RubyX

- Compile ruby to binary
- in 100% Ruby
- No external dependencies
- Fast (X times)
- Easy to understand
- Easy to modify own tool

Torsten

github.com/rubydesign

30+ years coding

from Finland

Run a b&b

www.villataika.fi

Raisa

in south Goa 2017

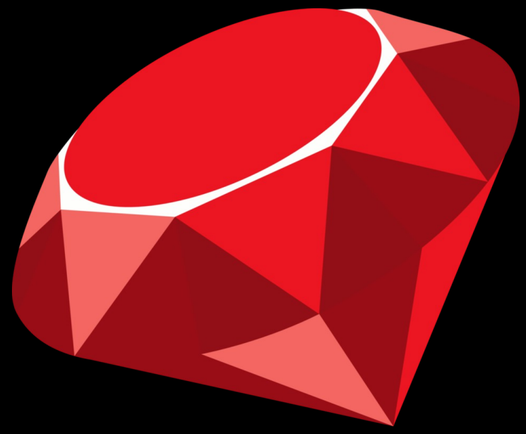
RubyX

- Compile ruby to binary

- in 100% Ruby

- 20min: what, not how

I

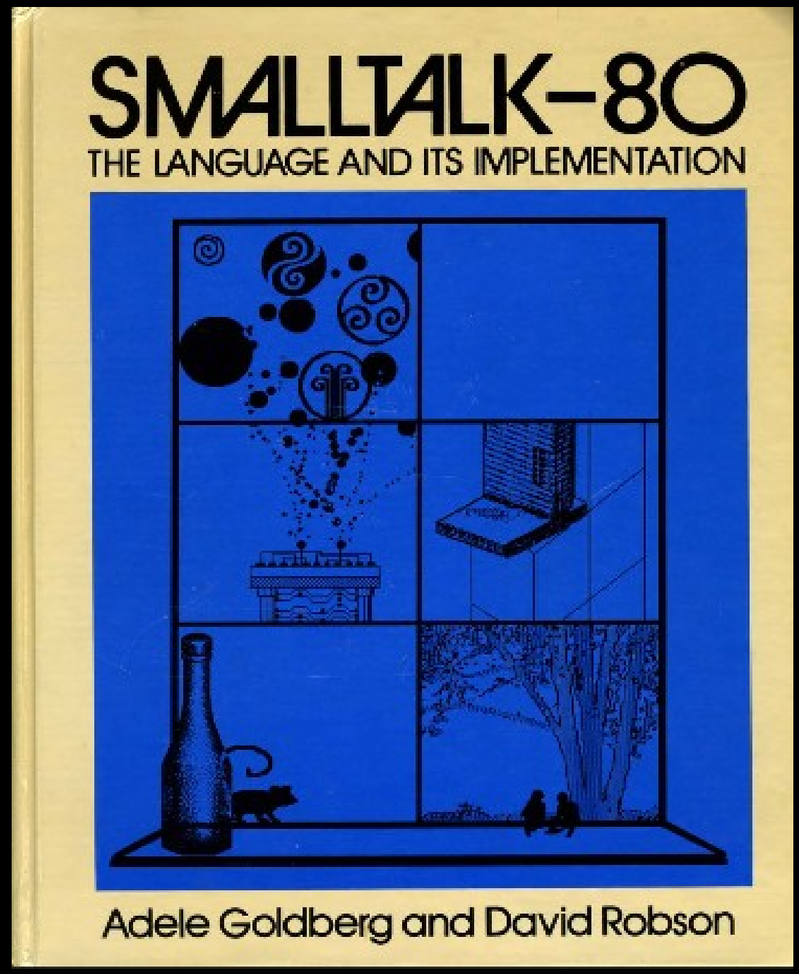


since 2001

mother Smalltalk

weird syntax

quite like ruby



Implementation Problems

- speed (laptop → pi)

- 2 language problem (nice OR fast)

- inaccessibility (written in C)

Boldy go where ...

compiling to binary

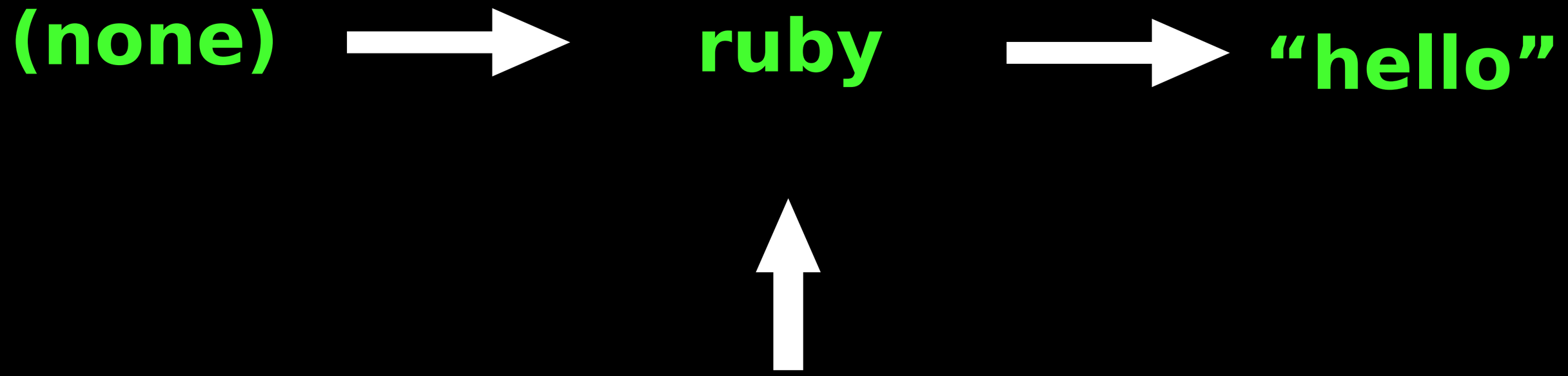
fix all 3 problems

(faster , one tool , in ruby)

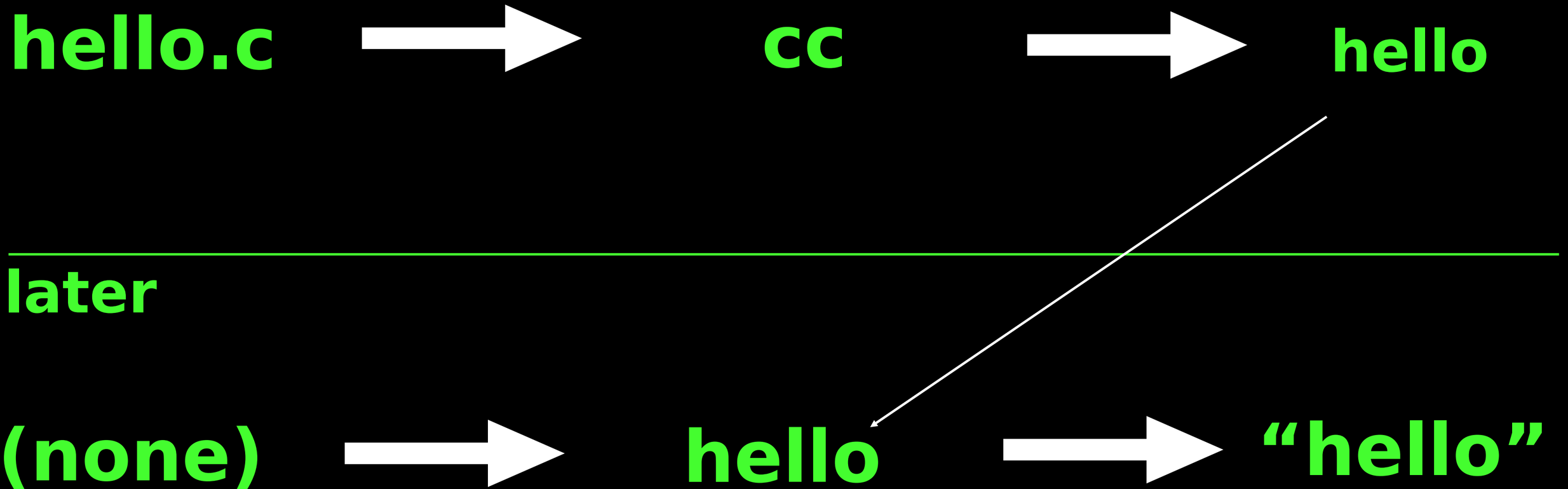
Any Program

Input **Program** **Output**

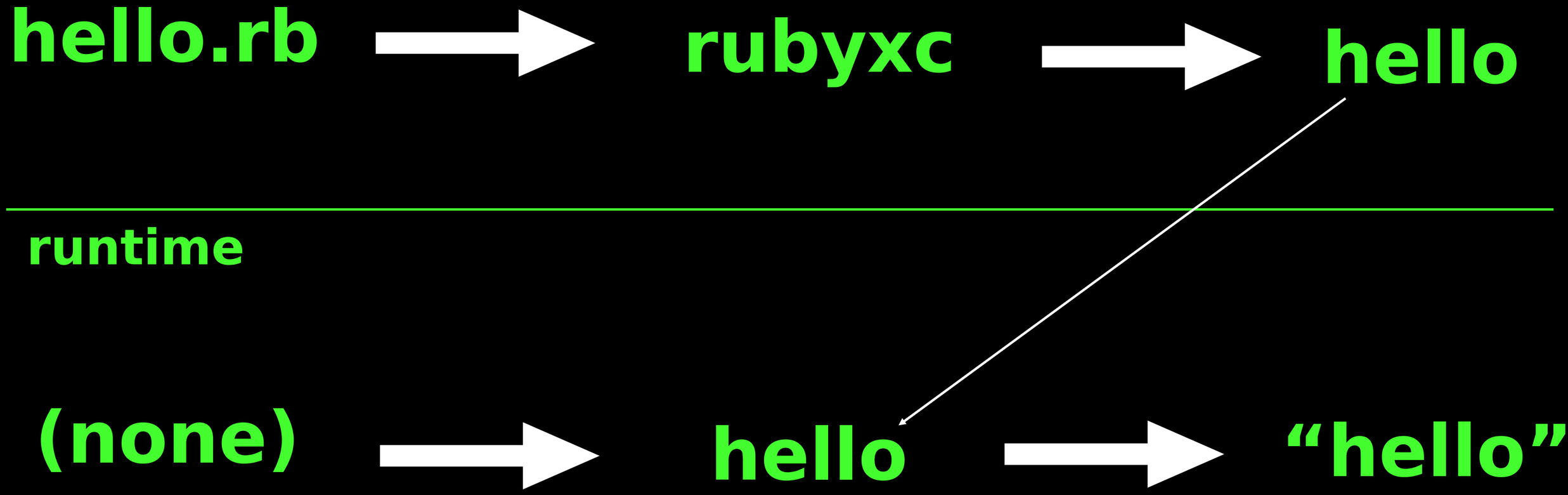
Mri – runtime only



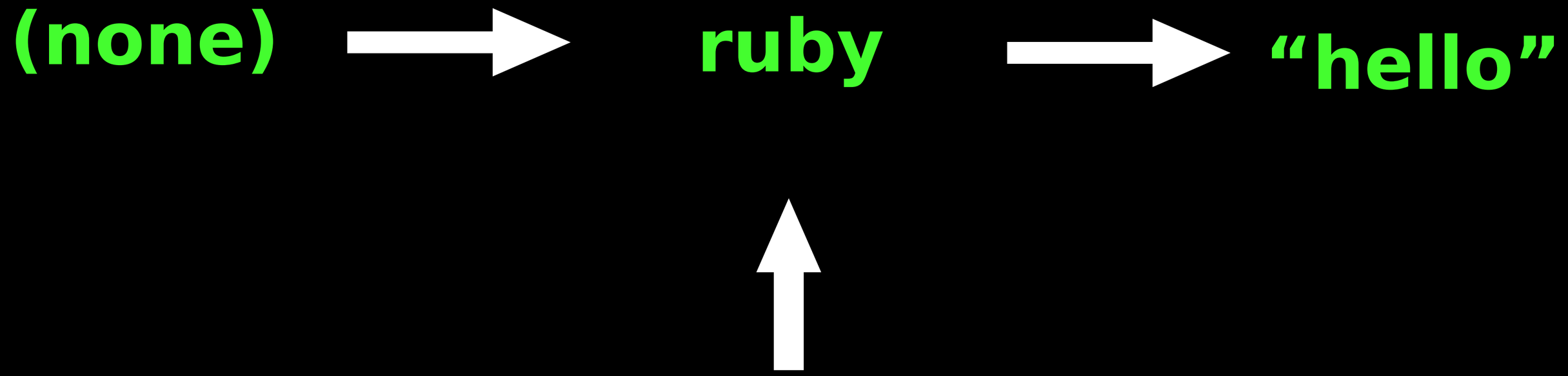
Compiling – compile and runtime



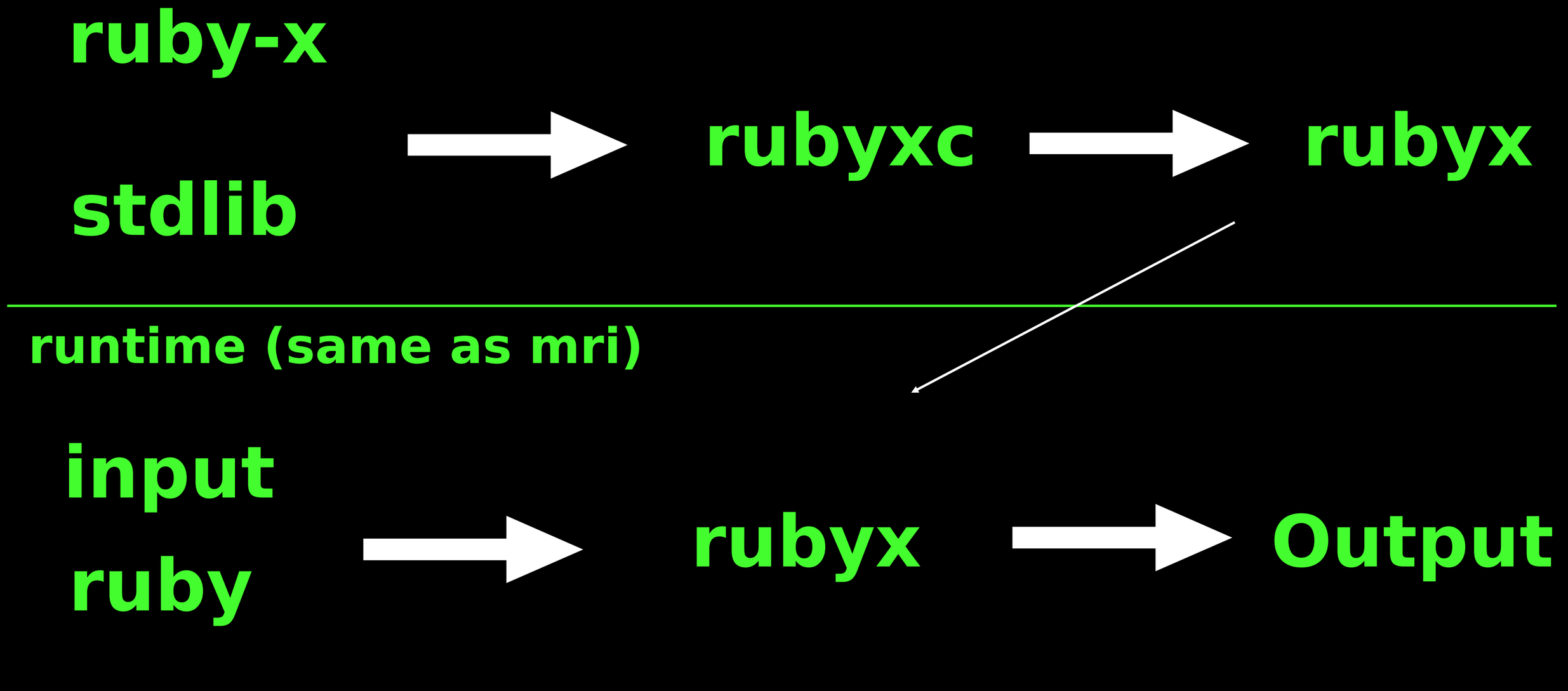
RubyX compiling ruby



Mri – runtime only



Boostrapping RubyX



Currently working

- basic oo (classes/ objects)
- calling convention
- memory layout
- binary creation

Object Model

- Everything is Object

- opaque data, ruby has no access

- builtin functions to process data

Object has Type

- Types are immutable

- Type defines memory layout

  - type reference may change

Many Types implement a Class

- Class has instance Type

- instance type may change

- instance type for new object

Currently working

control structures

- if / else
- while (no break/continue)

assignment

- local
- ivar

Sending

static calling

argument passing

  - local / ivar / expression

dynamic sending

  - method resolution / caching

Blocks

- implicit block capture
- block passing as argument
- yield with arguments
- return (lambda style)

Lots not working

- eval
- procs / binding
- exceptions
- class methods / variables
- multi - assignment
- stdlib . . . . . .

Compiler layers

- ruby source (parser gem)
- virtual oo language (vool)
- Minimal oo Machine (mom)
- risc abstraction
- Arm / Elf / binary

Risc abstraction

- arm without the fluff
- 20 instructions (compare llvm)
- extensible (class hierarchy)
- last virtual layer (interpreter)
- visual debugger

Demo time

http://ruby-x.org/

→ Architecture

→ Debugger

Project

- 4 years
- 3k commits , 1300 tests
- multi arch ready, arm working
- basic executables (mini rt)
- stable architecture

Guiding Ideas

- microkernel (leave it, if poss.)

- extensible (inheritance/gems)

- openness / empowerment

RubyX is

a start

Showing

a new way

An

Invitation

ruby-x.org

github.com/ruby-x