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Using Envoy Proxy as your Gateway to Service Mesh

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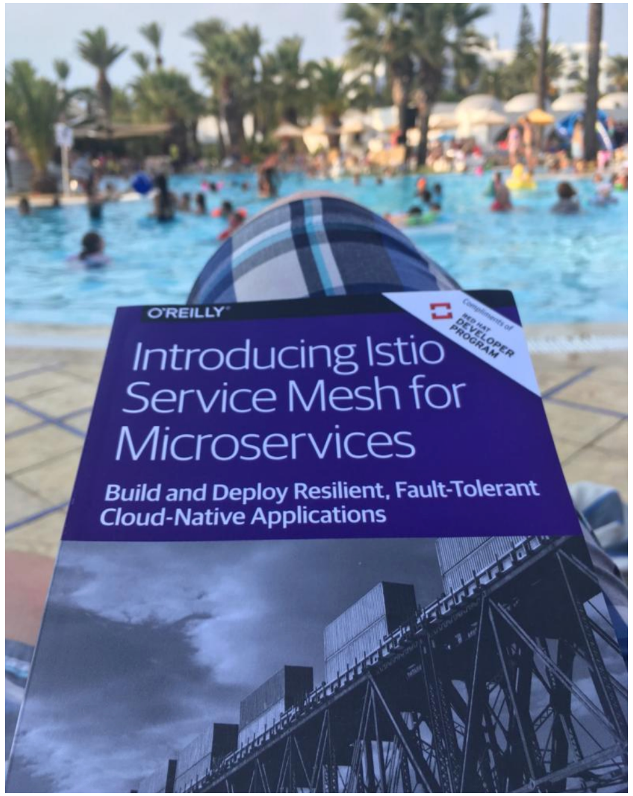
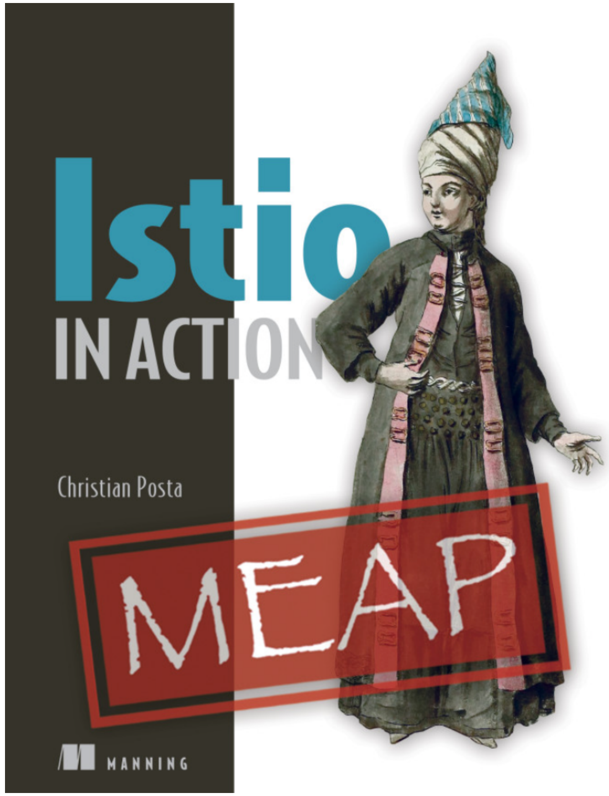
- Field CTO @ Solo.io
- Author of a few books
- Contributor to many open-source projects
- Architect, blogger, speaker, mentor, leader

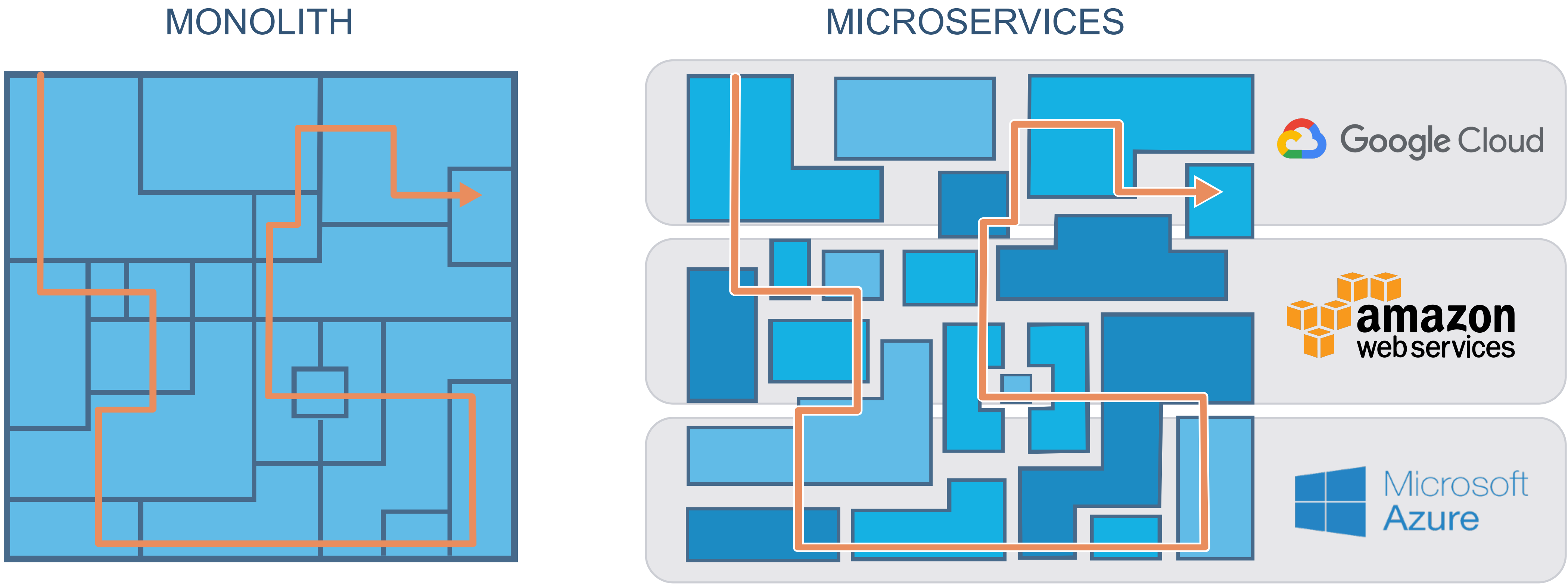
My books


O'REILLY
Compliments of RED HAT DEVELOPER PROGRAM
Introducing Istio Service Mesh for Microservices
Build and Deploy Resilient, Fault-Tolerant Cloud-Native Applications



https://bit.ly/istio-in-action

Why you might be interested?



HOW DO YOU MANAGE **APIs**?

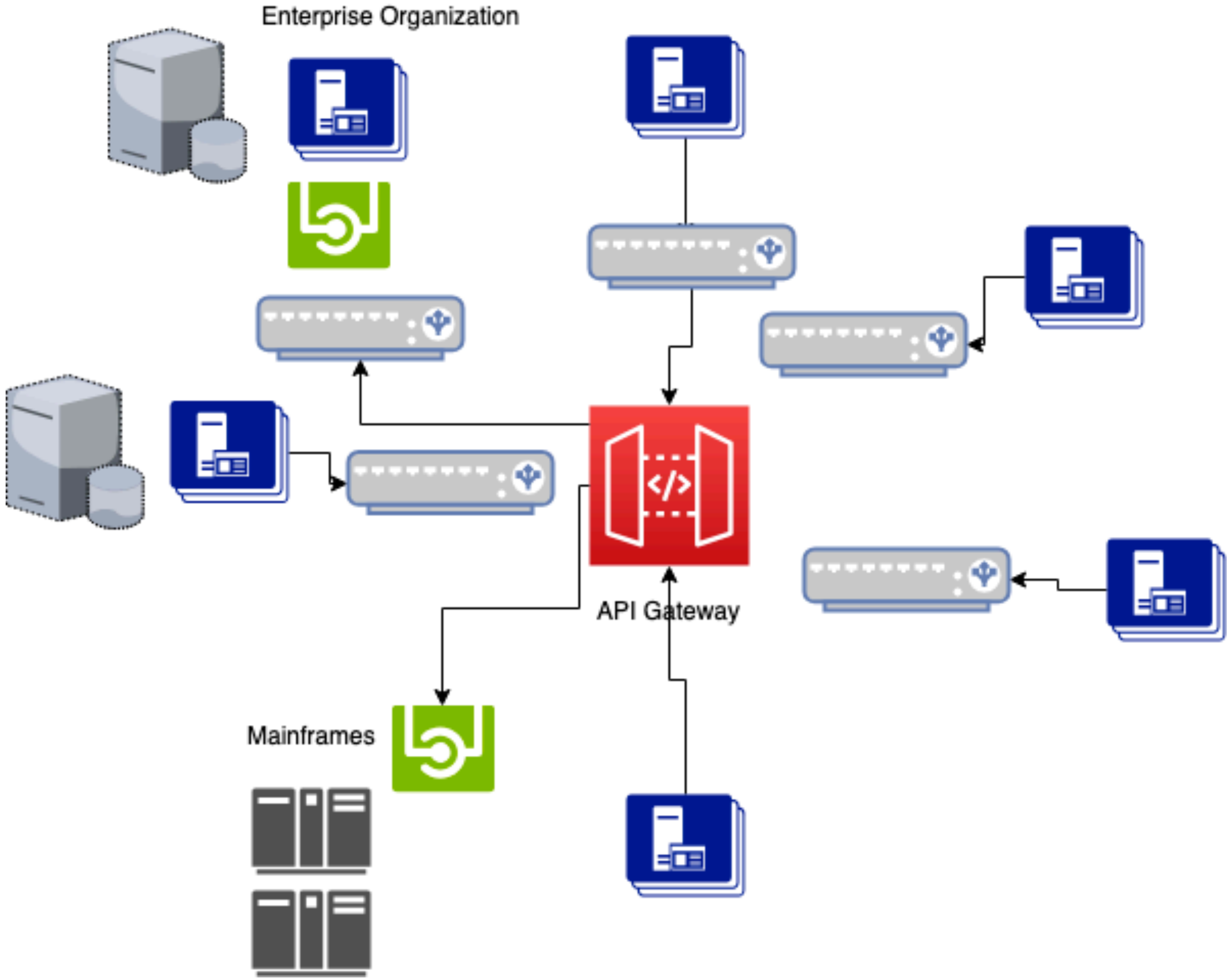
HOW CAN ENFORCE **SECURITY**?

HOW DO YOU **OBSERVE**?

Why you might be interested?

- Augment, complement, replace existing API infrastructure
- Support a microservices, cloud environment
- Need better traffic control and observability
- As little disruption as possible, target multiple compute
- Improve security posture

Why you might be interested?



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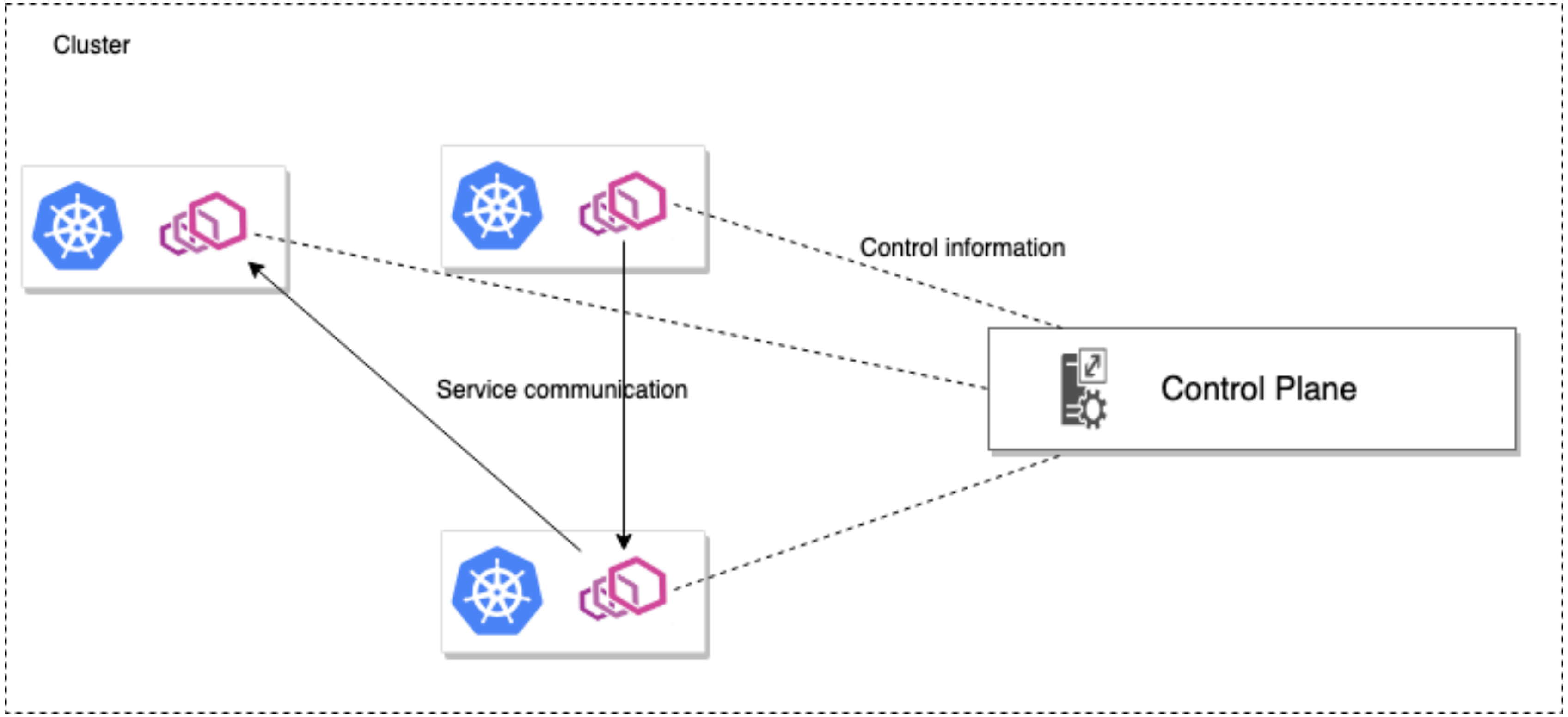
A service mesh to the rescue!



Challenges of adopting a service mesh

Do you need a service mesh?

- Do you have a mix of application languages or frameworks?
- Large deployment of microservices on cloud infrastructure?
- A lot of east/west, service-to-service communication?
- Struggling to implement application network observability?
- Have you mastered your existing infrastructure stack?

Challenges of adoption

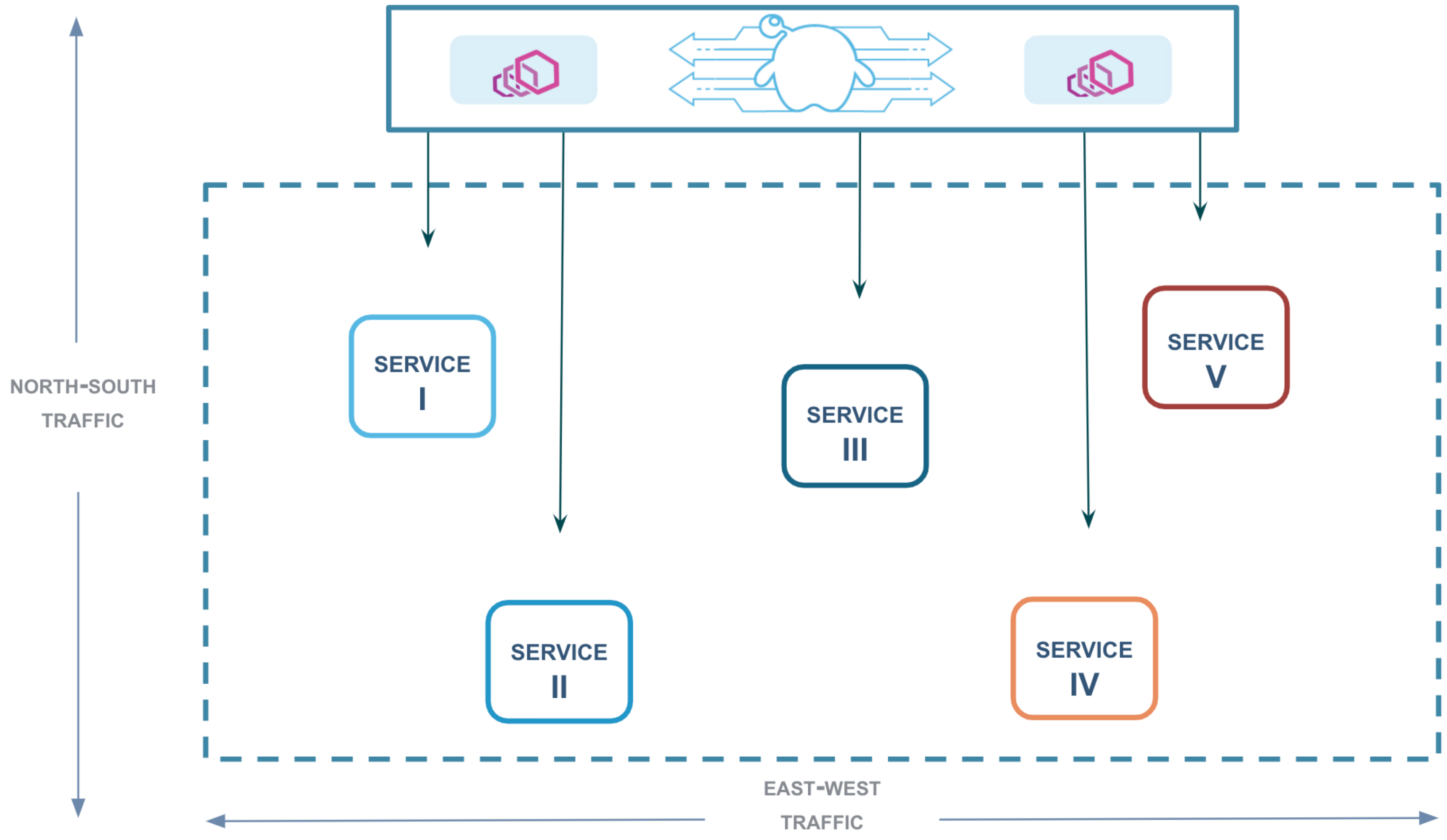
- Which one to choose?
- Who's going to support it?
- Multi-tenancy issues within a single cluster?
- No good way to manage multiple clusters?
- Fitting with existing services (sidecar lifecycle, race conditions, etc)
- What's the delineation between developers and operations?
- Non container environments / hybrid env?
- Centralization vs decentralization

How to get there?

Start with a gateway approach

- Start at the edge
- Start with one proxy, grow to more
- Pick a subset of traffic applications
- Get demonstrable value from it
- Data plane matters
- Pick something that lets you iteratively adopt service mesh

"Edge" concerns, North-South vs East-West



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“Edge” concerns, North-South vs East-West

Capability	Service Mesh	Edge
Traffic Control		
Traffic Routing		
TLS/mTLS		
Network Observability		
Policy Enforcement		

“Edge” concerns, North-South vs East-West

Capability	Service Mesh	Edge
OAuth/OIDC	✗	
Web Application Firewall	✗	
Message transformation	✗	
Request/response caching	✗	
Domain-specific rate limit	✗	
HMAC, request path security	✗	
Understand API surface, intended decoupling	✗	

Envoy proxy as a gateway

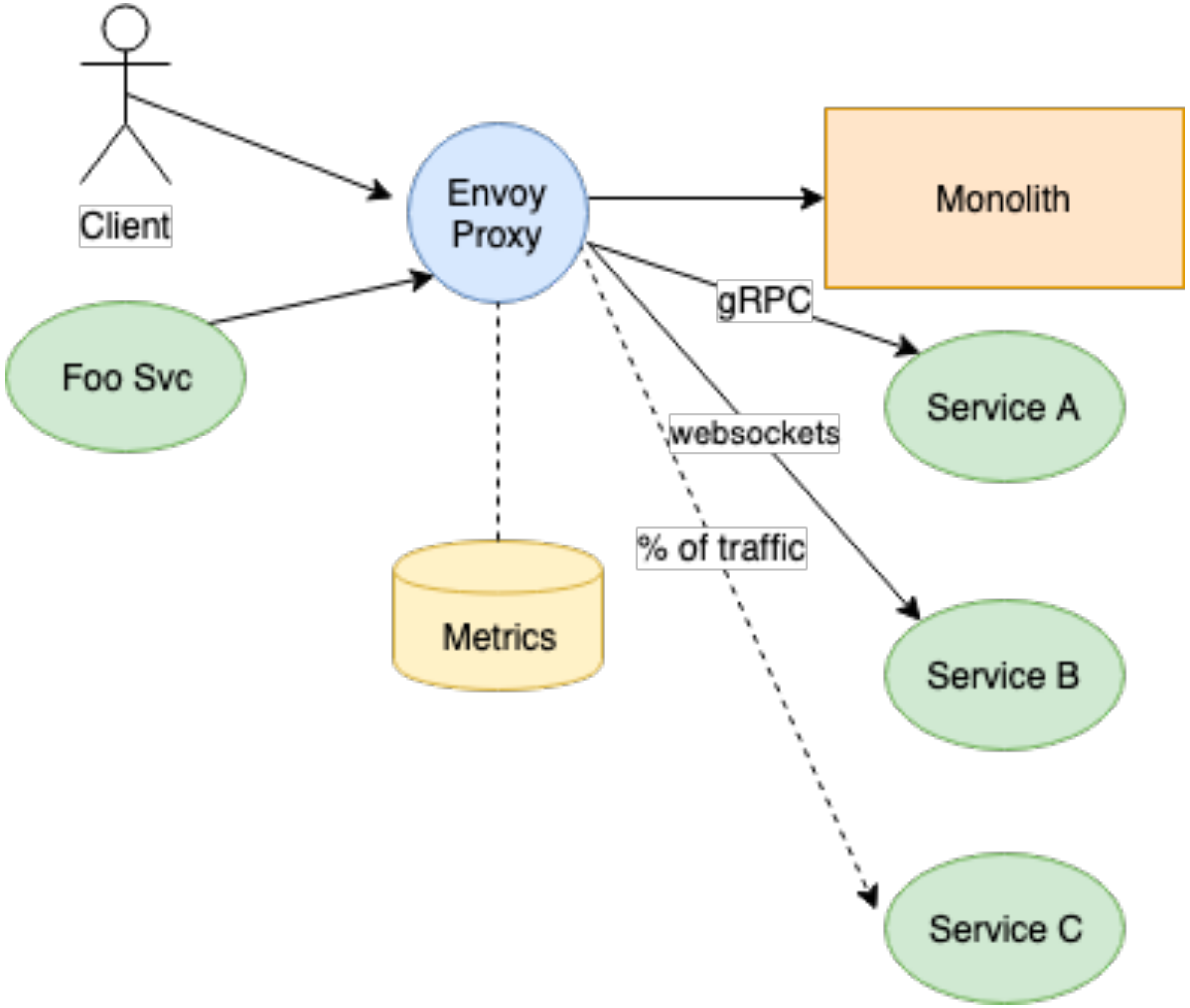
Meet Envoy Proxy

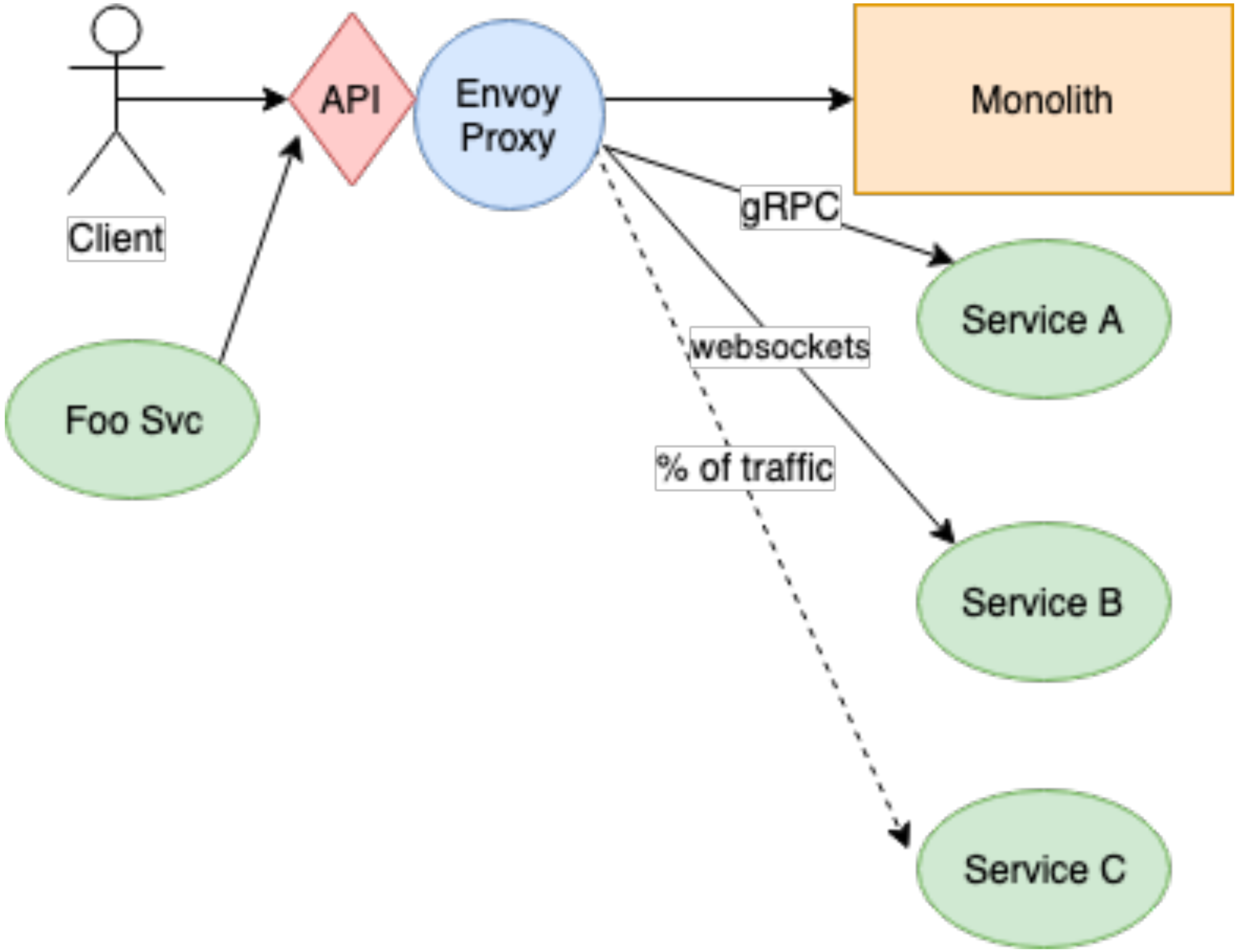
http://envoyproxy.io

ENVOY IS AN OPEN SOURCE EDGE AND SERVICE PROXY, DESIGNED FOR CLOUD-NATIVE APPLICATIONS

Envoy Proxy implements:

- zone aware, least request load balancing
- circuit breaking
- outlier detection
- retries, retry policies
- timeout (including budgets)
- traffic shadowing
- rate limiting
- access logging, statistics collection
- Many other features!


Client
Envoy Proxy
Monolith
Foo Svc
gRPC
Service A
websockets
Metrics
% of traffic
Service B
Service C


Client
API
Envoy Proxy
Monolith
gRPC
Service A
websockets
% of traffic
Service B
Service C
Foo Svc

Open source edge gateway built on Envoy

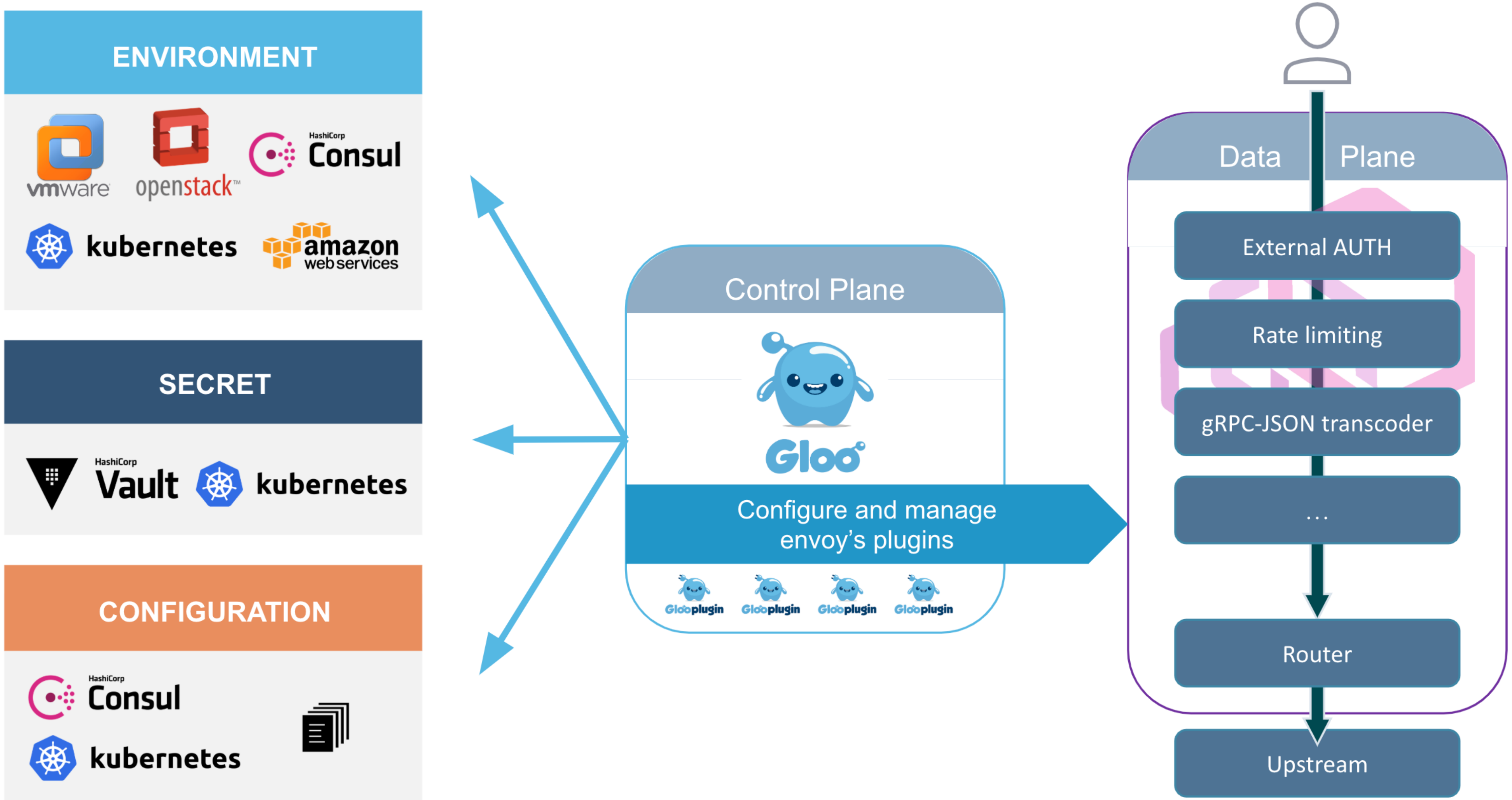
https://github.com/solo-io/gloo

What is Gloo?

- Enterprise Envoy Proxy
- API-level routing, decoupling
- Complements any service mesh
- Traffic control, canary releases
- OAuth flows
- TLS termination, passthrough, mTLS
- Rate limiting, Caching
- Request/Response transformation
- Kubernetes CRDs (when deployed to Kubernetes)

https://gloo.solo.io

Edge Gateway built on Envoy



Gloo adds these to service mesh!

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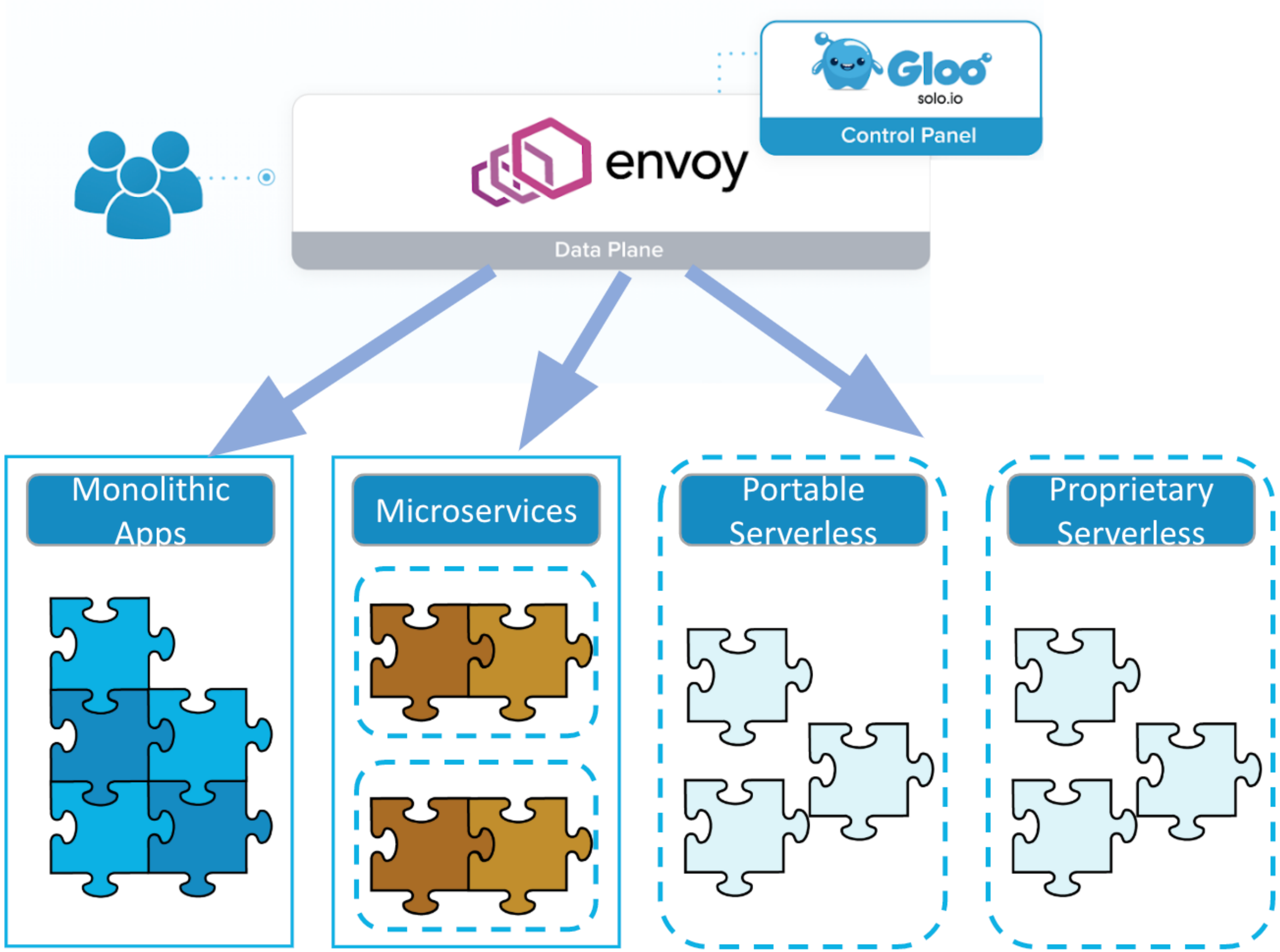
Demo!



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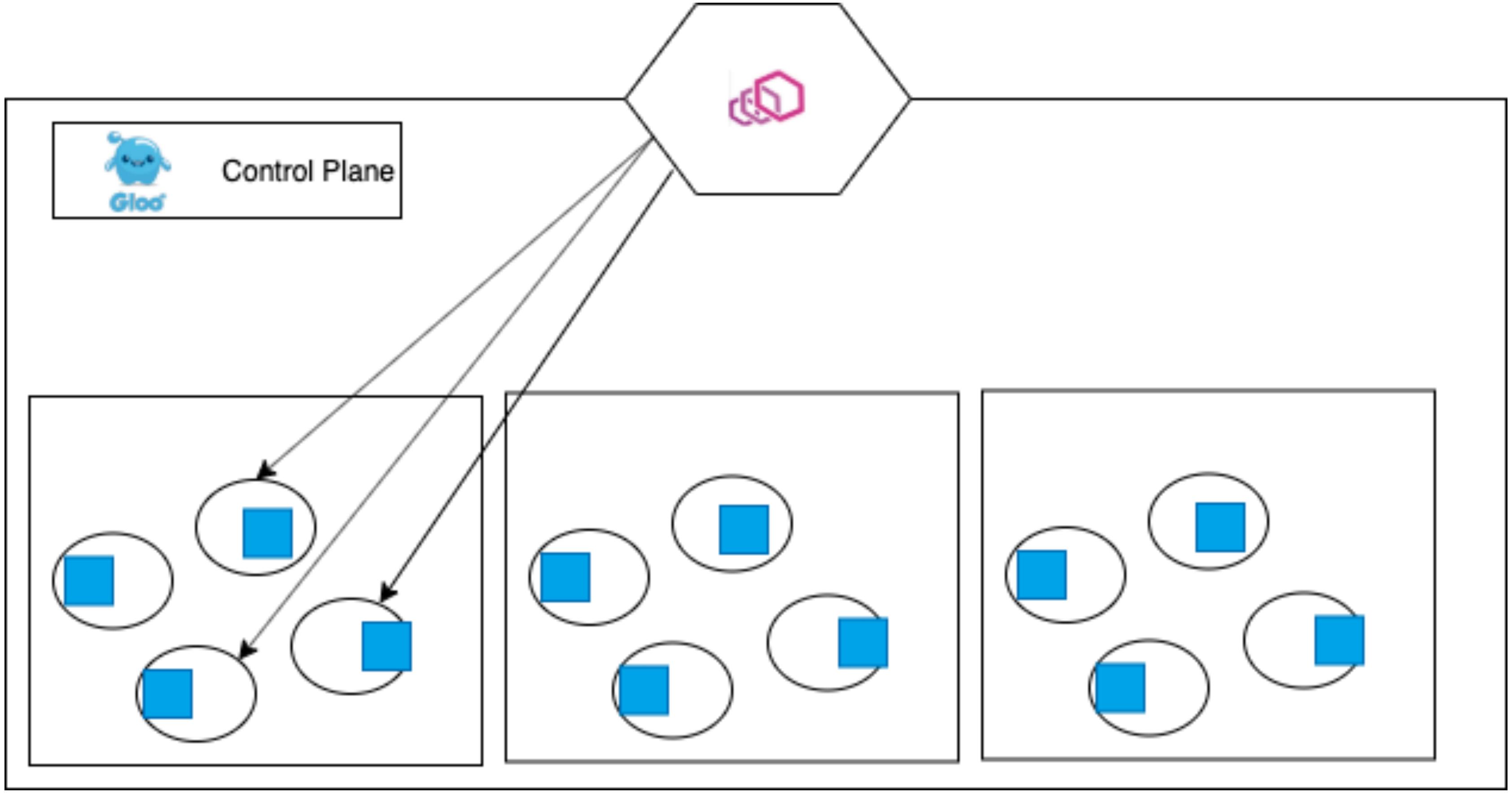
Gateway adoption patterns (waypoint architecture) on the journey to service mesh

Start with single proxy



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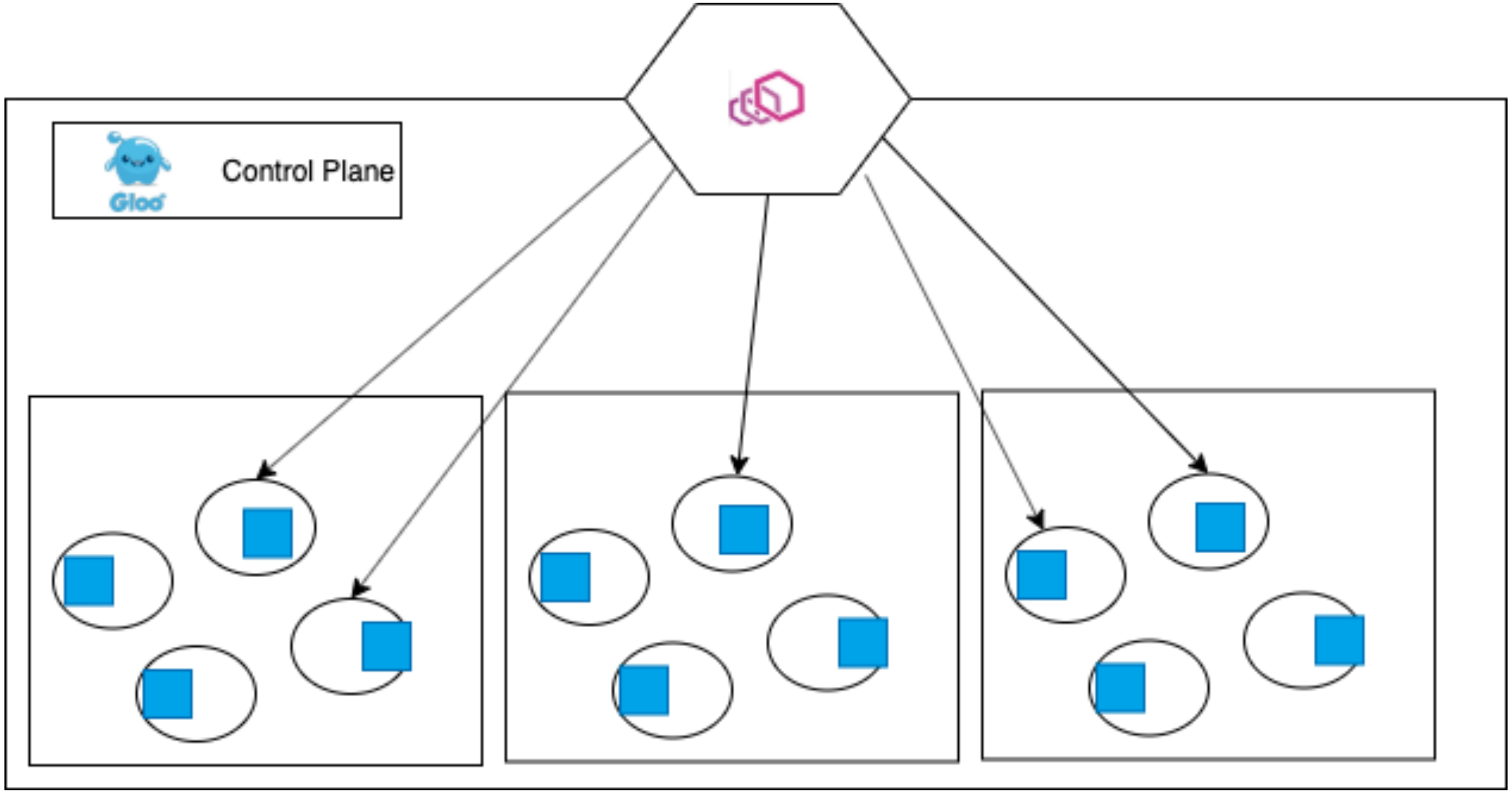
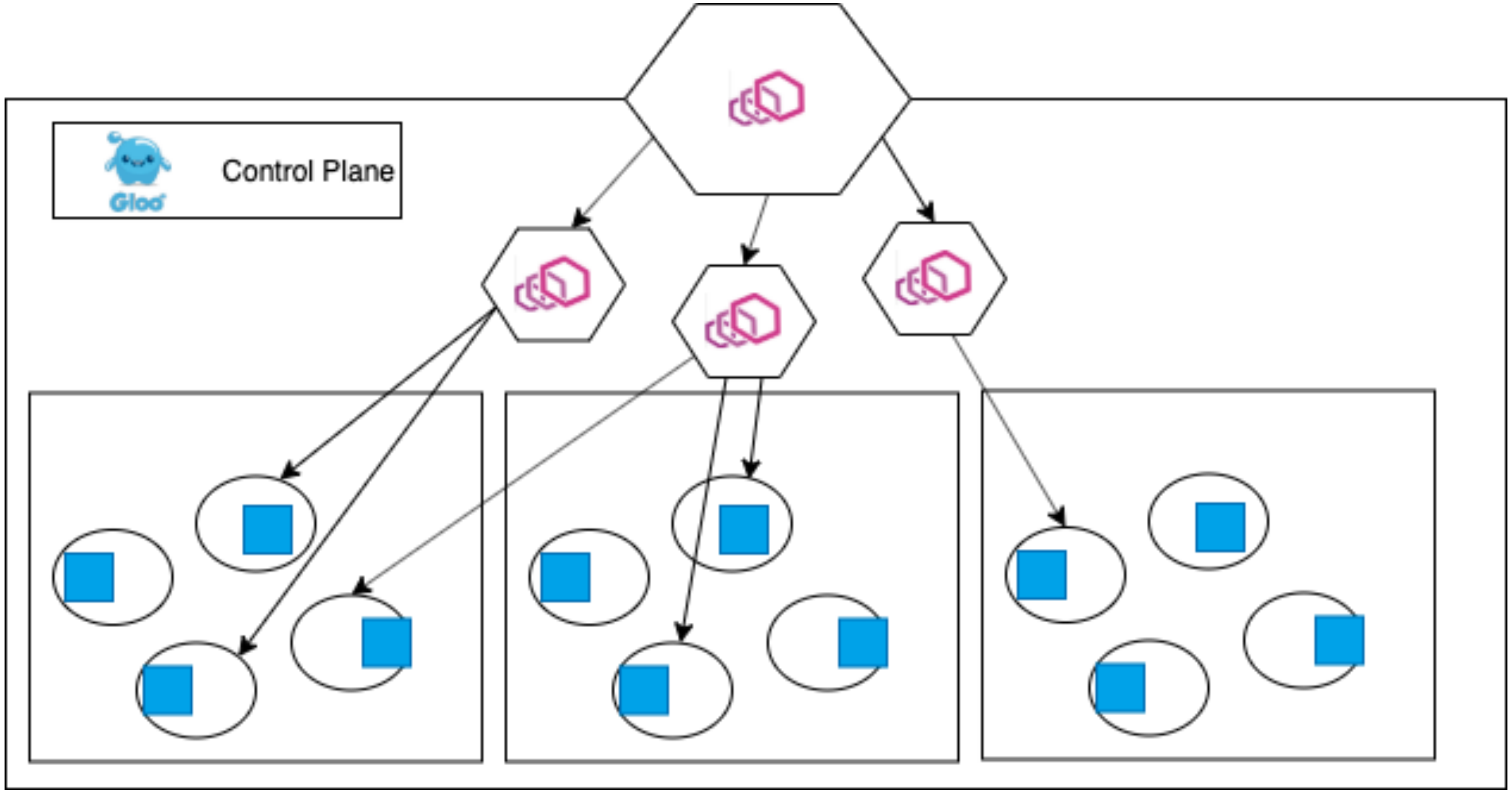
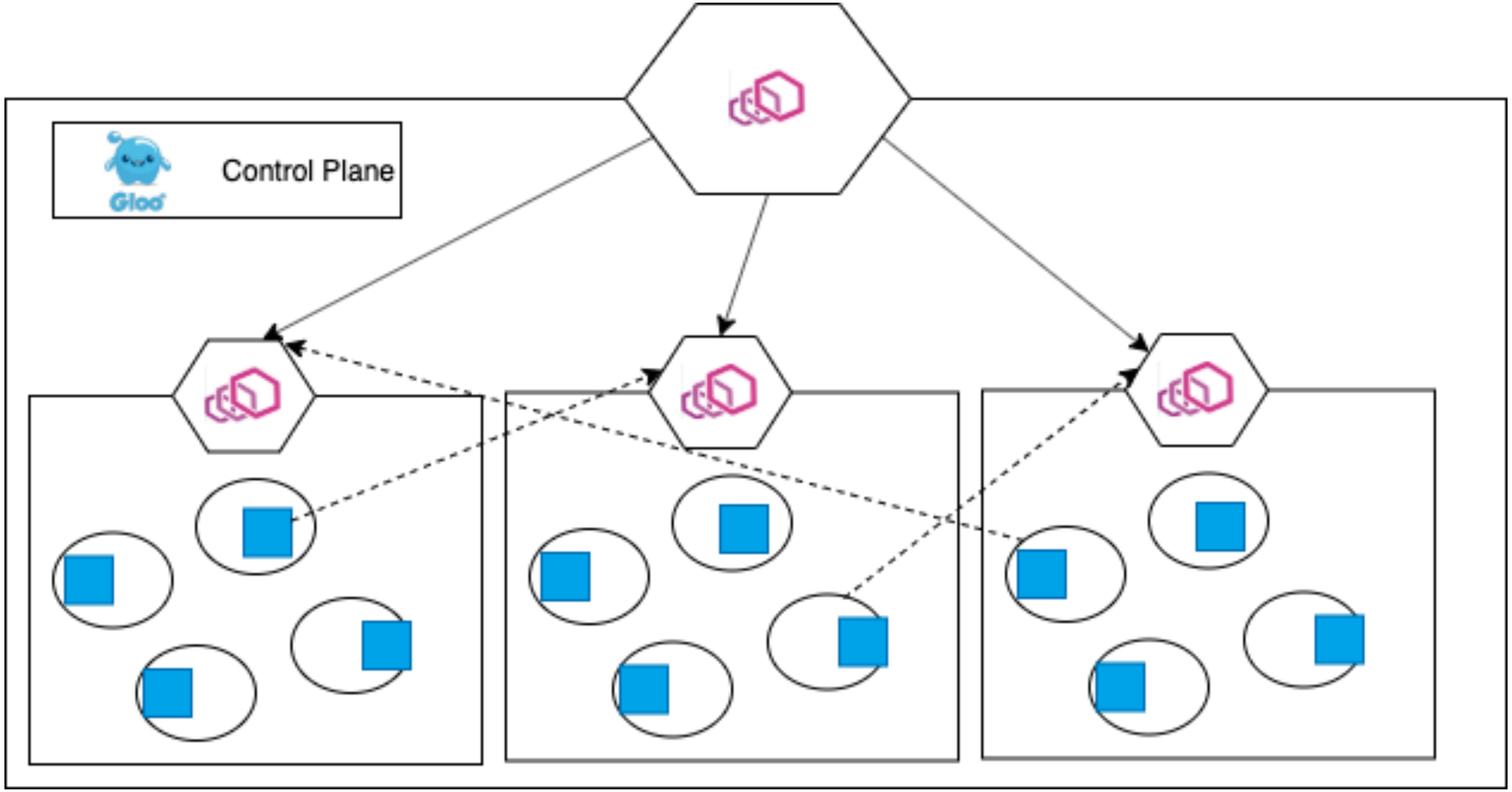


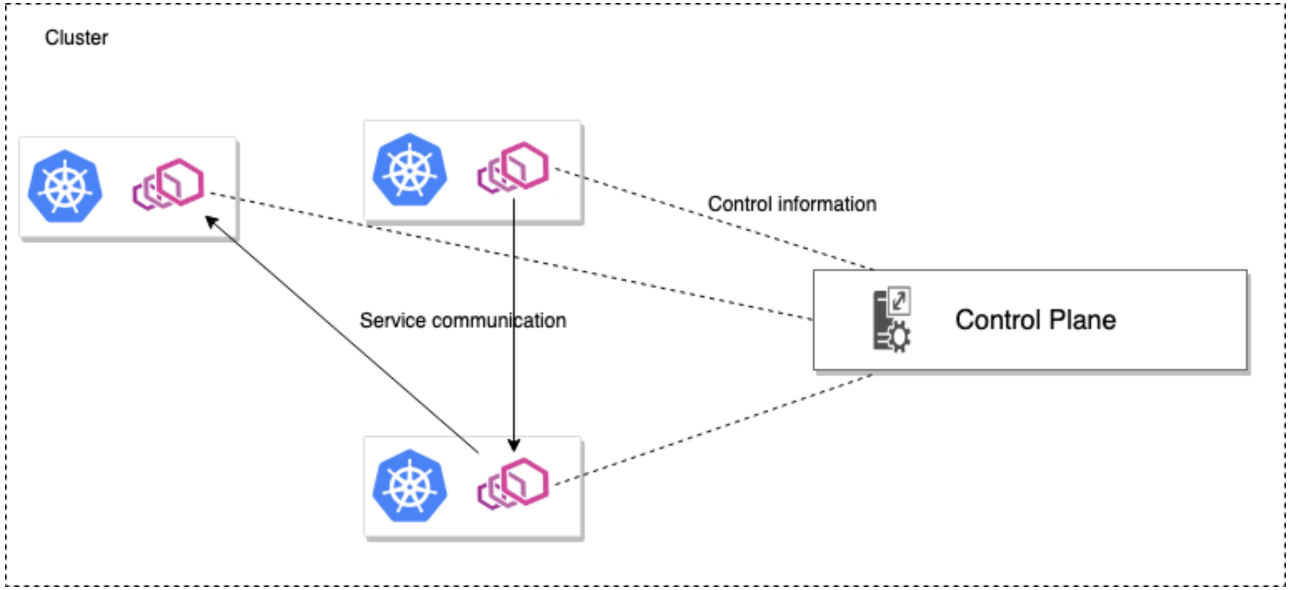
Bring in decoupling points (multi-tier gateway)

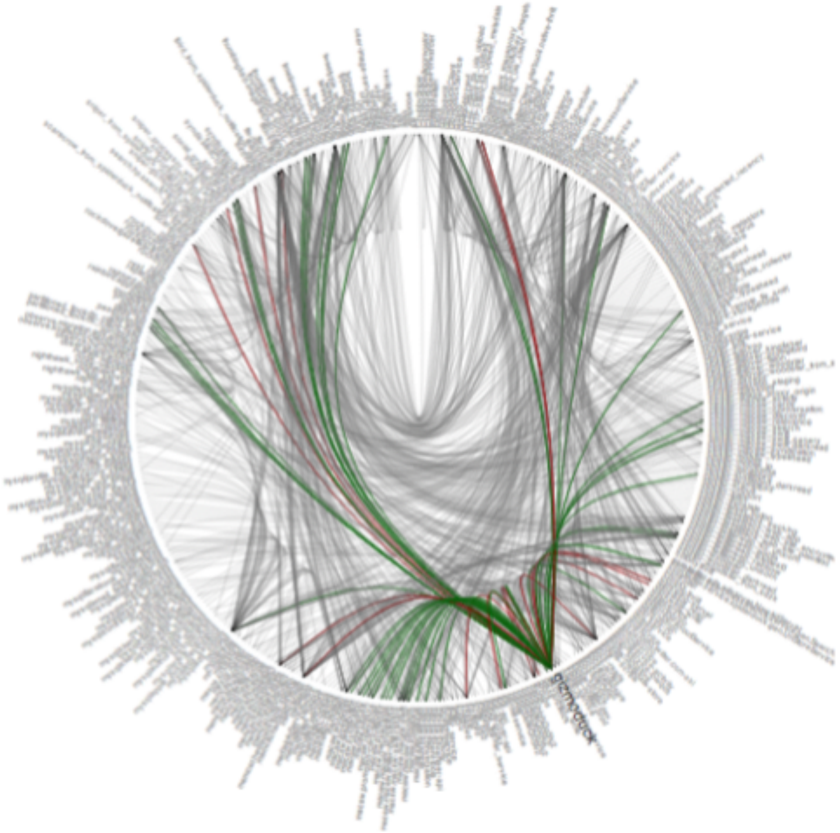


Gateway per product/domain/bounded context



Push gateways down as you grow, avoid death star architecture!





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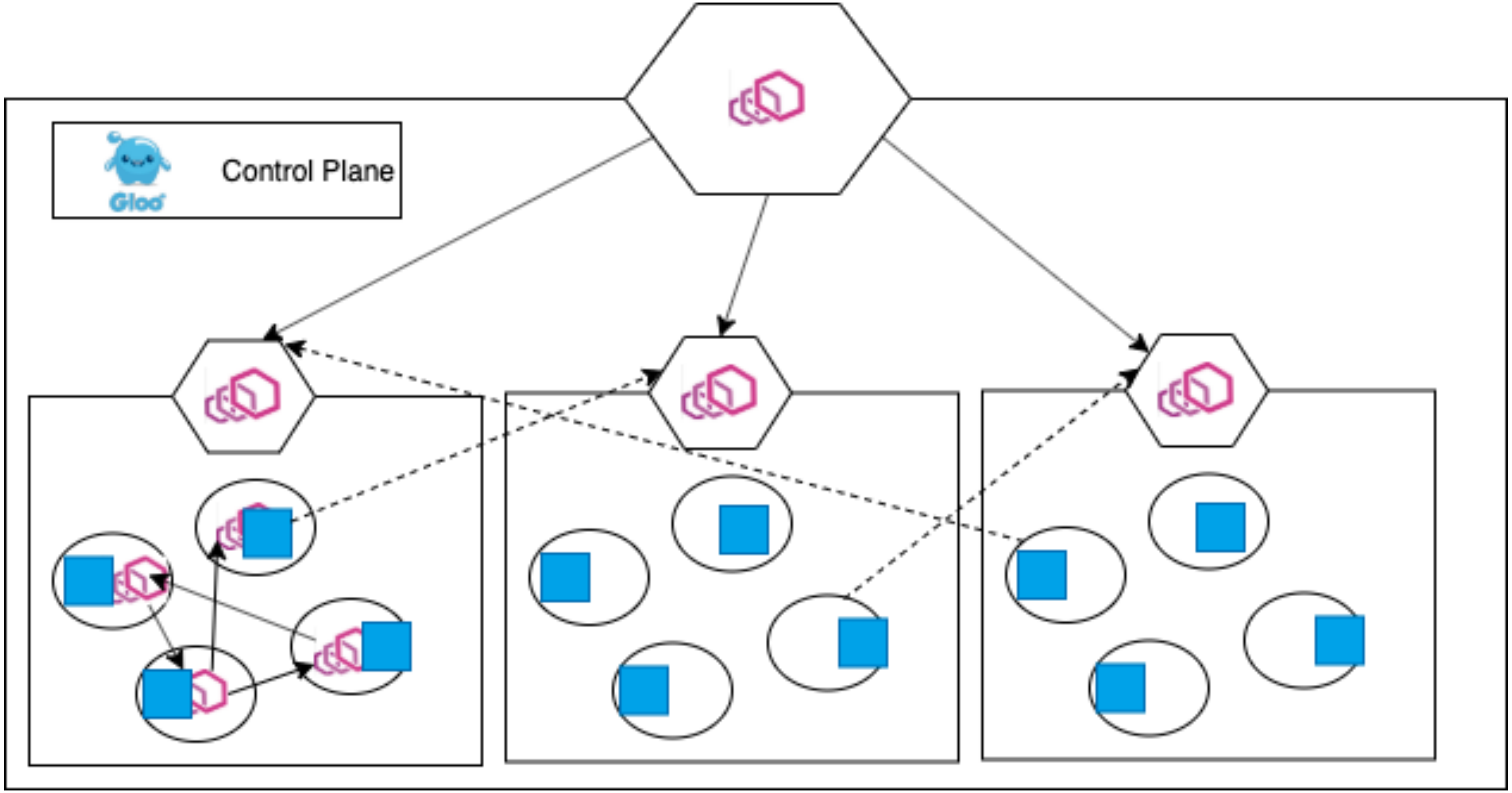

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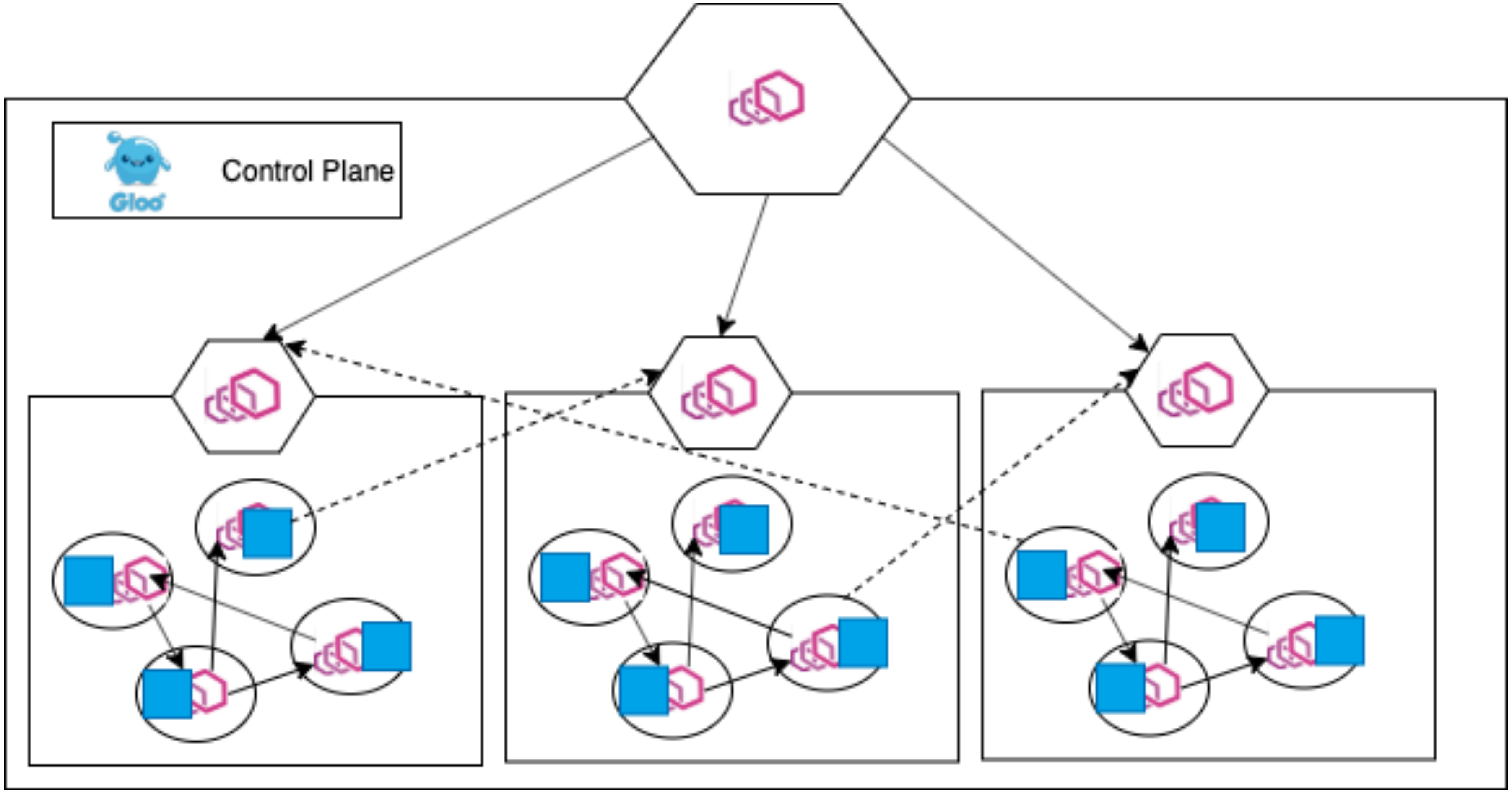

Solo.io projects:

Gloo	https://docs.solo.io/gloo/latest/
Gloo Enterprise	https://www.solo.io/products/gloo/
Service Mesh Hub	http://servicemeshhub.io
Autopilot	https://docs.solo.io/autopilot/latest/
Squash Debugger	https://squash.solo.io

The Service Mesh Journey with Solo.io

Solo.io connects and manages the world's applications with APIs and service mesh across any infrastructure.

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