



Gentoo Linux

Introduction/Overview

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Gentoo Linux

- Started in 1999 by Daniel Robbins
- Source-based meta distribution
- x86, PowerPC/64, 32-bit and 64-bit Sparc, Alpha, AMD64, IA64, MIPS, hppa, S309, ARM, more
- Active all-volunteer developer community
- Social contract
 - GPL-2, LGPL, or other OSI-approved license
 - Will never depend on non-free software
 - Will remain freely available
 - Submit bugs and patches upstream
 - Open development and bug process
- Visit us at Linux World Expo, Boston this month!



Philosophy

- Most distributions have tools that manage the entire system. Do you work their way, or do they work for you?
- Design tools and systems that allow the user to do their work as efficiently as possible, as they see fit
- Appreciate and leverage the richness and flexibility of the Linux and Free Software community
- Only possible when the tool is designed to reflect and transmit the will of the user
- If the tool forces the user to do things a particular way, then the tool is working against, rather than for, the user



How I came to Gentoo

- Cyber NOS/NOS-VE, Apple Mac OS
- UNIX user since mid-80s.
 - SunOS/Solaris, Apple A/UX, Data General Unix.
- Moved to RedHat Linux 2.0.1 to replace OS/2 Warp
- Tried Slackware, Mandrake, SuSe, progeny, others; working with Gentoo ~2 years (almost 1 year as dev)
- Main Gentoo desktop machine: Athlon XP 2000+, 512mb RAM, 1x 40gb and 1x 160gb disks, cdr/dvd
- Several x86 boxes in distcc build cluster (Athlons, Celerons), Athlon servers
- Also a Gentoo-based Transmeta notebook, 2 Ultra-Sparc machines in the build queue



RedHat annoyances

- Old version with RedHat 7.2
 - PHP 4.2.x and xslt
 - wget 1.8 ?
 - OpenSSH privilege separation
- config.rpmnew.
- qmail ?
- No package management for non-rpm files
- For existing RedHat users, what happened after April 2004 ?



Gentoo features

- glibc 2.3.4+, gcc 3.4.x, ext3, ReiserFS, XFS, JFS, ALSA, pcmcia-cs, SELinux, PaX/Grsecurity, Propolice
- Xfree86 4.3 (now xorg 6.8.0-r3), OpenGL, KDE 3.3.1, Gnome 2.6/2.8, iptables, QoS
- qmail (with mysql and LDAP), postfix, courier, exim
- udev/hotplug, sysfs, GRUB, lilo, milo, silo, palo, yaboot, BootX
- Multiple kernel possibilities
 - Vanilla 2.4.26, 2.6.8.1 (stable), aa-, ac-, acpi-, mm-, openmosix-, ppc-, ppc-benh-, redhat-sources
 - Gentoo kernels with preempt, low latency, EVMS
- Prelinking, ccache, distcc



Portage features

- We provide scripts which download, patch, compile, and install packages
- Modeled on the ports-based BSD distributions
- Dependency checking, extreme customization
- Original source tarballs are downloaded
 - No need to wait for someone to make a binary package for your distribution
- The user specifies what they want, and the system is built to their specifications
 - Compiles are optimized for your specific hardware
 - E.g. AltiVec on G4 PPC chips, Pentium versus Athlon
 - Specify settings once, and all packages are built to those options



Ebuild scripts

- Easy to read format, clear separation of phases
- KEYWORDS, DEPEND
- Stable versus testing
- CPAN/Portage integration
 - Install and manage dependencies via Portage
 - Package management for perl modules (including uninstall)
 - Ebuilds are automatically created for CPAN packages



USE flags

- Globally defined list of features
 - Configure yours in `/etc/make.conf`
- `USE="-gnome kde qt arts -nls python perl oggvorbis opengl sdl -postgres jpeg png truetype dvd avi aalib mpeg encode fbcon mmx"`
- Each one defines specific functionality for each package to support
- USE flags generally map onto `--configure` options
- Install only what you want. No need to trim down a default installation
- "Opt-in" versus "opt-out"



Init scripts

- Named (not numbered) run levels
- Smart dependencies
 - Scripts can 'use' or 'depend' on others
- Start / Stop / Pause
- `/etc/runlevels/default/`
- `/etc/runlevels/boot/`



Installation

- Doesn't it take a long time to install packages?
 - Designed for modern hardware
 - Will run on a Pentium or PPC 603 with 64mb RAM
 - Built-in ccache, distcc support
- Net connection recommended
- "Secure" by default
 - Because nothing is installed by default
- Packages are installed into a "staging" directory, then merged (portage sandbox)
- Virtual packages
- Build from source or install binary quarterly releases with optional GRP (Gentoo Reference Platform) packages



Portage demo

- rsync
 - Local Portage mirror
- Package searching
- Installation, cleaning, removal
- Ebuild command for developers
- etc-update
 - CONFIG_PROTECT
- /var/db/pkg



Installation process

- Currently no graphical installer
- Just follow the detailed install documents
 - Boot from CD, setup networking, partition
 - Unpack stage 1, stage 2, or stage 3
 - Chroot, bootstrap or emerge system
 - Compile kernel, install system logger, cron daemon
 - Setup bootloader.
 - Set timezone, configure additional users



Stage tarballs

- Stage 1 install
 - Bare-bones. Need to bootstrap, compile gcc, glibc, system (make, perl, etc.), kernel, and user environment
- Stage 2 install
 - Already bootstrapped. Compile system, kernel, and user environment
- Stage 3 install
 - Base system included. Compile kernel and boot manager
- GRP install
 - Precompiled packages with the default MAKEOPTS and USE flags for your architecture



Binary packages

- Build your own, distribute packages to your machines
 - `emerge --buildpkg`
 - `FEATURES="buildpkg"`
 - `PORTAGE_BINHOST="http://local-server"`
- GRP (Gentoo Reference Platform)
 - Pre-built binary packages using default options
 - Including Xfree86, Mozilla, Gnome, KDE, Emacs, OpenOffice.org, Apache, MySQL, PostgreSQL, Samba



Coming soon

- Direct GLSA/Portage integration
- Pathspec integration
- Portage-ng
- Ebuild signing
- Official AMD 64 and IA64 support - Done
- udev support - Done



Try out Gentoo Linux

- Download from www.gentoo.org
 - 95-600mb iso images, plus 10-85mb stage files
- Unreal Tournament 2004 demo for x86/NVIDIA
 - Does not touch your hard drive
- Live CDs for x86, PPC (NewWorld and OldWorld), Alpha, AMD 64, HPPA, Sparc
- All live CDs are also install and rescue CDs



Documentation

- Gentoo Handbook
- Installation, FAQs
- Portage user manual
- USE flags, ENV.D, Security guide
- Desktop configuration guide, rc-scripts, ALSA, DRI, Java
- AFS, OpenMosix, Diskless/LTSP, Printing, UML, IPv6, Virtual Mailhost
- Developer documentation
 - Ebuild creation, eclass
 - Documentation guide (XML syntax)



Gentoo Community

- Close contact with end users
- Many ebuild scripts are submitted by users
- IRC channels (on irc.freenode.net) - #gentoo is the largest on the network with 800+ users
- Web-based forums (on forums.gentoo.org), 1000+ posts per day, 100,000+ topics
- Fully-public bug tracking (bugs.gentoo.org), 20,000+ hits per day
- “Gentoo Bug Day”
- Linux World Expo in Boston, possibly SoCal Linux Expo in Los Angeles (Feb 2005)



Staying informed

- News on www.gentoo.org
- Gentoo Linux Security Announcements (GLSA)
- RDF feed of news. GLSA feed coming soon
- Multiple mailing lists (each architecture, documentation, security)
- Gentoo Weekly News (GWN)
- Informal Discussion and Announcements
 - Gentoo forums on forums.gentoo.org
 - Gentoo IRC channels on irc.freenode.net



This work is an updated version of the original work below; modified by Stephen Arnold <nerdboy@gentoo.org>

<<http://dev.gentoo.org/~rajiv/IntroToGentoo/>>

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