

Should you rewrite in Rust?

talks.edunham.net/lca2018/rust

@qedunham

LinuxConf Australia

January 23, 2018

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- ▶ "Rewrite your code!"

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- ▶ "Rewrite your code!"
- ▶ "Don't rewrite your code!"

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I assume

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I assume

- ▶ You're working on some code.
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- ▶ People help the project in non-code ways.

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I assume

- ▶ You're working on some code.
- ▶ People help you with the code.
- ▶ People help the project in non-code ways.
- ▶ People use the code.

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► You

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- ▶ Users

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What's a rewrite?

Rewriting is starting anew on a problem that you already have code to address.

Refactoring is modifying code which tries to solve a problem.

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Sort rewrites by size



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- ▶ Learn a tool

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- ▶ Understand a task

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- ▶ Ship production code

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- ▶ Writing
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- ▶ Explaining

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Costs everyone's time:

- ▶ Researching
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- ▶ Debugging
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- ▶ Ensuring backwards compatibility

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- ▶ Tooling and automation

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- ▶ Fixing new bugs

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- ▶ Improve maintainability

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- ▶ Improve maintainability
- ▶ Increase contributor base

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<http://talks.edunham.net/1ca2018/should-you-rewrite-in-rust/>

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- ▶ How would I know if the problem was solved?

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- ▶ Ask people about the proposed solution!
- ▶ Research others' attempts here!
- ▶ Research other projects' attempts!
- ▶ Can you get buy-in? Why or why not?

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What are you saying?

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- ▶ “Your work would be easy to replace!”

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- ▶ “You should throw out your hard work!”
- ▶ “Your work would be easy to replace!”
- ▶ “You don’t understand your own engineering tradeoffs!”

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- ▶ Why write code a project doesn’t want?

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“I know Rust and I wonder if it could make Zopfli compression faster”

github.com/carols10cents/rust-out-your-c-talk

<http://talks.edunham.net/lca2018/should-you-rewrite-in-rust/>

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“I have some familiar problems and I’d like to practice Rust”
github.com/BartMassey/advent-of-code-2016

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- ▶ C-like performance
- ▶ Minimal runtime

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- ▶ Dynamic vs static linking

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- ▶ Cargo, crates.io

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- ▶ Clippy

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► `doc.rust-lang.org`

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- ▶ `http://community.rs/resources`

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- ▶ doc.rust-lang.org
- ▶ <http://community.rs/resources>
- ▶ 1:40pm Thursday, Rust Programming Techniques, Nick Cameron

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- ▶ Educate larger teams later

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▶ github.com/ceejbot/npm-first-rust-service

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- ▶ github.com/ceejbot/npm-first-rust-service
- ▶ <https://www.youtube.com/watch?v=GCsxYAxw3JQ>

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- ▶ github.com/ceejbot/npm-first-rust-service
- ▶ <https://www.youtube.com/watch?v=GCsxYAxw3JQ>
- ▶ Wrote proxy, replaced microservice with Rust version

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▶ <http://bholley.net/blog/2017/stylo.html>

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- ▶ <http://bholley.net/blog/2017/stylo.html>
- ▶ <https://blog.rust-lang.org/2017/11/14/Fearless-Concurrency-In-Firefox-Quantum.html>

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- ▶ <http://bholley.net/blog/2017/stylo.html>
- ▶ <https://blog.rust-lang.org/2017/11/14/Fearless-Concurrency-In-Firefox-Quantum.html>
- ▶ hacks.mozilla.org/2017/08/inside-a-super-fast-css-engine-quantum-css-aka-stylo/

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- ▶ <http://bholley.net/blog/2017/stylo.html>
- ▶ <https://blog.rust-lang.org/2017/11/14/Fearless-Concurrency-In-Firefox-Quantum.html>
- ▶ hacks.mozilla.org/2017/08/inside-a-super-fast-css-engine-quantum-css-aka-stylo/
- ▶ “Rebuilding a jet engine in flight”

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- ▶ <https://www.rust-lang.org/en-US/friends.html>

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- ▶ <https://www.rust-lang.org/en-US/friends.html>
- ▶ Dropbox, Habitat, Coursera, etc

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- ▶ <https://www.rust-lang.org/en-US/friends.html>
- ▶ Dropbox, Habitat, Coursera, etc
- ▶ Rewriting requires backwards compatibility.

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<http://talks.edunham.net/1ca2018/should-you-rewrite-in-rust/>

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- ▶ Foreign Function Interface

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- ▶ Foreign Function Interface
- ▶ Call guest language from host language

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- ▶ Foreign Function Interface
- ▶ Call guest language from host language
- ▶ github.com/alexcrichton/rust-ffi-examples

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- ▶ `github.com/alexcrichton/rust-ffi-examples`
- ▶ `https://doc.rust-lang.org/book/first-edition/ffi.html`

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- ▶ Call guest language from host language
- ▶ `github.com/alexcrichton/rust-ffi-examples`
- ▶ `https://doc.rust-lang.org/book/first-edition/ffi.html`
- ▶ `cargo.toml`, `main.rs`, `main.pl`, `Makefile`

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cargo.toml

```
[package]
name = "perl-to-rust"
version = "0.1.0"
#modified based on python version
authors = ["Hao Wu <echowuhao@gmail.com>"]

[lib]
name = "double_input"
crate-type = ["dylib"]
```

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```
#[no_mangle]
pub extern fn double_input(input: i32) -> i32 {
    input * 2
}
```

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main.pl

```
use v5.10;
use FFI::Raw;

my $double_input = FFI::Raw->new(
    "target/debug/libdouble_input.so",
    'double_input',
    FFI::Raw::int,      # return value
    FFI::Raw::int      # arg #1
);

my $input  = 4;
my $output = $double_input->call($input);
say $input . " * 2 = " . $output;
```

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Makefile

```
ifeq ($(shell uname), Darwin)
    EXT := dylib
else
    EXT := so
endif

all: target/debug/libdouble_input.$(EXT)
    perl src/main.pl

target/debug/libdouble_input.$(EXT): src/lib.rs Cargo.toml
    cargo build

clean:
    rm -rf target
```

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- ▶ `doc.rust-lang.org/reference/linkage.html`

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- ▶ doc.rust-lang.org/reference/linkage.html
- ▶ <https://doc.rust-lang.org/1.12.1/book/advanced-linking.html#static-linking>

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- ▶ doc.rust-lang.org/reference/linkage.html
- ▶ <https://doc.rust-lang.org/1.12.1/book/advanced-linking.html#static-linking>
- ▶ `staticlib` crate type

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- ▶ doc.rust-lang.org/reference/linkage.html
- ▶ <https://doc.rust-lang.org/1.12.1/book/advanced-linking.html#static-linking>
- ▶ staticlib crate type
- ▶

```
$ rustc --target=x86_64-unknown-linux-musl foo.rs
```

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- ▶ doc.rust-lang.org/reference/linkage.html
- ▶ <https://doc.rust-lang.org/1.12.1/book/advanced-linking.html#static-linking>
- ▶ staticlib crate type
- ▶

```
$ rustc --target=x86_64-unknown-linux-musl foo.rs
```
- ▶ Recompile dependencies with musl

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- ▶ `usehelix.com`, Ruby

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- ▶ usehelix.com, Ruby
- ▶ github.com/neon-bindings/neon, Node.js

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- ▶ usehelix.com, Ruby
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- ▶ github.com/rust-lang-nursery/rust-bindgen, C

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