

Gentoo EAPI 6 (and beyond)

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1 Introduction

2 Features for EAPI 6

- Approved
- Undecided (yet)
- Rejected

3 Beyond EAPI 6



What are EAPIs?

- EAPI = Ebuild Application Programming Interface
- Interface between ebuild and package manager (PM)

- PMS = Package Manager Specification
<<https://wiki.gentoo.org/wiki/Project:PMS>>



Procedure for a new EAPI

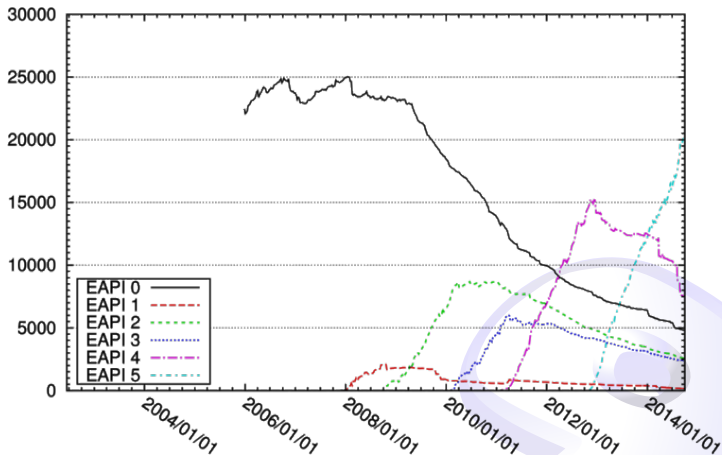
- Discuss ideas for new features in gentoo-dev mailing list
- All features traced via bugs `<http://bugs.gentoo.org/>`
Gentoo Hosted Projects – PMS/EAPI
- Pre-approval by Council
- Write the specification (PMS)
- Implement in Portage
- Final approval by Council

Takes time ...

- One EAPI every one or two years
- Not so bad, want to keep number of EAPIs in tree limited



History



Source: <<http://www.akhuettel.de/~huettel/plots/eapi.php>> (dilfridge)

- March 2011: Prefer latest EAPI (but guarantee upgrade path)
- February 2014: EAPIs 0, 1, 2, 3 deprecated

EAPI 5 is EAPI 4 with the following changes:

- Stable use masking and forcing
- `REQUIRED_USE` now supports ?? groups
- Slot operator dependencies
- `SLOT` now supports an optional sub-slot part
- `src_test` supports parallel tests
- `EBUILD_PHASE_FUNC`
- `USE` is calculated differently
- `find` is guaranteed to be GNU
- `best_version` and `has_version` support `--host-root`
- `econf` adds `--disable-silent-rules`
- `doheader` and `newheader` support
- `new*` can read from standard input
- `usex` support



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get_libdir()

Bug 463586

- Logic for `configure --libdir` already exists for `econf`
- Make available to ebuilds as separate `get_libdir()` function
- Avoids code duplication in eclasses

```
libdir ← “lib”
```

```
if the ABI environment variable is set then
```

```
  libvar ← LIBDIR_$ABI
```

```
  if the environment variable named by libvar is set then
```

```
    libdir ← the value of the variable named by libvar
```

```
  end if
```

```
end if
```

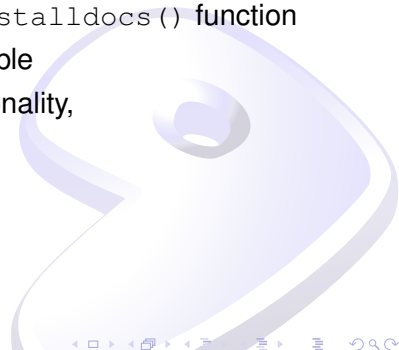
```
print libdir
```



einstalldocs()

Bug 459692

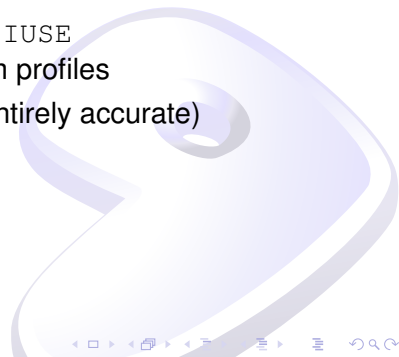
- Install documentation specified in `DOCS` variable (scalar or array)
- Similar to `default_src_install()` in EAPI 4
- Available to ebuilds as separate `einstalldocs()` function
- Added support for `HTML_DOCS` variable
- Several eclasses have similar functionality, partly incompatible with each other



Query function for IUSE_EFFECTIVE

Bug 449862

- Currently no sane way to query what USE flags are in IUSE
- Useful for eclasses
- Query IUSE_EFFECTIVE instead of IUSE
→ cover also USE flags injected from profiles
- `in_iuse` suggested as name (not entirely accurate)

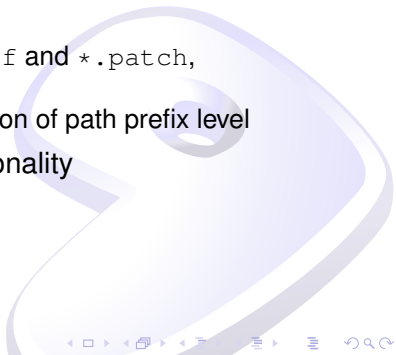


Patch applying function in package manager

Bug 463768

`eapply()`

- Needed for user patches and `PATCHES` support
- Similar to `epatch()`, but simplified:
 - Regular patch files
 - Directories, only files named `*.diff` and `*.patch`, applied in lexical order
 - Only `-p1` supported, no autodetection of path prefix level
- Keep `epatch()` for advanced functionality



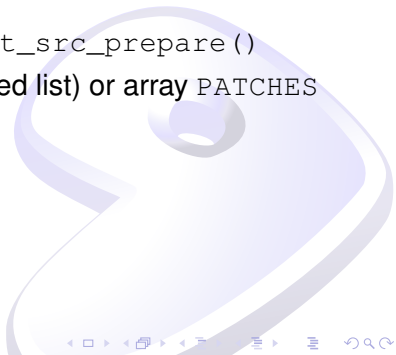
`eapply_user()`

- Apply user patches in package directory under (e.g.) `/etc/portage/patches`
- Long standing request from users
- Straight forward implementation:
 - No “magic” between `src_*` phase functions
 - No extra phase function (like `src_userpatch()`)
 - `eapply_user` called in `default_src_prepare()`
 - Calls `eapply` on patches directory
- Must be called by any `src_prepare()` function defined in an ebuild or eclass

PATCHES support in default src_prepare

Bug 463692

- “[...] this is the only thing left in base eclass that eapi5 can't do.” (scarabeus)
- Call `eapply` on `PATCHES` in `default_src_prepare()`
- Supports scalar (whitespace-separated list) or array `PATCHES`



Runtime-switchable USE flags

Bug 424283

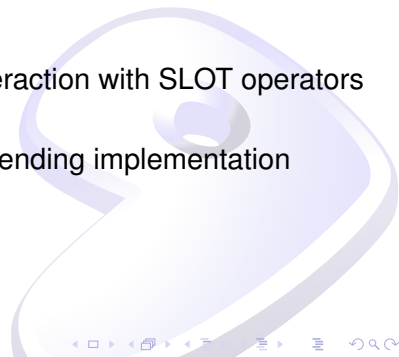
GLEP 62 <<https://wiki.gentoo.org/wiki/GLEP:62>>

- A way to specify optional runtime dependencies in ebuild
- USE dependencies: `RDEPEND="foo? (cat/foo)"`
- Behaves like a regular USE flag
- Avoid rebuilding the package when the flag is switched
- Two ways to implement:
 - New ebuild variable, `IUSE_RUNTIME="foo"`
 - Special syntax, like `IUSE="foo (*)"`
- Replaces proposed “recommended/suggested dependencies” (bug 327701)

Variant of `|| ()` with defined runtime behaviour

Bug 489458

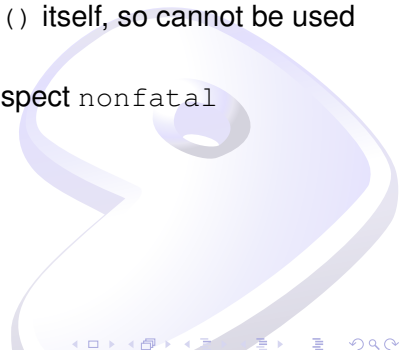
- Currently undefined if `|| (cat1/foo cat2/bar)` dependencies can be switched at runtime
- Replace by two new dependency types:
 - `||* ()` switchable at runtime
 - `||= ()` *not* switchable at runtime
- Still several open questions, e. g. interaction with SLOT operators (like `||* (A:= B:=)`)
- Conditionally approved by Council, pending implementation in Portage



nonfatal die()

Bug 451938

- Helper functions in EAPI 4 and later die on error
- Previous behaviour (non-zero return status) with `nonfatal`
- But: `nonfatal` doesn't apply to `die()` itself, so cannot be used for eclass functions
- Add option to `die()` that makes it respect `nonfatal`
- Same for `assert()`



Allow empty DOCS variable

Bug 463736

- Empty `DOCS` currently is like `unset DOCS`, i. e. causes `default_src_install()` to install the default set of files
- Explicit empty assignment should suppress installation



Directory support for DOCS

Bug 481980

- Call `dodoc -r` if a directory is met in DOCS



Unpack .txz

Bug 458102

- `unpack()` already supports `.xz` and `.tar.xz`
- Add support for `.txz`



Case-fold extensions in unpack

Bug 476730

- Currently complicated list what case combinations are allowed (e.g., uppercase `.ZIP`, but not `.TAR`)
- Just ignore case



unpack() accept absolute paths

Bug 483244

- **Current `unpack()` behaviour:**
 - Filename without path → look in `DISTDIR`
 - Path starting with `./` → look in `cwd`
 - Absolute path not allowed
- Mainly historical reasons



Directory support for `package.*` and `use.*`

Bug 282296

- Allow most `package.*` and `use.*` in profiles to be either regular files or directories
- Requested for overlays, not intended for gentoo-x86 tree



Pass `--docdir` and `--htmldir` options to configure

Bug 468202

- Supported in “new” Autoconf versions (since 2006, 2.59c)
- Scan output of `configure --help` for these options
- `--docdir="${EPREFIX}/usr/share/doc/${PF}"`
- `--htmldir="${EPREFIX}/usr/share/doc/${PF}/html"`



Not as trivial as it may appear:

- PM must read `EAPI` from `ebuild`
- But sourcing with different bash version may fail!
- Match first non-blank and non-comment line with regexp:

```
^[ \t]*EAPI=([' "])? ([A-Za-z0-9+_.-]*)\1[ \t]*([ \t]#.*)?$
```

- Verify (by sourcing)
- Introduced in July 2012 – two years have passed
- (Previous proposal: GLEP 55

<https://wiki.gentoo.org/wiki/GLEP:55>

`EAPI` suffixed ebuilds, e. g. `.ebuild-6`)

failglob in global scope

Bug 463822

- Prevent accidental globbing
- For example, missing quotes around wildcards:
`dev-python/foo[$(python_gen_usedep python2*)]`
- Only in global scope, not in local scope of functions



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Ban install()

Bug 524112

- Used scarcely (about 0.5% of ebuilds)
- Can be easily replaced by an `emake` call
- Build systems *not* supporting `DESTDIR` but autotools variables?
- Will break with `configure --docdir --htmldir`

```
emake \  
  prefix="${ED}"/usr \  
  datadir="${ED}"/usr/share \  
  mandir="${ED}"/usr/share/man \  
  infodir="${ED}"/usr/share/info \  
  libdir="${ED}"/usr/${libdir} \  
  localstatedir="${ED}"/var/lib \  
  sysconfdir="${ED}"/etc \  
  -j1 \  
  "$@" \  
install
```



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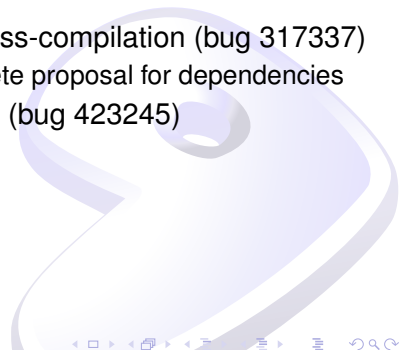
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Rejected features

- `EJOBS` variable (bug 273101)
 - Similar functionality already in place (`multiprocessing.eclass`)
- Source eclasses only once (bug 422533)
 - Alternative solution in eclasses
- `HDEPEND`: host dependencies for cross-compilation (bug 317337)
 - Partial solution only – Need complete proposal for dependencies
- `dohtml()` additional default suffixes (bug 423245)
 - Instead: `dohtml()` deprecated



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- About 50 additional requests in EAPI tracker bug 174380
- Very subjective selection follows



Remove trailing slash from directory variables

Bug 465772

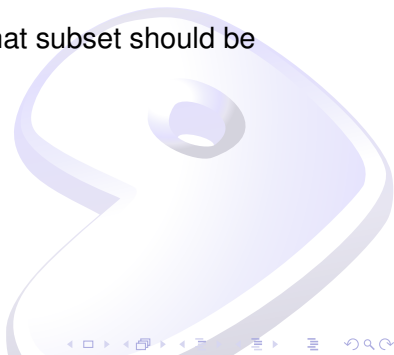
- Typical usage in ebuilds: "`${D}`" /usr/bin/foo
- `D` has a trailing slash, so we end up with `//` in path
- Proposal to remove trailing slash everywhere
- Problem: `ROOT` allowed to be empty?



Version comparison and components

Bug 482170

- Currently implemented in `versionator.eclass`
- Slow and sometimes called in global scope
- Also in PM → avoid duplicate code
- 15 functions in `versionator.eclass`, what subset should be implemented in PM?
 - Version comparison
 - Version component extraction
 - ...



src_fetch() for fetching VCS sources

Bug 481434

- Split off VCS fetching from `src_unpack()`
- Only useful for live ebuids ...



Replacement for RESTRICT=userpriv

Bugs 516614, 516616

- `RESTRICT=userpriv` raises privileges globally
- More fine-grained support:
 - Supplementary groups
 - `esudo` helper
- But: Scarcely used feature



New dependency types

Bugs 182028, 317337, 327701, 392239

`<https://wiki.gentoo.org/wiki/Future_EAPI/New_dependency_types>`

- Host/target build-time dependencies (when cross-compiling)
- Build-against dependencies (e. g., libX11 → xproto)
- Fetch dependencies (when fetching from VCS)
- Suggested dependencies
- ...
- Which ones do we need?
- Complete solution would be best



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