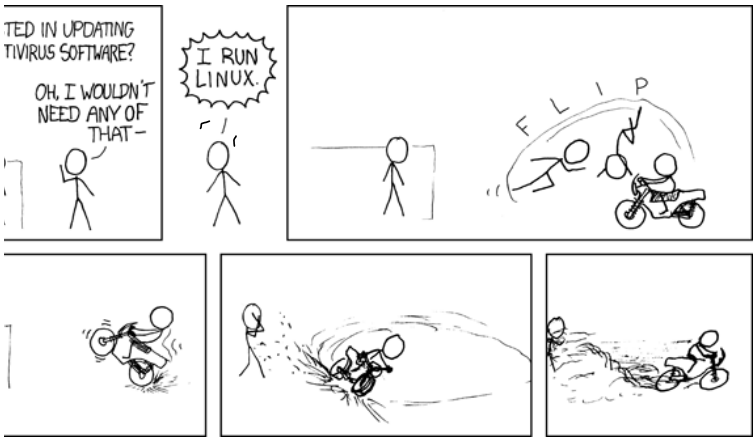
History of Linux and Introduction to course

Monday, January 12, 2015 9:05 AM



ay's goals 01/12/15

nderstand the history of UNIX ; Linux ; GNU

nderstand the philosophy of UNIX/LINUX

nderstand what "free software" means

---

ghly 23½ years ago

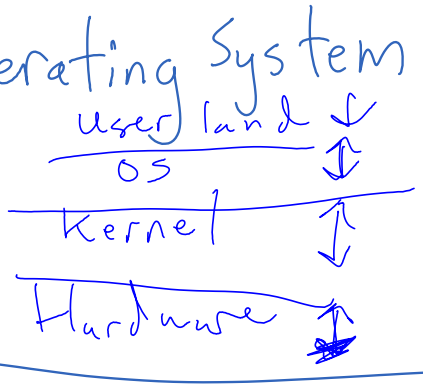
- Linux Kernel was released

By him

↙ Who is this?

What is Linux?

- Technically not an operating system
- It is a Kernel?
- What is a Kernel?



Who uses Linux?

- Facebook
- Google
- Amazon
- Redhat
- NYSE
- CME
- and on and on
- Do you use linux on a day to day basis?

Hint ↪

ANDROID

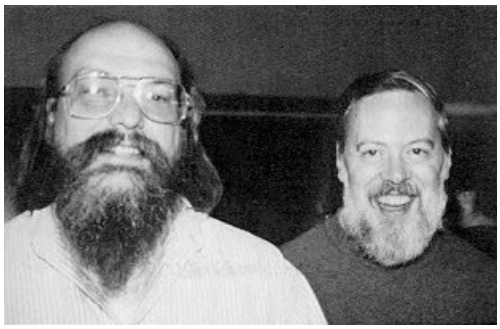
History

→ Linux came from UNIX

- You cannot understand Linux unless you understand UNIX & its core

philosophy.

- Even UNIX has its roots in something called MULTICS
- MULTICS project started in 1968-1969!
  - Two names to remember



  - Ken Thompson (face)
  - Dennis Ritchie (back)

- Employed on MULTICS at Bell Labs
  - Project stalled
  - Both developers had free time and expensive unused hardware

← Young Thompson & Ritchie

Over a few months in early 70's Thompson set about fixing MULTICS

- Since it was for himself he called it UNIX
- Everything from here on in is a PUN or inside joke.

- Thompson was a brillant engineer and pragmatic
  - Unix had a design philosophy

UNIX has 3 main tenants or pillars

I. - File System → every thing is a file
- Device Drivers
- Folders
- Executables
- "Soft Links"

→ All treated as files

- I/O devices (keyboard - Mouse)

I. I/O is redirectable - because each thing does well

using < | > these meta characters

Can redirect input and output

so that other programs can recieve it:

cat file.txt > newfile.txt

or:

ps -ef | grep apache | sort

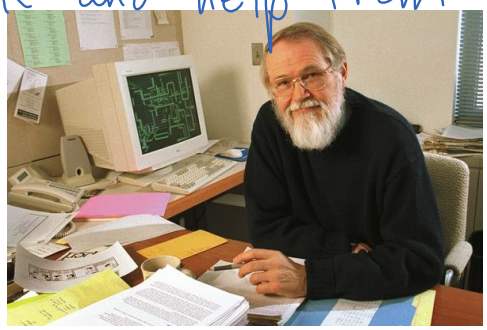
- Portability
  - Written in "C" language
    - "C" could be recompiled for any hardware making UNIX the first portable OS.

re on "C"

Originally UNIX was written in Assembler for PDP11 - but was hard to write/impossible to port

- Ritchie began working on a new high level language in early 70's called "B"

- With a bit of work and help from Brian Kernighan



- "C" allowed UNIX to be built - and today is still ~~written in "C" (most operating systems are)~~

- UNIX was written by a team lead by Thompson
  - They wrote it on their spare time
  - No company "owned" or designed it
  - Thompson + team wrote it to solve their own problems that made sense to them.
  - Built by engineers for engineers
  - Had a consistant philosophy

UNIX Usage

Inside Bell Labs others found out about UNIX and wanted to try it.

Internal Use grew

- Universities found out and wanted to use it for studying operating systems
- Bell Labs the began to give UNIX away to Universities starting 1975
- Those grads went to work and wanted to use UNIX at their jobs -- so Bell Labs began to license UNIX for commercial use.
- Berkley

J University (California)

- Began to use and change UNIX SUBSTANTIALLY
- Made their own derivative - called BSD
- BELL UNIX became SVR4

low Problem (1983)

RMS → Richard Stallman

GNU
HURD
FSF

GCC

Brillant researcher at MIT

- realised UNIX was not "free"
  - not cost
  - free as in freedom

Created GNU manifesto

- Idea ~~GNU~~ ≠ GNU's not UNIX was all software was owned by AT&T
  - no one could legally improve or modify source code, even though they paid for it!

- GNU project set about to reverse engineer ENTIRE Unix OS
  - By this time 14 years of work!
  - They did remarkably well
  - Actually reverse engineered everything in about 8 years. (1991)
  - Except 1 thing....

- NU was missing a Kernel
  - Remember what writting a Kernel is?
  - Kernel is much harder than it looks.
  - Work on this stalled.
  - A project call GNU HURD was started but never finished.

So...:

- All UNIX tools were built, but no Kernel for them.

On top of that...

- BSD Unix
- AT&T had become such a quality software decided to sue them to stop releases and kill competition
  - Court case lasted 3 years 1991 ~ 1994

So during that time — NO UNIX development could be done!

/hat happens next?

- Go to beginning of notes...
  - → Note the date of Linux Kernel Release
  - → 1991 → Grad student Linus Torvalds releases 0.01 Linux
  - → Done as a side project to fix shortcomings of UNIX and MINIX
  - → Just like Thompson....
  - → Linux had one problem, it tooling software Can use any one see the solutions? GNU software and Linux is born!

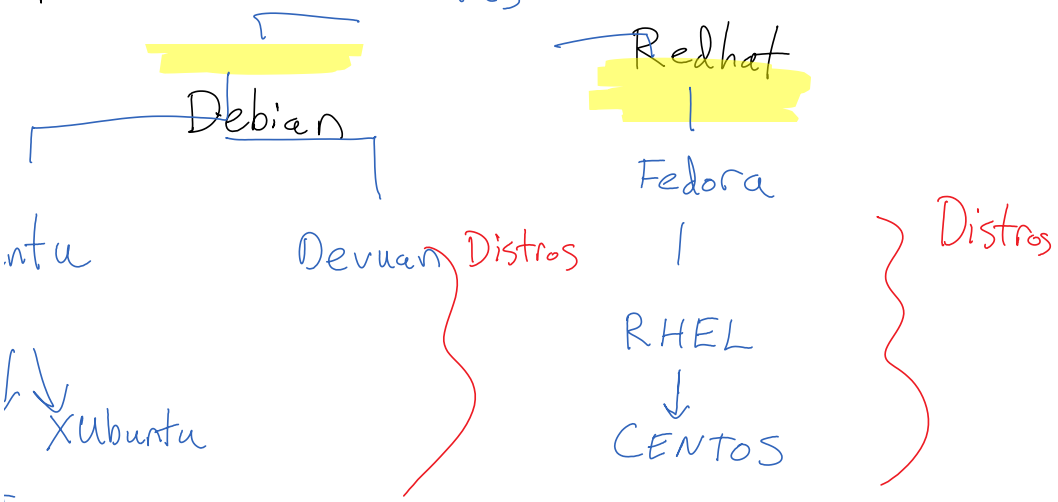
ause of BSD/AT&T Lawsuit
LL developers move to Linux, even corporations
st history is

x Kernel now maintained by: Intel, Qualcomm and so

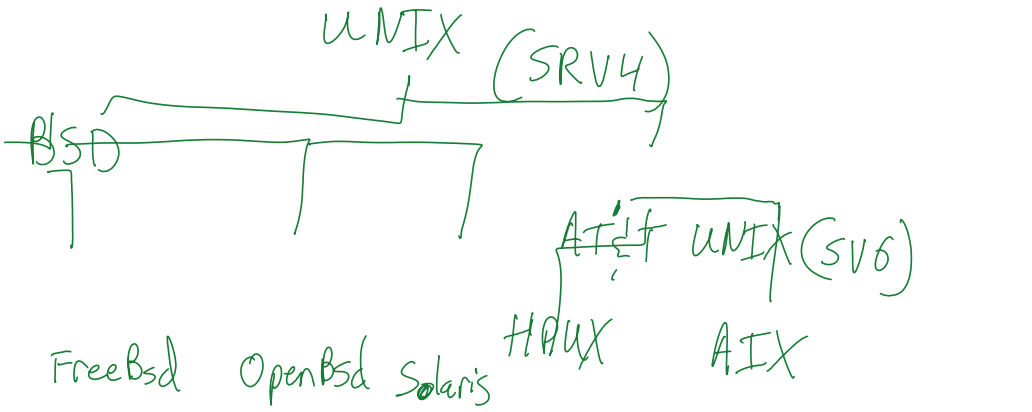
Red nal, IIT, Samsung, Qualcomm on.
erent

Linus'

op companies take Families kernel and add



rs such as Gentoo or Slackware as well
(has a tree too



d Licensing

order to protect Intellectual Property
FSF used licensing and attribution

Meaning the code is "free" free to be reused

changed

sngmodified and resold

as you and attribute release where and who the source

from you the source code.

GPL

Public License

y left

-v2 now GPLv3

x Kernel licensed under GPLv2 not 3

s some controversy

://www.gnu.org/licenses/quick-guide-gplv3.html

://en.wikipedia.org/wiki/GNU_General_Public_License#Version_3

FOSS?

-is

urce code available

ow to make money?

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ssignment:

-up virtual box and Linux Operating

ystems

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