R-Evolution

A Story of Rust Adoption

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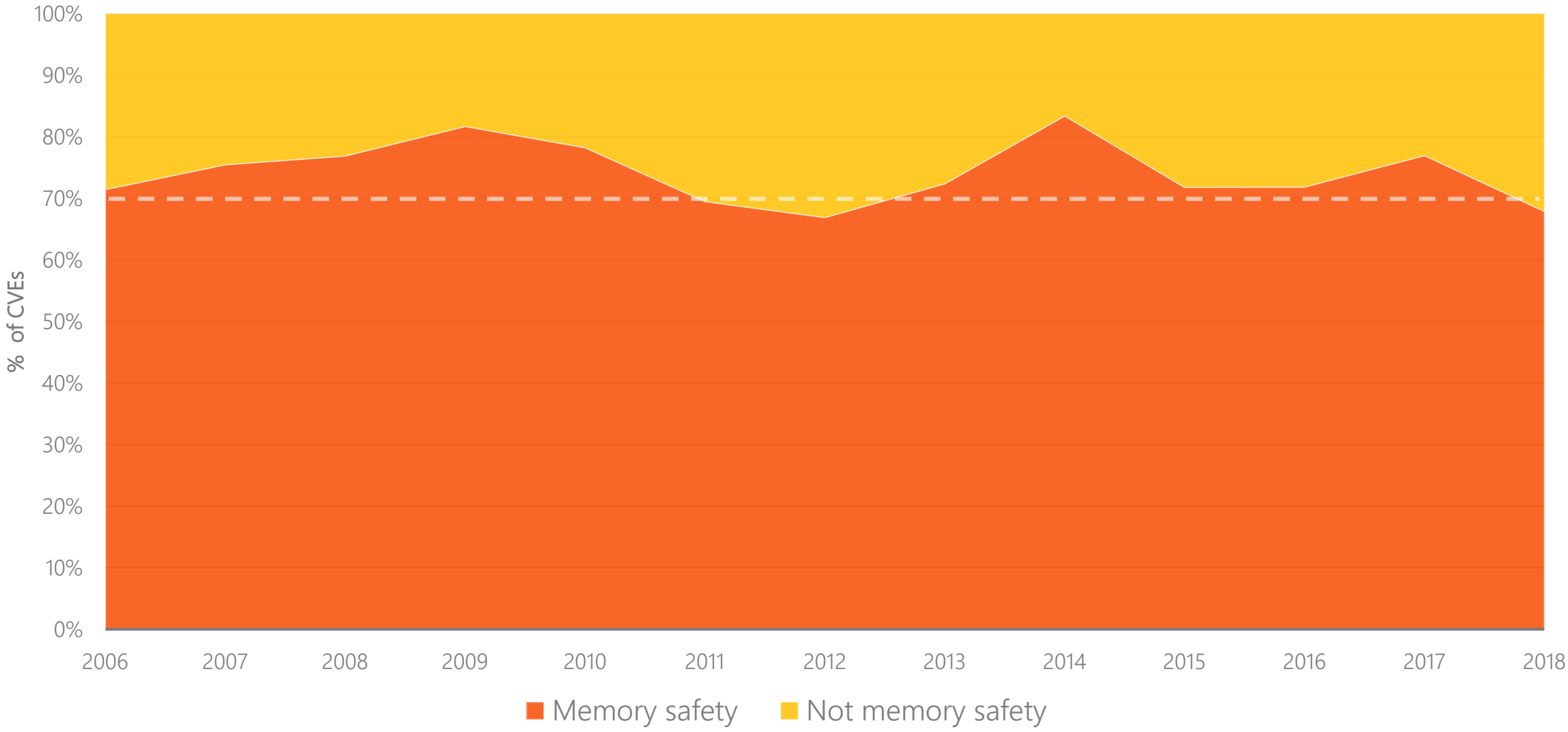
The Problem

At the core of this **problem**...

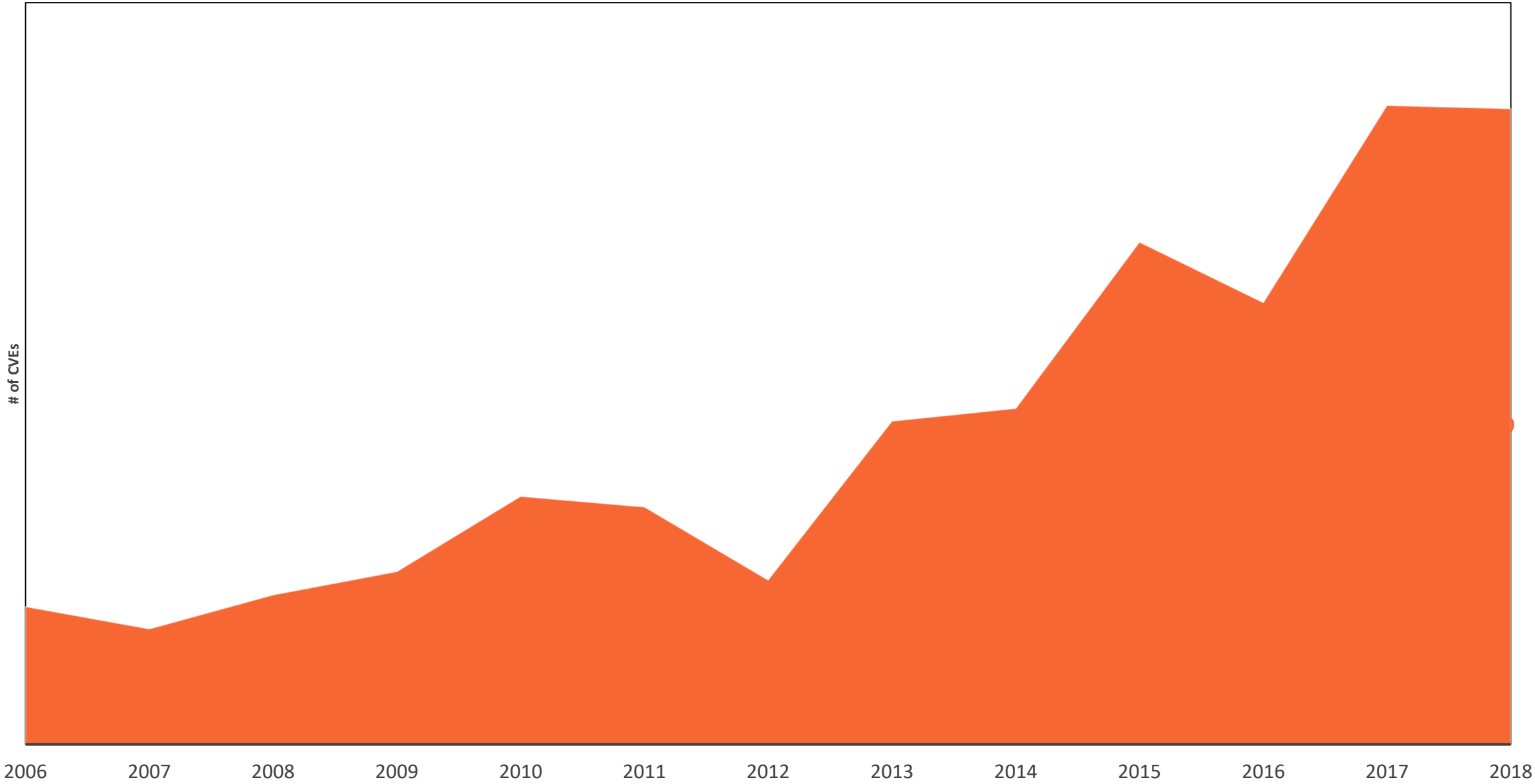

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% of CVEs
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Memory safety
Not memory safety

How much does this cost?

$150,000

How many issues
per year?

468!


# of CVEs
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

Can the cost be
even higher?

1:22 PM
9/14/2018

$4,000,000,000

How do we fix this?

We need better programmers.

We need
better analysis tools.

We need to make these issues impossible.

Runtime **Checks**

Garbage Collection

Rust

C/C++

- Code base

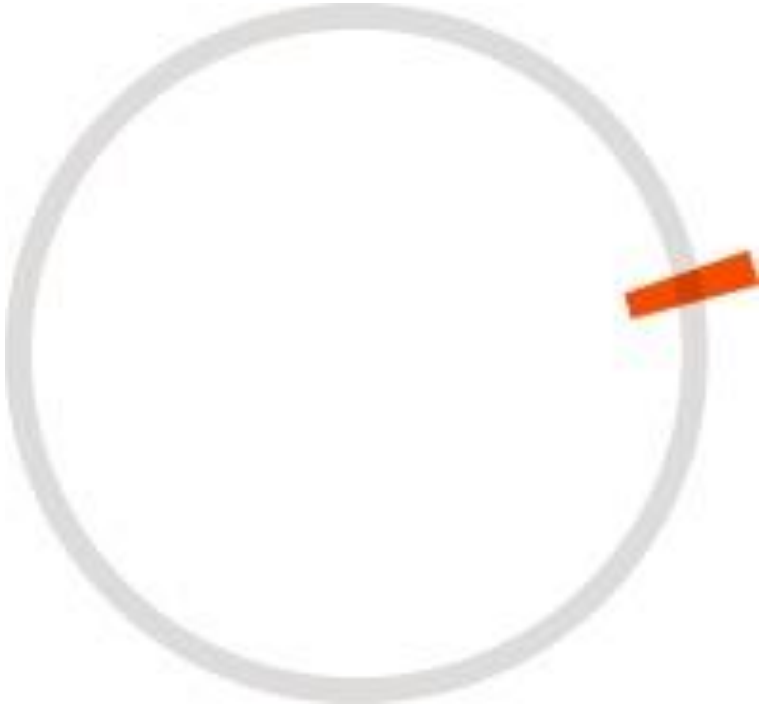
C/C++

○ Code base ○ Audit %

Rust

- Code base

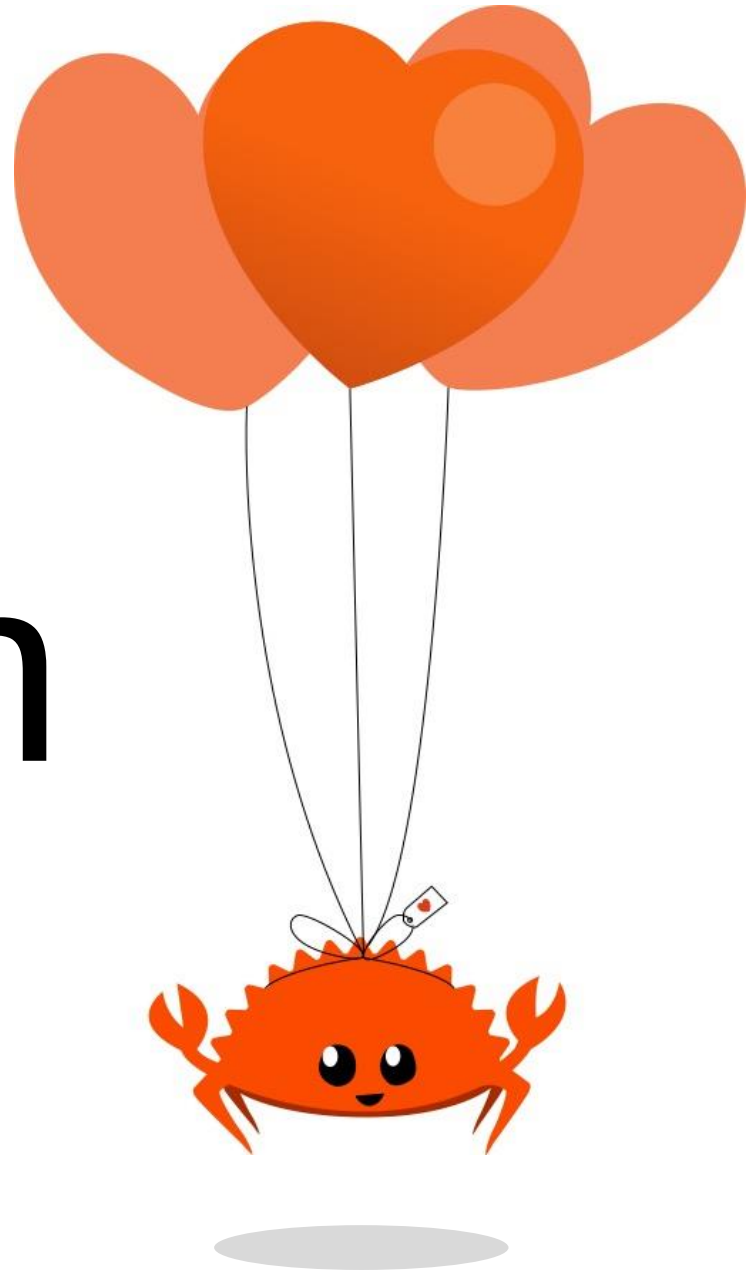
Rust



Code base Audit %

Of course, we're preaching to the choir

Adoption



How do languages get adopted?

Costs

Benefits

This is what makes
Rust more adoptable

Costs

Benefit

The issue:

For security critical software,
C++ is no longer acceptable.

The bet:
Rust allows us to write performant security critical components safely

Not rewriting the world

Ok, now what?

The challenge:
Integrate with the world

Tooling

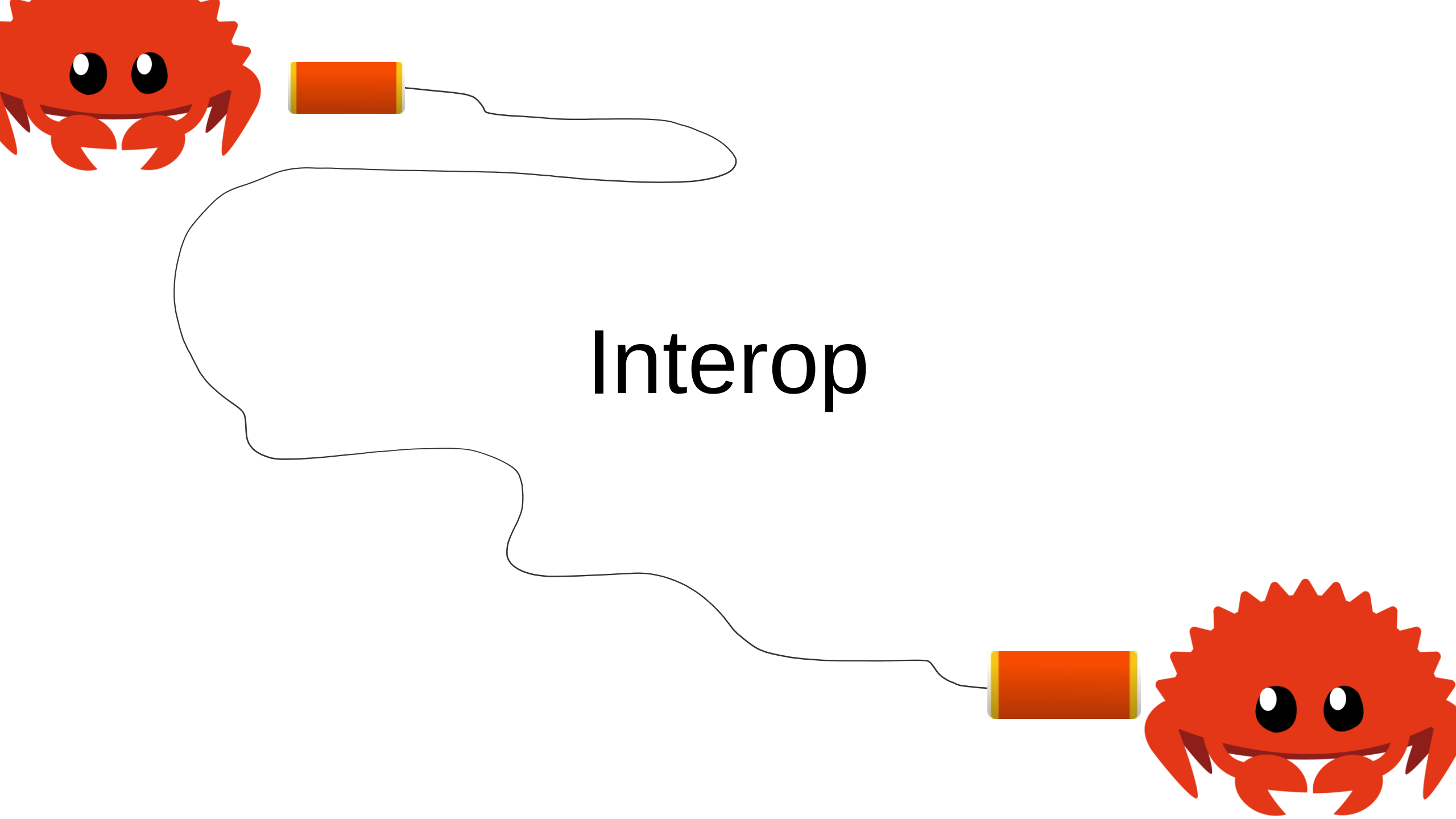
Tooling

- **Existing** tooling
- Assumptions around **MSVC**

Build systems

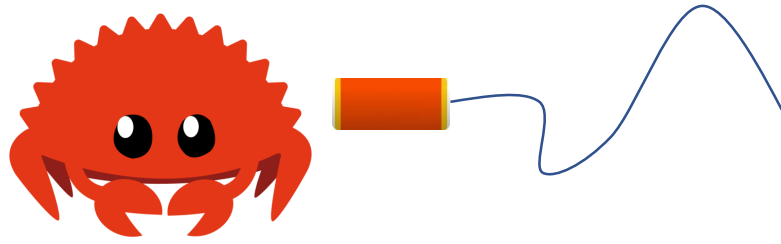
Build systems

- **Cargo** playing along
- **Existing** build systems


Interop

Interop

- Existing **C/C++** Code
- **Bindgen**
- COM, WinRT and Win32



Weird

Weird

- **Trusted** toolchain
- Binary security **policies**
- **Compliance**

Humans

Humans

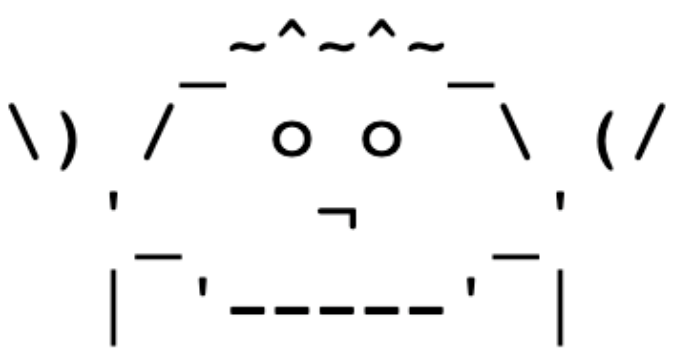
- **Convincing** others
- **Training** others

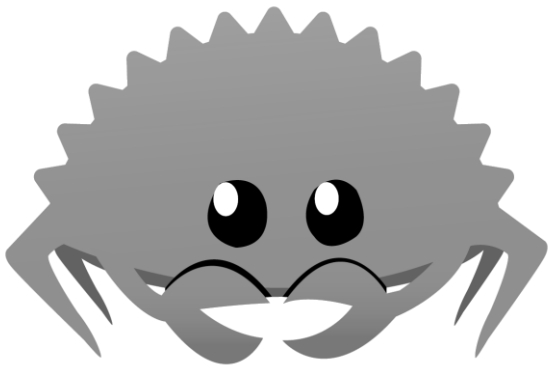
Governance

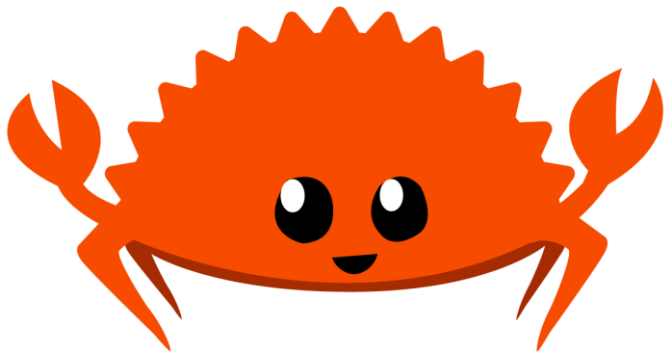
Governance

- **Ensuring** community ownership
- Establishing community **principles**

Language Changes



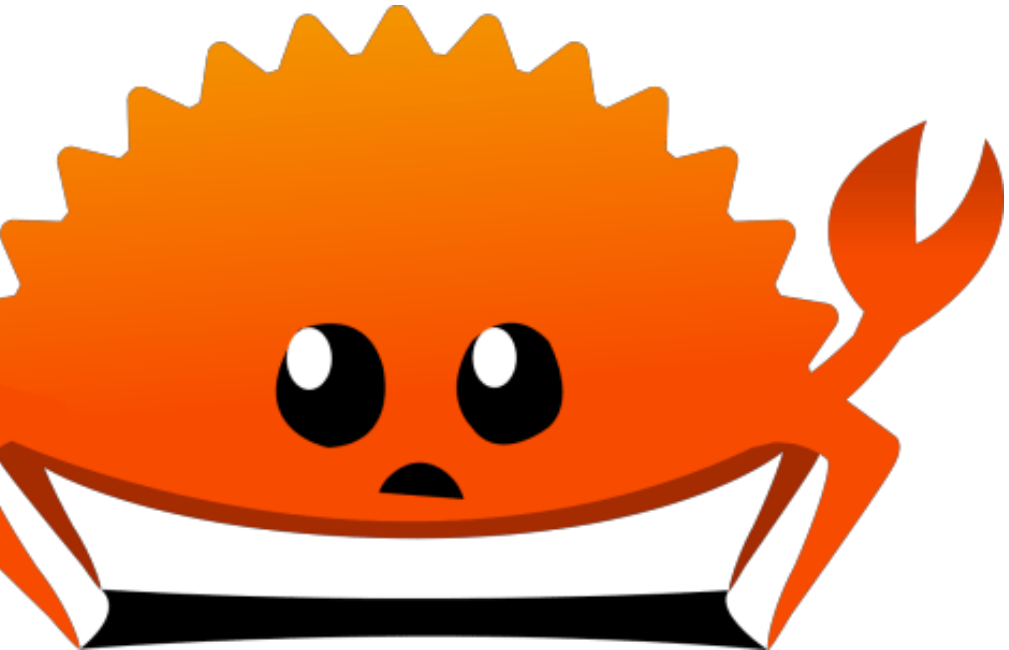




Language Changes

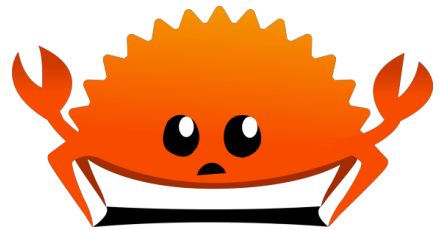
- Changes benefiting **majority**
- **Community** driven design

Reluctant Rustaceans

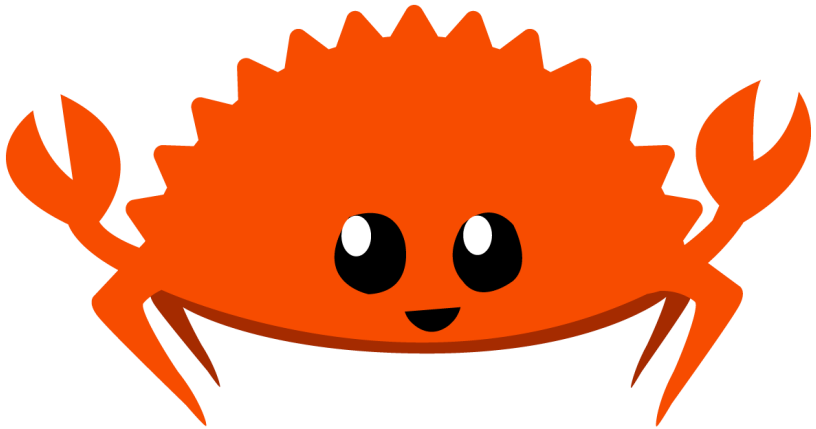


Reluctant Rustaceans

- Welcoming those who **have to write Rust**
- Maintaining community **spirit**



The Conclusion



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