

Compiling to Nix

a quick overview

<https://functional.cafe/@yvan>

Who?

- **PureNix** (Nix backend for the **PureScript** programming language)¹
- **dhall-to-nix** (output of the **Dhall** configuration language)²
- Nix integration of the **Nickel** configuration language³
- **Guile** (while Guix relies on `nix-daemon`, AFAIK, there are no facilities to convert Guix packages to Nix packages)

¹<https://github.com/purenix-org/purenix>

²<https://github.com/dhall-lang/dhall-haskell>

³<https://github.com/nickel-lang/organist>

Why? Types!

Why might someone choose not to write an expression directly in Nix?

Writing correct and maintainable large Nix expressions is hard.
Once again, types to the rescue!

E.g. There is the PoC of a `cabal2nix`⁴ clone that does not rely on IFD⁵ written in PureScript.

⁴<https://github.com/cdepillabout/cabal2nixWithoutIFD>

⁵Import From Derivation

What for?

Can I use language *X* to write:

- a Nix package?
- a developer shell?
- NixOS options?
- an entire NixOS configuration?
- a Flake?

Checklist

- ☐ Can I embed a Nix expression within it?
- ☐ Can I embed it within a Nix expression?

Checklist: **Dhall**

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Dhall cannot encode many common Nixpkgs/NixOS idioms, such as:

- general recursion (e.g., `pkgs.callPackages`, the overlay system, and the NixOS module system)
- weakly-typed conversions (like `builtins.listToAttrs`)
- row polymorphism (i.e., the `...` in `{ foo, bar, ... }`)

Checklist: PureScript

- ☒ Can I embed a Nix expression within it?
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PureScript allows you to import an arbitrary Nix expression as “*FFI*”. **But**, you need to ensure everything aligns with the strict type system.

PureScript offers its own ecosystem of packages (managed by spago) that can be harnessed to produce readable and well-organized Nix files. **But**, the generated code carries significant abstraction overhead and will always be an attribute set of what the module exposes.

Checklist: **Nickel**

- ☒ Can I embed a Nix expression within it?
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There is an **experimental** Nix toolkit to use nickel as a language for writing nix packages, shells and more.

But, AFAIU, Nickel does not compile to Nix!

Open questions

What languages do we commit in `nixpkgs`? Nix? Bash? Nickel? etc.

Q/A