

Debian



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Agenda

- Who am I?
- What is Debian?
- What/how/why?
- Inside the sausage factory
 - The project
 - Working on stuff
 - Collaboration
- Getting involved



Who am I?

- Studied Engineering in Cambridge (1993-1997)
- Professional software engineer, employed by Arm in Cambridge
- Working on Open Source and Free Software since 1994
- Debian Developer since 1996, elected Project Leader 2008-2010
- Contributions to many other projects
 - Linux, glibc, toolchains, GRUB, audio, graphics, CD/DVD, test automation, networking, ...



What is Debian?



- 2 aspects, interlinked:
 - The Community
 - The Operating System

Debian – the Community



- One of the longest-lived Free Software projects
- Founded 1993 by Ian Murdock
- Thousands of contributors spread all over the world
 - ~1000 “Debian Developers”
 - Many more maintainers, translators, etc.
 - Lots of “non-uploading” developers

Debian – the Community (2)



- Open development
 - We don't hide problems
- Large amounts of communication
 - Mailing lists, web sites and IRC channels
- Large number of active users
 - Users help each other, contribute packages, become developers



Debian – the OS

- Completely Free Software
 - Debian Free Software Guidelines
- Binary distribution
 - Source provided too, of course!
- Mainline support for 10 different platforms
 - amd64, arm64, armel, armhf, i386,
 - mips, mips64el, mipsel, ppc64el, s390x
- “Ports” for many others:
 - alpha, hppa, hurd-i386, ia64, kfreebsd, m68k, powerpc, ppc64, riscv64, sh4, sparc64, x32



Debian – the OS (2)

- Largest GNU/Linux distribution
 - 28,500 source packages
 - 57,000 binary packages
- Used as a base for **many** other distributions
 - Ubuntu, Mint, Devuan, Kali, Pexos, ...
 - Free Software is designed for sharing

Where does Steve fit in?



- Joined the project in 1996 while at college
- Package maintainer
 - Audio, graphics, CD/DVD, cvs, nas, strace (to name just a few!)
- Multiple teams
 - Images, installer, EFI, Arm porter, Cloud, Community Team, conferences
- 11th Project leader
 - “management” - ugh!



What do we do?

- Create the best operating system in the world!
- Develop bespoke software
 - Packaging system
 - Debian-specific infrastructure
- Package software written by others
 - Linux kernel, applications, games, etc.



What do we do? (2)

- Make it all work together
 - Integrate it into a single system
 - Test, fix bugs
- Ship it!
 - Multiple releases
 - CD/DVD/USB images
 - Cloud/Docker images



How do we do it?

- We work together:
 - With other Debian developers
 - With other Free Software developers
 - With our users
- Everything we do is **Free**



Free?

- No charge to download and install
- Free to share with others
 - No licensing fees
 - No limitations
- Encourage people to share the software
 - Code
 - Ideas
- Debian Free Software Guidelines (DFSG)

Debian Free Software Guidelines



- **Guidelines** only - not hard rules
- Used to help decide what we will distribute in the Debian system
- Software split into three sections
 - main
 - non-free
 - contrib



DFSG (2)

1. Free Redistribution
2. Source Code
3. Derived Works
4. Integrity of The Author's Source Code
5. No Discrimination Against Persons or Groups



DFSG (3)

6. No Discrimination against Fields of Endeavour
7. Distribution of License
8. License Must Not Be Specific To Debian
9. License Must Not Contaminate Other Software
10. Example Licenses



Social Contract

- Debian will remain 100% free
- We will give back to the free software community
- We will not hide problems
- Our priorities are our users and free software
- Works that do not meet our free software standards



Why do we do it?

- MANY reasons...
 - We can
 - We care about it
 - Recognition
 - To provide for our users
 - It's fun!
 - ...

Inside the sausage factory



- One of the world's largest software development organisations
- Geographically and socially diverse
- Volunteers
- A few challenges...



Project structure

- Started with limited structure
- Minimal “people management”
- Volunteers
- Package maintainers control their own work
 - Scalability
 - Focus on the bits you care about



Various teams

- Teams grow as jobs get bigger
- Examples:
 - ftpmaster
 - Installer team
 - Images team
 - Release team



Project decisions

- Overall it's a "do-ocracy"
 - Developers make decisions as they work
- Technical committee
- DPL elected each year
 - Delegates key project positions
- General resolutions (GRs)
 - Votes on important issues

Process: from Chaos...



- Thousands of contributors
- Thousands of packages
- Many thousands of bugs
- Millions of users



... to Stability

- Debian policy
- Quality checking of packages
- Testing (in many ways)
- Release



Policy

- Comprehensive list of requirements for packages:
 - What goes in a package, and where
 - Interactions with other packages
 - Configuration files
 - How services are managed
 - Upgrades



Quality

- Continuous Integration
 - Per-commit testing for lots of packages
- Lintian
 - Automated checks for packaging mistakes
- Autopkgtest
 - Testing of packages at runtime
- Piuparts
 - Testing package upgrades/removals
- Reproducible builds
 - Important for consistency, trust



Testing – in Packages

- Developers run their own tests before upload
- Build-time test harnesses
- More involved runtime testing
- Other developers and users report bugs
- Bugs (hopefully!) are fixed, new uploads made

Testing – as a Distribution



- Uploads go to “unstable” distribution
- After a period of time with no major bugs reported, packages become valid to migrate into “testing”
- Archive maintenance scripts check for dependencies
- Testing should be (almost) ready to release as “stable” at any point



Release

- Release Team in charge
 - Monitor the testing distribution
 - Co-ordinate uploads of key packages
 - Track / manage large package sets
 - Responsible for deciding release policy and dates
 - When is it “good enough”?
- Releases fully supported for cycle + 1 year
- Extra support via LTS, ELTS



Packaging

- Work with upstream developers
 - Many packaging teams include upstream
- Make software packages work together well in a consistent system
- Coordination of bug reports and fixes
- Support for users



Working on a package

- salsa.debian.org
 - Gitlab instance, used for most packages
 - Git server, merge requests, code reviews
- Package workflow
 - Work on packages a piece at a time
 - When ready, tag, build, sign and upload
 - Lots of different ways to do this!
- Demo
 - Fingers crossed! :-)

Working on a package (2)



- Dashboards
 - tracker.debian.org
 - buildd.debian.org
 - bugs.debian.org
 - udd.debian.org



Trust

- Developers sign packages before upload
 - Checked against keyring
- Checksums stored in metadata files (Packages and Sources)
- Release file signed
 - Links together individual files, signed by the master archive key
- Trust matters
 - Security
 - Malware prevention



Collaboration

- Distributed discussions
 - Mailing lists
 - Bug tracking system
 - IRC etc. for realtime discussion
- Real-life meetings becoming more common
 - DebConf
 - MiniDebConf
 - FOSDEM
 - Lots of developer sprints

The future – coming soon



- Stable/oldstable point releases
 - 8th/9th Feb
- Debian 11 (Bullseye) due next year
 - Freeze by end of 2020
 - Release when it's ready
- DebConf 20 in Haifa, Israel
 - August 2020
 - Major conference
 - Lots of work
 - Lots of FUN! :-)



Further on...

- Debian 12 (Bookworm)
 - After another 24 months?
- More...
 - Quality
 - Developers
 - Packages
 - Collaboration



Getting involved

- Test, report (and ideally fix!) bugs
- Translation
- Documentation
- Join a team
- Help with packages
- Sponsoring
- New Member Process



Want to know more?

- www.debian.org
- mailing lists
- IRC
- ask me!

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