

# Managing Apps on Kubernetes with Istio

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## INTRODUCING ISTIO



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# What is a service mesh?

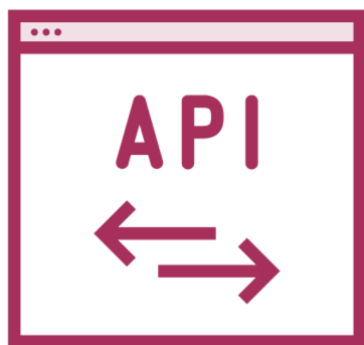
It's the communication  
between software components,  
made into its own thing.



web



database



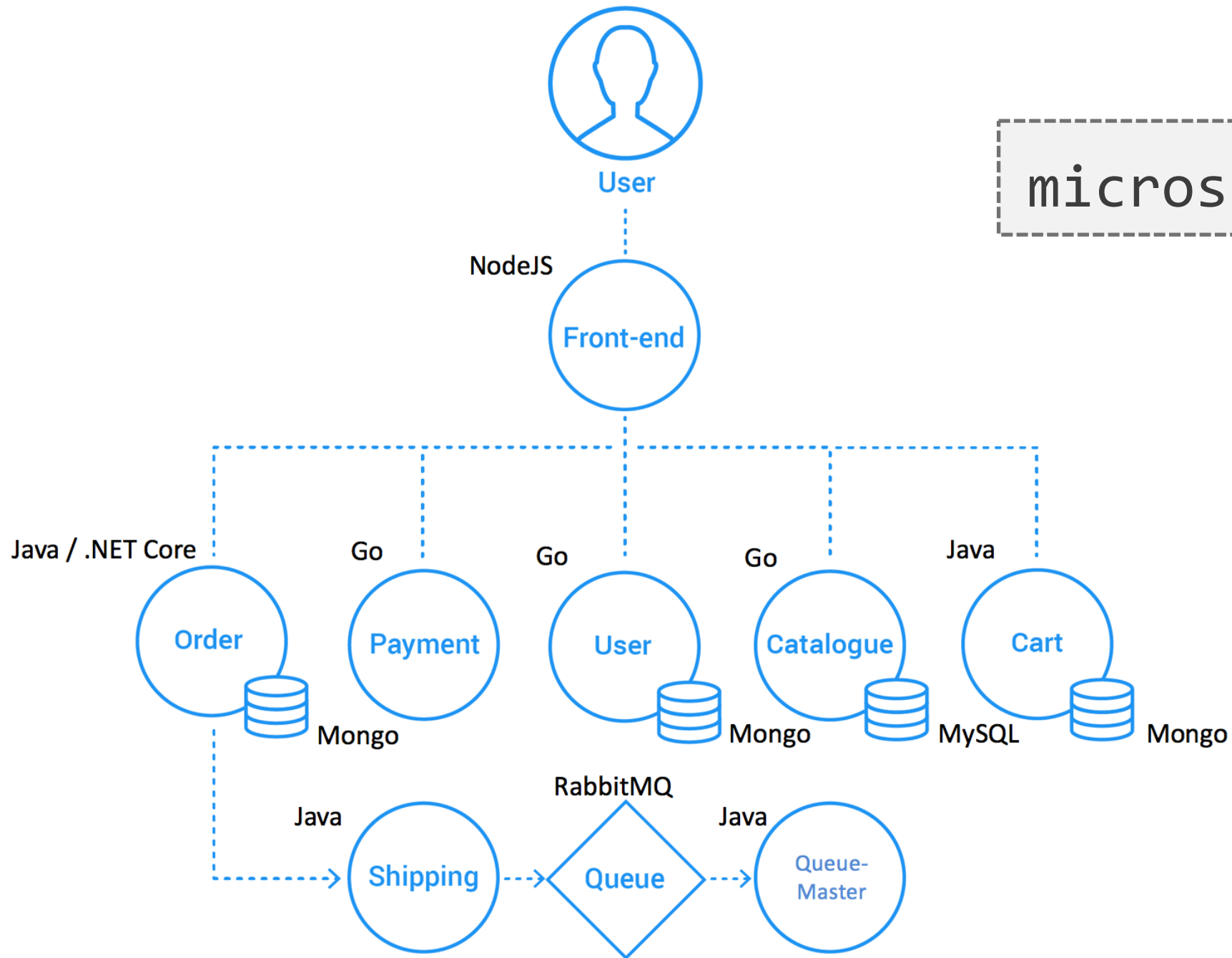
api

- **Address**
- **Timeout**
- **Retry**
- **Encryption**

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# microservices-demo



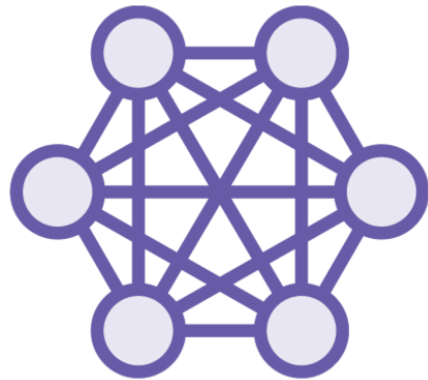
- **Address**
- **Timeout**
- **Retry**
- **Encryption**



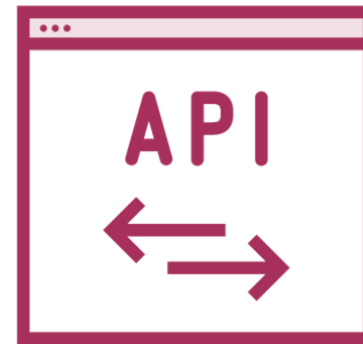
web



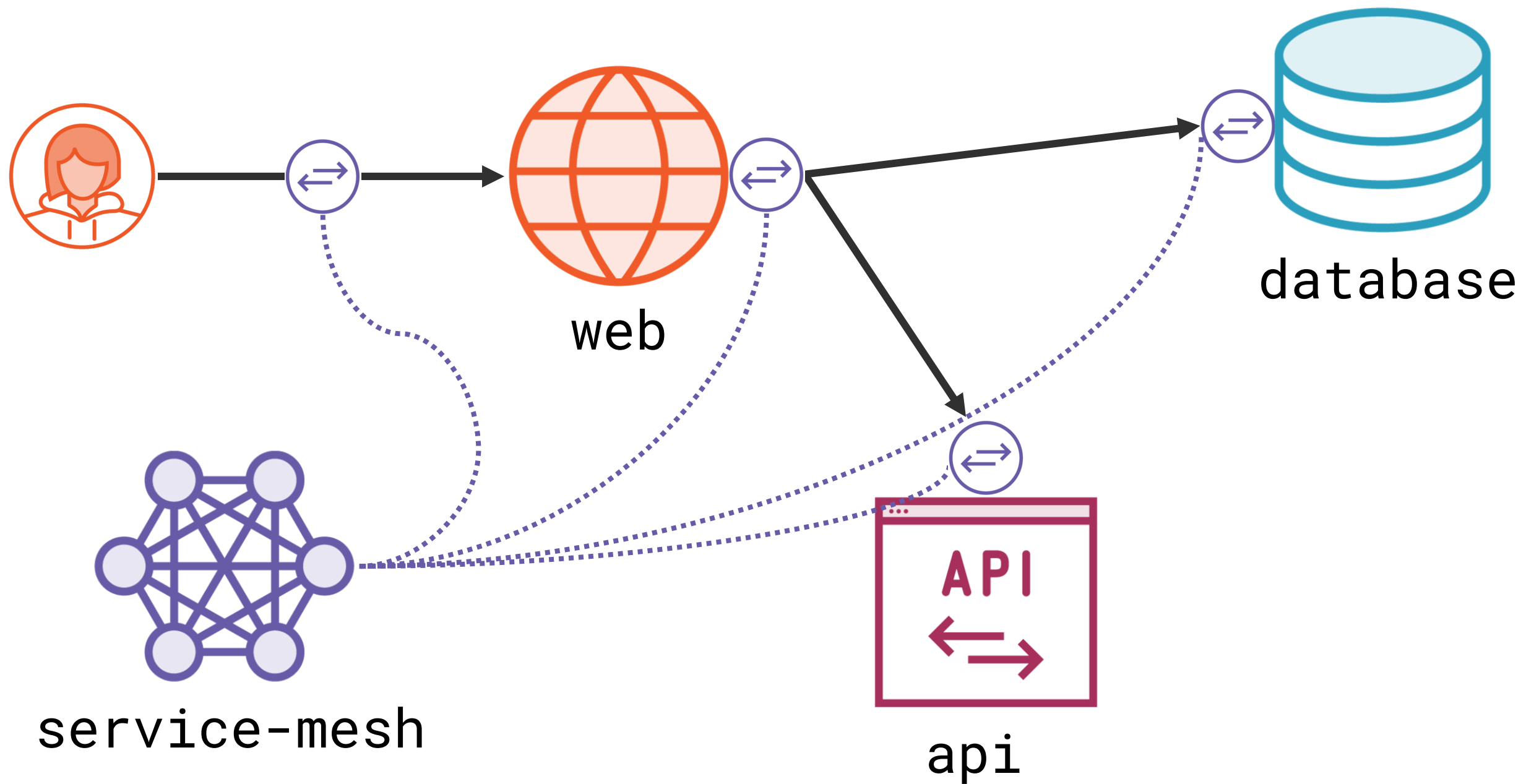
database



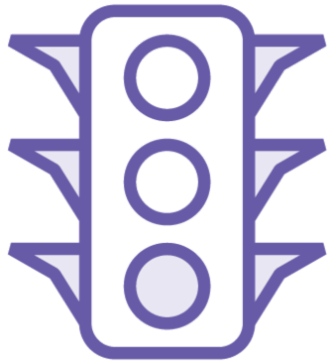
service-mesh



api



# Service Mesh Features



## Traffic Management

Discovery & routing

Load-balancing

Failure handling



## Security

Encryption

Authentication

Authorization

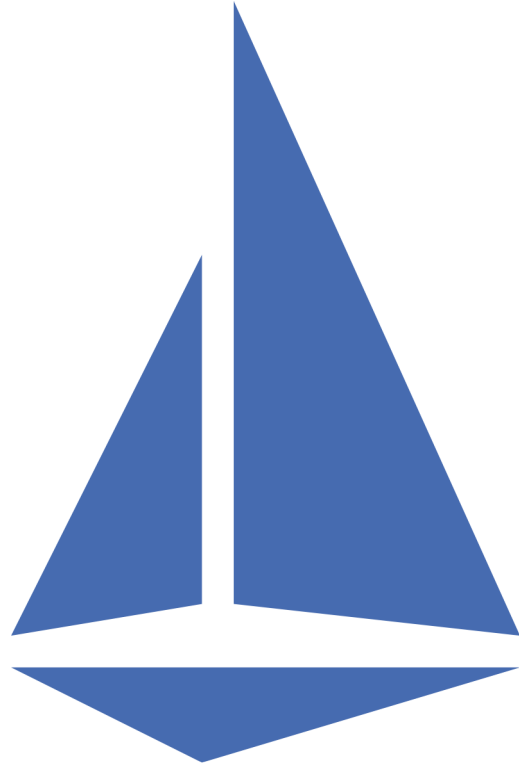


## Observability

Visualization

Tracing

Monitoring



## Introducing Istio

- Open source from Google, IBM & Lyft
- 0.1 in 2017, 1.0 in 2018, currently 1.4

## Platform-agnostic

- Optimal with Kubernetes
- Integrates with Consul or VMs

## One of many service meshes

- Linkerd, Consul Connect, Maesh
- SMI (Service Mesh Interface)



# Demo



## Installing Istio

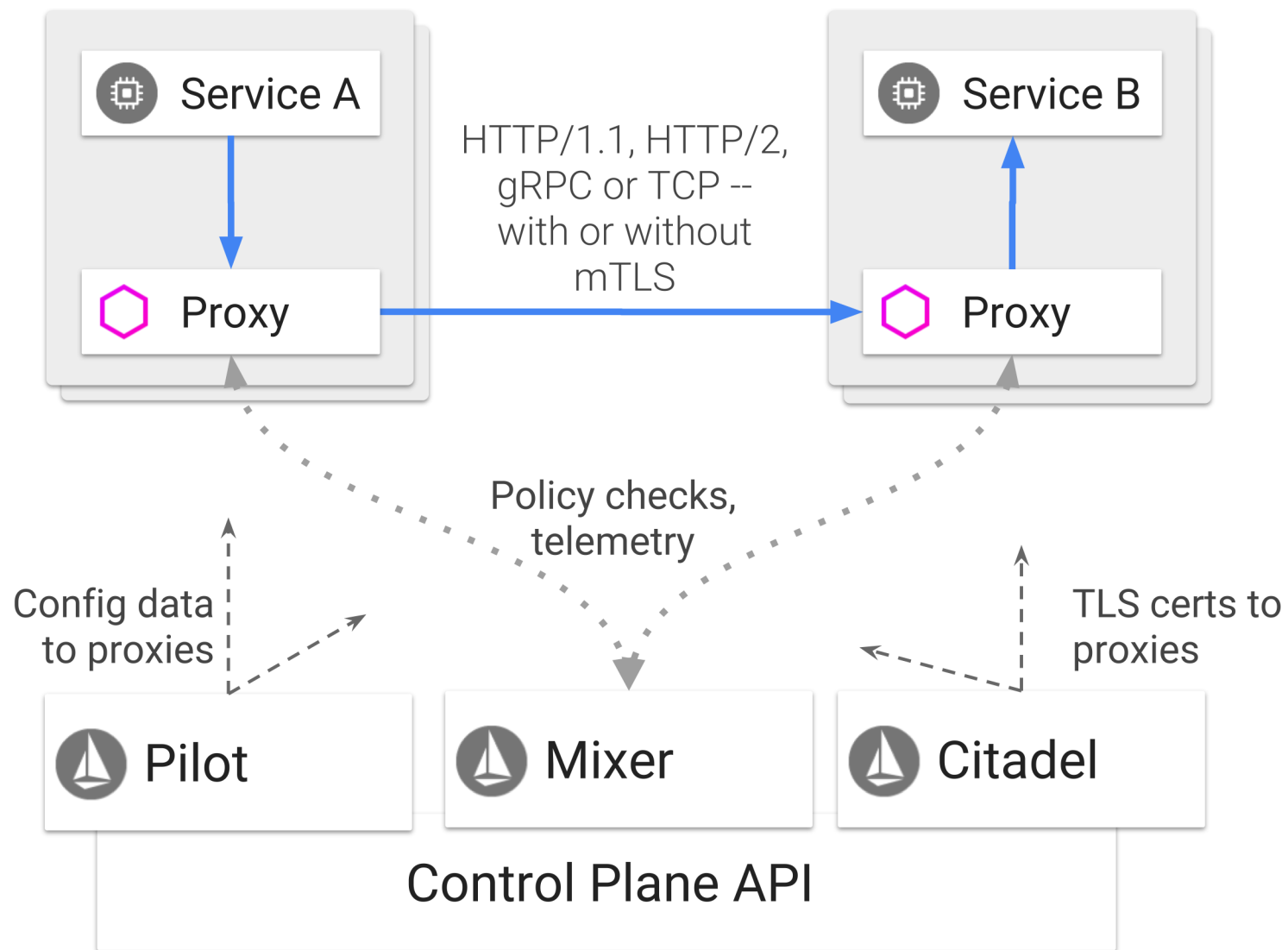
- Pre-requisites
- "Demo" configuration
- Installing with Docker Desktop

```
kubectl apply -f istio-crds.yaml
```

```
kubectl apply -f istio-demo.yaml
```

# Deploying Istio

## **Standard Kubernetes deployment**



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

“Here at Shopify, we’re working on deploying Istio as our service mesh. We’re doing quite well, but are hitting a wall: **Cost.**”

**Michael Kipper** <https://is.gd/ZqwILb>



## *Lines of Code*

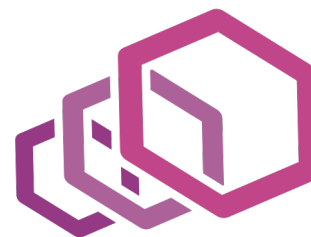


istio/istio

410K

envoyproxy/envoy

340K

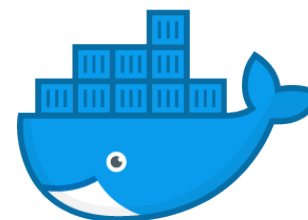


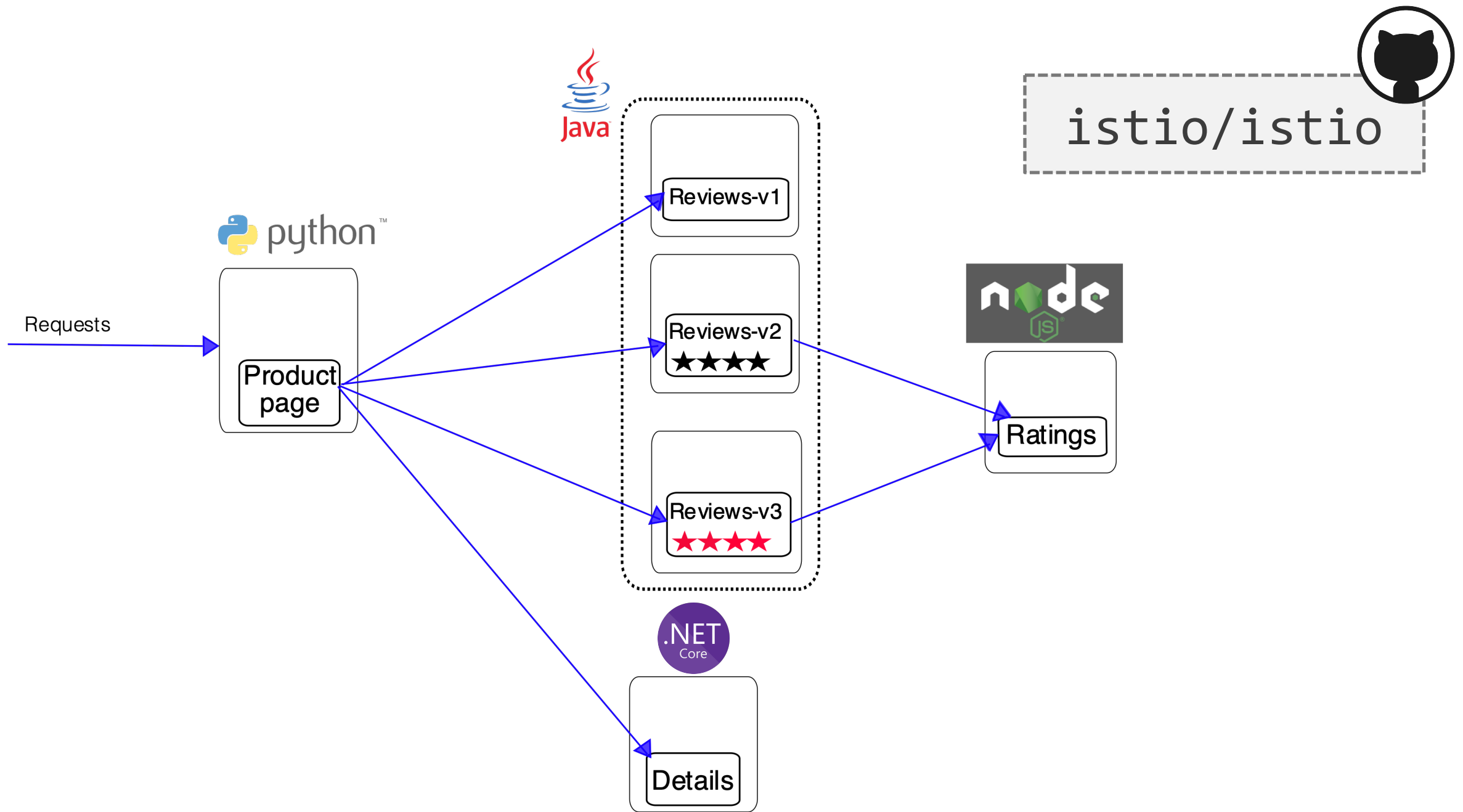
kubernetes/kubernetes

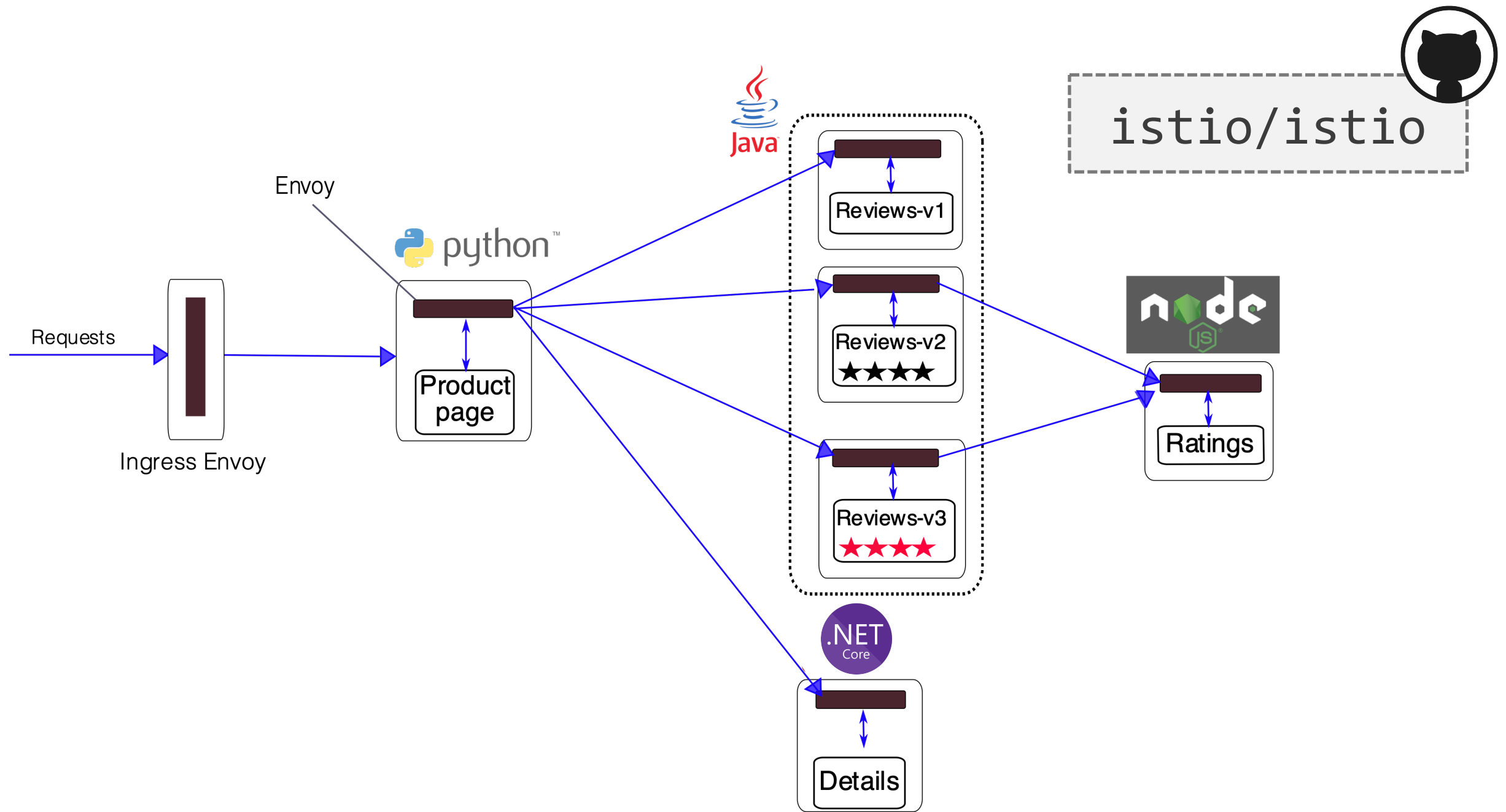
3.3M

moby/moby

1.1M







# Demo



## Deploying an Istio app

- Kubernetes services & pods
- Istio ingress gateway
- Testing the app

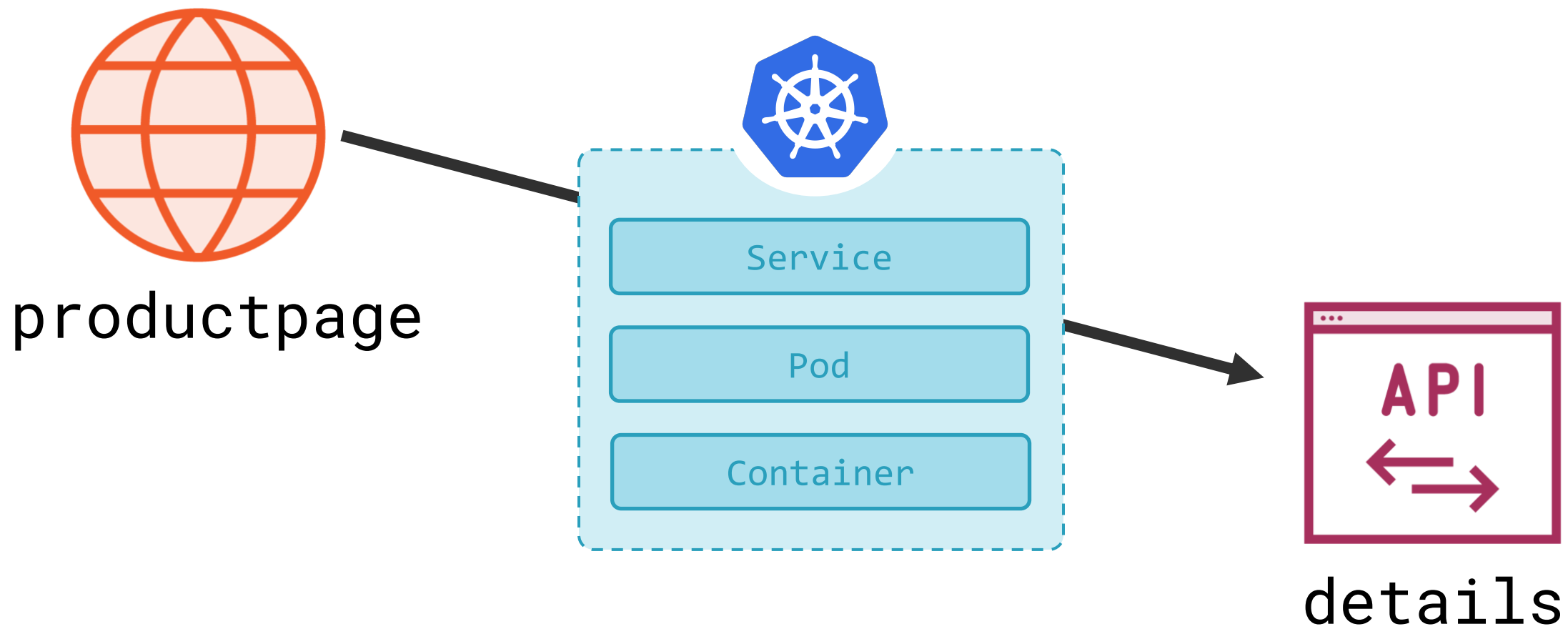


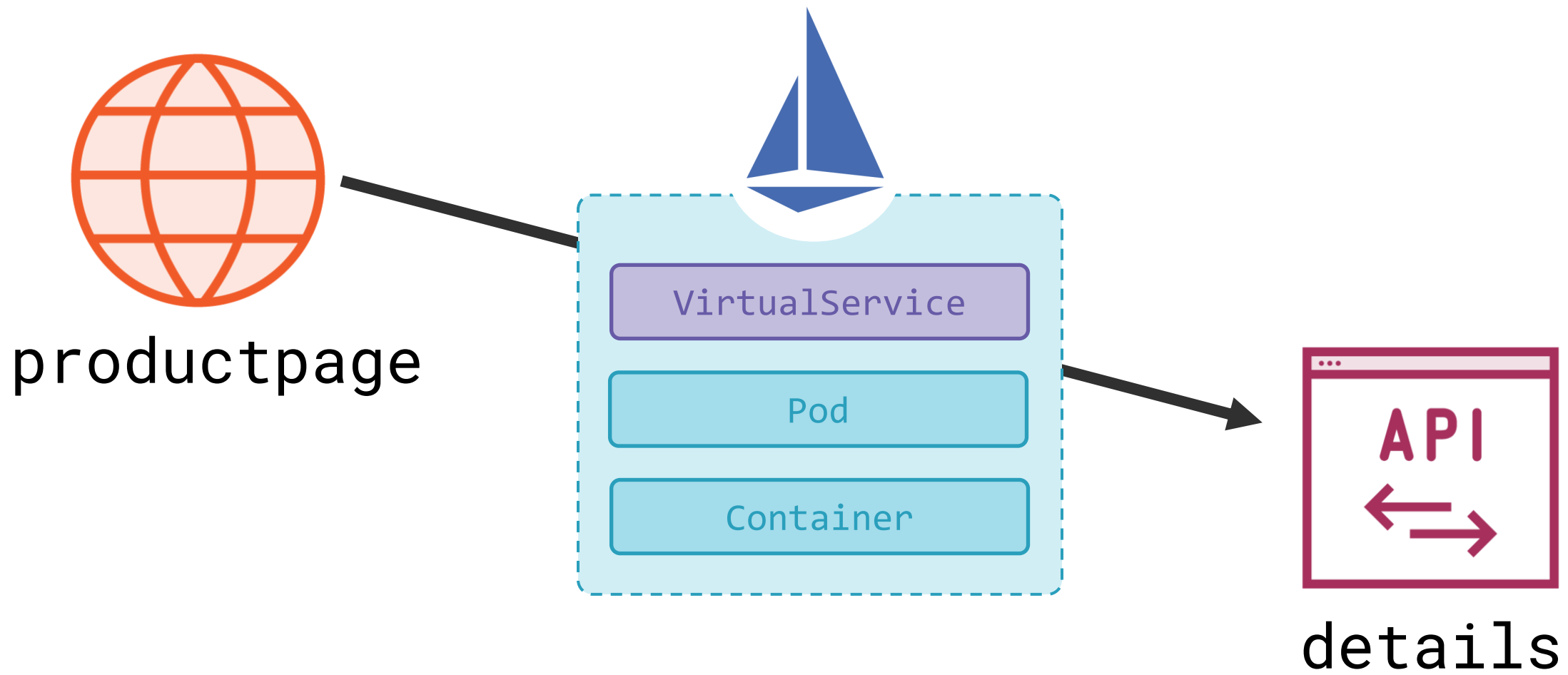
```
kubectl apply -f bookinfo-v1.yaml
```

```
kubectl apply -f bookinfo-gateway.yaml
```

# Deploying BookInfo

**Standard Kubernetes deployment - with Istio ingress**





```
apiVersion: networking.istio.io/v1alpha3
```

```
kind: VirtualService
```

```
spec:
```

```
  hosts:
```

```
    - details
```

```
  http:
```

```
    - route:
```

```
      - destination:
```

```
        host: details
```

◀ Istio custom resource

◀ Defines routing rules

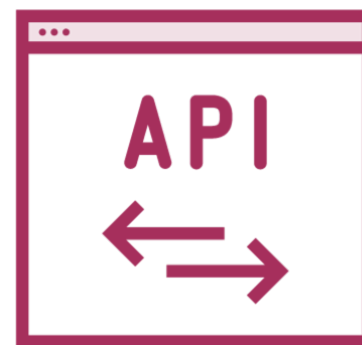
◀ The host requested by the client

◀ Routing for HTTP traffic

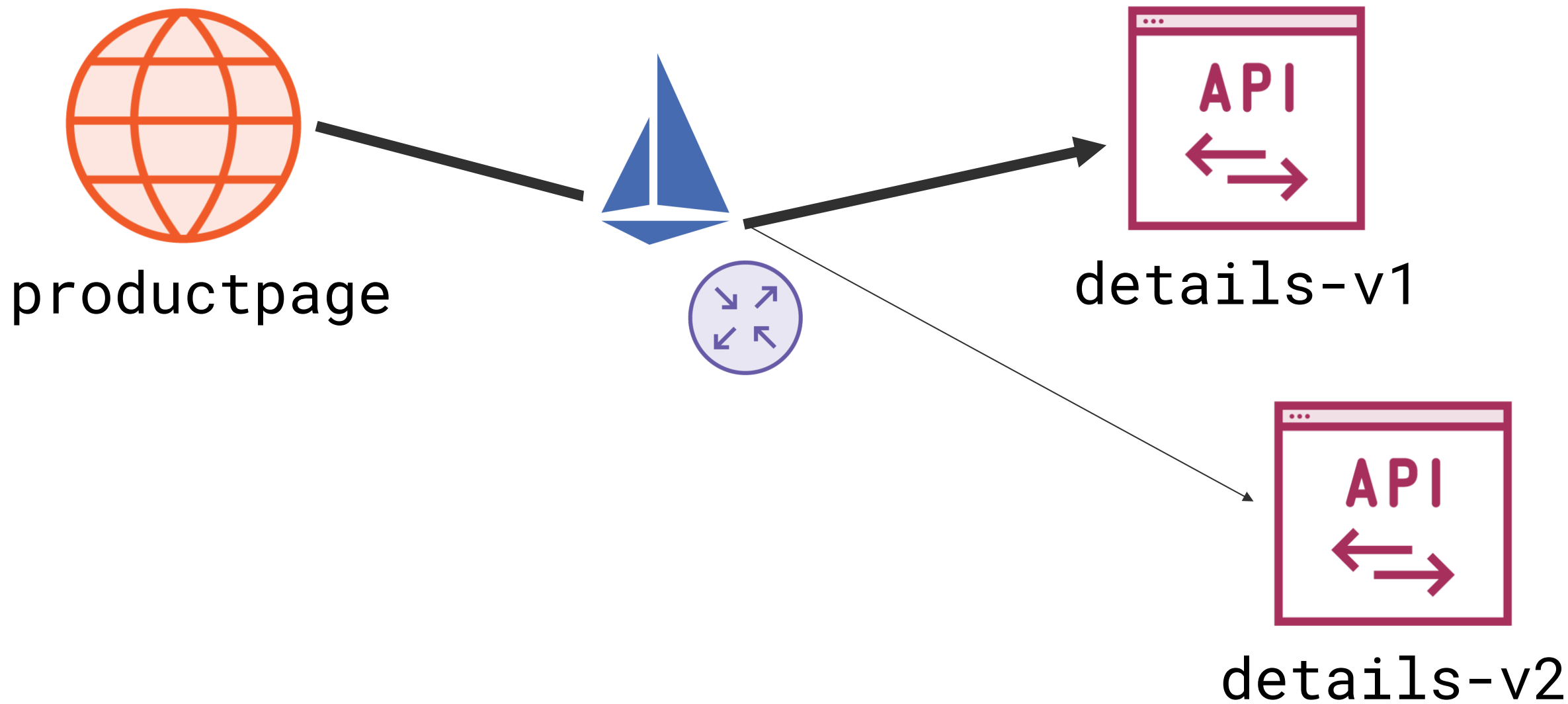
◀ The destination host routed by Istio



productpage

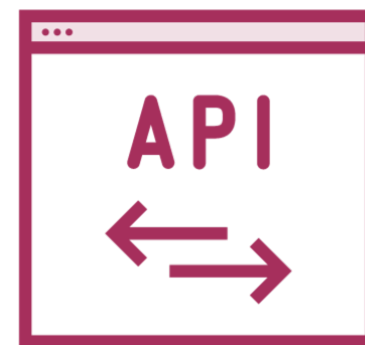


details





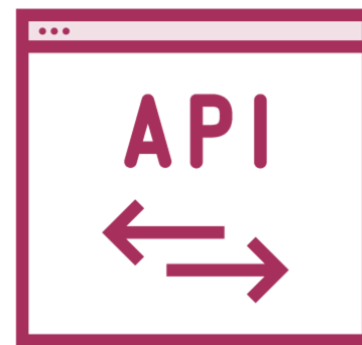
productpage



details



productpage



details

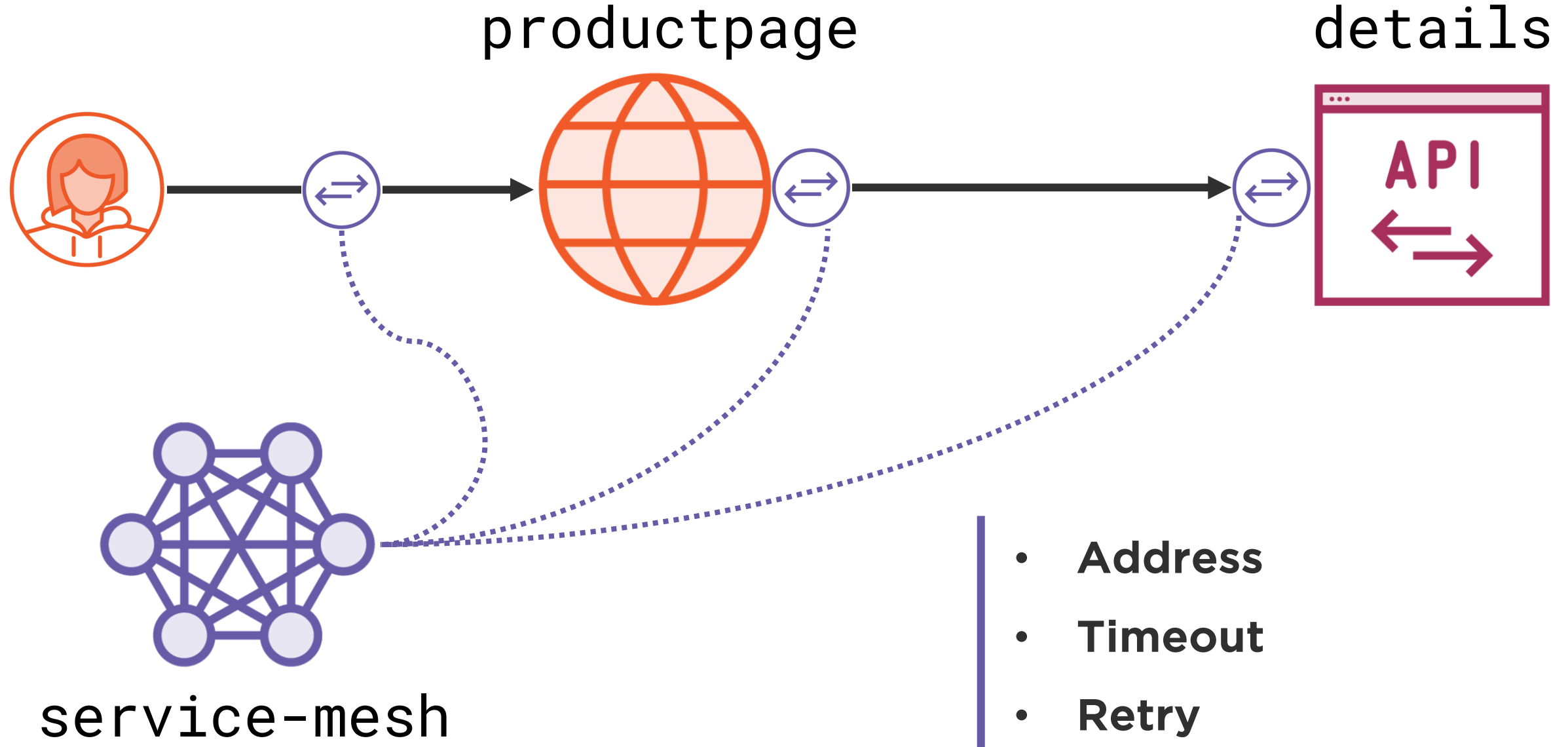


# Demo



## Managing traffic with Istio

- Fault-tolerance
- Client timeouts
- Automatic retries



# Summary



## **Istio is a communication control plane**

- Runs in Kubernetes
- Injects network proxies

## **Creating a service mesh**

- Traffic management
- Security
- Observability

Up Next:

Managing Service Traffic

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