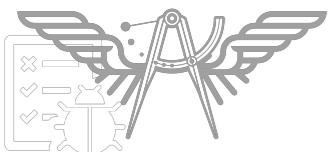


Microservice with Go





Somkiat Puisungnoen

Somkiat Puisungnoen

Update Info 1

View Activity Log 10+

...
Timeline About Friends 3,138 Photos More

When did you work at Opendream?
... 22 Pending Items

Post Photo/Video Live Video Life Event

What's on your mind?

Public Post

Intro
Software Craftsmanship

Software Practitioner at สยามชัมนาภิกิจ พ.ศ. 2556

Agile Practitioner and Technical at SPRINT3r

Somkiat Puisungnoen 15 mins · Bangkok · ⚙️

Java and Bigdata





Page

Messages

Notifications 3

Insights

Publishing Tools

Settings

Help ▾



somkiat.cc

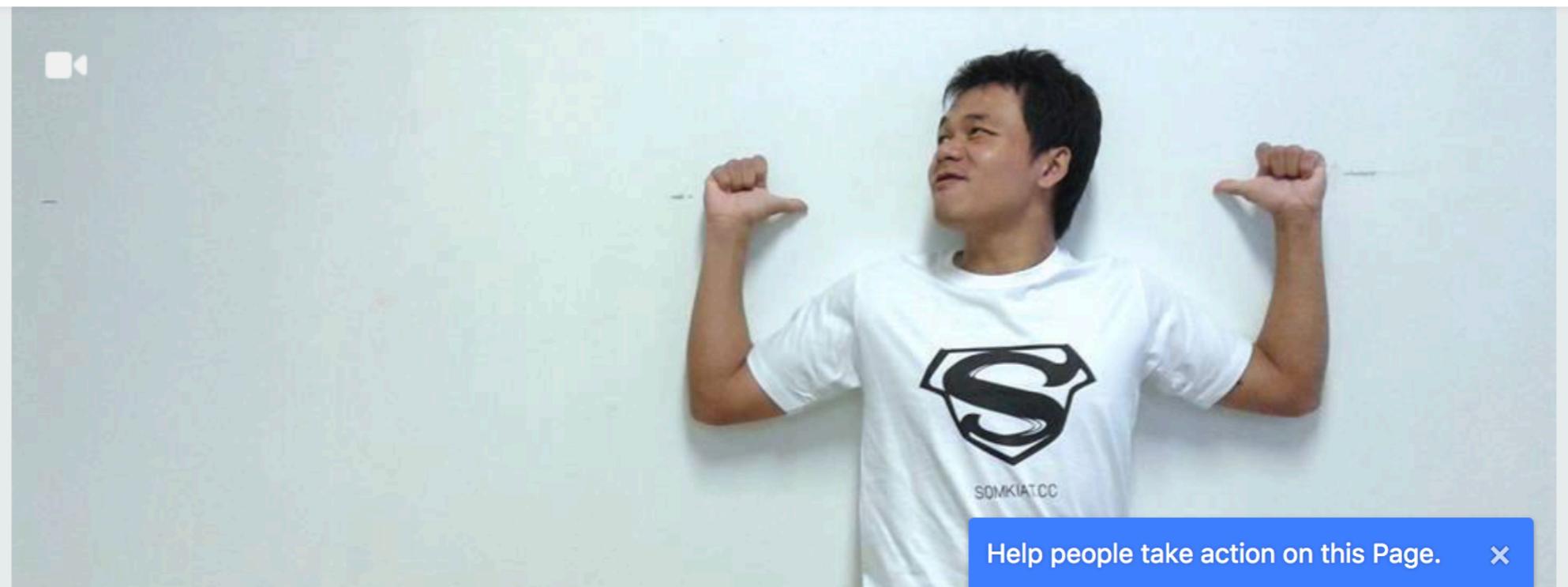
@somkiat.cc

Home

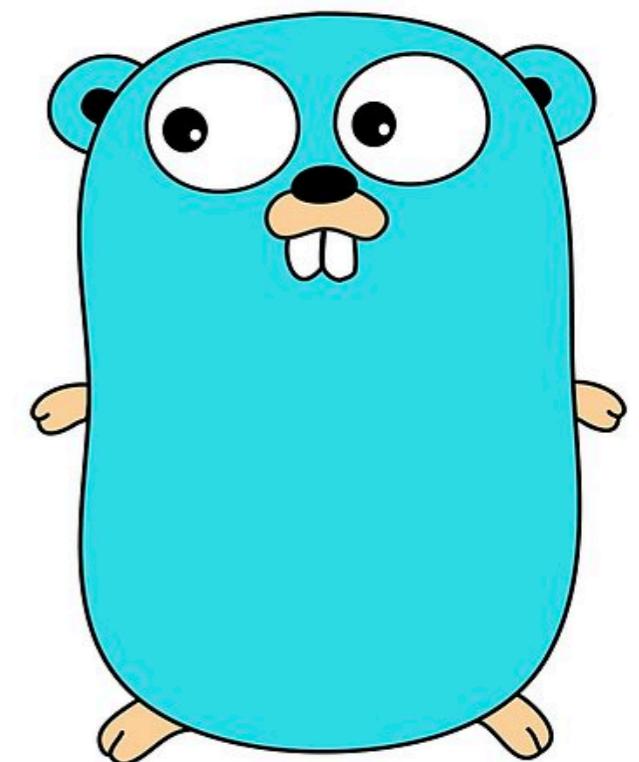
Posts

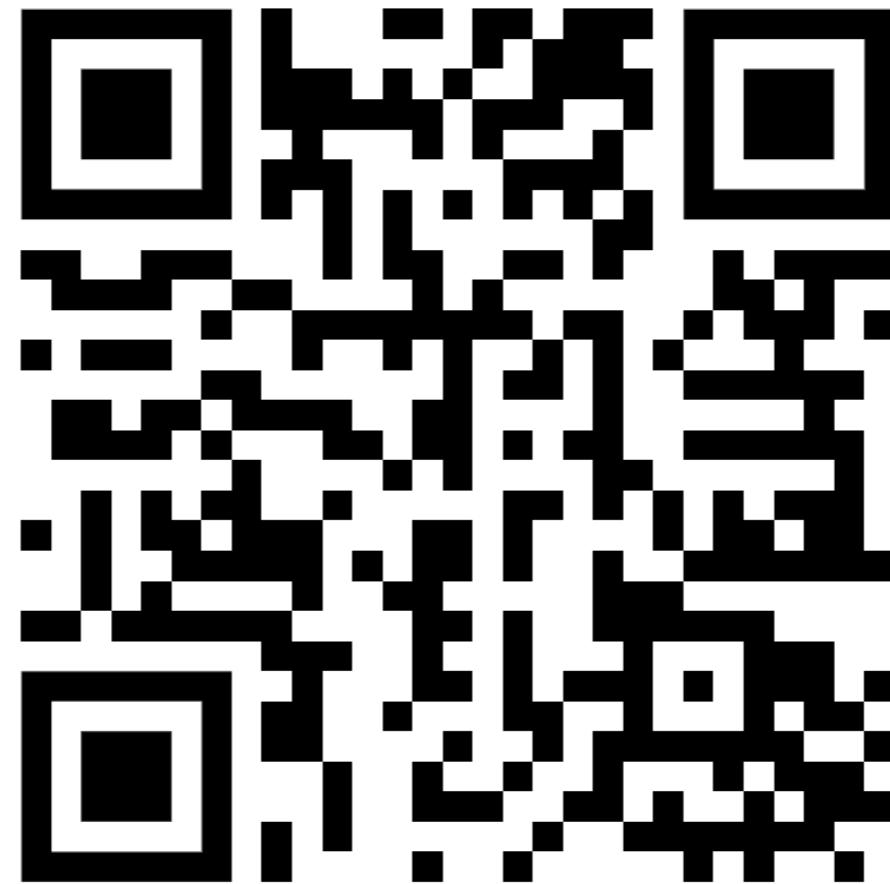
Videos

Photos



Microservice





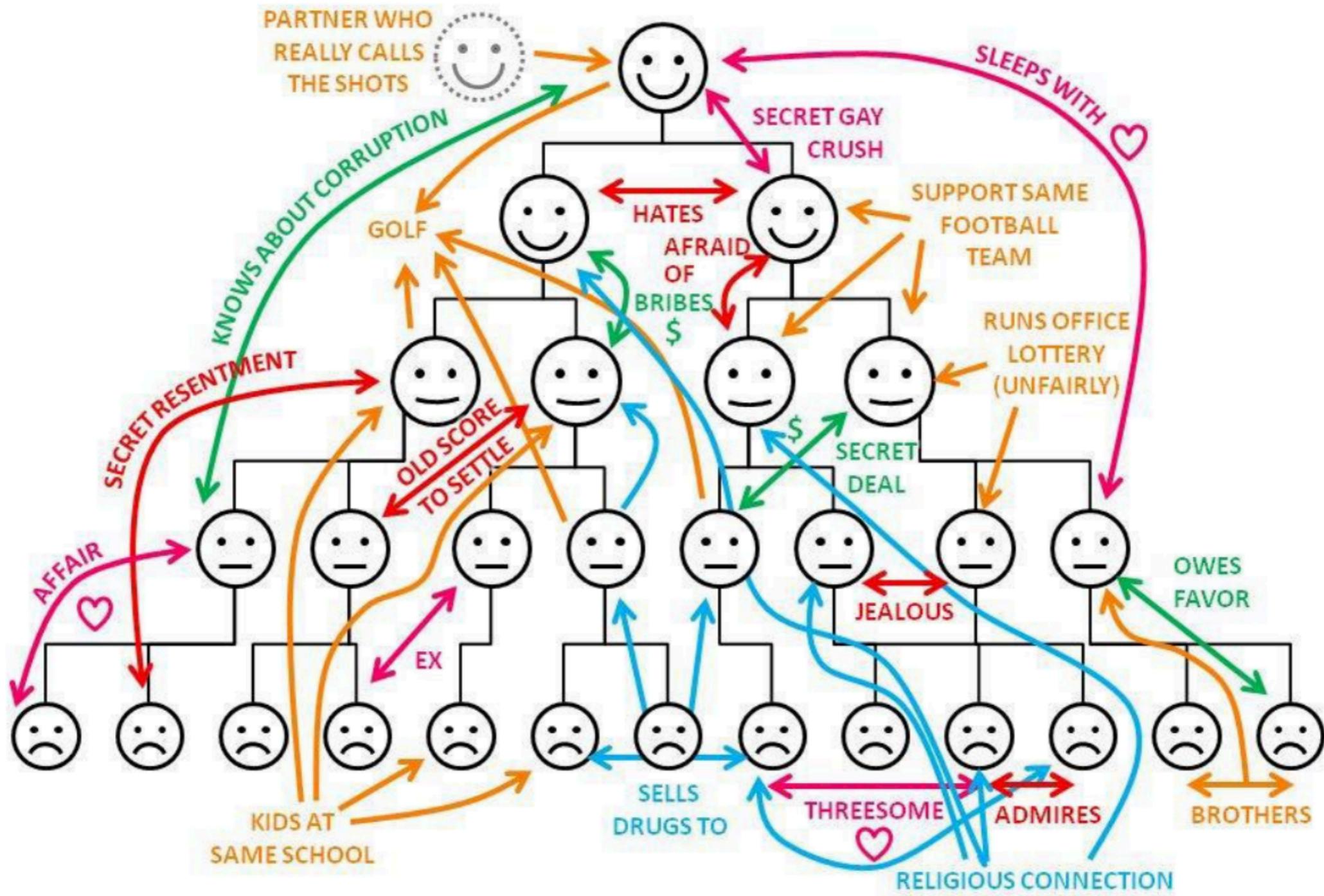
<https://github.com/up1/go-get-microservice-meetup>



"organizations which design systems ... are constrained to produce designs which are copies of the communication structures of these organizations"

- *Melvin Conwey, 1968* -





Evolution of Architecture

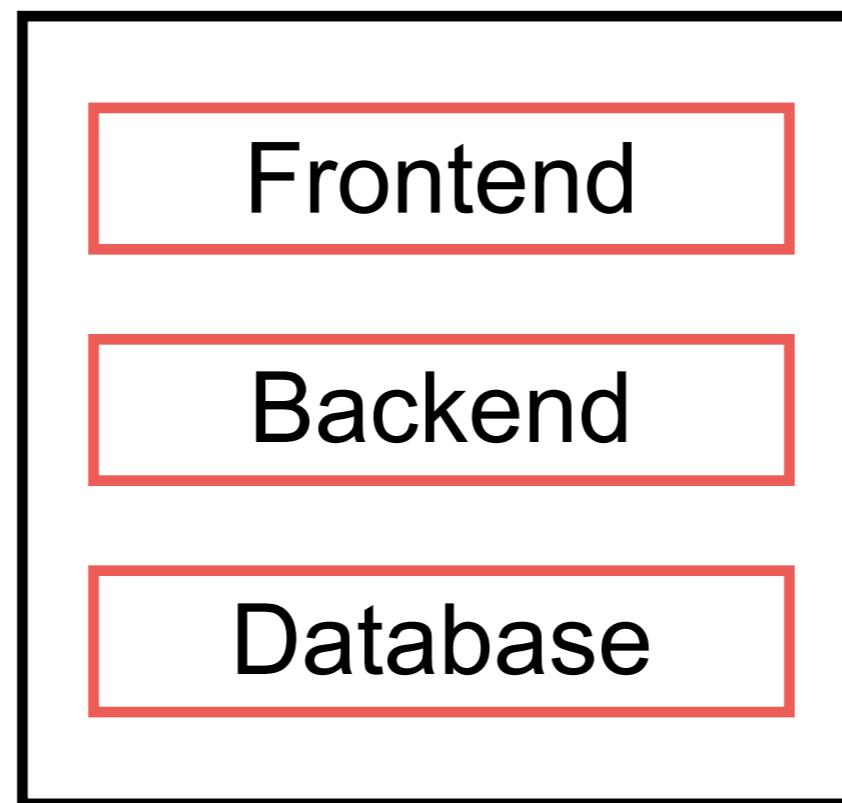


Monolith

App



Layer

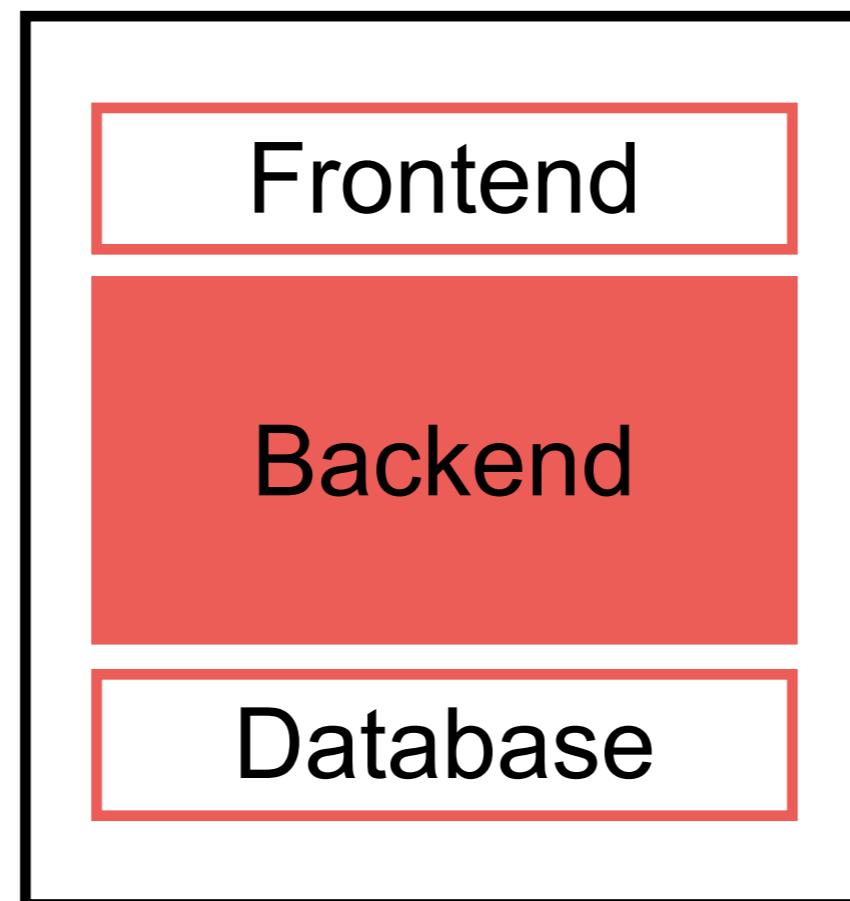


Monolith

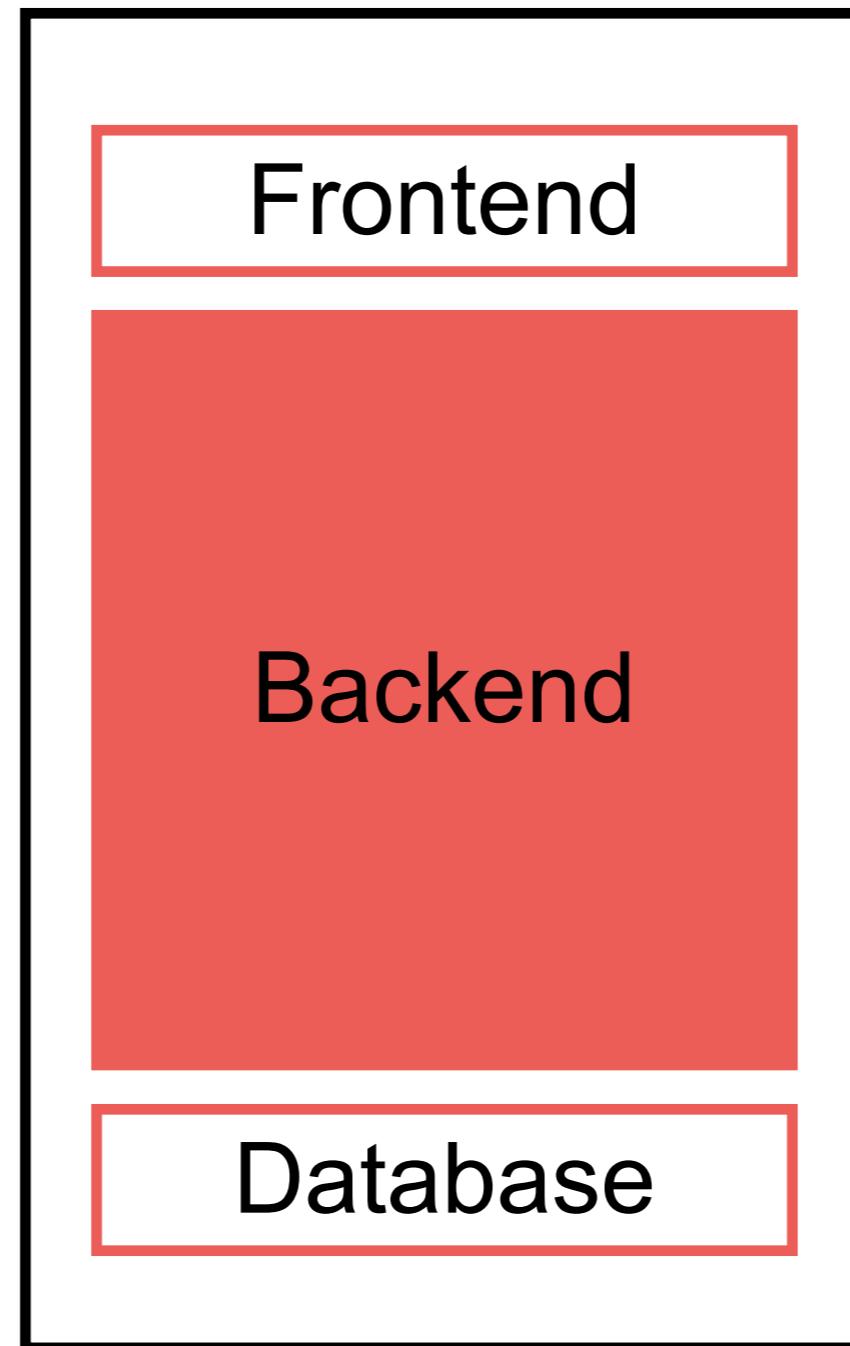
Easy to develop
Easy to change
Easy to testing
Easy to deploy
Easy to scale



More features ...



More features ...



More features ...

Frontend



In spaghetti code, the relations between the pieces of code are so tangled that it is nearly impossible to add or change something without unpredictably breaking something somewhere else.

Database



More features ...



In spaghetti code, the relations between the pieces of code are so tangled that it is nearly impossible to add or change something without unpredictably breaking something somewhere else.



More features ...



In spaghetti code, the relations between the pieces of code are so tangled that it is nearly impossible to add or change something without unpredictably breaking something somewhere else.





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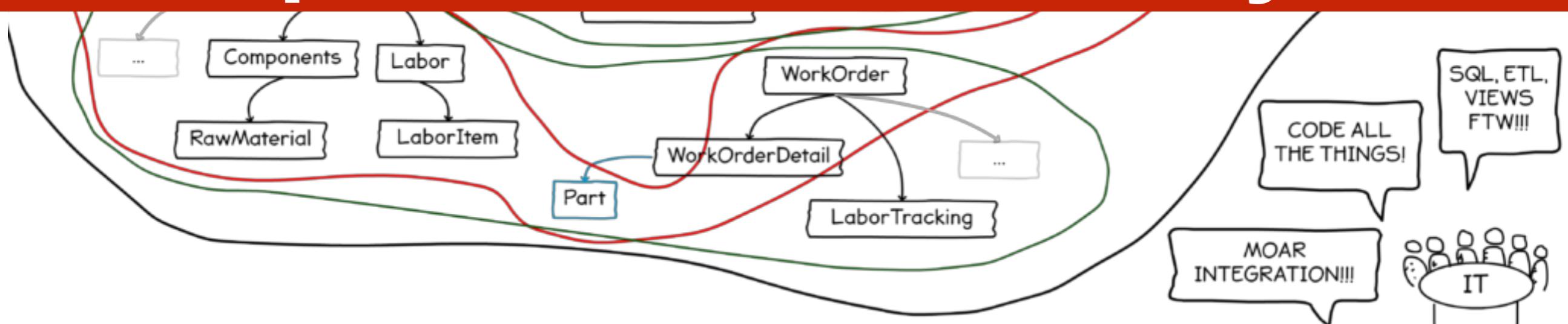
More features ...



Monolith Hell



Dependencies will kill you

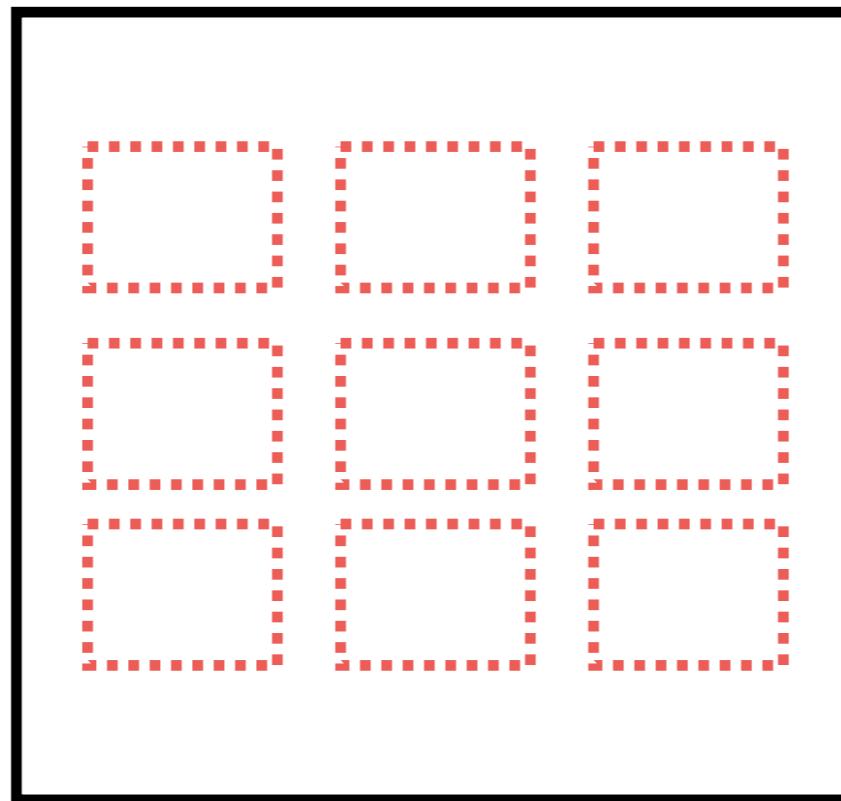


We need to improve

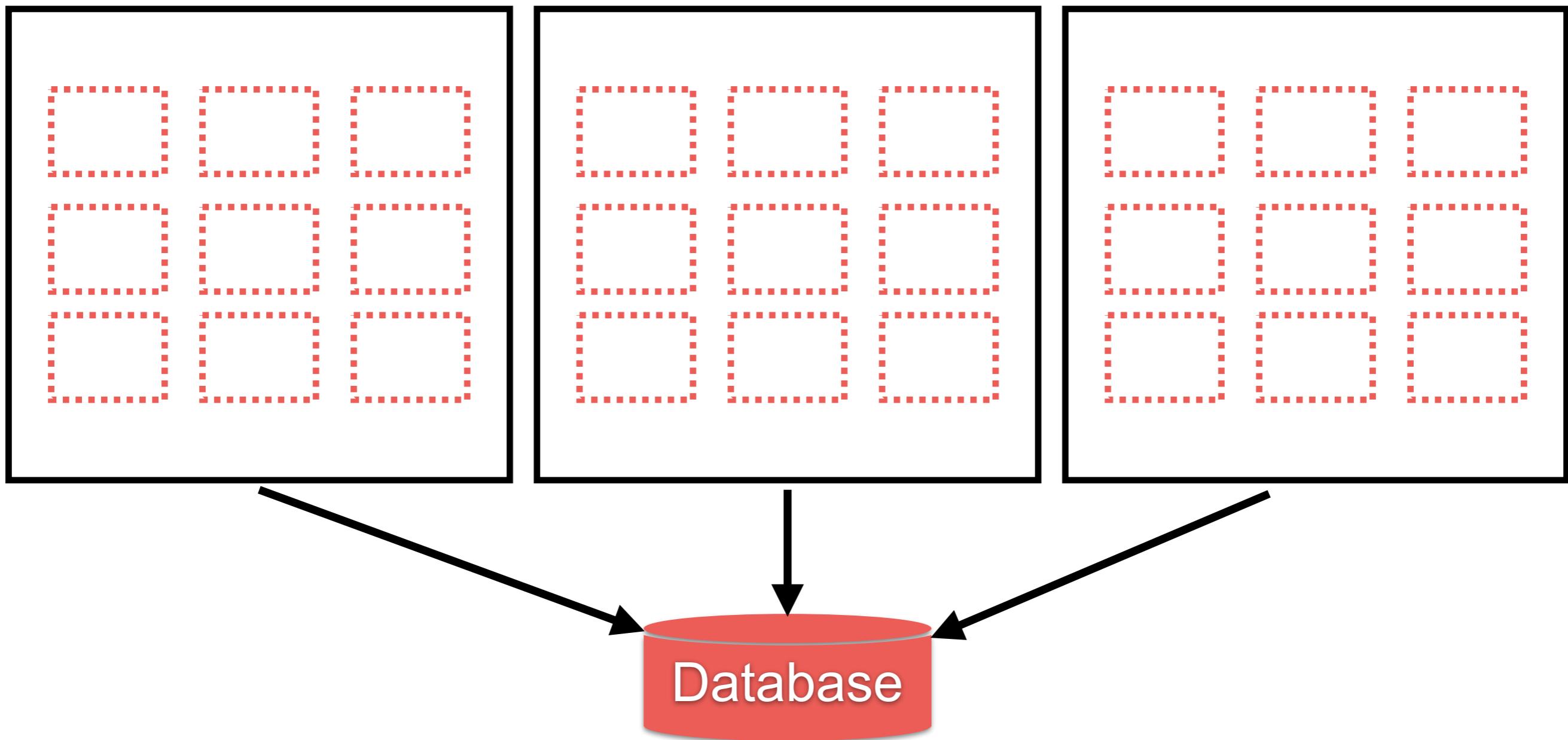
We need to get better



Modules



How to scale ?



What happens when we need more servers ?



What if we don't use all modules equally ?



How can we update individual models/database ?



Do all modules need to use the same Database, Language and Runtime ... ?



We need to improve

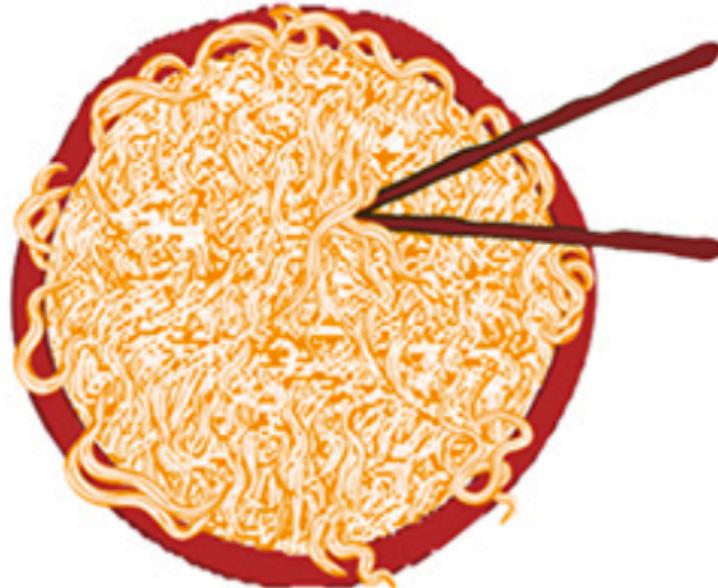
We need to get better



SOA

1990s and earlier

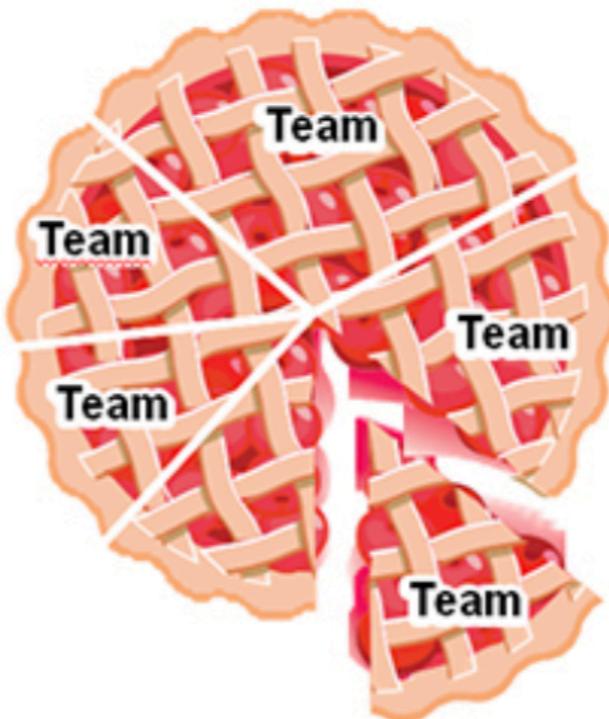
Pre-SOA (monolithic)
Tight coupling



For a monolith to change, all must agree on each change. Each change has unanticipated effects requiring careful testing beforehand.

2000s

Traditional SOA
Looser coupling



Elements in SOA are developed more autonomously but must be coordinated with others to fit into the overall design.

2010s

Microservices
Decoupled



Developers can create and activate new microservices without prior coordination with others. Their adherence to MSA principles makes continuous delivery of new or modified services possible.



SOA promise

Simpler system

Lowering integration cost

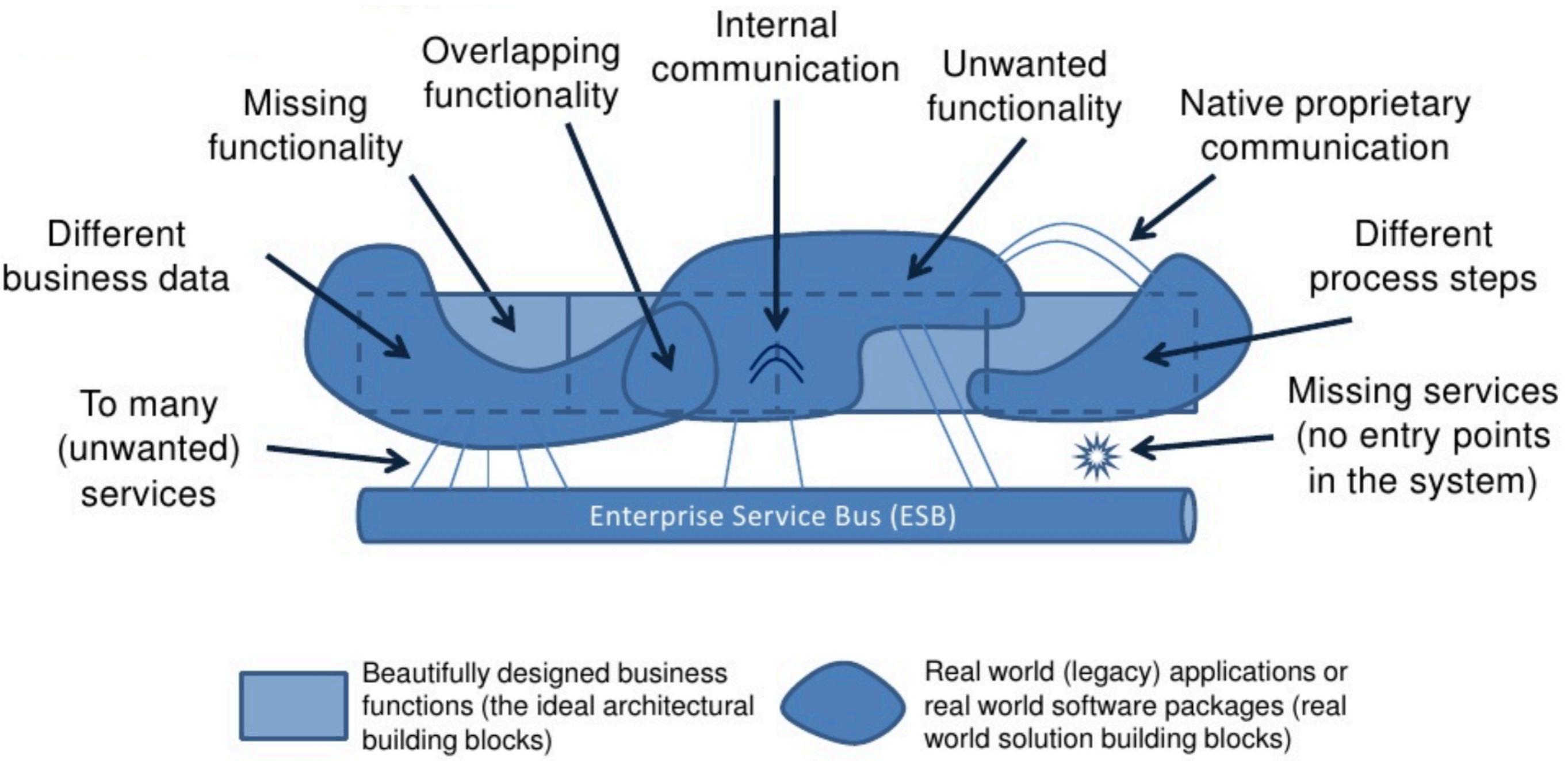
Lowering maintenance cost

Enhancing architectural flexibility

Becoming more agile



Real World



SOA promise

Simpler system

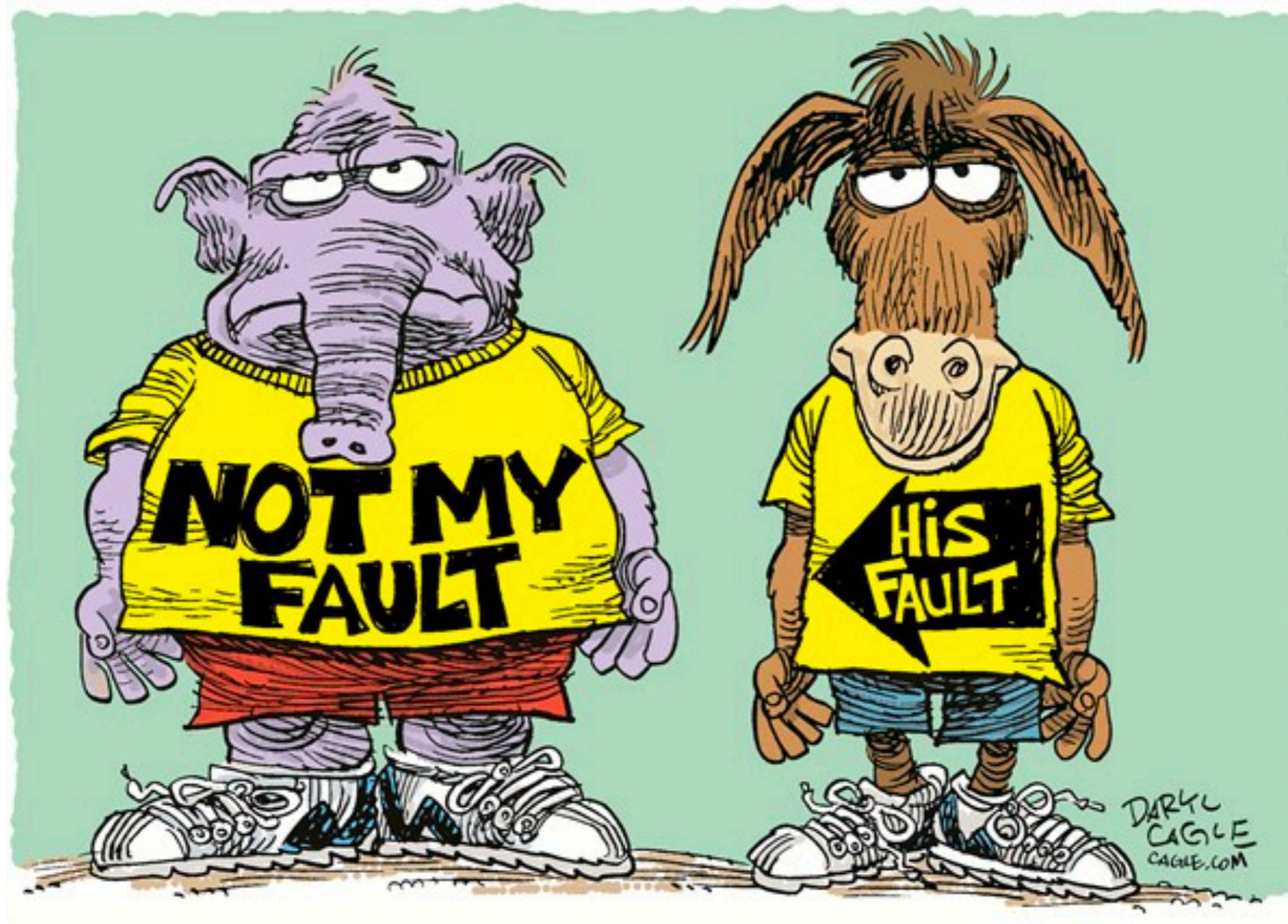
Lowering integration cost

Lowering maintenance cost

Enhancing architectural flexibility

Becoming more agile





We need to improve

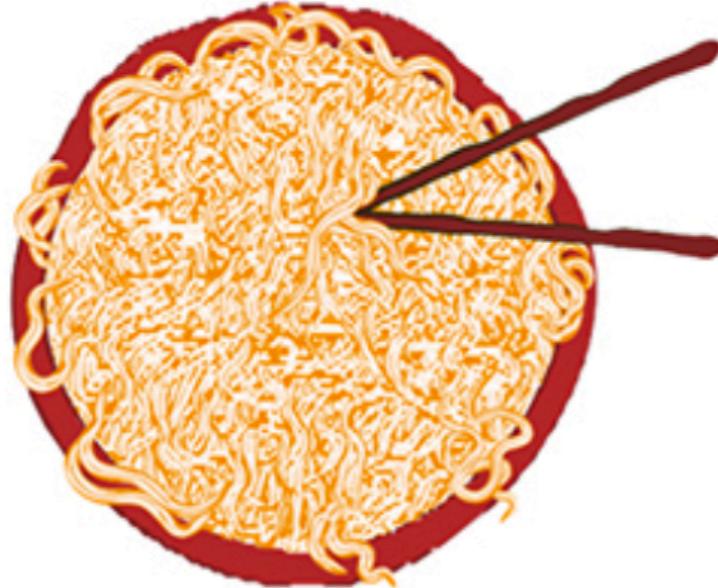
We need to get better



Microservices

1990s and earlier

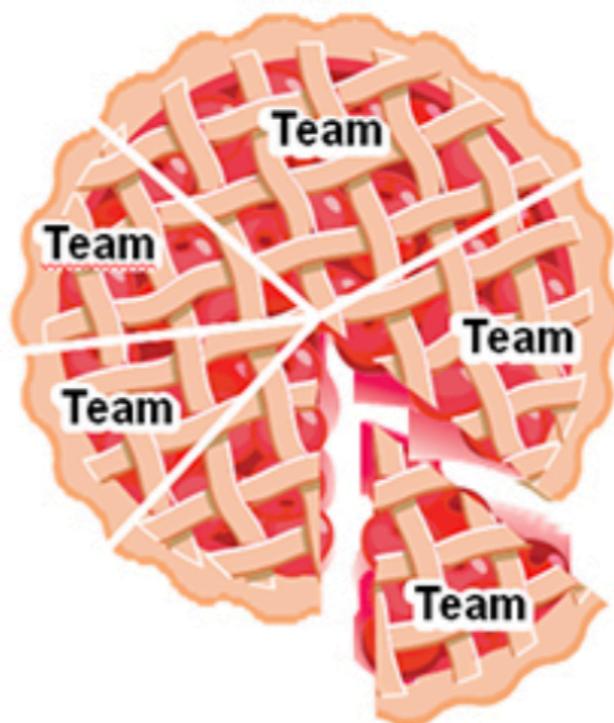
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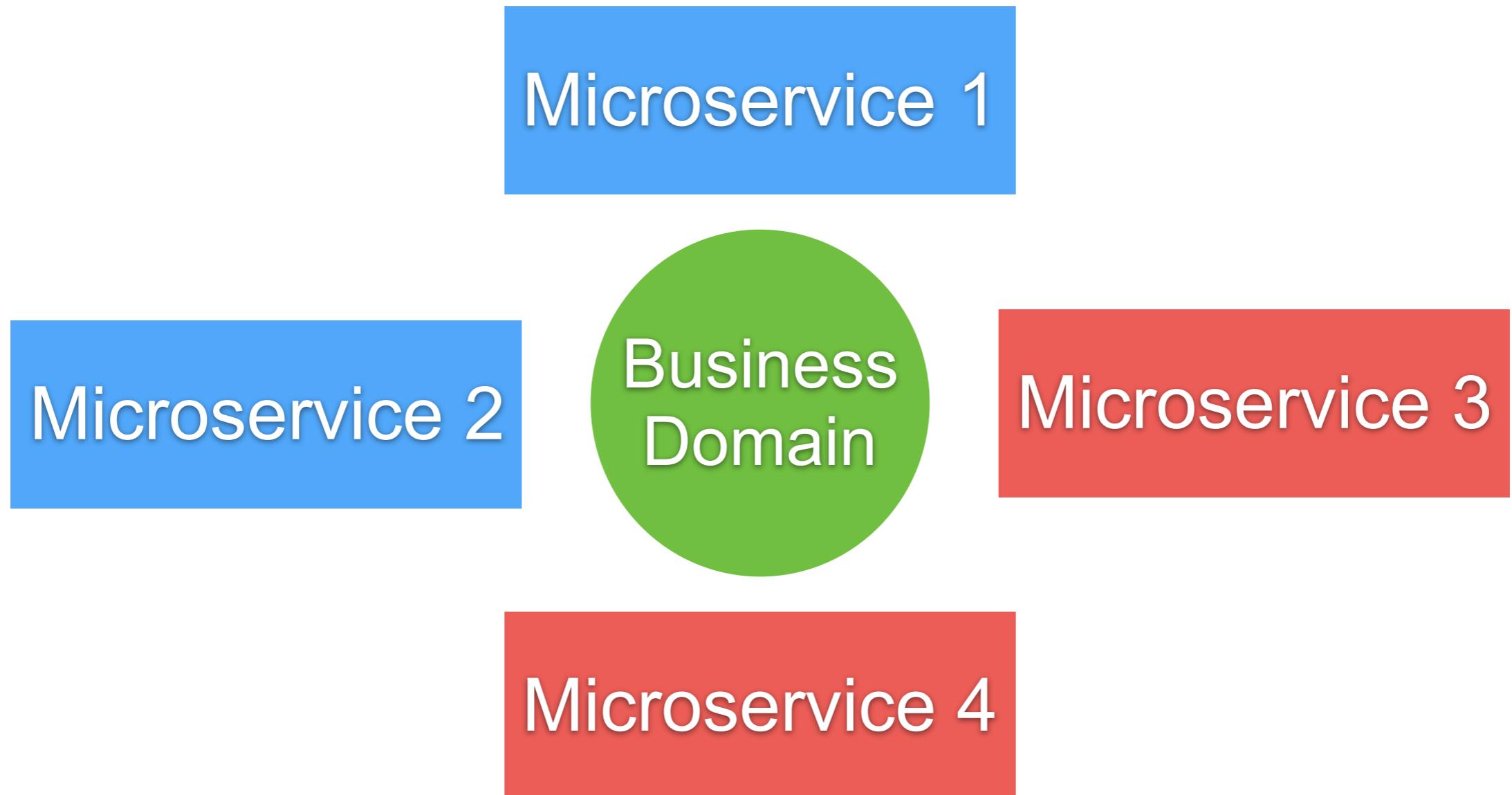
Developers can create and activate new microservices without prior coordination with others. Their adherence to MSA principles makes continuous delivery of new or modified services possible.



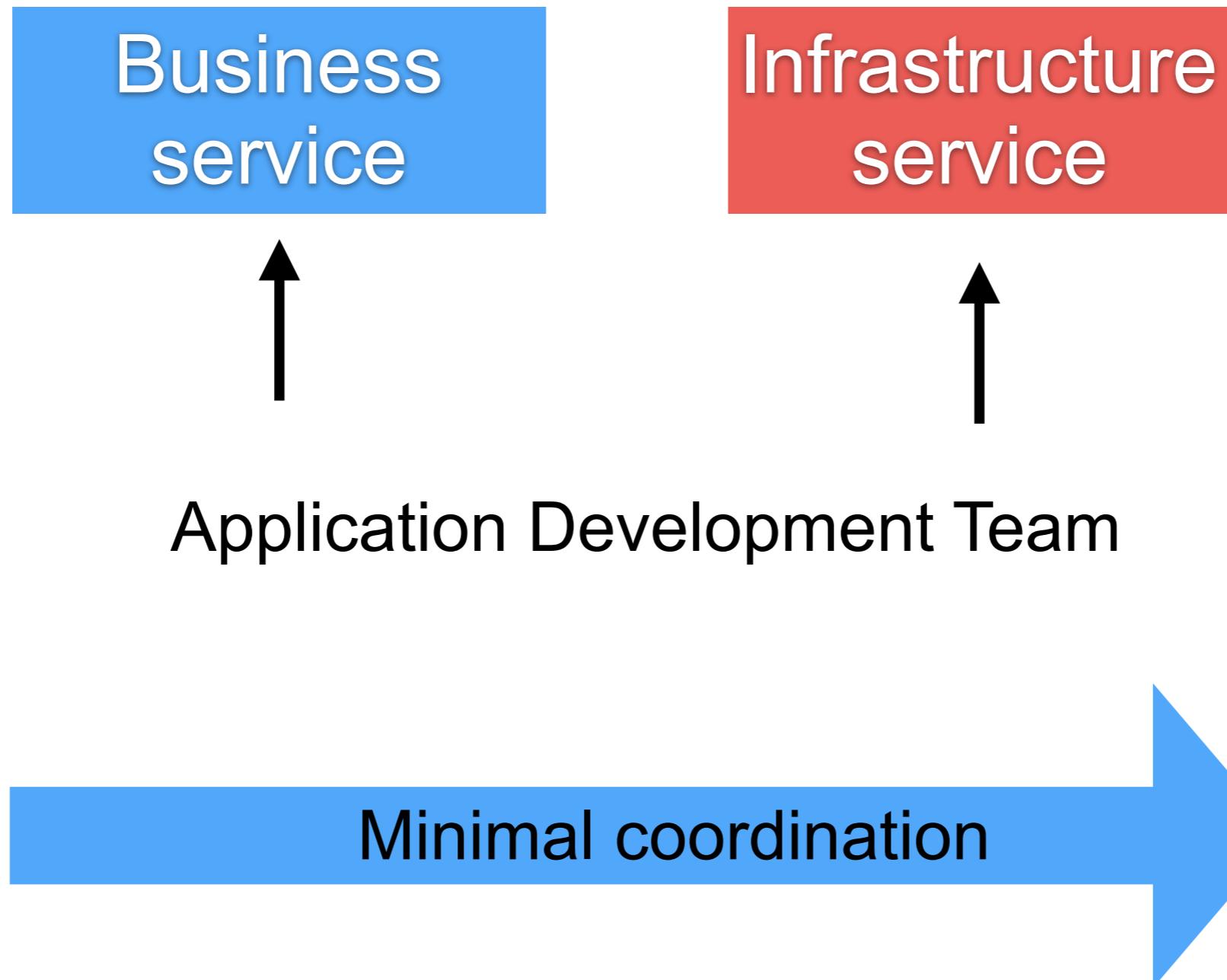
Microservice



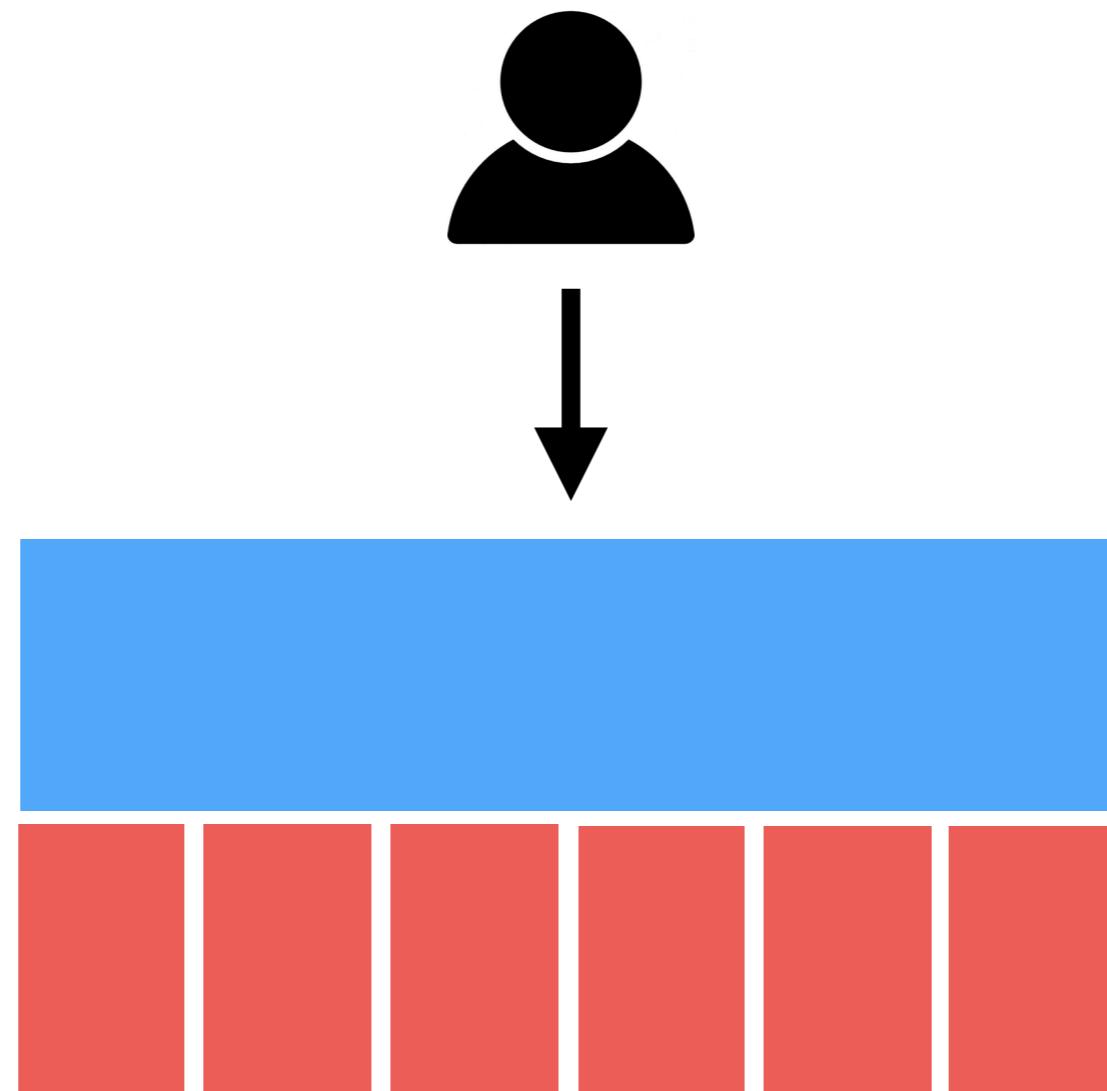
Microservice



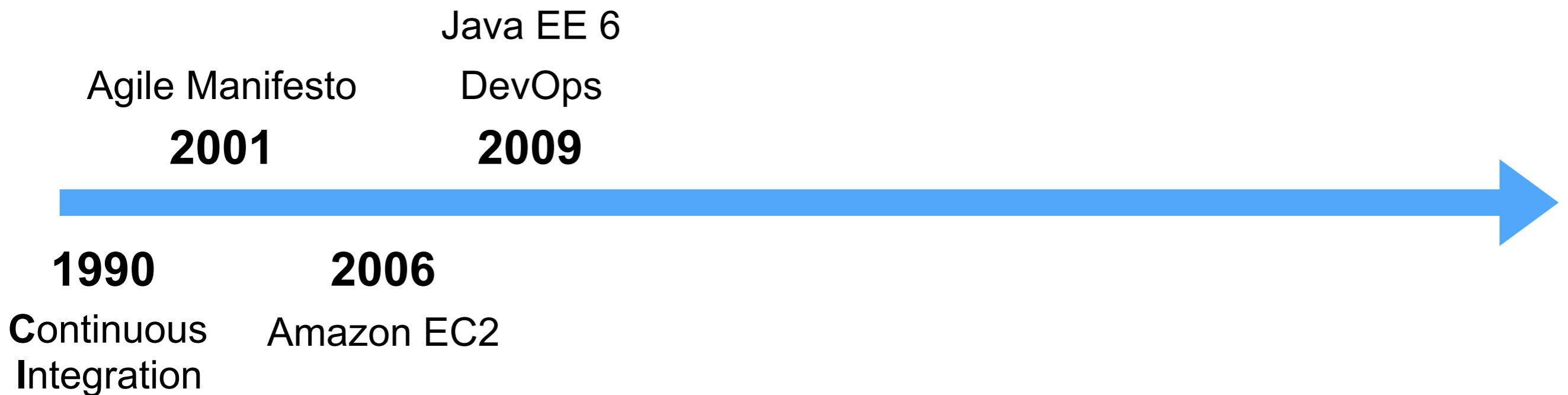
Microservice



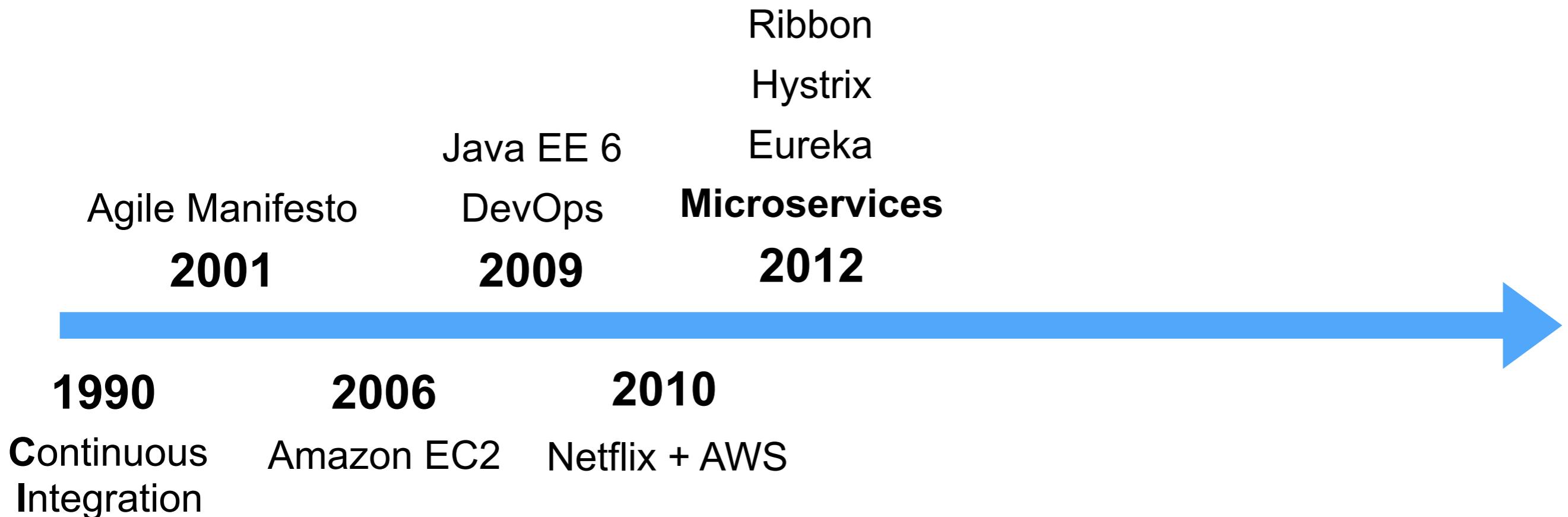
Microservice



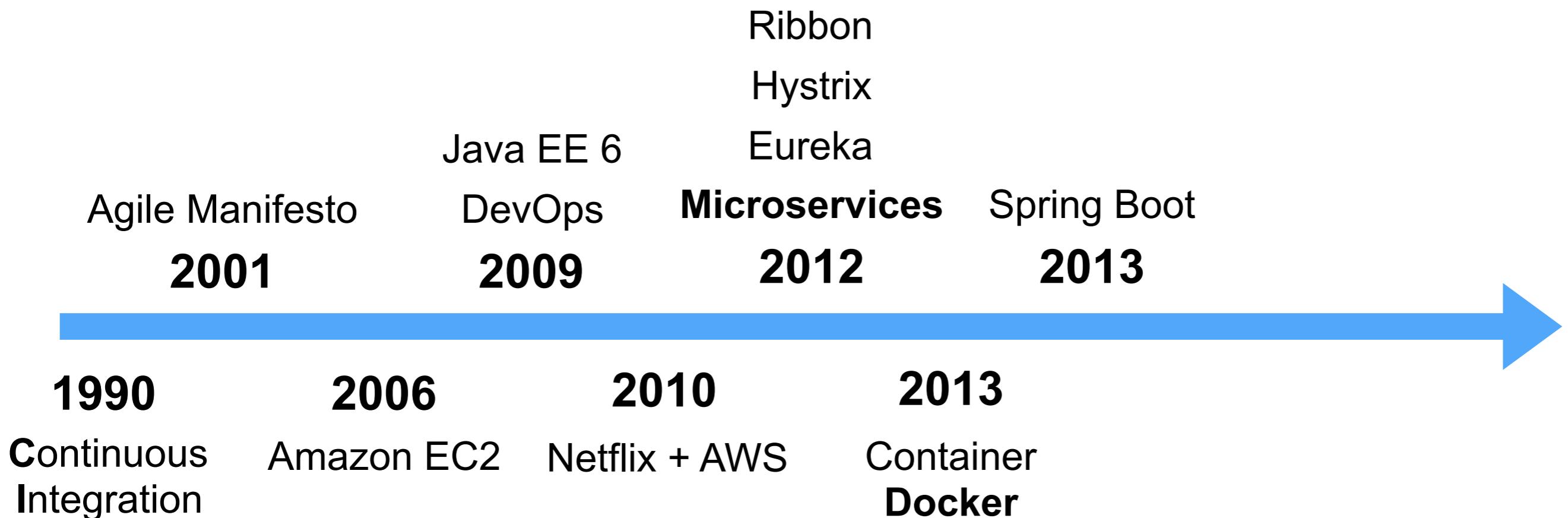
Microservice history



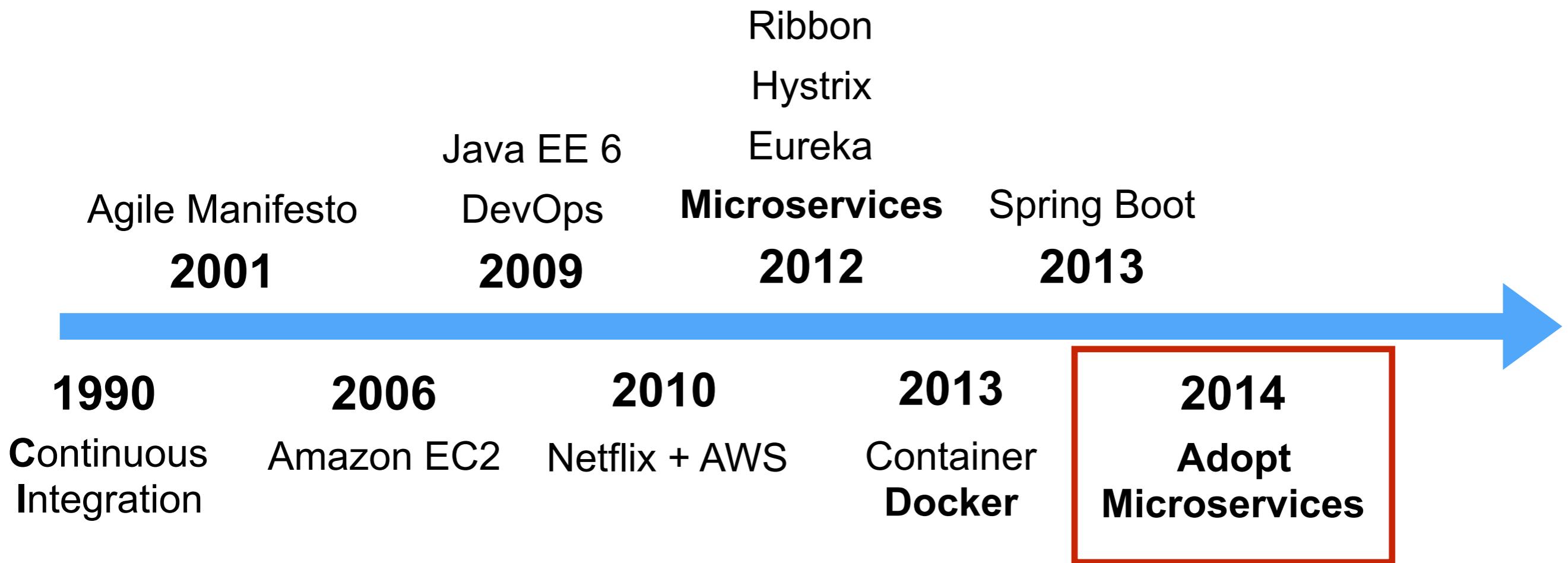
Microservice history



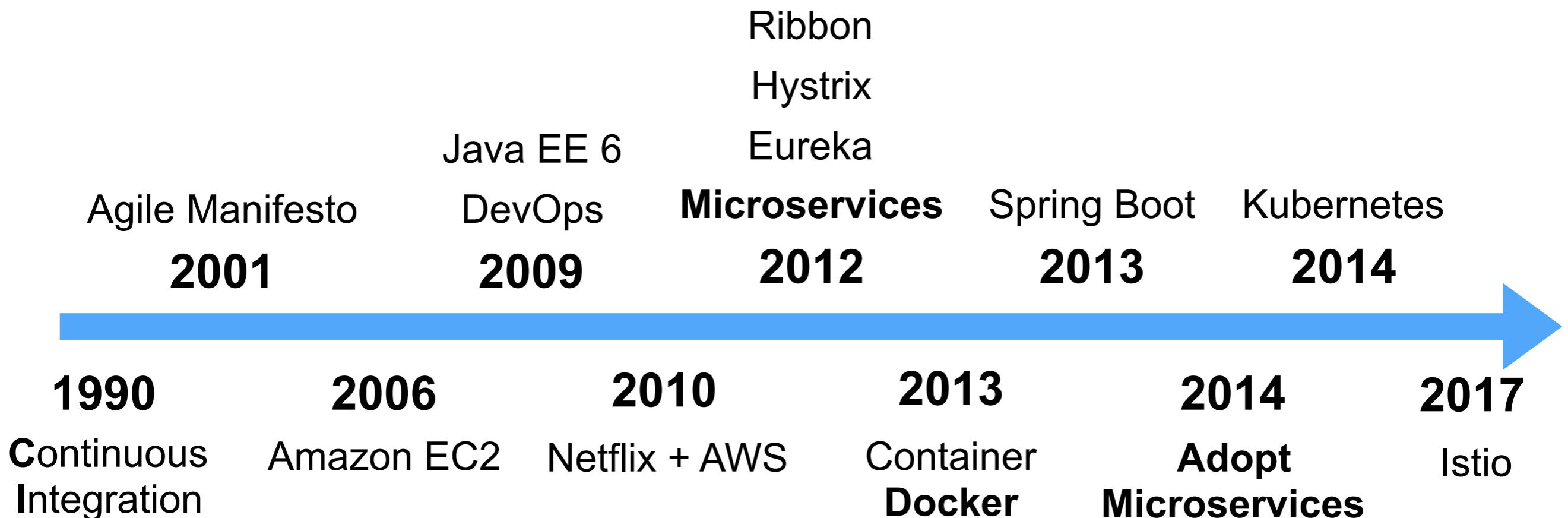
Microservice history



Microservice history



Microservice history



Microservice

Small, Do one thing (Single Responsibility)

Modular

Easy to understand

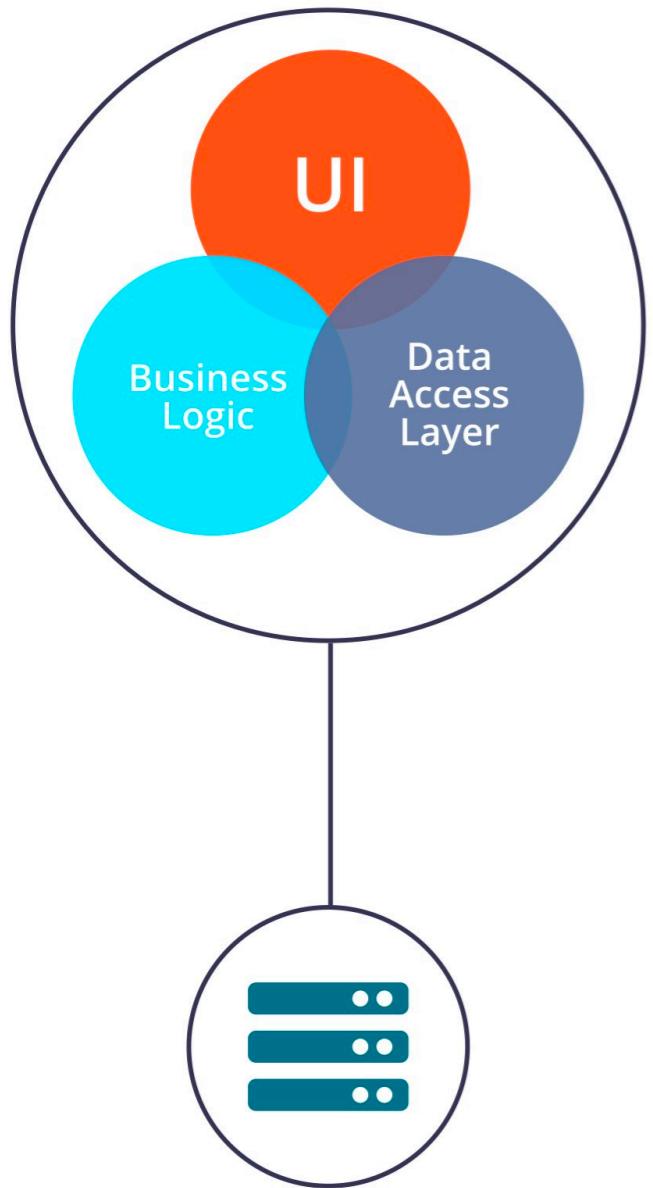
Easy to develop

Easy to deploy

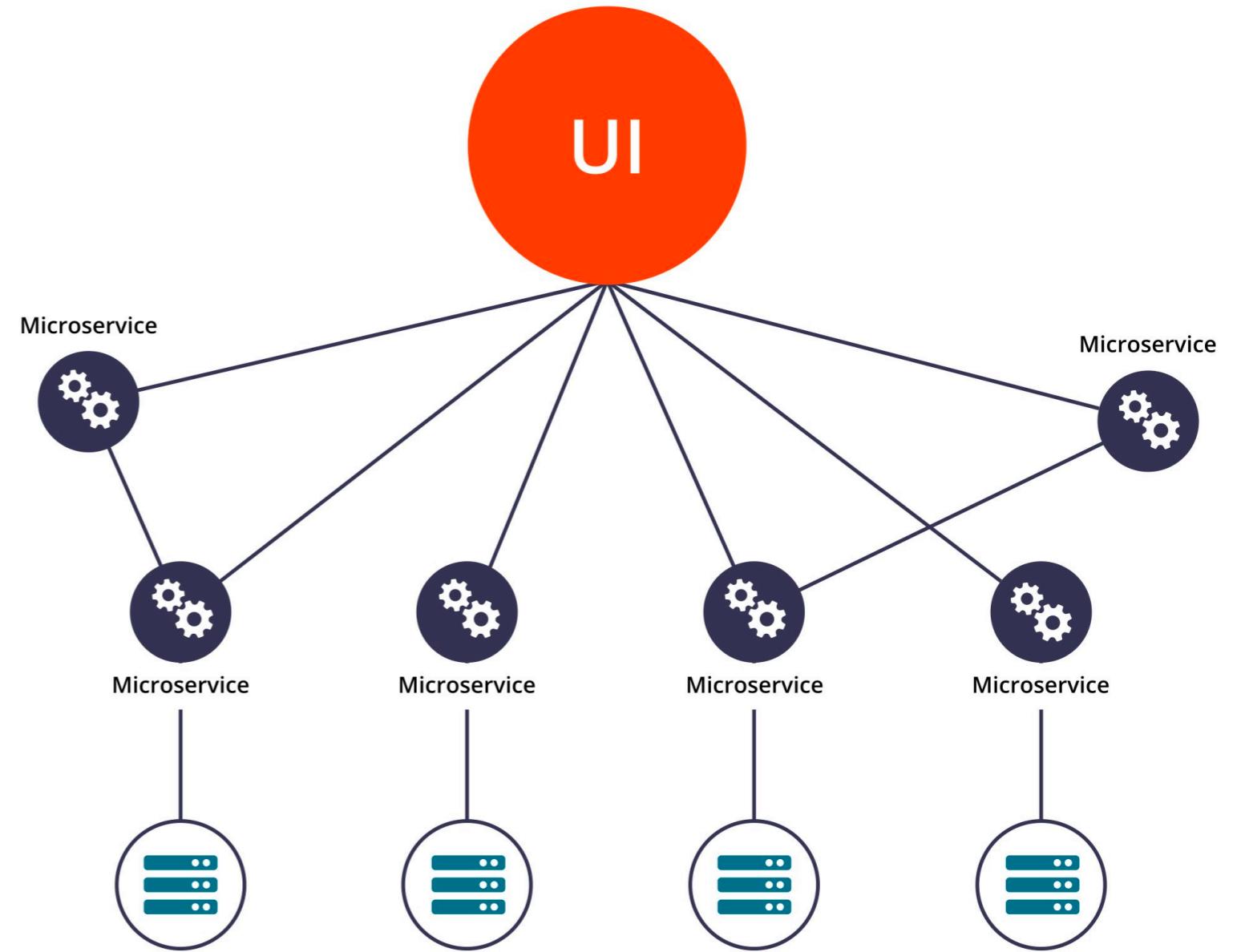
Easy to maintain

Scale independently





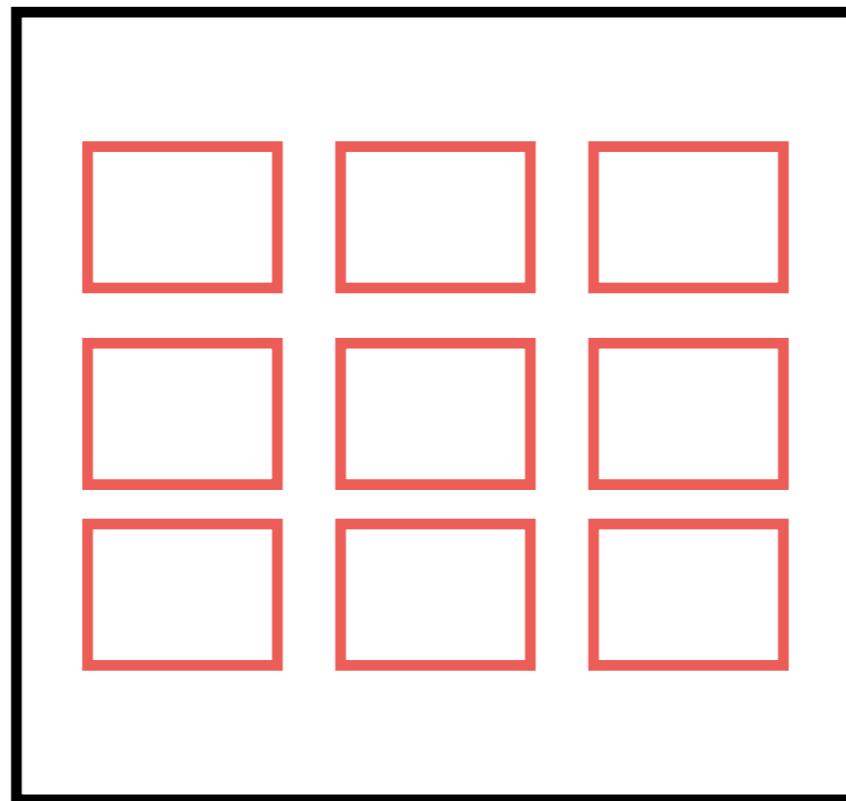
Monolithic Architecture



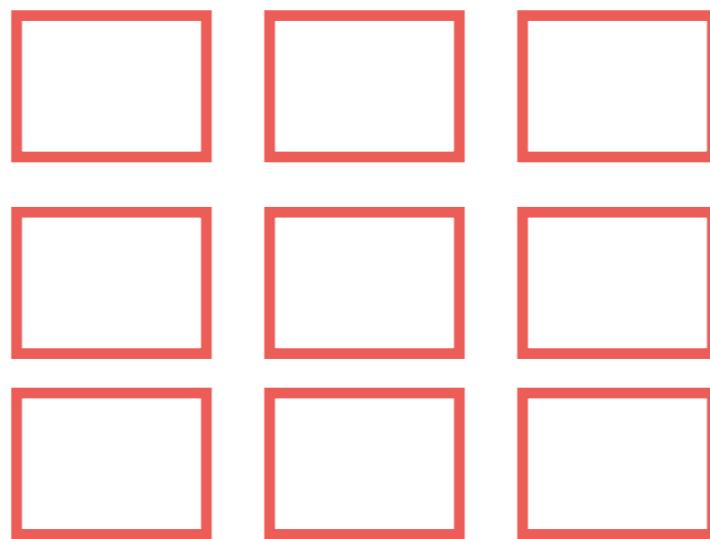
Microservice Architecture



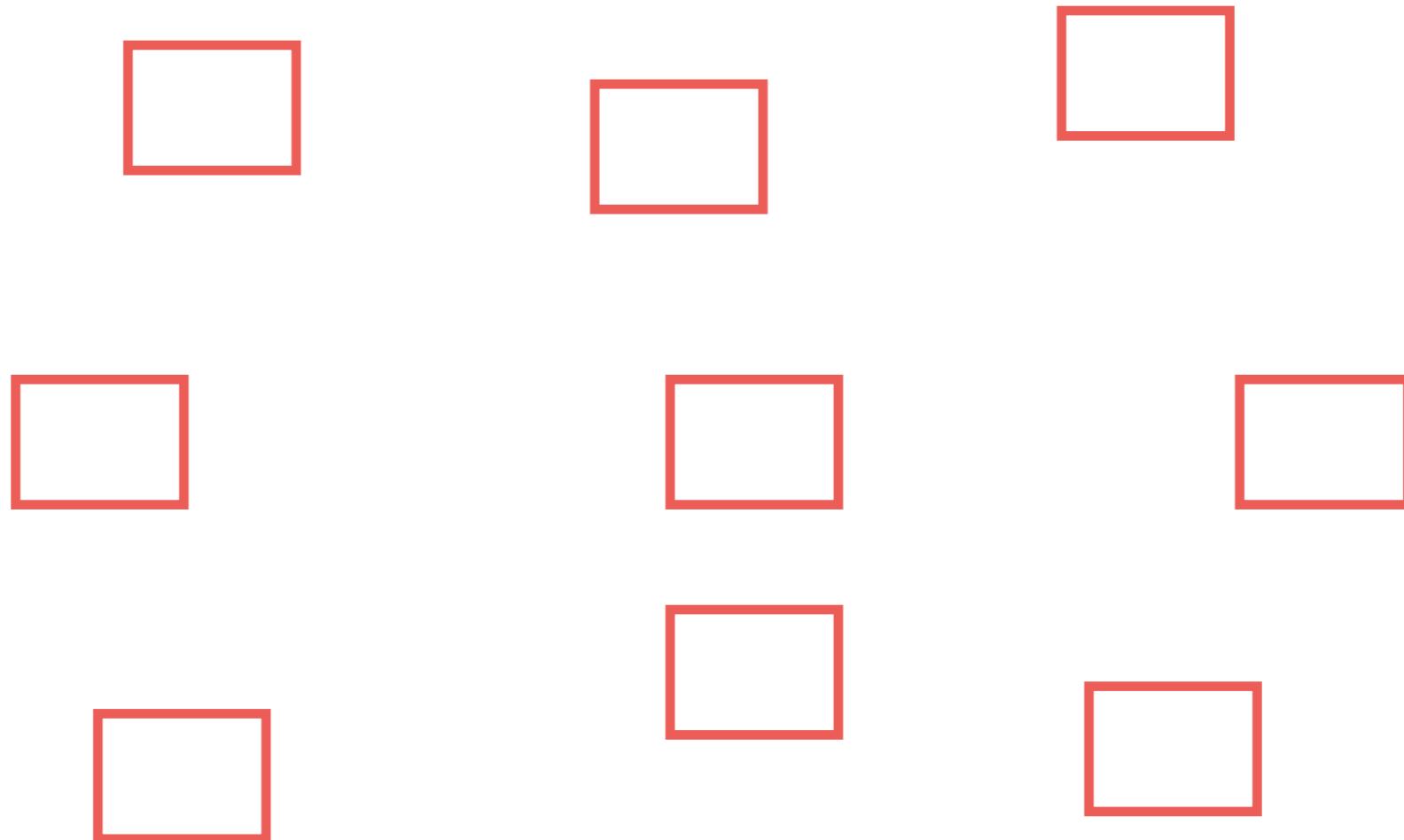
Microservice



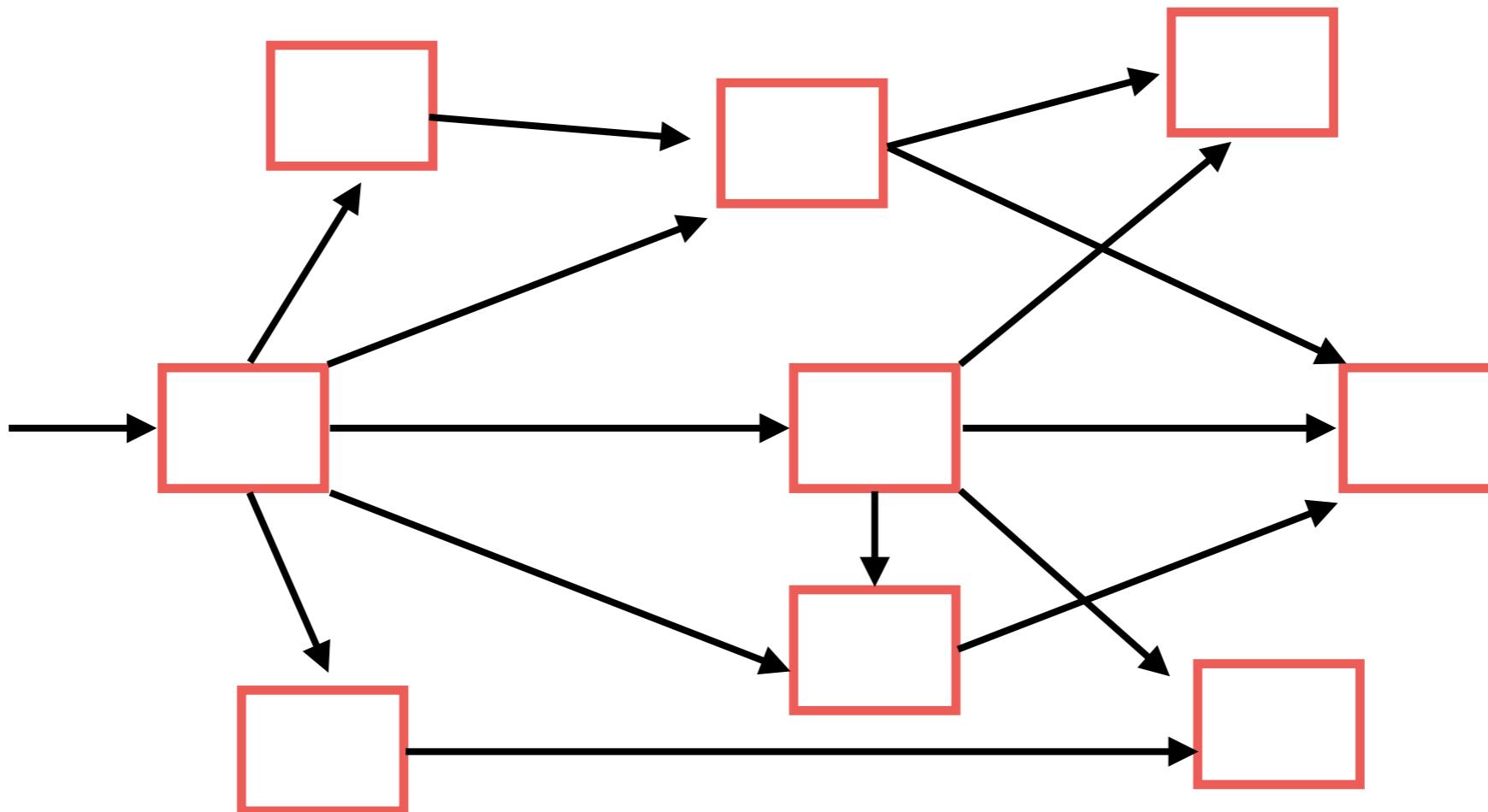
Microservice



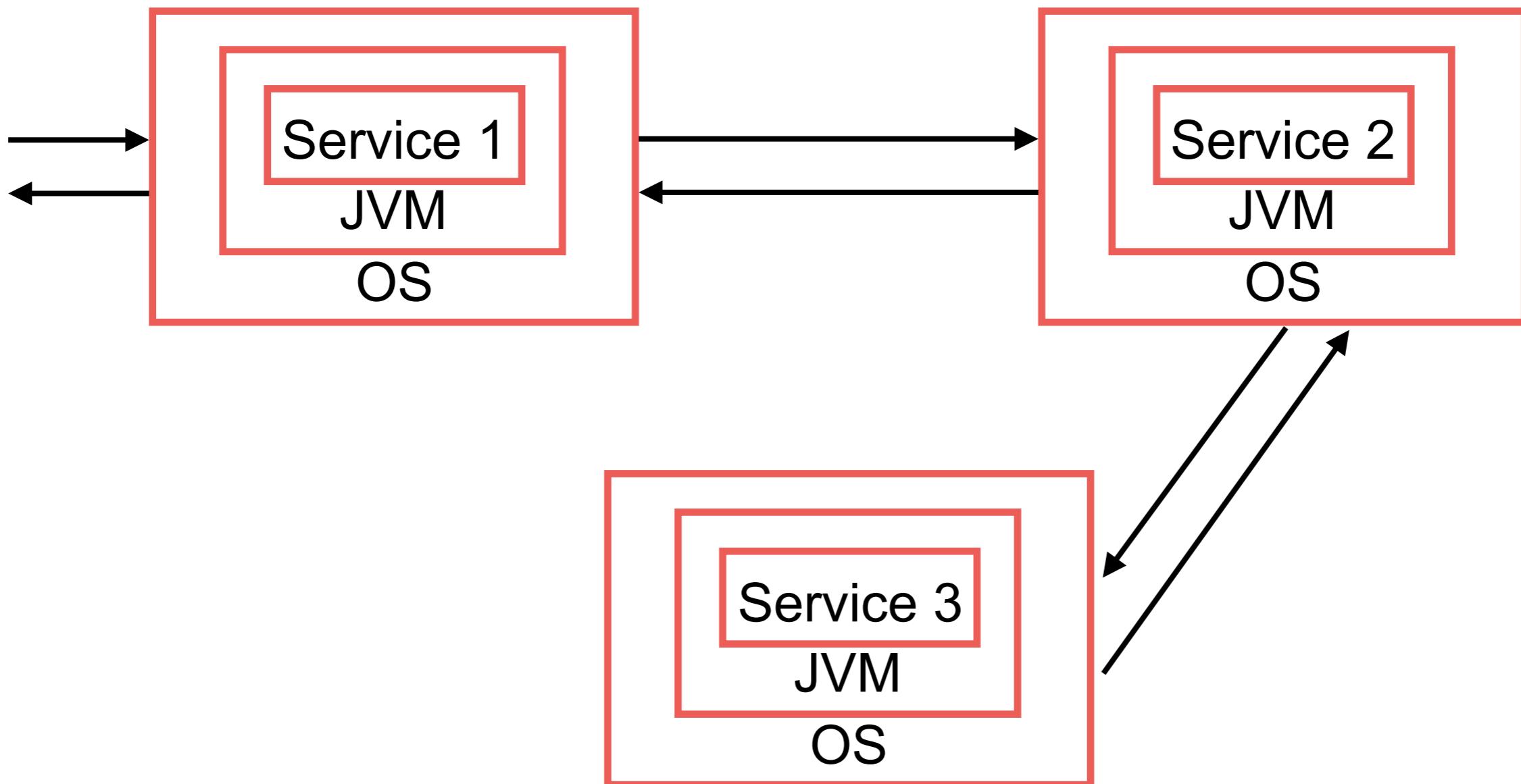
Microservice



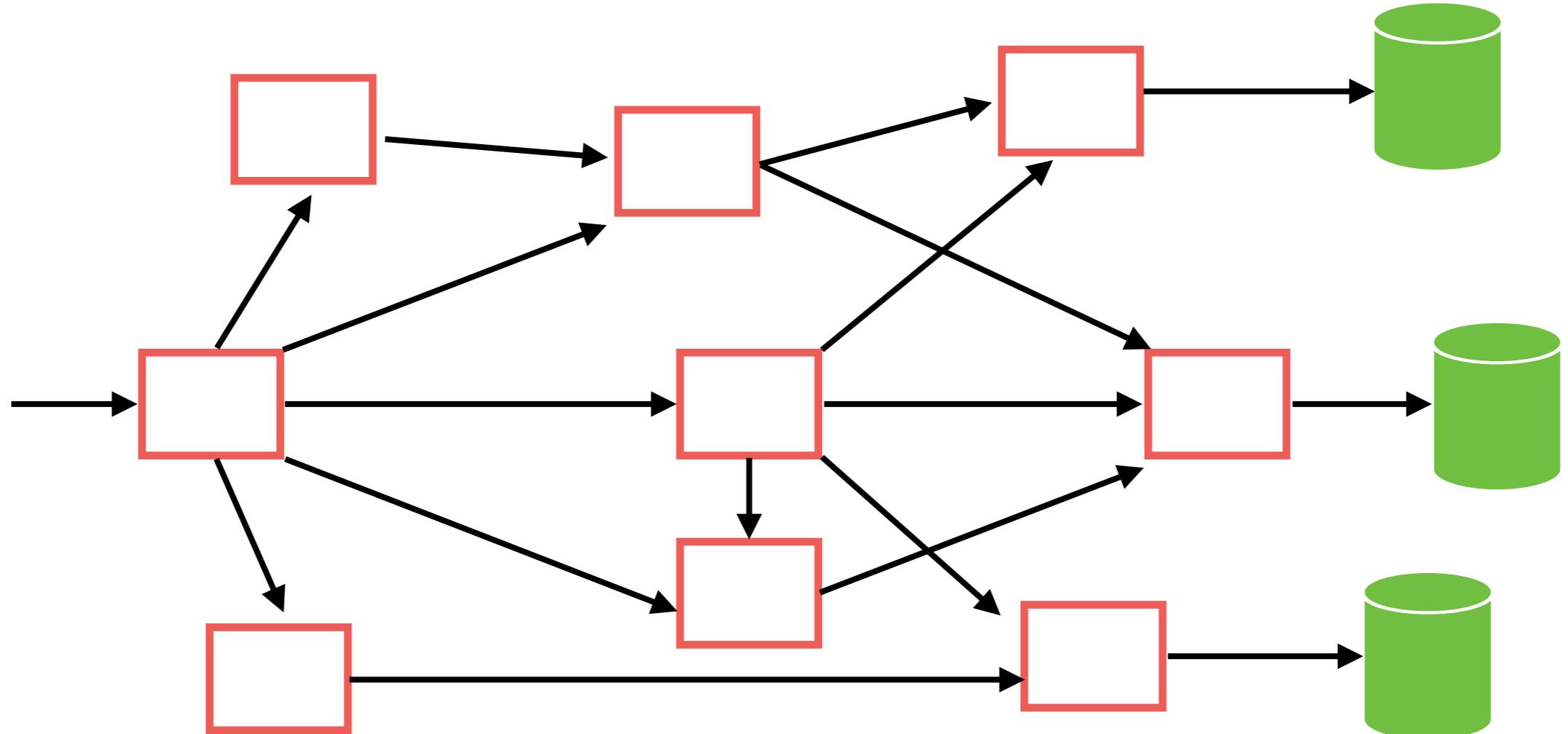
Microservice == Distributed



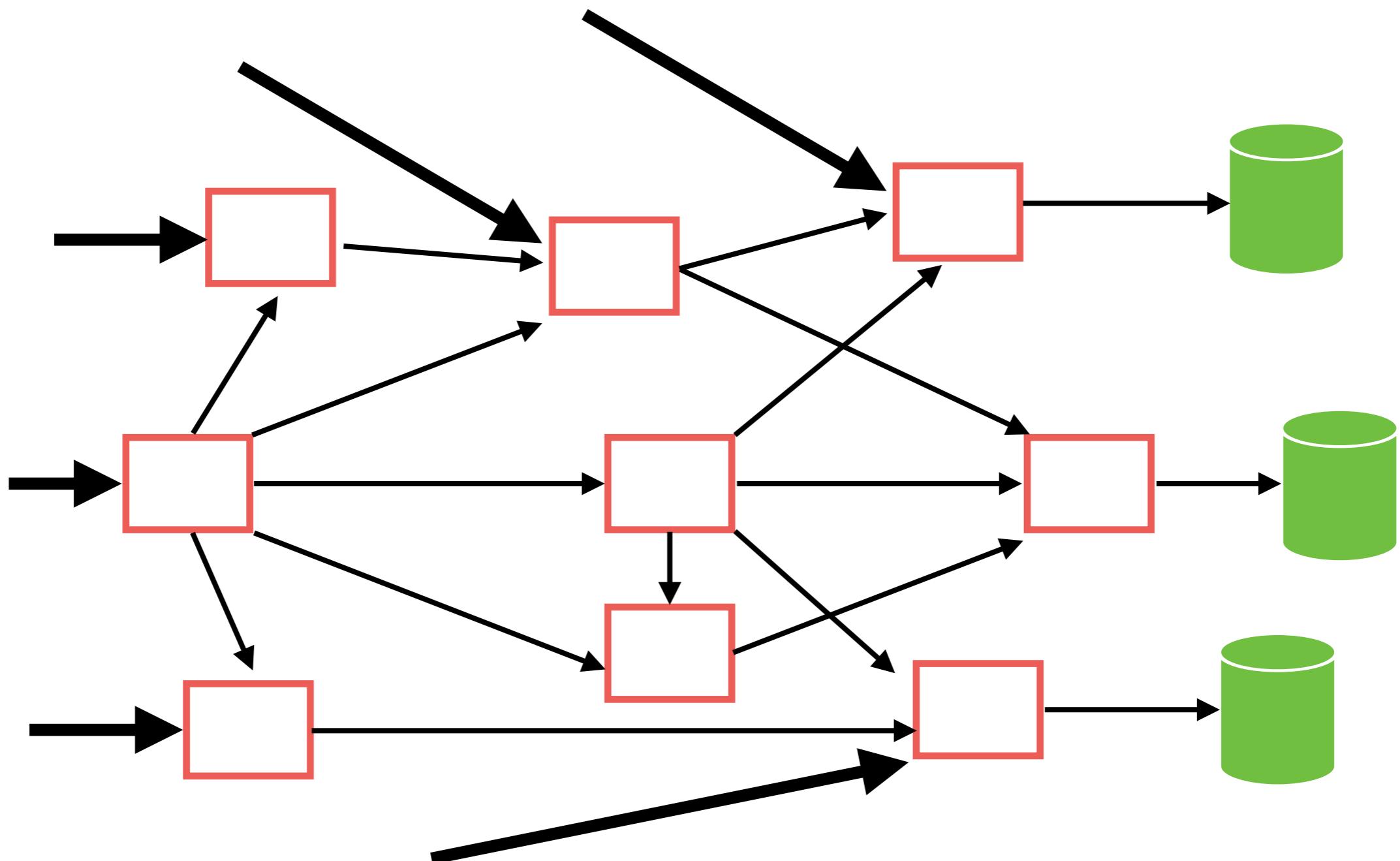
Network of services



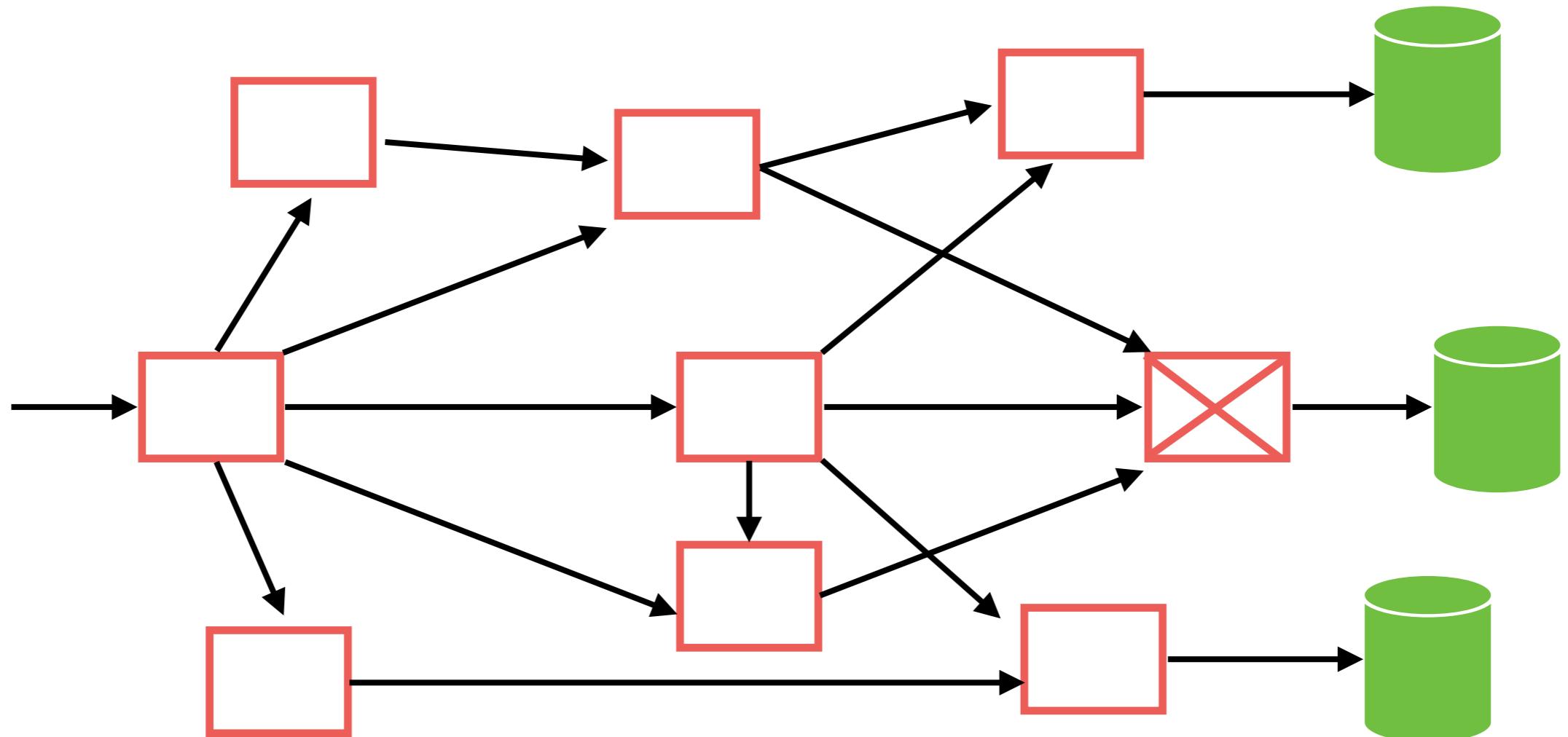
Own data



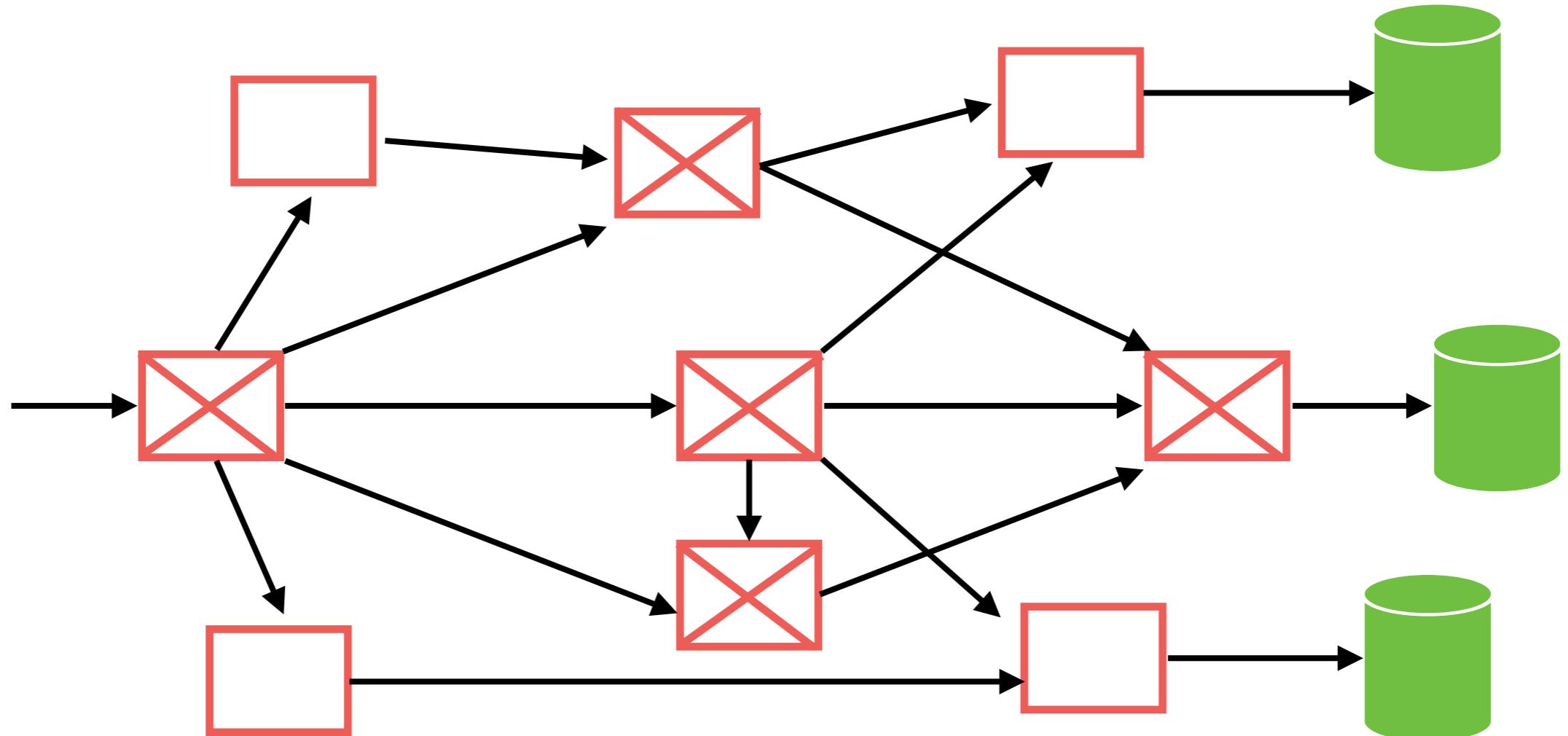
Multiple entry points



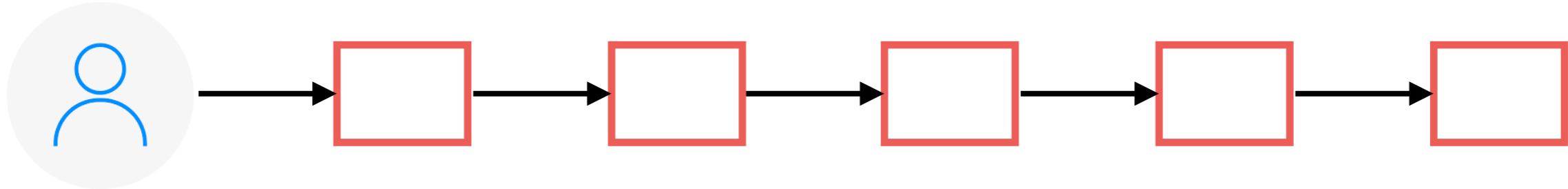
Failure !!



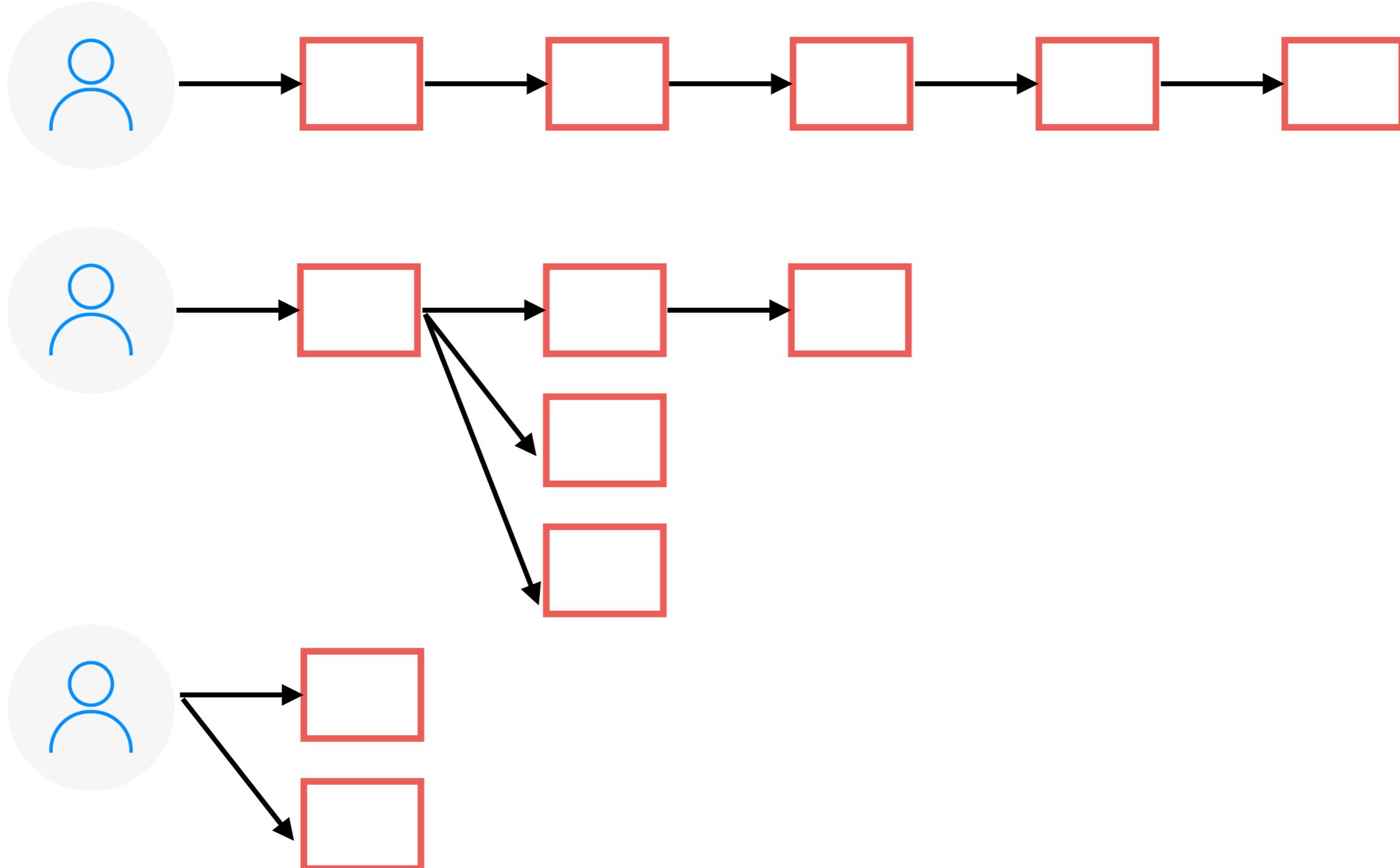
Cascading Failure !!



Service Dependencies



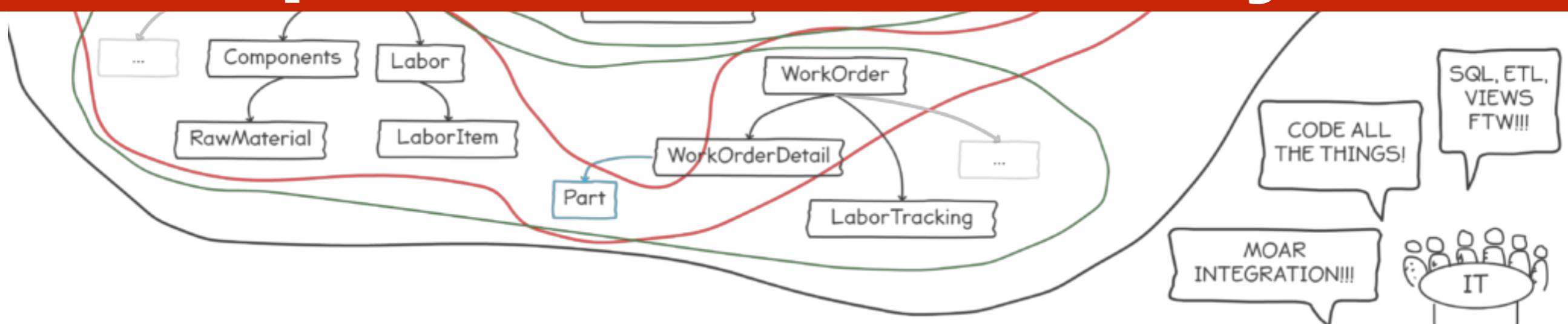
Service Dependencies



Microservice Hell



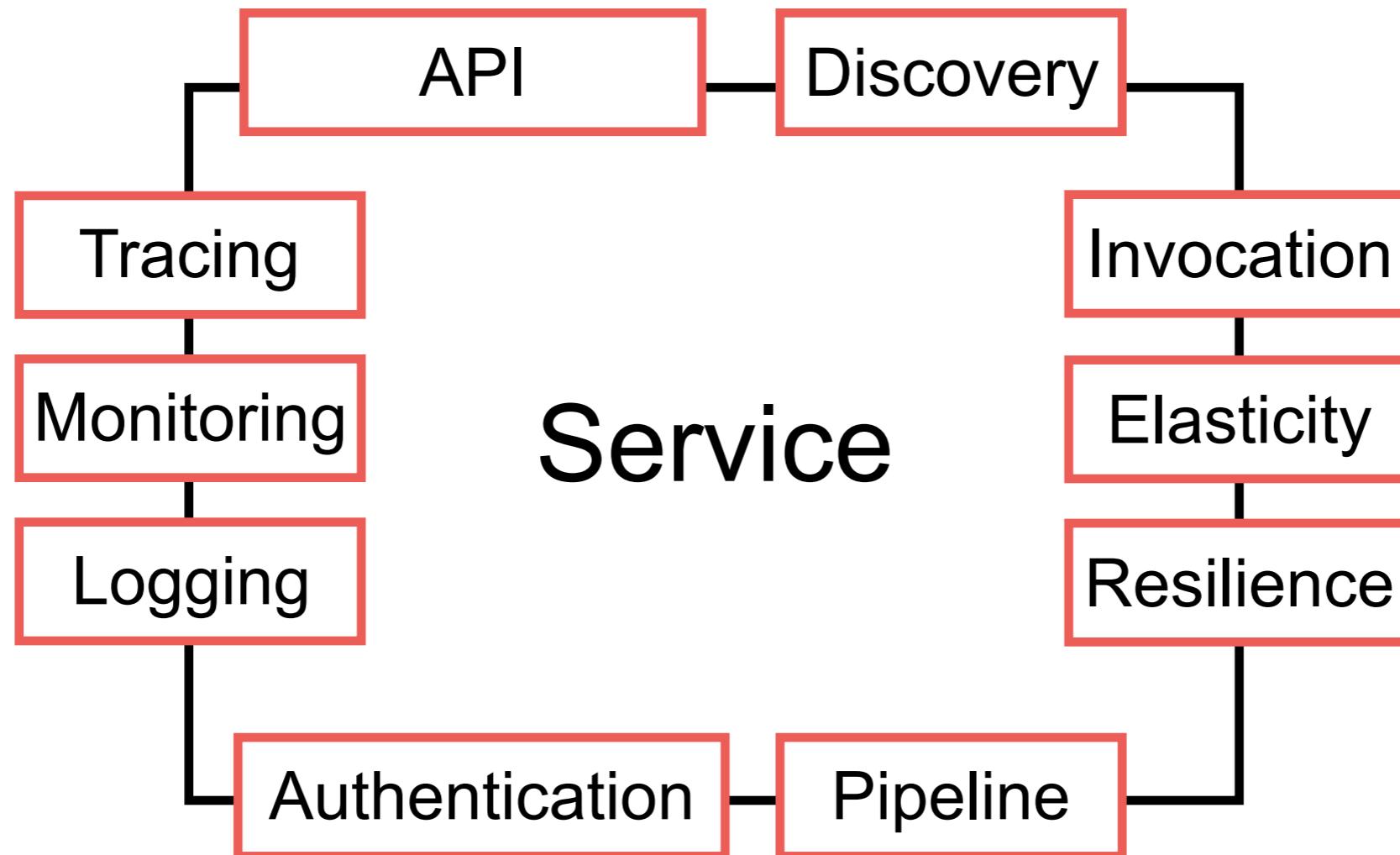
Dependencies will kill you



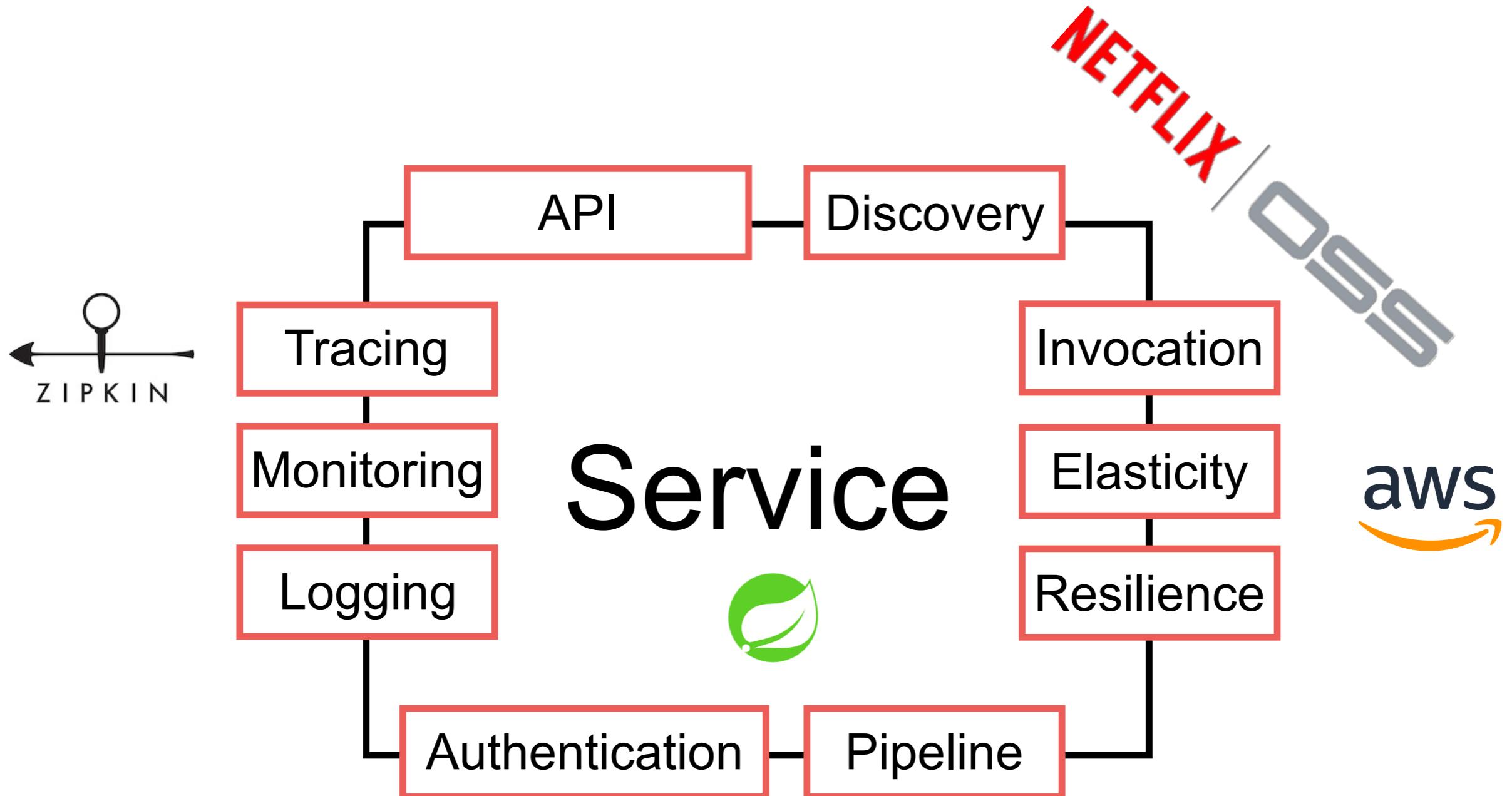
Properties of Microservice



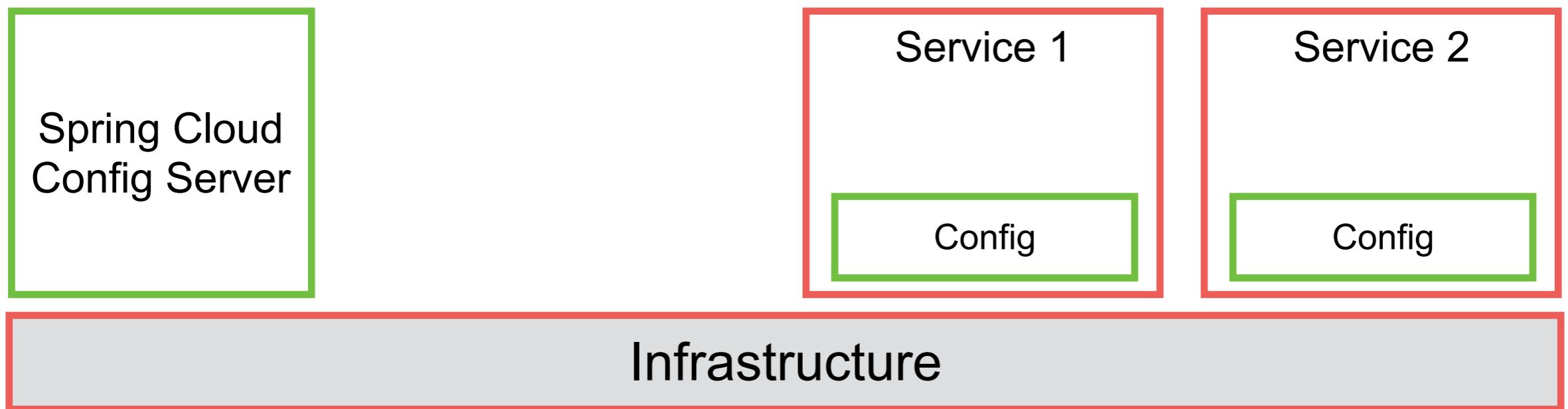
Properties of Microservice



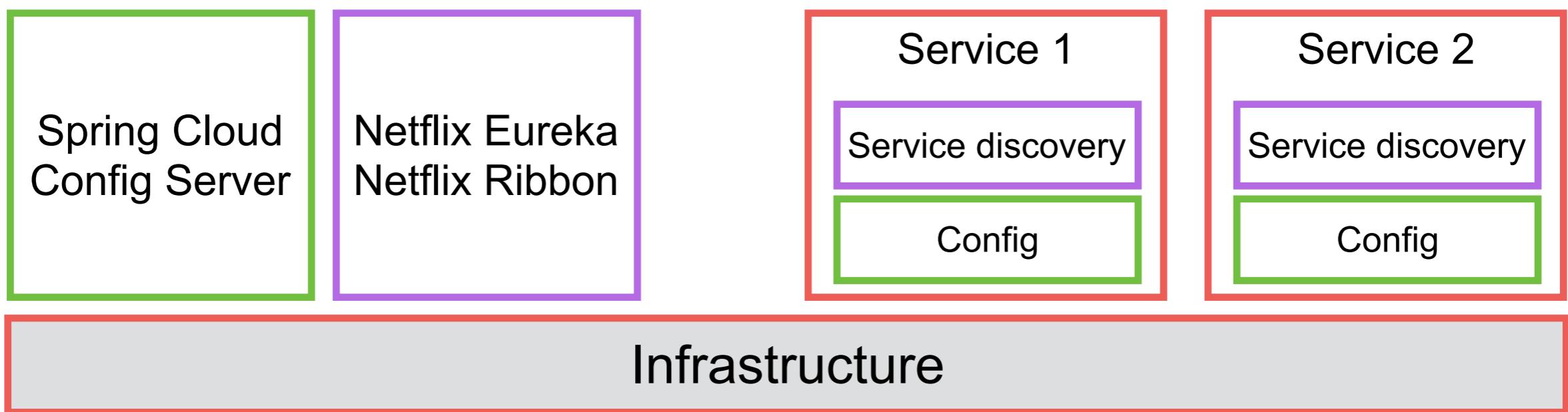
Microservice 1.0



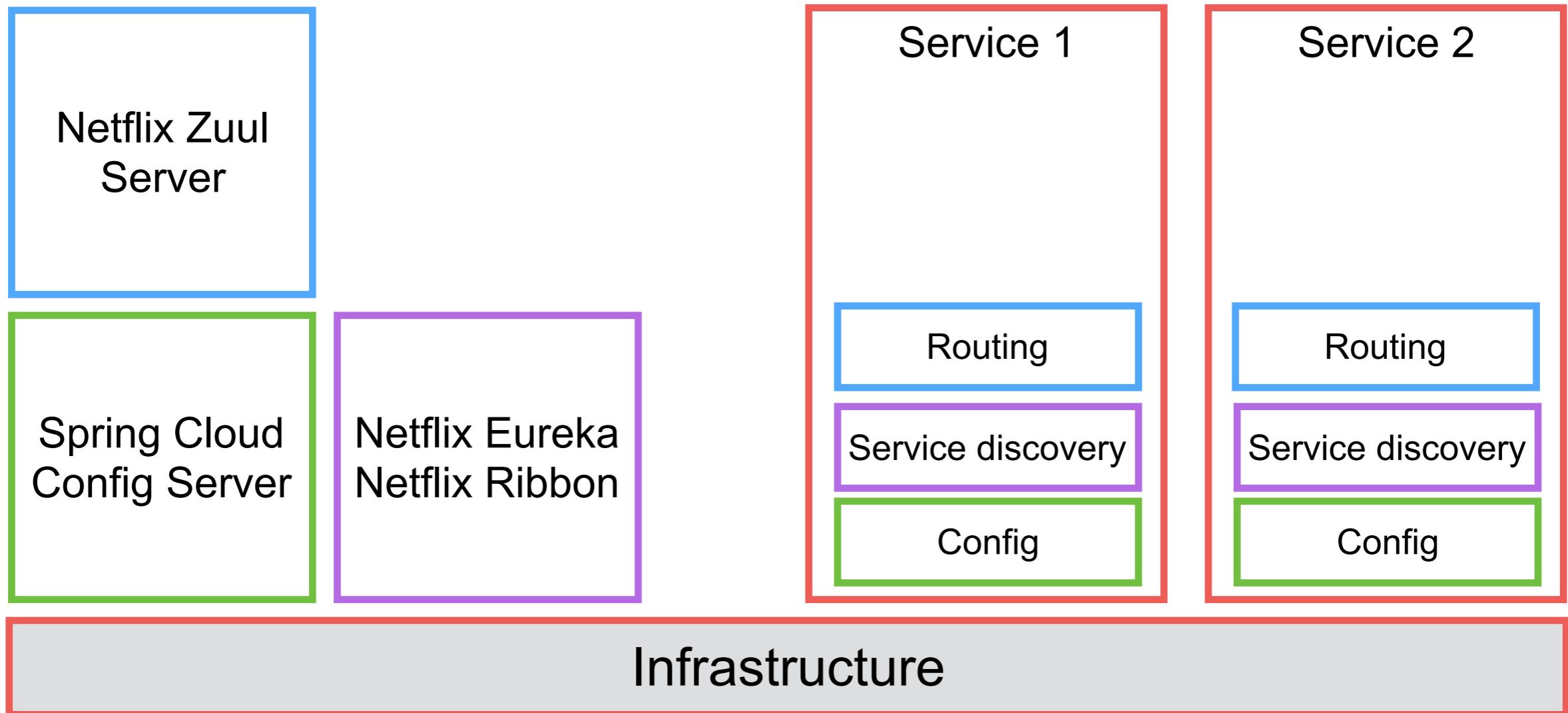
Configuration



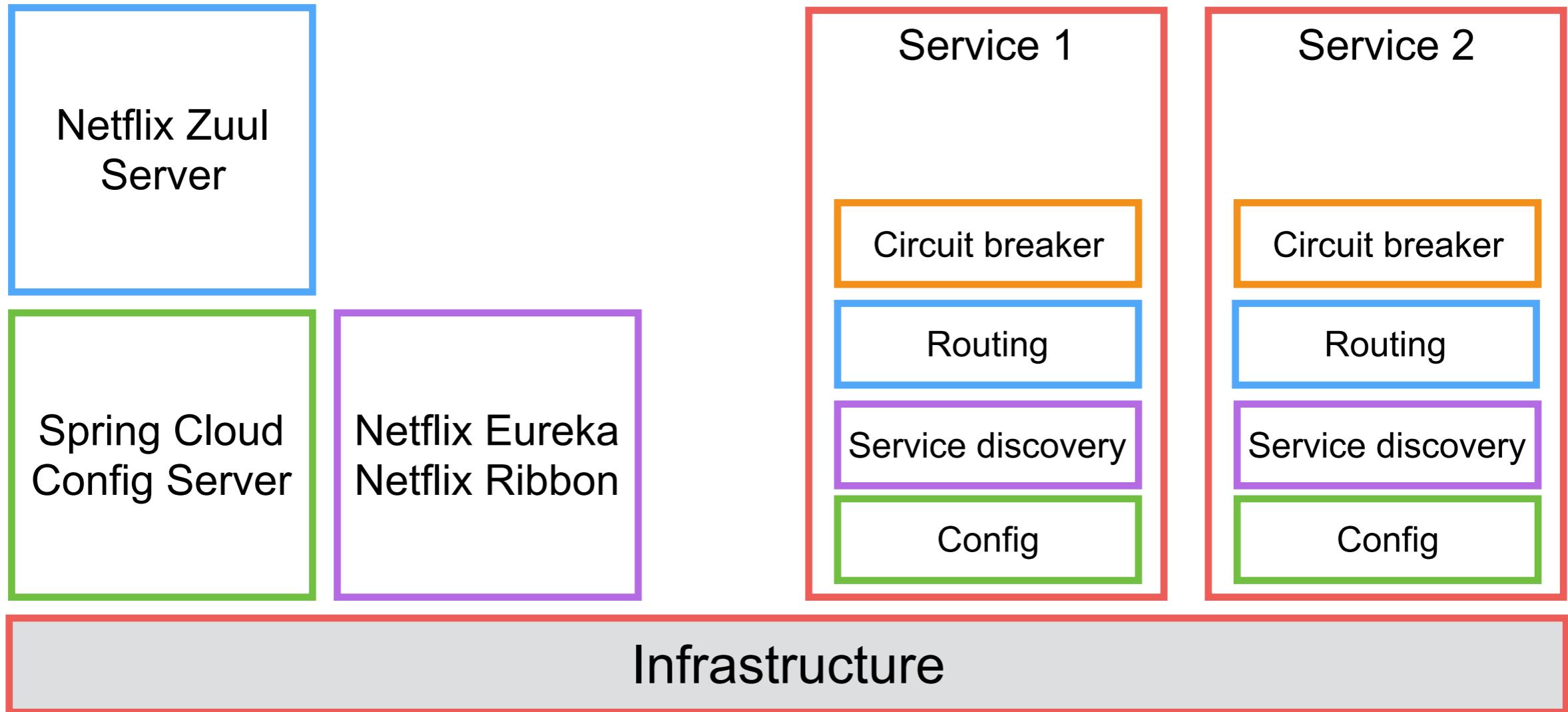
Service Discovery



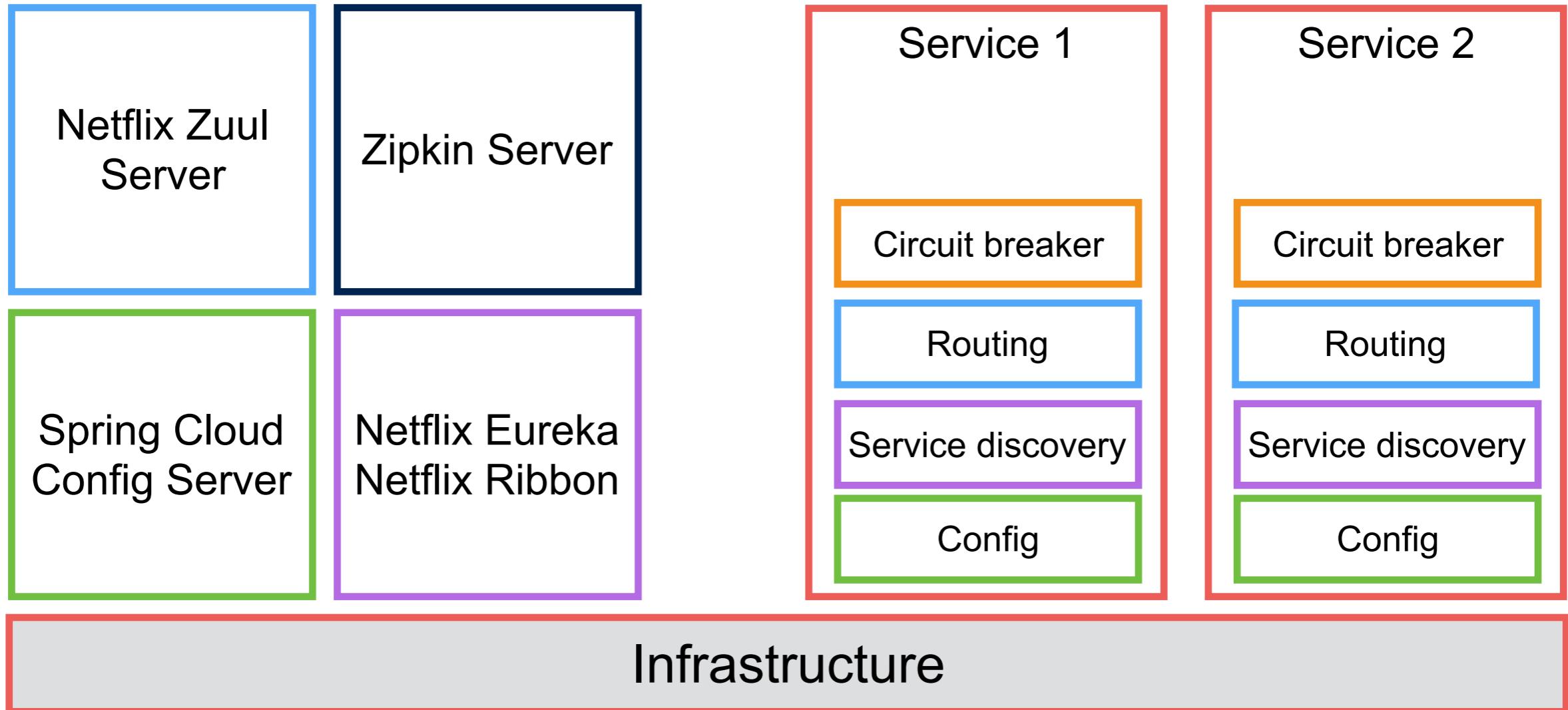
Dynamic Routing



Fault Tolerance



Tracing and Visibility



Microservice 1.0

JVM only

Add libraries to your code/service

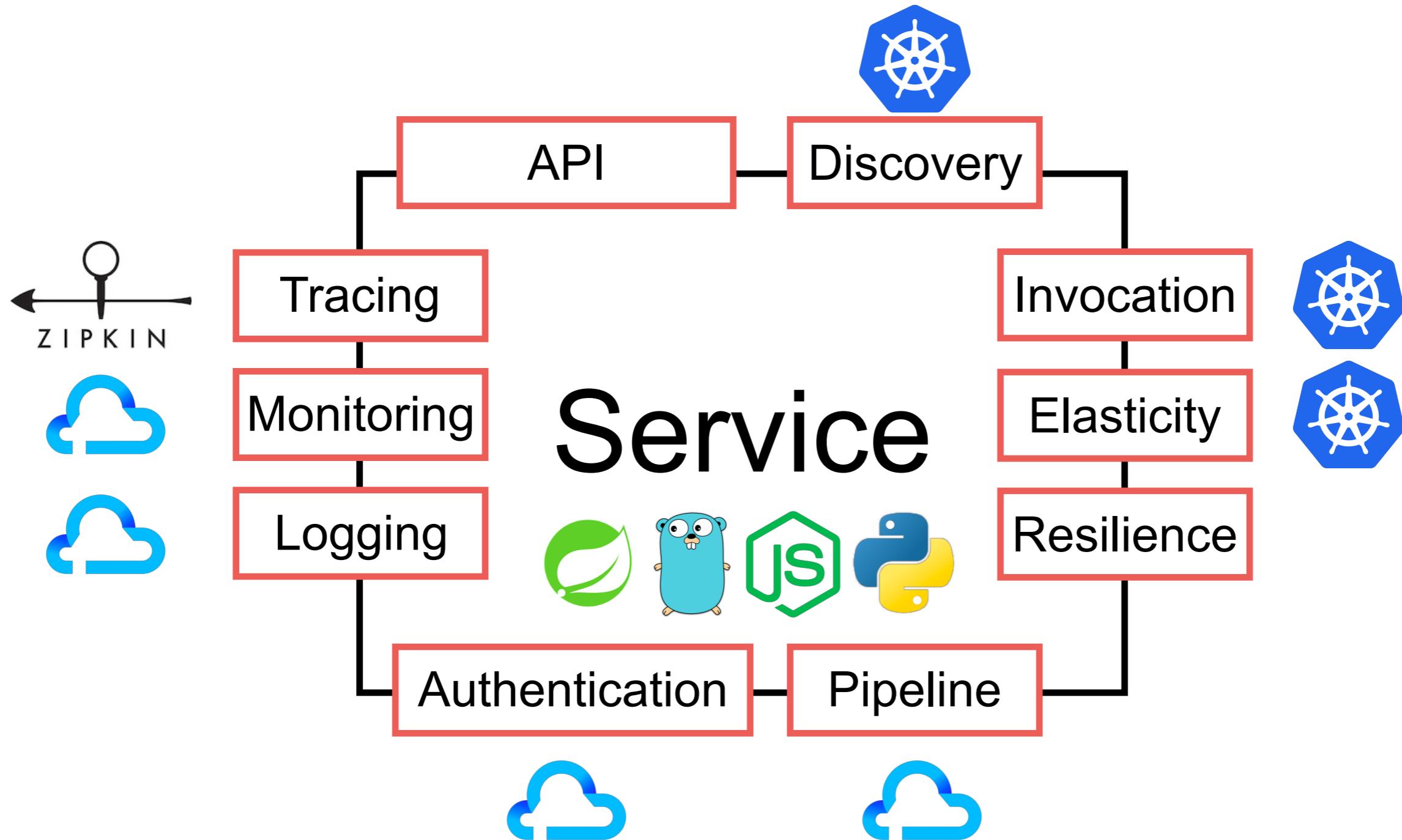


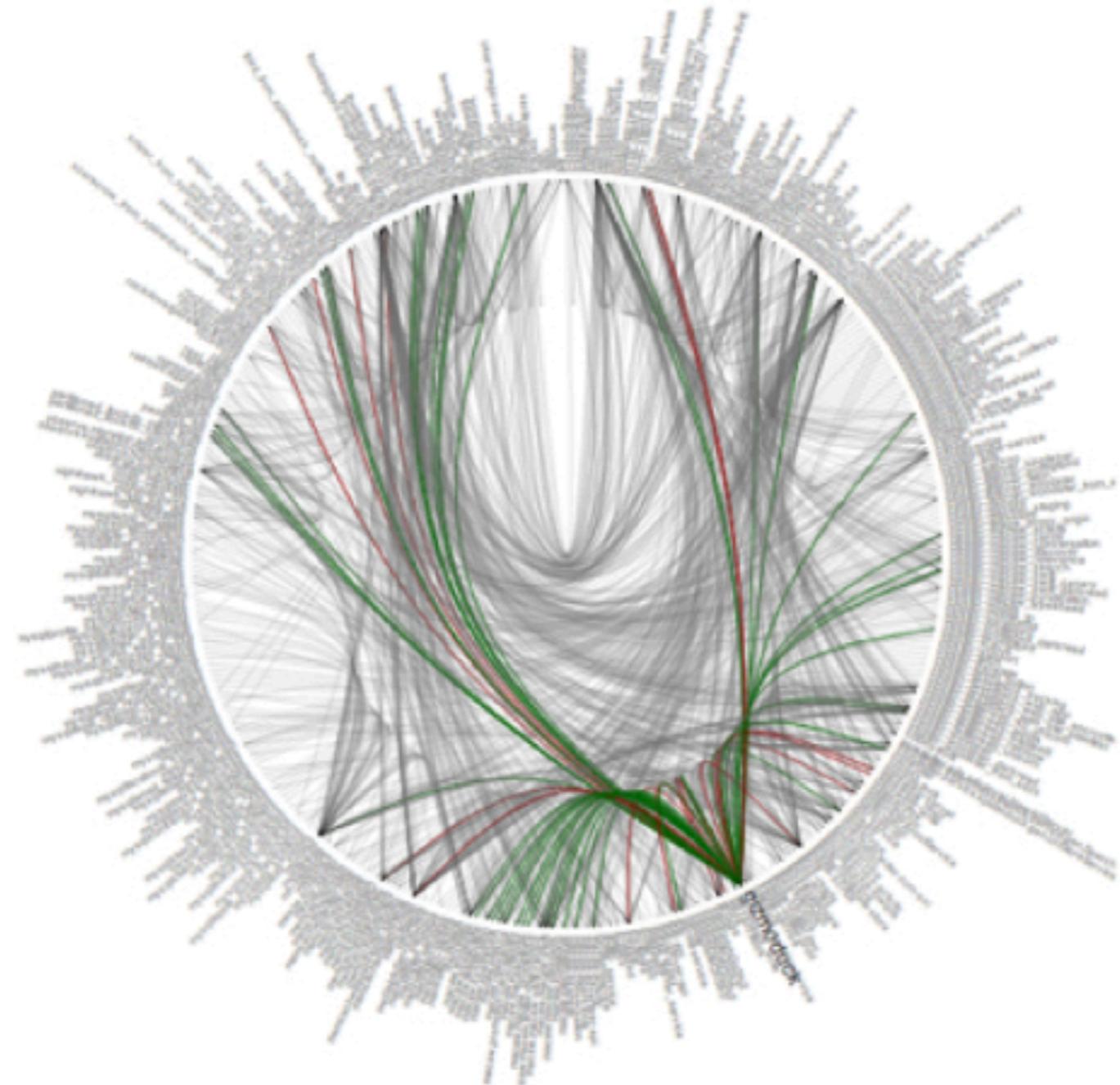


kubernetes



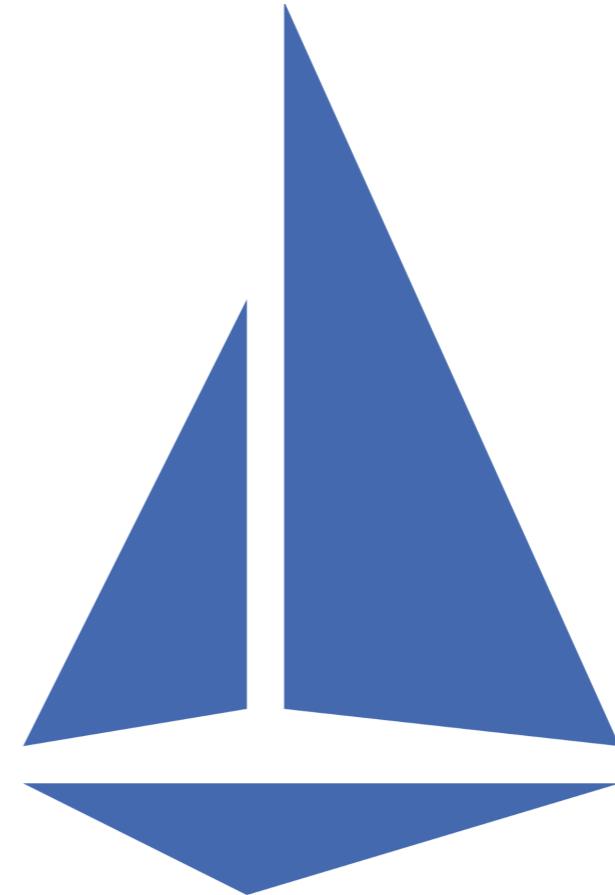
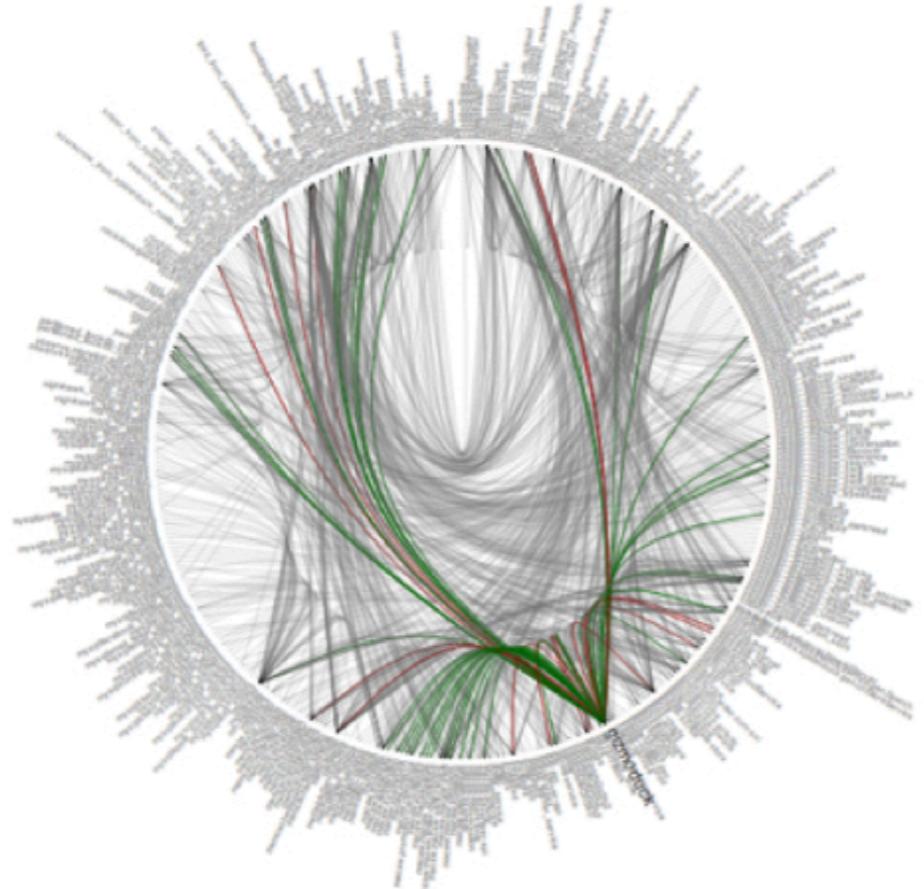
Microservice 2.0





Service Mesh

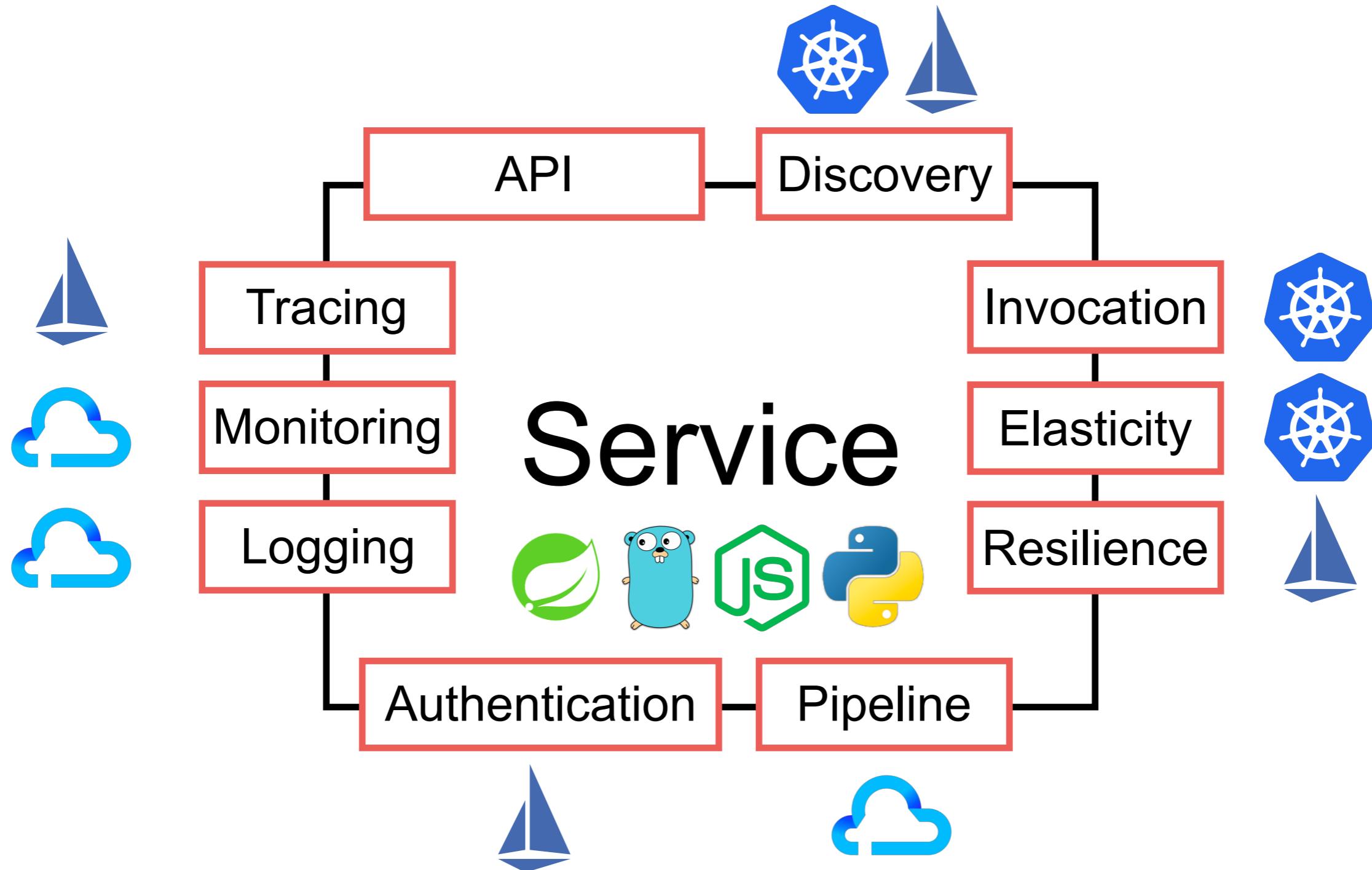




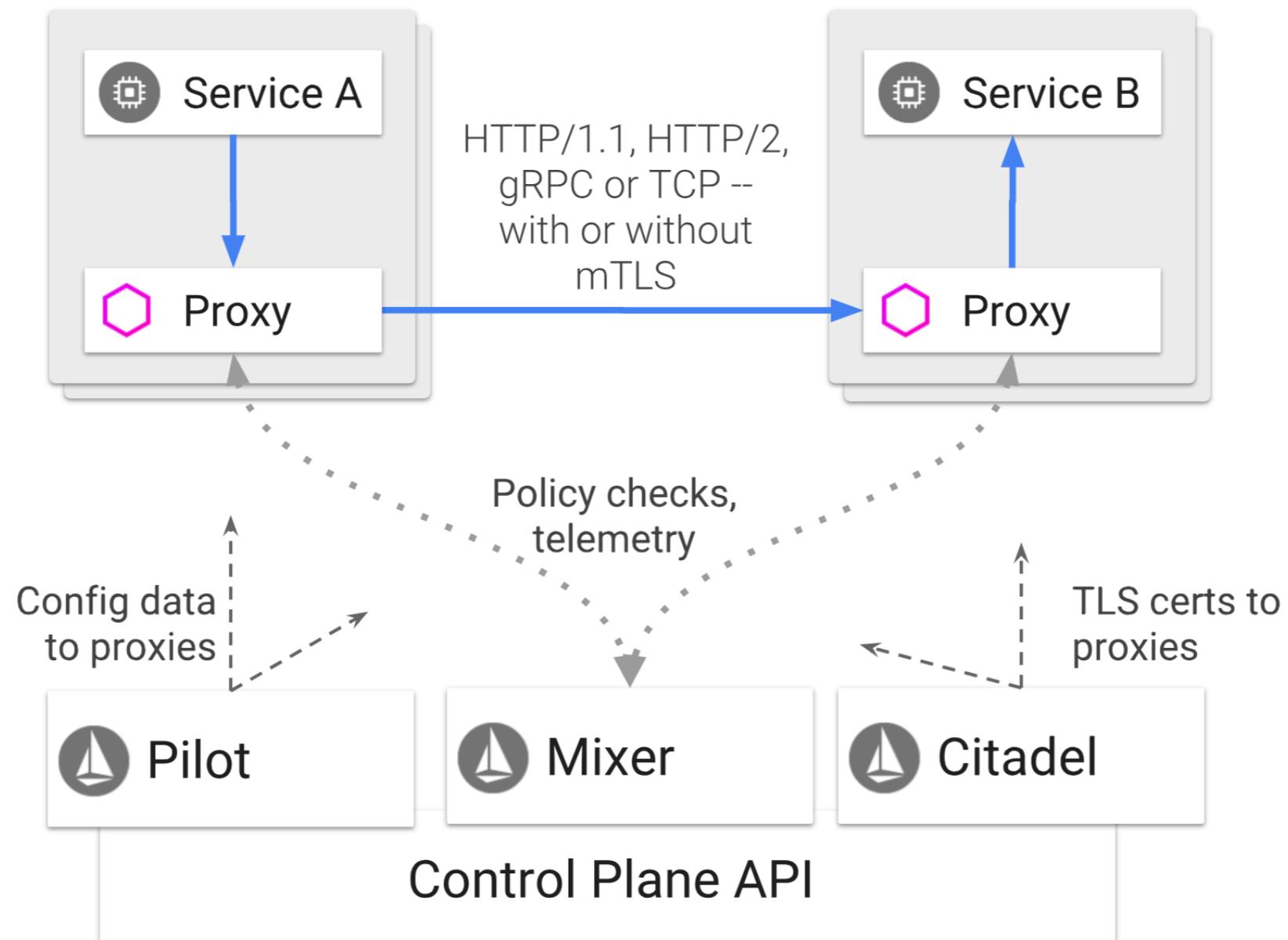
Service Mesh with Istio



Microservice 3.0



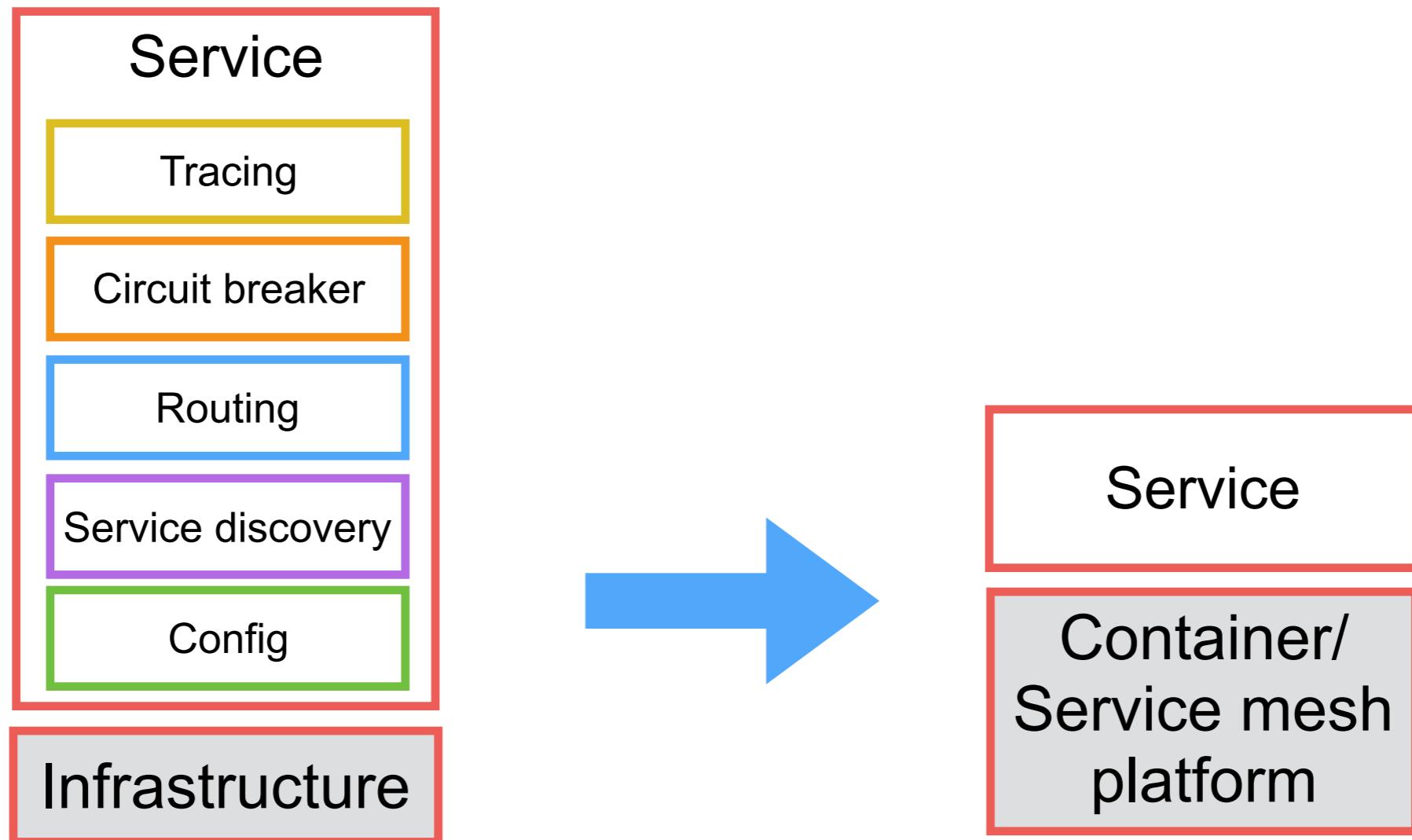
Istio



<https://istio.io/docs/concepts/what-is-istio/>



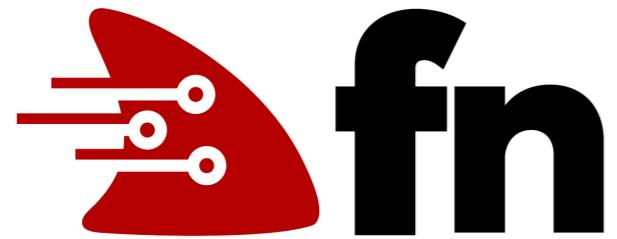
Microservice Evolution



Function-as-a-Service (FaaS)



Microservice 4.0 == FaaS



OPENFAAS



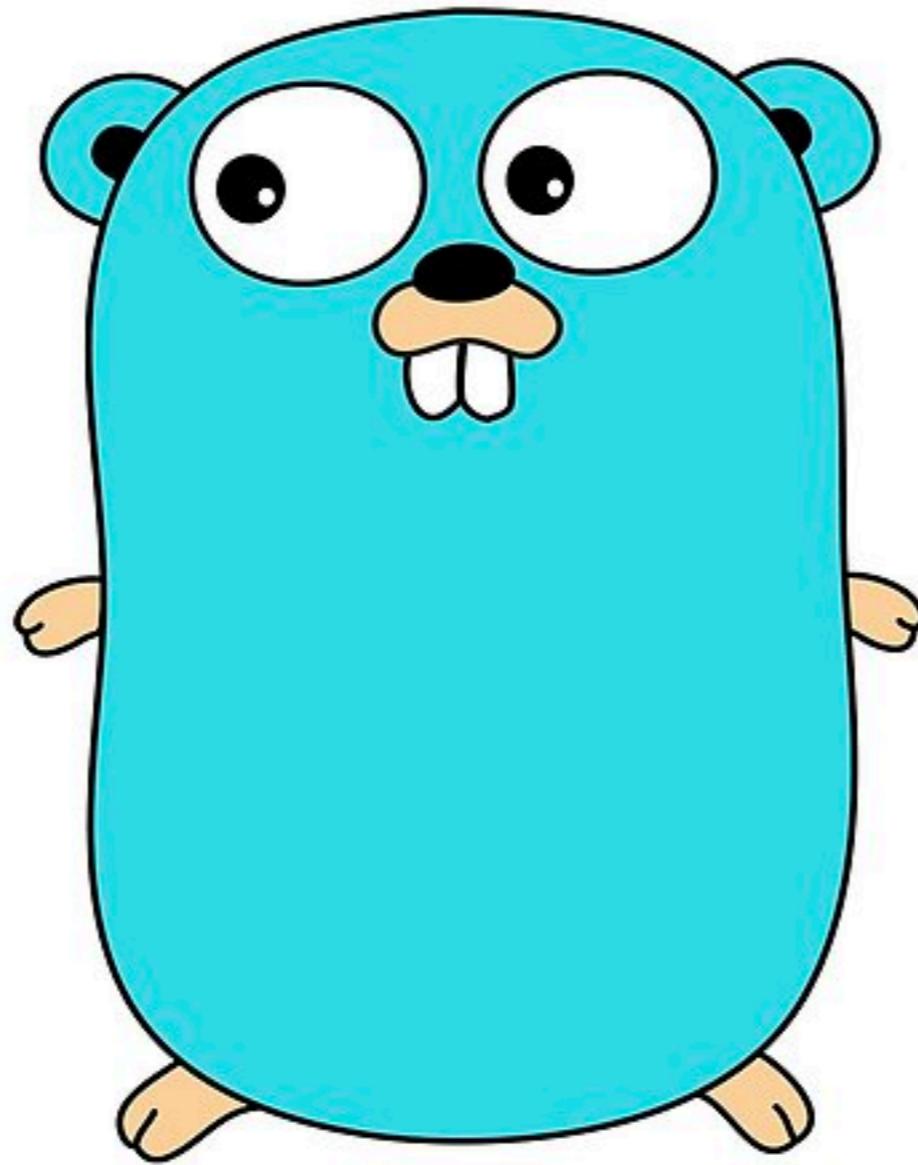
APACHE
OpenWhisk™



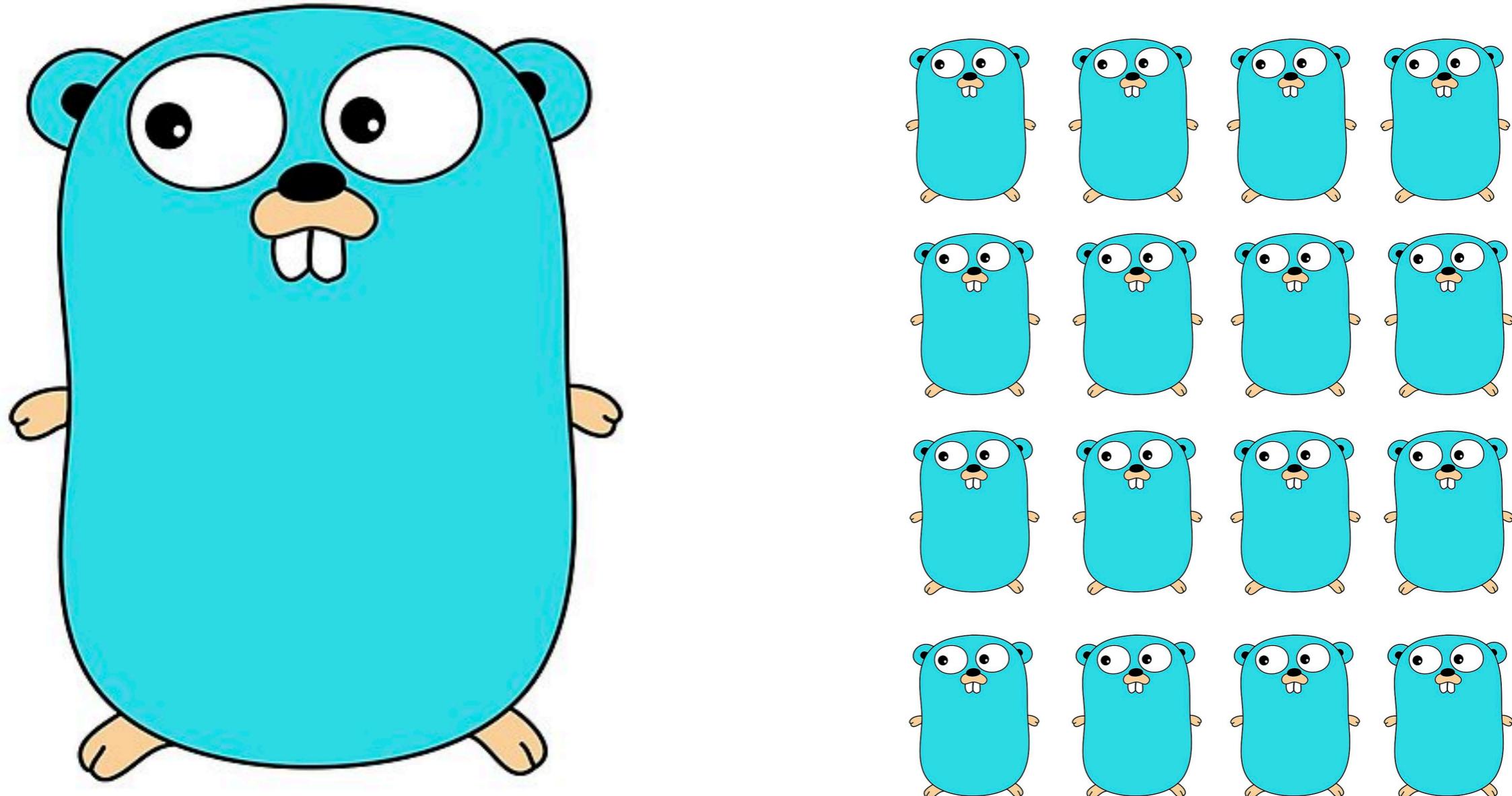
Back to Microservice with Go



Monolith



Microservice



Go missing !!

Transport library to solve RPC problem
Standard logging

Generic interface for service discovery, event stream ...

Hard to work with other team



Goa

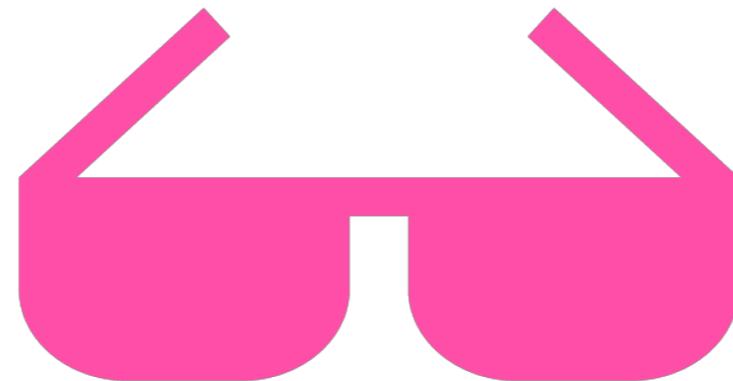
Twirp

Go-kit

Go-micro

dgota

Gizmo



awesome

<https://awesome-go.com/>



Focus on outcome
Not on tools/technologies



Composition over Inheritance



Library over Framework



Go-kit



Go kit

A toolkit for microservices

[Home](#) [Examples](#) [FAQ](#) [Blog](#) · [GitHub](#) [GoDoc](#) [Slack](#) [Mailing list](#)

🚀 Adopt Go in your organization.

Go is a lovely little language that's perfectly suited to writing microservices. Go kit fills in the gaps left by the otherwise excellent standard library, giving your team the **confidence** to adopt Go throughout your stack.

🔍 Focus on your business logic.

Adopting microservices means building a distributed system, and that comes with a lot of challenges. Go kit provides **guidance and solutions** for most of the common operational and infrastructural concerns. Allowing you to focus your mental energy on your business.

😊 Few opinions, lightly held.

You know your domain and context better than anyone. Go kit is lightly opinionated, and was designed for **interoperability** from day one. Use the databases, components, platform, and architecture that works best for you.

👥 Similar to...

[Finagle](#) · [Dropwizard](#) · [Spring Boot](#) · [Netflix Eureka](#) · [Ribbon](#) · [Hystrix](#) · [Nameko](#)

🌐 Plays nice with...

[Kubernetes](#) · [Mesos](#) · [Marathon](#) · [DC/OS](#) · [Docker](#) · [Docker Swarm](#) · [Heroku](#)

Why Go?

Go is designed from first principles to advance the practice of software engineering. It's easy to learn, easy to master, and — most importantly — easy to maintain, by large and dynamic teams of engineers. And with highly-efficient concurrency, an expansive standard library, and a steadily-improving runtime, it's practically the perfect language for writing microservices.

Why microservices?

Almost all of contemporary software engineering is focused on the singular goal of improving time-to-market. Microservices are an evolution of the service-oriented architecture pattern that elegantly eliminate organizational friction, giving your engineers and teams the autonomy they need to continuously ship, iterate, and improve.

Why Go kit?

Go is a great general-purpose language, but microservices require a certain amount of specialized support. RPC safety, system observability, infrastructure integration, even program design — Go kit fills in the gaps left by the standard library, and makes Go a first-class language for writing microservices in any organization.



Microservices

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Go-kit

Collections of Go packages
Robust
Reliable
Maintainable



Go-kit

Observability and resiliency pattern



Go-kit

Observability and resiliency pattern

- Logging
- Tracing
- Metric

Circuit-breaker

- Rate-limit

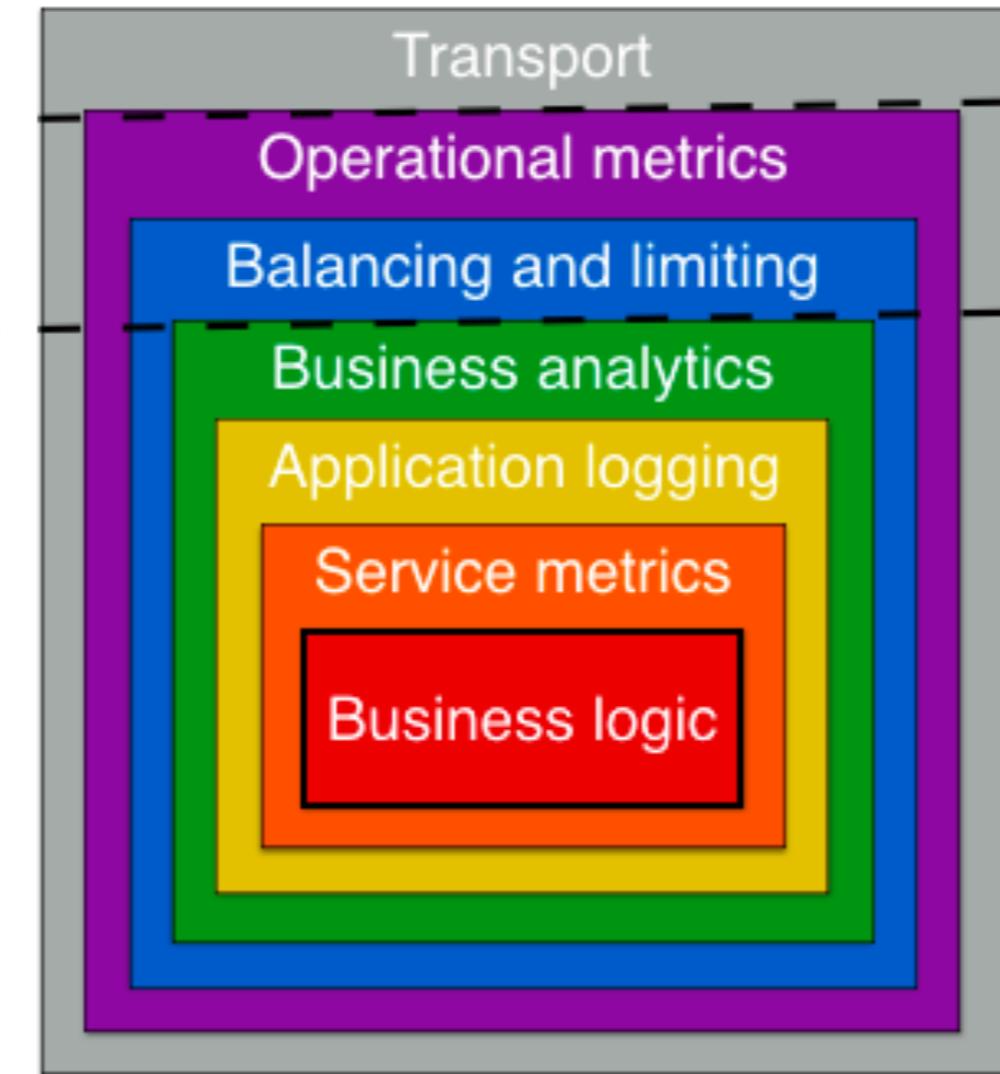


Goals of Go-kit

No global state
Composition
Explicit dependencies
Interface as contract



Go-kit :: Library



Go-kit :: Library

Transport Layer

Endpoint Layer

Service Layer



Transport Layer

Interaction between services
Synchronous
Asynchronous



Transport Layer

HTTP/REST, gRPC
Pub/Sub, AMQP, NATS, Thrift



Endpoint Layer

Expose service via endpoint

Single endpoint can be using multiple transports



Service Layer

Business logic



Demo with Go-kit



Installation !!!

github.com/go-kit/kit/transport

github.com/go-kit/kit/endpoint

github.com/go-kit/kit/metrics

github.com/go-kit/kit/ratelimit

github.com/go-kit/kit/log

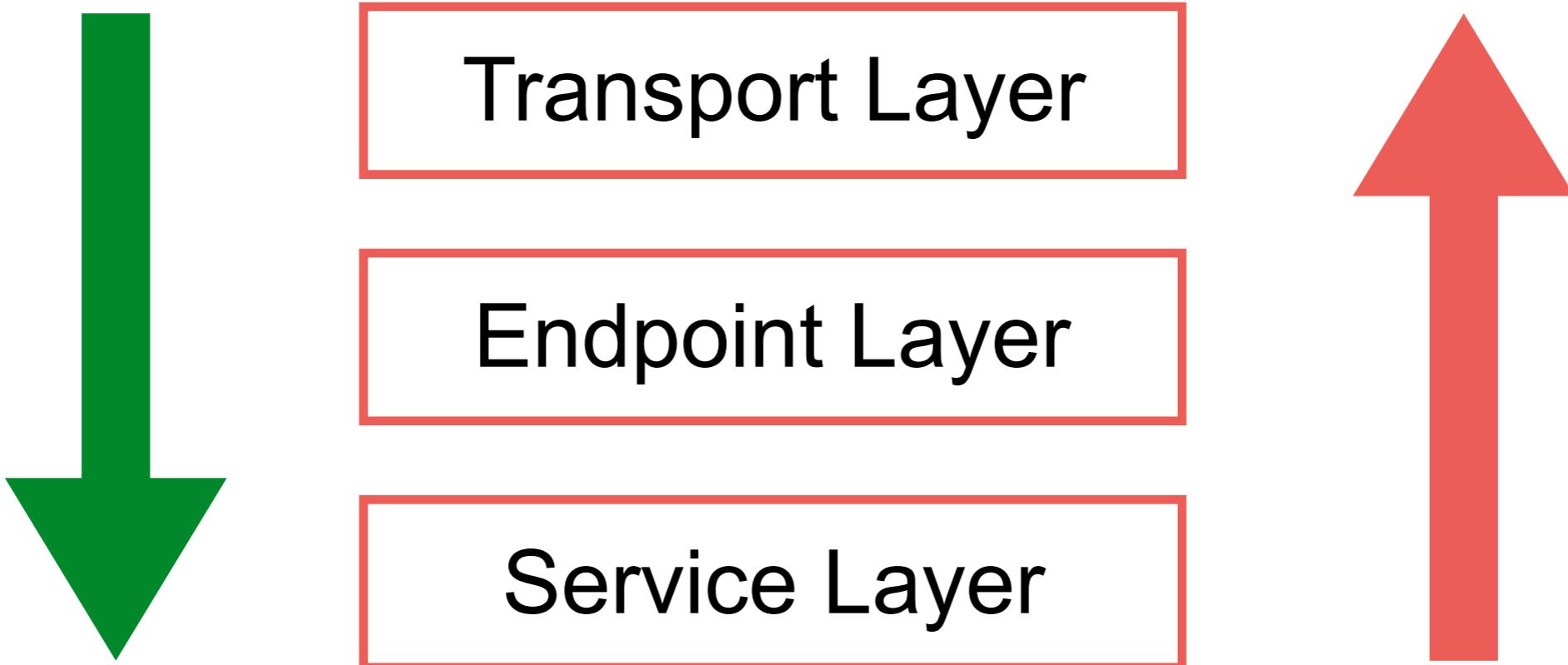
github.com/go-kit/kit/circuitbreaker

...

...



Development



Summary



Let's start with good monolith



Module 1

Module 2

Module 3

Module 4

Module 5

Module 6



Find your problem



Module 1

Module 2

Module 3

Module 4

Module 5

Module 6



Module 1

Module 2

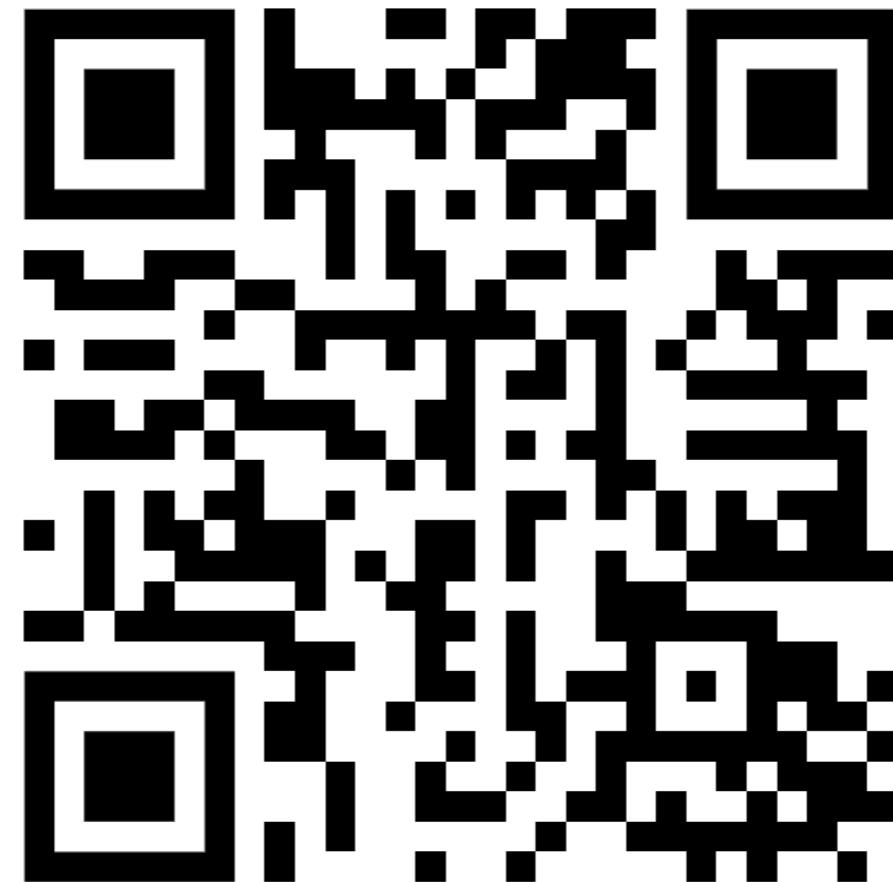
Module 3

Module 5

Module 6

Module 4





<https://github.com/up1/go-get-microservice-meetup>

