

Break New Ground

# The quest to the language Graal: one JVM to rule them all

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# Safe Harbor Statement

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# GraalVM™

## PERFORMANCE

## INTEROPERABILIDADE

## TOOLING

### Cenário Atual

Apenas linguagens com alto investimento

Alto custo de serialização

Cada linguagem com suas próprias ferramentas (debug, profiling, etc)

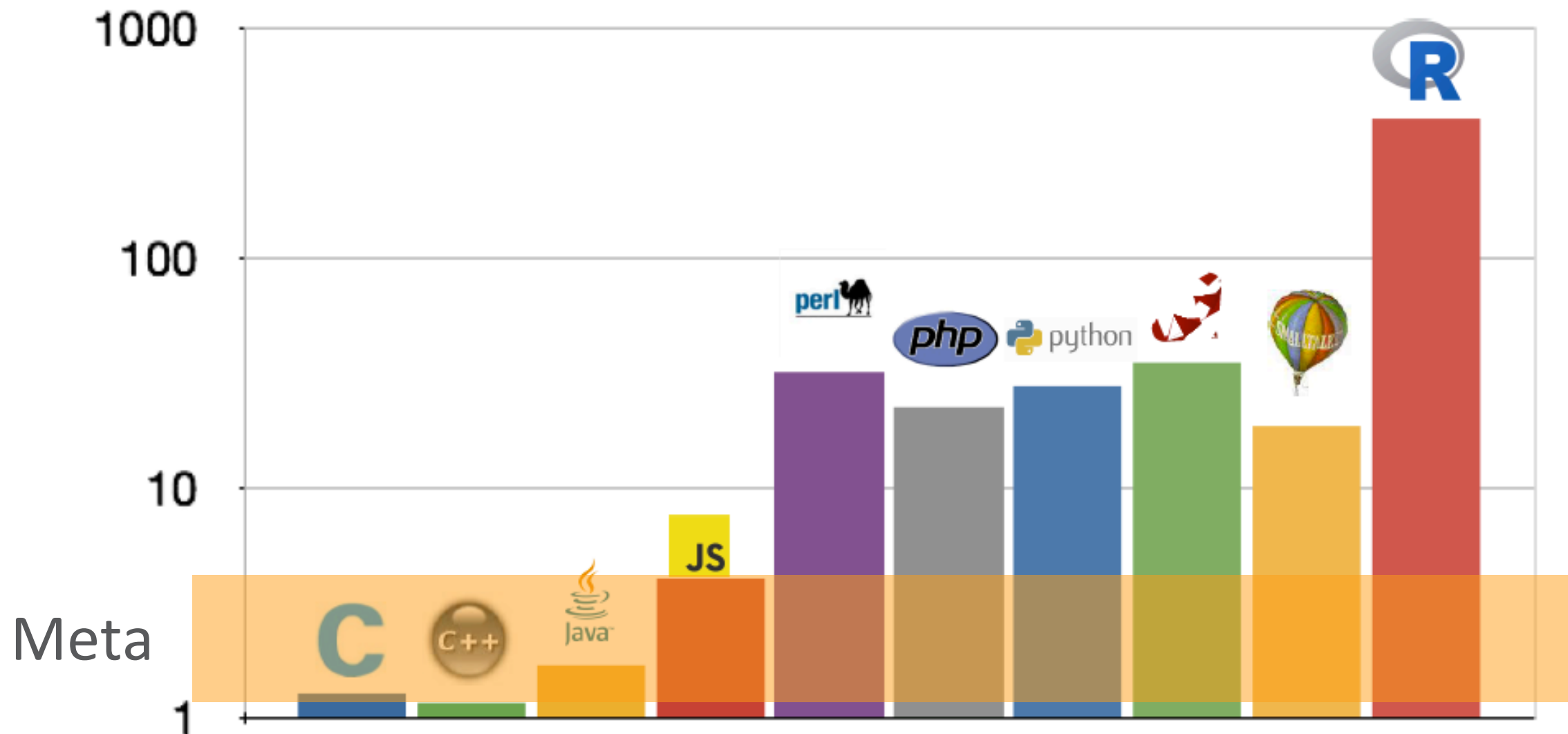
### Graal VM

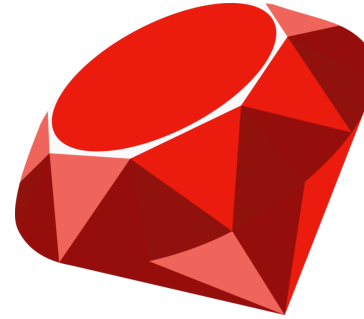
Alta performance para todas as linguagens

Zero overhead

Ferramentas únicas para todas as linguagens

# Comparação entre linguagens





Impl

Impl

Impl

Impl

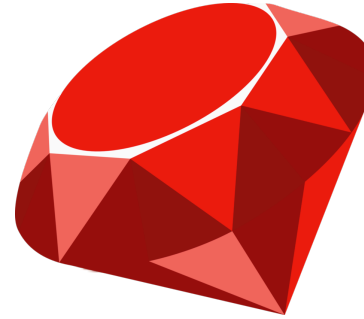
VM

VM

VM

VM



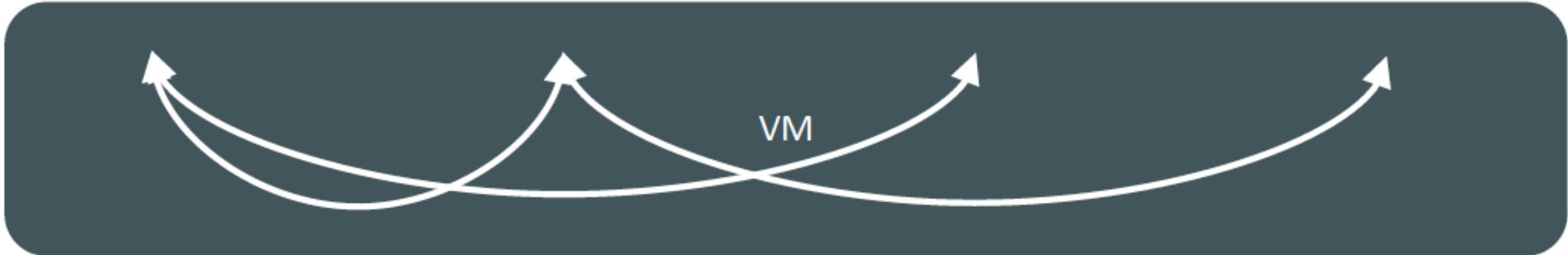


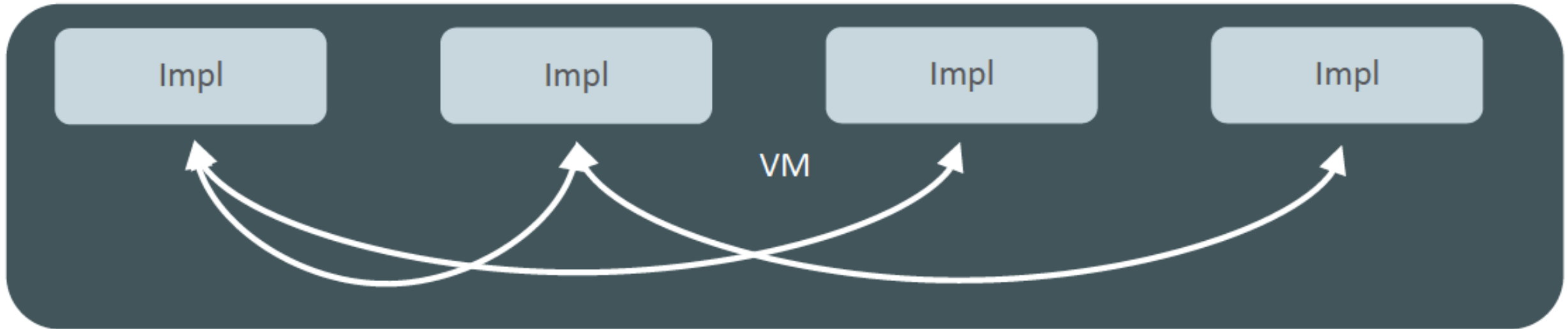
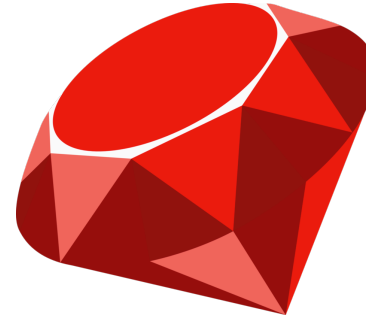
Impl

Impl

Impl

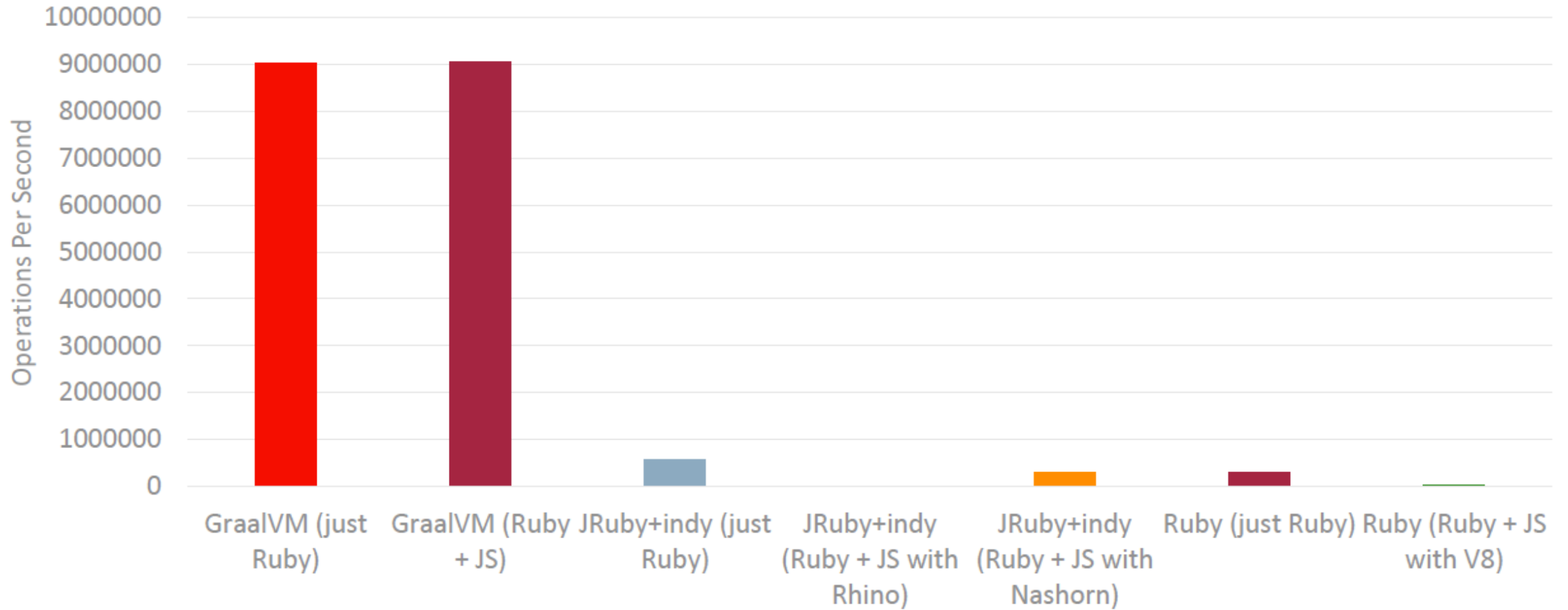
Impl







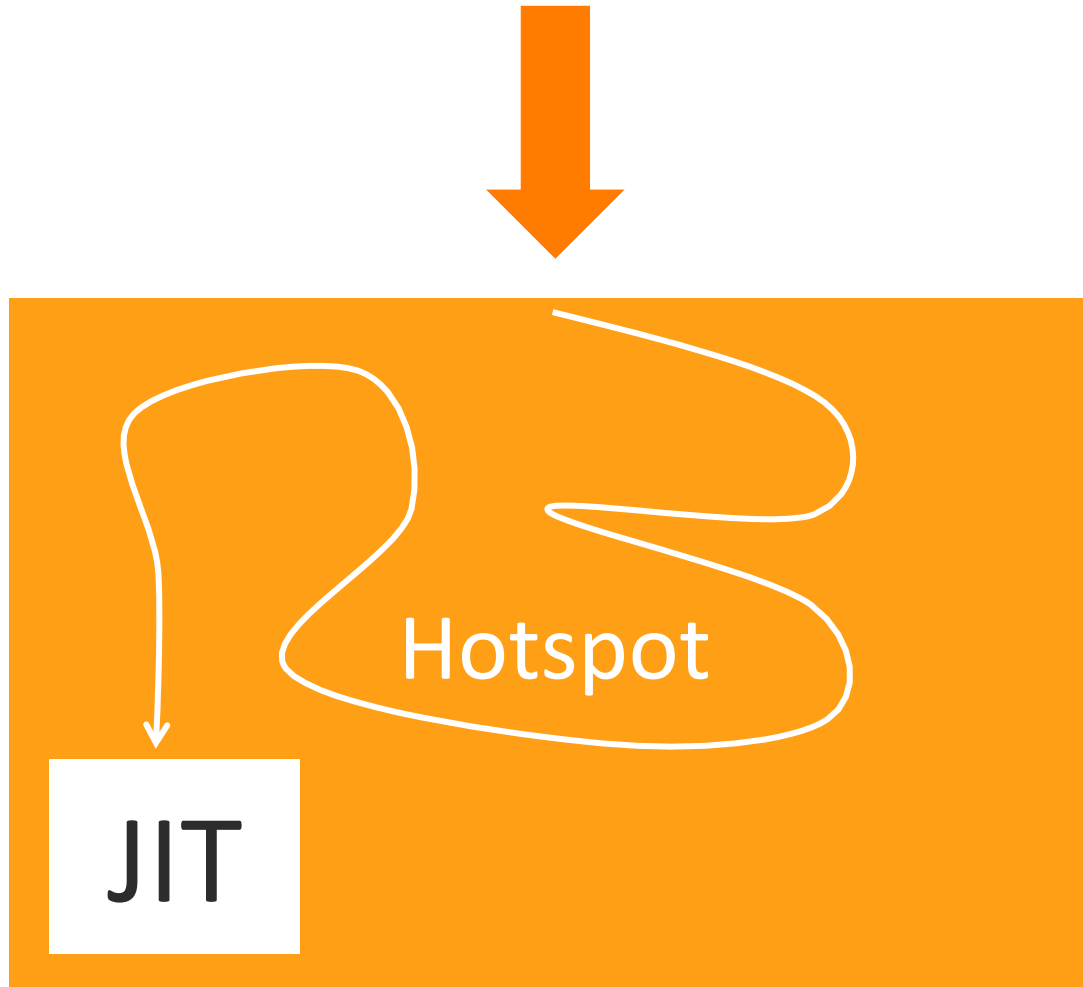
# Comparativo `clamp` em vários cenários

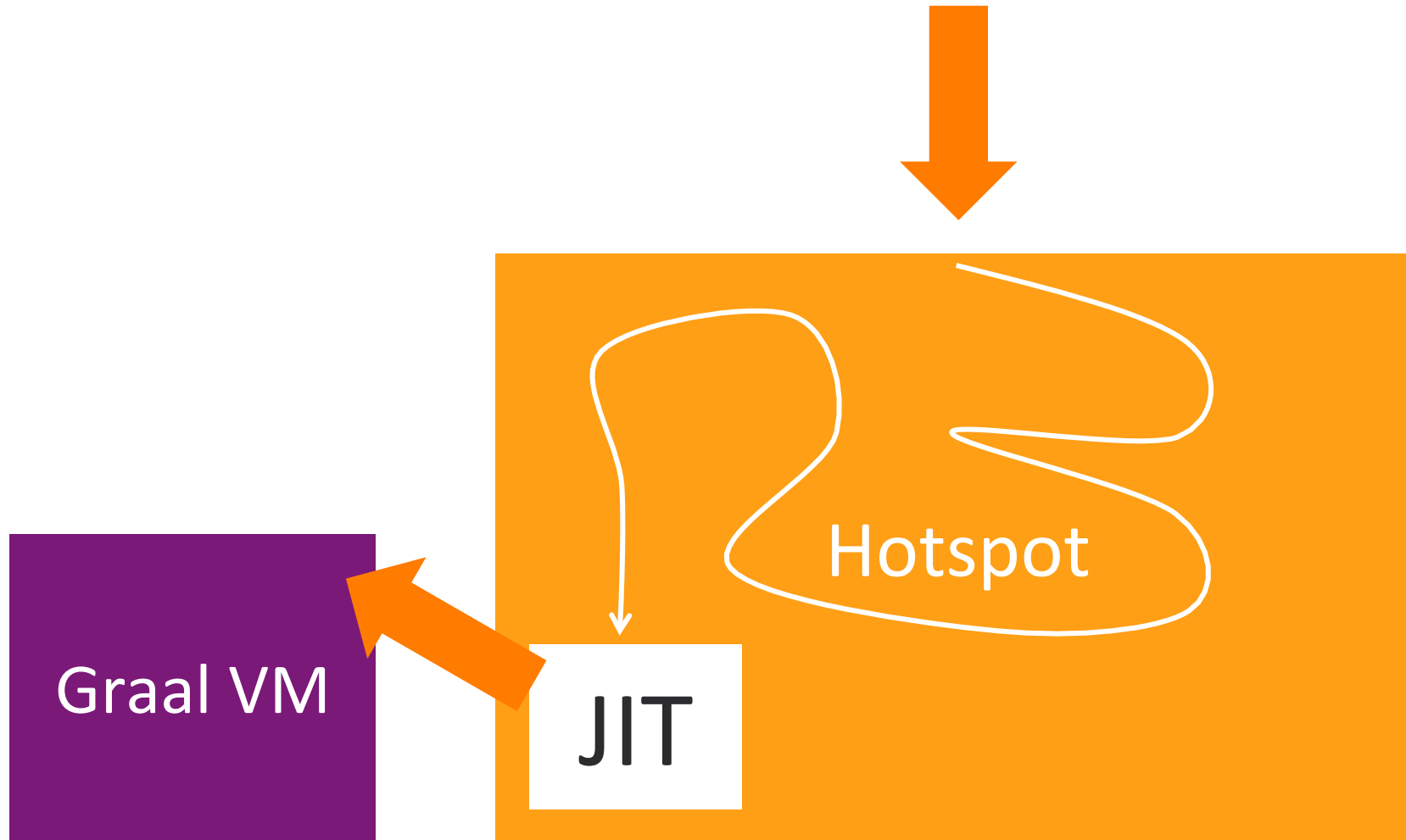


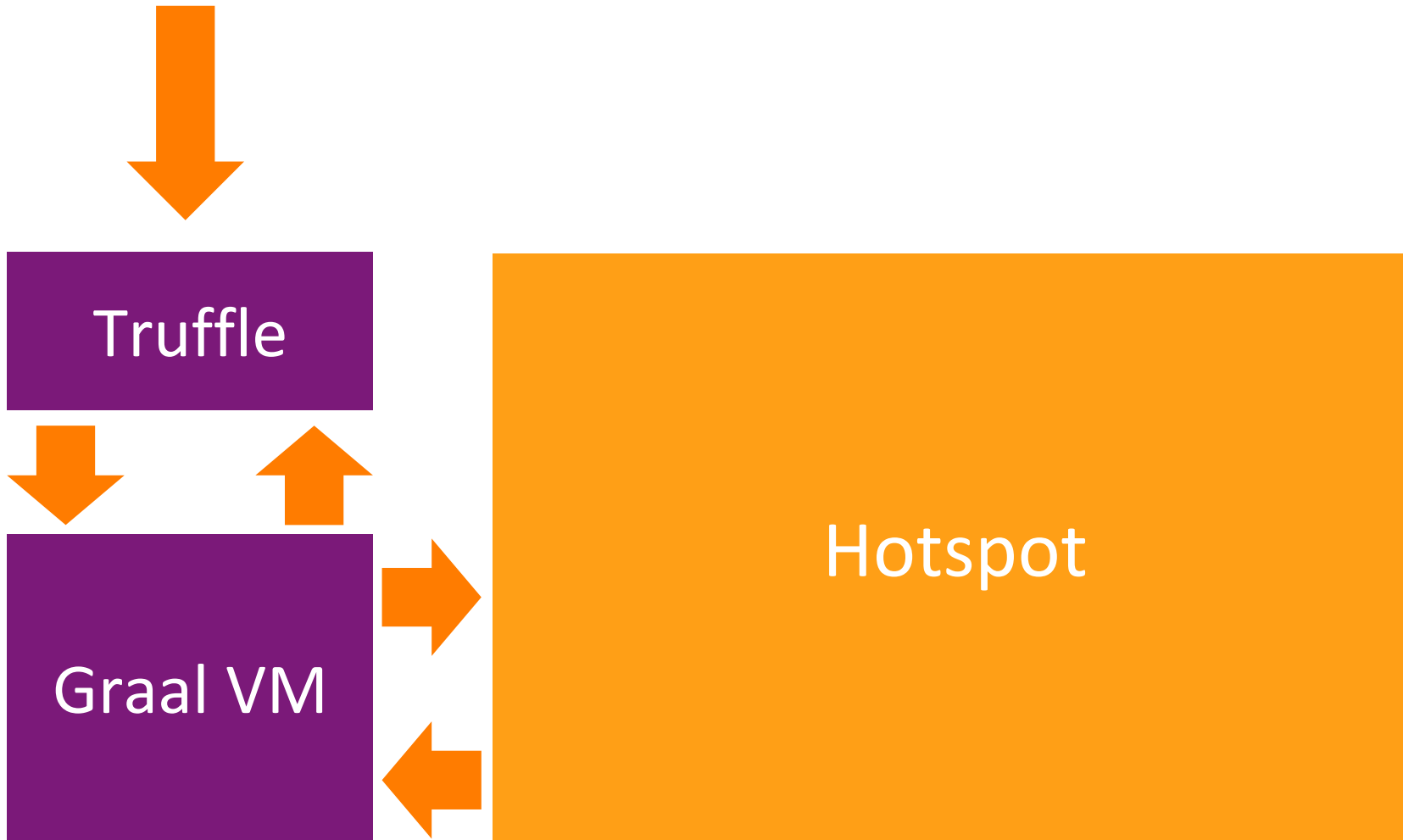


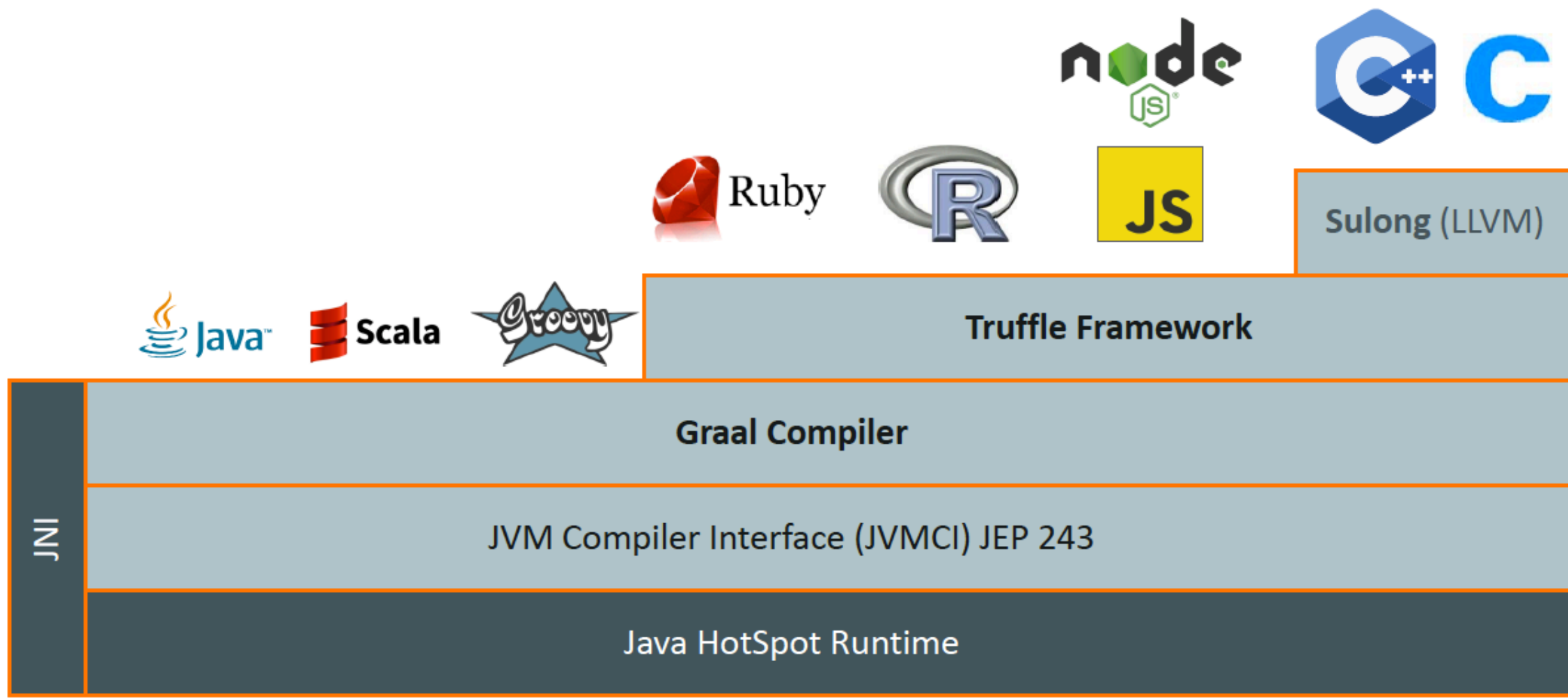


Implementações convencionais emitem bytecode para a JVM – o mesmo que é feito pelo compilador Java







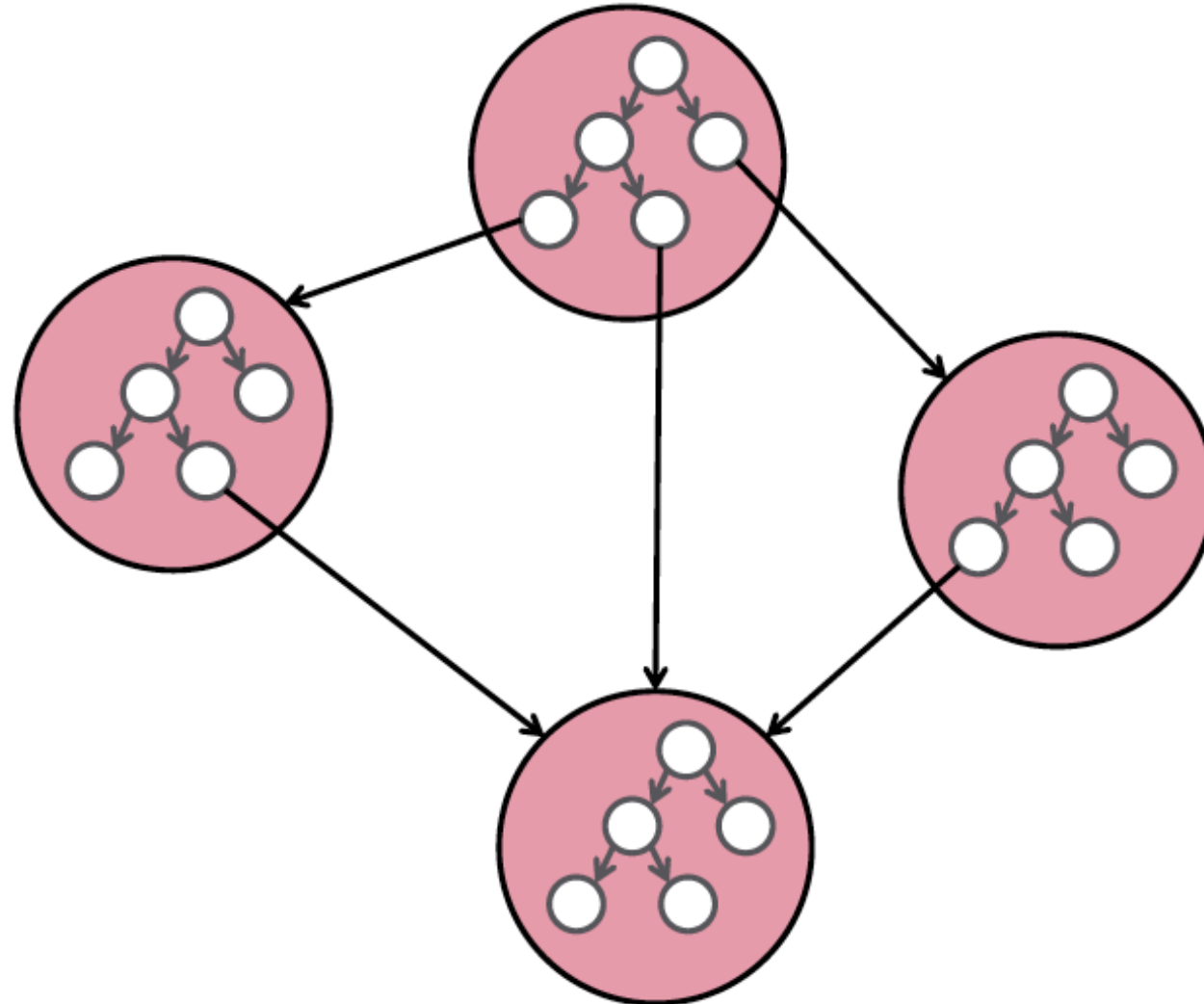


# Esclarecendo terminologias e funcionalidades

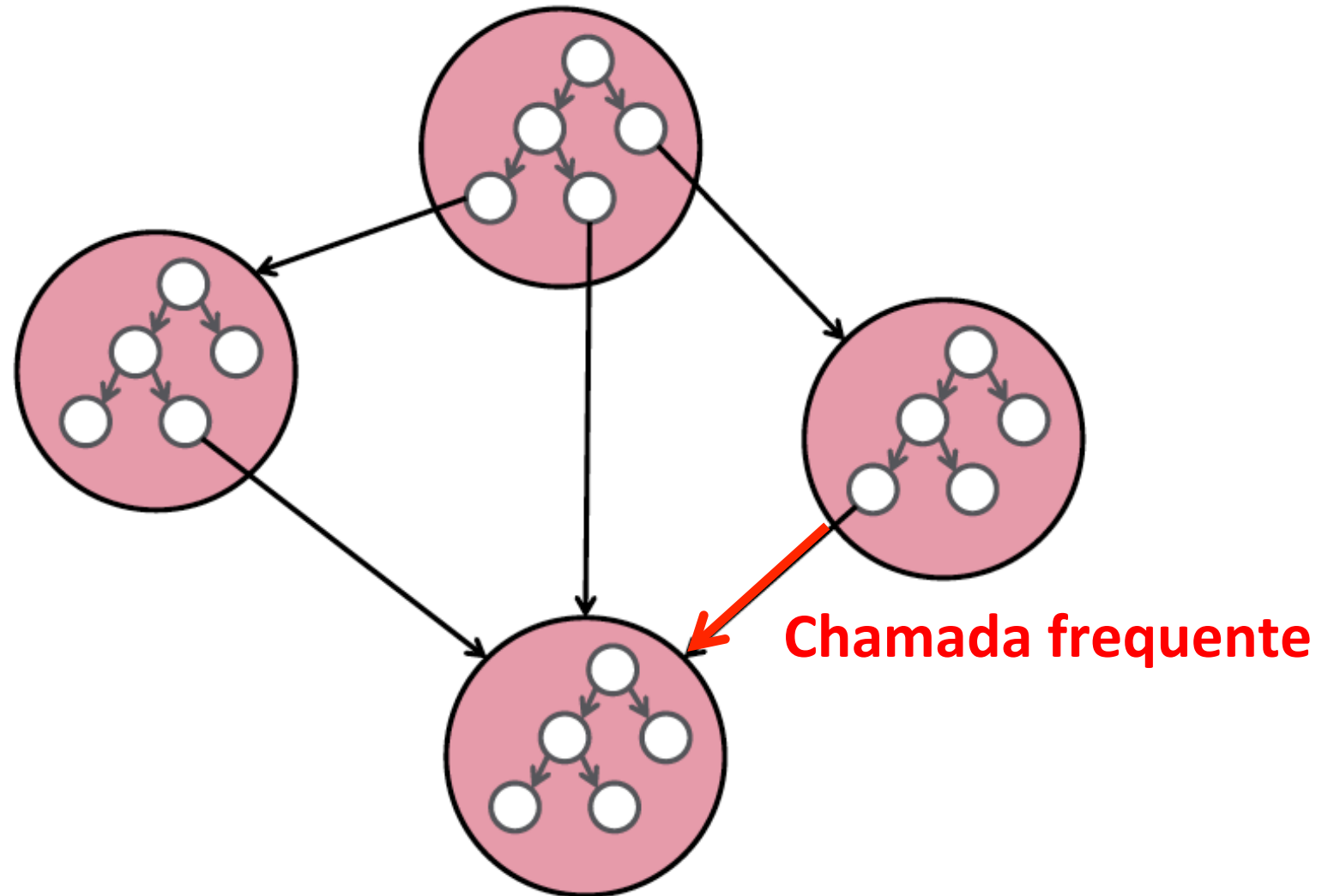
- Graal é um compilador JIT para a JVM
- Graal VM é a JVM com Graal, Truffle e as linguagens incluídas
- O Truffle usa o Graal por você



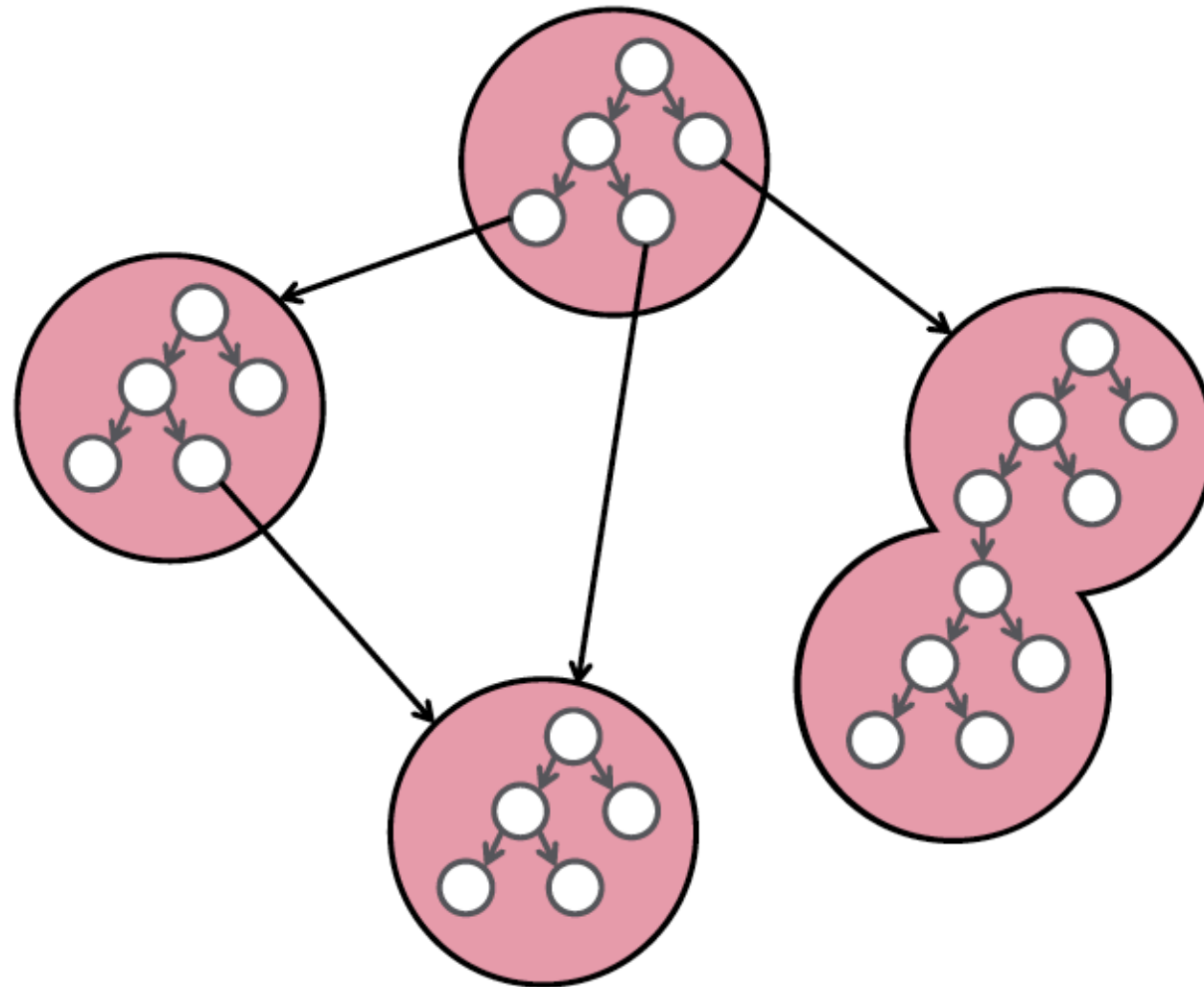
# Interface entre Truffle e Graal



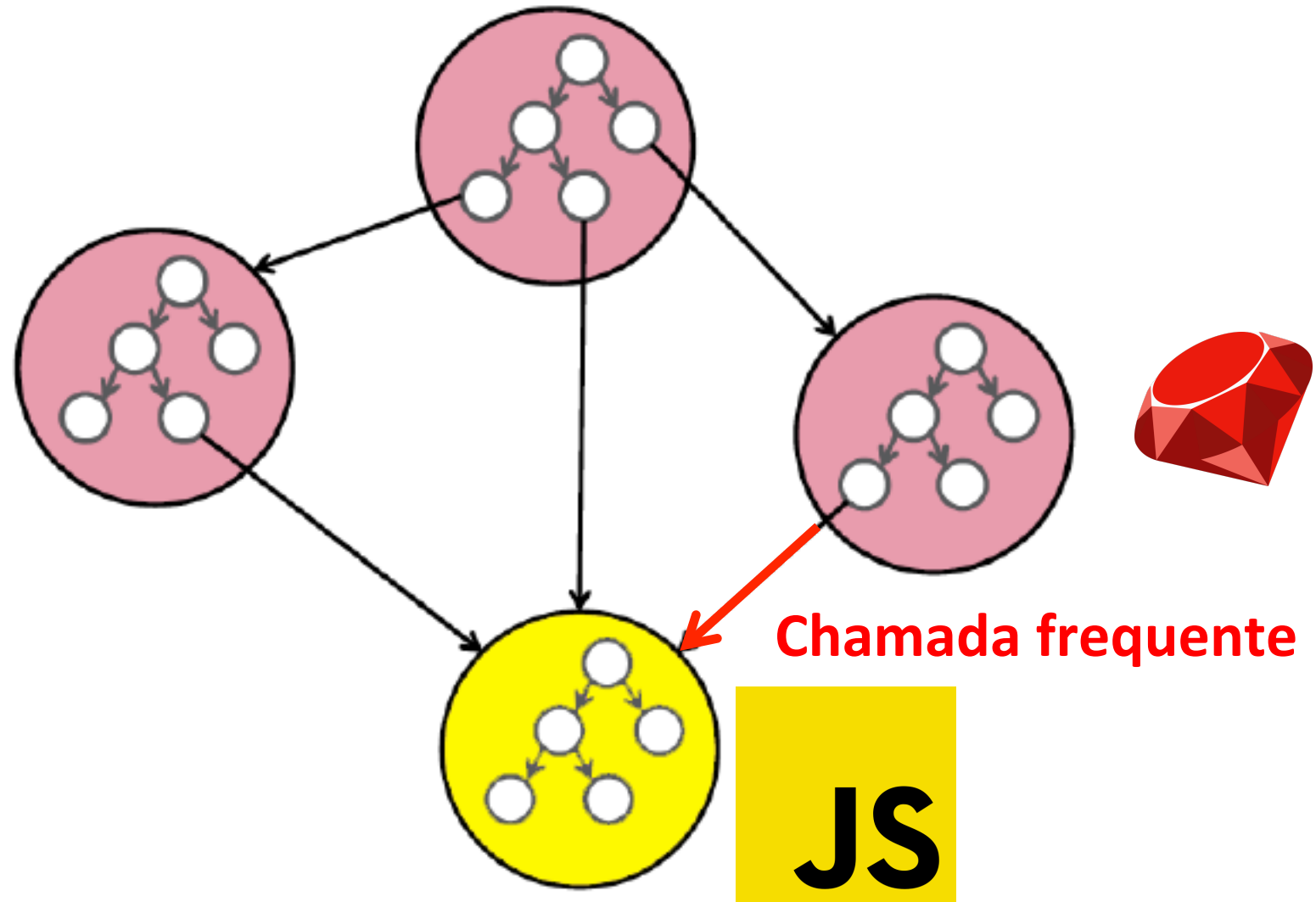
# Interface entre Truffle e Graal



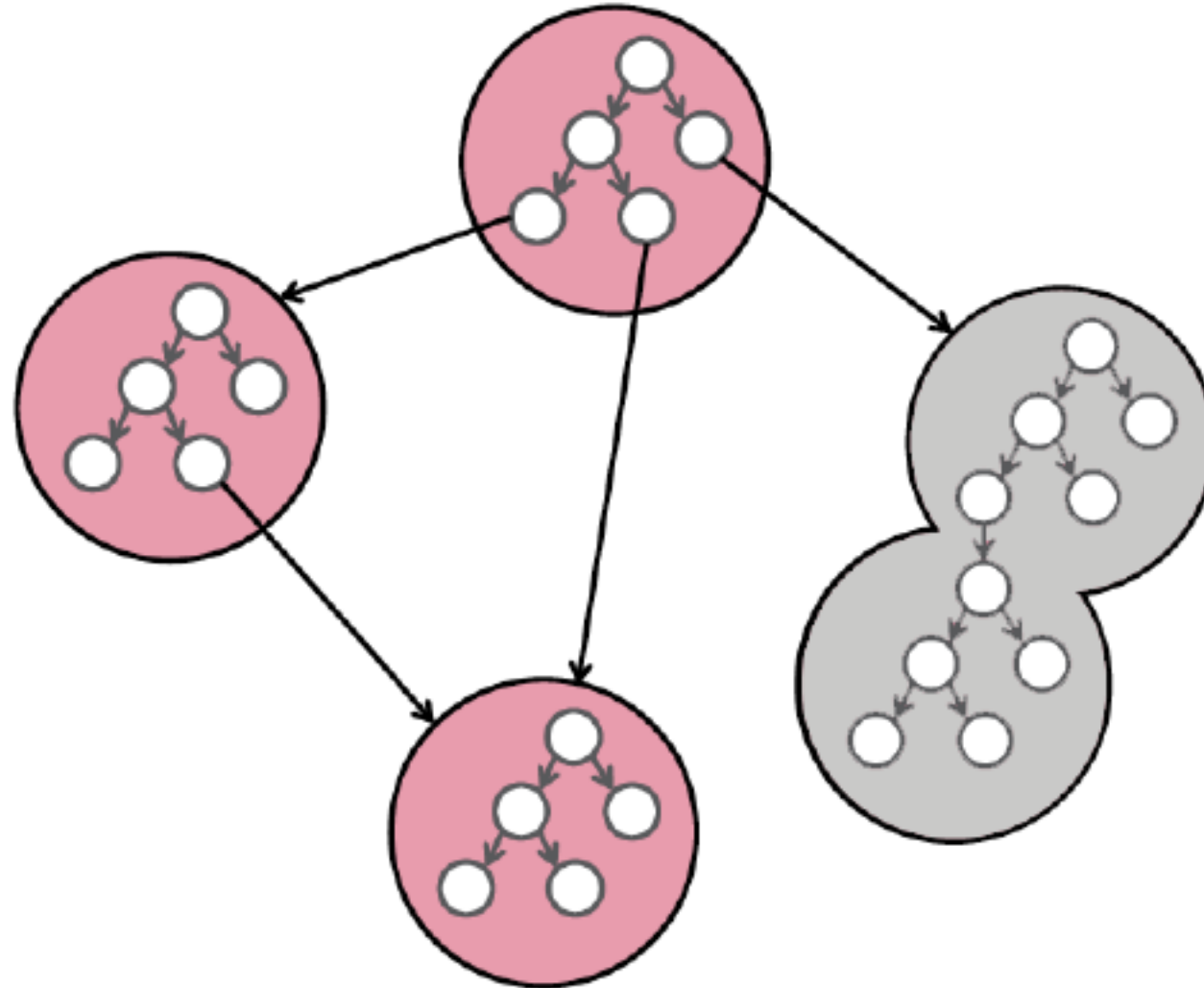
# Interface entre Truffle e Graal



# Interface entre Truffle e Graal



# Interface entre Truffle e Graal



- A ideia não é misturar código de diferentes linguagens
- Remove o quesito “performance” ao escolher uma linguagem
- Permite intercâmbio de bibliotecas entre linguagens

# Graal VM – Tudo em um único pacote

- Inclui
  - JVM (RE ou DK)
  - Java
  - Javascript
  - Ruby
  - R
  - Outras a caminho!
- Mac ou Linux



# Java 10+

```
java -XX:+UnlockExperimentalVMOptions -XX:+UseJVMCICompiler -jar ...
```

Parabéns, você está usando Graal! 😊



# Porque o Graal VM é mais rápido?

- Anos de pesquisa para criar um compilador JIT mais rápido
- Compilador JIT escrito em linguagem de alto nível (Java) ao invés de C++, permitindo sua evolução de forma mais fácil e segura
- Otimizações de *escape analysis* e *inlining* (arquitetura de processamento)

Está pronto para produção?





# Twitter & Graal VM

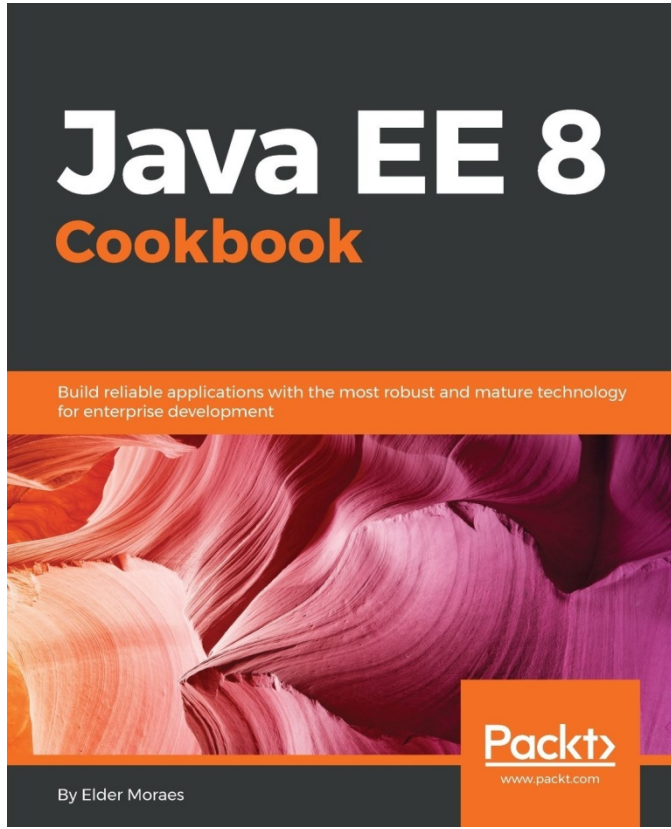
- Está em produção no Twitter!
- Eles dizem que já economizaram “centenas de milhares de dólares”
- Microservices em Scala
- Utilizam a versão Community; a performance poderia ser ainda melhor com a versão comercial

## 13% mais rápido com Graal VM

**DEMO GODS**



**PLEASE MAKE THIS DEMO WORK**



@elderjava

book.eldermoraes.com

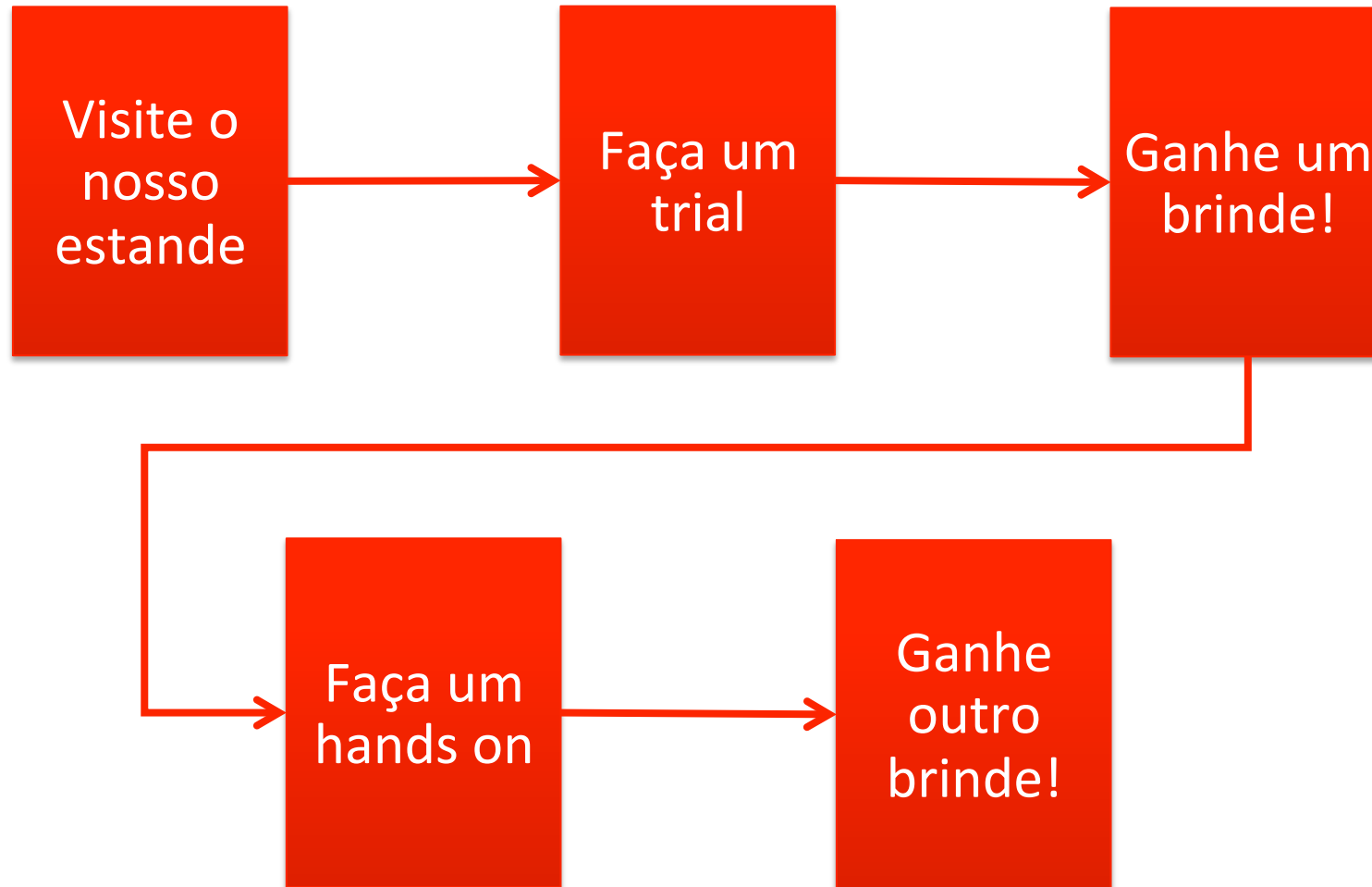




Java@Cloud Age

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