A Service Mesh Is Easy To Swallow In Small Pieces

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Why Should I Use A Service Mesh?
Managing Microservices Without a Service Mesh

Service A:
- Python
- Flask
- Lemur
- Kingpin
- OpenTracing Flask
- Open SSL 110d

Service B:
- Node.js
- http.createServer
- Express RL
- Zoologist
- Jaeger
- Open SSL 1021

Service C:
- Java
- Spring
- Ribbon
- Disco-java
- OpenTracing Spring
- Open SSL 110f

Pods

Service A

Service B

Service C
Managing Microservices With a Service Mesh

Service A
- Python
- Flask
- Service Mesh
- Pod
- Service A

Service B
- Node.js
- http.createServer
- Service Mesh
- Pod
- Service B

Service C
- Java
- Spring
- Service Mesh
- Pod
- Service C
Managing Microservices With a Service Mesh
Managing Microservices With Istio

Istio Control Plane

- Pilot
- Mixer
- Citadel
- Sidecar Injector
- Aspen Mesh Agent

- Config data to Envoys
- TLS certs to Envoys
- Monitors K8s for new pods to inject Envoys

- Policy, quota & telemetry

Envoys

- Flask
- Python

SERVICE A

- http.create server
- Node.js

SERVICE B

- Spring
- Java

SERVICE C

Ingress Gateway
Egress Gateway

Telemetry to Aspen Mesh SaaS
Aspen Mesh Architecture

User's Cluster

- Pilot
- Mixer
- Citadel
- Sidecar Inj
- Agent

SERVICE A
- Envoy
  - Flask
  - Python
- Envoy
  - http.createServer
- Envoy
  - Spring
  - Node.js
  - Java

SERVICE B
- Envoy

SERVICE C

Ingress
- Cortex
  - User mgt
    - Graph
      - Details
      - Istio-vet
        - Tardis
        - Jaeger
        - Client-ui

Istio 0.2.12 -> 1.0.4-am1
Small Pieces Framework
Getting Started With Istio

Walk: Easy / Out-of-the-box
Run: Good value for most
Jetpack: Extra credit
Sidecar for All Pods?
Sidecars

- Some services in the mesh
- All services in the mesh
- Multicluster
Mutual TLS
Mixer Adapters
Security Policy

Ingress Gateway

App A
Sidecar

App B

App C
Sidecar

App D
Sidecar

App E
Sidecar

App F
Sidecar

Cluster 1

Cluster 2

Load Balancing
Routing
TLS
Tracing
Metrics
Resiliency

Mutual TLS
Mixer Adapters
Security Policy

Global TLS

ASPen MESH
Tracing

No correlation headers

Correlation headers

Add app-specific spans
Headers to copy:

- x-b3-spanid
- x-b3-traceid
- x-b3-parentspanid
- x-b3-sampled
- x-b3-flags
- x-request-id
- x-ot-span-context

Mutual TLS

- Opt-in with config
- Global Enable
- Integrate with CA
Mutual TLS
Mutual TLS

Use DestinationRules to opt-in mesh services to mTLS – when all clients are mesh services.

No “choose your front door”
Mutual TLS

All services in the mesh – mTLS on by default
Mutual TLS

App C
Sidecar

App A
Sidecar

App B
Sidecar

App D
Sidecar

Citadel

Your CA

Bring your own signing cert
External clients and servers in same trust domain
Resiliency

- Timeouts & Outlier Detection
- Fault injection
- Retries
Timeouts & Outlier Detection

Timeouts
- Accelerate error notification
- Reduce hopeless-work-lingering

Outlier detection
- Eject overloaded/failed outliers
- Reduce hopeless-work-generation
Fault Injection

Exercise what happens if a particular microservice is slow or returns errors sporadically to test resilience.

Policies and selectors to only expose faults to particular workloads (test, beta)
Retries

Valid for requests that are IDEMPOTENT

Jitter

New upstream
**Sidecars**
- Some services
- All services
- Multicluster

**Mutual TLS**
- Opt-in with config
- Global Enable
- Integrate with CA

**Tracing**
- No correlation headers
- Correlation headers
- Add app-specific spans

**Resilience**
- Timeouts & Outlier Detection
- Fault injection
- Retries
Thank You
Rate today’s session

Effective enterprise architecture

Eben Hewitt (Sabre)
1:15pm - 2:05pm Wednesday, February 6, 2019
Enterprise architecture
Location: Grand Ballroom West
Level: Intermediate
Secondary topics: Best Practice, Framework-focused

Who is this presentation for?
- Architects of all stripes, tech leads, senior developers, and managers

Prerequisite knowledge
- Experience as a senior developer or architect working on software projects

What you’ll learn
- Learn a holistic approach to architecture that explains how to bring business architecture, information architecture, data architecture, application (software) architecture together to have the best chance for your system’s success
- Explore a practical set of architecture practices to create winning technical architectural guidance
- Understand how architecture works effectively with development teams, management, and product management teams through the value chain
- Get usable templates you can start incorporating into your teams immediately

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