AWS

SUMMIT

Building a Data Processing Pipeline on AWS

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Solutions Architect

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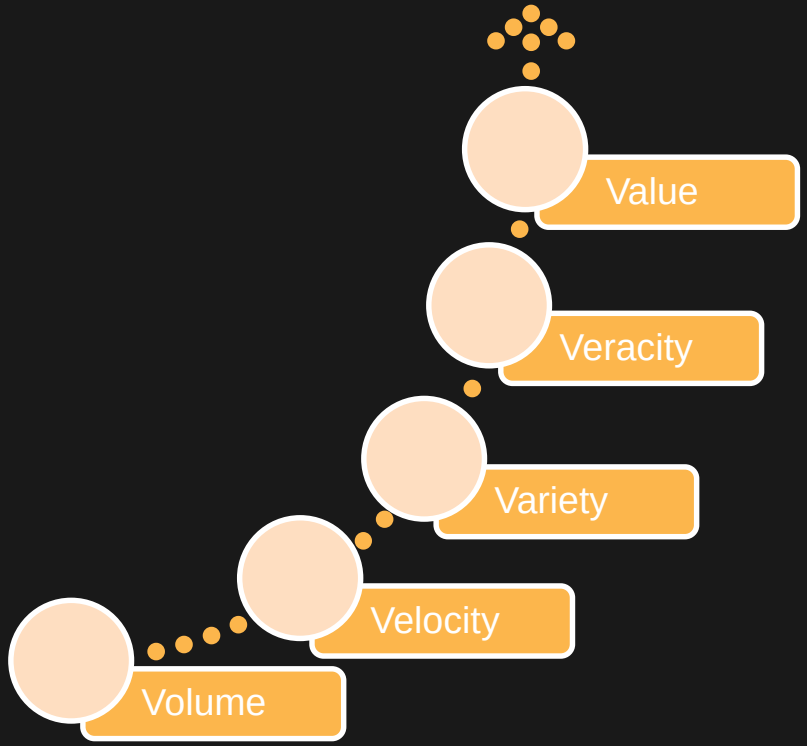
amazon web services

Agenda

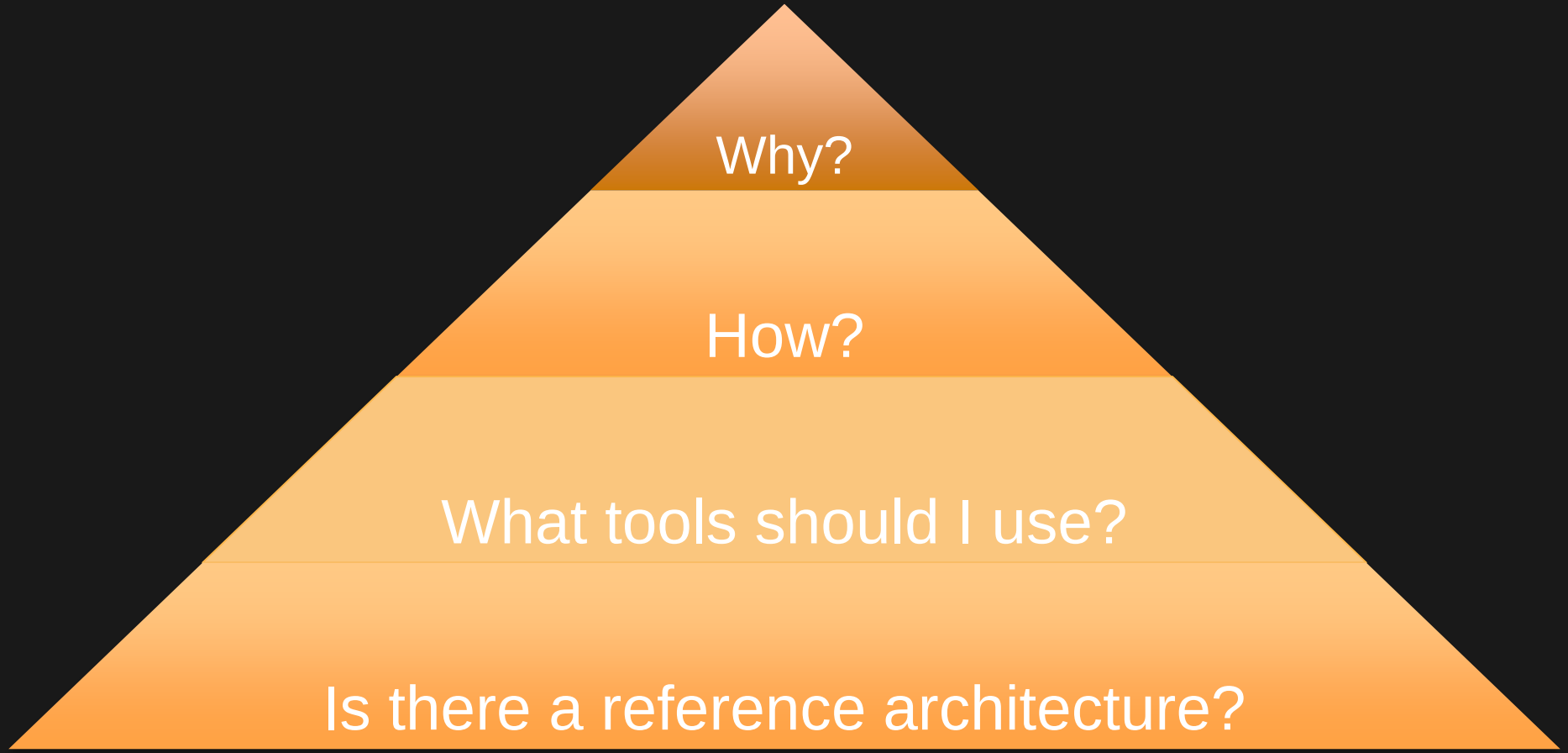
- Big Data Challenges
- Architectural Principles
- Stages in a Data Processing Pipeline
- Demo : Build a data processing pipeline
- Design Patterns

Ever Increasing Big Data



Plethora of Tools

Big Data Challenges



Architectural Principles

Build **decoupled** systems

- Data → Store → Process → Store → Analyze → Answers

Use the **right tool** for the job

- Data structure, latency, throughput, access patterns

Leverage AWS **managed services**

- Scalable/elastic, available, reliable, secure, no/low admin

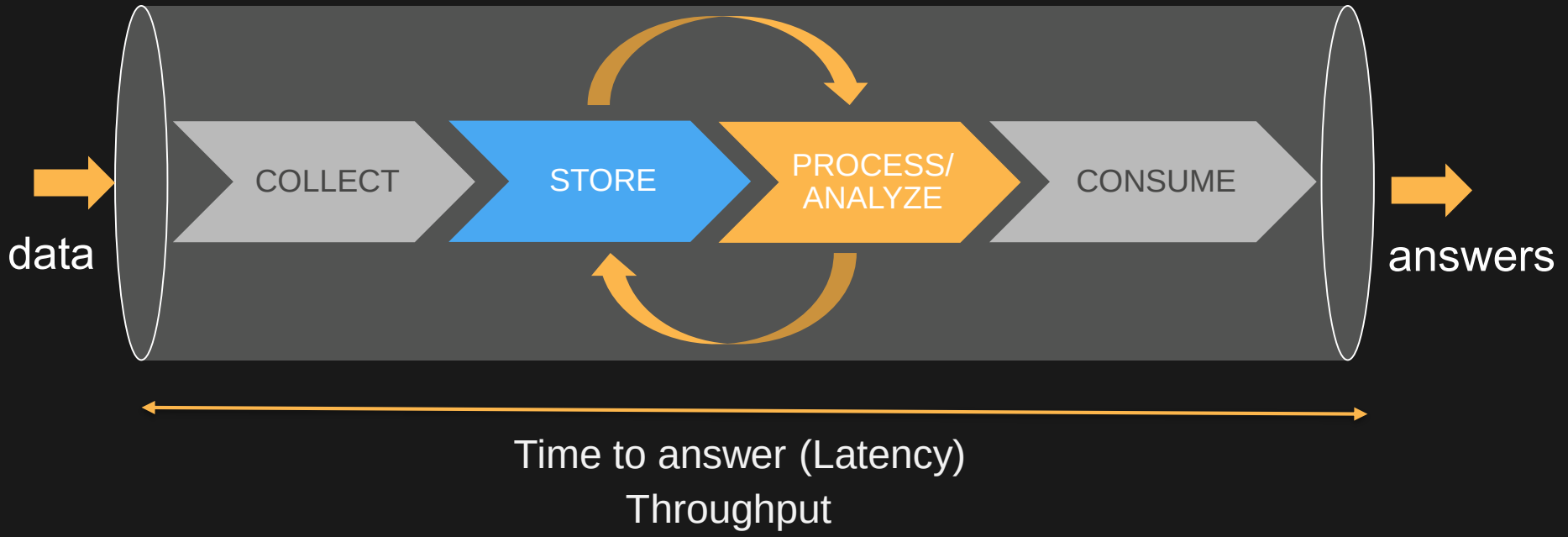
Use **log-centric** design patterns

- Immutable logs, materialized views

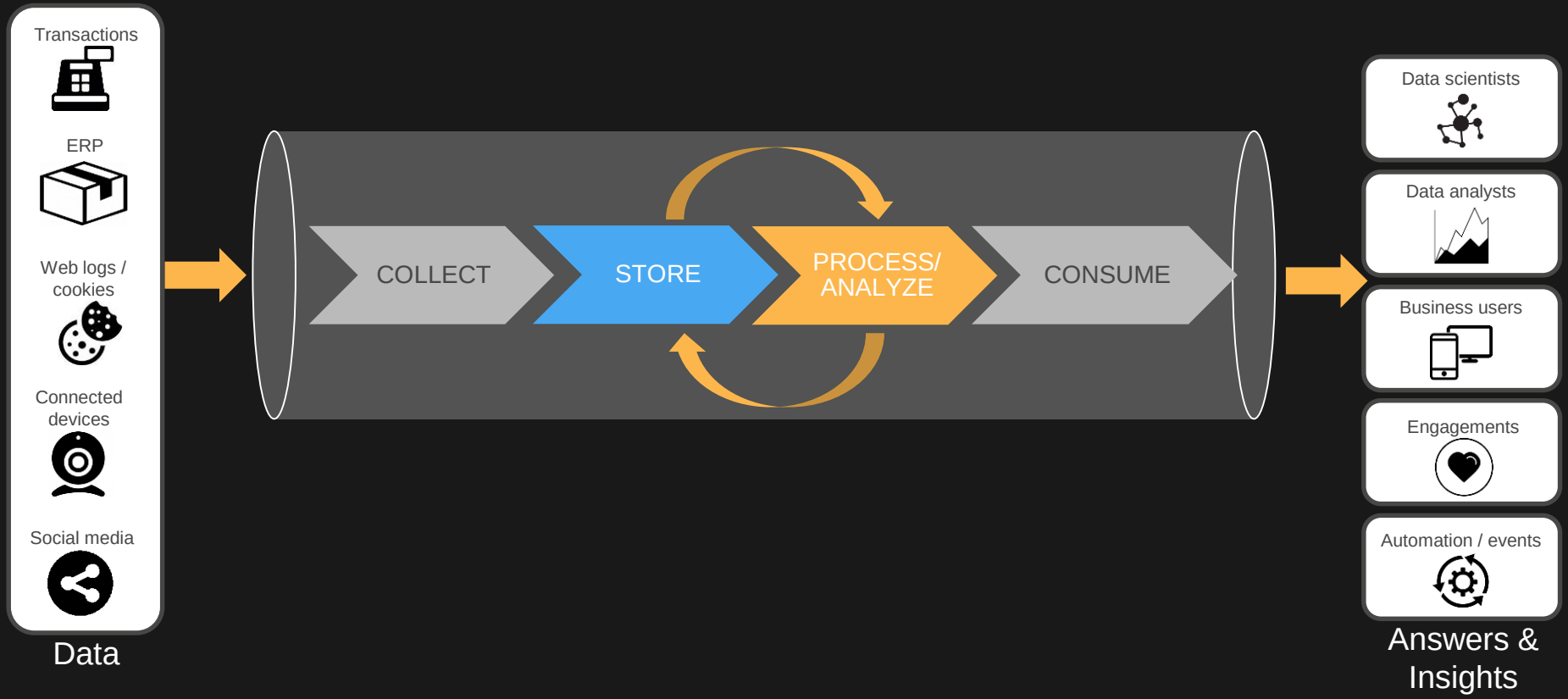
Be **cost-conscious**

- Big data ≠ big cost

Simplify Big Data Processing



Simplify Big Data Processing



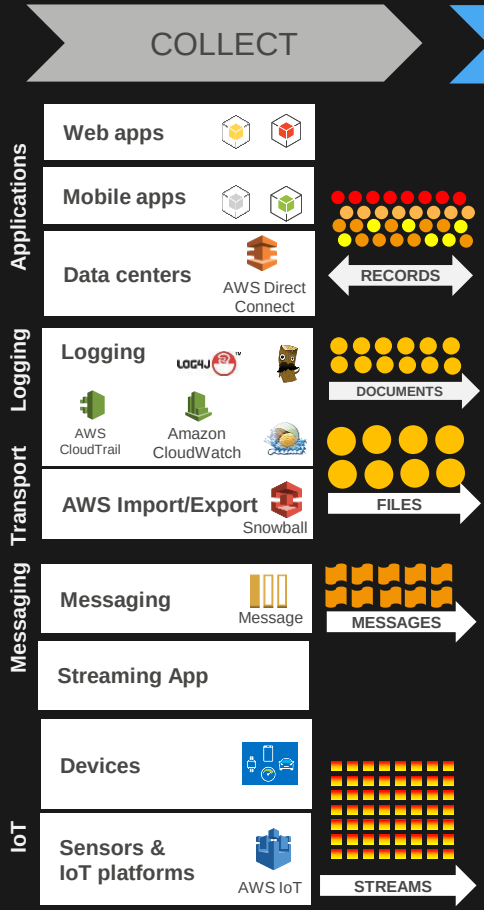
Building a pipeline - DEMO

STORE

COLLECT

PROCESS

ANALYZE & VISUALIZE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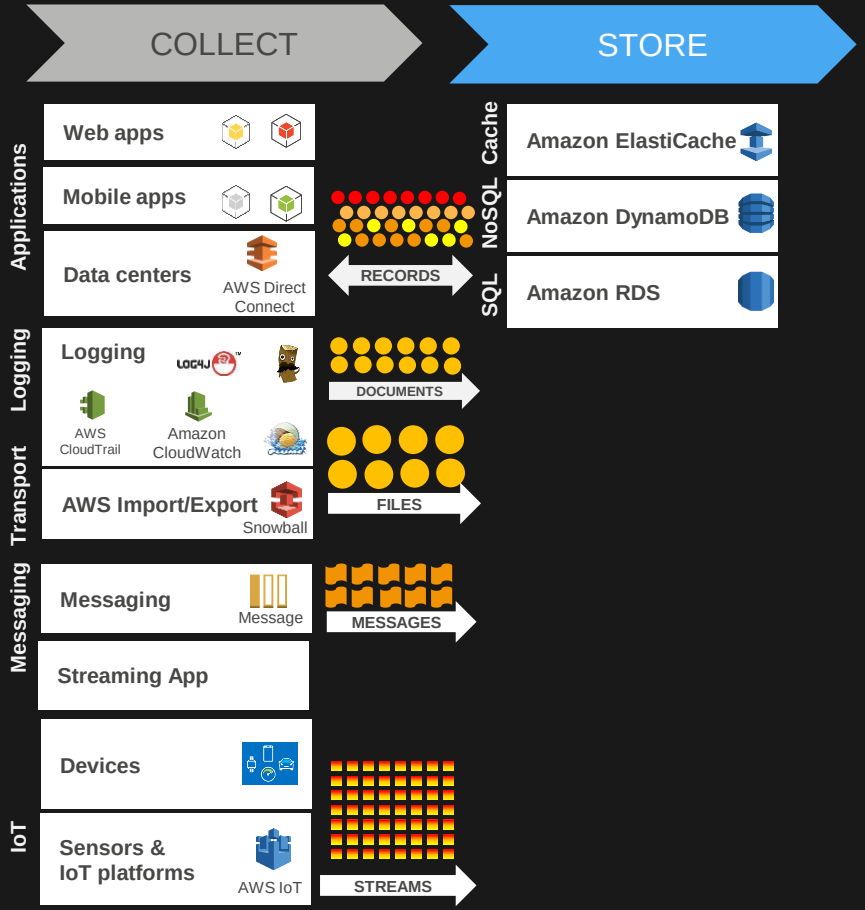
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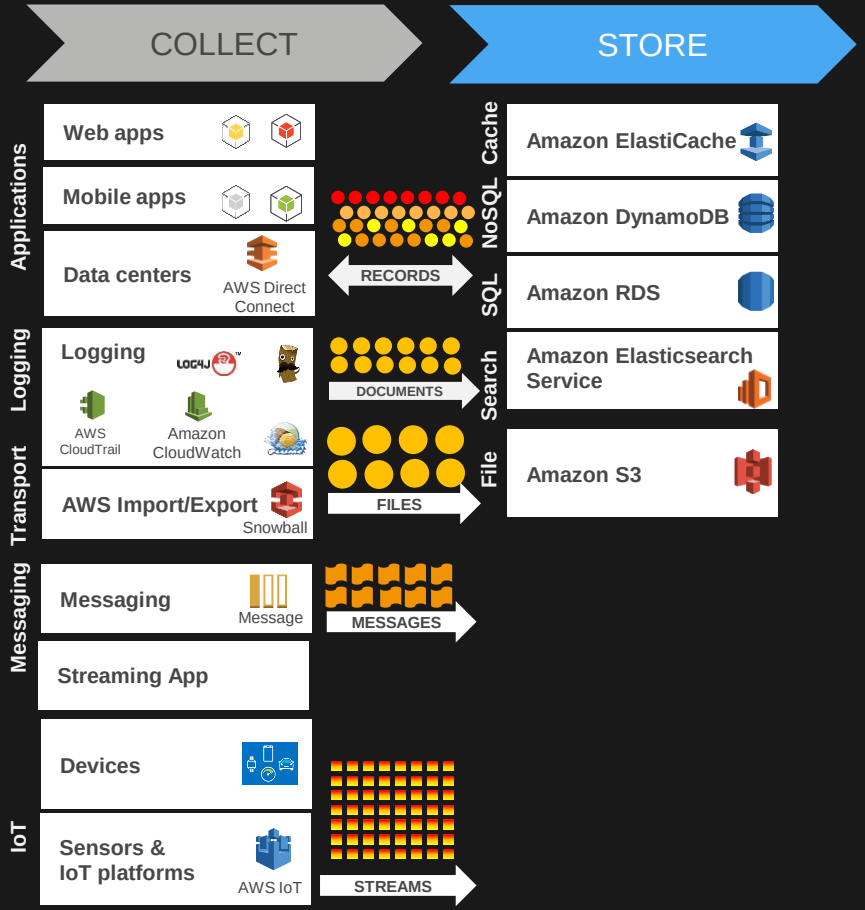
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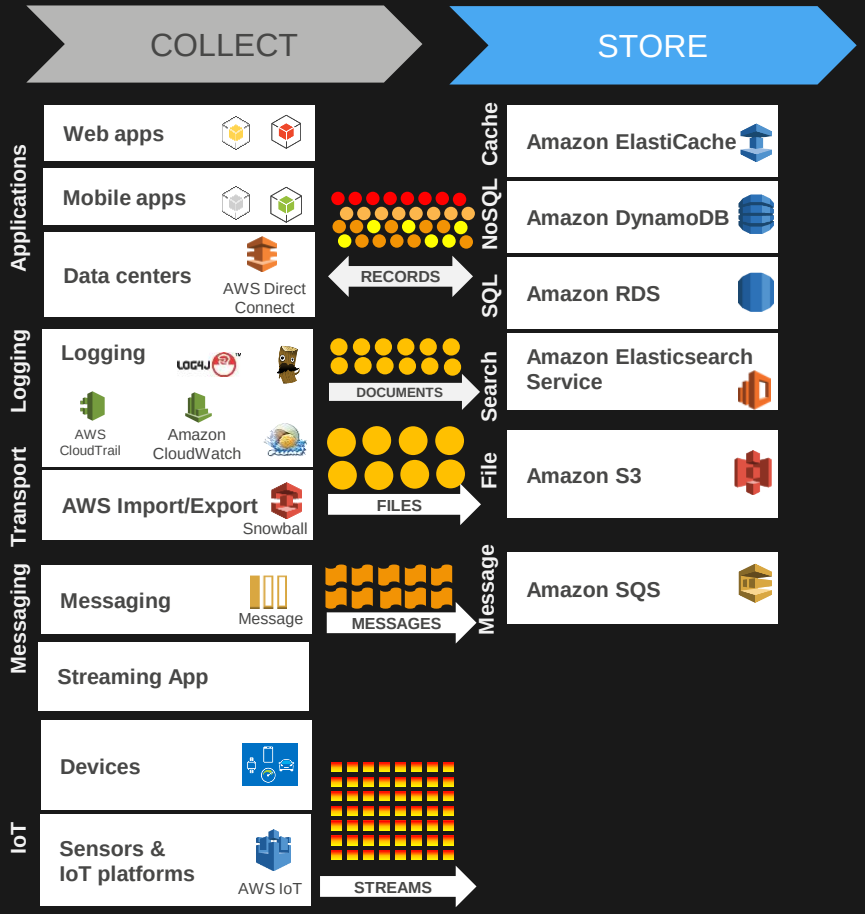
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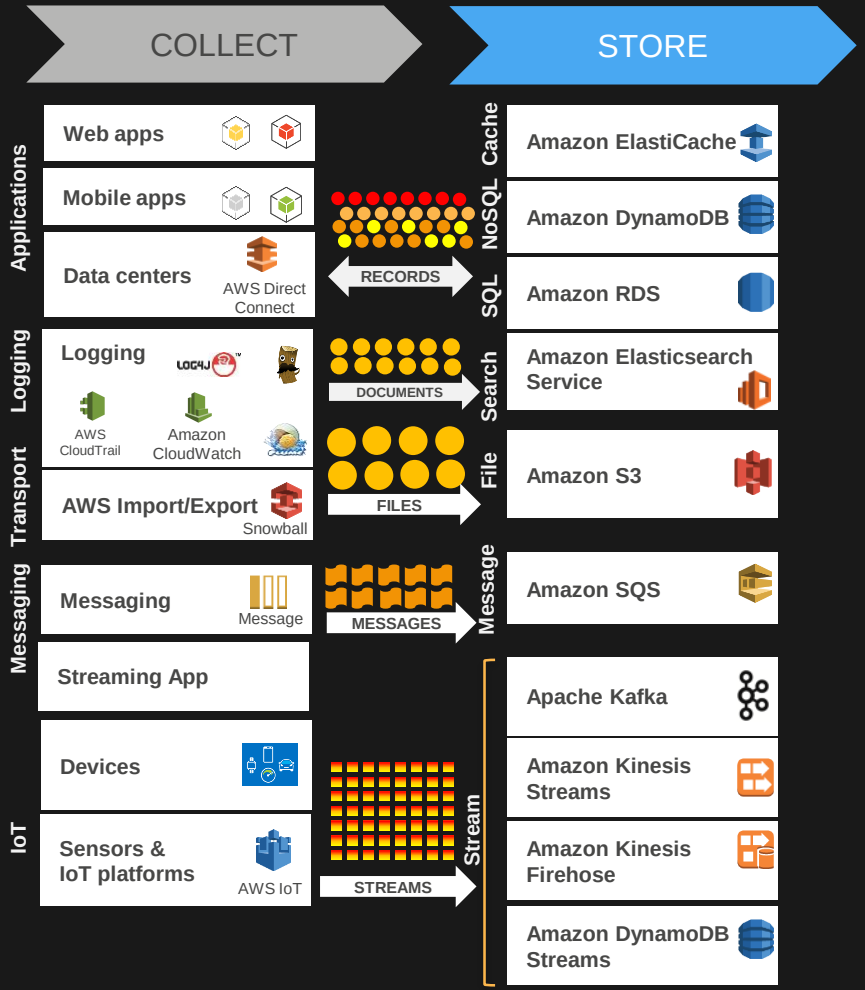
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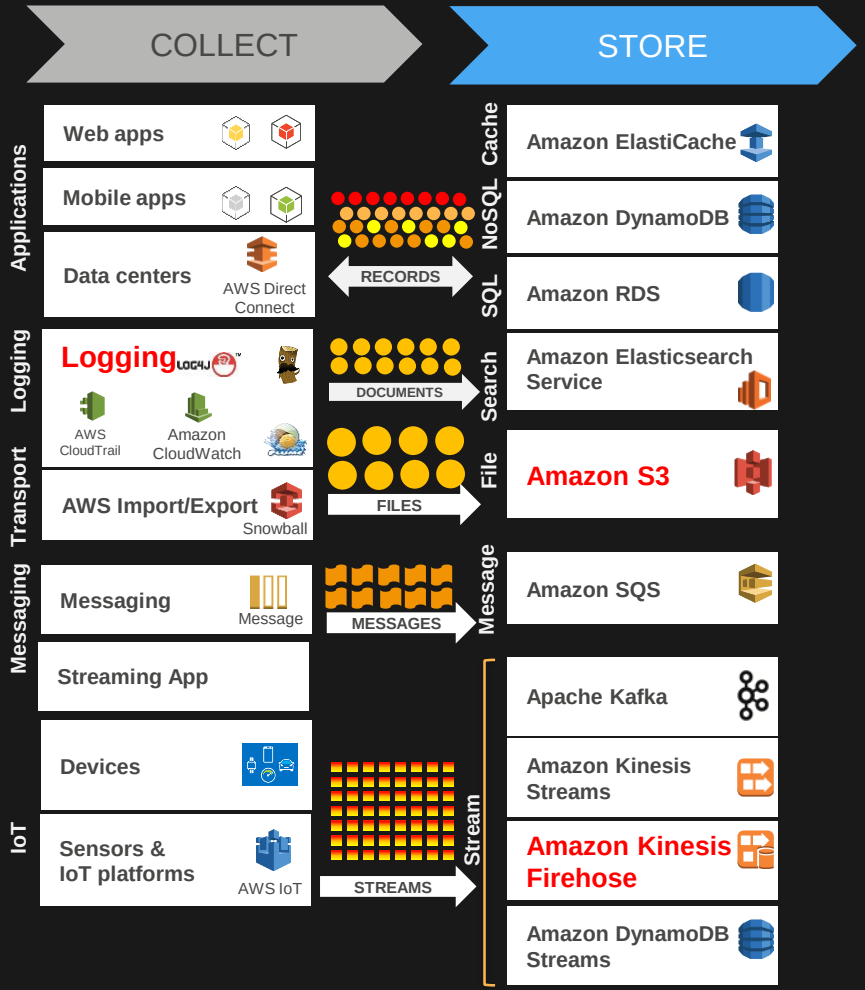
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Weblogs – Common Log Format (CLF)

```
75.35.230.210 - - [20/Jul/2016:22:22:42 -0700]
"GET /images/pigtrihawk.jpg HTTP/1.1" 200 29236
"http://www.swivel.com/graphs/show/1163466"
"Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.0.11)
Gecko/2009060215 Firefox/3.0.11 (.NET CLR 3.5.30729)"
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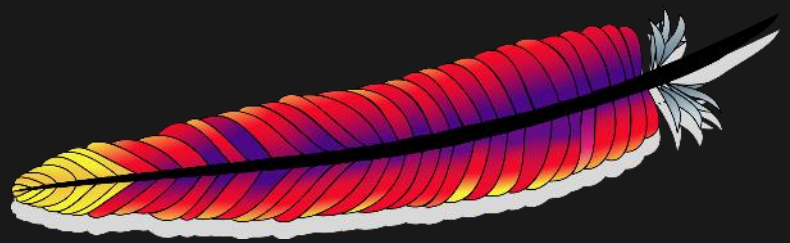
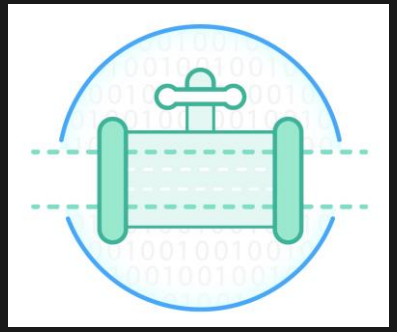


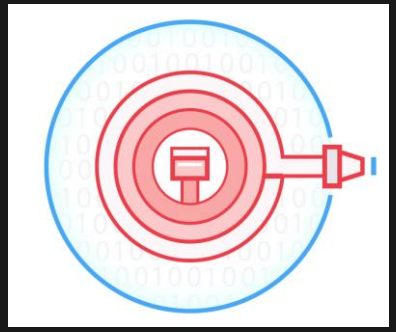
Amazon Kinesis: Streaming Data Made Easy

Services make it easy to capture, deliver and process streams on AWS



Amazon Kinesis Streams

- For Technical Developers
- Build your own custom applications that process or analyze streaming data



Amazon Kinesis Firehose

- For all developers, data scientists
- Easily load massive volumes of streaming data into S3, Amazon Redshift and Amazon Elasticsearch

Amazon Kinesis Analytics

- For all developers, data scientists
- Easily analyze data streams using standard SQL queries

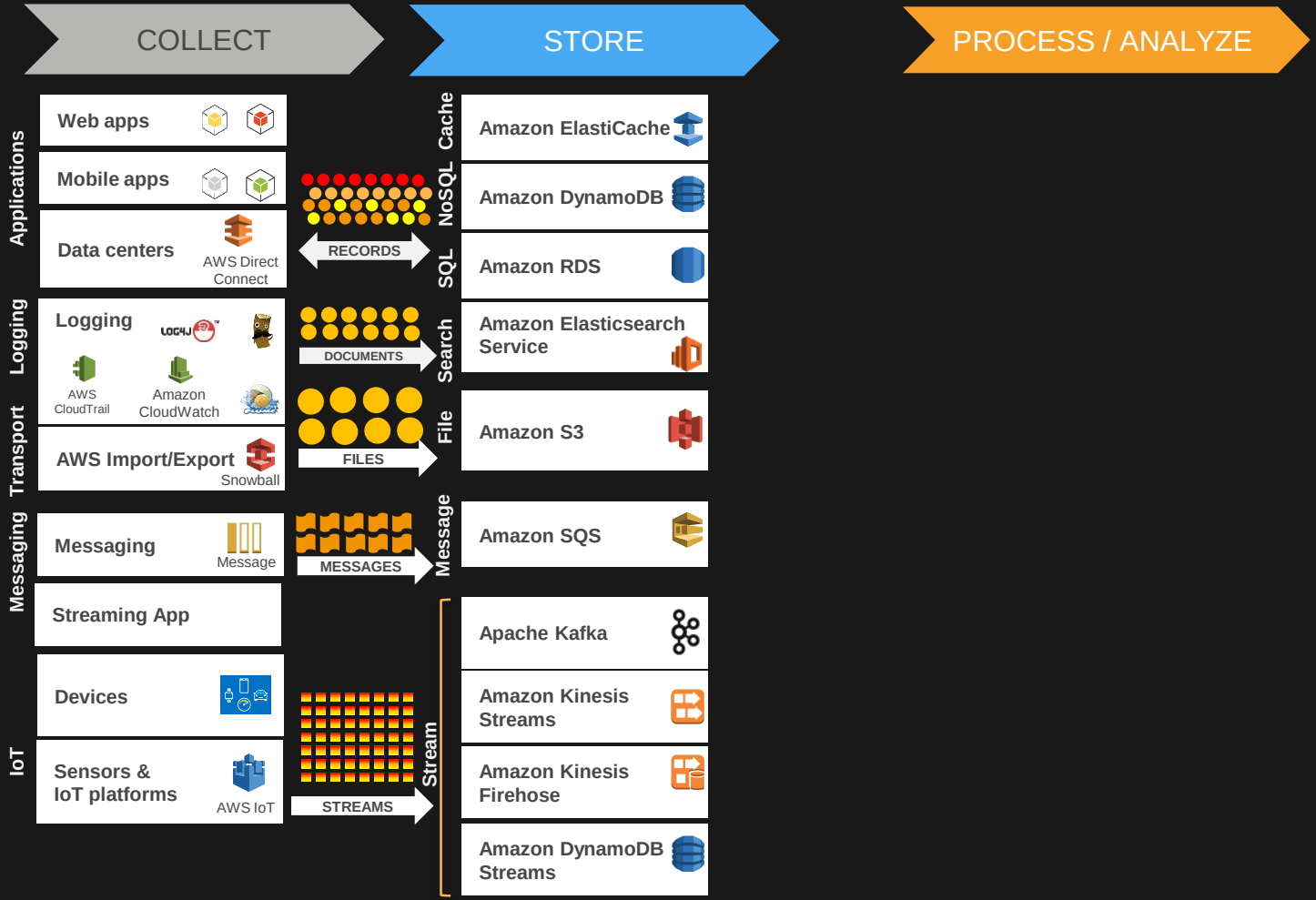
Why Is Amazon S3 Good for Big Data?

- **Unlimited** number of objects and **volume** of data
- Very high bandwidth – no aggregate throughput limit
- Natively supported by big data frameworks (**Spark**, Hive, Presto, etc.)
- No need to run compute clusters for storage (unlike HDFS)
- Multiple & heterogeneous analysis clusters can use the same data
- Designed for **99.99% availability** – can tolerate zone failure
- Designed for **99.999999999% durability**
- No need to pay for data replication
- Native support for versioning
- Tiered-storage (Standard, IA, Amazon Glacier) via life-cycle policies
- **Secure** – SSL, client/server-side encryption at rest
- **Low cost**

Building a pipeline - DEMO

Demo

- Create Amazon S3 Bucket
- Create Amazon Kinesis Firehose delivery stream
- Publish logs to Amazon Kinesis Firehose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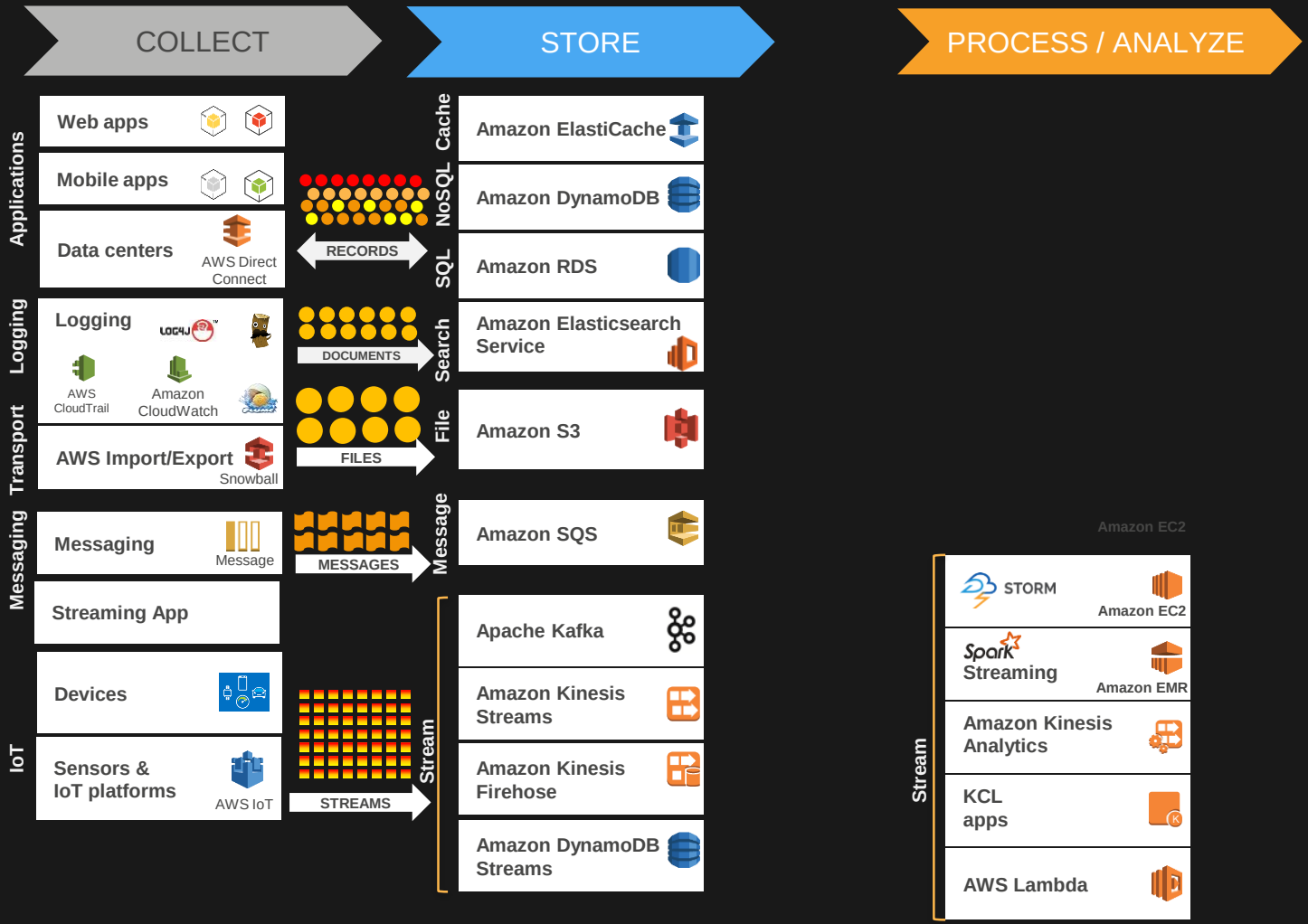
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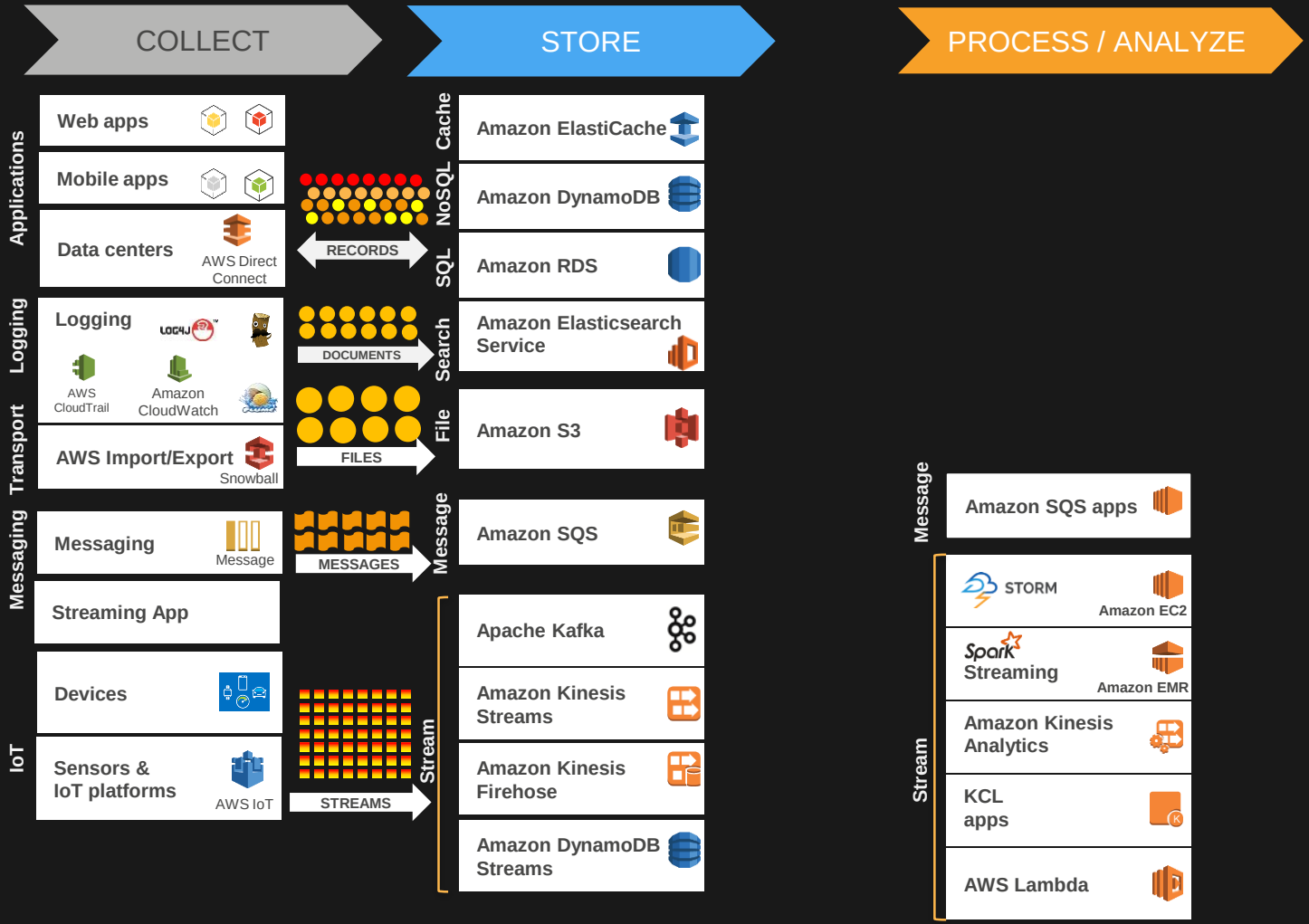
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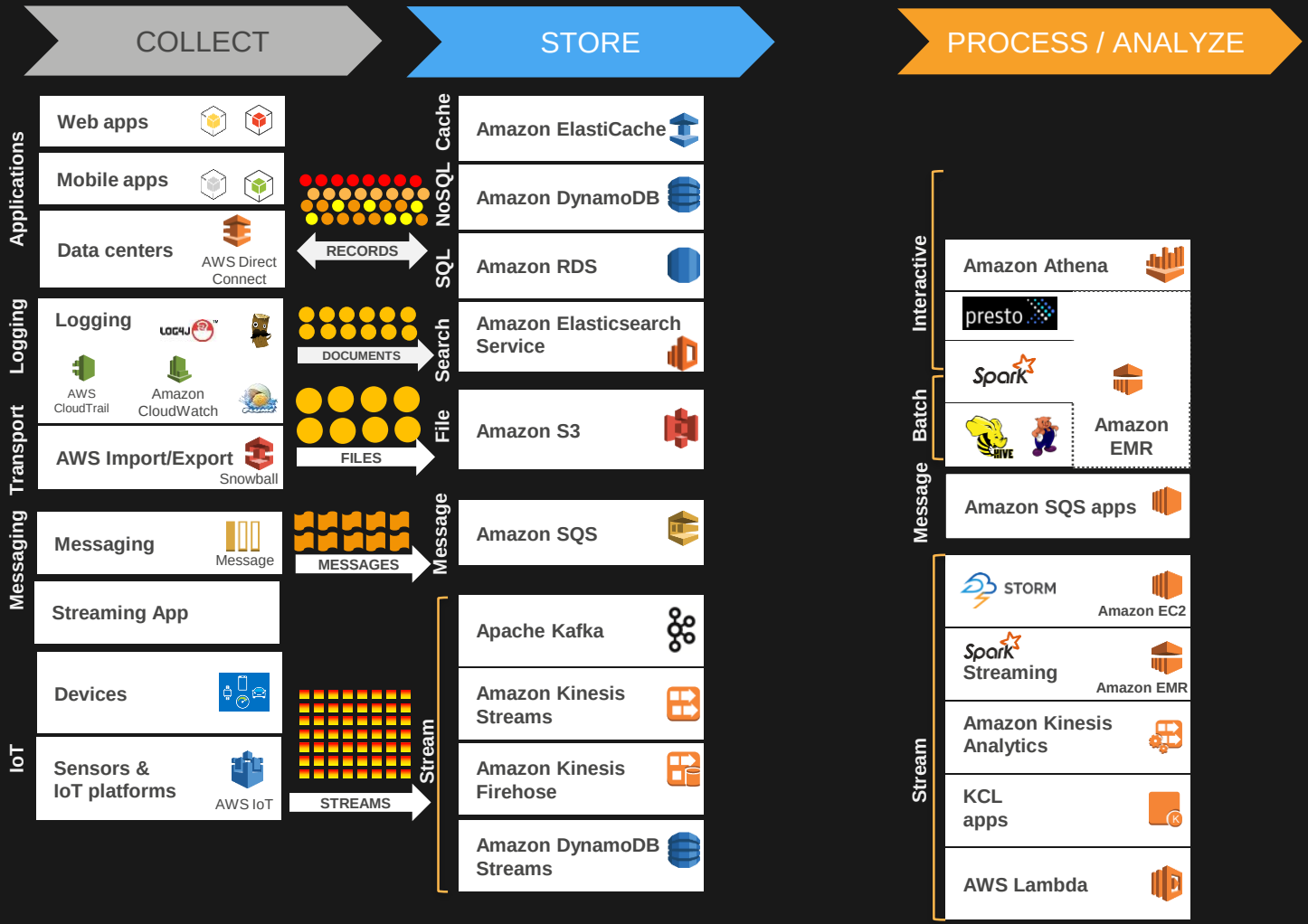
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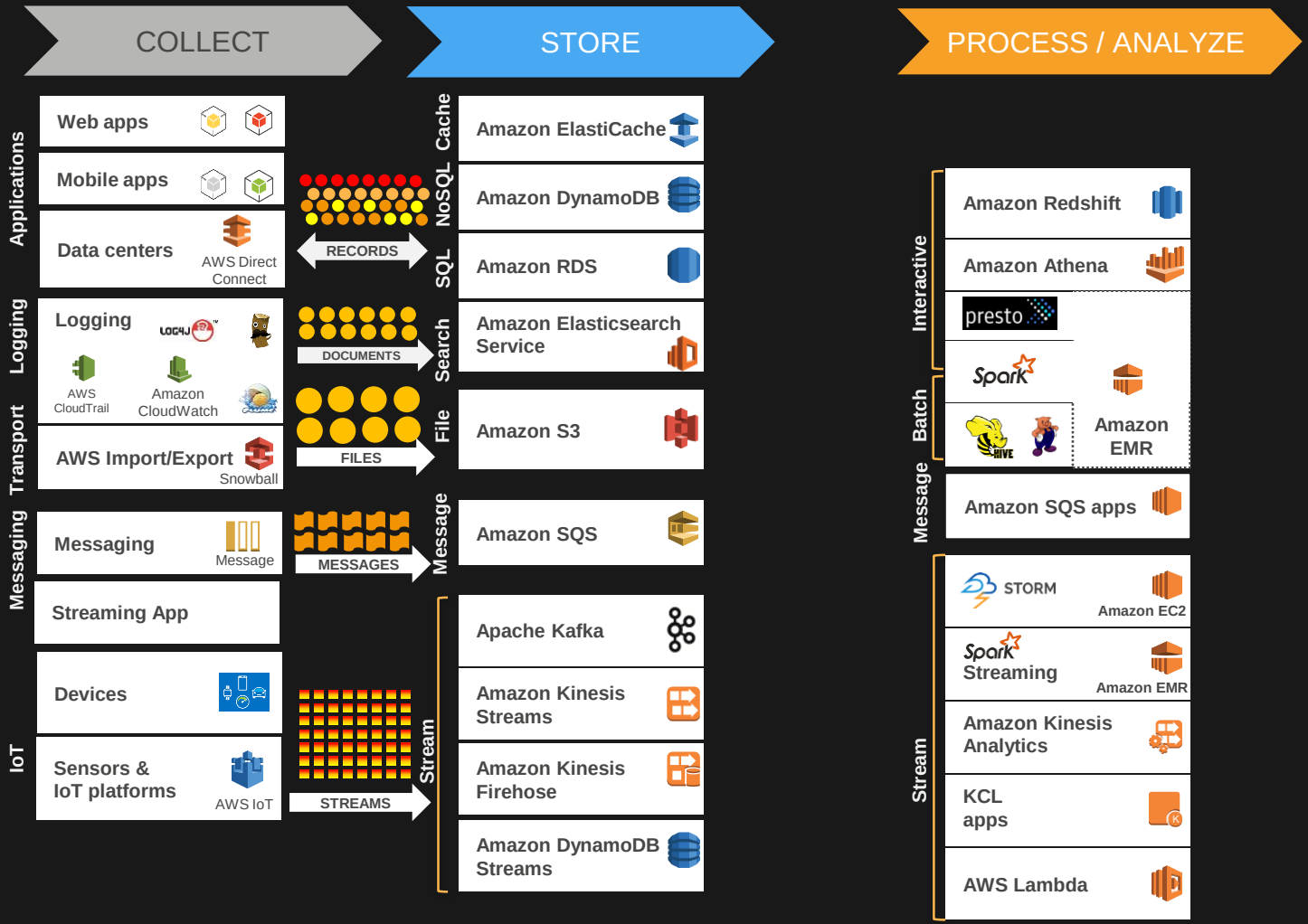
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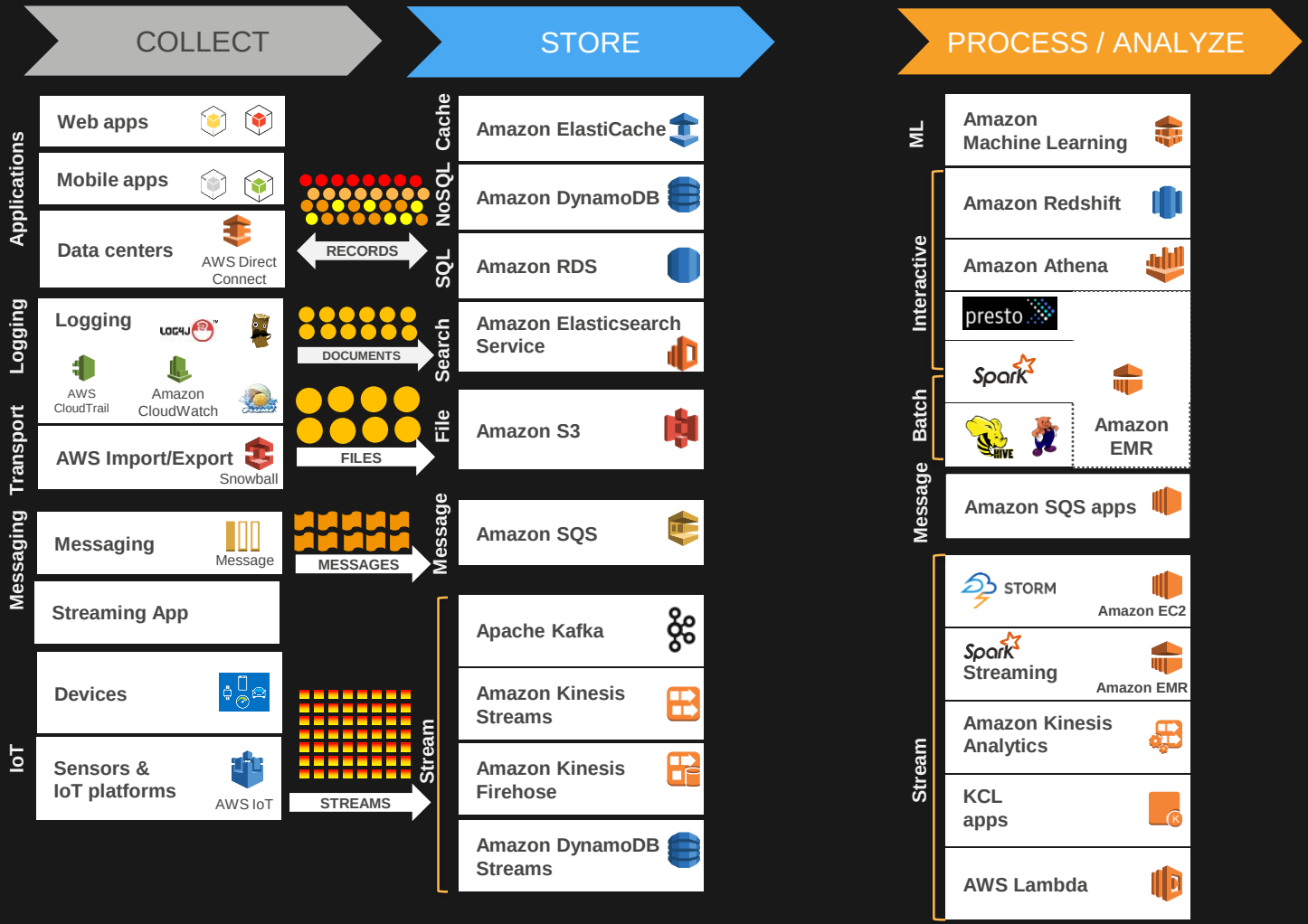
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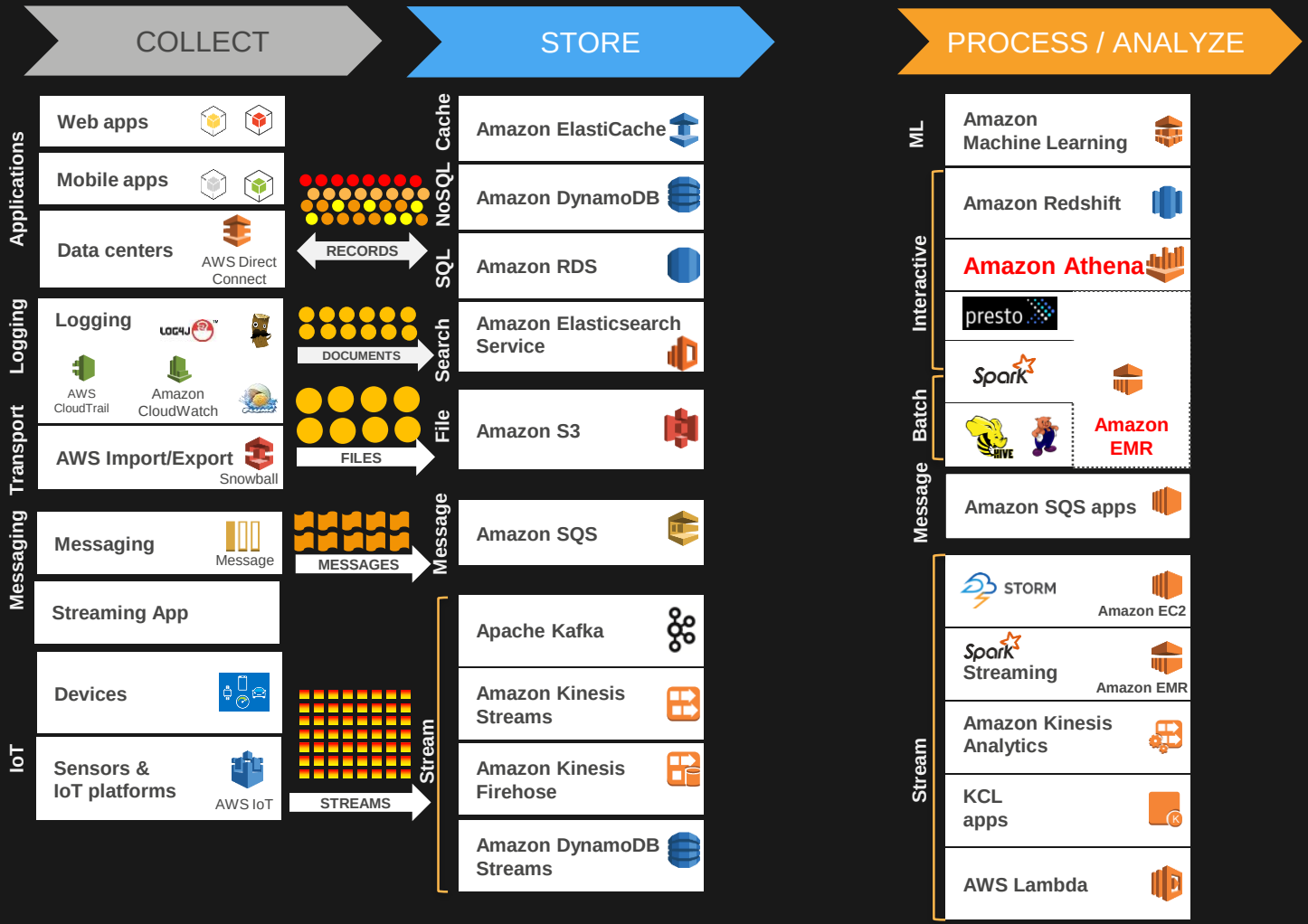
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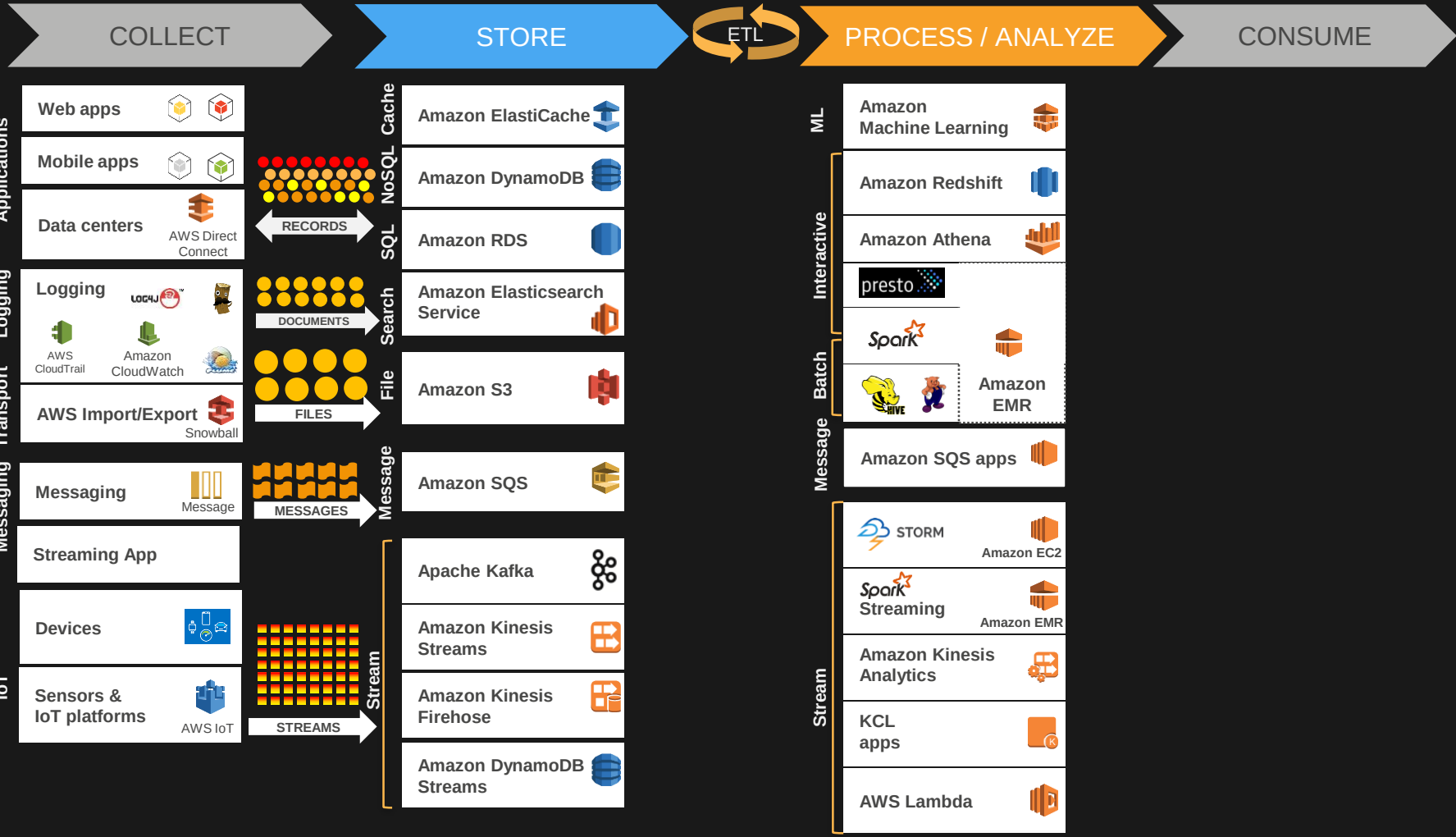
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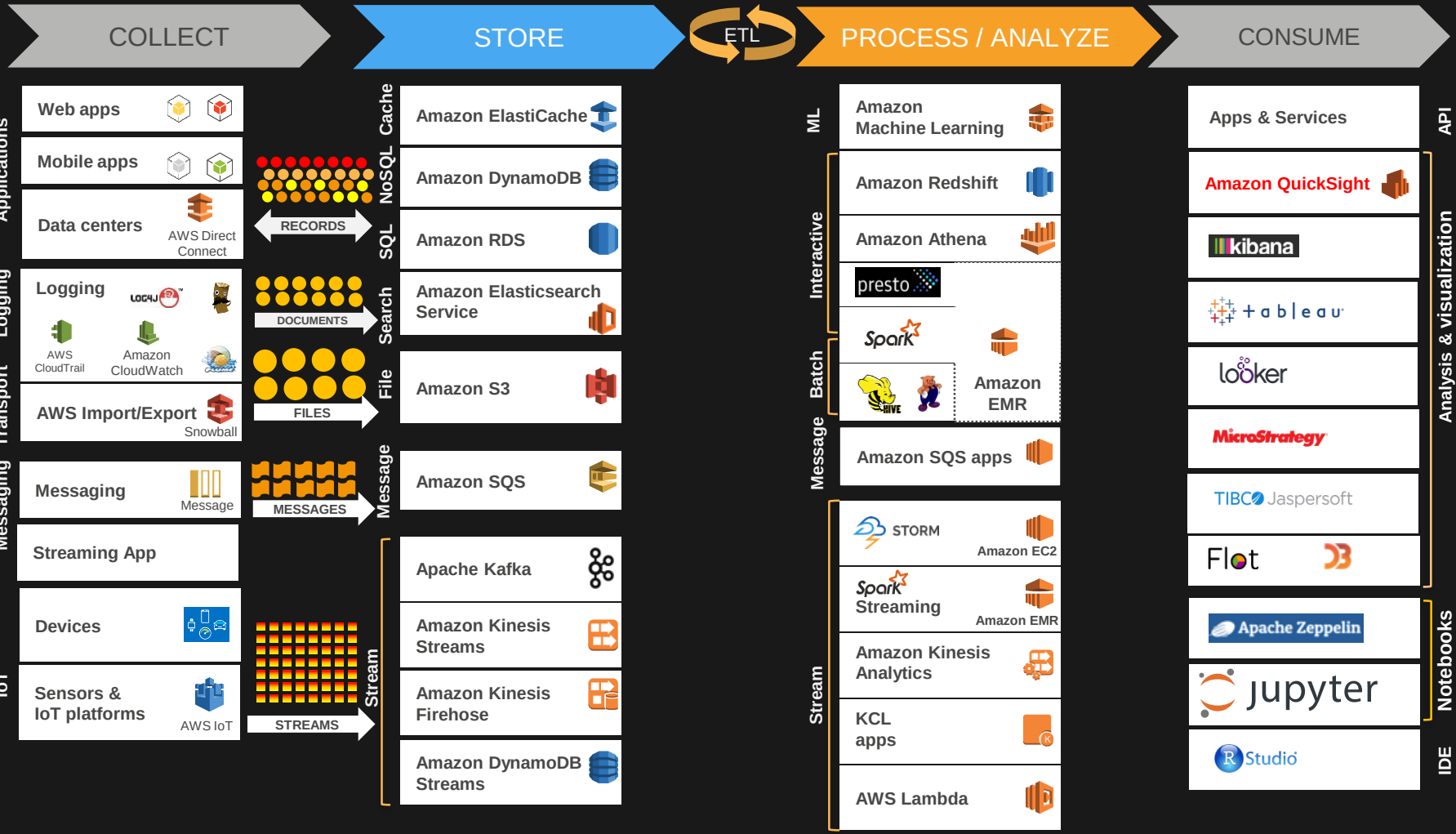
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+ableau
looker
MicroStrategy
TIBCO Jaspersoft
Flot
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Apache Zeppelin
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IDE
RStudio

Building a pipeline

Demo

- Check the files which were ingested into Amazon S3
- Clean the data using Amazon EMR (Spark)
- Create a table in Amazon Athena
    - Query data using SQL

Demo

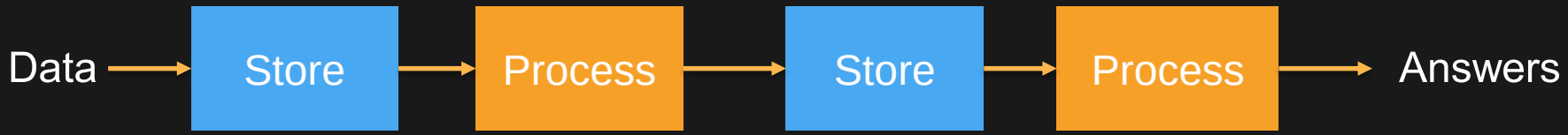
- Amazon QuickSight Demo

Design Patterns

Primitive: Decoupled Data Bus

Storage decoupled from processing

Multiple stages

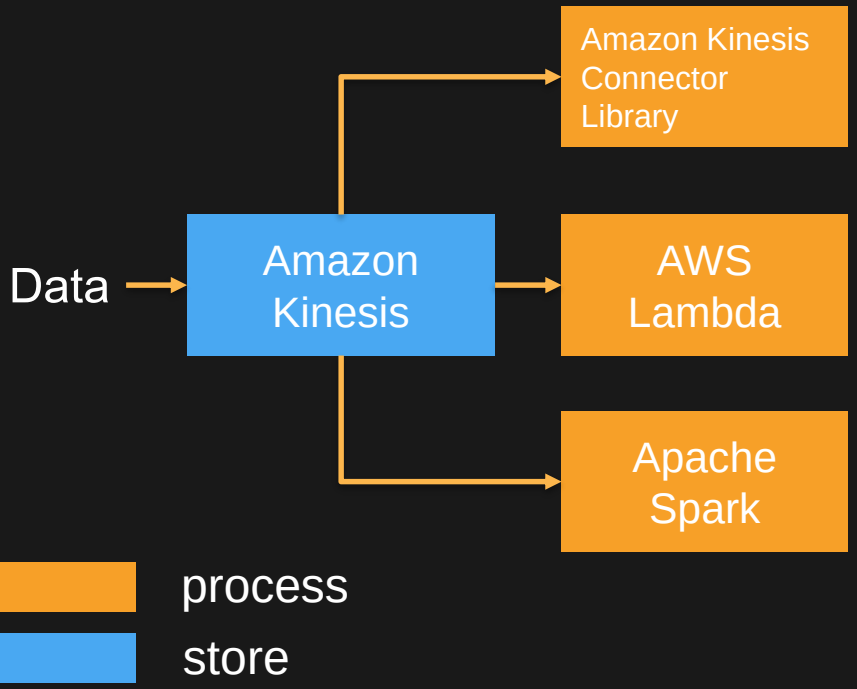


process

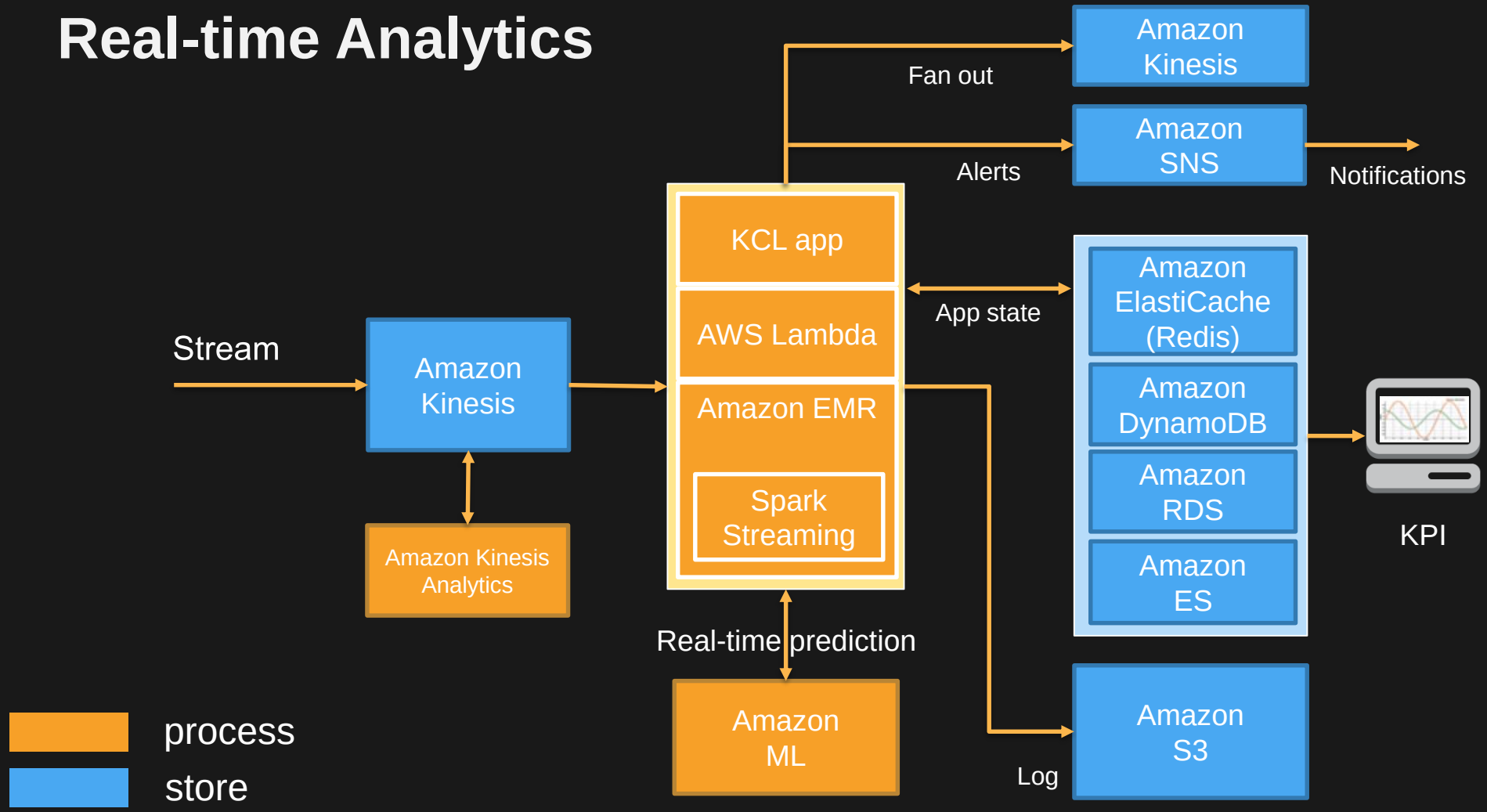
store

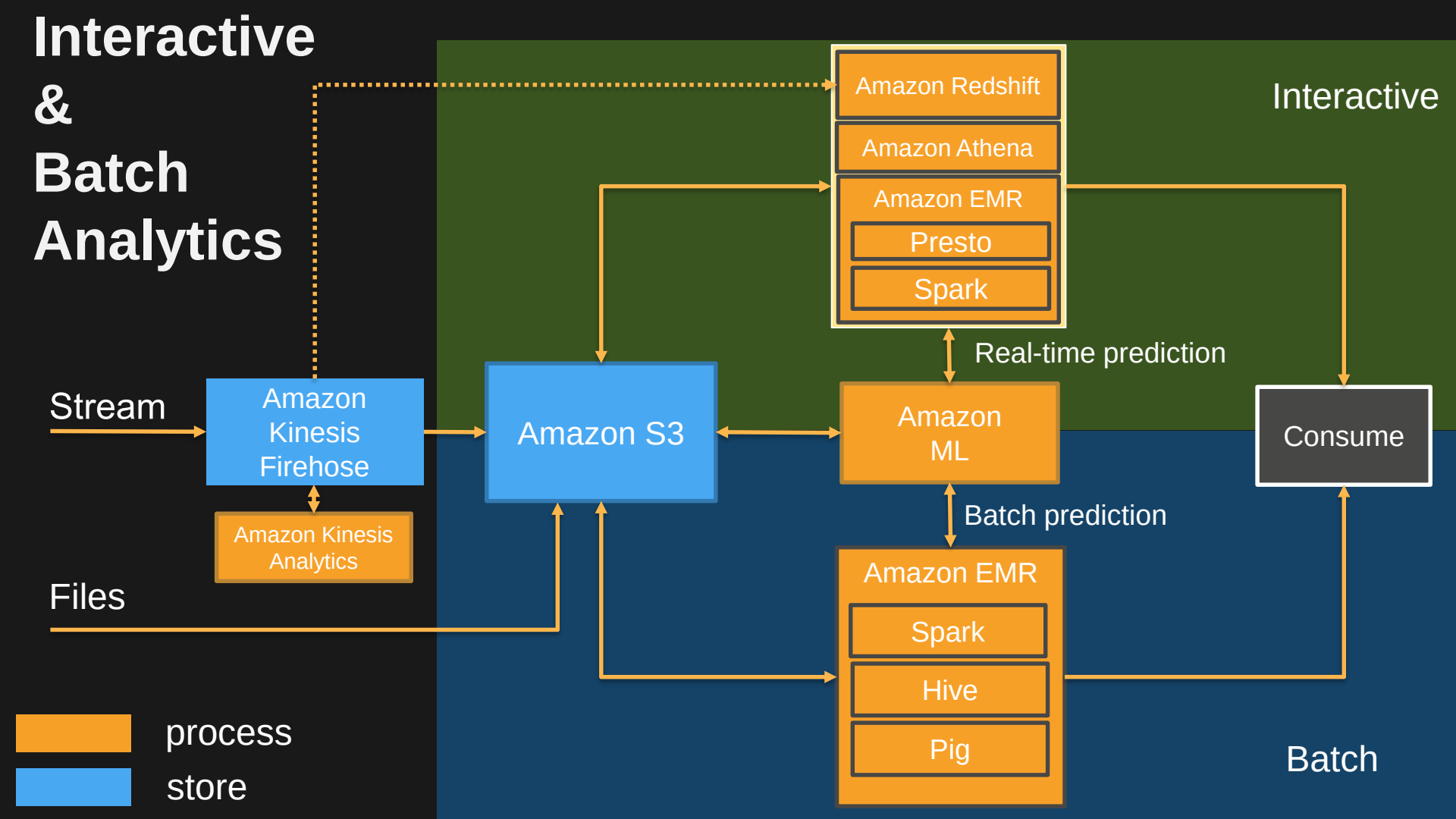
Primitive: Pub/Sub

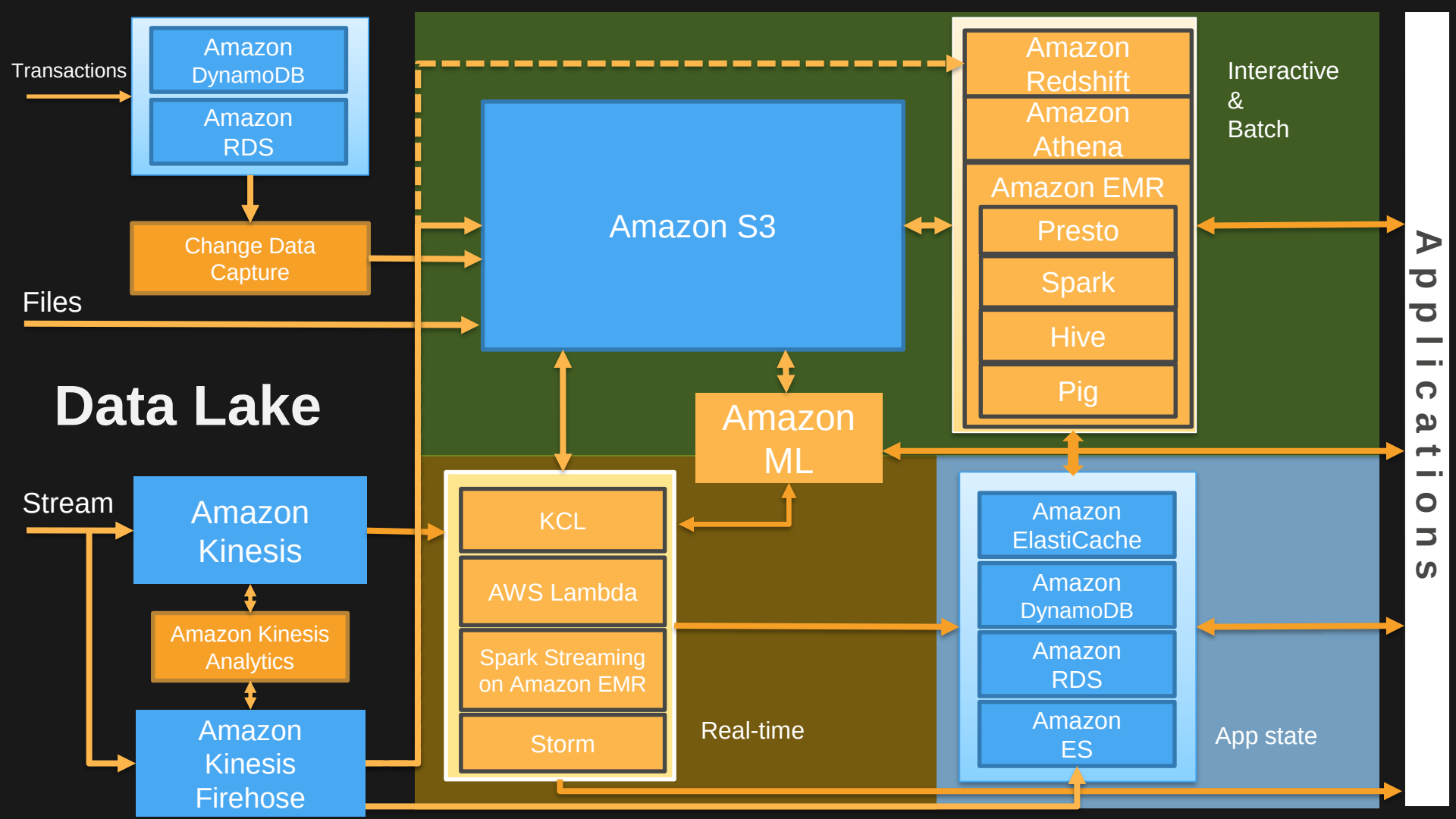
Parallel stream consumption/processing



Real-time Analytics




Interactive & Batch Analytics
Amazon Redshift
Amazon Athena
Amazon EMR
Presto
Spark
Interactive
Real-time prediction
Stream
Amazon Kinesis Firehose
Amazon S3
Amazon ML
Consume
Amazon Kinesis Analytics
Batch prediction
Files
Amazon EMR
Spark
Hive
Pig
Batch
process
store


Transactions
Amazon DynamoDB
Amazon RDS
Change Data Capture
Files
Data Lake
Stream
Amazon Kinesis
Amazon Kinesis Analytics
Amazon Kinesis Firehose
Amazon S3
Amazon ML
KCL
AWS Lambda
Spark Streaming on Amazon EMR
Storm
Real-time
Amazon Redshift
Amazon Athena
Amazon EMR
Presto
Spark
Hive
Pig
Interactive & Batch
Amazon ElastiCache
Amazon DynamoDB
Amazon RDS
Amazon ES
App state
Applications

Data Lake Solution Architecture on AWS

http://bit.ly/DataLakeOnAWS

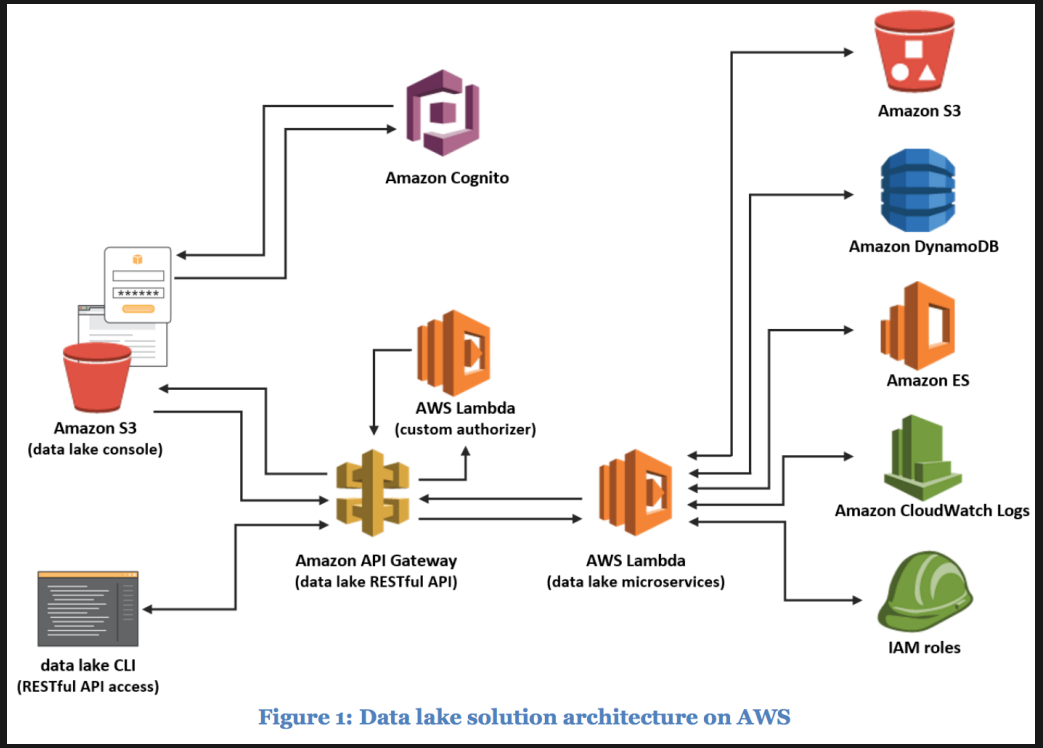
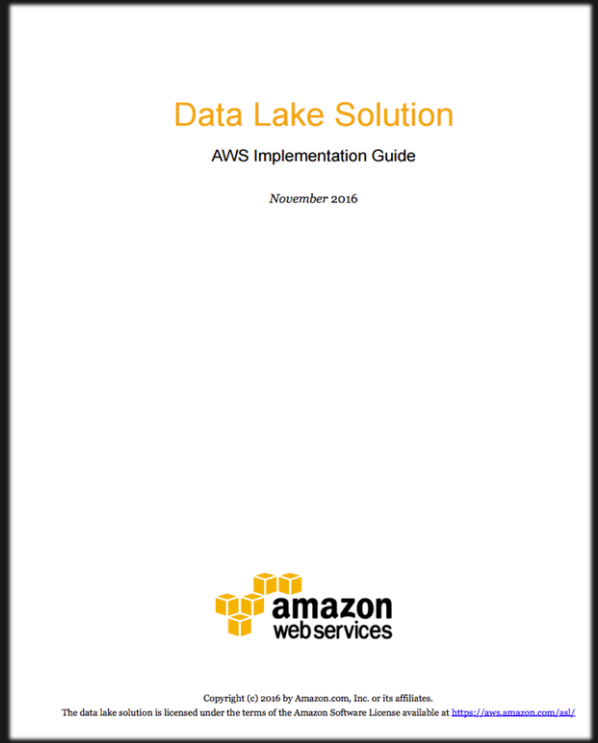


Figure 1: Data lake solution architecture on AWS



Data Lake Solution

AWS Implementation Guide

November 2016

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Thank You

http://blogs.aws.amazon.com/bigdata/

unni_k_pillai

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