Debian Packaging

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Overview

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  - The sid dilemma

Binary Packages

Every `.deb` is actually an `ar` archive, containing `data.tar.gz` (files for the filesystem), `control.tar.gz` (maintainer scripts and other metadata), and `debian-binary` (containing the packaging version, currently 2.0).
You can manually create or manipulate Debian packages using standard Unix tools – one of the advantages of the format. Far better, though, is to use the tools designed for the purpose...

- `dpkg --info x.deb` – Package metadata
- `dpkg --contents x.deb` – File listing
- `dpkg --unpack x.deb` – Extract the package, but don't run the configure scripts
- `dpkg --install x.deb` – Extract, configure, etc
- `dpkg --help` – Lots and lots and lots of options

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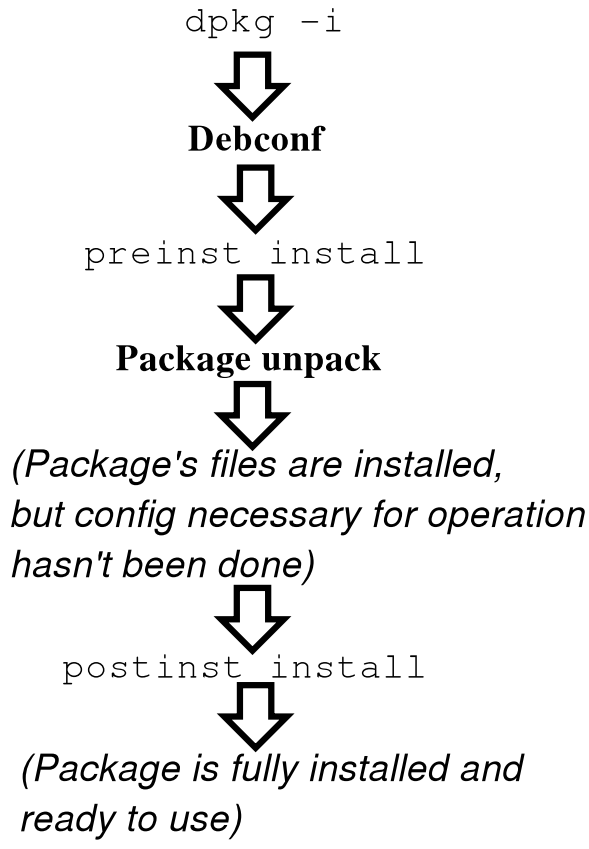
- `Architecture:` what CPU the package is built for.
- `Depends, Recommends, Suggests, Replaces, Conflicts, Enhances:` Fields describing various relationships with other packages.

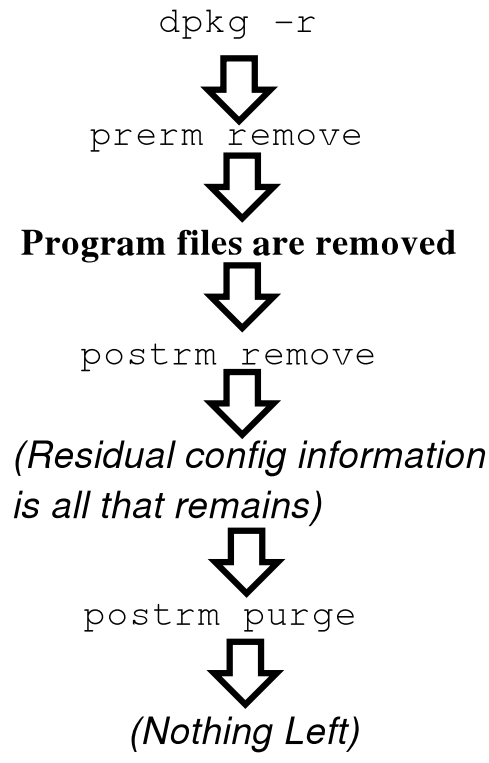
Maintainer Scripts

The package installation and removal scripts. Typically written in Bourne Shell or Perl, they perform any required configuration and deconfiguration on package installation and removal. The four standard scripts are `preinst`, `postinst`, `prerm`, and `postrm`. There is also a debconf pre-installation script, called `config`, which is supposed to ask the user all sorts of questions, whose answers are used in the other maintainer scripts.

Installation Flow

(See also Chapter 6 of Debian Policy)





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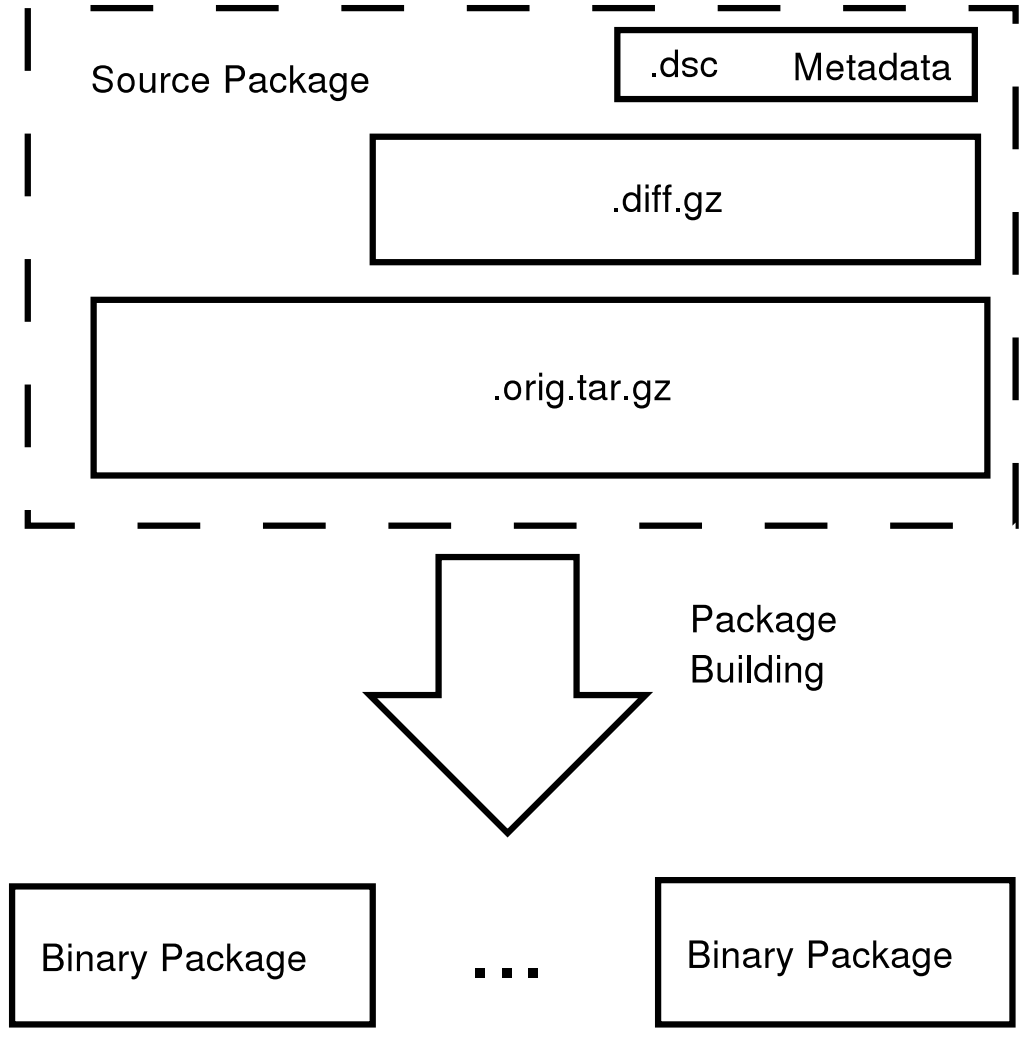
- “Native” packages have no orig and diff split, but simply put everything into a single tarball. Do not use this package format for most packages.

A Package Diagram



A source package unpacked

Most of the changes in a "Debianised" source package are localised in the `debian` directory. This directory contains the files which control both how the package gets built, what the binary packages are called, and the maintainer scripts used during binary package installation.

Other changes are often needed to source packages, to make them policy conformant or to fix bugs, but these should be minimised by passing changes upstream for integration.

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- `clean` returns the package to it's original (pre-build) state.

debian/control

This file describes the source package and all binary packages, including their section, architecture, and build and installation dependencies and conflicts.

The .changes file

This is an important file, mainly used for the upload stage of package development. It describes the changes represented by a given version of a package – the package affected, files supplied, version, bugs closed, the maintainer, the uploader, and so on. Primarily used by the upload queue processing software, but also useful as a summary of ongoing development.

Building a package

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A security note: the `fakeroot` program (from the `fakeroot` package) can be used to simulate operations requiring root privileges.

Helpers and their Usefulness

The most commonly used build help system is `debhelper`, in the package of the same name and documented in `debhelper`(7) and the great many `dh_*` commands available.

Each `dh_` script performs a particular small, well defined action, such as “install files related to init scripts” and “create defined symlinks”. You can assemble a list of appropriate `dh_` scripts to suit your particular package.

Config files for debhelper scripts are kept in the `debian/` directory, and their use is described in the relevant `dh_` manpage.

Automatic Packaging

`dh_make` (package: `dh-make`) is often used as an initial packaging tool. It creates a `debian/` directory full of useful examples and almost-ready-to-go scripts. It is an excellent starting point for most debianisation efforts.

`dh-make-perl` and `dh-make-php` are `dh_make` alternatives tuned for the particular requirements of packaging Perl modules and PEAR/PECL modules, respectively.

More Advanced Helpers

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And probably several others I've forgotten or don't know about.

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- `cvs-buildpackage` – Pulls a debian release out of CVS and automatically builds it. There are also analogous `svn-buildpackage` and `tla-buildpackage` scripts.

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  2. Copy the files in manually, either directly or via `debian/tmp`.

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- Development package, usually named `lib[name]-dev`, with a static version of the library, headers, development manpages, and a `.so` symlink.

Patch Management

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- Tally Ho!

The sid dilemma

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`pbuilder` to the rescue! Takes a source package description and runs the build process in a pre-built chroot of whatever release you wish to target.

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- Build your package in the chroot: `pbuilder build --basetgz /var/chroots/woody.tgz mypackage_1.1-1.dsc --buildresult ‘pwd‘`
- Periodically, you should update your chroot (especially important when building for sid): `pbuilder update --basetgz /var/chroots/woody.tgz`

Packages of Interest

Documentation: `maint-guide`, `developers-reference`, `debian-policy`, `build-essential`

debian/rules helpers: `debhelper`, `dpatch`, `cbs`, `cdbs`

Build-time helpers: `devscripts`, `dpkg-dev`, `{cvs,svn,tla}-buildpackage`, `pbuilder`, `fakeroot`

Packaging templates: `dh-make`, `dh-make-perl`, `dh-make-php`

Quality Checks: `lintian`, `linda`

Acknowledgements

- “If I have packaged farther, it is because I have hacked on the shoulders of giants.”
- Brown Brothers, for a very nice Port to sip while preparing slides.
- Meat Loaf, for the best possible hacking music.
- My employer for letting my hack on both Debian and these slides on company time.