Debian Quality Assurance
Gestion de la qualité dans Debian

Lucas Nussbaum
lucas@debian.org
Lucas Nussbaum

- Enseignant-chercheur (Maître de conférences) à l’univ. Nancy 2
- Enseignement: Licence Professionnelle ASRALL (Administration de systèmes, réseaux et applications à base de logiciels libres)
- Recherche: Systèmes distribués, calcul à haute performance

Logiciel libre:

- Développeur Debian et Ubuntu
  Quality Assurance, Ruby, Collaboration Debian/Ubuntu
- Développement en Ruby
  feed2imap, xmpp4r, tuns, suuntux
Debian

Well known and respected for:

▶ Its long and bumpy release cycles
▶ Its quality

But it was not a given:
▶ > 1000 Debian Developers
▶ Mostly volunteers, with their own agendas
▶ > 15000 software packages
▶ Some very popular packages
▶ A lot of niche packages
Debian

Well known and respected for:

- Its long and bumpy release cycles
Debian

Well known and respected for:

- Its long and bumpy release cycles
- Its quality

But it was not a given:

- > 1000 Debian Developers
  - Mostly volunteers, with their own agendas
- 15000 software packages
  - Some very popular packages
  - A lot of niche packages
Quality factors

Culture: "We release when it's ready"

Many DDs won't compromise on this

Packages ownership: individuals or small teams

About 600 active developers

Many of them experts of their packages

Release Critical (RC) bugs

Prevent packages from being part of a release

Everybody is welcomed to fix them

Non-Maintainer Uploads

Debian Quality Assurance team

lucas@debian.org
Quality factors

- Culture: "We release when it’s ready"
  - Many DDs won’t compromise on this
Quality factors

- Culture: "We release when it’s ready"
  - Many DDs won’t compromise on this

- Packages ownership: individuals or small teams
  - About 600 active developers
  - Many of them experts of their packages
Quality factors

- Culture: "We release when it’s ready"
  - Many DDs won’t compromise on this

- Packages ownership: individuals or small teams
  - About 600 active developers
  - Many of them experts of their packages

- Release Critical (RC) bugs
  - Prevent packages from being part of a release
  - Everybody is welcomed to fix them
    - Non-Maintainer Uploads
Quality factors

- Culture: "We release when it’s ready"
  - Many DDs won’t compromise on this

- Packages ownership: individuals or small teams
  - About 600 active developers
  - Many of them experts of their packages

- Release Critical (RC) bugs
  - Prevent packages from being part of a release
  - Everybody is welcomed to fix them
    - Non-Maintainer Uploads

- Debian Quality Assurance team
Debian QA team

- Goal: Improve the quality of Debian as a whole
- Not really a team (no strict membership), more like a central place to discuss and work on QA
- IRC: #debian-qa@irc.debian.org
- Mailing list: debian-qa@lists.debian.org
Debian QA team: Tasks

- Maintain infrastructure
- Run archive-wide checks and mass bug filings
- Take care of the dirty areas of Debian
Maintaining infrastructure
Infrastructure: mitigating the data hell

- Debian: aggregation of loosely-connected services
  - No Launchpad!

- Data everywhere
  A dozen of places to get interesting data

  **Tools required to gather data in a central place and expose it to the maintainers**
Overview of `nmap` source package

**General information**
- Latest version: 4.68-1
- Maintainer: LaMont Jones
- Conforms to: 3.7.2.2
- Priority: extra
- Section: net
- VCS: Git (browse)

**Available versions**
- Oldstable: 4.11-1
- Stable: 4.62-1
- Testing: 4.68-1
- Unstable: 4.68-1

**Source package**
- Files: .dsc .orig .diff

**Binary packages**
- nmap (27 builds: 0, 12, 2, 5, 6)

**Todo**
- Lintian reports 8 warnings about this package. You should make the package lintian clean getting rid of them.
- mentors.debian.net has version 4.76-1 of this package, you should consider sponsoring its upload.
- The package should be updated to follow the last version of Debian Policy (Standards-Version 3.8.2 instead of 3.7.2.2).
- The BTS contains patches fixing 1 bug, consider including or untagging it.

**Latest news RSS**
- [2009-02-16] nmap 4.68-1 MIGRATED to testing (Britney)
- [2008-08-01] Accepted 4.68-1 in unstable (low) (LaMont Jones)
- [2008-06-27] nmap 4.62-1 MIGRATED to testing (Britney)
- [2008-05-14] Accepted 4.62-1 in unstable (low) (LaMont Jones)
- [2008-04-25] nmap 4.53-3 MIGRATED to testing (Britney)
- [2008-04-04] Accepted 4.53-3 in unstable (low) (LaMont Jones)

**Bugs count**
- All bugs (graph): 29 (32)
- RC bugs: 0
- BTS bugs: 13 (14)
- M&W bugs: 12
- F&P bugs: 4 (6)

**PTS subscription**
- Subscribers count: 5
  - Subscribe
  - your email

**Other links**
- Changelog / Copyright
- Build: logs, more, exp, ports
- Lintian report (0, 8)
- Popcon stats

**Ubuntu ...**
- Version: 4.76-0ubuntu4
- Patch for version 4.76-0ubuntu4
- 13 open bugs

Source package-centric view

http://packages.qa.debian.org/package
# Developer Packages Overview (DDPO)

## Packages overview for Lucas Nussbaum

**main (8)**

<table>
<thead>
<tr>
<th>Source Name</th>
<th>Bugs</th>
<th>Version</th>
<th>Ubuntu</th>
<th>Excuses</th>
<th>Binary Package</th>
<th>Buildd</th>
<th>Debcheck St</th>
<th>Te</th>
<th>Un</th>
<th>Popcon</th>
<th>Watch Unstable</th>
<th>Exp</th>
<th>Section Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>developers-referencePTS Pool</td>
<td>65 (57)</td>
<td>3.3.8</td>
<td>3.4.0</td>
<td>3.4.3</td>
<td>-</td>
<td>3.4.2</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>1036 More</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>feed2mapPTS Pool</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>0.8.2</td>
<td>0.9.3.1</td>
<td>0.9.4.1</td>
<td>-</td>
<td>0.9.4.1</td>
<td>-</td>
<td>1</td>
<td>64 More</td>
<td>0.9.4</td>
<td>-</td>
</tr>
<tr>
<td>hpccPTS Pool</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1.3.1-1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>Build More</td>
<td>Te</td>
<td>Un</td>
</tr>
<tr>
<td>mpich2PTS Pool</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1.2.1-rc1-1</td>
<td>-</td>
<td>1.2-1-ubuntu1</td>
<td>-</td>
<td>1.2.1-rc1</td>
<td>1</td>
<td>2 More</td>
<td>1.2.1rc1</td>
</tr>
<tr>
<td>ruby-defaultsPTS Pool</td>
<td>8</td>
<td>-</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>1.8.2-1</td>
<td>4.2</td>
<td>-</td>
<td>4.2</td>
<td>1</td>
<td>Build More</td>
<td>20902 More</td>
<td>-</td>
</tr>
<tr>
<td>ruby-taglibPTS Pool</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.1-2</td>
<td>1.1-7</td>
<td>-</td>
<td>1.1-7</td>
<td>-</td>
<td>96 More</td>
<td>1.1</td>
<td>-</td>
</tr>
<tr>
<td>taktukPTS Pool</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.6.1-1</td>
<td>3.6.3-1</td>
<td>-</td>
<td>3.6.3-1</td>
<td>-</td>
<td>Build More</td>
<td>177 More</td>
<td>3.7beta2</td>
</tr>
<tr>
<td>websecPTS Pool</td>
<td>13</td>
<td>-</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>1.9.0-1</td>
<td>1.9.0-4</td>
<td>-</td>
<td>1.9.0-4-ubuntu3</td>
<td>-</td>
<td>1</td>
<td>82 More</td>
<td>-</td>
</tr>
</tbody>
</table>

### Developer-centric view

http://qa.debian.org/developer.php
Ultimate Debian Database (UDD)

➤ Gather everything into a single SQL DB
➤ Perfect tool for data-mining Debian

Currently imported in UDD:
Debian Sources and Packages, bugs, popcorn, testing migrations, upload history, orphaned packages, carnivore, lintian, debtags, translations, NEW queue, screenshots, DEHS, ldap, wanna-build, removals, Ubuntu Sources and Packages, Ubuntu bugs, Ubuntu popcorn

Possible questions you can answer with UDD:
➤ RC buggy packages in testing, sorted by popcorn?
➤ Packages for which the last 4 uploads were NMUs?
➤ Packages not maintained by official DDs?

http://udd.debian.org/
Archive-wide checks and Mass bug filings
Archive-wide checks and MBF

- Developers are volunteers:
  - Focus on interesting things
  - Manual testing is boring → not done

- Need automated tests

- Other advantage: treats all packages equally
  Niche packages are very important to some users
Archive rebuilds

- Rebuild all packages from source
  7 hours on 40 8-cores build nodes  (Thanks OpenOffice.Org)

- Detect packages that Fail To Build From Source (FTBFS)
  - Bugs in packages
  - Toolchain bugs
  - Failures caused by changes in other packages

- Ran every 2-3 weeks

- Scripts to analyze failures and file bugs semi-automatically
  (about 200 bugs filed per hour)

- Also used for test rebuilds with new compilers, linkers, ...
  → Valuable information for upstream

http://wiki.debian.org/qa.debian.org/ArchiveTesting
Debcheck

▶ Check (statically) that dependencies can be satisfied
▶ Not trivial: versioned dependencies, conflicts
▶ 2 versions:
  ▶ "Simple one", in PHP
    http://qa.debian.org/debcheck.php
  ▶ Better one: edos-debcheck (EDOS project)
    ▶ Can also work with RPMs
    ▶ http://edos.debian.net/

<table>
<thead>
<tr>
<th>Type of Issue</th>
<th>ARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ANY</td>
</tr>
<tr>
<td>Broken Relationships (main only)</td>
<td>1</td>
</tr>
<tr>
<td>Pre-Depends</td>
<td>656</td>
</tr>
<tr>
<td>Depends</td>
<td>423</td>
</tr>
<tr>
<td>Suggests</td>
<td>791</td>
</tr>
<tr>
<td>Half Broken Broken Relationships (main only)</td>
<td>0</td>
</tr>
<tr>
<td>Pre-Depends</td>
<td>3</td>
</tr>
<tr>
<td>Depends</td>
<td>775</td>
</tr>
<tr>
<td>Suggests</td>
<td>148</td>
</tr>
<tr>
<td>Suggests</td>
<td>158</td>
</tr>
</tbody>
</table>
Piuparts

- Testing package installation, upgrade and removal
- Find bugs in maintainer scripts
  (Shell) scripts executed during package installation/removal
- Developers don’t run it on their systems
  → Archive-wide setup

http://piuparts.debian.org
Lintian

- Static analysis of packages
- Usually run locally by the developer, before uploading
- Archive-wide setup for continuous testing
- Packages now rejected at upload time for some errors

http://lintian.debian.org
DEHS - Debian External Health Status

- Monitor upstream version of packages
- Detect when the Debian package is outdated
- HTML scraping + regular expressions configured in `debian/watch`

http://dehs.alioth.debian.org
Taking care of the dirty areas of Debian
Taking care of the dirty areas of Debian

Two complementary approaches:

- Focus on packages neglected by their maintainers
- Focus on maintainers neglecting their packages
Neglected packages

- Already orphaned:
  - Do minimalistic maintenance
  - Problem: > 500 orphaned packages

- Not (yet) orphaned:
  - Find them, orphan or remove them
  - Goal: *Put maintenance in the hands of people with time*
## Bapase: finding neglected packages

- Multi-criteria search for neglected packages
- Based on Ultimate Debian Database

<table>
<thead>
<tr>
<th>Package</th>
<th>Score</th>
<th>Action</th>
<th>O age</th>
<th>Testing</th>
<th>Migrate</th>
<th>Popcon</th>
<th>Whpp</th>
<th>RC Bugs</th>
<th>Last upload</th>
<th>NMUs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ivtools</td>
<td>124269</td>
<td>Should be removed (since 2008-07-11)</td>
<td>2122 (2002-10-15)</td>
<td>270</td>
<td>270</td>
<td>180</td>
<td>RFA</td>
<td>0</td>
<td>91 (2008-05-07) (Maint: 2008-08-24)</td>
<td>4</td>
<td>maintainer and possible adopter pinged, and removal proposed to maintainer</td>
</tr>
<tr>
<td>2 metamil</td>
<td>114643</td>
<td>Should be removed (O pkg) (since 2008-01-28)</td>
<td>1404 (2004-10-01)</td>
<td>0</td>
<td>0</td>
<td>3263</td>
<td>O</td>
<td>0</td>
<td>151 (2008-03-08)</td>
<td></td>
<td>still has revdeps, prop_rm filed on rdep.</td>
</tr>
<tr>
<td>3 electric</td>
<td>112643</td>
<td>Should be removed (O pkg) (since 2008-01-30)</td>
<td>1238 (2005-03-17)</td>
<td>0</td>
<td>0</td>
<td>415</td>
<td>O</td>
<td>0</td>
<td>202 (2008-01-17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 libstreamer-perl</td>
<td>103693</td>
<td>Should be orphaned (since 2008-02-06)</td>
<td>105 (2008-04-23)</td>
<td>0</td>
<td>0</td>
<td>47</td>
<td>ITA</td>
<td>0</td>
<td>92 (2008-05-06)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

http://udd.debian.org/bapase.cgi
Inactive maintainers

- Missing In Action (MIA) team
  - Find them, track them, orphan their packages
    Mostly based on reporting by users or fellow developers
    Echelon: records activity of DDs; Carnivore: tracks identities
  - Collaboration with the Account Managers:
    possible removal of their account
    (Unused accounts → possible security problems)
Open challenges: following Debian evolutions

- Co-maintenance

![Graph showing co-maintenance trends over time]
Open challenges: following Debian evolutions

Use of VCSes

![Graph showing the percentage of packages using different VCSes over time from 01/05 to 01/12. The graph indicates a trend of increasing usage of Git and decreasing usage of other VCSes.]

lucas@debian.org  Debian Quality Assurance
Open challenges: following Debian evolutions

Need to improve QA infrastructure
- Team-aware

- VCS-aware
  - Abstraction layer?
    
    *If I’ve learned anything, it’s that OSS projects can’t make a choice. And when you can’t make a choice, what do you do? You support all options! Yay! How do we support all options? An abstraction layer! Yay! Abstraction layers are fun to write! Yay! –– Linux Hater’s Blog*

- Standard workflows?
  - Keep track of sponsorship requests
  - Manage state of packages in VCS
Conclusion

Debian Quality Assurance:

- Mostly archive quality work
- Lots of tools and infrastructure developed within Debian
  - Evolutions needed to keep track of Debian evolutions
- What we do not do:
  - Focus on specific packages
  - Bug triaging
  - Manual testing to find bugs
    - We rely on you to find & file bugs

Join the QA team!

lucas@debian.org  Debian Quality Assurance