Service Mesh on Kubernetes

Agenda

- Service Mesh
- Overview of Bookinfo Application
- Bookinfo application on Istio Multi Cluster
- Bookinfo application on Kuma Multi Cluster
- Comparison

Basic Understanding about Service Mesh

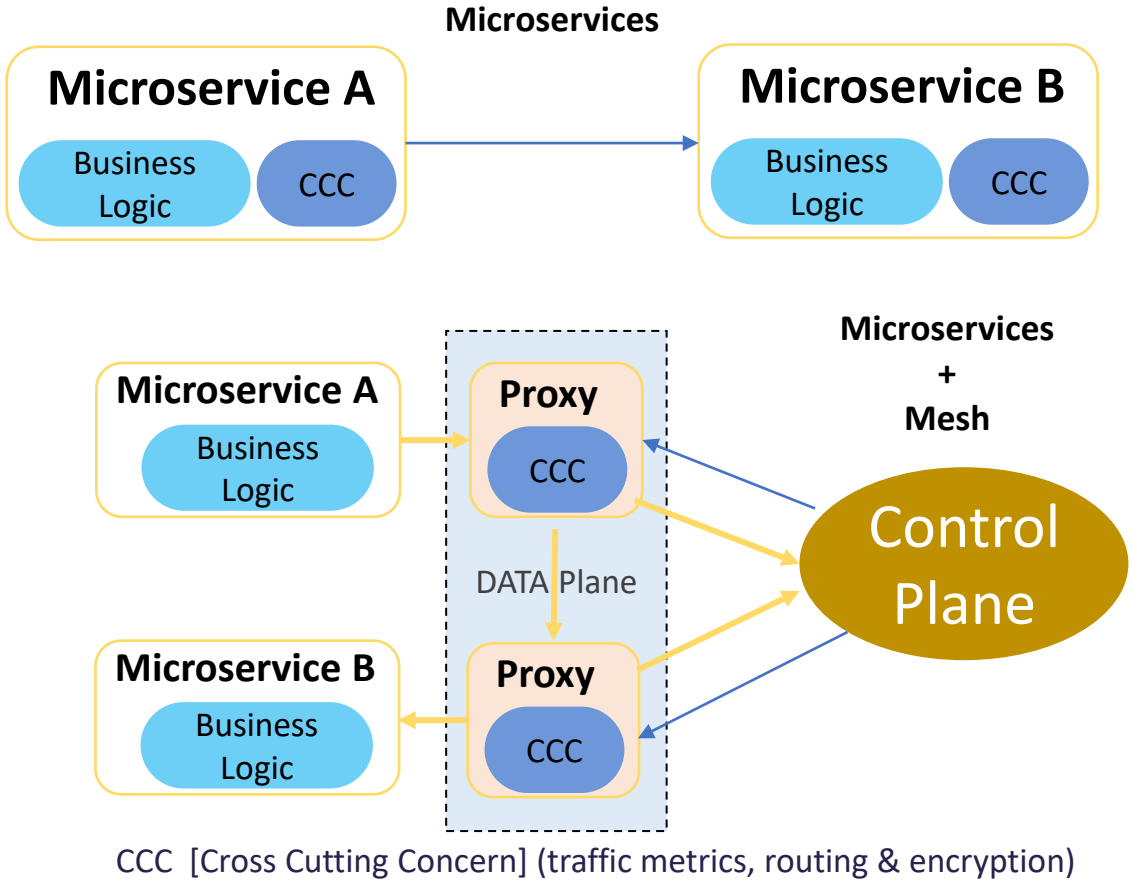
A service mesh is a dedicated infrastructure layer that controls service-to-service communication over a network. This method enables separate parts of an application to communicate with each other. Service meshes appear commonly in concert with cloud-based applications, containers and microservices.

A service mesh controls the delivery of service requests in an application. Common features provided by a service mesh include service discovery, load balancing, encryption and failure recovery.

How a service mesh works

A service mesh architecture uses a proxy instance called a sidecar in whichever development paradigm is in use, typically containers and/or microservices. In a microservice application, a sidecar attaches to each service. In a container, the sidecar attaches to each application container, VM or container orchestration unit, such as a Kubernetes pod.

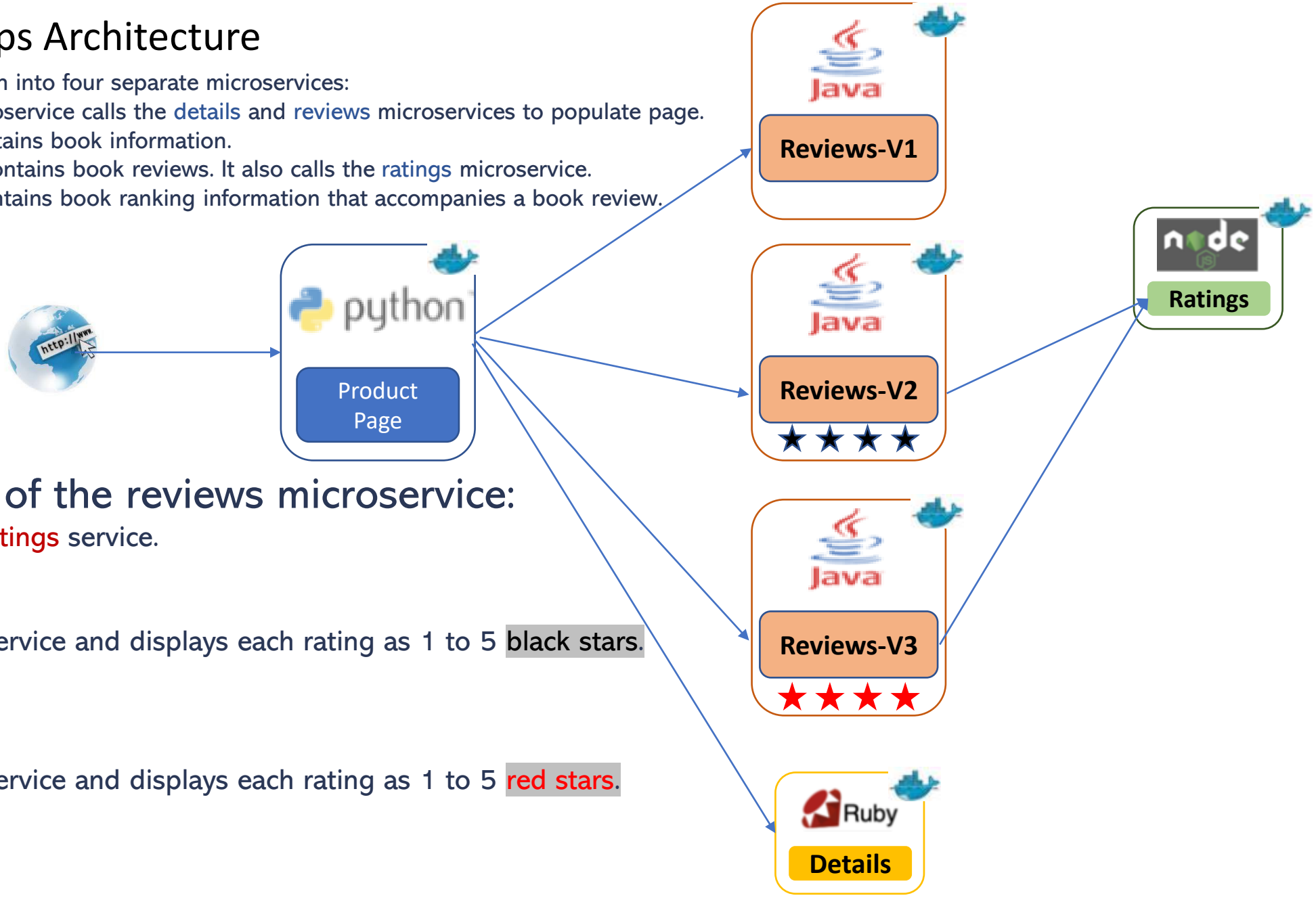
Sidecars can handle tasks abstracted from the service itself, such as monitoring and security. Service instances, sidecars and their interactions make up what is called the data plane in a service mesh. A different layer called the control plane manages tasks such as creating instances, monitoring and implementing policies for network management and security.



Sample Bookinfo Apps Architecture

The Bookinfo application is broken into four separate microservices:

- Productpage: productpage microservice calls the details and reviews microservices to populate page.
- Details: details microservice contains book information.
- Reviews: reviews microservice contains book reviews. It also calls the ratings microservice.
- Ratings: ratings microservice contains book ranking information that accompanies a book review.



There are 3 versions of the reviews microservice:

- Version V1 doesn't call the ratings service.

  — Reviewer2

- Version V2 calls the ratings service and displays each rating as 1 to 5 black stars.

  — Reviewer2

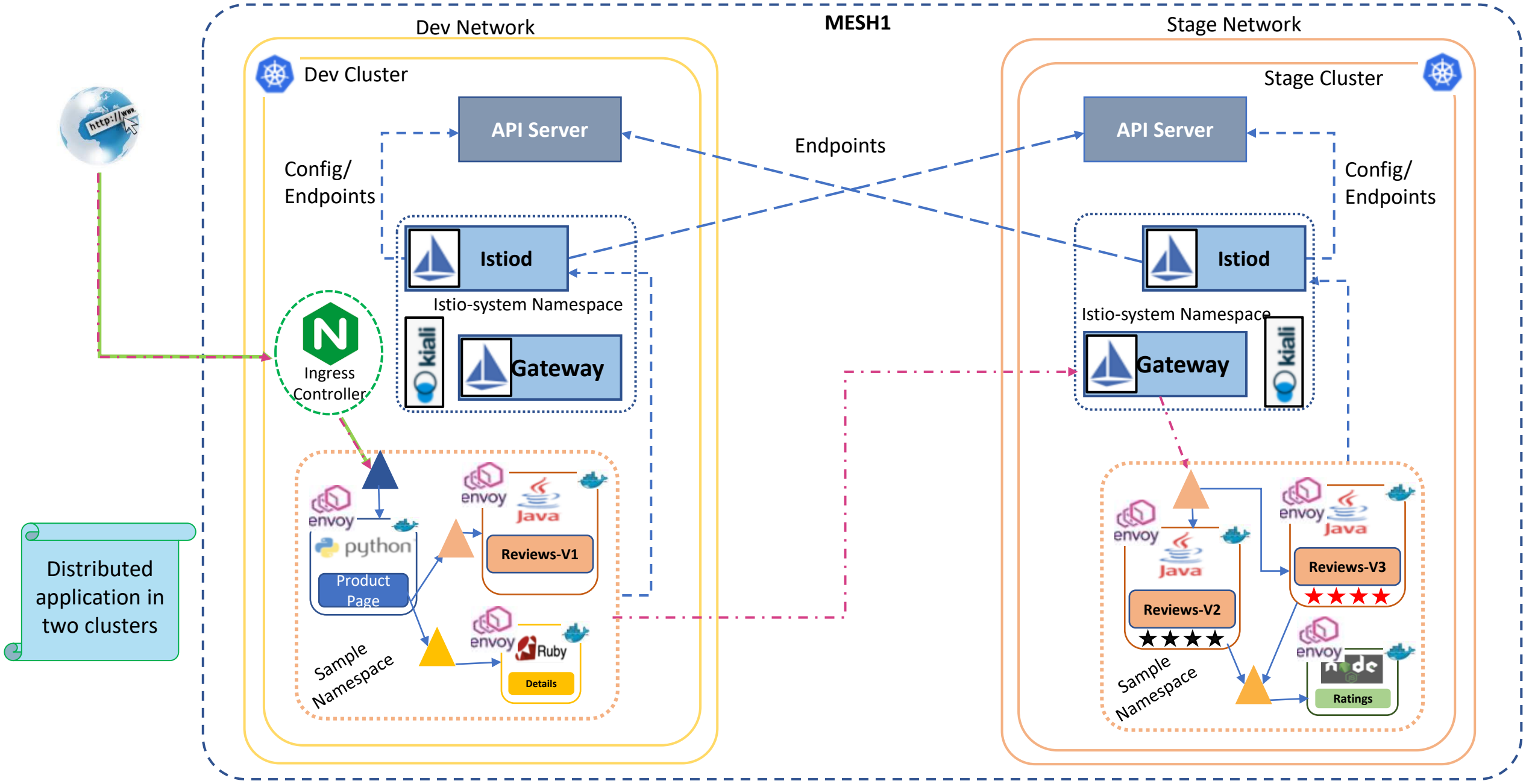
  ★★★★☆

- Version V3 calls the ratings service and displays each rating as 1 to 5 red stars.

  — Reviewer2

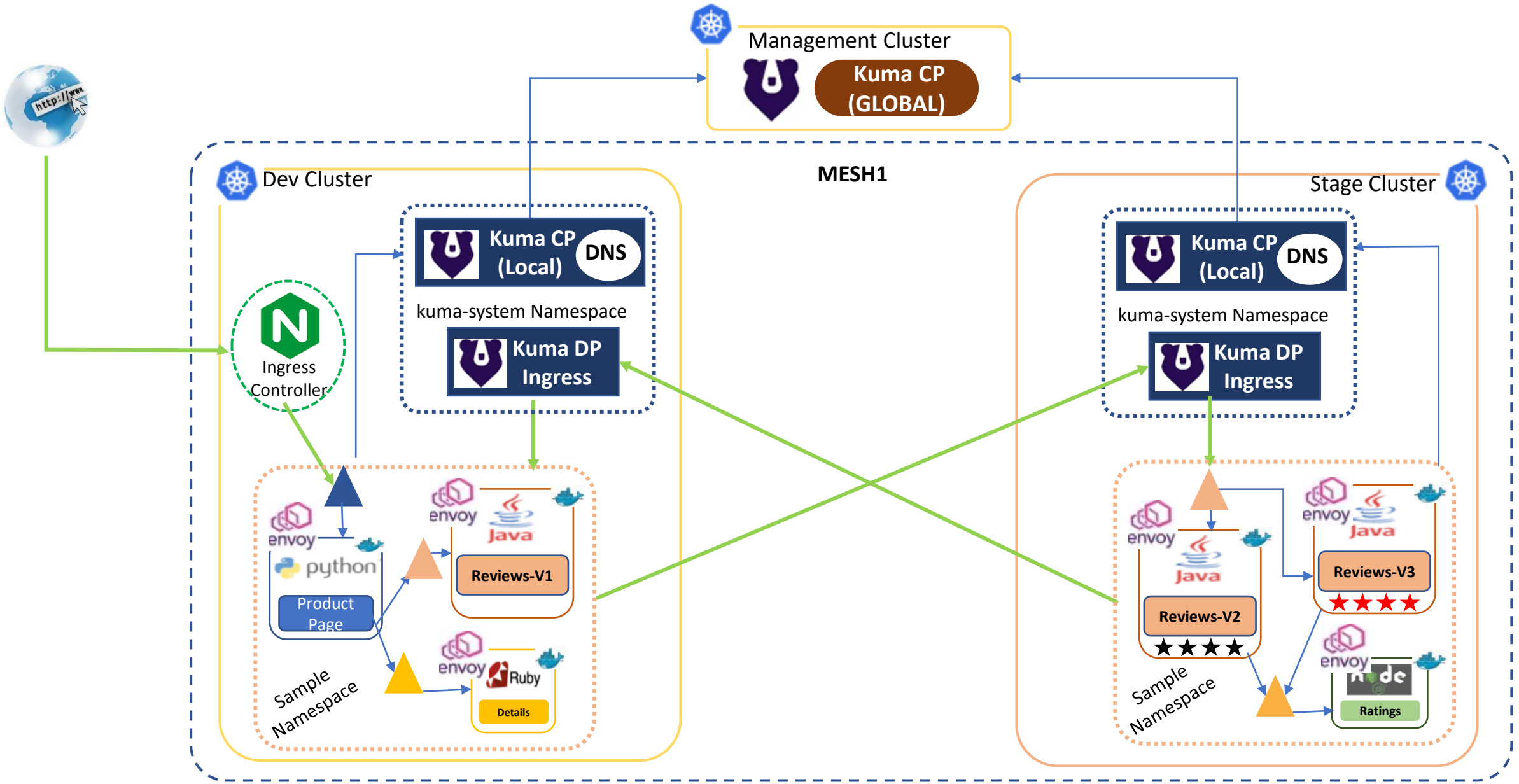
  ★★★★☆

Bookinfo Apps in Istio Multi Clusters

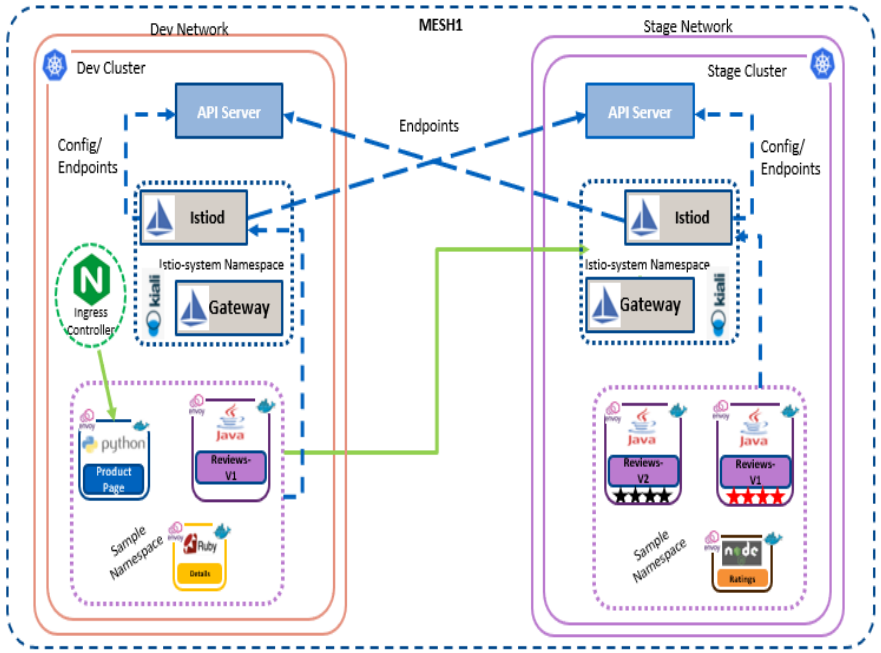


Demo

Bookinfo Apps in KUMA Multi Clusters



Comparison



Istio & Kuma both supports Kubernetes and VM modes.

Both uses same envoy proxy.

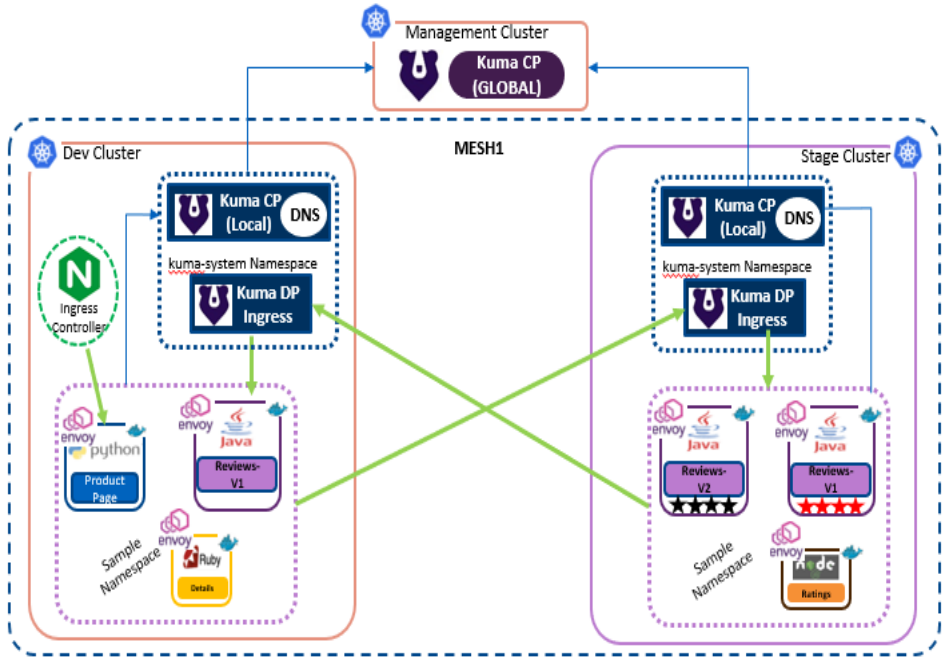
Both support mTLS encryption

Both are opensource

Both support multi clusters

Integration with Kong Gateway, Prometheus & Grafana possible.

Documentation for Multi cluster environment very poor



- ❖ Istio is the one with the biggest online community
- ❖ Community response very good
- ❖ Significant amount of resource overhead
- ❖ Complex deployment setup
- ❖ No native admin dashboard, third party tool (Kiali)
- ❖ Control plane only supported with Kubernetes containers
- ❖ Multi cluster deployment more complex
- ❖ As its opensource, free to use.

- ❖ Kuma/Kong is still young in the service mesh space
- ❖ Community response poor
- ❖ Less amount of resource consume compared to Istio
- ❖ Simplified deployment setup
- ❖ Own dashboard.
- ❖ Control plane supported with Kubernetes & VM
- ❖ Less complex than Istio for Multi cluster deployment
- ❖ Enterprise support costly.