



redhat.

THE OPEN SOURCE WAY



History of Free & Open Source Software [\[info\]](#)

David Kašpar [Dee'Kej]
Associate Software Engineer



OPEN SOURCE IS NOT NEW

HOW IT ALL STARTED?

HOW IT ALL STARTED

In the beginning almost all software was produced by academics and corporate researchers, often shared as a *public domain software*...

- principles of *openness and co-operation*
- *software & compilers* were delivered with *hardware* (no additional fees)
- source code distributed with the software itself
- ‘just hardware selling’ business
- nobody cared about selling software nor its licensing
- *A-2 system* developed by UNIVAC division of Remington Rand [1953]

< 1960s



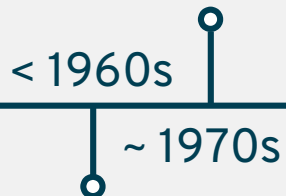
HOW IT ALL STARTED #2

However, as *large-scale operating systems* and *programming language compilers* matured and evolved, everything started to change...

- software industry growing
- software becoming commoditized

X

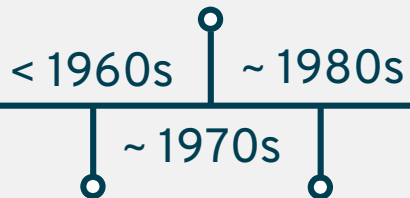
- software development costs dramatically increasing
- competition from HW manufacturer's bundled software
- *arise of first restrictive licenses*



HOW IT ALL STARTED #3

In the early 1970s, AT&T distributed early versions of **UNIX** to government and academic researchers at no cost...

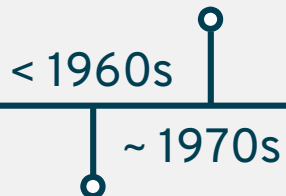
- no permission to redistribute or to distribute any modified versions
- UNIX has become widespread in the early 1980s
- AT&T stopped the free distribution and charged for system patches
- vendors and software-only companies started charging money for software licenses, and imposing new legal restrictions
- Bill Gates wrote an essay *Open Letter to Hobbyists* [1976]
(many early PC hobbyists were using Altair BASIC without paying for it)



INTERMEZZO #1 – HACKER CULTURE

A new subculture in academia around the MIT's *Tech Model Railroad Club* and *MIT Artificial Intelligence Laboratory* has started to grow since 1960s.

- *hack* – practical jokes & pranks to show off technical aptitude and cleverness, or to commemorate popular culture and historical topics
- done anonymously, with precedent, tradition & ethics
- MIT used to have “*Hall of Hacks*” museum
- examples include *Great Dome* being converted to *R2-D2*, full living room set hanging outside the *MIT Media Lab*, etc.

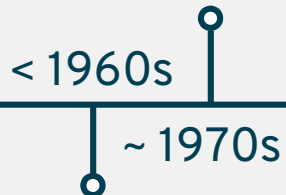


INTERMEZZO #1 – WHO IS HACKER?

In *computing* – a highly skilled computer expert that uses their technical knowledge to overcome a problem. **Jargon File** defines hacker like this:

"A person who enjoys exploring the details of programmable systems and stretching their capabilities, as opposed to most users, who prefer to learn only the minimum necessary."

- MIT housed **IBM 704** computer in the *EAM* room in 1959
- students sneaked into the *EAM* room after working hours (*"hacking"* their way in), to attempt programming of 30-ton, 2.7 meters tall computer...
- rise in *popular culture* in 1980s
- **hacker** vs. **cracker**, script-kiddies
- multiple hacker communities evolved in parallel



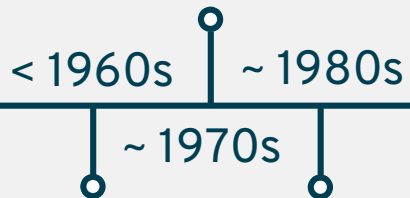
INTERMEZZO #1 – HACKER ETHICS

In 1984, the book *Hackers: Heroes of the Computer Revolution* was released. Steven Levy described the general principles of *hacker ethics*:

- *Sharing & Openness* – sharing was the norm & expected within hacker culture, *technology could be liberating rather than oppressing*

“Information wants to be free.” - Stewart Brand

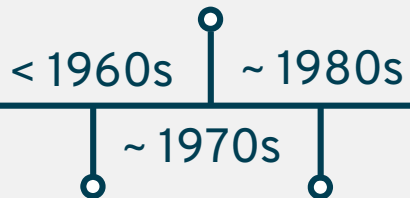
- *Hands-On Imperative* – if something is restricted, then *the ends justify the means*, to make it unrestricted so *that improvements can be made*
- *Community & Collaboration* – always important for each generation of hackers



INTERMEZZO #1 – HACKER ETHICS

Additionally other more specific beliefs were part of *hackers ethics*:

- *access to computers* – should be unlimited and total
- *all information should be free* – so hackers can fix, improve & reinvent systems
- *mistrust authority and promote decentralization* – no boundaries between hacker and piece of information; bureaucracies are flawed systems
- *hackers should be judged by their hacking skill* – not by degrees, age, race, sex, etc.
- *you can create art & beauty on a computer* – appreciation for innovative techniques



RICHARD MATTHEW STALLMAN

HOW IT ALL STARTED #4



"Playfully doing something difficult, whether useful or not, that is hacking."


- started studies at *Harvard* in 1970, became a *programmer* at *MIT* in 1971
- became part of the *hacker community*
- continued his studies at *MIT*
- became *AI research assistant* in 1975
- co-author of nowadays still used *dependency-directed backtracking*

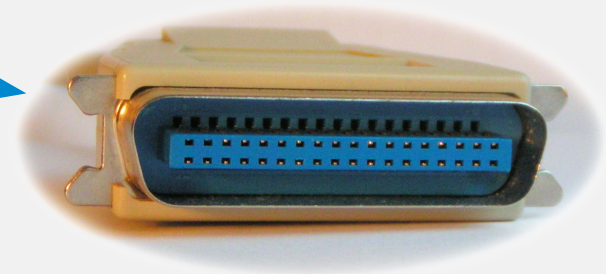
HOW IT ALL STARTED #5

MIT AI Laboratory owned several network connected XPG laser printers.

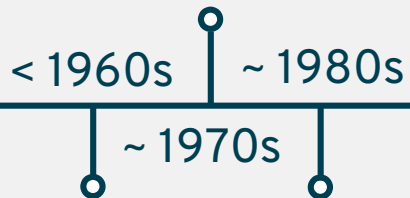
They were running software modified by RMS.

But one day, the university decided to go for an upgrade.

- new laser printer (**Xerox 9700**) with *IEEE 1284 plug* 
- lots of signals for “Centronics plug” (36 pins total)
- “**paper jammed**” signal was not working
- RMS tried to fix the issues, but the company refused to help because of *NDA*



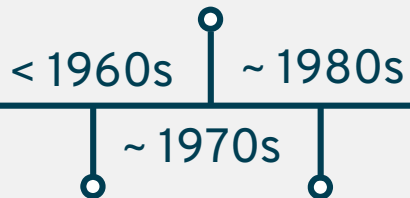
“I don't want software vendors to make divide between users and developers – if I like the software I must be able to give it to anyone and share it.” - RMS



HOW IT ALL STARTED #6

In September 1983, as part of the part of the *GNU Project*, RMS announced the plan for the new *GNU operating system* on several mailing lists, and left his job at MIT in February 1984 to work fully on it...

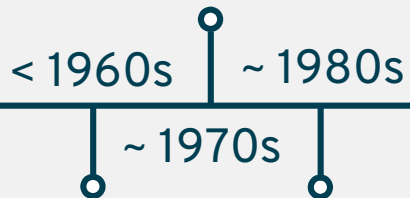
- *GNU Manifesto* published in 1985
- *Free Software Foundation* (FSF) founded in 1985
- *GNU C Compiler* released in 1987
- *GNU General Public Licence* 1.0 (GPL) released in 1989
- most of the GNU OS completed by 1989 (*emacs*, *gcc*, *gdb*, *make*)
- development of *GNU Hurd* microkernel started in 1990



INTERMEZZO #2

The resulting difference between **copyright** vs. **GPL** (copyleft):

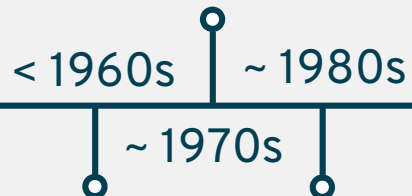
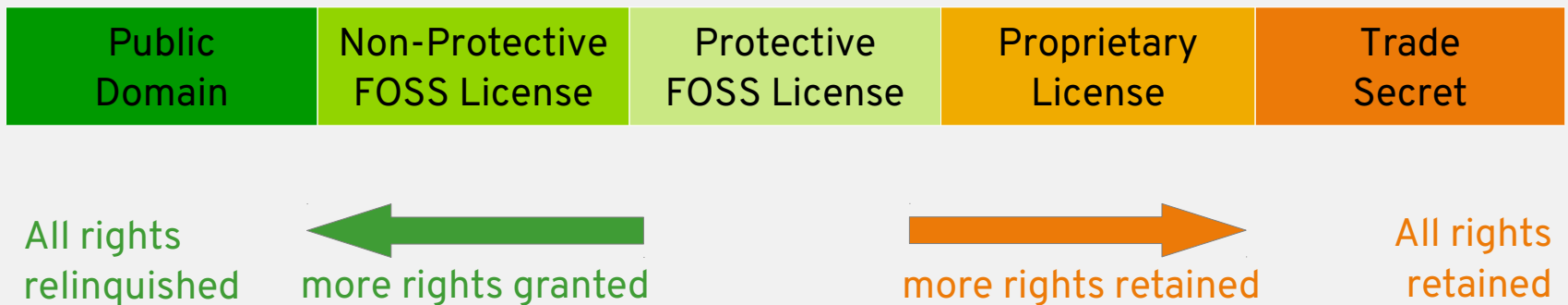
- **Copyright** - “You have right to restrict others from copying your work, modifying the work, and from distributing the work.”
- **GNU GPL** - “Hey there, we will give you those rights... And we will have only one requirement: If you do distribute the work, you have to do it under the same license.”



INTERMEZZO #2

Software licenses in context of copyright according to *Mark Webbink*:

Rights in Copyright



HOW IT ALL STARTED #7

In 1989 *Cygnus Solutions* was founded – to prove that *free software* can work as a business model as well...



“If you wanted something, you (had to) built it. And then, if you wanted something really special, you shared it.” - Michael Tiemann

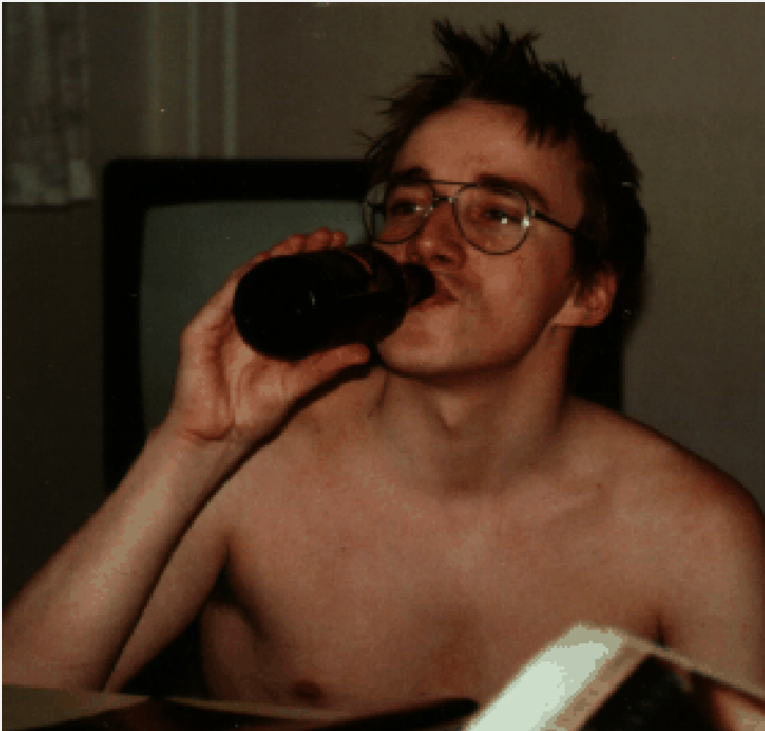
- wanted to write the “great American compiler” for C
- *RMS* was faster...



THE BIRTH OF LINUX

LINUS BENEDICT TORVALDS

HOW IT ALL STARTED #8

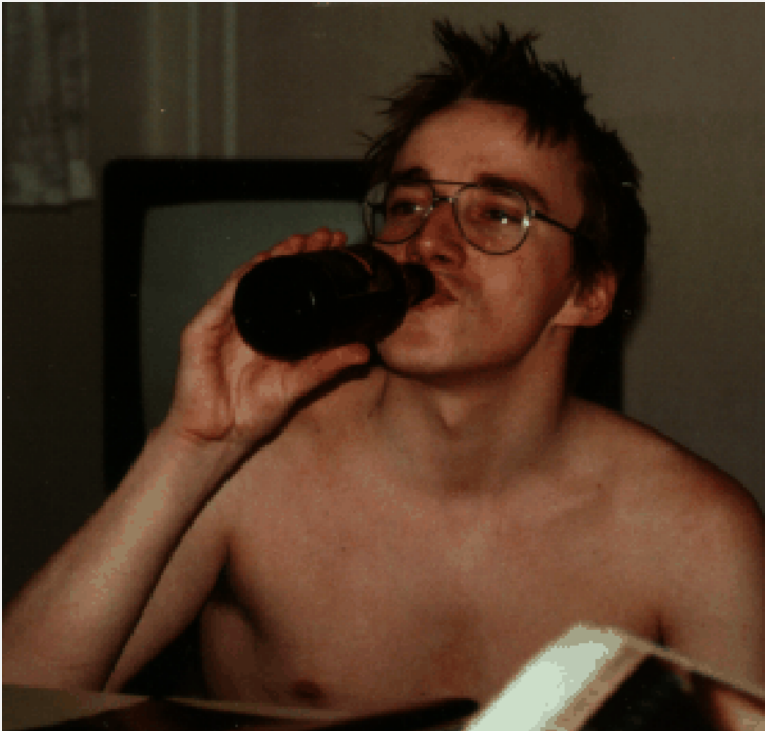


“Talk is cheap, show me the code!”

- studied at University of Helsinki
- created *Linux kernel* in 1991
- perfect timing of Linux release
- created another important project (?) in 2005

LINUS BENEDICT TORVALDS

HOW IT ALL STARTED #8



“Talk is cheap, show me the code!”

- studied at University of Helsinki
- created *Linux kernel* in 1991
- perfect timing of Linux release
- created *git* in 2005

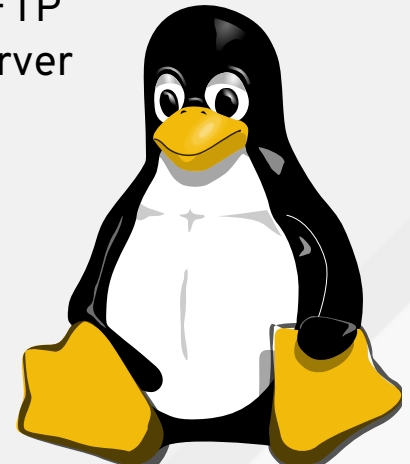
LINUS BENEDICT TORVALDS

HOW IT ALL STARTED #8



*"Regression testing"? What's that?
If it compiles, it is good;
if it boots up, it is perfect.*

- wanted to name Linux as ... (?)
- but it was changed by FTP administrator of the server



“Tux” by Larry Ewing, Simon Budig, Anja Gerwinski --

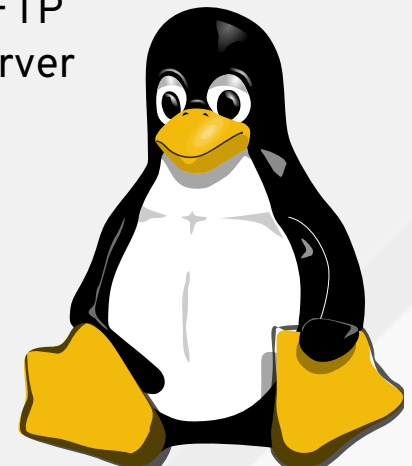
LINUS BENEDICT TORVALDS

HOW IT ALL STARTED #8



*"Regression testing"? What's that?
If it compiles, it is good;
if it boots up, it is perfect.*

- wanted to name Linux as **FREAX**
- but it was changed by FTP administrator of the server



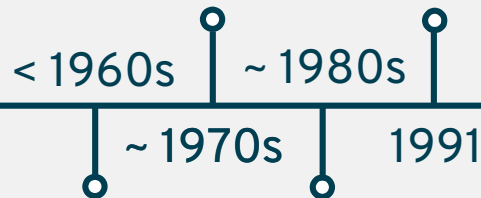
“**Tux**” by Larry Ewing, Simon Budig, Anja Gerwinski --

HOW IT ALL STARTED #9

From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)
Newsgroups: [comp.os.minix](#)
Subject: [What would you like to see most in minix?](#)
Summary: [small poll for my new operating system](#)
Message-ID: [<1991Aug25.205708.9541@klaava.Helsinki.FI>](#)
Date: [25 Aug 91 20:57:08 GMT](#)
Organization: [University of Helsinki](#)

"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).



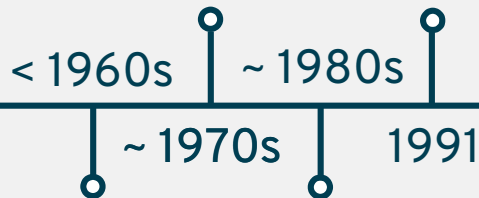
HOW IT ALL STARTED #9

...

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 protable (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-(."



INTERMEZZO #3



“Which leads me to 3 fundamental theories about the whole IT industry:

- 1) It all happened by accident.*
- 2) It was done by amateurs.*
- 3) Nothing has really changed.”*

– Jan Wildeboer
[Free & Open Source Evangelist]

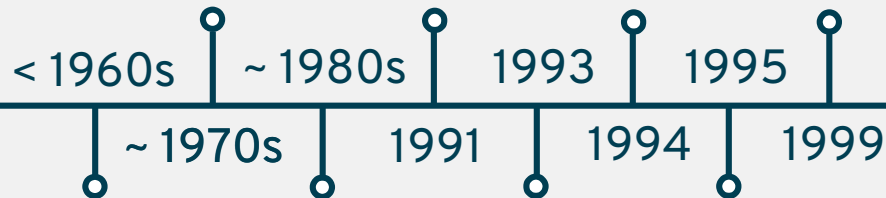


THE GUY IN RED HAT

HOW IT ALL STARTED #10

Marc Ewing used to wear **red lacrosse cap** in laboratories of *Carnegie Mellon University*, so other students could easily find him when they needed some help with their computer...

- founded **Red Hat Software** in 1993
- first release of **Red Hat Linux** distribution in 1994
- Bob Young bought Ewing's business in 1995
- **Red Hat** became publicly traded company in 1999,
as the first purely Open Source Software company in the history
- **Matthew Szulik** became the new CEO of Red Hat in 1999
- Red Hat acquired **Cygnus Solutions** company the same day



Bob Young & Marc Ewing

Co-founders of **Red Hat** company.



*“You wouldn't buy a car
with the hood welded
shut, would you?”*

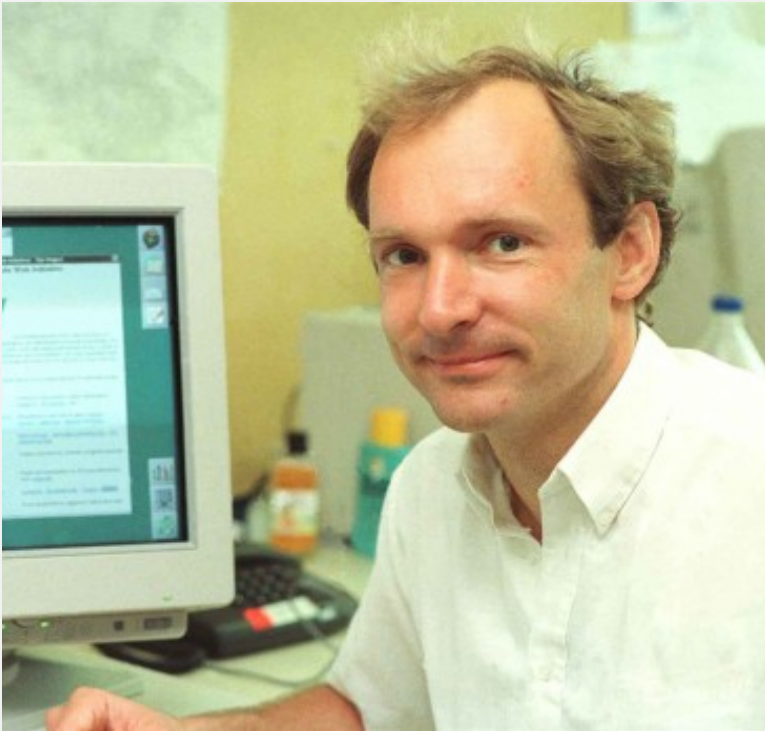
– Bob Young



THE “INTERNET” IS BORN

HOW IT ALL STARTED #11

CompuServe and *AOL* were major companies for networking, but their networks were proprietary...



“Everybody should be able to run his own server, and share documents they want.”

– *Sir Tim Berners-Lee*

- first versions of **WWW**, **HTML** and **HTTP** in 1998
- to make it work, we need standards that are **OPEN**

OPEN STANDARDS > **Open Source Software**

<http://www.w3.org/People/Berners-Lee/FAQ.html>



FIRST THEY IGNORE YOU

HOW IT ALL STARTED #12

“Remember the refrain: We always build on the past; the past always tries to stop us. Freedom is about stopping the past, but we have lost that ideal.”

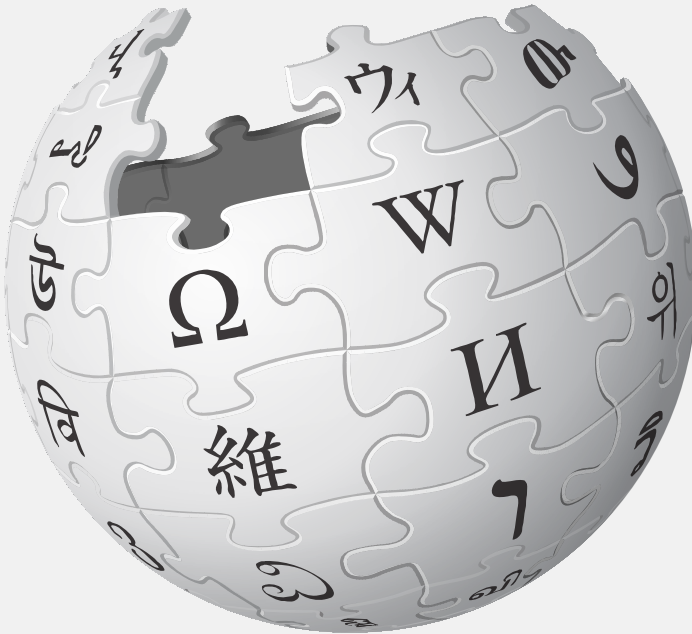
– prof. Lawrence Lessig



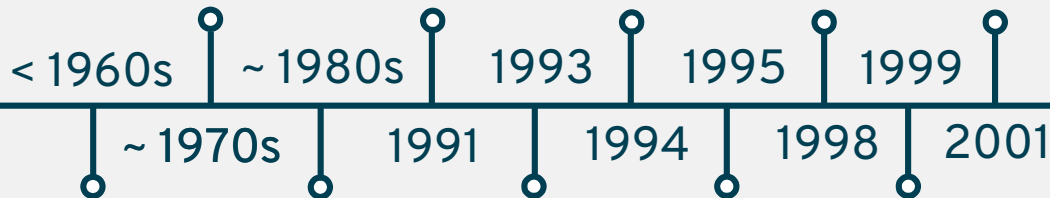
- founded *Open Source Initiative* (OSI) in 1998
- founded *Creative Commons* in 2001 (non-profit organization & set of licenses)
- *to expand the amount of creative works available to others*
- *to build upon work of others and share it – all completely legally*

WIKIPEDIA IS LAUNCHED

HOW IT ALL STARTED #13



- the earliest known proposal for *online encyclopedia* made by Rick Gates in 1993
- in 2000 RMS proposed **new concept** of a **free-as-in-freedom** online encyclopedia
- crucial idea that “*no central organization should control the editing*”
- competed with **Microsoft Encarta**, **Encyclopædia Britannica** and **Nupedia**





THEN THEY LAUGH AT YOU

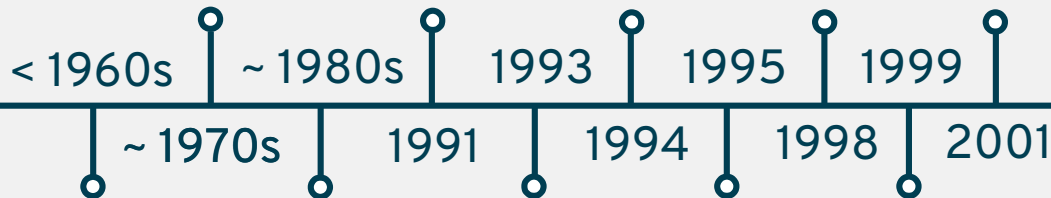
INTERMEZZO #4

During early days of Linux, it was not taken seriously...

“Linux is the Hype de Jour.” - Gartner Group [1999]

*“We think of Linux as a competitor in the student and hobbyist market.
But I really don't think in the commercial market we'll see it in any
significant way”* - Bill Gates [2001]

*“Linux is a cancer that attaches itself in an intellectual property sense to
everything it touches.”* - Steve Ballmer [2001]



INTERMEZZO #4

Q1: Why should I bother with something
which is not taken seriously?

Q2: Why should I work on something that can be used for free?
That will not pay my monthly bills...

Have you ever heard the follow up quote before?

“640K ought to be enough for anybody.”
!= Bill Gates [1981]

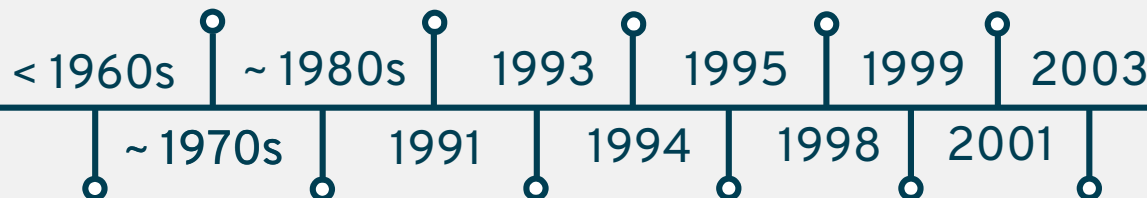
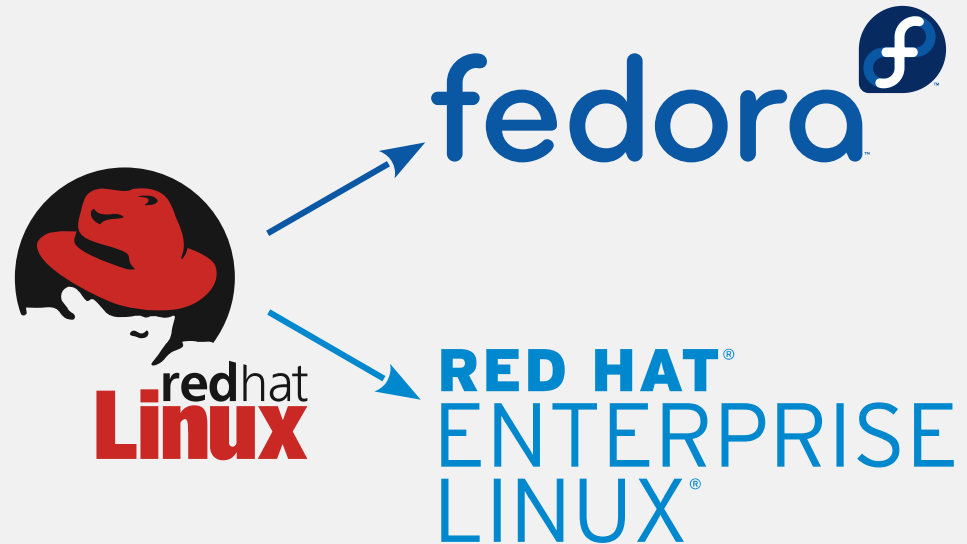


THEN THEY FIGHT YOU

HOW IT ALL STARTED #14

Since the start of the company, *Red Hat Linux* was released every 6 months. It was our the only source of revenue. In 2003, Red Hat took a *leap of faith*...

- *Red Hat Linux was retired, RHEL & Fedora Core were spawned*
- new business model created: *the SUBSCRIPTION MODEL*
- Red Hat has become service providing and technology company
- continued growth supported by additional company acquisitions

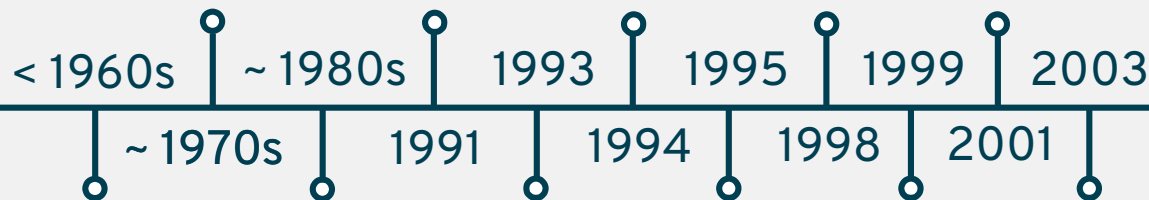


HOW IT ALL STARTED #14

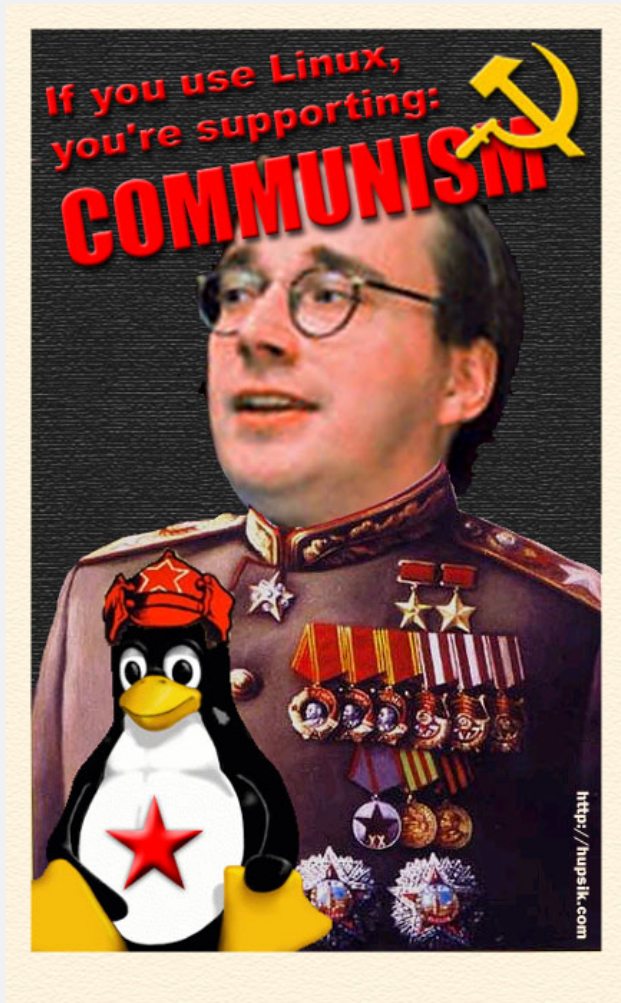
Since the start of the company, *Red Hat Linux* was released every 6 months. It was our the only source of revenue. In 2003, Red Hat took a *leap of faith*...

*“Linux isn’t going away.
Linux is a serious competitor.
We will rise to this challenge.”*

– Steve Ballmer [2003]



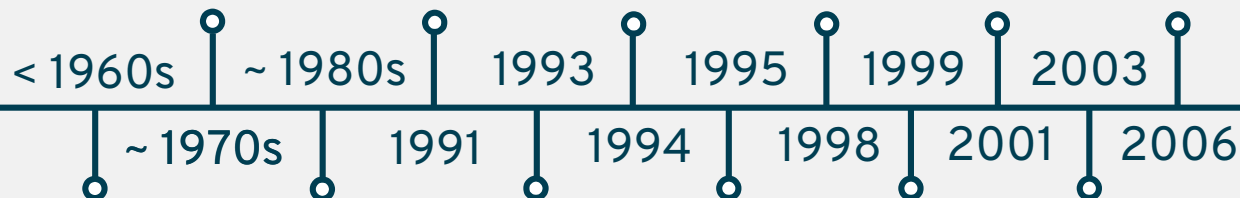
OPEN SOURCE AS COMMUNISM...



WALLACE vs. International BMC, et al.

INTERMEZZO #4

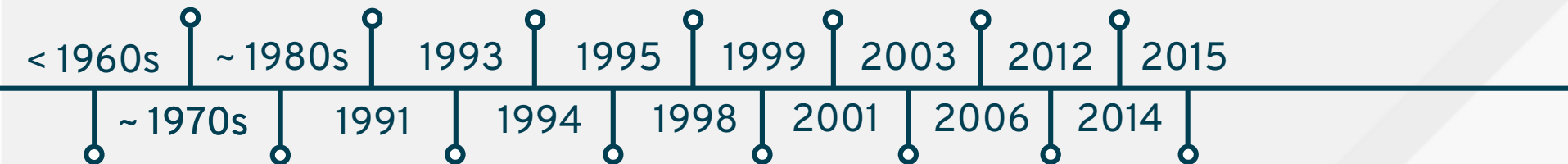
- Daniel Wallace sued Free Software Foundation in 2005, stating that GNU GPL is tantamount to *price fixing*
- after several amendments the case was dismissed, noting that *“GPL actually encourages the free competition and distribution of OS”*
- another lawsuit filed against IBM, Novell, and Red Hat, with allegations of engagement in *anti-competitive price fixing*
- he lost the case with prejudice



ANOTHER IMPORTANT MILESTONES

HOW IT ALL STARTED #15

- Red Hat appointed new CEO – *Jim Whitehurst* – in 2007
- *Red Hat* reached 1 billion \$ revenue in 2012,
as a first purely Open Source company in the World
- Microsoft appointed new CEO – *Satya Nadella* – in 2014
- *.NET Core source code released publicly* on *github.com* later in 2014
- Jim Whitehurst wrote *The Open Organization* book in 2015





THEN YOU WIN

ANOTHER IMPORTANT MILESTONES

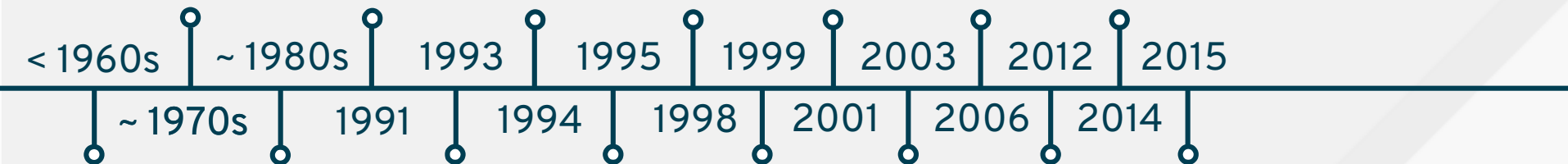
HOW IT ALL STARTED #16

In November 2015, something unexpected happen...

Microsoft and **Red Hat** announced partnership!

“With Red Hat and the leader in enterprise cloud workloads joining forces, our customers are the winners today, as we unite on common solutions to help them solve challenges in this hybrid cloud.”

– Paul Cormier



CURRENT STATUS

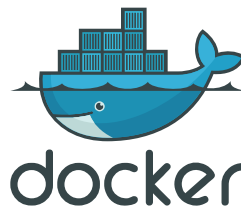
OPEN SOURCE IS NOT JUST LINUX

CURRENT STATUS #1

It's really much more...



oVirt



OPENSIFT
origin



OPEN SOURCE IS EVERYWHERE

CURRENT STATUS #2



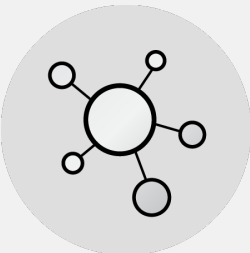
NOT JUST AN ALTERNATIVE

Many enterprise companies look at the Open Source solutions as their default choice.



More than 90% of Fortune 500 companies

Used Red Hat solutions in year 2014. All of these solutions are based on Open Source technologies.



HEADHUNTERS ARE LOOKING

For people actively engaged in Open Source projects.

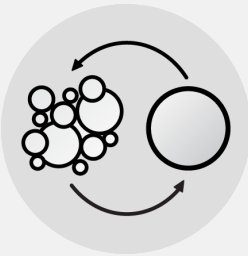
An aerial photograph of a shipping yard filled with rows of intermodal containers. The containers are primarily red, with some grey ones visible in the top-left and bottom-right corners. A large, semi-transparent red rectangle is overlaid on the center of the image, containing the text "NOT JUST TO MAKE MONEY". In the bottom-right corner, there is a small Red Hat logo and the word "redhat".

NOT JUST TO MAKE MONEY

RED HAT'S MISSION

We are not here just to make money... Our company's mission statement is:

“To be the catalyst in communities of customers, contributors, and partners creating better technology the open source way.”



UPSTREAM FIRST RULE

We draw and derive a lot from Open Source communities. Protect these communities, and give back to them.



FIGHT THE PATENT TROLLS

We protect both our customers and Open Source communities from destructive work of *patent trolls*...

RED HAT'S ACCOMPLISHMENTS

We are not here just to make money...



CREATIVE COMMONS

Red Hat helped to start the Creative Commons initiative.



OPENSOURCE.COM

Red Hat launched new website to show how & where the Open Source principles helped outside the IT industry.



WOMEN IN OPEN SOURCE AWARD

We know diversity makes us stronger, and we need more women in IT industry... Red Hat recognizes these women's contributions to Open Source world.

SHADOWMAN LOGO

This is not just a regular “logo”. It represents our history of *doing the right thing, and the confidence that brings...*



“It’s a symbol of our early days, when our founders embraced our outsider, subversive, revolutionary reputation and ran with it...”

SHADOWMAN LOGO

This is not just a regular “logo”. It represents our history of *doing the right thing, and the confidence that brings...*



“It’s a symbol of our early days, when our founders embraced our outsider, subversive, revolutionary reputation and ran with it...”

A large bridge with a teal overlay. The bridge's steel truss structure is visible, and the teal color is applied in a diagonal gradient across the image.

THE OPEN SOURCE WAY

WHAT IS THE OPEN SOURCE WAY?

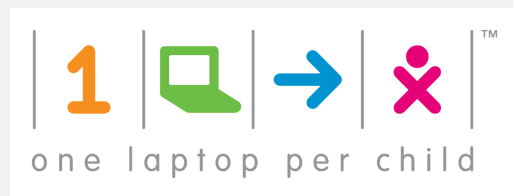
Applying the Open Source Software development *principles beyond the software & technology*... There are 5 principles of the *Open Source Way*:

- *open exchange* – we want to learn more
- *participation* – we are free to collaborate and to create
- *rapid prototyping* – at some point we will fail, accept it!
So fail early, learn by doing, and find better solutions faster as a result.
- *meritocracy* – best ideas win, no matter whom they come from
- *community* – common purpose brings us together

=>> *Way of life to change the world around us! :)*

APPLYING THE PRINCIPLES

What can we achieve when we use the Open Source Way? [Click for videos]



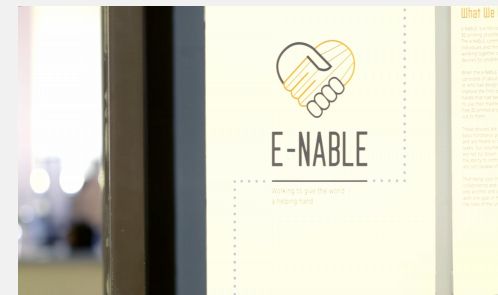
“If you get it right, if you are able to drive some good changes, it’s not just a small localized dis, but it has an effect on a lot of people.”

VENKY HARIHARAN
Fmr Corporate Affairs Dir
Red Hat India



“It’s basically the notion we should share equally. We should be totally transparent with what we’re thinking”

TOM DELBANCO, MD
Co-founder of OpenNotes
Harvard Medical School



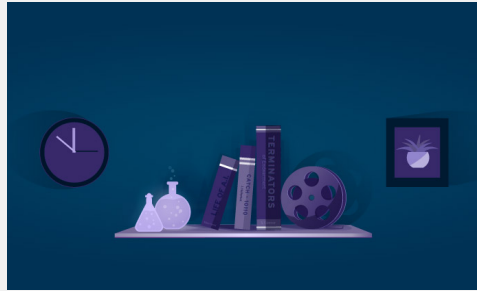
“I like to say we make children smile, we make parents weep, and we make nerds rejoice.”

JON SHCULL
Research scientist & founder of
e-NABLE



“We are on the verge of a revolution in agriculture, because our system is starting to fail.”

CALEB HARPER
Director of Open Agriculture
Initiative, MIT Media Lab



“Just as we learn our biases from the world around us, AI will learn its biases from us.”

NATHAN COLLINS
Science Writer
Pacific Standard



“Technology is not our main objective at all. The only thing we are interested in is the people.”

MARK LIM
Director of Government Digital
Services of Singapore

FINAL THOUGHT

“Would you rather fly in a plane that has been inspected for safety by 10 inspectors, or 100, or 1000 times? When it comes to finding problems, more eyes are always better.”

**WE CAN DO MORE
WHEN WE WORK TOGETHER!**



THANK YOU



plus.google.com/+RedHat



facebook.com/redhatinc



linkedin.com/company/red-hat



twitter.com/RedHatNews



youtube.com/user/RedHatVideos