

Linux and Free Software

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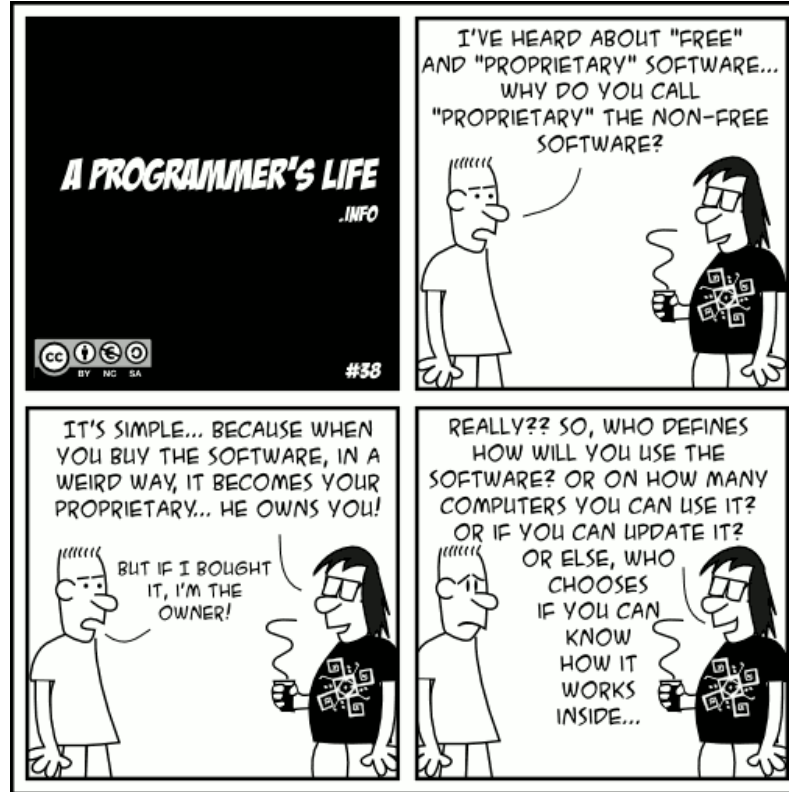
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What is Free Software?

- Free software is a type of computer software which is distributed with its source code and allows its users the following **freedoms**:
 - The **freedom to run** the program for any purpose.
 - The **freedom to study** how the program works, and change it to make it do what you wish.
 - The **freedom to redistribute** copies, so that you can help your neighbours.
 - The **freedom to improve** the program, and release your improvements to the public, so that the whole world benefits.
- Defined by **Richard Stallman** in **GNU General Public License**.

What is Free Software?



Richard Stallman



- American software developer, expert on computer systems.
- Started **The GNU Project** in 1983 to create an operating system composed entirely of free software.
- Written **GNU General Public License** and defined **Free Software** in 1989.

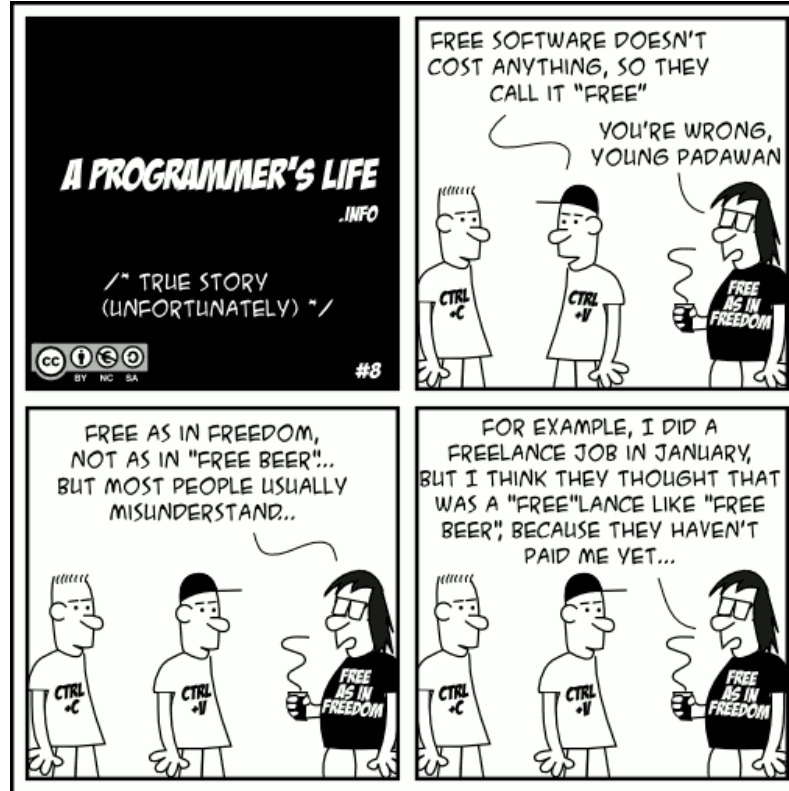


What is Free Software?

- The term “free software” should not be confused with an another term, “open source”.
 - Open source is a software development method.
- Free software is not unlicensed or freeware software.
 - Free software are licensed with General Public License.
- Free software should not be confused with free of charge software.
 - *“Free software” is a matter of liberty, not price. To understand the concept, you should think of “free” as in “free speech”, not as in “free beer”.*

Richard Stallman

What is Free Software?



The GNU Project

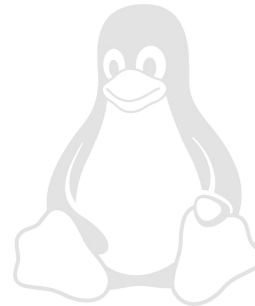
- The GNU Project, started in 1983, is a free software project which aims to provide computer users with an operating system composed full of free software that gives the users the freedom run, study, improve and distribute.
- By 1991, the operating system had all necessary utilities ready, except the kernel software that communicates directly with the computer hardware.
- That year, the **Linux Kernel** (developed by **Linus Torvalds**, outside the GNU Project) appeared.



Linus Torvalds



- Finnish software engineer.
- In 1991, when a student at the University of Helsinki, he started developing simple operating system components on his own.
- In time, these components has turned into a single, usable operating system kernel.
- Thus, the **Linux Kernel** was born.



Birth of the Linux Kernel

- Linus Torvalds has announced this project publicly by posting the following announcement on a newsgroup on Aug. 25, 1991:

From: torvalds@klaava.helsinki.fi (Linus Benedict Torvalds)
To: Newsgroup: comp.os.minix
Subject: What would you like to see most in minix?
Summary: small poll for my new operating system

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 (torv...@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 :-).

Birth of the GNU/Linux Operating System

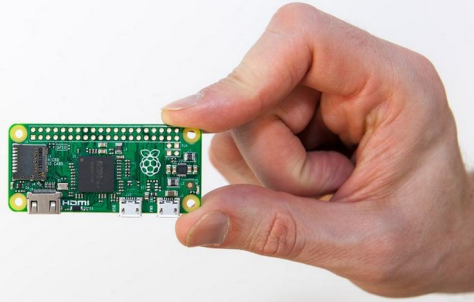
- In 1992, Linus Torvalds changed licensing of the Linux kernel to General Public License; made the Linux kernel a free software.
- Developers started to integrate the GNU Project with the Linux kernel.
- Thus the complete free operating system, **GNU/Linux** was born.

Advantages of Using Linux and Free Software

- Free software do not spy on their users.
- Free software are highly auditable.
- Free software encourage collaboration.
- Free software are secure and stable. A recently discovered security vulnerability can be patched and distributed around the world in just a few hours. A Linux server can run untouched without encountering any software crashes for many years.

Advantages of Using Linux and Free Software

- The Linux kernel can be modified to run on many different architectures and devices such as desktop computers, laptop computers, mobile phones, tablet computers, servers, smart TV's, cars, IoT devices, modems etc.



Advantages of Using Linux and Free Software

- Linux (GNU/Linux) based operating systems support working with multiple users. They can manage thousands of users, their files and running programs simultaneously.
- Linux based operating systems come with open source and freely modifiable free software. They are highly customizable.
- With the availability of many different distributions, everyone can find the best Linux based distribution that fits themselves.

Linux Distributions

- Any set of software (office, internet, development, utilities, games, etc) that are bundled together with the Linux kernel is called a **Linux Distribution**.



Arch Linux



Fedora



Linux Mint



Pardus



Debian



Gentoo



Mandriva



Red Hat Enterprise
Linux



elementary OS



Kubuntu



openSUSE



Ubuntu

and many more...

Statistics

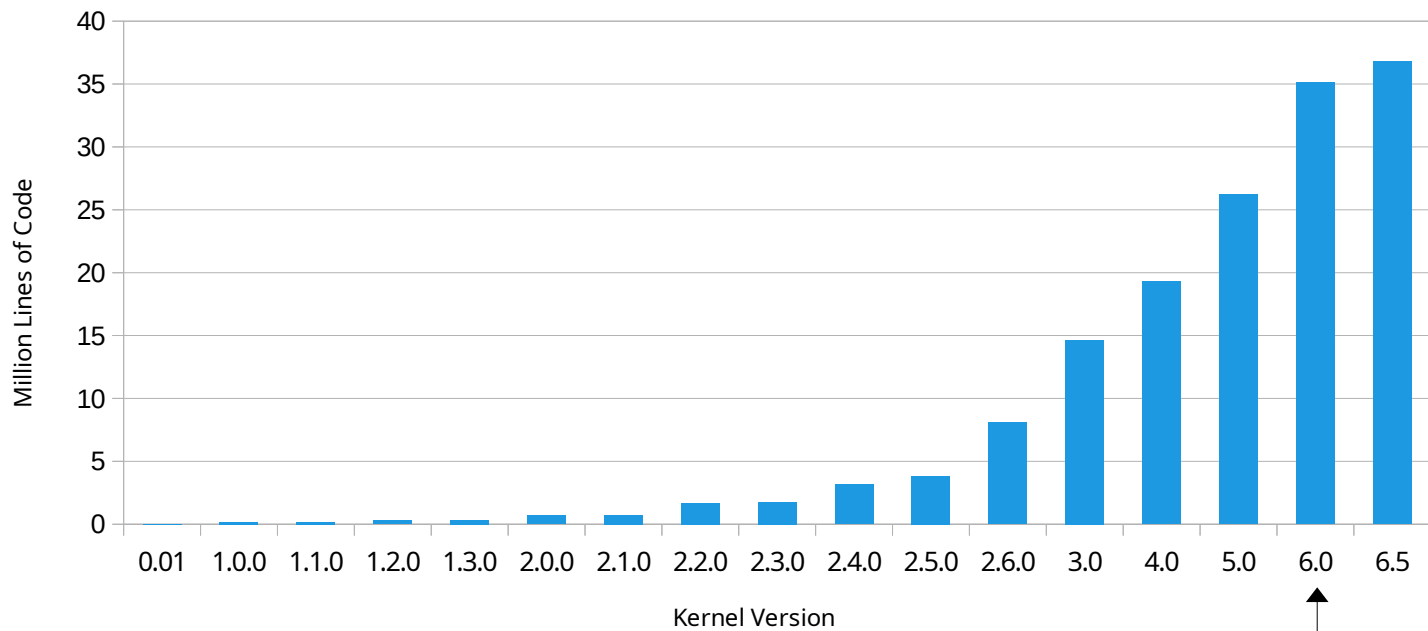
- 1991 – Linux 0.02 has been announced.
- 1992 – 10 users worldwide.
- 1993 – Linux 1.0 has been announced, more than 200 users.
- 1994 – 100.000 users worldwide.
- 1995 – Almost 500.000 users worldwide.
- 1996 – Linux 2.0 has been announced.
- 1997 – Almost 5.000.000 users.
- 1998 – Almost 10.000.000 users.
- 1999 – Linux 2.2 has been announced.

Statistics

- 2001 – Linux 2.4 has been announced.
- 2003 – Linux 2.6 has been announced.
- 2011 – Linux 3.0 has been announced.
- 2015 – Linux 4.0 has been announced.
- 2019 – Linux 5.0 has been announced.
- 2022 – Linux 6.0 has been announced.
- The development of Linux kernel continues with Version 6.5.
- It is estimated to be used by millions of people all around the world.

Statistics

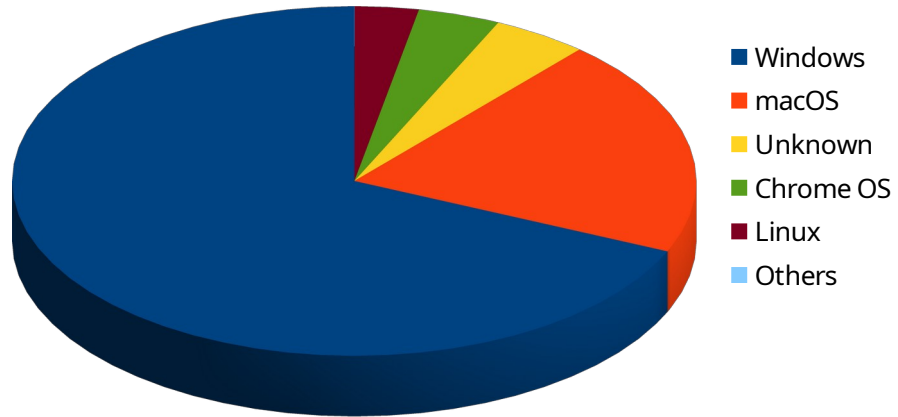
- Number of kernel contributors is estimated to be over 15.000 from over 1.000 different companies.



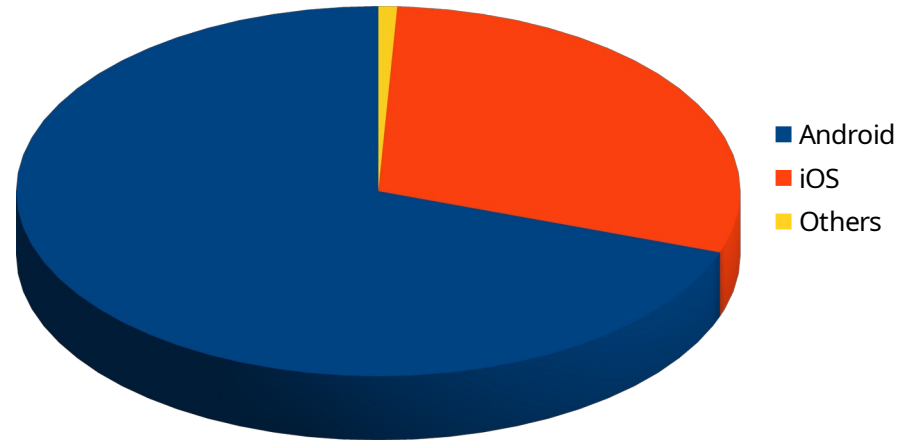
Version at CENG105 '22.

Statistics

Desktop Operating Systems (StatCounter)

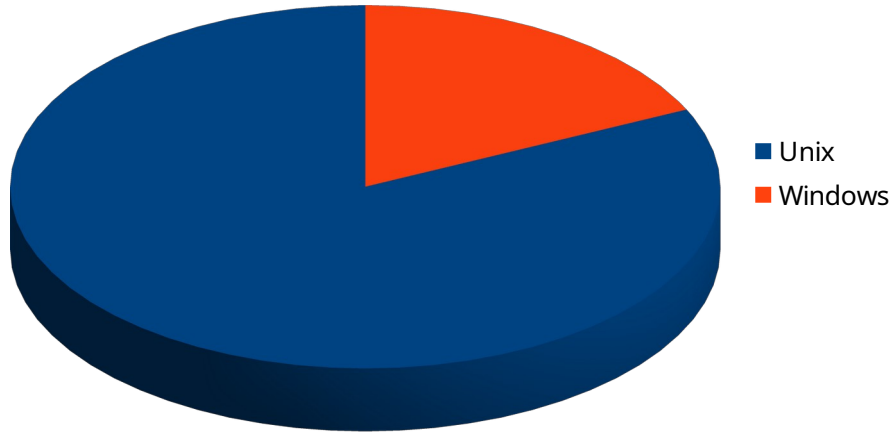


Mobile Operating Systems (StatCounter)

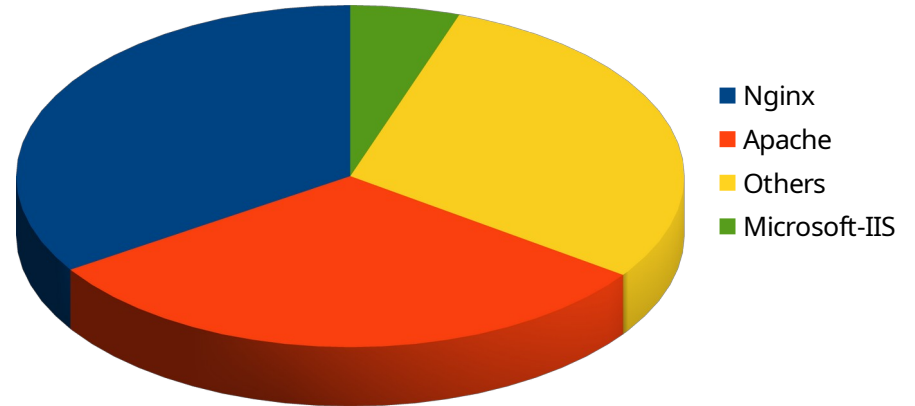


Statistics

Public Servers (W3Techs)

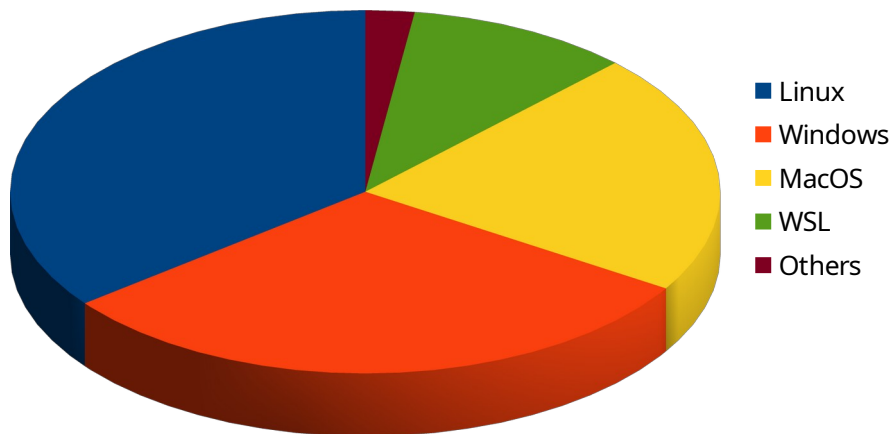


Web Server Software (W3Techs)

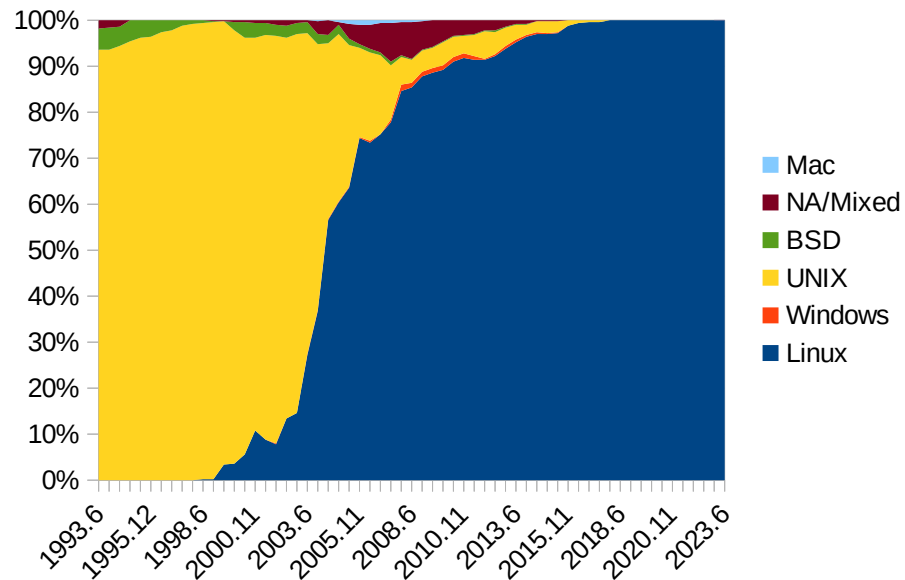


Statistics

Stack Overflow Developer Survey



Top 500 Supercomputers



Statistics



99% of the world's
top supercomputers
run Linux



1.4 Billion active
users of Linux-based
Android devices



80% of all stock
exchanges rely
on Linux



Linux helps IBM's Watson analyze
200 Million pages of
clinical data in 15 seconds



"The God Particle"
was discovered using CERN's
Linux-powered Large Hadron
Collider



**Google, Amazon, even
Microsoft** use Linux to
power their cloud services



**US air traffic
control** runs on Linux



Queensland Motorways
relies on Linux for smart traffic
management



Linux helps run
bullet trains in Japan

Users, Supporters, Contributors

amazon



cisco

Google

IBM

intel®



Microsoft



NETFLIX



Spotify®



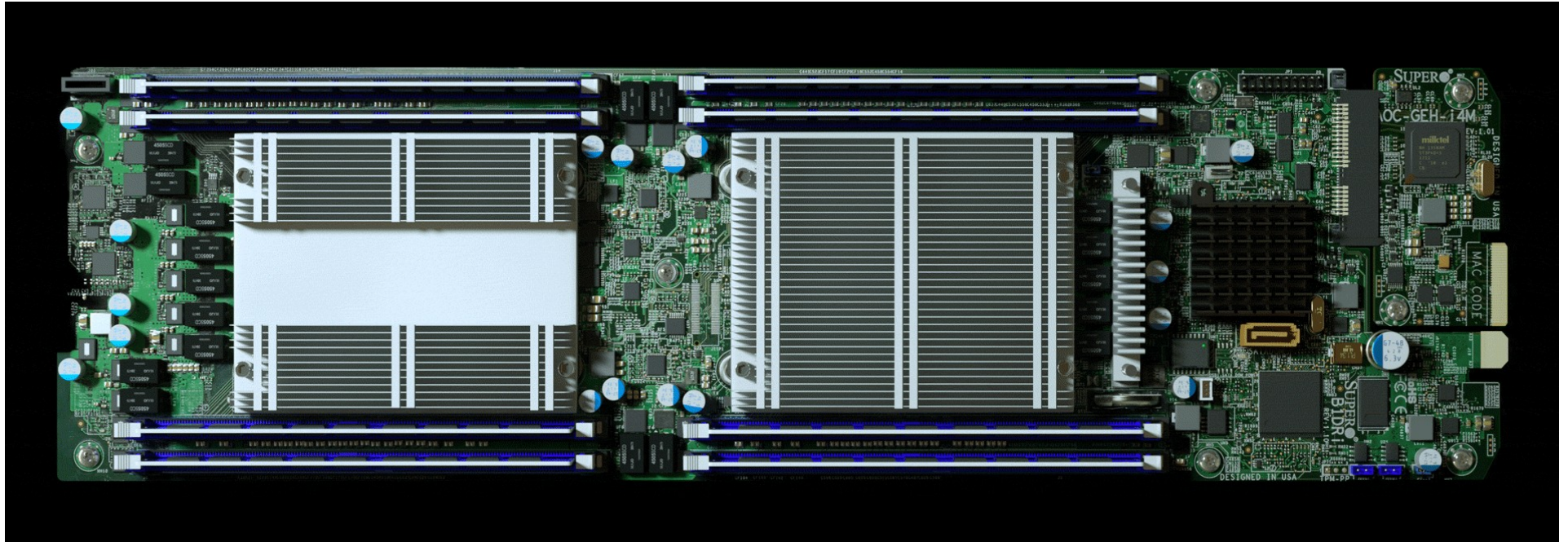
Uber

And many more...

Popular Questions

- Will Linux and other free software run on my computer?
- Can I really do whatever I want with Linux and free software?
- If Linux is good, then why doesn't everybody use it?
- What is the best Linux distribution?
- Will it cost money to use Linux and / or other free software in the future?
- I've started using Linux but I get lots of updates everyday, why?
- Are there any Linux and free software communities in our country?
- How can I contribute? I don't know how to start.

Free Software: Is It Sufficient?



Free Software: Is It Sufficient?



Your Questions?



Recommended Links

- Bilgisayar Mühendisleri Odası
<https://www.bmo.org.tr/>
- Linux Kullanıcıları Derneği
<https://www.lkd.org.tr/>
<https://linux.org.tr/>
- OMG! Ubuntu!
<https://www.omgubuntu.co.uk/>
- LinuxInsider
<https://www.linuxinsider.com/>
- Slashdot
<https://linux.slashdot.org/>
- How Many People Use Linux in 2023?
<https://earthweb.com/how-many-people-use-linux/>
- How many people use Ubuntu?
<https://ubuntu.com/blog/ubuntu-is-everywhere>
- Ubuntu Connects Everything
<https://ubuntu.com/blog/infographic-ubuntu-connects-everything>

Recommended Links

- TED: The mind behind Linux | Linus Torvalds
<https://www.youtube.com/watch?v=o8NPllzkFhE>
- Richard Stallman Interview on the History and Ethics of Free Software
<https://www.youtube.com/watch?v=gfwKnsHd9WM>

Thanks for Listening!

*This presentation has been created on
Free Operating System [KDE neon](#)
With
Free Office Suite [LibreOffice](#).*

"Free as in free speech, not free beer"

