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How To Use Distributed Tracing To Find the Biggest Customer-facing Errors and Slowness

OBS1921B

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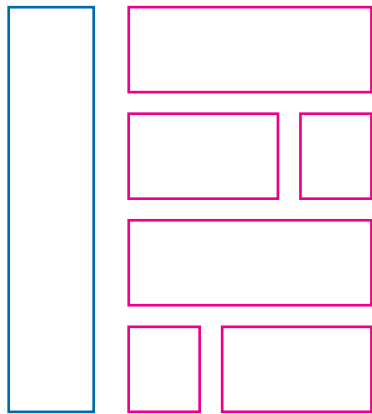
Agenda

- Tracing 101
- DEMO: Using Tracing to troubleshoot real issues
- Advanced Tracing Techniques
- Q & A

Every Company is Modernizing Applications

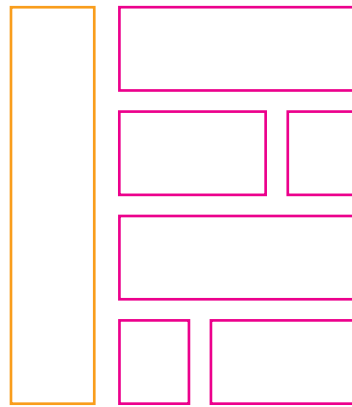
To Increase Velocity, Agility and Resilience

Retain & Optimize



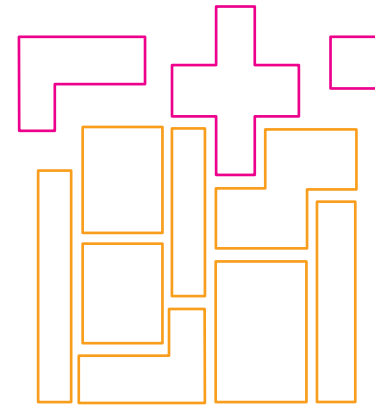
Tightly Coupled Apps,
Slow Deployment
Cycles

Lift & Shift



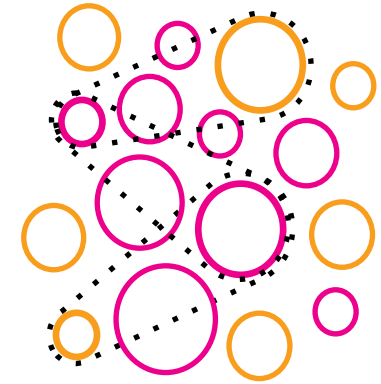
Primarily using
Cloud IaaS

Re-Factor



More Modular, but
Dependent App
Components

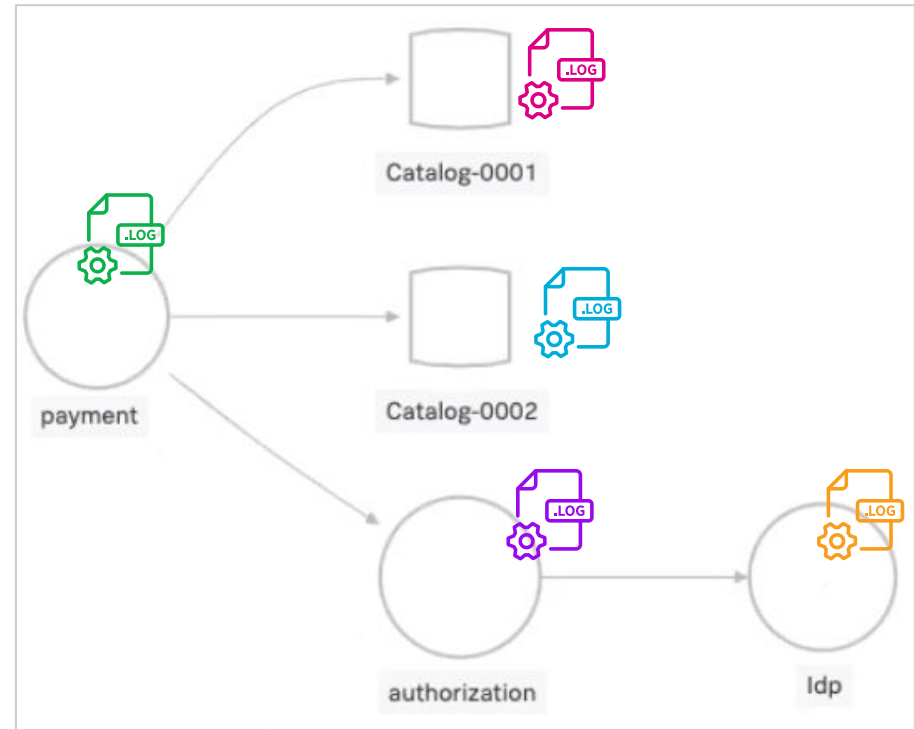
Re-Architect / Cloud-Native



Loosely Coupled
Microservices, and
Serverless Functions

Logs & Metrics

- Why?
 - Record what a service is doing and how it behaves
- How?
 - Instrument components of a system
 - Services generate logs; events generate metrics
 - Sent to centralized repository
 - Allows for searching, formating, alerting etc

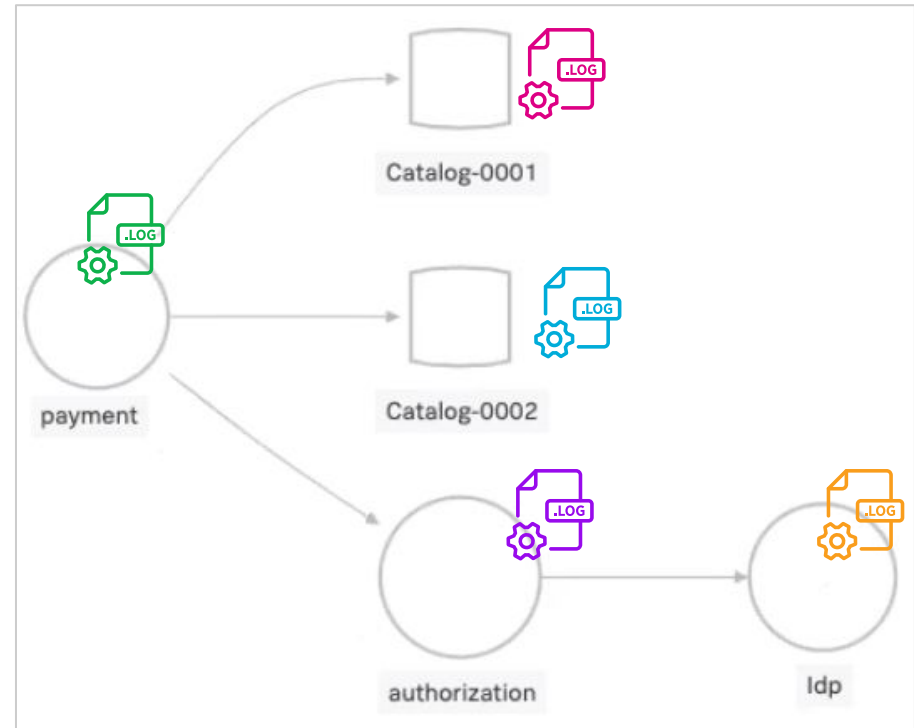


Example Logs

```

14:38:00 payment receive order for XYZ
14:38:01 payment receive order for ABC
14:38:03 payment receive order for CAT
14:38:05 Catalog-0001 error parsing!
14:38:06 Catalog-0001 tokens valid
14:38:06 authorization Org: 1337 success
14:38:06 Catalog-0001 tokens valid
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 processed request
14:38:11 ldp DB latency 21ms, result=100
14:38:11 payment receive order for ABC
14:38:12 authorization Org: 8088 FAILED!!
14:38:13 ldp DB latency 21ms, result=100
14:38:15 authorization Org: 1015 success

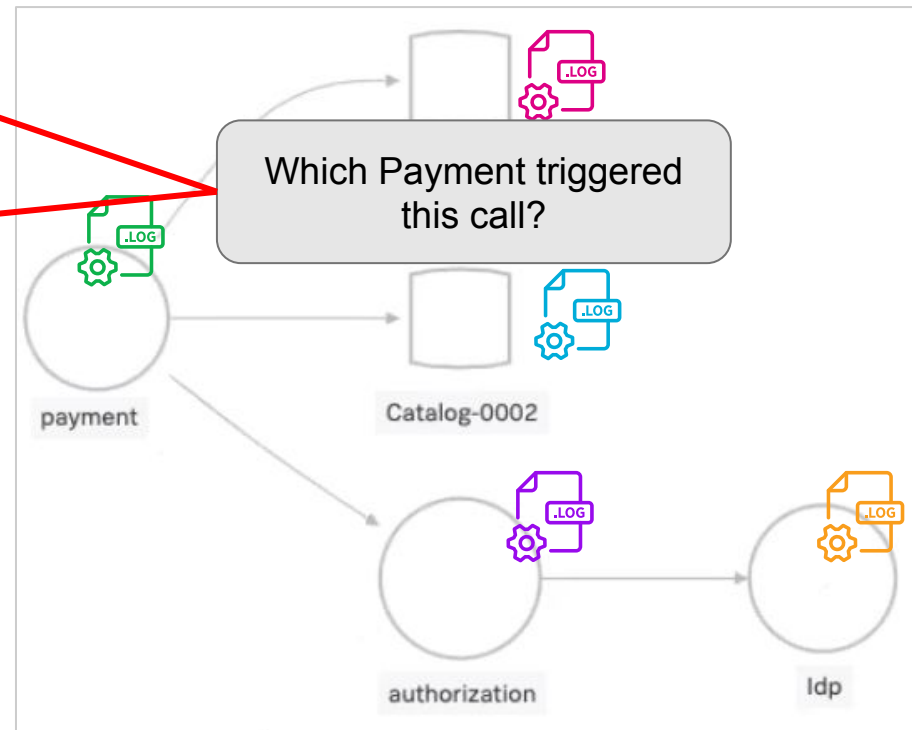
```



Logging Is Great, But It's Not Enough

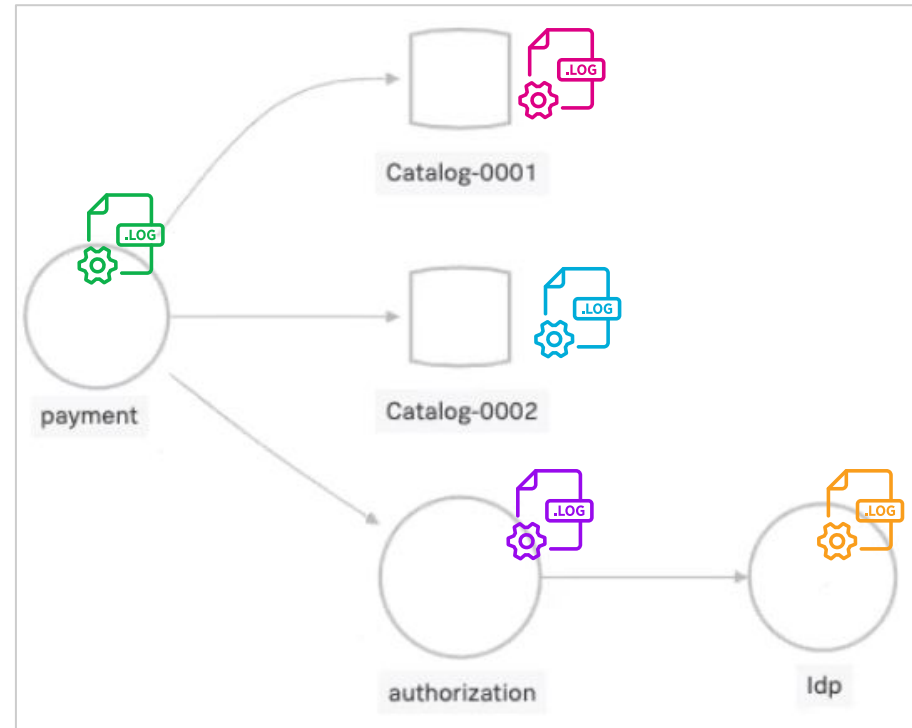
```

14:38:00 payment receive order for XYZ
14:38:01 payment receive order for ABC
14:38:03 payment receive order for CAT
14:38:05 Catalog-0001 error parsing!
14:38:06 Catalog-0001 tokens valid
14:38:06 authorization Org: 1337 success
14:38:01 Catalog-0001 tokens valid
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 processed request
14:38:11 ldp DB latency 21ms, result=100
14:38:11 payment receive order for ABC
14:38:12 authorization Org: 8088 FAILED!!
14:38:13 ldp DB latency 21ms, result=100
14:38:15 authorization Org: 1015 success
  
```

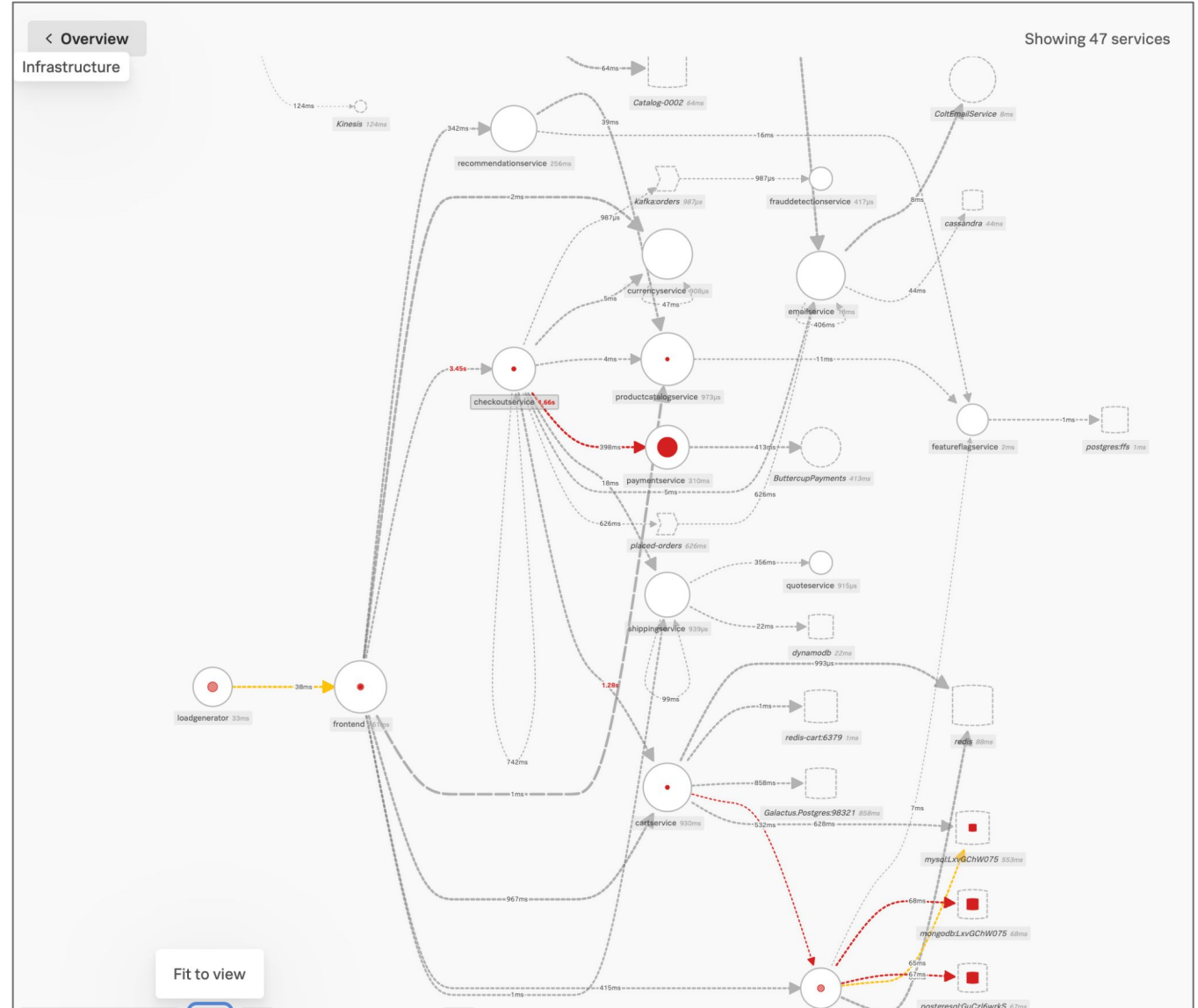


Logging Challenges

- Instrumenting agents to collect logs
- Level of detail and granularity
- Consistency of data collection
- Aligning disparate logs
- Connecting log entries together in a transaction



Aside: Complexity



We Want to Move From This...

```
14:38:00 payment receive order for XYZ
14:38:01 payment receive order for ABC
14:38:03 payment receive order for CAT
14:38:05 Catalog-0001 error parsing!
14:38:06 Catalog-0001 tokens valid
14:38:06 authorization Org: 1337 success
14:38:01 Catalog-0001 tokens valid
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 processed request
14:38:11 ldap DB latency 21ms, result=100
14:38:11 payment receive order for ABC
14:38:12 authorization Org: 8088 FAILED!!
14:38:13 ldap DB latency 21ms, result=100
14:38:15 authorization Org: 1015 success
```

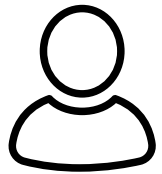
... to a View Like This



Trace-ID: ABC-123



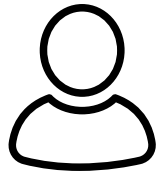
```
14:38:00 payment receive order for XYZ
14:38:06 Catalog-0001 tokens valid
14:38:06 Catalog-0002 received request
14:38:12 authorization Org: 8088 FAILED!!
14:38:13 ldp DB latency 21ms, result=100
```



Trace-ID: DEF-456



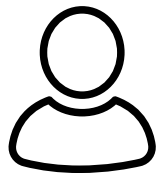
```
14:38:03 payment receive order for CAT
14:38:05 Catalog-0001 error parsing!
```



Trace-ID: GHK-565



```
14:38:01 payment receive order for ABC
14:38:01 Catalog-0001 tokens valid
14:38:06 Catalog-0002 received request
14:38:06 Catalog-0002 processed request
14:38:15 authorization Org: 1015 success
```



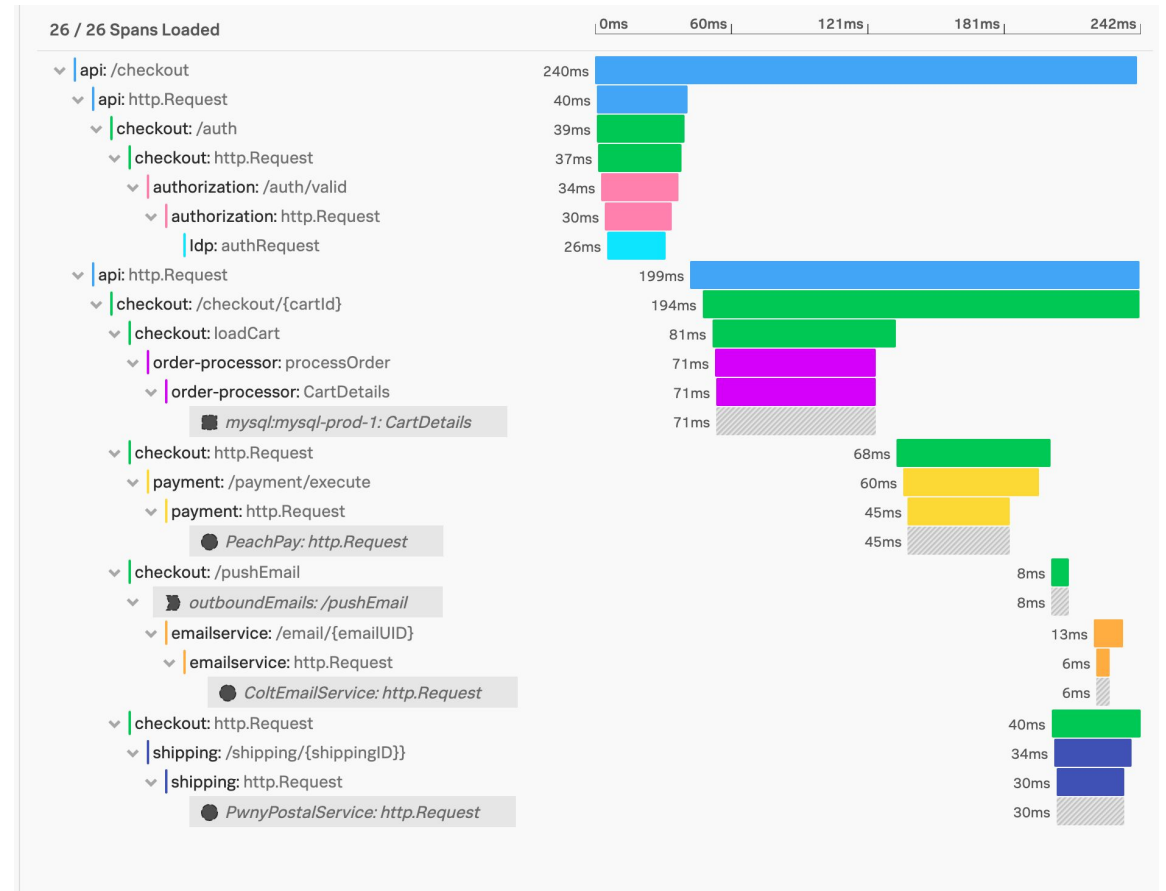
Trace-ID: TSA-137



```
14:38:11 payment receive order for ABC
14:38:06 authorization Org: 1337 success
14:38:13 ldp DB latency 21ms, result=100
```

Tracing Augments Logs

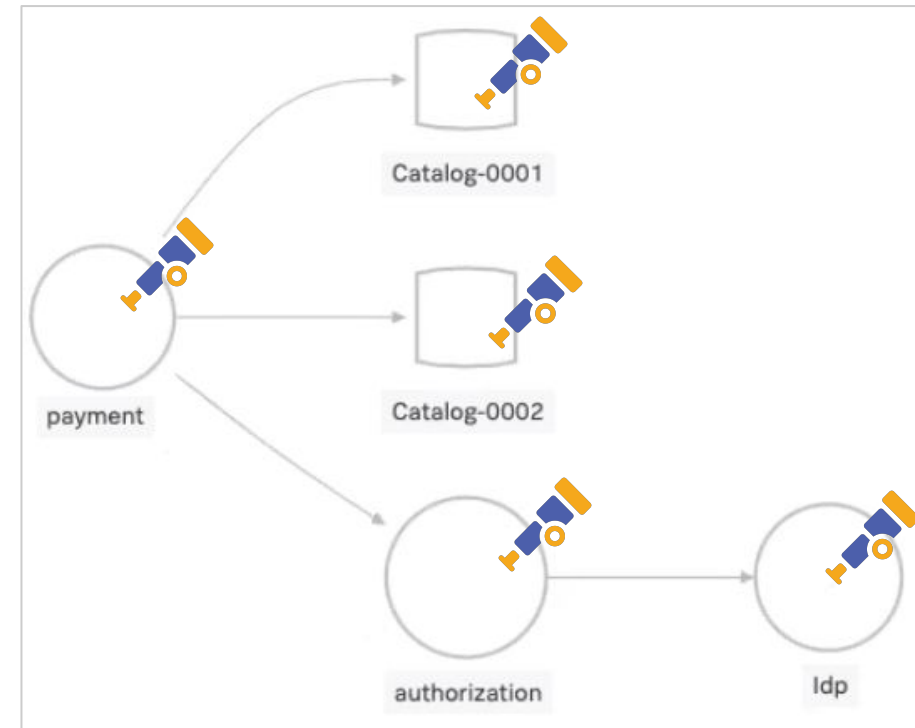
- Tracing represents the journey of a request
- Logs provide visibility into individual services
- Where's the issue > Trace
- What's the issue -> Logs



How to Get Started?

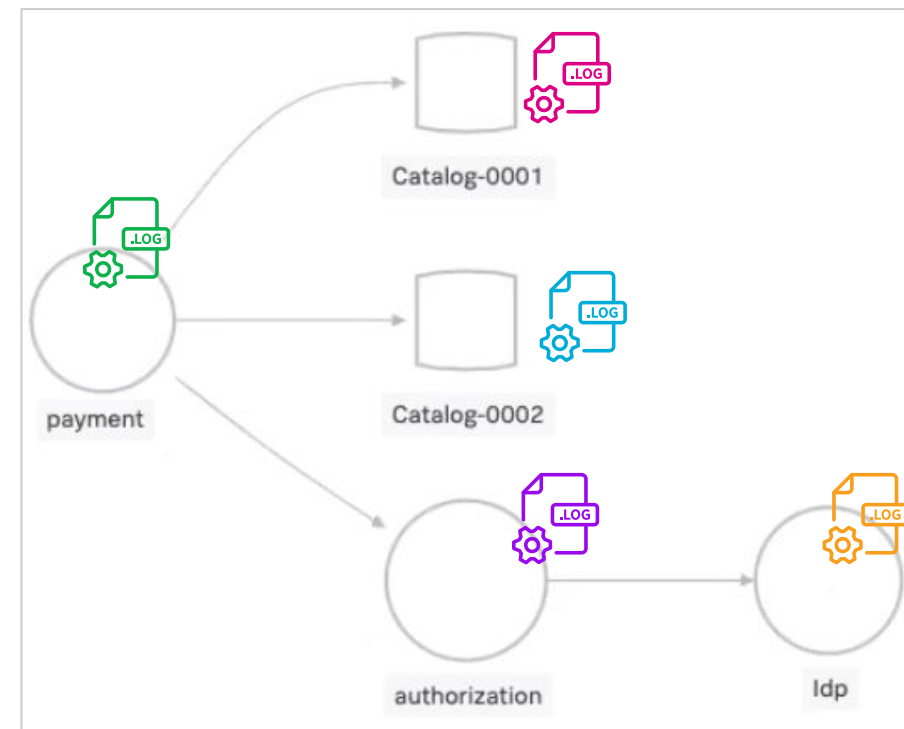
OTEL to the Rescue!

- Open Source
- Vendor Neutral
- Full-Fidelity, No sampling



Do it Yourself? How do You...

- Consistently insert a Trace-ID field?
- Ensure it propagates through the call-chain?
- Ensure it always be present in your components?
- Instrument 3rd parties?





Troubleshooting Issues Using Tracing



Identify the Root Cause of a Backend Error

DEMO



Identifying Performance Bottlenecks

DEMO



Finding Patterns

DEMO



Advanced Tracing Techniques

Finding Similar Traces

Visual analysis is not available because the tag filter includes one or more tags. Please modify the filter in order to be visualized or learn more.

Traces

Duration (ms) Min Max Errors Only

28 traces matched

4.8

11:44 AM Mon Mar 13 2023

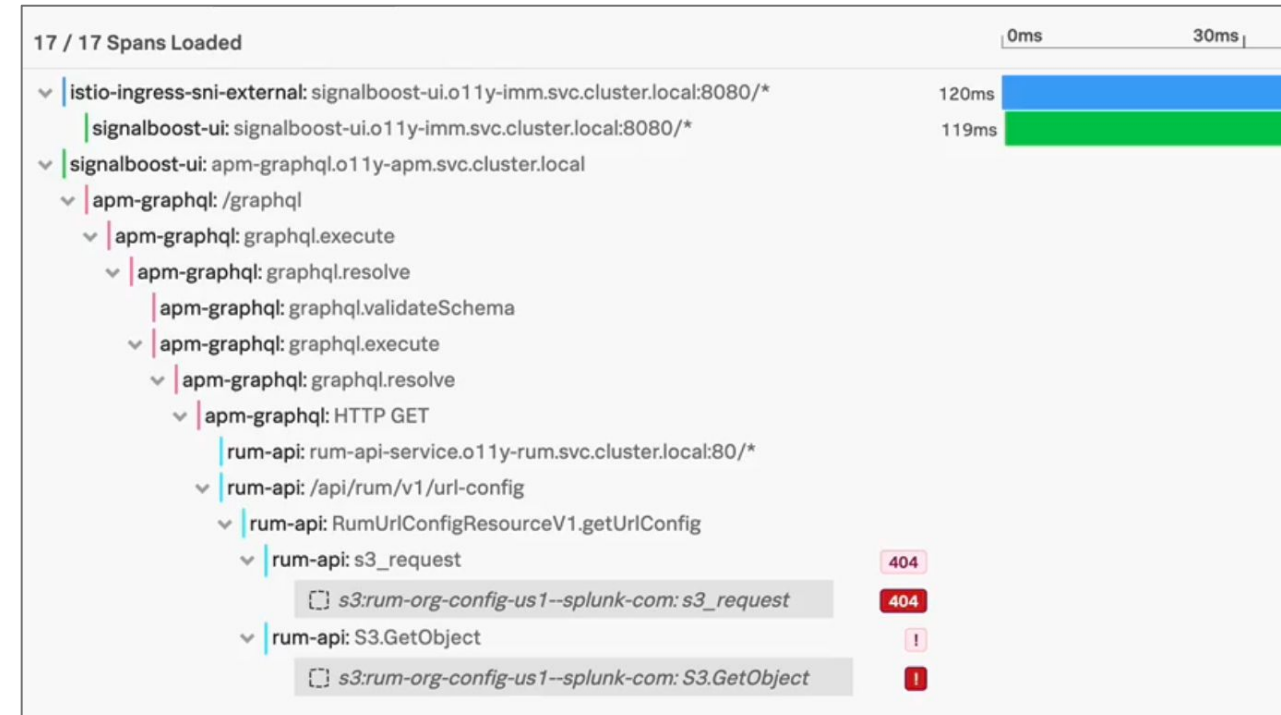
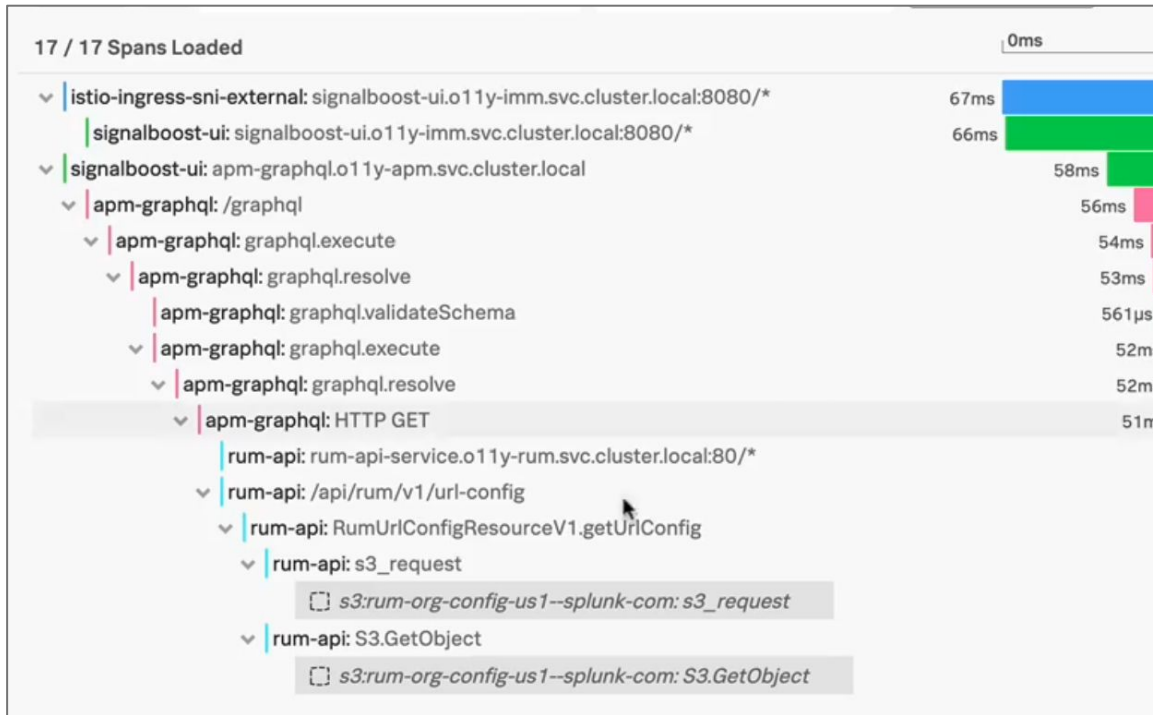
11:46 AM 11:48 AM 11:50 AM 11:52 AM 11:54 AM 11:56 AM 11:58 AM 12:00 PM 12:02 PM 12:04 PM 12:06 PM 12:08 PM 12:10 PM 12:12 PM 12:14 PM

Total traces Traces with error Not searched

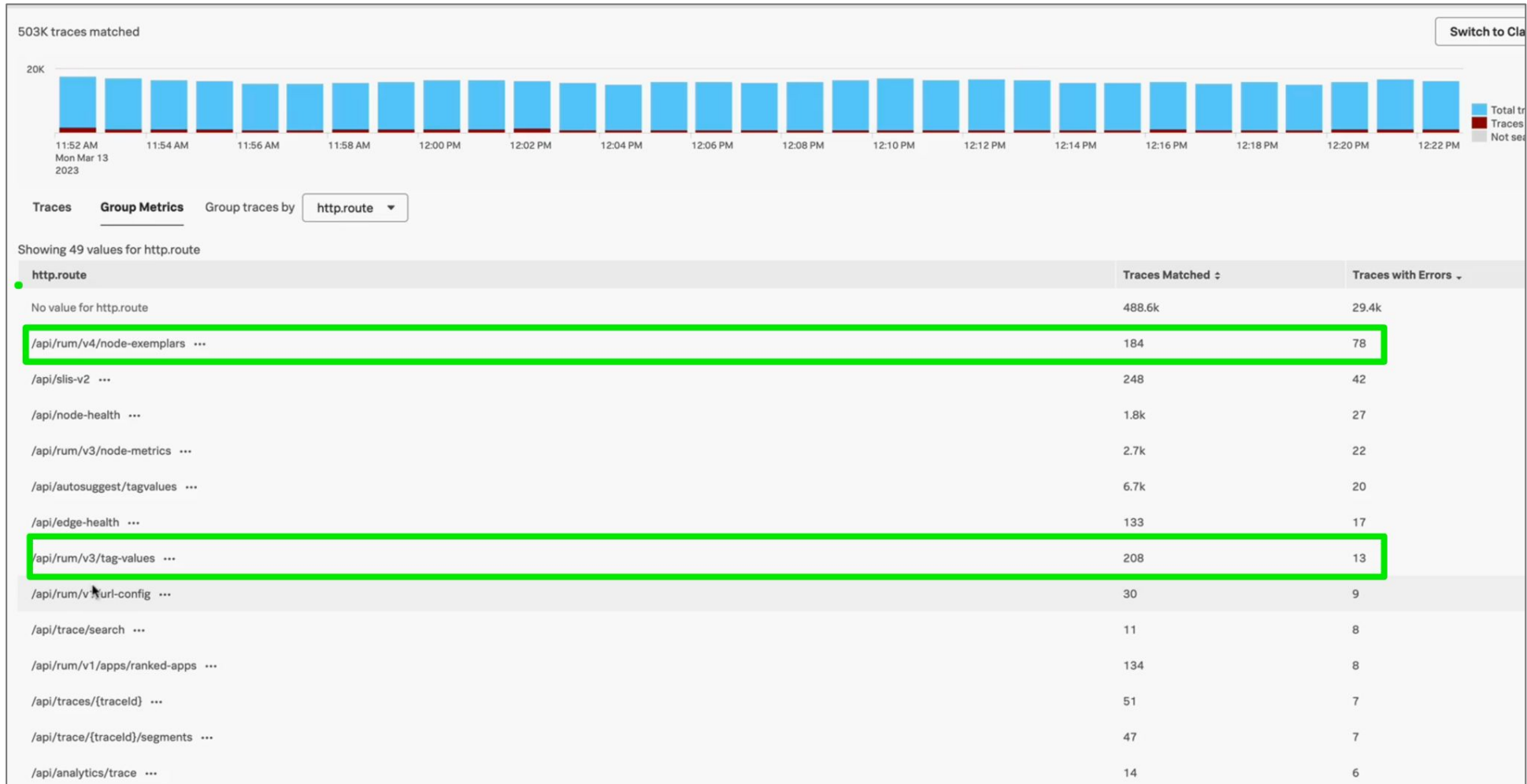
Traces Group Metrics Group traces by http.route

Trace ID	Timestamp	Duration	Initiating Operation	Services
6e71b7ccd14b090c	Mon, Mar 13 2023 12:06:13 PM EDT	91ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost-ui (2) s3:rum-org-config-us1--splunk-com (2) istio-ingress-sni-external
02c0bfb46c23fd42	Mon, Mar 13 2023 12:10:23 PM EDT	119ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost (3) s3:rum-org-config-us0--splunk-com (2) signalboost-ui (2) istio-ingress-sni-external
7e974f1f6ba4b57e	Mon, Mar 13 2023 12:10:08 PM EDT	120ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost (3) signalboost-ui (2) s3:rum-org-config-eu0--splunk-com (2) istio-ingress-sni-external
b34fd222d2598c95	Mon, Mar 13 2023 12:07:47 PM EDT	81ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost-ui (2) s3:rum-org-config-us1--splunk-com (2) istio-ingress-sni-external
01fcebda545c45	Mon, Mar 13 2023 12:06:13 PM EDT	61ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost-ui (2) s3:rum-org-config-us1--splunk-com (2) istio-ingress-sni-external
4ff0e8179404394	Mon, Mar 13 2023 12:06:13 PM EDT	30ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost-ui (2) s3:rum-org-config-us1--splunk-com (2) istio-ingress-sni-external
a8dd01eec8faed5b	Mon, Mar 13 2023 12:06:13 PM EDT	29ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost-ui (2) s3:rum-org-config-us1--splunk-com (2) istio-ingress-sni-external
ed0a9b81e4d5ec86	Mon, Mar 13 2023 12:06:13 PM EDT	31ms	istio-ingress-sni-external: POST signalbo...	apm-graphql (7) rum-api (5) signalboost-ui (2) s3:rum-org-config-us1--splunk-com (2) istio-ingress-sni-external

Comparing Traces to Isolate Issues



Examining % of Traces with Errors



Key Takeaways

- 1) Microservices architectures boost velocity but increase complexity
- 2) Tracing provides end-to-end visibility
- 3) Use Otel to instrument your applications
- 4) Splunk APM enables troubleshooting errors and identifying bottlenecks



Thank You

