



- What is Rust?
- What is production?
- Case Studies



Rust is a **systems** programming language that focuses on **safety**, **speed**, and **concurrency**.



Systems programming:  
“when the details matter”



## Details

- Memory management
- Memory layout
- Performance
- Determinism

<http://is.gd/uV8KjU>



Systems programming:  
embedding in other langs



Safety



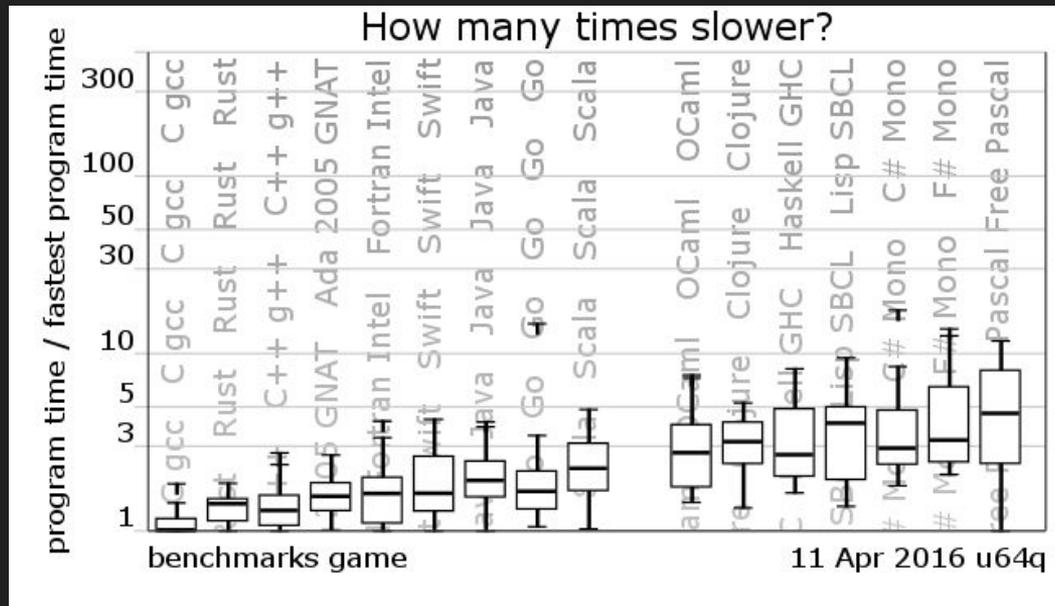
**At compile time, no:**

- Segfaults
- Dangling pointers
- Iterator invalidation

<http://is.gd/FtLhW8> <http://is.gd/uWSOU1>



Speed



<http://benchmarksgame.alioth.debian.org/u64q/which-programs-are-fastest.html>

<http://benchmarksgame.alioth.debian.org/u64q/rust.html>



Rust should be  
roughly the same  
speed as C or C++



Concurrency



“Shared mutable state is the root of all evil”



“~~Shared~~ mutable  
state is the root of  
all evil”



“Shared mutable  
state is the root of  
all evil”



“(Shared AND mutable) state is the root of all evil”

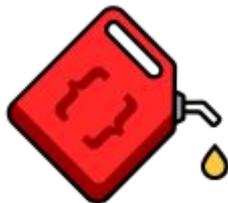


Rust will let you freely share immutable state, and won't let you share mutable state.

Unless you use a concurrency primitive that provides safety.



Tension: low-level street cred vs ease of use, eg “I don’t use C for a reason”



# DIESEL

## Rust code

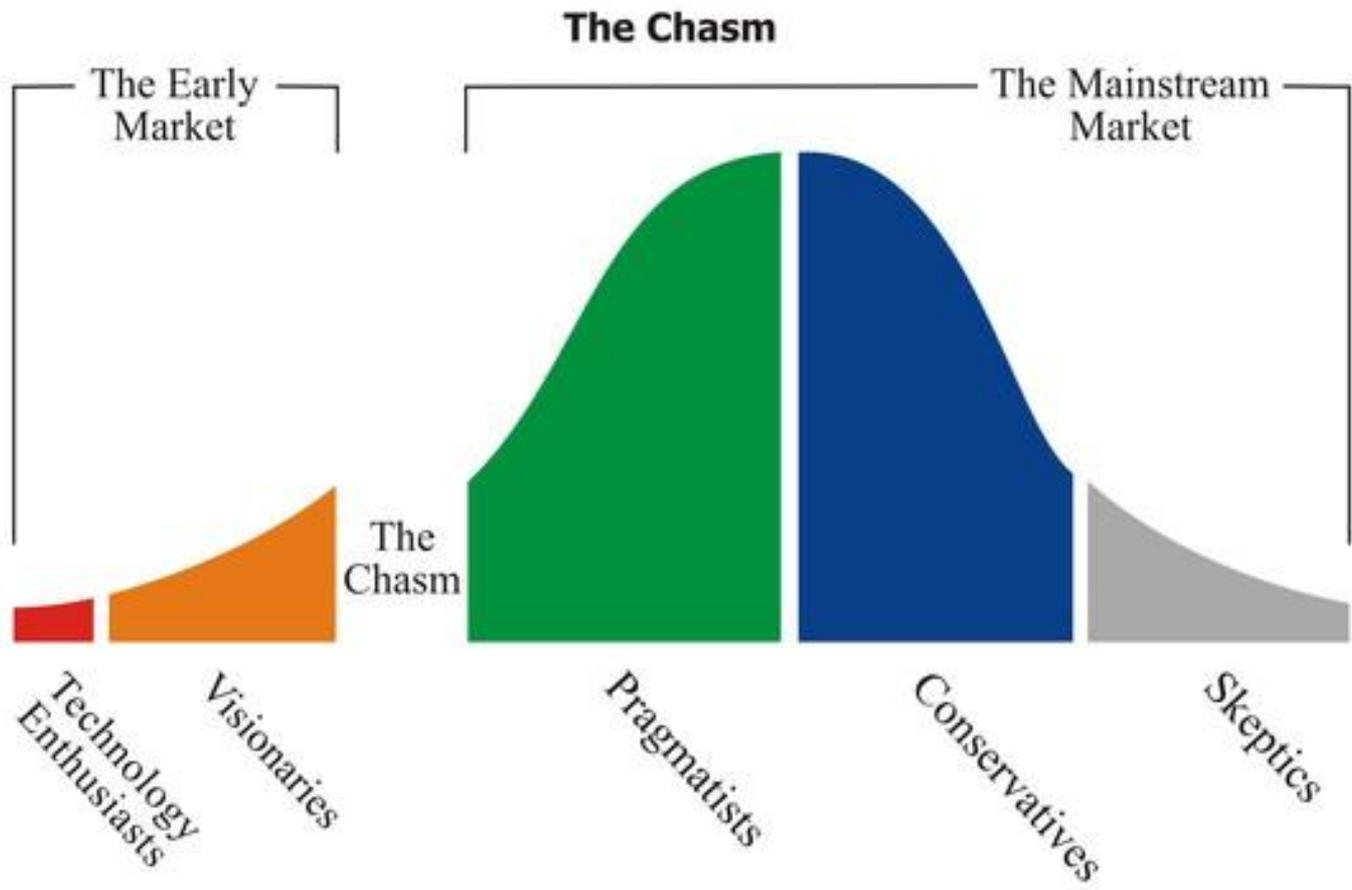
```
let versions = Version::belonging_to(krate)
    .select(id)
    .order(num.desc())
    .limit(5);
let downloads = try!(version_downloads
    .filter(date.gt(now - 90.days()))
    .filter(version_id.eq(any(versions)))
    .order(date)
    .load::<Download>(&conn));
```

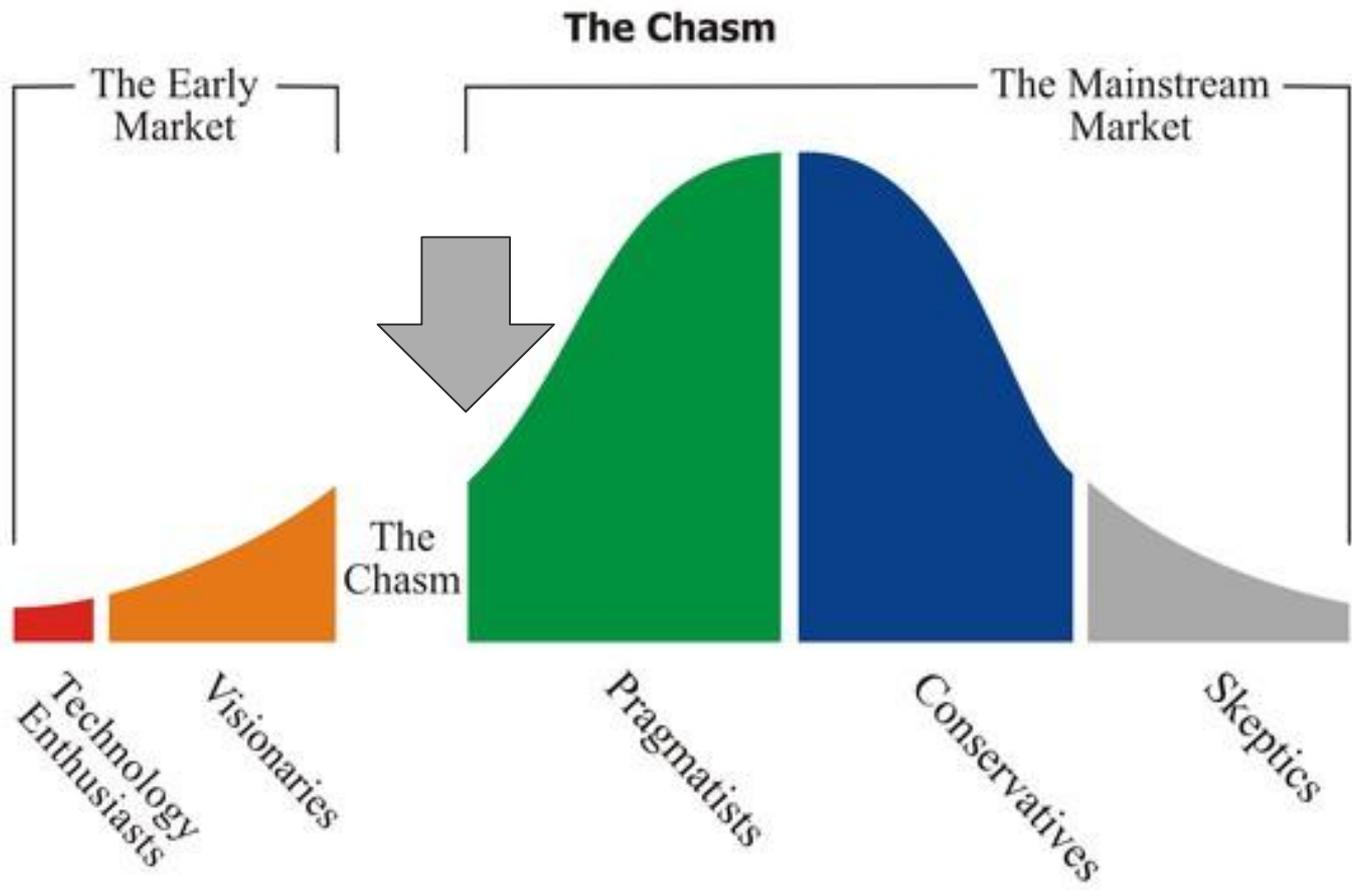
## Executed SQL

```
SELECT version_downloads.*
  WHERE date > (NOW() - '90 days')
  AND version_id = ANY(
    SELECT id FROM versions
     WHERE crate_id = 1
     ORDER BY num DESC
     LIMIT 5
  )
 ORDER BY date
```

“Production”

“Is it production ready” is  
a contextual question.









V1: 750kloc C++

V2: 75kloc C++

V3: 7.5kloc Rust



# The Rust community's crate host

[Install Cargo](#)[Getting Started](#)

Instantly publish your crates and install them. Use the API to interact and find out more information about available crates. Become a contributor and enhance the site with your work.

 **34,393,929** Downloads

 **4,592** Crates in stock

## New Crates

tdengine (0.1.0)



## Most Downloaded

libc (0.2.9)



## Just Updated

rosalind (0.8.0)





“We’re already  
farther along, even  
after a rewrite”



CADE METZ BUSINESS 03.14.16 10:00 AM

# THE EPIC STORY OF DROPBOX'S EXODUS FROM THE AMAZON CLOUD EMPIRE



“Stability has been very good; in the last 6 months, we've had no issues with the stability of the rust compiler, the output binaries, or the rust stdlib.”

“Long story short, we have a short list of minor grievances with rust, and a very short list of major ones (build times!), but in general it has worked out very, very well. We're seriously investigating writing more rust for choice pieces of our infrastructure at Dropbox.”

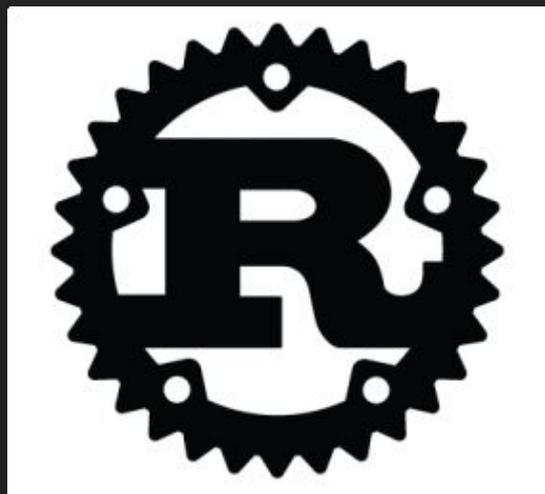
# Stability without stagnation

(and a shout-out to crater)

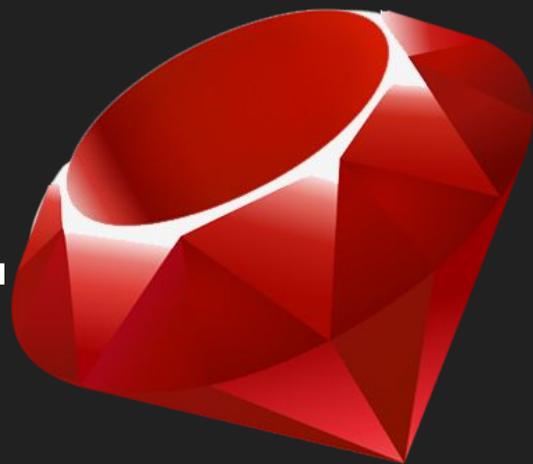




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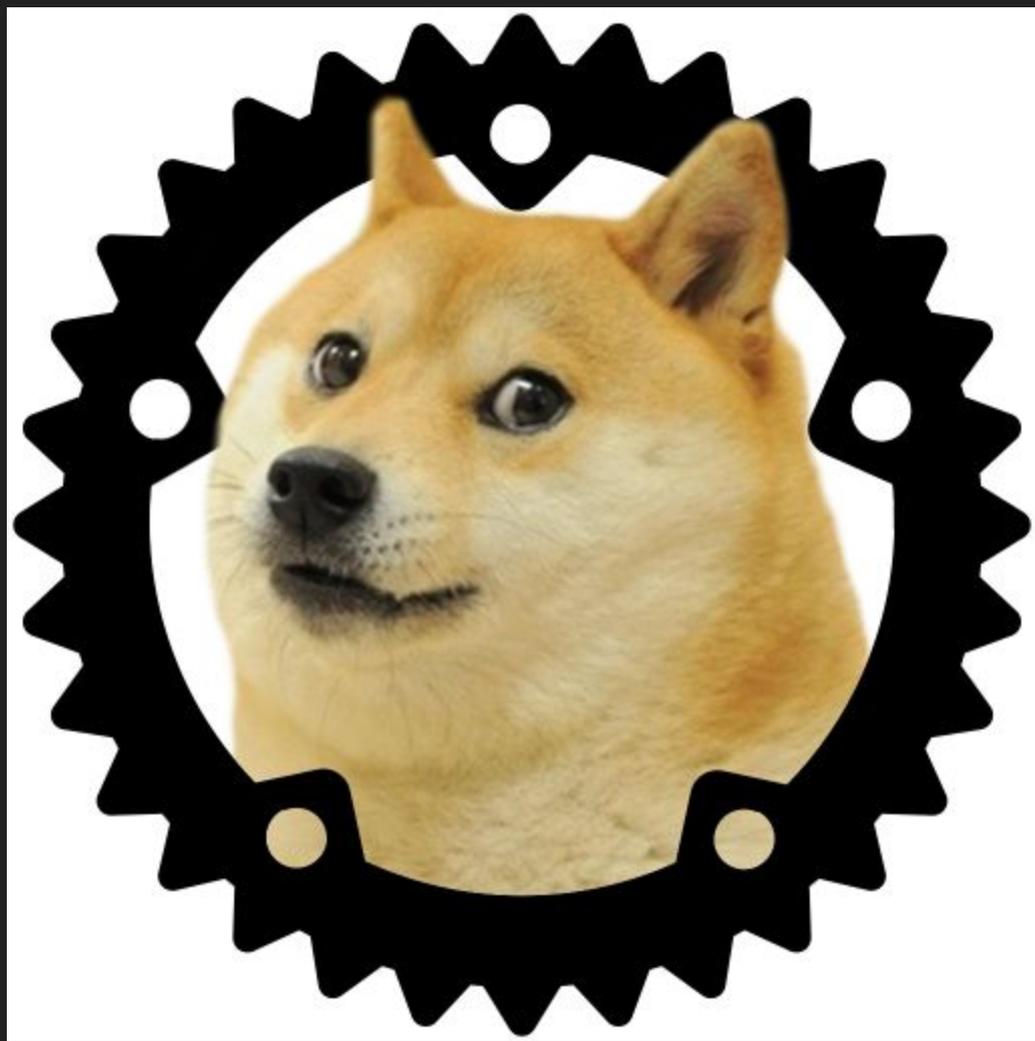




“We ship Rust code to \$REDACTED customers’ servers, and have done so for a few years. There have been two crashes total in those two years.”

“The employee who wrote the original Rust code has left, but we haven’t found it tough to maintain, even for new employees with less Rust expertise. All the bug fixes have been done by a primarily JavaScript & Ruby developer.”





The Rust Progr

http://reddit.com/r/rust

MY SUBREDDITS FRONT-ALL-RANDOM | PHILOSOPHY-MUSIC-GAMING-ART-NEWS-DIY-WRITINGPROMPTS-UPLIFTINGNEWS-S MORE »

ASKSCIENCE-GADGETS-LIFEPROTIPS-AWW-NOTTHEONION-MOVIES-PERSONALFINANCE-ASKREDDIT-BOOKS-SCIENC

 **THE RUST PROGRAMMING LANGUAGE** FOR AN INTERESTING HISTORY OF THE LANGUAGE, SEE THE TELEVISION WORLD NEWS PICS HISTORY GIFS TODAY I LEARNED FOOD JOKE

hot new rising controversial top added from

75 submitted 2 months ago \* by !kibwen - **sticked post**  
44 comments share

How to run HashMap in specific mmap region? (self.rust)  
submitted 1 hour ago by rustnewb9  
5 comments share

Address equality between trait objects (self.rust)  
submitted 1 hour ago by Gustom  
7 comments share

a crate I'm working on for the Github v3 API client (...)  
submitted 18 hours ago by orph4nus  
5 comments share

Iterator API inconsistency? (self.rust)  
submitted 17 hours ago by yokohammer7  
4 comments share

Firefox Gecko and Servo rendering some sites (...)  
submitted 1 day ago by floppd  
5 comments share

Rust bindings for libunity-scopes (self.rust)  
submitted 1 day ago \* by boehison  
2 comments share

Unwrapping result from type that implements trait FromStr (self.rust)  
submitted 1 day ago by finches  
5 comments share

Proposal: Spend most of the beta period \*not\* writing new features (internals.rust-lang.org)  
submitted 1 day ago by Manishearth [rust-serge]  
49 comments share

Error on Rust Upgrade (self.rust)  
submitted 1 day ago by -Y0-

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**The Rust Programming Language**

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Anything whatsoever related to the **Rust programming language**: an open-source systems programming language from Mozilla, emphasizing safety, concurrency, and speed.

**Rules:**

1. Respect our [code of conduct](#).
2. Constructive comments only.
3. No memes.
4. When mentioning other languages, keep the discussion civil. No zealotry!
5. Chill out! A programming language is a silly thing to get upset over.
6. Don't even.
7. Downvotes are for bad information or rudeness, not casual disagreement.

**Learn:**

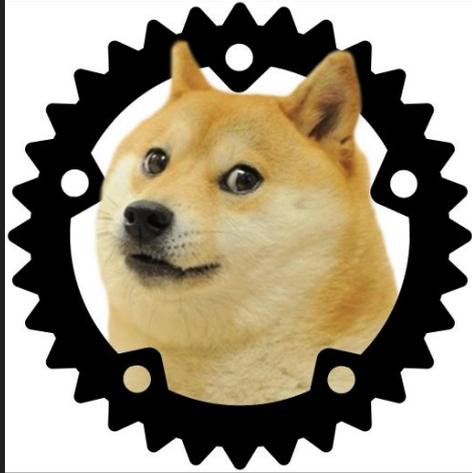
- See the [language FAQ](#) and [project FAQ](#).
- Read the [book](#).
- Skim the [release notes](#).

**Install:**

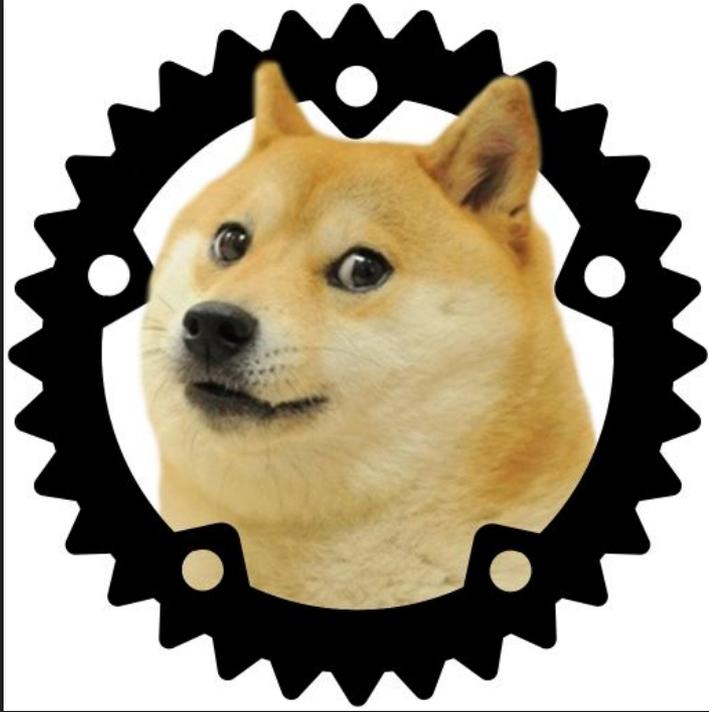
- Grab the [binary installers](#).
- [Build from source](#).

**Discuss:**

Visit the [official forums](#) for users and the



“There is no real-world web page that we don’t render at hundreds of frames per second.”



The Firefox you use  
today has Rust inside.

(on OS X and Linux, Windows in a few  
releases)

