Debian
Past, Present and Future

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Agenda

- What is Debian?
- Project structure
- Process
- Inside a Debian package
- Derivatives – using Debian as a base
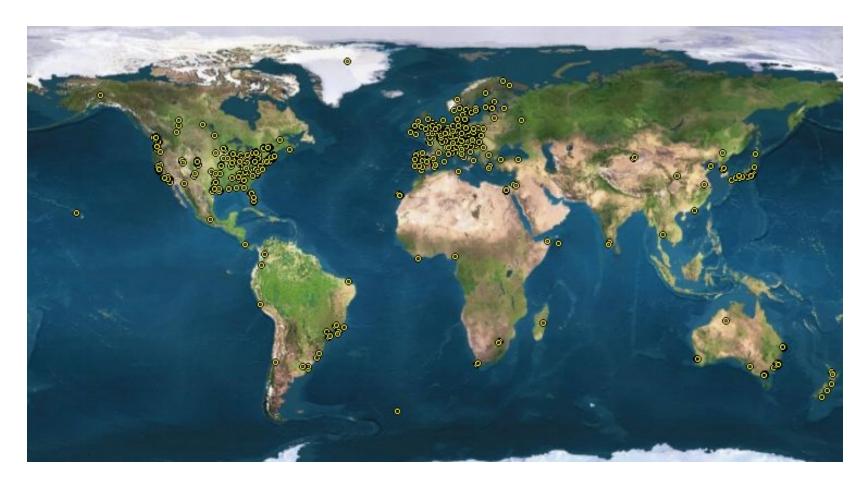- The future?
- Getting involved

What is Debian?

- 3 aspects, interlinked:
  - A Project
  - An Operating System
  - A Community

Debian – the Project

- Over 1,000 volunteer developers spread all over the world
  - Large numbers in North America & Europe
  - Smaller numbers in Australia & Japan
  - Growing Latin American development community

Debian – the Project (2)

http://www.debian.org/devel/developers.loc

Debian – the OS

- **Completely** Free Software
  - Debian Free Software Guidelines
- Support for 12 different architectures
  - alpha, amd64, arm, hppa, i386, ia64, m68k, mips, mipsel, powerpc, s390, sparc
- Largest GNU/Linux distribution
  - Over 15,000 binary packages in last release
  - Over 17,000 binary packages expected in the next release

Debian – the Community

- 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

How is Debian different?

- Volunteer-driven
  - No company in charge
- Free Software
  - Social Contract
  - Debian Free Software Guidelines
- Size
- Packaging system
- Stability & Support

Social Contract

- We declare that:
  - 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

DFSG

- **Guidelines** only – not hard rules
- Used to help decide what we will distribute in the Debian system
- main, contrib & non-free

DFSG (2)

- Free Redistribution

- Source Code

- Derived Works

- Integrity of The Author's Source Code

- No Discrimination Against Persons or Groups

DFSG (3)

- No Discrimination against Fields of Endeavour

- Distribution of License

- License Must Not Be Specific To Debian

- License Must Not Contaminate Other Software

- Example Licenses
  - BSD, GPL

History

- Founded in 1993 by Ian Murdock

- Named after DEBra and IAN Murdock

- The first major distribution developed "openly in the spirit of Linux and GNU"

- Early work sponsored by the GNU project

Leaders

- Ian Murdock (1993 – 1996)
- Bruce Perens (1996 – 1997)
- Ian Jackson (1997 – 1998)
- Wichert Akkerman (1999 – 2001)
- Ben Collins (2001 – 2002)

Leaders (2)

- Bdale Garbee (2002 – 2003)
- Martin Michlmayr (2003 - 2005)
- Branden Robinson (2005 - 2006)
- Anthony Towns (2006 – present)

Releases

- 1993: early development snapshots
- 1994: v0.91
- March 1995: v0.93R5
- November 1995: v0.93R6
- ~~December 1995: v1.0~~
- June 1996: v1.1 (Buzz)
- December 1996: v1.2 (Rex)

Releases (2)

- June 1997: v1.3 (Bo)
- July 1998: v2.0 (Hamm)
- March 1999: v2.1 (Slink)
- August 2000: v2.2 (Potato)
- July 2002: v3.0 (Woody)
- June 2005: v3.1 (Sarge)
- December 2006: v4.0 (Etch) ???

Project structure

- Started with limited structure

- Volunteers

- Minimal "people management"

- Package maintainers control their own work

Various teams

- Teams grow as jobs get bigger

- Examples:
  - ftpmaster
  - debian-installer
  - debian-cd
  - release team

Project decisions

- DPL elected each year

  – Delegates key project positions

- General resolutions (GRs)

  – Votes on important issues

- Technical committee

- Software in the Public Interest (SPI)

Process: from Chaos…

- Over a thousand Debian developers
- Several thousand packages
- Many thousand bugs
- Millions of users

... to Stability

- Debian policy
- Quality checking of packages
- Testing (^2)
- Release team coordination

Policy

- Comprehensive list of requirements for packages:
  - What goes in a package, and where
  - How to start & stop daemons
  - Interactions with other packages
  - Configuration files
  - Upgrades
  - etc.

Quality checking

- Lintian, linda
  - Run by maintainer to check for packaging mistakes after packages are built
  - Simple frameworks; new tests are added easily

- piuparts
  - Tests how well packages will upgrade from one version/release to the next

Testing - Packages

- Developers run their own tests before upload

- Build-time test harnesses

- Other developers and users report bugs

- Bugs (hopefully!) are fixed, new uploads made

Testing - 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 managers

- Constantly monitor the state of the testing distribution

- Co-ordinate uploads with package maintainers to make transitions smooth

- Track large groups of packages as they work through the system (e.g. KDE, Gnome)

- Responsible for deciding release goals and release dates

Security team

- Work with maintainers where possible
- Security updates for "oldstable"
- Security updates for stable
- Security updates for testing
- Coordination with other distributions
- security.debian.org, DSAs

Stable point releases

- Organised by the stable release team
- Made every few months
- Collect together:
  - Current security updates
  - Highly-tested package updates to fix other **serious** bugs
- Update the archive
  - rebuild CDs, DVDs etc.

Collaboration

- Many different source code control systems in use; choice of which is made by the developers
  - cvs, subversion, arch, bzr, darcs, others...
- Discussions via mailing lists
- IRC for realtime discussion
- Real-life meetings becoming more common
  - Debconf, Extremadura

Alioth

- Sourceforge-like system

  - cvs, svn, mailing lists, web space, ...

- Used for collaborating on Debian work

  - Projects like debian-installer, debian-cd

  - Packaging work

- Also hosts a number of non-Debian projects

Inside a Package - sources

- Packages are built from source by their maintainers

  – Make changes, compile, test, sign, upload

- Source packages are made up of:

  – .tar.gz of source

  – .diff. gz containing Debian changes

  – .dsc file listing the details of these

- One source package may make many binary packages

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Inside a Package - debian/

- debian/ subdirectory contains all the packaging metadata (similar to .spec):
  - debian/copyright
  - debian/control
  - debian/rules
  - debian/changelog

Building packages

- dpkg-buildpackage
  - fakeroot
  - sudo
- Auto-builders
  - sbuild
  - pbuilder
- Buildd
- .changes file

Binary packages

- Architecture-specific or arch-all
- Come as a.deb file; it contains:
  - debian-binary (version info)
  - control.tar.gz (metadata)
  - data.tar.gz (package contents)
  - Potentially other components
- Layout conforms to policy & FHS

Packaging system

- Modular design
- Simple low-level tool
  - dpkg installs and removes packages
- More intelligent higher level management
  - apt, aptitude, synaptic, etc.
- Packages.gz, Sources.gz, Release
  - Easy to create and mirror

Trust

- Developers sign packages before upload
  - Checked against keyring
- md5 hashes stored in Packages.gz and Sources.gz
- Release file signed
  - Links together individual files, signed by the master archive key

Derivatives

- Not just a distro, can be a base
- LOTS of derived distributions:
  - Ubuntu
  - Linspire
  - Xandros
  - Skolelinux
  - Debian-jr
  - many more

Derivatives (2)

- Why?
  - Licensing
  - Solid, stable base system
  - Reduce effort
- How?
  - Take existing packages and add extras
  - Rebuild packages where desired
- No problem – everybody wins!

The future – coming soon

- Etch due next weekend!
  - The system is hard frozen – RC bugfixes only
  - Release and documentation teams working hard
  - amd64 support added, m68k dropped
  - Party! :-)

Later this year

- Debconf 7 in Edinburgh, June 2007
  - Major conference
  - Lots of work
  - Lots of FUN! :-)

Further on…

- lenny after another 18 months?
- Even more developers
- Even more packages

Getting involved

- Test, report (and ideally fix!) bugs

- Translation

- Documentation

- Help with packages

- Sponsoring

- New Maintainer Process

Want to know more?

- www.debian.org

- mailing lists

- IRC

- ask me!