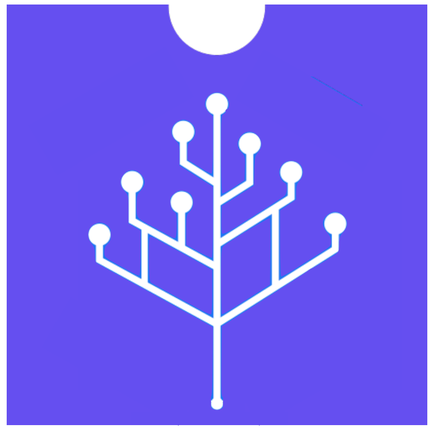
Autocodec

Self-Decoding Graphs



High Level

Pure Functions FTW

High Level

Why?

High Level

Why?

- Dynamically load codecs
- Instantly discoverable, travels with data
- Content signalling

High Level

Blob vs DSL

High Level

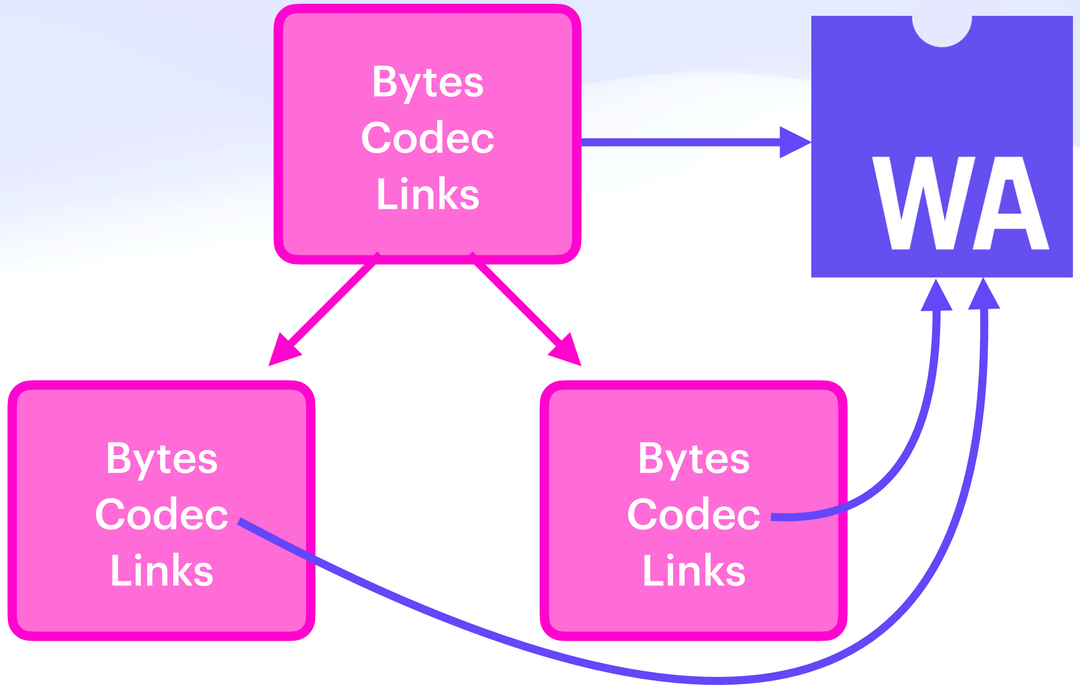
Blob vs DSL

- Content addressed Wasm blob
- Alternate: schema
  - More "correct" via DSL, but would likely be extremely complex
- "Worse is better"
  - Adoptable, familiar
  - Easy tooling
  - "Do exactly what I mean"
  - Openly extensible

Layout Options

Layout Options

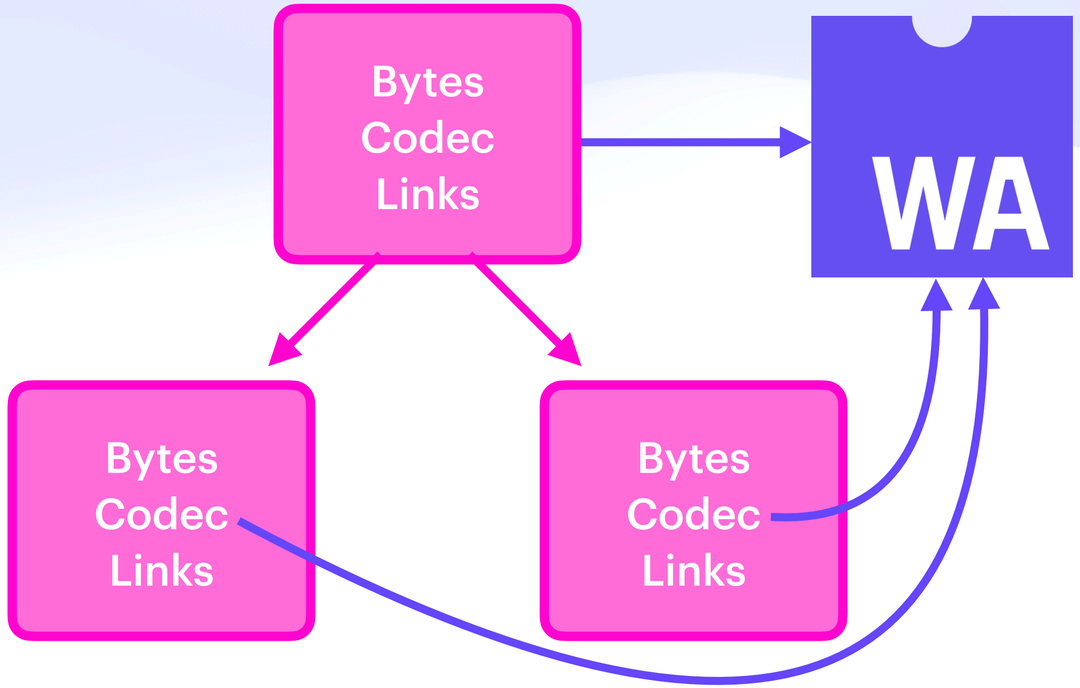
Direct Optional Field



Layout Options

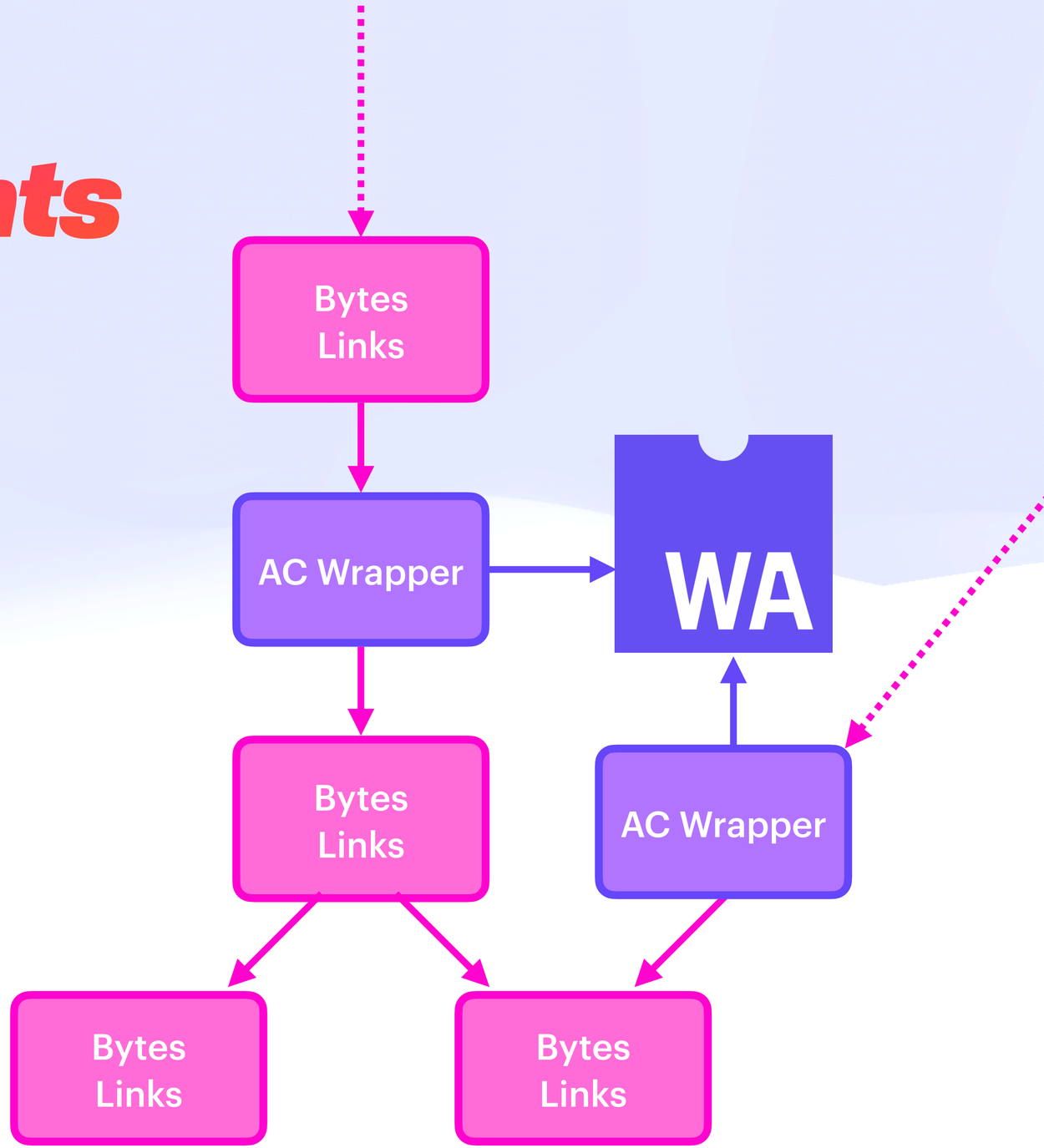
Direct Optional Field

- Compact (Bitswap friendly)
- Deep linking intact
- Redundancy (space)



Layout Options

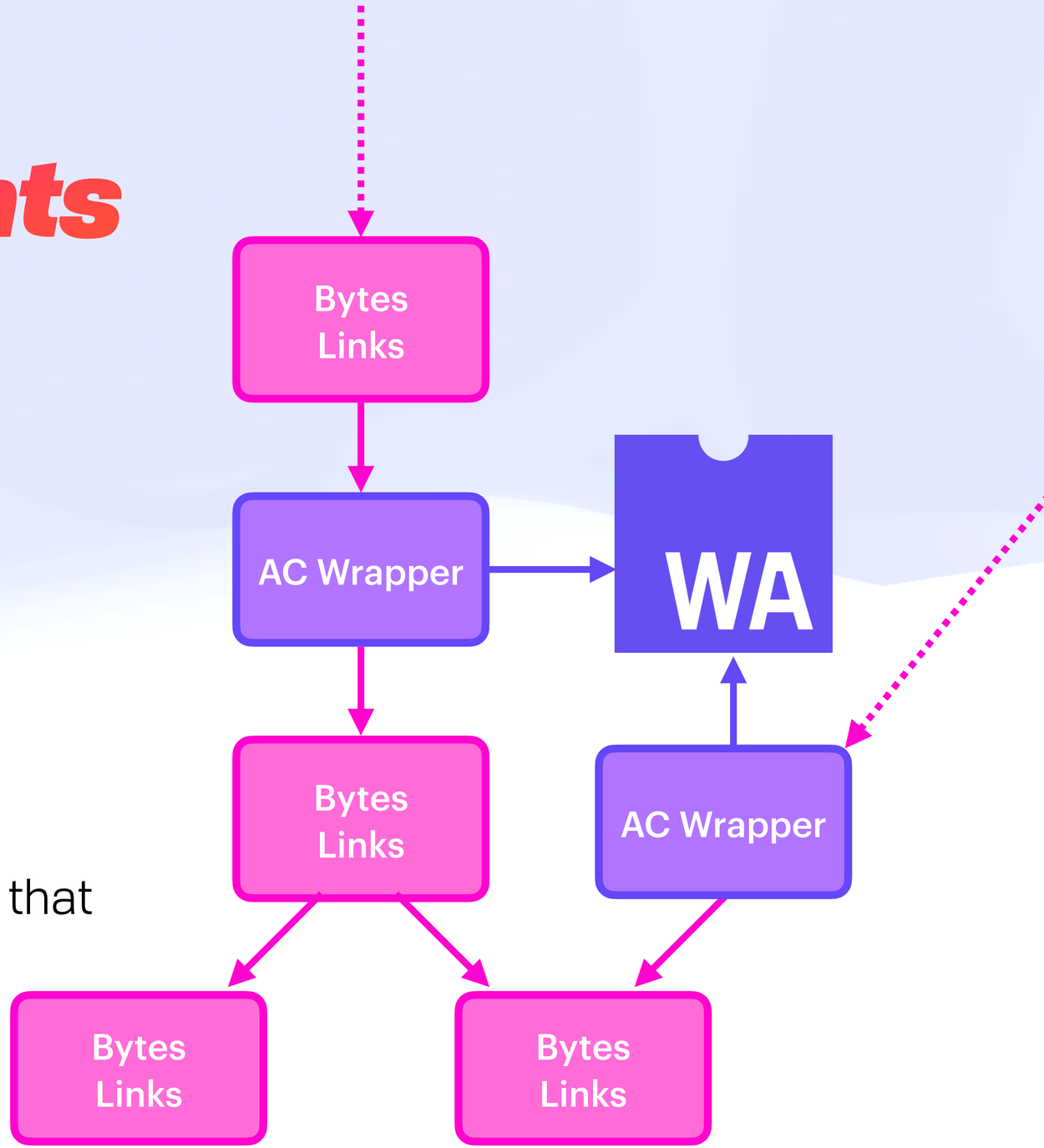
Wrap DAG Entry Points



Layout Options

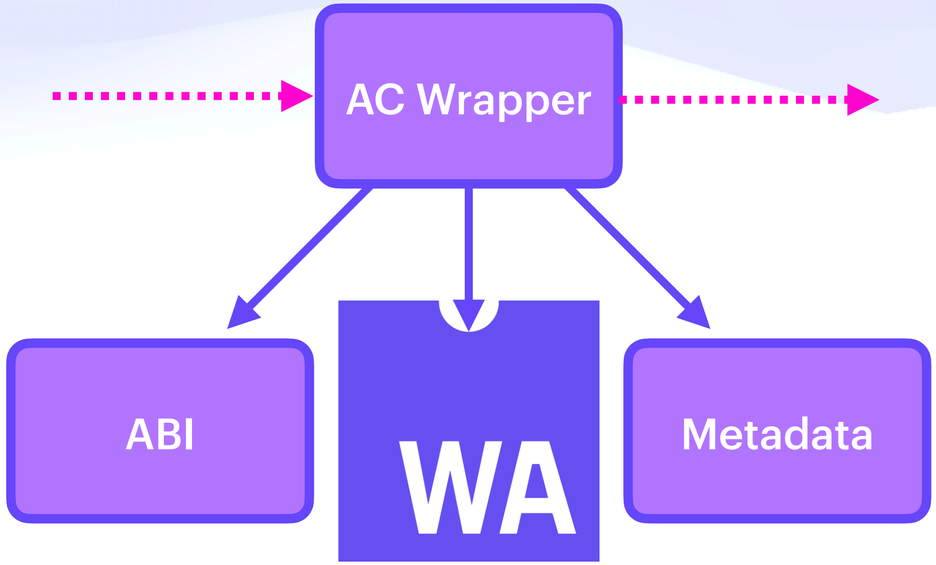
Wrap DAG Entry Points

- More nodes (deeper graphs)
- Potentially Byzantine (stacked wrappers)
- Have to be careful to wrap all nodes
- Breaks all existing codecs... but the Wasm will fix that



Layout Options

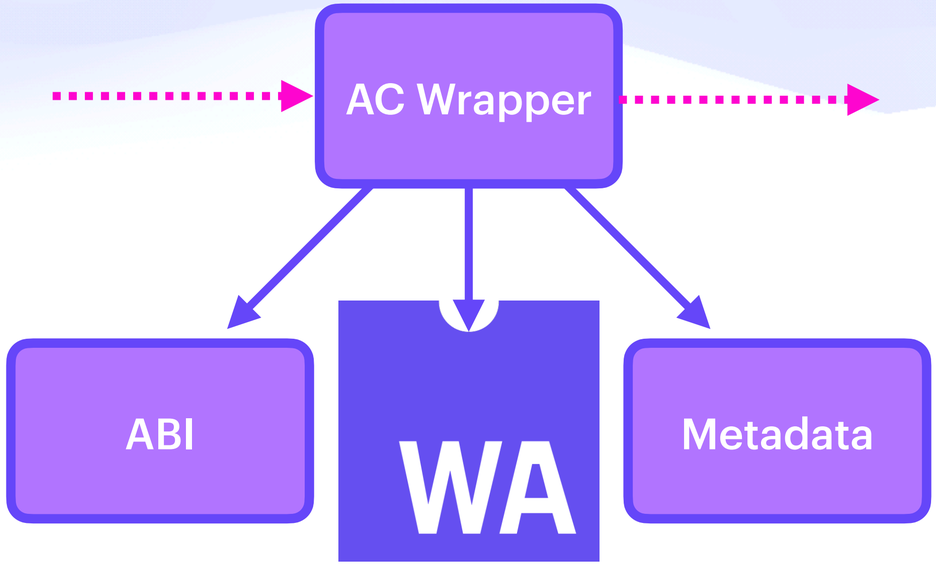
Self-Describing



Layout Options

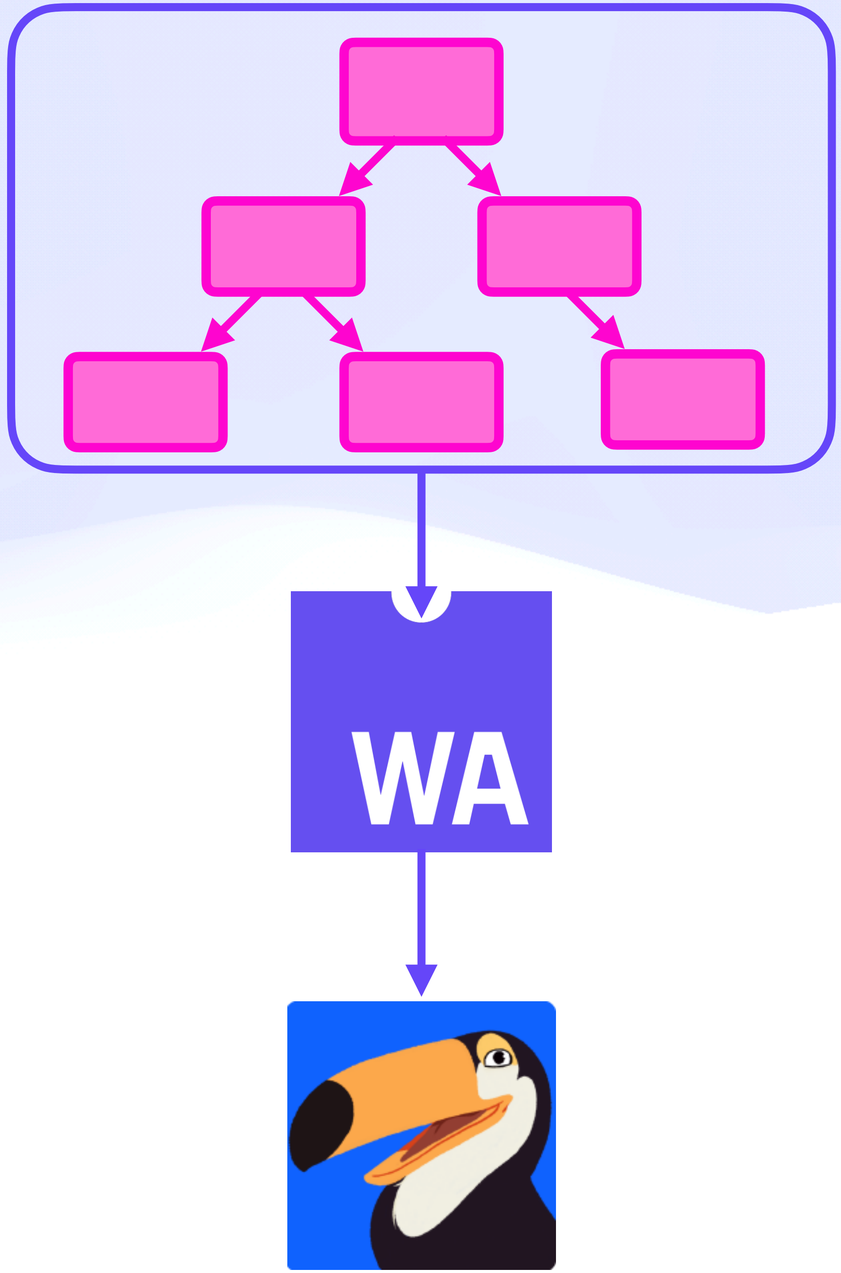
Self-Describing

- All interfaces via Wasm ABI
- MUST include raw IPLD decoder (e.g. from DAG-CBOR)
- MUST include one or more codecs, with a default
- MAY include transversal functions for output type



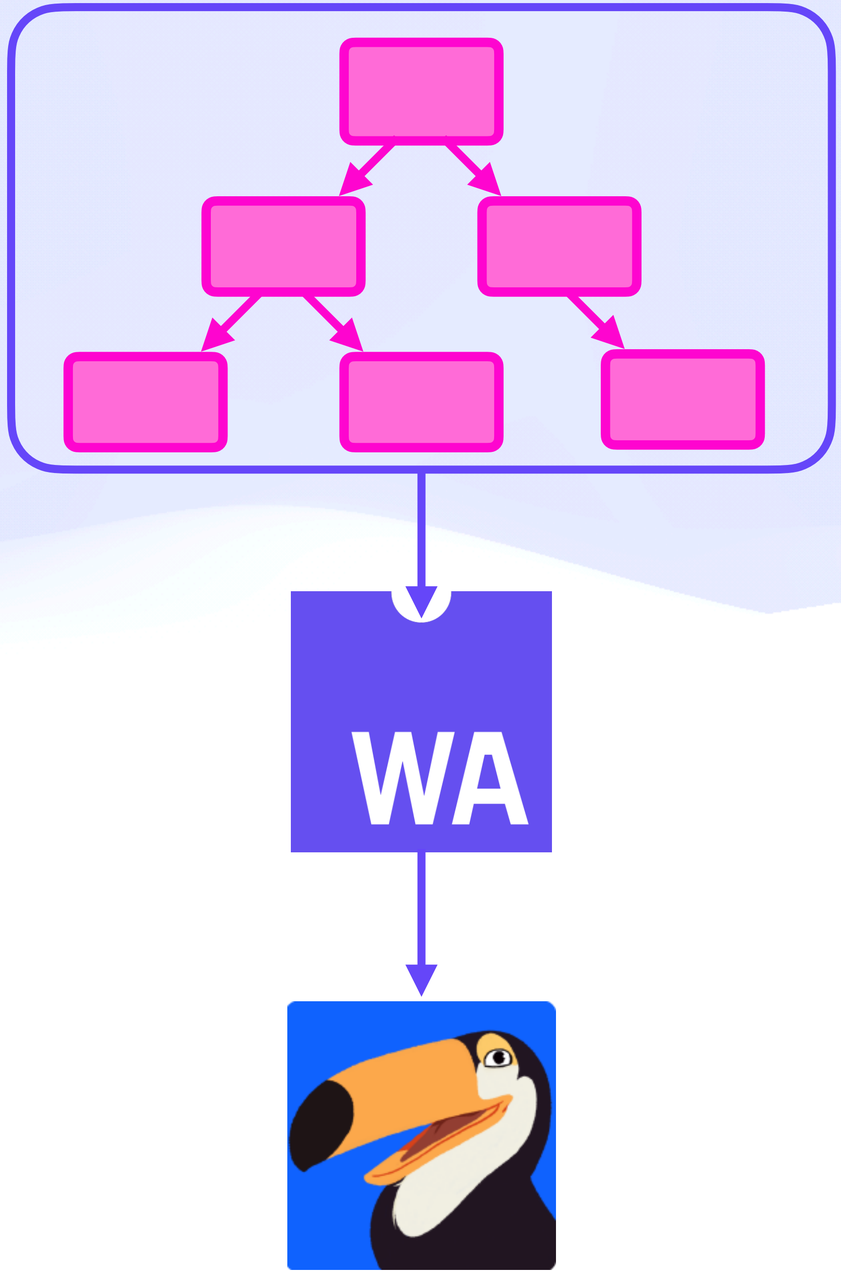
Layout Options

Execution & Bounding



Layout Options

Execution & Bounding



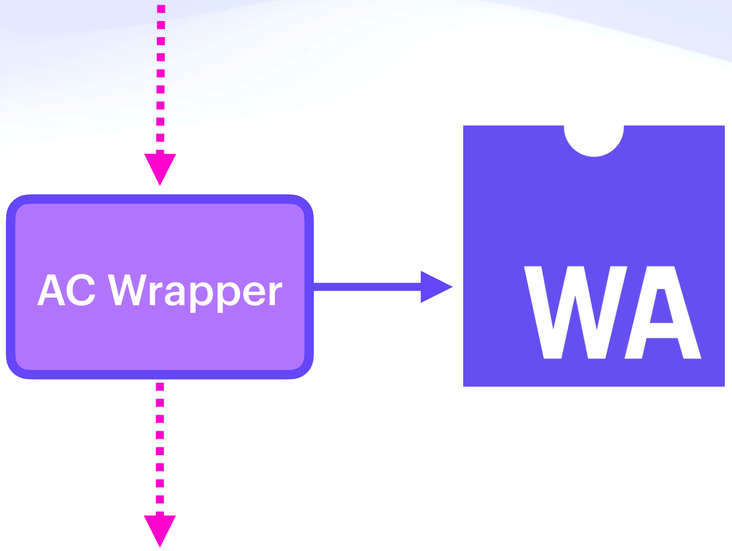
- MUST terminate
- Gas or timeout or AOT cost dynamics (probably gas)

Mutation

Who Encodes the Encoders?

Mutation

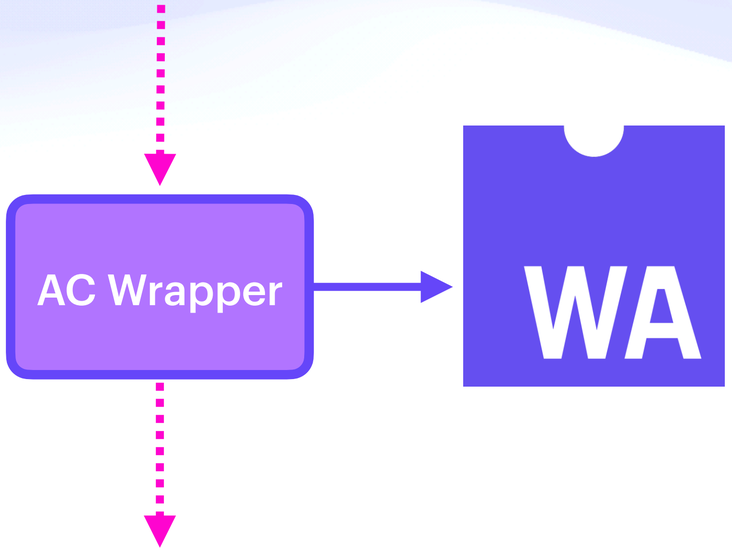
Adaptive Optimization



Mutation

Adaptive Optimization

- Either signalling method is "just" a tag
- Don't have to execute exactly this Wasm blob



Mutation

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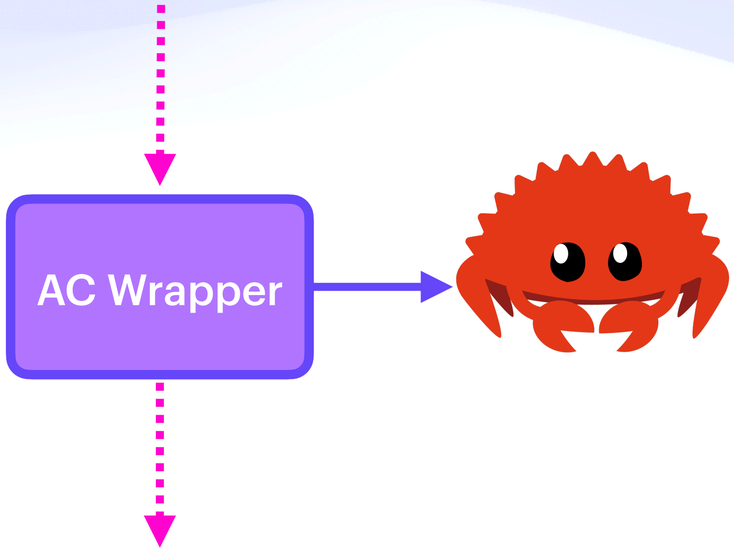

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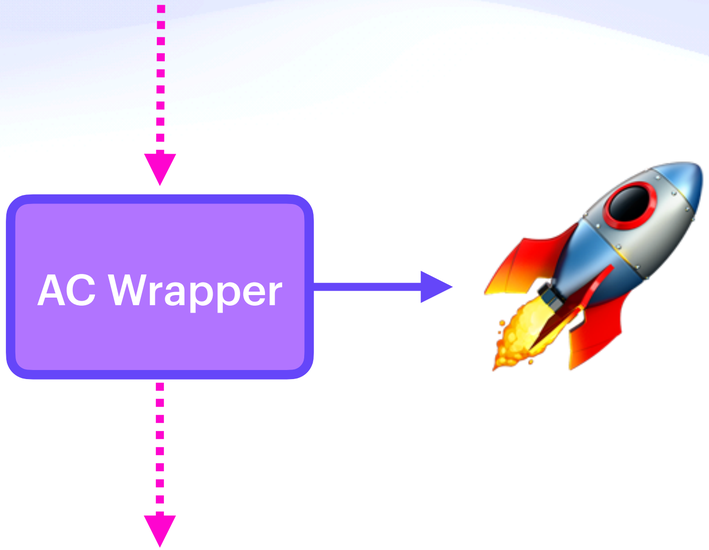


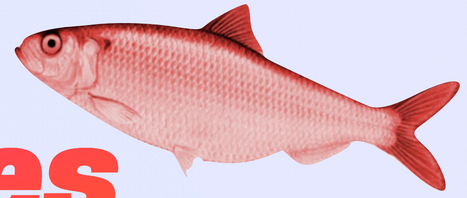
Mutation

In Place Upgrades & Fixes

- ...why?
  - Deterministic codec: check it
  - Wrong layer: just replace 🤷‍♀️
- If you REALLY want to...
  - Convention (detect and replace)
    - Back to AOT loading
    - Discourages updates 👍+👎
  - Mutable pointer (e.g. IPNS)
    - How often to check? Malicious updates?

Mutation

In Place Upgrades & Fixes



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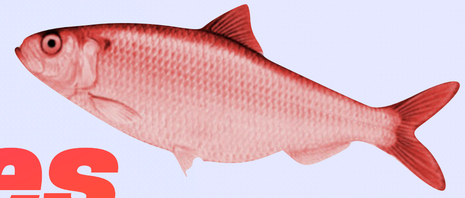

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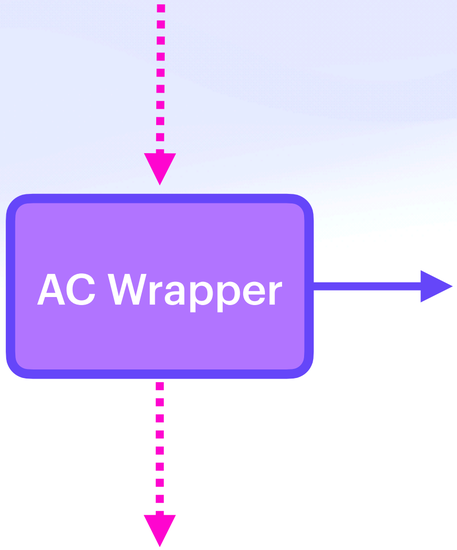

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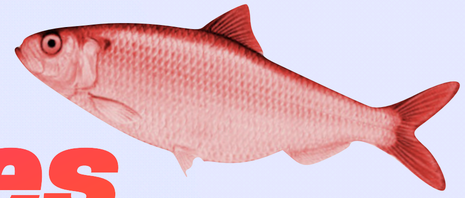
In Place Upgrades & Fixes



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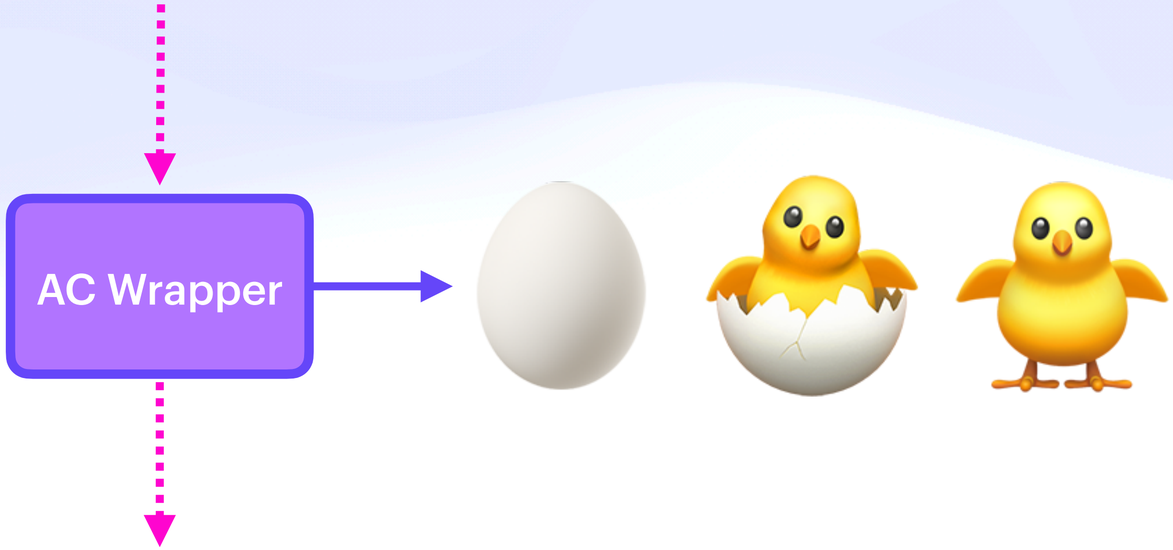

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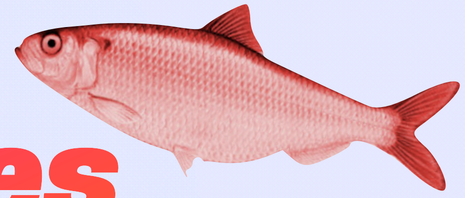

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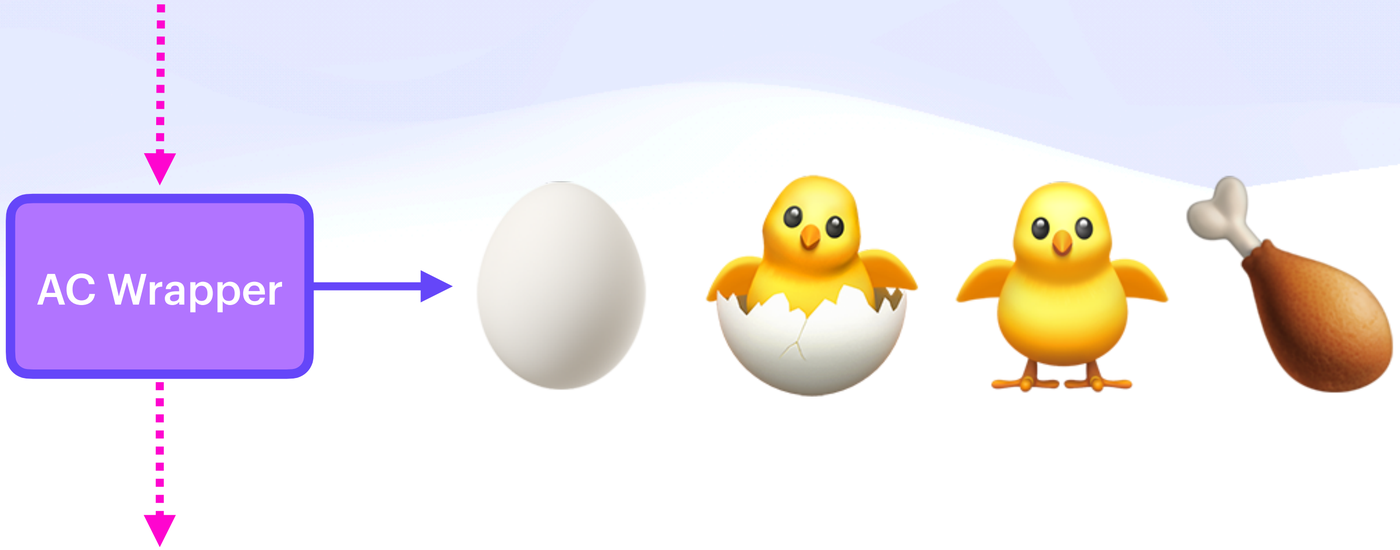

Wrap Up

Wrap Up

Summary

Wrap Up

Summary

- Highly extensible
- Dynamic
- **Concrete**
- Pure function
- Optimizable

🎉 Thank You, IPFS Þing 🇮🇸

https://fission.codes
brooklyn@fission.codes
@expede