

# GNU Guix behind the scene

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# What's GNU Guix?



# Guix

- ▶ Package manager written in Guile scheme.
- ▶ Advanced distribution proposing declarative system configuration for transparent and reproducible operating systems.

# Update Guix

```
guix pull --no-substitutes
```

```
[...]
```

```
New in this revision:
```

```
133 new packages: alembic, aws-vault, ...
```

```
252 packages upgraded: arm-trusted-firmware-rk3328@2.6, .
```

```
News for channel 'guix'
```

```
New '--tune' option for CPU micro-architecture tuning
```

```
'integer expected from stream'? Update your Guix daemon
```

```
hint: Run 'guix pull --news' to read all the news.
```

```
real 43m1.738s
```

```
user 2m9.620s
```

```
sys 0m1.658s
```

## What are substitutes?

- ▶ Archives containing the output of a derivation.

```
$ guix build hello -d
/gnu/store/260bk0ch4-hello-2.10.drv

$ curl https://ci.guix.gnu.org/260bk0ch4.narinfo
StorePath: /gnu/store/260bk0ch4np4-hello-2.10.drv
URL: nar/gzip/260bk0ch4np4-hello-2.10.drv
Compression: lzip
FileSize: 1180
URL: nar/zstd/260bk0ch4np4-hello-2.10.drv
Compression: zstd
FileSize: 1122
NarHash: sha256:12sbrgk0ypqmy
NarSize: 2408
References: 1zcr255w8la-linux-libre-headers-5.10.35.drv ...
Signature: 1;berlin.guix.gnu.org;KHNPZ2 ...
```

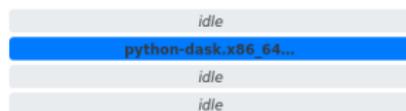
# Enter Cuirass

The logo for Cuirass, featuring the word "CUIRASS" in a bold, white, sans-serif font on a black rectangular background. To the right of the text is a stylized icon consisting of a white vertical bar with two orange rectangular shapes inside, resembling a circuit board or a specific component.

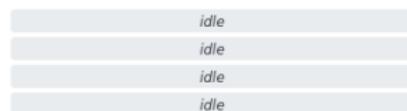
- ▶ Nix Hydra rewrite.
- ▶ Poll sources from multiple Git repositories.
- ▶ Execute builds on local or remote Guix daemons.
- ▶ Store build products or artifacts.
- ▶ Collect build logs and metrics.
- ▶ Provides a REST API and a web interface.

# Berlin build farm

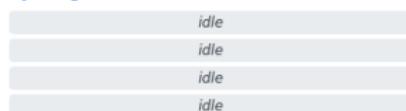
hydra-guix-118



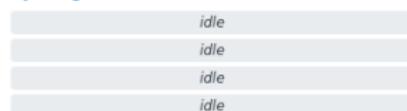
hydra-guix-120



hydra-guix-122



hydra-guix-123



- ▶ One head node: 96 CPUs, 188GiB of RAM, 37TB storage.
- ▶ 30 Intel workers.
- ▶ 6 ARM workers and 1 PowerPC via VPN.

# Maintaing Cuirass

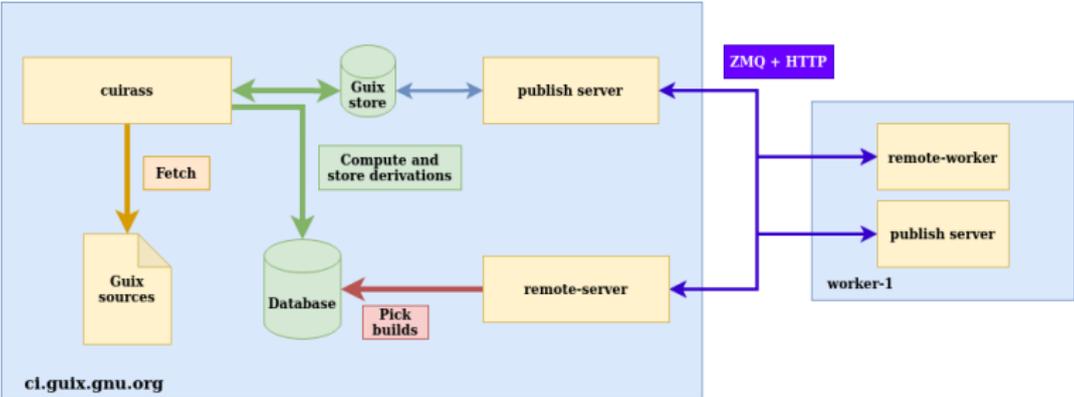
- ▶ Fibers is not mature.
- ▶ Sqlite did not scale.
- ▶ Daemon offloading was also problematic.

# Improving Cuirass



- ▶ 6 months of work sponsored by NLNET.
- ▶ Switch to PostgreSQL database.
- ▶ Better user interface.
- ▶ Offloading with ZMQ.
- ▶ Watchdog, timeouts, metrics and logging support.

# New architecture



## Extended CI use

- ▶ Build WIP branches.
- ▶ Run system tests.
- ▶ Build & deploy images.
- ▶ Check if sources are available.
- ▶ Build the disarchive database.
- ▶ Pull if substitutes.

# Development guidelines

- ▶ Write robust queries, optimize the existing.
- ▶ Add unit tests covering each and everyone of them.
- ▶ Maximal code reuse: publish, substitutes download.
- ▶ Track exceptions.
- ▶ Verbose logging.
- ▶ Minimize maintenance.

## Software issues

- ▶ Publish server timeouts and crashes.
- ▶ Guile ARM GC lock up.
- ▶ Cope with lack of space and RAM on the workers.
- ▶ Improve reporting.

## Hardware issues

- ▶ HDD storage + big store = GC issues.
- ▶ Missing ARM and PowerPC hardware.

# Future features

- ▶ Build patchsets.
- ▶ Show branches diff.

# Contribute

- ▶ Join the Guix sysadmin team.
- ▶ Donate machines or money.
- ▶ Report issues.