wanted to take advantage of his new PC with an 80386 processor
- therefore OS independant
- used GNU C compiler on MINIX



Torvalds on comp.os.minix

Hello everybody out there using minix -

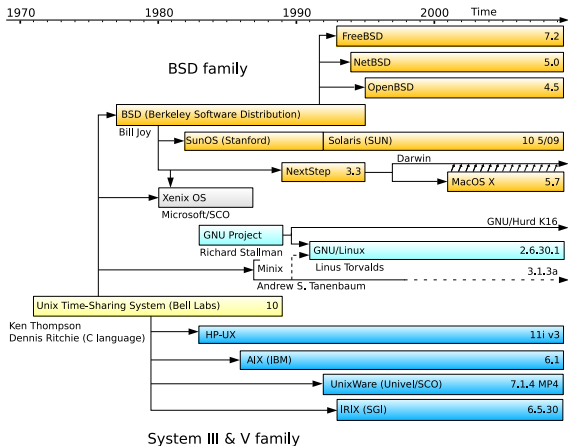
I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) among other things).

I've currently ported bash(1.08) and gcc(1.40), and things seem to work. This implies that I'll get something practical within a few months, and I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them :-)

Linus (torvalds@kruuna.helsinki.fi)

PS. Yes it's free of any minix code, and it has a multi-threaded fs. It is NOT portable (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-).

Unix timeline



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Boot

Typical boot sequence:

- 1 BIOS
- 2 MBR
- 3 Boot Loader
- 4 Kernel (+initrd)
- 5 init

Filesystem Hierarchy Standard (FHS)

Filesystem Hierarchy Standard (FHS)

- defines main directories and contents
- version 2.3 (2004)
- /
- virtual file system

Filesystem Hierarchy Standard (FHS)

- static files
- variable files
- shareable files
- unshareable files

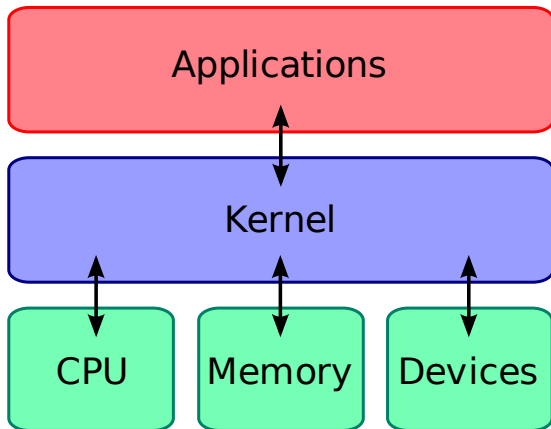
Directory structure I

- `/bin` (essential command binaries)
- `/boot` (bootloader files)
- `/dev` (devices)
- `/etc` (host-specific system-wide configuration files)
- `/home` (optional, user directories)
- `/lib` (kernel modules and dynamic libraries for `/bin` and `/sbin`)
- `/media` (optional, mount points for removable media)

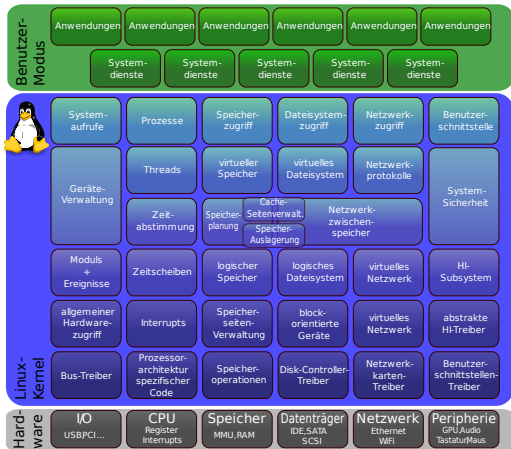
Directory structure II

- `/mnt` (optional, temporarily mounted filesystems)
- `/opt` (optional software packages)
- `/root` (optional, “home“-directory for the root user)
- `/sbin` (essential system binaries, for root user only*)
- `/srv` (service-data)
- `/tmp` (temporary files)
- `/usr` (secondary hierarchy for read-only user data)
- `/var` (variable data)

Linux Kernel Layout



Linux Kernel Structure



Linux Kernel

- version: 2.6.31.2 (“Man-Eating Seals of Antiquity“)
- license: GPL 2 / proprietary (BLOBs)
- monolithic kernel
- c / assembler
- 10.778.469 loc in 29.111 files

Outline

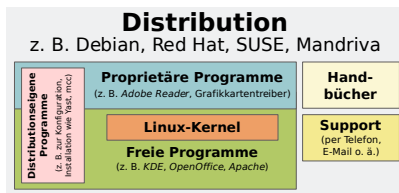
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What's a distribution?

Important

Linux is just the kernel, nothing more.

What's a distribution?



To build a distribution you need... (in general)

- the linux kernel,
- some GNU stuff,
- a package management system
- and applications

Where are the differences?

Guide to your favourite Linux distro:

- Installtools (LFS vs. Ubuntu)
- Hardware compatibility (x86, devices, ...)
- Documentation / Support (active community, books)
- Principles (live, free software, KISS)
- License (GPL, DFSG)
- Package Layout (meta vs. binary)

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Workshop

Workshop, let's do it!

Thanks for your attention.

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..and thanks to Richard & Linus ;)