



KubeCon



CloudNativeCon

Europe 2018



Istio by Example

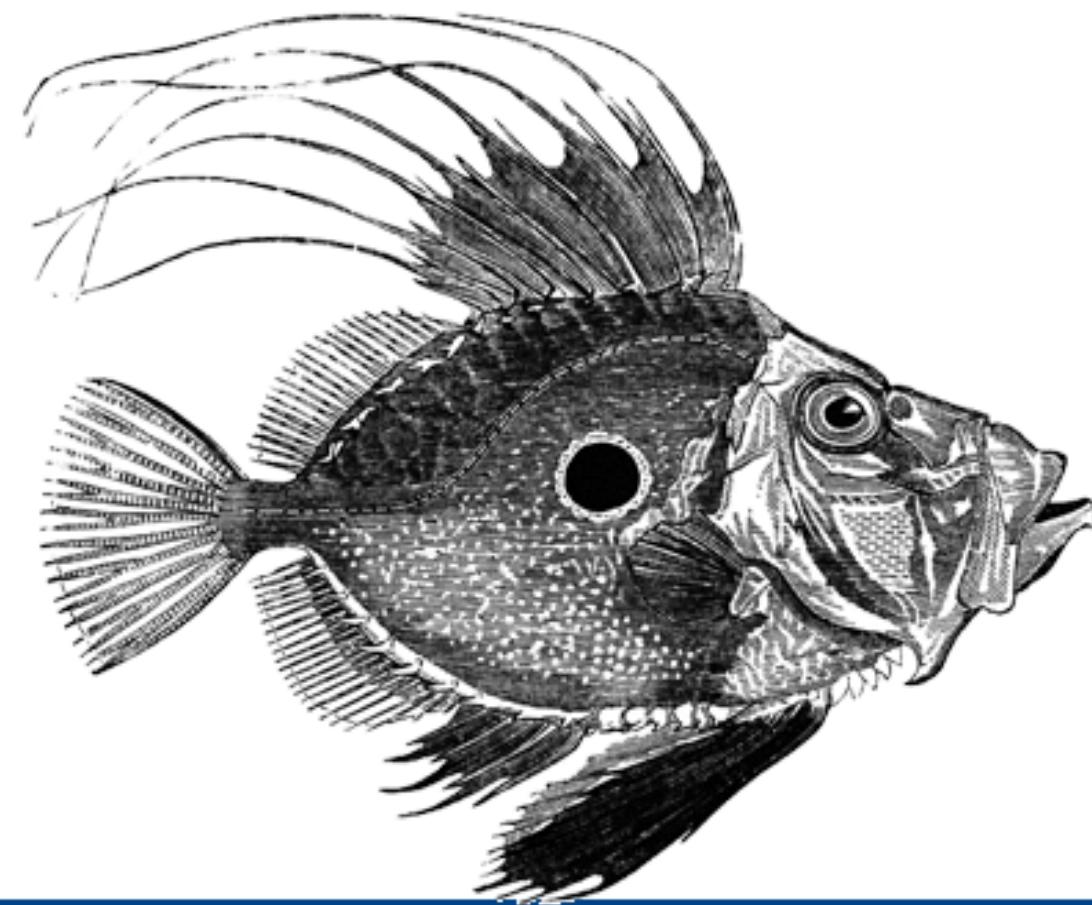
Josef Adersberger, CTO QAware



@adersberger



Why?

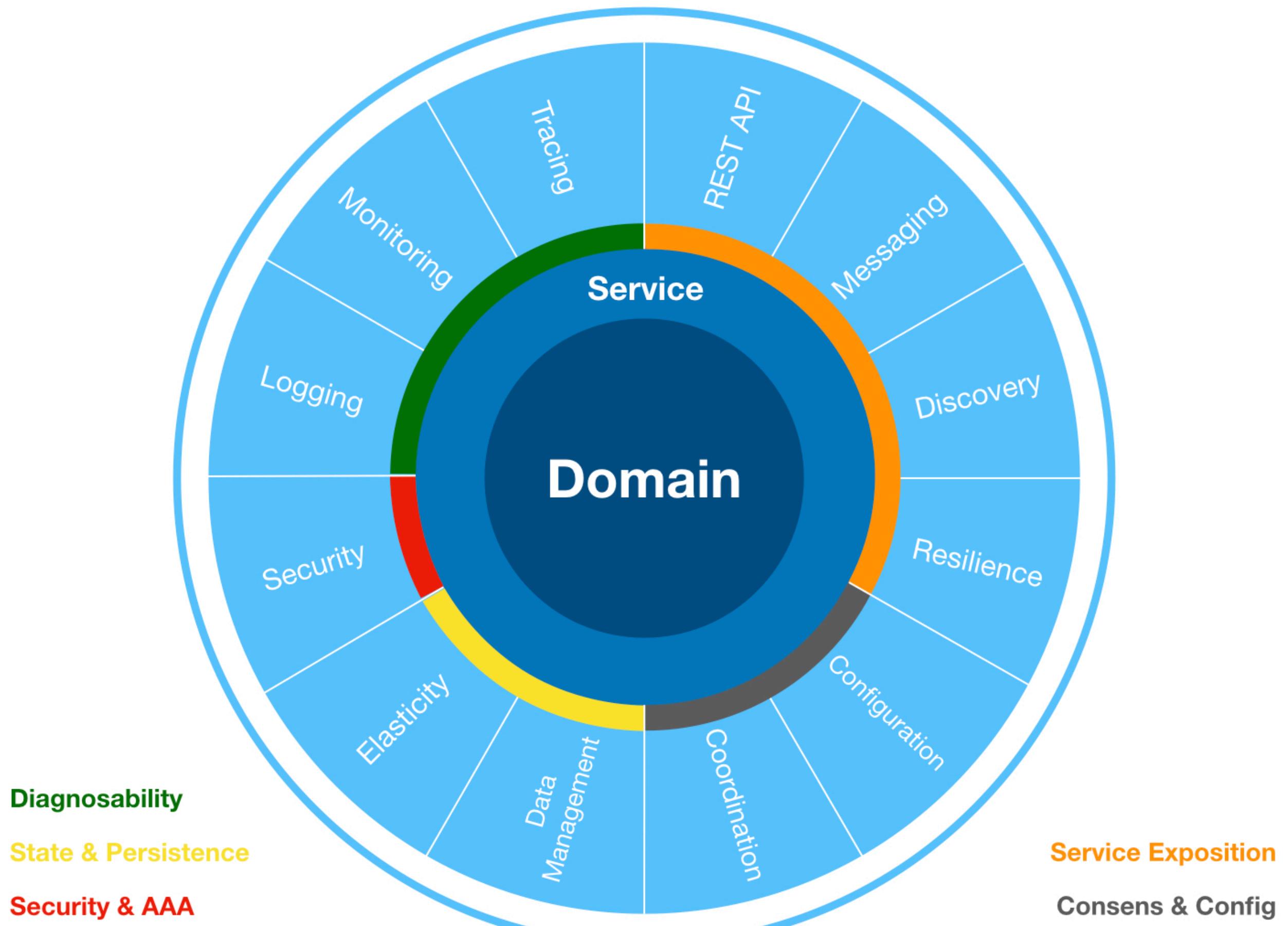


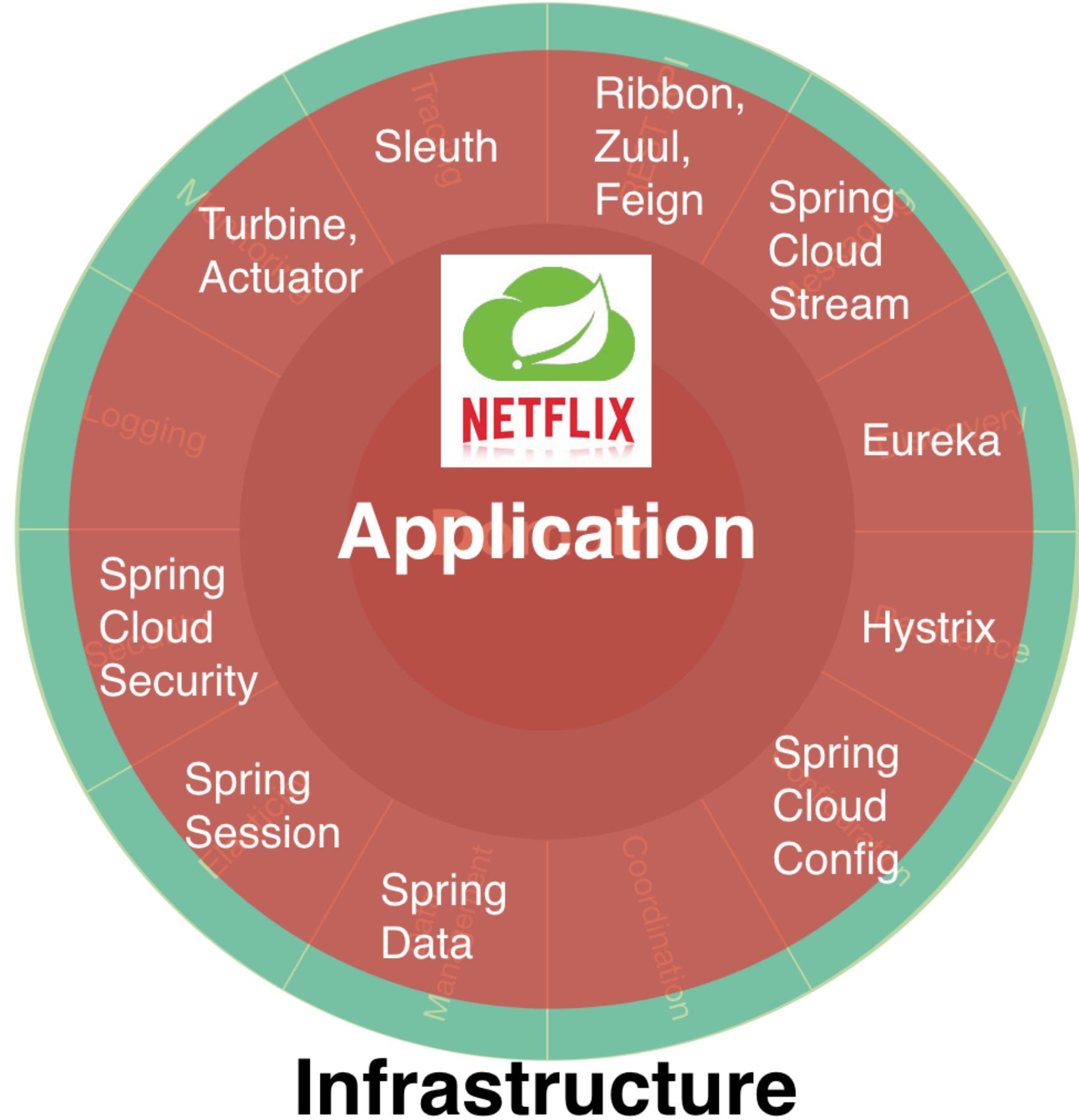
Hype-Driven Software Development

Istio Edition

O RLY[?]

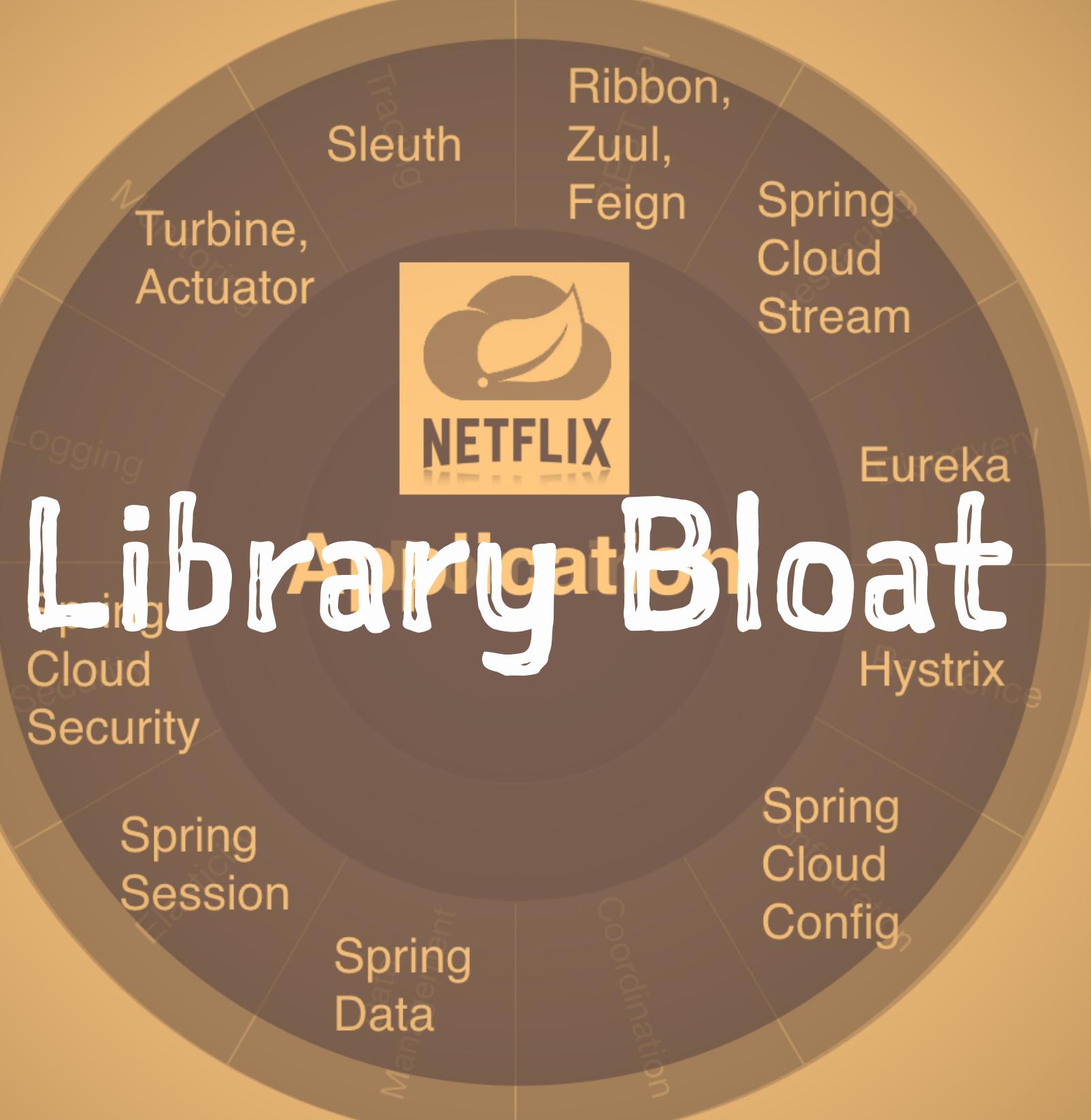
Josef Adersberger

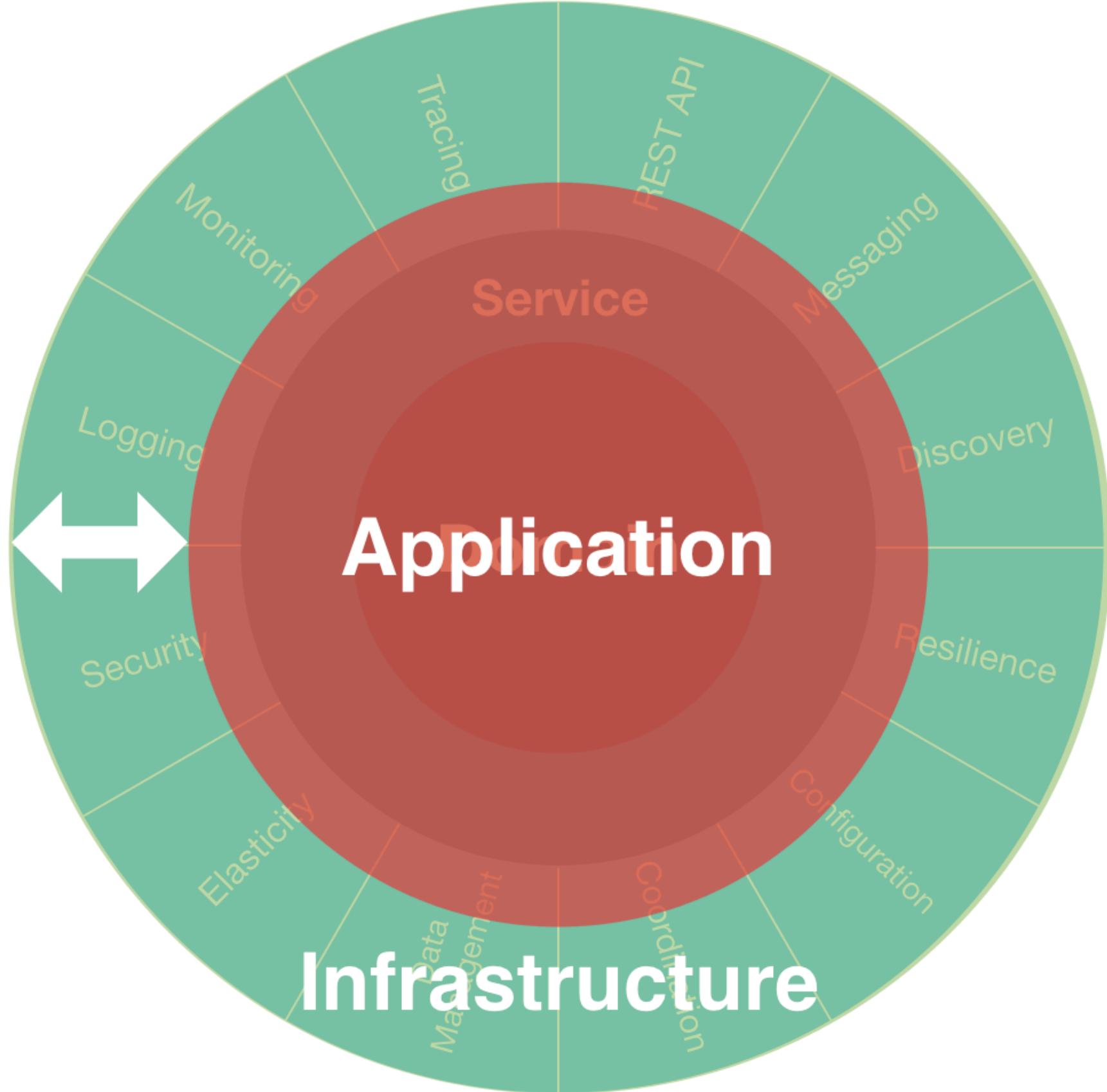


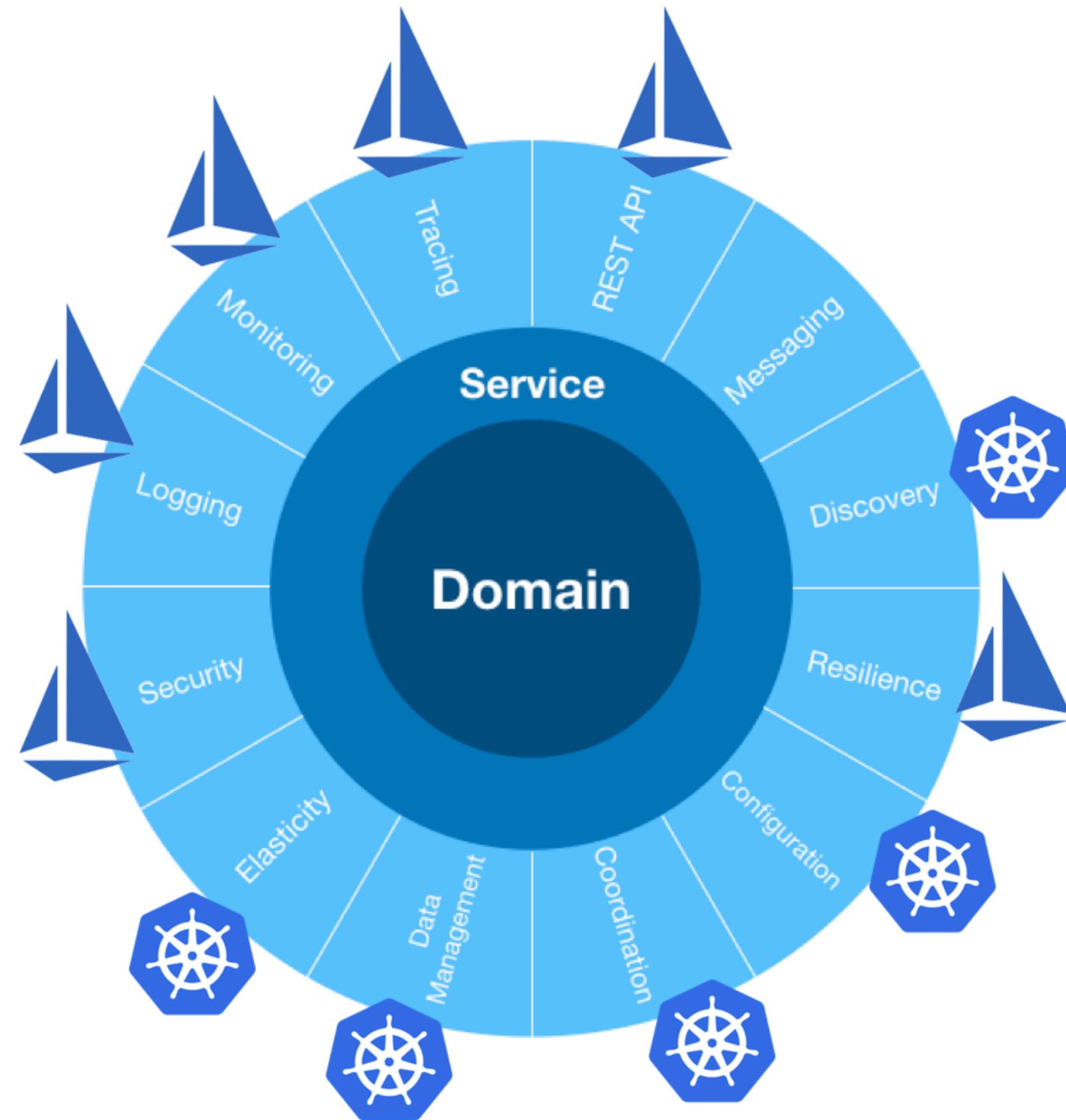


Library Bloat

Infrastructure







Setting the sails with Istio





Docker

Community Edition

Version 18.04.0-ce-mac62 (23965)

Channel: edge
e0a85640

Baby step: Install a (local) Kubernetes cluster



Engine: 18.04.0-ce

Notary: 0.6.0



Compose: 1.21.0



Credential Helper: 0.6.0



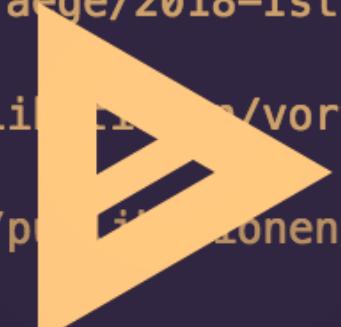
Machine: 0.14.0



Kubernetes: v1.9.6

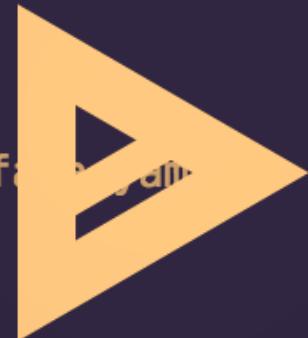
```
1 > # Setup Istio
2 > curl -L https://git.io/getLatestIstio | sh -
% Total    % Received % Xferd  Average Speed   Time   Time     Time  Current
          Dload  Upload Total   Spent    Left  Speed
0          0       0      0       0      0      0      0      0
100 1448 100 1448 0 0 1778 0 ---:--- ---:--- ---:--- 1778
Downloading istio-0.7.1 from https://github.com/istio/istio/releases/download/0.7.1/istio-0.7.1-osx.tar.gz ...
% Total    % Received % Xferd  Average Speed   Time   Time     Time  Current
          Dload  Upload Total   Spent    Left  Speed
100  612  0  612  0      0 1108 0 ---:--- ---:--- ---:--- 1106
100 11.2M 100 11.2M 0      0 413k 0 0:00:27 0:00:27 ---:--- 347k
Downloaded into istio-0.7.1:
LICENSE README.md      bin           install      istio.VERSION samples      tools
Add /Users/josef.adersberger/Documents/publikationen/vortraege/2018-Istio-by-Example/istio-by-example/code/istio-0.7.1/bin to your
path; e.g copy paste in your shell and/or ~/.profile:
export PATH="$PATH:/Users/josef.adersberger/Documents/publikationen/vortraege/2018-Istio-by-Example/istio-by-example/code/istio-0.7.1/bin"
3 > export PATH="$PATH:/Users/josef.adersberger/Documents/publikationen/vortraege/2018-Istio-by-Example/istio-by-example/code/istio-0.7.1/bin"
4 > istioctl
```

Video



Step 1: Deploy Istio and a Sample Application

```
1 > # Deploy Prometheus
3 > kubectl apply -f istio-*/install/kubernetes addons/prometheus.yaml
configmap "prometheus" unchanged
service "prometheus" created
deployment "prometheus" created
serviceaccount "prometheus" unchanged
clusterrole "prometheus" configured
clusterrolebinding "prometheus" configured
5 > kubectl expose deployment prometheus --name=prometheus-expose --port=9090 --target-port=9090 --type=LoadBalancer -n=istio-system
service "prometheus-expose" exposed
7 > # Deploy Grafana
9 > kubectl apply -f istio-*/install/kubernetes addons/grafana.yaml
service "grafana" created
deployment "grafana" created
serviceaccount "grafana" created
11 > kubectl expose deployment grafana --name=grafana-expose --port=3000 --target-port=3000 --type=LoadBalancer -n=istio-system
service "grafana-expose" exposed
13 > open http://localhost:3000/d/1/istio-dashboard
```



Video

Stimulate!

```
wget -P /usr/local/bin https://github.com/adersberger/slapper/releases/download/0.1/slapper  
slapper -rate 4 -targets ./target -workers 2 -maxY 15s
```

Canary Releases: A/B Testing

```
apiVersion: config.istio.io/v1alpha2
kind: RouteRule
metadata:
  name: reviews-test-v2
spec:
  destination:
    name: reviews
  precedence: 2
  match:
    request:
      headers:
        cookie:
          regex: "^(.*?; )?(user=jason)(; .*)?$"
  route:
  - labels:
      version: v2
```

```
istioctl create -f route-rule-reviews-test-v2.yaml
```

Canary Releases: Rolling Upgrade

```
apiVersion: config.istio.io/v1alpha2
kind: RouteRule
metadata:
  name: reviews-default
spec:
  destination:
    name: reviews
  precedence: 1
  route:
    - labels:
        version: v1
        weight: 50
    - labels:
        version: v3
        weight: 50
```

```
istioctl create -f route-rule-reviews-50-v3.yaml
```

Canary Releases: Blue/Green

```
apiVersion: config.istio.io/v1alpha2
kind: RouteRule
metadata:
  name: reviews-default
spec:
  destination:
    name: reviews
  precedence: 1
  route:
  - labels:
      version: v3
    weight: 100

istioctl replace -f route-rule-reviews-v3.yaml
```

Security: Access Control

```
apiVersion: "config.istio.io/v1alpha2"
kind: denier
metadata:
  name: denyreviewsv3handler
spec:
  status:
    code: 7
    message: Not allowed
---
apiVersion: "config.istio.io/v1alpha2"
kind: checknothing
metadata:
  name: denyreviewsv3request
spec:
---
apiVersion: "config.istio.io/v1alpha2"
kind: rule
metadata:
  name: denyreviewsv3
spec:
  match: source.labels["layer"]=="inner" && destination.labels["layer"] == "outer"
  actions:
  - handler: denyreviewsv3handler.denier
  instances: [ denyreviewsv3request.checknothing ]
```

Security: Egress

```
apiVersion: networking.istio.io/v1alpha3
kind: ExternalService
metadata:
  name: google-ext
spec:
  hosts:
  - www.google.com
  ports:
  - number: 443
    name: https
    protocol: http
---
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: google-ext
spec:
  name: www.google.com
  trafficPolicy:
    tls:
      mode: SIMPLE # initiates HTTPS when talking to www.google.com
```

Resiliency: Circuit Breaker

```
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: httpbin
spec:
  name: httpbin
  trafficPolicy:
    connectionPool:
      tcp:
        maxConnections: 100
      http:
        http1MaxPendingRequests: 1
        maxRequestsPerConnection: 1
    outlierDetection:
      http:
        consecutiveErrors: 1
        interval: 1s
        baseEjectionTime: 3m
        maxEjectionPercent: 100
```

Resiliency: Latency Injection

```
apiVersion: config.istio.io/v1alpha2
kind: RouteRule
metadata:
  name: ratings-delay
spec:
  destination:
    name: reviews
  route:
  - labels:
      version: v1
  httpFault:
    delay:
      percent: 10
      fixedDelay: 5s
```

Resiliency: Error Injection

```
apiVersion: config.istio.io/v1alpha2
kind: RouteRule
metadata:
  name: ratings-abort
spec:
  destination:
    name: ratings
  route:
    - labels:
        version: v1
  httpFault:
    abort:
      percent: 10
      httpStatus: 400
```

[https://github.com/
adersberger/istio-by-
example](https://github.com/adersberger/istio-by-example)

Thank you!



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@adersberger

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