A Brief Introduction to GNU Guix

David Thompson
davet@gnu.org

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- Introduction
- What is GNU Guix?
- Packages
- Operating Systems
- Demo

Who am I?

- My name is David Thompson
- I am the Web Developer at the Free Software Foundation
- I am a contributor to GNU Guix and GNU Guile

What is Guix?

- A purely functional package manager for the GNU system, and a distribution thereof
- Dependable, hackable, and liberating
- Based on Nix
- Written in Guile Scheme

Dependable

In addition to standard package management features, Guix supports transactional upgrades and roll-backs, unprivileged package management, per-user profiles, and garbage collection.

Hackable

It provides Guile Scheme APIs, including high-level embedded domain-specific languages (EDSLs), to describe how packages are built and composed.

Liberating

A user-land free software distribution for GNU/Linux comes as part of Guix.

Packages

- The package build and installation process is seen as a function, in the mathematical sense
- That function takes inputs, such as build scripts, a compiler, and libraries, and returns an installed package
- As a pure function, its result depends solely on its inputs
- Build processes are run in isolated environments, where only their explicit inputs are visible

Packages

```
(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+)))
```

Operating Systems

```
(operating-system
 (host-name "codefest-2014")
 (timezone "America/New_York")
 (locale "en_US.UTF-8")
 (bootloader (grub-configuration (device "/dev/sda")))
 (file-systems
  (list (file-system (mount-point "/") (device "dummy") (type "dummy"))
        %binary-format-file-system))
 (users (list (user-account
               (name "dave")
               (group "users")
               (supplementary-groups '("wheel"))  ; allow use of sudo
               (password "P@ssw0rd")
               (comment "Guix is pretty neat")
               (home-directory "/home/dave"))))
 (issue "Hello, Codefest 2014!")
 (services (cons* (slim-service #:auto-login? #t #:default-user "dave")
                  (static-networking-service "eth0" "10.0.2.10"
                                             #:gateway "10.0.2.2")
                  (avahi-service)
                  (dbus-service (list avahi))
                  %base-services))
 (packages (cons* emacs xterm avahi %base-packages)))
```

Demo

- Build VM image
- Install packages
- Rollback

Thanks!

- Guix 0.7 to be released in the coming weeks with bootable USB disk image
- We need your help to package useful sofware!
- Join us in `#guix` on freenode or the `guile-devel@gnu.org` mailing list
- Source code and documenation available at `https://gnu.org/s/guix`

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