Debian Packaging Tutorial

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About this tutorial

- Goal: **tell you what you really need to know about Debian packaging**
  - Modify existing packages
  - Create your own packages
  - Interact with the Debian community
  - Become a Debian power-user
- Covers the most important points, but is not complete
  - You will need to read more documentation
- Most of the content also applies to Debian derivatives distributions
  - That includes Ubuntu

Outline

1. Introduction
2. Creating source packages
3. Building and testing packages
4. Practical session 1: modifying the grep package
5. Advanced packaging topics
6. Maintaining packages in Debian
7. Conclusion
8. Practical session 0: simple rebuild of dash
9. Practical session 2: packaging GNUjump
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Debian

- **GNU/Linux distribution**
- 1st major distro developed “openly in the spirit of GNU”
- **Non-commercial**, built collaboratively by over 1,000 volunteers
- 30,000 binary packages; 12 ports (inc. 2 non-Linux); 120 derivatives
- 3 main features:
  - **Quality** – culture of technical excellence
    We release when it’s ready
  - **Freedom** – devs and users bound by the *Social Contract*
    Promoting the culture of Free Software since 1993
  - **Independence** – no (single) company babysitting Debian
    And open decision-making process (*do-ocracy* + *democracy*)
- **Amateur** in the best sense: done for the love of it

The Deb package format

- One of the two most common packages format (with RPM)
- A very powerful and convenient way to distribute software to users
- `.deb` file: an `ar` archive

```
$ ar tv wget_1.12-2.1_i386.deb
rw-r--r-- 0/0      4 Sep  5 15:43 2010 debian-binary
rw-r--r-- 0/0   2403 Sep  5 15:43 2010 control.tar.gz
rw-r--r-- 0/0 751613 Sep  5 15:43 2010 data.tar.gz
```

  - `debian-binary`: version of the deb file format, `"2.0\n"`
  - `control.tar.gz`: metadata about the package
    `control, md5sums, (pre|post)(rm|inst), triggers, shlibs,...`
  - `data.tar.gz`: data files of the package
- You could create your `.deb` files manually
  `http://tldp.org/HOWTO/html_single/Debian-Binary-Package-Building-HOWTO/`
- But most people don't do it that way

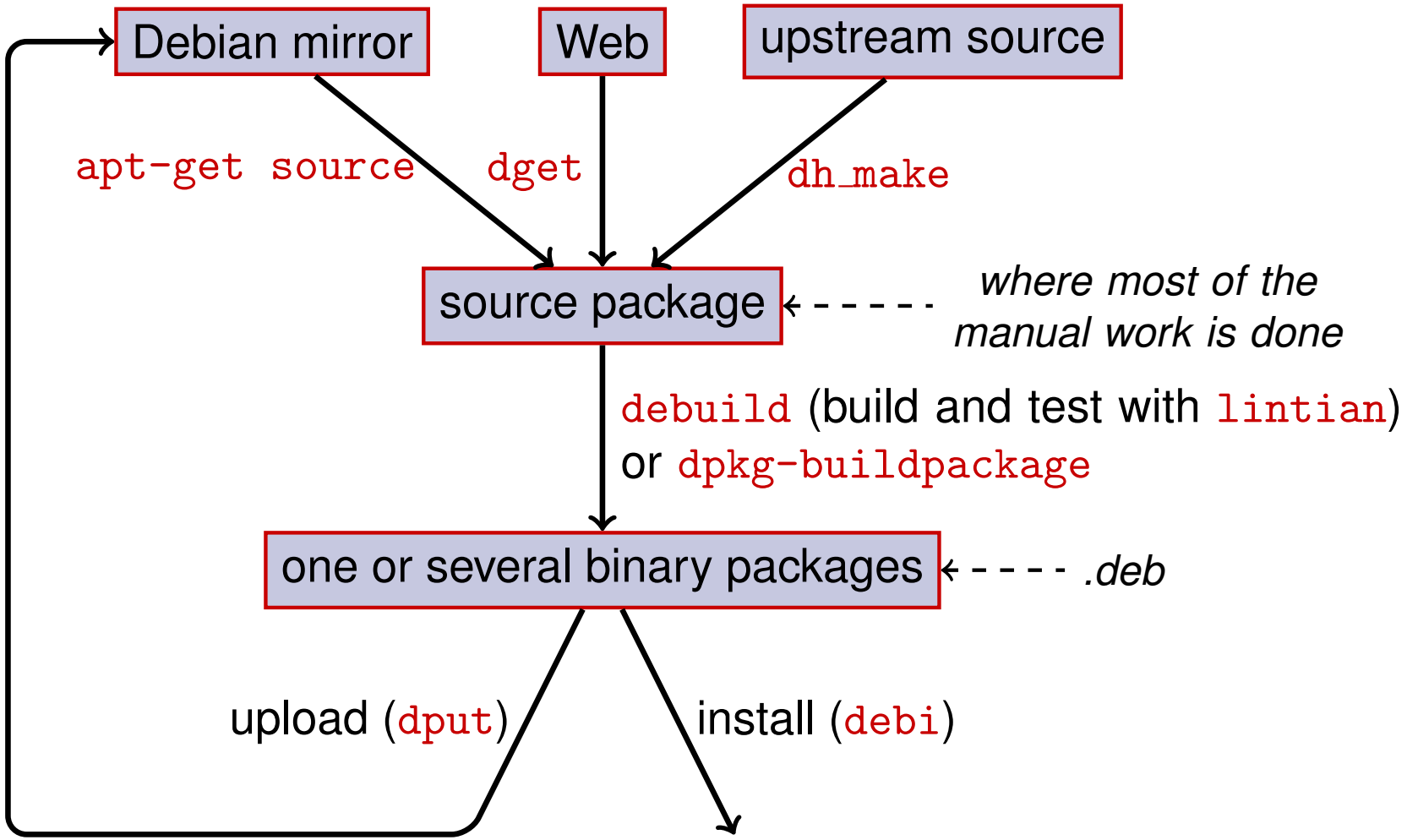
This tutorial: create Debian packages, the Debian way

Tools you will need

- A Debian (or Ubuntu) system (with root access)
- Some packages:
  - **build-essential**: has dependencies on the packages that will be assumed to be available on the developers' machine (no need to specify them in the `Build-Depends:` control field of your package)
    - includes a dependency on **dpkg-dev**, which contains basic Debian-specific tools to create packages
  - **devscripts**: contains many useful scripts for Debian maintainers

Many other tools will also be mentioned later, such as **debhelper**, **cdbs**, **quilt**, **pbuilder**, **sbuild**, **lintian**, **svn-buildpackage**, **git-buildpackage**, ...
Install them when you need them.

General packaging workflow



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Source package

- One source package can generate several binary packages
  e.g the `libtar` source generates the `libtar0` and `libtar-dev` binary packages
- Two kinds of packages: (if unsure, use non-native)
  - Native packages: normally for Debian specific software (*dpkg*, *apt*)
  - Non-native packages: software developed outside Debian
- Main file: `.dsc` (meta-data)
- Other files depending on the version of the source format
  - 1.0 – native: `package_version.tar.gz`
  - 1.0 – non-native:
    - `pkg_ver.orig.tar.gz` : upstream source
    - `pkg_debver.diff.gz` : patch to add Debian-specific changes
  - 3.0 (quilt):
    - `pkg_ver.orig.tar.gz` : upstream source
    - `pkg_debver.debian.tar.gz` : tarball with the Debian changes

(See `dpkg-source(1)` for exact details)

Source package example (wget_1.12-2.1.dsc)

```
Format: 3.0 (quilt)
Source: wget
Binary: wget
Architecture: any
Version: 1.12-2.1
Maintainer: Noel Kothe <noel@debian.org>
Homepage: http://www.gnu.org/software/wget/
Standards-Version: 3.8.4
Build-Depends: debhelper (>> 5.0.0), gettext, texinfo,
 libssl-dev (>= 0.9.8), dpatch, info2man
Checksums-Sha1:
 50d4ed2441e67[..]1ee0e94248 2464747 wget_1.12.orig.tar.gz
 d4c1c8bbe431d[..]dd7cef3611 48308 wget_1.12-2.1.debian.tar.gz
Checksums-Sha256:
 7578ed0974e12[..]dcba65b572 2464747 wget_1.12.orig.tar.gz
 1e9b0c4c00eae[..]89c402ad78 48308 wget_1.12-2.1.debian.tar.gz
Files:
 141461b9c04e4[..]9d1f2abf83 2464747 wget_1.12.orig.tar.gz
 e93123c934e3c[..]2f380278c2 48308 wget_1.12-2.1.debian.tar.gz
```

Retrieving an existing source package

- From the Debian archive:
  - `apt-get source` *`package`*
  - `apt-get source` *`package=version`*
  - `apt-get source` *`package/release`*

  (You need `deb-src` lines in `sources.list`)

- From the Internet:
  - `dget` *`url-to.dsc`*
  - `dget http://snapshot.debian.org/archive/debian-archive/20090802T004153Z/debian/dists/bo/main/source/web/wget_1.4.4-6.dsc`
    (`snapshot.d.o` provides all packages from Debian since 2005)

- From the (declared) version control system:
  - `debcheckout` *`package`*

- Once downloaded, extract with `dpkg-source -x` *`file.dsc`*

Creating a basic source package

- Download the upstream source
  (*upstream source* = the one from the software's original developers)
- Rename to `<source_package>_<upstream_version>.orig.tar.gz`
  (example: `simgrid_3.6.orig.tar.gz`)
- Untar it
- `cd upstream_source && dh_make` (from the **dh-make** package)
- There are some alternatives to `dh_make` for specific sets of packages:
  dh-make-perl, **dh-make-php**, ...
- `debian/` directory created, with a lot of files in it

Files in debian/

All the packaging work should be made by modifying files in `debian/`

- Main files:
  - **control** – meta-data about the package (dependencies, etc)
  - **rules** – specifies how to build the package
  - **copyright** – copyright information for the package
  - **changelog** – history of the Debian package
- Other files:
  - compat
  - watch
  - dh_install* targets
    *.dirs, *.docs, *.manpages, . . .
  - maintainer scripts
    *.postinst, *.prerm, . . .
  - source/format
  - patches/ – if you need to modify the upstream sources
- Several files use a format based on RFC 822 (mail headers)

debian/changelog

- Lists the Debian packaging changes
- Edited manually or with `dch`
- Special format to automatically close Debian or Ubuntu bugs
  Debian: `Closes: #595268`; Ubuntu: `LP: #616929`
- Installed as `/usr/share/doc/`*`package`*`/changelog.Debian.gz`

```
mpich2 (1.2.1.1-5) unstable; urgency=low

  * Use /usr/bin/python instead of /usr/bin/python2.5. Allow
    to drop dependency on python2.5.  Closes: #595268
  * Make /usr/bin/mpdroot setuid. This is the default after
    the installation of mpich2 from source, too. LP: #616929
    + Add corresponding lintian override.

 -- Lucas Nussbaum <lucas@debian.org>  Wed, 15 Sep 2010 18:13:44 +0200
```

debian/copyright

- Copyright and license information for the source and the packaging
- Traditionally written as a text file
- New machine-readable format: `http://dep.debian.net/deps/dep5/`

```
Format: <VERSIONED_FORMAT_URL>
Upstream-Name: X Solitaire
Source: ftp://ftp.example.com/pub/games

Files: *
Copyright: Copyright 1998 John Doe <jdoe@example.com>
License: GPL-2+
 This program is free software; you can redistribute it
 [...]
 .
 On Debian systems, the full text of the GNU General Public
 License version 2 can be found in the file
 '/usr/share/common-licenses/GPL-2'.

Files: debian/*
Copyright: Copyright 1998 Jane Smith <jsmith@example.net>
License:
 [LICENSE TEXT]
```

debian/control

- Package metadata
  - For the source package itself
  - For each binary package built from this source
- Package name, section, priority, maintainer, uploaders, build-dependencies, dependencies, description, homepage, ...
- Documentation: Debian Policy chapter 5
  `http://www.debian.org/doc/debian-policy/ch-controlfields.html`

```
Source: wget
Section: web
Priority: important
Maintainer: Noel Kothe <noel@debian.org>
Build-Depends: debhelper (>> 5.0.0), gettext, texinfo,
 libssl-dev (>= 0.9.8), dpatch, info2man
Standards-Version: 3.8.4
Homepage: http://www.gnu.org/software/wget/

Package: wget
Architecture: any
Depends: ${shlibs:Depends}, ${misc:Depends}
Description: retrieves files from the web
 Wget is a network utility to retrieve files from the Web
```

Architecture: all or any

Two kinds of binary packages:

- Packages with different contents on each Debian architecture
  - Example: C program
  - `Architecture: any` in `debian/control`
    - Or, if it only works on a subset of architectures: `Architecture: amd64 i386 ia64 hurd-i386`
  - buildd.debian.org: builds all the other architectures for you on upload
  - Named *package*_*version*_*architecture*.deb

- Packages with the same content on all architectures
  - Example: Perl library
  - `Architecture: all` in `debian/control`
  - Named *package*_*version*_all.deb

A source package can generate a mix of `Architecture: any` and `Architecture: all` binary packages

debian/rules

- Makefile
- Interface used to build Debian packages
- Documented in Debian Policy, chapter 4.8
  `http://www.debian.org/doc/debian-policy/ch-source.html#s-debianrules`
- Five required targets:
  - `build`: should perform all the configuration and compilation
  - `binary, binary-arch, binary-indep`: build the binary packages
    - `dpkg-buildpackage` will call `binary` to build all the packages, or `binary-arch` to build only the `Architecture: any` packages
  - `clean`: clean up the source directory

Packaging helpers – debhelper

- You could write shell code in `debian/rules` directly
  - See the `adduser` package for example
- Better practice (used by most packages): use a *Packaging helper*
- Most popular one: **debhelper** (used by 98% of packages)
- Goals:
  - Factor the common tasks in standard tools used by all packages
  - Fix some packaging bugs once for all packages

  dh_installdirs, dh_installchangelogs, dh_installdocs, dh_installexamples, dh_install, dh_installdebconf, dh_installinit, dh_link, dh_strip, dh_compress, dh_fixperms, dh_perl, dh_makeshlibs, dh_installdeb, dh_shlibdeps, dh_gencontrol, dh_md5sums, dh_builddeb, ...
  - Called from `debian/rules`
  - Configurable using command parameters or files in `debian/`

  `dirs`, *`package`*`.docs`, *`package`*`.examples`, *`package`*`.install`, *`package`*`.manpages`, ...
- Third-party helpers for sets of packages: **python-support**, **dh_ocaml**, ...
- Gotcha: `debian/compat`: Debhelper compatibility version (use "7")

debian/rules using debhelper (1/2)

```
#!/usr/bin/make -f

# Uncomment this to turn on verbose mode.
#export DH_VERBOSE=1

build:
        $(MAKE)
        #docbook-to-man debian/packagename.sgml > packagename.1

clean:
        dh_testdir
        dh_testroot
        rm -f build-stamp configure-stamp
        $(MAKE) clean
        dh_clean

install: build
        dh_testdir
        dh_testroot
        dh_clean -k
        dh_installdirs
        # Add here commands to install the package into debian/package
        $(MAKE) DESTDIR=$(CURDIR)/debian/packagename install
```

debian/rules using debhelper (2/2)

```
# Build architecture-independent files here.
binary-indep: build install

# Build architecture-dependent files here.
binary-arch: build install
        dh_testdir
        dh_testroot
        dh_installchangelogs
        dh_installdocs
        dh_installexamples
        dh_install
        dh_installman
        dh_link
        dh_strip
        dh_compress
        dh_fixperms
        dh_installdeb
        dh_shlibdeps
        dh_gencontrol
        dh_md5sums
        dh_builddeb

binary: binary-indep binary-arch
.PHONY: build clean binary-indep binary-arch binary install configure
```

CDBS

- With debhelper, still a lot of redundancy between packages
- Second-level helpers that factor common functionality
  - Building with `./configure && make && make install` or CMake
  - Support for Perl, Python, Ruby, GNOME, KDE, Java, Haskell, ...
- CDBS:
  - Introduced in 2005, based on advanced *GNU make* magic
  - Documentation: `/usr/share/doc/cdbs/`
  - But some people hate it:
    - Sometimes difficult to customize package builds: "*twisty maze of makefiles and environment variables*"
    - Slower than plain debhelper (many useless calls to `dh_*`)

```
#!/usr/bin/make -f
include /usr/share/cdbs/1/rules/debhelper.mk
include /usr/share/cdbs/1/class/autotools.mk

# add an action after the build
build/mypackage::
    /bin/bash debian/scripts/foo.sh
```

Dh (aka Debhelper 7, or dh7)

- Introduced in 2008 as a *CDBS killer*
- **dh** command that calls `dh_*`
- Simple *debian/rules*, listing only overrides
- Easier to customize than CDBS
- Doc: manpages (`debhelper(7)`, `dh(1)`) + slides from DebConf9 talk
  `http://kitenet.net/~joey/talks/debhelper/debhelper-slides.pdf`

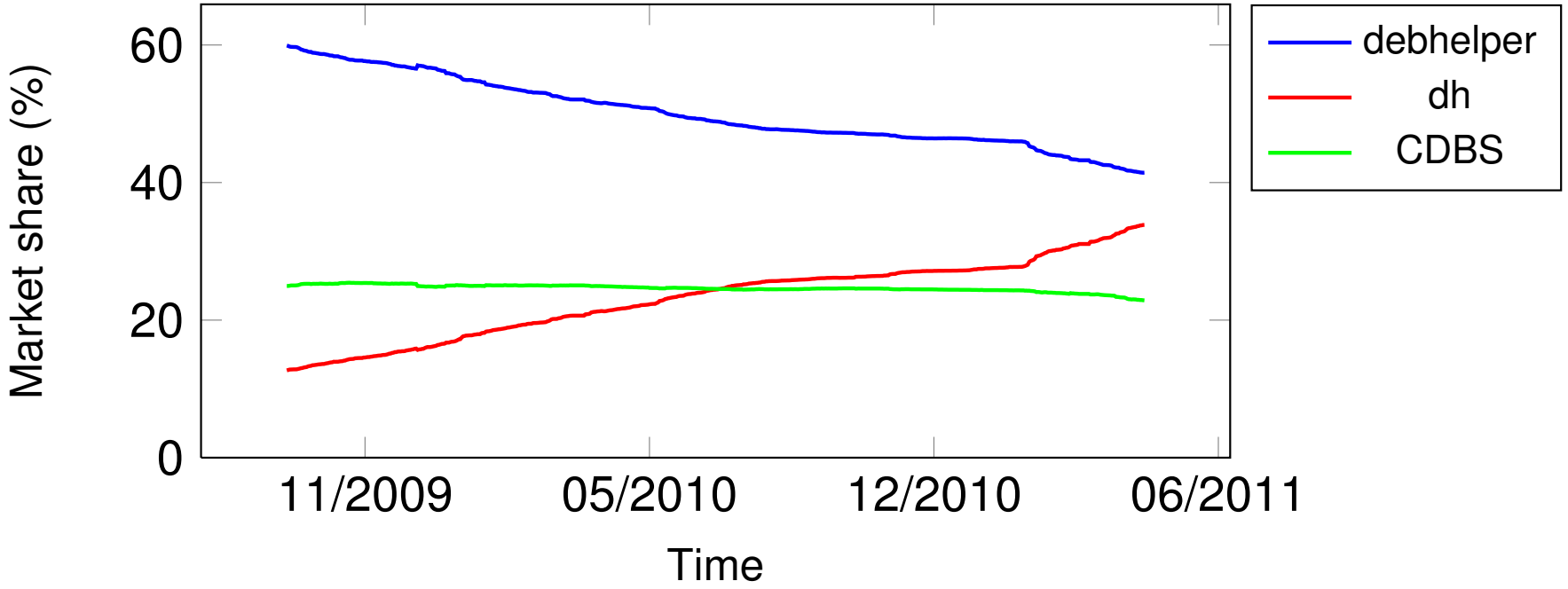
```
#!/usr/bin/make -f
%:
    dh $@

override_dh_auto_configure:
     dh_auto_configure -- --with-kitchen-sink

override_dh_auto_build:
     make world
```

Classic debhelper vs CDBS vs dh

- Mind shares:
  Classic debhelper: 41% CDBS: 23% dh: 34%
- Which one should I learn?
  - Probably a bit of all of them
  - You need to know debhelper to use dh and CDBS
  - You might have to modify CDBS packages
- Which one should I use for a new package?
  - **dh** (only solution with an increasing mind share)



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Building packages

- `apt-get build-dep mypackage`
  Installs the *build-dependencies* (for a package in the archive)
- `debuild`: build, test with `lintian`, sign with GPG
- Also possible to call `dpkg-buildpackage` directly
  - Usually with `dpkg-buildpackage -us -uc`
- It is better to build packages in a clean & minimal environment
  - `pbuilder` – helper to build packages in a *chroot*
    Good documentation: `https://wiki.ubuntu.com/PbuilderHowto`
    (optimization: `cowbuilder ccache distcc`)
  - `schroot` and `sbuild`: used on the Debian build daemons
    (not as simple as `pbuilder`, but allows LVM snapshots
    see: `https://help.ubuntu.com/community/SbuildLVMHowto`)
- Generate `.deb` files and a `.changes` file
  - `.changes`: describes what was built; used to upload the package

Installing and testing packages

- Install the package locally: `debi` (will use `.changes` to know what to install)
- List the content of the package: `debc ../mypackage<TAB>.changes`
- Compare the package with a previous version:
  `debdiff ../mypackage_1_*.changes ../mypackage_2_*.changes`
  or to compare the sources:
  `debdiff ../mypackage_1_*.dsc ../mypackage_2_*.dsc`
- Check the package with `lintian` (static analyzer):
  `lintian ../mypackage<TAB>.changes`
  `lintian -i`: gives more information about the errors
- Upload the package to Debian (`dput`) (needs configuration)
- Manage a private Debian archive with `reprepro`
  Documentation: `http://mirrorer.alioth.debian.org/`

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Practical session 1: modifying the grep package

1. Go to `http://ftp.debian.org/debian/pool/main/g/grep/` and download version 2.6.3-3 of the package
2. Look at the files in `debian/`.
   - How many binary packages are generated by this source package?
   - Which packaging helper does this package use?
3. Build the package
4. We are now going to modify the package. Add a changelog entry and increase the version number.
5. Now disable perl-regexp support (it is a `./configure` option)
6. Rebuild the package
7. Compare the original and the new package with debdiff
8. Install the newly built package
9. Cry if you messed up ;)

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Modifying the upstream source

Often needed:

- Fix bugs or add customizations that are specific to Debian
- Backport fixes from a newer upstream release

Several methods to do it:

- Modifying the files directly
  - Simple
  - But no way to track and document the changes
- Using patch systems
  - Eases contributing your changes to upstream
  - Helps sharing the fixes with derivatives
  - Gives more exposure to the changes
    `http://patch-tracker.debian.org/`

Patch systems

- Principle: changes are stored as patches in `debian/patches/`
- Applied and unapplied during build
- Past: several implementations – *simple-patchsys* (*cdbs*), *dpatch*, ***quilt***
  - Each supports two `debian/rules` targets:
    - `debian/rules patch`: apply all patches
    - `debian/rules unpatch`: de-apply all patches
  - More documentation: `http://wiki.debian.org/debian/patches`
- **New source package format with built-in patch system: 3.0 (quilt)**
  - Recommended solution
  - You need to learn *quilt*
    `http://pkg-perl.alioth.debian.org/howto/quilt.html`

Documentation of patches

- Standard headers at the beginning of the patch
- Documented in DEP-3 - Patch Tagging Guidelines
  http://dep.debian.net/deps/dep3/

```
Description: Fix widget frobnication speeds
 Frobnicating widgets too quickly tended to cause explosions.
Forwarded: http://lists.example.com/2010/03/1234.html
Author: John Doe <johndoe-guest@users.alioth.debian.org>
Applied-Upstream: 1.2, http://bzr.foo.com/frobnicator/revision/123
Last-Update: 2010-03-29

--- a/src/widgets.c
+++ b/src/widgets.c
@@ -101,9 +101,6 @@ struct {
```

- All patches are published on http://patch-tracker.debian.org/

Doing things during installation and removal

- Decompressing the package is sometimes not enough
- Create/remove system users, start/stop services, manage *alternatives*
- Done in *maintainer scripts*
  `preinst, postinst, prerm, postrm`
  - Snippets for common actions can be generated by debhelper
- Documentation:
  - Debian Policy Manual, chapter 6
    `http://www.debian.org/doc/debian-policy/ch-maintainerscripts.html`
  - Debian Developer's Reference, chapter 6.4
    `http://www.debian.org/doc/developers-reference/best-pkging-practices.html`
  - `http://people.debian.org/~srivasta/MaintainerScripts.html`
- Prompting the user
  - Must be done with **debconf**
  - Documentation: `debconf-devel(7)` (`debconf-doc` package)

Monitoring upstream versions

- Specify where to look in `debian/watch` (see `uscan(1)`)

```
version=3

http://tmrc.mit.edu/mirror/twisted/Twisted/(\d\.\d)/ \
  Twisted-([\d\.]*)\.tar\.bz2
```

- Debian infrastructure that makes use of `debian/watch`:
  Debian External Health Status
  `http://dehs.alioth.debian.org/`
- Maintainer warned by emails sent to the Package Tracking System
  `http://packages.qa.debian.org/`
- `uscan`: run a manual check
- `uupdate`: try to update your package to the latest upstream version

Packaging with a VCS (SVN, Git, etc.)

- Several tools to help manage branches and tags for your packaging work: `svn-buildpackage`, `git-buildpackage`
- Example: `git-buildpackage`
  - `upstream` branch to track upstream with `upstream/`*`version`* tags
  - `master` branch tracks the Debian package
  - `debian/`*`version`* tags for each upload
  - `pristine-tar` branch to be able to rebuild the upstream tarball
- `Vcs-*` fields in `debian/control` to locate the repository
  - `http://wiki.debian.org/Alioth/Git`
  - `http://wiki.debian.org/Alioth/Svn`

```
Vcs-Browser: http://git.debian.org/?p=devscripts/devscripts.git
Vcs-Git: git://git.debian.org/devscripts/devscripts.git

Vcs-Browser: http://svn.debian.org/viewsvn/pkg-perl/trunk/libwww-perl/
Vcs-Svn: svn://svn.debian.org/pkg-perl/trunk/libwww-perl
```

- VCS-agnostic interface: `debcheckout`, `debcommit`, `debrelease`
  - `debcheckout grep` → checks out the source package from Git

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Several ways to contribute to Debian

- **Worst** way to contribute:
  1. Package your own application
  2. Get it into Debian
  3. Disappear
- Adopt existing unmaintained packages (*orphaned packages*)
  - Many unmaintained packages in Debian
  - Including some that you use daily!
- Get involved in packaging teams
  - Many teams that focus on set of packages, and need help
  - List available at `http://wiki.debian.org/Teams`
  - An excellent way to learn from more experienced contributors
- Bring new software to Debian
  - Only if it's interesting/useful enough, please
  - Are there alternatives already packaged in Debian?

More interested in Ubuntu?

- Ubuntu mainly manages the divergence with Debian
- No real focus on specific packages
  Instead, collaboration with Debian teams
- Usually recommend uploading new packages to Debian first
  `https://wiki.ubuntu.com/UbuntuDevelopment/NewPackages`
- Possibly a better plan:
  - Get involved in a Debian team and act as a bridge with Ubuntu
  - Help reduce divergence, triage bugs in Launchpad
  - Many Debian tools can help:
    - Ubuntu column on the Developer's packages overview
    - Ubuntu box on the Package Tracking System
    - Receive launchpad bugmail via the PTS

Adopting orphaned packages

- Full list: `http://www.debian.org/devel/wnpp/`
- Installed on your machine: `wnpp-alert`
- Different states:
  - **O**rphaned: the package is unmaintained
    Feel free to adopt it
  - **RFA**: **R**equest **F**or **A**dopter
    Maintainer looking for adopter, but continues work in the meantime
    Feel free to adopt it. A mail to the current maintainer is polite
  - **ITA**: **I**ntent **T**o **A**dopt
    Someone intends to adopt the package
    You could propose your help!
  - **RFH**: **R**equest **F**or **H**elp
    The maintainer is looking for help
- Some unmaintained packages not detected → not orphaned yet
- When in doubt, ask `debian-qa@lists.debian.org`
  or `#debian-qa` on `irc.debian.org`

Getting your package in Debian

- You do not need any official status to get your package into Debian
  1. Prepare a source package
  2. Find a Debian Developer that will sponsor your package
- Official status (when you are already experienced):
  - **Debian Maintainer (DM):**
    Permission to upload your own packages
    See `http://wiki.debian.org/DebianMaintainer`
  - **Debian Developer (DD):**
    Debian project members; can vote and upload any package

Where to find help?

Help you will need:

- Advice and answers to your questions, code reviews
- Sponsorship for your uploads, once your package is ready

You can get help from:

- Other members of a packaging team: the best solution
  - They know the specifics of your package
  - You can become a member of the team
  - See `http://wiki.debian.org/Teams`
- The Debian Mentors group (if your package doesn't fit in a team)
  - `http://wiki.debian.org/DebianMentorsFaq`
  - Mailing list: `debian-mentors@lists.debian.org`
    (also a good way to learn by accident)
  - IRC: `#debian-mentors` on `irc.debian.org`
  - `http://mentors.debian.net/`

Official documentation

- Debian Developers' Corner
  `http://www.debian.org/devel/`
  Links to many resources about Debian development

- Debian New Maintainers' Guide
  `http://www.debian.org/doc/maint-guide/`
  An introduction to Debian packaging, but could use an update

- Debian Developer's Reference
  `http://www.debian.org/doc/developers-reference/`
  Mostly about Debian procedures, but also some best packaging practices (part 6)

- Debian Policy
  `http://www.debian.org/doc/debian-policy/`
  - All the requirements that every package must satisfy
  - Specific policies for Perl, Java, Python, ...

- Ubuntu Packaging Guide
  `https://wiki.ubuntu.com/PackagingGuide`

Debian dashboards for maintainers

- **Source package centric**: Package Tracking System (PTS)
  `http://packages.qa.debian.org/dpkg`
- **Maintainer/team centric**: Developer's Packages Overview (DDPO)
  `http://qa.debian.org/developer.php?login=pkg-ruby-extras-maintainers@lists.alioth.debian.org`

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4. Practical session 1: modifying the grep package
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7. Conclusion
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10. Practical session 3: packaging a Java library

Conclusion

- You now have a full overview of Debian packaging
- But you will need to read more documentation
- Best practices have evolved over the years
  - If not sure, use the **dh** packaging helper, and the **3.0 (quilt)** format
- Things that were not covered in this tutorial:
  - UCF – manage user changes to configuration files when upgrading
  - dpkg triggers – group similar maintainer scripts actions together
  - Debian development organization:
    - Bug Tracking System (BTS)
    - Suites: stable, testing, unstable, experimental, security, *-updates, backports, . . .
    - Debian Blends – subsets of Debian targeting specific groups

Feedback: **lucas@debian.org**

Legal stuff

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Latest version & source code

- Latest version:
  `http://git.debian.org/?p=users/lucas/packaging-tutorial.git;a=blob_plain;f=packaging-tutorial.pdf;hb=refs/heads/pdf`
- Contribute:
  `git clone git://git.debian.org/~lucas/packaging-tutorial.git`
  Or over HTTP:
  `http://git.debian.org/?p=users/lucas/packaging-tutorial.git`
- Feedback: `lucas@debian.org`

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Practical session 0: simple rebuild of dash

1. Install build-essential debhelper devscripts
2. Create a working directory, and get in it
3. Grab the `dash` source package
4. Build the package
5. Check that it worked

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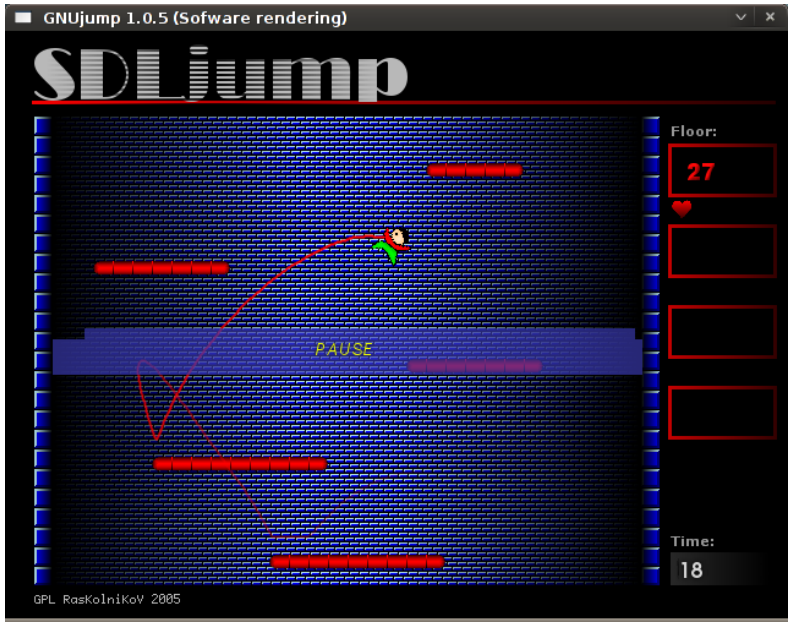
Practical session 2: packaging GNUjump

1. Download GNUjump 1.0.6 from
   `http://ftp.gnu.org/gnu/gnujump/1.0.6/gnujump-1.0.6.tar.gz`

2. Create a Debian package for it
   - Install build-dependencies so that you can build the package
   - Get a basic working package
   - Finish filling `debian/control` and other files

3. Enjoy



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Practical session 3: packaging a Java library

1. Take a quick look at some documentation about Java packaging:
   - http://wiki.debian.org/Java
   - http://wiki.debian.org/Java/Packaging
   - http://www.debian.org/doc/packaging-manuals/java-policy/
   - http://pkg-java.alioth.debian.org/docs/tutorial.html
   - Paper and slides from a Debconf10 talk about javahelper:
     http://pkg-java.alioth.debian.org/docs/debconf10-javahelper-paper.pdf
     http://pkg-java.alioth.debian.org/docs/debconf10-javahelper-slides.pdf
2. Download IRClib from http://moepii.sourceforge.net/
3. Package it