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Advanced stream processing best practices with Amazon Kinesis

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Advanced stream processing best practices with Amazon Kinesis

In this chalk talk, we discuss how AWS uses Amazon Kinesis to power some of its largest internal services, including AWS Billing, Amazon CloudWatch, Amazon Kinesis Data Firehose, and more.

We describe these architectures at a high level and talk about best practices that you can use to build highly available, real-time applications.

Agenda

Service overviews and dogfooding at AWS

Amazon CloudWatch and data partitioning

AWS IoT Events and highly available, low-latency apps

Core data streaming services at AWS



Amazon Kinesis Data Streams

Capture and store data streams



Amazon Kinesis Data Firehose

Load streaming data into streams, data lakes, and data warehouses



Amazon Kinesis Data Analytics

Analyze data streams in real time



Amazon Managed Streaming for Apache Kafka

Capture and store data streams

Dogfooding at AWS is encouraged but not required

“Eating your own dog food,” also called “dogfooding,” occurs when an organization uses its own product



Amazon CloudWatch Vended Logs

Amazon CloudWatch Vended Logs are published by AWS services on behalf of customers

Uses



Amazon Kinesis Data Streams

To help deliver things like:

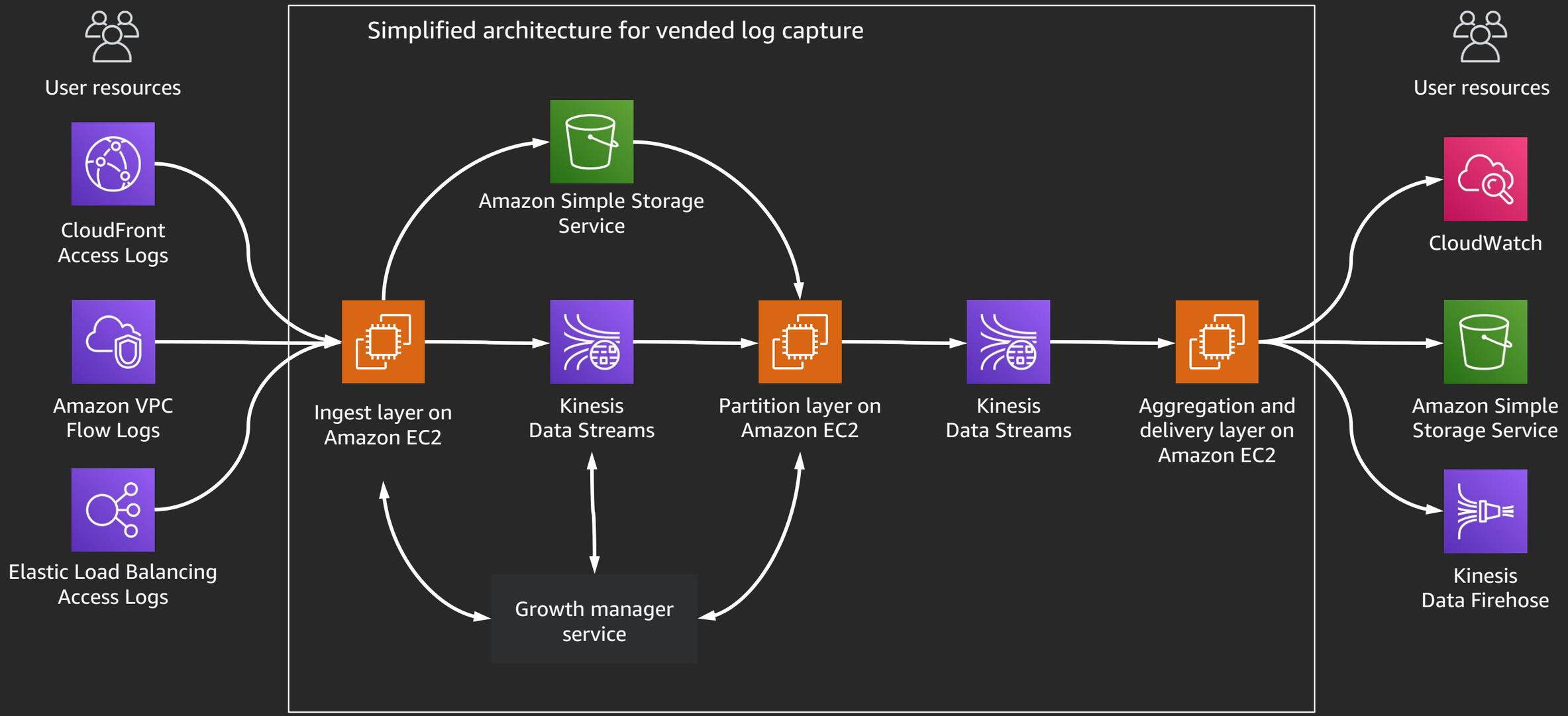


Amazon VPC Flow Logs

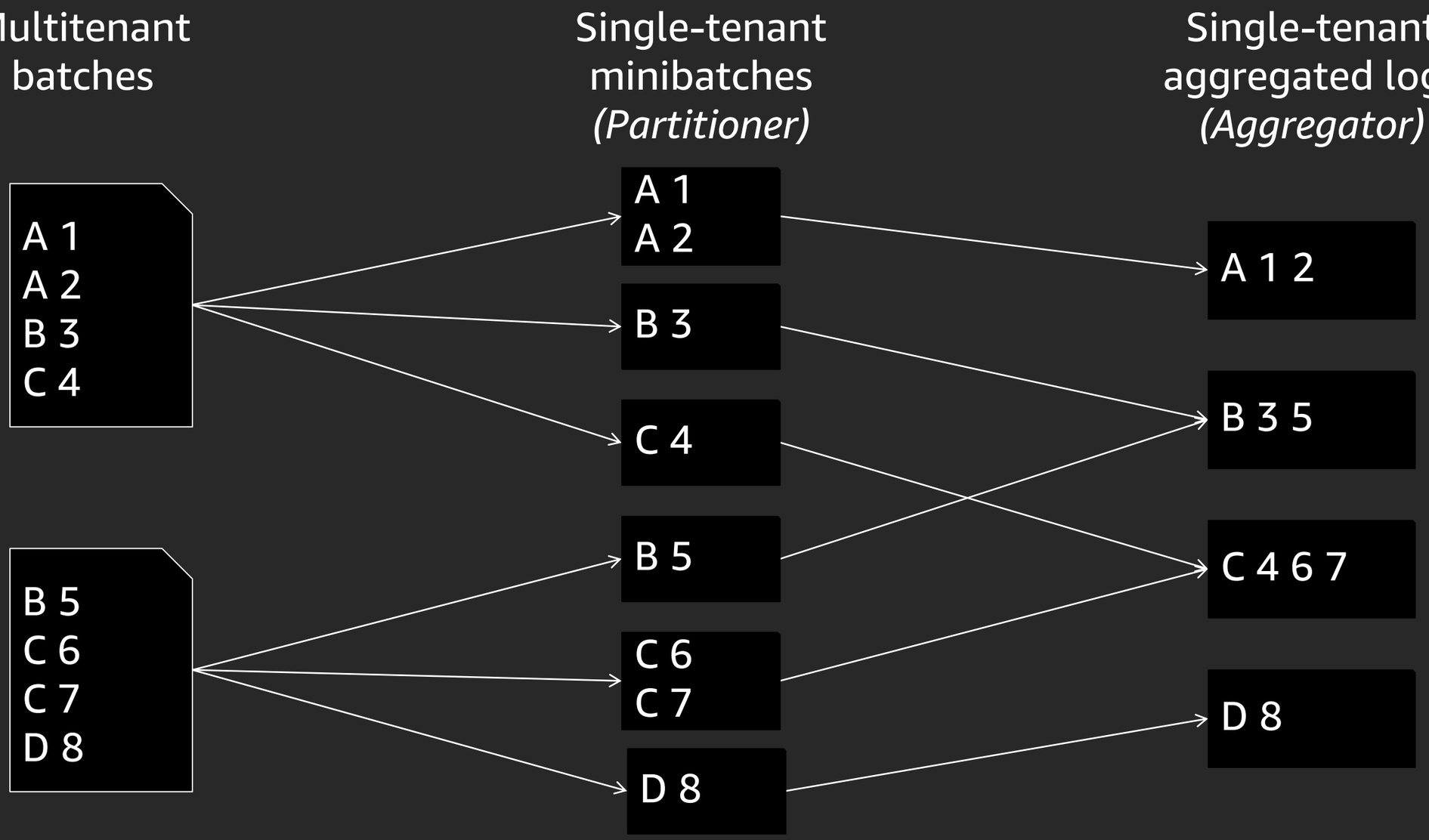


Amazon CloudFront Access Logs

(Simplified) vended log capture subarchitecture



Data partitioning in streaming data

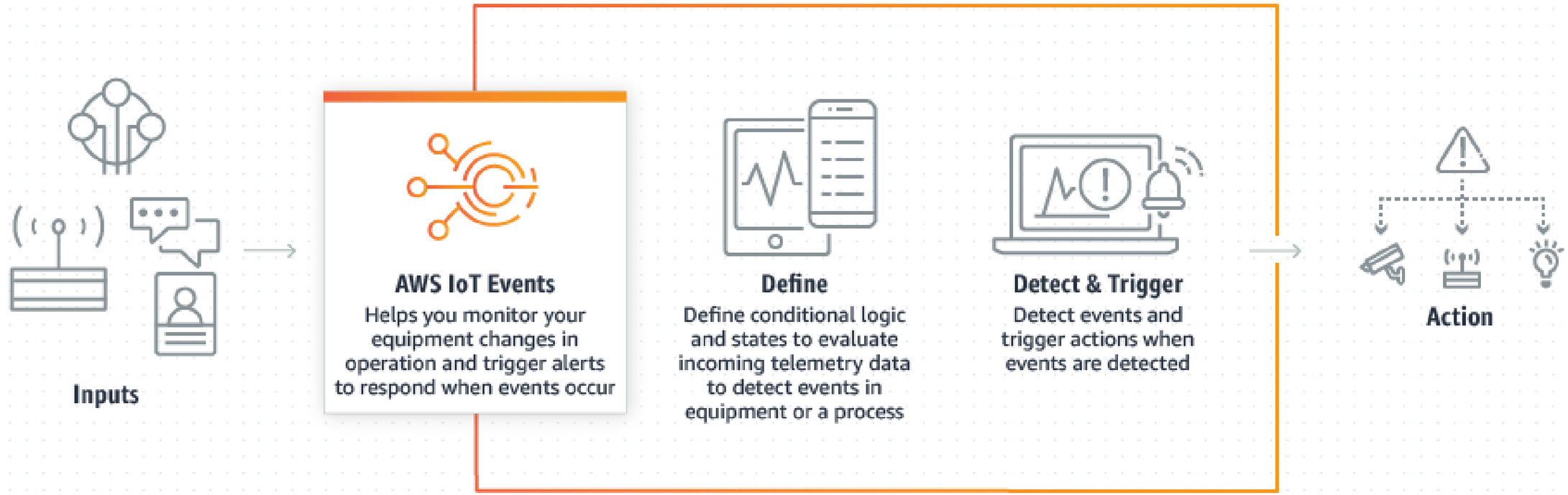


Lessons learned

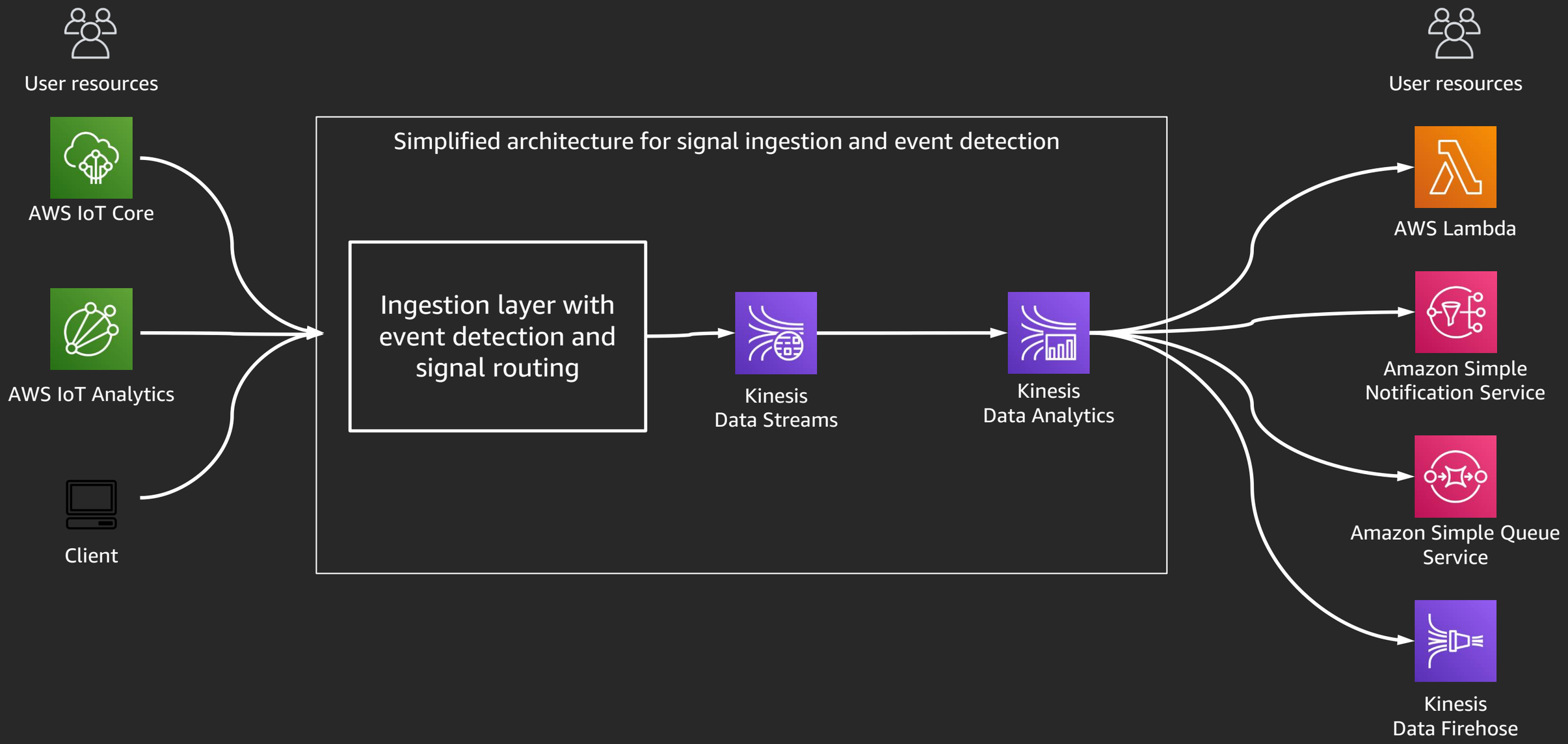
- Added a growth manager to partition traffic on throttling
- Associating partitioning with storage is cost effective but not flexible
- Handling traffic spikes on behalf of customers

AWS IoT Events

AWS IoT Events is a fully managed service that makes it easy to detect and respond to events from IoT sensors and applications



(Simplified) AWS IoT Events message processing

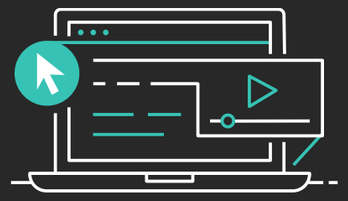


Low-latency, highly available applications

- Challenges
  - State management
  - Exactly once and in-order processing semantics
  - Message routing
- Easy-to-design, low-latency apps in steady state
- However, app disruptions like code changes impact availability
- Availability directly impacts latency and can be customer-facing

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