



AWS – APPLICATION SERVICES

BY

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APPLICATION SERVICES

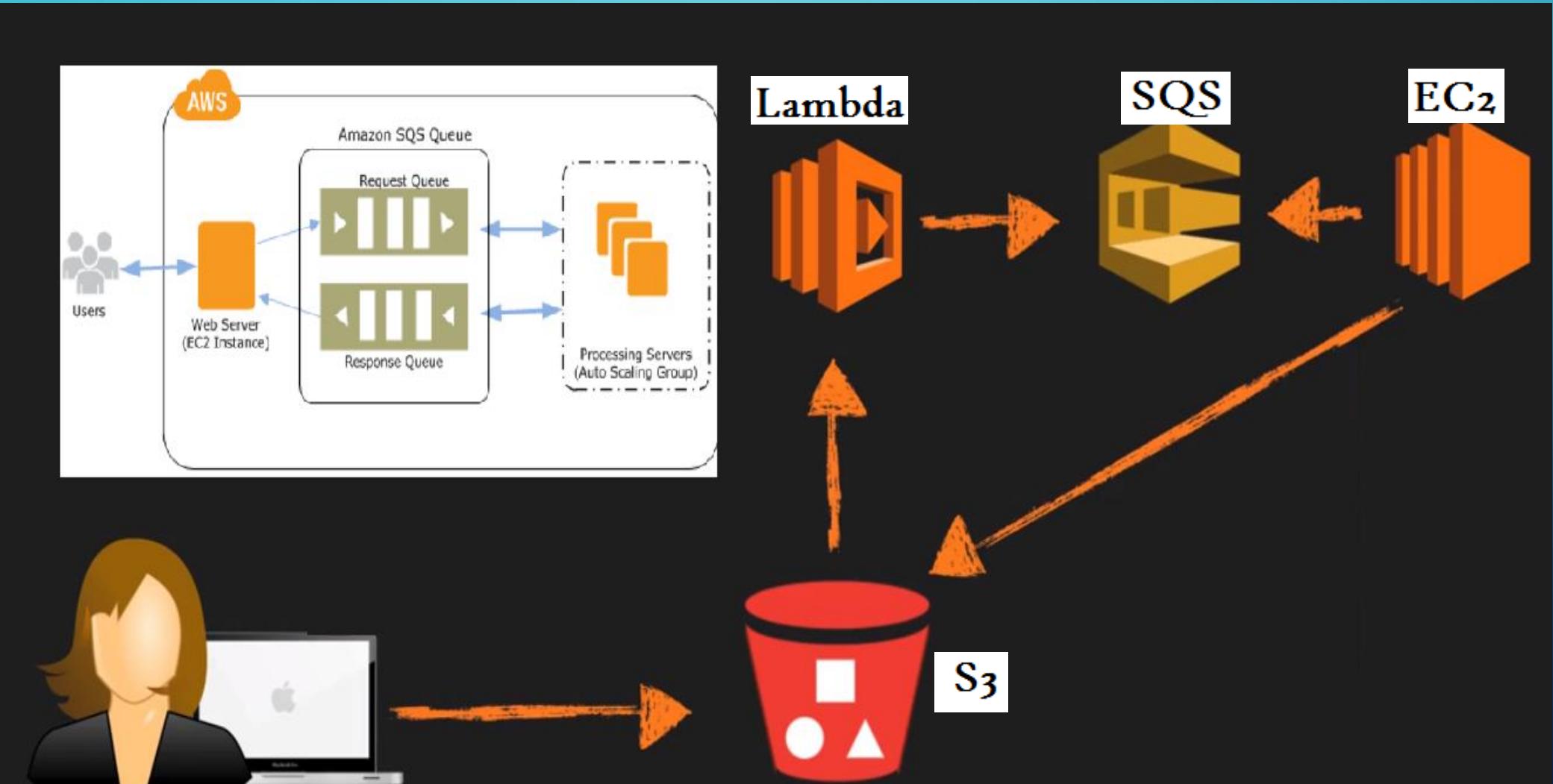
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1. SQS (PULL BASED)

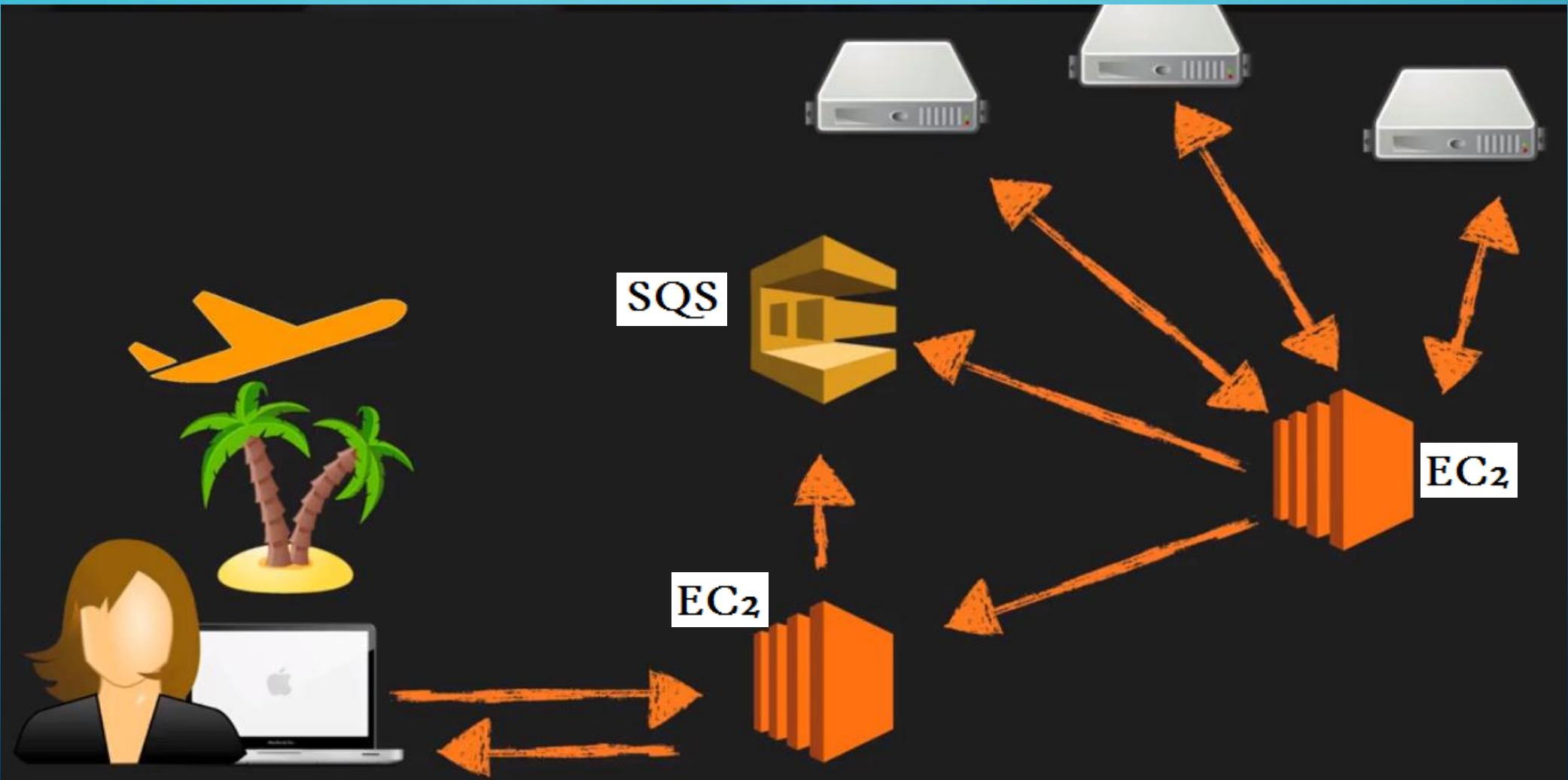
Amazon SQS is a web service that gives you access to a message queue that can be used to store messages while waiting for a computer to process them.

Amazon SQS is a distributed queue system that enables web service applications to quickly and reliably queue messages that one component in the application generates to be consumed by another component. A queue is a temporary repository for messages that are awaiting processing.

SQS FLOW



SQS – TRAVEL WEBSITE EXAMPLE



WHAT IS SQS?

The queue acts as a buffer between the component producing and saving data, and the component receiving the data for processing. This means the queue resolves issues that arise if the producer is producing work faster than the consumer can process it, or if the producer or consumer are only intermittently connected to the network.

SQS - KEYPOINTS

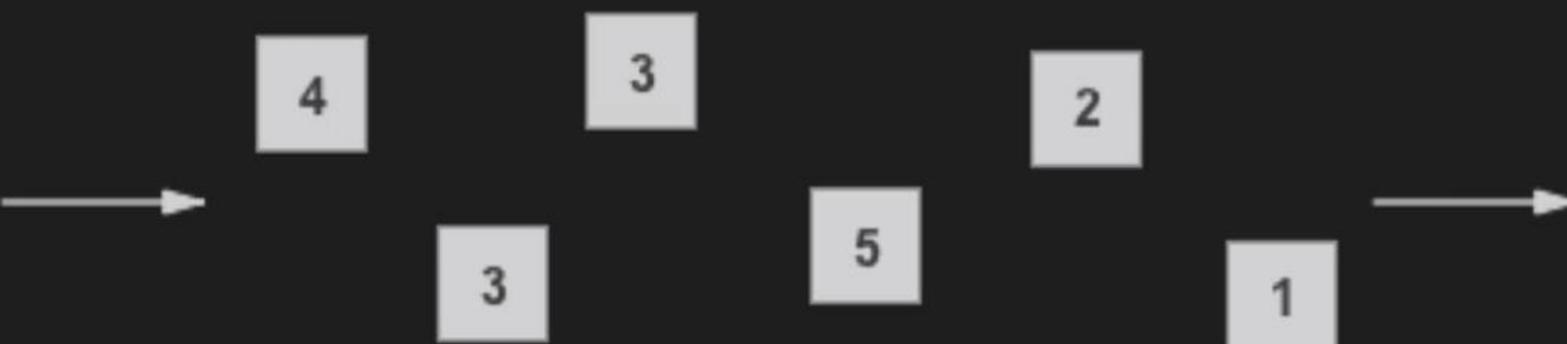
- SQS is pull based, not pushed base
- Messages are 256 KB in size
- Messages can be kept in the queue from 1 minute to 14 days. The default is 4 days.
- Visibility Time Out is the amount of time that the message is invisible in the SQS queue after a reader picks up that message. Provided the job is processed before the visibility time out expires, the message will then be deleted from the queue. If the job is not processed within that time, the message will become visible again and another reader will process it. This could result in the same message being delivered twice.
- Visibility time out maximum is 12 hours

CONTIN...

- SQS guarantees that your messages will be processed at least once.
- Amazon SQS long polling is a way to retrieve messages from your Amazon SQS queues. While the regular short polling returns immediately, even if the message queue being polled is empty, long polling doesn't return a response until a message arrives in the message queue, or the long poll times out.

SQS – QUEUE TYPES – 1. STANDARD & 2. FIFO

Amazon SQS offers standard as the default queue type. A standard queue lets you have a nearly-unlimited number of transactions per second. Standard queues guarantee that a message is delivered at least once. However, occasionally (because of the highly-distributed architecture that allows high throughput), more than one copy of a message might be delivered out of order. Standard queues provide best-effort ordering which ensures that messages are generally delivered in the same order as they are sent.



FIFO QUEUE

The FIFO queue complements the standard queue. The most important features of this queue type are FIFO (first-in-first-out) delivery and exactly-once processing: The order in which messages are sent and received is strictly preserved and a message is delivered once and remains available until a consumer processes and deletes it; duplicates are not introduced into the queue. FIFO queues also support message groups that allow multiple ordered message groups within a single queue. FIFO queues are limited to 300 transactions per second (TPS), but have all the capabilities of standard queues.



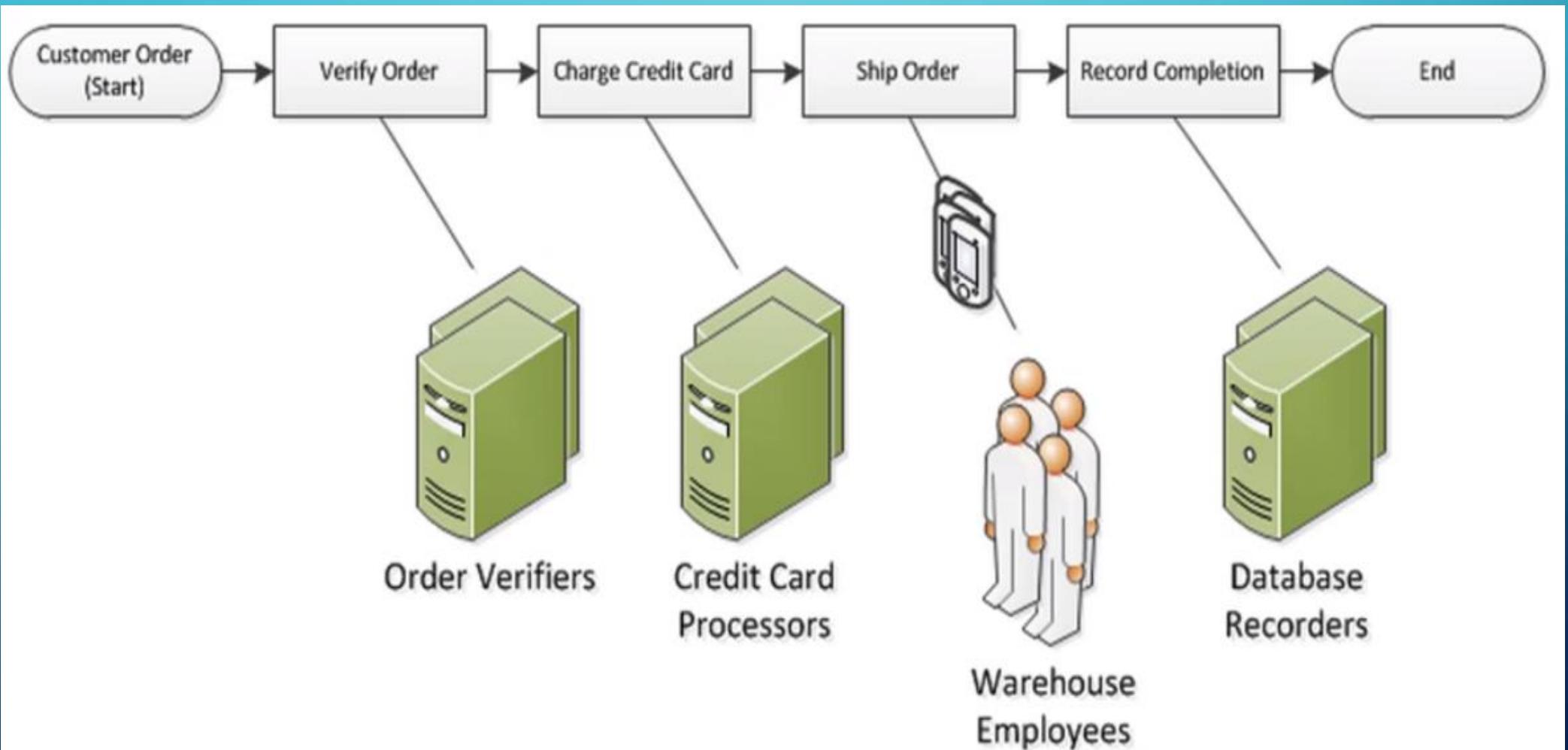
SIMPLE WORKFLOW SERVICE

Amazon Simple Workflow Service (Amazon SWF) is a web service that makes it easy to coordinate work across distributed application components. Amazon SWF enables applications for a range of use cases, including media processing, web application back-ends, business process workflows, and analytics pipelines, to be designed as a coordination of tasks.



Tasks represent invocations of various processing steps in an application which can be performed by executable code, web service calls, human actions, and scripts.

EXAMPLE



SWF – WORKERS & DECIDER

- Workers :
- Workers are programs that interact with Amazon SWF to get tasks, process received tasks, return the results.
- Decider :
- The decider is a program that controls the coordination of task, i.e. their ordering, concurrency, and
- scheduling accordingly to the application logic.

SWF – WORKERS AND DECIDER

The workers and the decider can run on cloud infrastructure, such as Amazon EC2, or on machines behind firewalls. Amazon SWF brokers the interactions between workers and the decider. It allows the decider to get consistent views into the progress of tasks and to initiate new tasks in an ongoing manner.

At the same time, Amazon SWF stores tasks, assigns them to workers when they are ready, and monitors their progress. It ensures that a task is assigned only once and is never duplicated. Since Amazon SWF maintains the application's state durably, workers and deciders don't have to keep track of execution state. They can run independently, and scale quickly.

SWF - DOMAINS

Your workflow and activity types and the workflow execution itself are all scoped to a domain. Domains isolate a set of types, executions, and task lists from others within the same account.

You can register a domain by using the AWS Management Console or by using the `RegisterDomain` action in the Amazon SWF API.

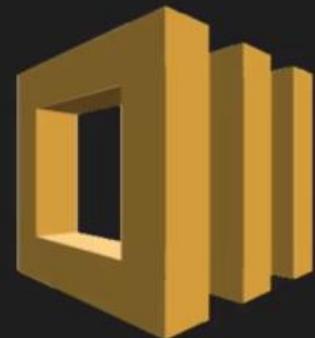


HOW LONG FOR WORKFLOWS?

MAXIMUM WORKFLOW CAN BE 1 YEAR AND THE VALUE IS ALWAYS MEASURED IN SECONDS
SQL IS 12 HRS

The parameters are specified in JavaScript Object Notation (JSON) format.

<https://swf.us-east-1.amazonaws.com>
RegisterDomain
{
 "name" : "867530901",
 "description" : "music",
 "workflowExecutionRetentionPeriodInDays" : "60"
}



SWF VS SQS

- Amazon SWF presents a task-oriented API, whereas Amazon SQS offers a message-oriented API.
- Amazon SWF ensures that a task is assigned only once and is never duplicated. With Amazon SQS, you need to handle duplicated messages and may also need to ensure that a message is processed only once.
- Amazon SWF keeps track of all the tasks and events in an application. With Amazon SQS, you need to implement your own application-level tracking, especially if your application uses multiple queues.



SNS – SIMPLE NOTIFICATION SERVICE

Amazon Simple Notification Service (Amazon SNS) is a web service that makes it easy to set up, operate, and send notifications from the cloud.



It provides developers with a highly scalable, flexible, and cost-effective capability to publish messages from an application and immediately deliver them to subscribers or other applications.

SNS

PUSH NOTIFICATIONS TO APPLE, GOOGLE, FIRE OS, AND WINDOWS DEVICES, AS WELL AS ANDROID DEVICES IN CHINA WITH BAIDU CLOUD PUSH

Besides pushing cloud notifications directly to mobile devices, Amazon SNS can also deliver notifications by SMS text message or email, to Amazon Simple Queue Service (SQS) queues, or to any HTTP endpoint.



To prevent messages from being lost, all messages published to Amazon SNS are stored redundantly across multiple availability zones.

SNS - TOPICS

SNS allows you to group multiple recipients using topics. A topic is an “access point” for allowing recipients to dynamically subscribe for identical copies of the same notification.

One topic can support deliveries to multiple endpoint types -- for example, you can group together iOS, Android and SMS recipients. When you publish once to a topic, SNS delivers appropriately formatted copies of your message to each subscriber.



SNS - BENEFITS

- Instantaneous, push-based delivery (no polling)
- Simple APIs and easy integration with applications
- Flexible message delivery over multiple transport protocols
- Inexpensive, pay-as-you-go model with no up-front costs
- Web-based AWS Management Console offers the simplicity of a point-and-click interface



SNS VS SQS

- Both Messaging Services in AWS
- SNS - Push
- SQS - Polls (Pulls)



SNS - PRICING

- Users pay \$0.50 per 1 million Amazon SNS Requests
- \$0.06 per 100,000 Notification deliveries over HTTP
- \$0.75 per 100 Notification deliveries over SMS
- \$2.00 per 100,000 Notification deliveries over Email



ELASTIC TRANSCODER

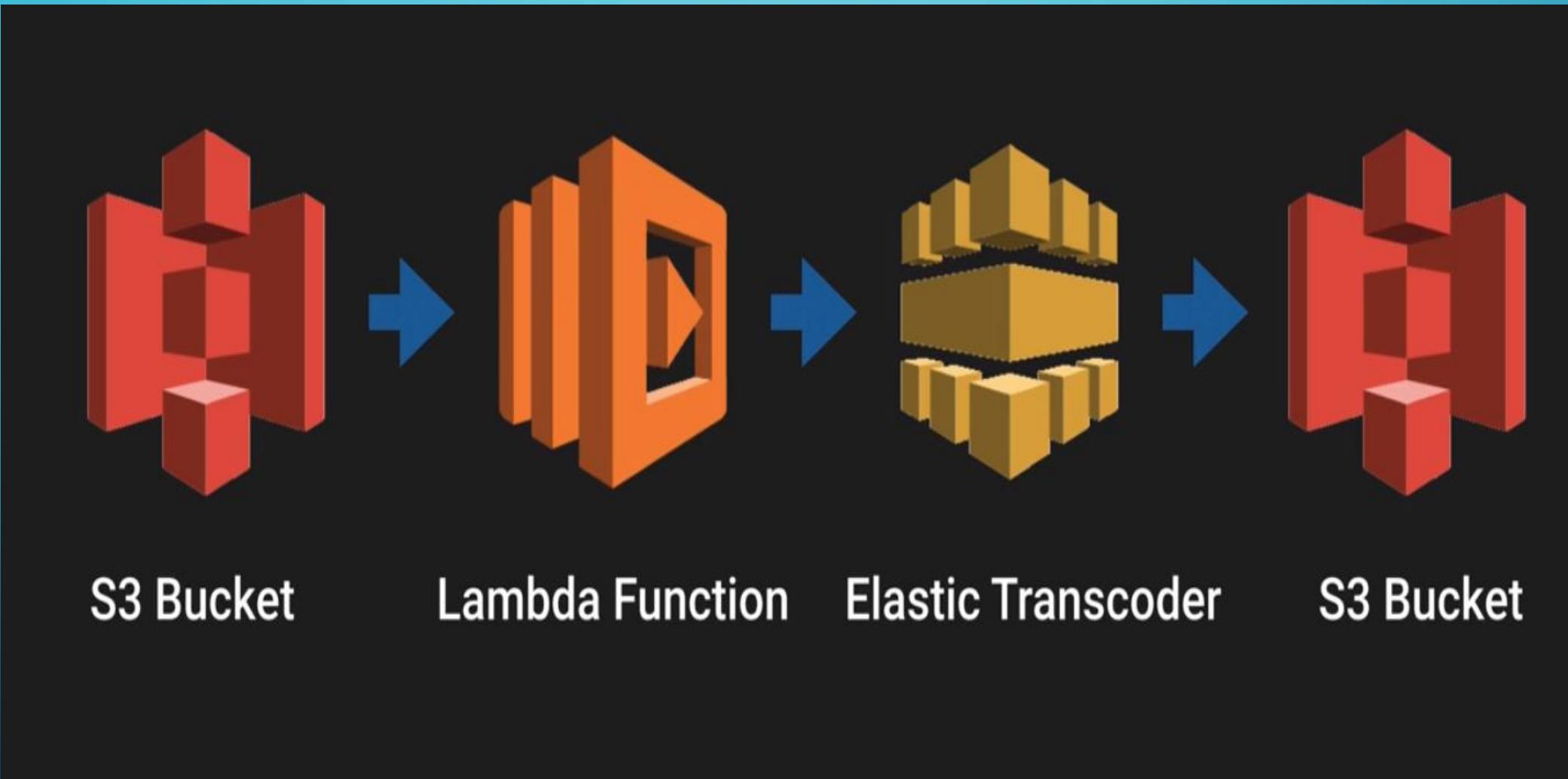
Media Transcoder in the cloud.

Convert media files from their original source format in to different formats that will play on smartphones, tablets, PC's etc.

Provides transcoding presets for popular output formats, which means that you don't need to guess about which settings work best on particular devices.

Pay based on the minutes that you transcode and the resolution at which you transcode.

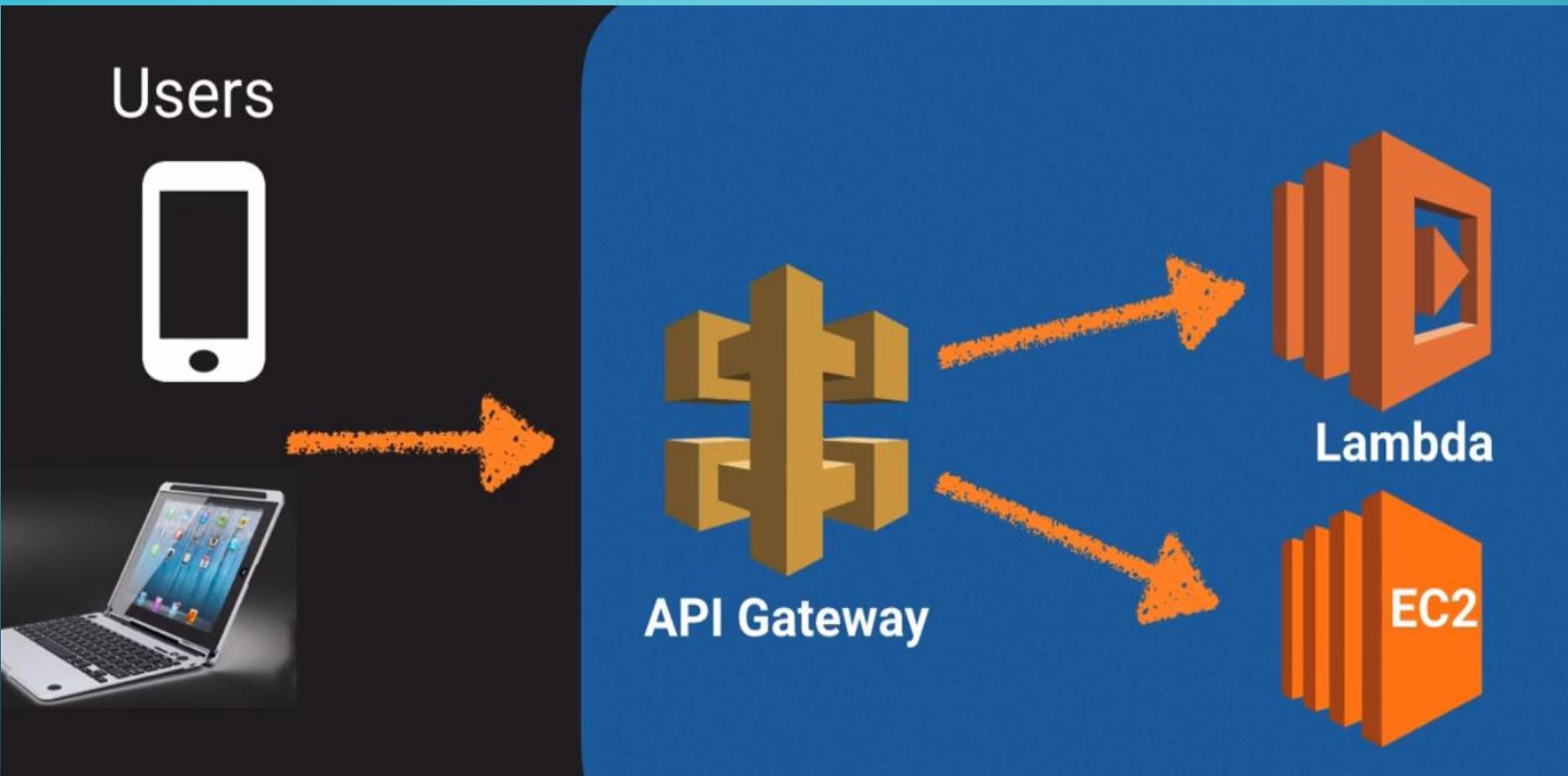
USEAGE OF ELASTIC TRANSCODER



API GATEWAY

Amazon API Gateway is a fully managed service that makes it easy for developers to publish, maintain, monitor, and secure APIs at any scale. With a few clicks in the AWS Management Console, you can create an API that acts as a “front door” for applications to access data, business logic, or functionality from your back-end services, such as applications running on Amazon Elastic Compute Cloud (Amazon EC2), code running on AWS Lambda, or any web application.

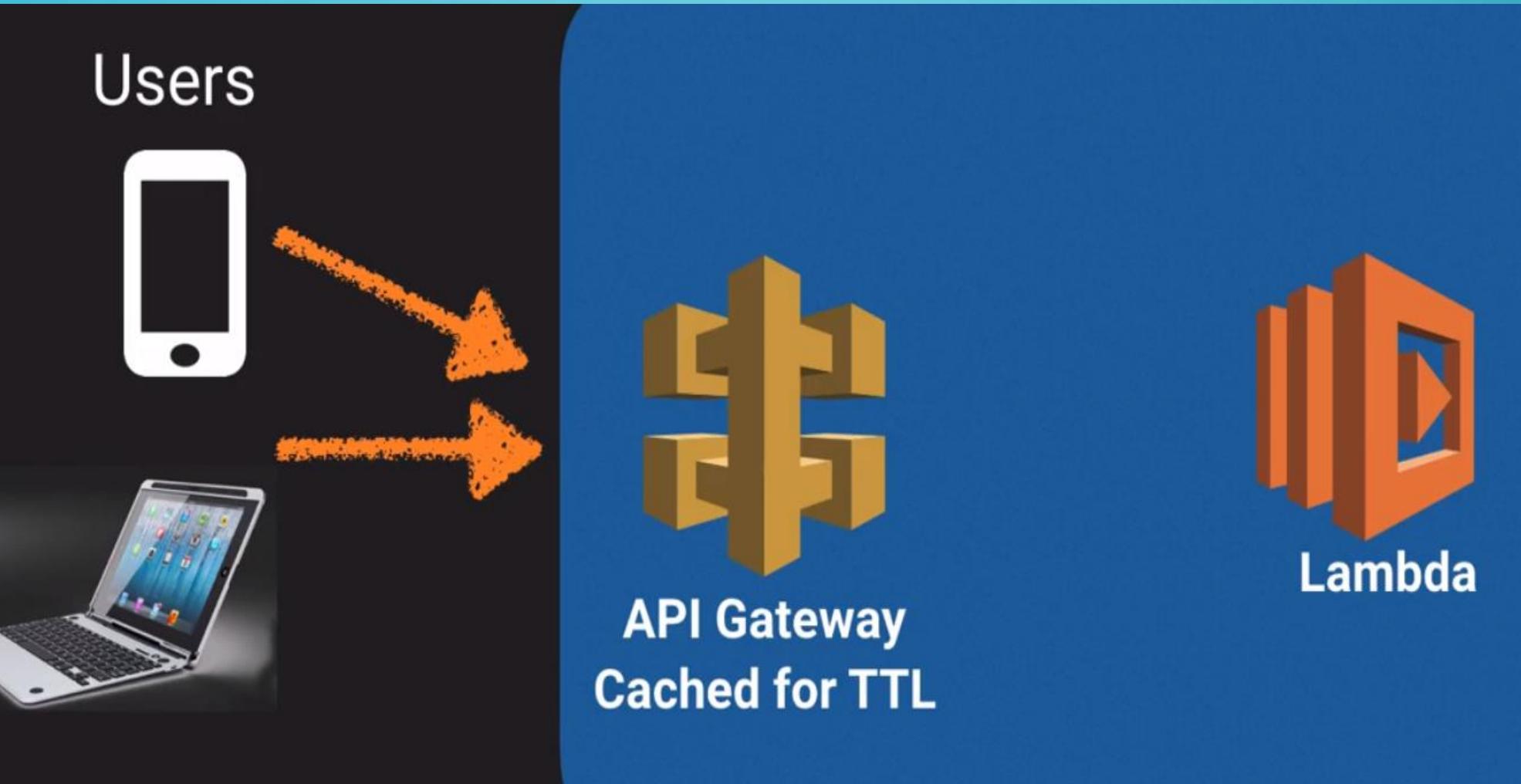
EXAMPLE API GATEWAY FLOW



WHAT IS API CACHING?

You can enable API caching in Amazon API Gateway to cache your endpoint's response. With caching, you can reduce the number of calls made to your endpoint and also improve the latency of the requests to your API. When you enable caching for a stage, API Gateway caches responses from your endpoint for a specified time-to-live (TTL) period, in seconds. API Gateway then responds to the request by looking up the endpoint response from the cache instead of making a request to your endpoint.

API GATEWAY CACHING



- What can API Gateway Do?

- Low Cost & Efficient
- Scales Effortlessly
- You can throttle Requests to prevent attacks

- Origin Policy :

- In computing, the same-origin policy is an important concept in the web application security model.
- Under the policy, a web browser permits scripts contained in a first web page to access data in a second web page, but only if both web pages have the same origin

CROSS-ORIGIN RESOURCE SHARING(CORS)

CORS is one way the server at the other end (not the client code in the browser) can relax the same-origin policy.

Cross-origin resource sharing (CORS) is a mechanism that allows restricted resources (e.g. fonts) on a web page to be requested from another domain outside the domain from which the first resource was served.

Error - “Origin policy cannot be read at the remote resource?”. You need to enable CORS on API Gateway.

API – GATEWAY EXAM TIPS

- Remember what API Gateway is at a high level
- API Gateway has caching capabilities to increase performance
- API Gateway is low cost and scales automatically
- You can throttle API Gateway to prevent attacks
- You can log results to CloudWatch
- If you are using Javascript/AJAX that uses multiple domains with API Gateway, ensure that you have enabled CORS on API Gateway

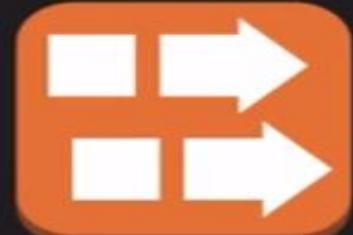
KINESIS - WHAT IS STREAMING?

Streaming Data is data that is generated continuously by thousands of data sources, which typically send in the data records simultaneously, and in small sizes (order of Kilobytes).

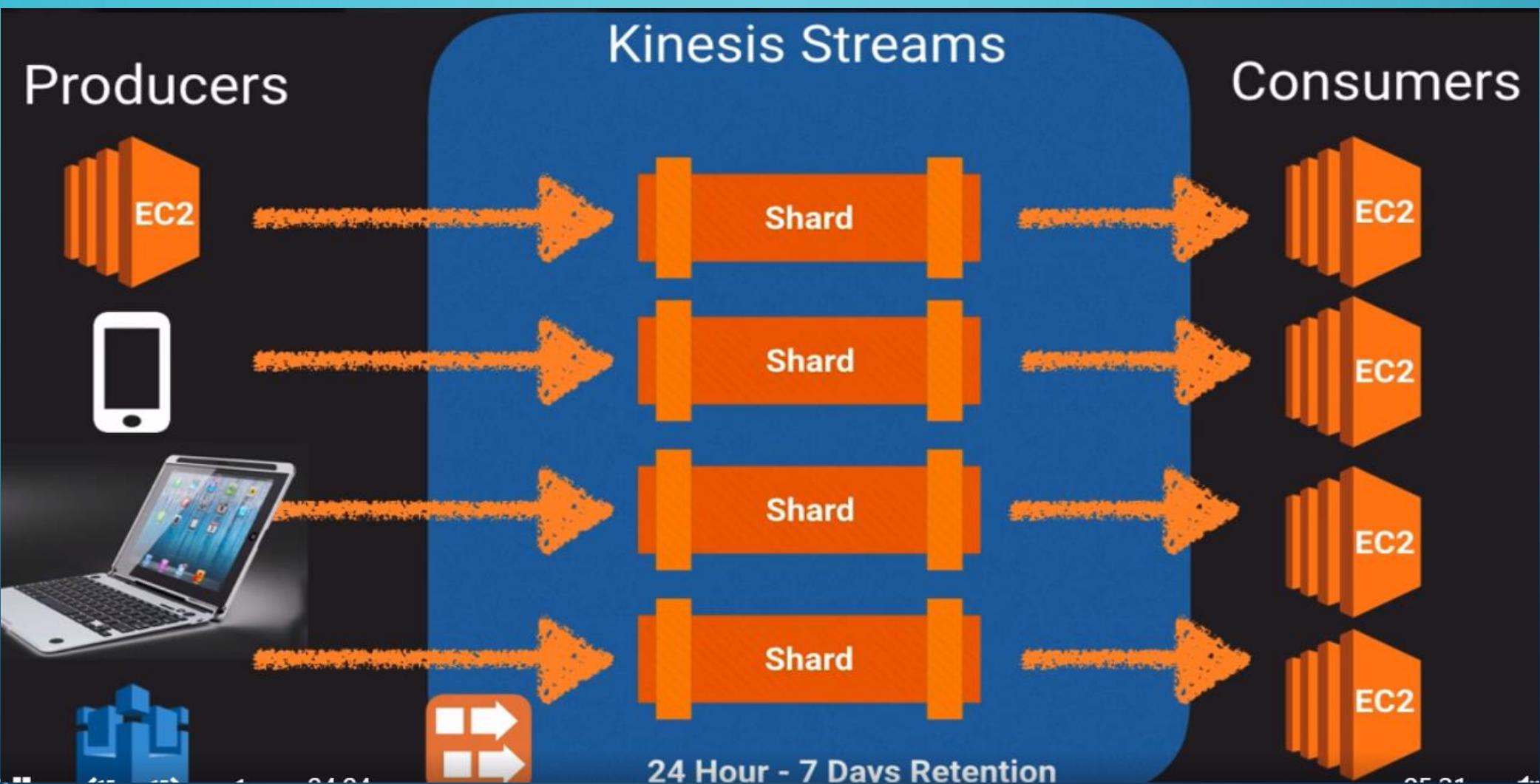
- Purchases from online stores (think amazon.com)
- Stock Prices
- Game data (as the gamer plays)
- Social network data
- Geospatial data (think uber.com)
- IoT sensor data

KINNESSI CORE SERVICES

- Kinesis Streams
- Kinesis Firehose
- Kinesis Analytics



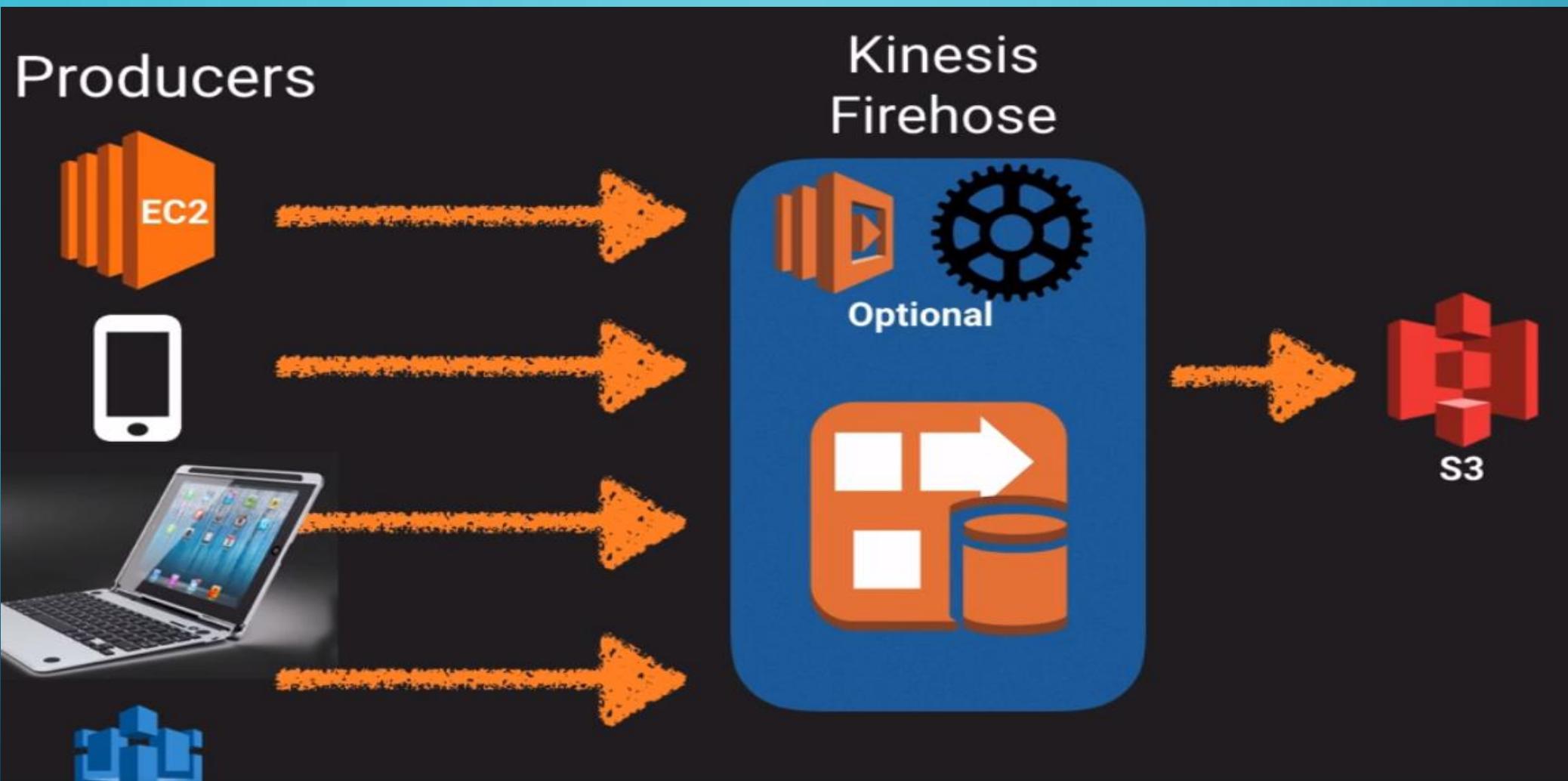
KINESIS STREAMS



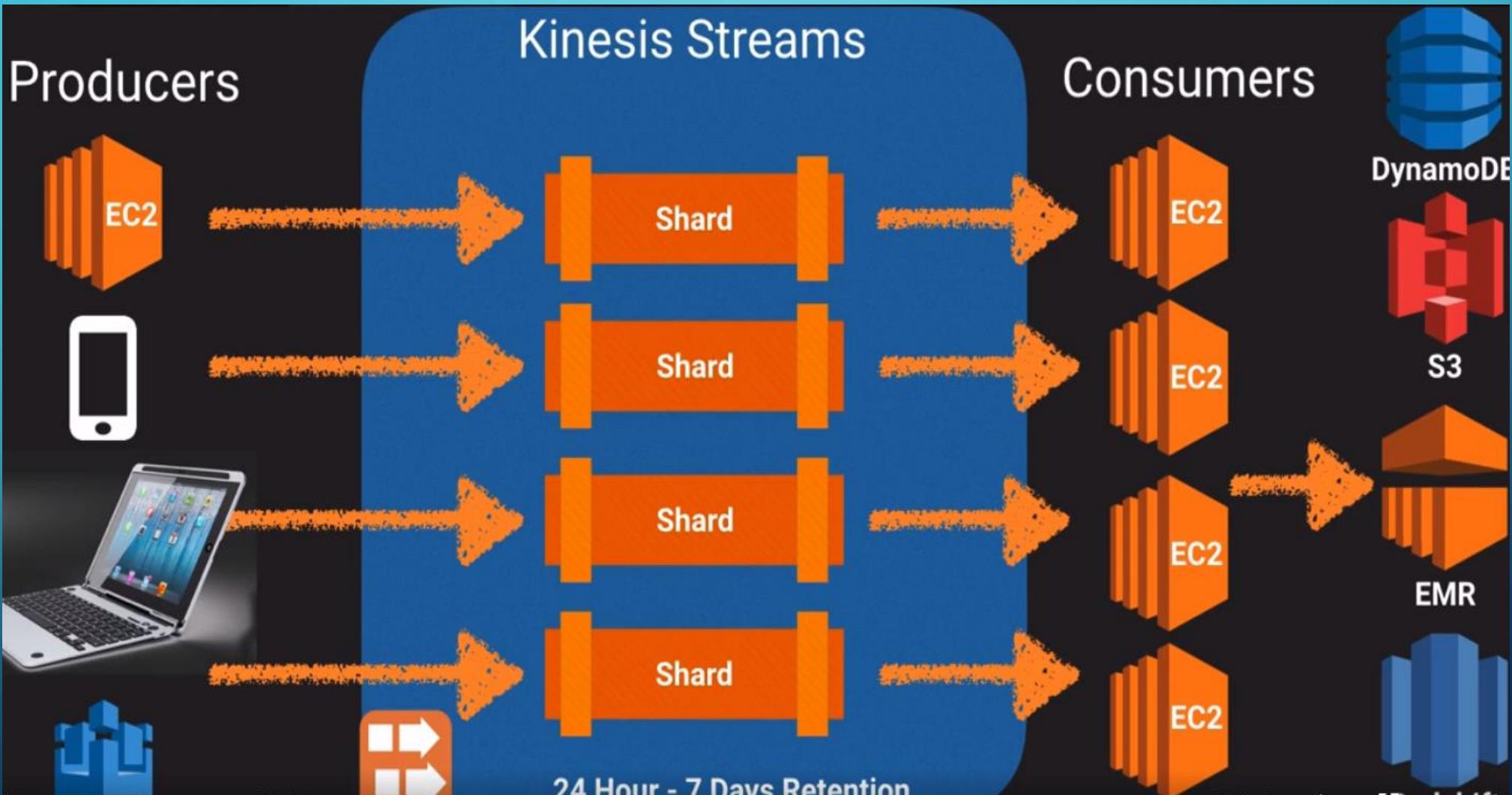
KINESIS STREAMING

- Kinesis Streams consist of shards
 - 5 transactions per second for reads, up to a maximum total data read rate of 2 MB per second and up to 1,000 records per second for writes, up to a maximum total data write rate of 1 MB per second (including partition keys).
 - The data capacity of your stream is a function of the number of shards that you specify for the stream. The total capacity of the stream is the sum of the capacities of its shards.

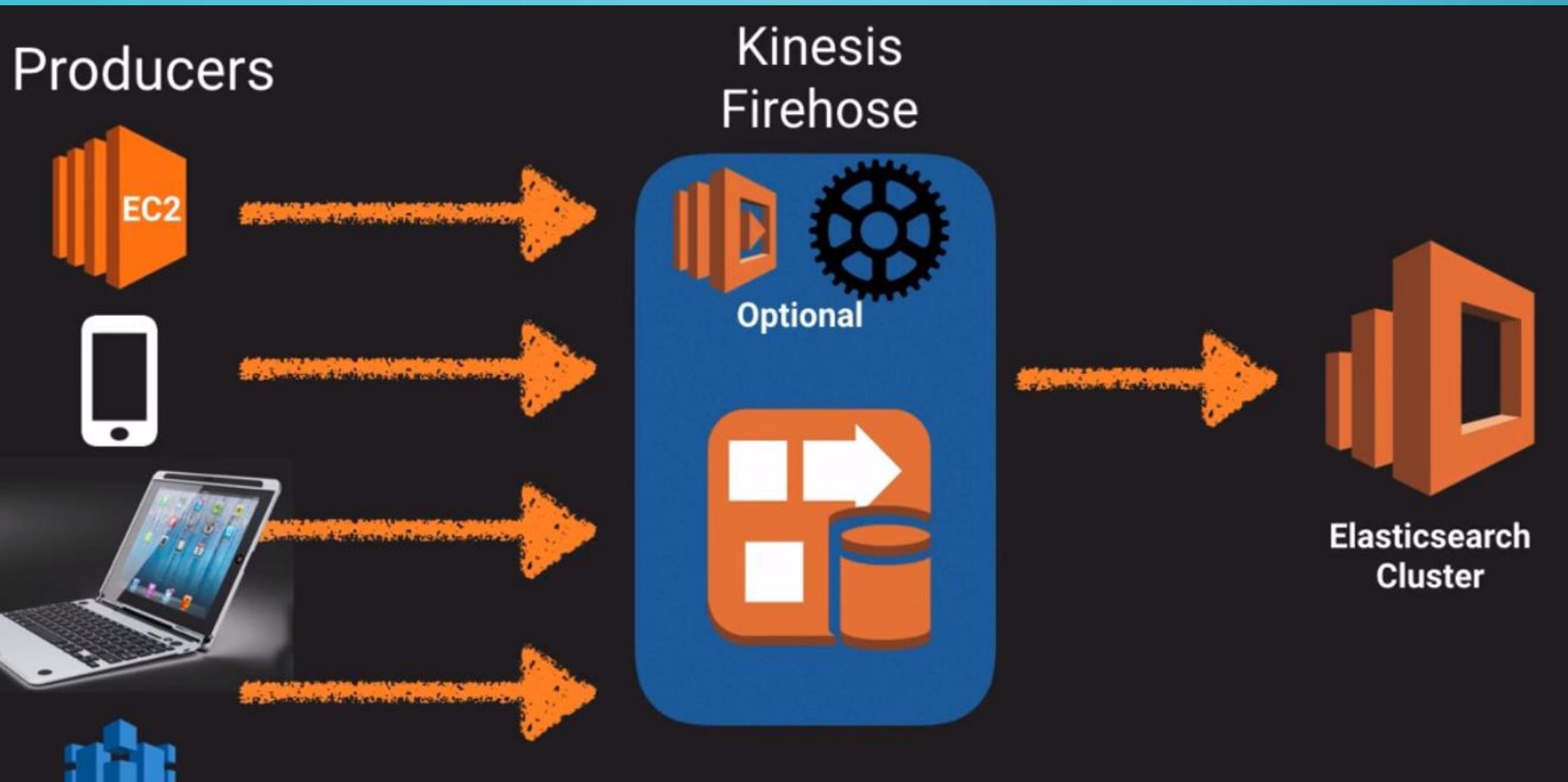
KINESIS STREAMS WITH S3



KINESIS WITH DYNAMODB, S3, EMR & REDSHIFT



KINESIS FIREHOSE WITH ELASTICSEARCH CLUSTER



KINESIS ANALYTICS

