# eigr.io – A Serverless Runtime on the BEAM

ACM SIGPLAN, ICFP Erlang Workshop 2021
Marcel Lanz, August 26th 2021

eigr.io

# Agenda

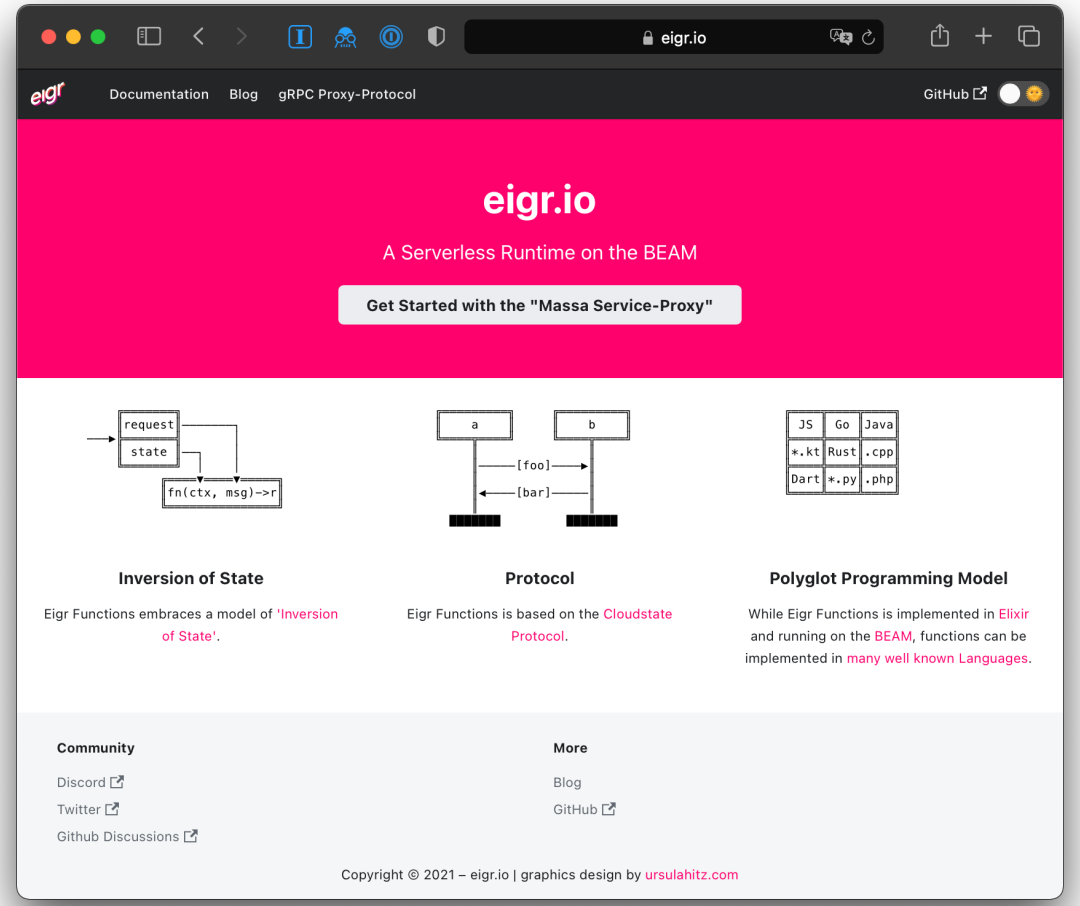
- eigr.io – Eigr Functions
  - A Serverless Runtime on the BEAM
- Highlights
  - Inversion of State, a Protocol, being Polyglot
- Current State & Challenges

# Eigr Functions

- Serverless Runtime
  - that enables General Purpose Applications to be built
- Open Source Project
- Bases on a concept of another open source project
  - Inactive at the moment
  - Implementation of a *Cloudstate* Service Proxy
- Based on a Protocol
- Polyglot SDKs

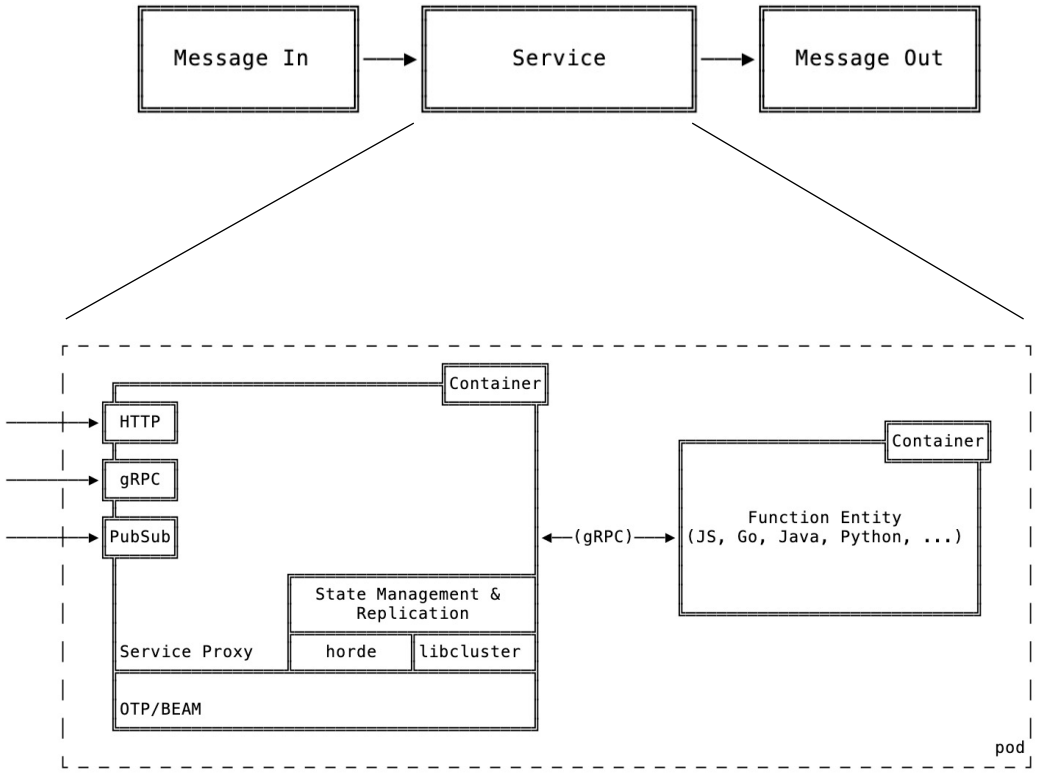
# Highlights

- A Service Proxy
  - with managed State
  - Cloud Native deployment (k8s)
- A Protocol
  - gRPC based, with a spec and a TCK
- Polyglot Programming Model
  - SDKs in
    JavaScript, Python, Kotlin, Java,
    Go, C#, Dart, Elixir, …
- … and it runs on the BEAM :)



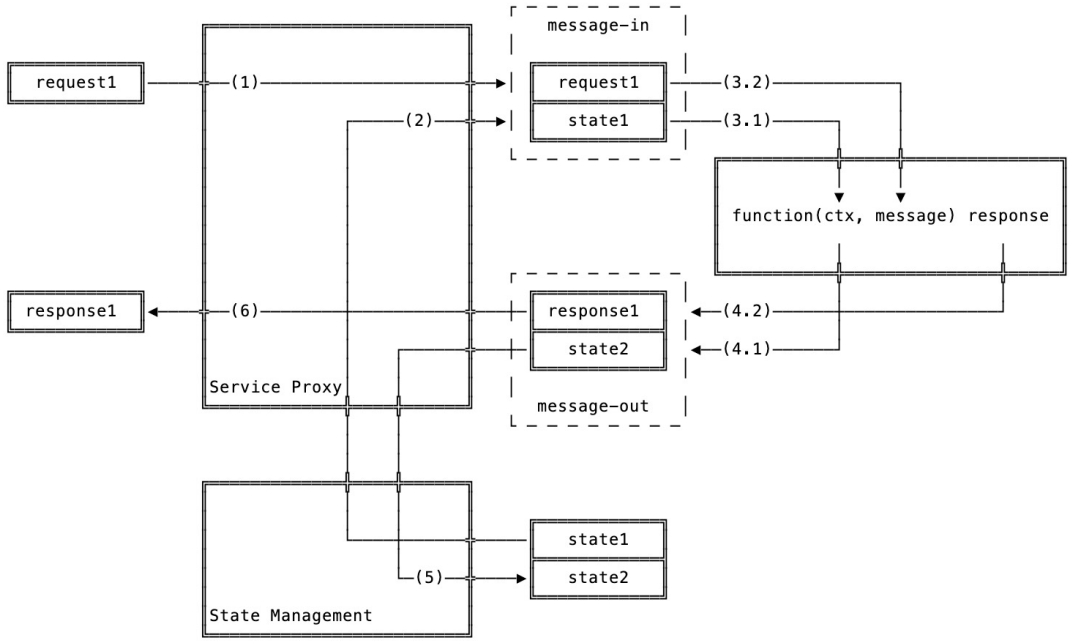
# Service Proxy

- “Message IN, Message OUT”
- eigr/massa
  - Implemented in Elixir
- Kubernetes Operator
  - Sidecar Proxy



# Inversion of State

- FaaS is usually stateless
- State is brought to the function.
- State Model to choose
  - Action
  - Eventsourcing
  - CRDTs
  - Value Entity (CRUD)



# A Protocol to use

- Eigr Functions implements the Cloudstate Protocol
  - Abstracts State
  - defines these State Models in *.proto files
- gRPC based
  - based on HTTP/2
  - enables Streaming
  - Protocol spec defined in *.proto (protocol buffer)
- Technology Compatibility Kit (TCK)
  - ensures proxy and SDKs compatiblity

# Polyglot Programming Model

- SDK support for all gRPC enabled languages possible
  - gRPC compiler available
- JavaScript, Java and Go with 100% TCK coverage
- Python, Kotlin, Java, Go, C#, Dart, Elixir with at least Support for Eventsourcing

# Current State & Challenges

- Service Proxy in Elixir (eigr/massa)
  - gRPC Reflection ☑
  - Discovery and Action Protocol ☑
- Next Challenges
  - Implement State Models
    - CRDT, Eventsourcing, CRUD
  - Enhance and Improve SDKs
    - Focus on JS, Java, Python and Go
  - Enhance the TCK

# Thanks!

eigr.io
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@eigr_io

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