Service Mess to Service Mesh

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Service Mesh - An Analogy
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Introducing Rob...

Rob Richardson

- Tech Evangelist for MemSQL
- Microsoft MVP
- Leads the Southeast Valley .NET User Group
- AZGiveCamp Organizer

Personal interests

Coding, Teaching, and Travel
Introducing Kavya...

Kavya Pearlman

- Well known as the “Cyber Guardian”
- Cybersecurity Strategist at Wallarm
- An Award-winning Cybersecurity Professional
- Founder and CEO of XR Safety Initiative
- Former Information Security Director Linden Lab
- Former Facebook Third Party Security Risk Advisor

Personal interests

Travel, Gaming, Virtual Worlds

wallarm
Let's Talk about Service Mesh!

- The Service Mesh
- From Monolithic to Microservices
- The Challenge with API Gateways
- Deep Dive into Service Mesh
  a. Istio
  b. Linkerd
- Demo
- Service Mesh Best Practices
A Service Mesh manages the network traffic between services in a graceful and scalable way.

Service Mesh IS the answer to:

“How do I observe, control, or secure communication between microservices?”
Service Mesh

**OBSERVE**
monitor network

**CONTROL**
access policies

**SECURE**
mutual TLS
From Monolithic to Microservices

Before:
- User Interface
- Business Logic
- Data Layer
- MONOLITH APPLICATION DB

After:
- User Interface
- MICROSERVICE
- MICROSERVICE
- MICROSERVICE
- DATA SOURCE
- DATA SOURCE
- DATA SOURCE
From North-South to East-West

- North-South
  - Container to Clients
- East-West
  - Between Containers
The Challenge with API Gateways

- USER INTERFACE
- API GATEWAY
- MICROSERVICE
  - DATA SOURCE
- MICROSERVICE
  - DATA SOURCE
- MICROSERVICE
  - DATA SOURCE
Service Mesh: How does it work?

HTTP or TCP often with mTLS

Policy checks, telemetry

Service Mesh Control Plane
Service Mesh

**OBSERVE**
monitor network

**CONTROL**
access policies

**SECURE**
mutual TLS
More than just a proxy

NETWORK TOPOLOGY

SERVICE HEALTH

LOGGING
More than just a proxy

CIRCUIT BREAKER

A/B TESTING

BETA CHANNEL
More than just a proxy
Prevent Unexpected Traffic Patterns

USER INTERFACE

MICROSERVICE  →  MICROSERVICE  →  MICROSERVICE

DATA SOURCE  →  DATA SOURCE  →  DATA SOURCE
Methodology:
Linkerd focuses on simple setup and critical features

Add 3rd party components to get additional features
Methodology:
A kitchen sink of features to enable / disable

Istio combines third-party components

- Envoy Proxy
- Metrics to Grafana
- Prometheus dashboard
- Jaeger tracing dashboard

```yaml
apiVersion: networking.istio.io/v1alpha3
kind: VirtualService
metadata:
  name: bookinfo
spec:
  hosts:
  - reviews
  http:
  - route:
    - destination:
      host: reviews
      subset: v1
      weight: 75
    - destination:
      host: reviews
      subset: v2
      weight: 25
```
In a Nutshell

- Monitoring, Logging, Service Health
- Intelligent Routing
- Network Topology Diagram
“If it doesn’t have a control plane, it ain’t a Service Mesh.”

- Zach Butcher
Service Mesh Implementation Cost
Benefits of Service Mesh

- Observe: transparency of communication
- Control: enhanced resilience to network disruption
- Secure: abstraction without code changes
Use Service Mesh if:

- Running highly sensitive workloads (PKI, PCI)
- Running untrusted workloads
- Running multi-tenant workloads
- Need A/B routing or beta channel
- Need security in depth