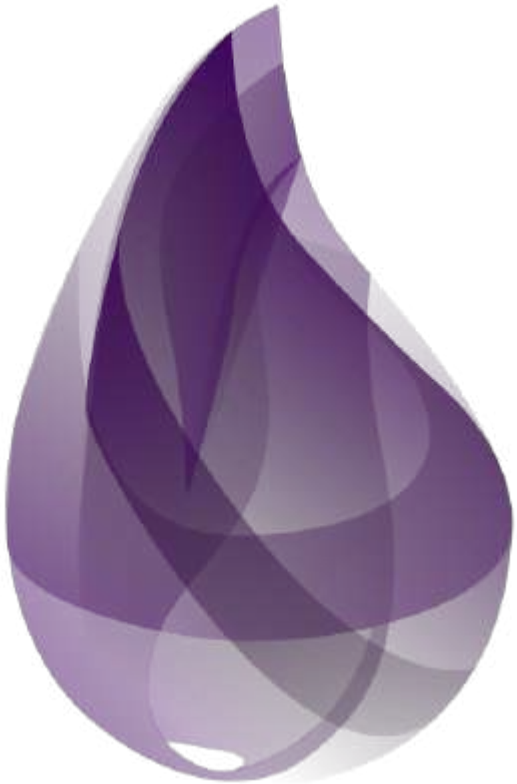
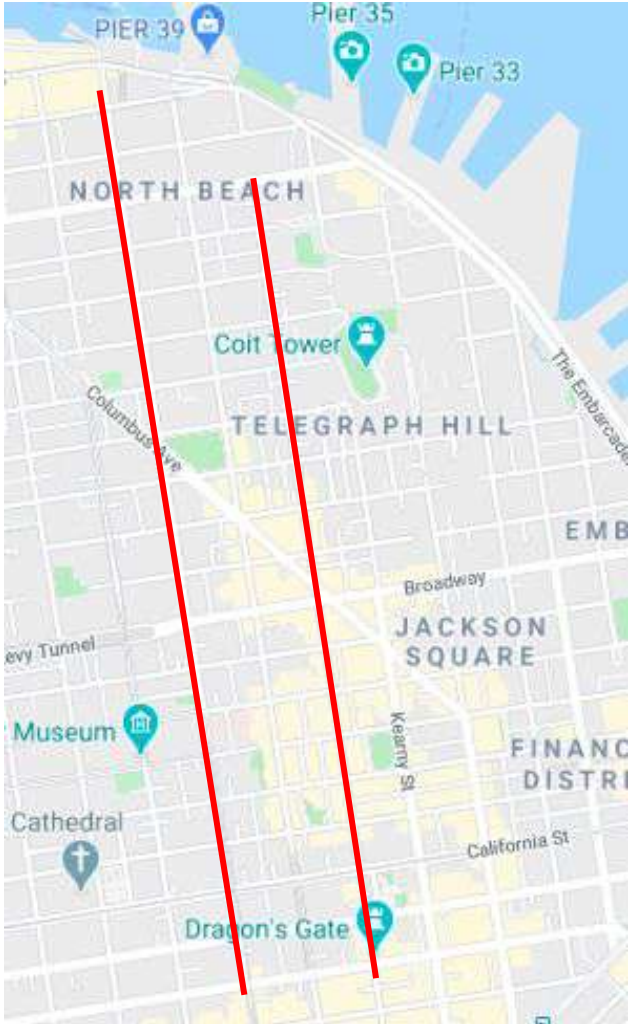


#CodeBEAMSF

Grant Powell

#CodeBEAMSF

#CodeBEAMSF

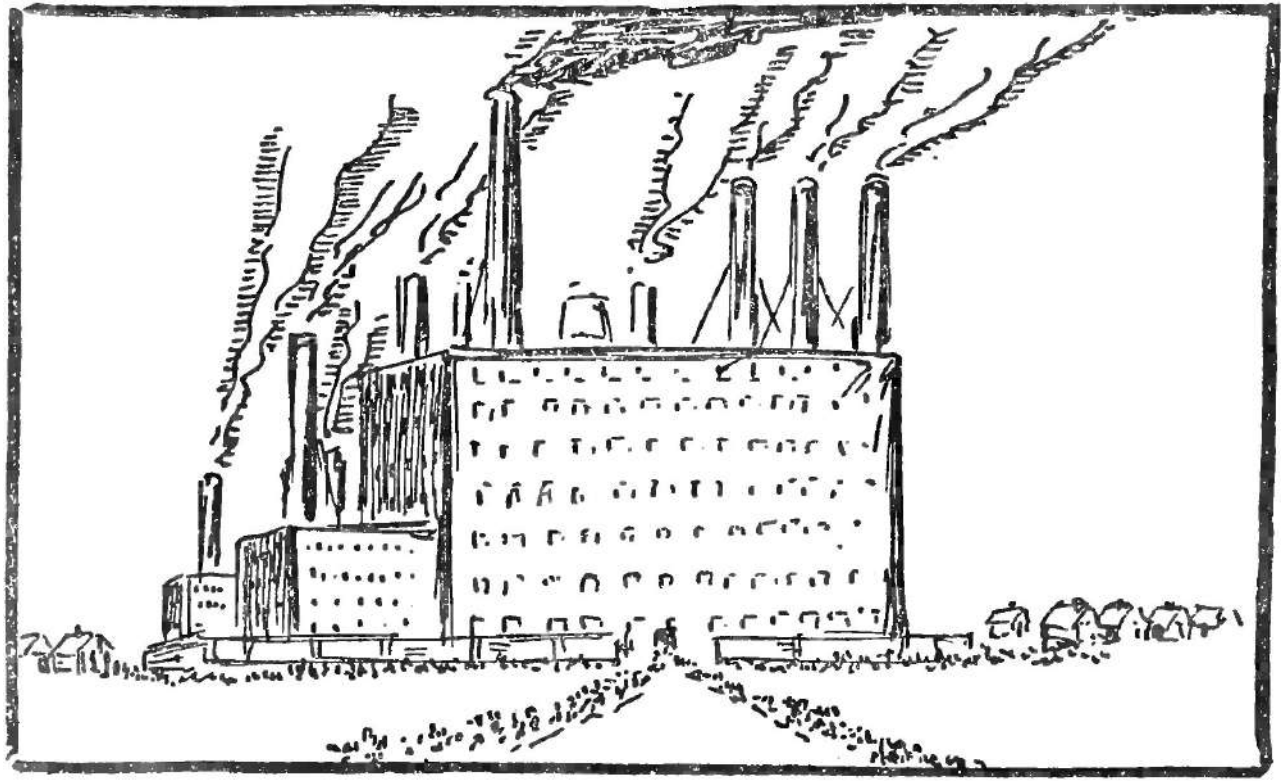

PIER 39
Pier 35
Pier 33
NORTH BEACH
Coit Tower
TELEGRAPH HILL
Columbus Ave
Broadway
JACKSON SQUARE
Museum
Kearny St
Cathedral
California St
Dragon's Gate

#CodeBEAMSF

Thanks for coming to my talk

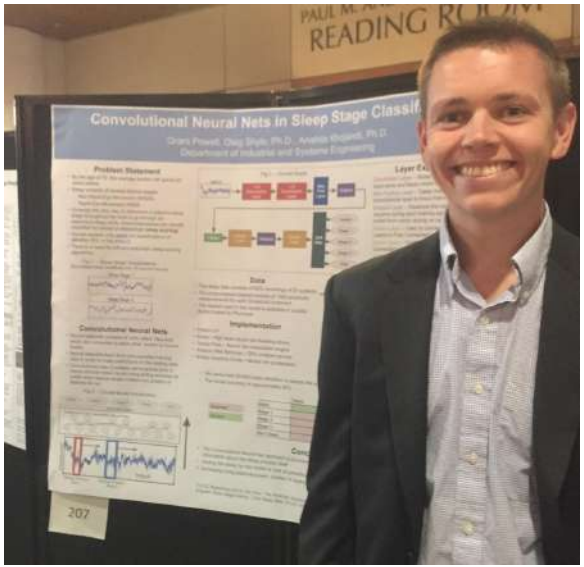
#CodeBEAMSF

Why software development is exciting for me



Hendrik Willem Van Loon / Public domain

#CodeBEAMSF


READING ROOM
Convolutional Neural Nets in Sleep Stage Classif
207

#CodeBEAMSF

One faithful day...

That was the first moment

Getting into web development

django

#CodeBEAMSF

I love building things for people

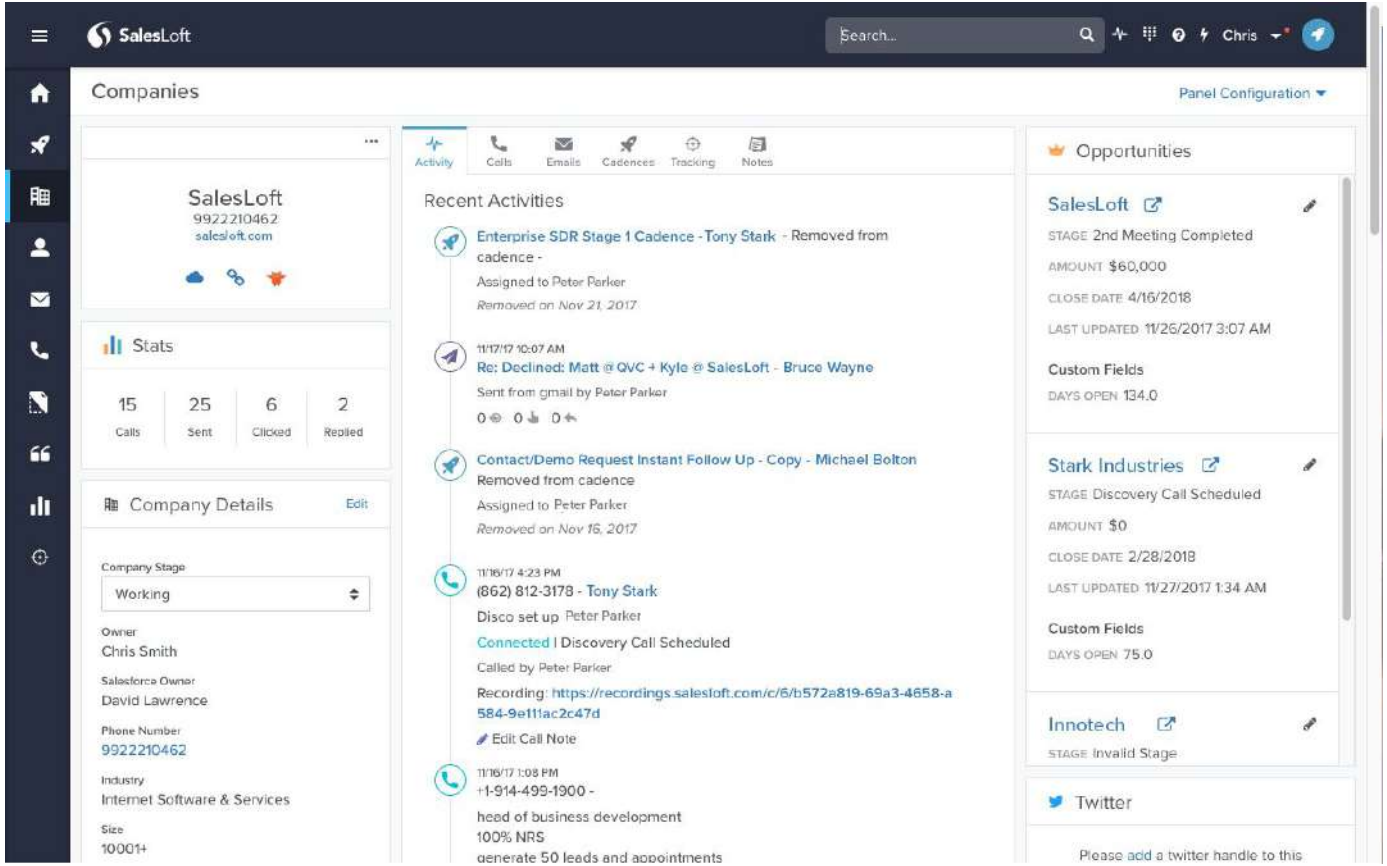
About Y'all

I've given this talk before...

Had my next big stroke of luck

SalesLoft

#CodeBEAMSF


SalesLoft
Search...
Chris
Companies
Panel Configuration
SalesLoft
9922210462
salesloft.com
Stats
15
Calls
25
Sent
6
Clicked
2
Replied
Company Details
Edit
Company Stage
Working
Owner
Chris Smith
Salesforce Owner
David Lawrence
Phone Number
9922210462
Industry
Internet Software & Services
Size
10001+
Activity
Calls
Emails
Cadences
Tracking
Notes
Recent Activities
Enterprise SDR Stage 1 Cadence - Tony Stark - Removed from cadence -
Assigned to Peter Parker
Removed on Nov 21, 2017
11/17/17 10:07 AM
Re: Declined: Matt @ QVC + Kyle @ SalesLoft - Bruce Wayne
Sent from gmail by Peter Parker
Contact/Demo Request Instant Follow Up - Copy - Michael Bolton
Removed from cadence
Assigned to Peter Parker
Removed on Nov 16, 2017
11/16/17 4:23 PM
(862) 812-3178 - Tony Stark
Disco set up Peter Parker
Connected | Discovery Call Scheduled
Called by Peter Parker
Recording: https://recordings.salesloft.com/c/6/b572a819-69a3-4658-a584-9e111ac2c47d
Edit Call Note
11/16/17 1:08 PM
+1-914-499-1900 -
head of business development
100% NRS
generate 50 leads and appointments
Opportunities
SalesLoft
STAGE 2nd Meeting Completed
AMOUNT $60,000
CLOSE DATE 4/16/2018
LAST UPDATED 11/26/2017 3:07 AM
Custom Fields
DAYS OPEN 134.0
Stark Industries
STAGE Discovery Call Scheduled
AMOUNT $0
CLOSE DATE 2/28/2018
LAST UPDATED 11/27/2017 1:34 AM
Custom Fields
DAYS OPEN 75.0
Innotech
STAGE Invalid Stage
Twitter
Please add a twitter handle to this

#CodeBEAMSF

#CodeBEAMSF

#CodeBEAMSF

Getting in the Rails Mindset

#CodeBEAMSF

Things we love about rails

Excellent Tooling

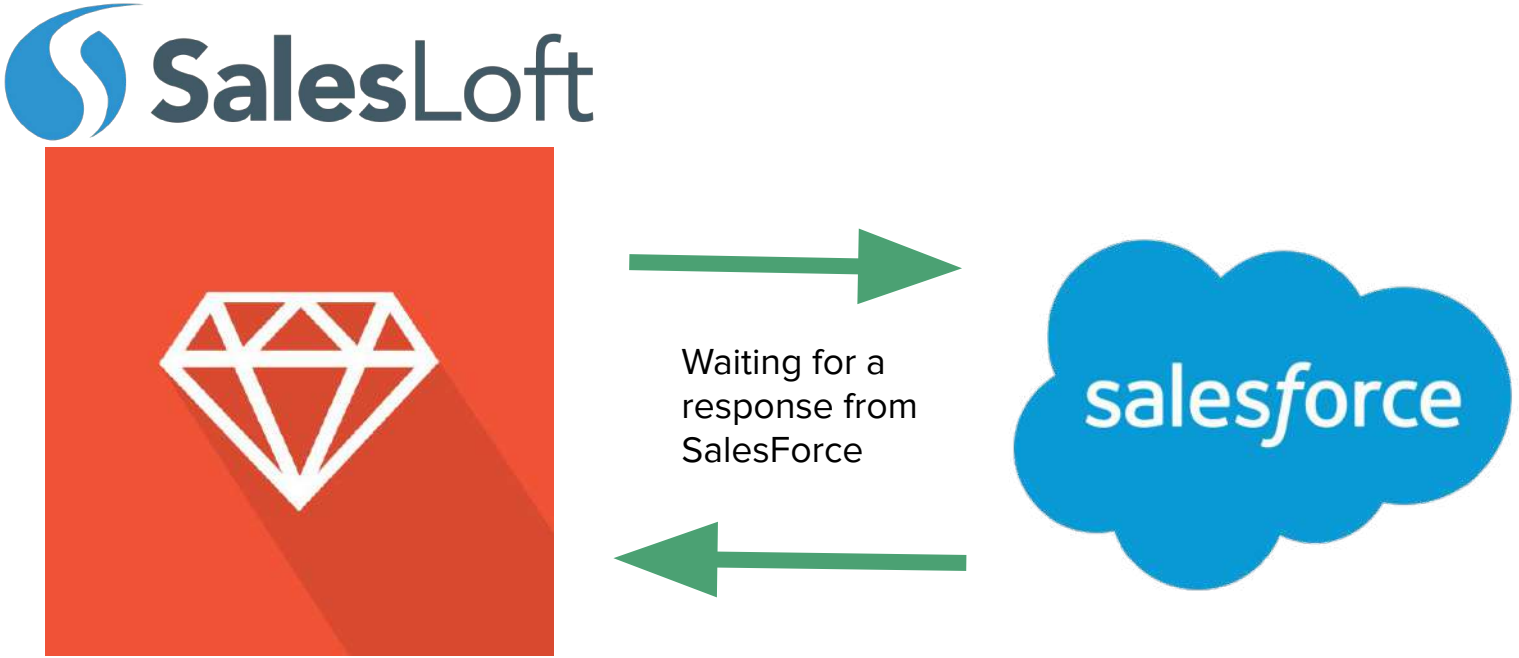
Mature Sass Community

Developer Productivity

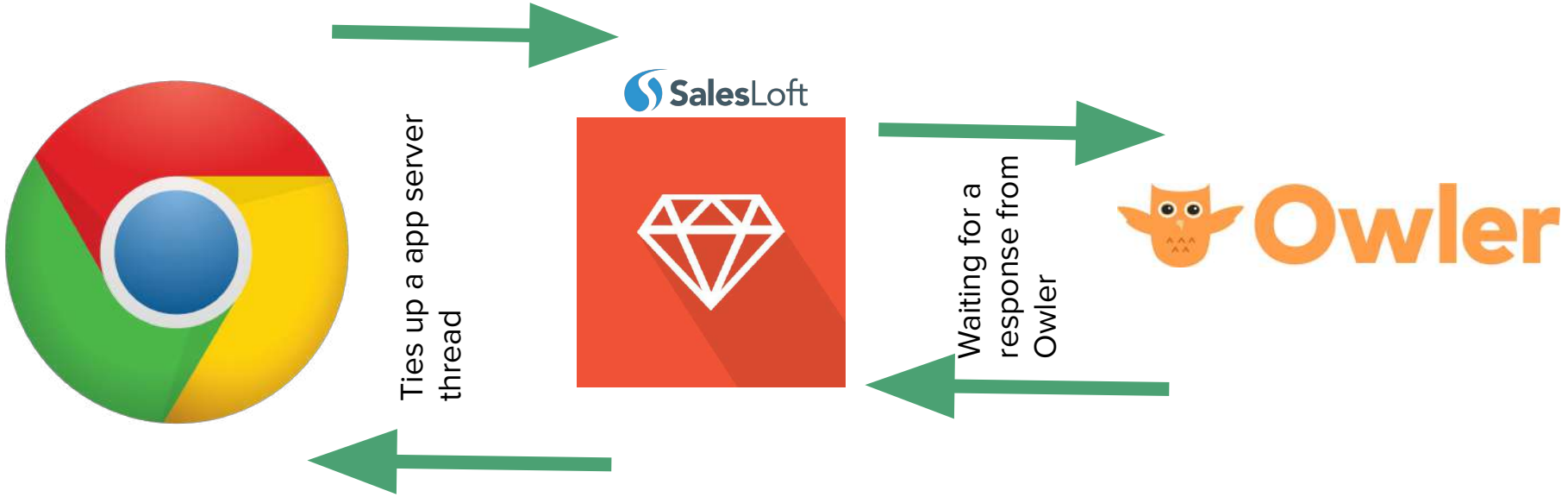
Starting to Feel the Rails pain.

- Much of our workload is IO Wait
  - Calling out to 3rd party resources
  - Talking to the Database
  - Talking between microservices
- Only option for async work are ruby background workers, which don't map nicely to every problem domain

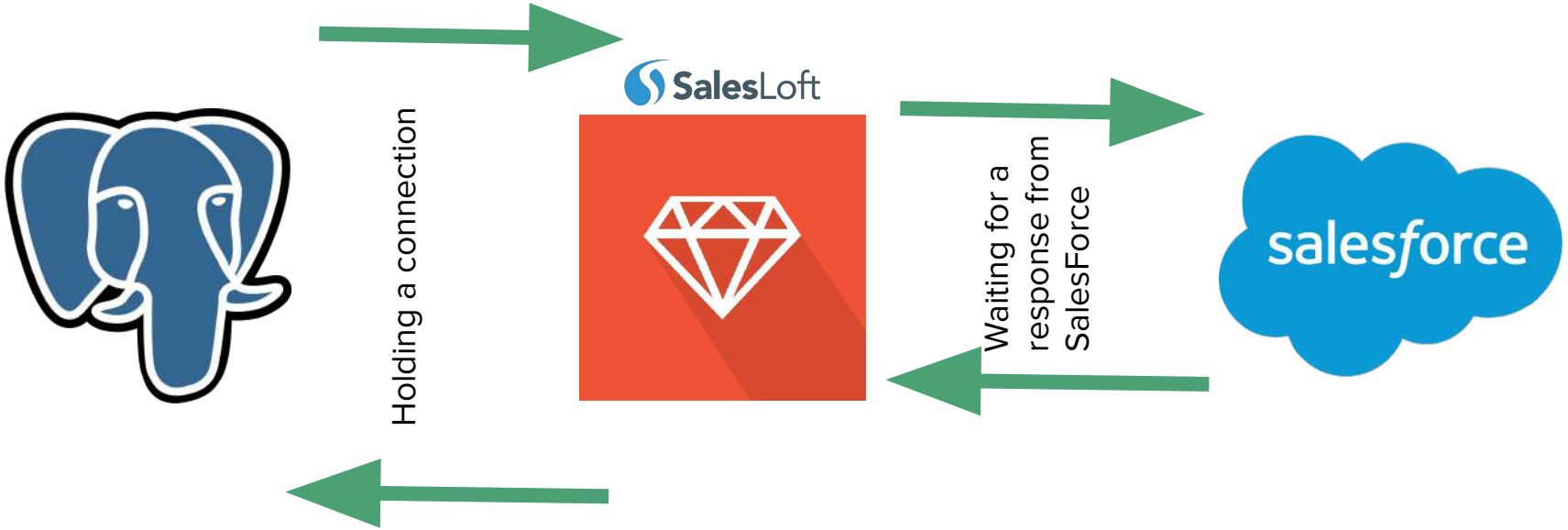
IO Wait


SalesLoft
Waiting for a response from SalesForce
salesforce

#CodeBEAMSF


SalesLoft
Owler
Ties up a app server thread
Waiting for a response from Owler

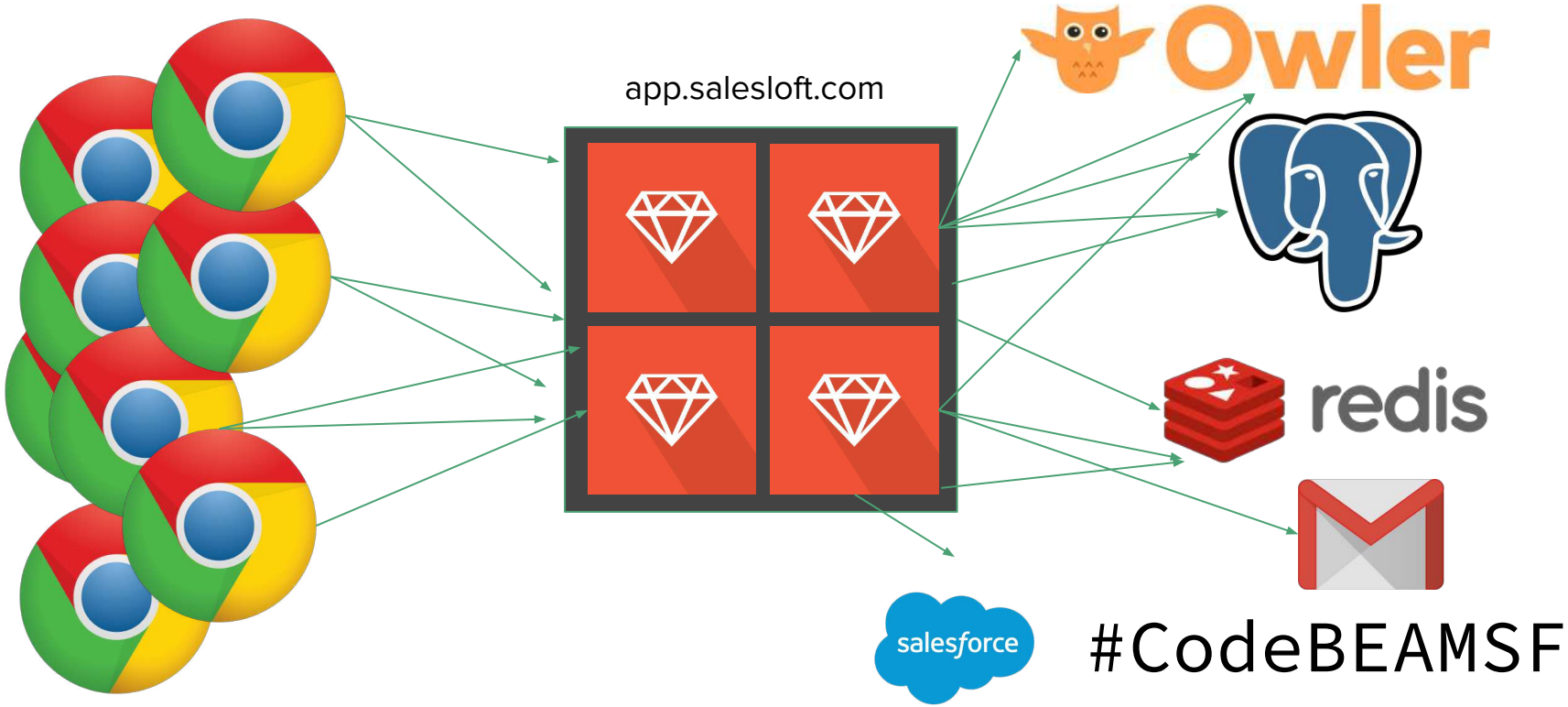
Sharing is Caring



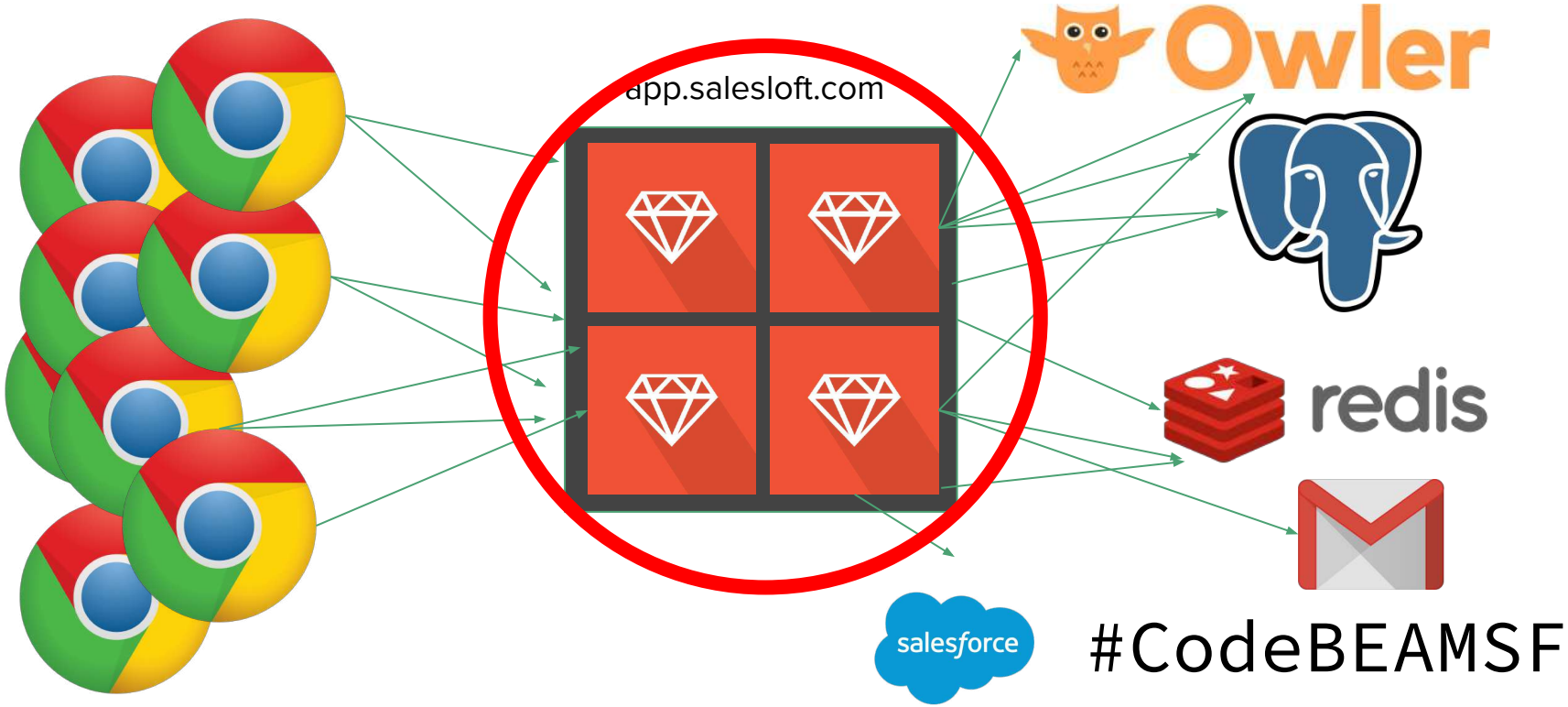
PGBouncer

#CodeBEAMSF

Web Servers are a Concurrency Problem



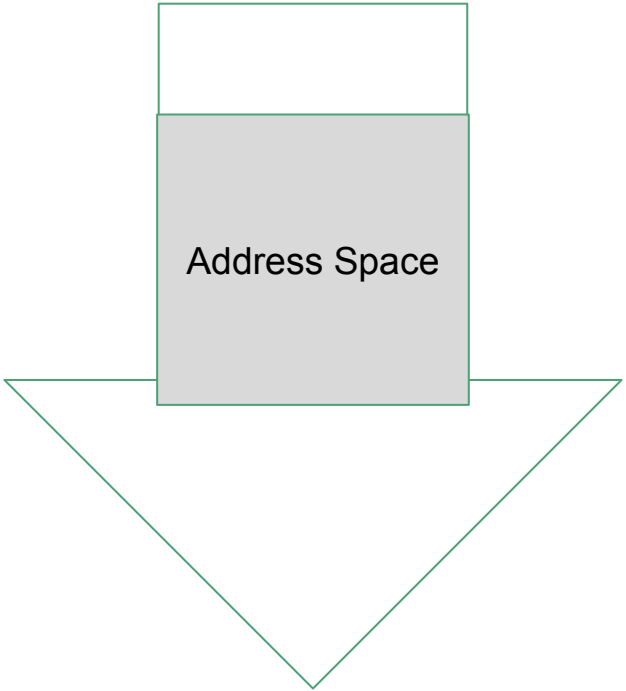
Web Servers are a Concurrency Problem



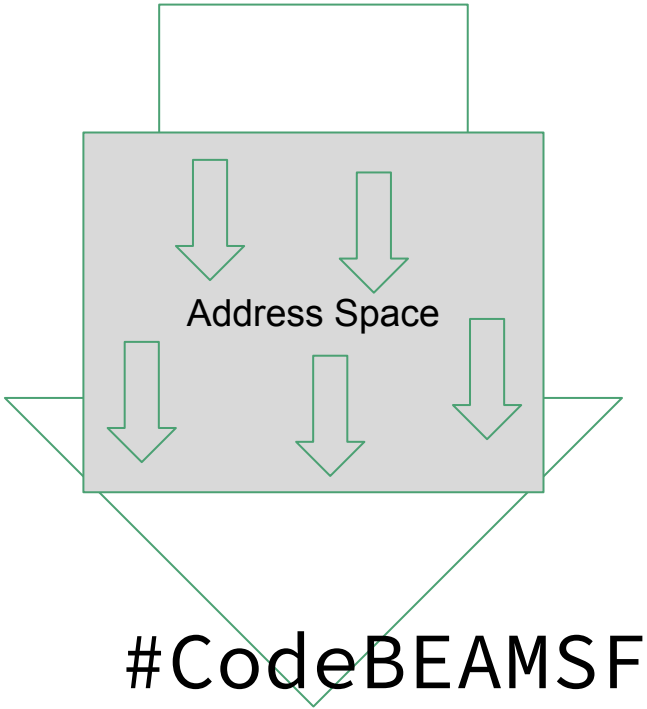
Terms

Understanding OS processes and OS Threads

A process contains one address space



A process can contain one to many threads

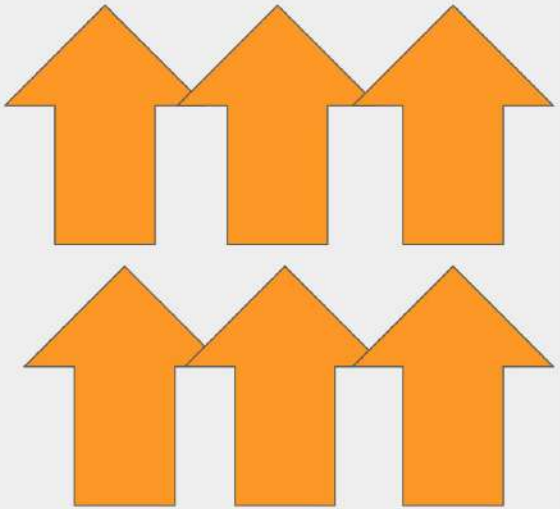


Rails App Servers

#CodeBEAMSF

Unicorn

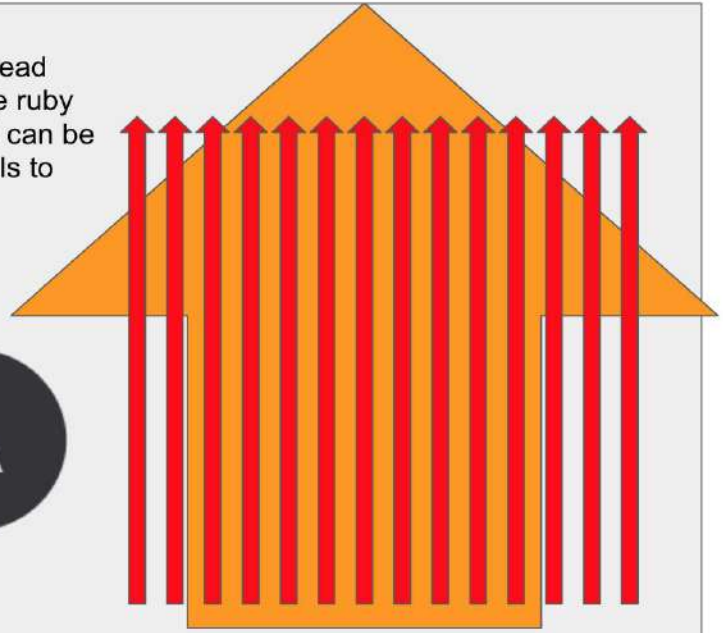
6 Big Process, each of which can only handle one request at a time. If a request needs to make a http call or talk to the db, the whole process must wait



#CodeBEAMSF

Puma

One big process, up to 16 threads. Each thread can represents a request.It can only execute ruby code in one thread at once, but each thread can be waiting on things like http requests or db calls to finish without blocking the process.

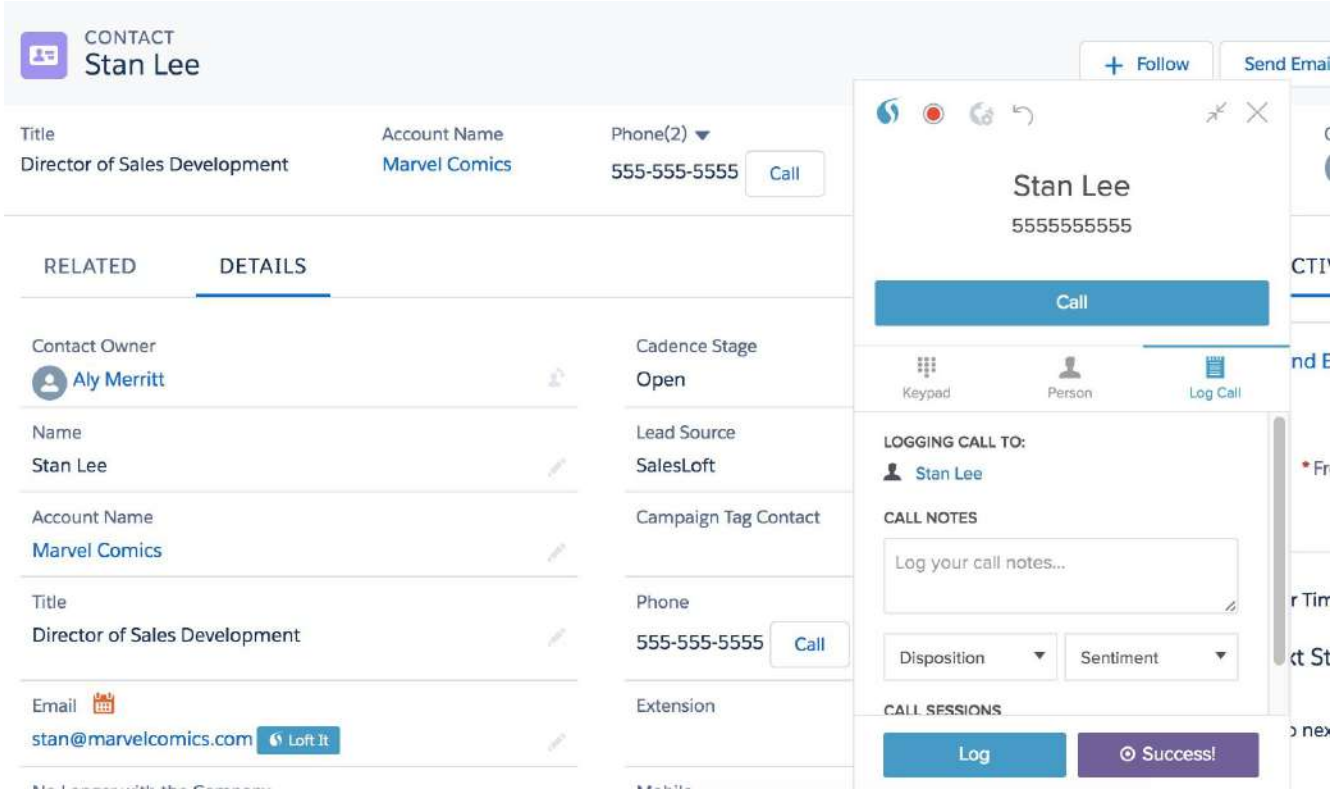


Bringing Elixir into a Rails Mindset

#CodeBEAMSF

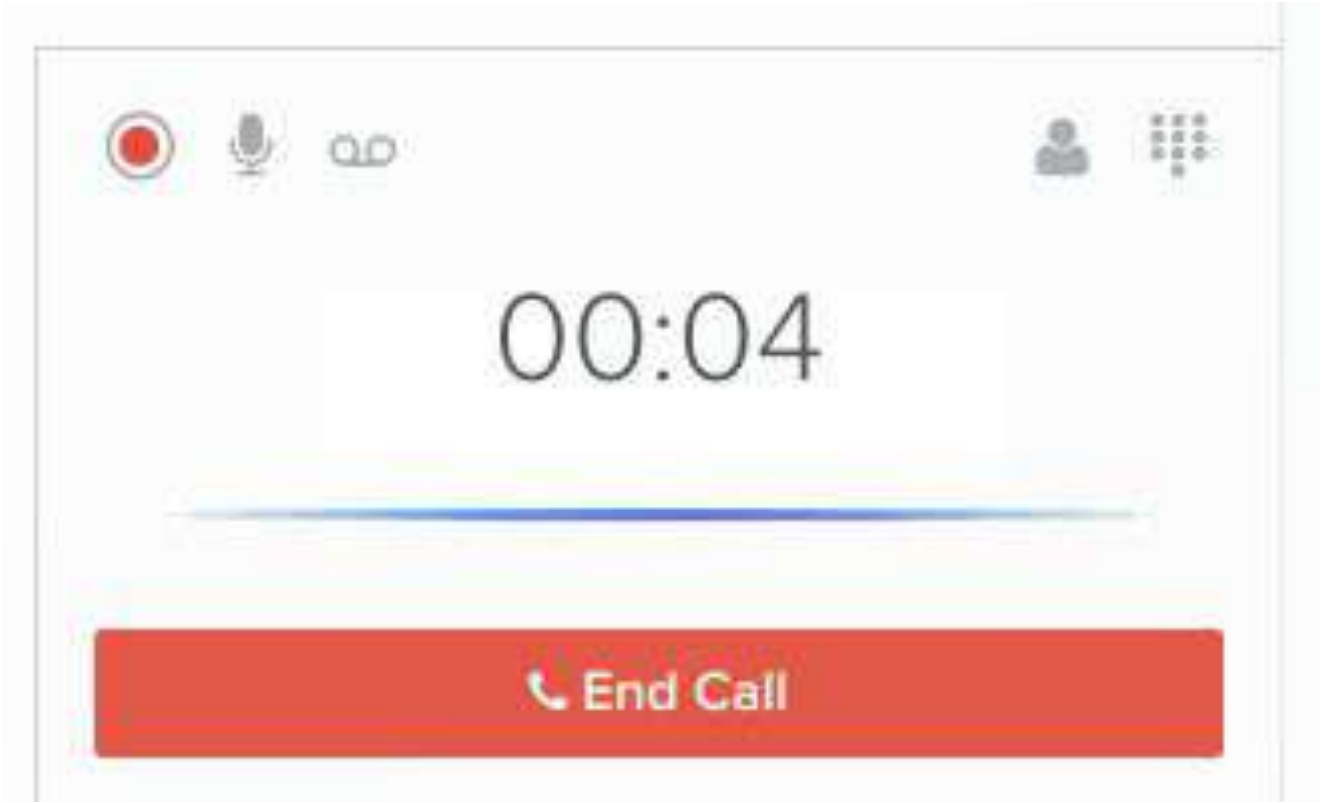
We got dragged kicking and screaming into Elixir

#CodeBEAMSF

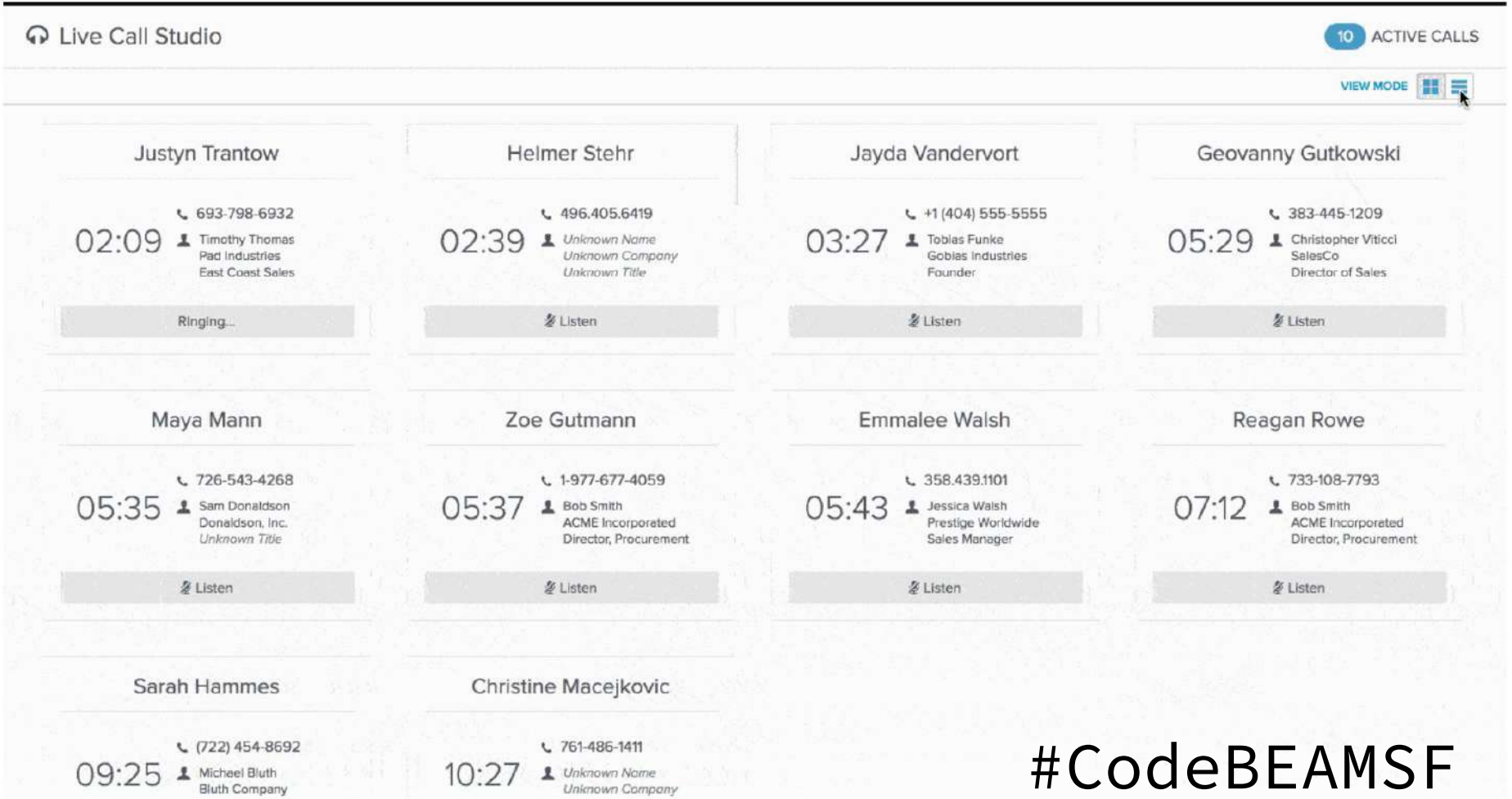

CONTACT
Stan Lee
+ Follow
Send Emai
Title
Director of Sales Development
Account Name
Marvel Comics
Phone(2)
555-555-5555
Call
RELATED
DETAILS
Contact Owner
Aly Merritt
Name
Stan Lee
Account Name
Marvel Comics
Title
Director of Sales Development
Email
stan@marvelcomics.com
Loft It
Cadence Stage
Open
Lead Source
SalesLoft
Campaign Tag Contact
Phone
555-555-5555
Call
Extension
Stan Lee
5555555555
Call
Keypad
Person
Log Call
LOGGING CALL TO:
Stan Lee
CALL NOTES
Log your call notes...
Disposition
Sentiment
CALL SESSIONS
Log
Success!

#CodeBEAMSF

Sales Teams need a Sales Calling Solution

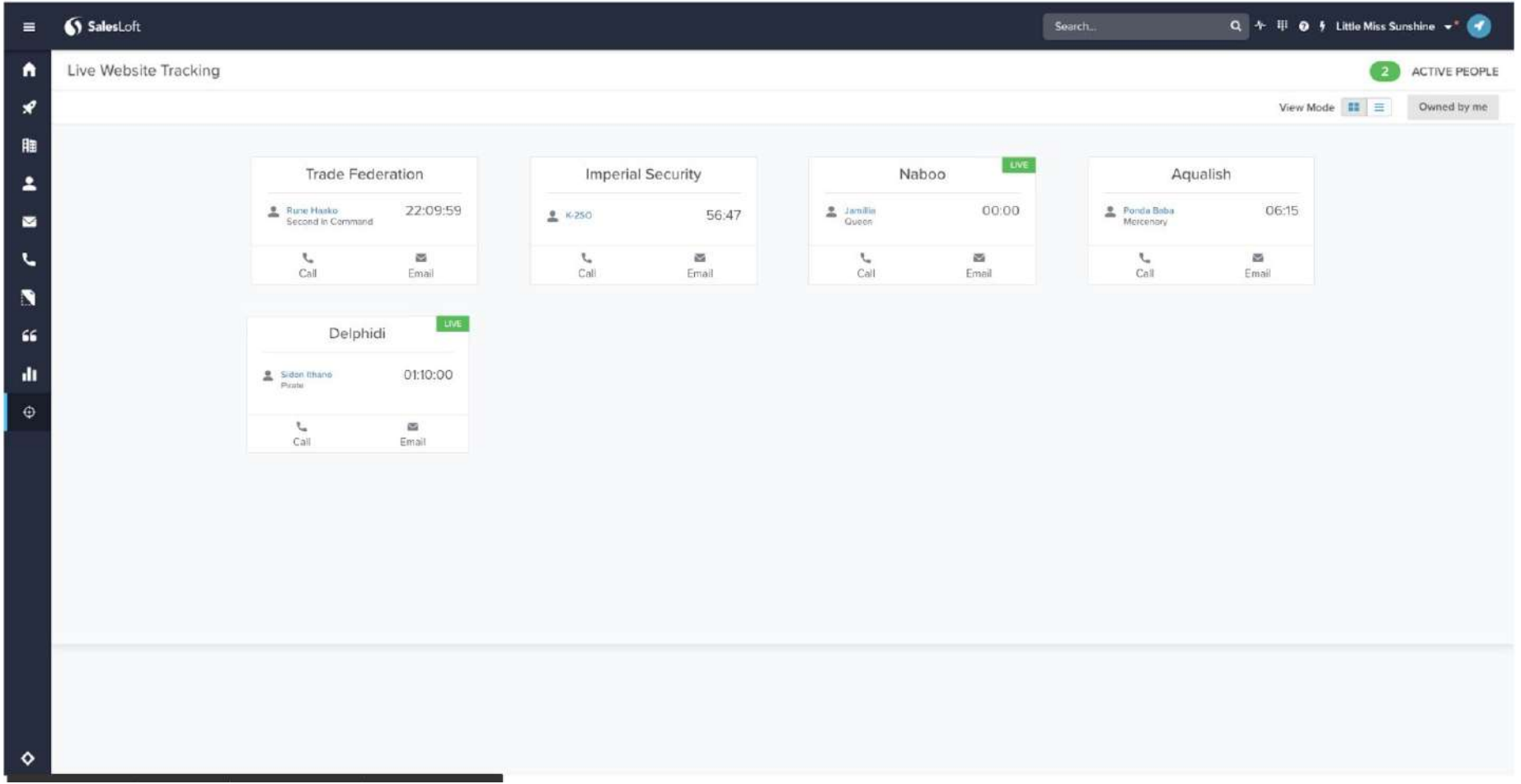


#CodeBEAMSF


Live Call Studio
10 ACTIVE CALLS
VIEW MODE
Justyn Trantow
693-798-6932
02:09
Timothy Thomas
Pad Industries
East Coast Sales
Ringing...
Helmer Stehr
496.405.6419
02:39
Unknown Name
Unknown Company
Unknown Title
Listen
Jayda Vandervort
+1 (404) 555-5555
03:27
Tobias Funke
Gobias Industries
Founder
Listen
Geovanny Gutkowski
383-445-1209
05:29
Christopher Viticci
SalesCo
Director of Sales
Listen
Maya Mann
726-543-4268
05:35
Sam Donaldson
Donaldson, Inc.
Unknown Title
Listen
Zoe Gutmann
1-977-677-4059
05:37
Bob Smith
ACME Incorporated
Director, Procurement
Listen
Emmalee Walsh
358.439.1101
05:43
Jessica Walsh
Prestige Worldwide
Sales Manager
Listen
Reagan Rowe
733-108-7793
07:12
Bob Smith
ACME Incorporated
Director, Procurement
Listen
Sarah Hammes
(722) 454-8692
09:25
Michael Bluth
Bluth Company
Christine Macejkovic
761-486-1411
10:27
Unknown Name
Unknown Company

#CodeBEAMSF

Then I got hired


SalesLoft
Search...
Little Miss Sunshine
Live Website Tracking
2
ACTIVE PEOPLE
View Mode
Owned by me
Trade Federation
Rune Haako
Second In Command
22:09:59
Call
Email
Imperial Security
K-2SO
56:47
Call
Email
Naboo
LIVE
Jamillia
Queen
00:00
Call
Email
Aqualish
Ponda Baba
Mercenary
06:15
Call
Email
Delphidi
LIVE
Sidon Ithano
Pirate
01:10:00
Call
Email

What things does SalesLoft need?

Developer Productivity

Efficient IOWait

Performance and Scalability

Elixir is Beautiful and Feels like Ruby

#CodeBEAMSF

```elixir
defmodule Hydra2Web.UserController do
  use Hydra2Web, :controller
  alias Hydra2Web.UserView
  alias Phoenix.Token

  def show(conn, _params) do
    github_user =
      conn
      |> get_session(:token)
      |> get_github_user()

    user = %{
      username: github_user["login"],
      avatar: github_user["avatar_url"],
      token: Token.sign(conn, "", github_user["login"])
    }

    conn
    |> put_status(200)
    |> put_view(UserView)
    |> render("user.json", %{user: user})
  end

  def get_github_user(token) do
    HTTPoison.get!("https://api.github.com/user", %{"Authorization" => "token #{token}"}).body
    |> Jason.decode!()
  end
end
```

#CodeBEAMSF

Massively performant and powerful

Joseph A. Lambach, U.S. Marine Corps / Public domain

Very comfortable to write

Skeeze / CC0

BEAM

#CodeBEAMSF

Elixir Makes Waiting on IO Cheap

#CodeBEAMSF

STAR
WARS

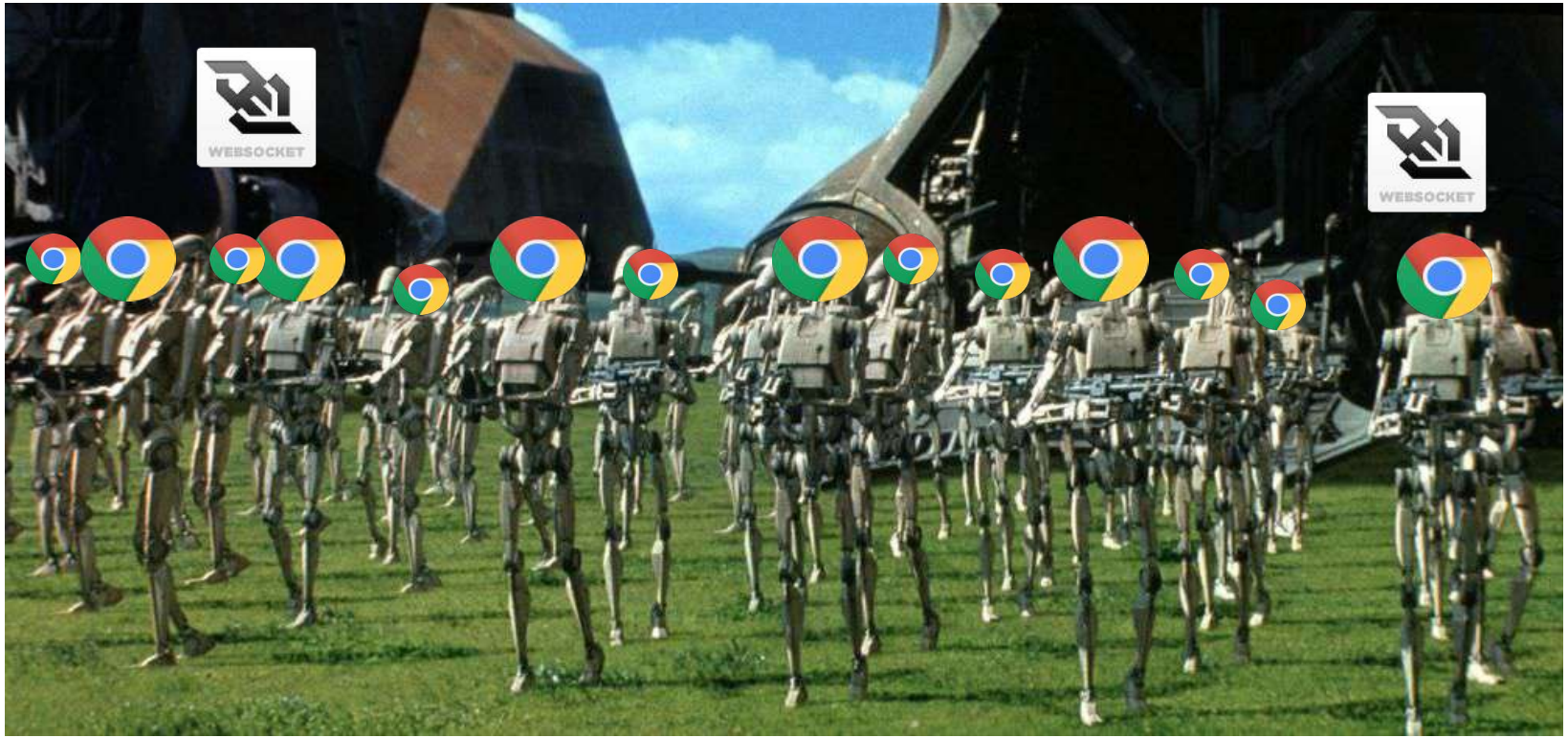
The BEAM and Star Wars

Traditional OS primitive concurrency systems

#CodeBEAMSF

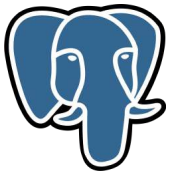
#CodeBEAMSF

With 6 Jedi you can serve at most 6 concurrent requests

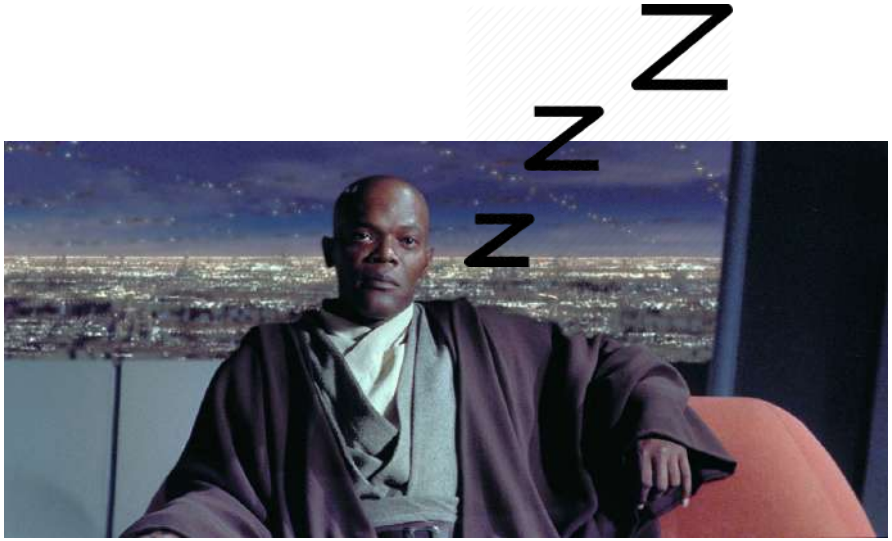


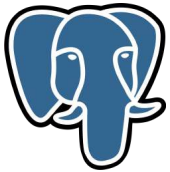
#CodeBEAMSF

#CodeBEAMSF



#CodeBEAMSF





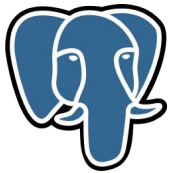
#CodeBEAMSF

#CodeBEAMSF

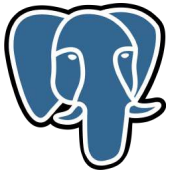
#CodeBEAMSF

Clones are bad at concurrency

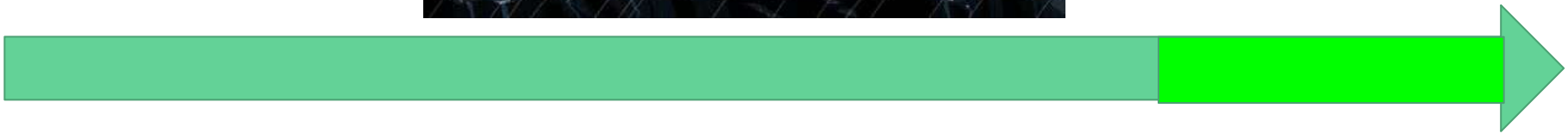
...but there are many of them



#CodeBEAMSF



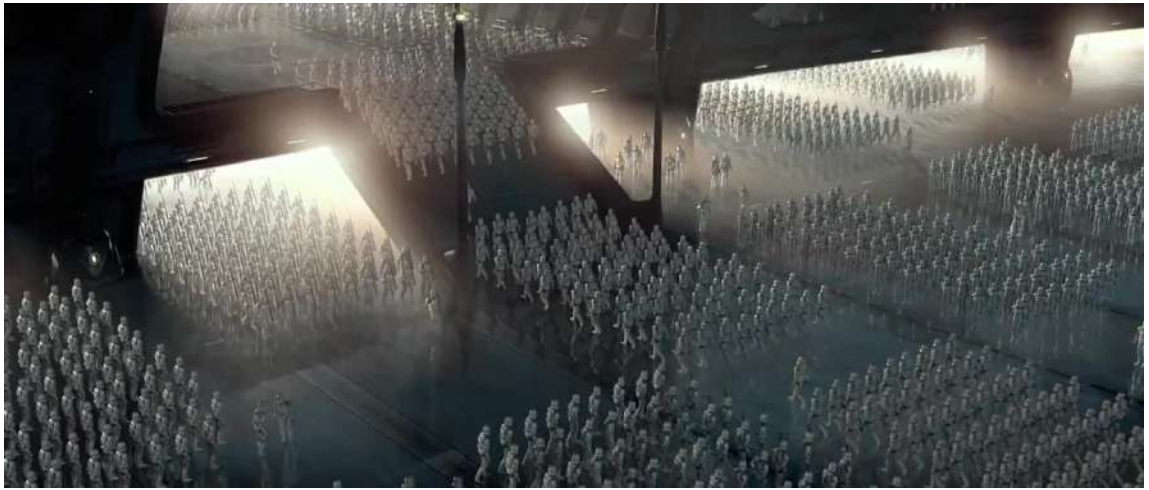
#CodeBEAMSF



#CodeBEAMSF

The BEAM

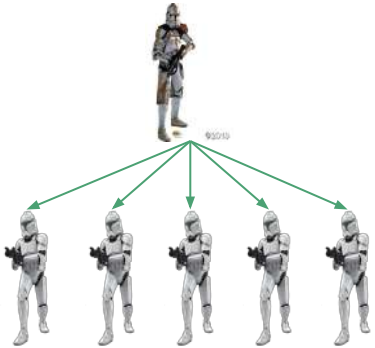
BEAM Processes



#CodeBEAMSF

BEAM processes fail independently of each other

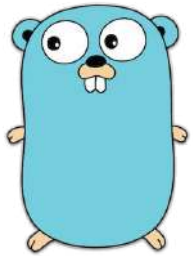
- A process failing will not bring down a node, or affect other processes
- A process can use a VM primitive called a monitor, which means that it will receive a message if another process dies. This can be used for error recovery
- Beam applications organize their processes into a hierarchical structure called a "supervision" tree, where "parents" are responsible for listening to messages that their child failed and restarting them

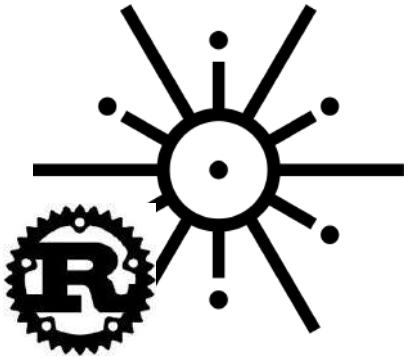


#CodeBEAMSF

BEAM processes are **NOT** OS Process or OS Threads

Other languages/frameworks are trying to build clone armies





Ruby/EventMachine

Fast Network I/O and Event Management for Ruby Programmers

#CodeBEAMSF

The Key to Elixir is Understanding What Makes the BEAM special

#CodeBEAMSF

BEAM

=

Concurrency

The BEAM makes hard problems easy

#CodeBEAMSF

The BEAM isn't great
for every problem

#CodeBEAMSF

The BEAM is not great for every problem

- Not great at number crunching
- Not statically typed (some people view this as a plus)
- Not as fast as Go on individual computations
- Smaller community than other languages

Elixir/Erlang are NOT Object Oriented

There are no:

- Classes
- Instances of Classes
- Sub Classes
- Mutable State

What the BEAM is good at

- Ultra efficient IOWait,
- Wildly efficient resource pooling,
- High developer productivity.

A story about a bathroom

#CodeBEAMSF

#CodeBEAMSF