Service Mesh Using Istio

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1. Introduction

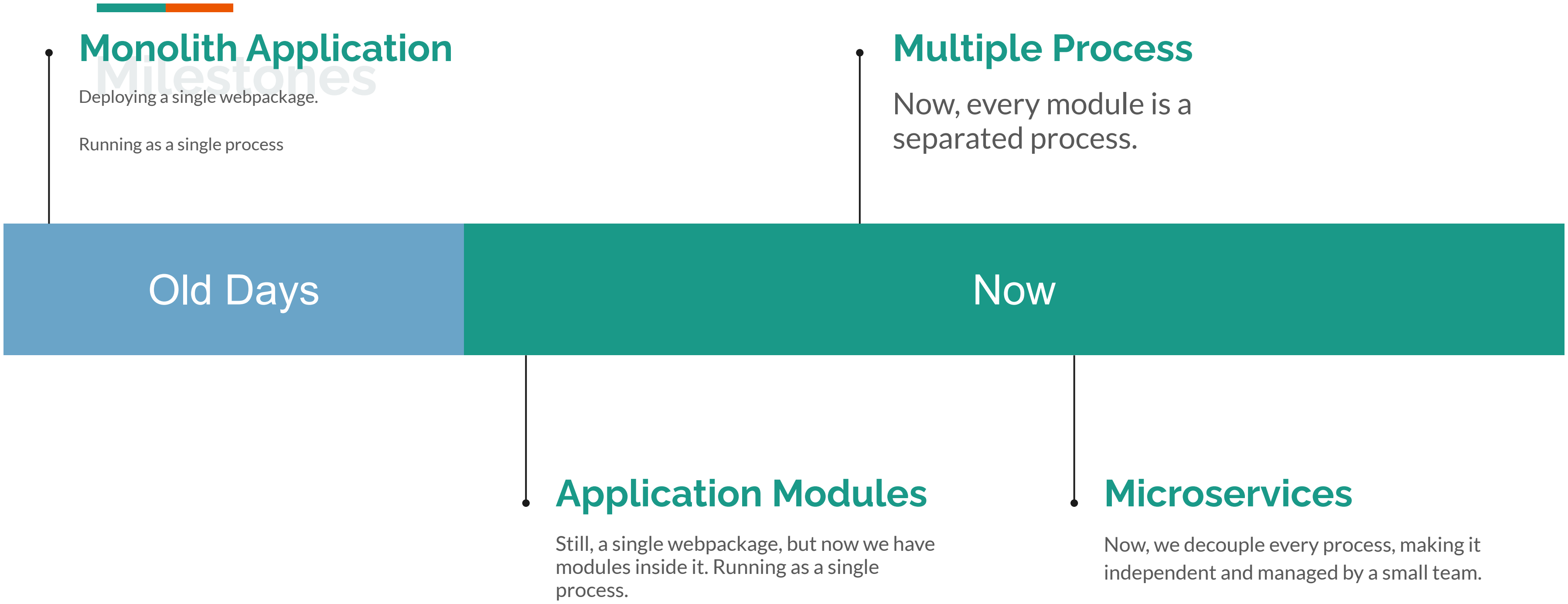
How did we get to Service Mesh?

➔ **What is it?**
History, details and concepts.

➔ **Do we need it?**
Architecture using Service Mesh.

➔ **What can I do with it?**
Traffic Management, Policies and OAuth.

Milestones



Monolith Application

Deploying a single webpackage.

Running as a single process

Multiple Process

Now, every module is a separated process.

Application Modules

Still, a single webpackage, but now we have modules inside it. Running as a single process.

Microservices

Now, we decouple every process, making it independent and managed by a small team.

But how can we ship all of those microservices?

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Running Containers.

Docker

Docker is an open platform for developing, shipping, and running applications.

Docker enables you to separate your applications from your infrastructure so you can deliver software quickly.

Now I have 500 containers.
How do I manage all that?

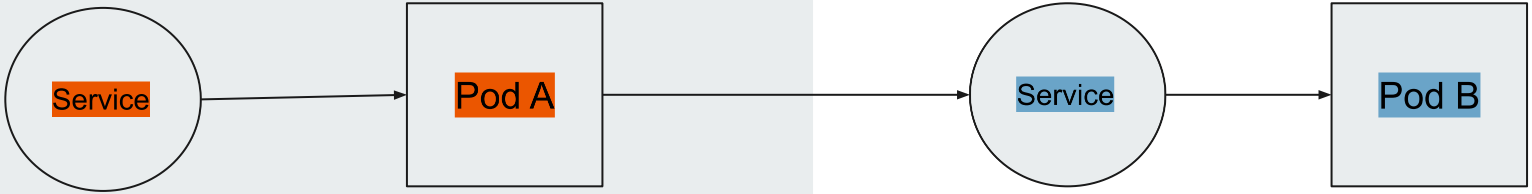
Now I have 500 containers. How do I manage all that?

Using an Orchestrator.

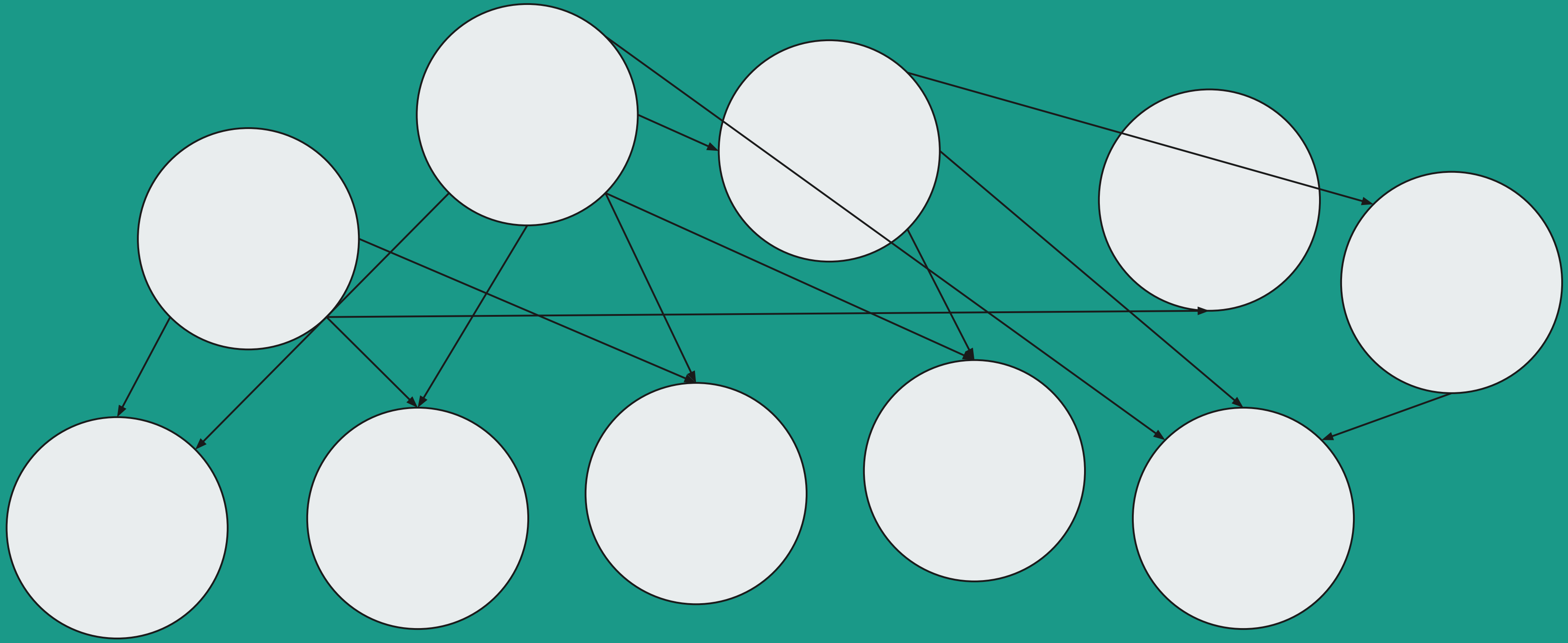
Kubernetes

Kubernetes is a portable, extensible, open-source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation.

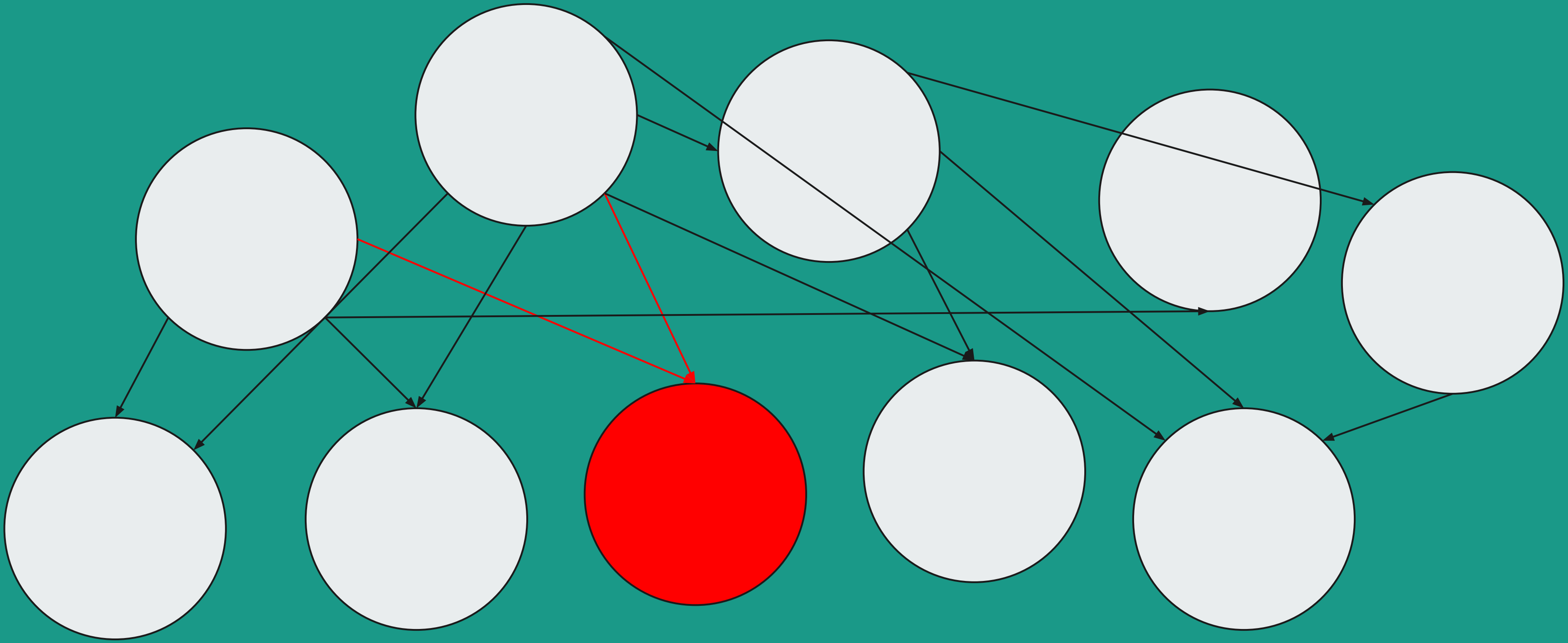
Connecting Two Microservices



High Complexity



What if something fails?



How do I avoid failures, downtimes and increase my security?

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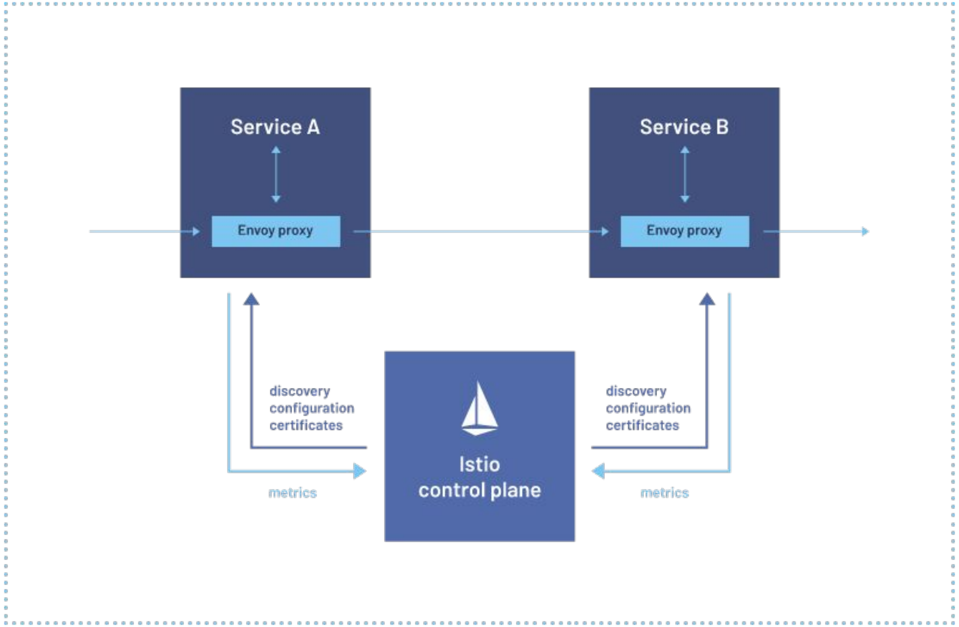
Using a Service Mesh.

Istio

Istio is an service mesh that helps organizations run distributed, microservices-based apps. Istio manages traffic flows between services, enforces policies without requiring changes to application code.

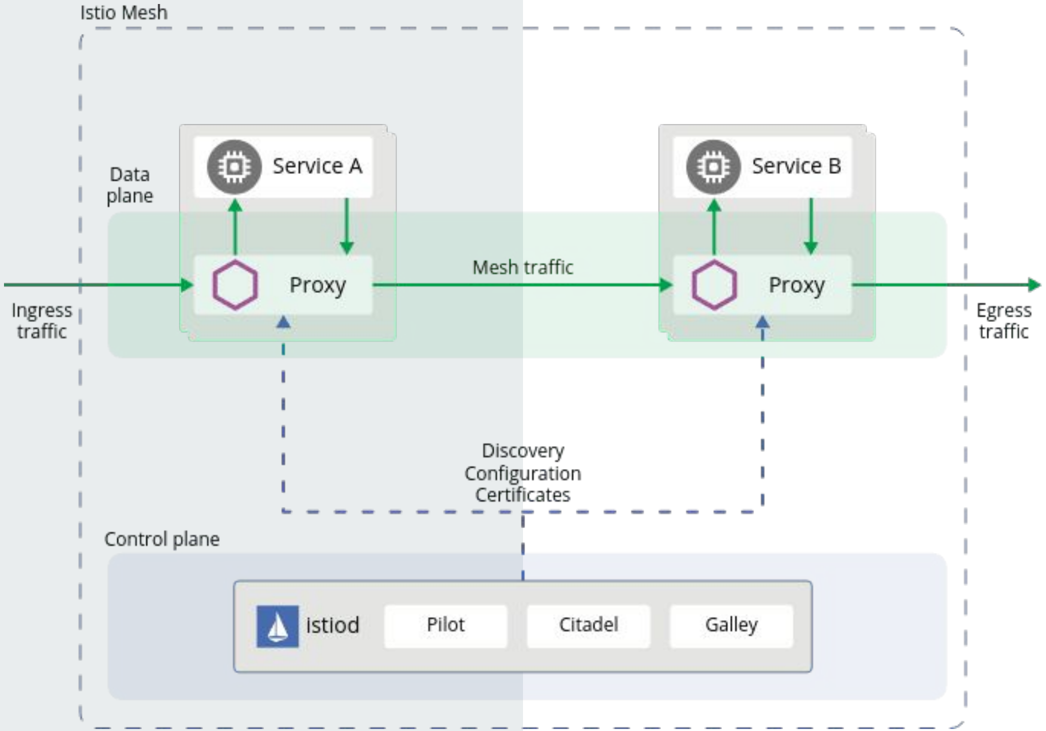
What is a Service Mesh?



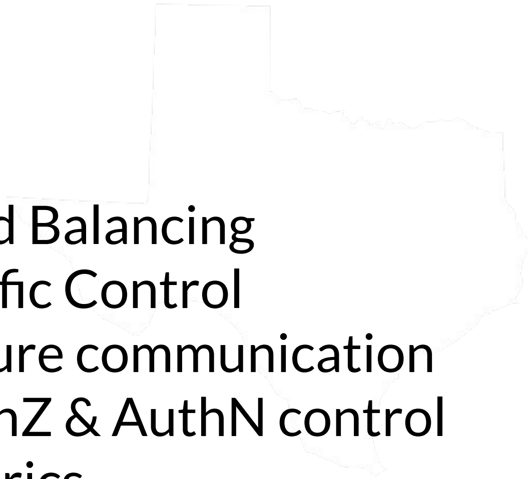
Infrastructure/framework that handles communication between services.

Network proxies deployed alongside the microservices.

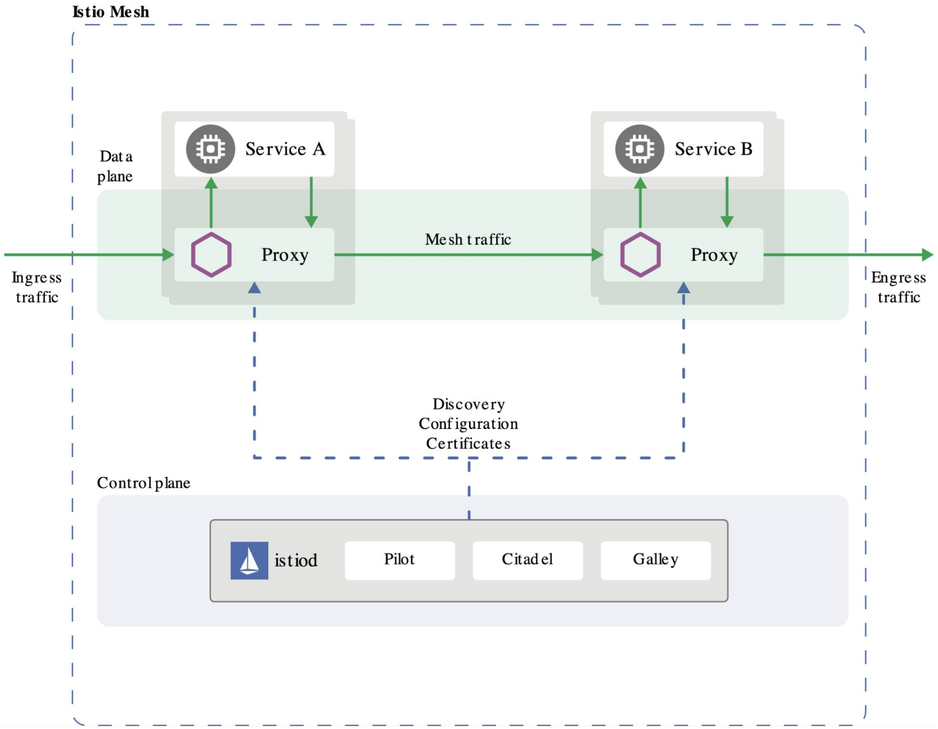
Meet Istio.


Istio Mesh
Data plane
Service A
Service B
Proxy
Mesh traffic
Proxy
Ingress traffic
Egress traffic
Discovery
Configuration
Certificates
Control plane
istiod
Pilot
Citadel
Galley

Istio Features



- Load Balancing
- Traffic Control
- Secure communication
- AuthZ & AuthN control
- Metrics
- Tracing
- Sidecar Proxy

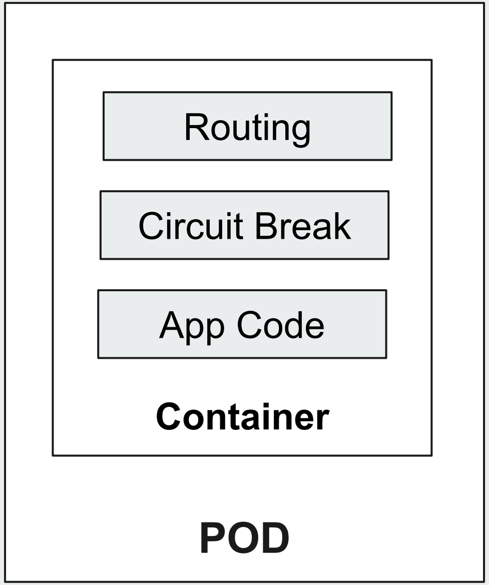


What is Istio Sidecar

A proxy is deployed in a container next to each instance of microservice (inside a pod).

Envoy open source proxy is currently used.

Why should I use a sidecar?



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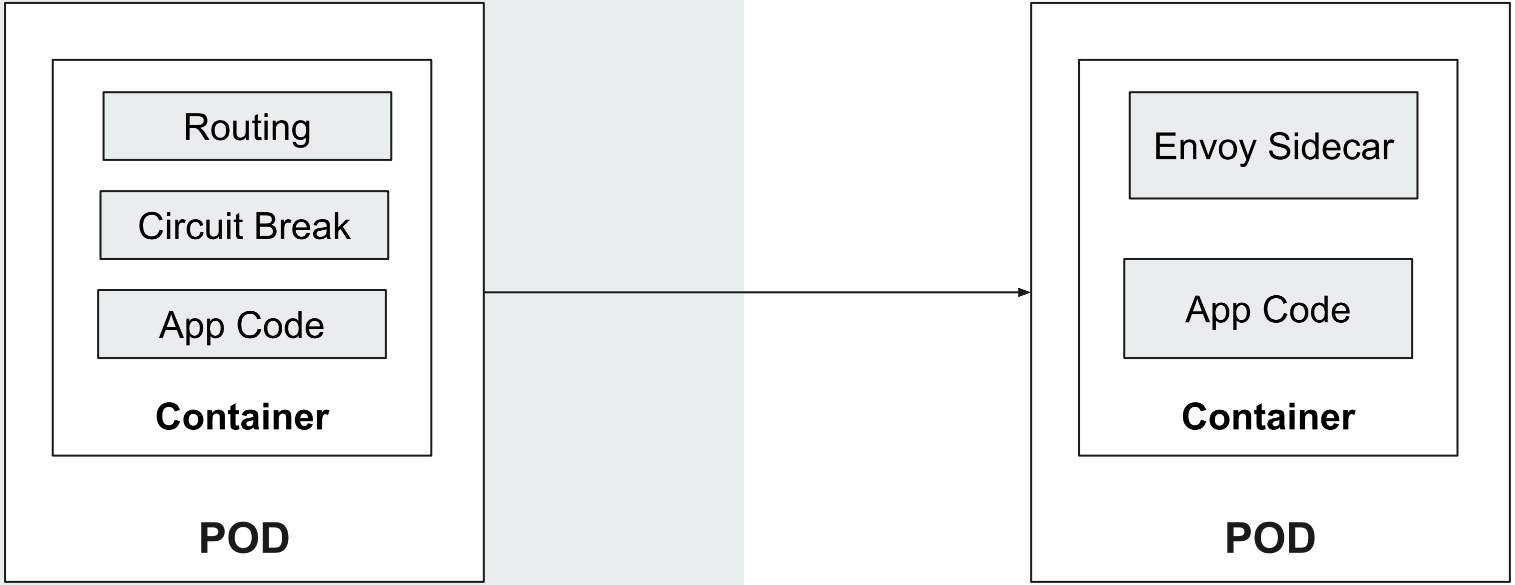
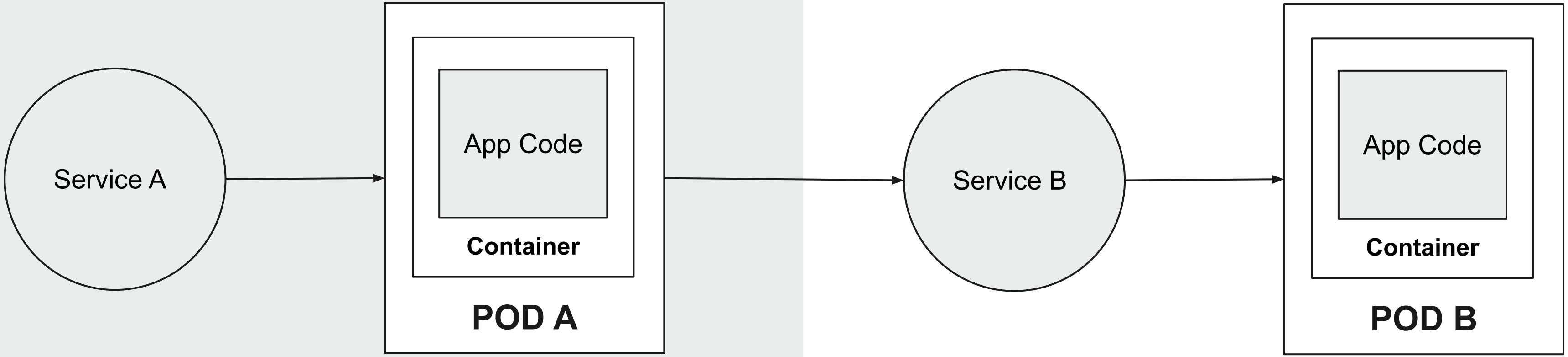


Routing Traffic without Istio



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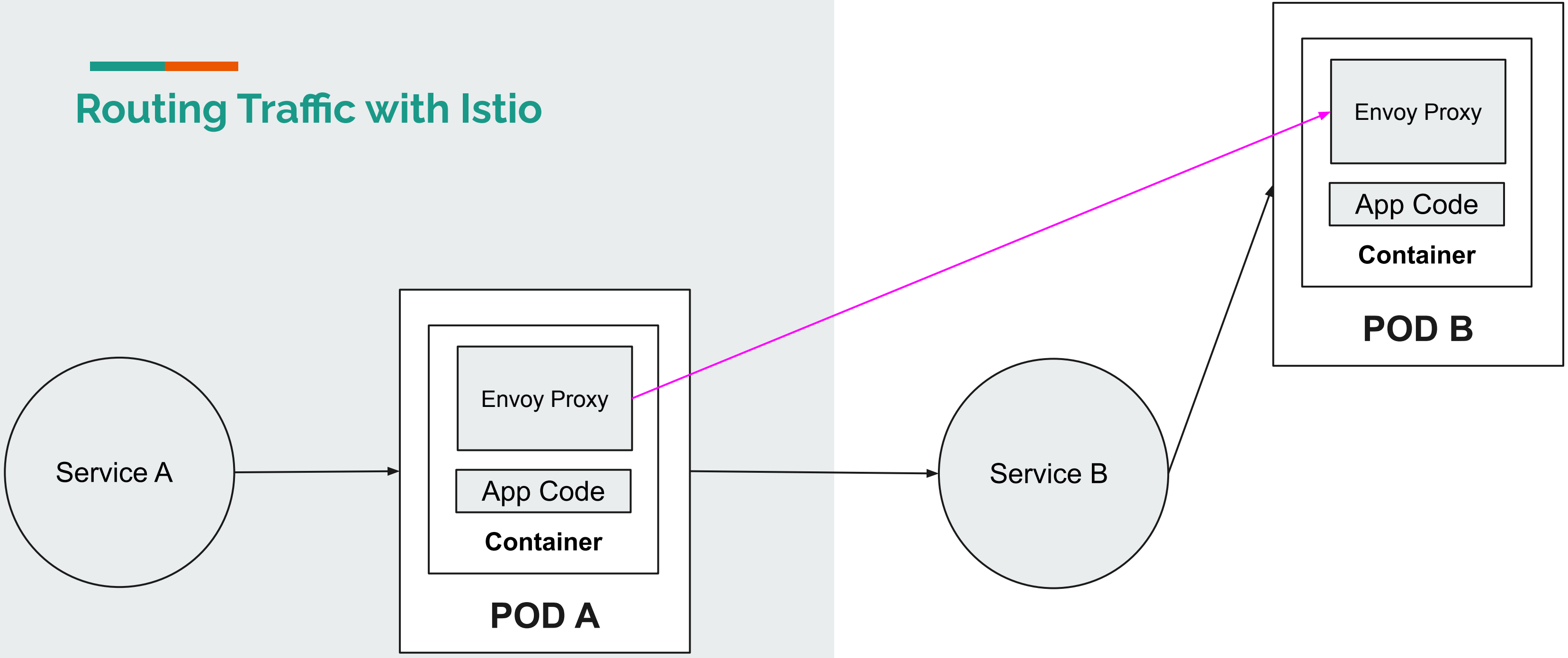
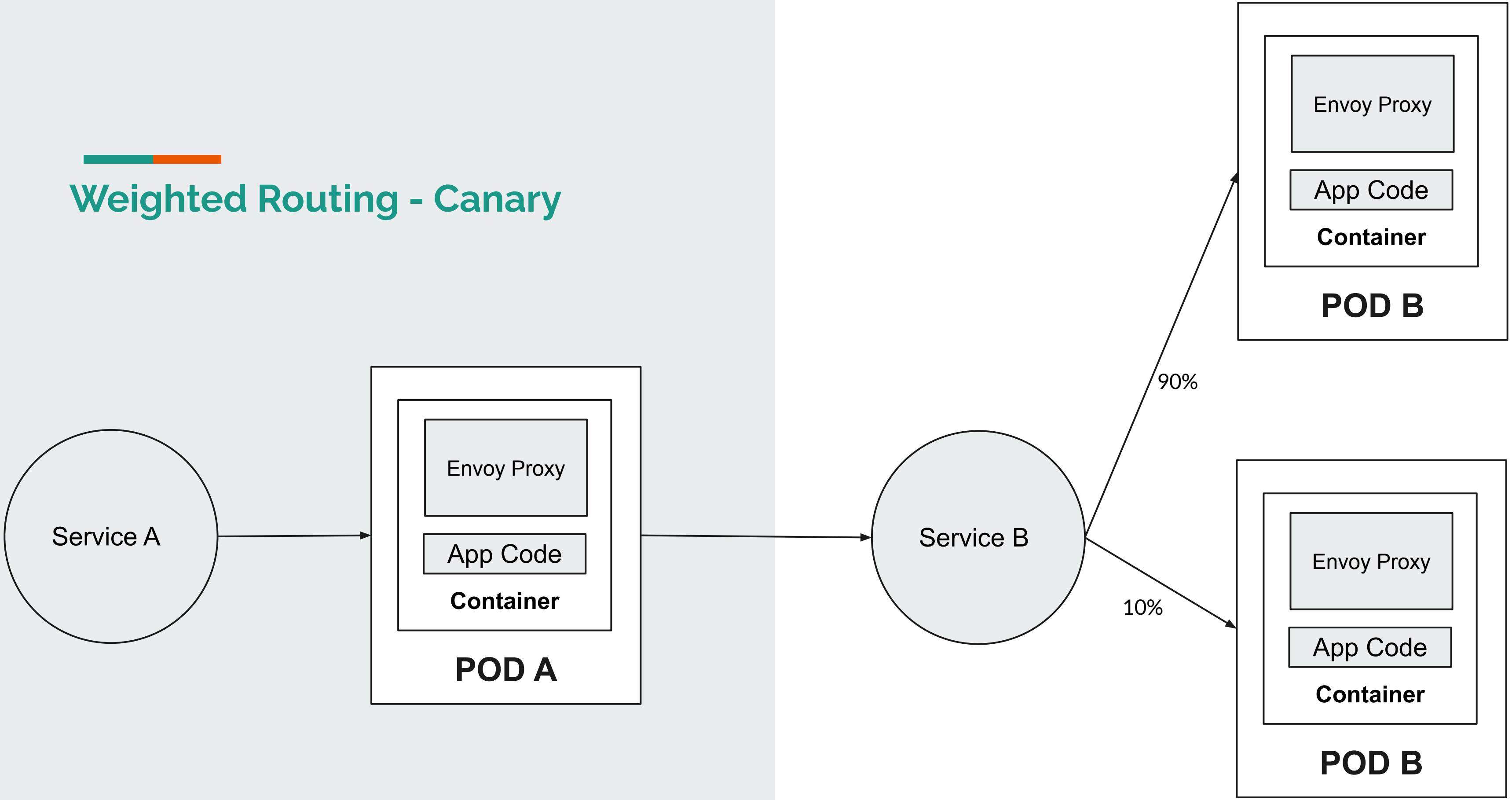
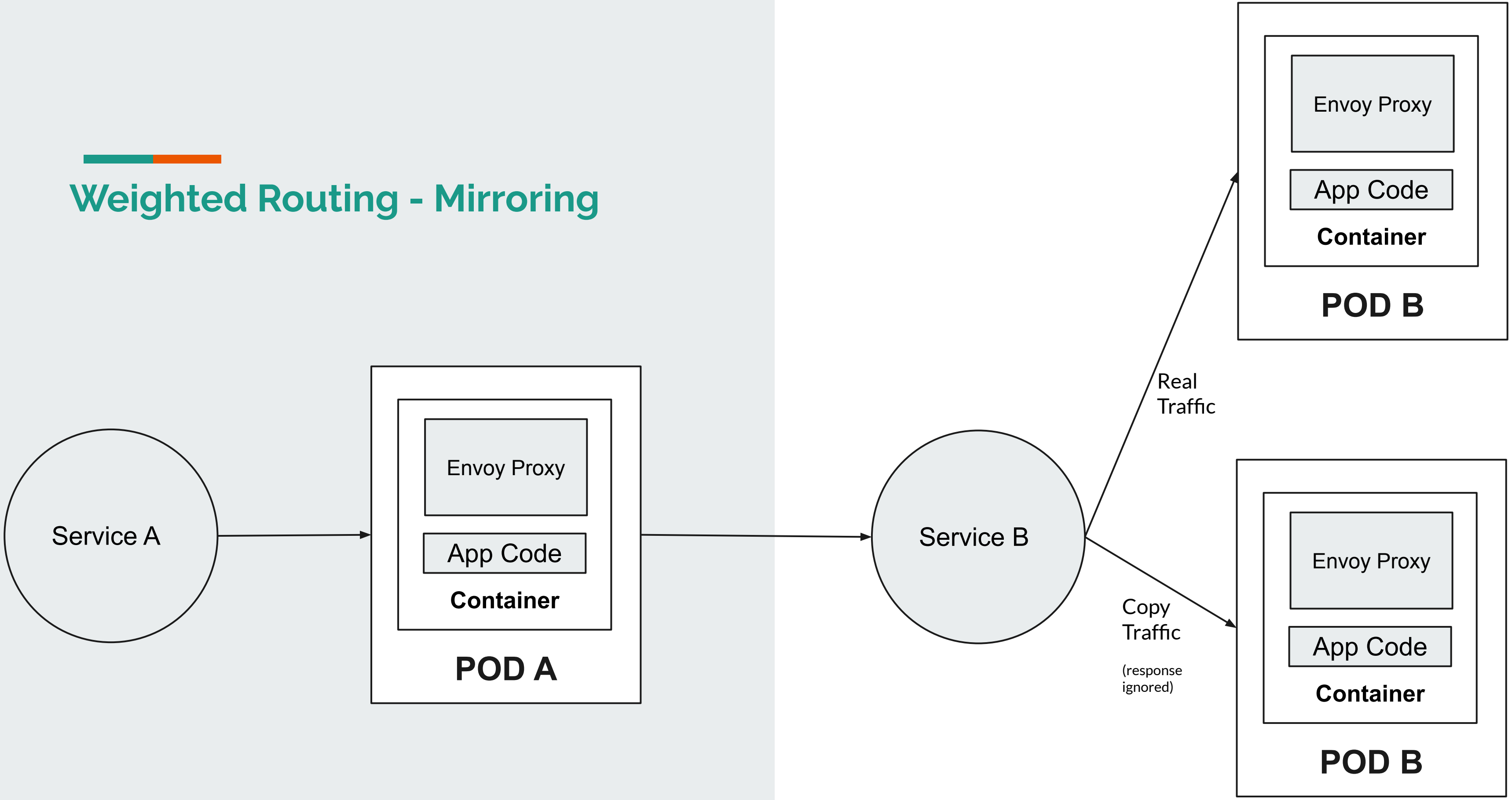


Communication Envoy-to-Envoy

Weighted Routing - Canary



Weighted Routing - Mirroring



Demo