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ANT219

Dow Jones and 3M: Observability with Amazon OpenSearch Service

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What is search all about?



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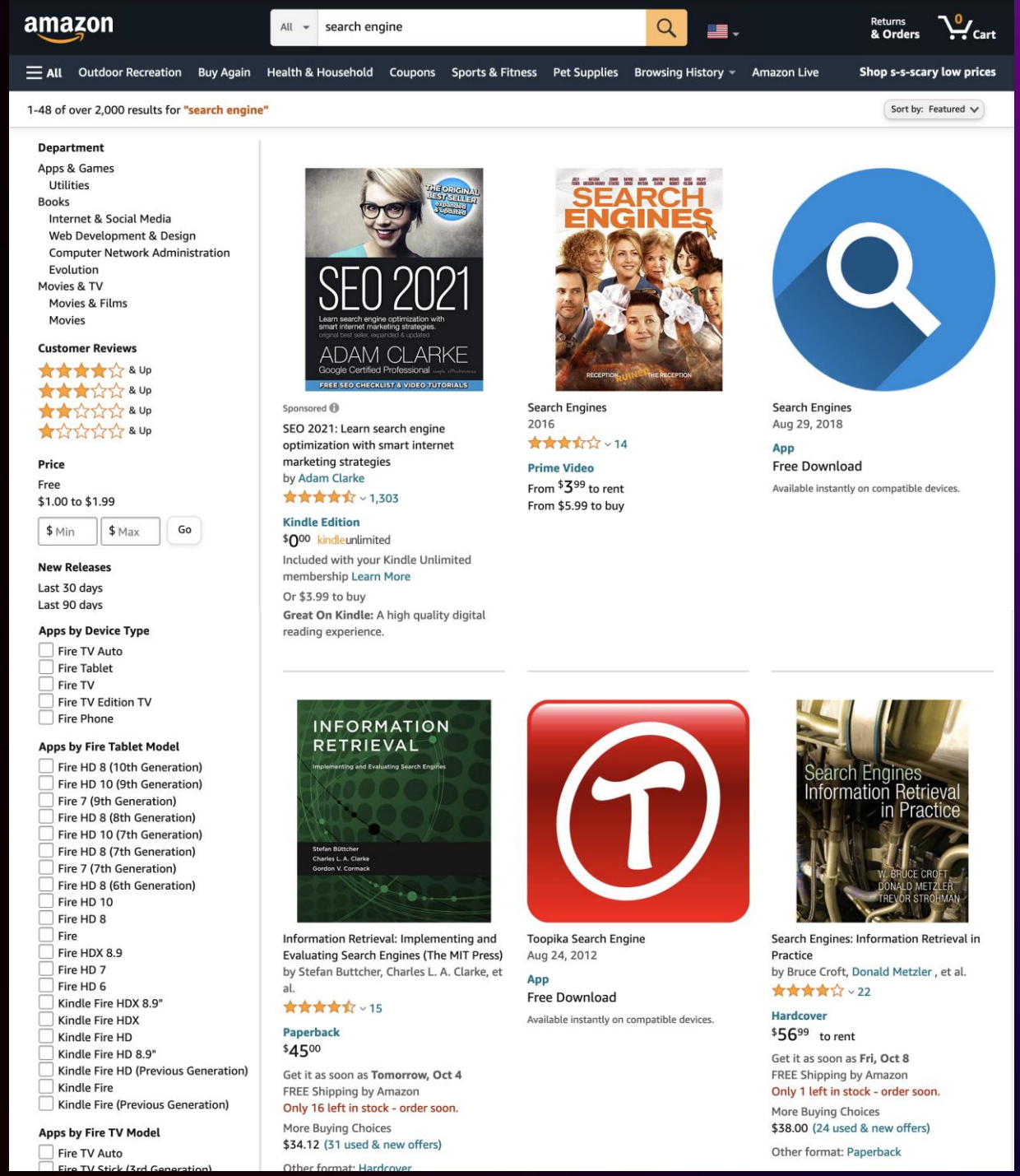
Searching

Search engines match terms to objects in a catalog

Match free text or structured data

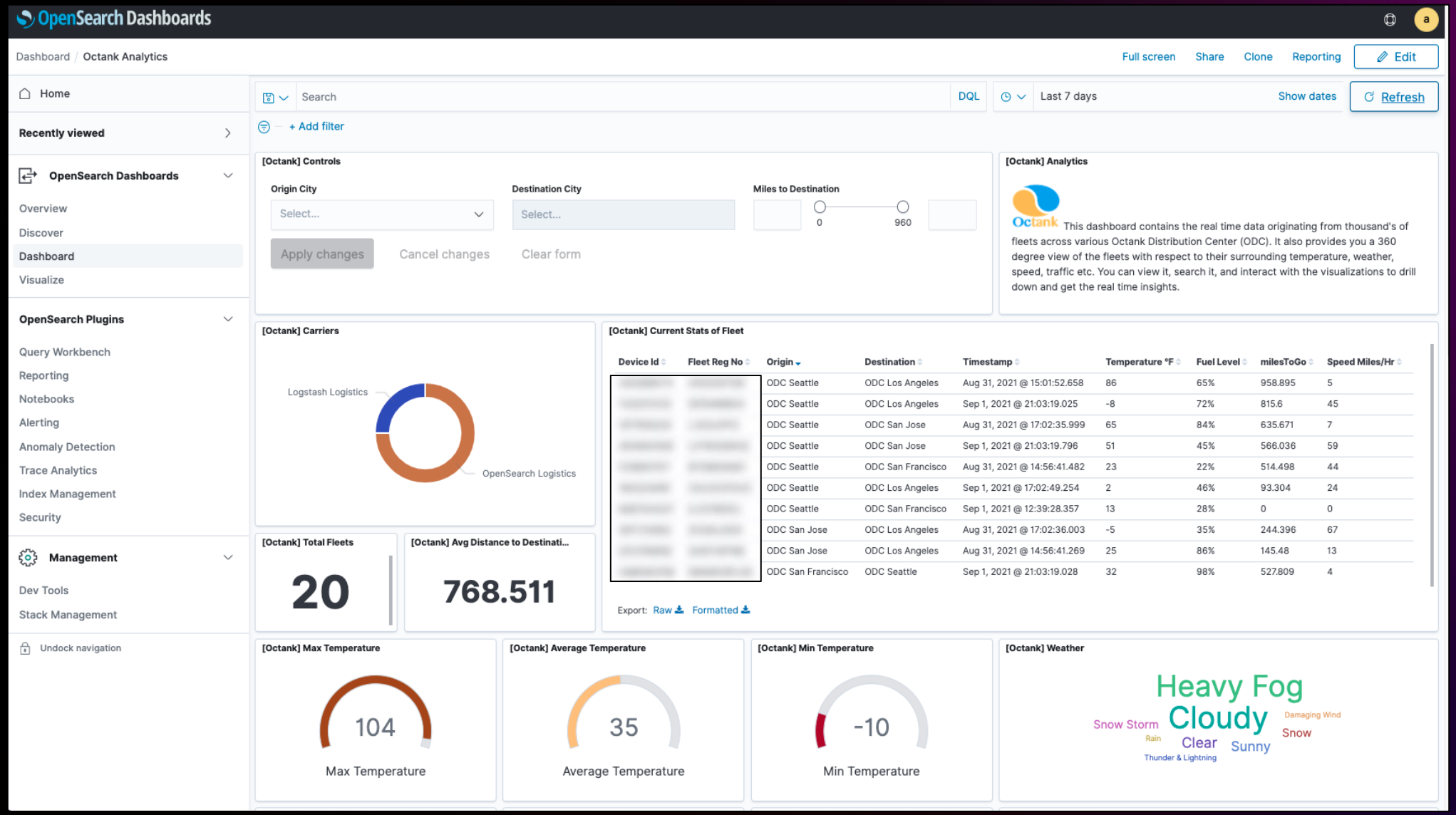
Relevance determines sort order

Facets enable users to drill in to the search results to narrow by attribute value



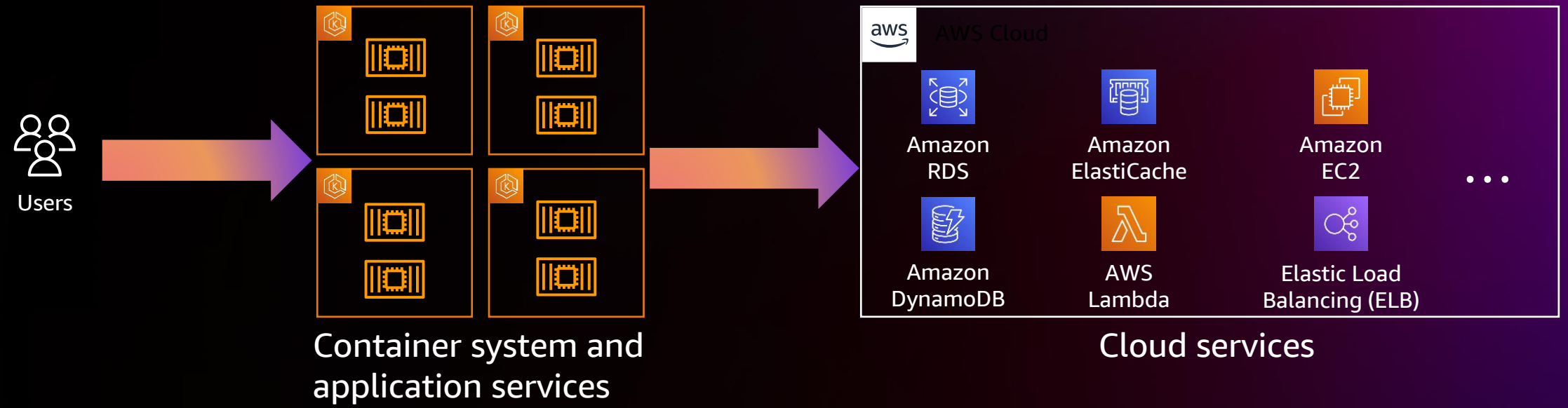
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Analyzing streaming data



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Modern applications

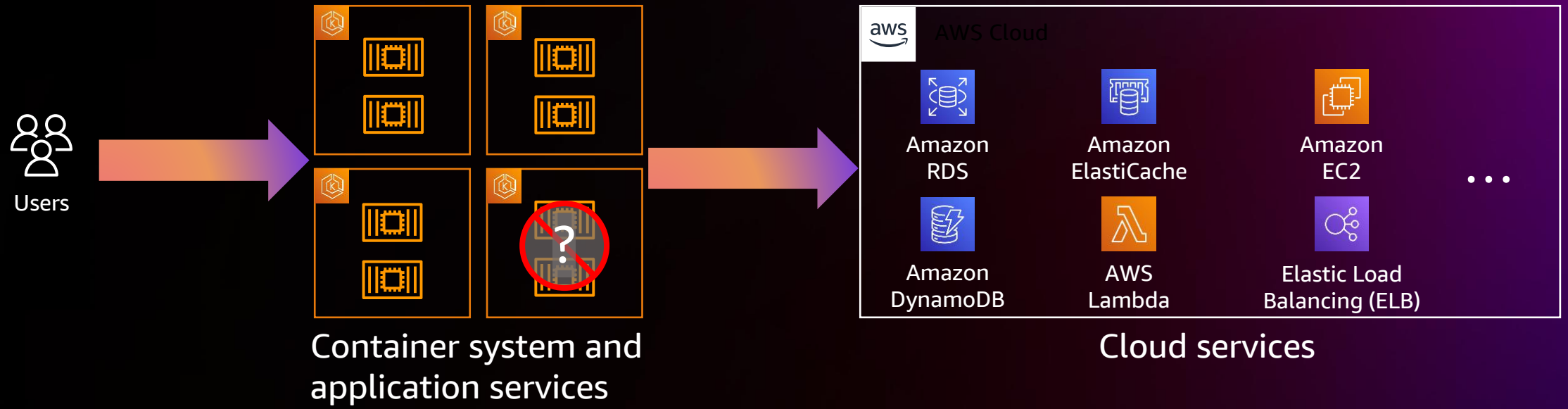


Distributed across services and micro-services

Visibility can be low, especially for application micro-service interaction and interaction with AWS services

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When things go wrong

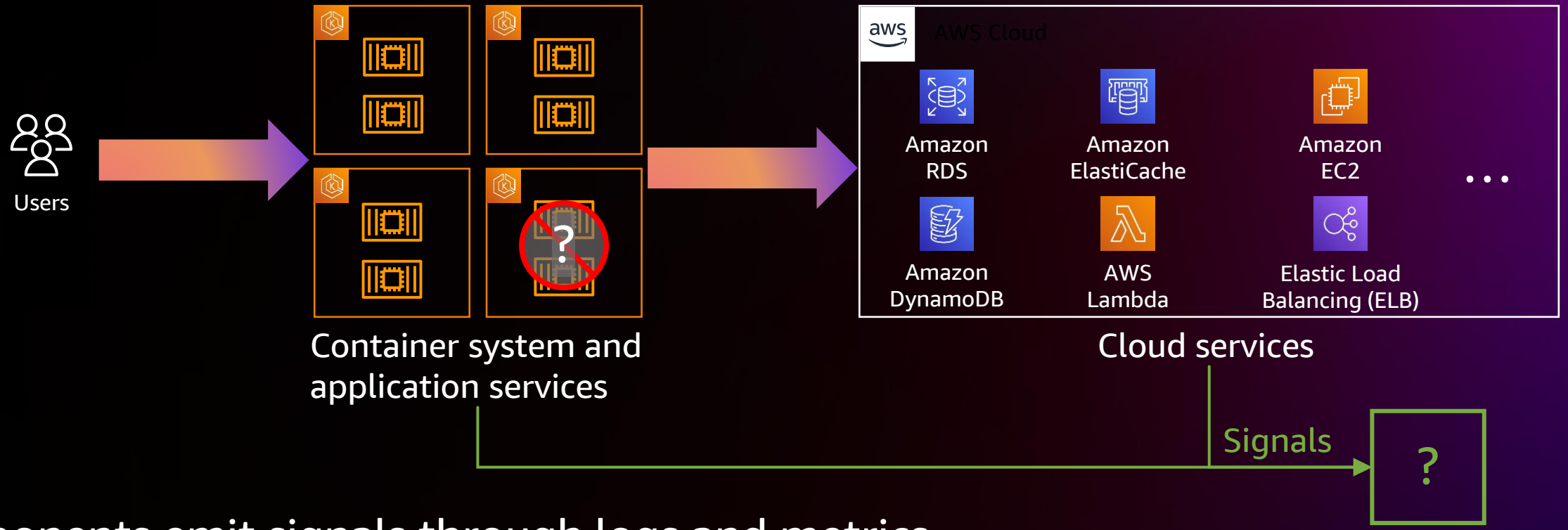


Was it: A code bug? A service-API failure? A cloud service failure?

Decoupled code and services are hard to diagnose!

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Gathering and analyzing signals



Components emit signals through logs and metrics

Logging includes details on the originating request - traces

Remediate failures with analysis of interactions and code

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OpenSearch

Community-driven, open-source search and analytics suite. Consists of a search engine, OpenSearch; a visualization user interface, OpenSearch Dashboards; as well as a series of functionality-adding tools and plugins.



Amazon OpenSearch Service

Fully managed service that makes it easy to deploy, manage, and run OpenSearch cost effectively with industry-leading reliability, scalability, and security.

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OpenSearch project growth

>100MM
OpenSearch project downloads since launch

Top 4 search engine
DB-Engines ranking

40+
Partners and growing

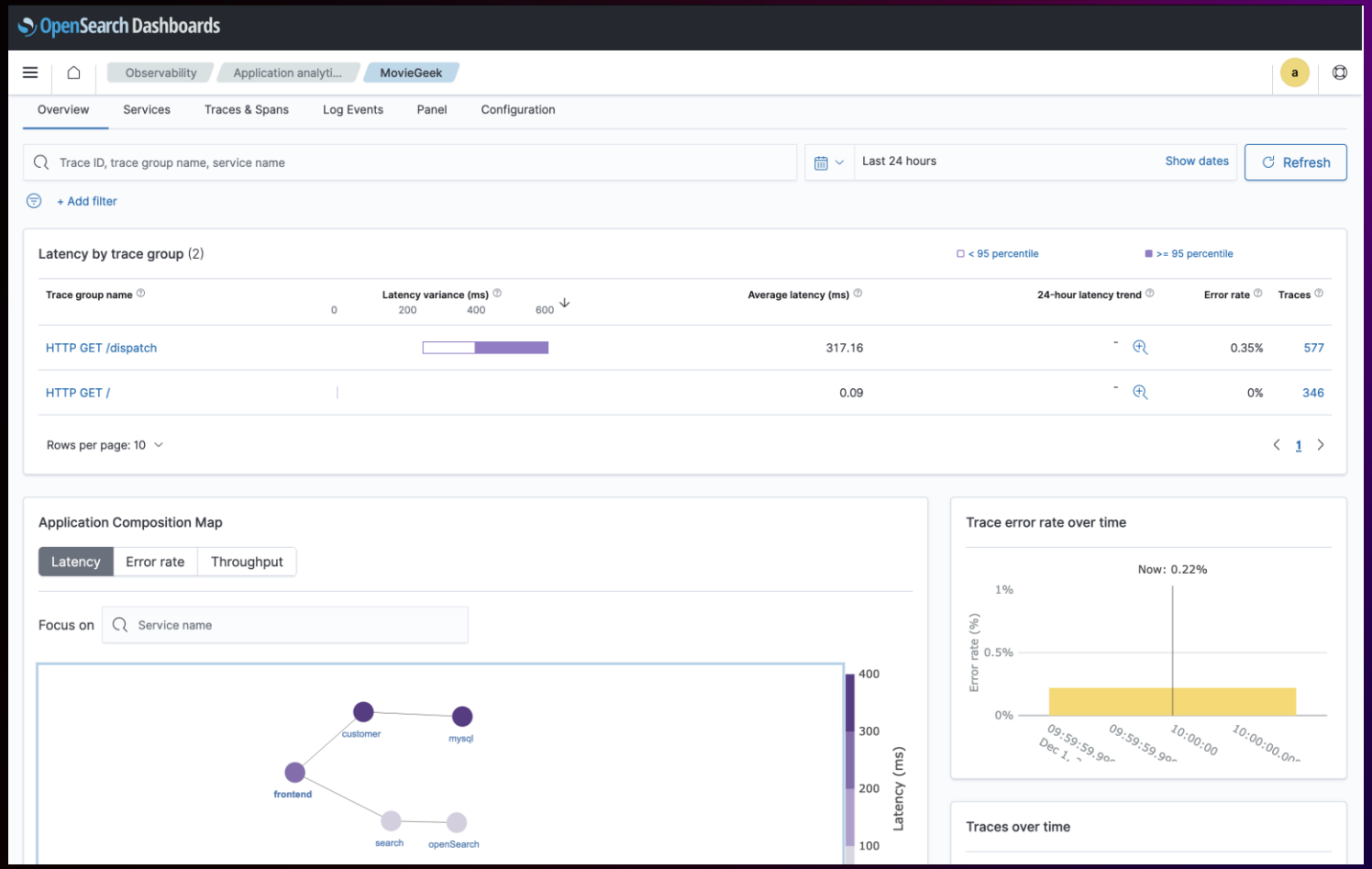
10k+ pull request merged
200%+ growth

Multiple service providers
AWS, Oracle, Aiven-Azure, Bonsai-GCP

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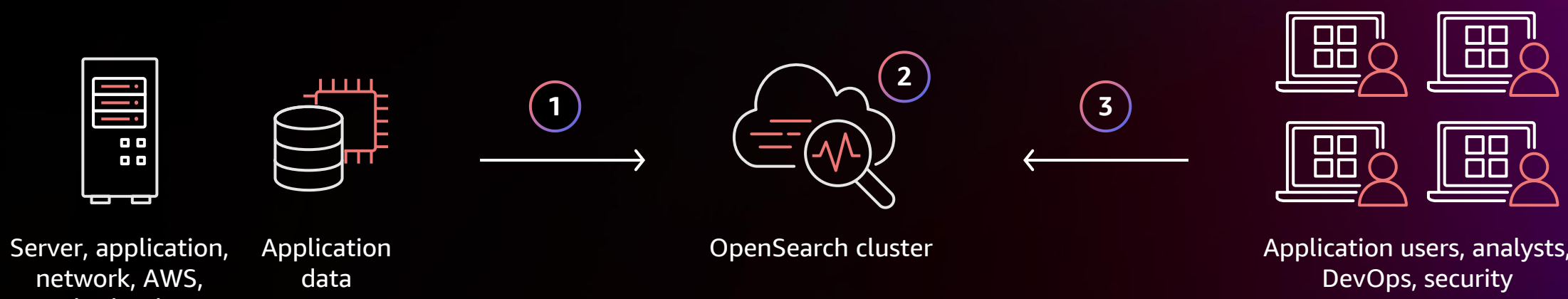
OpenSearch observability

- Distributed tracing – trace analytics
- APM – application analytics to correlate logs and traces
- Log monitoring, event analytics – expanded log analytics capabilities
- Metric analytics, metrics from logs, Prometheus metrics *(OpenSearch 2.4)*



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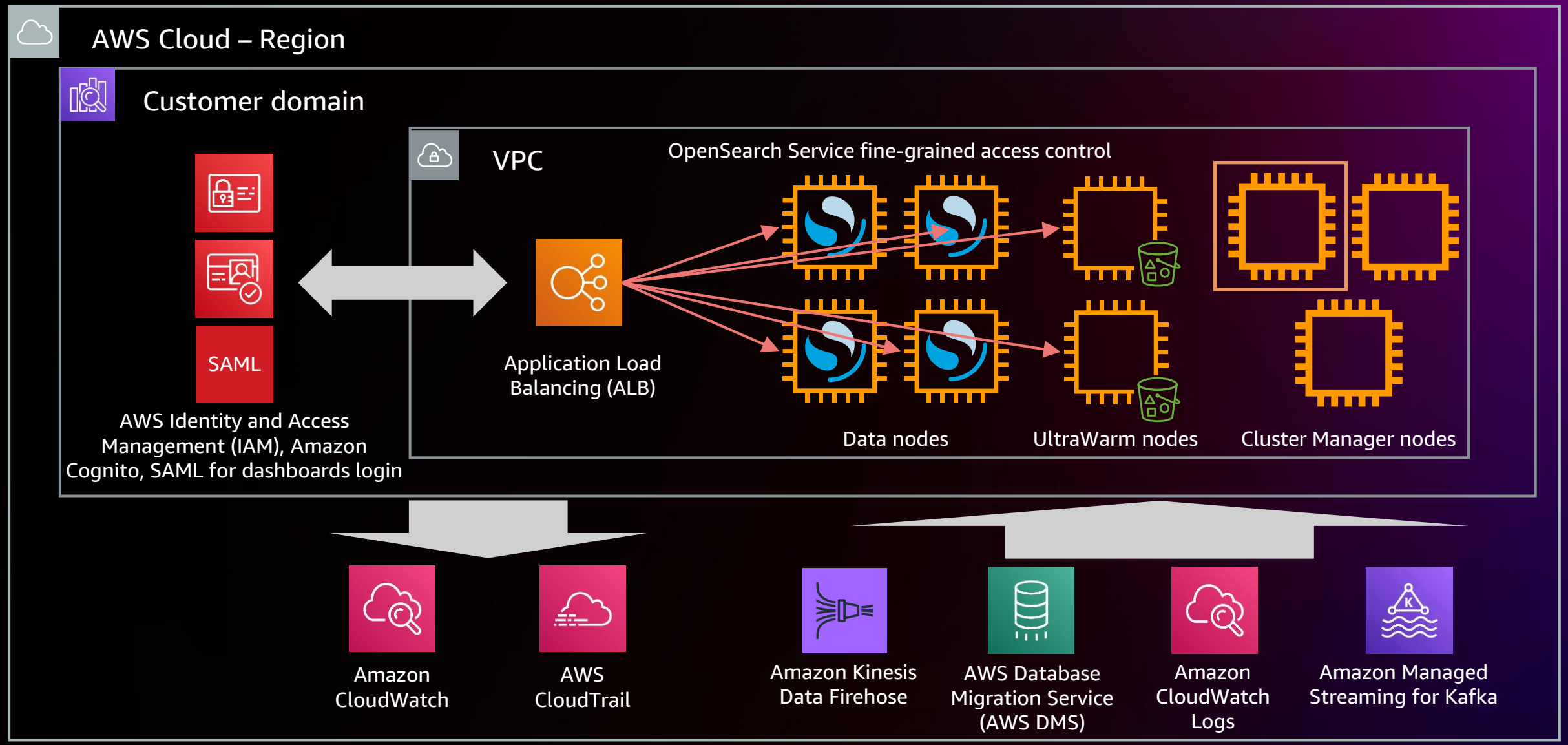
How does it work?



1. **Send data as JSON via REST APIs**
2. **Data is indexed—all fields searchable, including nested JSON**
3. **REST APIs, for fielded matching, Boolean expressions, sorting, and analysis**

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Amazon OpenSearch Service – provisioned



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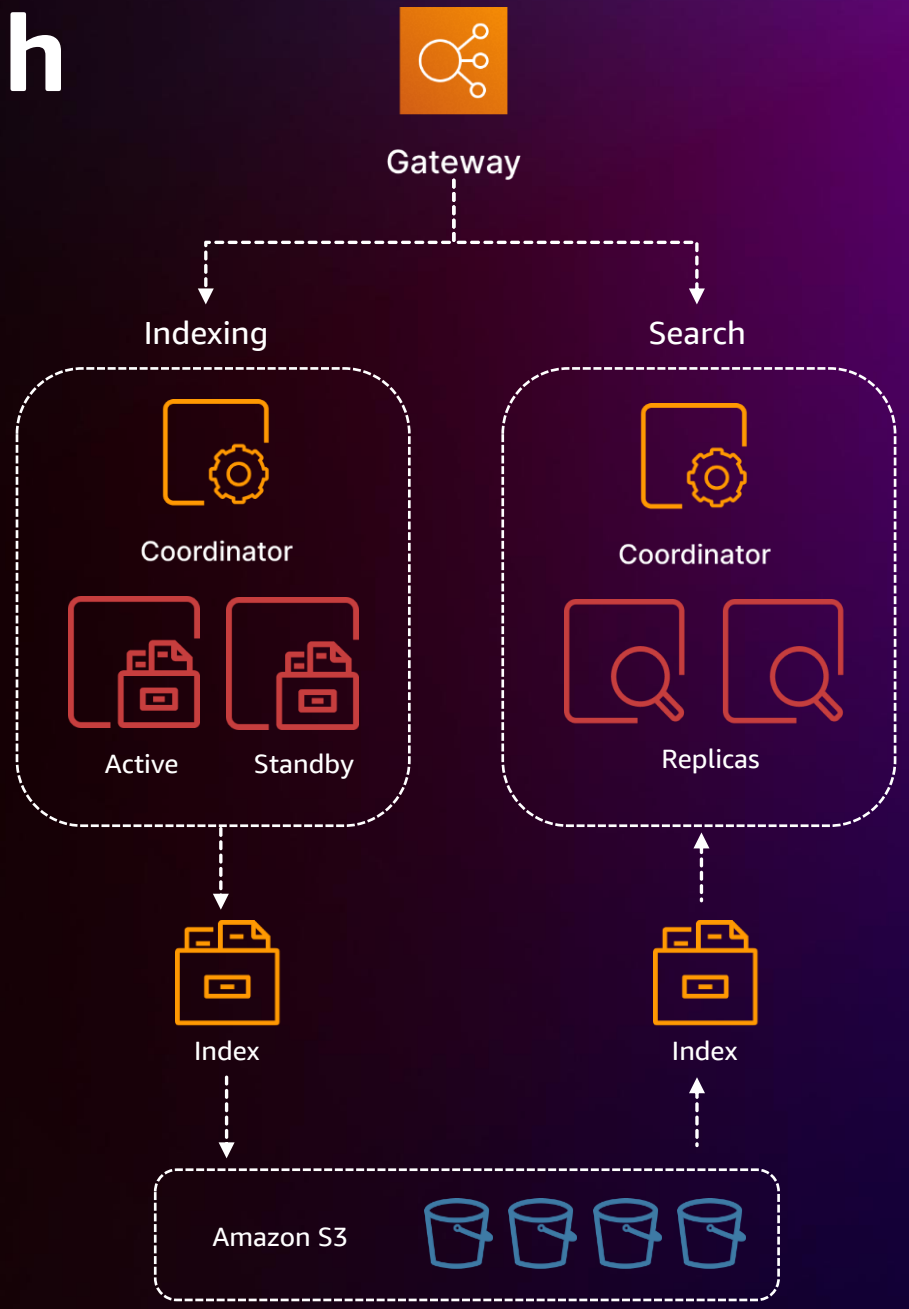
(Preview) Amazon OpenSearch Serverless

Easy to administer
No sizing, scaling and tuning of clusters, and no shard and index lifecycle management

Fast
Automatically scale resources to maintain consistently fast data ingestion rates and query response times

Ecosystem
Get started in seconds using the same OpenSearch clients, pipelines, and APIs

Cost-effective
Pay only for the resources consumed



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Breakout tomorrow

ANT 221 – Provision and scale OpenSearch resources with serverless

Friday, December 2, 10:45. Lido 3003, Venetian

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3 Takeaways

OpenSearch unlocks your data and helps you find the golden needle in the silver needle haystack

Enable your users to find the right content

OpenSearch observability enables your organization to quickly discover, diagnose, and remediate issues with your application infrastructure, container systems, and security

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3M Health Care Business Group

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3M Health Care

- Improve every life by advancing healthcare delivery and innovating life science solutions
- 3M Health Care Business Group sales (2021): $8.6 billion
- Plans to spin off the health care business; to be completed by end of 2023

Medical
Preventing complications, protecting skin, and healing wounds

Oral care
Promoting lifelong oral health

Separation and purification sciences
Increasing speed to clinicals and lowering manufacturing costs

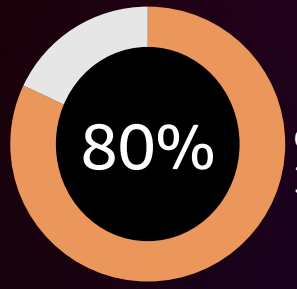
Health information systems
Strengthening the utility of health information





41 states
use 3M methodologies as their basis of payment

20 countries



of US hospitals use the 3M encoder software

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Project “Astrolabe”

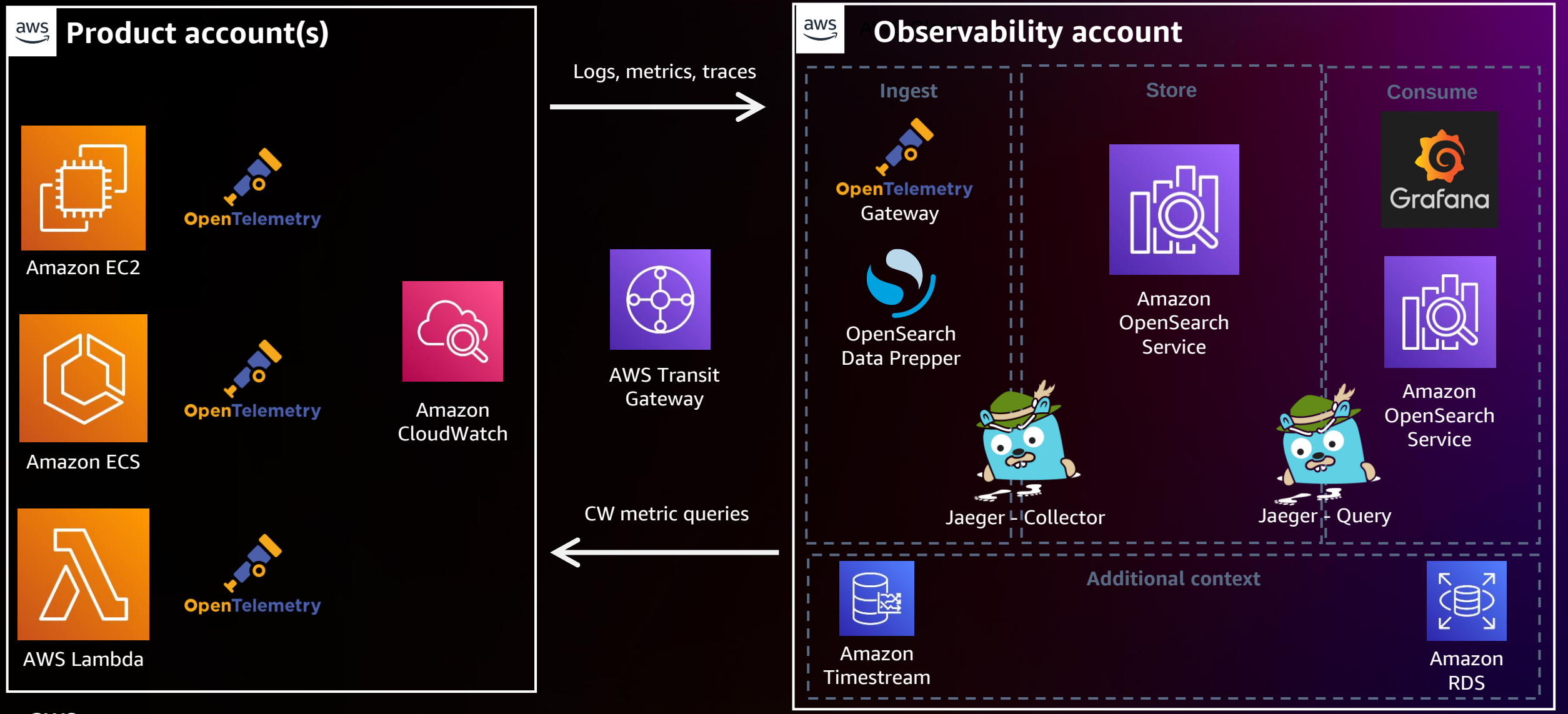
NOT JUST AN OBSERVABILITY AND MONITORING SOLUTION

	Summary	Primary pillars enabled
Empowered incident response	Engineers and operations teams want to quickly diagnose and resolve issues	Operational excellence, reliability
Enhance product delivery	Engineers, operators, and product owners want to understand how their systems function to make the best product possible	Performance efficiency, reliability, operational excellence, cost optimization
Improve interoperability	All stakeholders want comprehensive context on the behavior of their systems within the organization	Operational excellence, cost optimization

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Architecture (beyond observability)

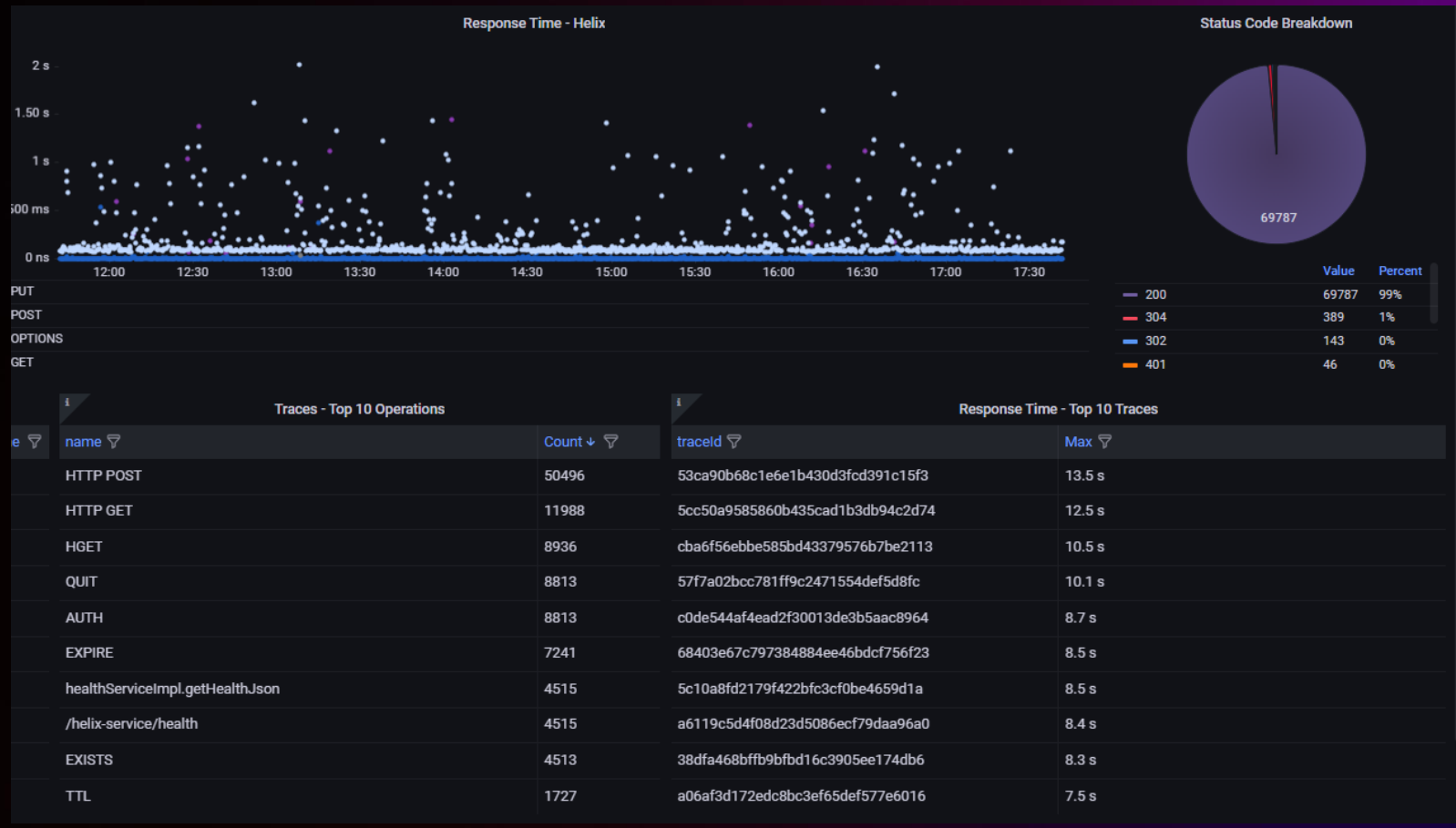


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Success metrics

Product and team

- 2 FTE
- Ingesting 100TB+ in core production on a monthly basis
- 6 environments, multiple regions
- Data is streaming on critical systems 24/7/365
- Over 75 applications supported
- Onboard new customers monthly



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Success story: Catastrophe averted on production database

1. OpenSearch Service alerted there was an abnormally high volume of service certificates being generated
2. We quickly identified the offending application by searching logs and traces
3. Multiple teams were able to coalesce around a solution using the same data
4. In a **matter of minutes**, the support team generated a whole new visualization for stakeholders to monitor the situation

Result

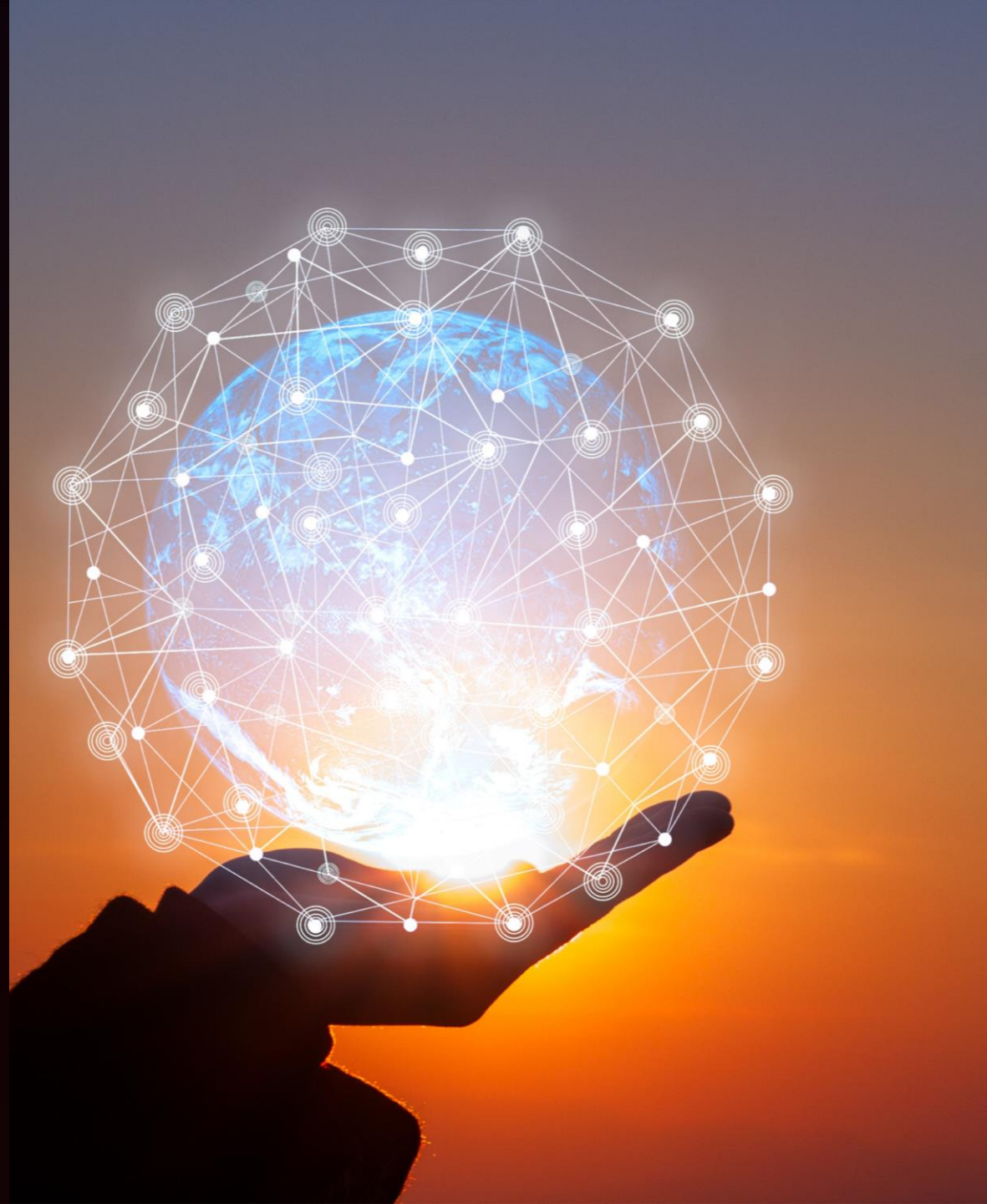
The offending application had a fix pushed the same day and the erroneous data was cleaned up within 24 hours; Database performance was minimally impacted

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Challenges

- Migration from old to new
- Many potential solutions
- Sensitive data
- Global deployments
- Nascent OTEL and evolving products
- Vast number of observability sources
- Expertise



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Dow Jones

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Dow Jones & Co.

- Dow Jones, a subsidiary of News Corporation, is a leading provider of business news and information services
- Publishing the news since 1882
- Two complementary business divisions
  - Financial news publications – The Wall Street Journal, Barron's, MarketWatch
  - Information and data services – Factiva, Risk & Compliance, Newswires
- **Content** company transforming into a **Technology** company

THE WALL STREET JOURNAL.

BARRON'S

DOW JONES FACTIVA

MarketWatch

DOW JONES NEWSWIRES

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Observability journey

- Utilized third-party tools for application monitoring and alerting by using logs and metrics
- Challenges
  - Centrally managed and inflexible
  - Tight quota on storage and queries
  - Underutilized features
  - Vendor lock-in
  - Isolation of data

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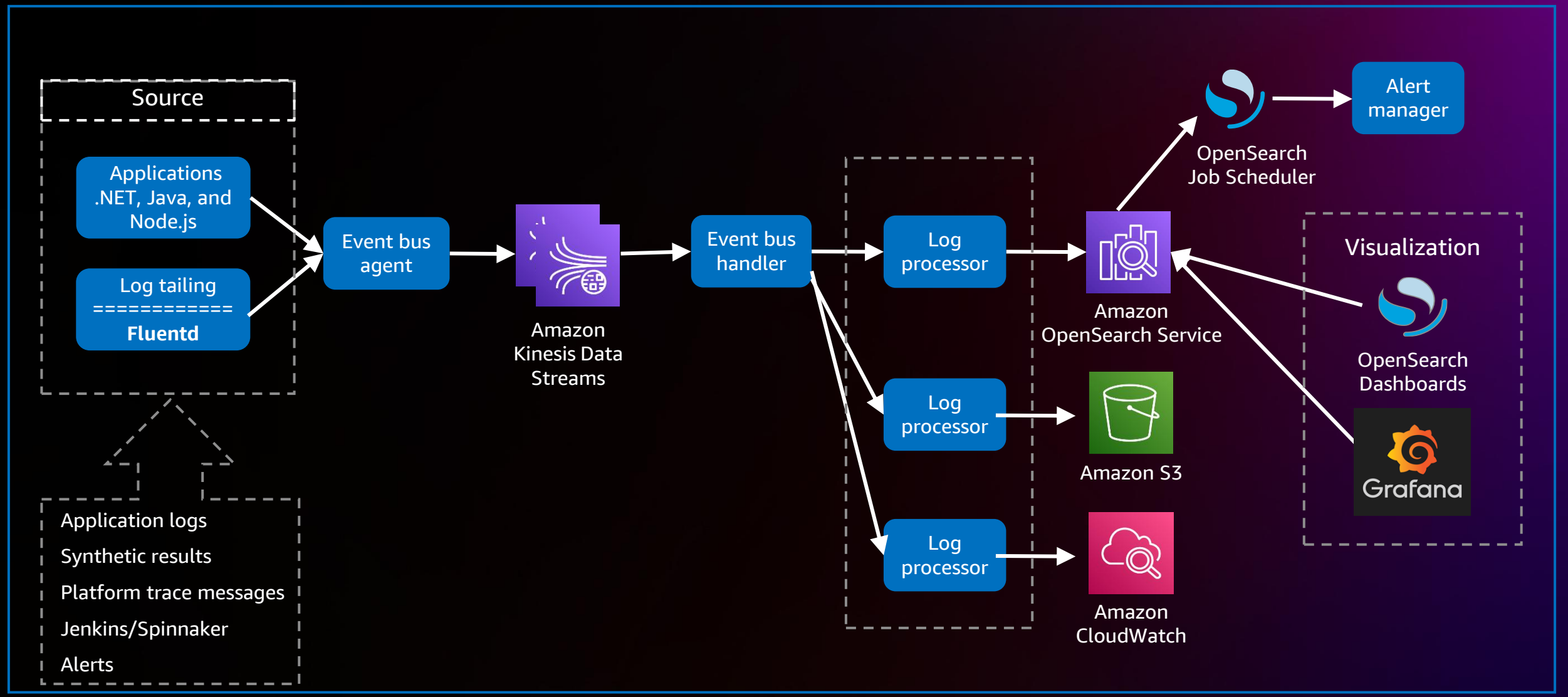
Observability journey

- Transformation using our observability aggregation platform which utilizes AWS services, open source software, and our own event bus
  - Decentralized and extensible
  - Observability at scale
  - Open source
  - Vendor neutrality
  - Data mobility

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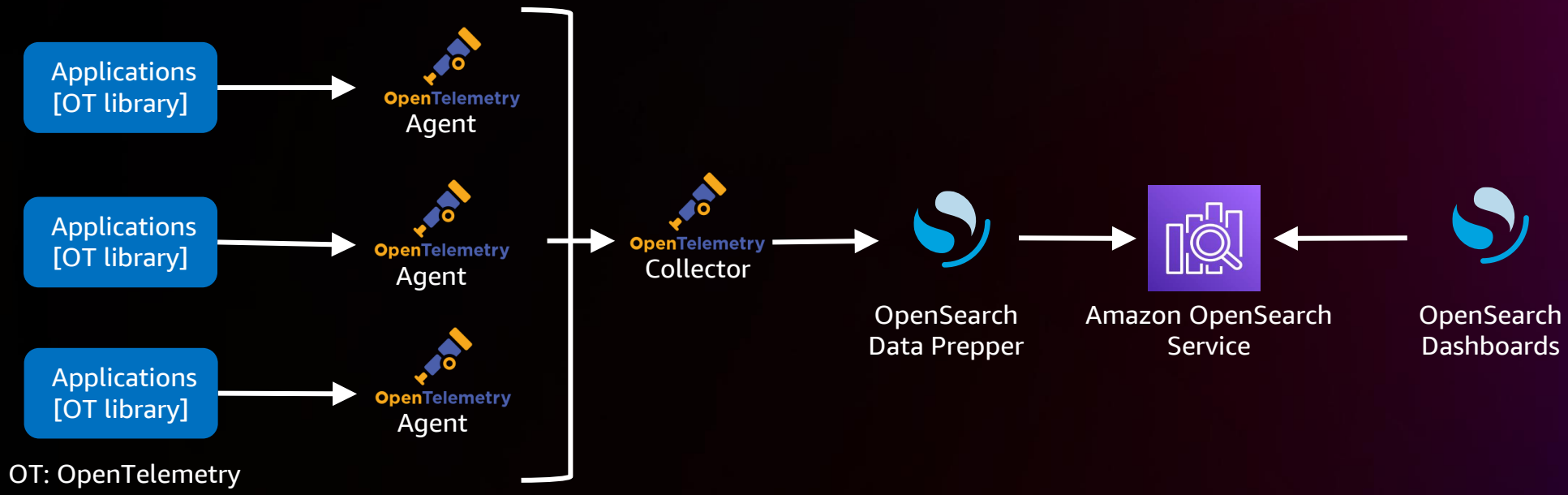
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Architecture (application logs)



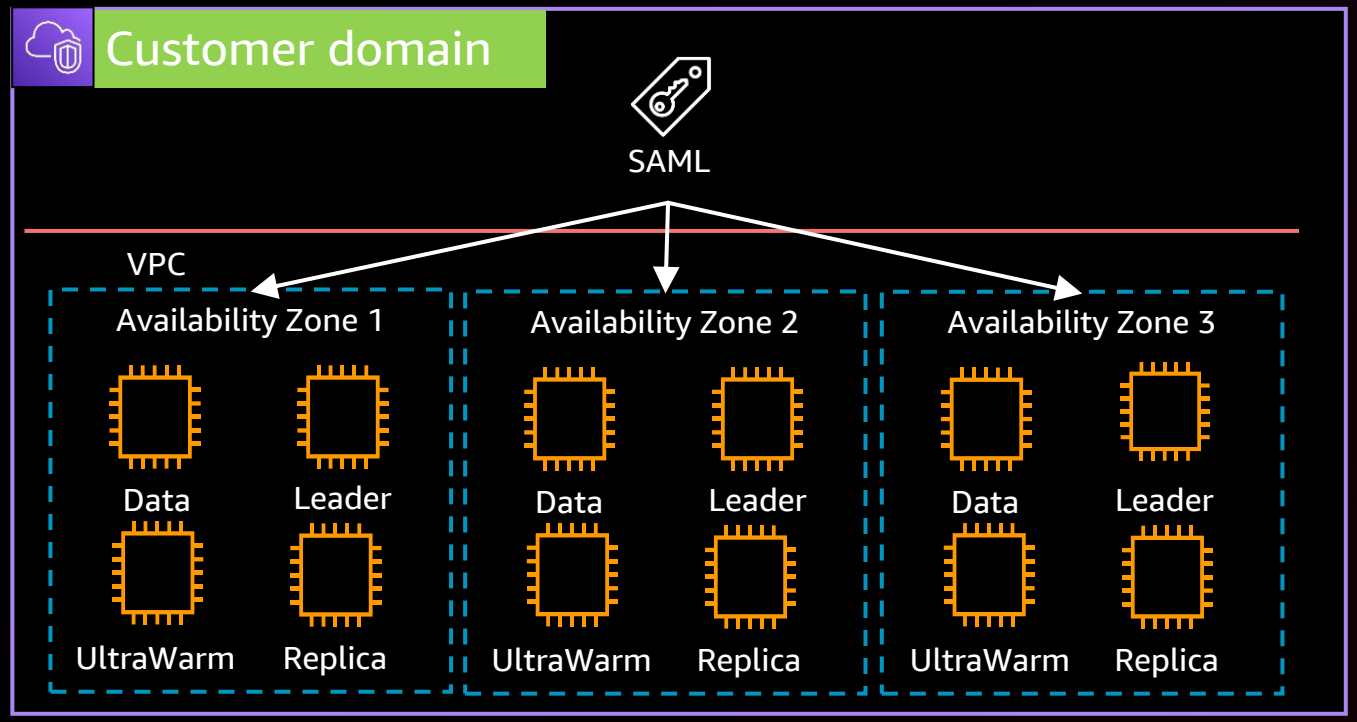
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Architecture (distributed tracing)



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Architecture (OpenSearch Service)



- 3 Availability Zones (AZs) and 1 replica
- 3 leader and data nodes
- Ultra-warm storage
- SAML enabled
- HTTPS and encryption at rest
- Auto-tune enabled
- Hourly snapshots (DR)

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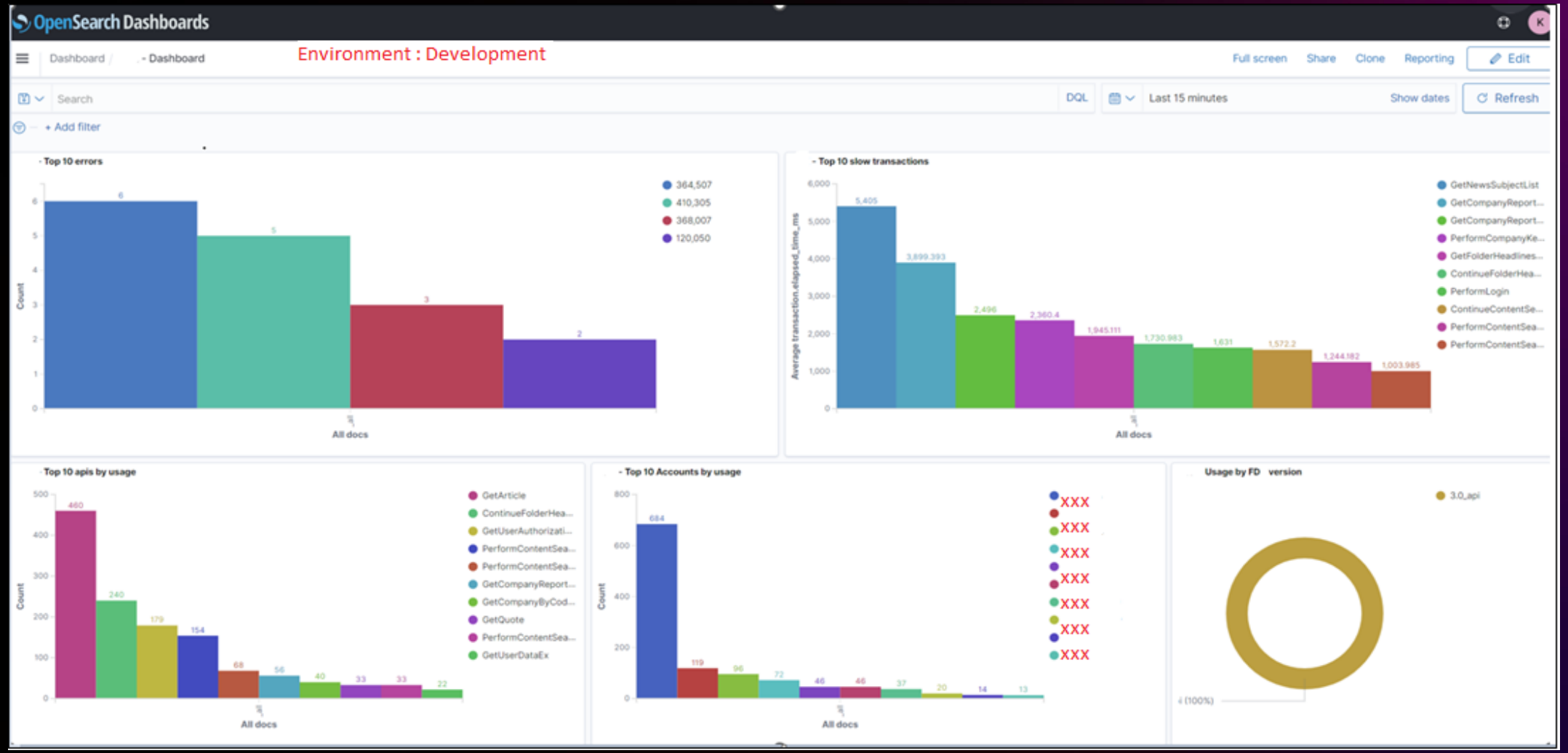
Success metrics due to transformation

- Ingesting terabytes of data at lower cost
- Operational excellence
  - Reduced Mean Time To Resolution (MTTR)
  - Improved SLO
- 50% cost savings due to ultra-warm storage
- Over 50 applications supported
- Multi-region support

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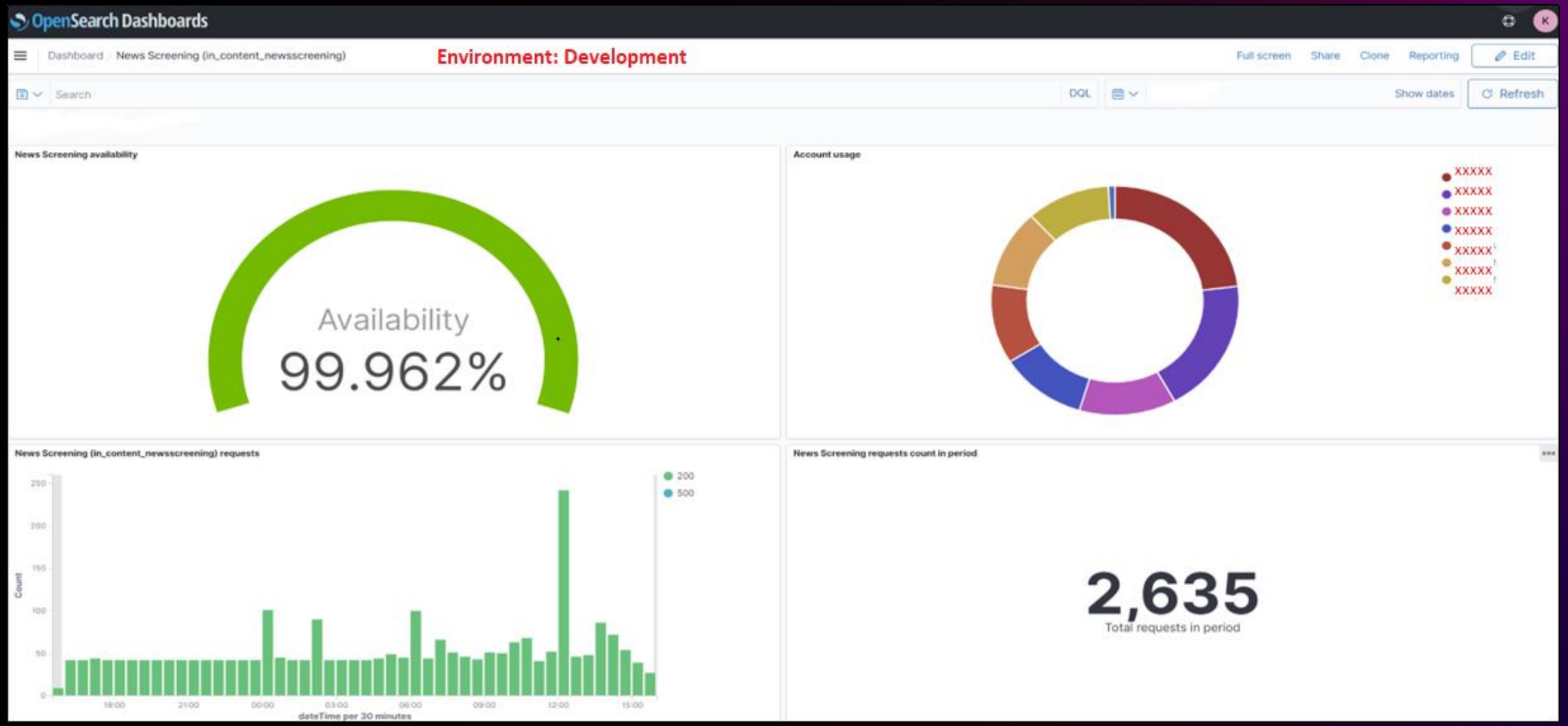
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OpenSearch Dashboard (example)



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OpenSearch Dashboard (example)



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Discussion

As you transform your businesses, how do you see the role of logs and Observability changing?

Does Amazon OpenSearch Serverless change your logging and monitoring strategy?

What were the key drivers for your migration to OpenSearch?

Where do you see crossover in usage between logs/metrics/traces?

What business KPIs does OpenSearch support in your organization?

What cost tradeoffs do you make in collecting, storing, and retaining your log data?

What is one change that you would make to improve the service?

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What to do next

- Take the observability workshop



https://tinyurl.com/5bj9z9en

- Read more customer success stories



https://go.aws/3TTjzZL

- Sign up for migration assessment and assistance



https://bit.ly/3i50irf

- Find a partner to help



https://go.aws/3GyR8NR

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