Wanco: WebAssembly AOT Compiler That Supports Live Migration

Raiki Tamura
Kyoto University
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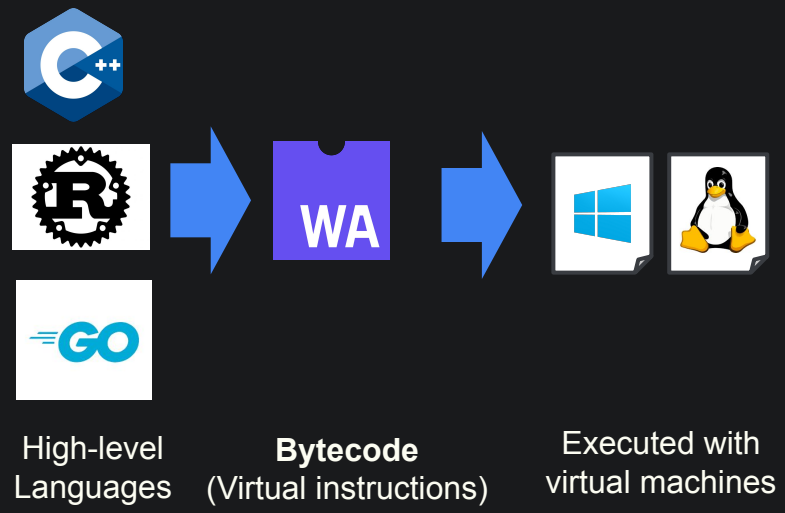
WebAssembly + Live Migration

WebAssembly (Wasm)

- A **Portable** program format
- Stack machine



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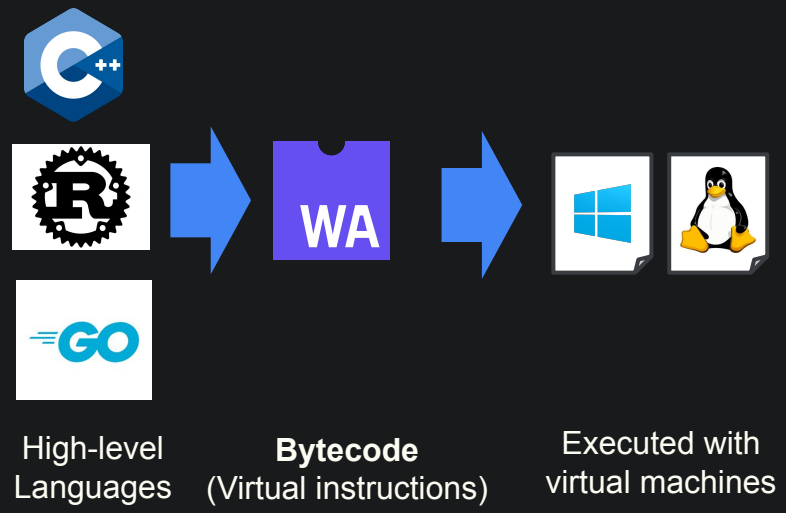
Live Migration

- Migrate a running program to another host (typically between hosts on the same platform)
- Supported by Xen, gVisor, Docker, etc.



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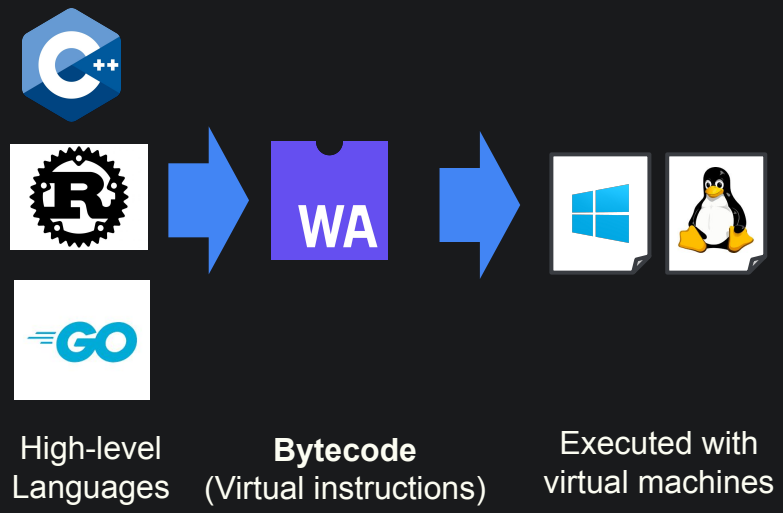

→ Migration of Wasm runtimes extends Wasm's portability!

Wanco: Our WebAssembly AOT Compiler

- Compiles Wasm into Linux ELF with LLVM
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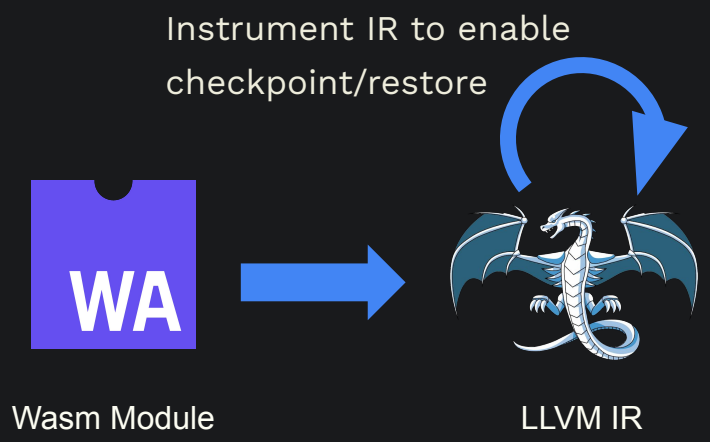

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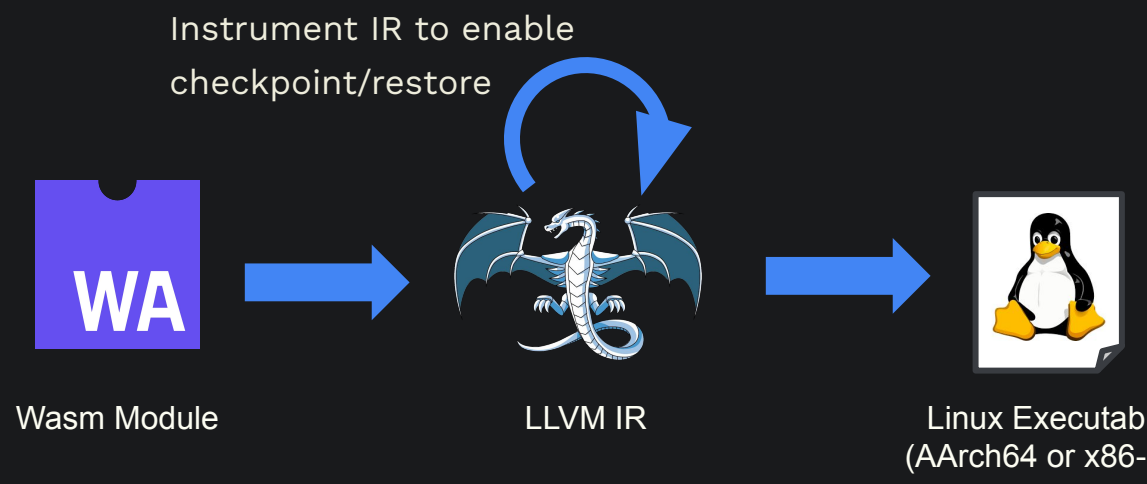

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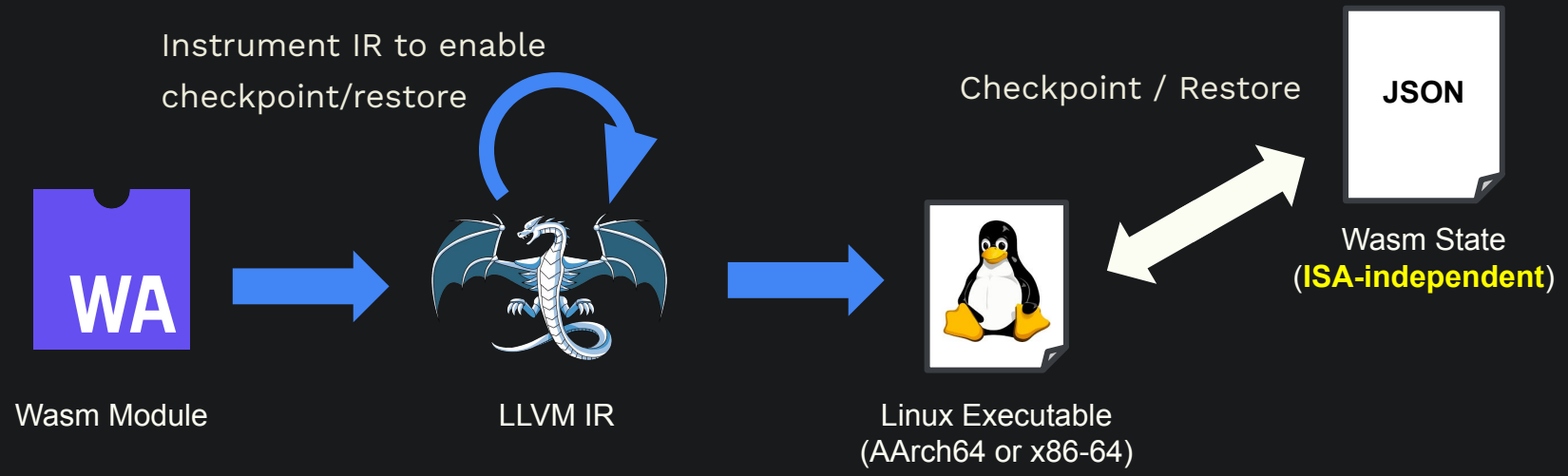

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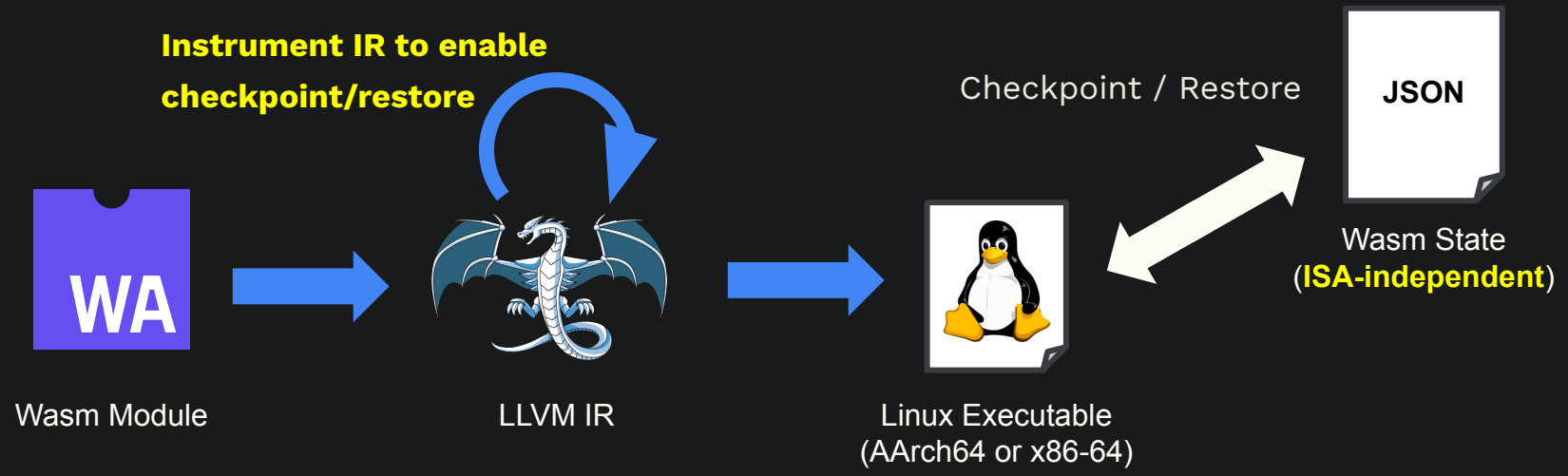

1. Insert migration points
2. Instrument code that rewinds the call stack

```
(func $foo
  loop $loop
  call $bar
  br $loop
  end
)
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Original Program

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Check a migration request

Dump stackmap

Create a snapshot

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Summary

- We extend portability of WebAssembly with “migratability”
- Our compiler leverages LLVM so that Wasm program can be checkpointed and restored
- We published Wanco on GitHub!
  - GitHub: tamaroning/wanco

GitHub Repository