AWS

SUMMIT

Building a Data Processing Pipeline on AWS

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Solutions Architect

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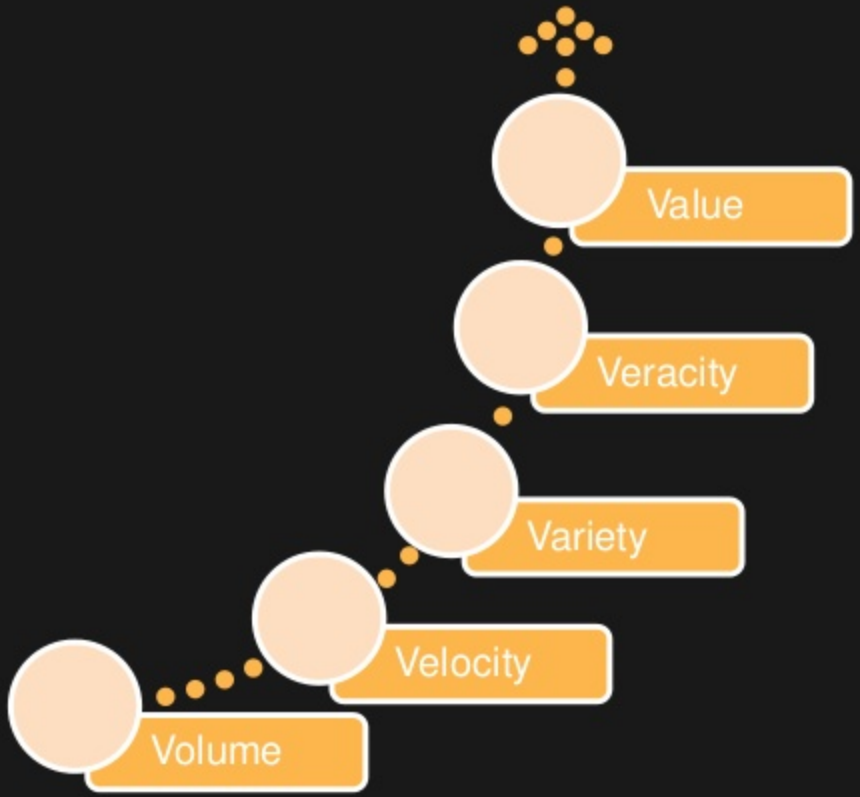
amazon web services

Agenda

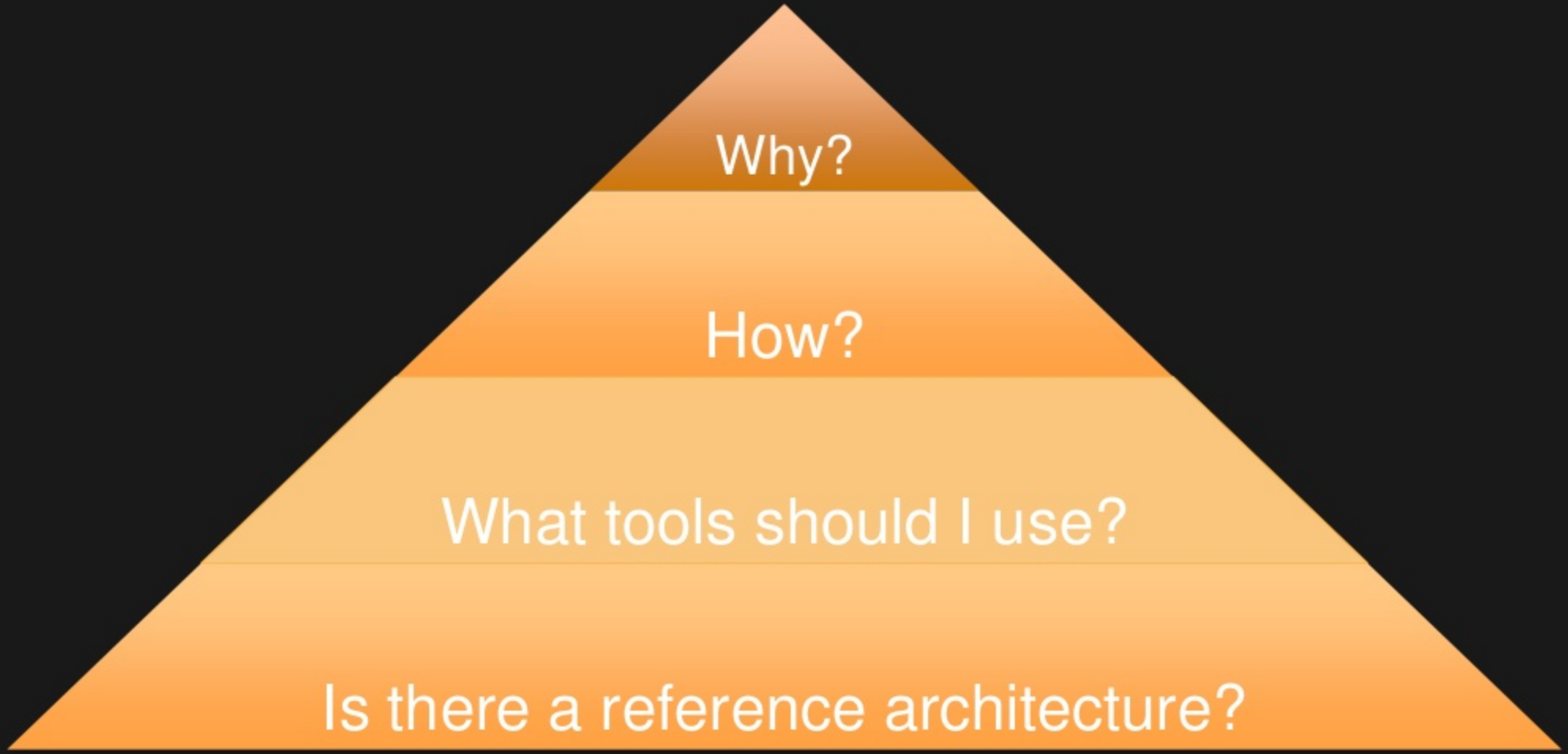
- Big Data Challenges
- Architectural Principles
- Stages in a Data Processing Pipeline
- Demo : Build a data processing pipeline
- Design Patterns

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

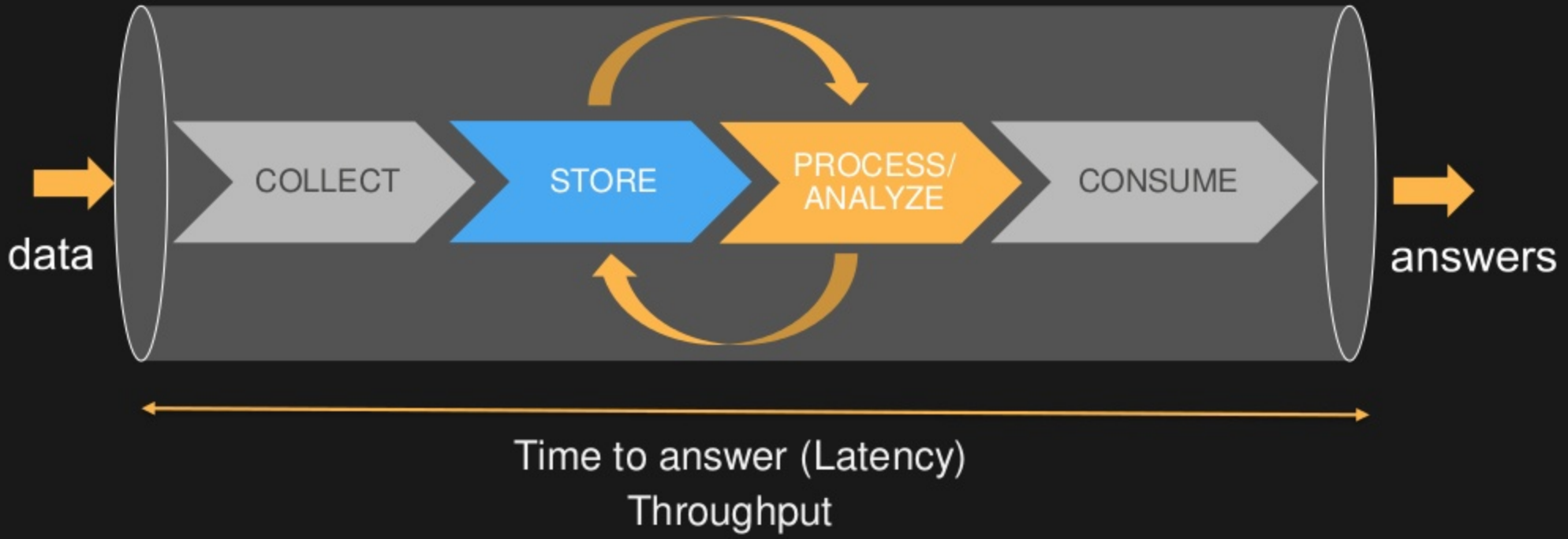
Use **log-centric** design patterns

- Immutable logs, materialized views

Be **cost-conscious**

- Big data ≠ big cost

Simplify Big Data Processing



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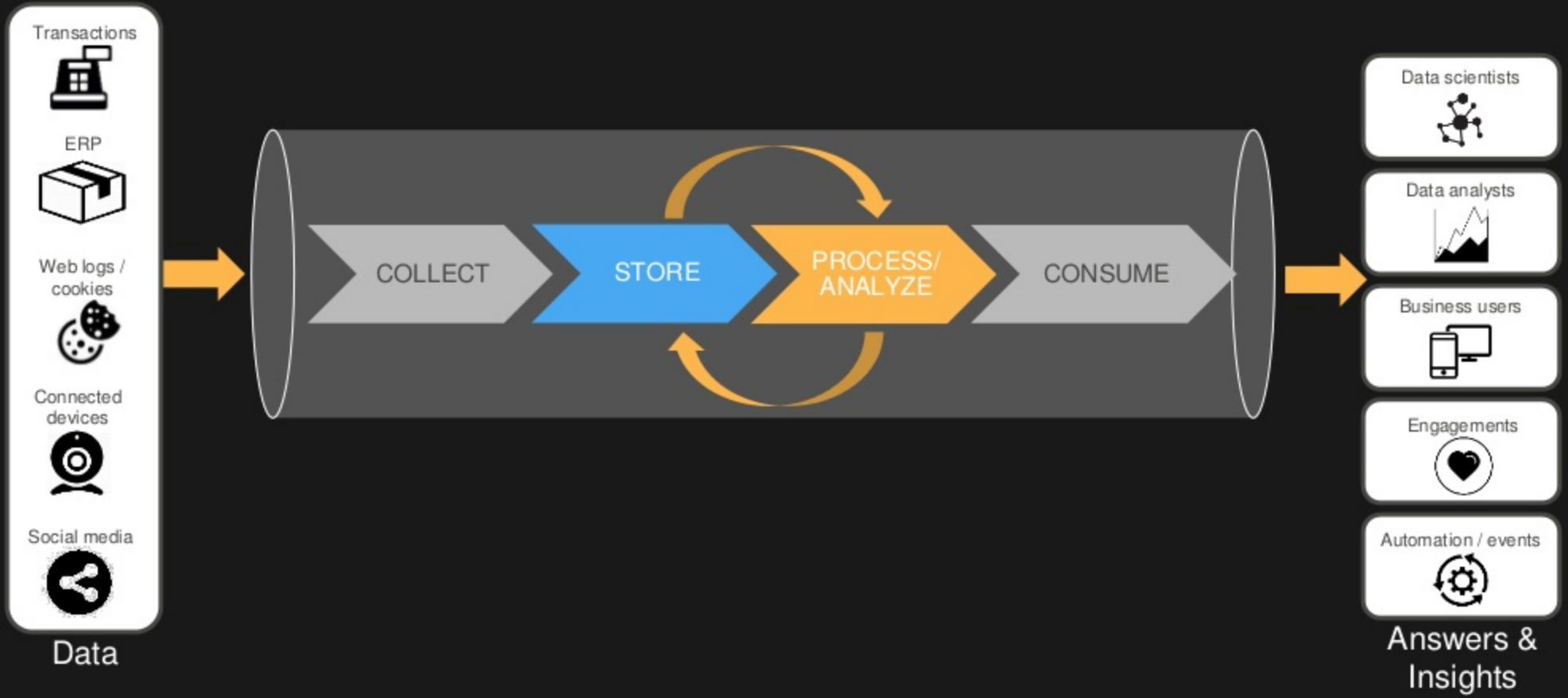
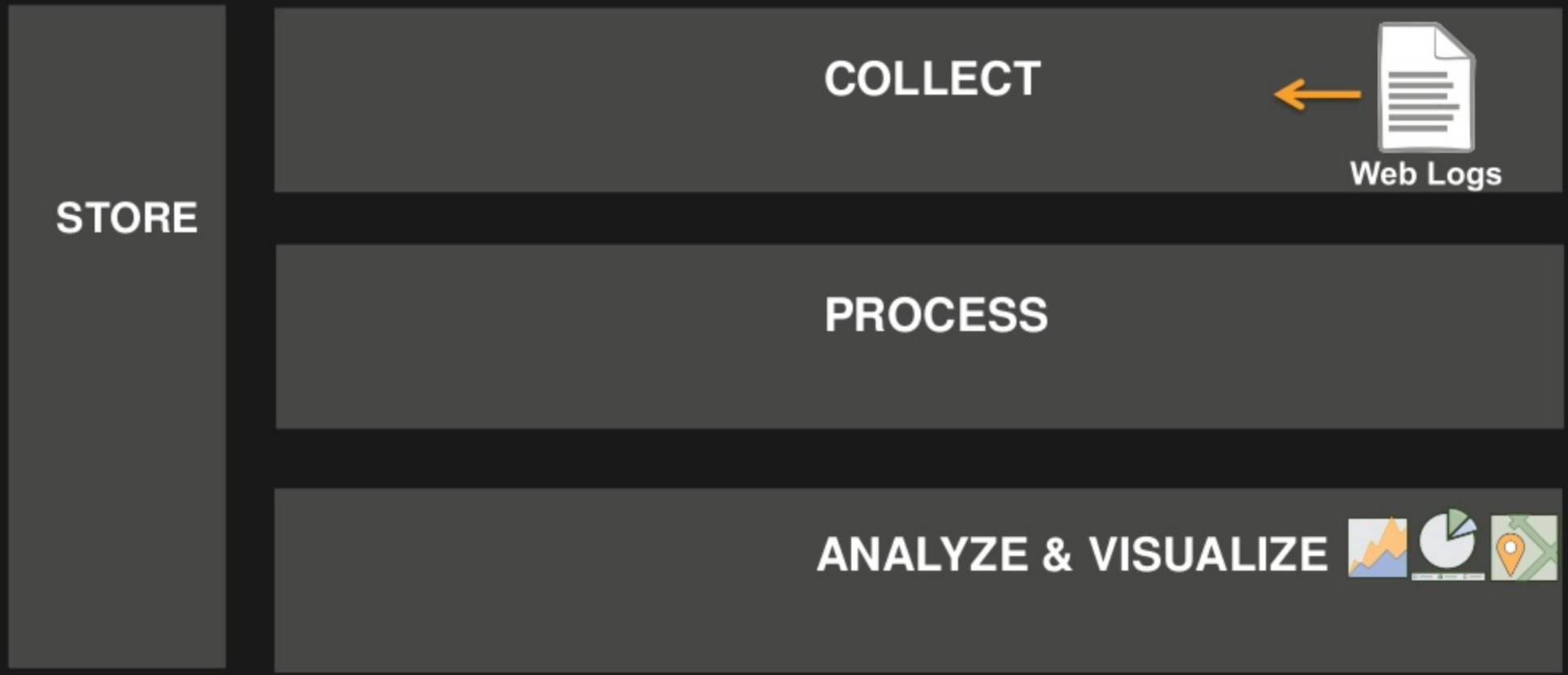


Building a pipeline - DEMO

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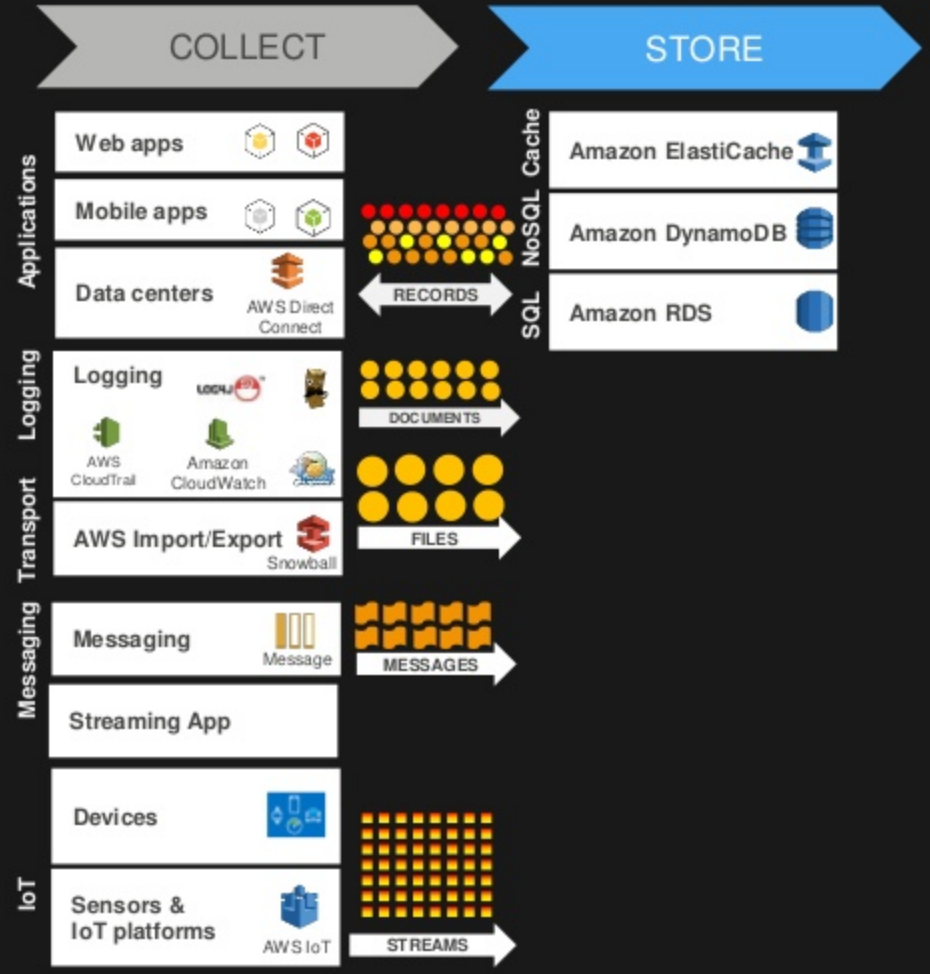
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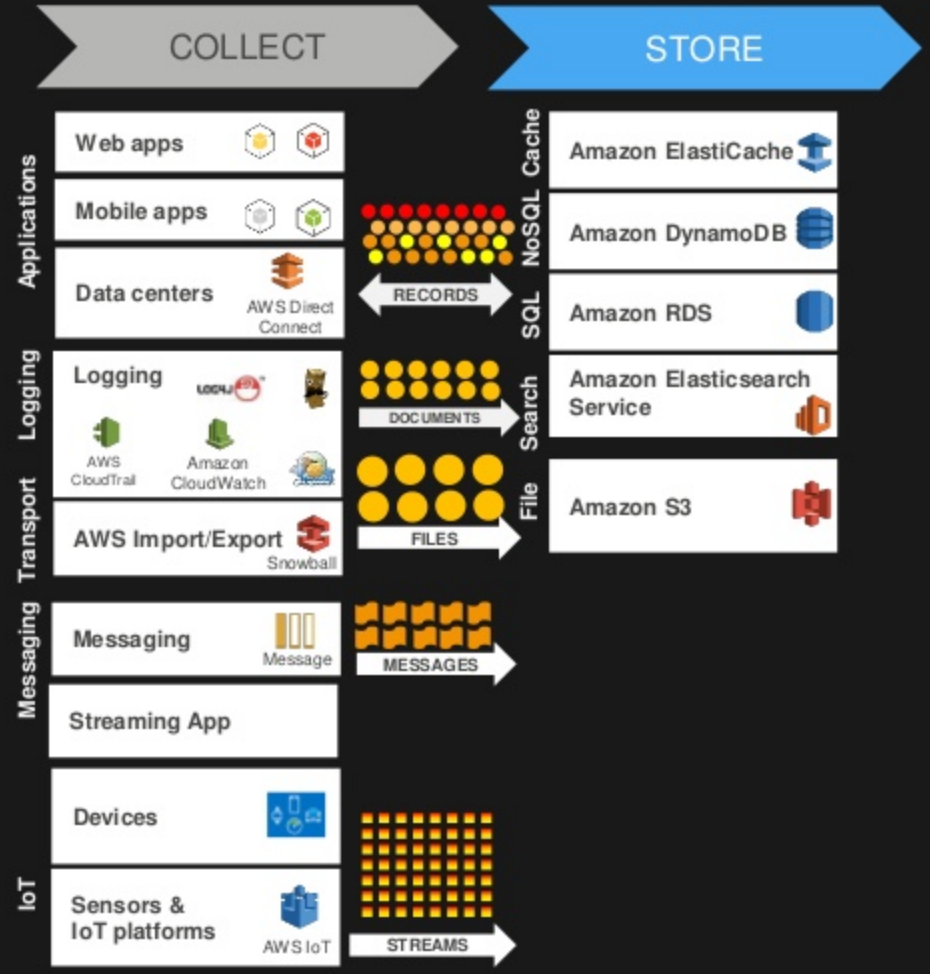
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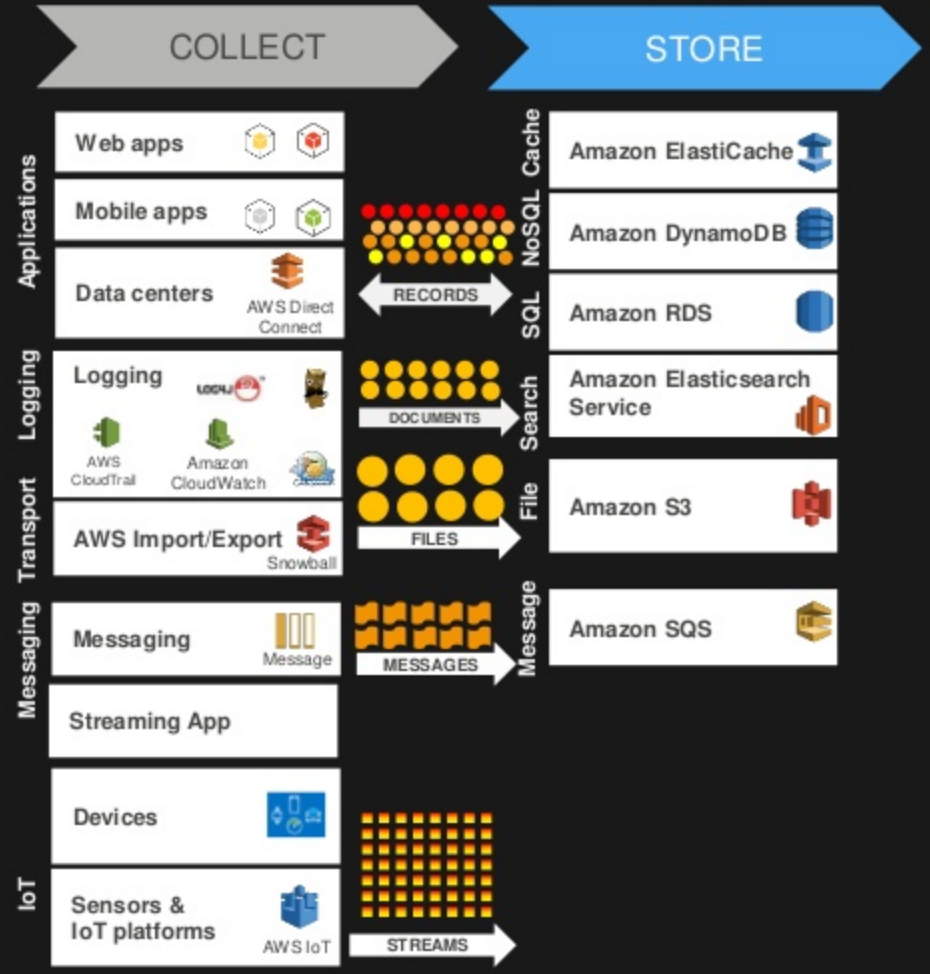
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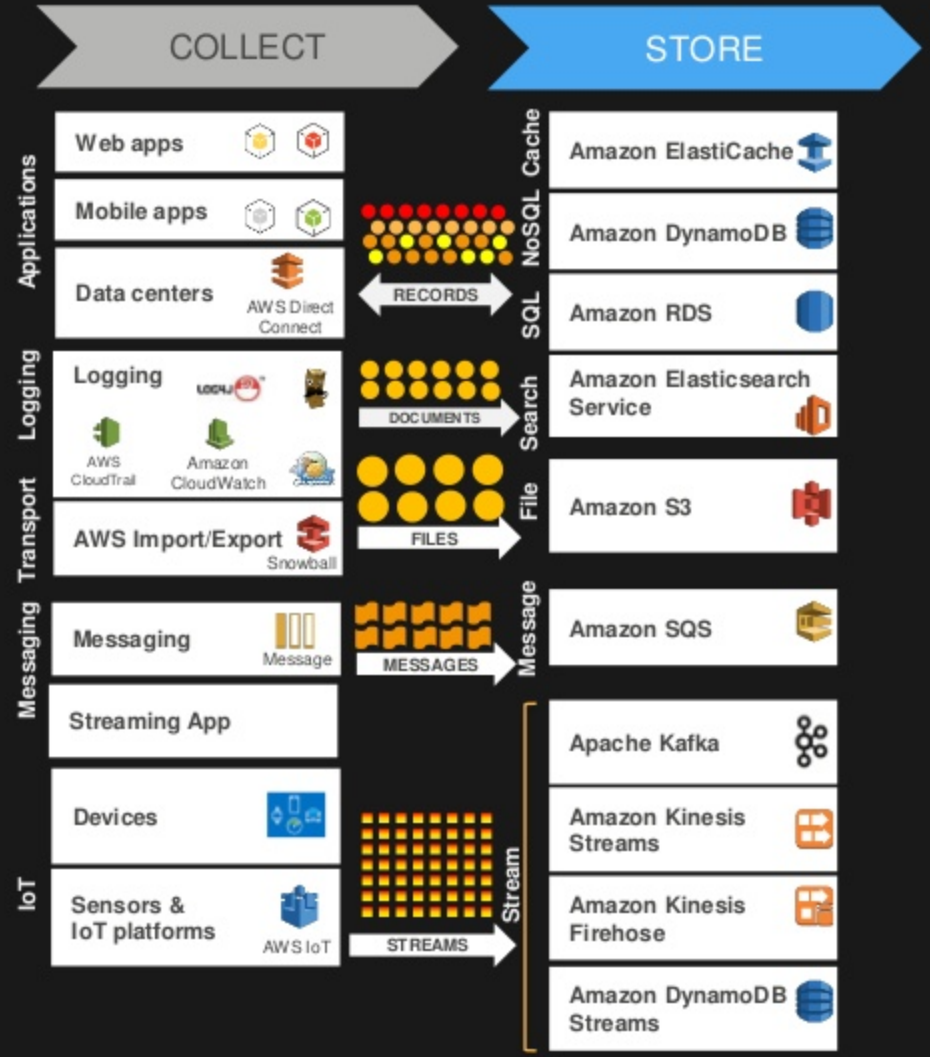
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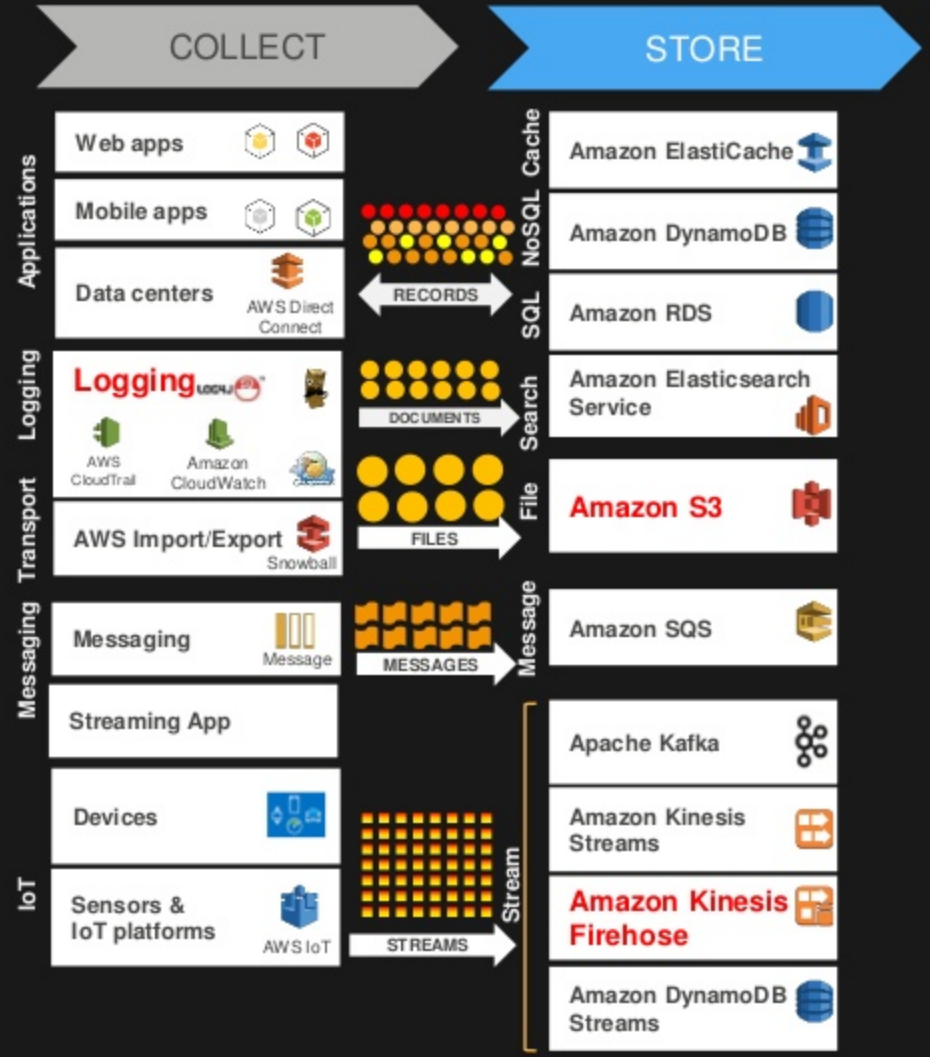
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Weblogs – Common Log Format (CLF)

```
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)
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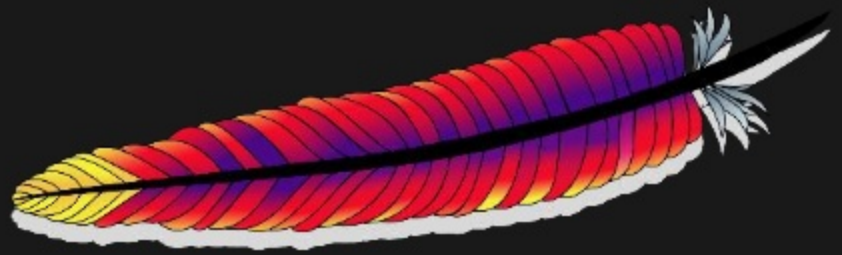
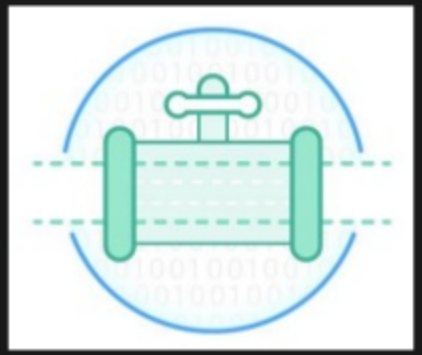


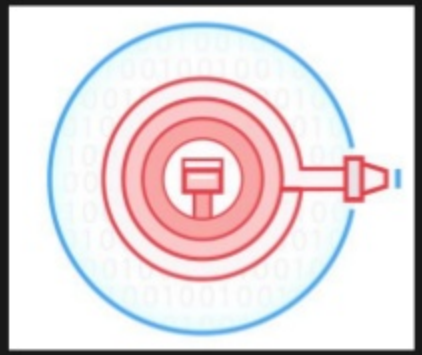
Amazon Kinesis: Streaming Data Made Easy

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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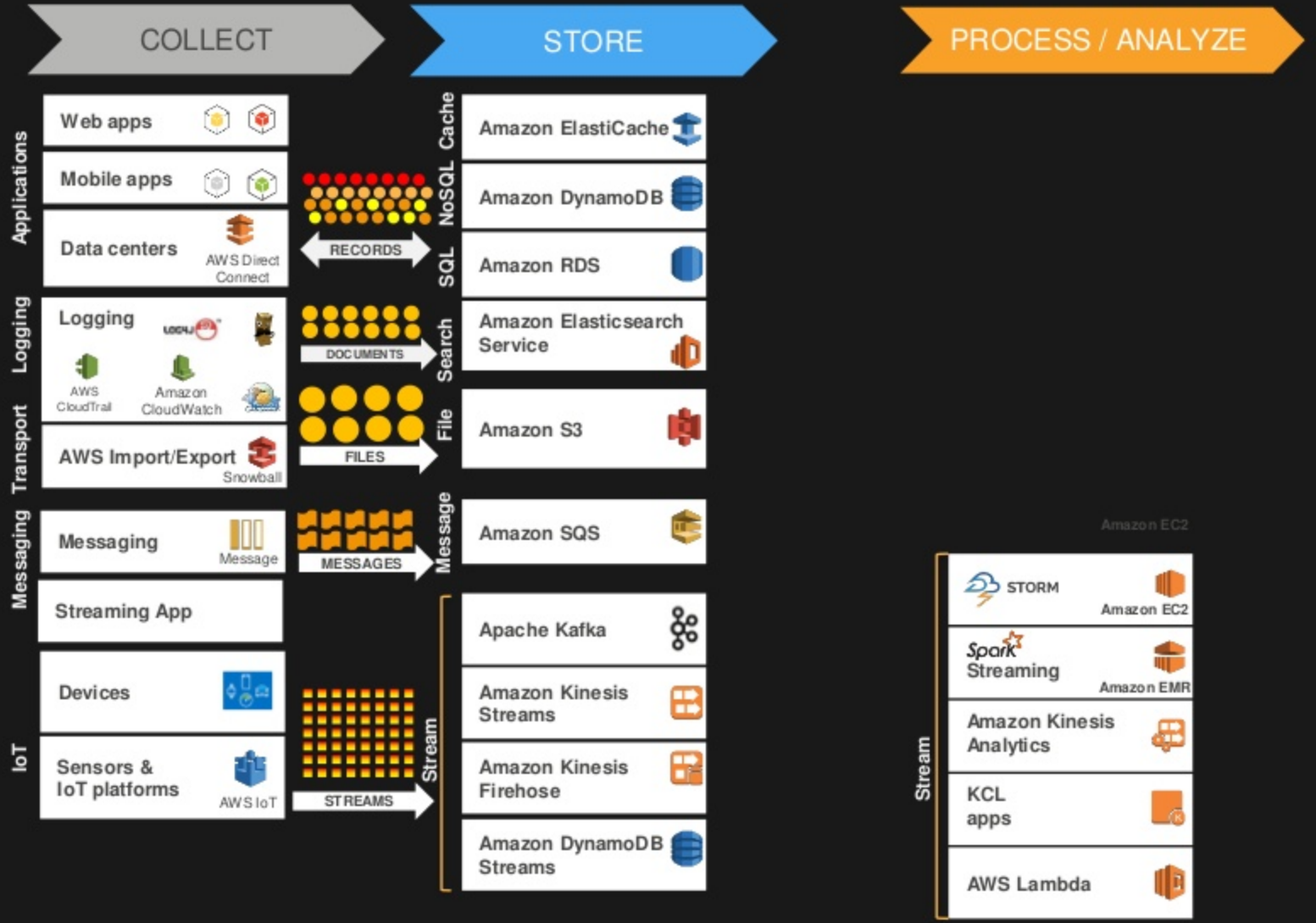
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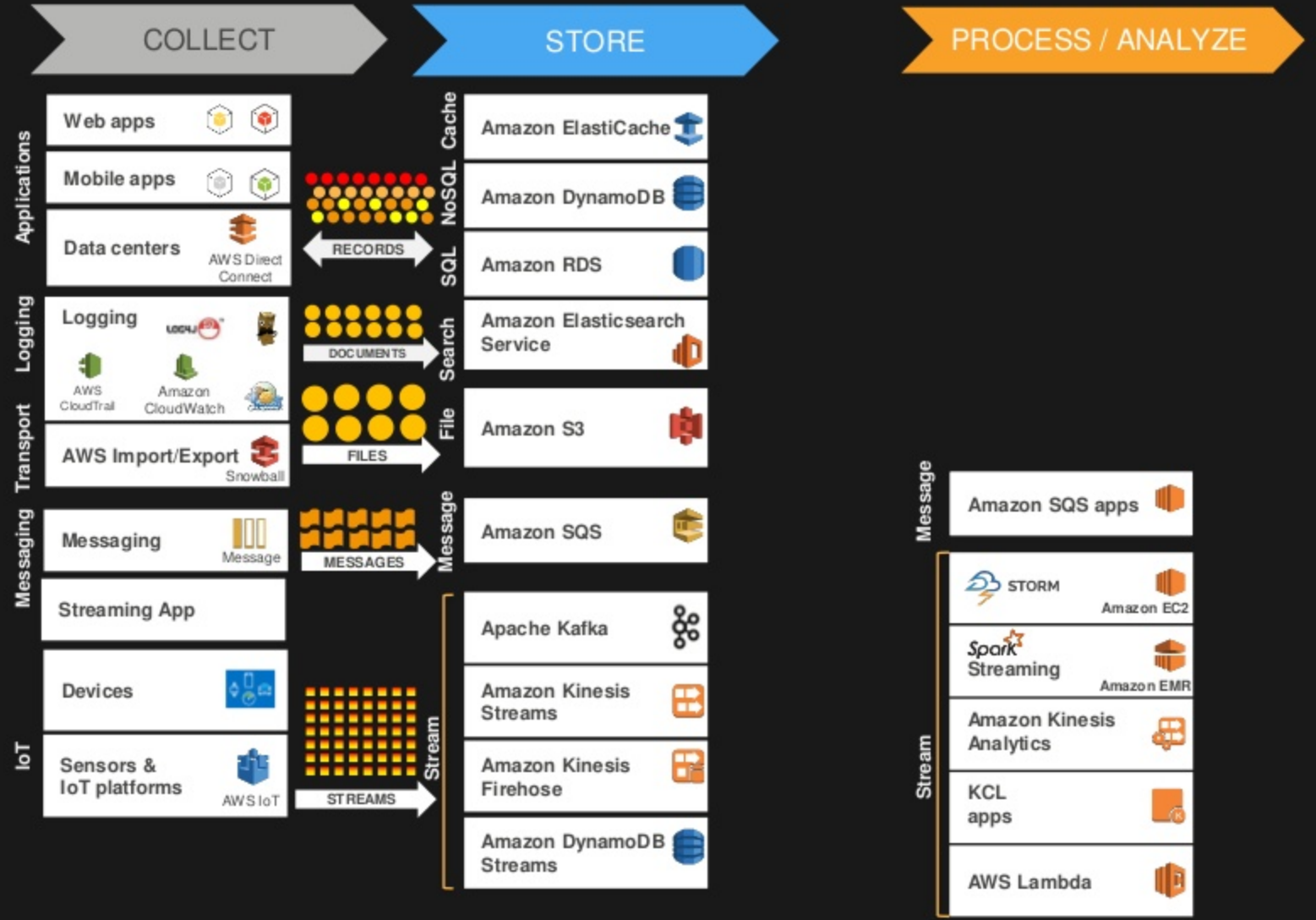
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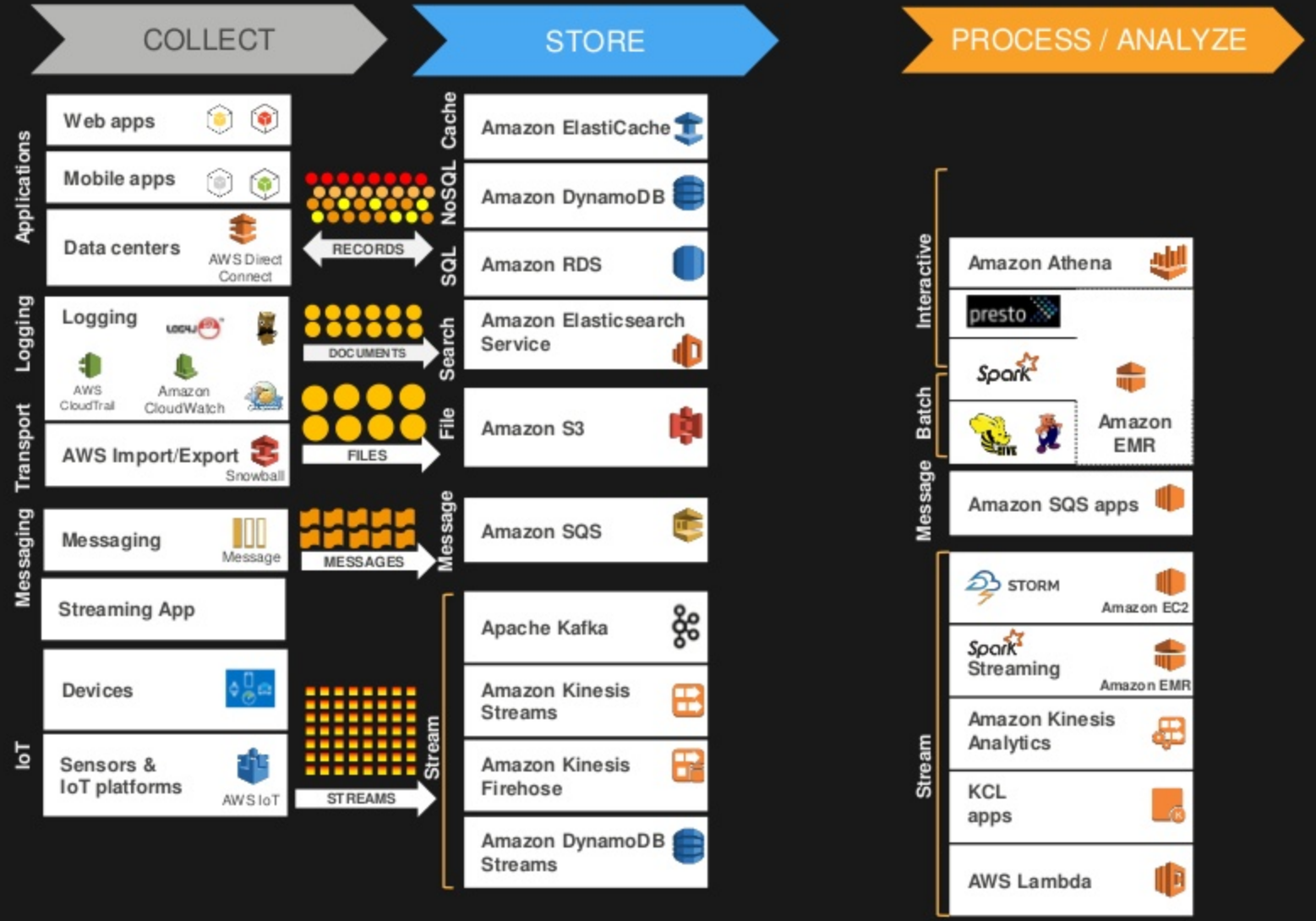
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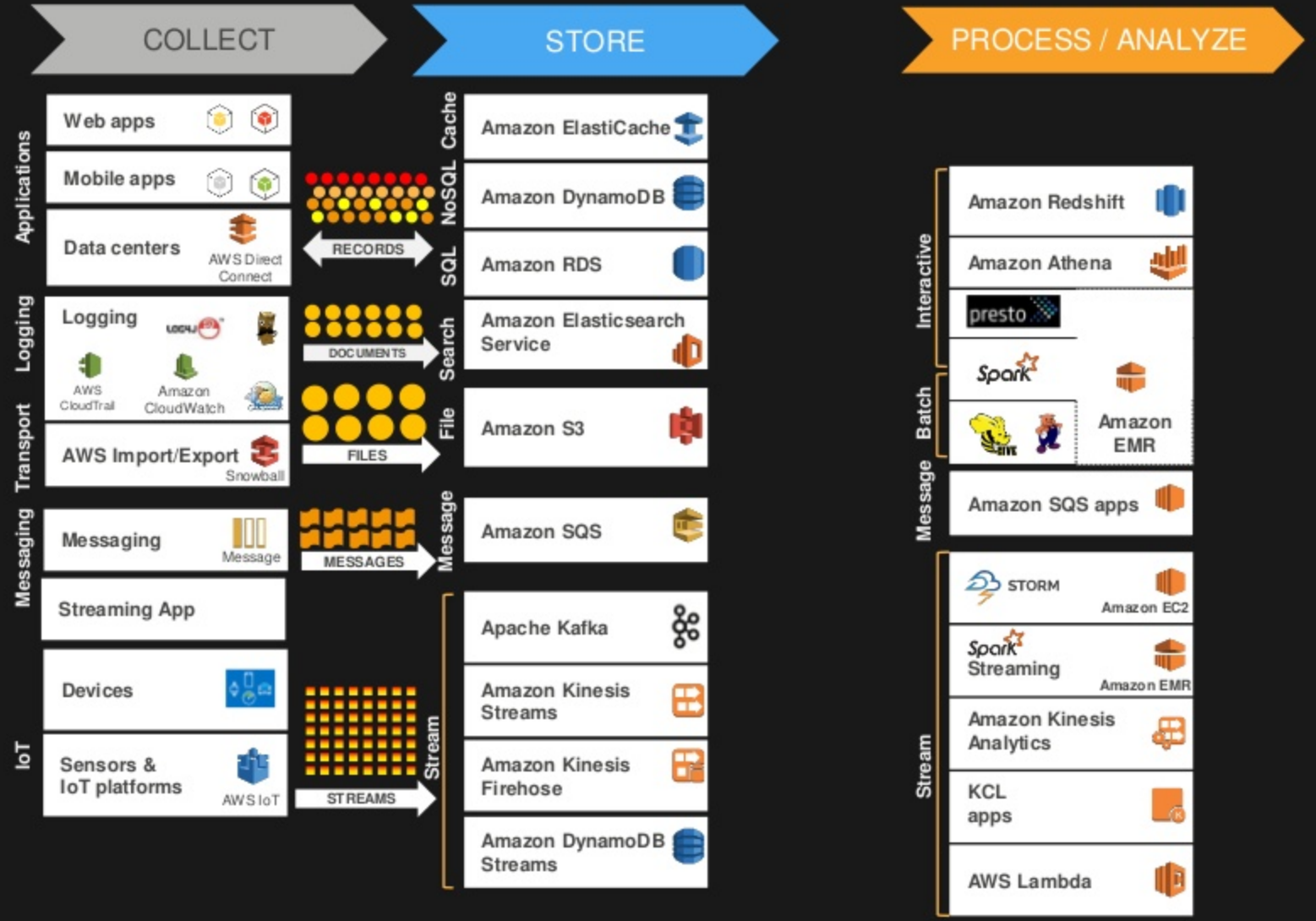
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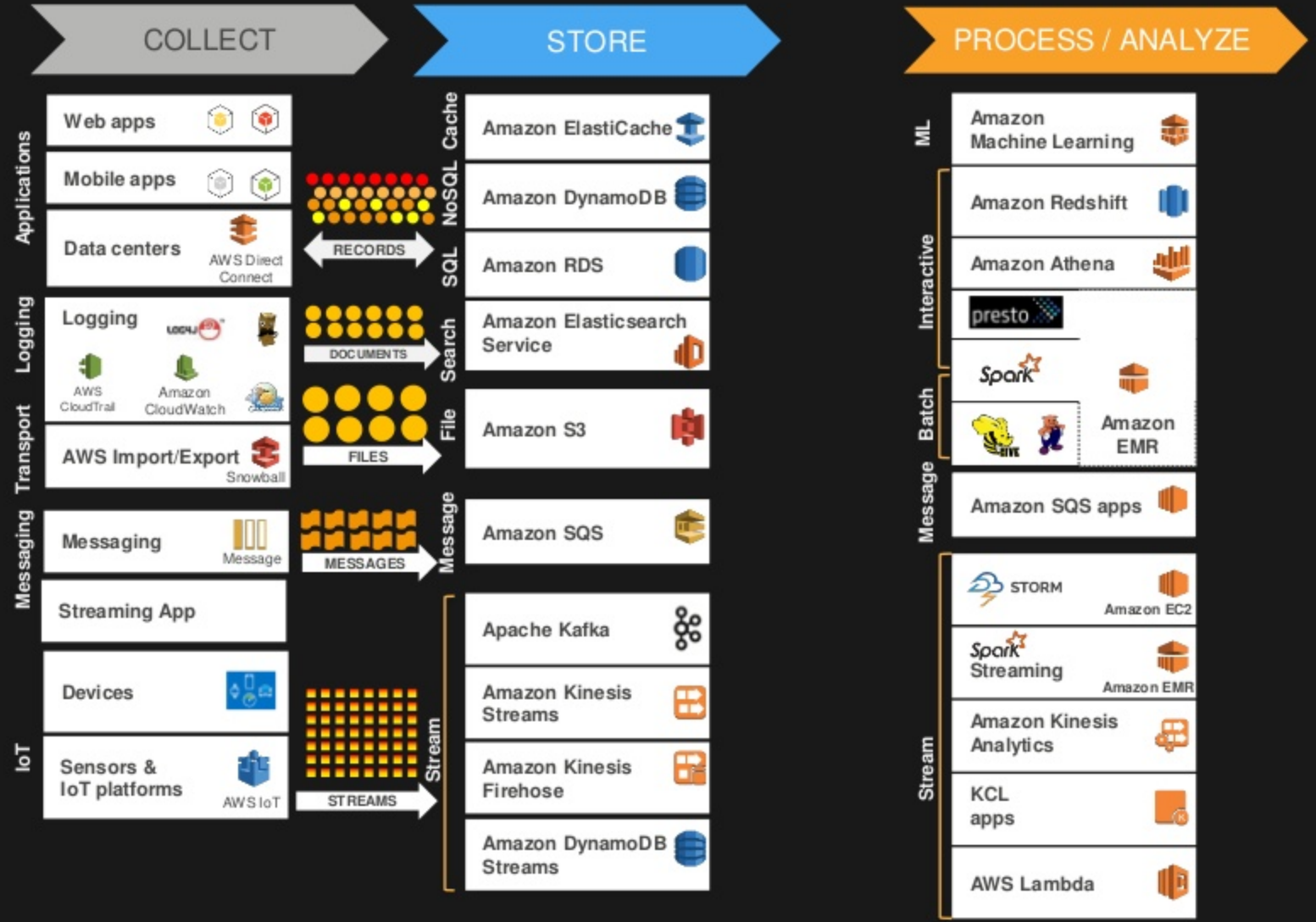
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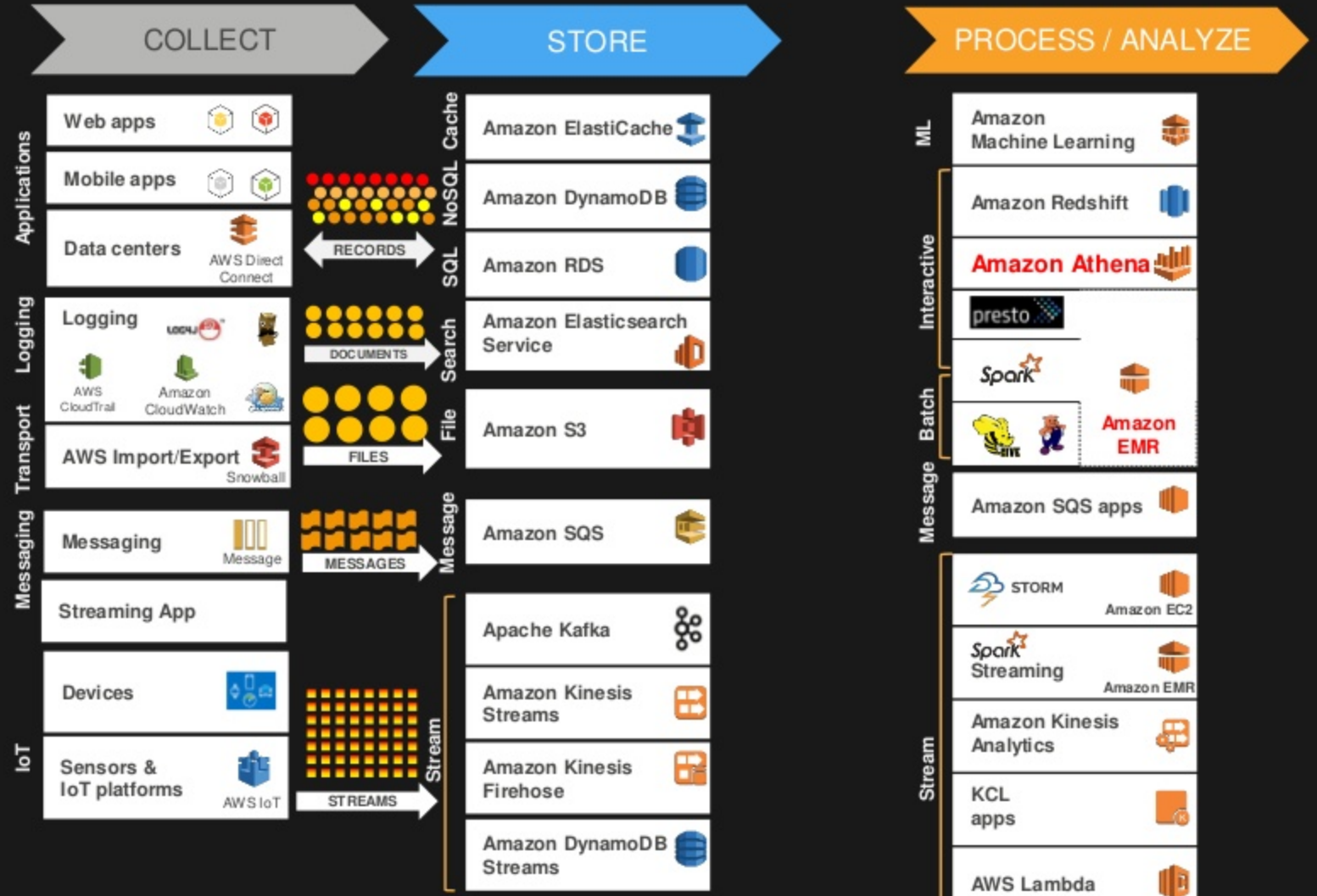
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Building a pipeline

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

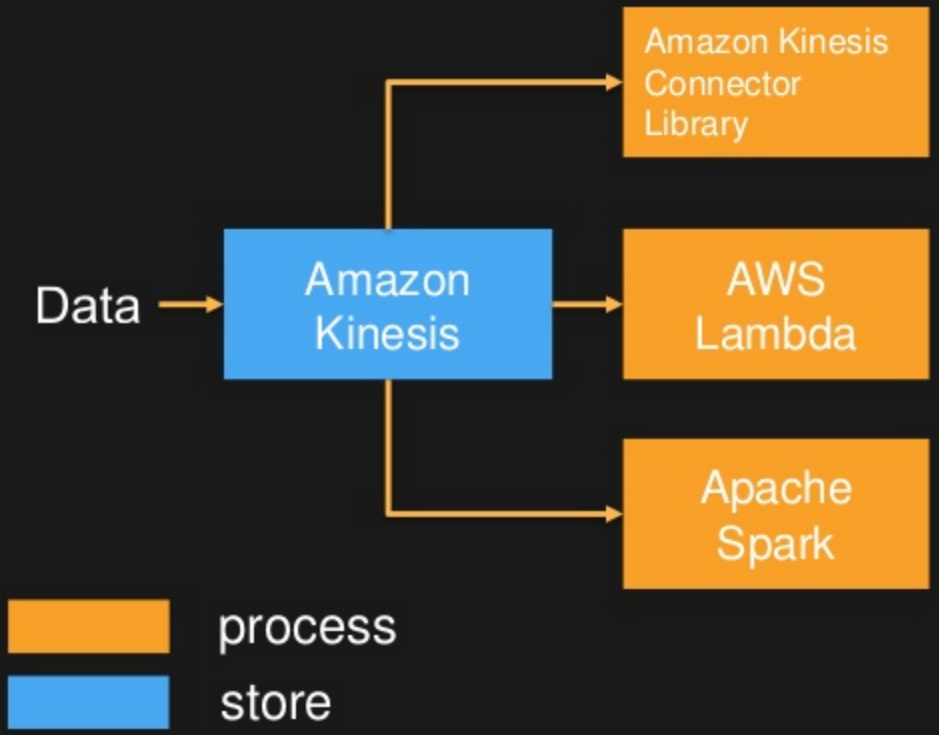
Primitive: Decoupled Data Bus

Storage decoupled from processing

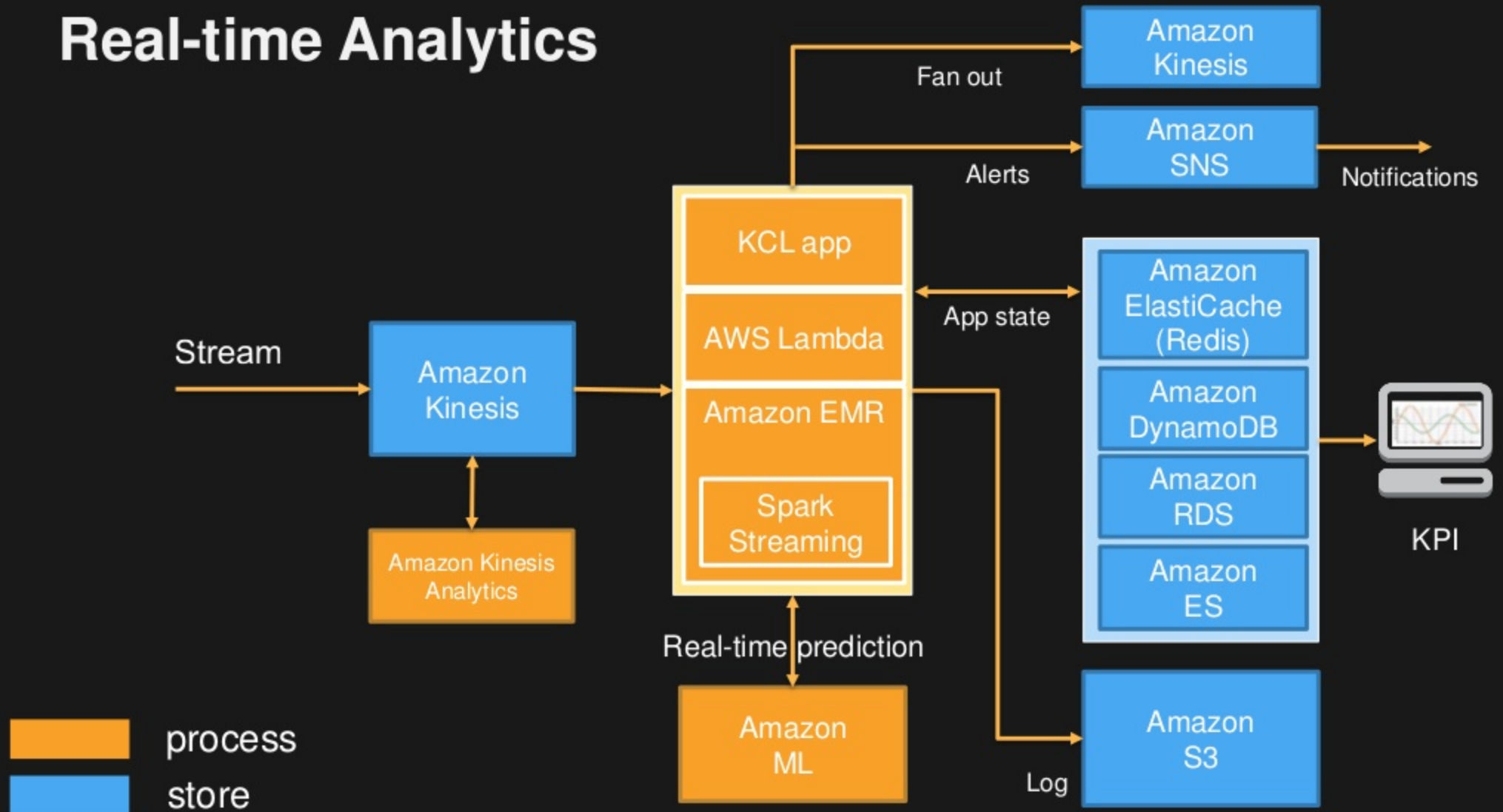
Multiple stages

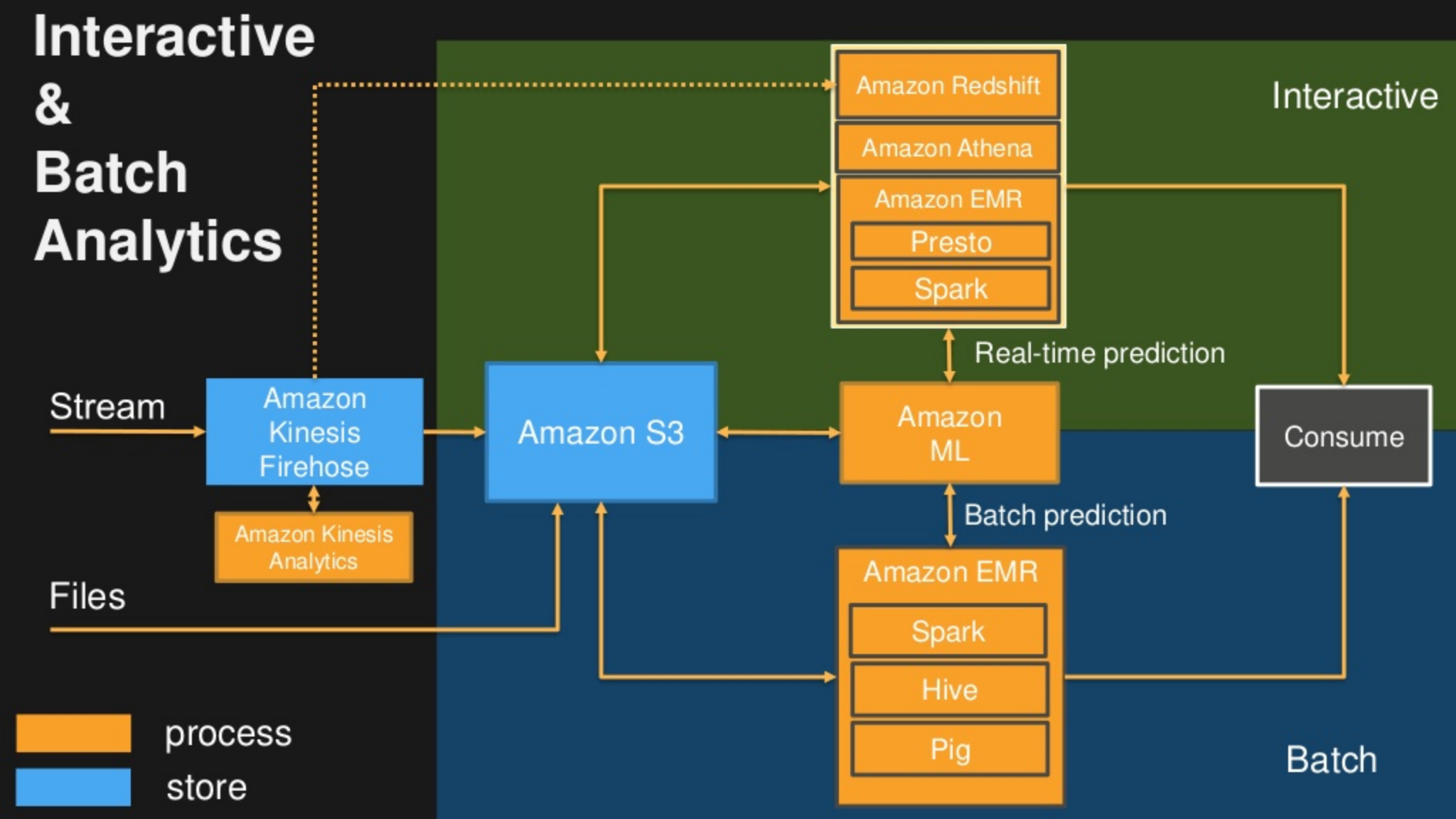
Primitive: Pub/Sub

Parallel stream consumption/processing



Real-time Analytics

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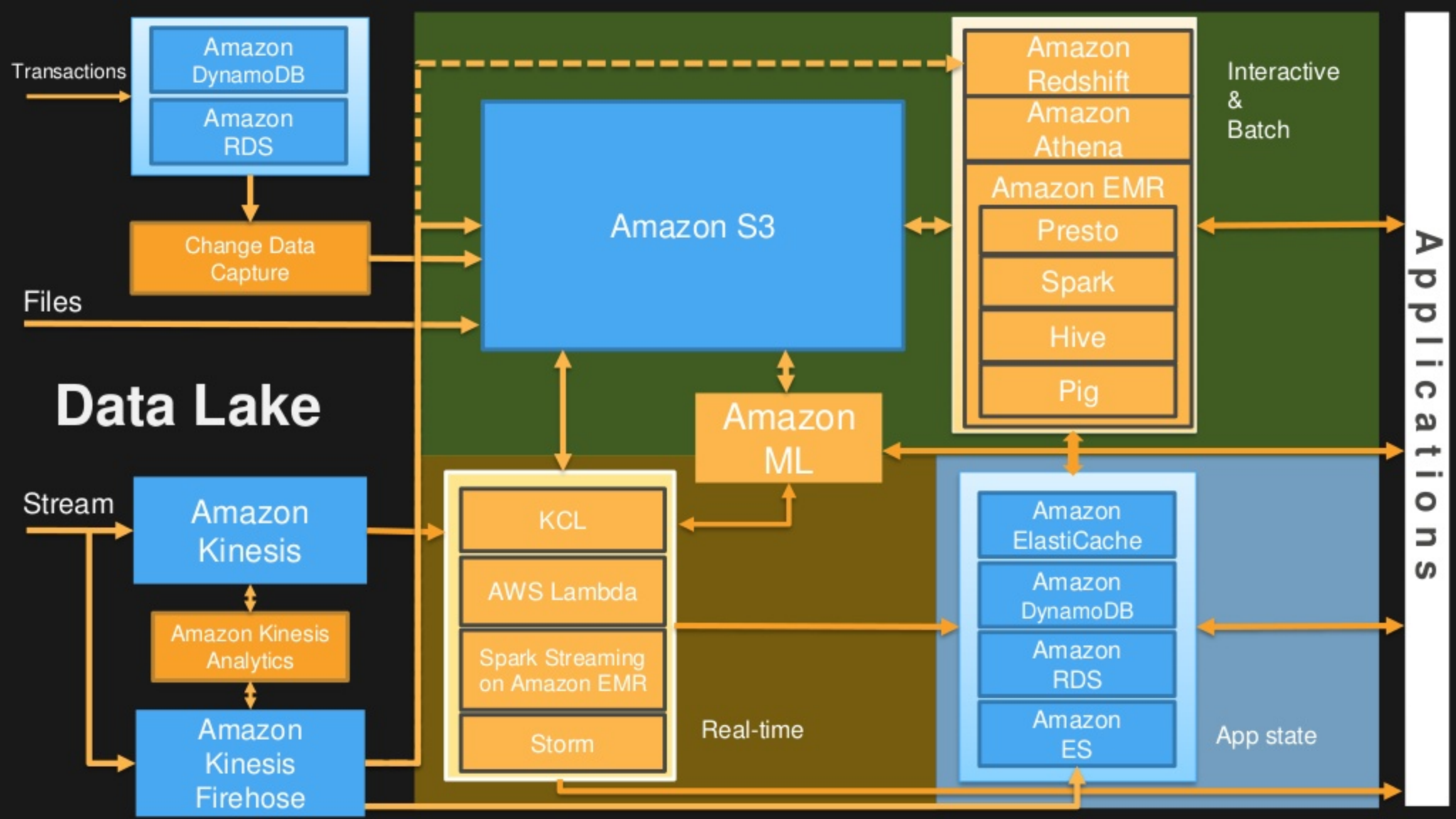
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Data Lake Solution Architecture on AWS

http://bit.ly/DataLakeOnAWS

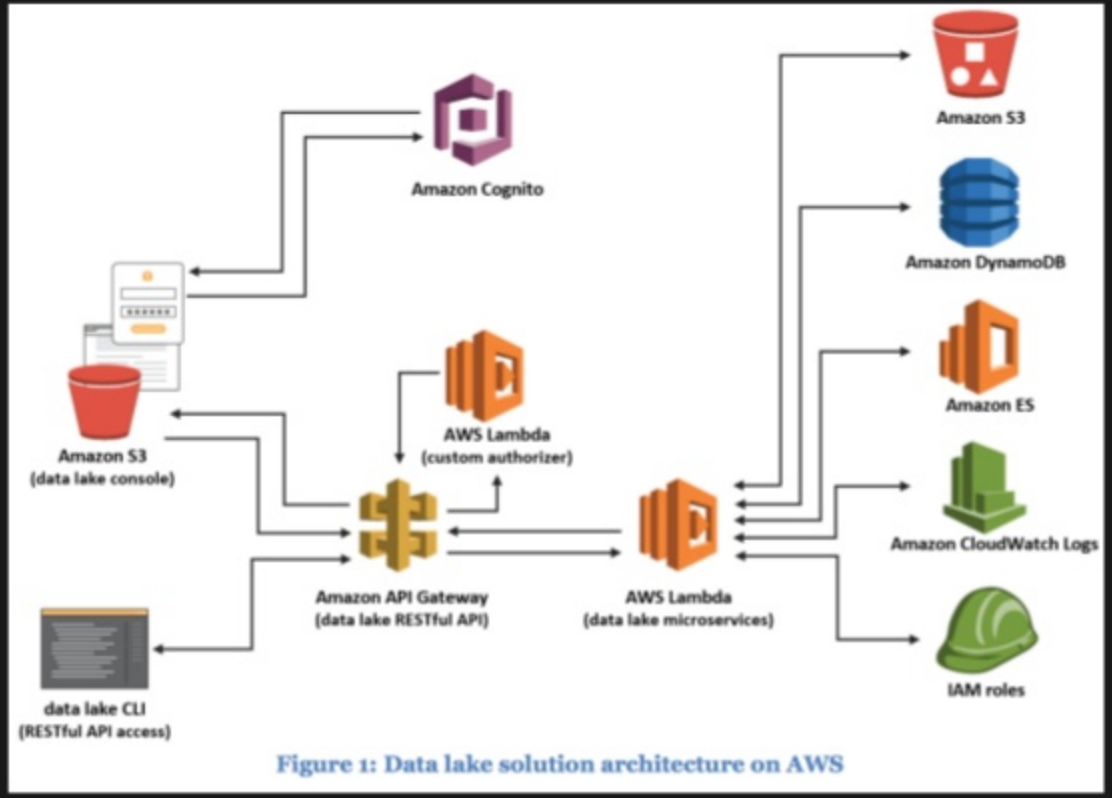
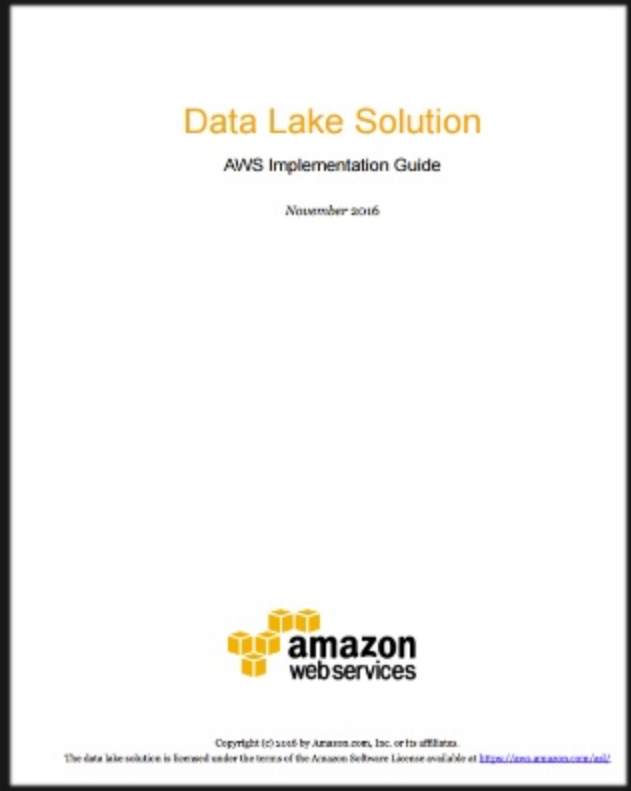


Figure 1: Data lake solution architecture on AWS



AWS

SUMMIT

Thank You

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

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