

GNU Guix is 4 years old!

Ludovic Courtès

GNU Hackers Meeting, Rennes, August 2016

**The rise and fall of
distros.**

*“Debian and other distributions
are going to be **that thing you
run docker on**, little more.”*

— Jos Poortvliet, ownCloud developer

 **tianon** Update to 7.0.12, 8.1.5, and 8.2.22 contributors  

50 lines (40 sloc) | 1.58 KB





```
1 FROM php:5.6-apache
2
3 RUN apt-get update && apt-get install -y \
4     bzip2 \
5     libcurl4-openssl-dev \
6     libfreetype6-dev \
7     libicu-dev \
8     libjpeg-dev \
9     libmcrypt-dev \
10    libpng12-dev \
11    libpq-dev \
12    libxml2-dev \
13    && rm -rf /var/lib/apt/lists/*
14
```

It's also that thing
you run *inside*
Docker!

main griefs:

- ▶ distros are **inflexible**
- ▶ distros “**lag behind**”
- ▶ developers have to “**chase distros**”

Application-level package managers [[edit](#)]

- [Anaconda](#) - a package manager for Python
- [Assembly](#) - a partially [compiled](#) code library for use in [Common Language Infrastructure](#) (CLI) deployment, versioning and security.
- [Biicode](#)  - a file-focused dependency manager for C/C++ languages and platforms (PC, Raspberry Pi, Arduino).
- [Bower](#) - a package manager for the web.
- [UPT](#)  - a fork of Bower that aims to be a universal package manager, for multiple environments and unlimited kind of package
- [Cabal](#) - a programming library and package manager for [Haskell](#)
- [Cargo](#)  - a package manager for [Rust \(programming language\)](#)
- [CocoaPods](#) - Dependency Manager for [Objective-C](#) and [RubyMotion](#) projects
- [Composer](#) - Dependency Manager for [PHP](#)
- [CPAN](#) - a programming library and package manager for [Perl](#)
- [CRAN](#) - a programming library and package manager for [R](#)
- [CTAN](#) - a package manager for [TeX](#)
- [DUB](#)  - a package manager for [D](#)

As of **npm@2.6.1** , the **npm update** will only inspect top-level packages. Prior versions of **npm** would also recursively inspect all dependencies. To get the old behavior, use **npm --depth 9999 update** , but be warned that simultaneous asynchronous update of all packages, including **npm** itself and packages that **npm** depends on, often causes problems up to and including the uninstallation of **npm** itself.

To restore a missing **npm** , use the command:

```
curl -L https://npmjs.com/install.sh | sh
```

```
#!/bin/bash
```

```
pip install "$1" &  
easy_install "$1" &  
brew install "$1" &  
npm install "$1" &  
yum install "$1" & dnf install "$1" &  
docker run "$1" &  
pkg install "$1" &  
apt-get install "$1" &  
sudo apt-get install "$1" &  
steamcmd +app_update "$1" validate &  
git clone https://github.com/"$1"/"$1" &  
cd "$1";./configure;make;make install &  
curl "$1" | bash &
```


Giving up?

Giving up?

→ “app bundles”

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ruby:latest

722 mb

Layers: 17

python:latest

689 mb

Layers: 13

golang:latest

725 mb

Layers: 14

ADD file:e5a3d20748c5d3dd5fa11542dfa4ef8b72a0bb78ce09f6da

125 mb

CMD "/bin/bash"

0 bytes

RUN apt-get update && apt-get install -y --no-install-recommends ca-certificates curl wget && rm -f

44 mb

RUN apt-get update && apt-get install -y --no-install-recommends bzip2 git mercurial openssh-client subversion pro

123 mb

RUN apt-get update && apt-get install -y --no-install-recommends

RUN apt-get update && apt

... still too low-level

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Maybe what we need is an
app store that *feels* like
apt, yum & co.?

TECHNOLOGY LAB —

Adios apt and yum? Ubuntu's snap apps are coming to distros everywhere

More secure replacement for debs coming to Fedora, Arch, Debian, and more.

JON BRODKIN - 6/14/2016, 7:00 PM



“This is, to put it diplomatically, a heaping pile of steaming bullshit [...] served by the Canonical press department.”

— Adam Williamson (Red Hat, Fedora)

“This is, to put it diplomatically, a heaping pile of steaming bullshit [...] served by the Canonical press department.”

*“There is in fact another system with very similar goals, which is now called **Flatpak** [...]”*

— Adam Williamson (Red Hat, Fedora)

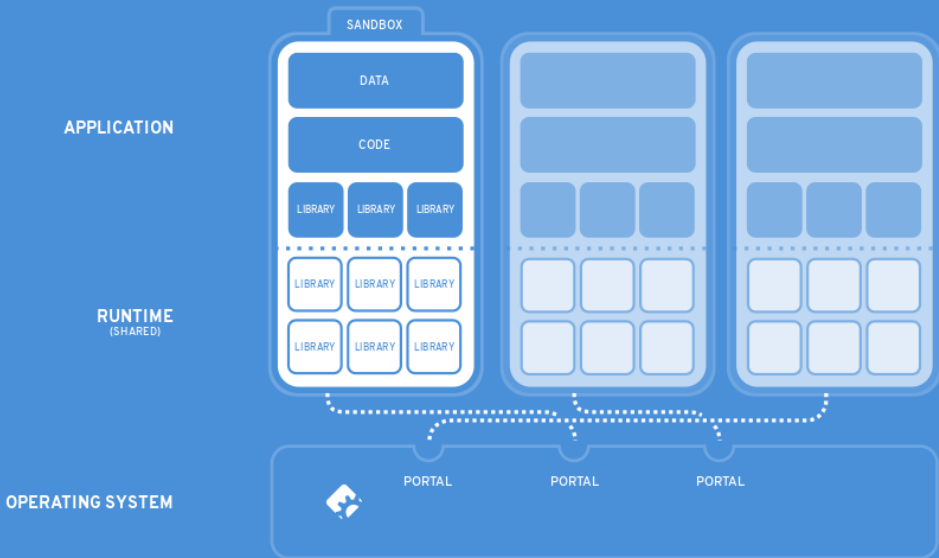
THE FUTURE OF APPLICATION DISTRIBUTION

The days of chasing multiple Linux distributions are over. Standalone apps for Linux are here!

[FIND OUT HOW](#)

How it works

<http://flatpak.org/>



“app bundles” are headed wrong

- ▶ difficulty to **compose** software packages
- ▶ no “big picture” **integration work**
- ▶ where’s the **Corresponding Source**?
- ▶ “app” model/free software commons mismatch



Guix

1. transactional package manager
2. software environment manager
3. APIs & tools to customize environments
4. packaging tools

```
$ guix package -i gcc-toolchain coreutils sed grep
```

```
...
```

```
$ eval 'guix package --search-paths'
```

```
...
```

```
$ guix package --manifest=my-software.scm
```

```
...
```

Want to get started hacking
on GIMP?

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A simple matter of installing the deps, right?



```
$ guix environment --container gimp
```

```
...
```

```
$ guix environment --container gimp \  
    --ad-hoc git autoconf automake gdb
```

```
...
```

Creating package variants at the command line

```
$ guix package -i emacs \  
  --with-source=./emacs-25.1rc0.tar.gz
```

```
...
```

```
$ guix package -i emacs \  
  --with-source=./emacs-25.1rc0.tar.gz  
...
```

```
$ guix package -i git \  
  --with-input=openssl=libressl  
...
```

Your personal packages or
variants in
GUIX_PACKAGE_PATH!

Security updates “grafted”
onto available binaries



```
(operating-system
  (host-name "pluto")
  (timezone "Europe/Paris")
  (locale "en_US.utf8")

  (bootloader (grub-configuration
    (device "/dev/sda"))))
```

```
(mapped-devices (list (mapped-device
  (source "/dev/sda3")
  (target "home")
  (type luks-device))
  ;en
```

GuixSD: declarative OS config

```
(file-systems (cons* (file-system
  (device "root")
  (title 'label)
  (mount-point "/")
  (type "ext3"))
  (file-system
  (device "/dev/mapper/home")
  (mount-point "/home")
  (type "ext3"))
```

Linux-libre

Linux-libre



initial RAM disk

Linux-libre



initial RAM disk

Guile

Linux-libre



initial RAM disk



PID 1: GNU Shepherd
services...

Guile

Linux-libre



initial RAM disk



PID 1: GNU Shepherd
services...

Guile

Guile

Linux-libre



initial RAM disk

Guile



PID 1: GNU Shepherd
services...

Guile



applications

Status.

4 years!

- ▶ Aug. 2012 — GNU Hackers Meeting, Düsseldorf
- ▶ Nov. 2012 — dubbed GNU
- ▶ Jan. 2013 — **0.1**
- ▶ ...
- ▶ July 2014 — **0.7**, **installable operating system**
- ▶ ...
- ▶ Nov. 2015 — **0.9.0**, new service framework, etc.
- ▶ Jan. 2016 — successful **fundraiser** for new **build farm**
- ▶ Mar. 2016 — **0.10.0**, grafts, GNOME
- ▶ Aug. 2016 — **0.11.0**, system tests, more services



growth!

- ▶ 3,800+ packages
- ▶ 4 architectures
- ▶ binaries at <https://hydra.gnu.org>
- ▶ \approx 500 new packages per release

Activity

30 Day Summary

Jun 27 2016 — Jul 27 2016

411 [Commits](#)

30 [Contributors](#)

including 5 new contributors

12 Month Summary

Jul 27 2015 — Jul 27 2016

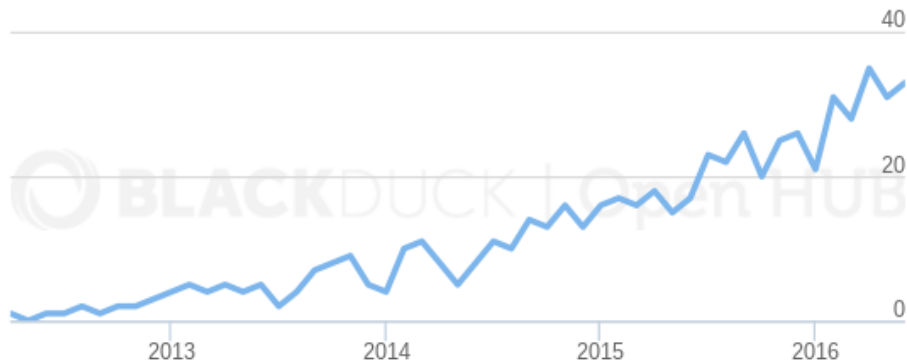
5607 [Commits](#)

Up + 1303 (30%) from previous 12 months

96 [Contributors](#)

Up + 49 (104%) from previous 12 months

Contributors per Month



Scaling up.

importers & updaters

- ▶ `guix import`
 - ▶ **8.5 importers**: GNU, Nix, PyPI, CPAN, CRAN, Hackage, ELPA, Gem, npm (GSoC 2016)
- ▶ `guix refresh`
 - ▶ **11 updaters**: GNU, GNOME, KDE, Xorg, ELPA, CRAN, Bioconductor, Hackage, PyPI, Gem, GitHub
- ▶ `guix lint -c cve` (vulnerabilities)

contributions

- ▶ **documented processes**, code of conduct
- ▶ **consensus-based** decision making
- ▶ **tools**: `guix lint` (12 checkers!), `guix build --rounds=2`, etc.
- ▶ good **reviews & mentoring**

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- ▶ good **reviews & mentoring**
- ▶ 30 committers, but **5–10 frequent reviewers**
- ▶ 50+ emails per day, **hard to track patches**
 - ▶ Patchwork? QEMU's patches? suggestions?

maintainership, responsibilities

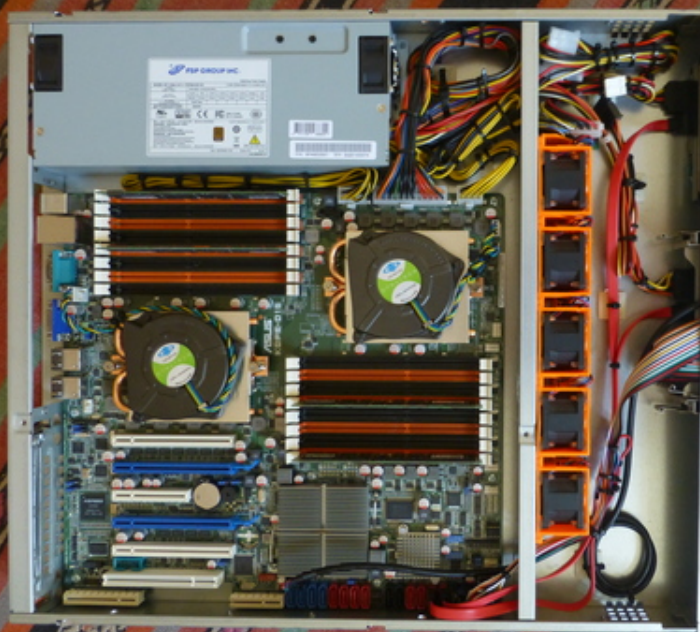
- ▶ **Ricardo Wurmus** co-maintainer since July!
- ▶ currently \approx **3 build farm sysadmins**
 - ▶ ... but heading towards distributed sysadmin!
 - ▶ run GuixSD everywhere, version-control that
 - ▶ eventually: `guix deploy`

build farm & funding

- ▶ **hardware donated** by FSF, TUM, GNU Spain, individuals
- ▶ 2 **Novena** boards (ARMv7) donated by Bunnie
- ▶ **raised \$8,000+** in January 2016
- ▶ **5,000 EUR donated by Igalia**
- ▶ **“Guix Europe”** NPO created in France in 2016

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Libreboot inside! No ME™!

What's left before 1.0?

getting to 1.0

- ▶ `guix pull` & authenticated checkouts
- ▶ performance & usability improvements
- ▶ **GuixSD**
 - ▶ encrypted root file system
 - ▶ LVM support
 - ▶ more system services
 - ▶ fix bugs and glitches!
- ▶ self-hosted infra: `guix publish` and Cuirass

your help needed!

- ▶ **install the distribution**
- ▶ **use it**, report bugs, add packages
- ▶ help with the **infrastructure** + admin
- ▶ **donate** hardware/money
- ▶ share your **ideas!**



GuixSD

`ludo@gnu.org`

`http://gnu.org/software/guix/`

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