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

COP201

How Discovery increased operational efficiency with AWS observability

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Solutions Architect
AWS

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Warner Bros. Discovery (WBD)

Warner Bros. Discovery (Nasdaq: WBD) is a leading global media and entertainment company that creates and distributes the world's most differentiated and complete portfolio of content and brands across television, film, and streaming.



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Studios & Networks

Motion Pictures



Media networks & original content



Direct-to-Consumer



International



News & Sports





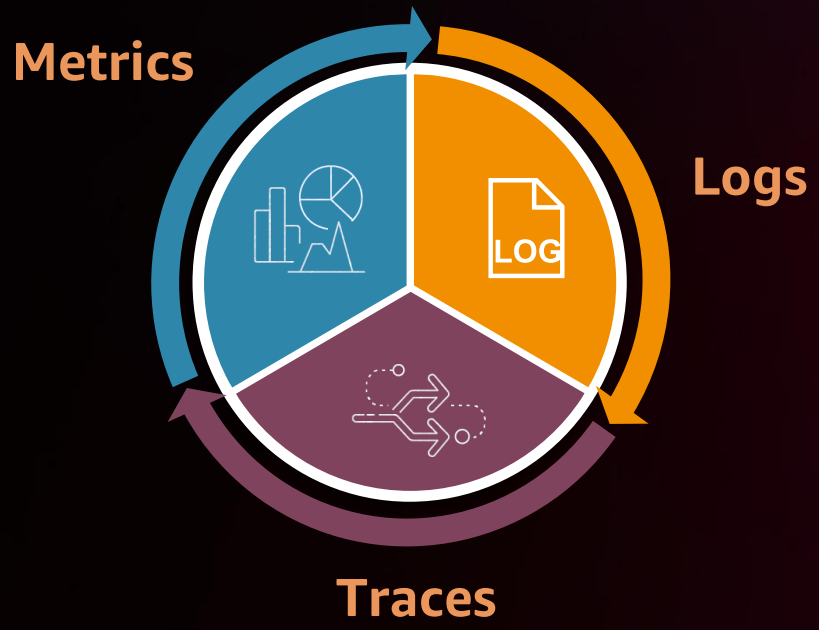
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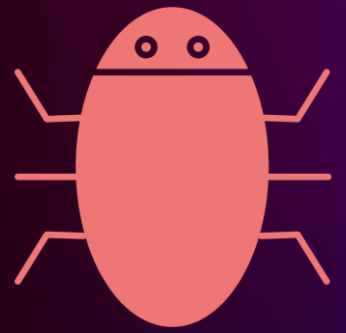
Observability at WBD



Unknown-unknowns



Three pillars



Beyond debugging

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Discovery's observability evolution



Where we started

Fragmentation, scaling, and cost opportunities

Establishing order

Laying the groundwork for usable operational data

Adoption

Adopting technologies that fit our needs

Expansion

Building on use-cases and improving operations

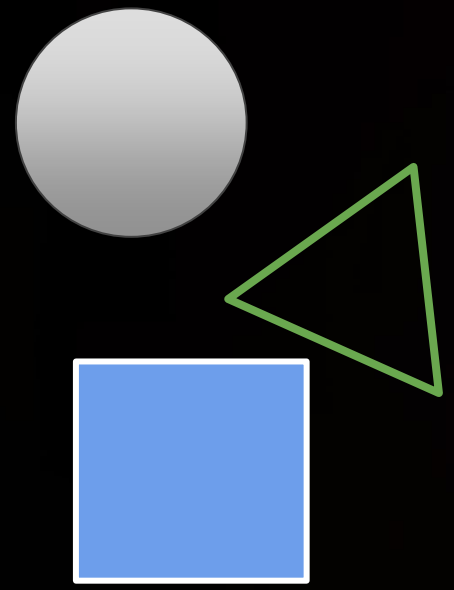
Today

Engineer focused ecosystem putting operational data at their fingertips

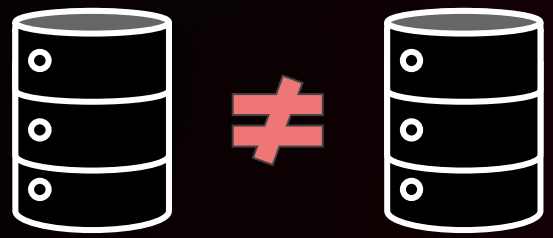
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Where we started



Heterogeneous ecosystem



Minimal data standardization



System scalability

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Operational metadata specification

Goals

1. Establish a functional hierarchy of Discovery's ecosystem
2. Align all operational data to elements of the hierarchy

```
omd_business_service
  name: observability
  description:  A centralized
  monitoring capability

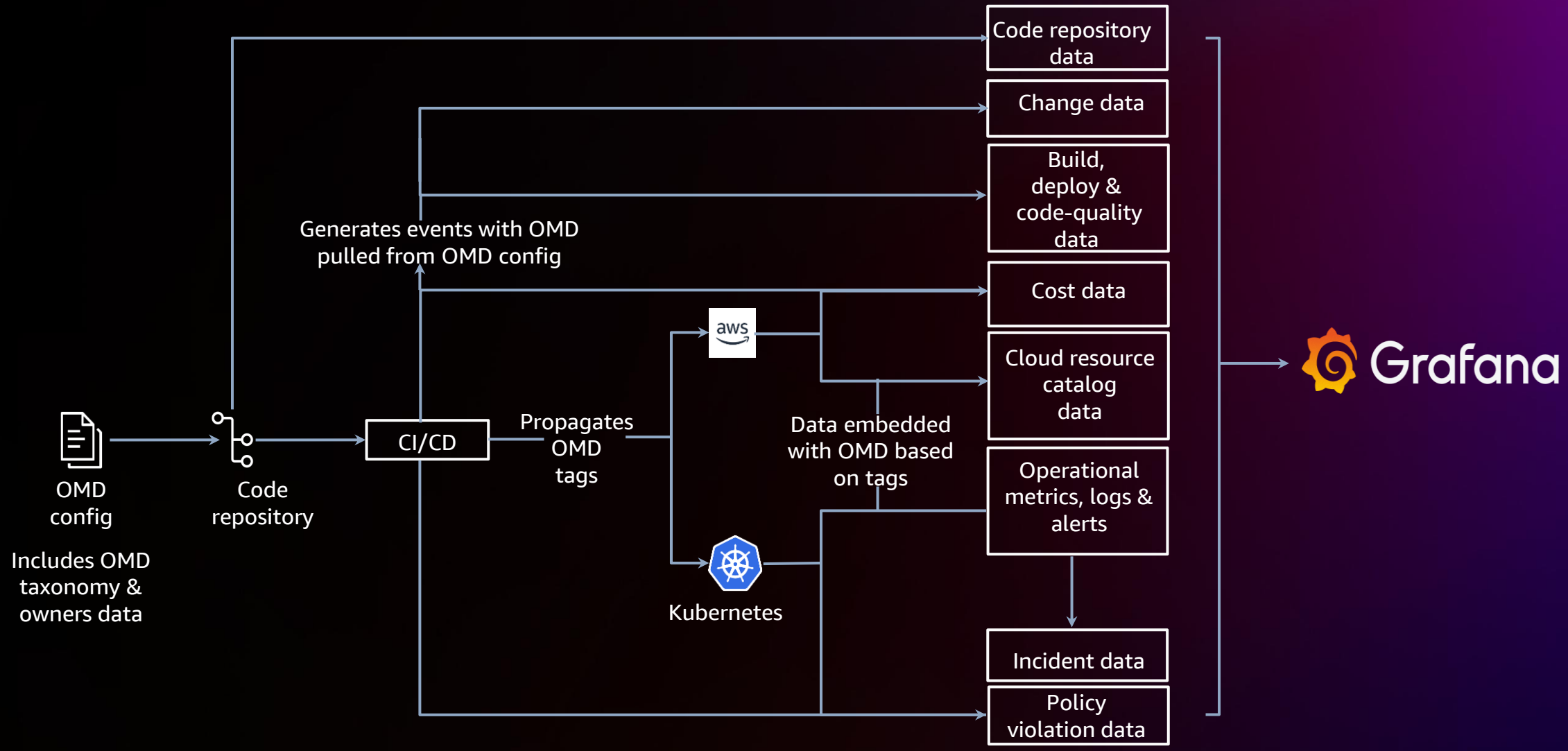
omd_service:
 name: logging
 description: Systems pertaining to
 the capture and retention of
 operational logs

omd_component:
 name: backend
 description: Systems dedicated to
 providing logs for backend services
 and infrastructure
```

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Standardizing operational metadata (OMD)

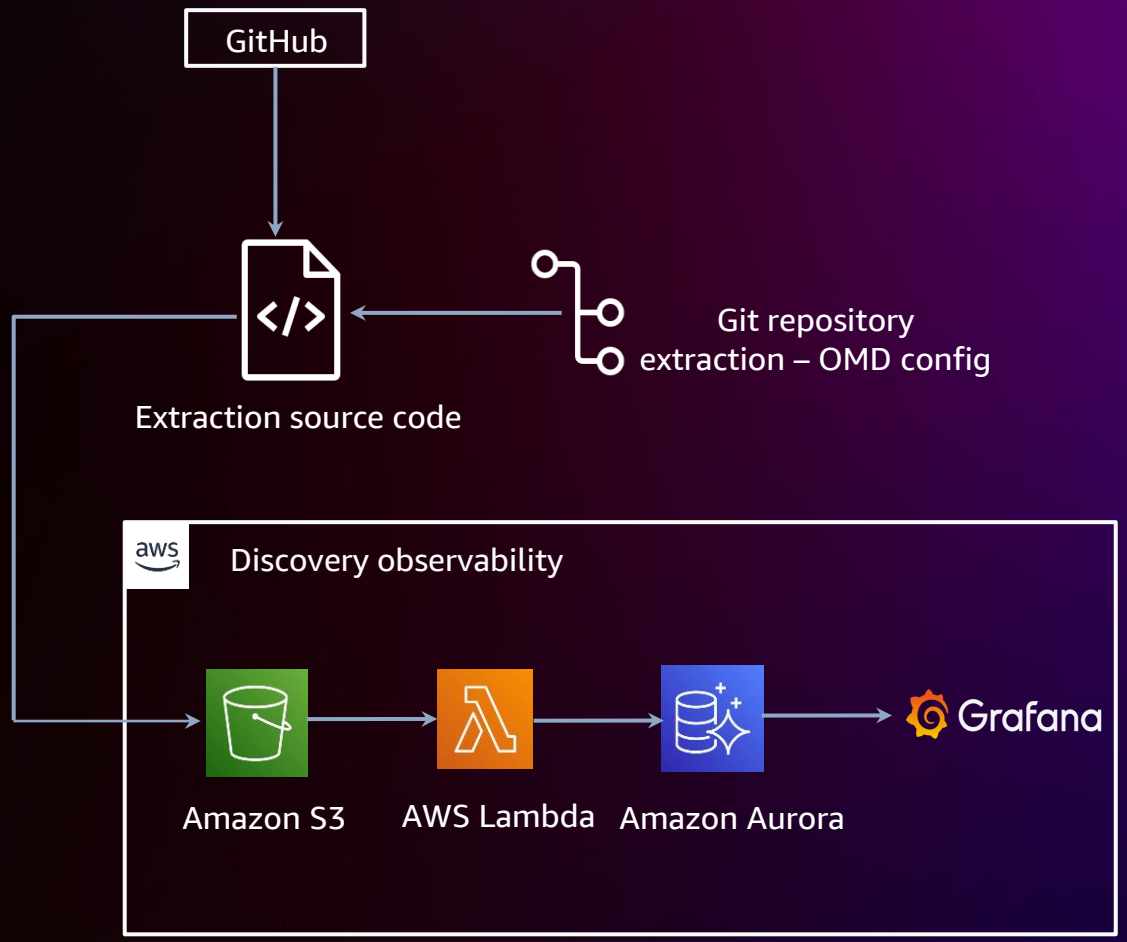


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Establishing order – AWS Service Catalog

Capabilities

1. Developer-centric catalog management
2. Aligns ownership and organizational metadata to services
3. Grafana integration simplifies democratization



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Tenets for change

- [x] All operational data must be relatable
- [ ] We must “own” our data
- [ ] Open source over proprietary offerings
- [ ] Managed over self-hosted
- [ ] Flexibility in deployments and partitioning
- [ ] Regulation compliant

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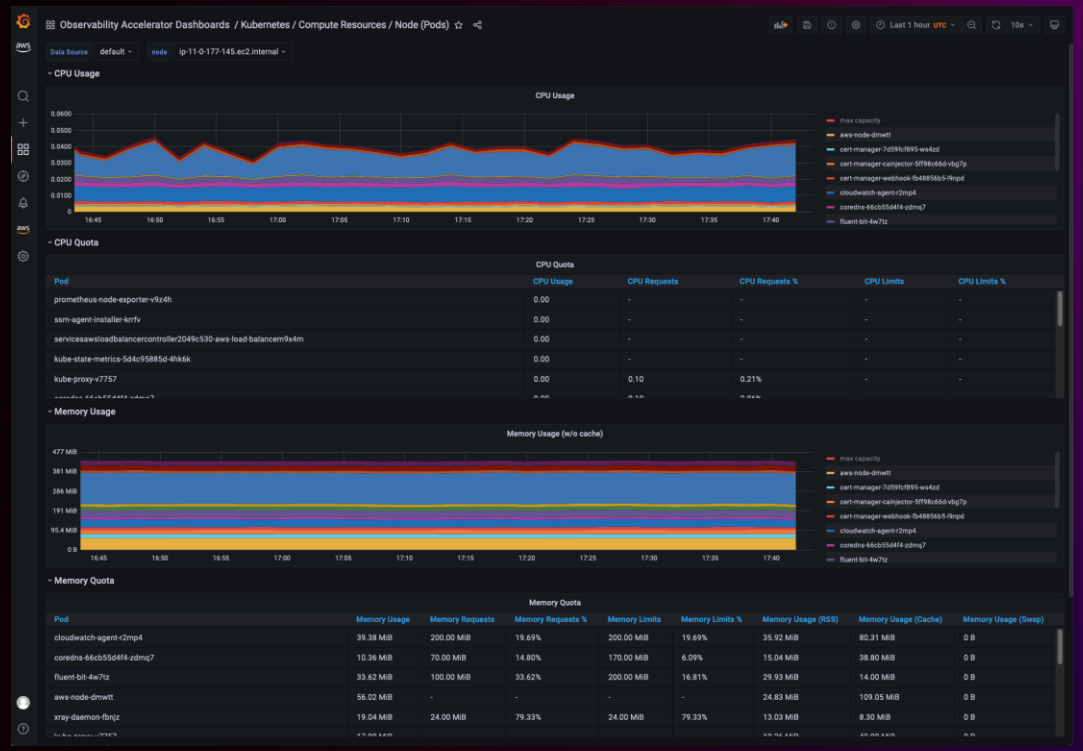
Open-source observability

Amazon Managed Grafana

Amazon Managed Service for Prometheus

Amazon OpenSearch Service

Jaeger & Zipkin tracing

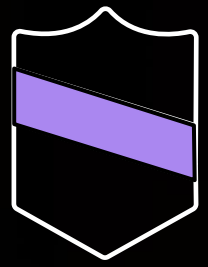


AWS Distro for OpenTelemetry (ADOT)

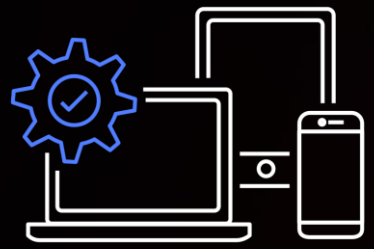
Collection and instrumentation - collectors and SDKs

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Why AWS managed open source?



Security first



Production workloads

Seamless integrations



Open-source contribution

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Working with the open-source community



CLOUD NATIVE COMPUTING FOUNDATION

cortex

OpenTelemetry

Prometheus

Fluent Bit

OpenSearch

Grafana data source plugins

Amazon Athena
Amazon CloudWatch
Amazon Redshift
Amazon Timestream
AWS X-Ray
AWS IoT SiteWise

Amazon top contribution for cortex in last year (1500+)
Amazon top fourth contributor for OpenTelemetry (9k+)

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Amazon Managed Service for Prometheus



HIGHLY AVAILABLE, SECURE, AND MANAGED MONITORING

A serverless Prometheus-compatible monitoring service for metrics to securely monitor container environments at scale

Fully managed, secure, and highly available using Multi-AZ deployments

Use the same open-source Prometheus data model and query language as they do today to monitor the performance of their containerized workloads

No up-front investments required to use the service, and customers only pay for the number of metrics ingested

Highly available and scaled Prometheus-compatible alert manager and ruler

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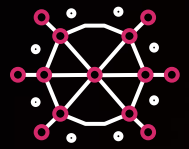
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OpenTelemetry provides

A single, vendor-agnostic instrumentation API per language

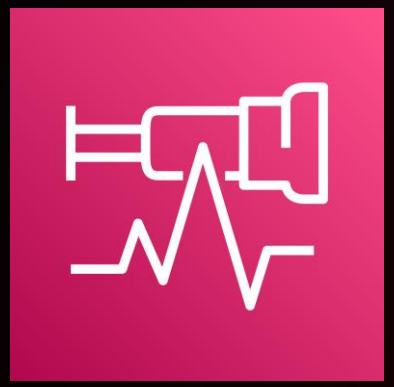


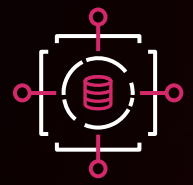
A collector that can be deployed in a variety of ways



An end-to-end implementation to generate, emit, collect, process, and export telemetry data







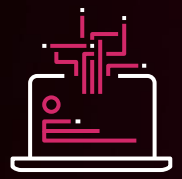
Full control of your data



Support with a path forward, no matter where you are on your observability journey



The ability to support multiple context propagation formats

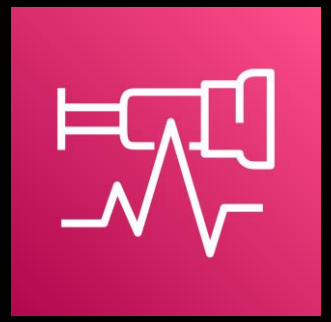


Open-standard semantic conventions to ensure vendor-agnostic data collection

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AWS Distro for OpenTelemetry (ADOT)



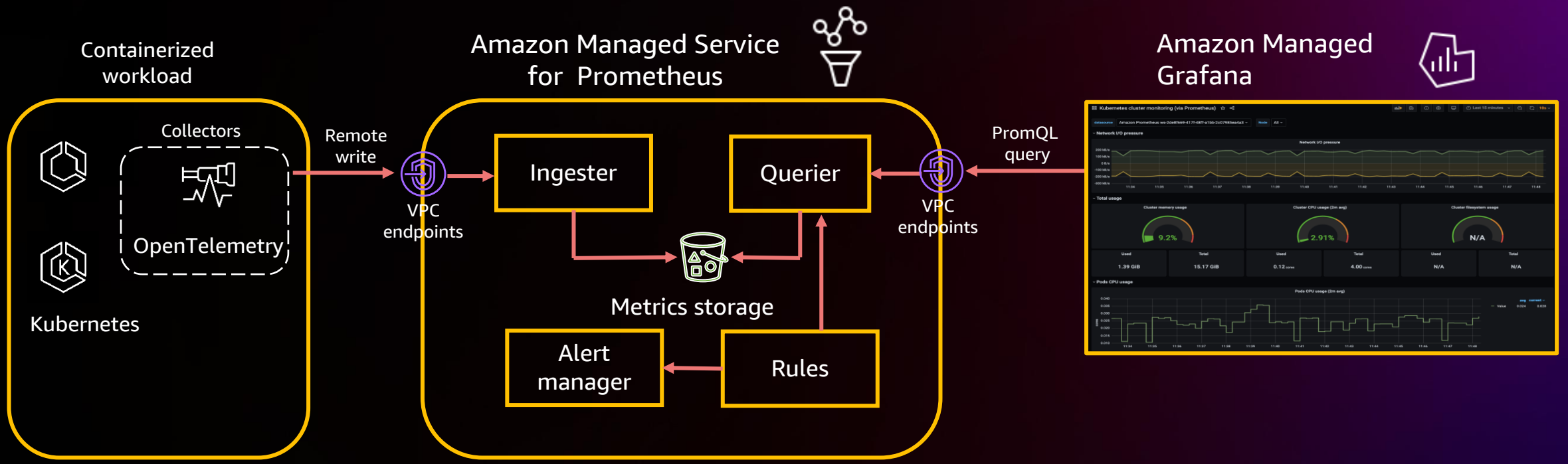
- Secure, production-ready open source distribution supported by AWS
- All code contributions from AWS are in OpenTelemetry
- Certified by AWS for security and predictability

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Amazon Managed Service for Prometheus & Amazon Managed Grafana

EXAMPLE USE CASE: UNIFIED CONTAINER MONITORING



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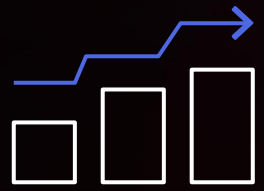
What's new?



Security and compliance

Amazon Managed Service for Prometheus: designed to be SOC and ISO compliant

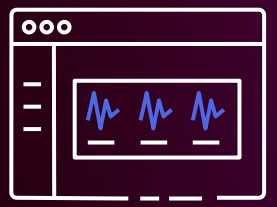
Amazon Managed Grafana: secure access to VPC sources



Scale

Amazon Managed Service for Prometheus: 200M active series per workspace

Amazon Managed Grafana: 10K users per workspace



Single pane of glass

One step onboarding

Amazon Managed Grafana now supports Prometheus alerts

Amazon Managed Grafana: Dashboard across on premises, cloud, VPC data sources

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Amazon Managed Service for Prometheus – WBD's 2022 highlights

- Vended metrics to Amazon CloudWatch
- Vended logs for Alert Manager
- NEW Cost attribution – Native Kubecost support in Amazon EKS
- NEW Configurable storage retention
- NEW AWS Controllers for Kubernetes

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Amazon OpenSearch Service

SECURELY UNLOCK REAL-TIME SEARCH, MONITORING, AND ANALYSIS OF OPERATIONAL DATA

Fully managed

A managed service that makes it easy to **deploy, operate,** and **scale OpenSearch** and OpenSearch dashboards

Open source

Community-driven, open-source **search and analytics suite** derived from Apache 2.0 licensed Elasticsearch 7.10.2 and Kibana 7.10.2

Highly available

Self-healing, 24/7 monitoring, Multi-AZ with a click, automatic backups, AWS support available, metrics in Amazon CloudWatch

Highly secure

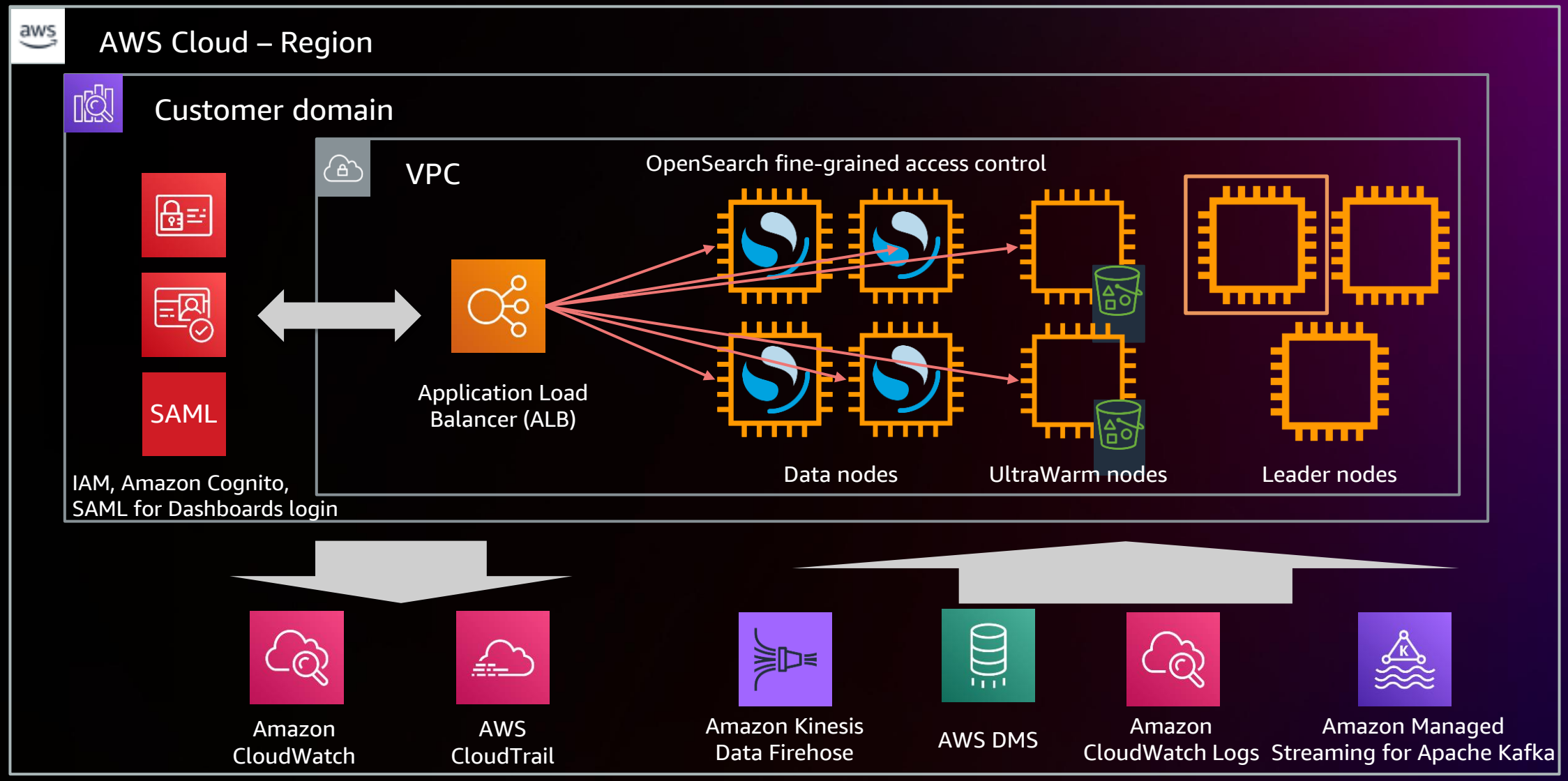
Encryption at-rest and in-transit. Network isolation with Amazon VPC and fine-grained access control

Feature rich

Built-in integrations across ingest, monitoring, security, and visualization

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Amazon OpenSearch Service architecture



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Amazon OpenSearch Service – WBD's 2022 highlights

- UltraWarm – Low cost, long-term retention
- Graviton2 instances
- NEW gp3 volume type
- NEW Cross-cluster search
- NEW OpenSearch 2.3 - Lucene 9.1, New algorithms to the machine learning (ML) commons library

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Anatomy of logging-as-a-service



Data collection
FluentD



Event stream
Kinesis + Kinesis
Data Firehose



Data store 1
OpenSearch

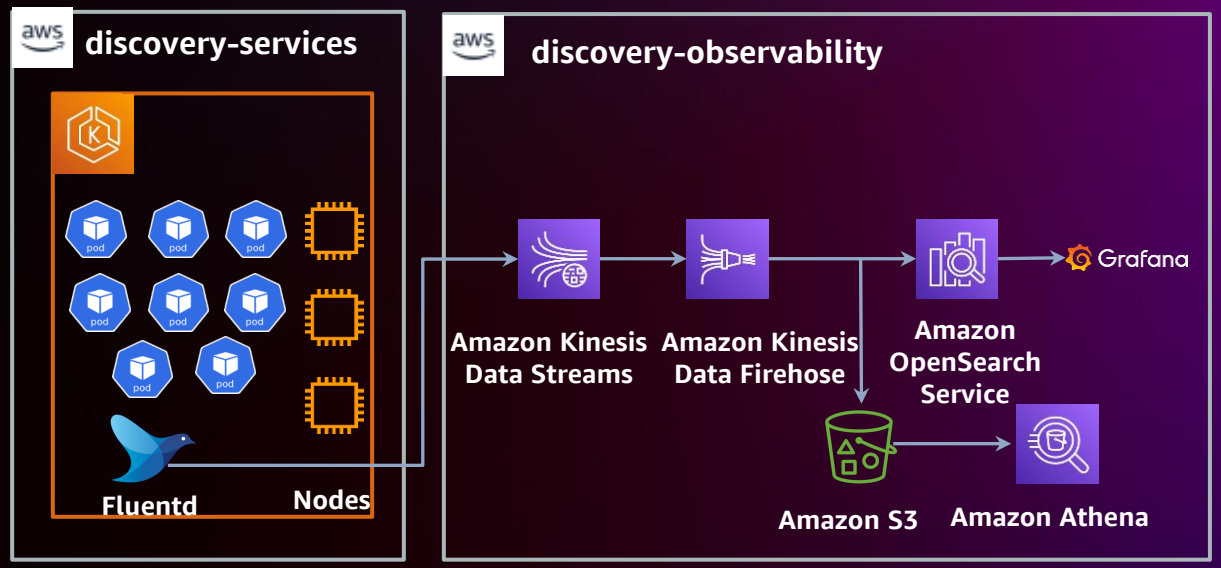


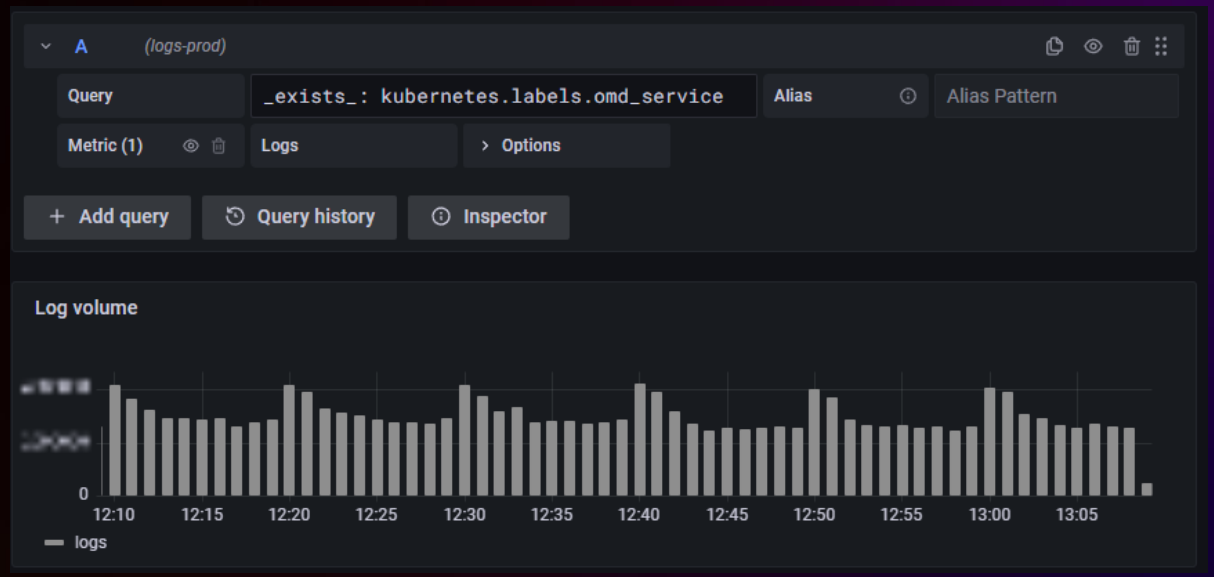
Data store 2
Amazon S3

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Logging-as-a-service solution

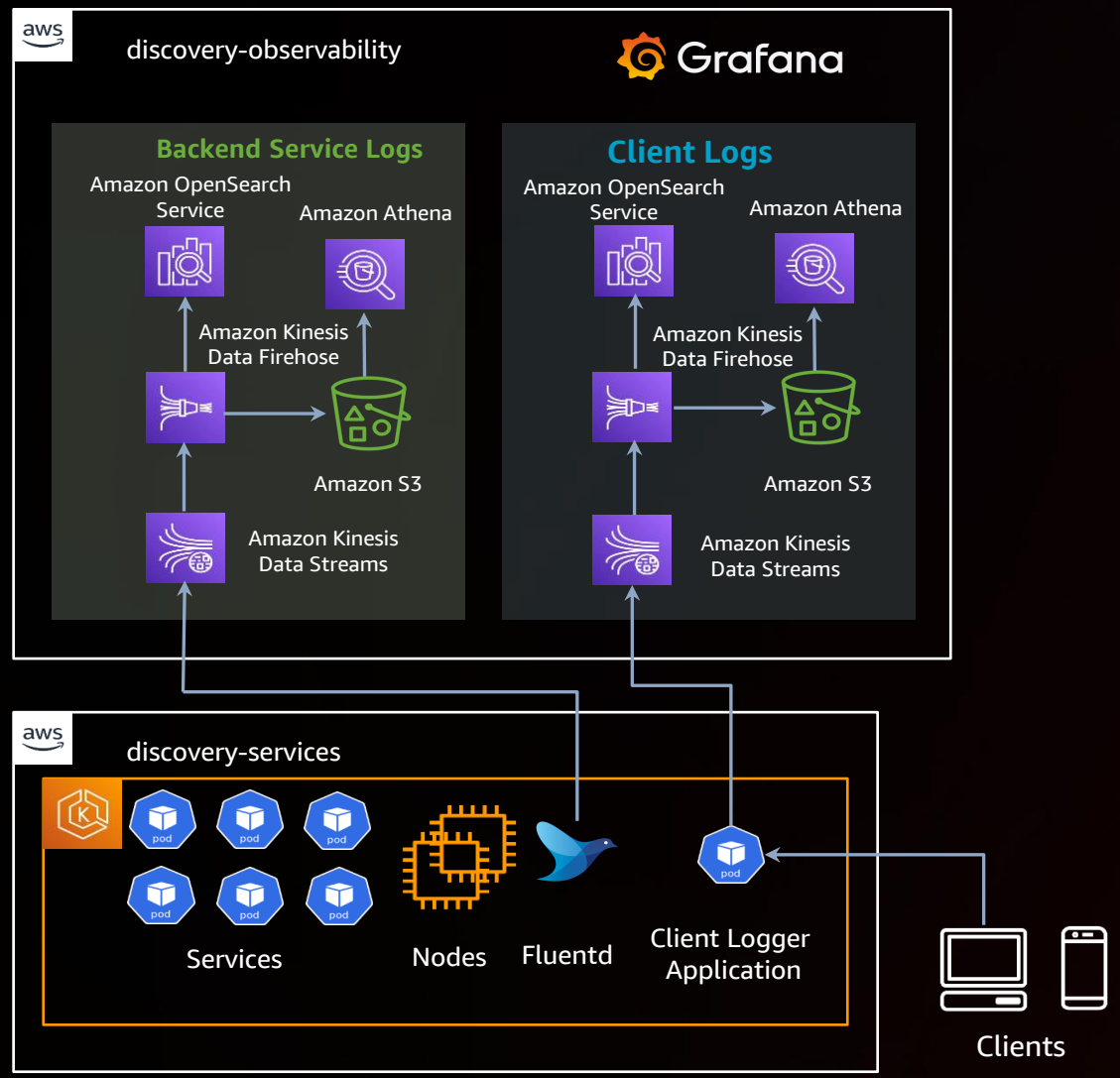
- ✓ All operational data must be relatable
- ✓ We must “own” our data
- ✓ Open source over proprietary offerings
- ✓ Managed over self-hosted
- ✓ Flexible deployments and partitioning
- ✓ Regulation compliant





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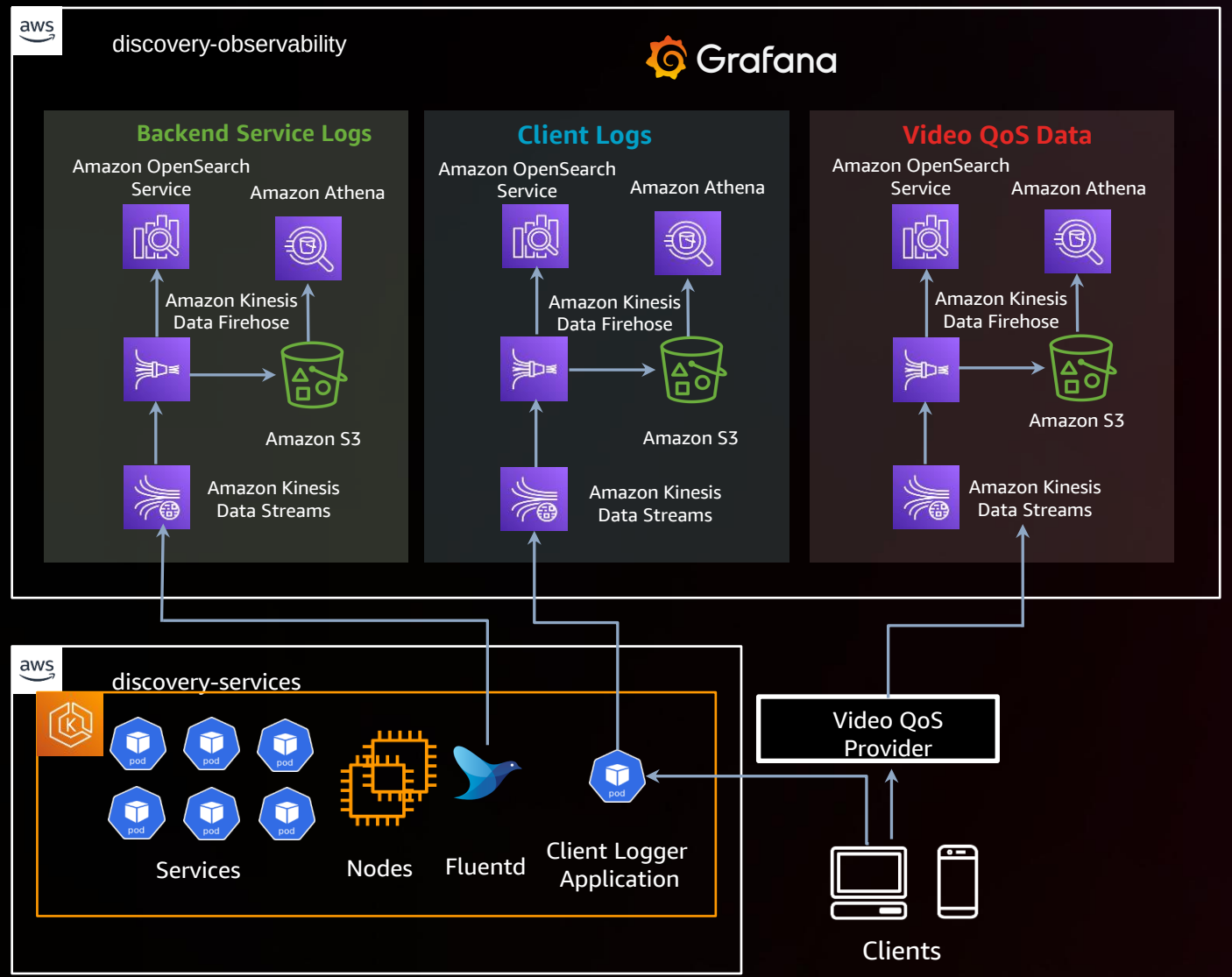
Scaling & expansion – logging use cases



The pattern worked so… we expanded by providing a client-side logging capability

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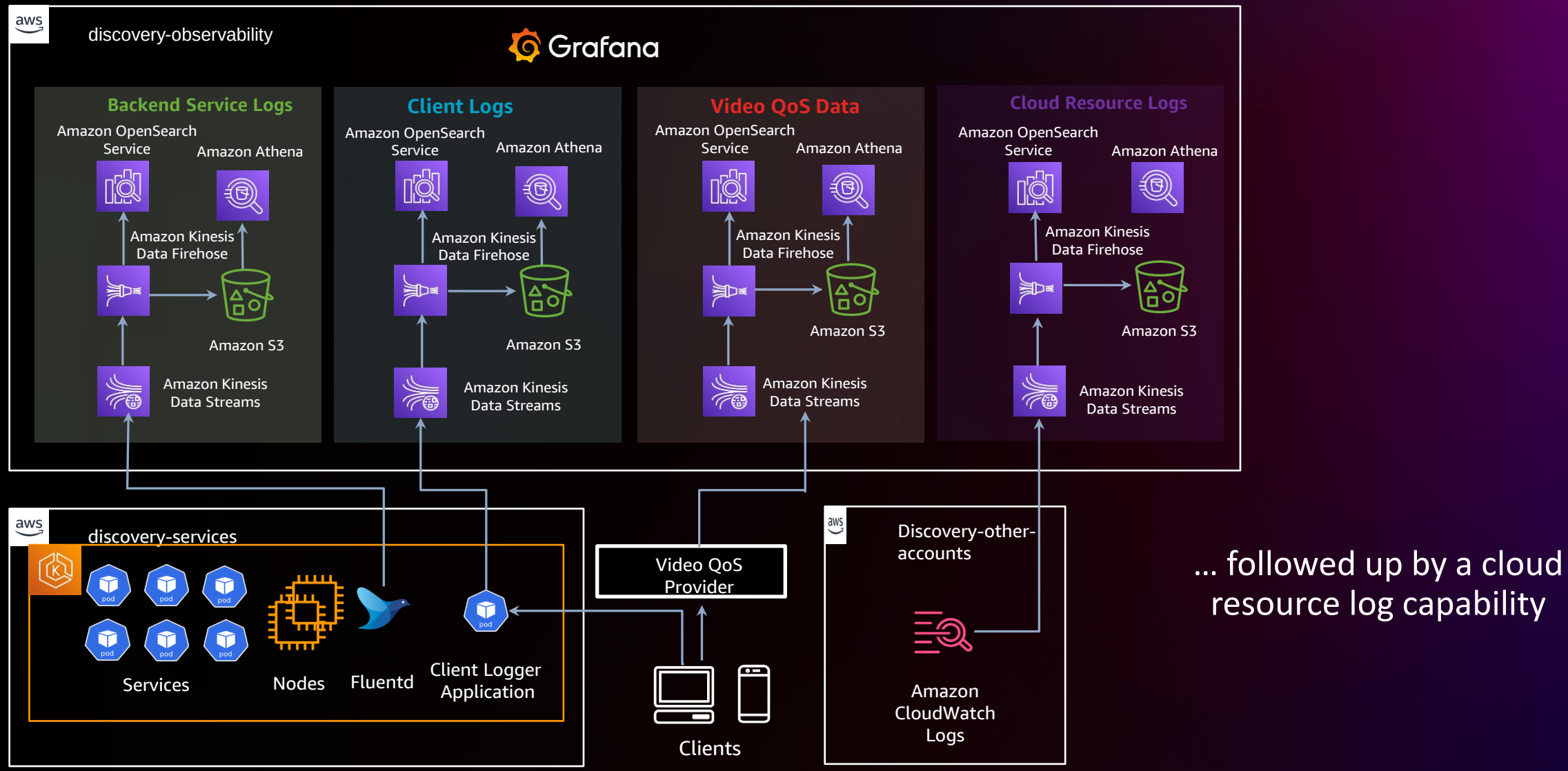
Scaling & expansion – logging use cases



… and then a video quality of service capability

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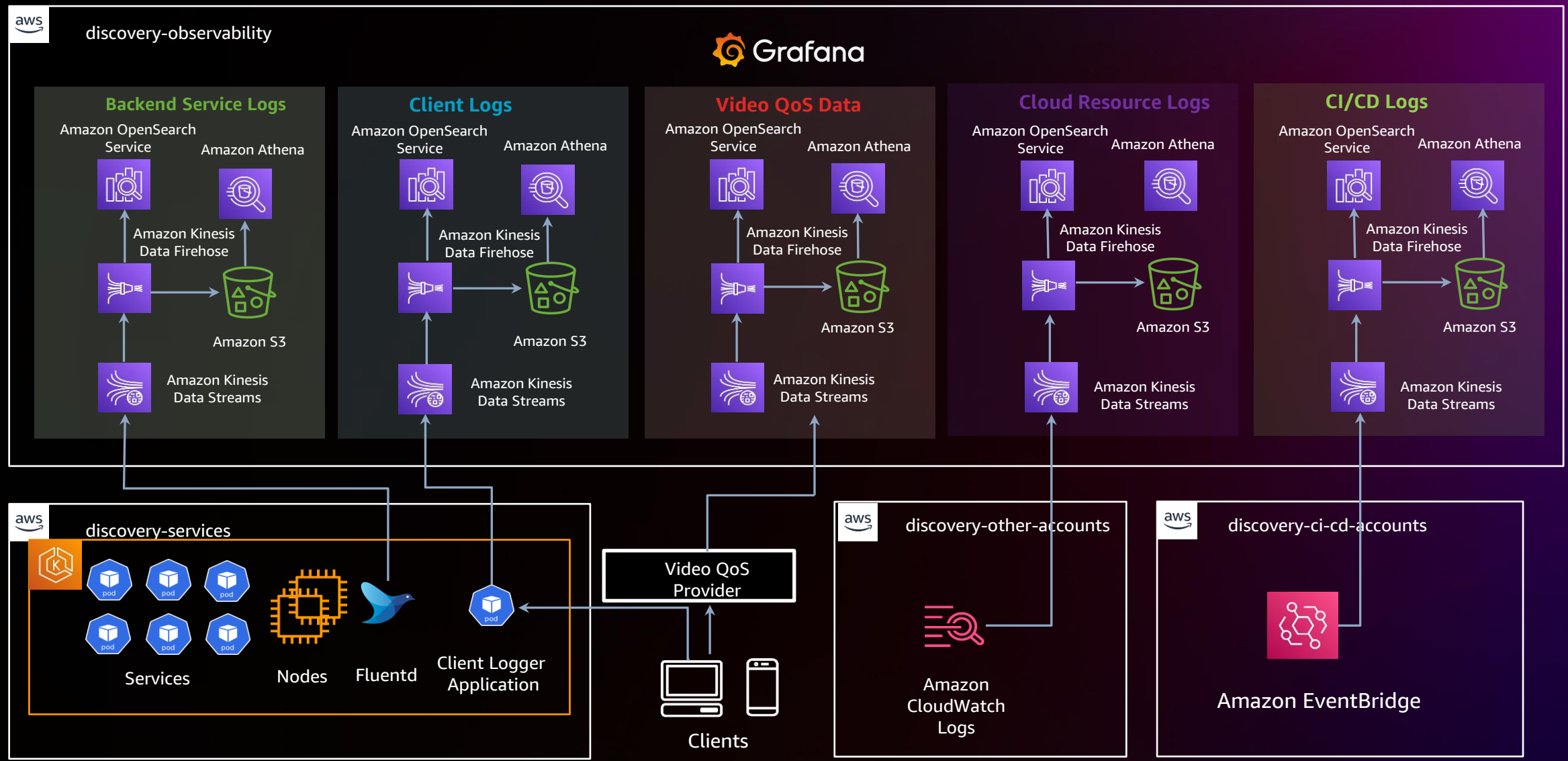
Scaling & expansion – logging use cases



… followed up by a cloud resource log capability

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Scaling & expansion – logging use cases



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Anatomy of metrics-as-a-service



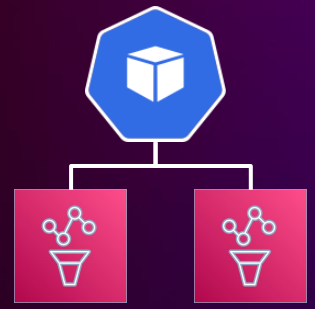
Data collection



Amazon Managed Service for Prometheus



Visualization Grafana OSS



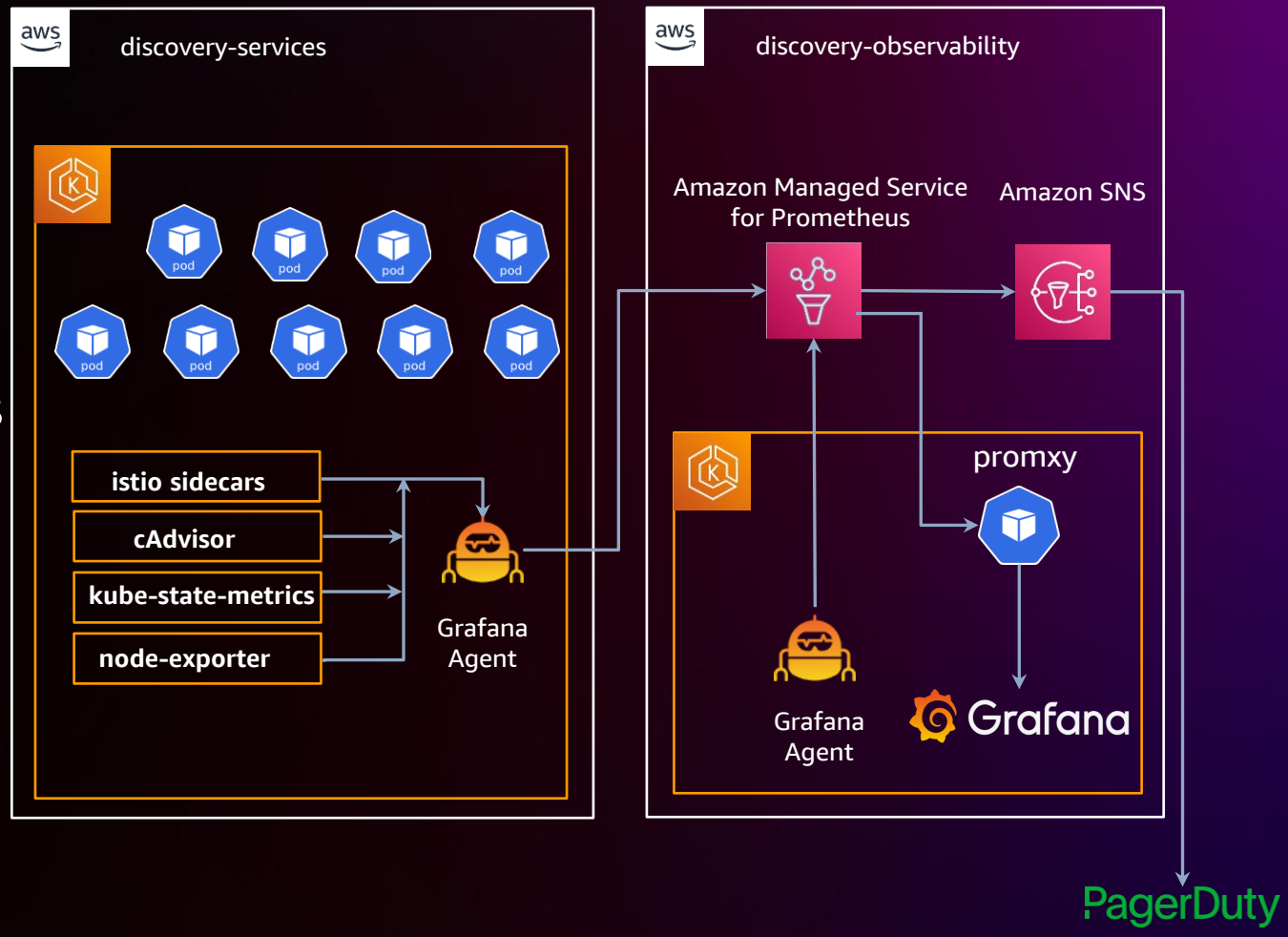
Query federation promxy

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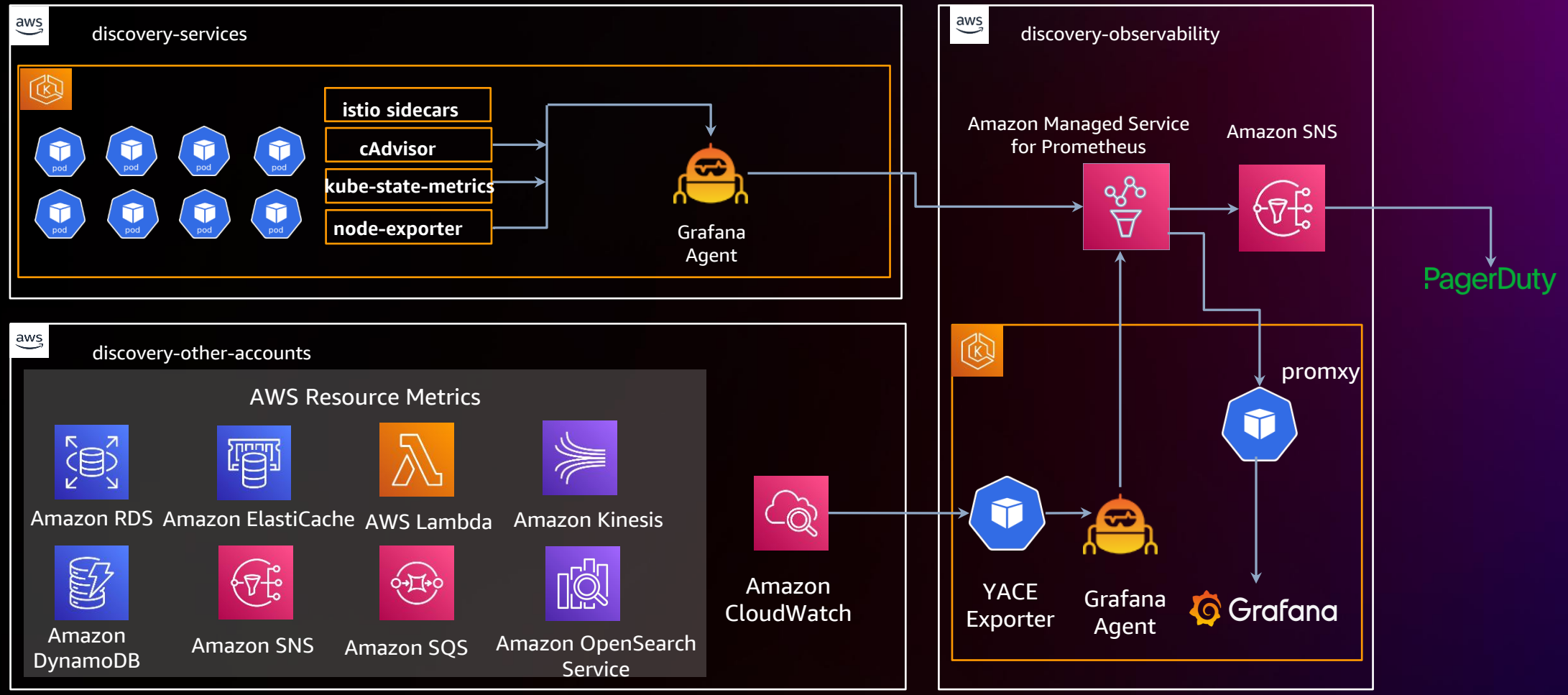
Metrics-as-a-service

- ✓ All operational data must be relatable
- ✓ We must “own” our data
- ✓ Open source over proprietary offerings
- ✓ Managed over self-hosted
- ✓ Flexible deployments and partitioning
- ✓ Regulation Compliant



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Scaling & expansion – metrics use cases



For full unification – resources outside of Amazon EKS needed to be considered as well

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Scaling operations – log & metric insights

Logging-as-a-service

1. Growth in data ingest: 6 → 12 TB/d
2. Avg log query latency: 20ms

Metrics-as-a-service

1. Metrics generated per day: 7.3M
2. Alerts triggered per day: 100,000
3. Queries per day: 700,000

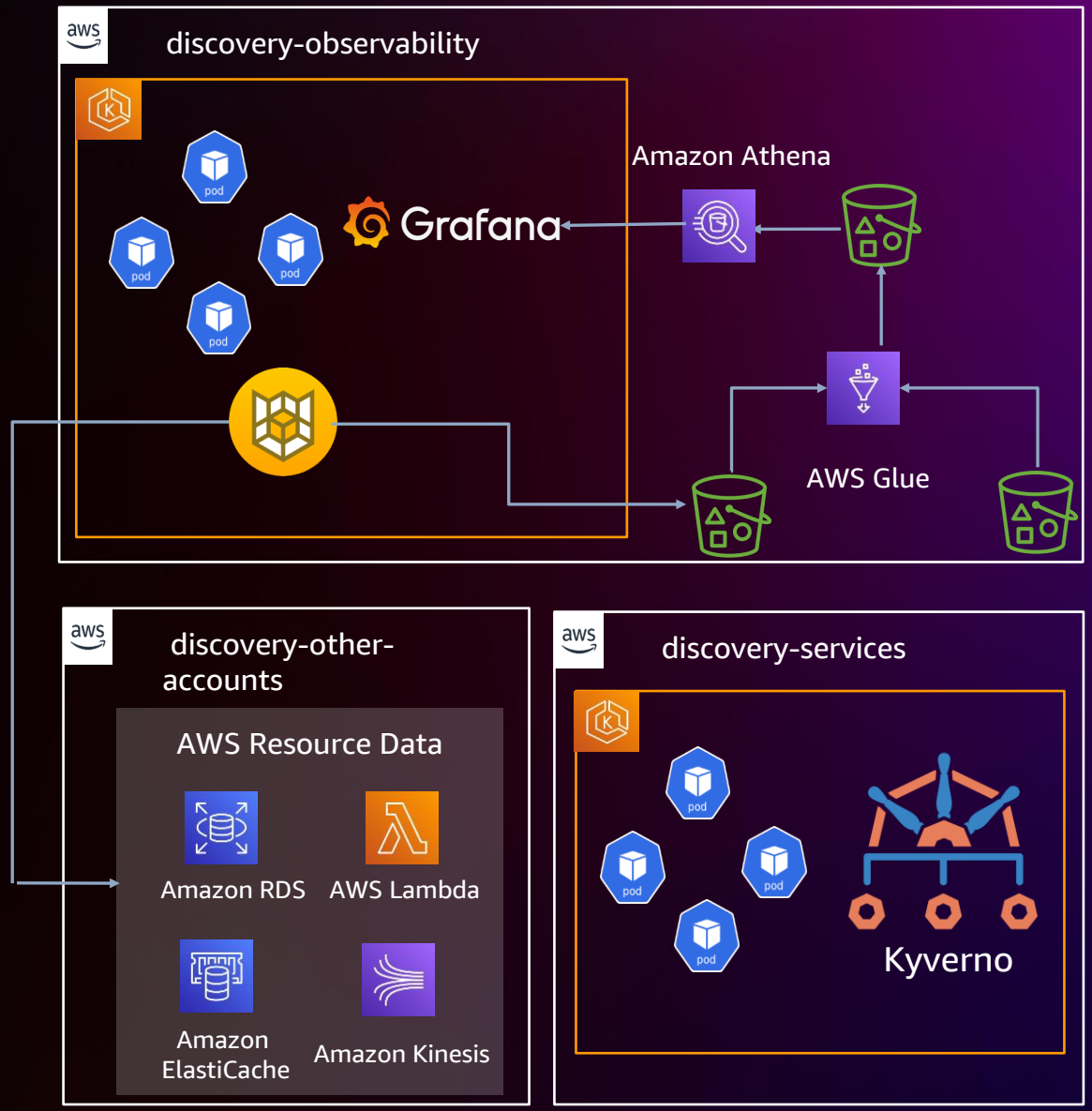
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Scaling insights – cloud resource catalog

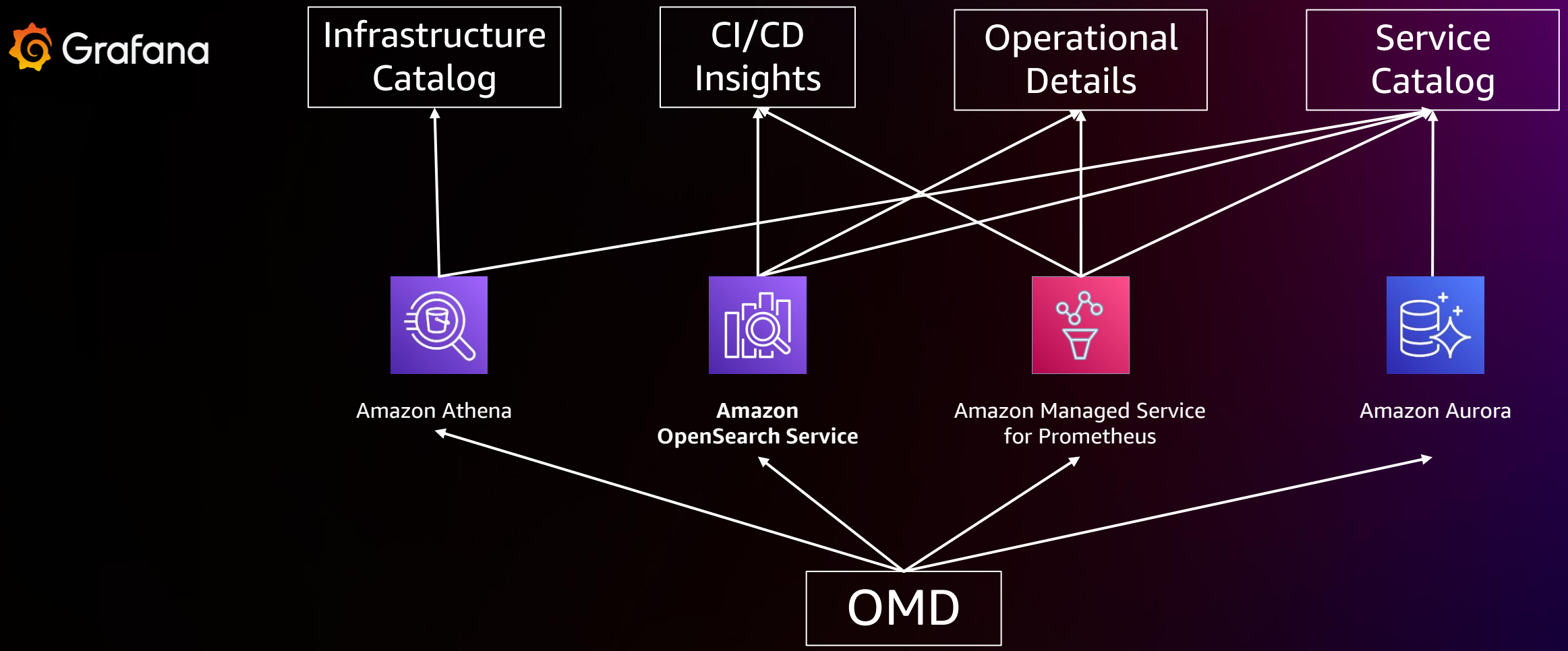
Capabilities

1. Tagging policy enforcement
2. Cloud and Kubernetes Resource Registry
3. Aligns these resources to OMD classification
4. > 150,000 resources scanned per day



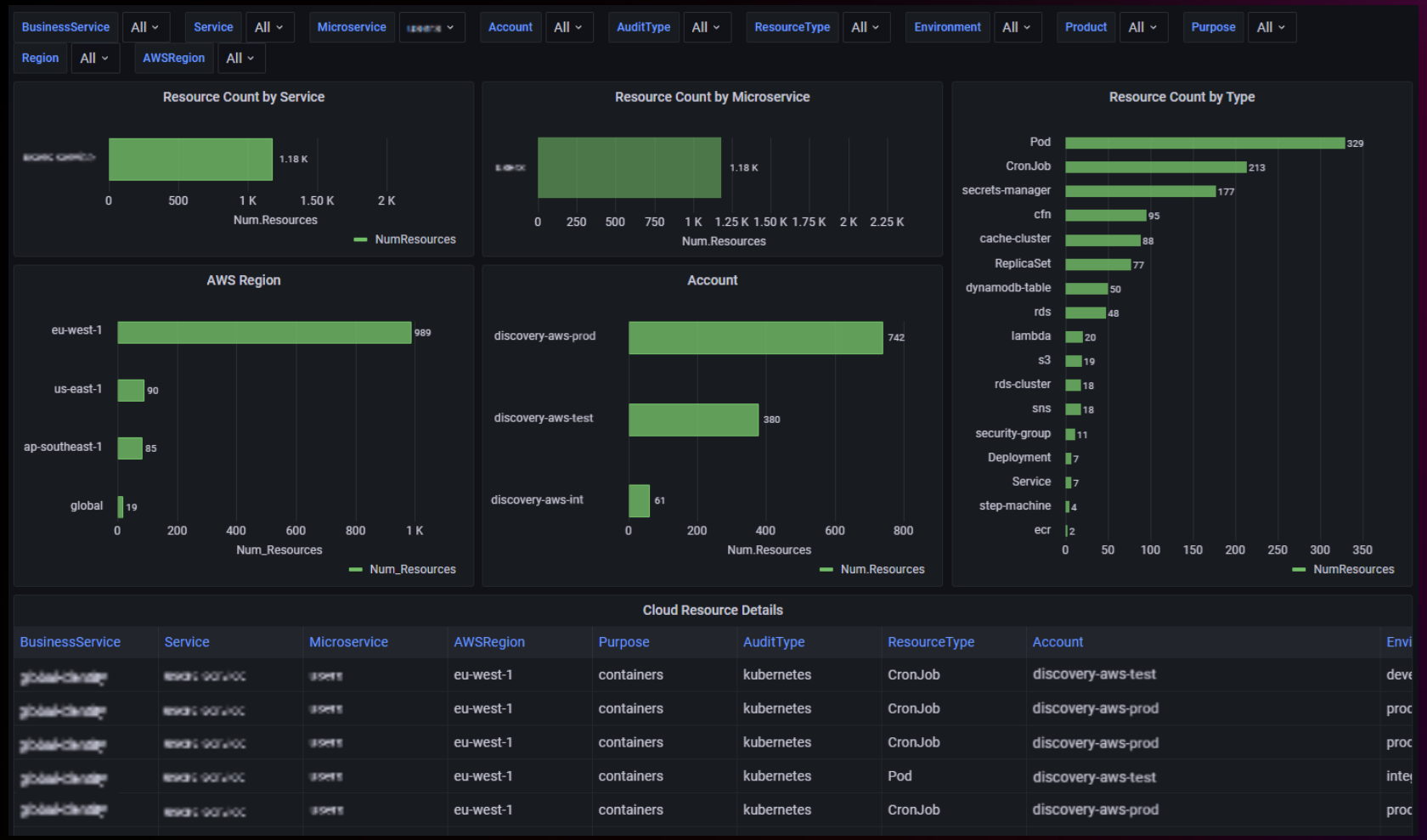
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The Observability Platform



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The infrastructure catalog



All of a service's AWS and Kubernetes resources on one page

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Standardized operational dashboards



Out of the box views of 150+ metrics/logs for any service from day 0

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CI/CD Insights



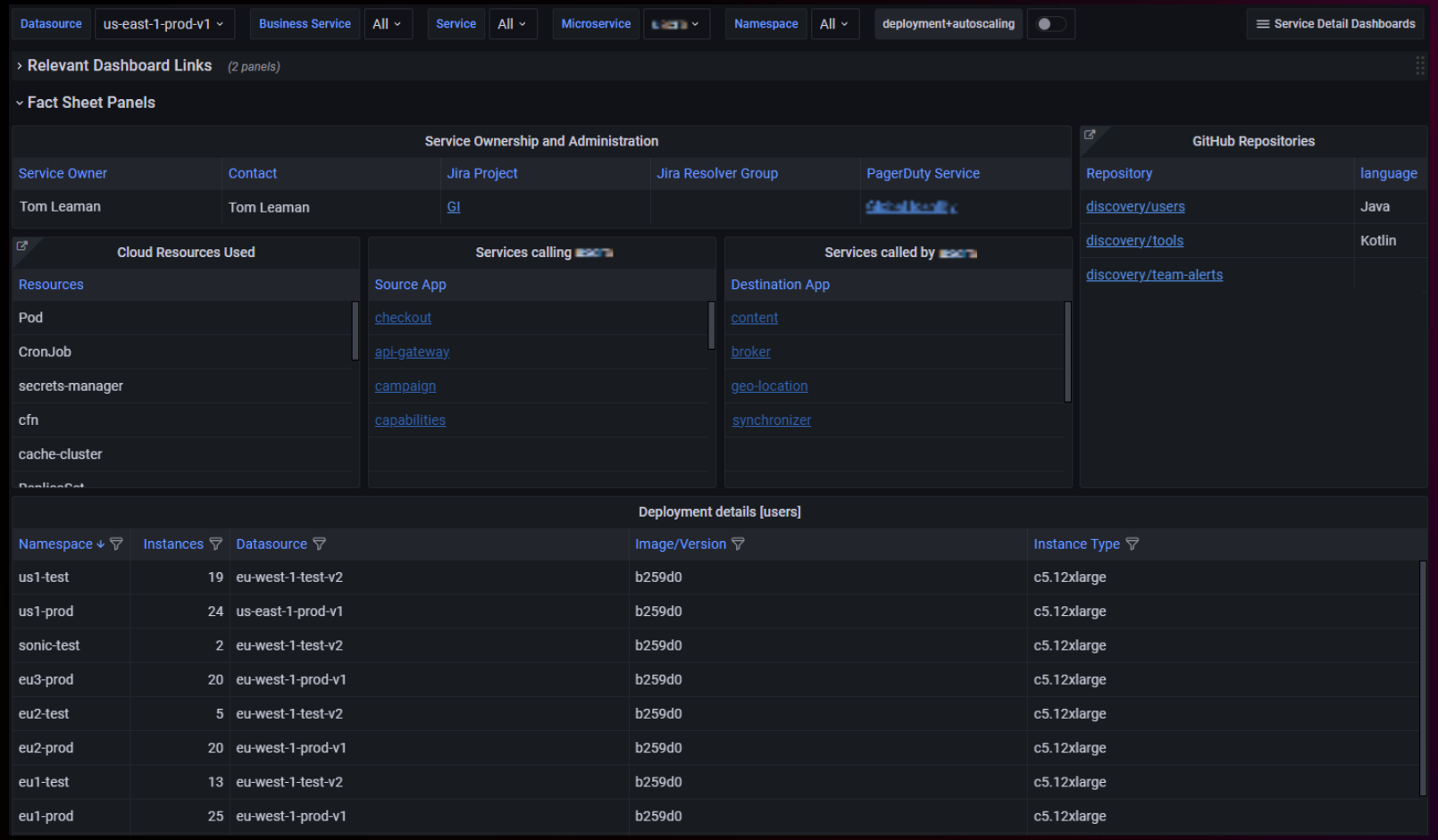
Job Execution Details

time	Service	Component	Action	Activity	Status	Duration (s)	detail.metric.labels.wo
2022-11-25 16:37:39	hello-world-java	greeter	3550814760	test	success	57	
2022-11-25 16:36:21	hello-world-java	greeter	3550814760	build-and-push	success	118	build
2022-11-25 16:36:17	hello-world-java	greeter	3550814760	test	success	90	
2022-11-25 16:34:47	hello-world-java	greeter	3550814760	operational-checklist	success	15	
2022-11-25 16:32:49	hello-world-java	greeter	3550814760	build-and-push	cancelled	42	build
2022-11-25 16:32:46	hello-world-java	greeter	3550814760	test	cancelled	24	

All build and deploy activity across our portfolio

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Service Catalog - unifying every data source



Operational detail sourced from Amazon Managed Service for Prometheus, OpenSearch, Athena, and more

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What’s next?

1. Log-to-metric conversion
2. Kubernetes cost attribution via Kubecost
3. OpenTelemetry backed distributed tracing
4. OpenSearch cross-cluster search optimizations
5. Multi-tenant resource metering

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Key takeaways

1. Govern your operational data
2. Minimize the interfaces and query languages in operations
3. Leverage managed offerings for flexibility, scalability, and reliability
4. Provide “out-of-the-box” solutions to prevent “re-inventing the wheel”

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Key takeaways – AWS observability

Amazon Monitoring and Observability sessions at re:Invent

Amazon Managed Service for Prometheus

Amazon Managed Grafana

Amazon OpenSearch Service

AWS Distro for OpenTelemetry

EKS Observability Accelerator

Kubecost integration with Amazon Managed Service for Prometheus

Speed up Highly Available Deployments on Kubernetes

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Thank you!



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