Rust and Fedora

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Who am I?

- Professional technologist
- Contributor and package maintainer in the Fedora Project
- Contributor and package maintainer in Mageia Linux
- Contributor to RPM, DNF, and various related projects
- Diligent follower of the telecommunications industry
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Overview of Rust

What is Rust?

According to the Rust website:

- *Rust is a systems programming language that runs blazingly fast, prevents segfaults, and guarantees thread safety.*

Rust, as a language, is designed to help make writing memory and concurrency-safe software easier than conventional compiled programming languages.

Some interesting features of Rust...

- zero-cost abstractions
  - Through traits, there's no overhead in having templates for interfaces
- move semantics
  - Data is moved instead of copied whenever possible
- guaranteed memory safety
  - Rust's ownership and borrowing model for data/memory implicitly enables this
- threads without data races
  - This is also enabled through Rust's ownership and borrowing model for data
- minimal runtime
- efficient C bindings
- And more...

Who is using Rust?

Rust is quite new. It was created in 2010 by Mozilla to be a systems language that explicitly prevented the source of many kinds of bugs in Mozilla Firefox: memory leaks, memory access violations, etc. As it turns out, memory management is hard in programming. As the language has finally started coming onto its own in the last couple of years, it has seen some interesting usage:

- Mozilla is writing the successor to Gecko engine in Rust, called Servo. Also, the MP4 container parser has been written in Rust in Firefox since Firefox 48.
- GNOME's librsvg now has Rust components in its code
- Chef's delivery-cli is completely written in Rust

So how does Rust relate to Fedora?

Rust for Fedora

One of the chief focuses of Fedora is to provide an excellent platform for developing any kind of software. Fedora already provides high quality development stacks for:

- Python
- Ruby
- Go
- C#
- PHP
- Java
- Node.js
- Haskell
- Windows C/C++
- And others...

Rust as a language provides interesting features that aren't available anywhere else!

Rust for Fedora (cont'd)

Key applications like Firefox are increasingly adopting Rust components. Various members of the GNOME and GStreamer communities are also looking to use Rust to improve the performance and reliability of libraries, frameworks, and applications.

Rust is also increasingly viewed as a viable language to write safer system tools, due to its excellent C/C++ FFI (foreign function interface).

Using Rust code on Fedora

The Rust compiler is available in Fedora, as well as Cargo (the Rust ecosystem dependency manager). Getting both is a matter of “sudo dnf install rust cargo”.

Rust application/library packages are offered as “crates”, which can be installed through Cargo. For example, if you want to install “ripgrep” (an enhanced grep written entirely in Rust), you can install it by running “cargo install ripgrep”.

Rust code will build and run on all of Fedora’s supported architectures: 32-bit and 64-bit x86, POWER, System z, and 32-bit and 64-bit ARM.

Fedora Rust SIG

Fedora has “Special Interest Groups” that take care of specific aspects of the distribution. Fedora has SIGs for KDE software, Ruby, PHP, and .NET, among many other things.

Fedora has a new SIG for developing Rust support in the Fedora ecosystem. The goal of the Rust SIG is to develop and maintain Rust support in the distribution. This includes maintaining Rust compiler and the Cargo developer dependency manager tool, as well as developing specifications and tooling for packaging application and library crates in Fedora.

If you're interested in Rust and Fedora, check out the Rust SIG!

Some cool programs written in Rust...

- Servo: https://servo.org/
- ripgrep: https://github.com/BurntSushi/ripgrep
- alacritty: https://github.com/jwilm/alacritty
- limonite: https://github.com/qmx/limonite

Some more: https://github.com/kud1ing/awesome-rust#applications-written-in-rust

Extra Resources

- Rust: https://www.rust-lang.org/
- Rust Programming Language Blog: https://blog.rust-lang.org/
- *Rust by Example*: http://rustbyexample.com/
- *Rust meets Fedora*, Fedora Magazine: https://fedoramagazine.org/rust-meets-fedora/
- Rust -- Fedora Developer Portal: https://developer.fedoraproject.org/tech/languages/rust/rust-installation.html
- Rust SIG - Fedora Project: https://fedoraproject.org/wiki/SIGs/Rust

The End

Any Questions?