

Distributions and Platforms

COMP8440: FOSSD
Lecture 11



FOSS not just for Linux

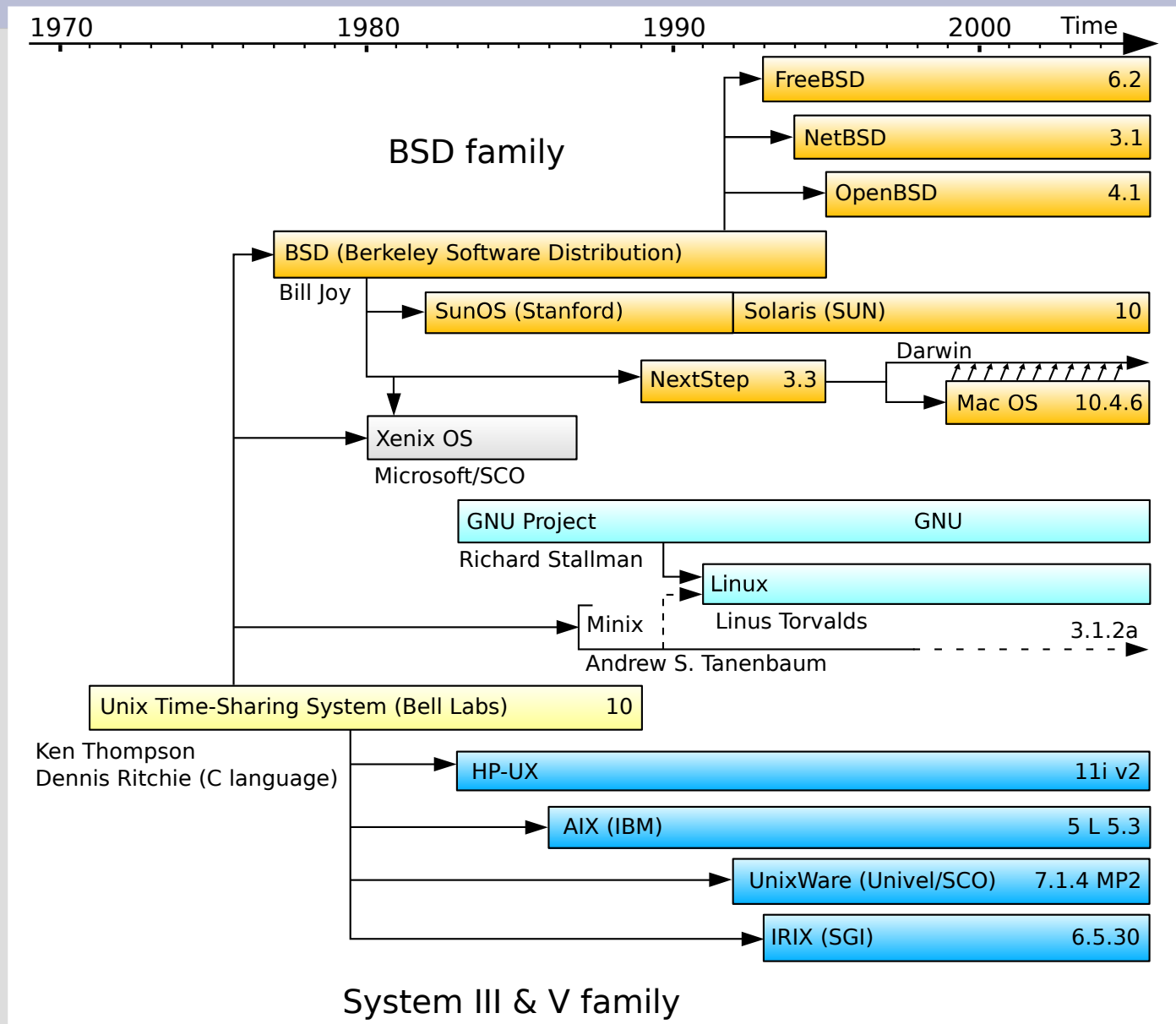
- FOSS exists for a number of operating systems:
 - Microsoft Windows
 - Apple Mac OS X
 - Various proprietary Unix variants
 - Phones and PDAs
 - Specialised, such as real-time operating systems (RTOS)

FOSS Operating Systems

- Linux
- BSD variants: FreeBSD, NetBSD, OpenBSD
- MINIX
- FreeDOS
- OpenSolaris
- Darwin, OpenDarwin, PureDarwin
- seL4
- Plan 9

http://en.wikipedia.org/wiki/Comparison_of_open_source_operating_systems

Unix based Operating Systems



Linux+GNU

- All the pieces for an entirely free open source operating system
 - Kernel (Linux)
 - Compiler (GCC)
 - Core libraries (glibc, etc)
 - User space utilities and applications (GNU, etc)
 - Graphical user interfaces (GNOME, etc)

Linux+Other

- Other Linux systems may use non-GNU software, such as uClibc and busybox.
- Android uses a Linux kernel with Bionic C library and Java based Android Runtime (ART) for user space.

Linux Distributions

- Free software comes as source code
- Inconvenient to compile entire operating system manually
- Linux distributions compile open source projects into binary form for ease of use (use package managers)
- Affectionately known as “distros”
- Some just make compiling from source easier

Linux Distros

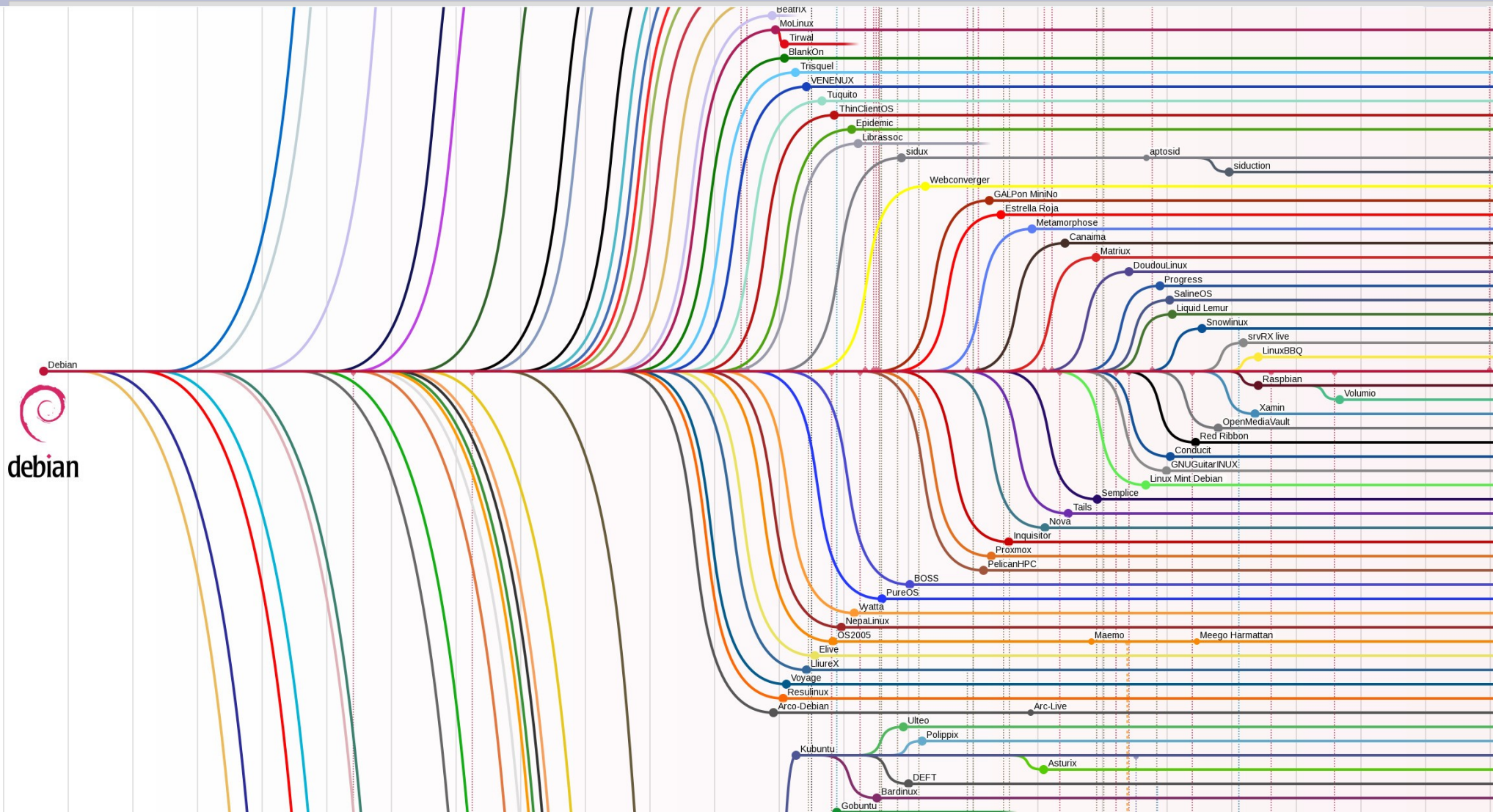
- DistroWatch is a popular Linux news website which tracks distro releases, status and reviews
- Maintains a database of over 800 distributions
- Around 250 of these are **active** today

Why so many?

Three founding Fathers

- Three oldest surviving Linux distros
 - Slackware (July 1993, based on Softlanding Linux System SLS)
 - Debian (August 1993)
 - Red Hat (July 1994)
- Most are derivatives of these three, although many are completely independent

Linux history chart (Debian)



Popular Linux distros today

- Debian
- Ubuntu (based on Debian)
- Fedora
- openSUSE
- Arch
- Manjaro (based on Arch)
- Mageia (fork of Mandriva)
- Mint (based on Ubuntu)
- elementary (based on Ubuntu)

Korora Project

- Started in Australia in 2005
- Name means “little penguin” in Māori
- Originally released as a binary install method for Gentoo (a source distro)
- In 2010 became a Fedora Remix
- Fedora doesn't ship support for proprietary software, codecs or patent encumbered software
- Korora makes Fedora easier to use out of the box

Classifying Linux Distributions

- Many ways to classify or group Linux distros, there's no one way

Package Management

Those using Red Hat Package management (.rpm):

- Red Hat Enterprise Linux, CentOS
- Fedora
- OpenSUSE
- OpenMandriva
- Many others

Those using Debian (.deb) packages:

- Debian
- Ubuntu
- Knoppix
- Many others

No Package Management

Many distros don't use package management at all:

- Slackware (oldest current distro)
- Gentoo
 - Uses “portage” system to build apps from source
- Various embedded distros which are custom built for purpose

Commercial Support

Various distros have commercial support:

- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

Small footprint

Some distros are focused on running on small footprint

- Damn Small
- Puppy
- Tiny Core
- Feather

Security Focused

Various distros focus on security, such as penetration testing a system:

- Kali (Debian based)
- Pentoo (Gentoo based)
- WHAX (Slackware based)

Or deliberately vulnerable:

- Damn Vulnerable Linux (discontinued)
- Metasploitable (metasploit framework on Linux)

Security Focused

Or providing privacy and anonymity online:

- BackBox
- Tails
- Whonix

Or secure Internet connections and firewalls:

- IPCop
- IPFire
- pfSense (BSD)

Servers

Some provide full “small business” servers, like authentication, filesharing, calendaring, email, etc

- ClearOS

Or optimised for virtual machines, containers and the cloud:

- CoreOS

Other classifications

Could also classify by:

- Server vs. desktop
- Stable vs. development
- Hardware architecture (CPU) supported
- Live boot vs. traditional install
- Strictness of adherence to FOSS principles
 - Blag (based on Fedora)
 - Trisquel (Ubuntu based)
 - gNewSense (Debian based)
 - Parabola (Arch based)

Look for yourself

- Have a look in DistroWatch's database!
<http://distrowatch.com/search.php>
- 26 different categories
 - Beginners
 - Desktop
 - Education
 - Firewall
 - Gaming
 - Multimedia
 - Privacy
 - Server, etc

FOSS is everywhere

- Not just desktops
- Linux distributions power most of the Internet
 - Google, Baidu, Alibaba, Facebook, Twitter, Wikipedia, Amazon, YouTube, Netflix, Snapchat, Dropbox, Pinterest, Reddit, Instagram, Uber, Spotify, and most of the rest
- Linux powers the International Space Station
- Stock exchanges around the World
- Government departments such as Munich
- Hollywood movies and animations

FOSS is everywhere

- 494 of the top 500 supercomputers run Linux
 - Other 6 run Unix
 - Since 2013, Tiānhé-2 (天河 -2) from China has been the World's fastest super computer
 - 32,000 Intel Xeon CPUs
 - 384000 CPU cores
 - 1,375 TiB memory
 - 12.4 PB storage
 - 33.86 PFLOPS (floating-point operations per second)
 - 17.6 MW of power
 - Cost US\$390million, ¥2.4 Billion
 - Runs Kylin 麒麟 (qílín) Linux
 - Originally BSD based, now derived from Ubuntu