
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV



PRT263

SPONSORED BY DATADOG

Observability in the real world: Improve systems with an iterative approach

Junaid Ahmed

Vice President, APM and Dev Experience
Datadog



© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Shipping with confidence



Image courtesy of Julius Silver via Pexels

However …

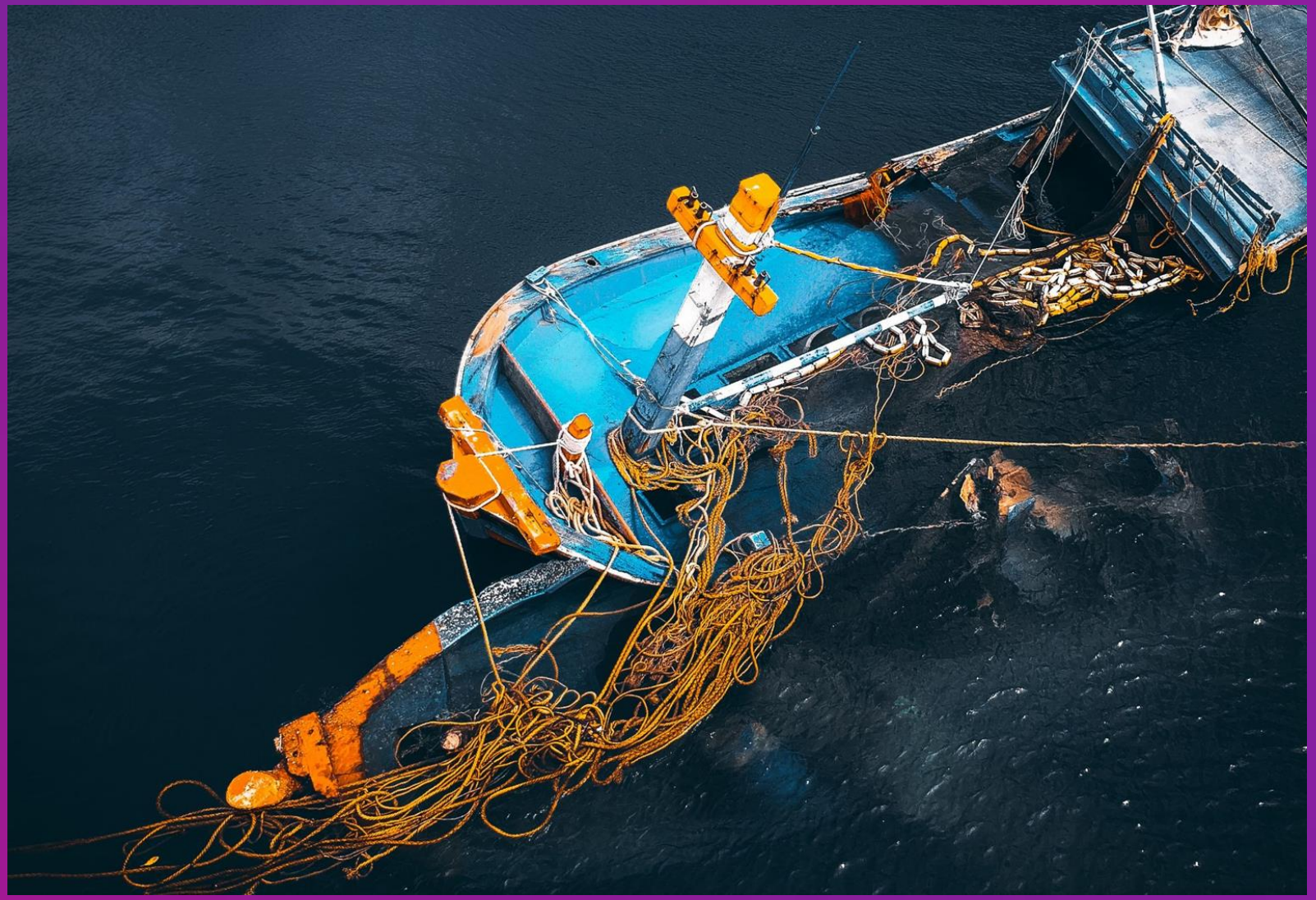


Image courtesy of Pok Rie via Pexels

A fragmented understanding of systems

Size and dependencies impossible for even experts to handle

The Experience Gap

100+	50+	500+
microservices	teams	engineers



Your LEAST experienced engineer

Spends hours to find the right information



Your MOST experienced engineer

Knows where to look,
still inefficient and manual

Why are real environments hard to monitor ?

- Legacy systems
- Neophobia
- Coordination across teams
- Cost to upgrade

Deep observability matters!

- Better understanding of service inter-dependencies
- Sharp focus on code changes & issues
- More confidence in shipping code
- Stronger engineering culture

Approach



Service Instrumentation



Metrics & Traces



Correlation



Learn & Discover



“Low Effort”

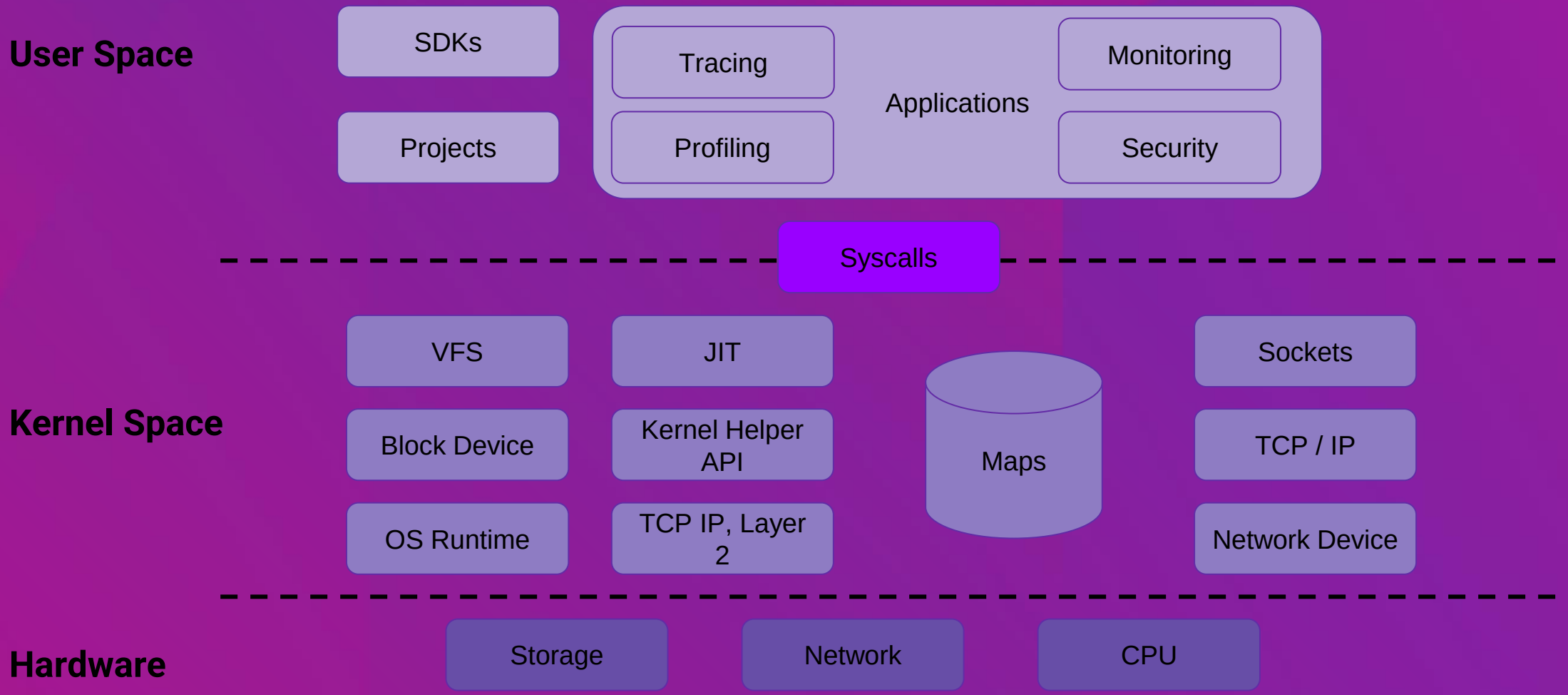
Service Instrumentation

Service Discovery and No-Code Instrumentation

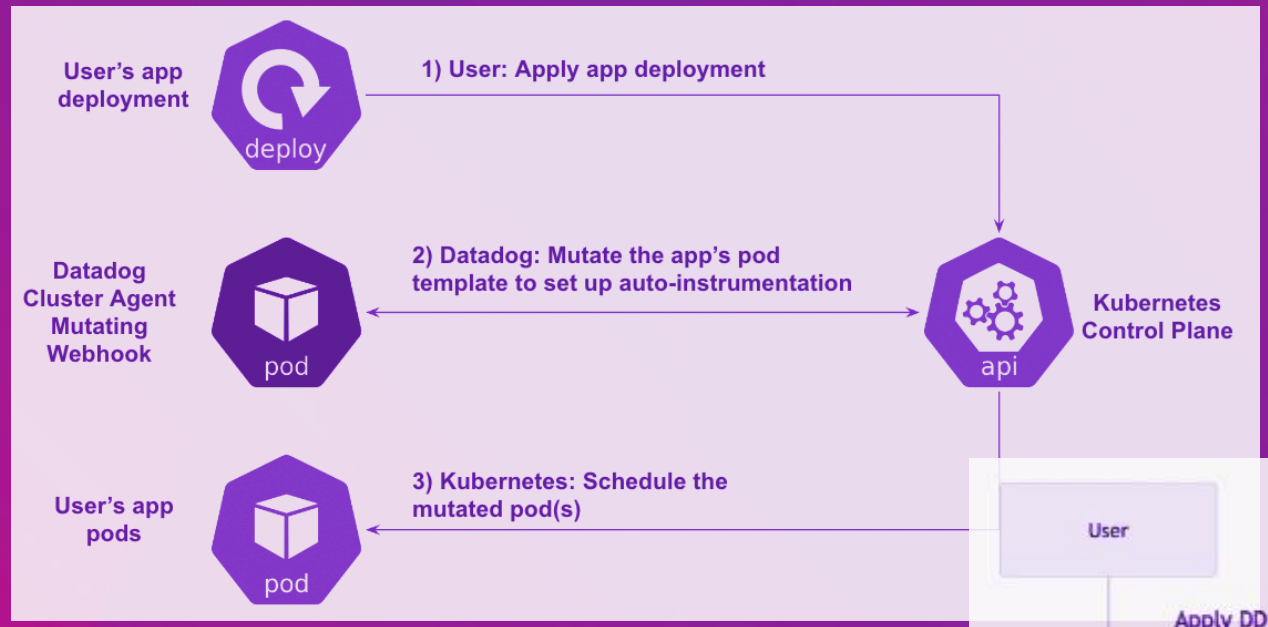
	Service Discovery	Metrics	Coverage
eBPF		RED Metrics through network packet processing	Communication Protocols
Admission Controller - K8s		RED Metrics & Distributed Tracing through APM libraries	K8s only
OS runtime		RED Metrics & Distributed Tracing through APM libraries	OS & Language

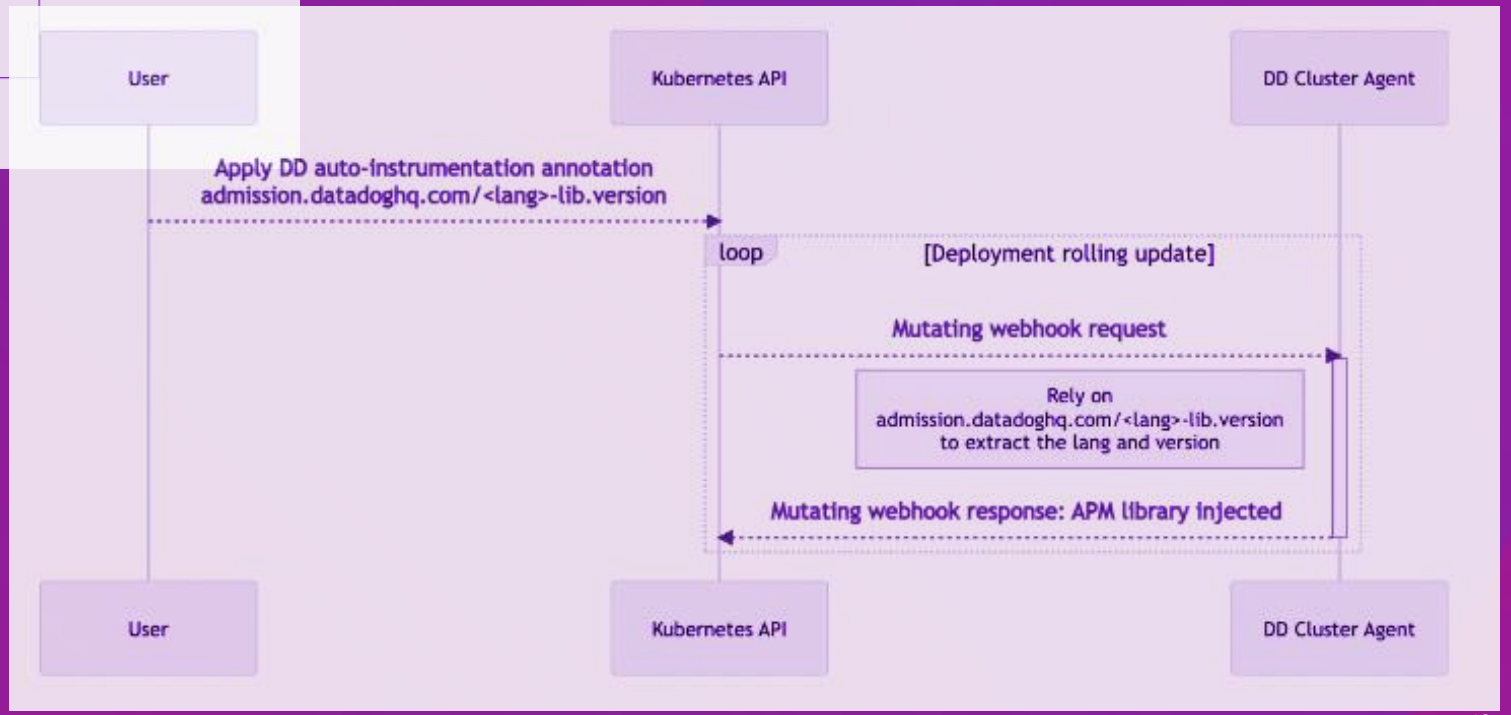
DATADOG

eBPF


User Space
SDKs
Projects
Tracing
Profiling
Applications
Monitoring
Security
Syscalls
Kernel Space
VFS
Block Device
OS Runtime
JIT
Kernel Helper API
TCP IP, Layer 2
Maps
Sockets
TCP / IP
Network Device
Hardware
Storage
Network
CPU

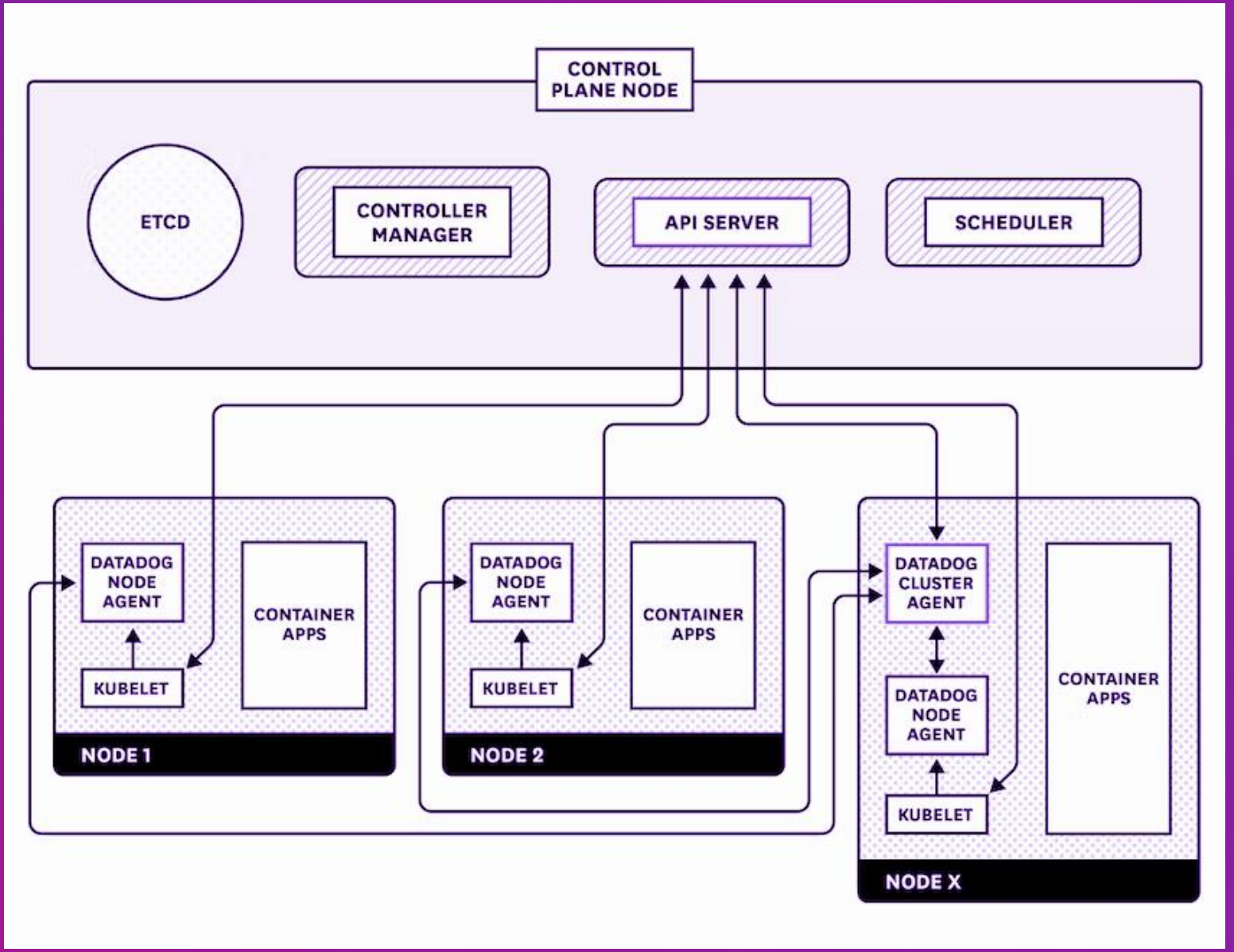
Kubernetes – Admission Controller





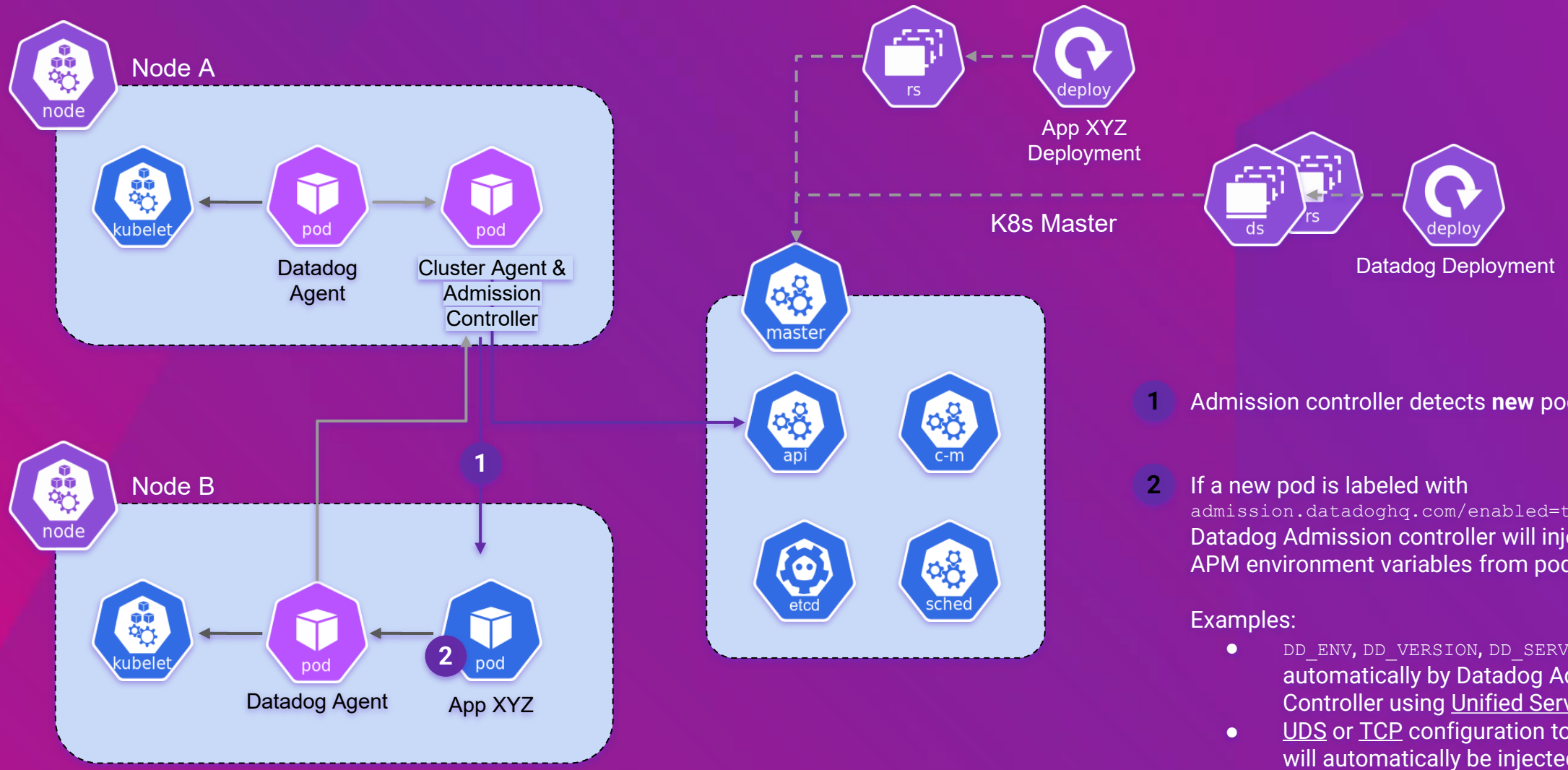
DATADOG

Datadog – Admission Controller



DATADOG

Monitoring K8s clusters at large scale: APM & Admission Controller



1. Admission controller detects **new** pods creation.

2. If a new pod is labeled with `admission.datadoghq.com/enabled=true` Datadog Admission controller will inject APM environment variables from pod tags.

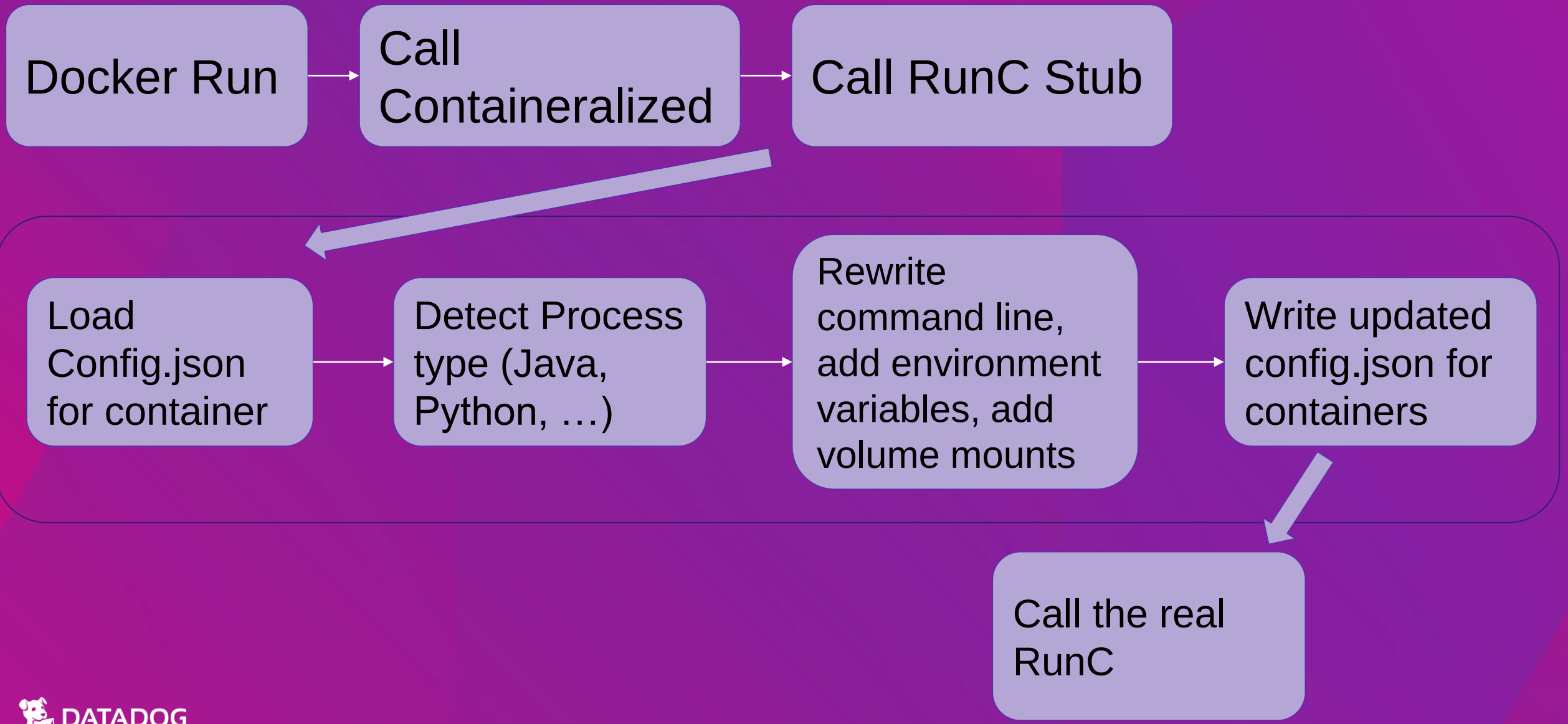
Examples:

- `DD_ENV`, `DD_VERSION`, `DD_SERVICE` will be set automatically by Datadog Admission Controller using Unified Service tags
- UDS or TCP configuration to submit traces will automatically be injected

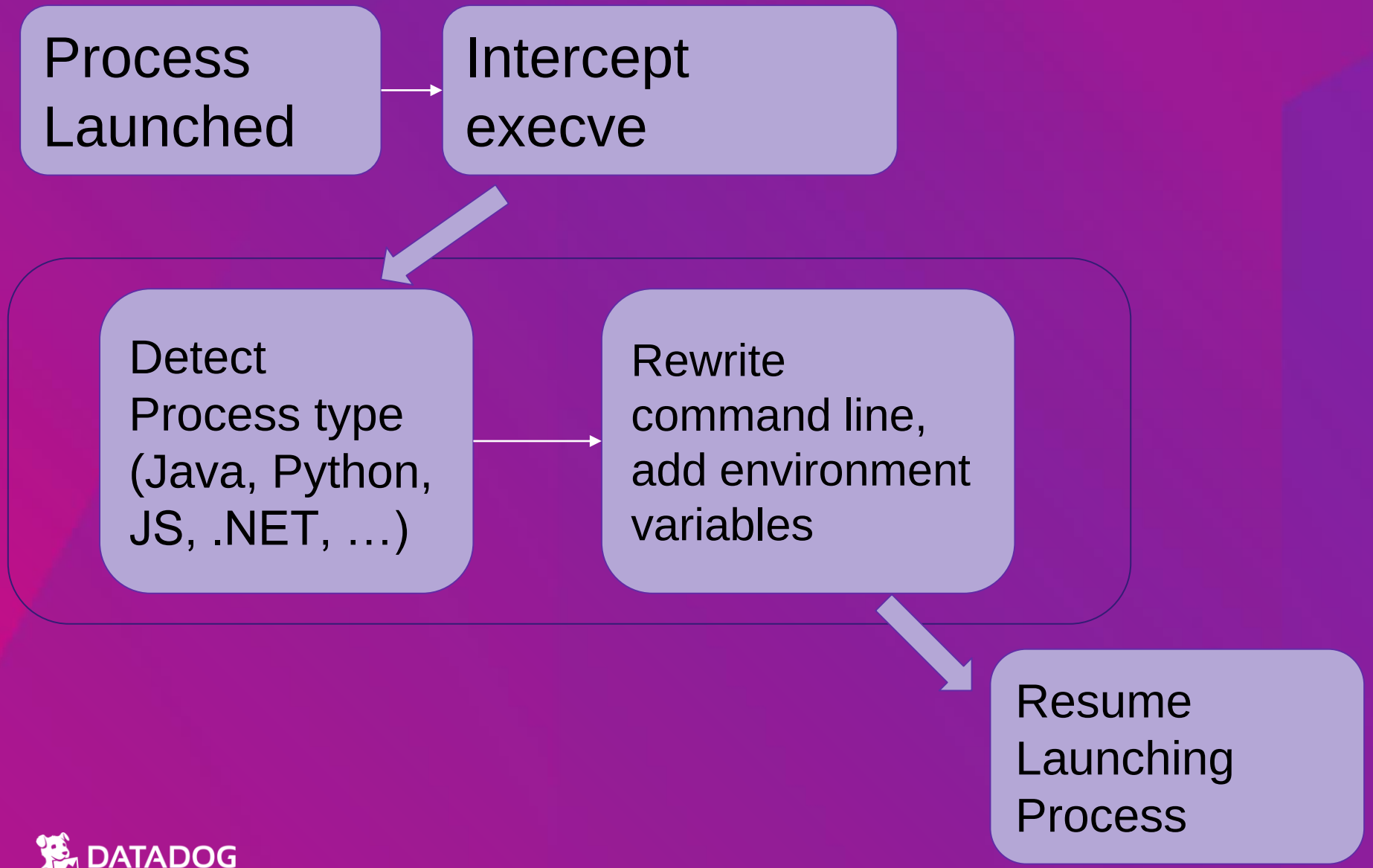
See here for full details

DATADOG

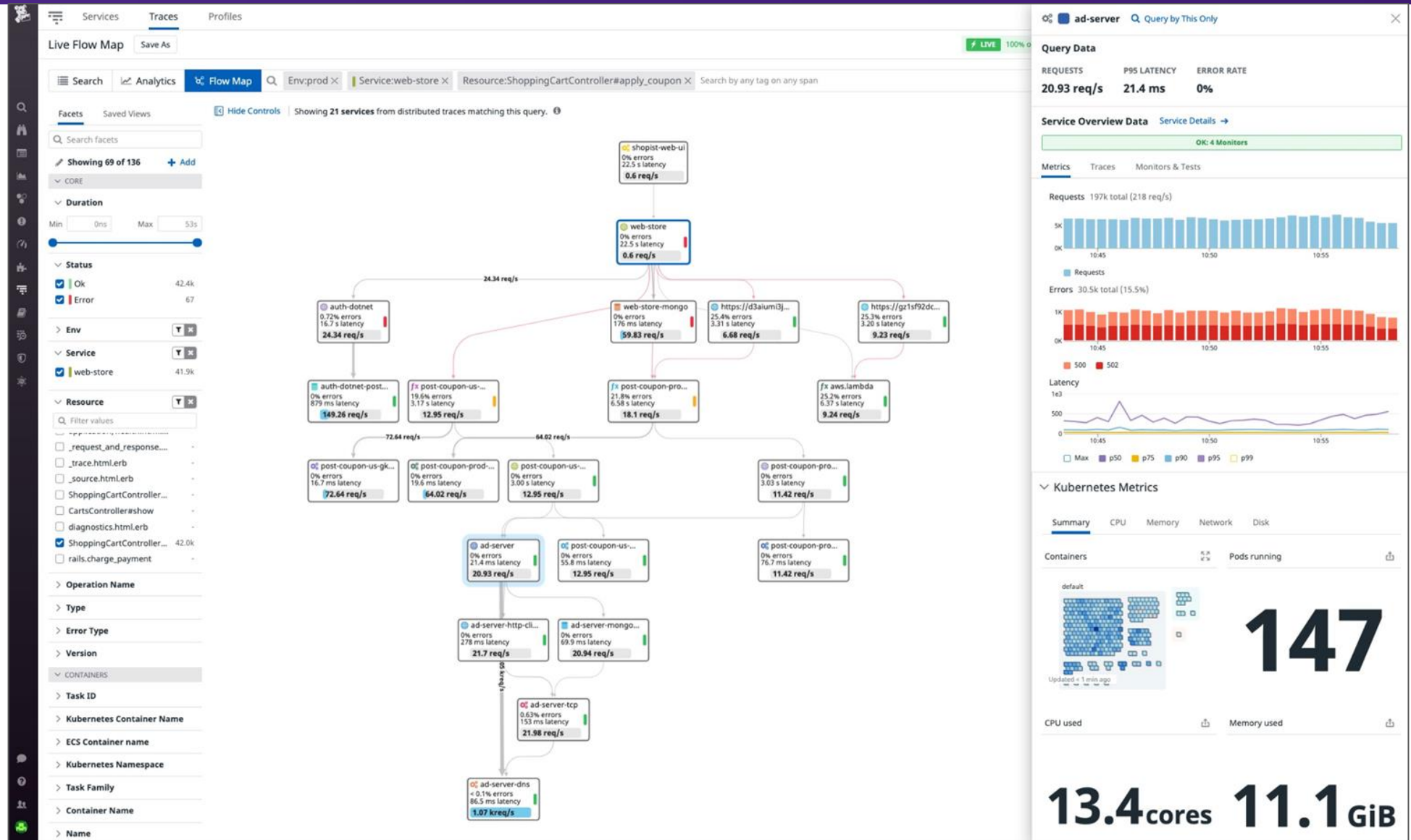
OS runtime support - RunC



OS runtime support - ExecV



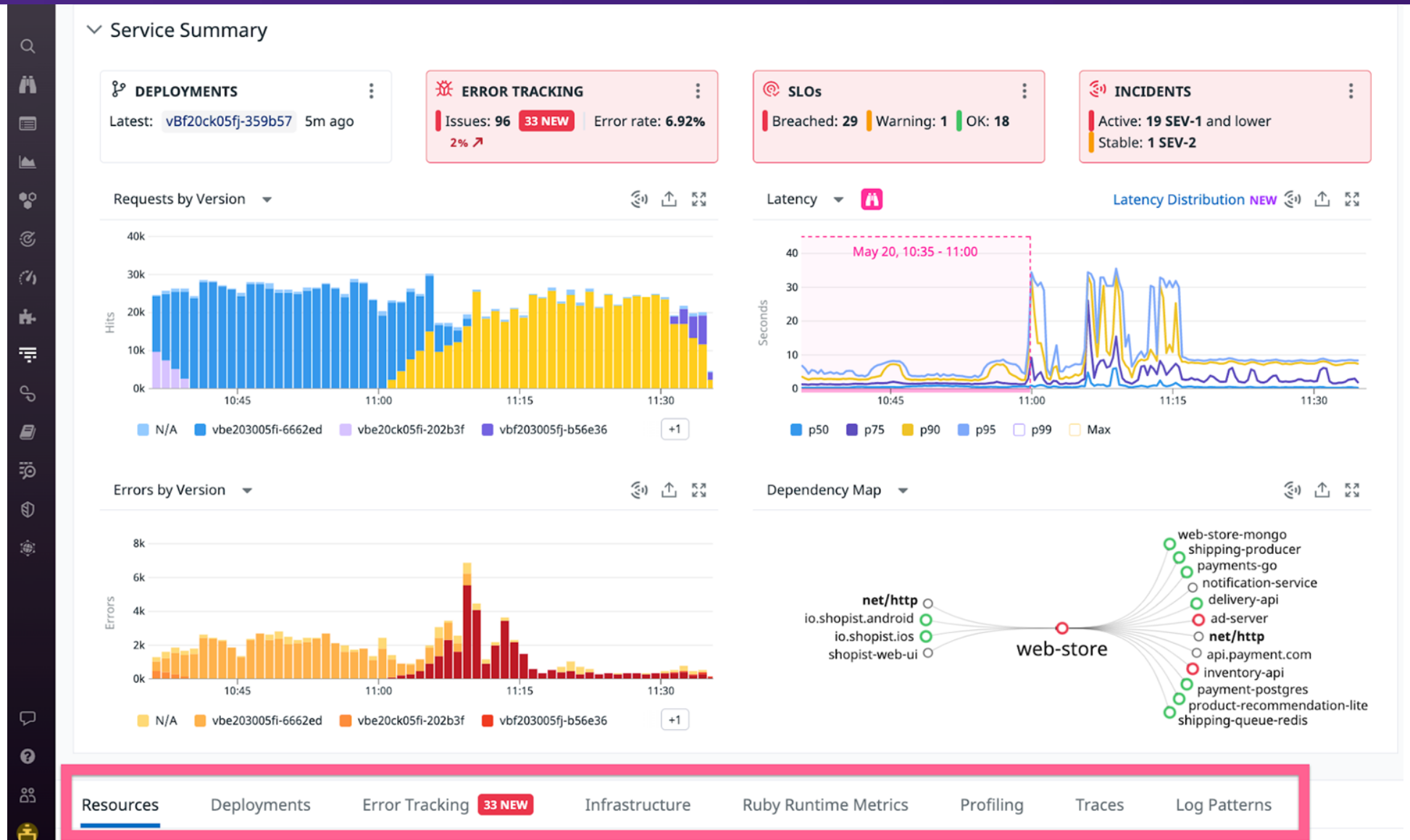
Service Topology



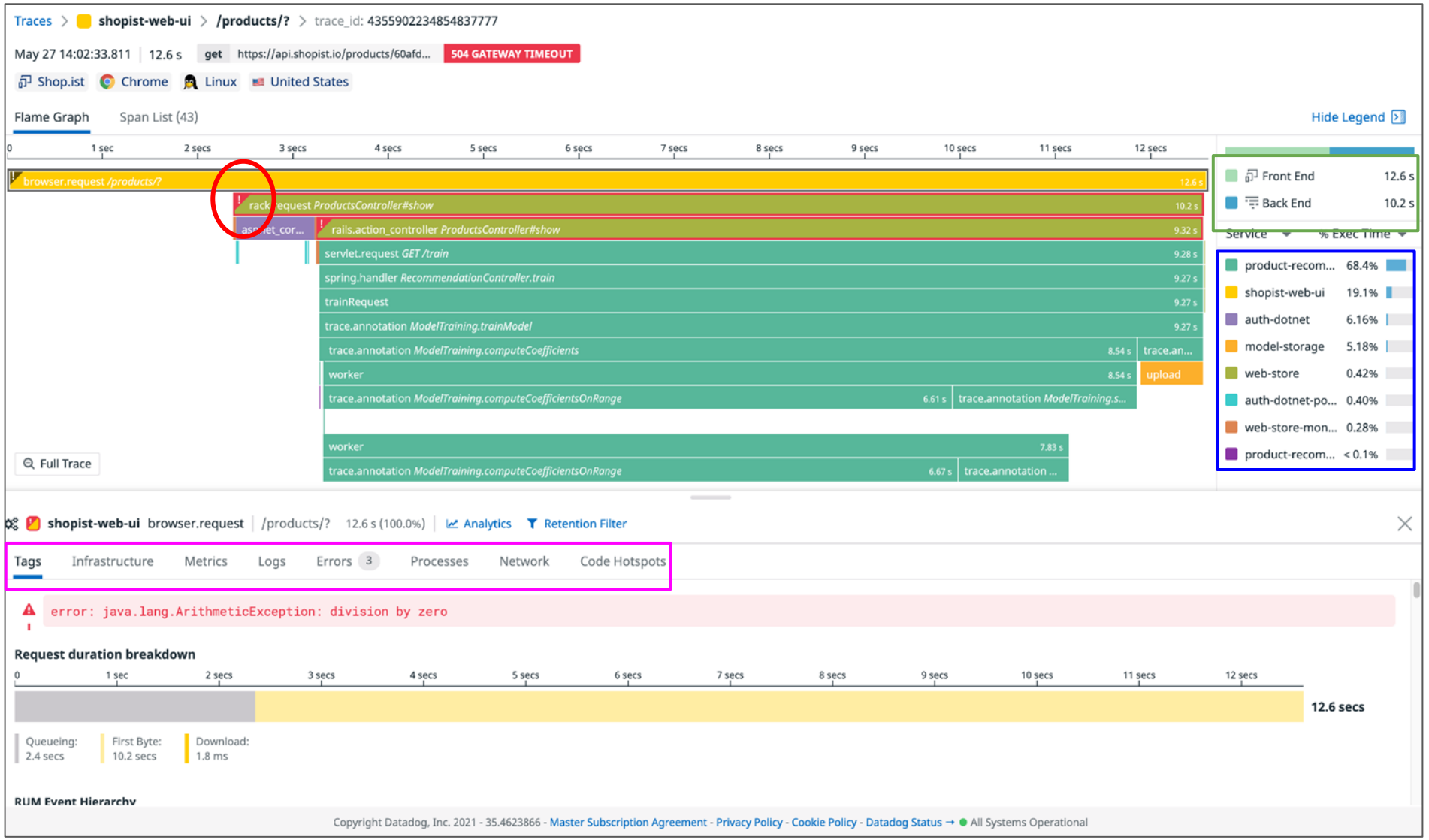


Metrics & Traces

Service-Specific Metrics & SLOs

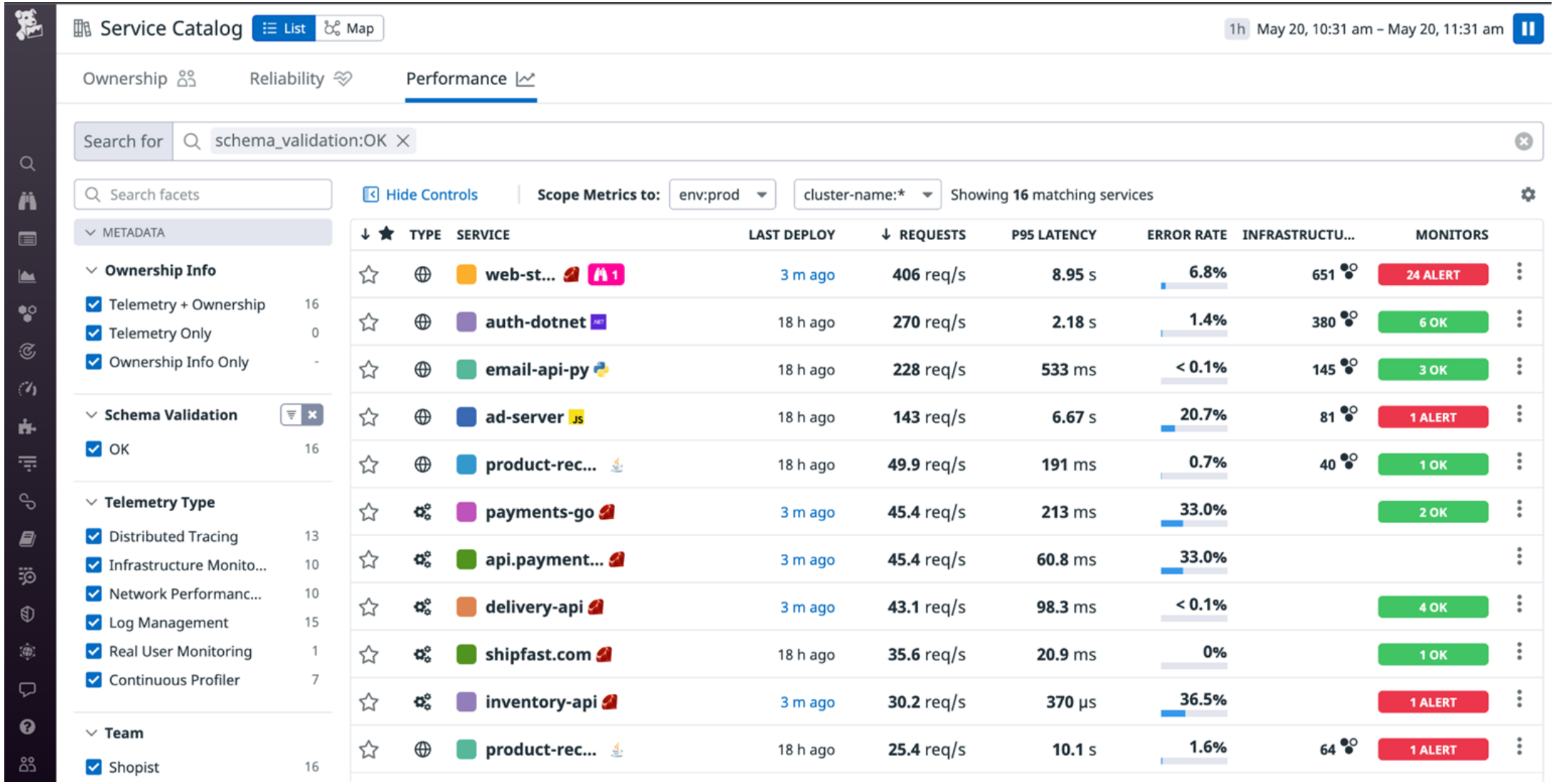


Distributed Tracing: Capturing the flow of context

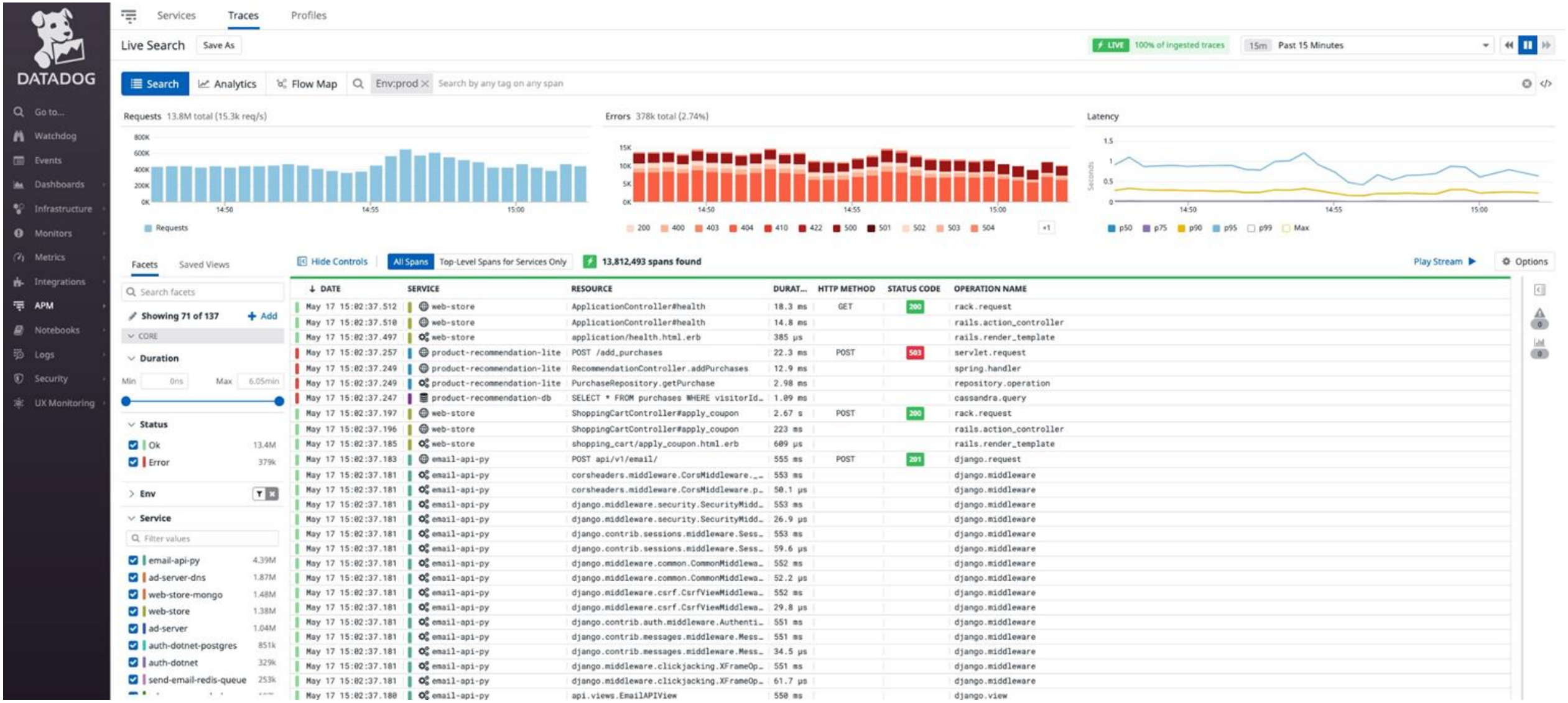


DATADOG

Service Ownership



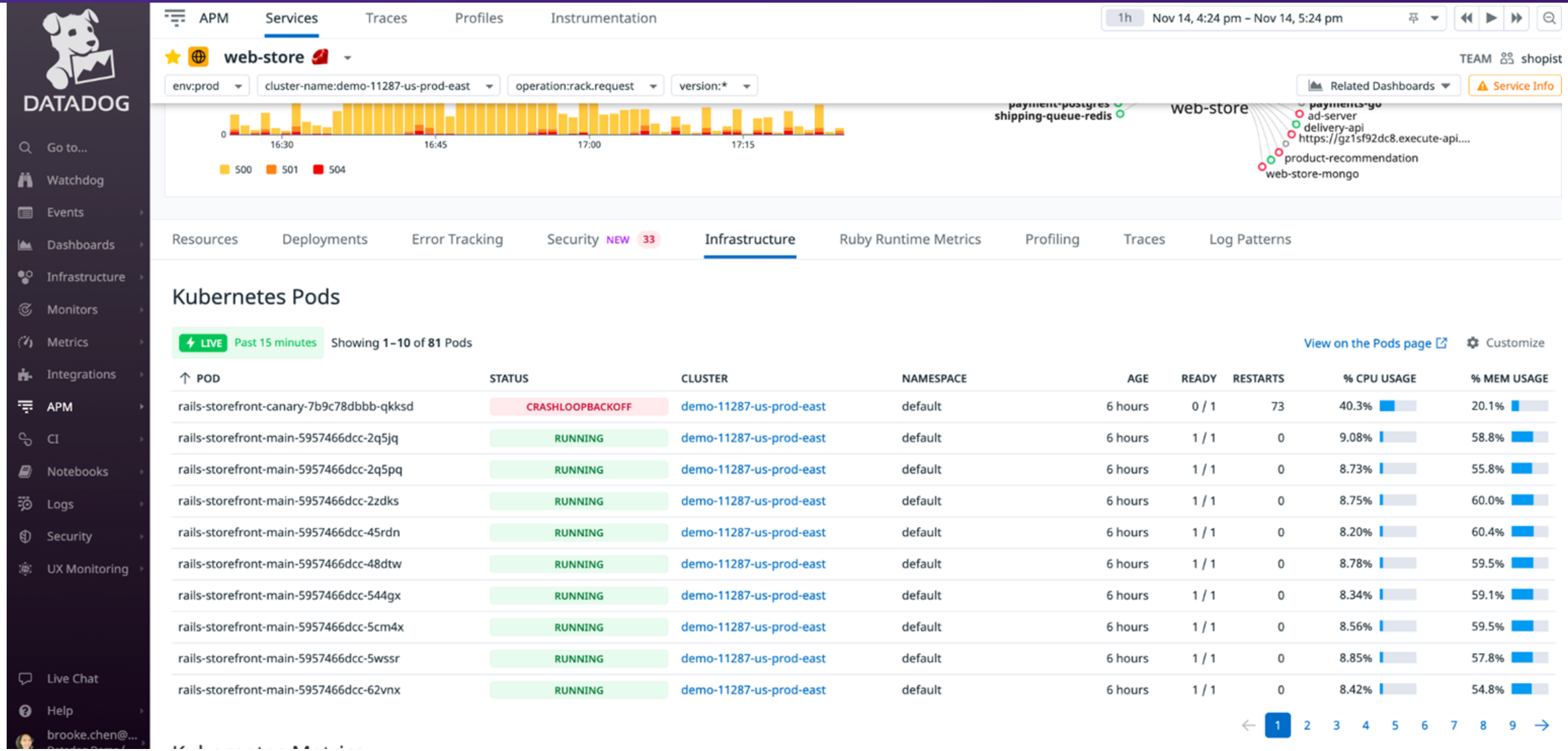
Live Search & Analytics



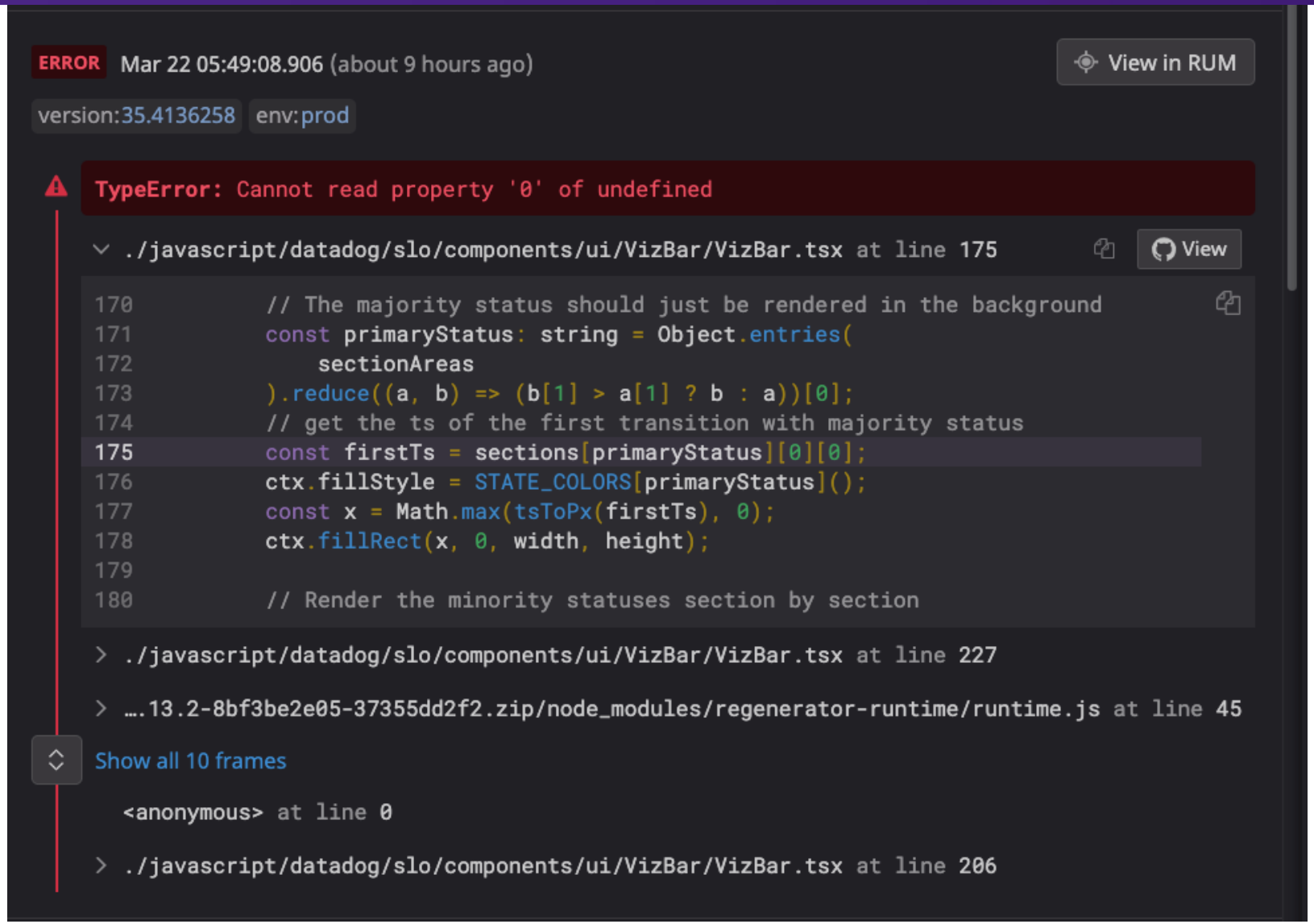


Correlation

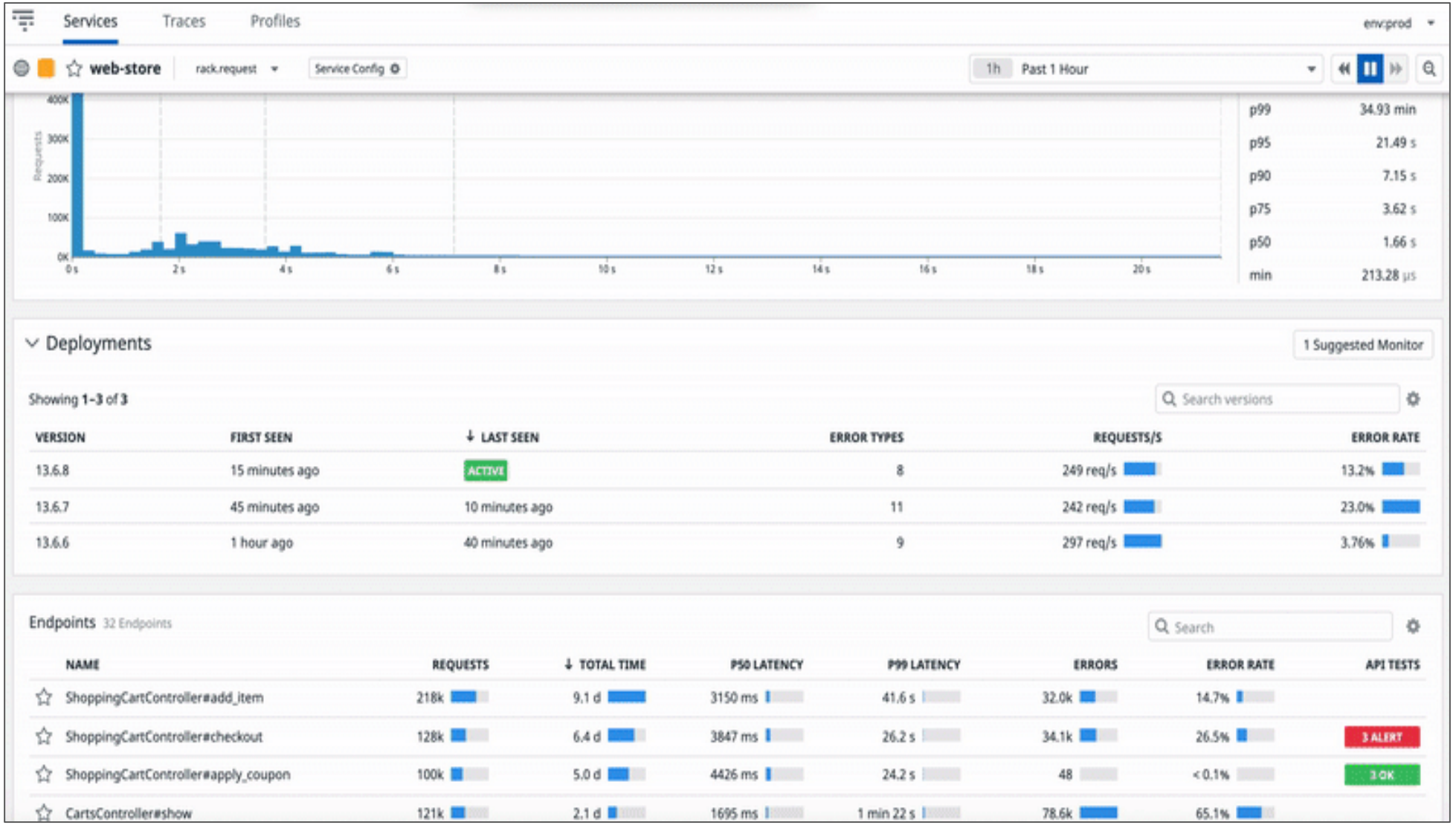
Breaking Silos



Error Tracking - Group Errors into Issues



Deployment Tracking





Learn & Iterate

Enabling out of box learning

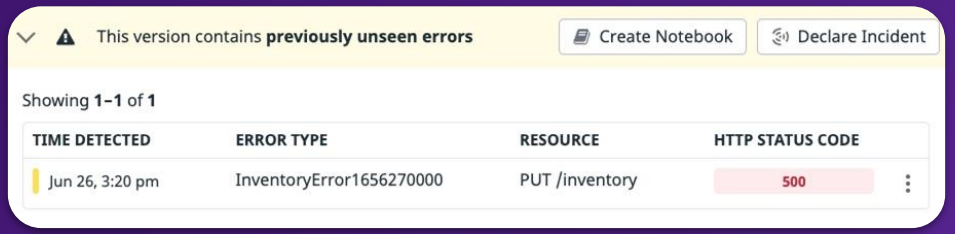
01 Anomaly Detection



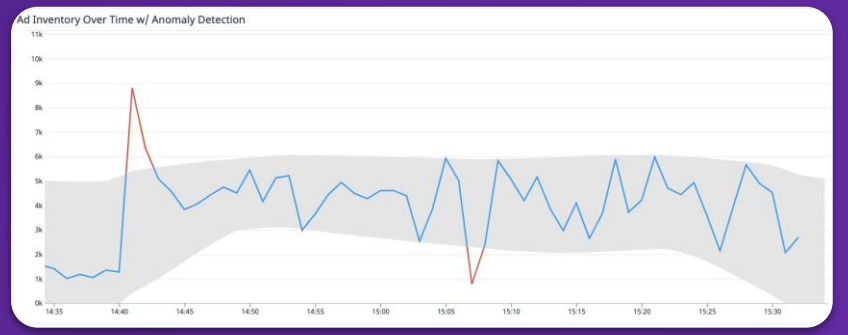
02 Forecasting



Version Tracking

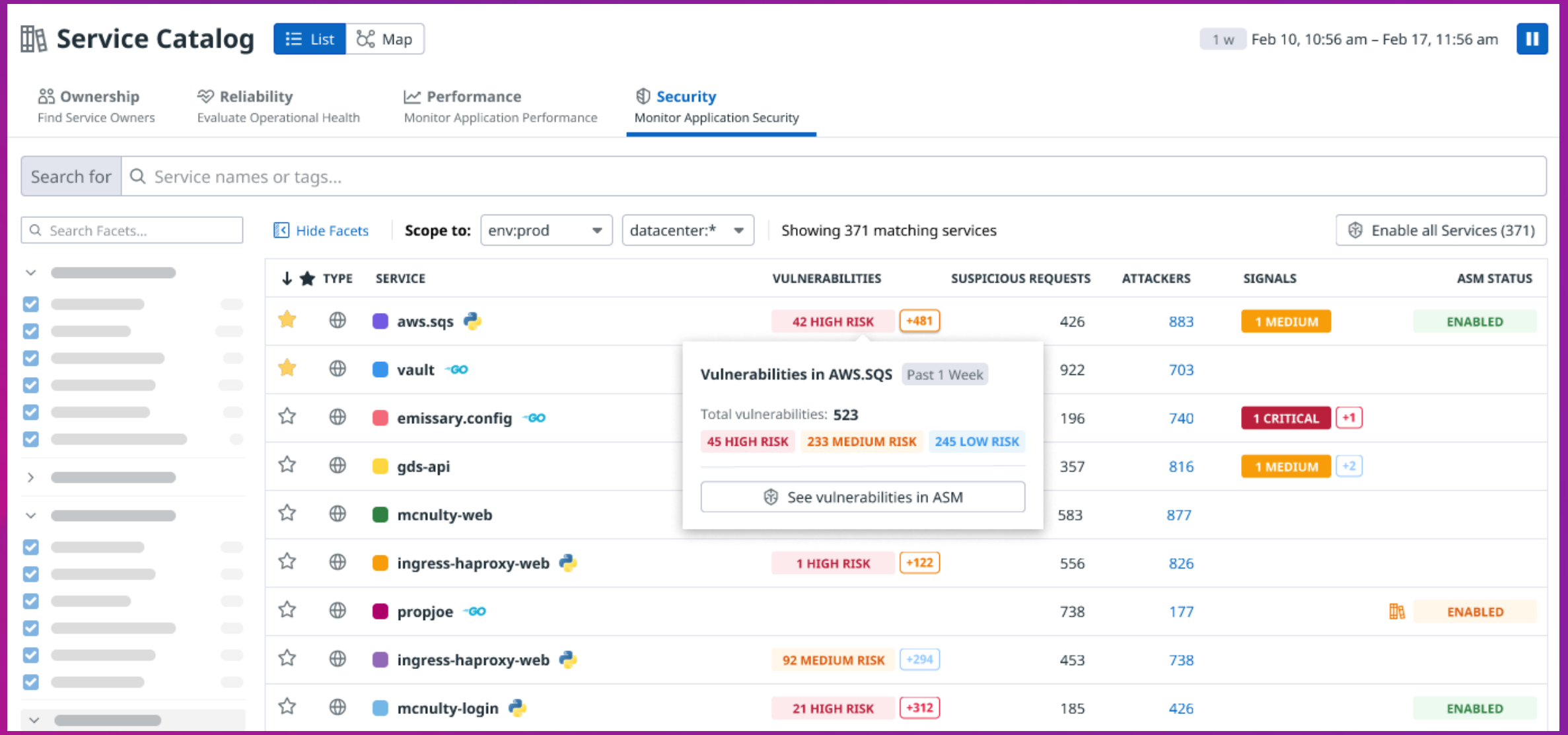


04 SLOs & Custom Metrics

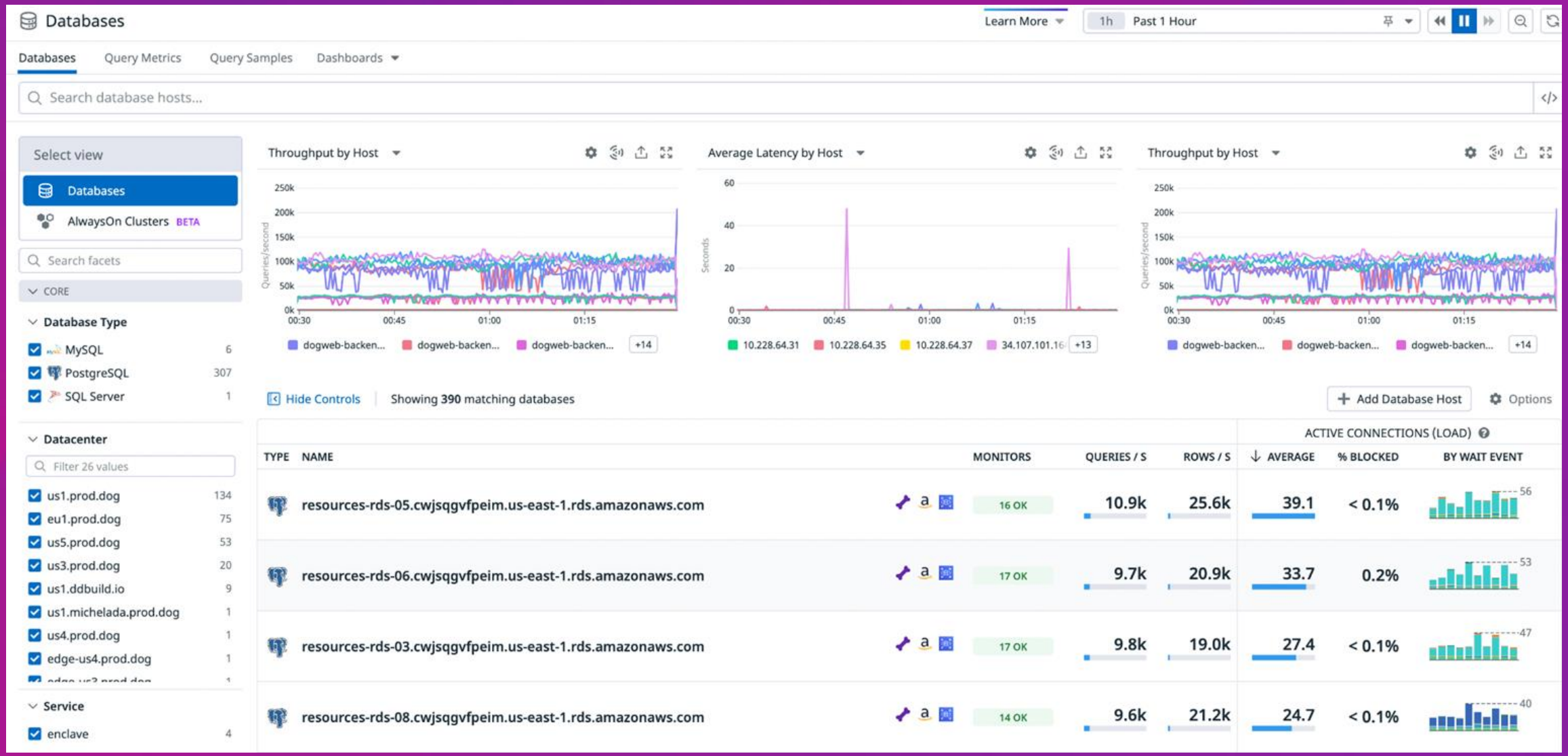


DATADOG

Security Assessment from service instrumentation



Databases, Profiling, RUM, and more …



Not Secure | bitsboutique.co/index.html

Support : Datadog... | Home - Workday | Bits of Info - Confl... | Best Leadership &... | Datadog Udemy | Radiate Confidenc... | Home - Confluence | https://datadog.mi... | APM Initiatives -... | Seating Chart and... | Datadog New Hire...

OFFER OF THE DAY Buy 1000 socks, get a shoe for free!

Login | Register

bits boutique by Shopist

HOME CATALOGUE



WE LOVE SOCKS!

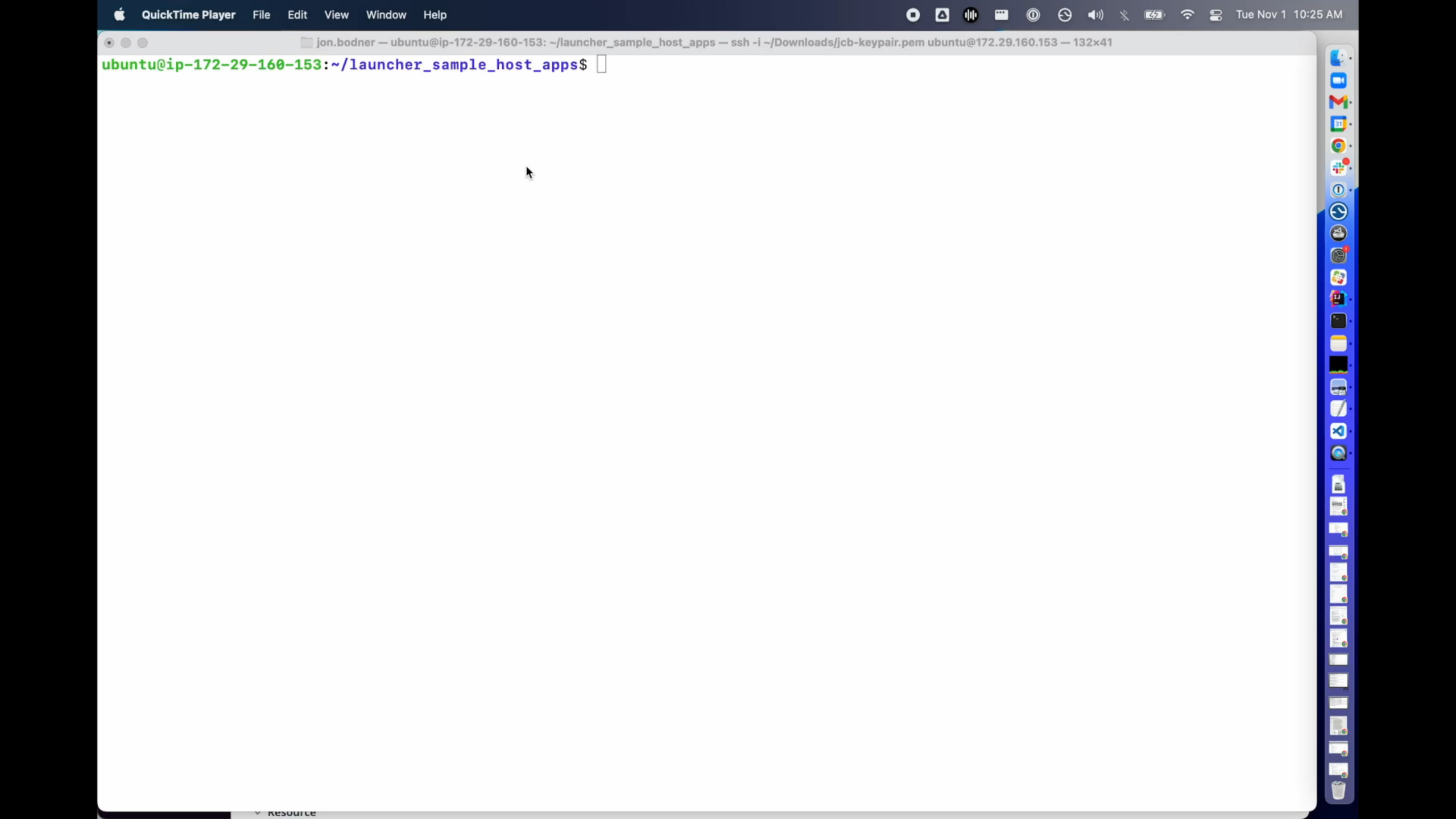
We use the highest quality materials because we care!

BEST PRICES

We price match!

100% SATISFACTION GUARANTEED

Free returns on most items!


QuickTime Player File Edit View Window Help
Tue Nov 1 10:25 AM
jon.bodner — ubuntu@ip-172-29-160-153: ~/launcher_sample_host_apps — ssh -i ~/Downloads/jcb-keypair.pem ubuntu@172.29.160.153 — 132×41
ubuntu@ip-172-29-160-153:~/launcher_sample_host_apps$

Arielle Allen

Starbucks



STARBUCKS REWARDS POWERED BY STARBUCKS PLATFORM AS A SERVICE



Getting started is easy

Earn Stars and get rewarded in a few easy steps.

1

Create an account

To get started, join now. You can also join in the app to get access to the full range of Starbucks® Rewards benefits.

2

Order and pay how you'd like

Use cash, credit/debit card or save some time and pay right through the app. You'll collect Stars all ways. Learn how

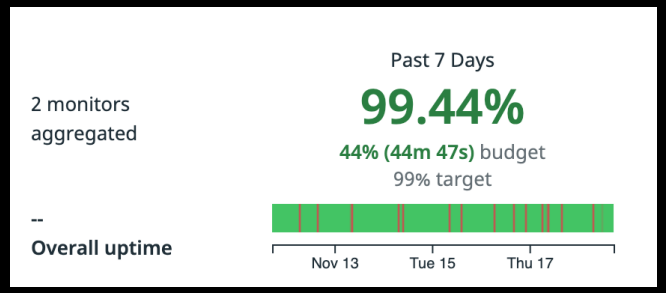
3

Earn Stars, get Rewards

As you earn Stars, you can redeem them for Rewards—like free food, drinks, and more. Start redeeming with as little as 25 Stars!



Why SLOs

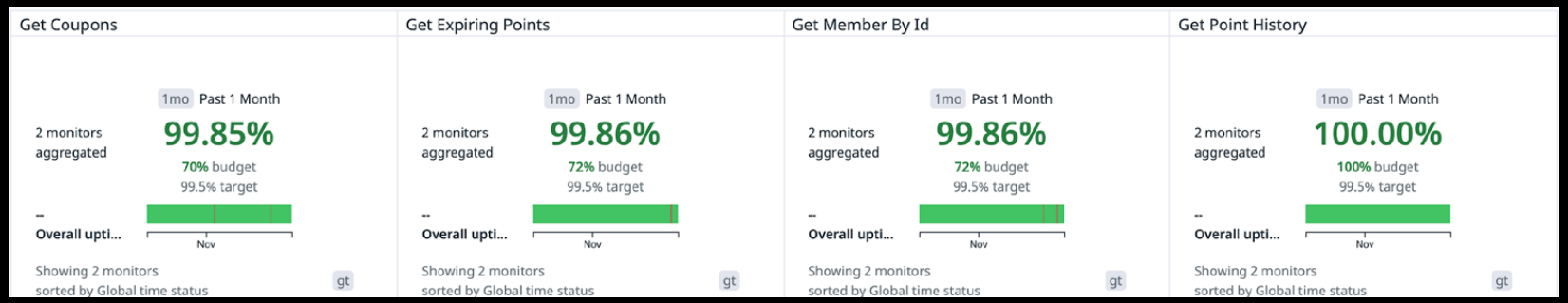


- SLAs are generally for paying customers
- Contain measurable metrics, which are documented and shared between stakeholders
- Provides accountability for maintaining a consistent service level
- Enables service owner to better report on overall health of the service over time
- SLOs used during incidents?



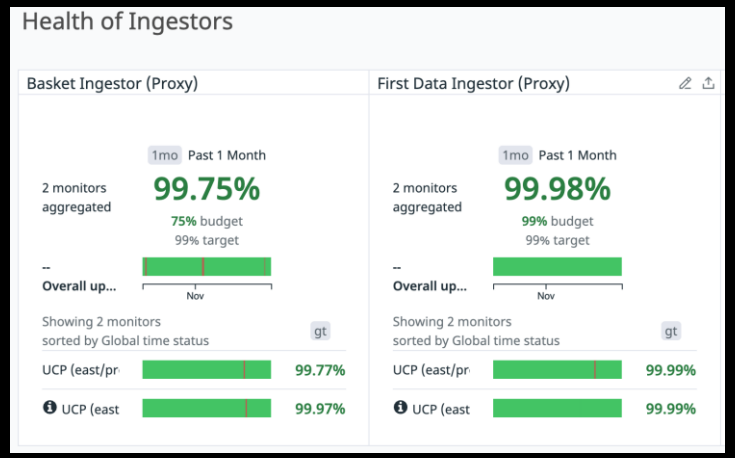
Defining SLOs

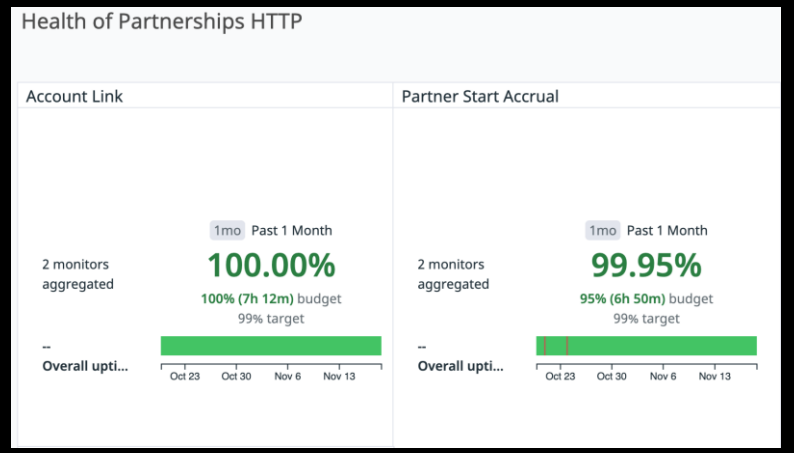
- Study data to find a set reasonable metrics show system health
- Propose and agree upon critical health metrics
- Create dashboards to visualize those metrics over time and decide on thresholds for unhealthy systems
- Create monitors and alerts to notify engineers when those systems are not health



Monitoring SLOs upstream and downstream

- Using SLOs, we are about to see the health of service upstream and downstream
- Adding these SLO widgets to our dashboards allow us to quickly understand if we are impacting or being impacted
- These also allow us to share with our partner teams where we see an issue

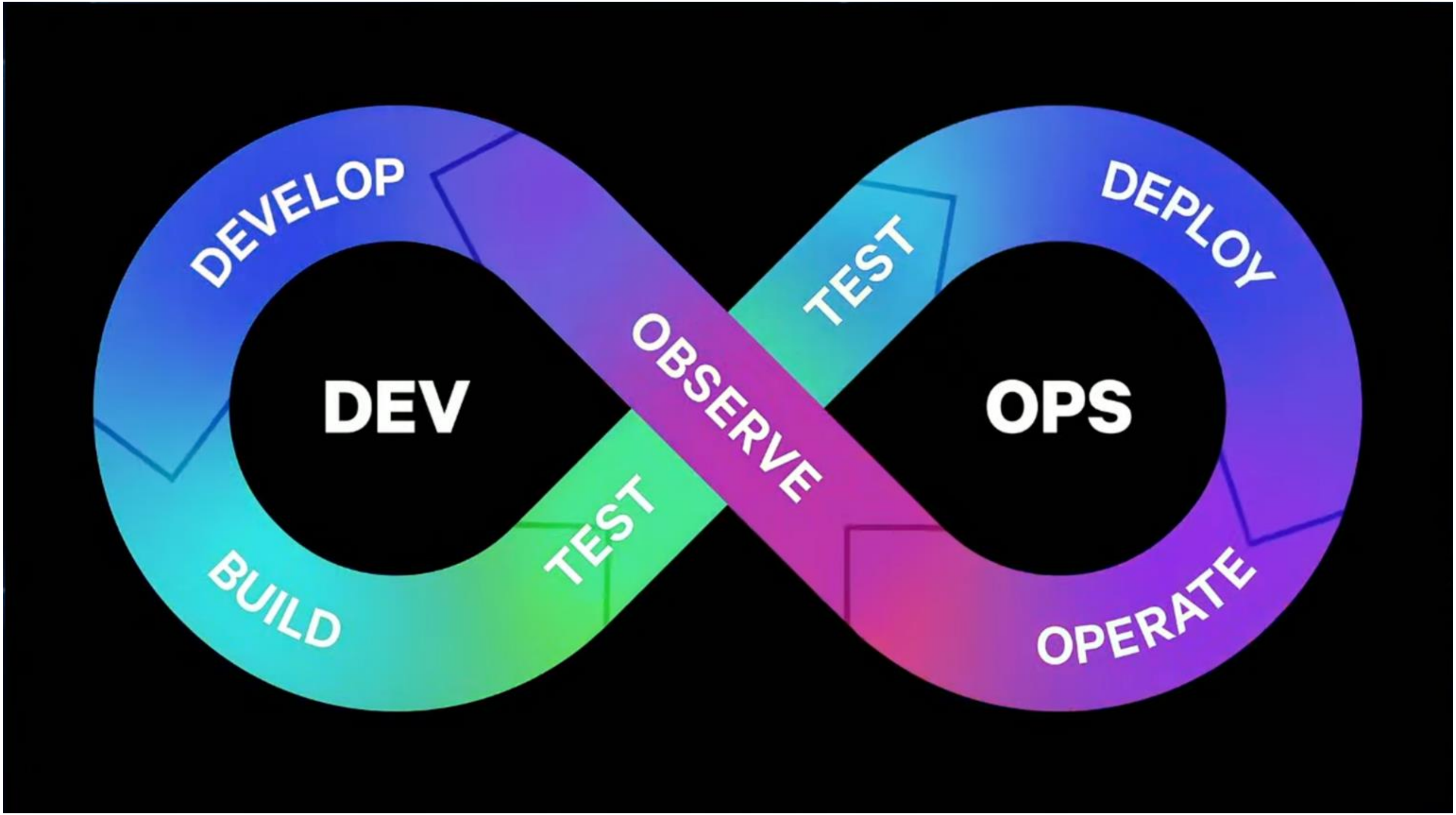






Always more work to be done

- Improve service mapping
    - Specifically, across child accounts in Datadog
- Add financial impact numbers
- How might we use this beyond just troubleshooting incidents or impact?
    - Are our services effectively interacting with each other? Etc.
- End to end transaction tracing to identify and track metrics for critical workflows
    - Tracing regardless where the service emits metrics to


DEVELOP
DEV
BUILD
TEST
OBSERVE
TEST
OPS
DEPLOY
OPERATE

Thank you!



Junaid Ahmed

junaid@datadoghq.com

https://www.linkedin.com/in/junahmed/

@junahmed27

Arielle Allen

aallen@starbucks.com



Please complete the session survey in the **mobile app**

aws

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.