LINUX

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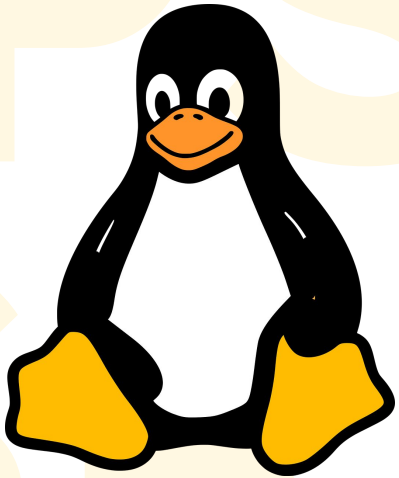


https://de.wikipedia.org/wiki/Linux#/media/Datei:Tux.svg

Quick overview

General information
- Definition
- Linus Torvalds
- Open Source
- GNU license

More facts
- Operating system comparison
- Linux for development
- Linux distribution
- Linux distributions - Overview

Linux terminal
- History
- Shell - CLI
- Pros and cons
- Shell script

Live session
- Show some commands
- Example apps
- Cheat sheet

What is Linux?

→ Unix-like operating system

→ based on the Linux kernel

→ released in 1991 by
Linus Torvalds

→ open-source system

https://www.savonsanomat.fi/paakirjoitus-mielipide/6060866

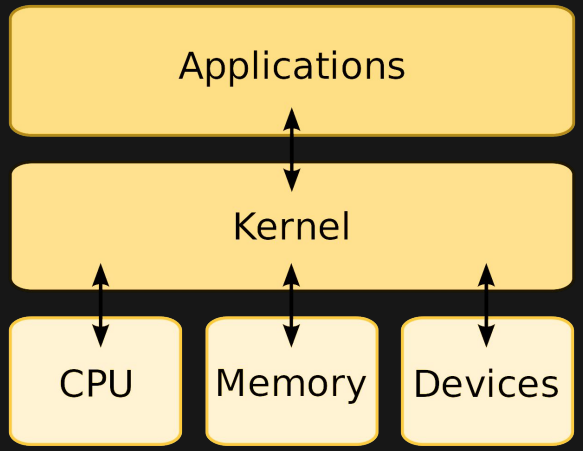
...based on the Linux Kernel?

→ central component of the system

→ manages fundamental functions

→ forms the hardware-abstraction layer in an operating system

→ provides software with a uniform interface (API) that is independent of the computer architecture.



https://yourdevice.ch/linux-kernel-updaten/

Origin from Unix → the precursor

Unix was developed in 1969 at AT&T's Bell Labs
→ to provide a simple, powerful operating system for research and academic purposes

→ it was very successful

→ AT&T later began to market and license Unix commercially

→ which increasingly restricted access to the Unix source code

GNU and GPL

1983: Richard Stallman founded the GNU Project
to create a free, Unix-compatible operating system

1985: Establishment of the Free Software Foundation (FSF)

1989: Introduction of the GNU General Public License (GPL)

GNU GPL
Allows free use, modification, and distribution of software,
provided that modified versions also remain under the GPL.

https://linupedia.org/opensuse/GNU_General_Public_License

Linus, Minix and Linux

1990: Linus Torvalds, a student at the University of Helsinki, encountered the Minix in a Unix course.

What is Minix?

→ a minimal Unix-like operating system

→ developed for educational purposes

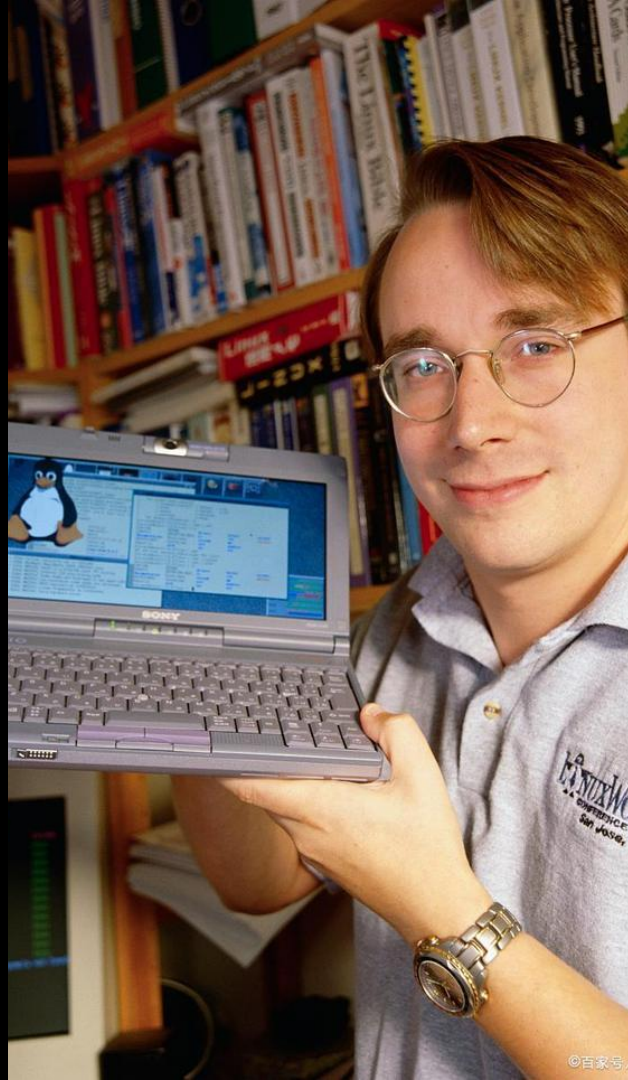
→ Minix source code was freely accessible

Linus, Minix und Linux

1991: Torvalds developed his own kernel based on Minix

Linux and GNU
→ Torvalds replaced Minix components in the Linux kernel with GNU applications

→ Thanks to the GNU GPL, Linux became a free, complete operating system



https://users.cs.cf.ac.uk/JinC8/123/3.html

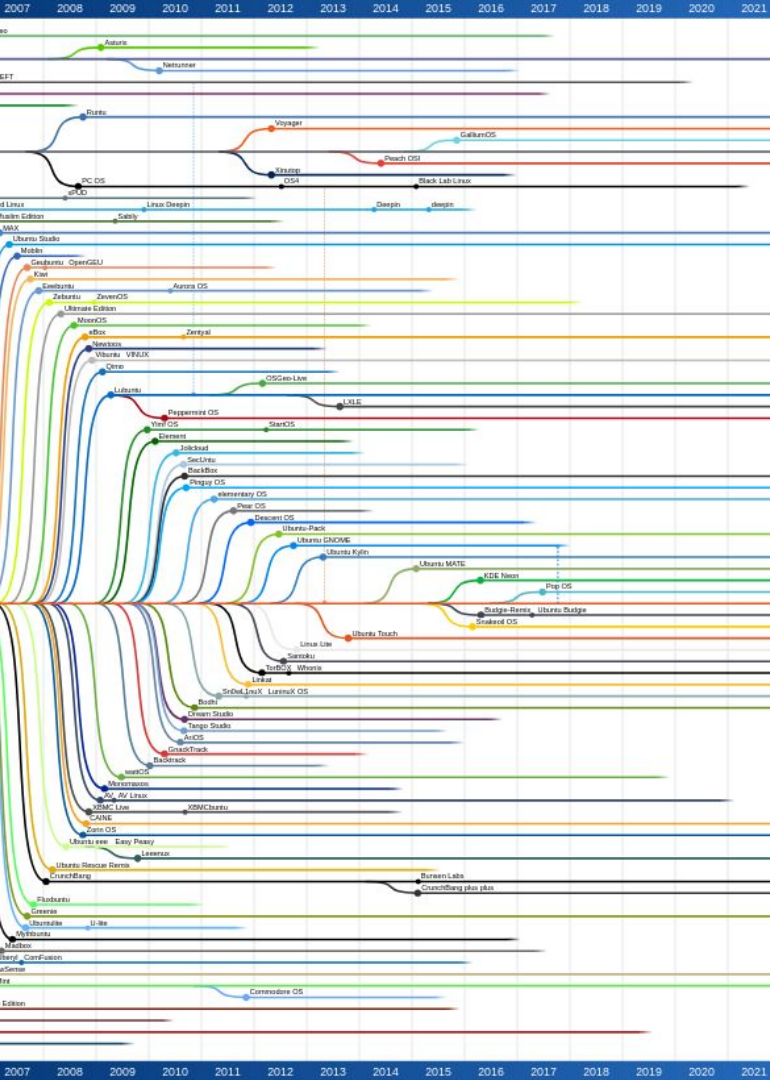
Comparison of Linux and other OS

	MacOS	Windows	Linux
PRO	- Ideal for iOS and macOS development - High stability on Apple hardware - Unix-based, well-suited for server tasks	- Beginner-friendly - Extensive software and hardware compatibility - Optimal for game development	- Highly customizable and secure - Open-source - Runs on almost all devices
CON	- Usable only on Apple devices - Higher cost - Limited game support	- More vulnerable to security risks - Less common in server environments - requires a lot of resources	- Often requires technical knowledge - Challenging for beginners

Why Linux for IT professionals?

- Open and customizable structure
- Widely used in servers and supercomputers
- Strong community and extensive support
- Flexibility for diverse hardware and budgets
- Enhances career prospects

https://de.freepik.com/vektoren-kostenlos/webtech-weisser-hintergrund-mit-binaeren-code-algorithmuszahlen_310507637.htm#fromView=keyword&page=1&position=1&uuid=e67716d1-85c7-493e-904d-62a802c67721



Linux Distribution

→ Collection of Software

- Linux Kernel - GNU Tools - Libraries
- > 1000 different distros around

→ Rolling Release vs. LTS

https://upload.wikimedia.org/wikipedia/commons/7/79/UbuntuFamilyTree1210.svg

Linux Distributions - Overview

Arch - normally without GUI - specialized Linux

Debian - large Software Pool - flexible & widely used

Ubuntu - rich & intuitive GUI - beginner friendly

Knoppix - first Live Distro - OS via CD / USB

RedHat - commercial version - now enterprise only

Fedora - community project RedHat - free licenses

Linux Terminal

→ Back to the Future 1970

→ Unix Shell Interpreter

→ Command Line Interface

→ executes prompts sequential

→ no graphical user interface

https://github.com/abishekvashok/cmatrix

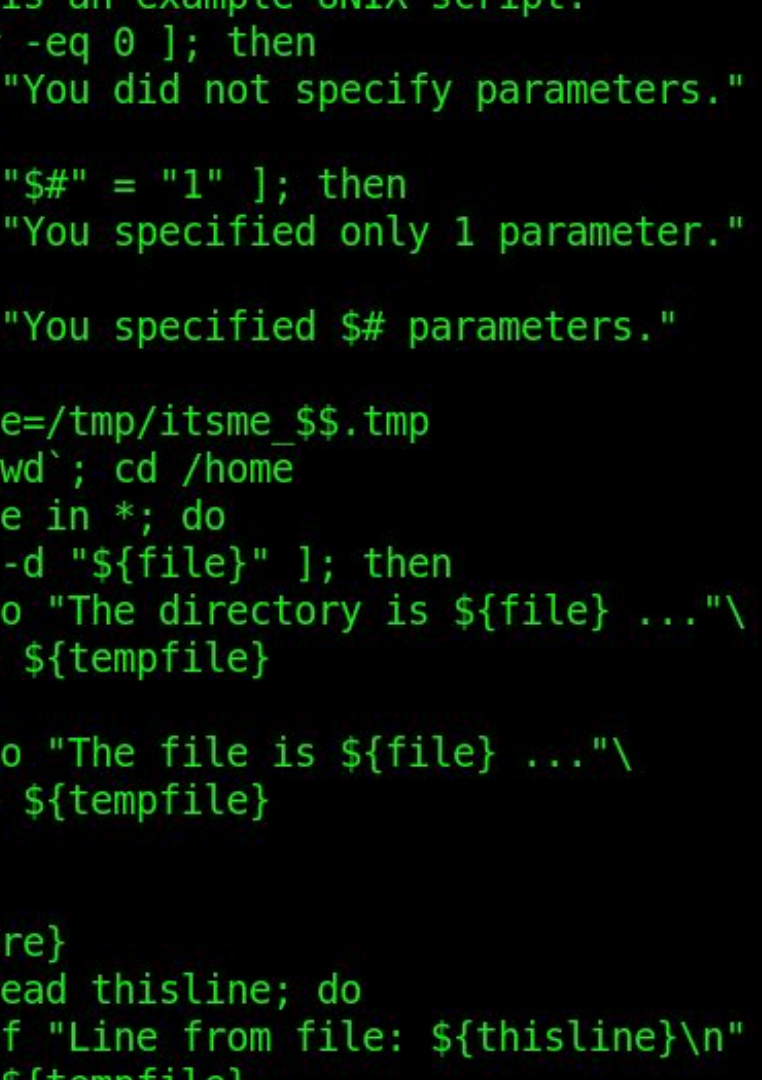
Pros and Cons

Pros

→ no resource-hungry GUI required
→ direct system access via text input but secure
→ experienced users are very fast

Cons

→ commands must be known
→ little visual feedback
→ quickly becomes confusing at the beginning



Shell Script

→ program to be run by a unix shell
- executable textfile .sh

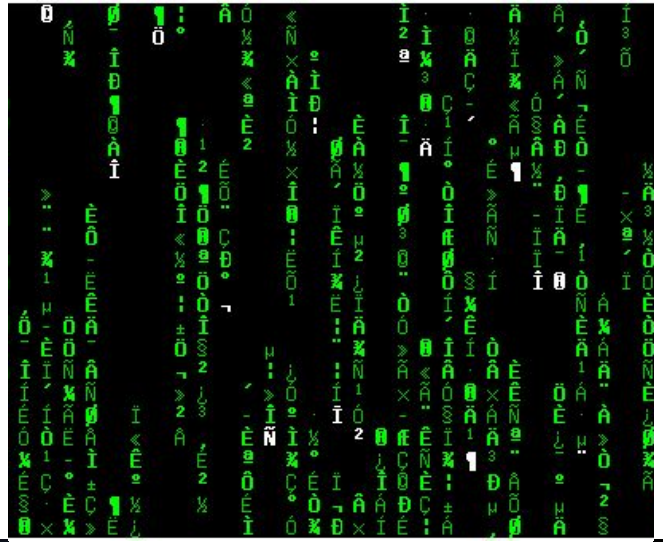
→ programming language with
- variables, loops, conditions

→ contains
- Hashbang #!
- Path to interpreter Shell
- Code

https://koenaerts.ca/wp-content/uploads/script3.png

spotify - tui

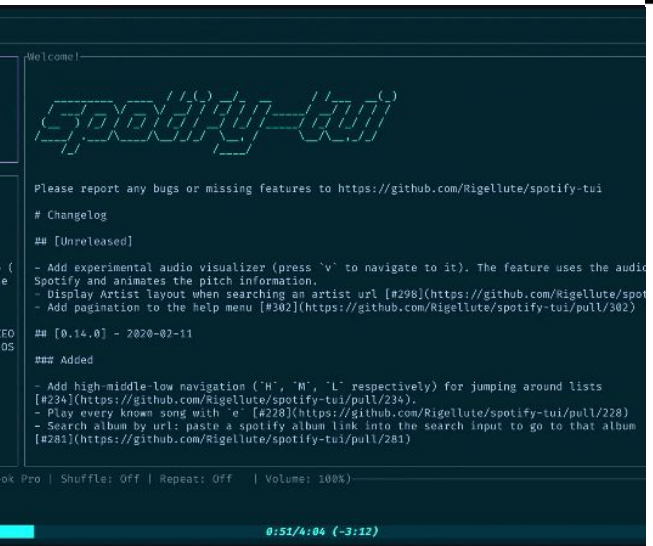
https://github.com/Rigellute/spotify-tui



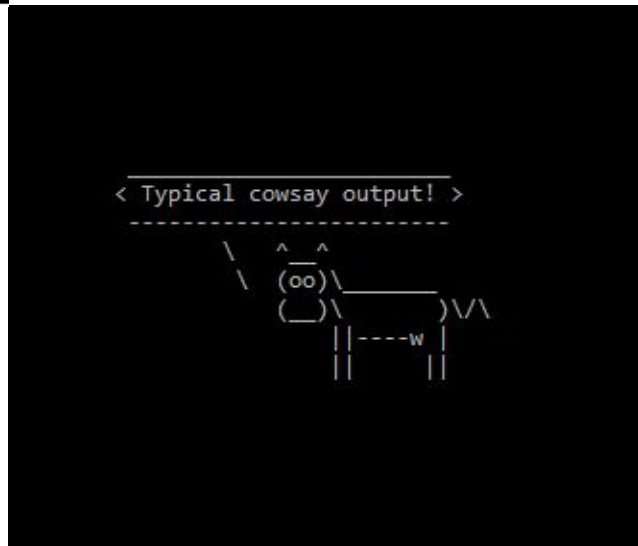
https://github.com/abishekvashok/cmatrix

cowsay

https://github.com/piuccio/cowsay



cmatrix



Terminal - Live Session

Get your command cheat sheet →

Thank you!

Sources (1)

- https://ubuntu.com/tutorials/command-line-for-beginners#1-overview
- https://de.wikipedia.org/wiki/Shell_(Betriebssystem)
- https://de.wikipedia.org/wiki/Bash_(Shell)
- https://de.wikipedia.org/wiki/Shebang
- https://en.wikipedia.org/wiki/Shell_script
- https://github.com/santosh373/Linux-Basics/blob/master/linux%20cheat%20sheet.pdf
- https://www.qrcode-monkey.com/
- https://www.digitalocean.com/community/tutorials/bashrc-file-in-linux
- https://en.wikipedia.org/wiki/Linux
- https://de.wikipedia.org/wiki/Linux_(Kernel)#:~:text=Aufgaben%20des%20Kernels,-%E2%86%92%20Hauptartikel%3A%20Kernel&text=Linux%20ist%20dabei%20ein%20modularer,Ausgabe%2DOperationen%20auf%20verschiedenen%20Ger%C3%A4ten.
- https://de.wikipedia.org/wiki/GNU
- https://en.wikipedia.org/wiki/Richard_Stallman
- https://de.wikipedia.org/wiki/Rolling_Release
- https://en.wikipedia.org/wiki/Long-term_support
- https://de.wikipedia.org/wiki/Abspaltung_(Softwareentwicklung)

Sources (2)

- https://de.wikipedia.org/wiki/Liste_von_Linux-Distributionen
- https://de.wikipedia.org/wiki/Linux-Distribution
- https://de.wikipedia.org/wiki/OpenSUSE
- https://de.wikipedia.org/wiki/Fedora_(Linux-Distribution)
- https://upload.wikimedia.org/wikipedia/commons/d/d8/Red_Hat_logo.svg
- https://de.wikipedia.org/wiki/Knoppix
- https://de.wikipedia.org/wiki/Ubuntu_(Betriebssystem)
- https://de.wikipedia.org/wiki/Debian
- https://www.redhat.com/en/blog/unix-linux-history
- https://de.wikipedia.org/wiki/Unix#Geschichte
- https://comheld.de/einfuehrung-in-betriebssysteme-windows-vs-mac-vs-linux/
- https://clickup.com/de/blog/218063/mac-vs-linux-vs-windows-fuer-programmierung
- https://www.ko2.co.uk/advantages-and-disadvantages-of-linux/
- https://datascientest.com/de/linux-betriebssystem-warum-ist-es-das-beliebteste-os-fuer-entwickler#:~:text=Wie%20bereits%20erw%C3%A4hnt%2C%20gilt%20Linux,als%20Amateur%2C%20Student%20oder%20Profi.