Observability for Istio Service Mesh

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Agenda

- Introduction to observability
- Istio telemetry
- Soccer Demo - Istio, Kiali, Jaeger
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- Distributed tracing
- Jaeger, OpenTracing (OTSC)
- MicroProfile-OpenTracing, other frameworks, runtimes
- Github: @pavolloffay
- Twitter: @ploffay
$ curl ui.192.168.42.59.nip.io
$ curl: (6) Could not resolve host...
Large deployment
## Traditional Monitoring Stack

<table>
<thead>
<tr>
<th><strong>Logging</strong></th>
<th><strong>Metrics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Events, stack traces, errors</td>
<td>- Gauges, counters, timers, histograms</td>
</tr>
<tr>
<td>- SLF4J, Log4j</td>
<td>- Micrometer, dropwizard</td>
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<tr>
<td>- ELK, Fluentd, Splunk</td>
<td>- Prometheus, Grafana, statsd</td>
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</tbody>
</table>
Istio Architecture

- Metrics
- Distributed tracing
- Logs
Istio Telemetry - Mixer

- Provides metrics, distributed tracing, logs in an unified way via attributes
- Pluggable adapters - P8s, StackDriver, DataDog, fluentd, SolarWinds...
Metrics

- By default Prometheus and Grafana
Distributed Tracing Context Propagation

Context{traceId=198423, ...}
Distributed Tracing in-process context p.

*Thread pools, queues, futures...
Distributed Tracing in Istio/Envoy

- By default Jaeger
- Envoy/Mixer uses Zipkin format by default
- Headers: B3\{x-b3-traceid, x-b3-spanid, x-b3-parentspanid, x-b3-sampled, x-b3-flags\}, Lightstep x-ot-span-context, x-request-id
- Or use existing instrumentations - [github.com/opentracing-contrib](https://github.com/opentracing-contrib)

- The future seems to be bright: tracestate and traceparent headers [w3.org/trace-context](http://w3.org/trace-context)
Logging

- *Mixer* sends custom logs to *fluentd*
- *Fluentd* daemon supports many backends e.g. *ELK*

- Is logging useful for monitoring microservices?
  - Too expensive, verbose, no causality
  - Maybe useful for app lifecycle events?
Demo

- https://github.com/jotak/demo-mesh-arena
Demo two balls: round robin, 75-25%
Demo two balls: round robin, 75-25%
Demo Messi, Mbappe, two games via labels

```yaml
# Scenario 2: By label
---
apiVersion: networking.istio.io/v1alpha3
kind: VirtualService
metadata:
  name: ball-vs
spec:
  hosts:
    - ball
  http:
    - match:
      - sourceLabels:
        version: basic
        route:
          - destination:
            host: ball
            subset: ball-v1
          - destination:
            host: ball
            subset: ball-v2
```

Commanderie - Locals: 4 - Visitors: 11 ~ Time:
Distributed Tracing features

- Distributed transaction monitoring
- Root cause analysis
- Performance and latency optimization
- Service dependency analysis

Distributed context propagation!