# emerge world

Putting Your Processor to the Grindstone

## What is Gentoo?



- Simply: a GNU/Linux metadistribution that focuses on building systems and software from source.
  - Full x86 installation instructions from the Gentoo Foundation <u>here</u>.
- The user is responsible for:
  - fetching necessary binaries for system functionality (all of /usr/bin);
  - installing the bootloader;
  - o configuring and installing the kernel;
  - o other basic programs for a bootable system.
- Upstream provides:
  - documentation on all of the above;
  - a bootable liveCD/liveDVD/liveUSB;
  - basic utilities to build the above.
- Portage works with both <u>FreeBSD</u> and <u>Linux From Scratch</u>.

## The setup

- The computer used for this talk is a stable x86 machine with the following:
  - kernel; bootloader (GRUB 2); other packages as needed
- Portage already installed
- Assuming the user installed the system per the Gentoo installation manual.

# Portage utility: emerge

emerge is the central program for installing, managing and updating programs. This comes standard with the system.

#### Some important features:

- Package information stored in flat files (ebuilds)
- USE flags for feature toggling
- Source build instructions
- Portage-dependent package dependencies
- Sync feature keeps systems current.
- Source files known as distfiles

### Dealing with packages in Portage

- Keep up-to-date with with the emerge --sync command
  - Upstream Gentoo team maintains new & removed packages on their server.
  - Sync can be done via rsync (default) or over HTTP (webrsync option)
- Searching in Portage
  - emerge -S program name
  - Time consuming

- Package structure
  - <category>/<package name>
  - Ex: app-misc/hello

What is hello? It is simply a GNU "Hello, world" application. user@host:~\$ hello Hello, world!

For the sake of time, it is listed as app-misc/hello. Some highlights of the ebuild file:

- DESCRIPTION & HOMEPAGE: software description & homepage, respectively
- SRC\_URI: where to obtain the source files
  - Full documentation via <u>upstream</u>.
- KEYWORDS:
- IUSE: USE flags that the package will accept.

src functions - specific instructions to carry out during certain phases of the build

- src\_configure: carry out the specified instructions and pass them to autoconf
- src\_install: carry out the specified instructions before and/or after executing make install

#### An ebuild exemplar: GNU hello

# **USE Flags**

Gentoo upstream maintains full documentation online.

#### USE flags ~= keywords:

gnome enables GNOME support, ncurses enables the NCURSES text-based interface, and so forth.

Some packages have USE flags specific to the program itself.

E.g. Lighttpd (www-servers/lighttpd) has the webdav flag that enables a patch for that specific package.

Users may set USE flags globally or on a package-specific level.

## Calling emerge to build packages

### Installing GNU Hello:

emerge -pv app-misc/hello emerge -v app-misc/hello

-p or --pretend: set up, calculate dependencies, but do nothing

-a or --ask: set up, calculatedependencies, but prompt the user prior to merge

-v or --verbose: Tell me **EVERYTHING**.

<u>Documentation from Gentoo</u> <u>upstream</u>

<u>man 1 emerge</u>

# Files in /etc/portage

1. make.conf

2. package.use

3. package.mask

- This is where users can toggle USE flags globally for their system, and set other Portage-related variables. This also includes GCC flags for their processors.
- This is for individual package USE flag toggles.
   Syntax: <package name> <+/-flag>
- 3. Block packages entirely.

## Keeping up with the Joneses

Maintaining a list of installed packages (sets) via flat files.

**System:** the list of packages needed for basic system functionality

To update this set:

emerge system

WOrld: all the packages that the user has manually installed as well as any dependencies merged.

To update this set:

emerge world

These packages are written to /var/lib/portage/world. **DO NOT EDIT THIS FILE MANUALLY.** 

- Flexibility
  - install what programs you want and how you want them
- Control
  - Specify what programs you want built with certain functionality;
  - Filter programs based on stability, license, and personal choice.
- Competent package nomenclature.

And lastly, a slight inclination towards insanity.

#### **But why Portage?**

## Hacking Portage for Fun and Profit

- eix (app-portage/eix)
  - Builds a flat file database of everything installed & available in Portage
    - This speeds up searches greatly
  - Provides version information
  - Provides description & homepage
  - Will also list toggled & available USE flags

#### Gentoolkit

(app-portage/gentoolkit)

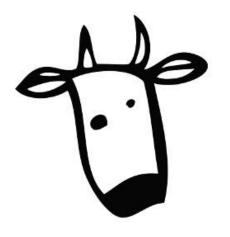
- A suite of programs, inc:
- equery
  - The uses flag lists and describes all of the available USE flags for a package.
  - list flag will search for any packages installed matching the query

#### Other resources



Gentoo/FreeBSD logo

# Gentoo Wiki Gentoo upstream documentation Gentoo forums



Unofficial Gentoo mascot: Larry the Cow

Speaker information:
Glenn Kerbein
spontaneousdancing.net