Ten years of failures

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Ten Years of Guix
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To me at the time Guix had the exact mix of upstart energy, optimism, and long-term vision that I was hoping to find.

—Eric Bavier

Finally a viable promise for the GNU System and much more innovative than I could have hoped for.

—Jan Nieuwenhuizen

Im Anfang war die Tat

It all started as a geeky itch-scratching experiment: a tiny bit of Guile code to make remote procedure calls (RPCs) to the Nix build daemon.
Why? As I was involved in and excited about Guile and Nix, it felt natural to try and bridge them.

—Ludovic Courtès

The first commit

```
commit 207cba8114d354737b231e510d6110ea2a42e07b
Author: Ludovic Courtès <ludo@gnu.org>
Date:   Wed Apr 18 23:21:11 2012 +0200
    Initial commit.

guix.scm with 525 lines


(define (write-int n p)
  (let ((b (make-bytevector 8 0)))
    (bytevector-u32-set! b 0 n (endianness little))
    (put-bytevector p b)))
...
```

The first commit

```
;; remote-store.cc
(define-record-type <nix-server>
  (%make-nix-server socket major minor)
  nix-server?
  (socket nix-server-socket)
  (major  nix-server-major-version)
(define* (open-connection ...

;; derivations
(define-record-type <derivation>
  derivation?
  (outputs  derivation-outputs)
  (inputs   derivation-inputs)
  (sources  derivation-sources)
  (system   derivation-system)
  (builder  derivation-builder) ...
```

This talk will present Guix, detail this **incredible feature set**, and show what it's like to **package software** with it. We will discuss whether and how it could fit in the **Grand Plan of making a "GNU distro".**

—Ludovic Courtès

```
13 June 2022:
guix/gnu-build-system.scm,
guix/build/gnu-build-system.scm


28 June 2022:
guix/packages.scm,
distro/base.scm — the hello package!
      (long-description "Yeah...")
```

It was far from obvious that this would lead us anywhere — did the world really need another package manager? The decisive turn of event, for me, was to see that, at the time Guix officially became part of GNU in November 2012, it had already become a **group effort**; there was, it seems, a shared vision of why such a crazy-looking project made sense not just technically but also **socially** — for GNU, for user freedom.
I remember Nikita Karetnikov as the first heroic contributor at a time when Guix could barely install packages.

—Ludovic Courtès

23 November 2012:
official announcement on gnu-system-discuss
34 scheme files in `distro/packages`, 67 packages

In the beginning were people

It's been about 8 years of Guix for me (the heck!). I started using the **package manager** on Debian, **gradually switched** the provenance of my software from Debian to Guix, and, **once** GNOME became **available**, I **moved to Guix's distribution** of the GNU operating system, which I've been using as my **main system** for about 3 years now (and I don't see that changing anytime soon).

—Luis Felipe

People's beginnings

```
commit 7da7ae937e69dc7bca77df94a387ed2dc039090f
Author: Ludovic Courtès <ludo@gnu.org>
Date:   Fri Oct 5 00:19:29 2012 +0200
    ...as suggested by Nikita Karetnikov


commit a52e429f76282080c58444ce2ac82a1968d5f29d
Author: Nikita Karetnikov <nikita@karetnikov.org>
Date:   Tue Oct 16 23:24:58 2012 +0000
    distro: Add i686 support.
    * distro/packages/base.scm (gcc-4.7): Turn `arguments'
    into a lambda. Use `glibc-dynamic-linker' instead of
    the hard-coded linker name.
```

People's beginnings

```
commit ba55b1cb691e410339fbb446a95c65b9ea59017e
Author: Ludovic Courtès <ludo@gnu.org>
Date:   Wed Dec 12 14:46:43 2012 +0100
    doc: Fix typos.
    * doc/guix.texi: Fix typos.
    Reported by Andreas Enge <andreas@enge.fr>.


commit 8e1cd713767b7e8266dbf54211d94f687f0301d9
Author: Andreas Enge <andreas@enge.fr>
Date:   Wed Dec 12 20:03:07 2012 +0100
    distro: mpc: Update to 1.0.1.
    * distro/packages/multiprecision.scm (mpc):
    Update to 1.0.1.
```

Commit 100000!

```
commit 9fe9856ebef515927900e56686a1071936bdafcc (HEAD)
Author: Ricardo Wurmus <rekado@elephly.net>
Date:   Wed Aug 10 12:19:55 2022 +0200
    gnu: r-fontawesome: Update to 0.3.0.
    * gnu/packages/cran.scm (r-fontawesome):
    Update to 0.3.0.
```

- 832 unique entries in the git "Author" field
  (counting varying email addresses)
- 273 unique Authors for the last 10000 commits
  (since December 2021)

What's in a name?
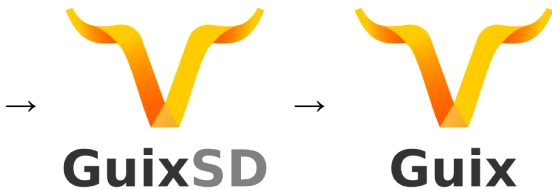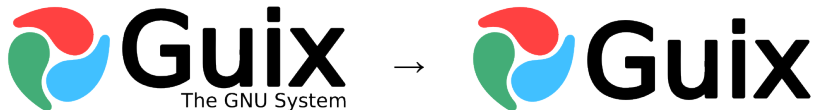
We're building the GNU system!

—Ricardo Wurmus

Reviewing the **GNU system** for FSDG compliance
—22 July 2014, Ludovic Courtès, `gnu-linux-libre`

The GNU Guix distribution of GNU/Linux meets all of our criteria and will be an **endorsed distro** so long as **RMS decides** the way the project is described on the Guix homepage does **not** create confusion or lead users to believe that it is **the official GNU System.**
—18 November 2014, Joshua Gay

Is Guix just the next step into having GNU as a real operating system? Are Guix and dmd the things that will allow the GNU project to finally release their GNU operating system?
—29 August 2014, Omar Radwan, gnu-system-discuss

I don't know what we will say about the name, but I am happy with the advances in packaging that Guix makes.
—30 August 2014, Richard Stallman

When can we expect a version 1.0 of **the GNU Operating System?**
—20 November 2014, Felipe López

As I can see it, the only "effort" missing is the GNU project declaring that this is **the official GNU system.**
—21 November 2014, Andreas E.

> I would argue that rather than talking about producing **The Official GNU System**, we should be talking about producing **a reference distribution** of the GNU system. The Guix guys are effectively doing that in my opinion and I think it's great.
> —22 November 2014, Brandon Invergo

> Perhaps "The GNU Project's avant-garde distribution of GNU/Linux". This also avoids the undesirable effect of suggesting that other free distros are rejected.
> —16 December 2014, Richard Stallman

If Guix is the GNU package manager and integrates the components of GNU, why can't the resulting distribution be called The GNU Operating System (or GNU, for short)?

—20 November 2014, Felipe López

Builds: bayfront and berlin

Wikipedia, cc-by-sa4.0

Wikipedia, fdl1.2+

Build farm woes

- `hydra.gnu.org`
  - ▶ Virtual machine hosted at the FSF
  - ▶ Running hydra continuous integration of Nix
  - ▶ Too weak for our growing needs
- We need our own physical machine!
  But it must be in line with our core values:
  - ▶ Free firmware!
  - ▶ Libreboot!
  - ▶ GuixSD!
  - ▶ Self-hosted!
  - ▶ Cuirass!

Being overwhelmed

- 4 February 2016: First contact with Vikings
- 32 core server with ASUS KGPE-D16 mainboard
- Lots of questions for which we software people are incompetent...
  - ▶ How many disks?
  - ▶ Sacrifice a case fan to save space?
  - ▶ How to get remote access — serial console with an extra ARM board?
  - ▶ Libreboot not yet ready.
- GuixSD is not ready
  - ▶ Hard disk encryption?
  - ▶ Raid?
  - ▶ GuixSD on the extra ARM board?

Sturm und Drang

10 June 2016: Guix Europe buys the machine for 2142€ (at cost) from Vikings, using a 5000€ donation by Igalia.

- Libreboot!
- Two different harddisks of 4TB in RAID-10
- No disk encryption
- Work by many people on `mdadm` for RAID
- Remote access replaced by remote power switch.
- Hosted by Aquilenet, non-profit ISP in Bordeaux
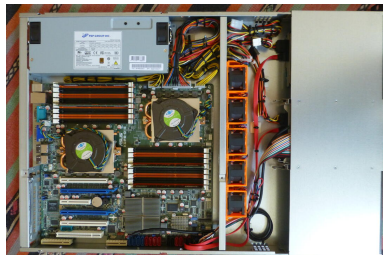
And it works!

After four days of testing various things, thanks to Ludovic's help and with a lot of trial and error related to our meta-programming, finally the code for RAID-10 is working. So I just managed to install the new server with GuixSD.

—16 July 2016, Andreas E.

Houston, we have a problem

While trying to install GuixSD, twice in a row the machine worked for a while, compiled packages or downloaded others, then rebooted. I also noticed occasional ECC errors in L2 in a CPU.

—15 July 2016, Andreas E.

This is not good, looks like the CPU is damaged.

—Vikings

We've hired the developer who did the coreboot port of the board and work with him to fix this issue, no matter if it's a firmware or user-space issue.

—23 September 2016, Vikings

4 May 2017: Vikings sends us two 6278 CPUs to replace the 6262HE CPUs

December 2017: Vikings exchanges the complete server.

Meanwhile in another part of the galaxy

```
commit 7d1f97258b9071a227a8c4e191f74b59dae325ef
  Author: Ricardo Wurmus <rekado@elephly.net>
  Date:   Thu Jul 20 23:42:37 2017 +0200
  hydra: Add initial configuration of berlin.
  * hydra/berlin.scm: New file.
  * hydra/nginx/berlin.conf: New file.
```

- Almost perfect solution: No libreboot, but GuixSD
- Compile farm backed by an academic institution (MDC)
- Competent people to set it up
- Bus factor > 1 (but still low)
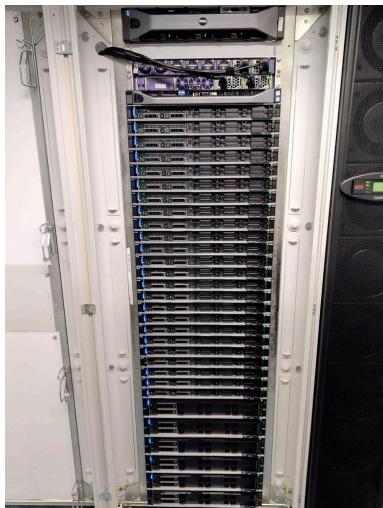
Now, in addition to ci.guix.gnu.org, bordeaux.guix.gnu.org is a default substitute server.
—18 June 2021, Christopher Baines

Foundation

Donation campaign

We'll add Guix to the FSF's Free Software Fund, which will allow the **FSF** to collect **financial donations** on behalf of the Guix project.

—30 September 2015, Ludovic Courtès

- Still online...
- Average donation 106 US-$
- FSF keeps 10%
- Current balance about 59000 US-$

The FSF is overworked so the Free Software Fund still isn't set up for us, and I'm even concerned about its viability at this point.

—18 November 2015, Ludovic Courtès

Funding the build farm: Definitely I am in favour of creating a French "association loi 1901".

—22 November 2022, Andreas E.

Do the right thing™ and square the circle

- **Collective leadership**:
  All members have an equal say.

- **Privacy**
  Minimal number of members declared to the French administration.

- **Resilience**
  Survive to hostile take-over attempts by proponents of
  non-free software.

- **Diplomacy**
  Do not alienate people who were afraid we would move away
  from the FSF (in the US).

Guix Europe: Foundation on 11 February 2016

- **Goal**

  L'Association a pour but la promotion, l'utilisation et le développement de logiciels et de systèmes d'exploitation respectueux des **libertés des usagers**, en favorisant en particulier les utilisations à des fins de **recherche** ou d'**éducation sans volonté commerciale**.

  L'Association s'engage notamment à soutenir le projet **GNU Guix**.

- **Members**

  Mathieu Lirzin (Présidence)
  Andreas E. (Trésorerie)
  Ludovic Courtès (SAC member)
  Cyril Roelandt (SAC member)

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Standard 01.40.58.75.00
Annonces...................01.40.58.77.56
Accueil commercial.... 01.40.15.70.10

Associations

**Associations syndicales
de propriétaires**

Fondations d'entreprise

Fonds de dotation

Annonce n° 760 - page 49

33 - Gironde

ASSOCIATIONS

Créations

Déclaration à la préfecture de la Gironde.
GUIX EUROPE.
Objet : la promotion, l'utilisation et le développement de logiciels et de systèmes d'exploitation respectueux des libertés des usagers; en favorisant en particulier les utilisations à des fins de recherche ou d'éducation sans volonté commerciale ; l'association s'engage notamment à soutenir le projet GNU Guix.
Siège social : 43, rue Paul Louis Lande, 33000 Bordeaux.
Date de la déclaration : 11 février 2016.

Le Directeur de l'information légale et administrative : Bertrand MUNCH

Organisation of Guix Europe

3 levels

1. Members
   - Hold powers through General Assemblies (GA)
   - Nominal membership fee of 10€ per calendar year
2. Solidary Administrative Council (SAC)
   - Elected by GA
   - Approves new members
   - Takes all day to day decisions
3. Board: Présidence and Trésorerie
   - Elected by GA
   - Represent foundation externally
   - Only people whose data is declared to the French administration

Guix Europe in practice

- Entity holding assets on behalf of the Guix project
- Advancing funds for hosting and purchases, usually reimbursed from the funds held at the FSF (own fundraiser not excluded in the future)
- Co-organising, sponsoring and being financially responsible for the Guix Days in Brussels
- 17 members, of which 3 late for their 2021 membership fees
- 10 members are in the SAC
- Getting a website just now...
- Not unleashing its full potential for advancing Guix

See separate presentation by Simon Tournier, current Présidence.

La bonne conduite

Community building

French is a strongly gendered language:
le président / la présidente, le trésorier / la trésorière
Guix Europe hack: la Présidence, la Trésorerie

GNU Hackers' Meeting 2014 in München

- anti-harassment policy
- speaker threatens to cancel talk
- heated discussion at the internal business meeting
- éclat on whether to adopt a Code of Conduct

As usual, two opposing camps

- The voice of reason, often with a queer-feminist background, wanting an **inforceable Code of Conduct**.
- Free speech extremists wanting **non-committal appeal** to good behaviour, as exemplified later by Richard Stallman's **Kind Communication Guidelines**.

> I don't know about you, but I think this growing community here has always been very kind, welcoming, and helpful, IOW: awesome. I added a 'CODE-OF-CONDUCT' file, which is essentially a way of telling the lurkers out there: yes, we do our best to be welcoming and we're committed to doing so, so join us!
>
> —9 December 2015, Ludovic Courtès

```
commit e15fcdd149cec662fcaf4b550ee32879bd53a591
Author: Ludovic Courtès <ludo@gnu.org>
Date:   Wed Dec 9 13:39:40 2015 +0100
    Add "Contributor Covenant".
    * CODE-OF-CONDUCT: New file
    * doc/contributing.texi (Contributing): Mention it.
```

Contributor Covenant

- 103 lines
- Matters of course

  We as members, contributors, and leaders **pledge** to make participation in our community a **harassment-free experience** for everyone, regardless of ...

- Guix maintainers are responsible for action

  Community leaders are **responsible** for clarifying and **enforcing** our standards of acceptable behavior and will take appropriate and fair corrective **action** in response to any behavior that they deem inappropriate, threatening, offensive, or harmful.

Contributor Covenant

- Escalating action options:
    1. Correction
       often implicit by polite suggestions on IRC or mailing lists
    2. Warning
       about twice
    3. Temporary Ban
    4. Permanent Ban
       about once

- Seemingly paradoxical statement in FAQ
    > Those who discriminate or make others feel
    > **unwelcome** are themselves **not welcome.**

While I was immediately smitten by the perfection and elegance of Guix, I have stayed this long not for the technical excellence but for the **people**. The Guix community is the **warmest and most caring** free software **community** I have ever been a part of.

—Arun Isaac

the very friendly, supportive, tolerant (only to the **tolerant, thanks to the code of conduct**) community

—Björn Höfling

But probably my favorite part of Guix is the **fantastic community** I've seen grow around the project. It exemplifies the sort of **caring, kind, supportive group** I wish many other projects had.

—Eric Bavier

This is how I found how **amazingly helpful and friendly** the **community** was.

—Jan Nieuwenhuizen

I quickly found perhaps the biggest and most important: the GNU Guix community. They have been nothing short of amazing: **helpful, intelligent, supportive, and fun to hang out with** on the #guix channel.

—John Kehayias

I also learned to appreciate the Guix community, which is **friendly, competent, and refreshingly low-ceremony** in spite of continuous growth.

—Konrad Hinsen

The Guix community is **amazing** as well!

—Thiago Jung Bauermann

This is **one of the best communities** centered around a piece of tech that I've been in

—raingloom

I really appreciate the community around Guix and the process, **values and thoughtfulness** that work **proactively** to maintain a **healthy community,** even in the face of inevitable and occasional conflict.

—Vagrant Cascadian

What's next?

Wikipedia, cc-by-sa4.0

Bikeshedding, pipe dreams and blue flowers

- GNU Hurd

> Manolis successfully completed the recipes to get a
> cross-compilation toolchain to GNU/Hurd, with part of the
> work already in the main branch. This allowed him to
> produce statically-linked bootstrap binaries (stumbling
> upon nasty ld.so issues on the way.) Manolis is now
> running Guix and building packages natively on
> GNU/Hurd, which will constitute a large part of the
> remainder of his project.
>
> —19 July 2015, Ludovic Courtès

> What possibly started somewhat as a April fools joke in
> 2020 about the Hurd — this is still unclear — was
> (mis?)taken by some as a real project and led to a fun
> hacking frenzy of several months finally producing the
> "Childhurd": A Guix Shepherd service that gives access to
> the GNU/Hurd in a VM.
>
> —8 October 2020, Jan Nieuwenhuizen et al.

Bikeshedding, pipe dreams and blue flowers

- Peer-to-peer substitutes
- Build daemon in Guile Scheme
- Community building

> My wish for the near future is a community more structured: more events and meetups, more process for smoothing the contributions ("teams" for improving the reviewing by sharing the load, RFC for discussing new features, regular releases, etc.), and more materials for using Guix in various configurations.
>
> —Simon Tournier