Microservices to Service Mesh

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Important Notes

- Key Takeaways
  - Evolution of Software Development in NashTech
  - Software Developer Craftsmanship
  - Cloud Native
  - Service Mesh
  - Myth from Modern Era
- What is NOT?
  - Asynchronous Communication
  - Eventually Consistency Mechanism for Data
  - Stateful Service or Application
  - Testing Strategy in distributed system
- Q&A

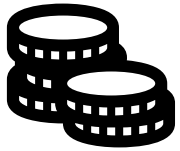
Evolution of Software Development in NashTech

Let’s begin with what NashTech’ Solution Architects do so far…

Requirements



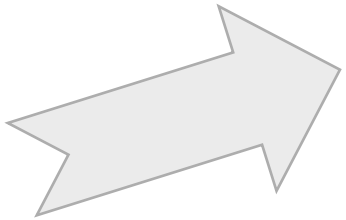


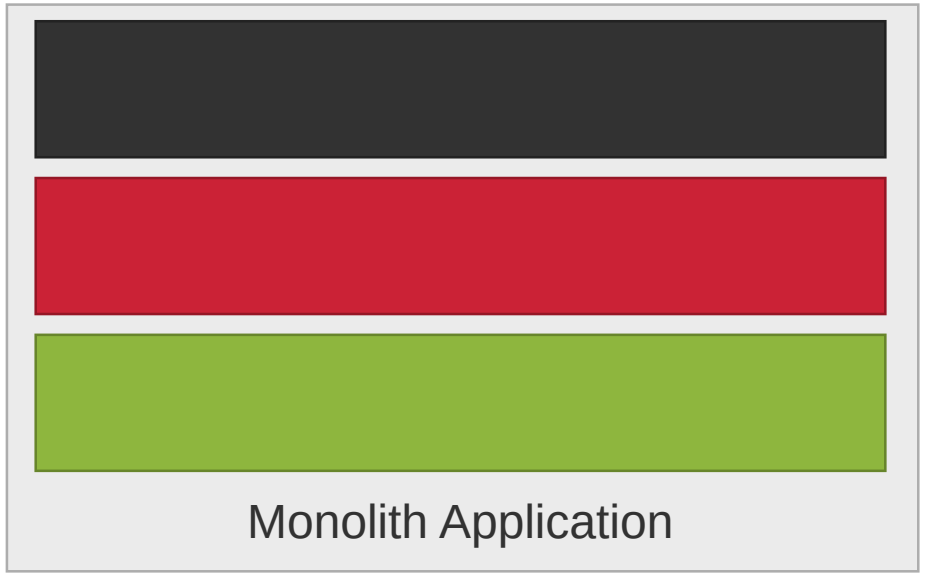




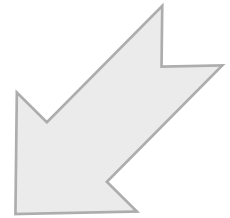

NashTech Story

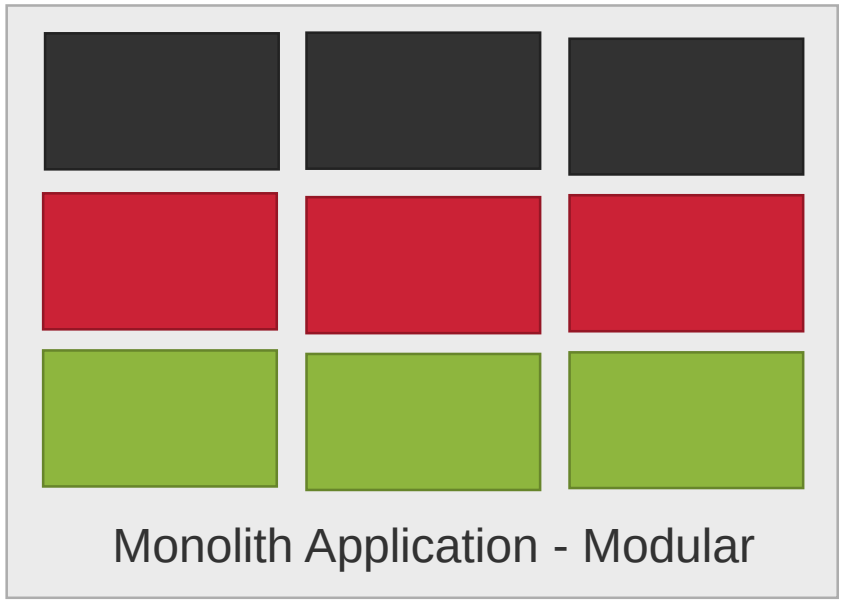
~ ➔ 2015





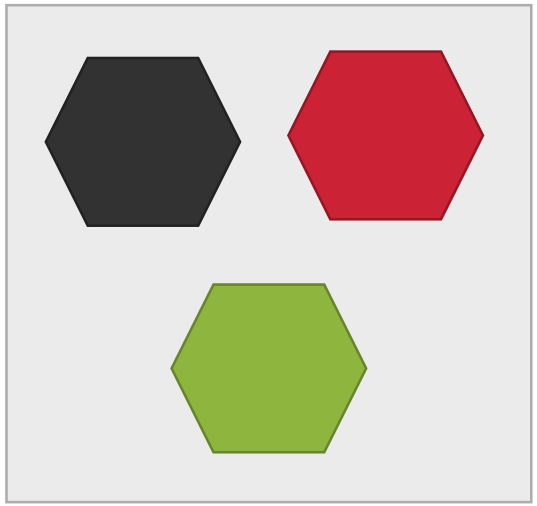
Bounded Context
Event Driven Architecture





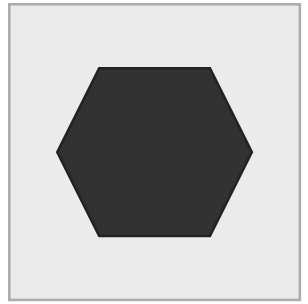
NashTech Story

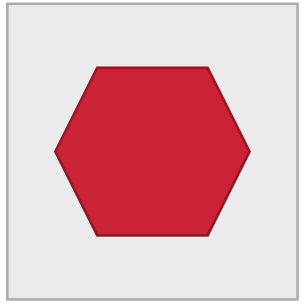
2016 ➔
Early 2017



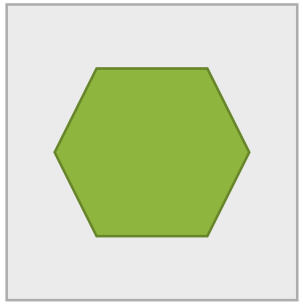
- **Bounded Context**
- **Event Driven Architecture**
- **Strangling Pattern**
- **Containerization**
- **12 factors App Principles**
- **Infrastructure as Code**

2017 ➔ ~





Legacy Systems & COTS



Cloud Native

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NashTech Story

- Monolithic Deployment
- Traditional Infrastructure

- Containerization
- 12-Factor App Principles

- Microservices
- Cloud-native Apps

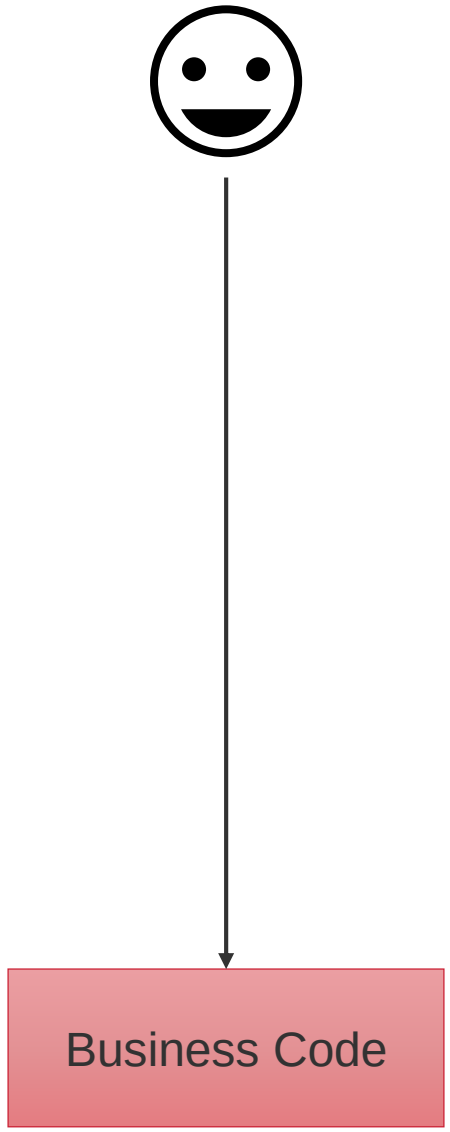
Reference at **Steinzeit war gestern! Die vielfältigen Wege der Cloud-nativen Evolution**

NASH TECH
The Power to Innovate

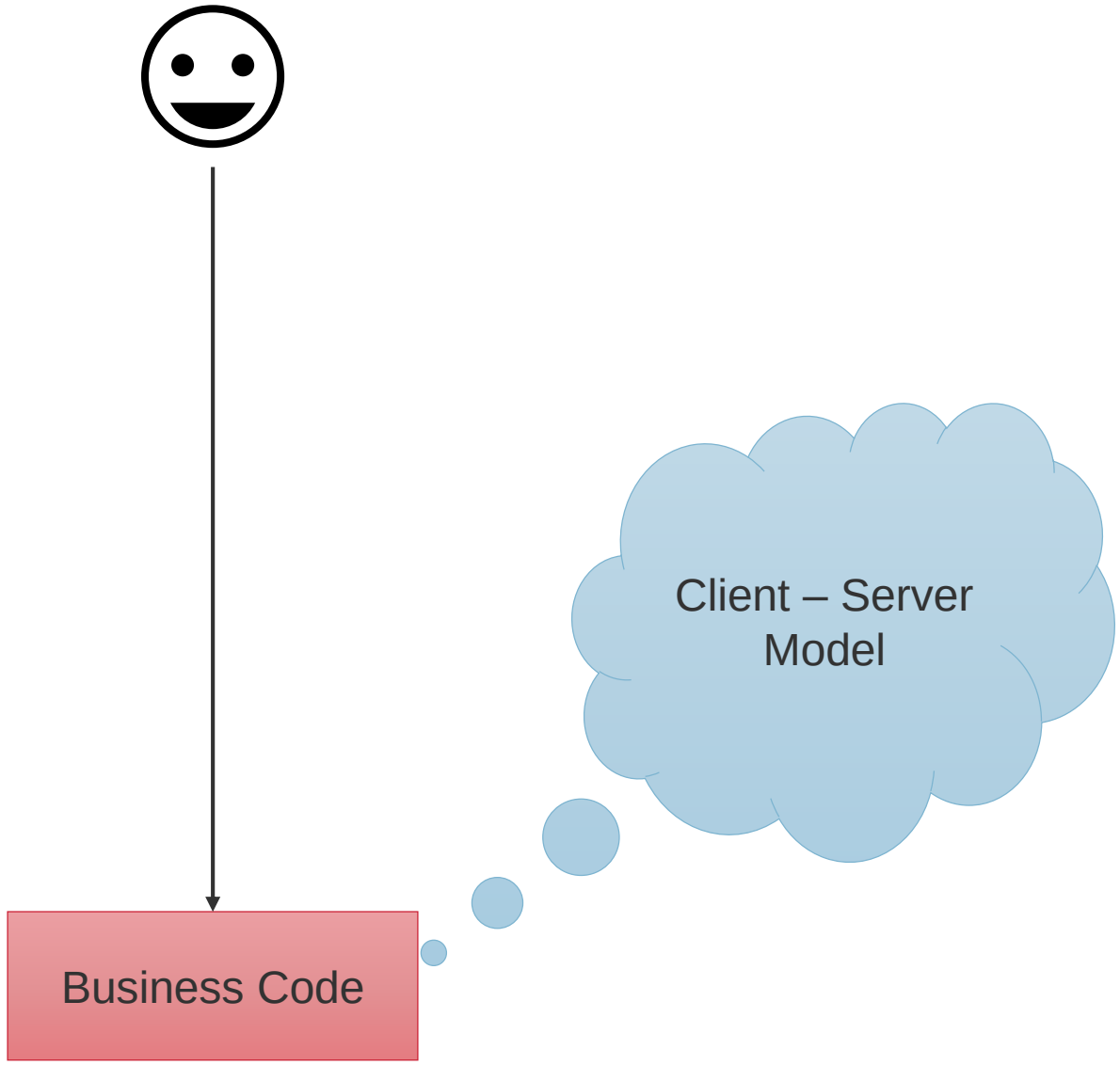
Software Developer Craftsmanship

Let see how NashTech developers do on the daily basis…

Developer Story



Developer Story



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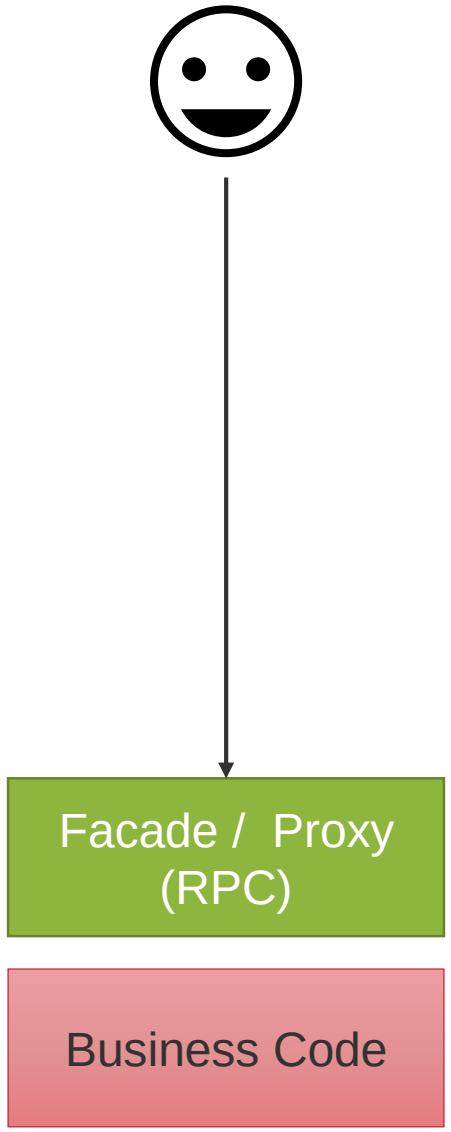

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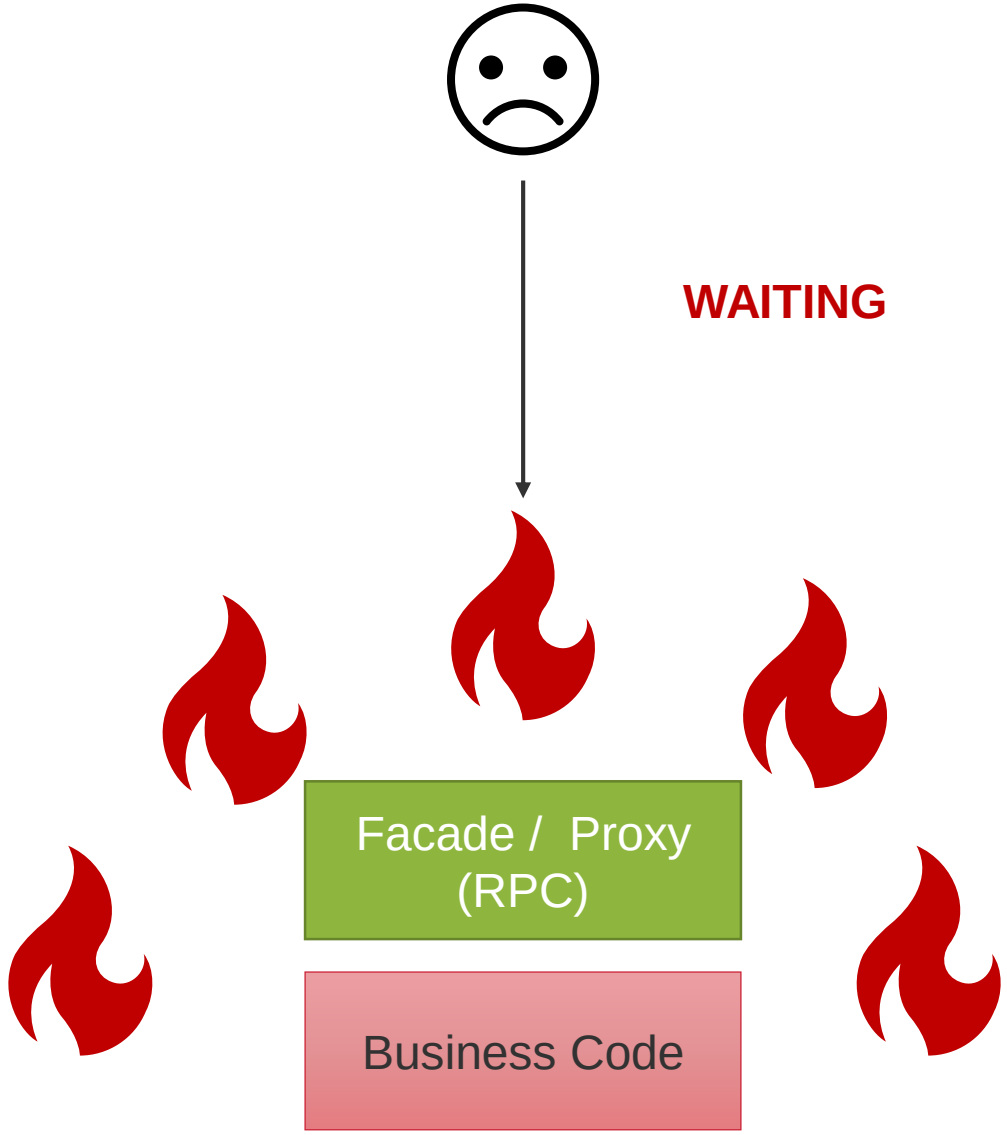

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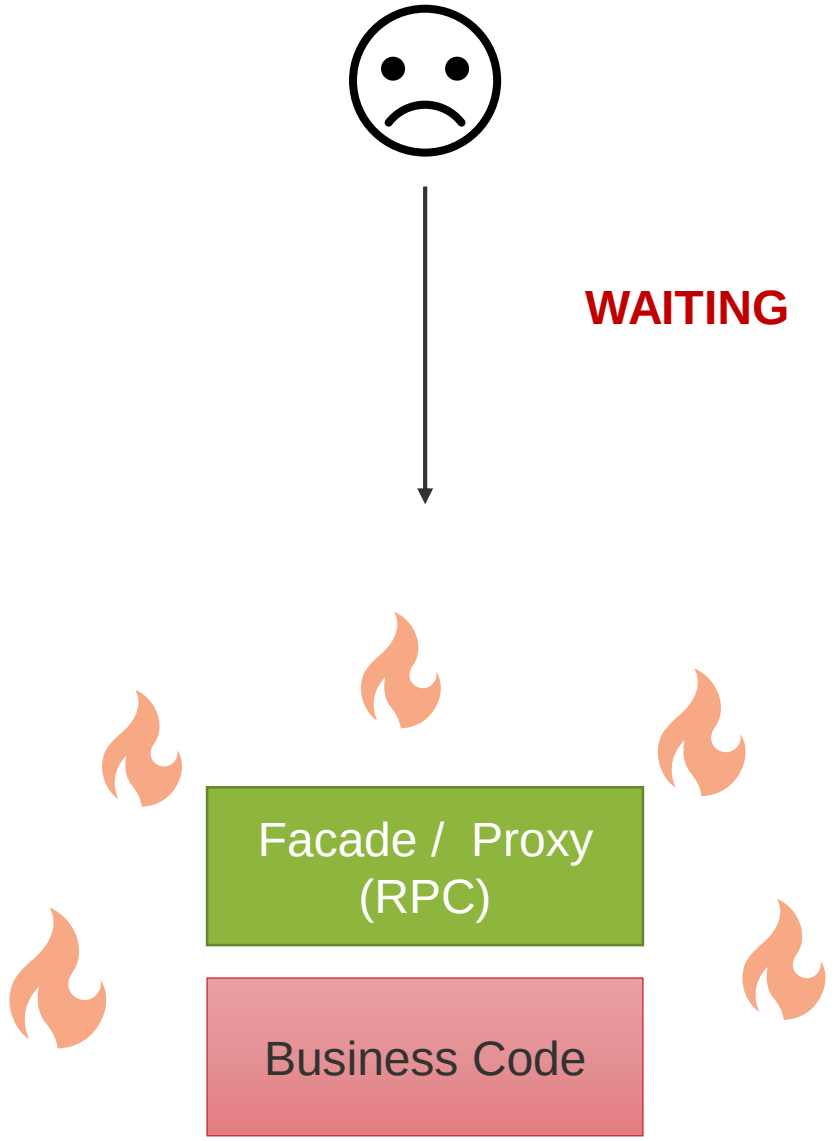

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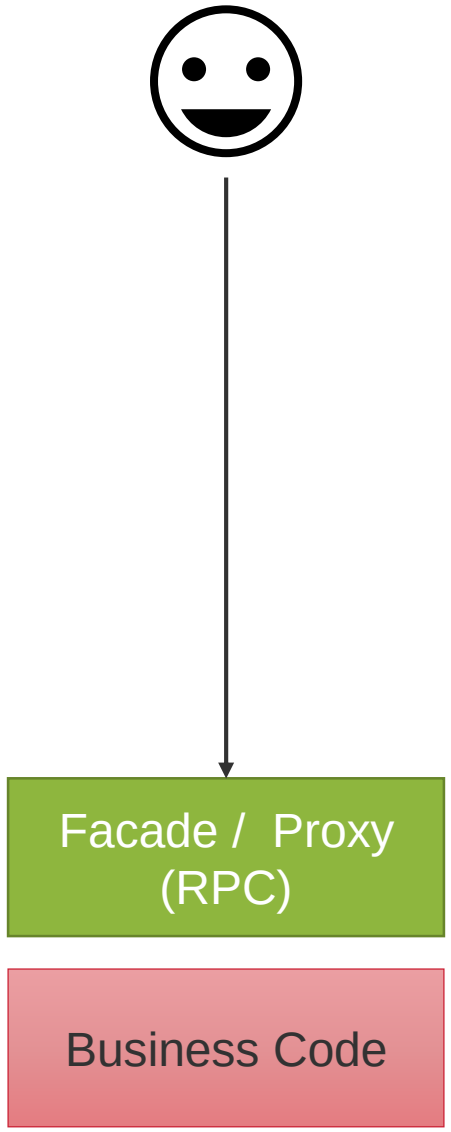

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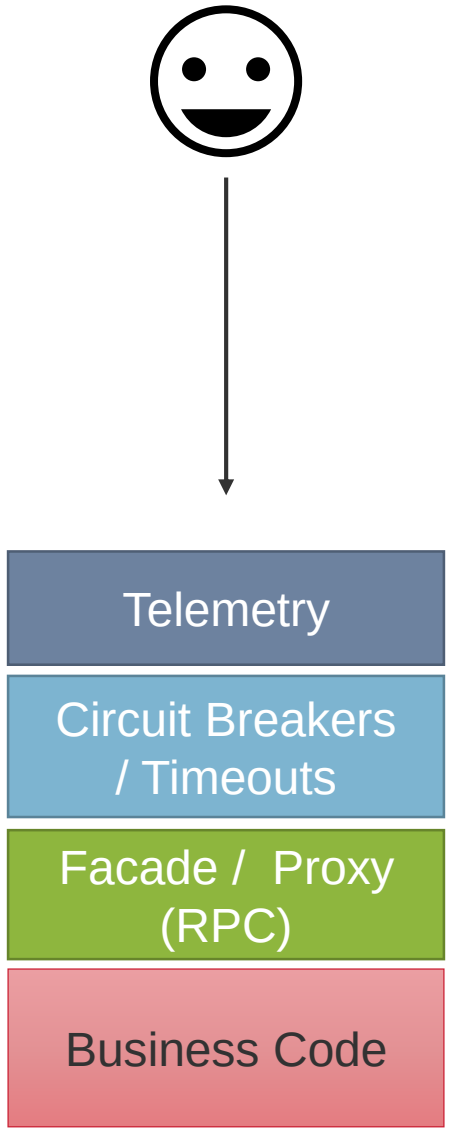

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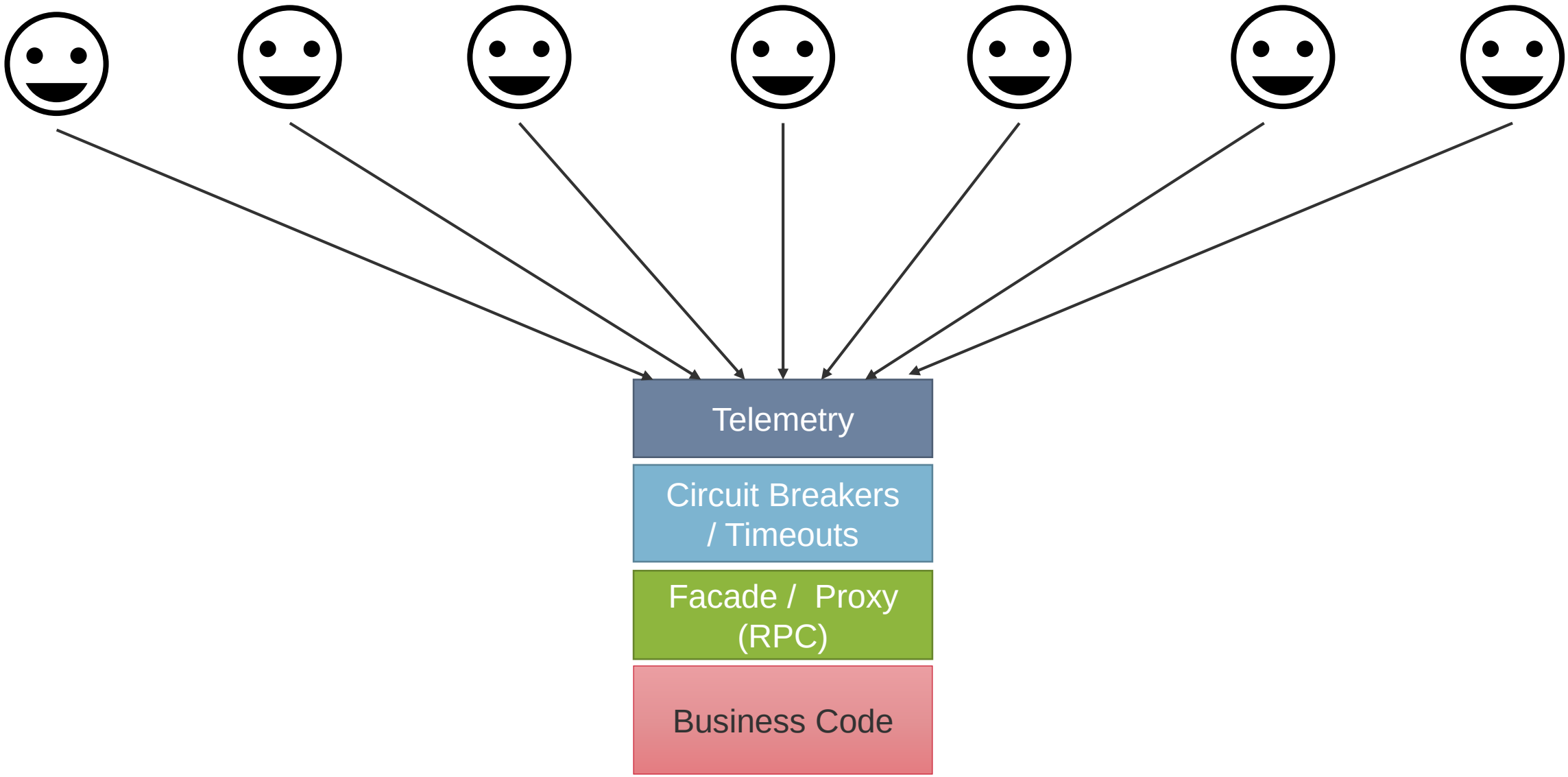
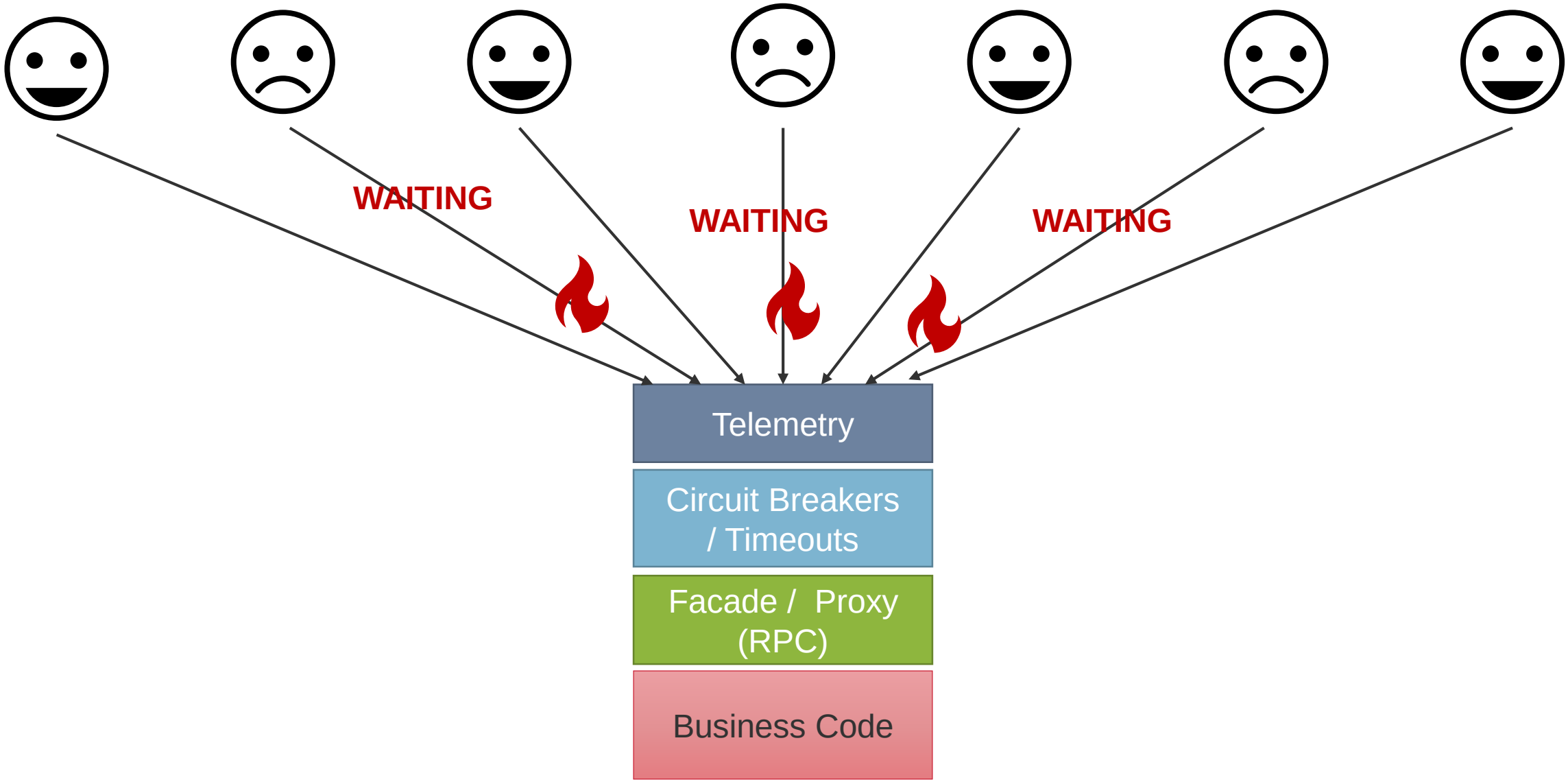


Developer Story



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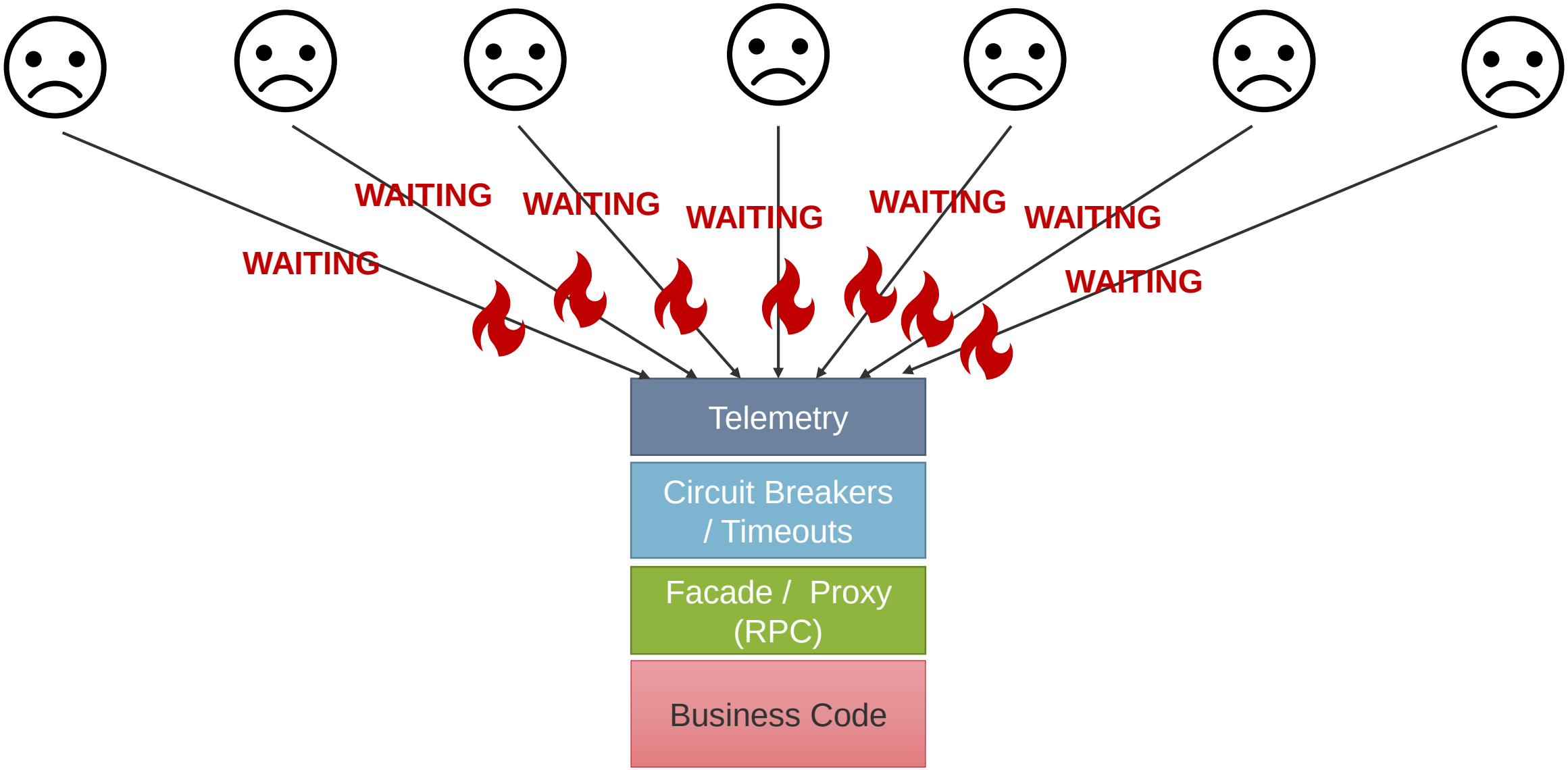

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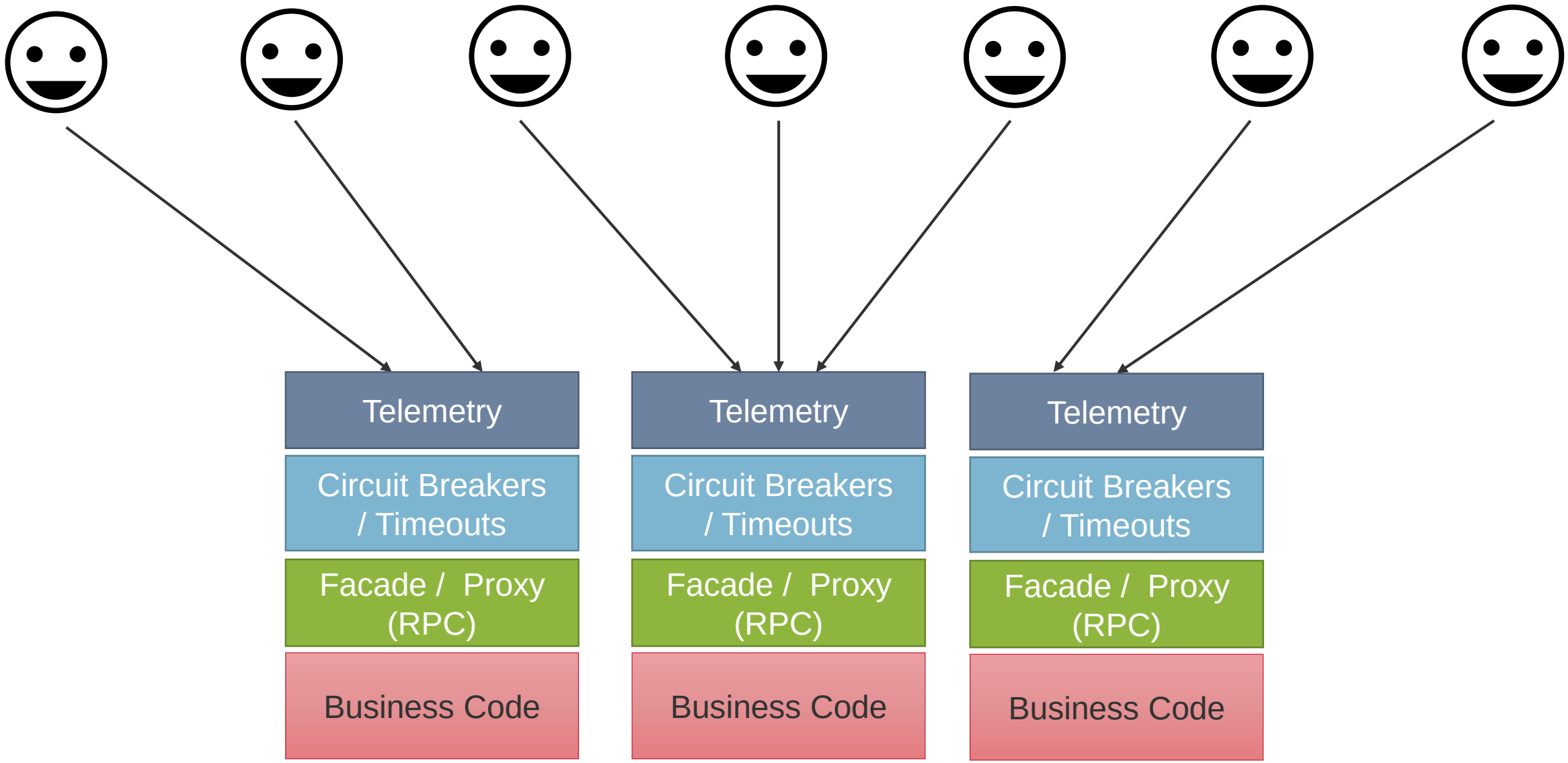

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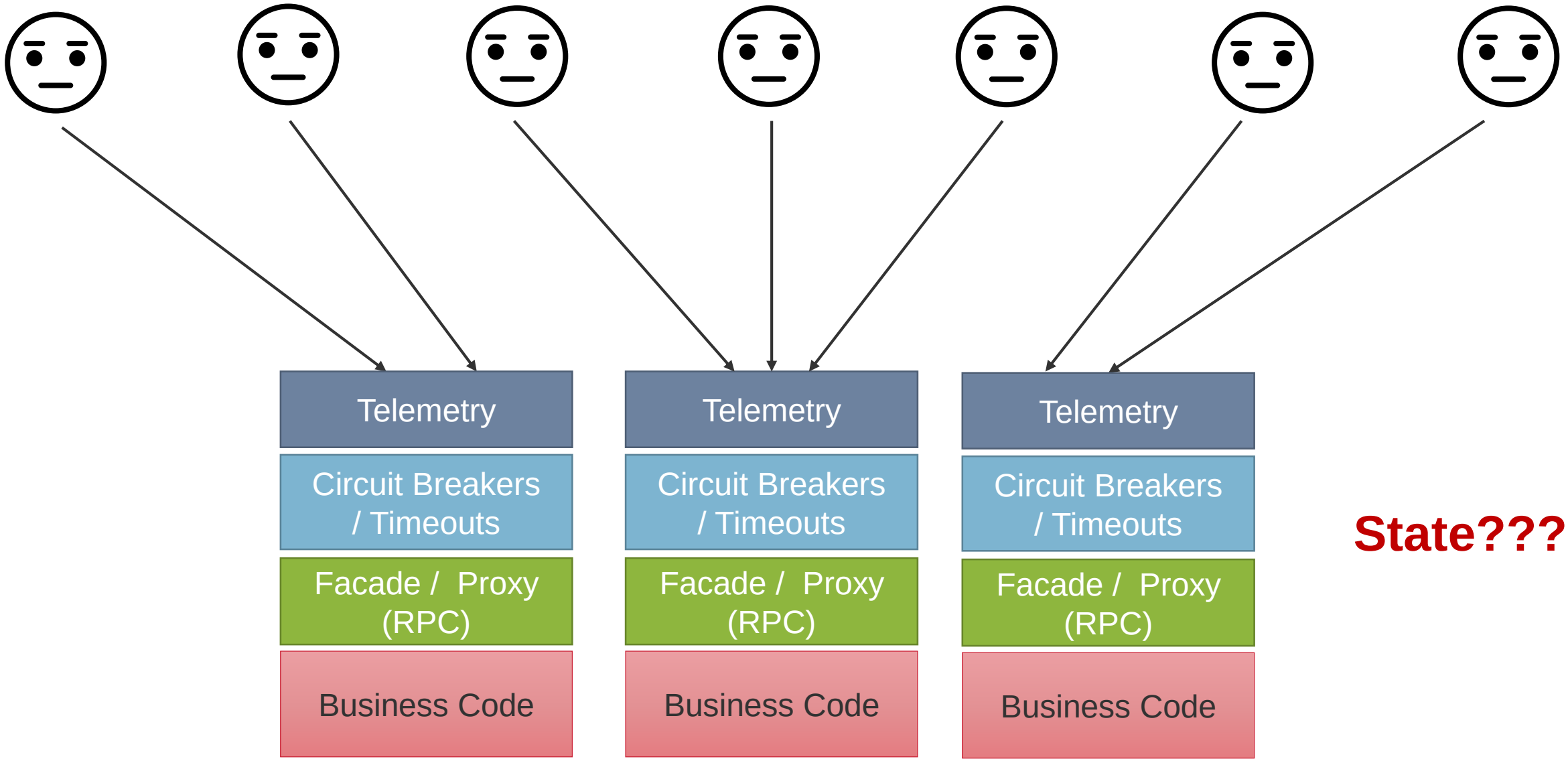

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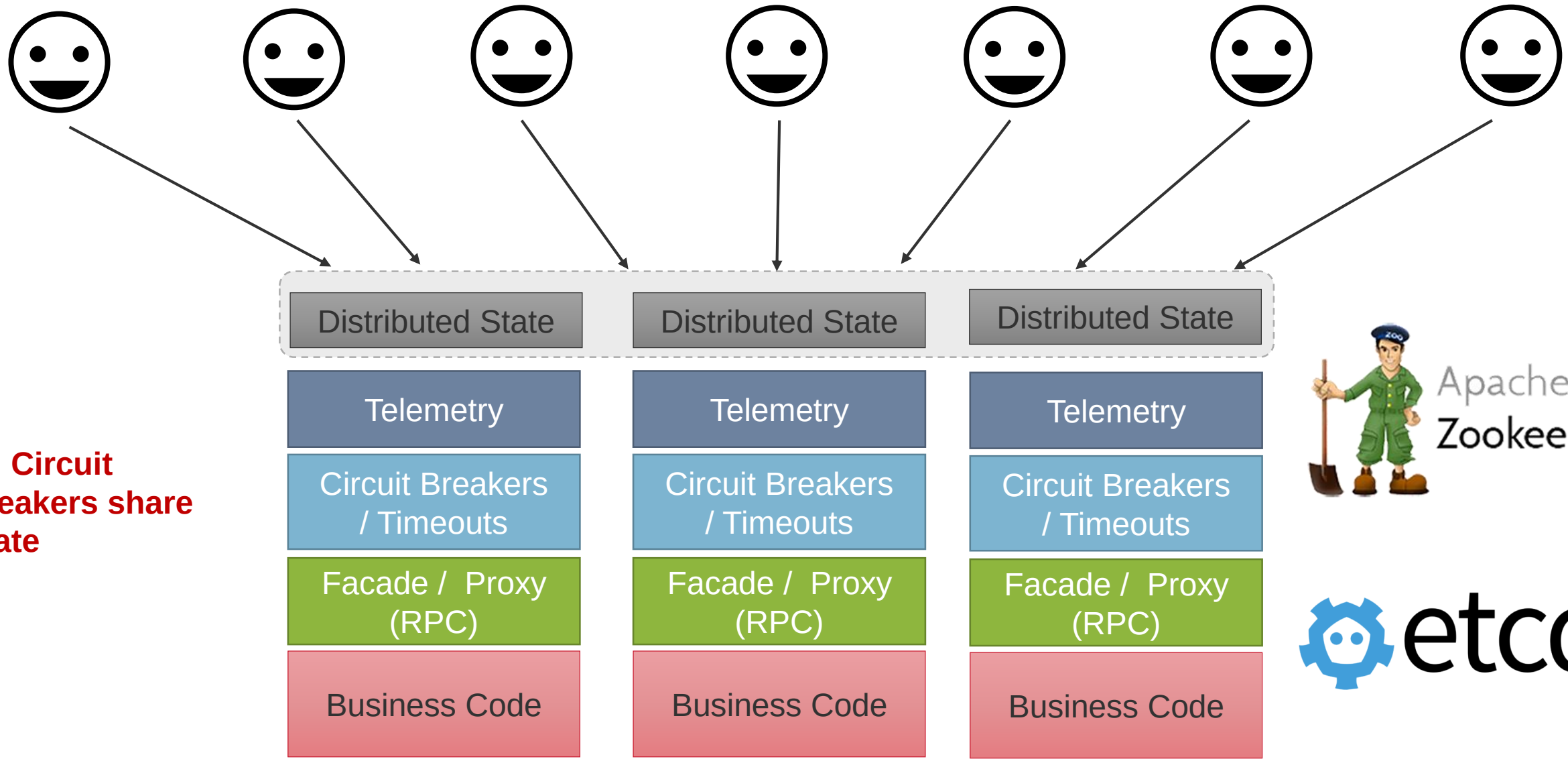
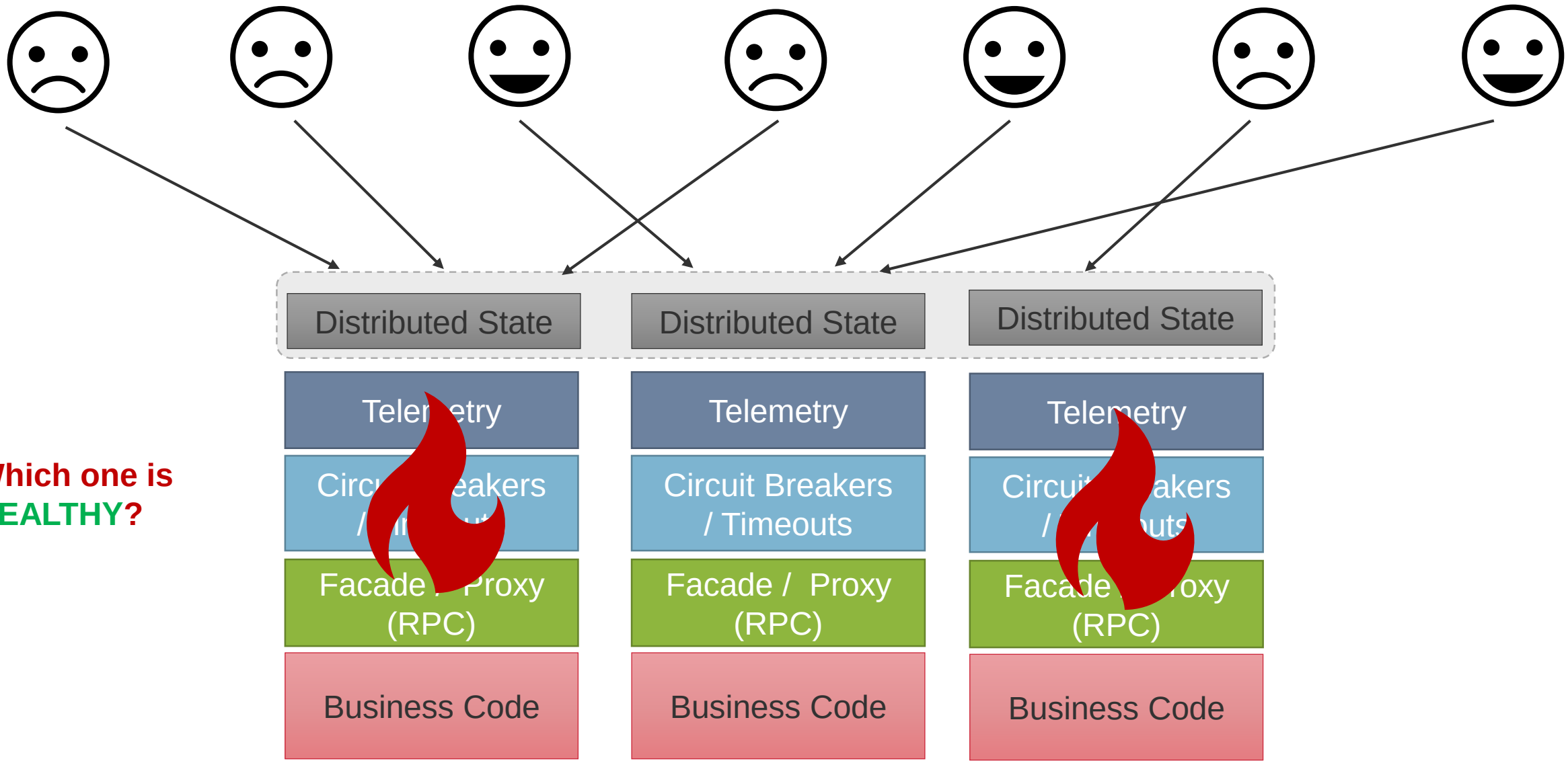


All Circuit Breakers share State

Apache Zookeeper

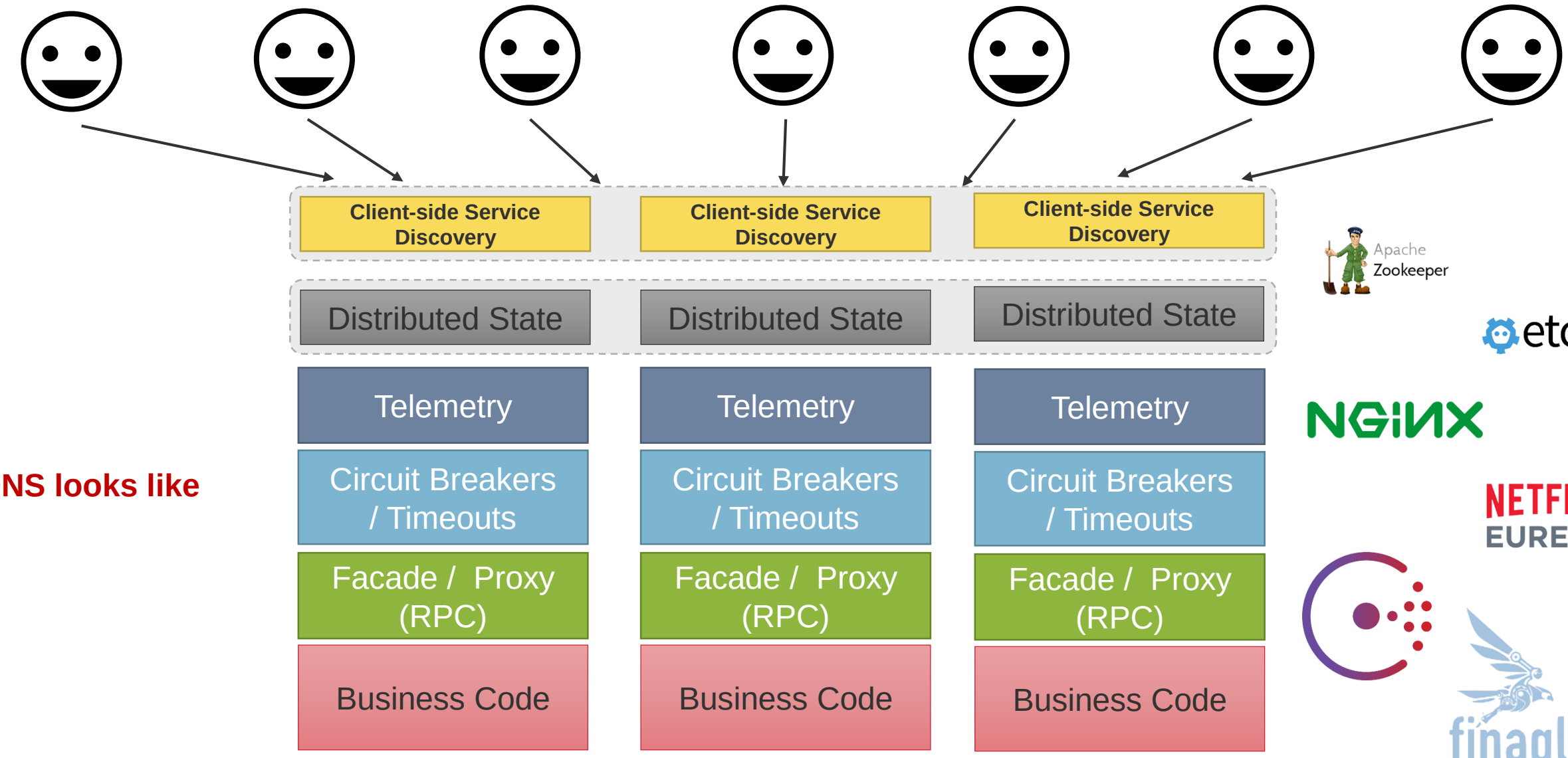
etcd

Developer Story



Which one is HEALTHY?

Developer Story

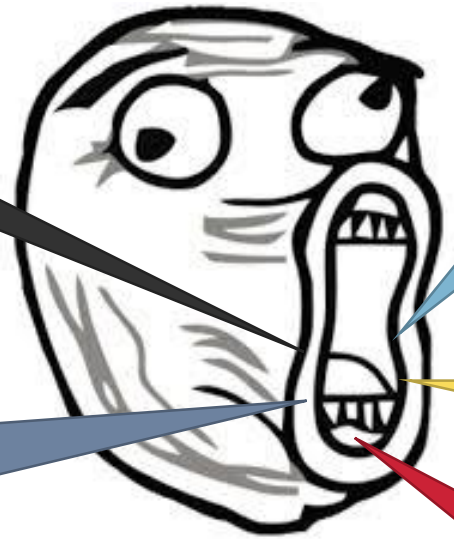


DNS looks like

WTFun for Application Modernization?

Just for RPC Reliability & Resiliency

Then, 8 Fallacies of Distributed Computing



Then, 5 Cloud Commandments

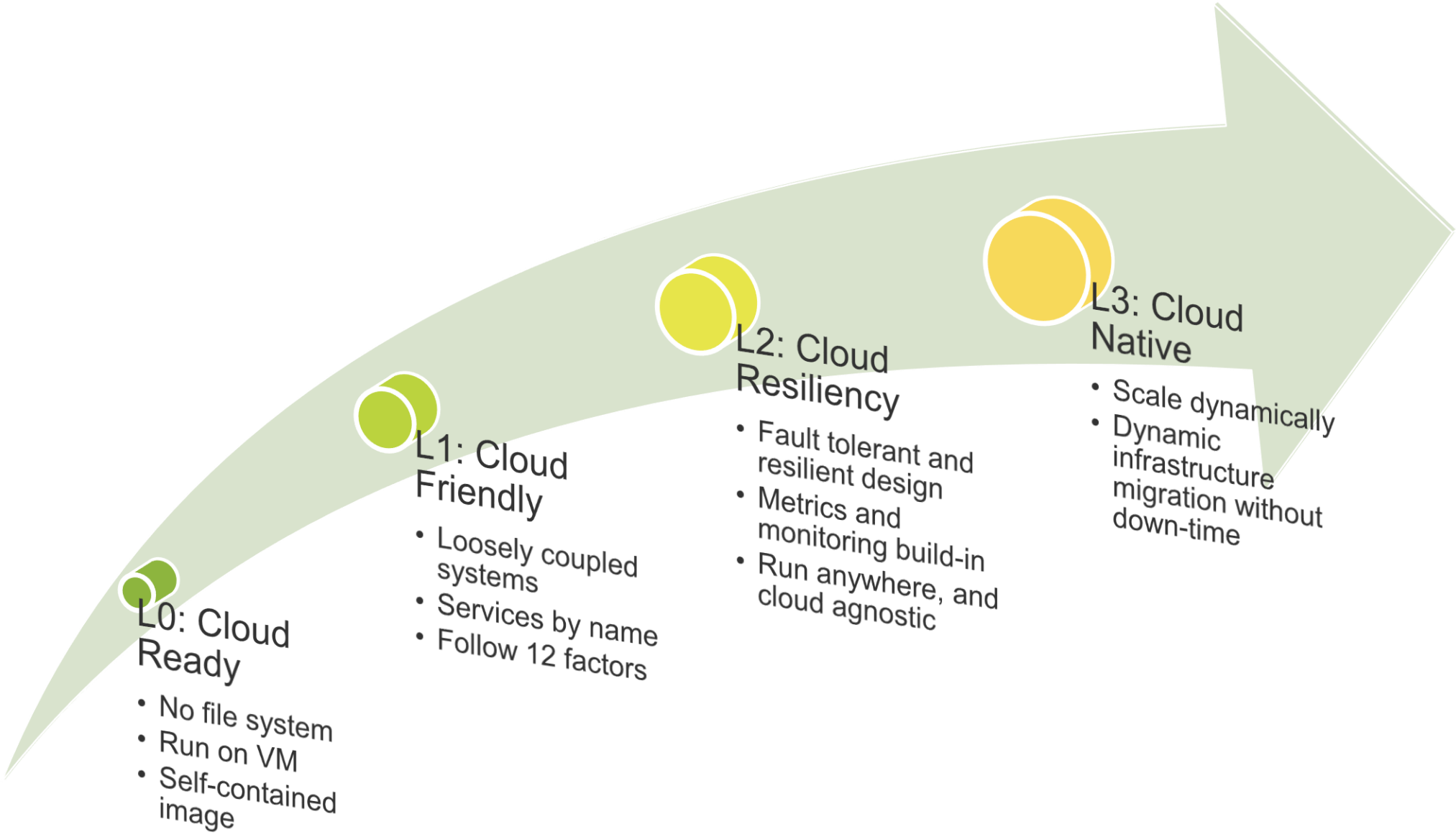
Then, 12 Factor App Principals

Loose Polyglot, Hard to Change……

Cloud Native

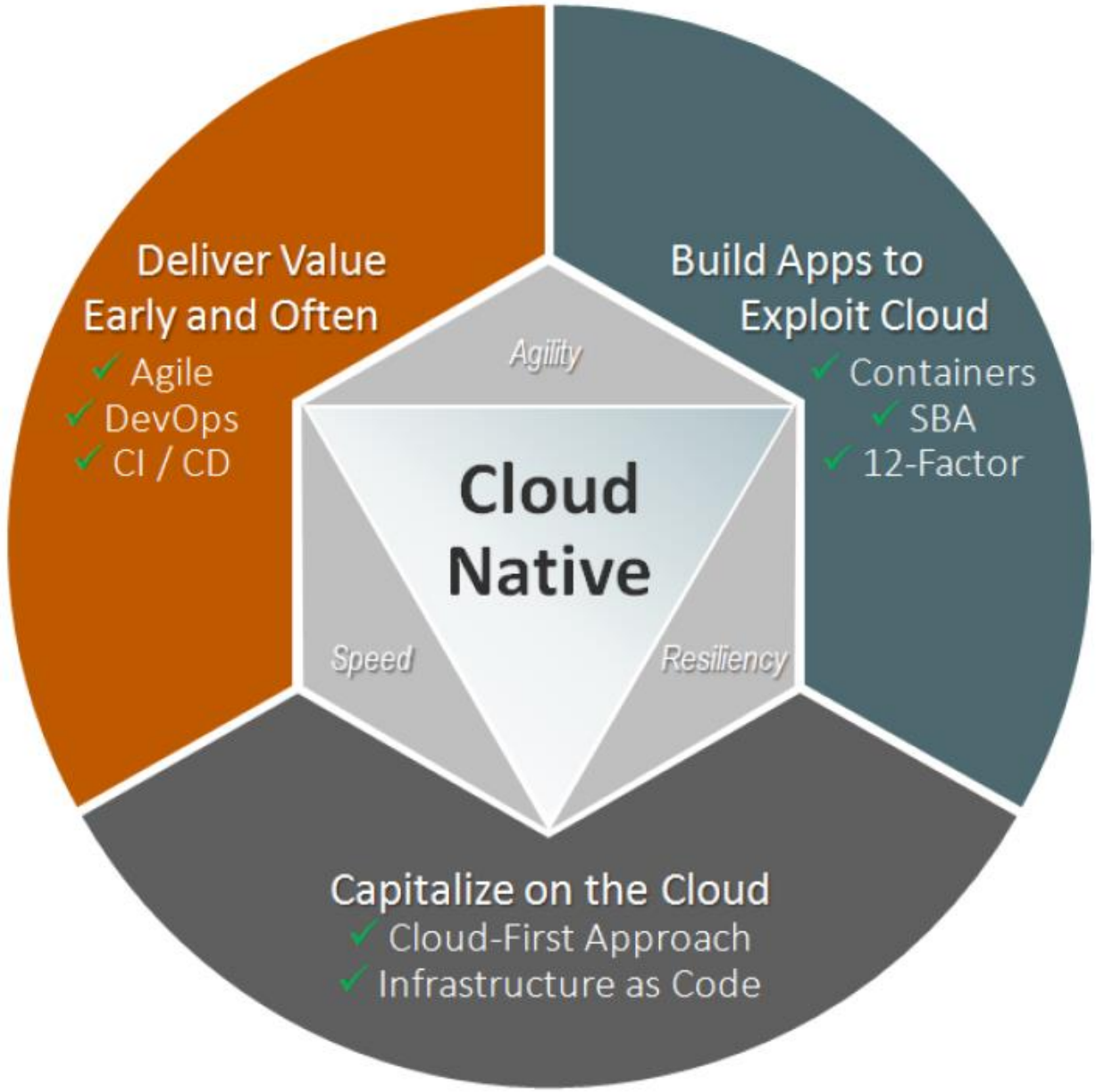
Everywhere is cloudy, especially in NashTech…

Cloud Native Application Maturity



Cloud Native Application Development

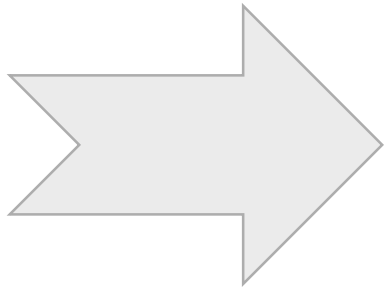
2017



Reference from Cloud Native Application development - A New Computing Paradigm by Oracle

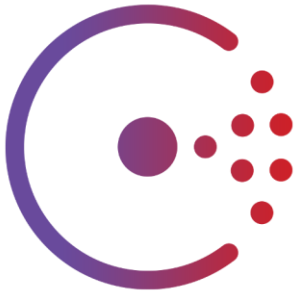
What make different?

2017



kubernetes

docker



Prometheus

NGINX

JAEGER

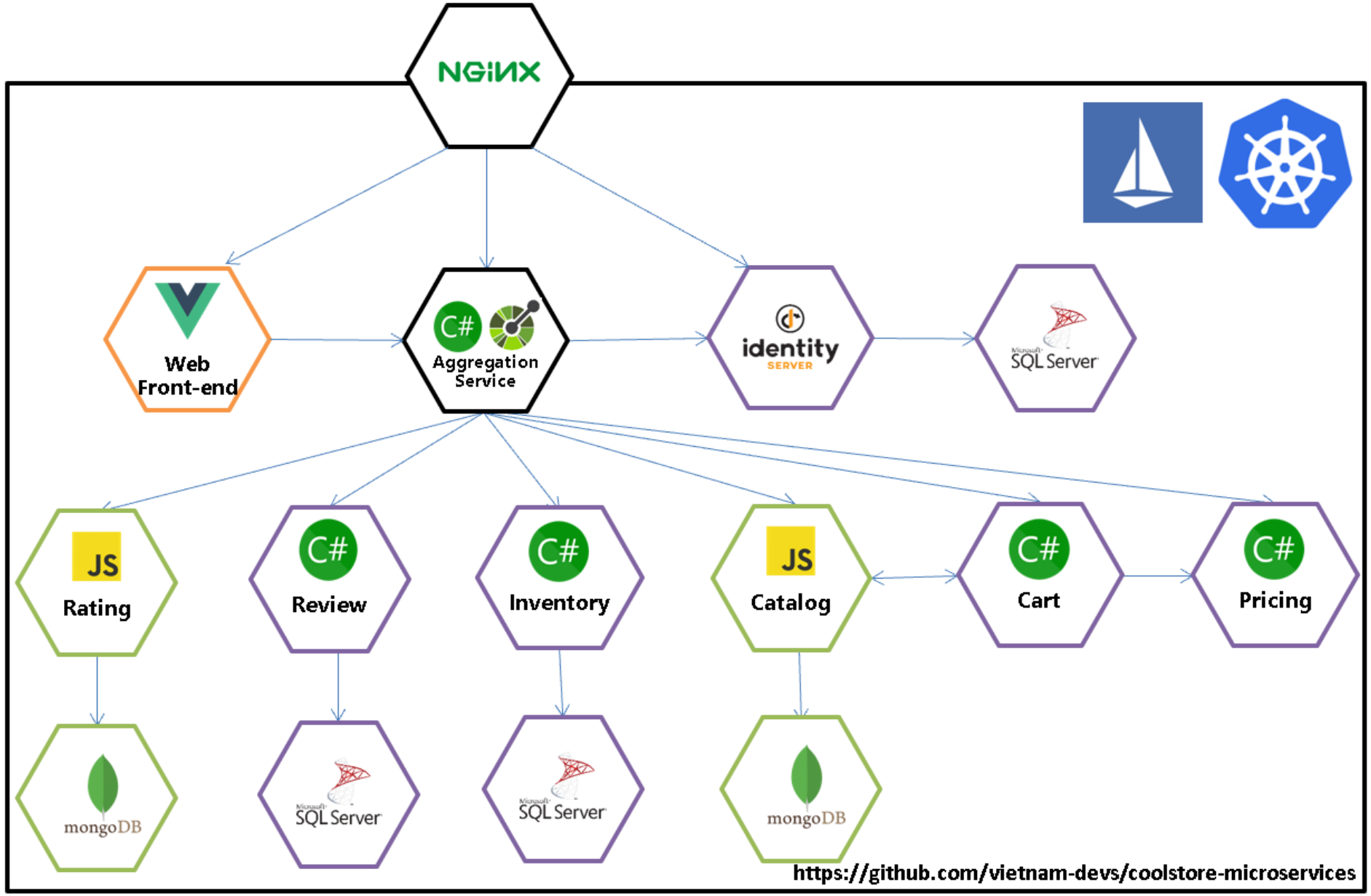
IPKIN

Grafana

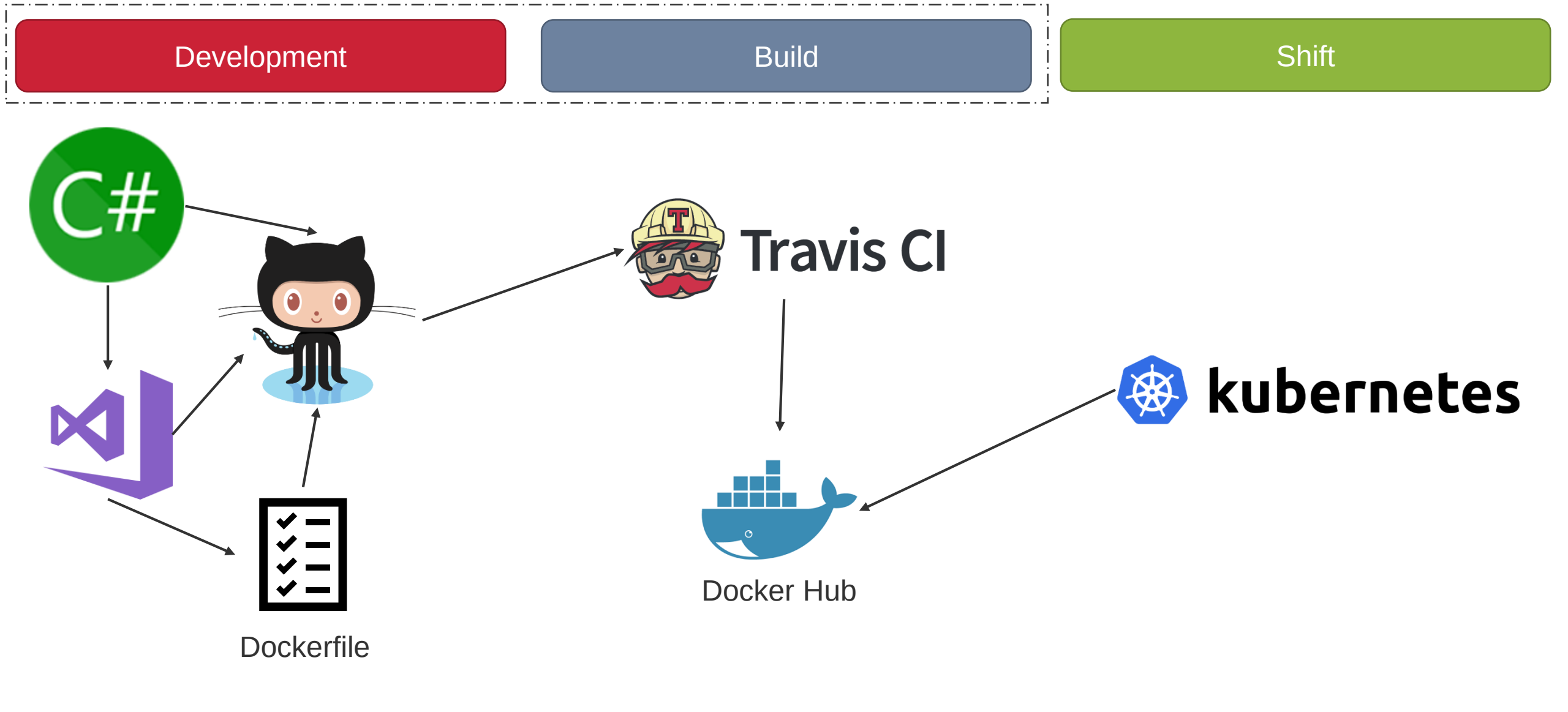
HYSTRIX

DEFEND YOUR APP

DEMO: Build Microservices Application on Kubernetes



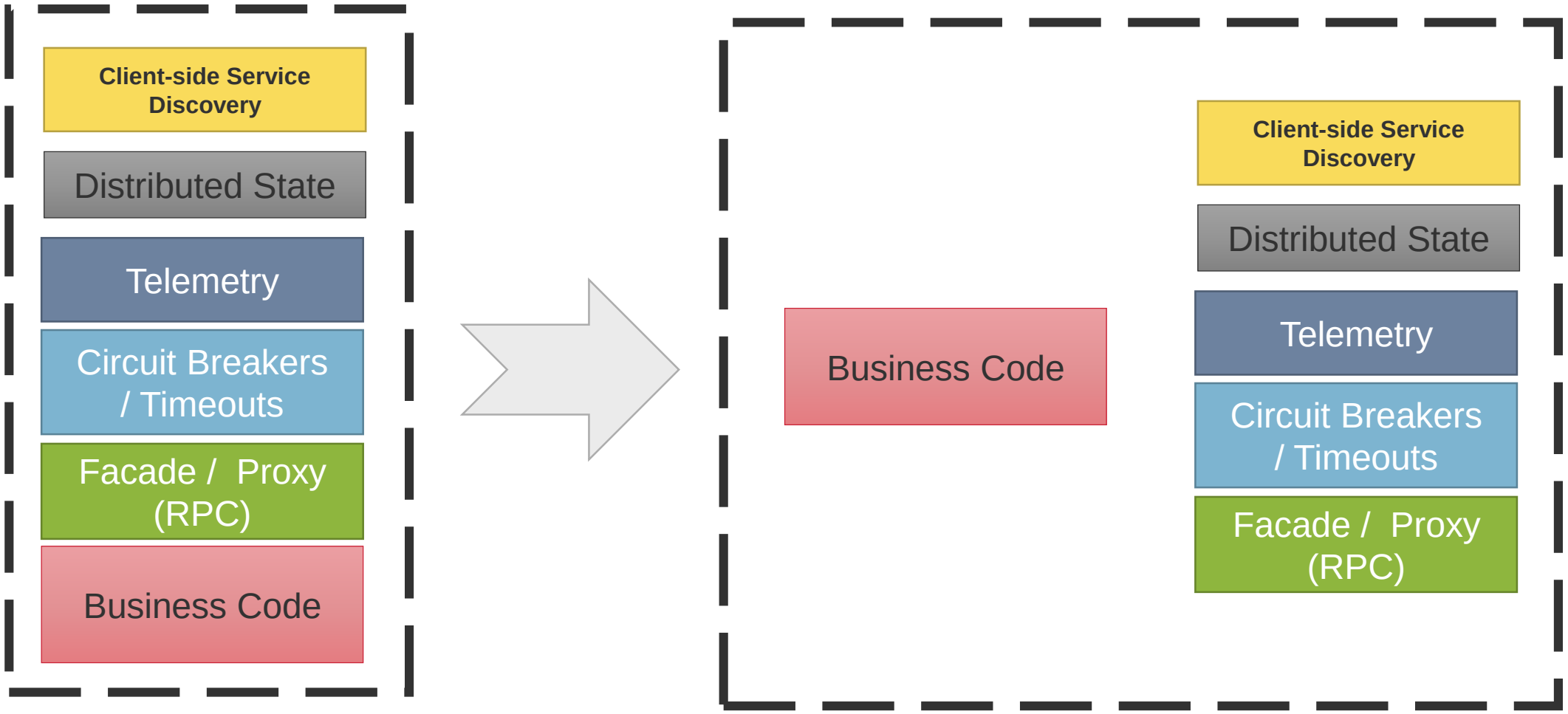
DEMO: Lift and Shift the Application



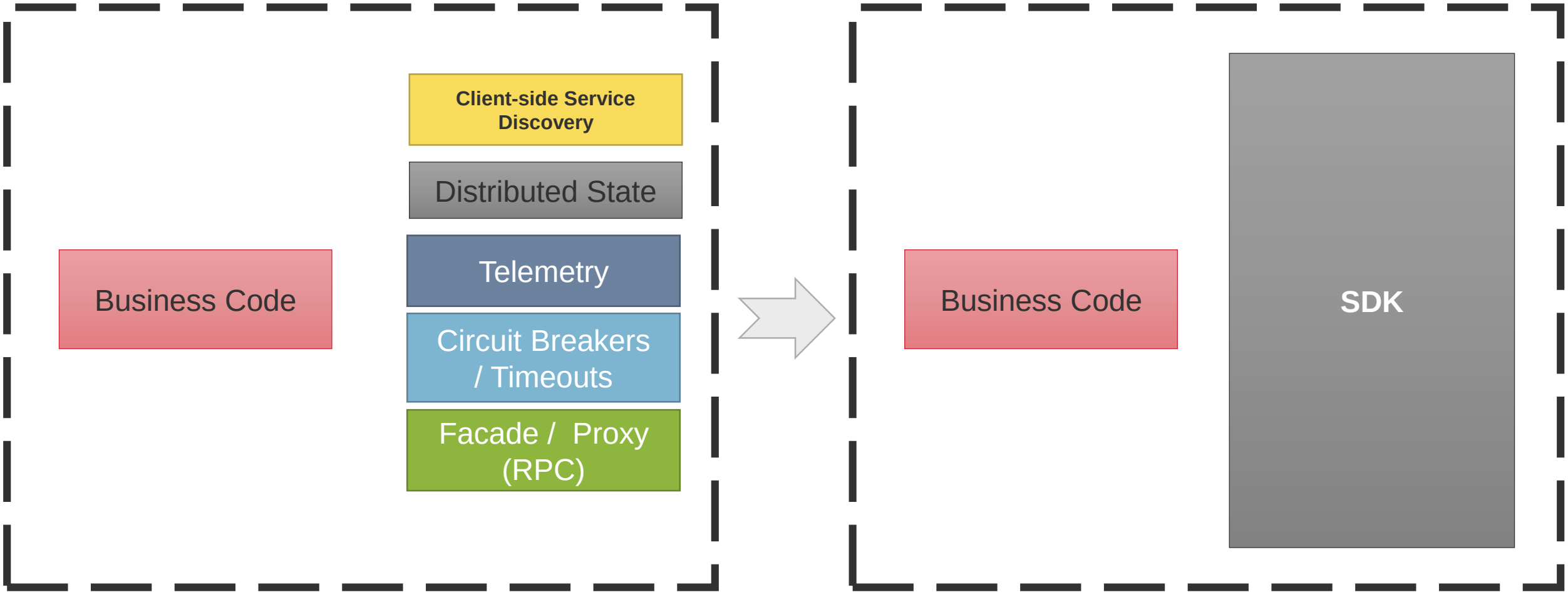
Service Mesh

Let’s mess everything up, but tidy it right later on…

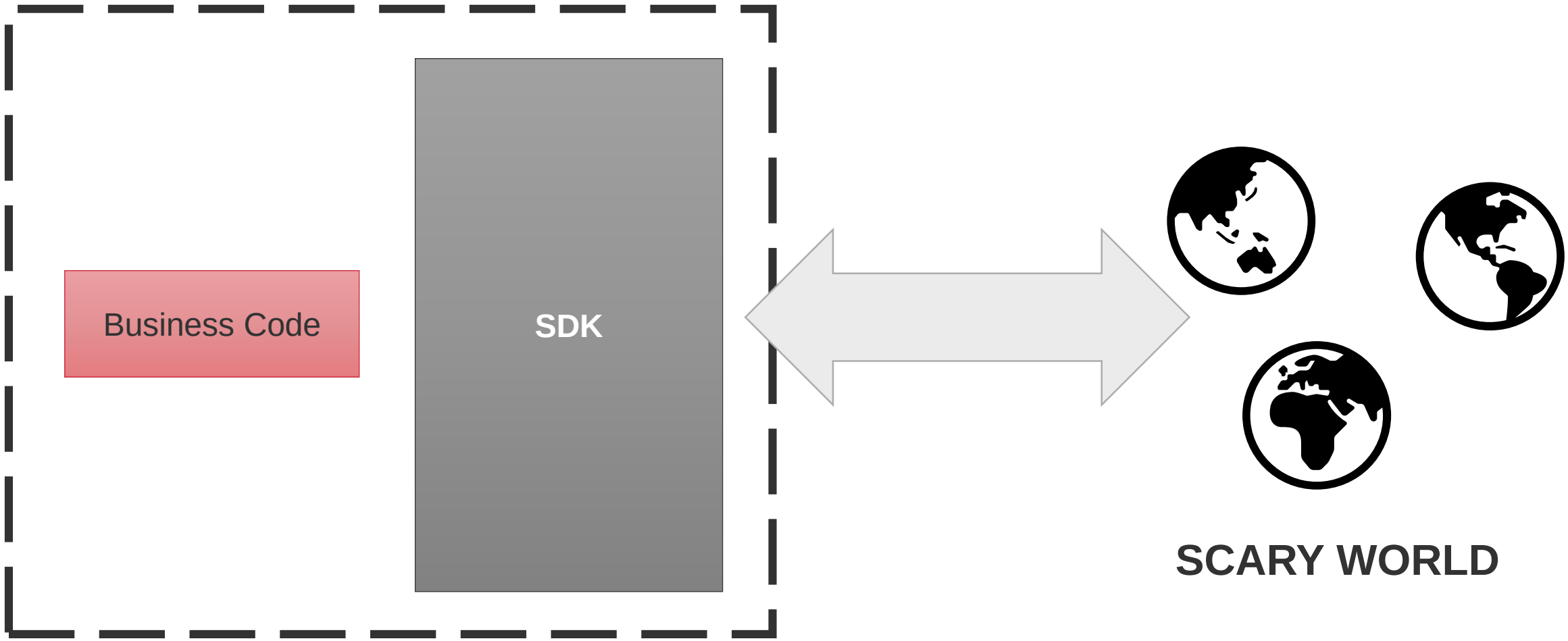
Development View



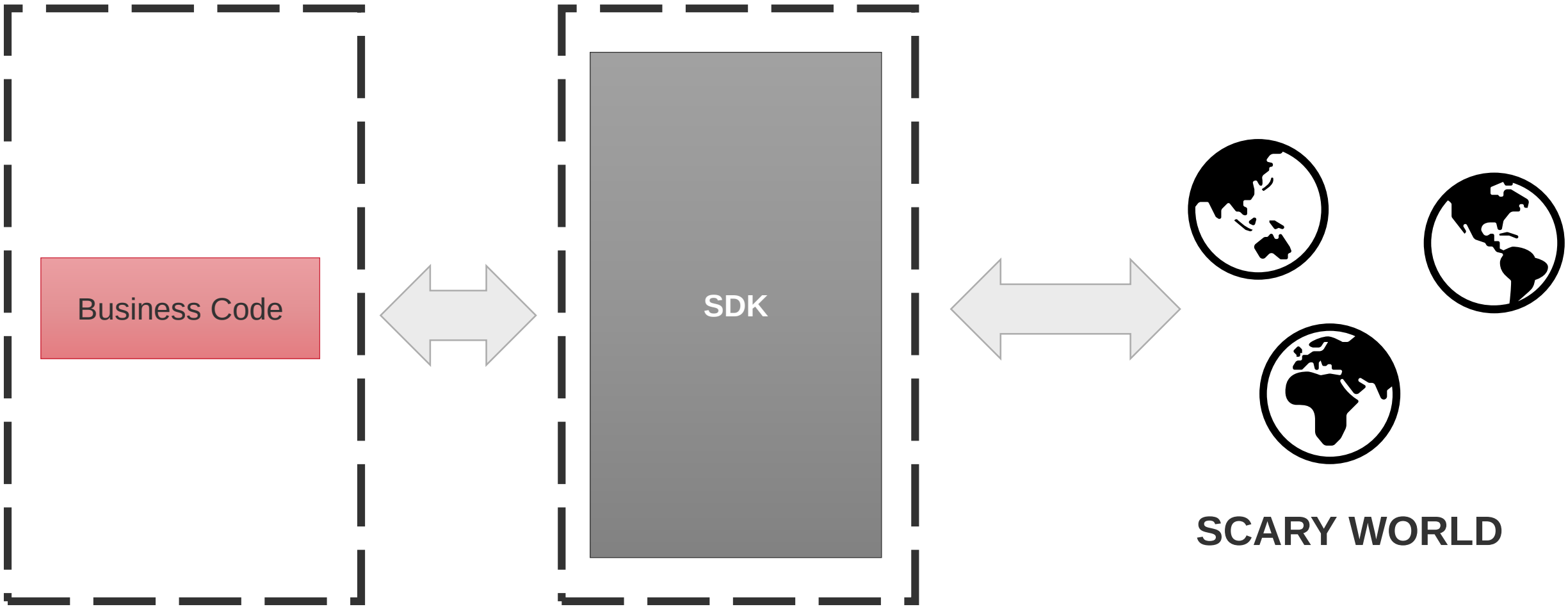
Development View



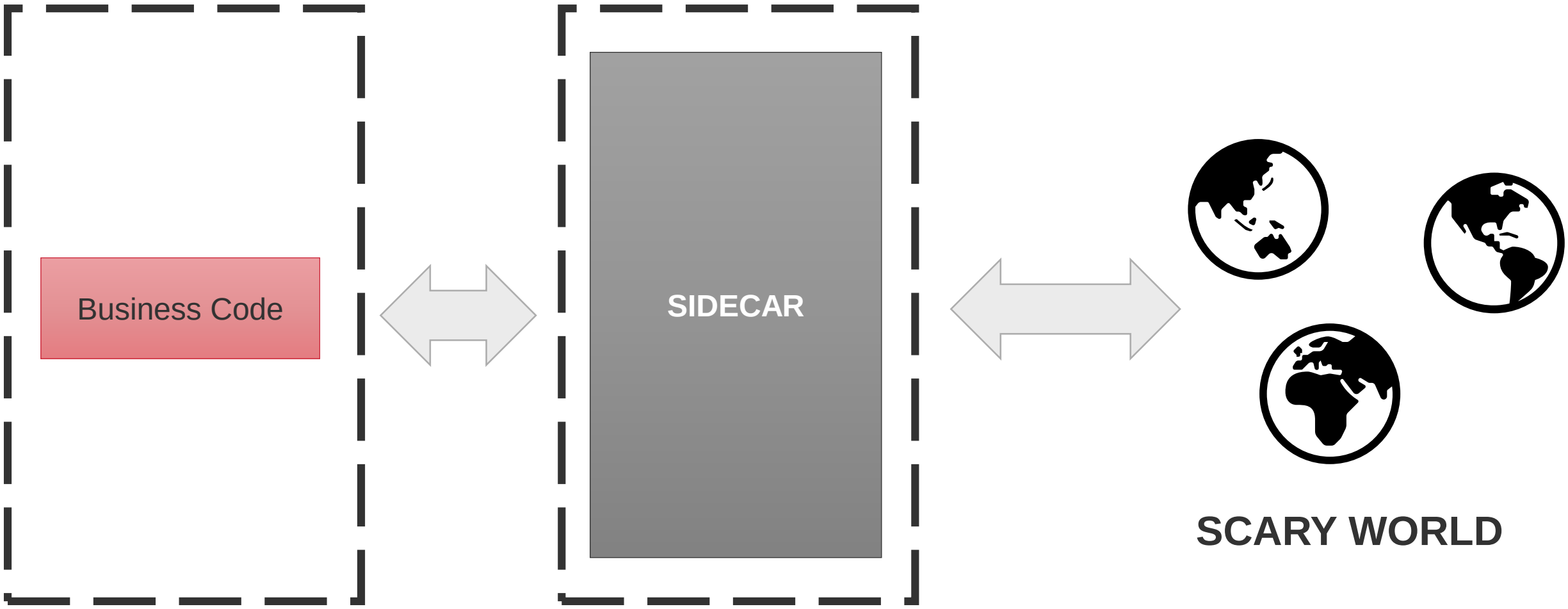
Development View



Development View



Development View



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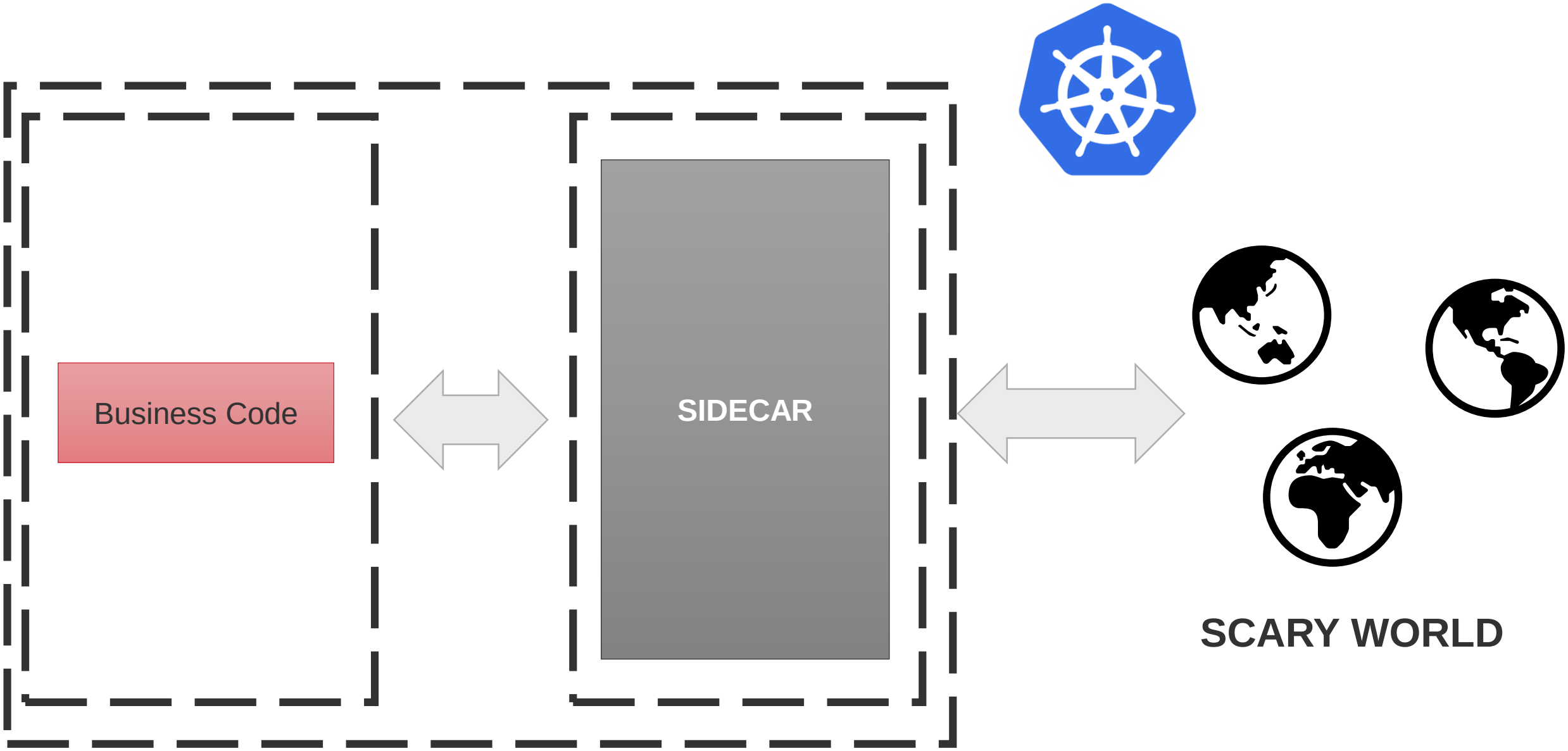

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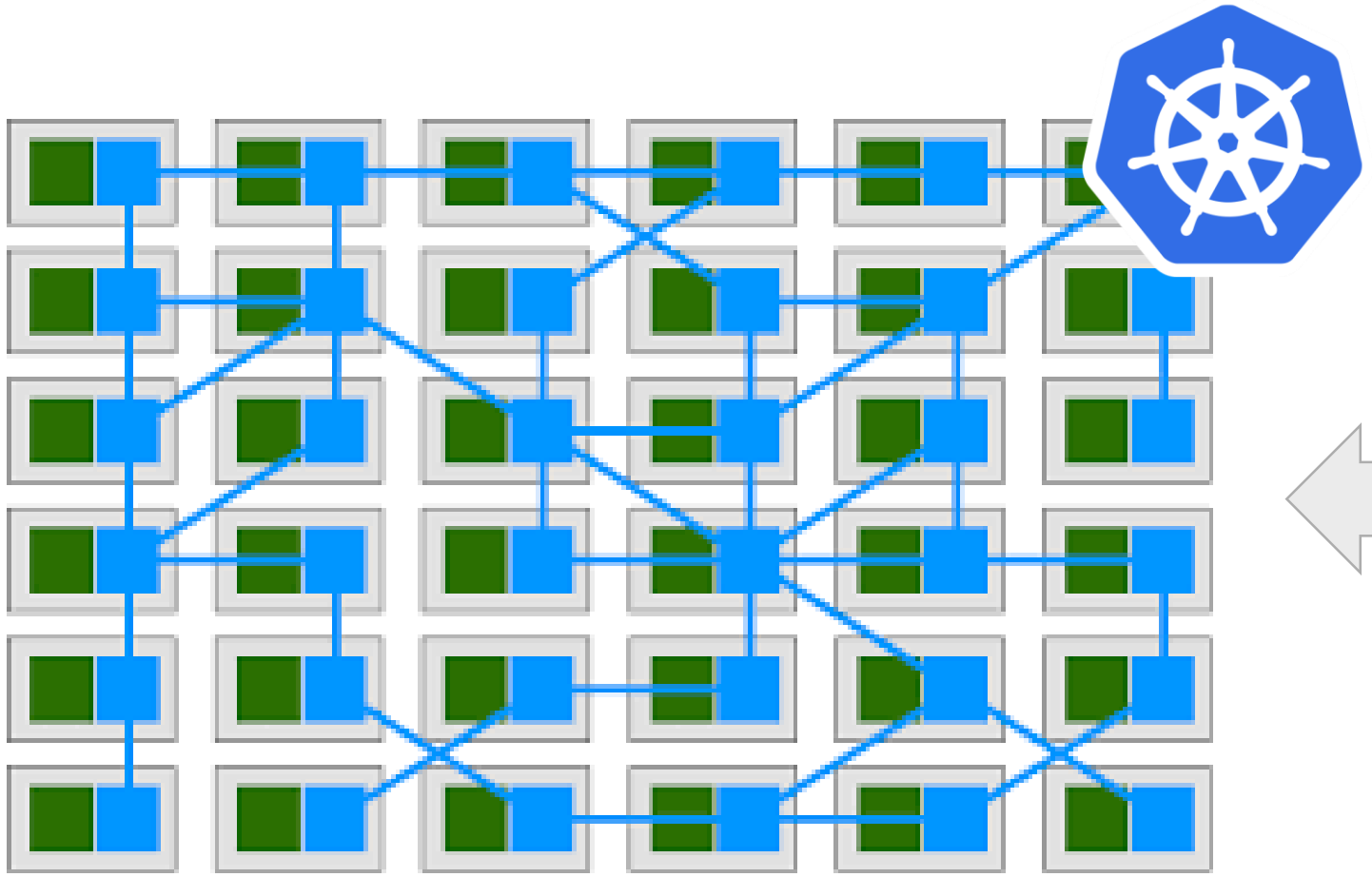
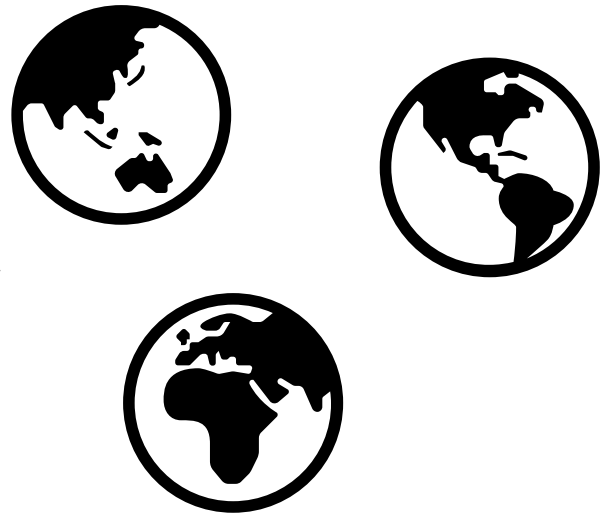
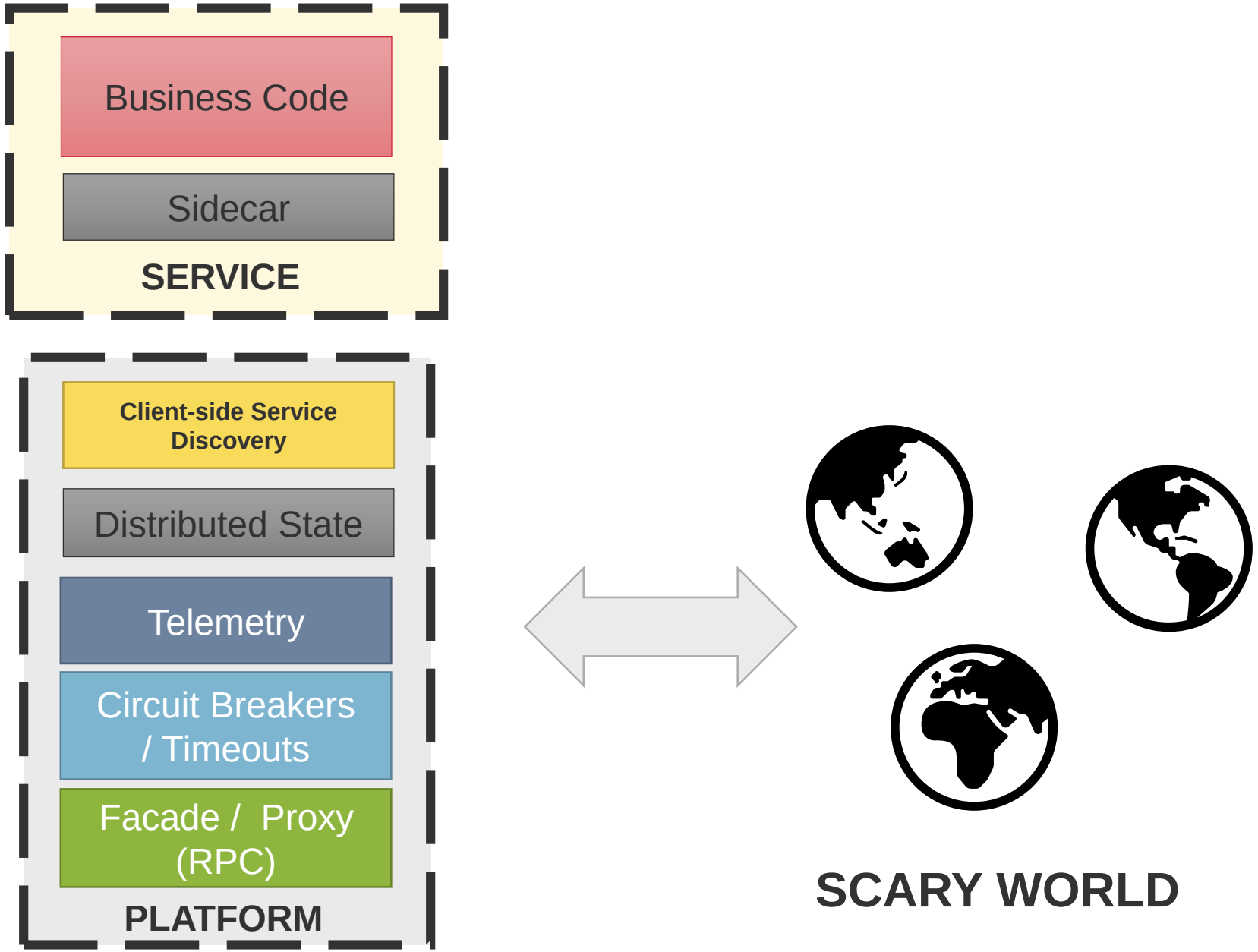


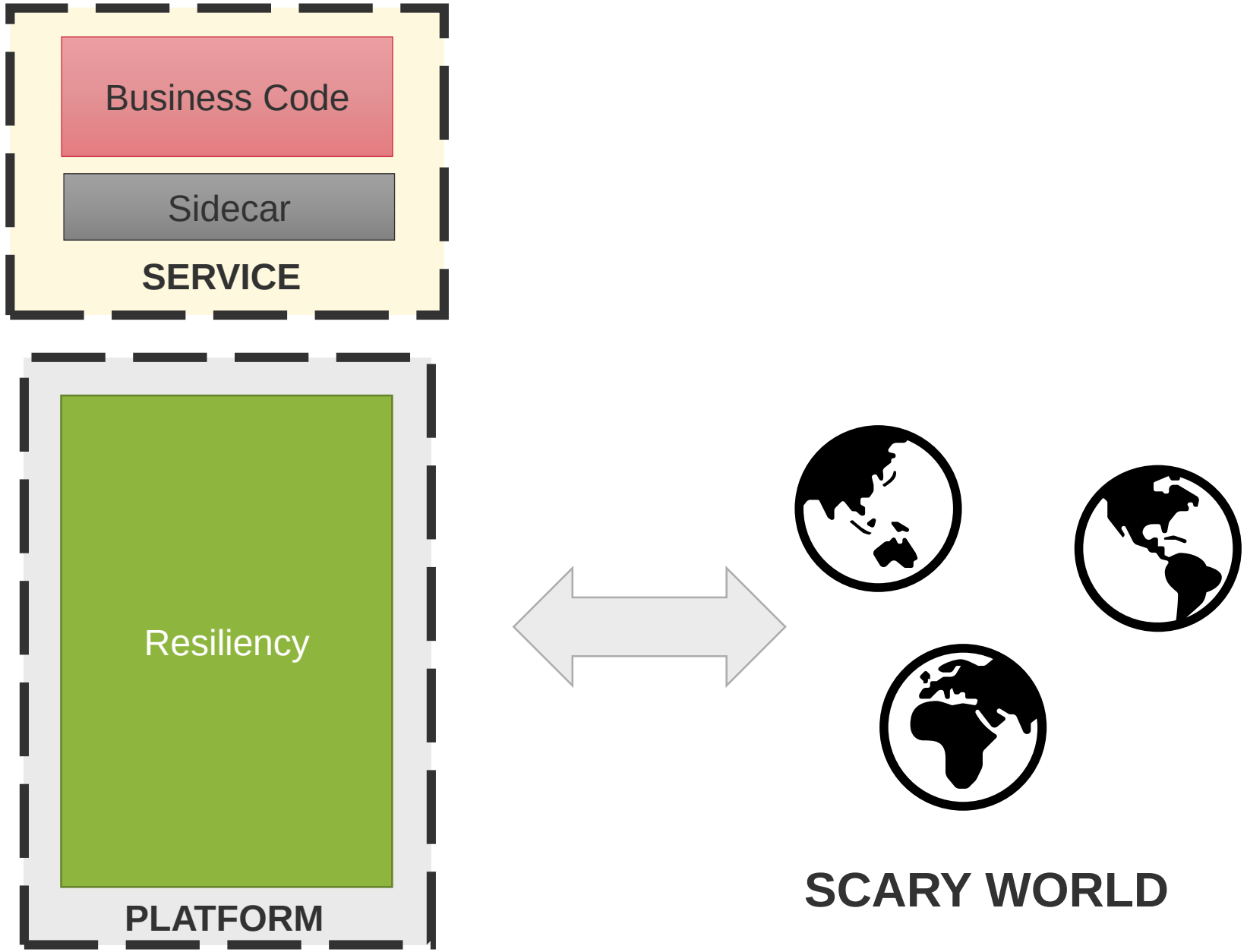


SCARY WORLD

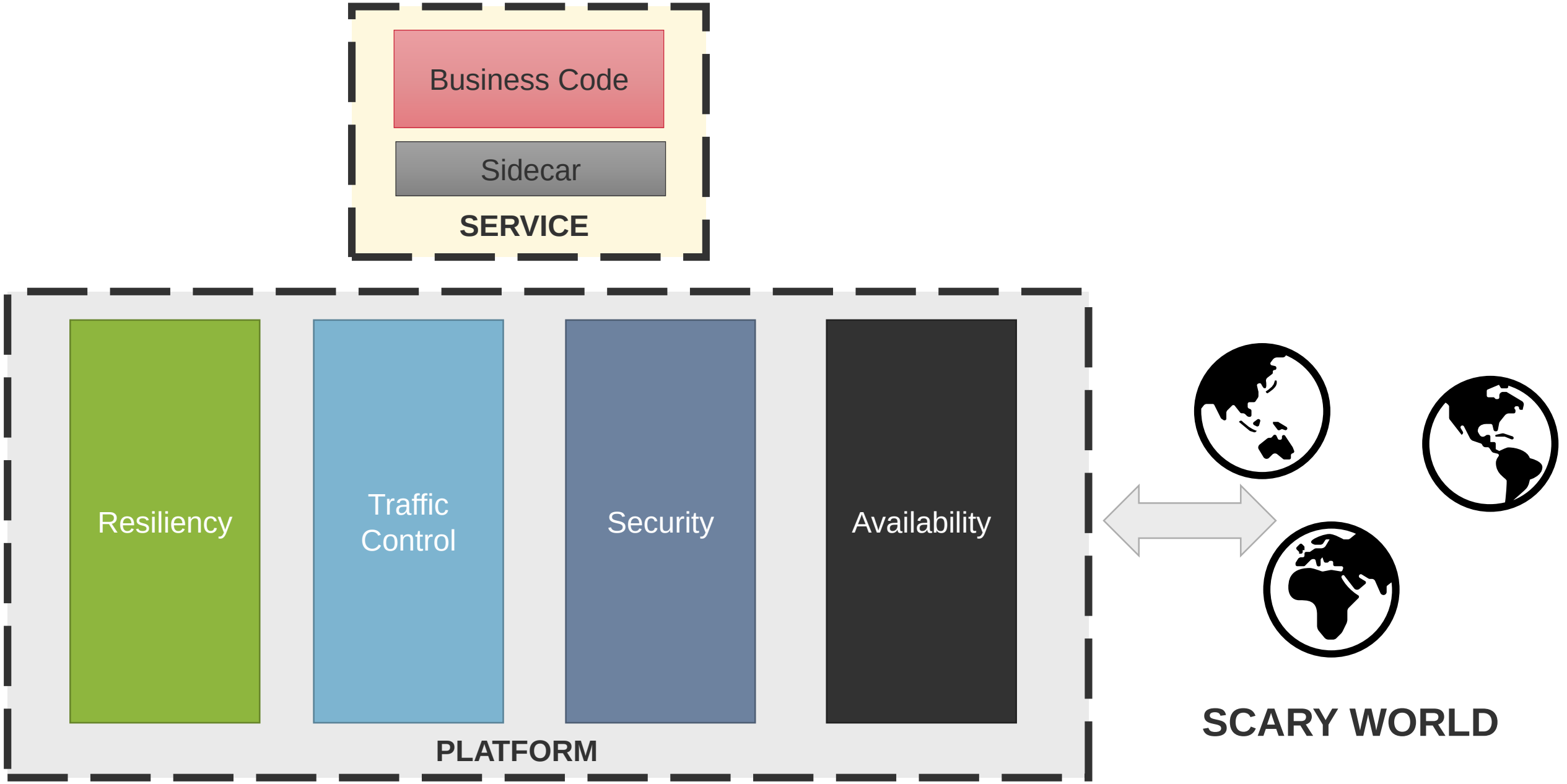
Orchestrator View



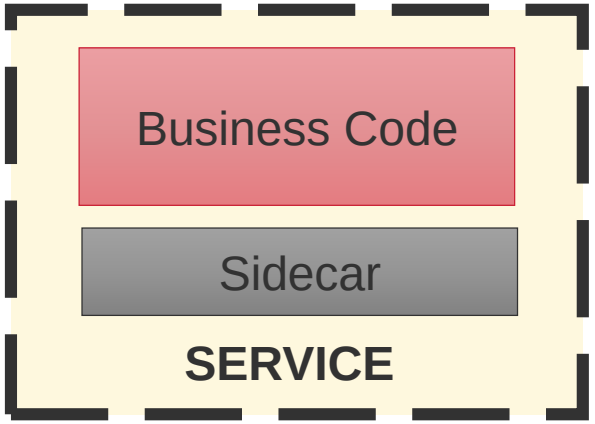
Orchestrator View



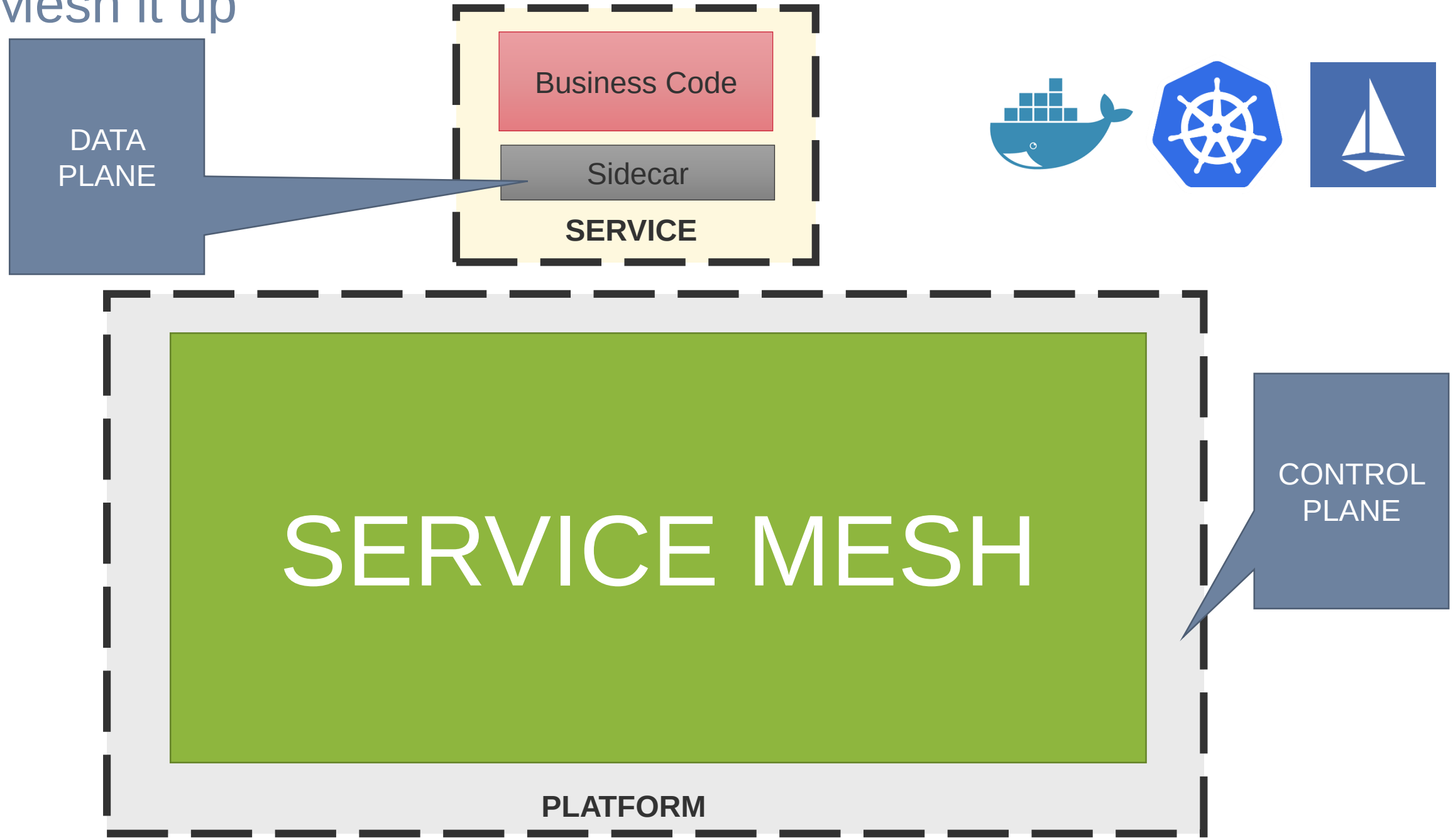
Orchestrator View



Mesh it up

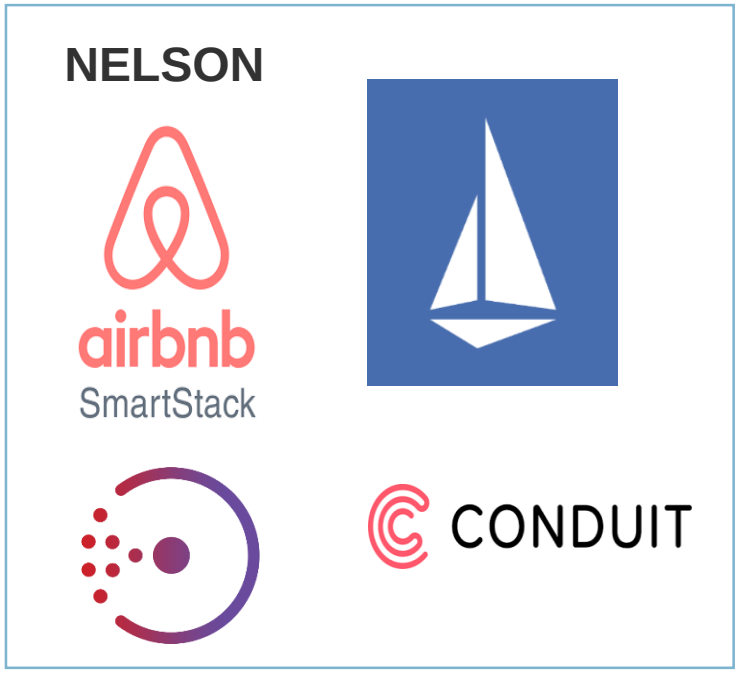


Mesh it up


DATA
PLANE
Business Code
Sidecar
SERVICE
SERVICE MESH
CONTROL
PLANE
PLATFORM

Service Mesh Umbrella

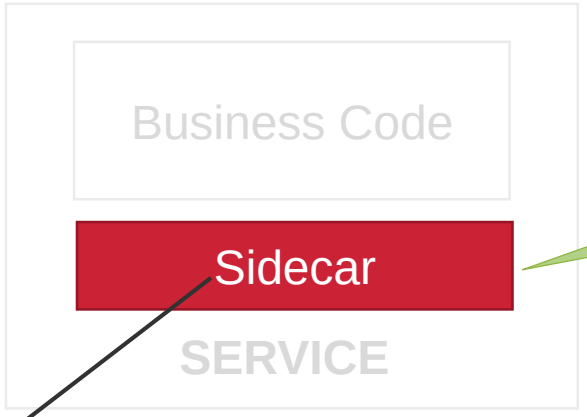
CONTROL PLANE



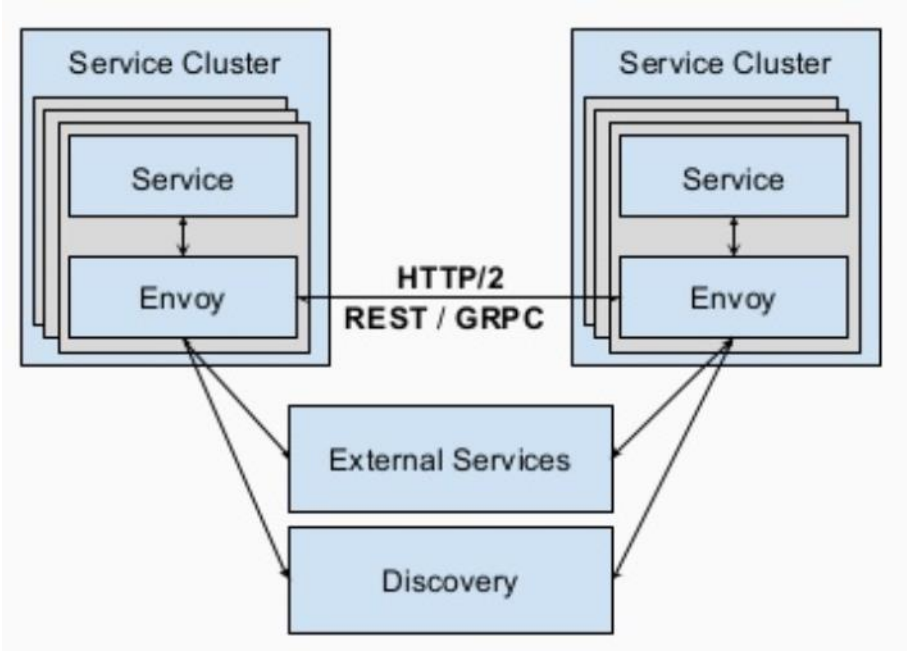
DATA PLANE

You name it…

Proxy Architecture

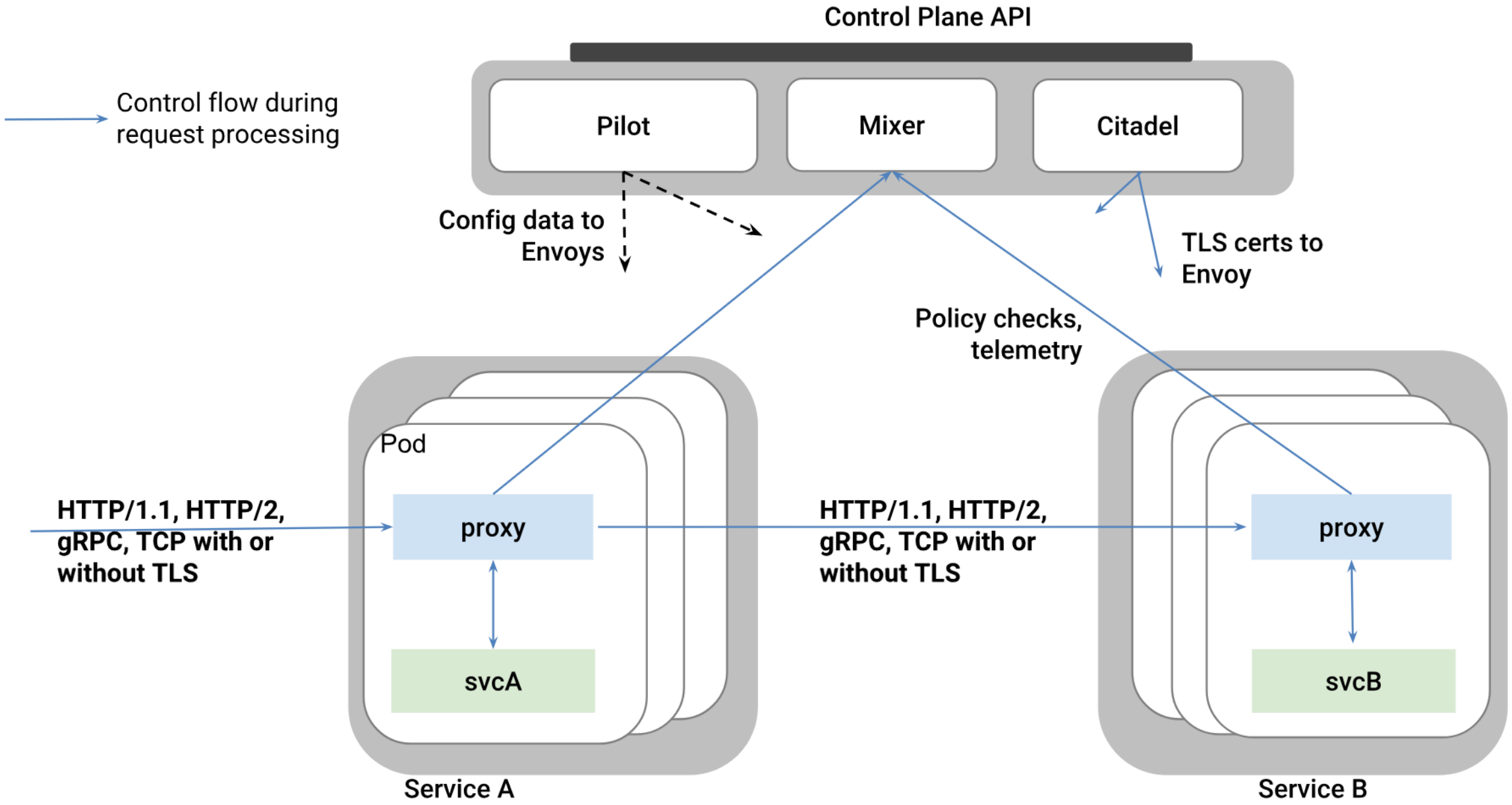


- **Edge Proxy**
- **Shared Proxy**
- **Sidecar Proxy**

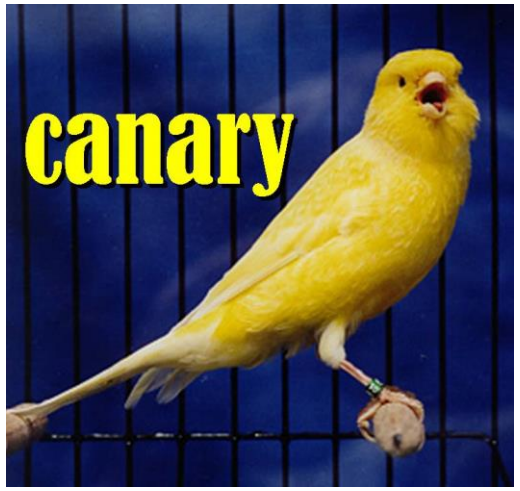


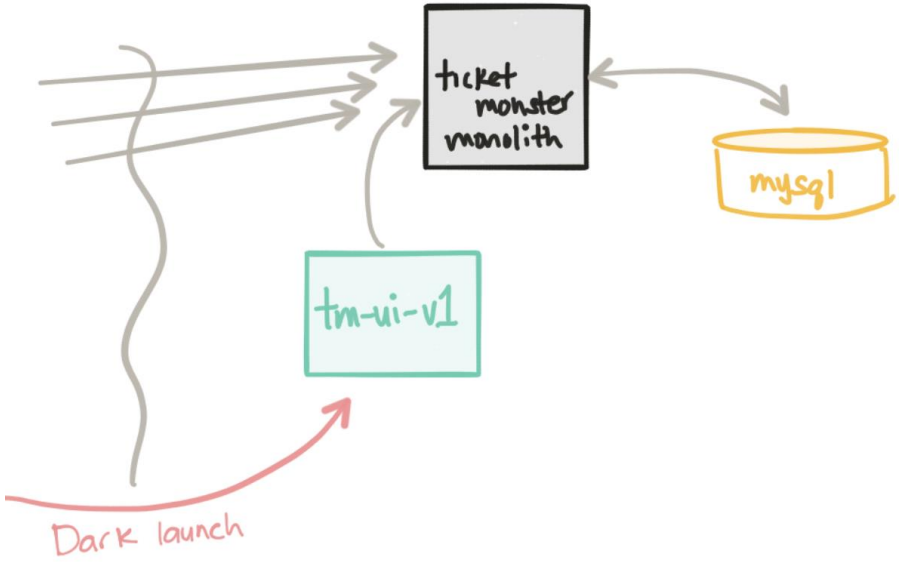
https://www.slideshare.net/datawire/lyfts-envoy-from-monolith-to-service-mesh-matt-klein-lyft/12

Istio Architecture



Istio Architecture: Traffic Control





Egress

Reference at http://blog.christianposta.com/microservices/low-risk-monolith-to-microservice-evolution-part-ii

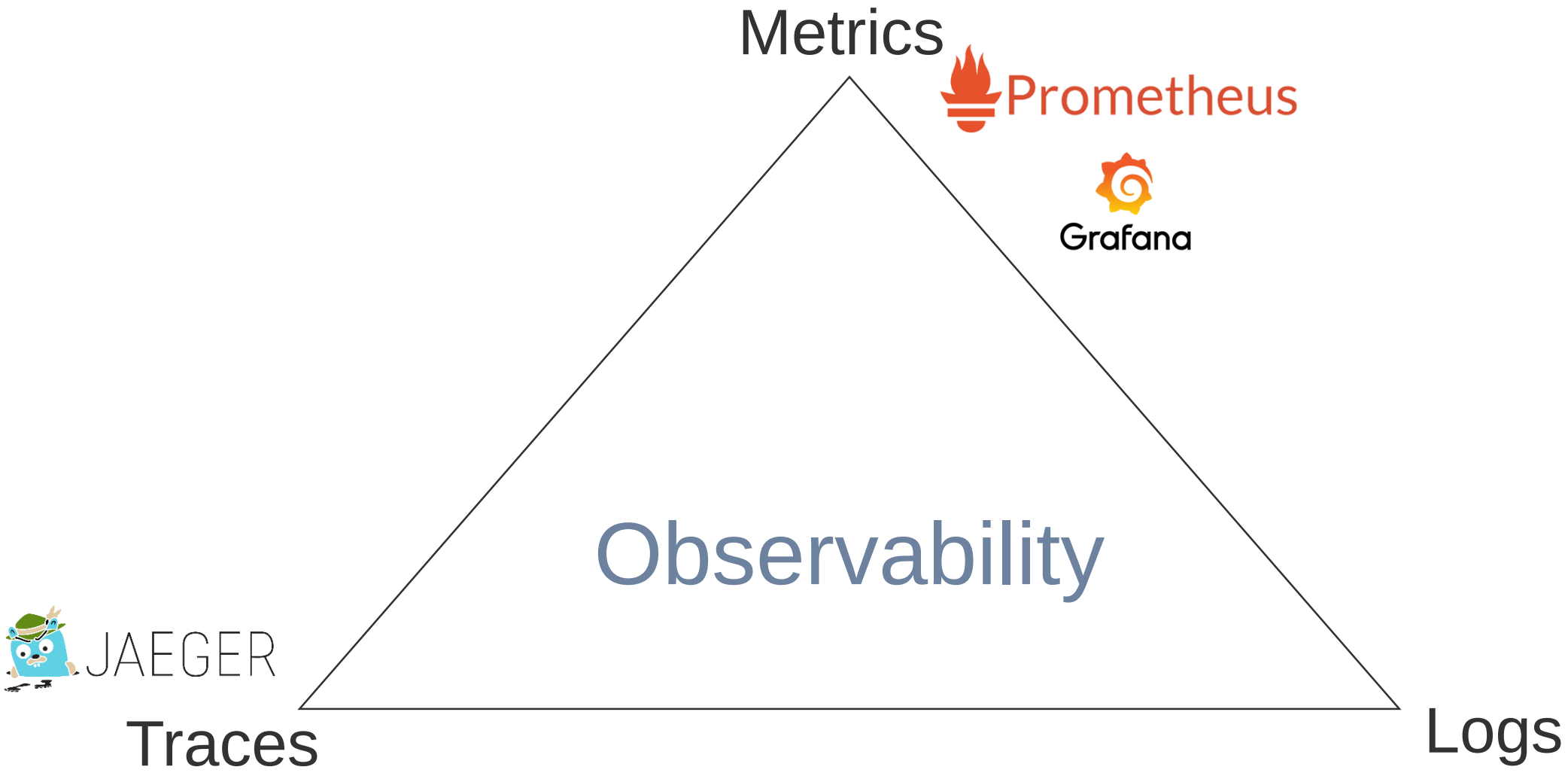
Istio Architecture: Resiliency

- Load Balancing
- Timeout
- Retry
- Circuit Breaker
- Pool Ejection

Istio Architecture: Chaos Testing

- HTTP Errors
- Delays

Istio Architecture: Observability



Istio Architecture: Security

- Blacklist

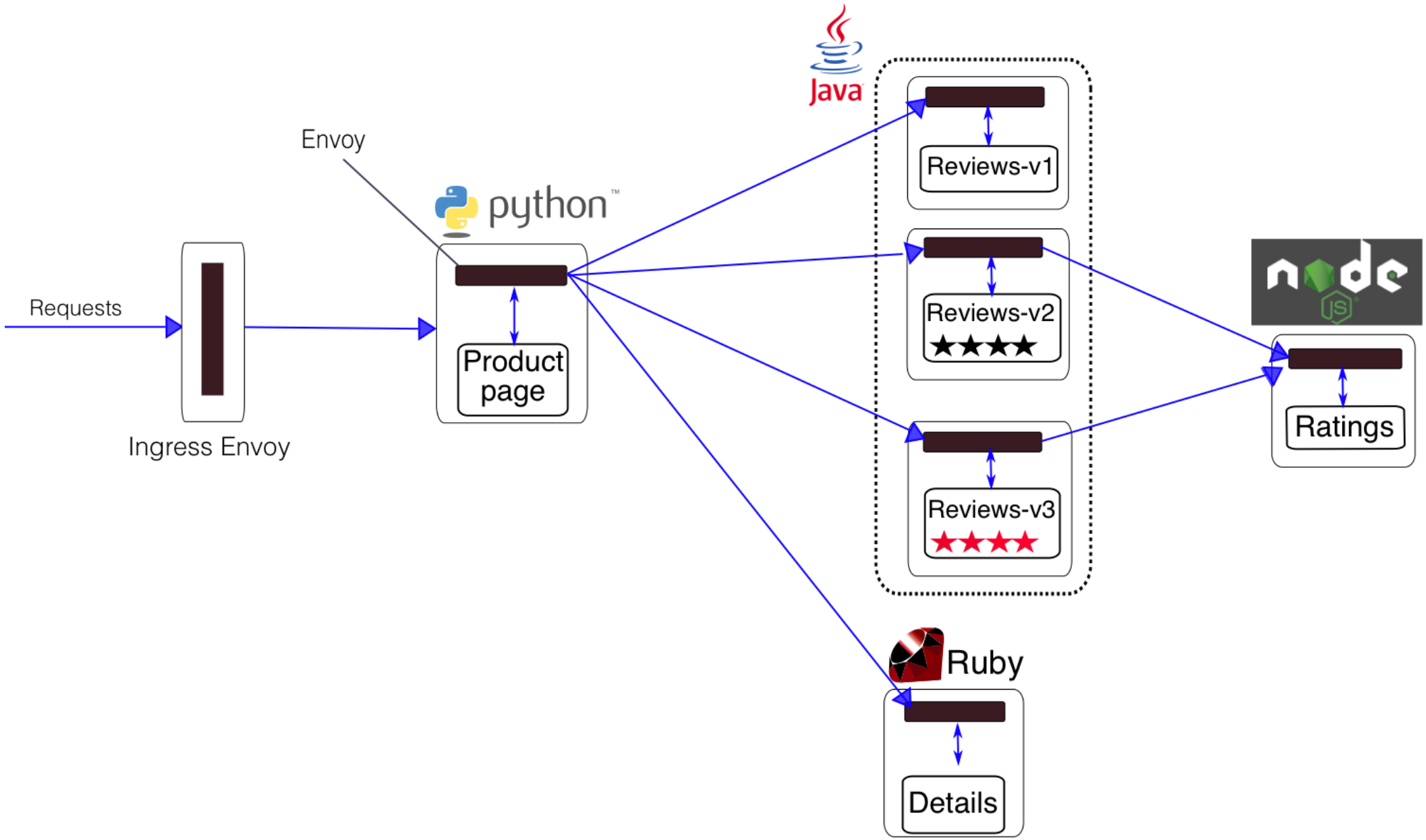
```
apiVersion: "config.istio.io/v1alpha2"
kind: denier
metadata:
  name: denycustomerhandler
spec:
  status:
    code: 7
    message: Not allowed
---
apiVersion: "config.istio.io/v1alpha2"
kind: checknothing
metadata:
  name: denycustomerrequests
spec:
---
apiVersion: "config.istio.io/v1alpha2"
kind: rule
metadata:
  name: denycustomer
spec:
  match: destination.labels["app"] == "preference" && source.labels["app"]=="customer"
  actions:
  - handler: denycustomerhandler.denier
    instances: [ denycustomerrequests.checknothing ]
```

Istio Architecture: Security

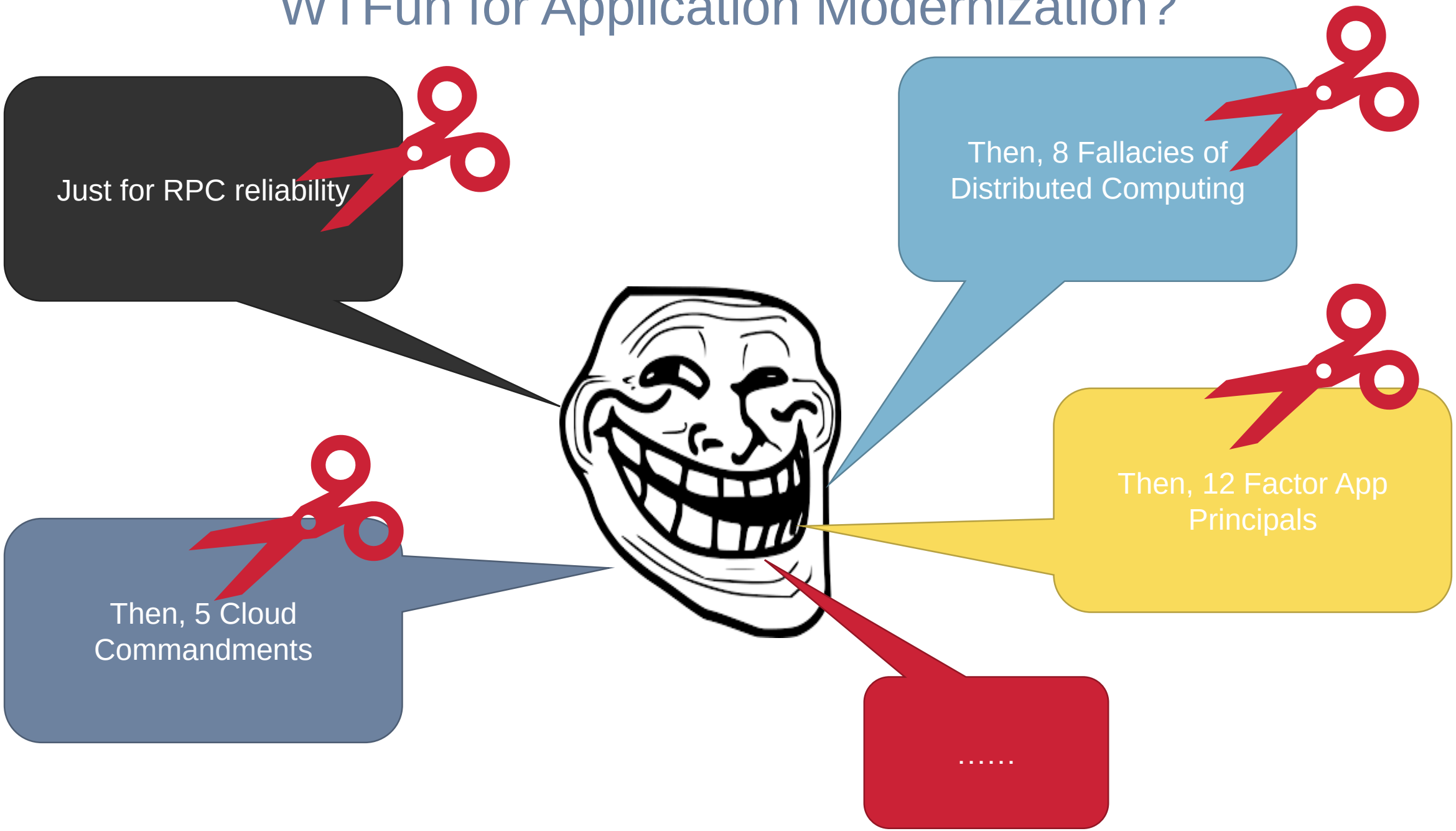
- Whitelist

```
apiVersion: "config.istio.io/v1alpha2"
kind: listchecker
metadata:
  name: preferencewhitelist
spec:
  overrides: ["recommendation"]
  blacklist: false
---
apiVersion: "config.istio.io/v1alpha2"
kind: listentry
metadata:
  name: preferencesource
spec:
  value: source.labels["app"]
---
apiVersion: "config.istio.io/v1alpha2"
kind: rule
metadata:
  name: checkfromcustomer
spec:
  match: destination.labels["app"] == "preference"
  actions:
  - handler: preferencewhitelist.listchecker
  instances:
  - preferencesource.listentry
```

DEMO: BookInfo



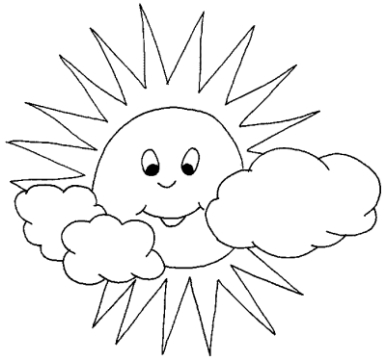
WTFun for Application Modernization?



Myth from Modern Era

Greek is a modernized life in the ancient world, but we can make it even better nowadays...

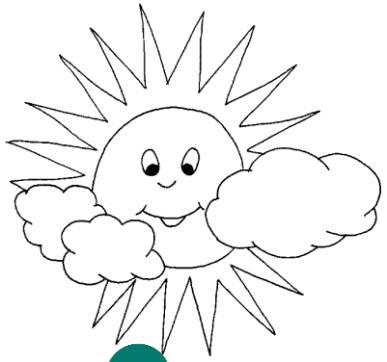
The Myth



Images source at https://printablefreecoloring.com

The Myth

Google Cloud Platform Live



IBM Cloud

Alibaba Cloud

ORACLE CLOUD

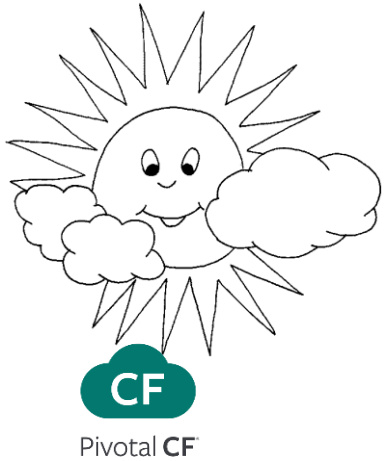
amazon web services

CF

Pivotal CF

Images source at https://printablefreecoloring.com

The Myth



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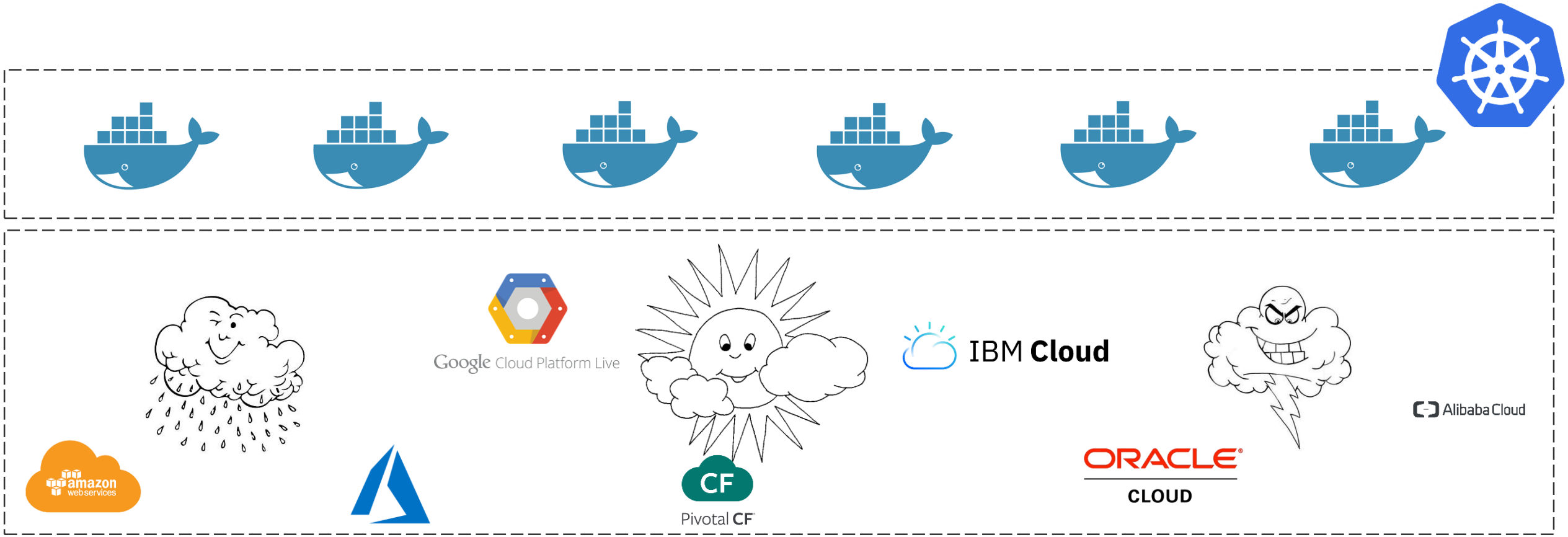
The Myth



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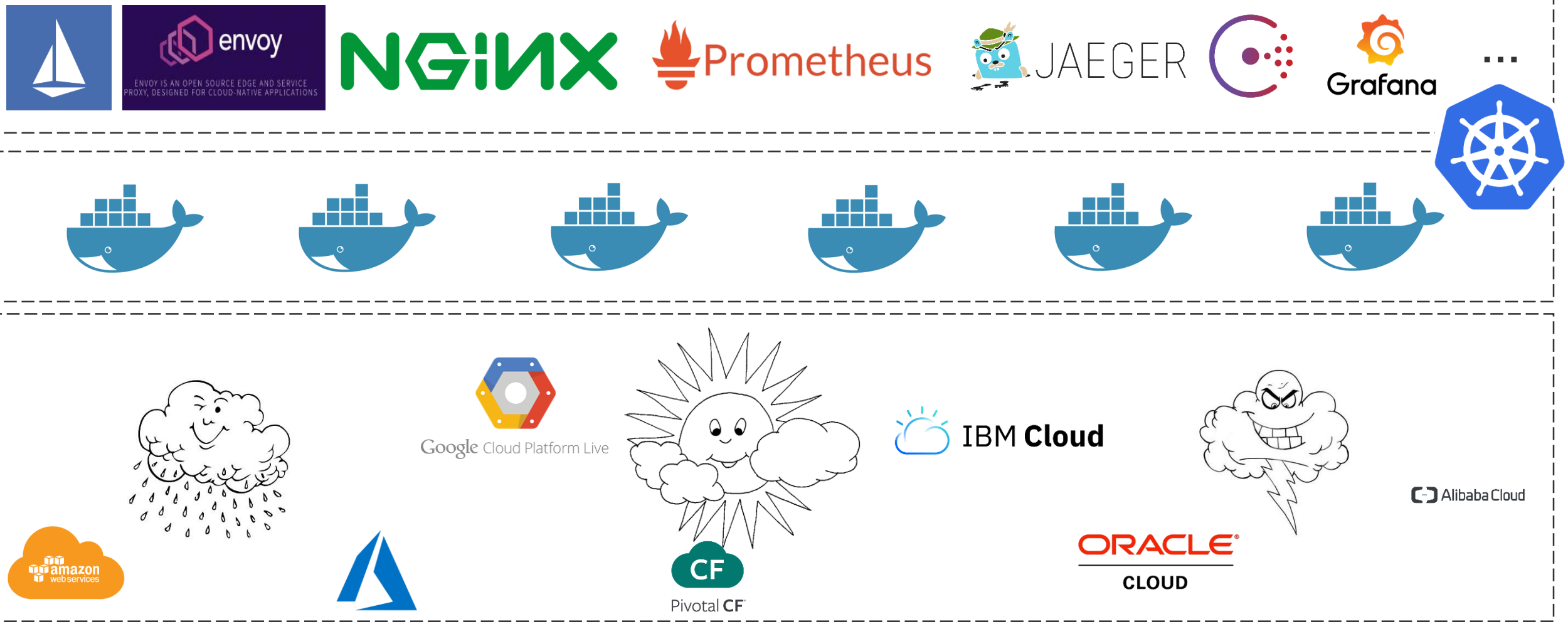
The Myth



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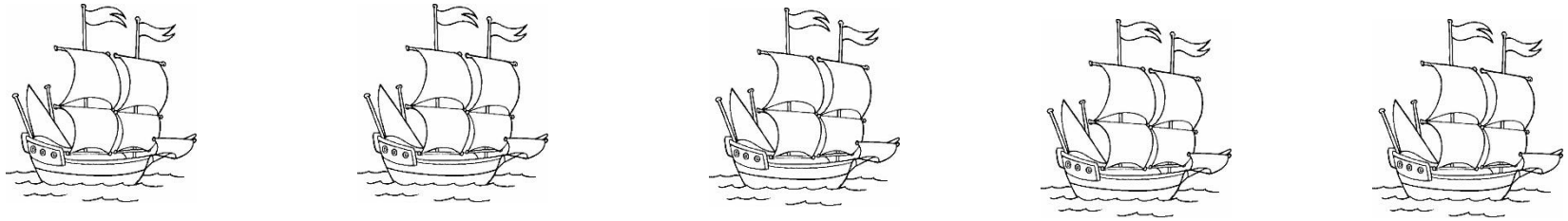
The Myth



envoy
ENVOY IS AN OPEN SOURCE EDGE AND SERVICE PROXY, DESIGNED FOR CLOUD-NATIVE APPLICATIONS

NGINX

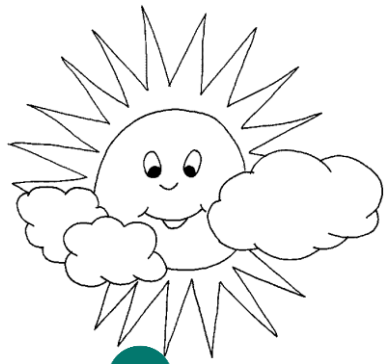
Prometheus

JAEGER

Grafana

...

Google Cloud Platform Live



IBM Cloud

Alibaba Cloud

amazon web services

Pivotal CF

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Q&A