Functional Package Management with GNU Guix

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Common problems

- outdated packages
- version conflicts
- changes affect all users
- potentially dangerous
- trust

Partial solutions

- **third-party repositories**
  EPEL, PPAs, ...
- **manual compilation**
  install to custom prefix, static linking
- **language-specific package systems**
  gem, cabal, pip, cpan, npm ...
- **build your own system package**
  RPM, deb, PKGBUILD, ...
- **meta package managers**
  e.g. fpm generating RPM, deb, gem
- **giving up**
  virtual machines, “app images”, snapshots

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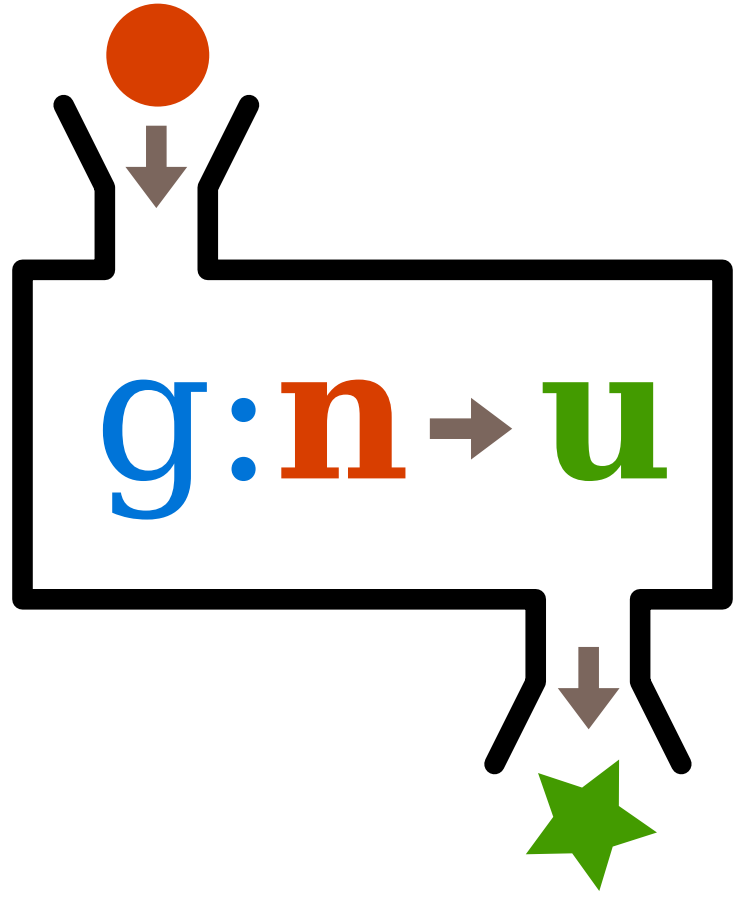
Guix

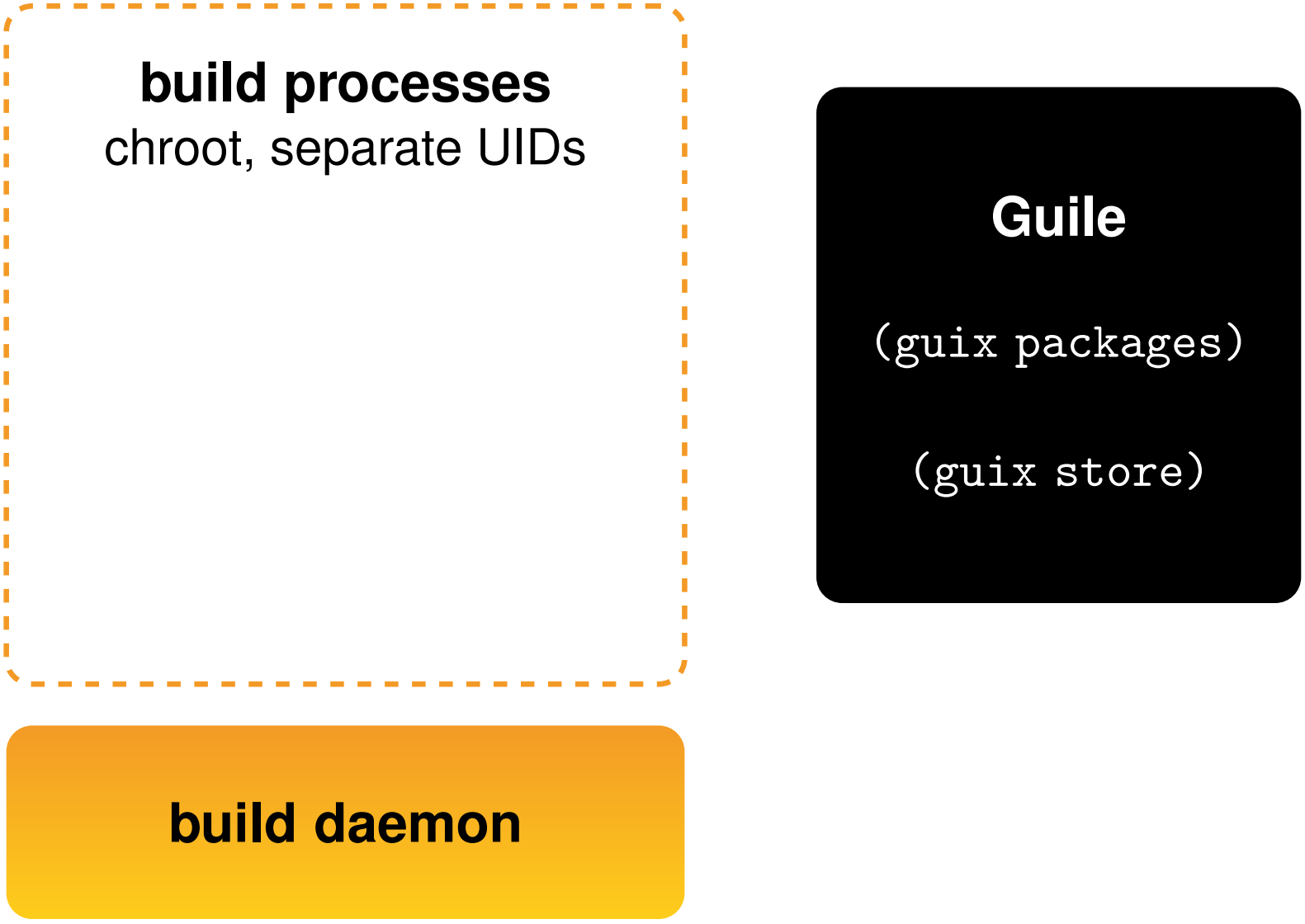

g:n→u

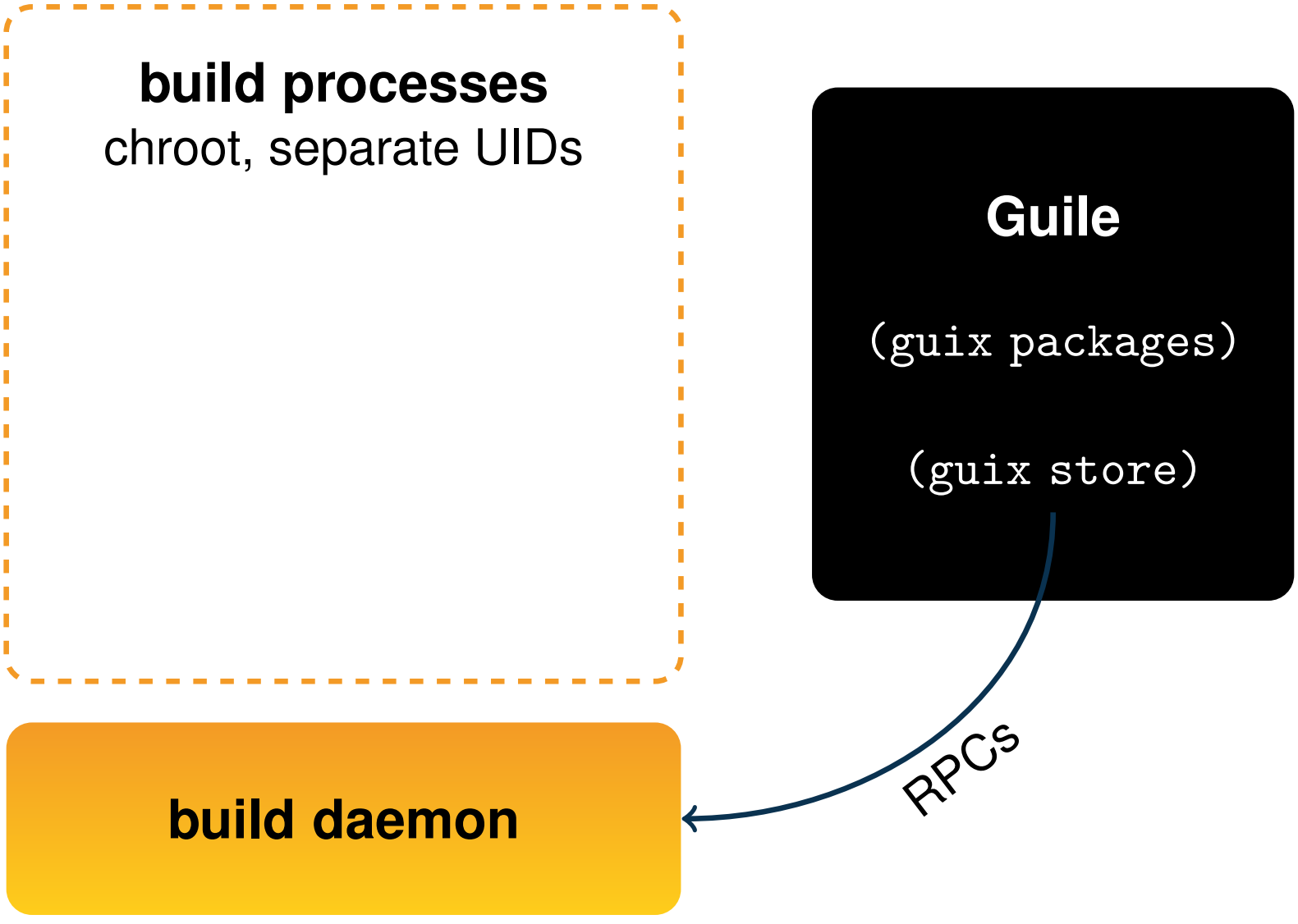
headers
build tools
libraries
recipe:
in→out
package

```
(define hello
  (package
   (name "hello")
   (version "2.8")
   (source (origin
            (method url-fetch)
            (uri (string-append
                  "mirror://gnu/.../hello-" version
                  ".tar.gz"))
            (sha256 (base32 "0wqd...dz6"))))
   (build-system gnu-build-system)
   (synopsis "Hello, GNU world: An example GNU package")
   (description "Produce a friendly greeting.")
   (home-page "http://www.gnu.org/software/hello/")
   (license gpl3+)))
```

Functional package management

- no **global** values:
  /bin, /usr/include, /usr/lib, ...
- only **declared inputs** are visible
- **immutable** results:
  build outputs can be cached and substituted;
  automatic deduplication!
- no **side effects**:
  nothing outside of the cache and internal state is modified
- every package output has its **own unique directory** in the store


build processes
chroot, separate UIDs
Guile
(guix packages)
(guix store)
build daemon


build processes
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RPCs
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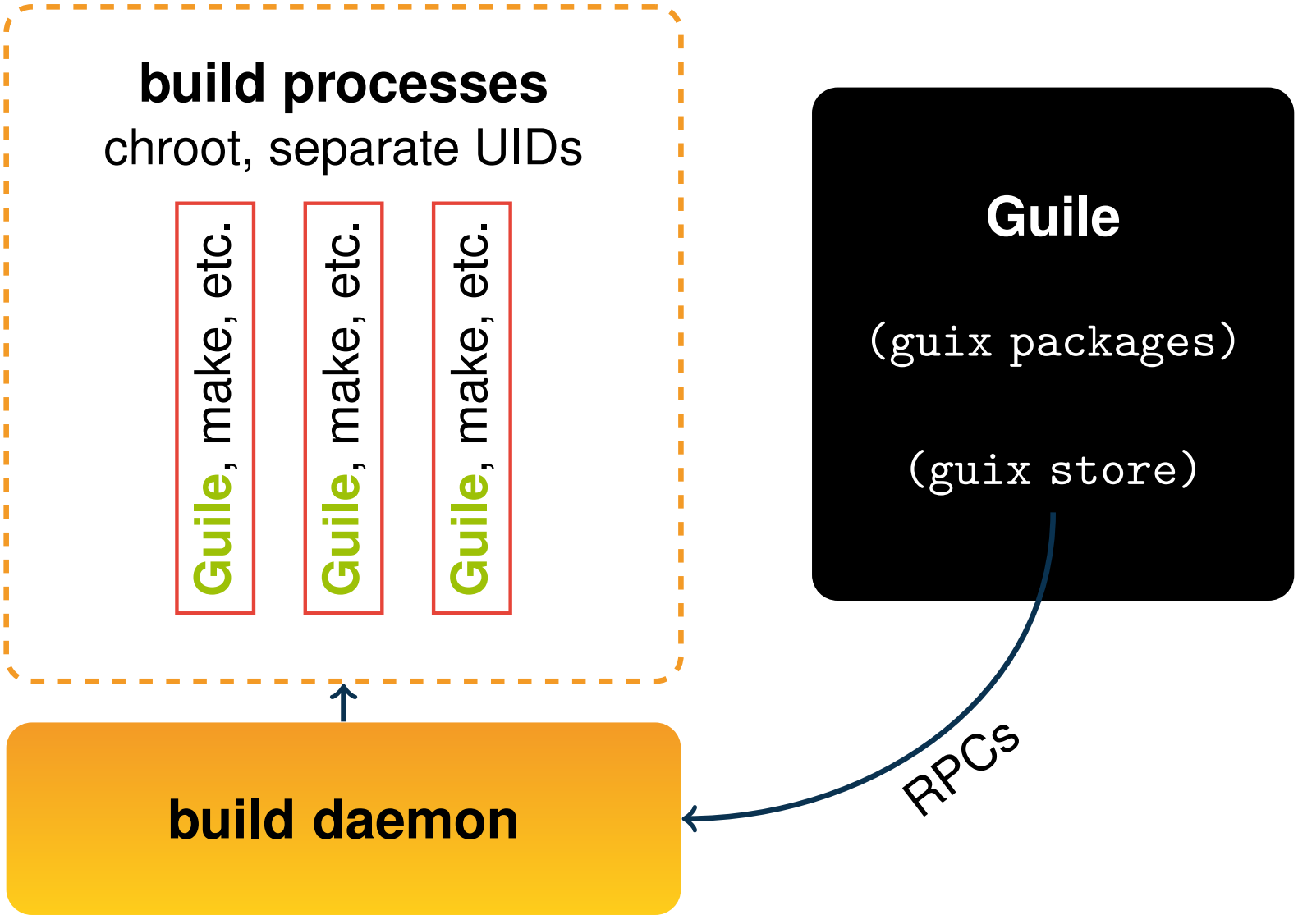
build processes
chroot, separate UIDs
Guile, make, etc.
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(guix packages)
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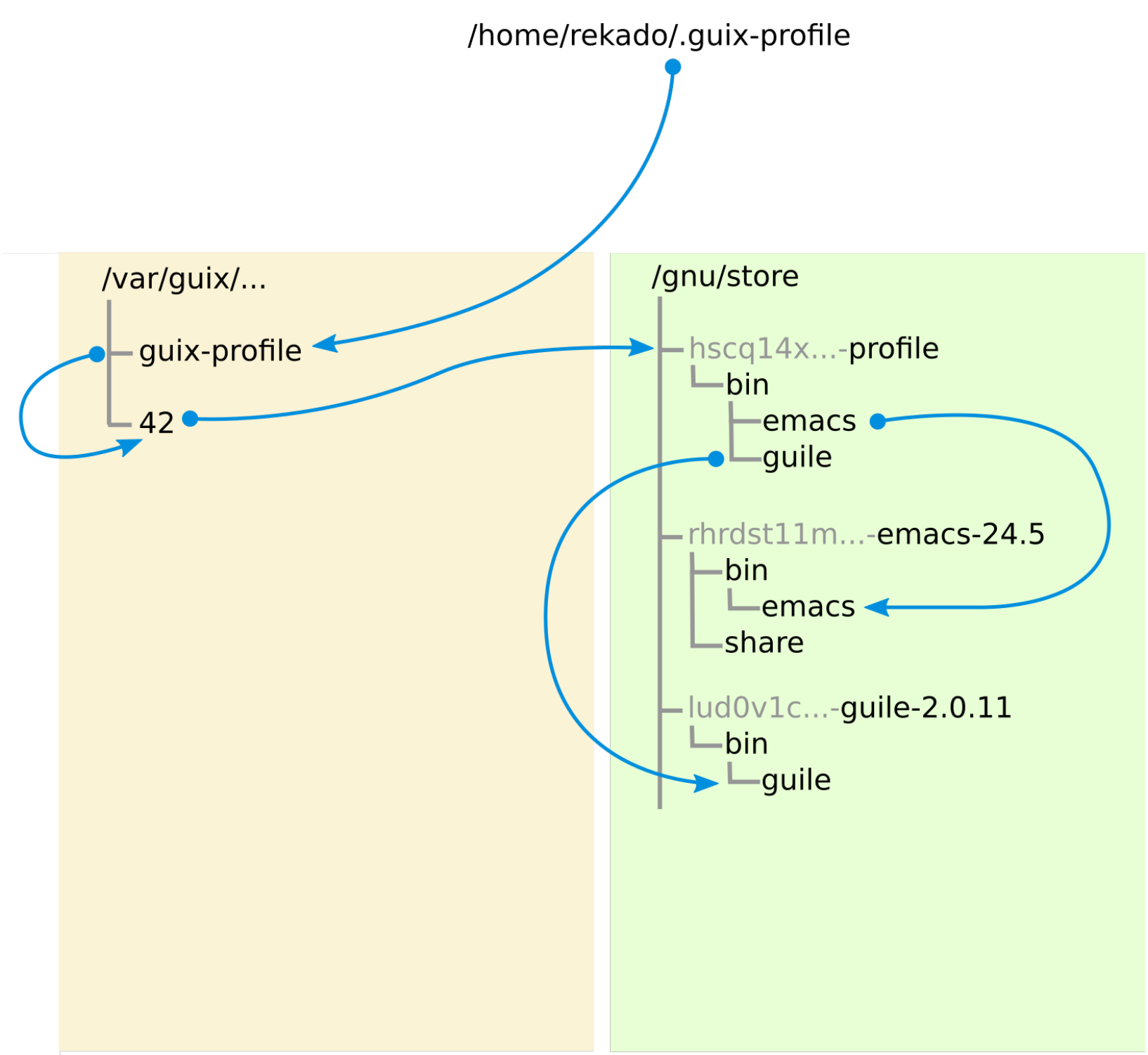
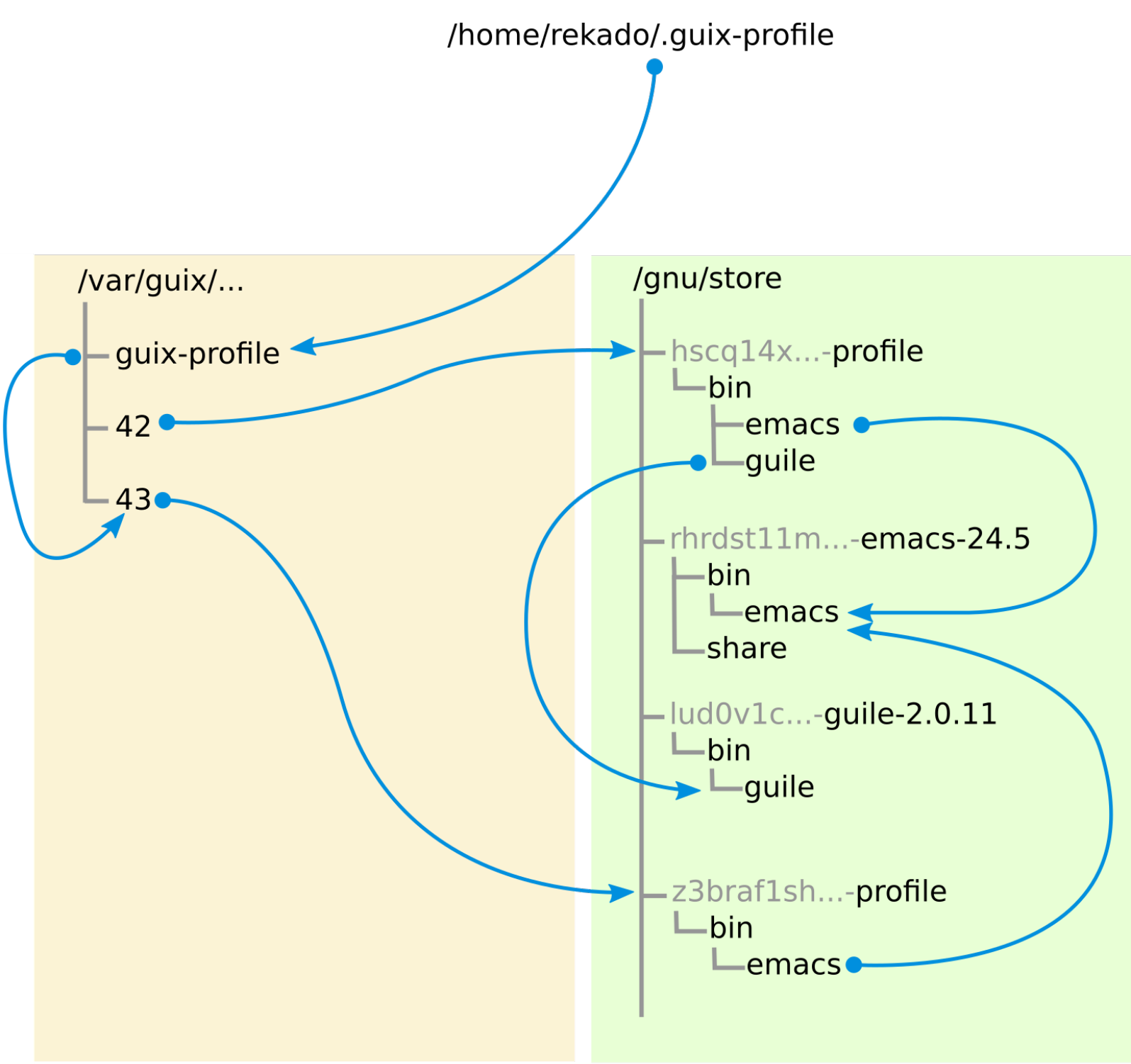

/home/rekado/.guix-profile
/var/guix/...
guix-profile
42
/gnu/store
hscq14x...-profile
bin
emacs
guile
rhrdst11m...-emacs-24.5
bin
emacs
share
lud0v1c...-guile-2.0.11
bin
guile


/home/rekado/.guix-profile
/var/guix/...
guix-profile
42
43
/gnu/store
hscq14x...-profile
bin
emacs
guile
rhrdst11m...-emacs-24.5
bin
emacs
share
lud0v1c...-guile-2.0.11
bin
guile
z3braf1sh...-profile
bin
emacs

your help needed!

- version 0.8.2 is **out now**
- **install the distribution**
- **use it**, report bugs, add packages
- help with the **infrastructure** + admin
- share your **ideas**!

GuixSD

Guix

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

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