

Tutorial:

**Functional Testing
of Debian Packages**

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introduction

automated tests
are great and we
need more of it



automated tests
don't replace all
manual testing



topics

- history
- specs
- tools
- functional tests
by example





history

autodebtest (0.5.0) unstable; urgency=low

- Initial release [...].

-- Ian Jackson <iwj@...> Fri, **20 Jan 2006** ...



Title: autopkgtest -
automatic as-installed package testing
DEP: 8
State: DRAFT
Date: **2012-06-25**
URL: <http://dep.debian.net/deps/dep8>
*(kind of; actually points to the
autopkgtest git repo)*



Title: autopkgtest -
automatic as-installed package testing

Abstract:

Establish a **standard interface** to define and run "as-installed" **tests of packages**, i.e. the testing of packages in a context as close as possible to a Debian system where the **packages subject to testing are properly installed.**



```
( that is great, someone )  
( should run that on the )  
.o0( whole archive ... )
```



Debian Continuous Integration
comes alive in January 2014

mid-2014: 2 GSOC projects


+ lots of hacking time ...



News

 ruby-parallel 1.9.0-1 FAILED on unstable/amd64 (previously passed)
2017-03-12 21:11:03 UTC | **15 hour(s) ago**


 libcoap 4.1.2-1 PASSED on unstable/amd64
2017-03-12 17:15:11 UTC | **19 hour(s) ago**

 grr 3.1.0.2+dfsg-2 PASSED on unstable/amd64
2017-03-12 16:54:07 UTC | **19 hour(s) ago**

 akonadi 4:16.04.3-4 PASSED on unstable/amd64
2017-03-12 17:08:44 UTC | **19 hour(s) ago**

 jekyll 3.1.6+dfsg-3 PASSED on unstable/amd64
2017-03-12 14:16:04 UTC | **22 hour(s) ago**

 ruby-handlebars-assets 2:0.23.1-1 PASSED on unstable/amd64
2017-03-11 20:11:59 UTC | **1 day(s) ago**

 ruby-handlebars-assets 2:0.23.1-1 FAILED on unstable/amd64 (previously passed)

Packages

[3](#) [4](#) [a](#) [b](#) [c](#) [d](#) [e](#) [f](#) [g](#) [h](#) [i](#) [j](#) [k](#) [l](#) [lib3](#)
[liba](#) [libb](#) [libc](#) [libd](#) [libe](#) [libf](#) [libg](#) [libh](#) [libi](#) [libj](#) [libk](#)
[libl](#) [libm](#) [libn](#) [libo](#) [libp](#) [libq](#) [libr](#) [libs](#) [libt](#) [libu](#) [libv](#)
[libw](#) [libx](#) [liby](#) [libz](#) [m](#) [n](#) [o](#) [p](#) [q](#) [r](#) [s](#) [t](#) [u](#)
[v](#) [w](#) [x](#) [y](#) [z](#)

<https://ci.debian.net/>

Recent test runs

✘ unity8 on zesty/armhf

Triggers: ubuntu-system-
settings/0.4+17.04.20170301-0ubuntu1

✘ unity8 on zesty/armhf

Triggers: qtmir/0.5.1+17.04.20170307-0ubuntu1

✔ blktp-dkms on xenial/ppc64el

Triggers: linux-meta-hwe/4.8.0.42.13 blktp-
dkms/2.0.93-0.7ubuntu2~16.04.1

✔ dm-writeboost on xenial/ppc64el

Triggers: linux-meta-hwe/4.8.0.42.13
dm-writeboost/2.1.1-1ubuntu1

✘ broadcom-sta on xenial/armhf

Triggers: linux-meta-hwe/4.8.0.42.13 broadcom-
sta/6.30.223.271-3~16.04.1

✔ blktp-dkms on xenial/armhf

Triggers: linux-meta-hwe/4.8.0.42.13 blktp-
dkms/2.0.93-0.7ubuntu2~16.04.1

✔ broadcom-sta on xenial/i386

Triggers: linux-meta-hwe/4.8.0.42.13 broadcom-
sta/6.30.223.271-3~16.04.1

✘ broadcom-sta on xenial/ppc64el

Triggers: linux-meta-hwe/4.8.0.42.13 broadcom-

Package Index

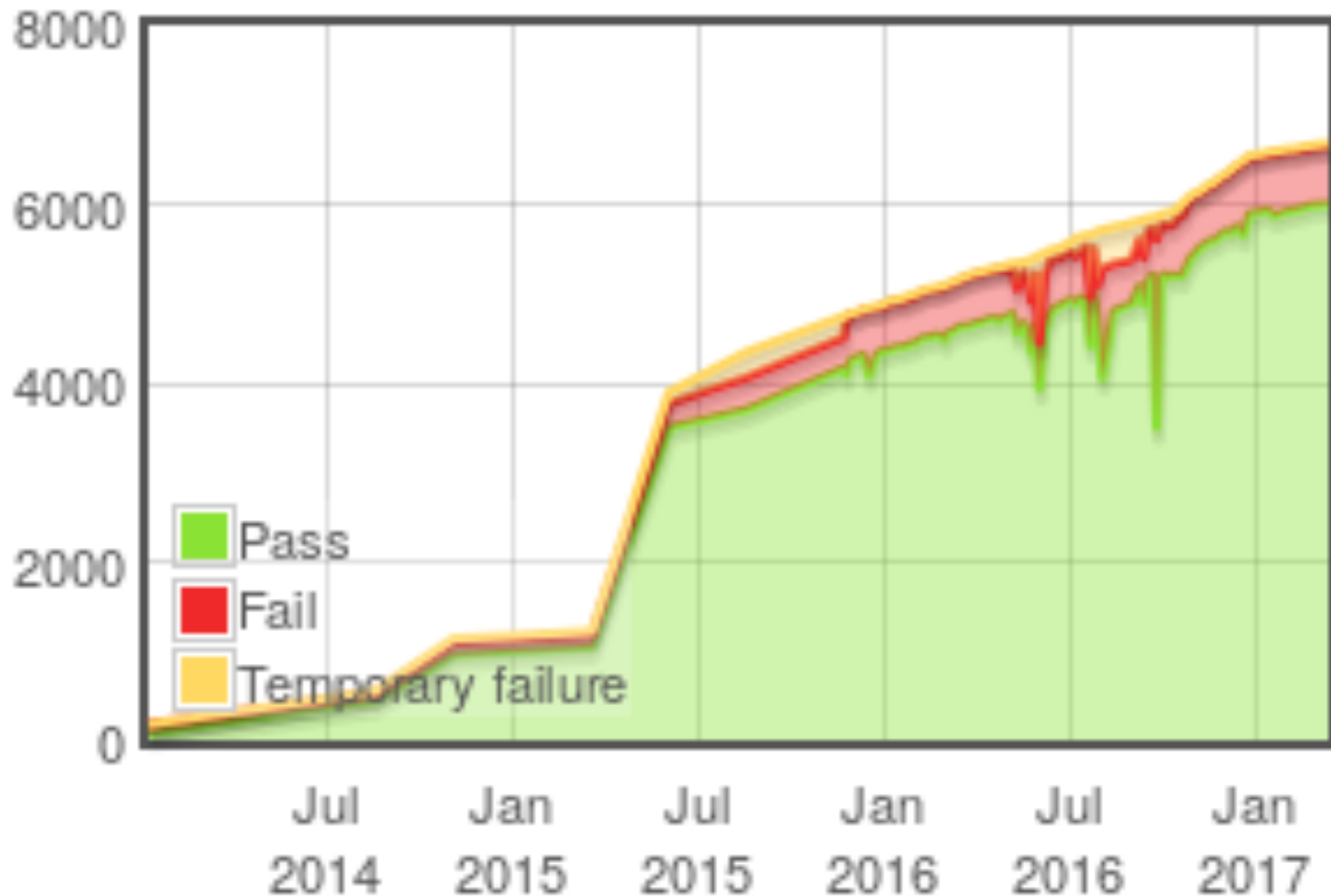
You can navigate to /packages
/packagename to get results for a
particular package.

- [a](#) [b](#) [c](#) [d](#) [e](#) [f](#)
- [g](#) [h](#) [i](#) [j](#) [k](#) [l](#)
- [liba](#) [libb](#) [libc](#) [libd](#)
- [libe](#) [libf](#) [libg](#) [libh](#)
- [libi](#) [libj](#) [libk](#) [libl](#) [libm](#)
- [libn](#) [libo](#) [libp](#) [libq](#)
- [libr](#) [libs](#) [libt](#) [libu](#)
- [libv](#) [libw](#) [libx](#) [liby](#)
- [libz](#) [m](#) [n](#) [o](#) [p](#) [q](#)
- [r](#) [s](#) [t](#) [u](#) [v](#) [w](#)
- [x](#) [y](#) [z](#)

Machine readable data

- [Currently running tests in JSON format](#)

<http://autopkgtest.ubuntu.com/>



packages in ci.debian.net
















~24% of the *source packages* in the archive is currently being tested (6647/27374)

up from ~1% in January 2014



[d](#) / [debci](#) / unstable/amd64

debci [unstable/amd64]

Version	Date	Duration	Status	Results
1.5.1	2017-03-11 13:41:53 UTC	0h 6m 5s	 pass	debci log test log artifacts
1.5.1	2017-03-10 15:16:51 UTC	0h 6m 14s	 pass	debci log test log artifacts
1.5.1	2017-03-09 19:19:30 UTC	0h 6m 10s	 pass	debci log test log artifacts
1.5.1	2017-03-08 23:19:22 UTC	0h 7m 52s	 pass	debci log test log artifacts
1.5.1	2017-03-07 13:35:25 UTC	0h 6m 12s	 pass	debci log test log artifacts
1.5.1	2017-03-07 08:13:50 UTC	0h 5m 39s	 pass	debci log test log artifacts
1.5.1	2017-03-06 08:12:36 UTC	0h 5m 24s	 pass	debci log test log artifacts
1.5.1	2017-03-06 05:03:44 UTC	0h 7m 7s	 pass	debci log test log artifacts
1.5.1	2017-03-05 22:25:06 UTC	0h 6m 33s	 pass	debci log test log artifacts
1.5.1	2017-03-05 14:48:49 UTC	0h 7m 11s	 pass	debci log test log artifacts
1.5.1	2017-03-05 06:16:52 UTC	0h 7m 8s	 pass	debci log test log artifacts
1.5.1	2017-03-04 17:49:16 UTC	0h 6m 13s	 pass	debci log test log artifacts
1.5.1	2017-03-02 18:05:59 UTC	0h 6m 32s	 pass	debci log test log artifacts
1.5.1	2017-03-02 02:52:17 UTC	0h 6m 5s	 pass	debci log test log artifacts
1.5.1	2017-03-01 23:34:50 UTC	0h 6m 2s	 pass	debci log test log artifacts

CI data is also in

- UDD/DMD
- DDPO
- package tracker(s)



The background is a dark teal color with a white spiral in the upper right quadrant and several white wavy lines that sweep across the middle of the slide. There are also a few small white dots scattered in the upper right area.

specs

DEP-8: full text available from
<http://dep.debian.net/deps/dep8>

debian/control

Source: foo

[...]

Testsuite: autopkgtest

debian/tests/control

Tests: foo bar baz



Tests: foo bar baz

*foo, bar and baz must be
executables in debian/tests/*



Test-Command: `foo --version \`
`| grep 'foo version [0-9.]+'`

no need to write one-line shell scripts



Tests: test-my-package
Depends: @, test-tool

install extra dependencies



Tests: test-my-package

Depends: @, test-tool

Tests: smoke-test

*tests with different
characteristics*



Tests: upstream-tests

Depends: @, @builddeps@

*need build dependencies
to run tests*



Tests: my-tests

Restrictions: [...]

additional requirements for tests



Tests: break-the-world

Restrictions: **breaks-testbed**

*testbed will not be reused
for other tests*



Tests: play-with-danger

Restrictions: **needs-root**

tests need to be run as root

(think twice before doing this)



Tests: complain-but-succeed
Restrictions: **allow-stderr**

*does not fail if test program
produces output on stderr*



Tests: mess-with-services

Restrictions: **isolation-container**

*skip if testbed is not at least as isolated
from the host system as a container*



Tests: mess-with-kernel

Restrictions: **isolation-machine**

*skip if testbed is not at least as isolated
from the host system as a VM*



Tests: test-extra-features

Restrictions: **needs-recommends**

installs Recommends: into the testbed



The background is a dark teal color with a white spiral in the upper right quadrant and several wavy, translucent teal lines that sweep across the middle of the frame. There are also a few small white dots scattered on the right side.

tools

sadt(1) from devscripts

```
$ sadt
```

*runs tests from source package
at current directory, on the current
system — somewhat limited*

currently needs ♥ (python3)



autopkgtest(1) from autopkgtest

Usage:

```
$ autopkgtest [options] \  
  -- [virt. args]
```



```
$ autopkgtest -B -- null
```

*runs the tests from the source package
at the current directory, without building it
first, on the current system (i.e.
"null" virtualization)*

```
alias a='autopkgtest -B -- null'
```



```
$ autopkgtest -u debci \  
  /path/to/foo_1.2.3-1_amd64.changes \  
  -- schroot debci-unstable-amd64
```

run tests from the source referenced by the changes file, using its binaries, under a user called debci, in a schroot(1) session based on the debci-unstable-amd64 chroot



```
$ autopkgtest -u debci \  
  /path/to/foo_1.2.3-1_amd64.changes \  
  -- lxc adt-sid-amd64
```

also supported: qemu, ssh
requested: pbuilder, docker





functional tests by example

(plus tips and tricks)

pinpoint

tip 1: shunit2(1)





redmine

tip 4: testing services



a random Ruby package
(let's try ruby-barby)

tip 5: autodep8(1)



autodep8(1)

automatically generates
`debian/tests/control` *at runtime*
for well-known groups of packages.
Called by `autopkgtest`.

Supported: Ruby, Perl, Python,
NodeJS, Kernel module (DKMS), R,
Emacs Lisp (ELPA)



autodep8

tip 6: adding DEP-8 tests
for sets of similar packages



debci

tip 7: running "upstream"
test suite



vagrant

tip 8: really simple
smoke tests



tip 9:

```
$ autopkgtest --shell
```

```
$ autopkgtest --shell-fail
```





conclusions

Join the automated testing movement

- add tests to your packages
- add generic tests for your packaging team to autodep8
- help improving/maintaining ci.debian.net



learn more

<https://ci.debian.net/doc/>



contact

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terceiro on OFTC

#debian-qa

#debian-devel

