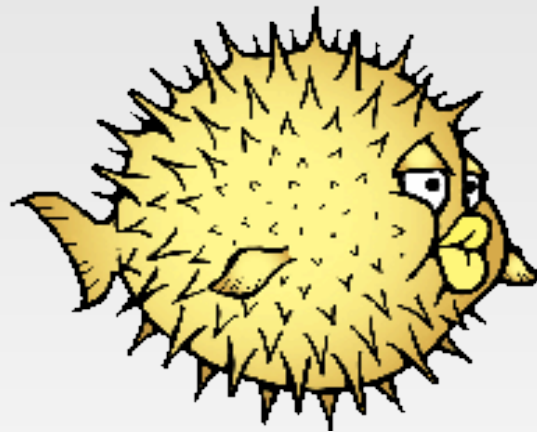


Atheros and FOSS

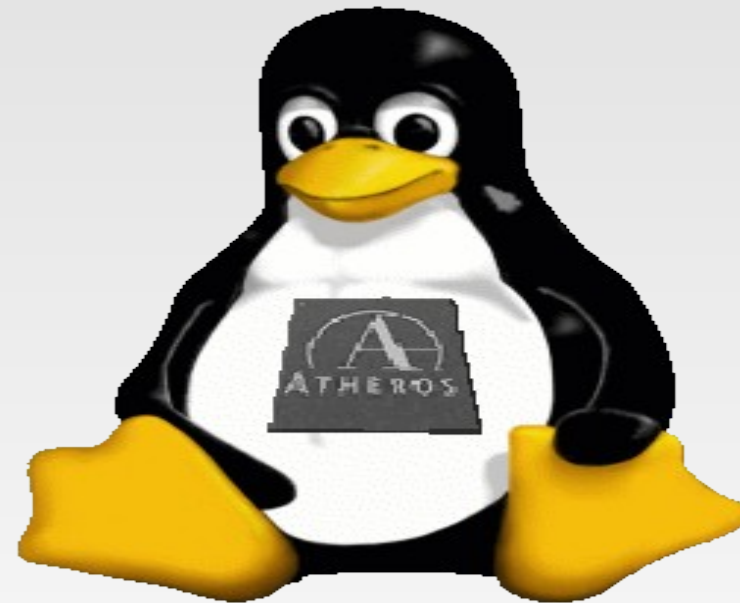


Linux was born



August 25, 1991

- Linus Torvalds announces:
 - I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones.



Becomes the most **successful** collaboration project in the **world**.

- Is there competition for this title?

Is Linux successful?



- In 2006, a study funded by the European Union put the redevelopment cost of kernel version 2.6.8 higher, at €882 million euro (\$1.14 billion USD).
- New kernel every 86 days, based on last 10 releases
- In July, 2009 even Microsoft contributes 20,000 lines of code
- **2.6.30** stats:
 - 1.14 million lines of code added
 - 513,000 lines removed
 - 624,000 Net growth in lines of code
 - 11,733 changes
 - 1,125 contributors
 - 4,957.73 lines removed per day
 - 2,829.51 lines changed per day
 - 12,993.46 lines added per day / 541 lines added per hour
 - 153.2 changes per day / 6.4 changes per hour

How about processor and device support?



- **Linux** supports more **different processor types** than **any** other operating system has in the history of computing.
- **Linux** supports more **different devices** than **any** other operating system has in the history of computing.
- **Almost** all of these **devices** are supported on all of those different **processors**.

What else?



- The U.S. **Army** is “the” single largest install base for Red Hat Linux
- State owned Industrial and Commercial Bank of China (ICBC) is installing Linux in all of its 20,000 retail branches as the basis for its web server and a new terminal platform. (2005)
- Cuba - The Cuban Government announced that it has launched its own version of Linux called "Nova" to replace Microsoft Windows on that government's computers.
- France's national police force, the National Gendarmerie started moving their 90,000 desktops from Windows XP to Ubuntu in 2007 over concerns about the additional training costs of moving to Windows Vista. The migration should be completed by 2015. The force has saved about €50 million on software licensing between 2004 and 2008
- France's Ministry of Agriculture uses Mandriva Linux
- The French Parliament has switched to using Ubuntu on desktop Pcs.
- Macedonia's Ministry of Education and Science deployed more than 180,000 Ubuntu based classroom desktops, and has encouraged every student in the Republic of Macedonia to use Ubuntu computer workstations
- The People's Republic of China exclusively uses Linux as the operating system for its Loongson processor family, with the aim of technology independence
- CERN uses Scientific Linux in all its work, including running the Large Hadron Collider and for its 20,000 internal servers.
- The New York Stock Exchange uses Linux to run its trading applications
- Google uses a version of Ubuntu internally nicknamed Goobuntu.

Why is it so successful?



- 1950s: Transistor, **Bell Labs** credited
- 1969: **UNIX** – **Bell Labs**
- 1972: **c** programming language – **Bell Labs**
- 1985: **GNU Manifesto** – GNU Project, Richard M. Stallman
 - *"In 1987, I realized that GNU software was some of the best software to be found anywhere, and that the GNU Manifesto was really a business plan in disguise."*
 - Michael Tiemann – Hacker, Author of world's first native-code C++ compiler GNU C++, Cygnus co-founder 1989, Vice President of Open Source Affairs at Red Hat Inc, previous CTO at Red Hat Inc.
- 1991: **Linux** 0.01 released by Linus Torvalds, **just for fun**
- 1992: Torvalds adopts **GNU GPLv2**, dropping his license (which had not permitted commercial redistribution)
- 1997: The Cathedral and the Bazaar (**CatB**), Eric S. Raymond

"Given enough eyeballs, all bugs are shallow." - Linus law Even GNU Emacs and GCC learned

Most active 2.6.30 employers



Employer	Changesets	Percentage
Community	1970	16.8%
Red Hat	1305	11.1%
Unknown	1184	10.1%
Intel	855	7.3%
Novell	832	7.1%
IBM	630	5.4%
Consultant	293	2.5%
Atheros	262	2.2%
Oracle	252	2.1%
University of Virginia	227	1.9%

Linux distributions



- Take a pick, what do you need?



redhat

fedora^f



ubuntu



debian

Alternative Linux distributions



- Netbooks / MID distributions:
 - Android: **Google**
 - Moblin: **Linux Foundation**
 - Ubuntu Netbook Remix: **Canonical**
- AP firmware replacements: customers are **asking** for support:
 - **OpenWRT**: **anyone** can build upon. Commercial usage allowed.
 - **DD-WRT**: commercial use requires a **paid** license, there is a "*professional version*", vs the "*freely available version*"

Licensing



- **Must always respect a Copyright license !**
- *"Permission to **use, copy, modify,** and/or **distribute** this software **for any purpose** with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear **in all copies**"*
- **GPL: FSF**
 - **Must** provide changes if you make **changes** to source code and **distribute binaries** based on those changes.
 - Can **charge** a shipping fee **or** you can be a **good citizen** and upload patches online.
 - Compatible with **NDA**s, or **contracts**?
 - How about when you **violate** the license?
 - `EXPORT_SYMBOL(symbol_name)` **Vs** `EXPORT_SYMBOL_GPL(symbol_name)`
- **Permissive licenses:** no need to give back, **BSD, ISC, Apache**
 - **Allows** you to take code and **never contribute the changes back.**
 - Is that something you really want? There have been disputes on this before. If you do why do you want to use it?
 - **Good reason** to use it: let other FOSS Operating Systems port it, or to support getting changes back for **Windows.**

How to get upstream?



- **Do it yourself:**
 - Able to **influence** change
 - **Best support** for your hardware
 - Fastest **turnaround time**
- **Hope** someone will do it for you, **for free:**
 - **Should** provide **documentation**
 - Existing **code** will help
 - Staging drivers: **TAINT_CRAP**
- Someone **will** do it for you:
 - Creates **motivation** amongst willing developers
 - Reverse engineering: **b43, b43-legacy, b43** firmware!
 - **Not the best support** for your hardware
 - Clashes with your own proprietary Linux solutions: **ssb**

What is Atheros doing?



- **Top Linux 802.11** Linux contributor: drivers, mac80211, cfg80211, hostapd, wpa_supplicant, crda, wireless-regdb, iw, documentation. Just on kernel **2.6.30: 241** patches Vs Intel at **163**
- **8th** most active Linux kernel employer
- **First wireless vendor** to completely open up support for their wireless devices: **ath9k requires no firmware**
- **First wireless vendor** (maybe first vendor) to **open up firmware** source code: **ar9170.fw**
- **Documentation and hardware samples** to developers for legacy devices: **ath5k, ar9170**
- **Community** participation: **active ath5k, ar9170**, and **ath9k** contributions. **OpenWRT** contributing to **ath9k**, **FSF** recommends Atheros devices
- Use **permissive license** for our work where possible: **OpenSolaris, BSDs**

What lies ahead



- CPU based wireless cards: USB, PCI
- Ethernet
- Switch
- Mobile
- Upstream MIPS board support
- Expect everything to work out-of-the box

Is there competition for this title?



- **Is Linux the most active community project in the world?**
- **Creative Commons** licensed projects:
- **Wikipedia**: 13 **million** articles
- **Wikinews**: 15,000 articles
- **Flickr**: 3.6 **billion** images
- **Jamendo**: 22,000 albums, 12,000 artists
- **Thingiverse**: digital designs