Compiling to Nix

a quick overview

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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 language[3]
- ~~**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 IFD[5] written in PureScript.

[4] https://github.com/cdepillabout/cabal2nixWithoutIFD
[5] Import 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