Eliminando Gargalos de Processamento Utilizando Rust

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Sumário

Introdução

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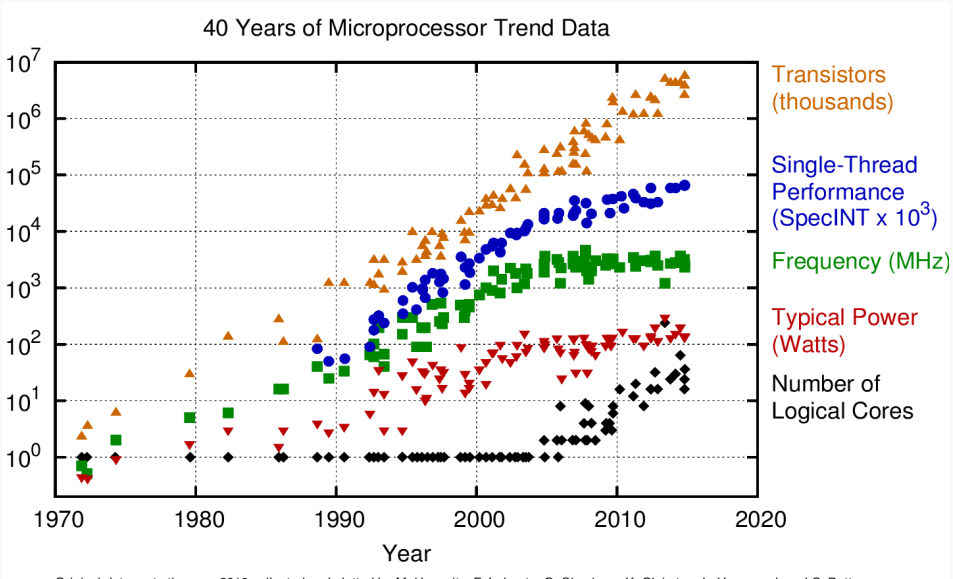
Uma linguagem de programação de sistemas que roda incrivelmente rápido, previne falhas de segmentação, e garente segurança entre threads.

Motivação

"O clock dos processadores dobra a cada 18 meses."

Lei de Moore, 1965.

Motivação

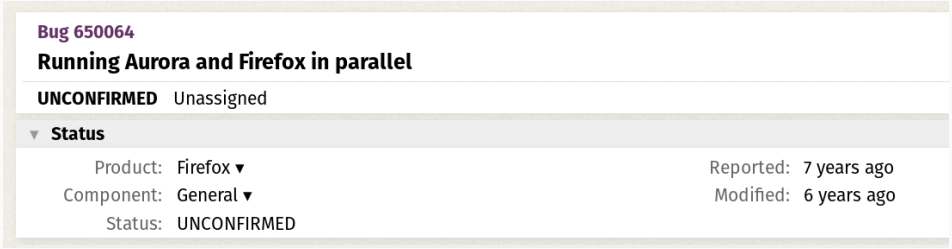

40 Years of Microprocessor Trend Data
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0
1970
1980
1990
2000
2010
2020
Year
Transistors (thousands)
Single-Thread Performance (SpecINT x 10^3)
Frequency (MHz)
Typical Power (Watts)
Number of Logical Cores

Motivação

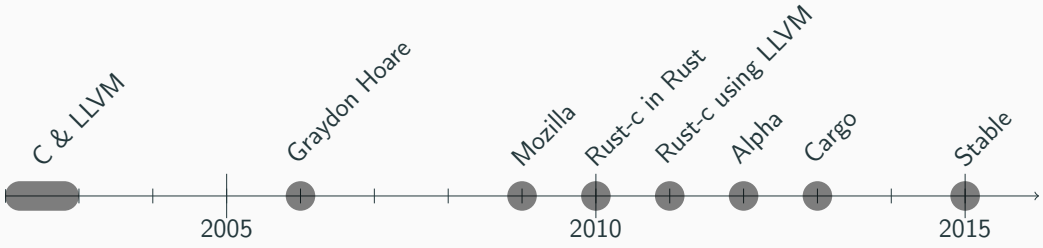
"The way the processor industry is going, is to add more and more cores, but nobody knows how to program those things. I mean, two, yeah; four, not really; eight, forget it."

Steve Jobs, Apple.

Motivação


Bug 650064
Running Aurora and Firefox in parallel
UNCONFIRMED Unassigned
Status
Product: Firefox ▾
Component: General ▾
Status: UNCONFIRMED
Reported: 7 years ago
Modified: 6 years ago

História


C & LLVM
Graydon Hoare
Mozilla
Rust-c in Rust
Rust-c using LLVM
Alpha
Cargo
Stable
2005
2010
2015

Desenvolvimento

- Licensa MIT no Github;
- Duas versões: Stable e Nightly;
- Processo de RFC;
- Quando uma RFC é aprovada ela é adicionada na versão Nightly;
- Após algum tempo em Nightly, ela pode ser adicionada na versão Stable, deixada de lado ou alterada;

Quem usa? E para que?

Quem usa? E para que?

"Optimizing cloud file-storage."

Quem usa? E para que?

"Everything from server monitoring to middleware!"

Quem usa? E para que?

"Developing memory-safe embedded applications on our SmartThings Hub and supporting services in the cloud."

Quem usa? E para que?

"Building the Servo browser engine, integrating into Firefox, other projects."

Quem usa? E para que?

"Programming Assignments in secured Docker containers."

Quem usa? E para que?

"Letting you develop, deploy and manage infrastructure, run-time environments and applications."

Quem usa? E para que?

"We use Rust in a service for analyzing petabytes of source code."

Quem usa? E para que?

"Replacing C and rewriting performance-critical bottlenecks in the registry service architecture."

Quem usa? E para que?

"Habitat is automation that travels with the app. Rust aid us to remove bottlenecks."

Quem usa? E para que?

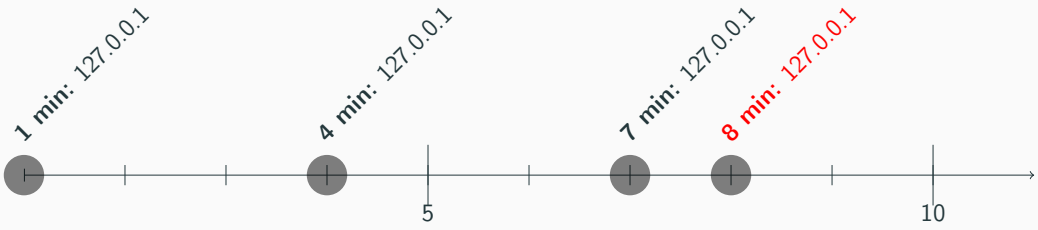
- No site oficial da linguagem há mais 123 empresas que deixaram claro que utilizam Rust;

Sugestões de Regras do Velocity

Velocity

Regras de repetição:

- 5 repetições de um **Cpf** em 10 minutos;
- 10 repetições de um **Cartão** em 2 dias;
- 2 repetições de um **Ip** em 5 minutos;

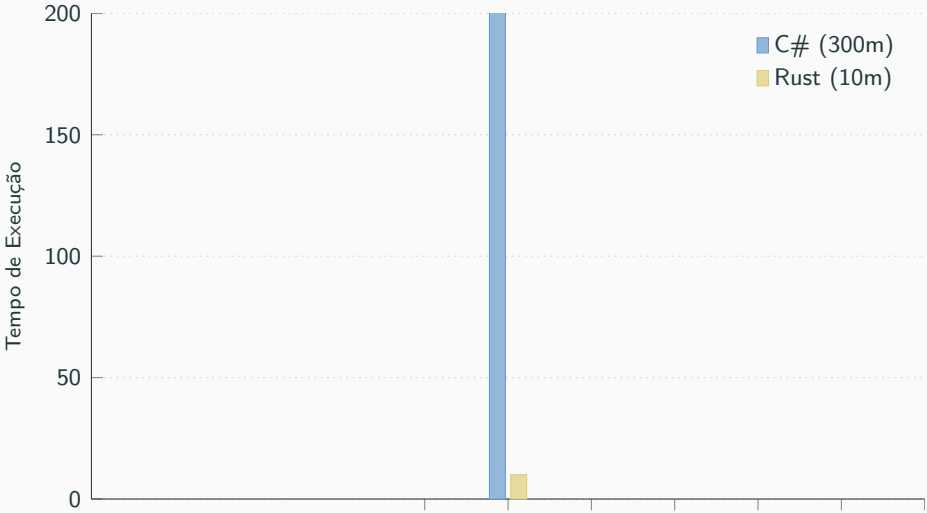


Algoritmo

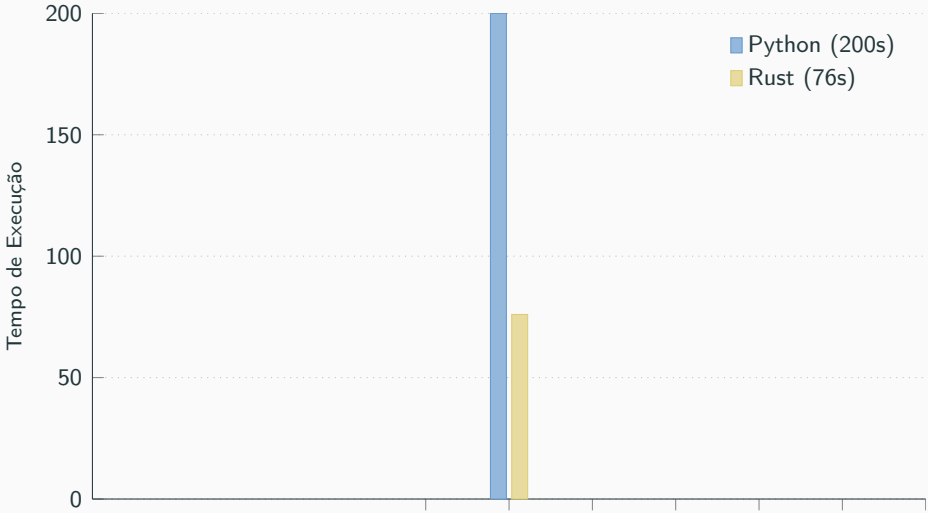
```
var transactions = List<Transaction>();
var quarantine = new DateTime();

for transaction in transactions do
    if quarantine_is_active(quarantine, transaction) then
        block(transaction);
        update(quarantine);
    else
        if extrapolate_rule(transaction) then
            block(transaction);
            update(quarantine);
        end
    end
end
```

Benchmark (v1.0)

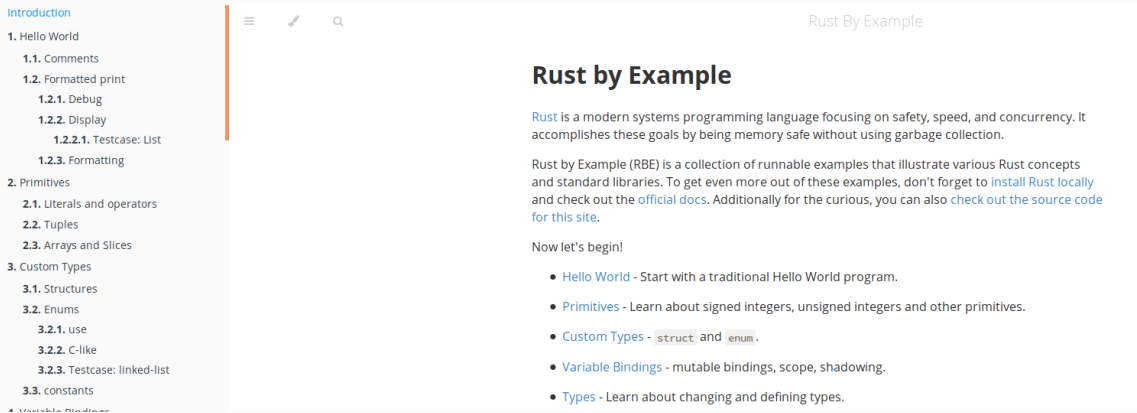


Benchmark (v2.0)



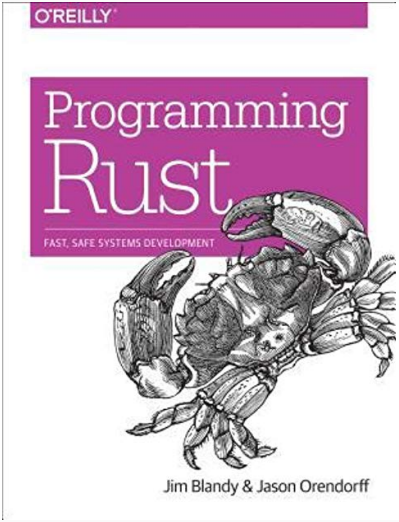
Material de estudo

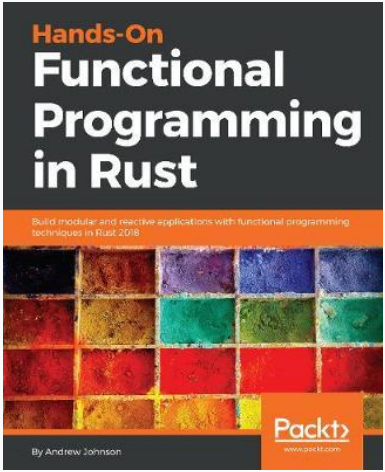
Rust by Example




Rust
Concorrência e alta performance
com segurança
RUST
Casa do
Código
MARCELO CASTELLANI

Programming Rust




Hands-On
Functional Programming in Rust
Build modular and reactive applications with functional programming techniques in Rust 2018
By Andrew Johnson
Packt
www.packt.com

Obrigado