



RED HAT®
**DEVELOPER
PROGRAM**

developers.redhat.com

Who am I ?



Kamesh Sampath

Director of Developer Experience at Red Hat

- Active Open Source Contributor
 - OpenWhisk
 - Eclipse Che
 - fabric8 Platform <https://fabric8.io/>
- Creator vert.x-maven-plugin →
<https://vmp.fabric8.io/>



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@kamesh_sampath



bit.ly/istio-tutorial

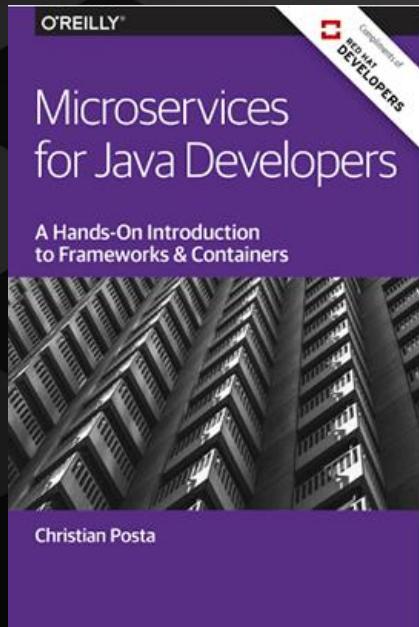
What is a microservice ?

The microservice architectural style is an approach to developing a single application as a suite of small services, each running in its own process and communicating with lightweight mechanisms, often an HTTP resource API.

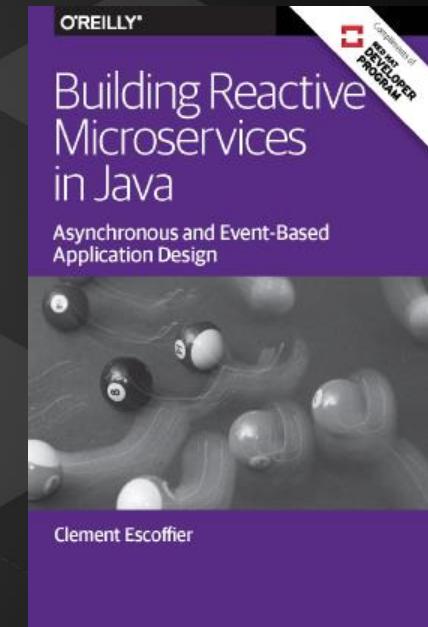
These services are built around business capabilities and independently deployable by fully automated deployment machinery. There is a bare minimum of centralized management of these services, which may be written in different programming languages and use different data storage technologies.

Martin Fowler

bit.ly/javamicroservicesbook



bit.ly/reactivemicroservicesbook



Microservices Introductory Materials

Demo: bit.ly/msa-instructions

Slides: bit.ly/microservicesdeepdive

Video Training: bit.ly/microservicesvideo

[Kubernetes for Java Developers](#)

Microservices Advanced Materials

bit.ly/istio-tutorial

bit.ly/mono2microdb

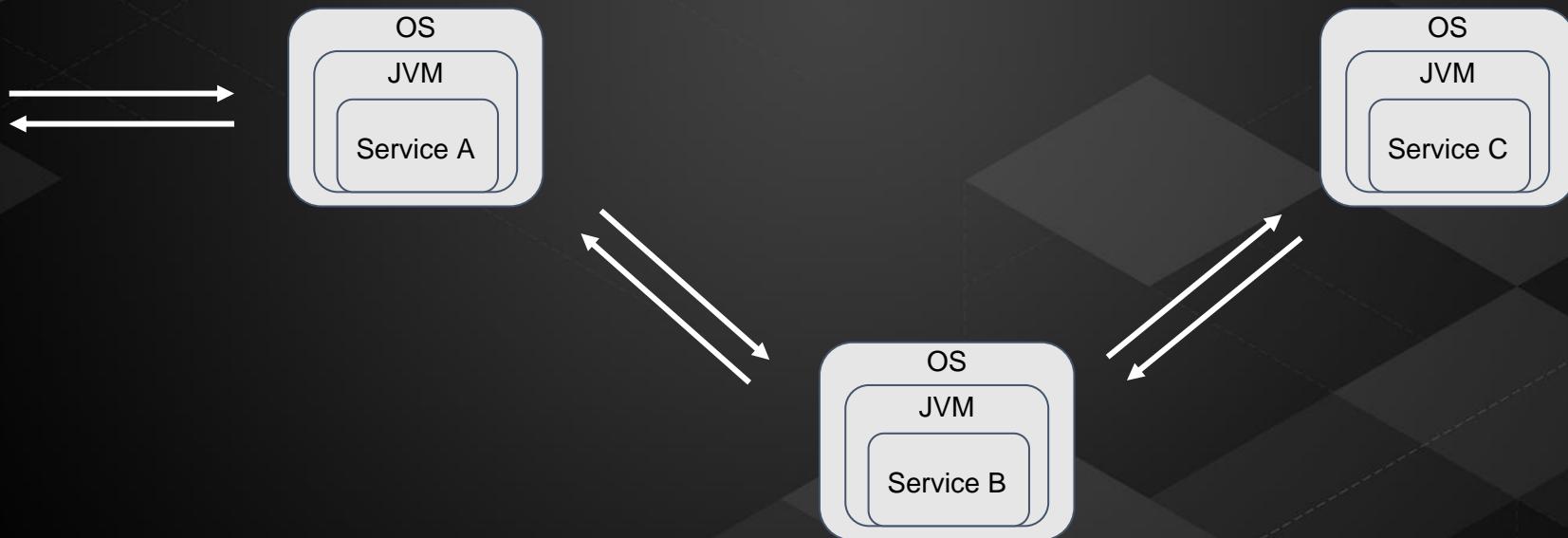
Istio.io

Short History of Microservices

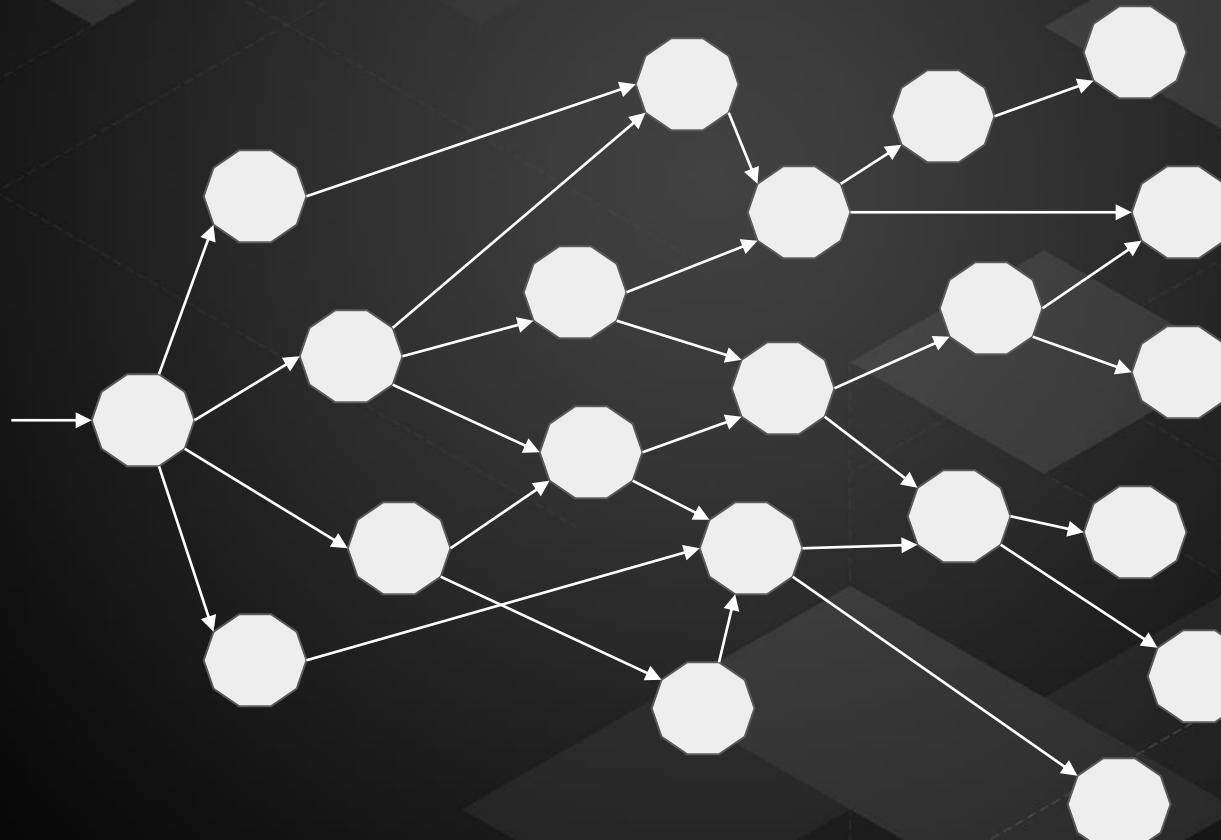


NETFLIX | OSS

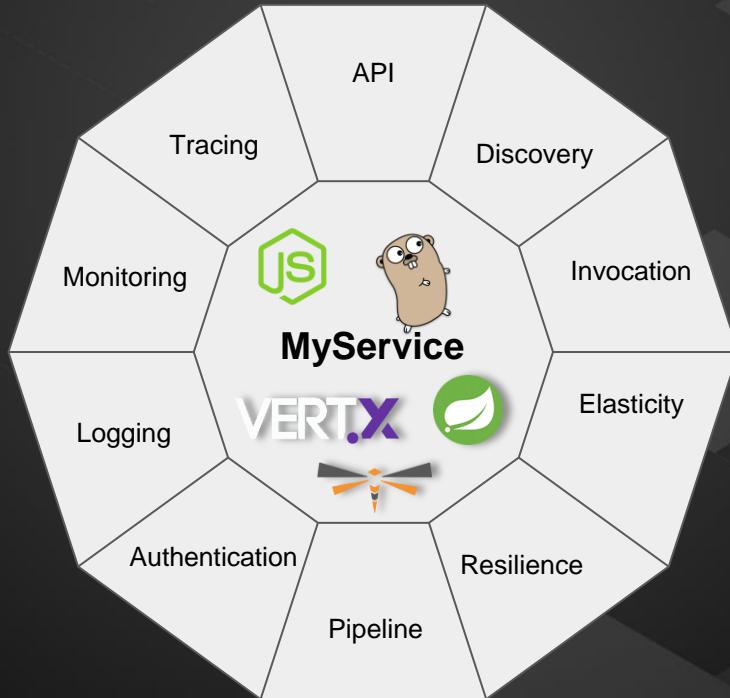
Microservices == Distributed Computing



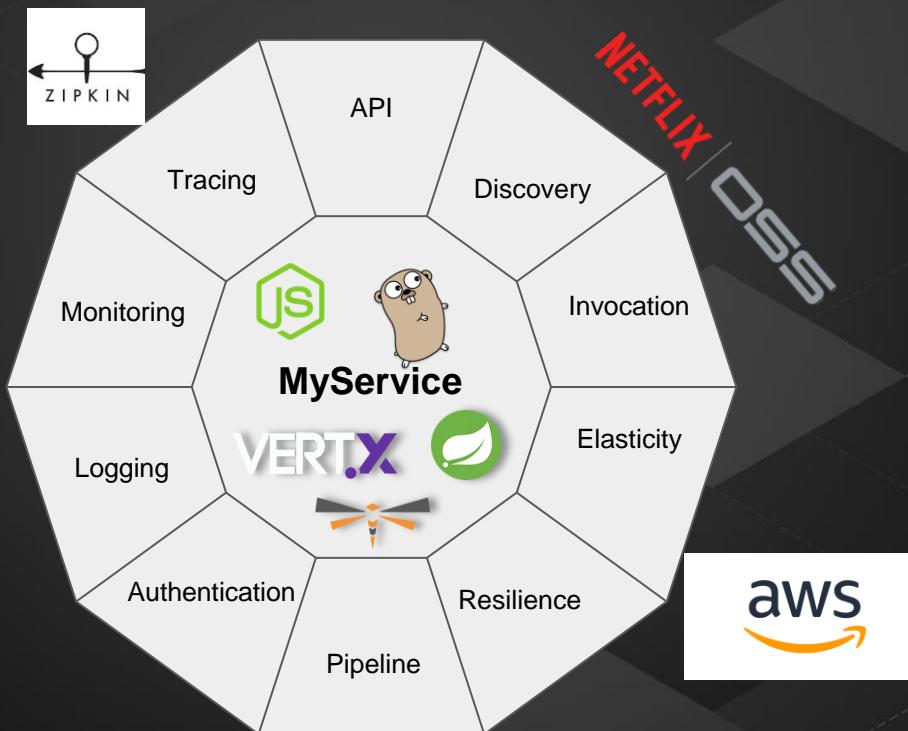
Distributed Computing == Network of Services



Microservices'ilities



Microservices'ilities

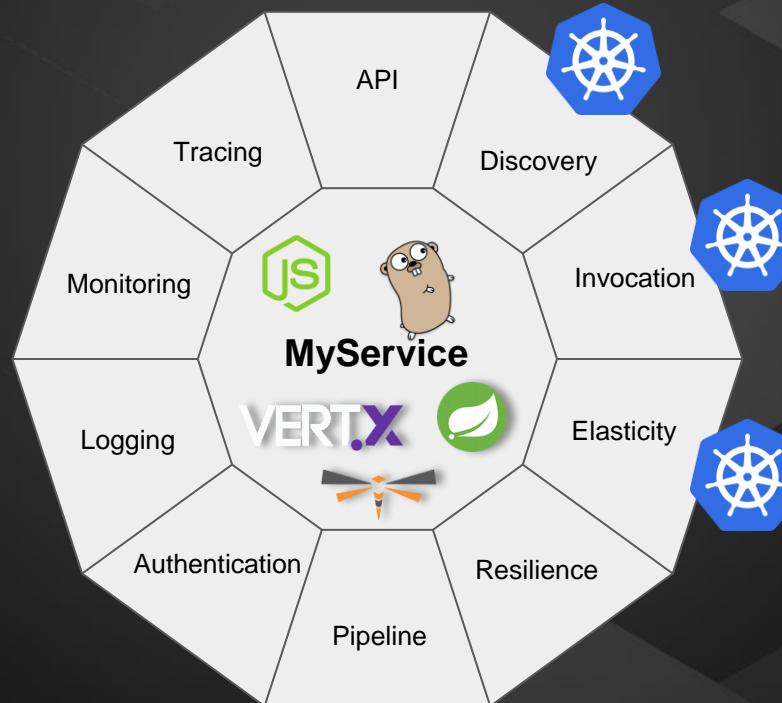


Some Action!!!!

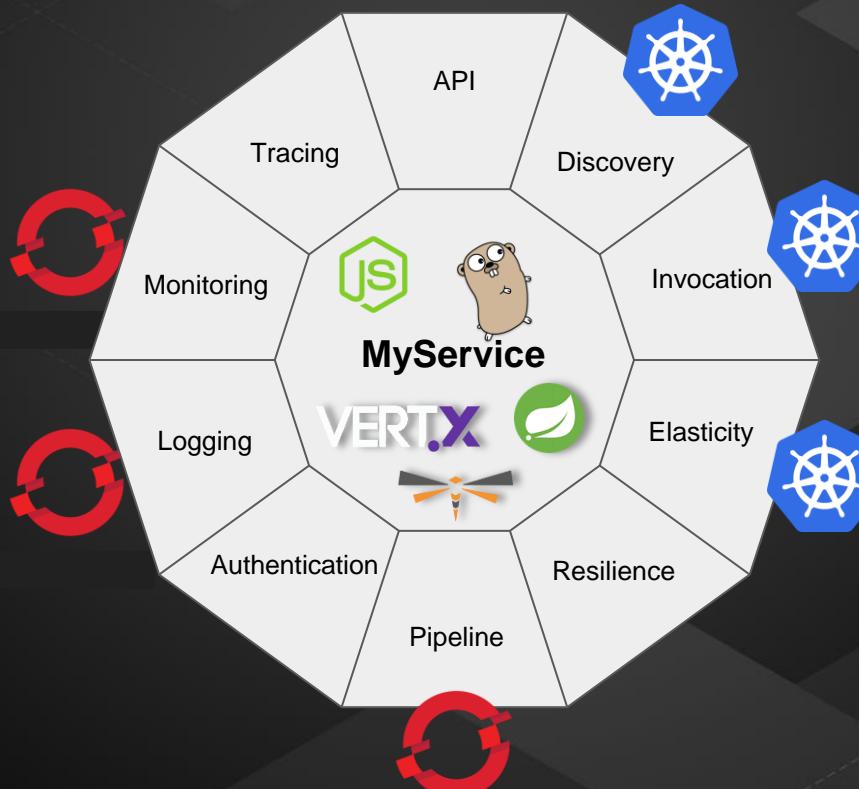


OPENSIFT

Microservices'ilities + Kubernetes



Microservices'ilities + OpenShift



Microservice(Yes) Pain Points

- Discovery
- Distributed Tracing
- Circuit Breakers
- Metrics and Monitoring
- Operational Requirements
 - A/B Testing
 - Canary Release
 - Rate Limiting
 - Access Policies

What's Wrong with Netflix OSS?

Java Only

Adds a lot of libraries to YOUR code

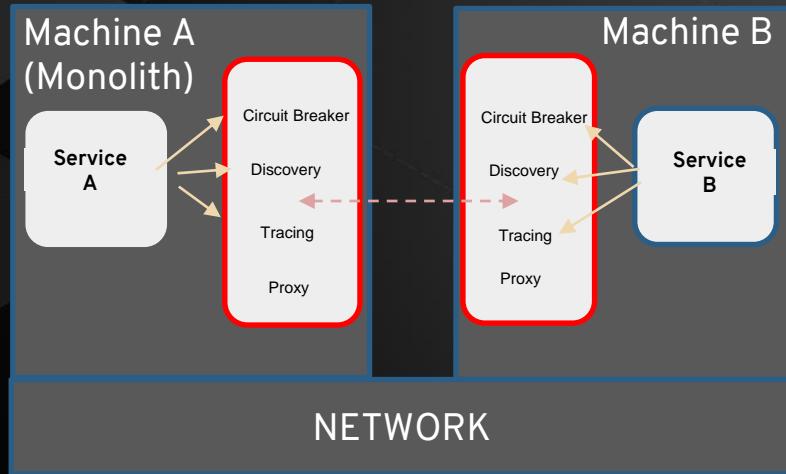




Istio - Sail

(Kubernetes - Helmsman or ship's pilot)

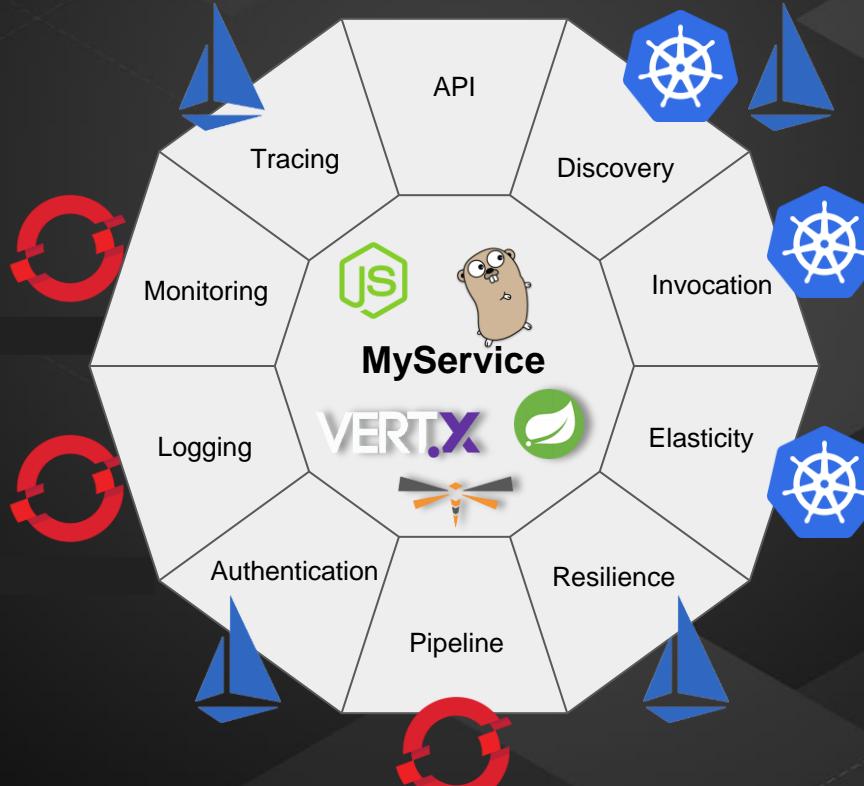
What is a service mesh ?



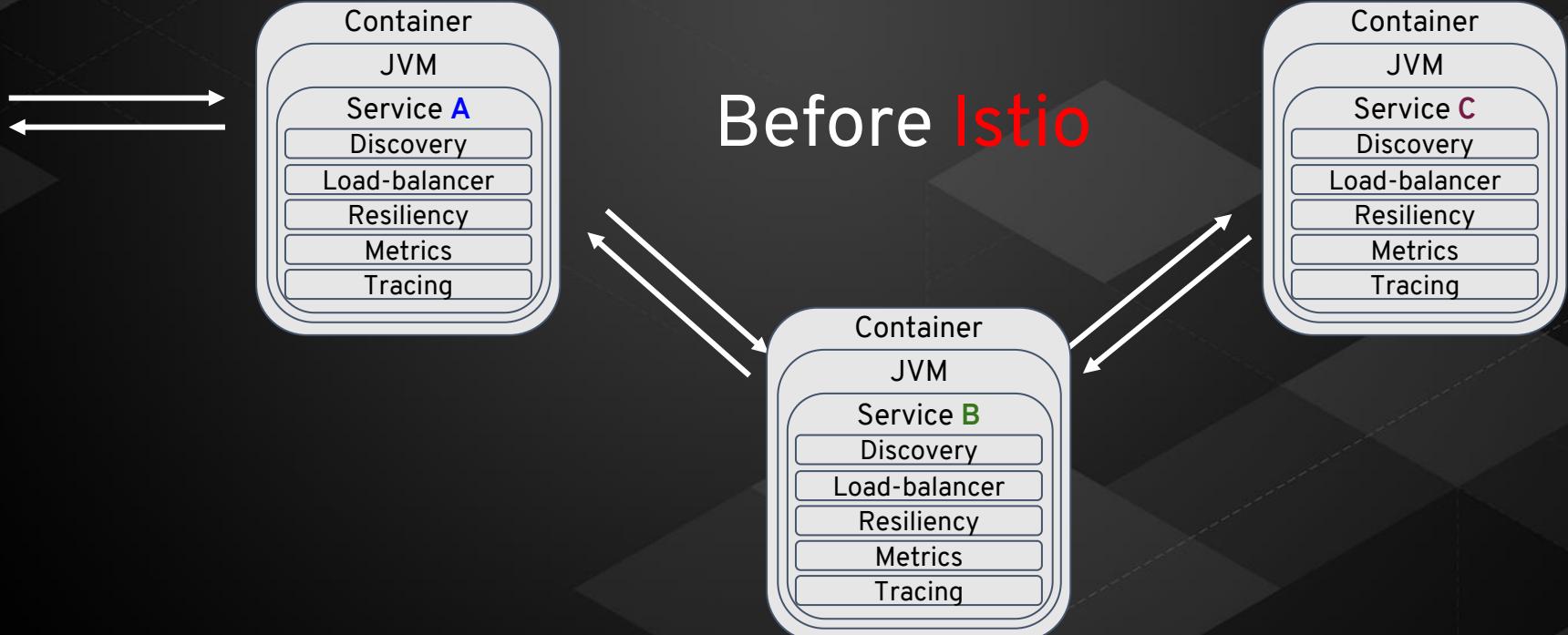
A service mesh is a dedicated infrastructure layer for handling service-to-service communication. It's responsible for the reliable delivery of requests through the complex topology of services that comprise a modern, cloud native application. In practice, the service mesh is typically implemented as an array of lightweight network proxies that are deployed alongside application code, without the application needing to be aware

<https://buoyant.io/2017/04/25/whats-a-service-mesh-and-why-do-i-need-one/>

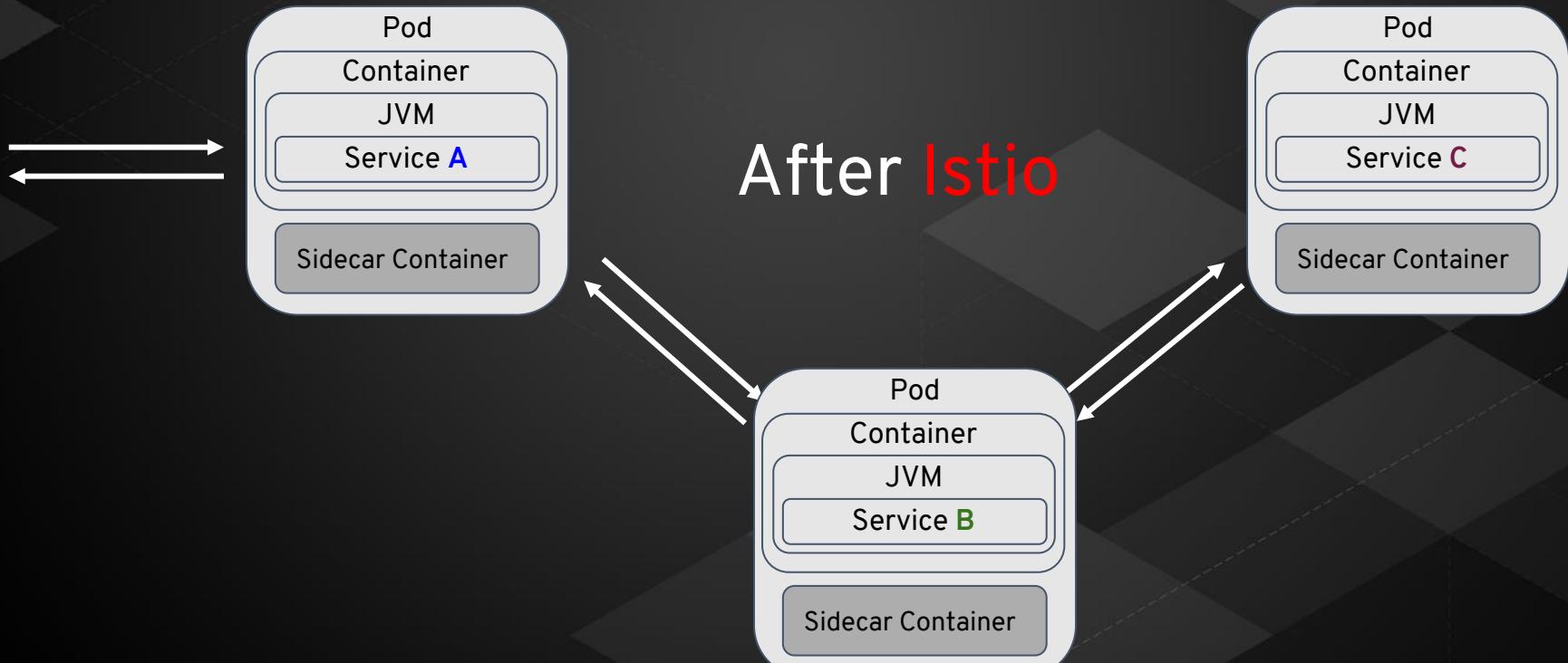
Microservices'ilities + Istio



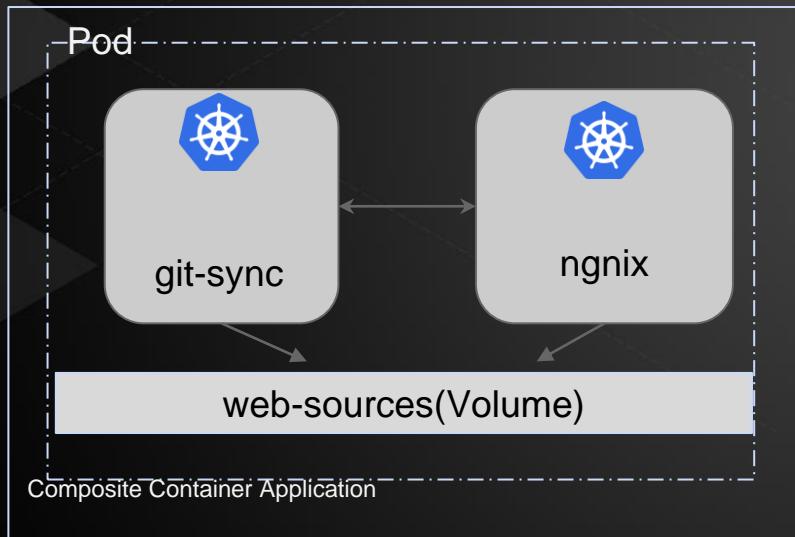
Microservices embedding Capabilities



Microservices externalizing Capabilities

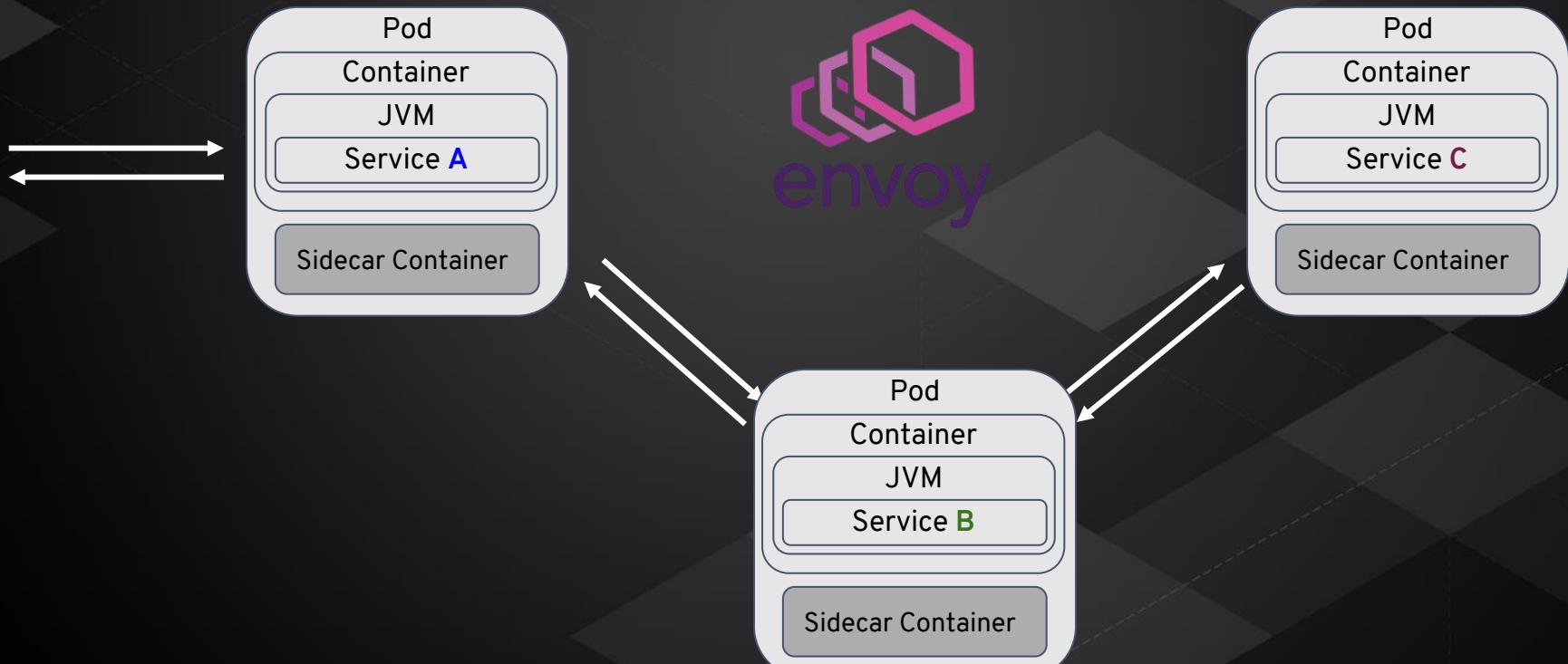


SideCars

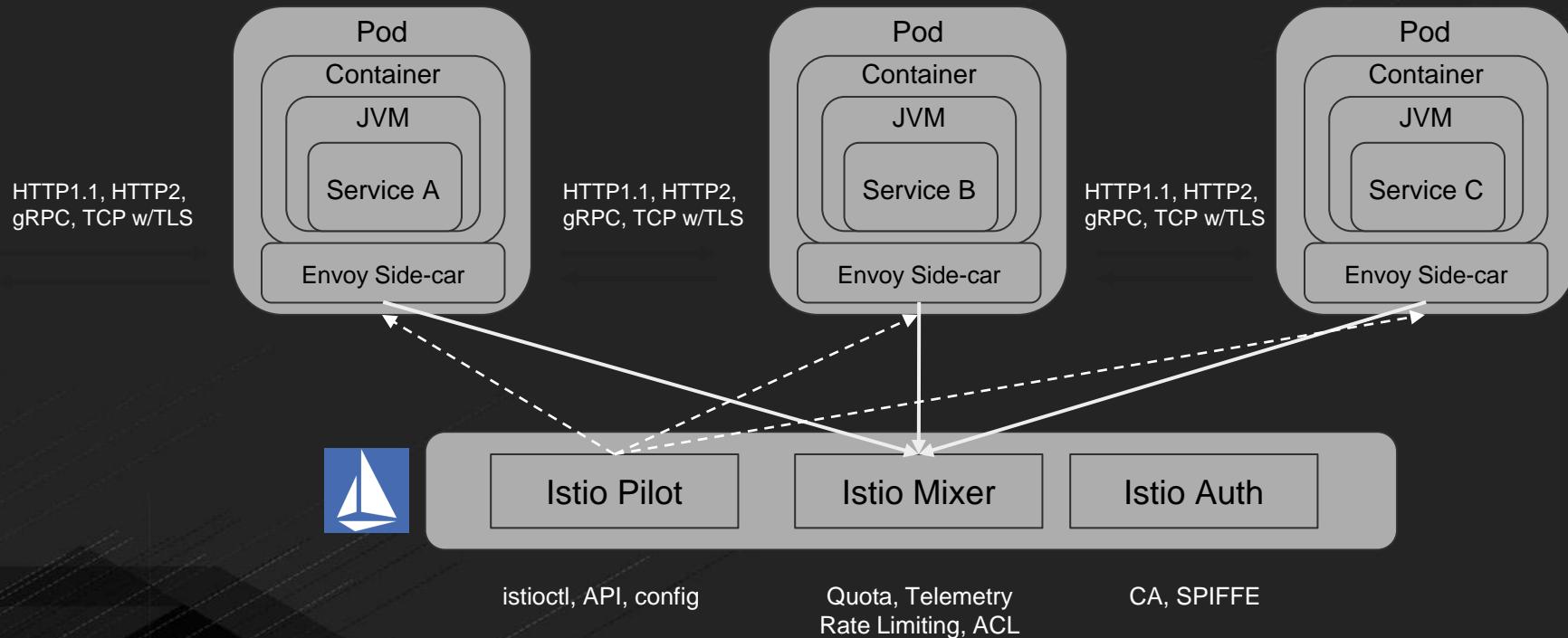


- Two or more containers deployed to same pod
- Share
 - same namespace
 - same Pod IP
 - Shared lifecycle
- Used to enhance the containers

Kubernetes, Istio, Envoy



Istio Control Plane



EXPLORER

OPEN EDITORS

- ! bookinfo.yaml
- ! bookinfo_istio.yaml
- ! bookinfo_istio.yaml ↔ bookinfo...

BOOKINFO

- ! bookinfo_istio.yaml
- ! bookinfo-ingress.yaml
- ! bookinfo-v1.yaml
- ! bookinfo.yaml
- cleanup.sh
- ! destination-ratings-test-delay.yaml
- ! loadbalancing-policy-reviews.yaml
- ! mixer-rule-additional-telemetry.yaml
- ! mixer-rule-empty-rule.yaml
- ! mixer-rule-ratings-denial.yaml
- ! mixer-rule-ratings-ratelimit.yaml
- README.md
- ! route-rule-all-v1.yaml
- ! route-rule-delay.yaml
- ! route-rule-reviews-50-v3.yaml
- ! route-rule-reviews-test-v2.yaml
- ! route-rule-reviews-v2-v3.yaml
- ! route-rule-reviews-v3.yaml

Annotations:

```
alpha.istio.io/sidecar: injected
alpha.istio.io/version: jenkins@ubuntu-16-04-build
pod.beta.kubernetes.io/init-containers: '[{"args": "-w kernel.core_pattern=/tmp/core.%e.%p.%t \u0026 creationTimestamp: null
labels:
  app: details
  version: v1
spec:
  containers:
    - image: istio/examples-bookinfo-details-v1
      imagePullPolicy: IfNotPresent
      name: details
      ports:
        - containerPort: 9080
      resources: {}
      args:
        - proxy
        - sidecar
        - -v
        - "2"
      env:
        - name: POD_NAME
          valueFrom:
            fieldRef:
              fieldPath: metadata.name
        - name: POD_NAMESPACE
          valueFrom:
            fieldRef:
              fieldPath: metadata.namespace
        - name: POD_IP
          valueFrom:
            fieldRef:
              fieldPath: status.podIP
      image: docker.io/istio/proxy_debug:0.1
      imagePullPolicy: Always
```

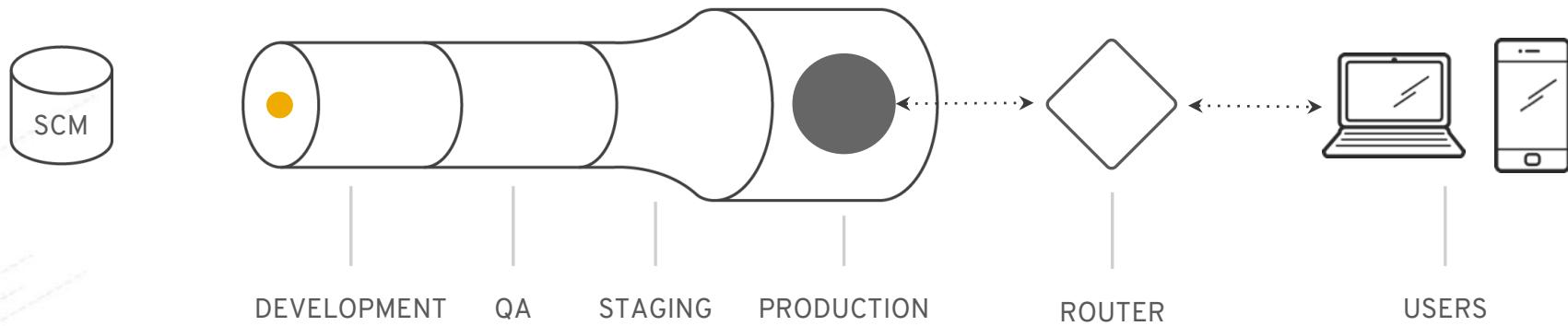
Labels:

```
app: details
version: v1
spec:
  containers:
    - name: details
      image: istio/examples-bookinfo-details-v1
      imagePullPolicy: IfNotPresent
      ports:
        - containerPort: 9080
```

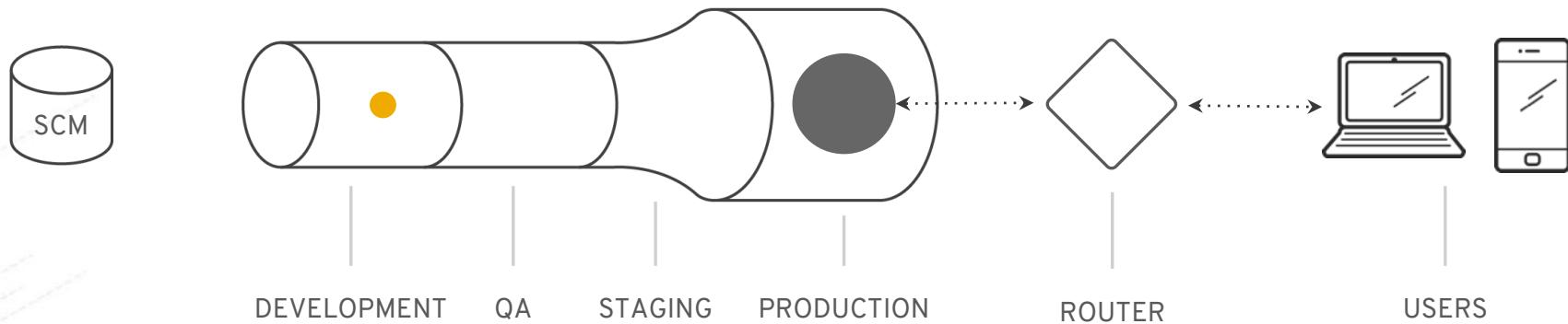
Ports:

```
- containerPort: 9080
```

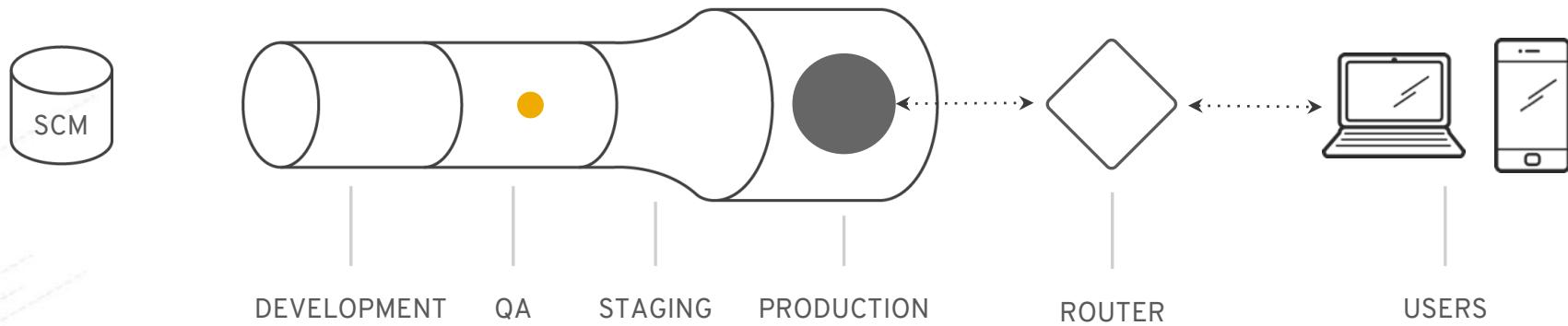
Canary Deployment



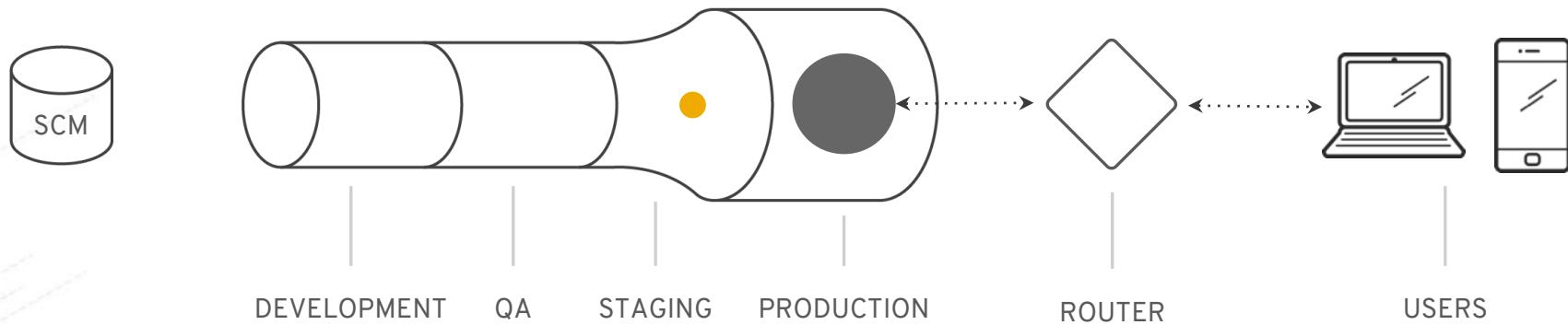
Canary Deployment



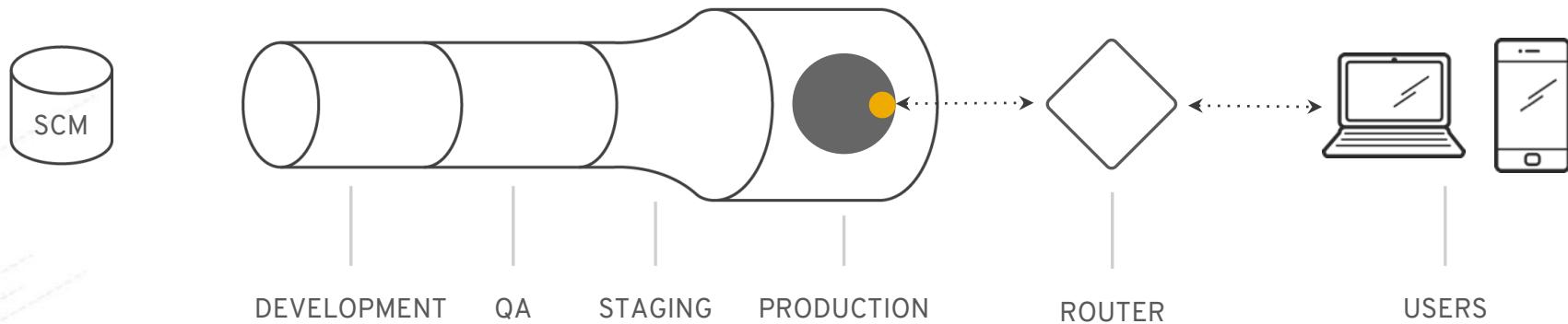
Canary Deployment



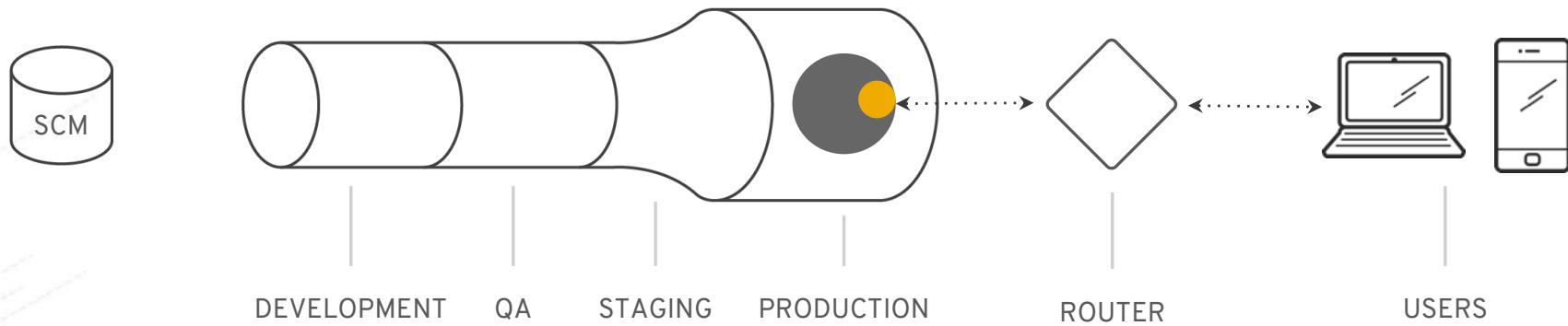
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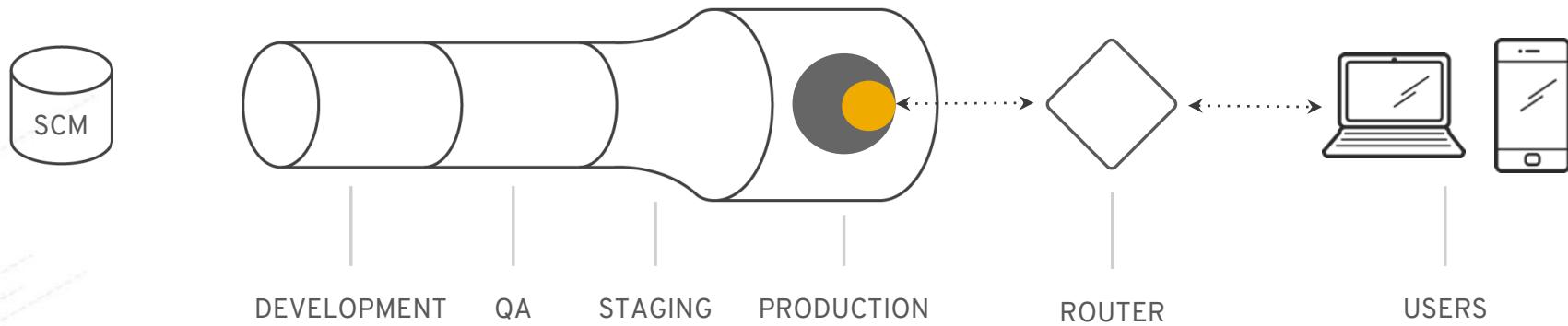
Canary Deployment



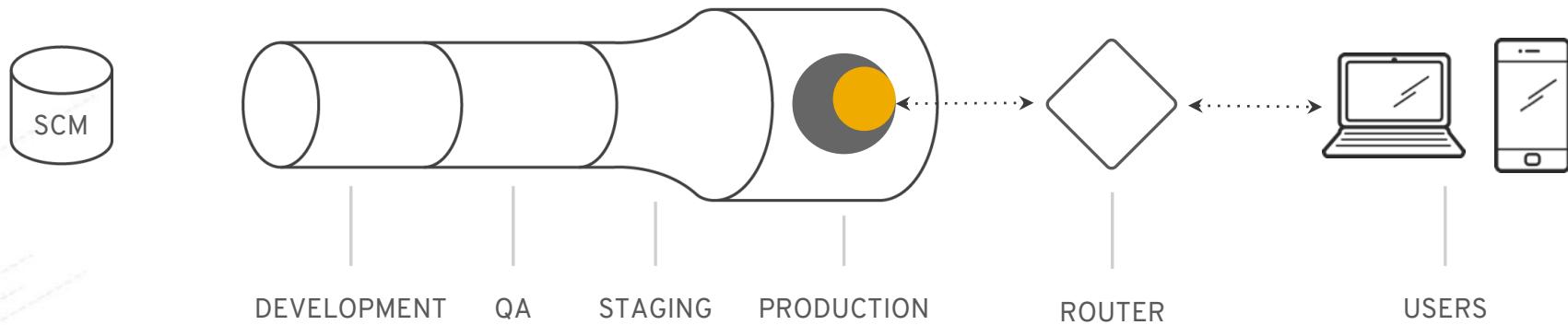
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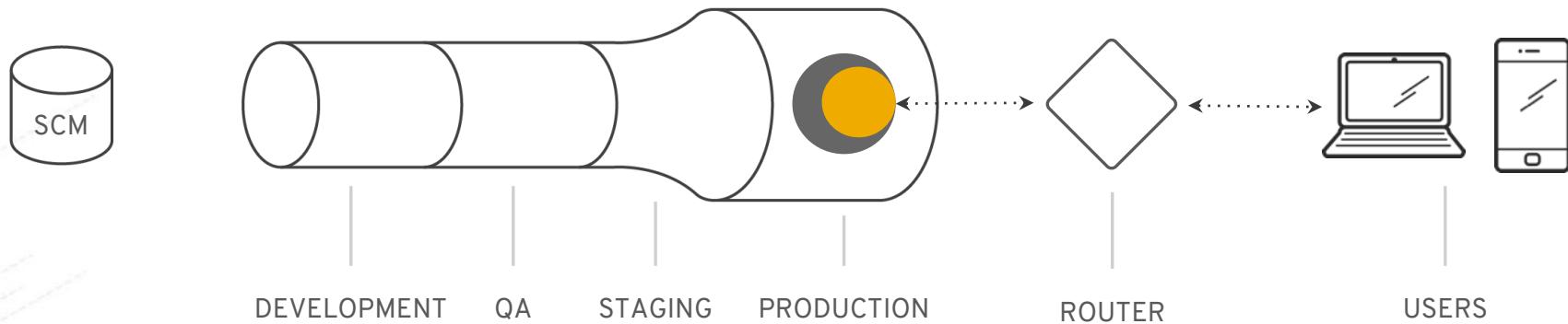
Canary Deployment



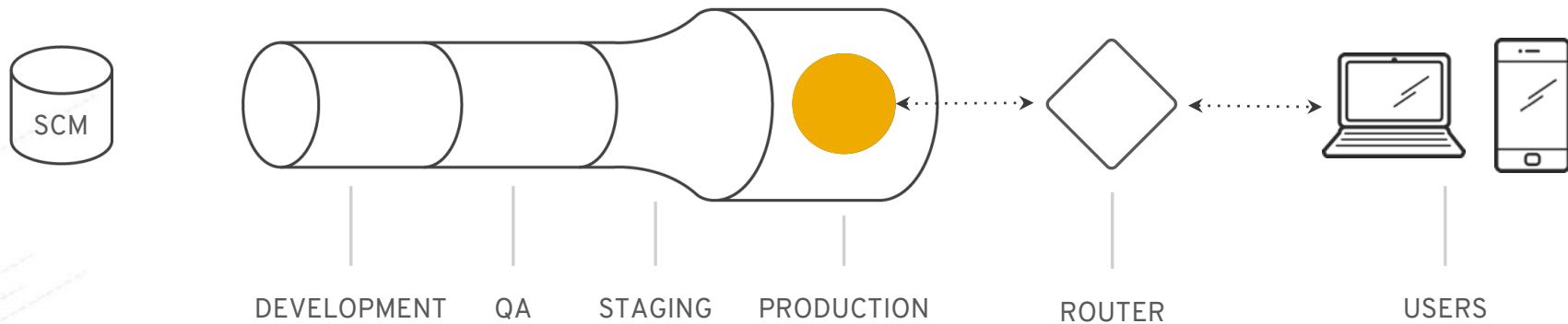
Canary Deployment



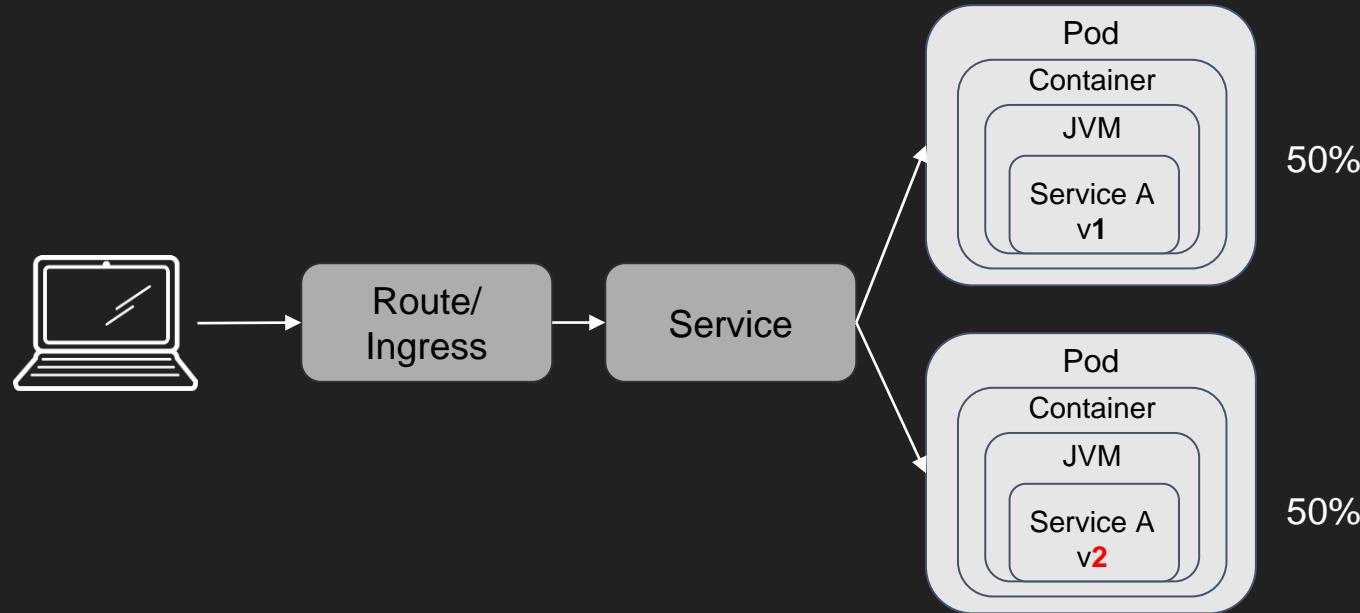
Canary Deployment



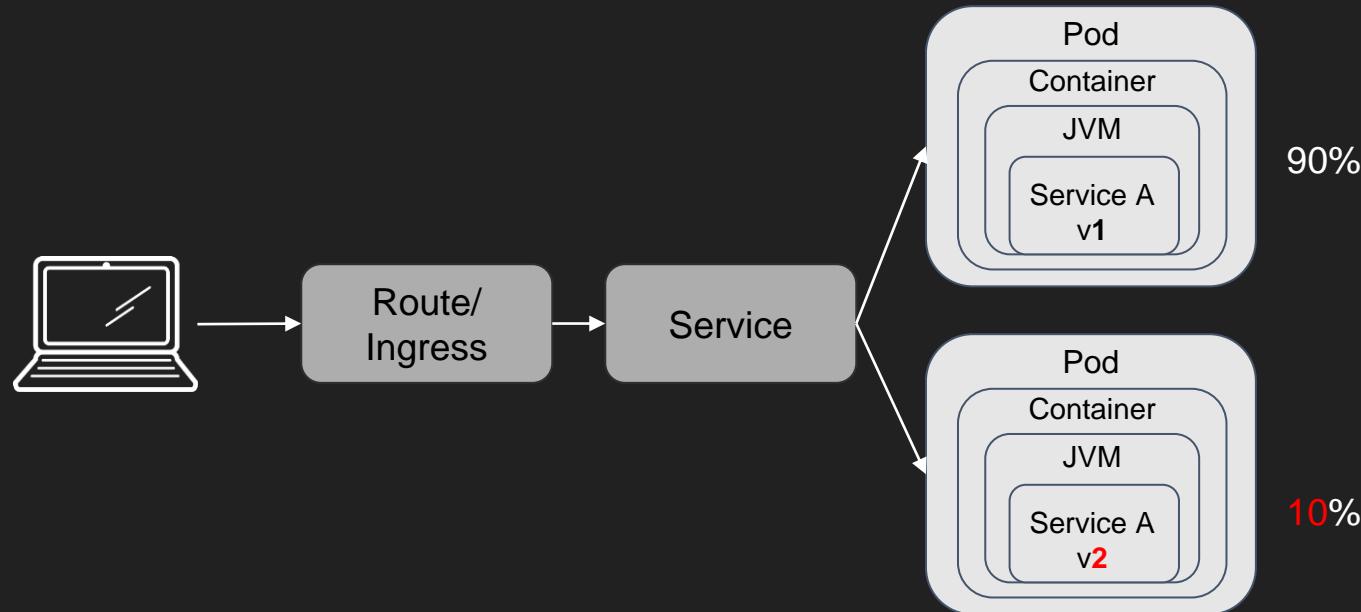
Canary Deployment



Canaries with Kubernetes



Canaries with Istio



Next Generation Microservices - Service Mesh

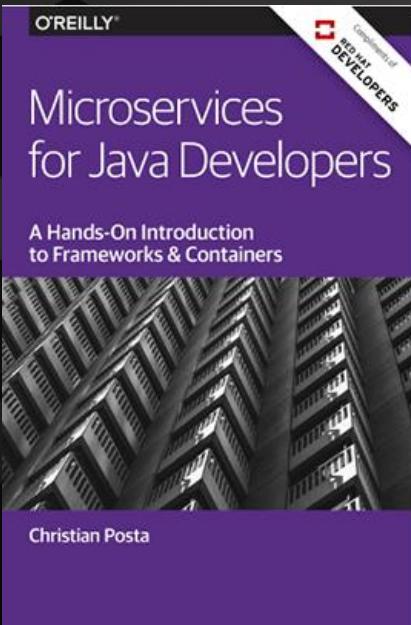
Code Independent (Polyglot)

- Intelligent Routing and Load-Balancing
 - A/B Tests
 - Smarter Canary Releases
- Chaos: Fault Injection
- Resilience: Circuit Breakers
- Observability: Metrics and Tracing
- Fleet wide policy enforcement



bit.ly/istio-tutorial

bit.ly/javamicroservicesbook



Free eBooks from developers.redhat.com

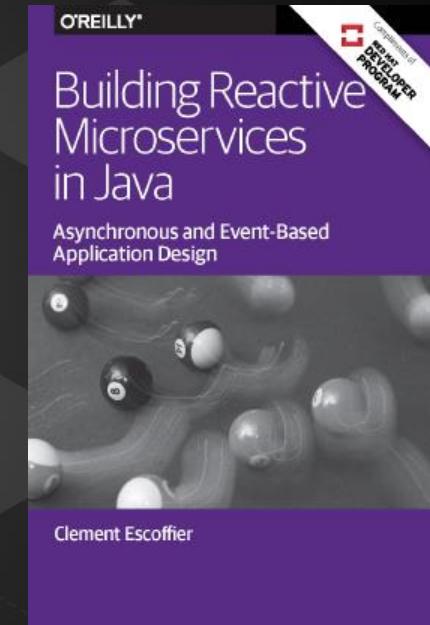
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Istio.io

Some more Action!!!!

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