



aws INNOVATE

DATA EDITION

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Observability made easy with Amazon OpenSearch Service

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Agenda

- Why observability is important to organizations today?
- Foundations for observability
- Observability reference architecture
- Observability ecosystem with Amazon OpenSearch Service
- Demo
- Summary
- Resources

What are your organization's goals?



Grow new
revenue streams



Improve operational and
financial efficiency



Lower business risk

**“Everything fails,
all the time.”**

—Dr. Werner Vogels, Amazon CTO



The (hidden) cost of downtime



Monetary impact

Average hourly cost downtime per year



Time impact

Avg. no. of hours of downtime per year

Interruptions to IT operations

Opportunity loss, cost
of not doing business

Penalties of not meeting
customer SLAs

Brand alienation

Monitoring more than failures



Is it behaving
as expected?



What is the usage?



What is the
business impact?

Operational insights to business outcomes



Get visibility



Troubleshoot
in real time



Build highly-
resilient apps

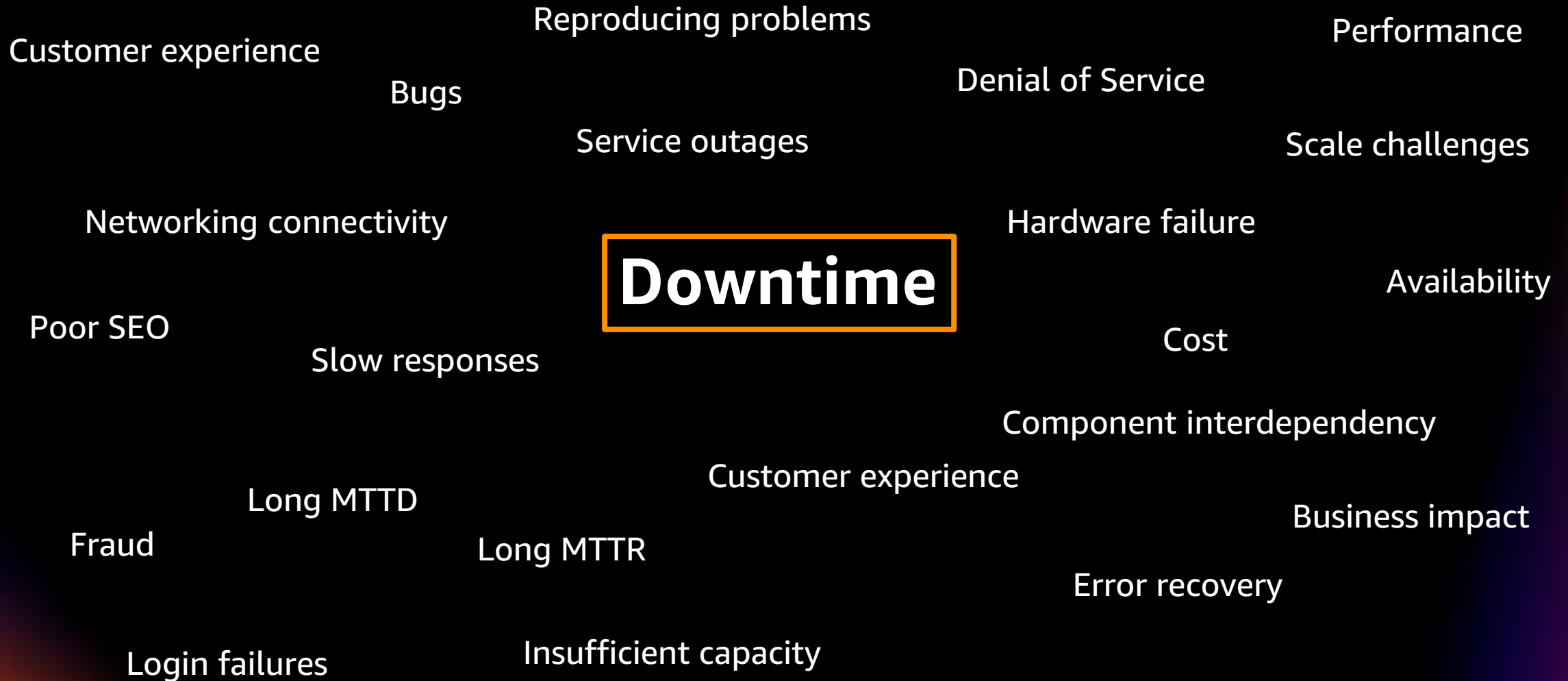


Improve customer
experience

Operational

Business

Why Observability



What is “Observability?”

The act of *collecting and analyzing* data from applications and infrastructure so that you can *understand* their internal states and be *alerted to, troubleshoot,* and *resolve issues* with application availability and performance.

What is the goal of observability?

Improve the overall *end-user*
experience with your applications
and services

Foundation for observability: data drives decisions



Metrics



Traces



Logs



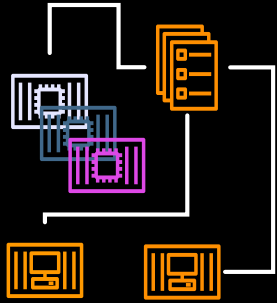
AWS monitoring and observability services help you maintain SLAs by **detecting, investigating, and remediating problems** to achieve

Availability

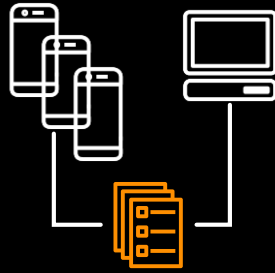
Reliability

Performance

Emerging observability use cases



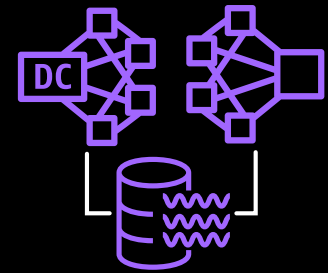
Microservices
and containers



Digital
experience
monitoring



AI/Ops and
DevOps



Data lakes

Operational mechanics of observability

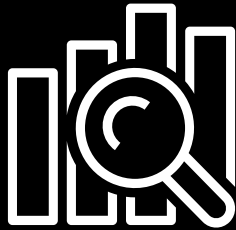


Observability with Amazon OpenSearch service

Amazon OpenSearch and OpenSearch dashboards



- OpenSearch is a **community-driven, open source** search and analytics suite derived from Apache 2.0 licensed Elasticsearch 7.10.2 & Kibana 7.10.2.
- It consists of a search engine, **OpenSearch**, and a visualization and user interface, **OpenSearch Dashboards**.
- Amazon OpenSearch enables people to **easily ingest, secure, search, aggregate, view, and analyze data** provided by logs, metrics and traces
- Amazon OpenSearch **provides observability, anomaly detection, and alerting plugins** that enable you to easily identify and react to issues in your solutions

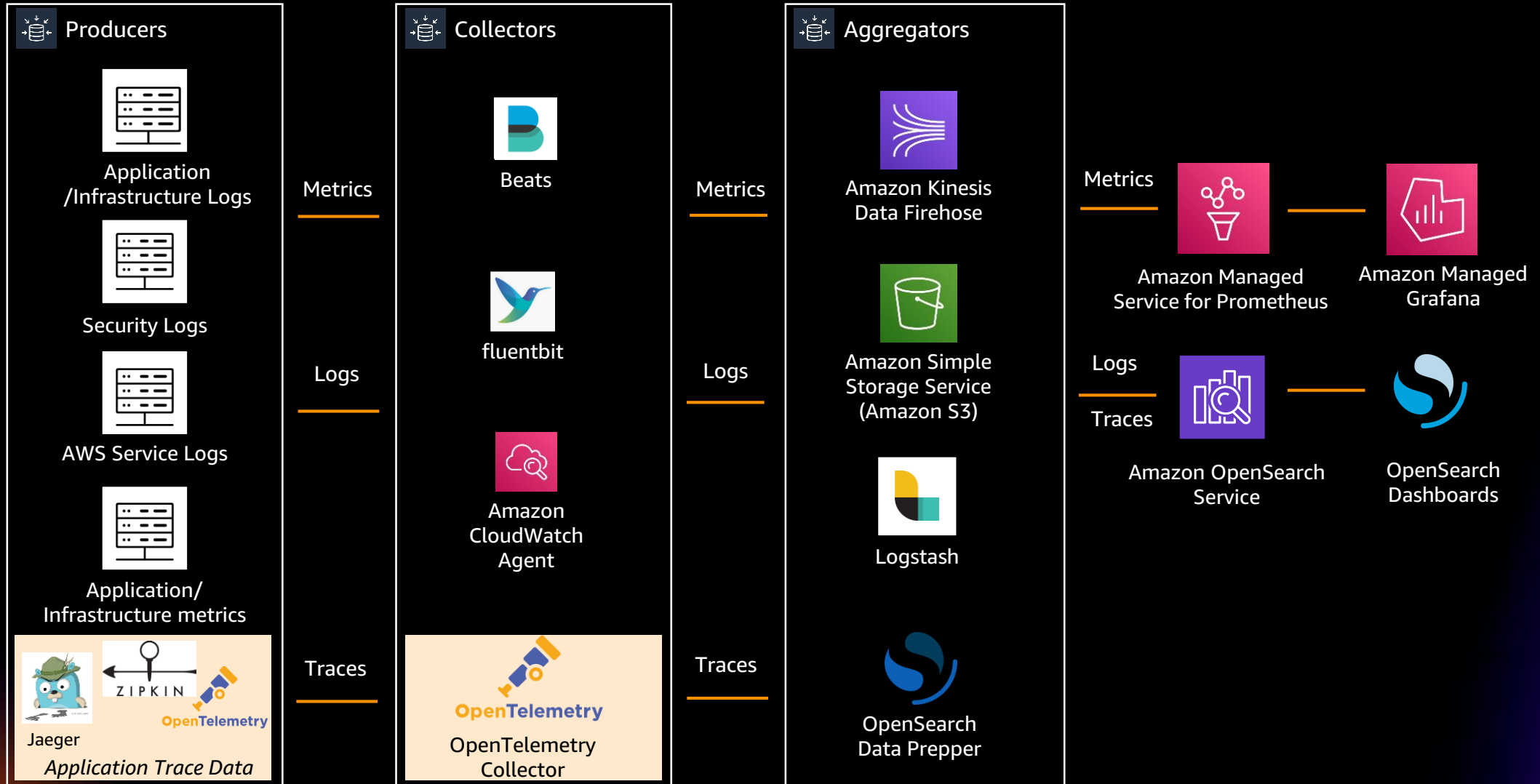


Amazon OpenSearch Service

Amazon OpenSearch Service

A managed service that makes it easy to **deploy, operate** and **scale OpenSearch** and legacy Elasticsearch clusters on the AWS Cloud

Observability reference architecture



OpenSource instrumentation and transformation



- OpenTelemetry is a **community-driven, open source** project designed for the **creation and management** of *telemetry data* such as **traces, metrics, and logs**
- Supports many popular open-source wire formats including **Jaeger, Zipkin, and Prometheus**
- **Currently supports** traces (GA), metrics (preview), and logs (experimental)



- Fluent Bit is a **community-driven, open source** super fast, lightweight, and highly scalable logging and metrics processor and forwarder
- Plugin based ecosystem that **collects, filters, transforms and augments** data for logs, metrics and traces.
- **Extensible** and integrates with Prometheus, OpenSearch, Amazon CloudWatch, Amazon X-Ray, Amazon S3, Amazon Kinesis Data Streams and other AWS managed open source offerings



- Data Prepper is a **community-driven, open source** data collector for processing observability data
- Provides features to **filter, enrich, transform, normalize, and aggregate data** for downstream analytics and visualization
- Currently supports **processing of distributed trace data and log ingestion** with plans to support metric data in the future
- Integrations with **Jaeger, Zipkin, OpenTelemetry, and Fluentbit**

Prometheus



Prometheus



- Prometheus is a **community-driven, open source** systems monitoring and alerting toolkit
- Prometheus collects and stores its **metrics** as time series data alongside optional key-value pairs called labels.
- It consists primarily of a **Prometheus server**, **Alertmanager**, and a **Pushgateway**. Visualization is typically handled by Grafana
- Prometheus enables you to gain insights from numeric measurements monitored over time

Amazon Managed Grafana

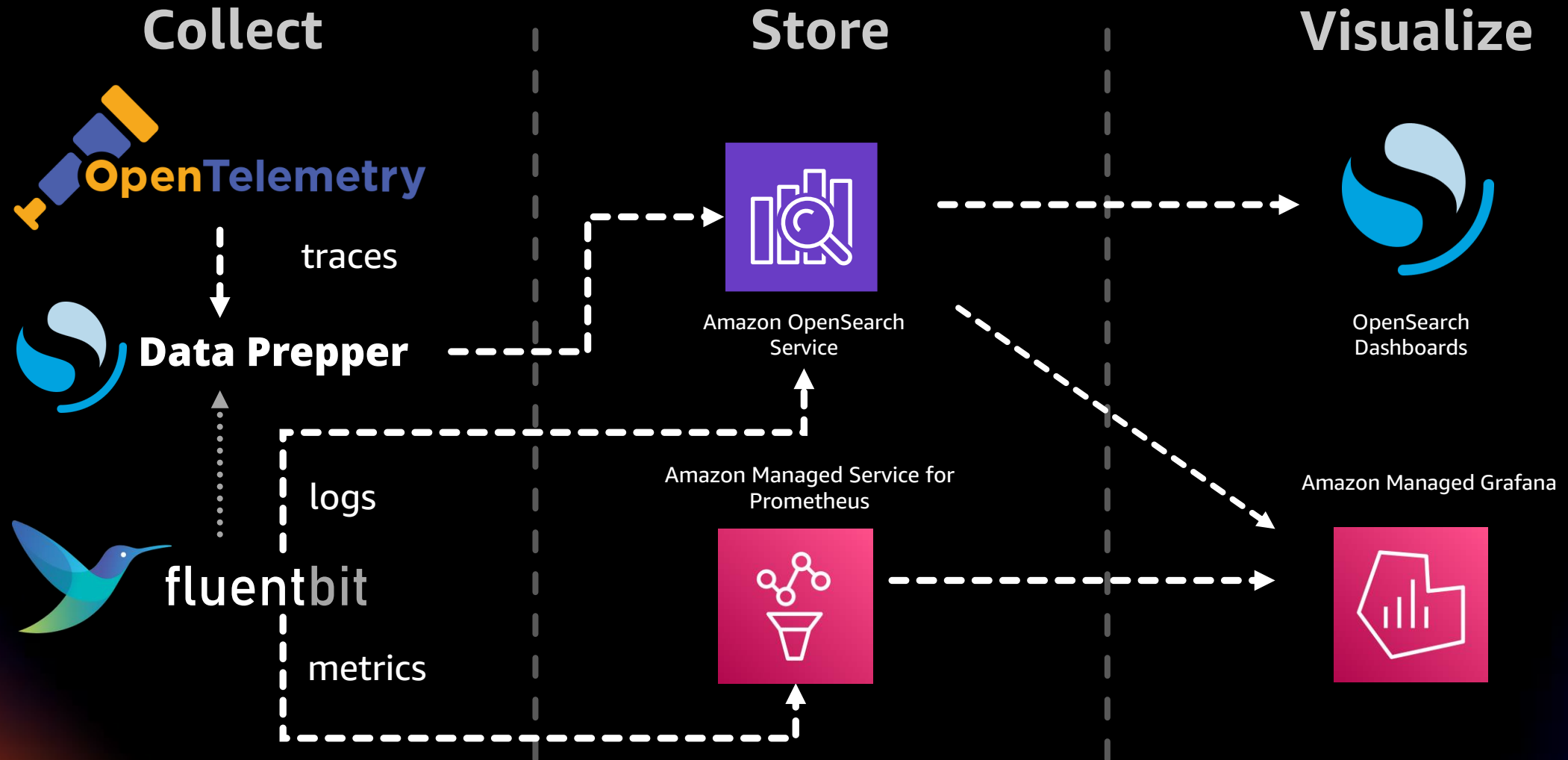
A secure, production-ready open source distribution supported by AWS



Amazon Managed Service
for Grafana

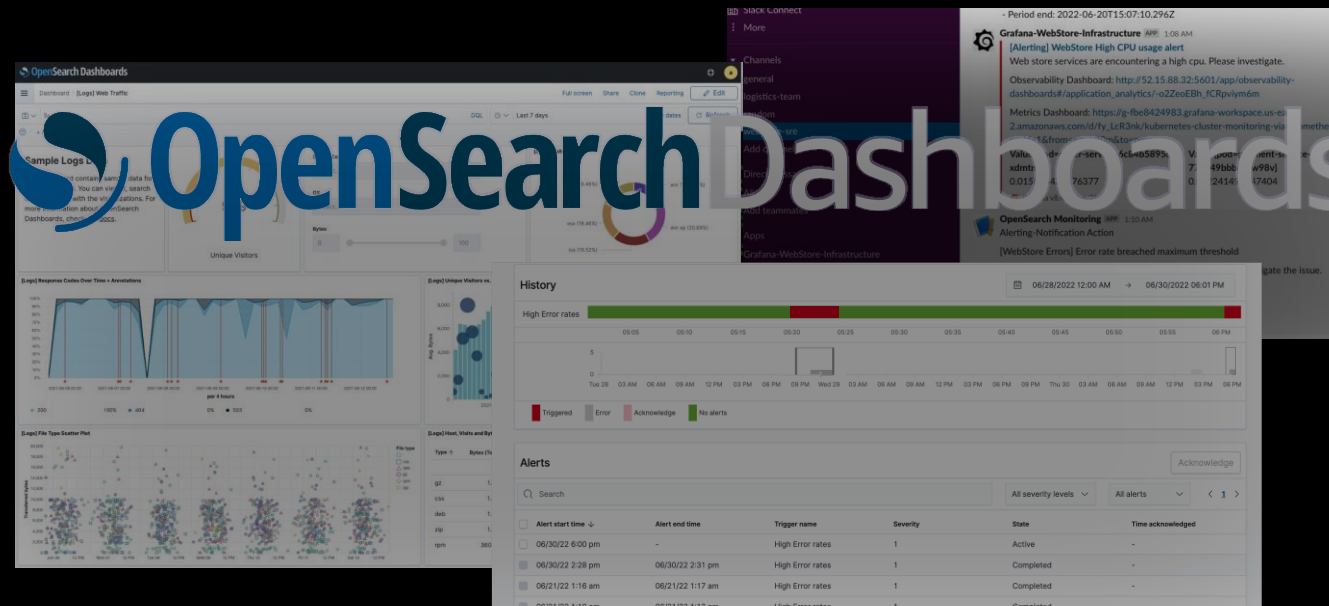
- Developed in collaboration with Grafana labs
- Sources: Amazon OpenSearch Service, Amazon Managed Service for Prometheus (AMP), AWS X-Ray, Amazon CloudWatch, Amazon TimeStream
- Secure connection with data sources and a deep security model for dashboard access
- Pre-built dashboards to support fast access to insights

Observability architecture



Observability with Amazon OpenSearch Service

Metrics monitoring & alerting



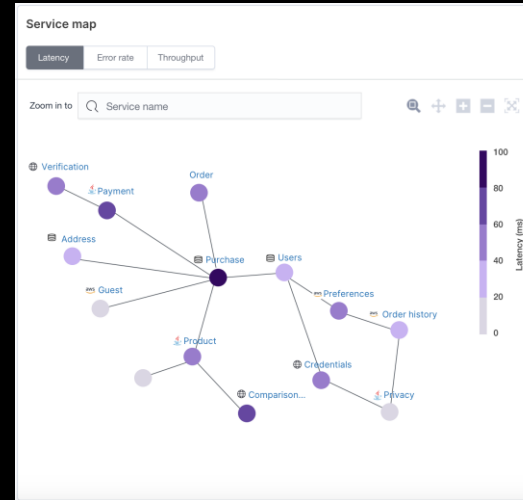
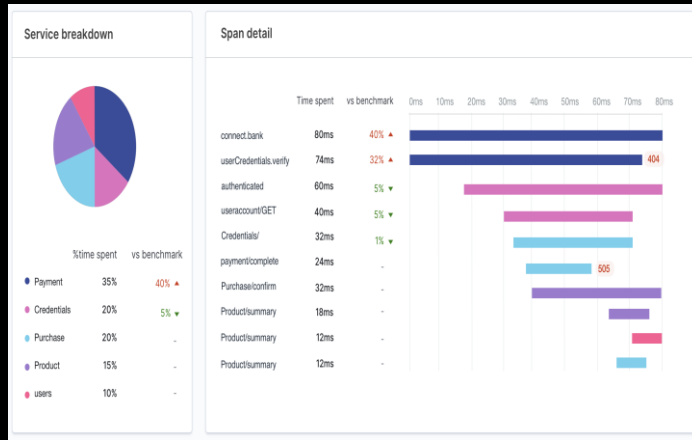
OpenSearch Dashboard



Grafana

- Analyze, monitor, and alarm on log data
 - Provides anomaly detection feature
 - Supports multiple notification destinations
- Analyze, monitor, and alarm across multiple metric data sources; native AWS as well as 3rd party
 - Supports multiple notification destinations

Trace analytics



Latency by trace group

< 95th percentile

>= 95th percentile

Benchmark

This time last week

▼

Trace group name	Latency variance ↴	Average latency (ms)	Average latency vs benchmark	24-hour latency trend	Error rate	Traces
	020406080					
MakePayment.auto	<div><div></div><div></div></div>	45	30% ▲	<div><div></div><div></div></div>	20%	1,500
Order.confirmation	<div><div></div><div></div></div>	48	5% ▼	<div><div></div><div></div></div>	1%	2,000
MakePayment.oneoff	<div><div></div><div></div></div>	42	30% ▲	<div><div></div><div></div></div>	2%	1,200
Product.comparison	<div><div></div><div></div></div>	40	5% ▼	<div><div></div><div></div></div>	3%	1,000
Purchase.buynow	<div><div></div><div></div></div>	60	30% ▲	<div><div></div><div></div></div>	3%	800
MakePayment.auto	<div><div></div><div></div></div>	46	30% ▲	<div><div></div><div></div></div>	2%	900
Order.confirmation	<div><div></div><div></div></div>	64	15% ▼	<div><div></div><div></div></div>	0%	200
MakePayment.oneoff...	<div><div></div><div></div></div>	65	30% ▲	<div><div></div><div></div></div>	10%	400
Product.comparison...	<div><div></div><div></div></div>	43	10% ▼	<div><div></div><div></div></div>	10%	100
Purchase.buynow...	<div><div></div><div></div></div>	28	10% ▼	<div><div></div><div></div></div>	10%	1,100

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Trace-Span details

- Single request performance
- Diagnose root cause

Service Maps

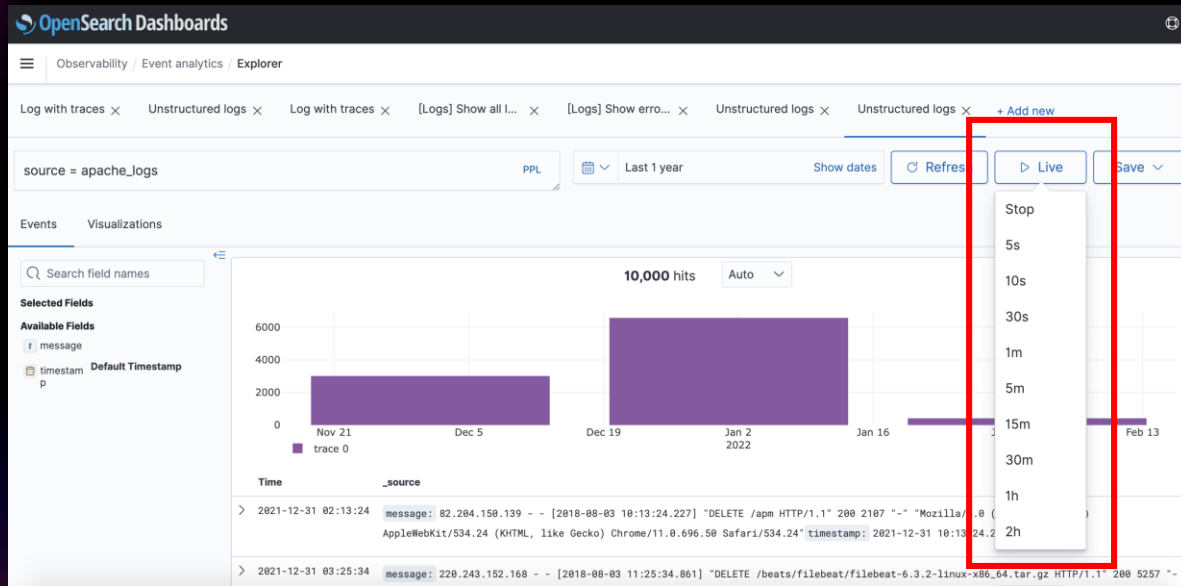
- End-to-end view
- Isolate issues to services

Trace Groups

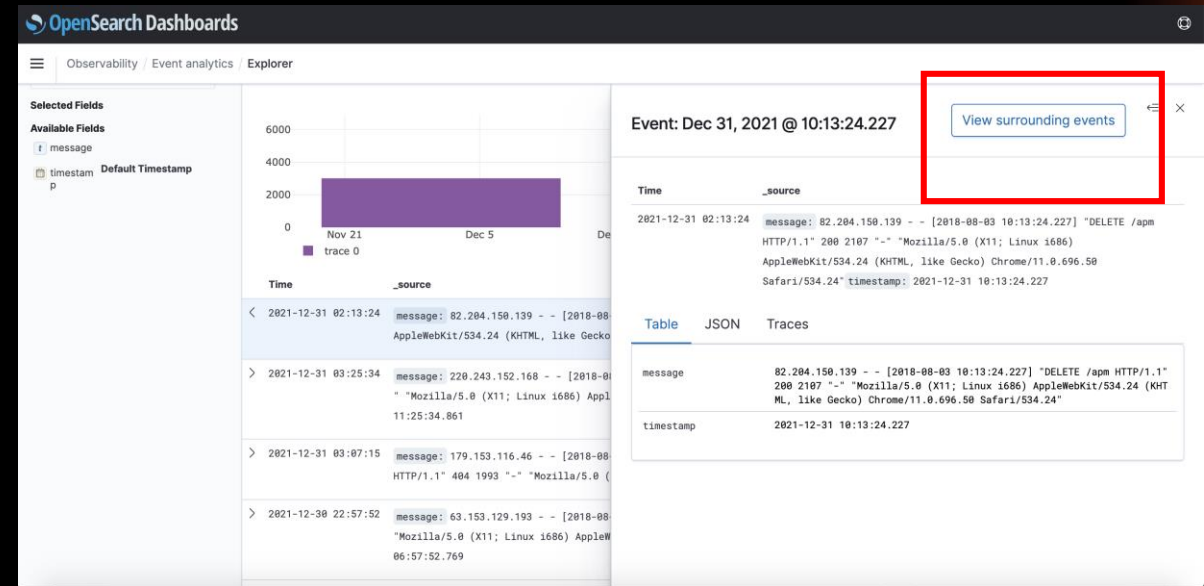
- Monitor performance
- Identify issues early

Log monitoring

Live Tail

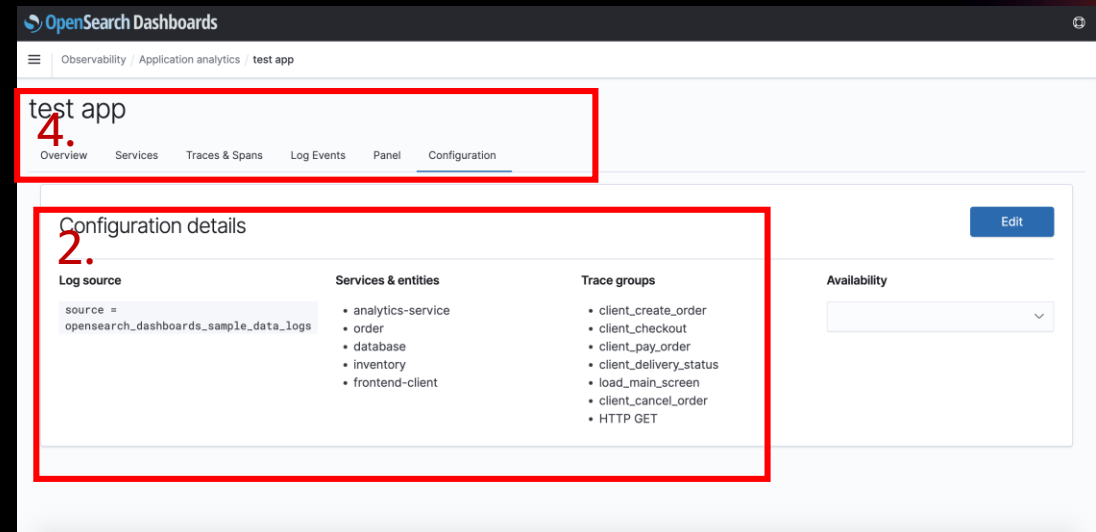
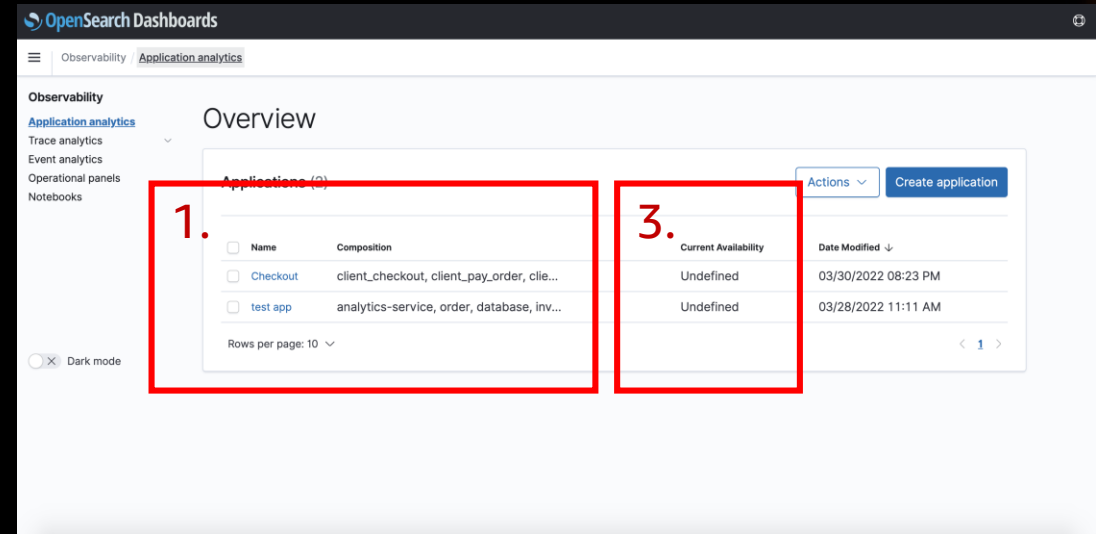


Log Surround



Application analytics

1. Build multiple application views into collected log, trace, and metric data
2. Select log sources, trace groups, or services to be part of each application
3. Monitor application availability
4. Drill into detailed view of traces, services, and logs
5. Easily trace and log events using span-id and trace-id embedded within log events and span details



Demo



Summary

- Observability helps you reduce your downtime by offering faster detection, and investigation
- Metrics, traces and logs are foundational to any observability system
- Amazon OpenSearch and Amazon Managed Service for Prometheus can be combined to build a observability solution
- Amazon OpenSearch offers purpose built features that help detect investigate failures quickly
- Observability is goes beyond application failures and help you build better customer experiences

Other resources

01

Observability is key

To measure and monitor the behavior of distributed applications and infrastructure

[Learn more!](#)

Start your [Amazon OpenSearch Service free trial](#)

02

Flexibility of open source, powered by AWS

Integration with Open Telemetry for trace data
Integration with fluent Bit, Open Telemetry collectors and Data Prepper for log data

03

Enhance monitoring and debugging

Live Tail, Log Surround, Correlation b/w logs and traces, App analytics



Visit the AWS Data resource hub

A modern data strategy can help you manage, act on, and react to your data so you can make better decisions, respond faster, and uncover new opportunities. Dive deeper with these resources today.

- Harness data to reinvent your organization
- In unpredictable times, a data strategy is key
- Make data a strategic asset
- Rewiring your culture to be data-driven
- Put your data to work with a modern analytics approach
- ... and more!



<https://tinyurl.com/data-hub-aws>

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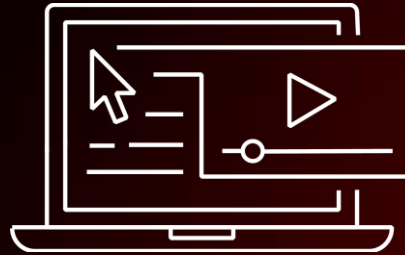
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