

Gentoo Prefix

“Gentoo on a different level”

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Some History



- Gentoo for Mac OS X (ppc-macos)
- Portage on OSX installing in /bin, /usr/bin
- Rely on (outdated/buggy/non-GNU) host-provided software and tools
- Many blocks for packages that couldn't be updated



Lessons Learnt

- Approach quickly stalls
- Annoys the hell out of everyone
 - users
 - developers
 - the other Gentoo developers
- Simply won't work long term



Take Two

- Minimally rely on host-system
- “Upgrade” host-provided packages
- Have full development-friendly environment
- (Get `vim` and `mutt` out-of-the box)

“Father, why are we hiding from the police?”



Introducing Prefix

- Portage installs into an offset (= prefix)
- Offset is arbitrary: no conflicts, full control
- Can install as much as possible
- Just rely on minimum (kernel, libc)

“because they use emacs son, and we use Vi”



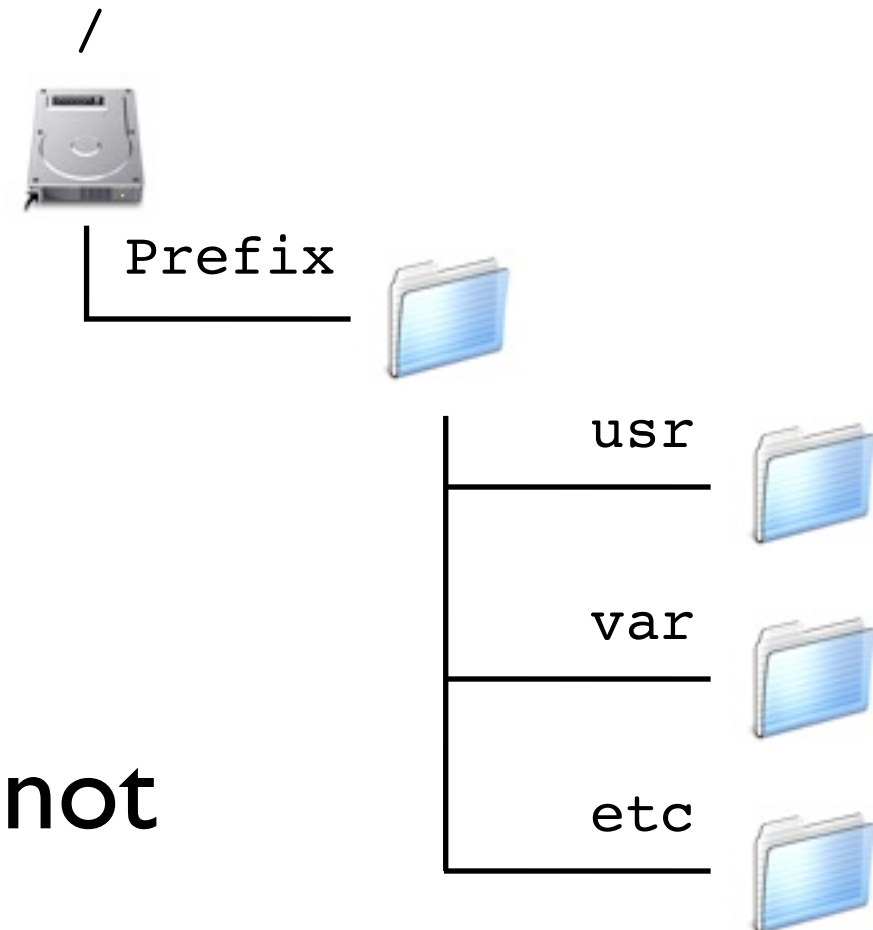
Prefix for Dummies

- Avoid conflicts, use an offset
- Works on multiple platforms, not just Linux
- Builds identical toolset everywhere

“One Prefix to Rule Them All”



Prefix for Dummies



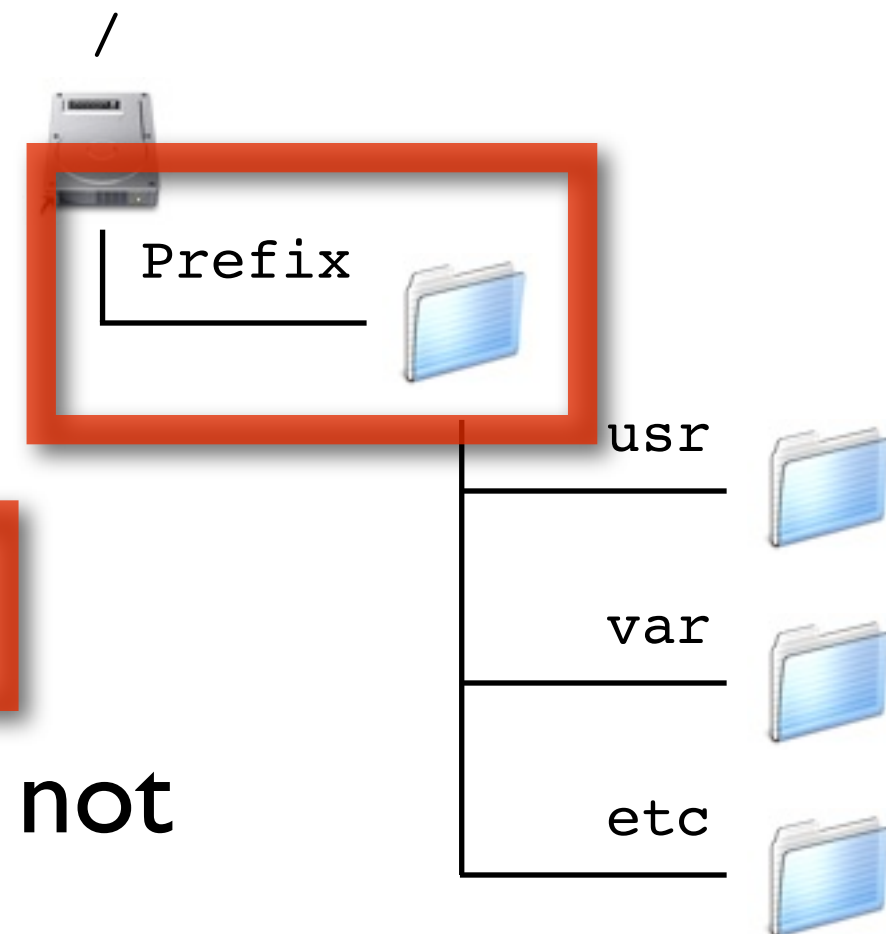
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“One Prefix to Rule Them All”



Prefix for Dummies

- Avoid conflicts, use an **offset**
- Works on multiple platforms, not just Linux
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“One Prefix to Rule Them All”



Wall of Fame

- Michael Haubenwallner makes patch
- Brian Haring forks off a branch
- Kito Danya Dietrich engineers first version

“Once upon a time...”



Start-up Problems

- Developers leave or disappear
 - knowledge vaporises
- Nothing happens

“... things that should not have been forgotten, were lost ...”

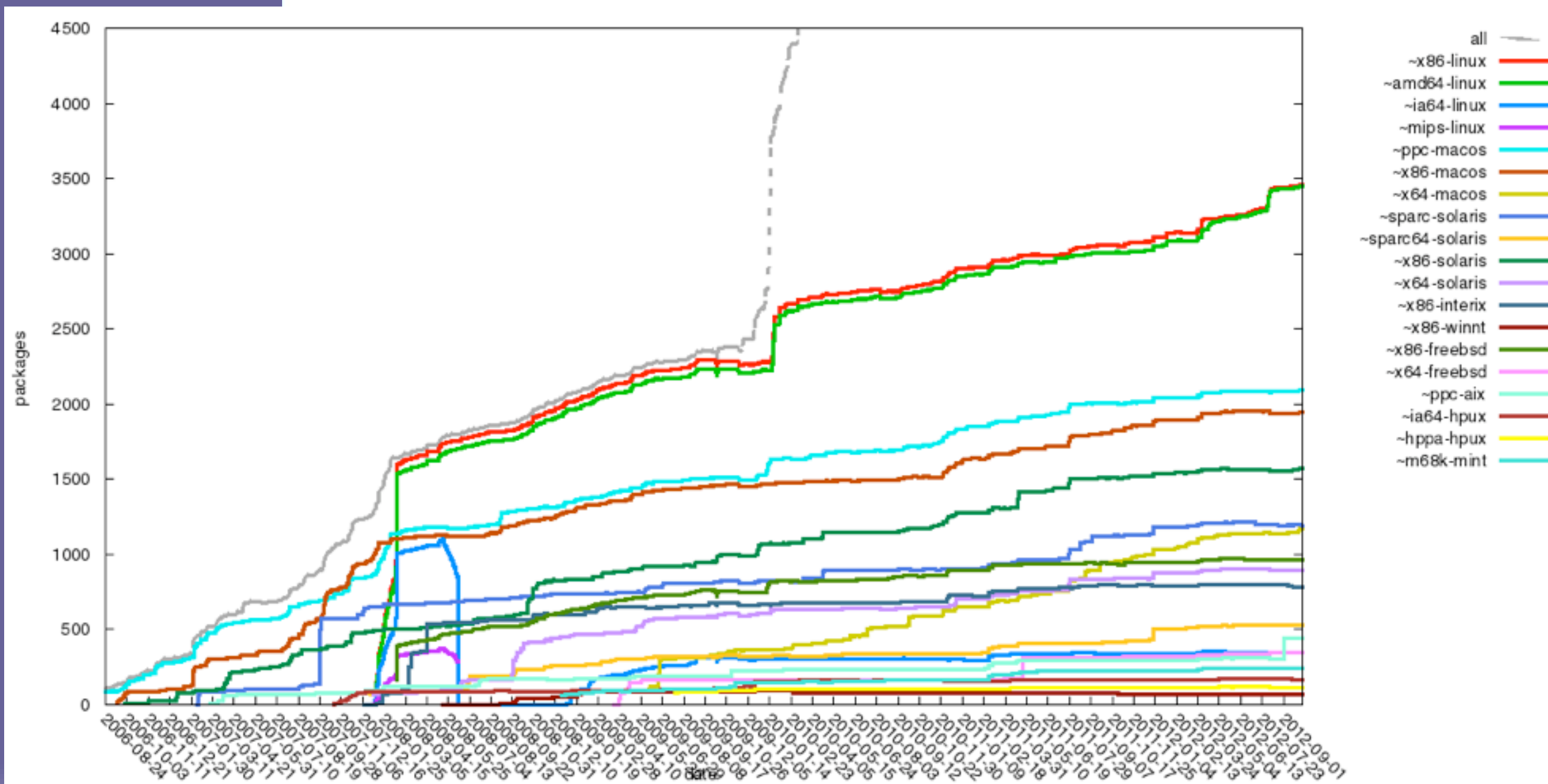


Get the Ball Rolling

- Rebirth of Prefix
- New Portage implementation
- Periodically sync prefix overlay with main tree for updates, fixes, etc.
- Package and contributions growth



Tree Overlay Keywords





Some Facts

- Prefix Portage is branch of official Portage
- Very close to “master”, but autotooled
- Merges are ~95% of the time automatic

“99% of all statistics are made up”



Infrastructure

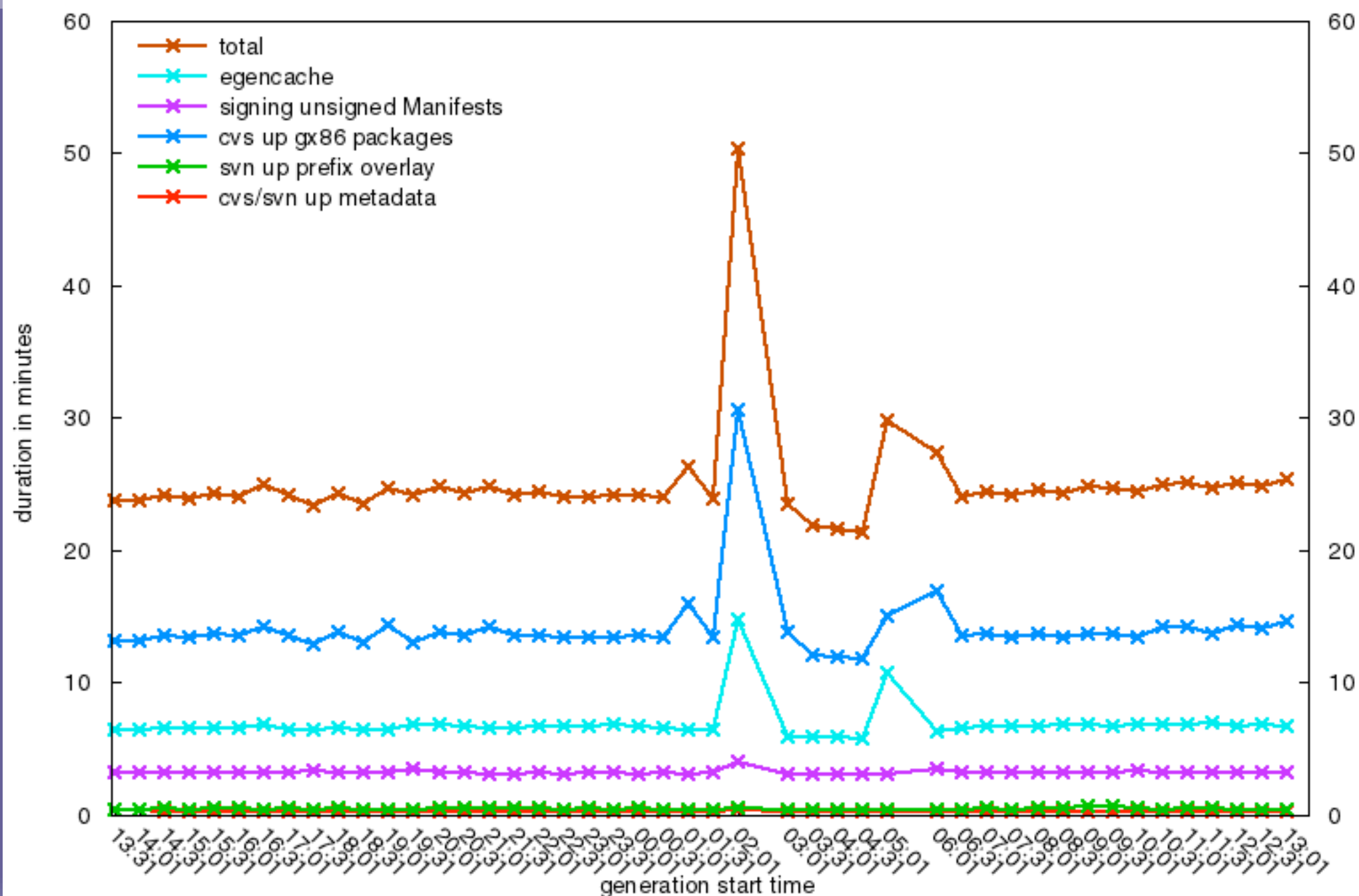
- Prefix has its own rsync tree (generation and slaves)
- Fully signed (automated key)
- gx86 overlaid with Prefix overlay
- regeneration twice per hour

“Prefix, Just Do It”



Rsync Tree Generation

Prefix rsync0 generation timings breakdown for the last 24 hours





The Prefix

- No root privileges
 - unnecessary in Prefix
 - allows user installations
- Exact Gentoo Linux layout in offset
 - often makes no sense (/usr?)
 - eases compatibility with mainline Gentoo

“Got root? No.”



Prefix EAPI 3

- The offset itself `EPREFIX`
- Two conveniences:
 - `EROOT=${ROOT}${EPREFIX}`
 - `ED=${D}${EPREFIX}`
- Functions `econf`, `dosym`, etc. are prefix-aware (`--prefix=${EPREFIX}/usr`)



Prefix Changes

- Patches for build-systems
 - hard-coded path lookups in host system, competitors (macports, fink, ...)
 - hard-coded system knowledge (Solaris always uses Sun Id, not in Prefix)
- (Config) file locations
 - packages should look for config in Prefix



Ebuild Changes

- Ensure we find and use Prefix'
 - tools
 - headers
 - libs
- And install in the Prefix as well



Scripts

- Easily go unnoticed (emerge fine)
- Shebang, start of the story (Portage check)
`#!/usr/bin/ruby`
- Encoded paths (needs manual checking)
- Essential ones (gcc-config,eselect, ...)



The Result

- Gentoo inside another system
 - development-friendly
 - superb package management
- Runs as an ordinary user
- Builds an identical toolset for different systems

“Going places no Gentoo has gone before”

Questions?

Thanks for your attention

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