

Zsh Plugin Standard

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Version 0.91, 06/02/2018

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What is a Zsh plugin?

Zsh plugins were first defined by Oh-My-Zsh. They provide for a way to package together files that extend or configure the shell's functionality in a particular way.

At a simple level, a plugin:

1. Has its directory added to `$fpath` ([zsh doc](#)).
2. Has its first `*.plugin.zsh` file sourced (or `*.zsh`, `init.zsh`, `*.sh`, these are non-standard).

The first point allows plugins to provide completions and functions that are loaded via Zsh's `autoload` mechanism (a single function per-file).

From a more broad perspective, a plugin consists of:

1. A directory containing various files (main script, autoload functions, completions, Makefiles, backend programs, documentation).
2. A script that obtains the path to its directory via `$0` (see the [next section](#) for a related enhancement proposal).
3. A Github (or other site) repository identified by two components `username/pluginname`.
4. A software package containing any type of command line artifacts – when used with advanced plugin managers that have hooks, it can run Makefiles, add directories to `$PATH`.

Below follow proposed enhancements and codifications of the definition of a "Zsh plugin" and the actions of plugin managers – the proposed standardization.

1. Standardized `$0` handling

To get the plugin's location, plugins should do:

```
0="${${ZERO:-${0:#$ZSH_ARGZERO}}:-${(%):-%N}}"  
  
# Then ${0:h} to get plugin's directory
```

The one-line code above will:

1. Be backwards-compatible with normal `$0` setting and usage.
2. Use `ZERO` if it's not empty,
 - plugin manager will be easily able to alter effective `$0` before loading a plugin,
 - this allows for e.g. `eval "$(<plugin)"`, which can be faster than `source` ([comparison](#), note that it's not for a compiled script).
3. Use `$0` if it doesn't contain the path to the Zsh binary,

- plugin manager will still be able to set `$0`, although more difficultly (requires `unsetopt function_argzero` before sourcing plugin script, and `0=...` assignment),
 - `unsetopt function_argzero` will be detected (it causes `$0` not to contain plugin-script path, but path to Zsh binary, if not overwritten by `0=...` assignment),
 - `setopt posix_argzero` will be detected (as above).
4. Use `%N` prompt expansion flag, which always gives absolute path to script,
- plugin manager cannot alter this (no advanced loading of plugin is possible), but simple plugin-file sourcing (without a plugin manager) will be saved from breaking caused by the mentioned `*_argzero` options, so this is a very good last-resort fallback.

The goal is flexibility, with essential motivation to support `eval "${<plugin}"` and definitely solve `setopt no_function_argzero` and `setopt posix_argzero` cases.

A plugin manager will be even able to convert a plugin to a function (author implemented such proof of concept functionality, it's possible), but performance differences of this are unclear. It might however provide a use case.

2. Unload function

If a plugin is named e.g. `kalc`, then it can provide a function, `kalc_unload_plugin`, that can be called by a plugin manager to undo the effects of loading that plugin.

A plugin manager can implement its own tracking of changes made by a plugin so this is in general optional. However, to properly unload e.g. a prompt, detailed tracking (easy to do by the plugin creator) can provide better, predictable results. Any special, uncommon effects of loading a plugin are possible to undo only by a dedicated function.

3. Plugin manager activity indicator

Plugin managers should set the `$LOADED_PLUGINS` array to contain all previously loaded plugins and the plugin currently being loaded (as the last element). This will allow plugins to:

1. Check which plugins are already loaded.
2. Check if it is being loaded by a plugin manager (i.e. not just sourced).

The first item allows a plugin to e.g. issue a notice about missing dependencies. Instead of issuing a notice, it may be able to satisfy the dependencies from resources it provides. For example, `pure` prompt provides `zsh-async` dependency library, which is a separate project and can be loaded by the user directly. Consequently, the prompt can decide to source its private copy of `zsh-async`, having also reliable `$0` defined by previous section (note: `pure` doesn't normally do this).

The second item allows a plugin to e.g. set up `$fpath`, knowing that plugin manager will not handle this:

```
if [[ ( ${+LOADED_PLUGINS} = 0 || ${LOADED_PLUGINS[-1]} != */kalc ) && -z
"${fpath[(r){0:h}]} " ]]; then
    fpath+=( "${0:h}" )
fi
```

This will allow user to reliably source the plugin without using a plugin manager.

4. Global parameter with PREFIX for make, configure, etc.

Plugin managers should export the parameter `$ZPFX` which should contain a path to a directory dedicated for user-land software, i.e. for directories `$ZPFX/bin`, `$ZPFX/lib`, `$ZPFX/share`, etc. Suggested name of the directory is `polaris`, Zplugin uses this name and places this directory at `~/.zplugin/polaris` by default.

User can then configure hooks (feature of e.g. `zplug` and `Zplugin`) to invoke e.g. `make PREFIX=$ZPFX install` to install software like e.g. `tj/git-extras`. This is a developing role of Zsh plugin managers as package managers, where `.zshrc` has a similar role to Chef or Puppet configuration and allows to **declare** system state, and have the same state on different accounts / machines.

No-narration facts-list related to `$ZPFX`:

1. `export ZPFX="$HOME/polaris"` (or e.g. `$HOME/.zplugin/polaris`)
2. `make PREFIX=$ZPFX install`
3. `./configure --prefix=$ZPFX`
4. `cmake -DCMAKE_INSTALL_PREFIX=$ZPFX .`
5. `zplugin ice make"PREFIX=$ZPFX install"`
6. `zplug ... hook-build:"make PREFIX=$PFX install"`

Appendix A: Revision history (history of updates to the document)

v0.91 06/02/2018: Fix the link to the PDF for Github

v0.9, 12/12/2018: Remove ZERO references (bad design), add TOC

Reminder: The date format that uses slashes is `MM/DD/YYYY`.