

# The secret sauce of Debian



DebConf24  
Busan, Korea

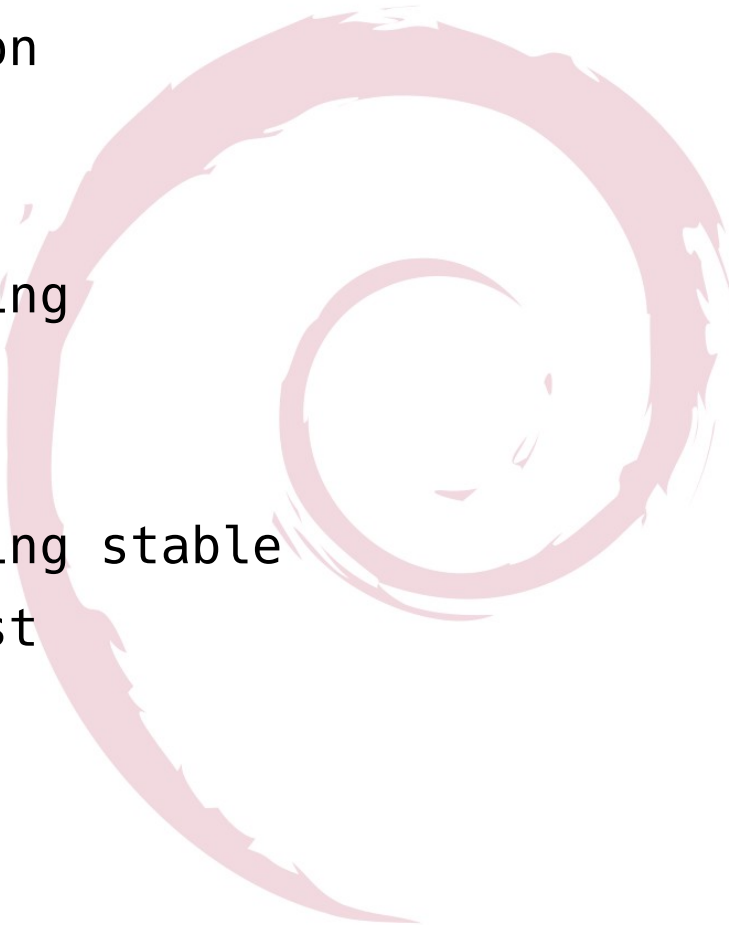
Slides available at [samueloph.dev/slides](https://samueloph.dev/slides)

# About me

- Samuel Henrique <samueloph>
- Debian Developer since 2018
- Member of the Security Tools Packaging Team
- Maintains curl, rsync, shellcheck...
- Mentorship for newcomers learning packaging
- System Development Engineer for Amazon Linux, security team
- Debian/Linux, Python, Rust, Bash, Security
- [linkedin.com/in/samueloph](https://www.linkedin.com/in/samueloph)
- [samueloph.dev](https://samueloph.dev)

# Summary

- Debian organization
- CPU Architectures
- Debian releases
- Unstable and Testing
- Creating stable
  - Freezing
- Maintaining/Updating stable
- General QA and test
  - Autopkgtest
  - Debci
  - Others...



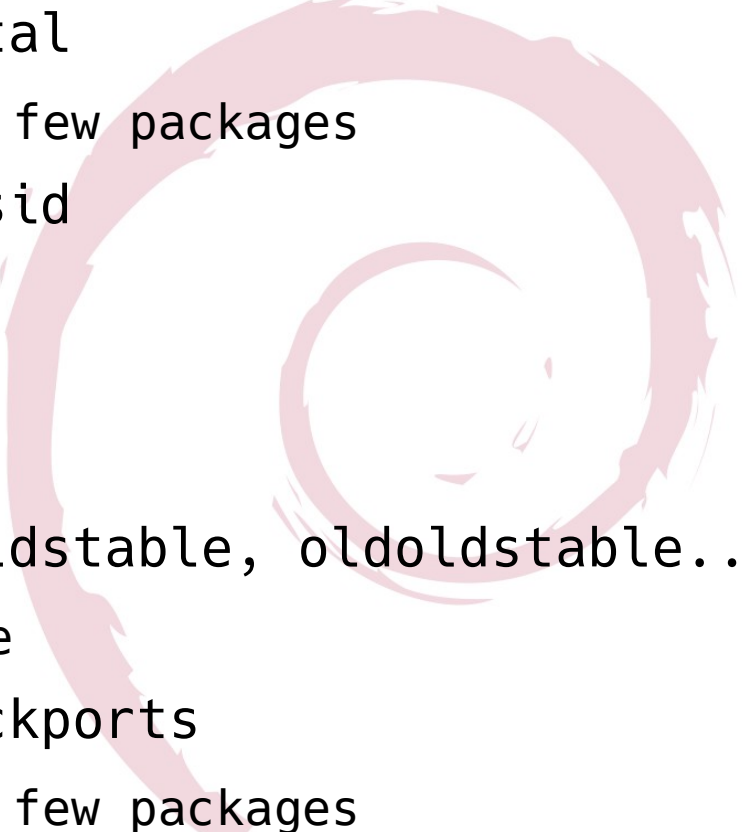
# A distribution

- Distributes software :)
  - Choses defaults
  - Tweaks the user experience
  - Shall not ship issues
- Supports the distributed software
  - Fixes issues
  - Fixes security issues
- Keeps distributing software
  - Constantly evolving repositories

# Organization

- Debian social contract
  - [https://www.debian.org/social\\_contract](https://www.debian.org/social_contract)
- Debian constitution
  - <https://www.debian.org/devel/constitution>
- Debian policy
  - <https://www.debian.org/doc/debian-policy/>
- Debian Developer's Reference
  - <https://www.debian.org/doc/manuals/developers-reference/index.en.html>

# Debian releases and special repositories

- Debian experimental
    - Only contains a few packages
  - Debian unstable/sid
    - Rolling release
  - Debian testing
    - Rolling release
  - Debian stable, oldstable, oldoldstable...
    - Official release
  - Debian stable-backports
    - Only contains a few packages
- 

# 20 Architectures





















- 9 official:

- amd64
- arm64
- armel
- armhf
- i386
- mips64el
- ppc64el
- riscv64
- s390x

- 11 not-official:

- alpha
- hppa
- hurd-amd64
- hurd-i386
- loong64
- m68k
- powerpc
- ppc64
- sh4
- sparc64
- x32

Package(s):  Suite:    
 Compact mode  Co-maintainers

Architecture	Version	Status	For	Buildid	State	Section	Logs	Actions
<i>all is not present in the architecture list set by the maintainer</i>								
 amd64	9.4-3.1	Installed	137d 11h 36m	<a href="#">x86-ubc-01</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 arm64	9.4-3.1	Installed	137d 11h 36m	<a href="#">arm-ubc-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 armel	9.4-3.1	Installed	129d 15h 6m	<a href="#">arm-arm-03</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 armhf	9.4-3.1	Installed	129d 23h 25m	<a href="#">arm-ubc-05</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 i386	9.4-3.1	Installed	137d 11h 36m	<a href="#">x86-ubc-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 mips64el	9.4-3.1	Installed	137d 9h 37m	<a href="#">mipsel-osuosl-01</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 ppc64el	9.4-3.1	Installed	137d 11h 36m	<a href="#">ppc64el-conova-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 riscv64	9.4-3.1	Installed	137d 9h 37m	<a href="#">rv-osuosl-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 s390x	9.4-3.1	Installed	137d 4h 45m	<a href="#">zani</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 alpha	9.4-3.1	Installed	133d 10h 10m	<a href="#">imago</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 hppa	9.4-3.1	Installed	137d 11h 25m	<a href="#">c8000</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 hurd-amd64	9.4-3.1	Installed	16d 5h 20m	<a href="#">boralus</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 hurd-i386 ↓	9.4-3.1	Failed	137d 7h 48m	<a href="#">mahler</a>	out-of-date	utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 loong64	9.4-3.1	Installed	133d 19h 55m	<a href="#">loong64-loongson-01</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 m68k	9.4-3.1	Installed	131d 14h 30m	<a href="#">m68k-osuosl-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 powerpc	9.4-3.1	Installed	137d 11h	<a href="#">blaauw</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 ppc64	9.4-3.1	Installed	137d 11h 25m	<a href="#">debian-project-be-1</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 sh4	9.4-3.1	Installed	114d 15h 40m	<a href="#">sh4-gandi-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 sparc64	9.4-3.1	Installed	137d 6h 14m	<a href="#">sompék4</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>
 x32	9.4-3.1	Installed	137d 10h 25m	<a href="#">x32-do-02</a>		utils	<a href="#">old</a>   <a href="#">all</a> (1)	<a href="#">giveback</a>



# Diversity of architectures

- Non-linux
  - hurd-amd64, hurd-i386 (previously kfreebsd too)
- Endianess
  - ppc64 (Big endian), ppc64el (Little endian)
- 32 and 64 bits
  - i386, amd64
- Sizeof
  - int, long double, time\_t...
- <https://wiki.debian.org/ArchitectureSpecificsMemo>



The screenshot shows the GitHub interface for a commit in the repository 'benhoyt/goawk'. The repository is marked as 'Public'. The navigation bar includes 'Code', 'Issues' (9), 'Pull requests' (2), and 'Actions'. The main heading is 'Commit'. The commit message is 'Fix number formatting on non-64bit architectures (#235)'. Below the message, there is a reference to a previous commit: 'Fix number formatting on non-64bit architectures (#234)'. The commit body contains the text: 'Run CI tests with GOARCH=386 (-race is not supported when running tests on Linux/386.)' followed by a separator line '-----'. Below the separator, it says 'Co-authored-by: Ben Hoyt <benhoyt@gmail.com>'. At the bottom, it shows the branch 'master (#235)' and the commit authors 'guilherme-puida and benhoyt' committed on Jun 12, with a 'Verified' badge.


aircrack-ng / aircrack-ng Public

Notifications Fork 908


<> Code Issues 389 Pull requests 28 Discussions Actions Security Insights

# 1.7 fails to build on s390x (and other big endian archs) #2324

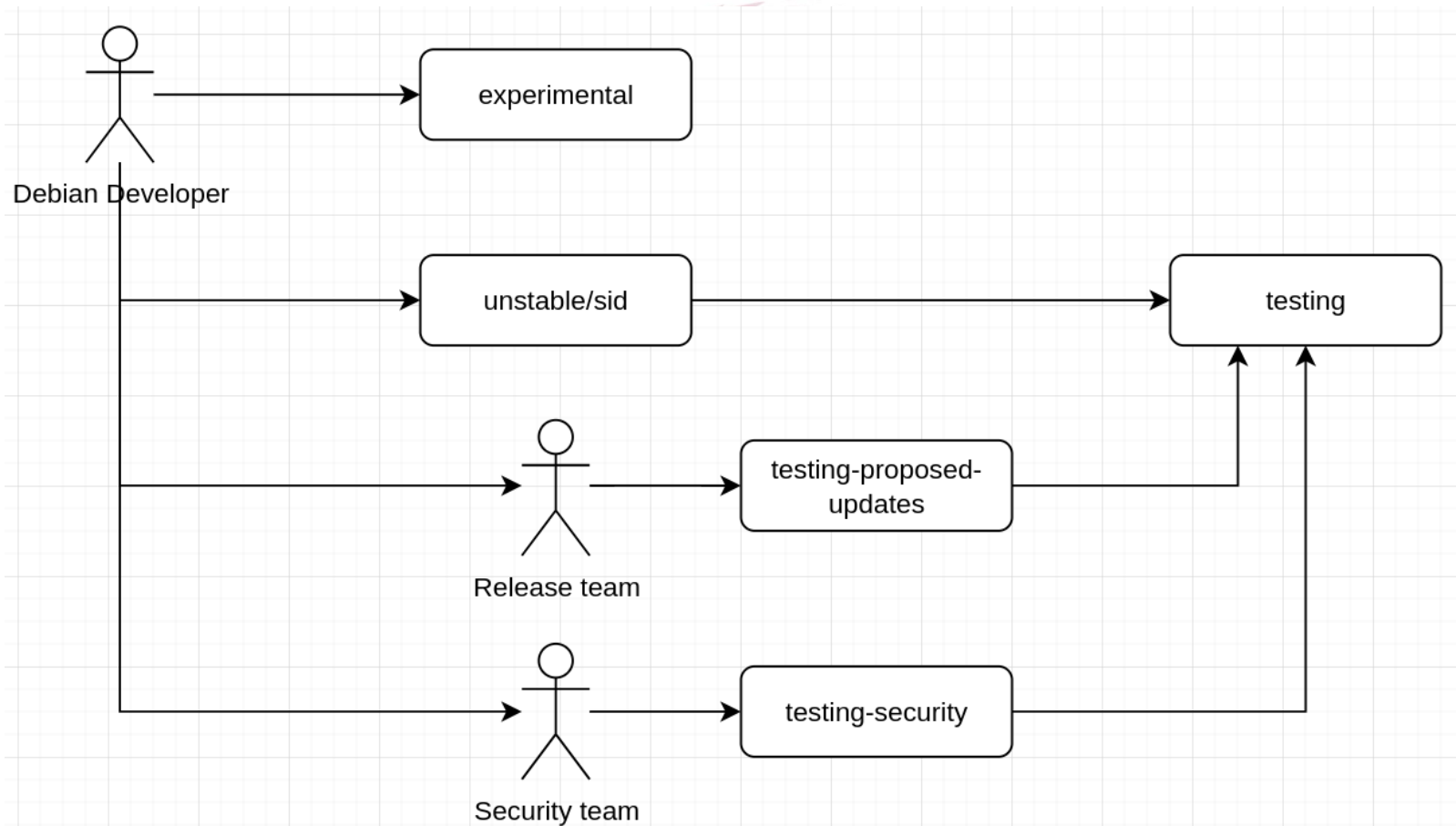
Closed 1 of 4 tasks samueloph opened this issue on Aug 2, 2022 · 3 comments · Fixed by #2335

 samueloph commented on Aug 2, 2022 · edited Contributor

## Defect Report

Assignees  jbenden

# Experimental, Unstable and Testing



# Experimental

- Not officially-supported
- Only certain packages available
- Easier to manually test changes
- Some of the automated testing/QA infrastructure infrastructure kicks in
- Let's other users test it too
- Reverting changes is simple
- Changes can be pushed to unstable at anytime while the package is in experimental
  - Two variants of the same package available at the same time

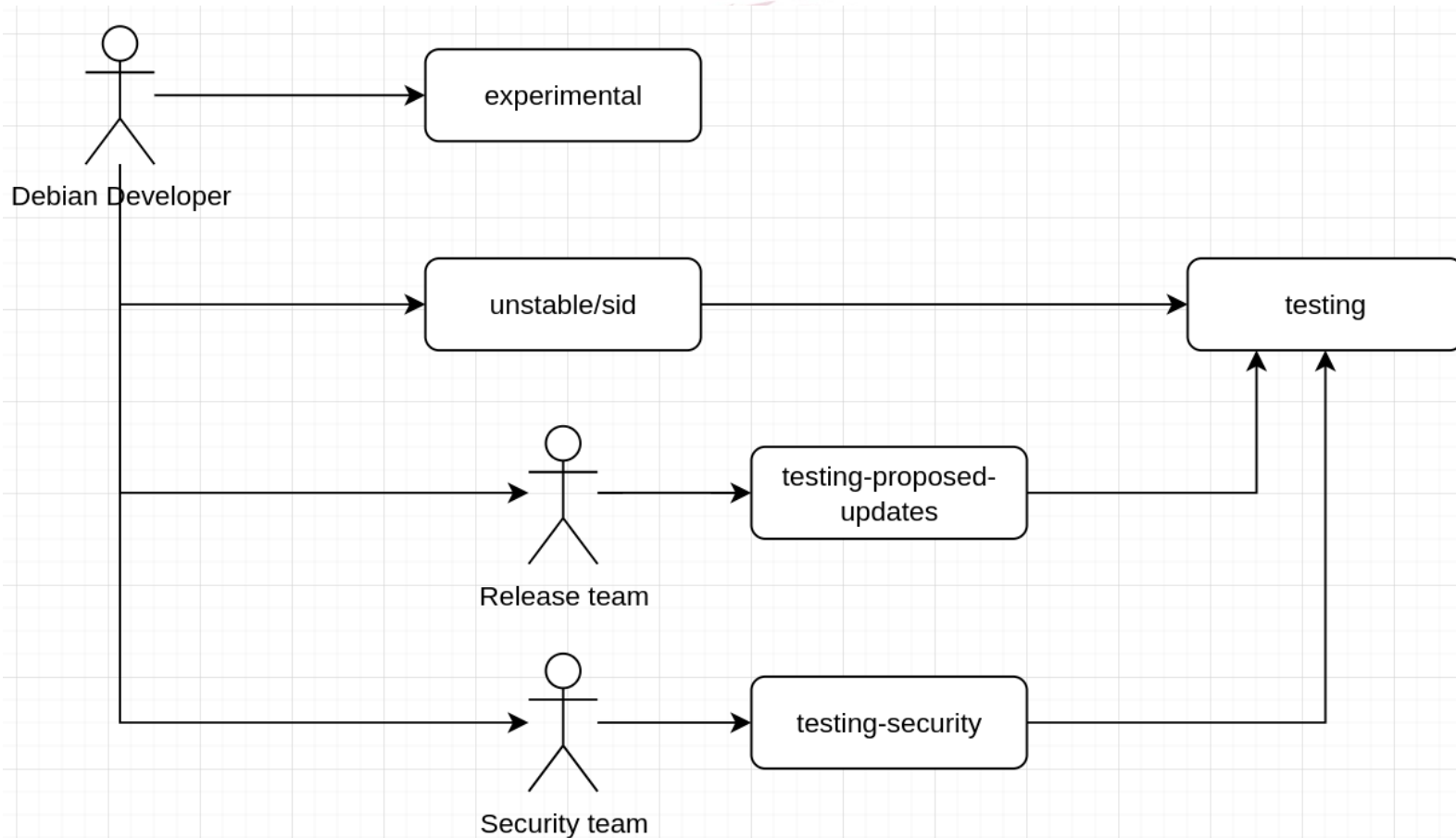
# Unstable

- Rolling release
  - Not officially-supported
- All packages available
- Installed and used by expert users
- The place where changes first get through
- Full coverage of testing/QA infrastructure
- Build artifacts eventually end up as the next Stable
- Packages automatically migrate to Debian Testing after bake time and test/QA results are green

# Testing

- Rolling release
  - Not officially-supported
  - Recently broken by the `time_t` transition (once every 20 years?). Fully recovered now
- All packages available
- Installed and used by advanced users
- Broken packages are removed
- Installer available
- Recommended by me for most non-server usecases
  - As stable as any other rolling release distro
- Used for the preparation of the next Stable release

# Experimental, Unstable and Testing





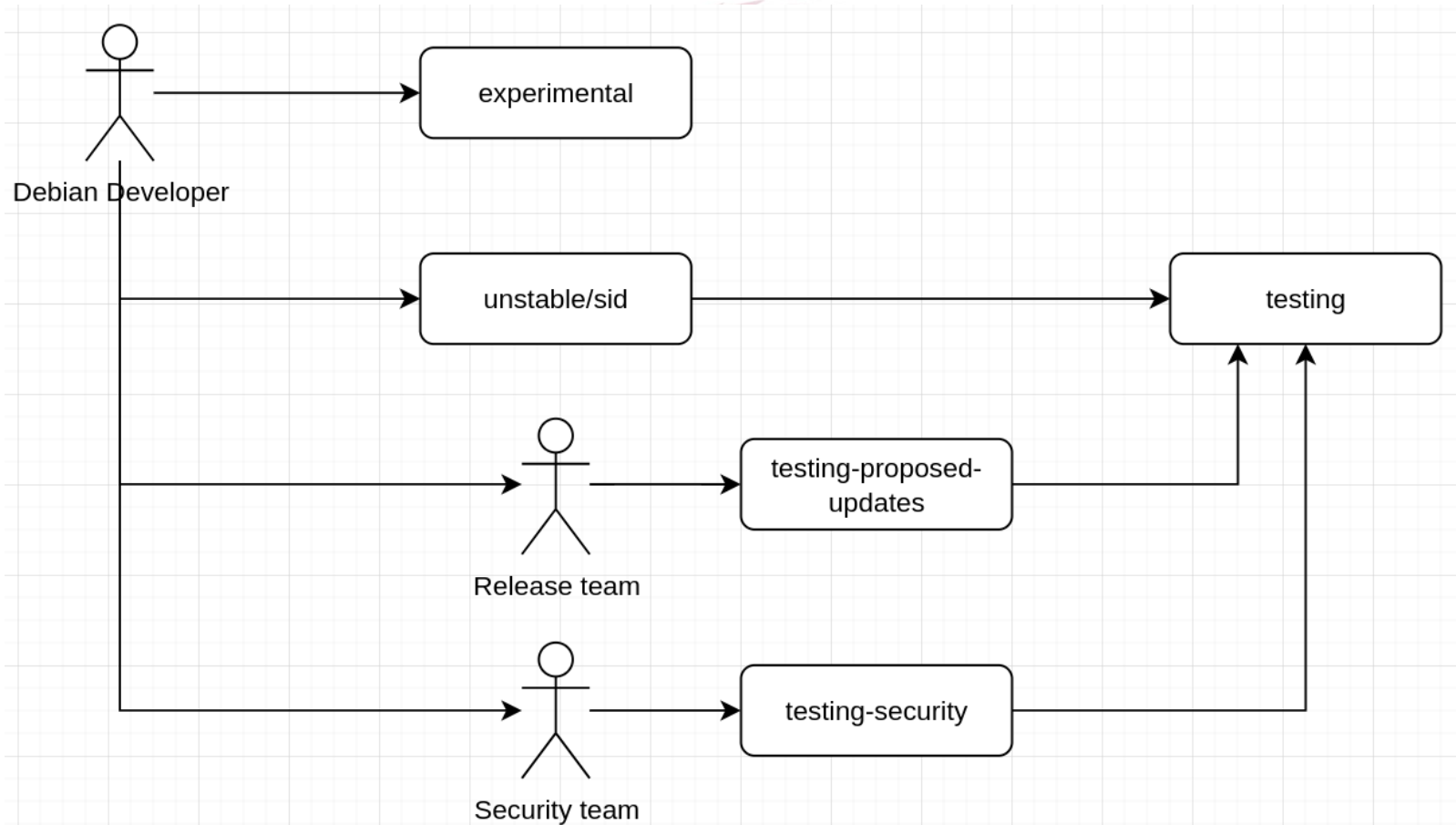
# Stable creation?

- Not a rolling release
- “Created” (new release) every 2 years
- Done by turning a snapshot of Debian Testing into the new Debian Stable





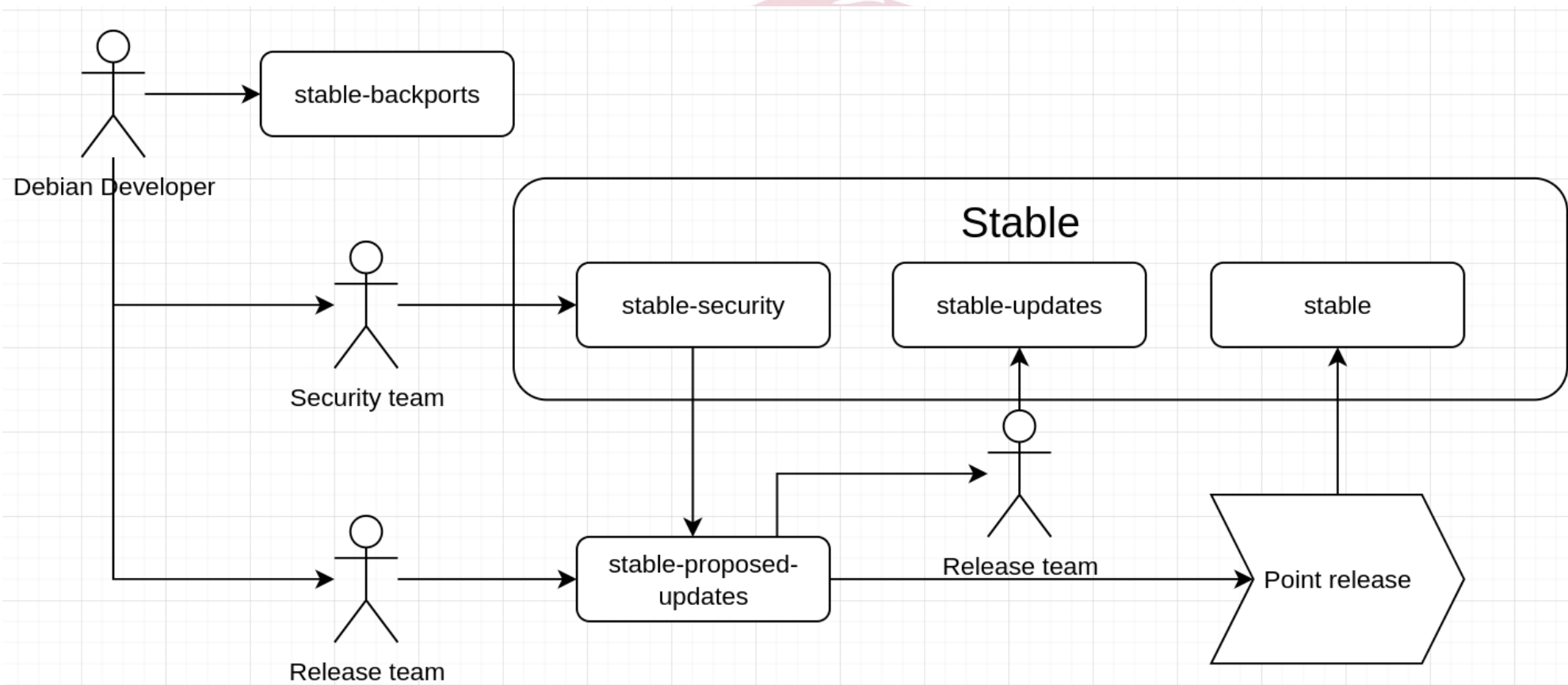
# Experimental and Testing



# Stable updating?

- Everything needs to be cross-reviewed and approved
  - Security team
  - Release team
- Non-critical fixes spend baking-time in the proposed-updates queue
  - At least 1 week generally
  - Shipped as part of planned Debian point-releases, e.g.: 12.1, 12.2, 12.3...

# Stable repositories



# The release process

- Experimental, Unstable and Testing are development releases aimed at creating the next Stable release
- Stable releases only receive carefully tested and reviewed changes
- QA/testing/CI accross all

# QA/CI/testing

- `dh_auto_test`
- `Lintian`
- `Autopkgtest` & `debci`
- `Salsa-ci`
- And many, many more...
  - <https://wiki.debian.org/qa.debian.org>

# dh\_auto\_test

- Runs upstream tests at the package's build-time
  - Results shown in build logs
- Confirms everything is fine between the software and:
  - Debian's supported architectures
  - Dependencies provided by the Debian repository
  - Build flags used by Debian
- Detects issues before the upload
  - If they don't affect the arch used by the maintainer, detected after upload in build.d.o



# Lintian

- > Lintian dissects Debian packages and reports bugs and policy violations. It contains automated checks for many aspects of Debian policy as well as some checks for common errors.
- Thousands of checks
  - Licensing issues
  - Spelling mistakes
  - Unexpected library bumps
  - Missing sources
  - Statically linked binaries
  - Files installed in wrong places
  - And more...
- Packages can be auto-rejected based on lintian results

### Use python3 in test 1451

This is a continuation of commit [ec91b5a](#) in which changing this test was missed.  
There are no other python2 leftovers now.

Based on a Debian patch originally written by Alessandro Ghedini <ghedo@debian.org>



**samueloph** committed on Oct 25, 2021

commit ce432e0fe642c003a76db32a8aab3706c4decbd2

2 tests/data/test1451

```
@@ -29,7 +29,7 @@ Basic SMB request
29 29  -u 'curltest:curltest' smb://%HOSTIP:%SMBPORT/TESTS/%TESTNUMBER
30 30  </command>
31 31  <precheck>
32 32  - python -c "__import__('pkgutil').find_loader('impacket') or
    (__import__('sys').stdout.write('Test only works if Python package impacket
    is installed\n'), __import__('sys').exit(1))"
32 32  + python3 -c "__import__('pkgutil').find_loader('impacket') or
    (__import__('sys').stdout.write('Test only works if Python package impacket
    is installed\n'), __import__('sys').exit(1))"
33 33  </precheck>
34 34  </client>
```

# Autopkgtest and debci

- Autopkgtest
  - Standardizes test definitions for the package's CI
  - Test the installed package (not a build-time test)
  - Can be used to run upstream tests, but perfect for Debian-specific tests
- Debci
  - <https://ci.debian.net/>
  - Service constantly running autopkgtests
  - Amd64, arm64, armel, armhf, i386, loong64, ppc64el, riscv64, s390x

# debci

- Results are blockers for Unstable -> Testing migration
- For a package update, every reverse-dependency's tests are run
- Migration-references as a baseline to decide if a failure is a regression
  - Done against Testing
  - Constantly refreshed
- When package A gets updated to version 5
  - Package B depends on package A
  - Package B fails when ran against A v5
  - Package B also fails when ran against foo v4 (migration reference)
    - NOT A REGRESSION
- Important packages tend to have a lot of reverse-dependencies with autopkgtests

## testing migrations

This package will soon be part of the [glibc-2.38](#) transition. You might want to ensure that your package is ready for it. You can probably find supplementary information in the [debian-release archives](#) or in the corresponding [release.debian.org bug](#).

This package will soon be part of the [auto-libselineux](#) transition. You might want to ensure that your package is ready for it. You can probably find supplementary information in the [debian-release archives](#) or in the corresponding [release.debian.org bug](#).

### excuses:

- Migration status for glibc (2.37-18 to 2.37-19): BLOCKED: Rejected/violates migration policy/introduces a regression
- Issues preventing migration:
  - • autopkgtest for [389-ds-base/2.4.4+dfsg1-3](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [6tunnel/1:0.13-2](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [7zip/23.01+dfsg-12](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [7zip-rar/23.01-4](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [9base/1:6-14](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [abcm2ps/8.14.14-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [abcmidi/20240321+ds1-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [abinit/9.10.4-3](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [ableton-link/3.1.1+dfsg-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [abpoa/1.5.1-1](#): amd64: [Test in progress](#), arm64: [Pass](#), ppc64el: [Test in progress](#)
  - • autopkgtest for [abseil/20230802.1-4](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [abyss/2.3.7-3](#): amd64: [Test in progress](#), arm64: [Pass](#), ppc64el: [Test in progress](#)
  - • autopkgtest for [achilles/2-12](#): amd64: [Test in progress](#), arm64: [No tests, superficial or marked flaky](#) (reference ↻), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [acl/2.3.2-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [acmetool/0.2.2-2](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [acorn-fdisk/3.0.6-13](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [adacgi](#): amd64: [Test in progress](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [adapterremoval/2.3.3-2](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [adios2/2.9.2+dfsg1-9](#): arm64: [Pass](#), ppc64el: [Test in progress](#), s390x: [Test in progress \(will not be considered a regression\)](#)
  - • autopkgtest for [admesh/0.98.5-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [adms/2.3.7-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [aegean/0.16.0+dfsg-3](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)
  - • autopkgtest for [aerc/0.17.0-1](#): amd64: [Test in progress](#), arm64: [Pass](#), i386: [Test in progress](#), ppc64el: [Test in progress](#), s390x: [Test in progress](#)

# <https://bugs.debian.org/989179>

**From:** Jan Gru <j4n6ru@gmail.com>  
**To:** Debian Bug Tracking System <submit@bugs.debian.org>  
**Subject:** aeskeyfind calculates wrong results on kernel 5.10.0.6 and glibc 2.31-11  
**Date:** Thu, 27 May 2021 19:35:15 +0200

Package: aeskeyfind  
Version: 1:1.0-8  
Severity: important  
Tags: upstream

Dear Maintainer,

I was in the process of creating autopkgtests for aeskeyfind and discovered, that using aeskeyfind with kernel 5.10.0.6 and glibc 2.31-11 leads to wrong results. Existing AES-keys are not found, although they are and extracted by aeskeyfind on kernel 5.4.0.73 and glibc 2.27 at least. Further testing revealed, that the values of the variables named xor\_count\_128 and xor\_count\_256 are higher in the failing setup. This seems to stem from the following two functions:

<https://salsa.debian.org/pkg-security-team/aeskeyfind/-/blob/debian/master/util.h#L25>  
<https://salsa.debian.org/pkg-security-team/aeskeyfind/-/blob/debian/master/util.h#L25>

# <https://bugs.debian.org/1039613>



**Message #23** received at 1039613@bugs.debian.org ([full text](#), [mbox](#), [reply](#)):

**From:** Gordon Fyodor Lyon <fyodor@nmap.org>  
**To:** Paul Wise <pabs@debian.org>, 1039613@bugs.debian.org  
**Cc:** Paul Gevers <elbrus@debian.org>, nmap@packages.debian.org, udptunnel@packages.debian.org  
**Subject:** Re: Bug#1039613: nmap breaks udptunnel autopkgtest: UDPTunnel communication failed  
**Date:** Sun, 23 Jul 2023 09:51:39 -0700

[[Message part 1](#) (text/plain, inline)]

Thanks Paul. We did make some changes in Nmap 7.94 which could have caused regressions. I've opened an issue for this on our upstream tracker (<https://github.com/nmap/nmap/issues/2685>). Please let us know if you figure anything else out.

-Gordon



### d/curl.NEWS: Update wcurl description

**Warning** Samuel Henrique created pipeline for commit `ff68bd01` 2 weeks ago, finished 2 weeks ago

For `debian/unstable`

12 jobs 24 minutes 50 seconds, queued for 5 seconds

Pipeline Needs Jobs **12** Failed Jobs **1** Tests **4**

Group jobs by Stage Job dependencies

```
graph LR; provisioning --> build; build --> test;
```

**provisioning**

- extract-source

**build**

- build
- build i386
- build source

**test**

- autopkgtest
- blhc
- lintian
- piuparts
- reprotest
- test-build-all
- test-build-any
- test-crossbuild-arm64



# Honorable mentions

- Multi-arch hints
- Archive-wide rebuilds
- Janitor



# Questions?

I will be around for the whole DebConf, feel free to reach out too



Muito obrigado!

# The secret sauce of Debian

DebConf24  
Busan, Korea

Slides available at [samueloph.dev/slides](https://samueloph.dev/slides)