AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

OPN313

When life hands you data, grab OpenSearch

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Agenda

- Introduction to OpenSearch
- Distributed tracing with OpenTelemetry
- Labs: Dashboarding and monitoring

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OpenSearch is a fork



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

Consists of a search engine, OpenSearch, and a visualization and user interface, OpenSearch Dashboards, as well as series functionality adding tools and plugins

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Why OpenSearch?

100% open source

Use, modify, monetize

Built in the open

No contributor license agreement

Community driven

Made with your input

Public road map

Welcome contributions

Full featured

Full text search

Analytics

Fast ingest

Machine learning

Security

and more...

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What does it mean for you?



A path forward: Open-source Elasticsearch users can keep advancing

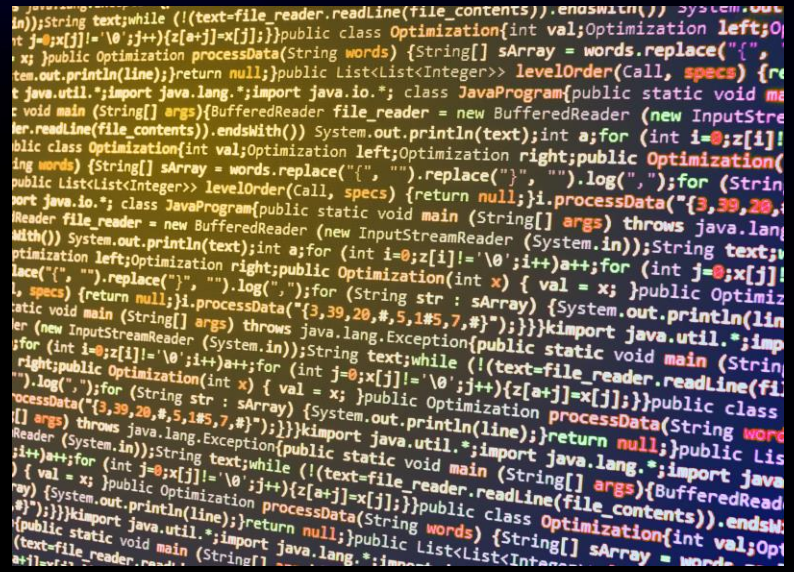
No lock-in: The same software you get from us can be run on-premises or in any other cloud

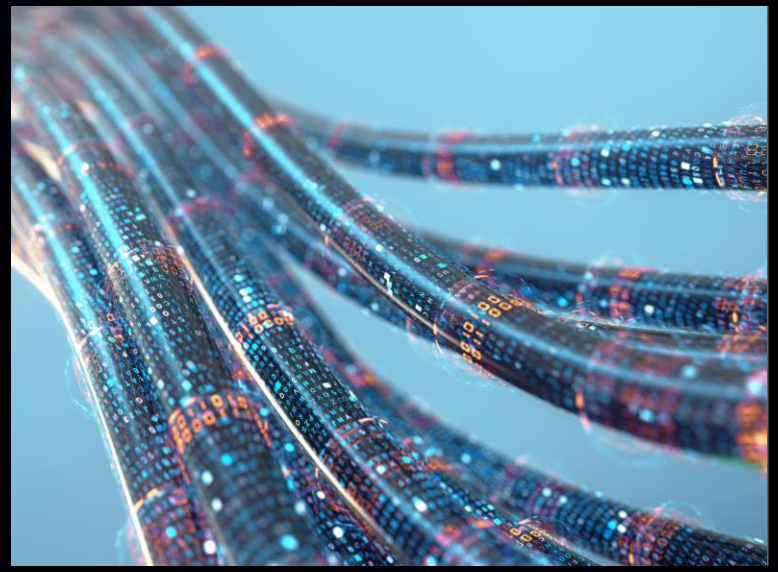
Compatible: No code changes required – including new universal language–specific clients

Innovative: Dozens of new features in just first few releases, including: *Cross-cluster replication, shard-level backpressure, notebooks, data streams, index transforms, bucket-level alerting, and more*

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OpenSearch is a powerful analytics engine







Text search

Natural language

Boolean queries

Relevance

Streaming data

High-volume ingest

Near real time

Distributed storage

Analysis

Time-based visualizations

Nestable statistics

Time series tools

aws

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Machine-generated data is exploding



Applications and services

- Services / microservices
- Web applications
- Business applications
- APIs



IT and DevOps

- Databases
- Load balancers
- Networking
- Servers



IoT and wireless

- Automotive
- Home devices
- Manufacturing
- Mobile applications

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44 zettabytes by the end of 2020

44,000,000,000,000,000,000,000!

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Troubleshooting: Finding a needle in a haystack

```
199.72.81.55 - - [01/Jul/1995:00:00:01 -0400] "GET /history/apollo/ HTTP/1.0" 200 6245
unicomp6.unicomp.net - - [01/Jul/1995:00:00:06 -0400] "GET /shuttle/countdown/ HTTP/1.0" 200 3985
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burger.letters.com - - [01/Jul/1995:00:00:11 -0400] "GET /shuttle/countdown/liftoff.html HTTP/1.0" 304 0
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net-1-141.eden.com - - [01/Jul/1995:00:00:19 -0400] "GET /shuttle/missions/sts-71/images/KSC-95EC-0916.jpg HTTP/1.0"
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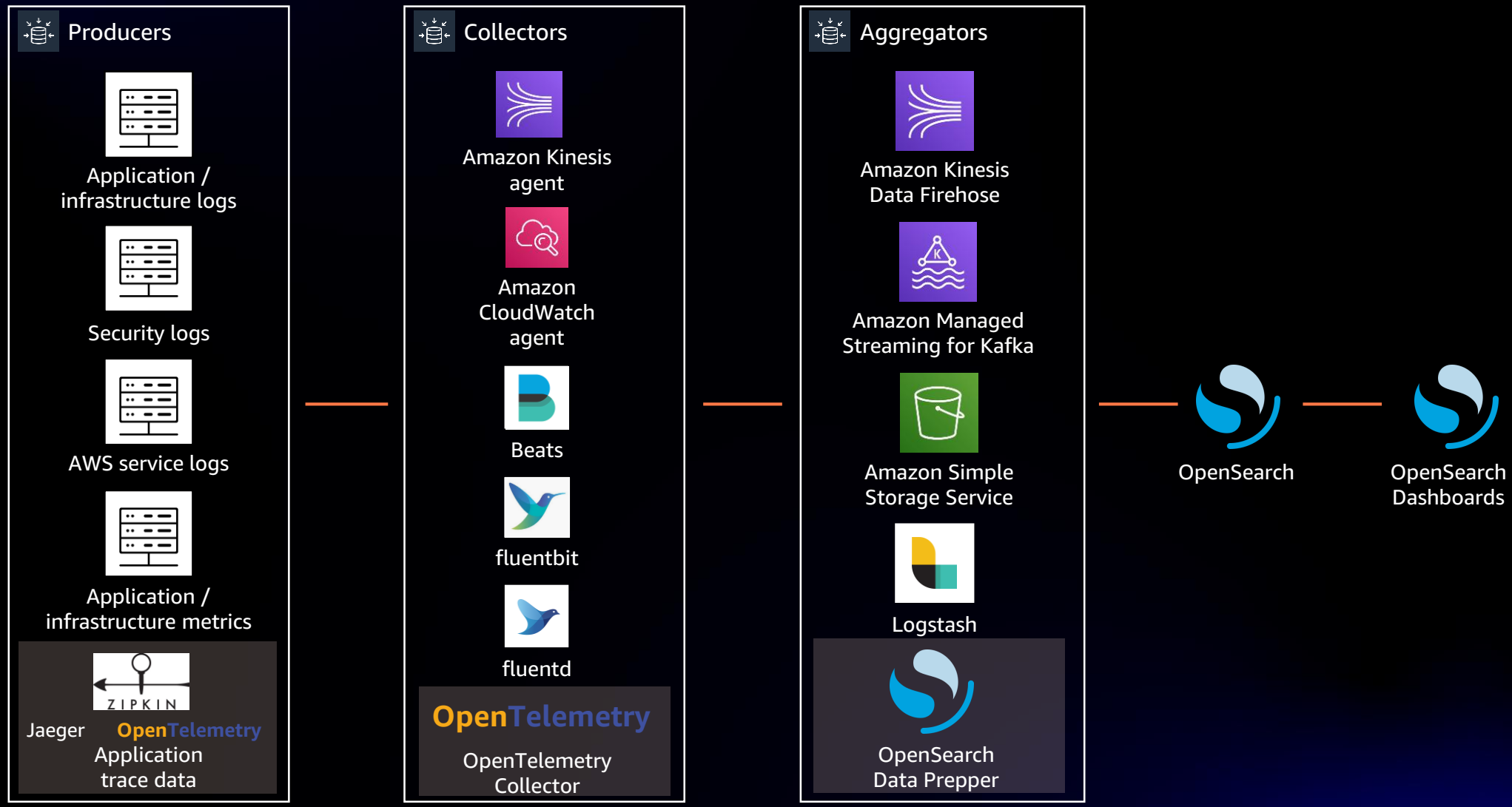
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Distributed Trace Analytics

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Observability data flow



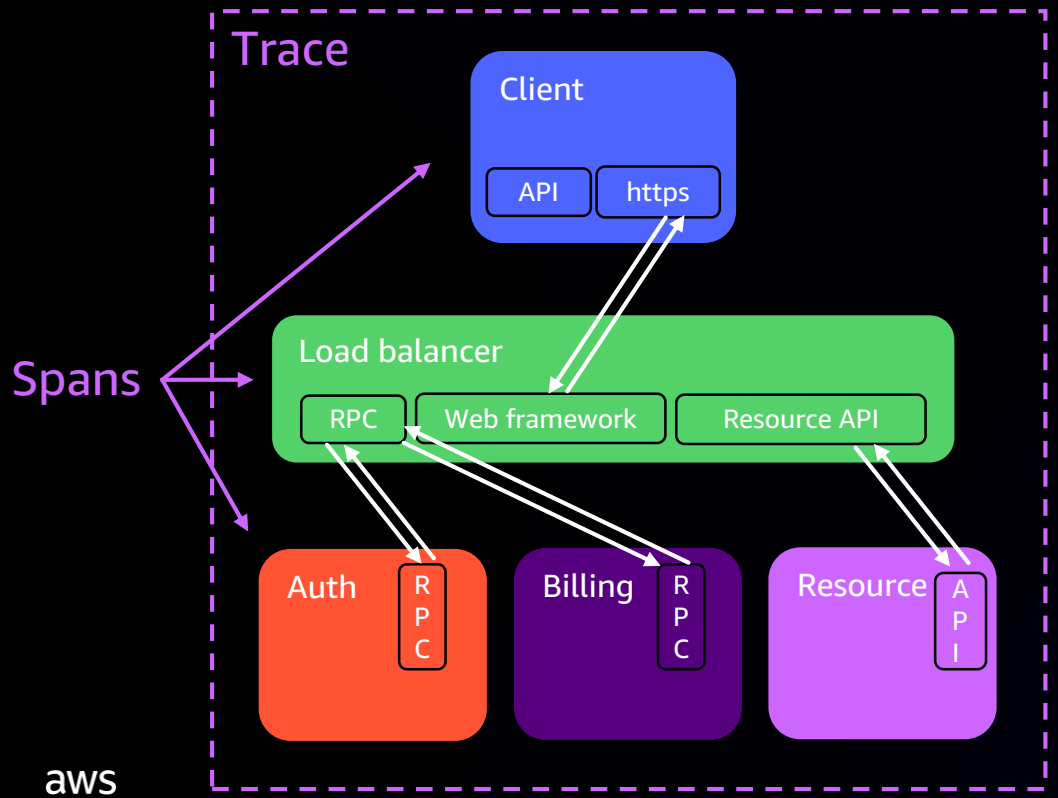
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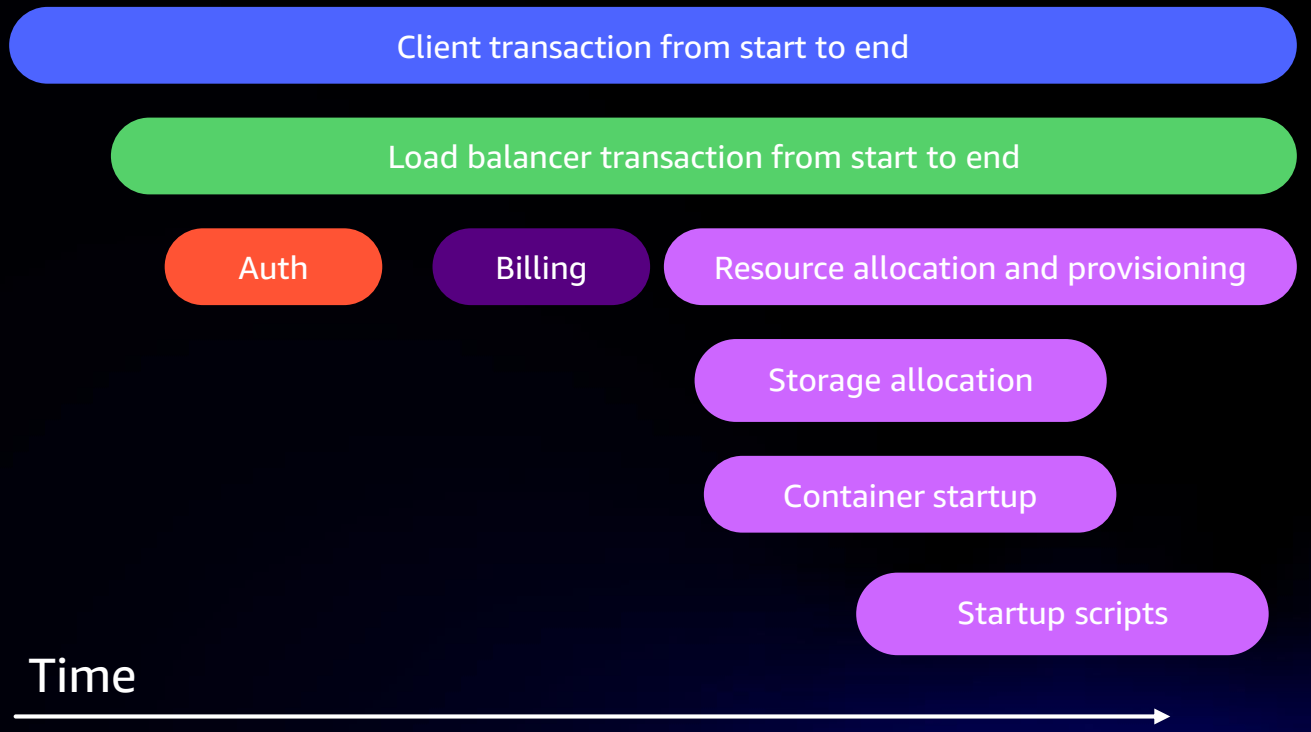
What is distributed tracing?

IDENTIFYING PROBLEMS IN CLOUD APPLICATIONS

A method of observing requests as they propagate through distributed systems

Trace: Hierarchical, end-to-end record of processing a request

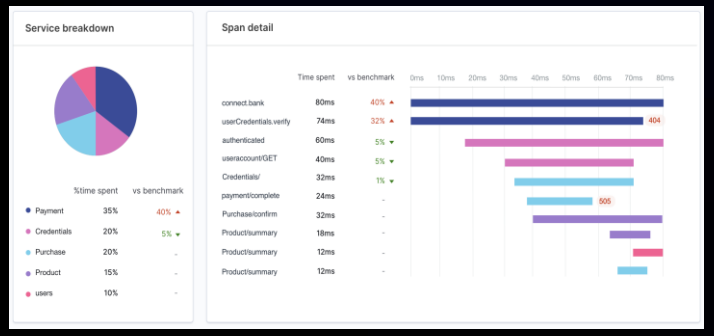


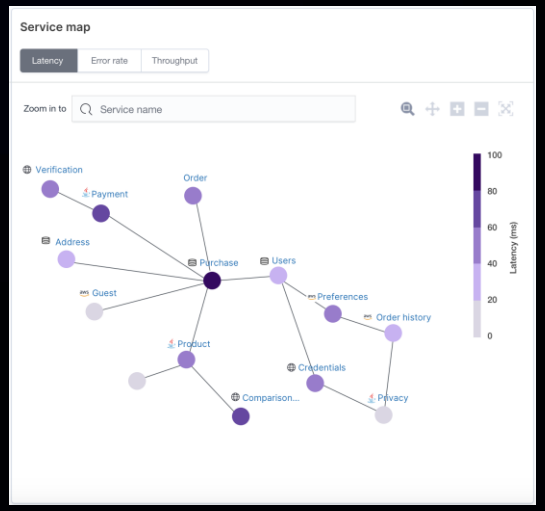


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OpenSearch Trace Analytics

BUILT ON CNCF OpenTelemetry







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

Available starting with Elasticsearch 7.9 (ODFE 1.12)

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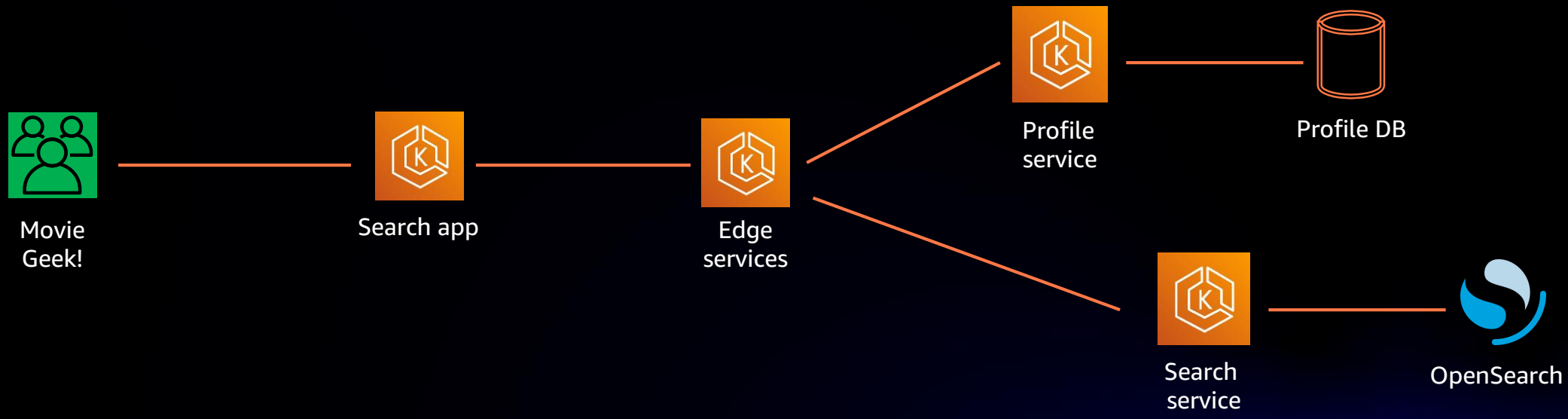
What are you building?

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Lab 1: Search application

Prebuilt set of microservices coordinate searching in OpenSearch

- Provision application data (IMDB Top 5000 titles)
- Publish search templates
- Review application monitoring with prebuilt dashboards

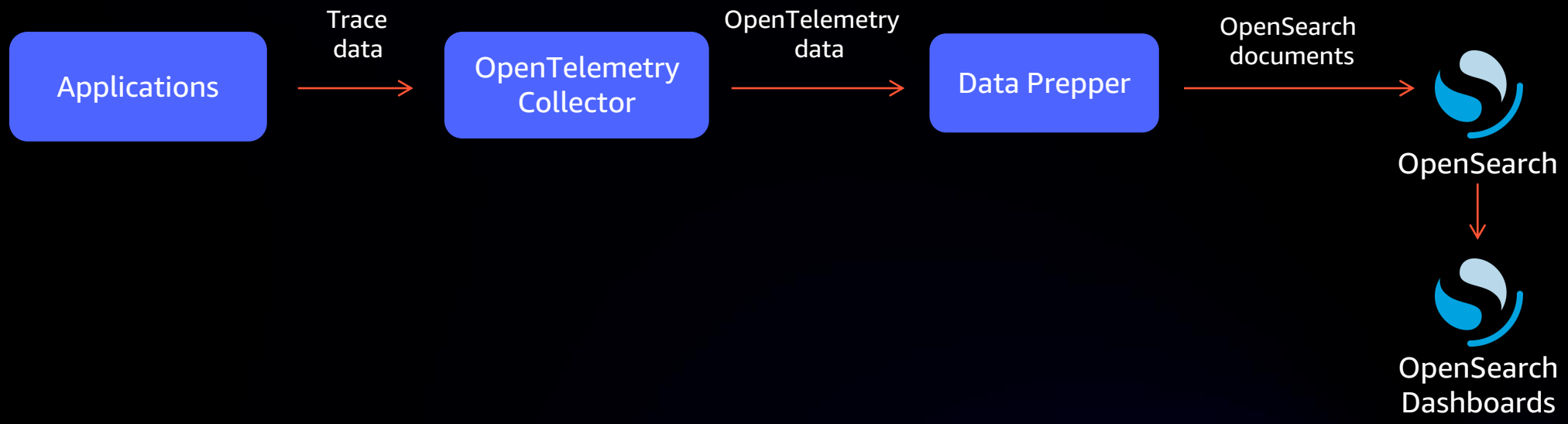


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Lab 2: Distributed tracing

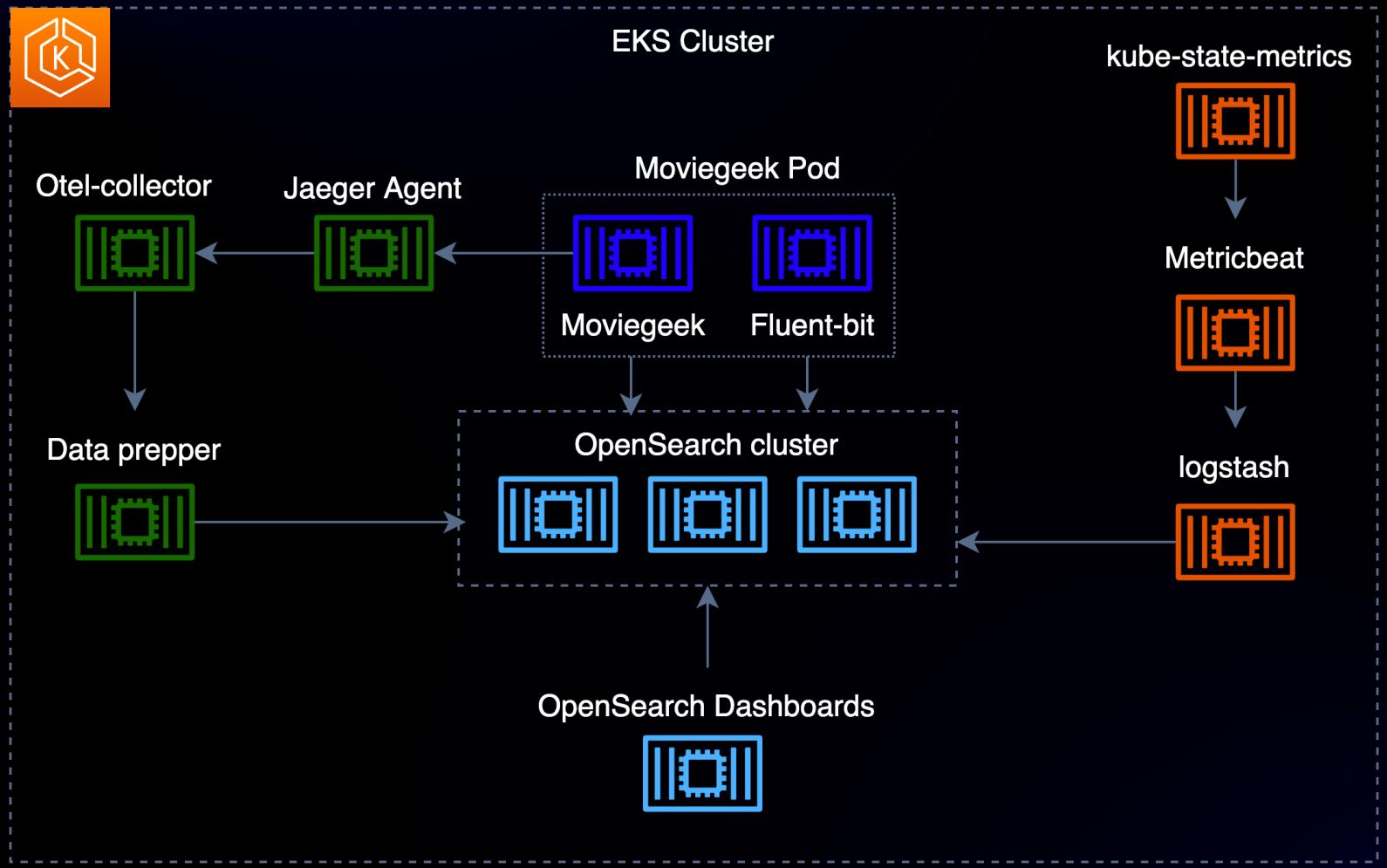
Review prebuilt trace data ingestion pipeline

- Simulate errors in services
- Debug and fix them



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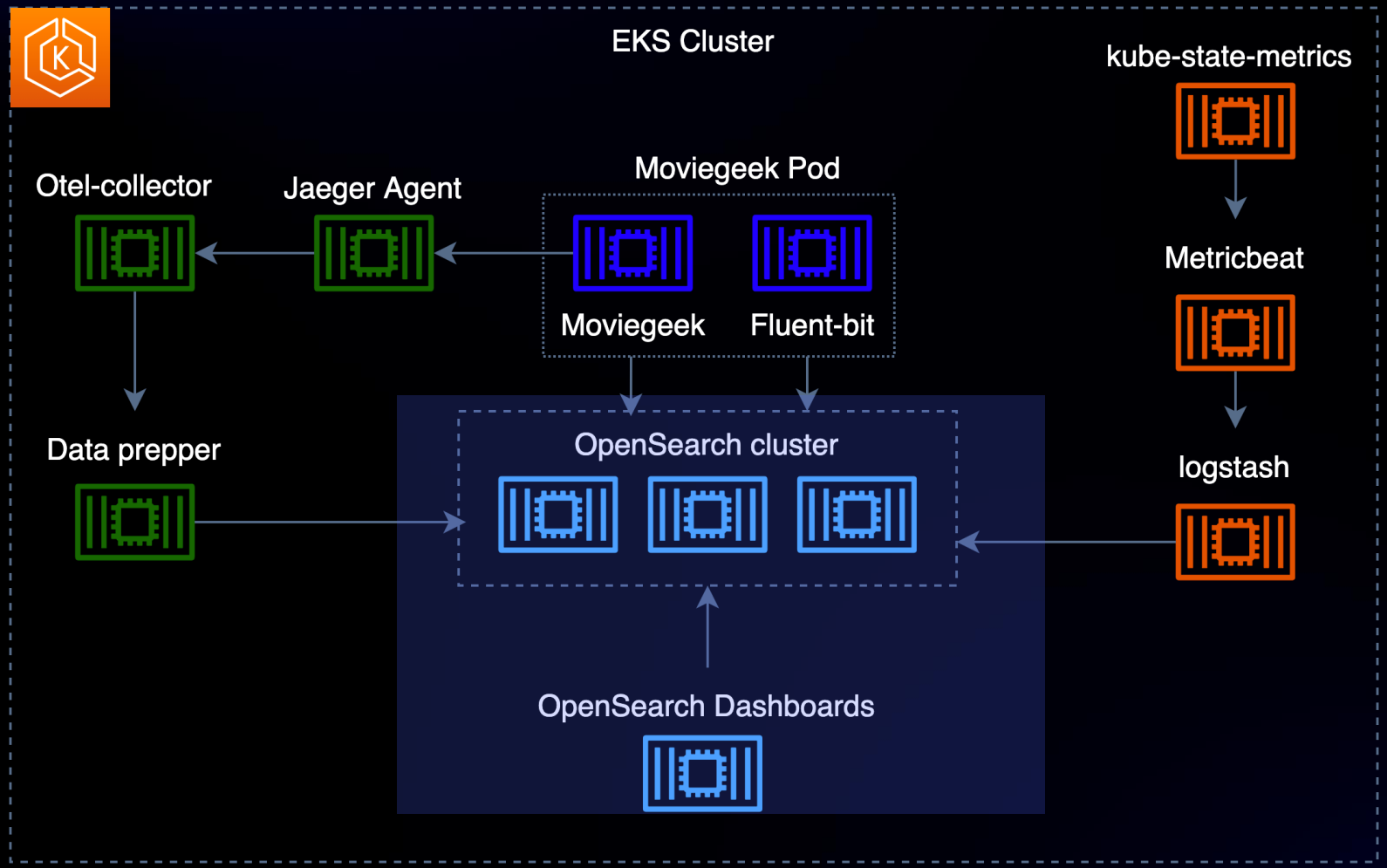
Lab 3: Monitoring Kubernetes cluster



- 3 m5.large worker nodes

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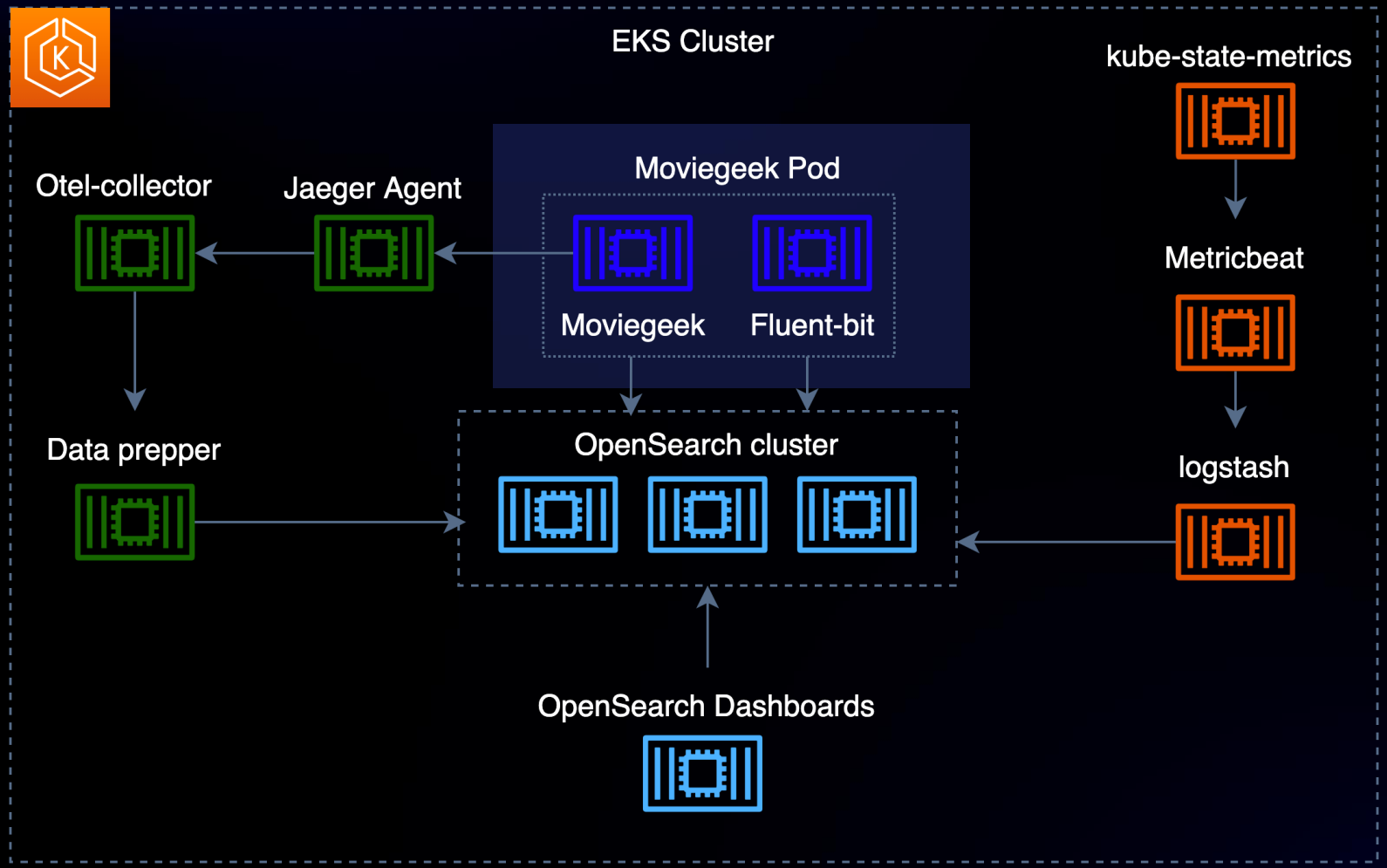
Lab 3: Monitoring Kubernetes cluster



- 3 m5.large worker nodes
- OpenSearch Cluster and Dashboards

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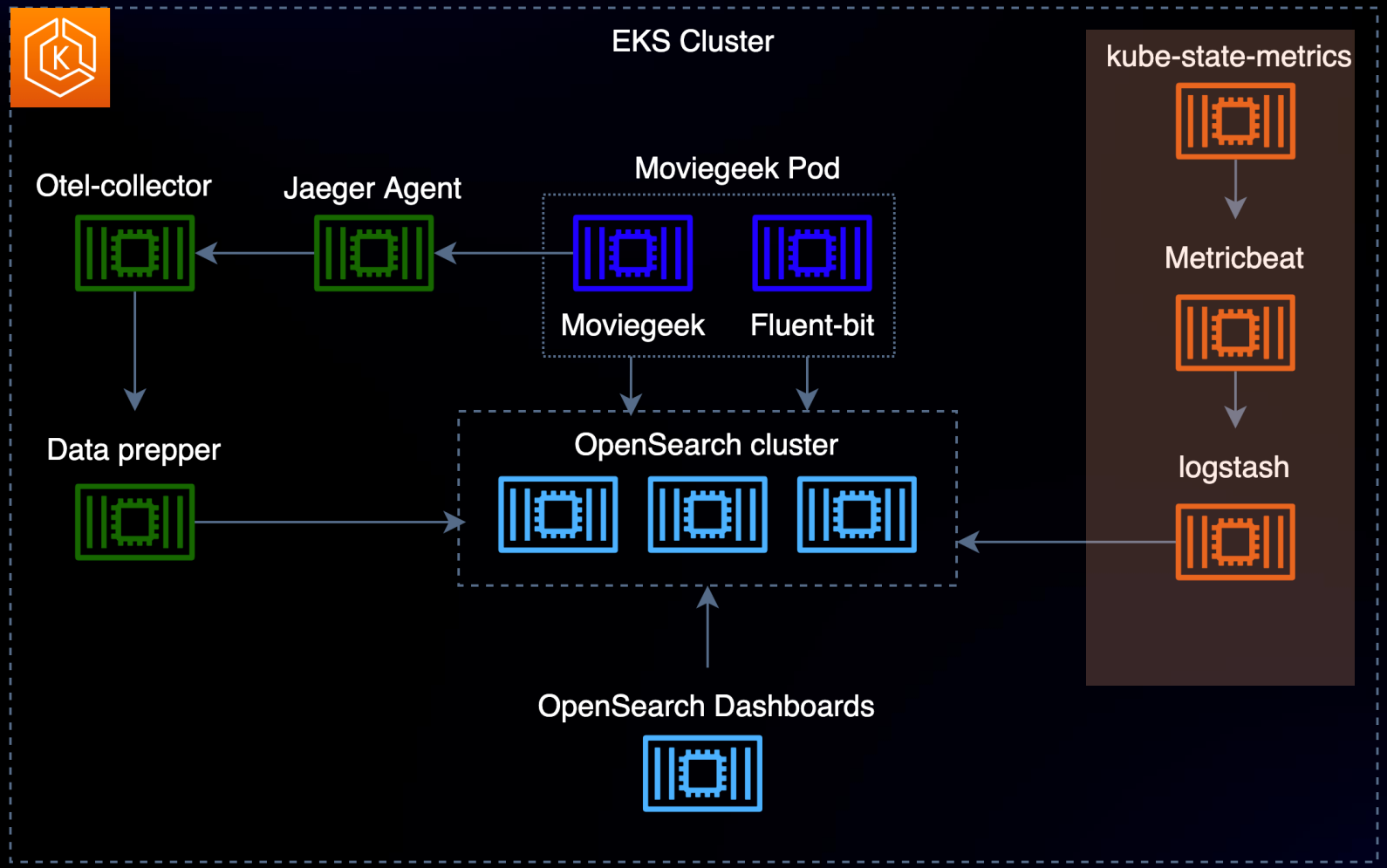
Lab 3: Monitoring Kubernetes cluster



- 3 m5.large worker nodes
- OpenSearch Cluster and Dashboards
- Application with Fluent-bit sidecar

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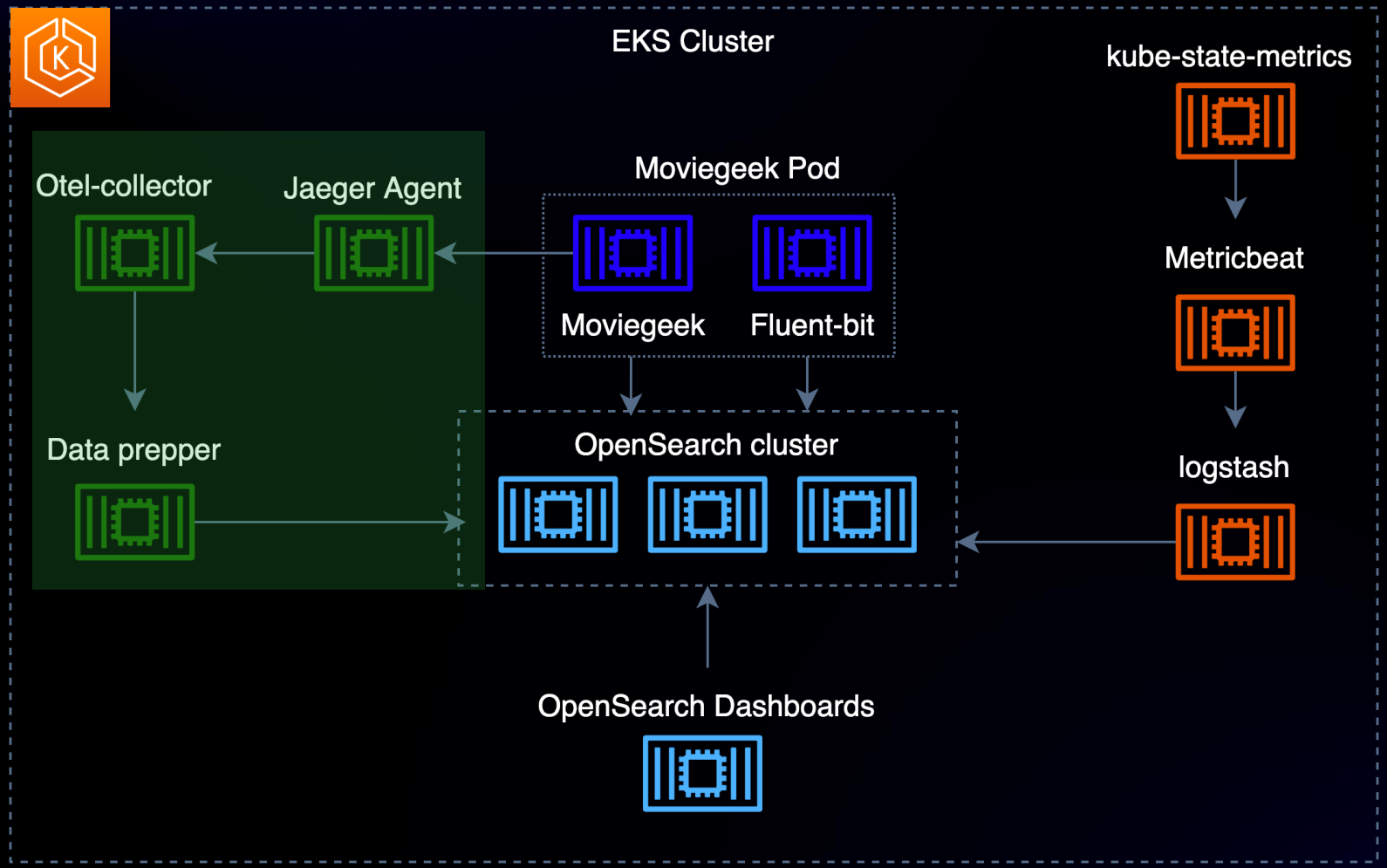
Lab 3: Monitoring Kubernetes cluster



- 3 m5.large worker nodes
- OpenSearch Cluster and Dashboards
- Application with Fluent-bit sidecar
- Cluster monitoring
  - Logstash
  - Metricbeat – daemonset
  - Kube-state-metrics

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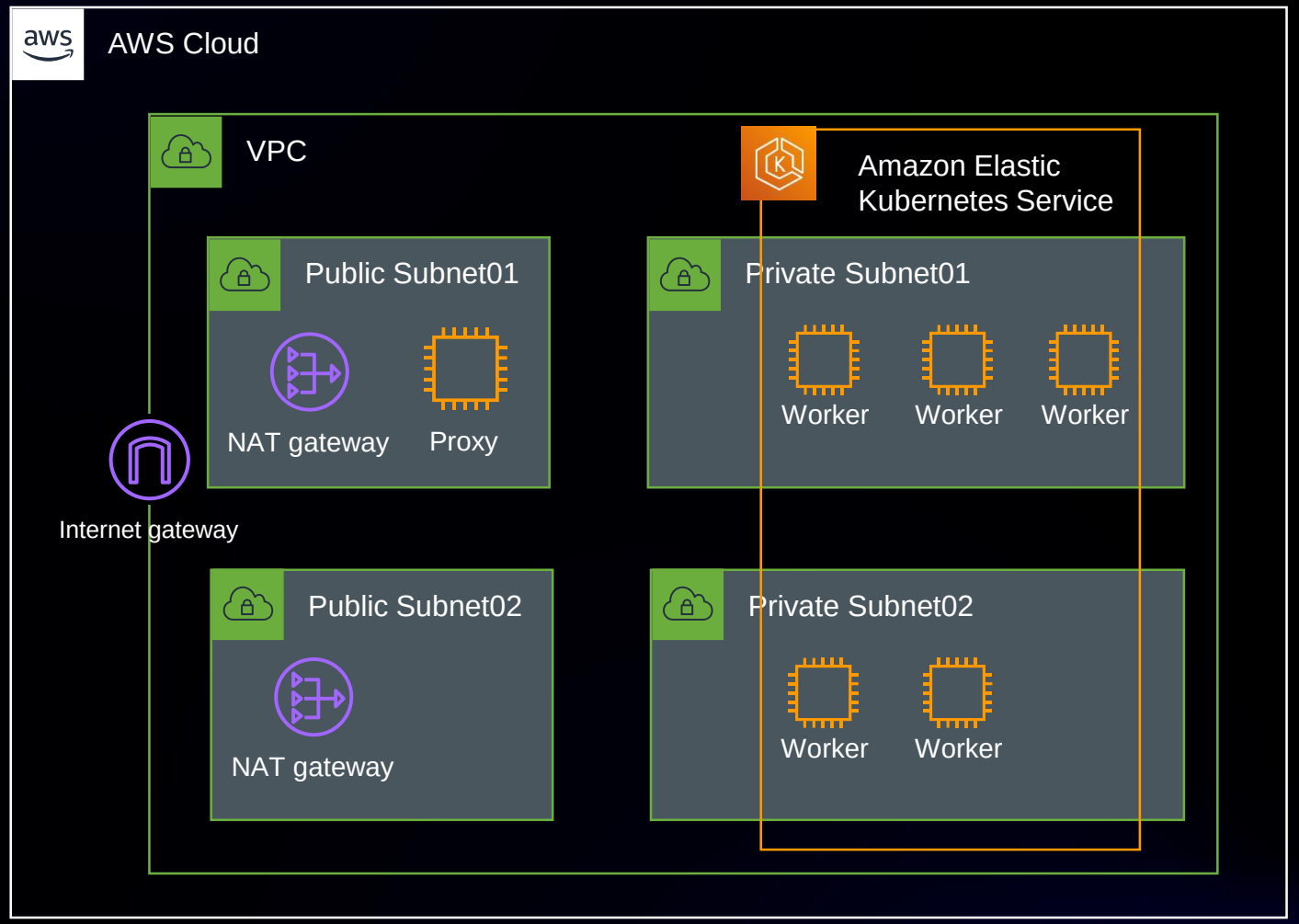
Lab 3: Monitoring Kubernetes cluster



- 3 m5.large worker nodes
- OpenSearch Cluster and Dashboards
- Application with Fluent-bit sidecar
- Cluster monitoring
  - Logstash
  - Metricbeat – daemonset
  - Kube-state-metrics
- Trace Analytics
  - Jaeger Agent
  - Otel-collector
  - Data prepper

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Lab architecture



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Lab details

URL: https://tinyurl.com/2tfbppys



Event Hashes

- **c8e7-1a00da1a54-ee**
- **c4f5-1986bd99f4-ee**

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Thank you!

Arun Lakshmanan

Jon Handler

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